

പതിനഞ്ചാം കേരള നിയമസഭ

പന്ത്രണ്ടാം സമ്മേളനം

നക്ഷത്രചിഹ്നമിടാത്ത ചോദ്യം നം.717

08.10.2024 ൽ മറുപടി നൽകേണ്ടിയിരുന്നത്

സ്മാർട്ട് സിറ്റിയുടെ ഭാഗമായുള്ള സോളാർ പവർ പ്ലാന്റിന്റെ സ്ഥാപനം

ചോദ്യം	മറുപടി
ശ്രീ. എം. വിൻസെന്റ്	ശ്രീ. കെ. കൃഷ്ണൻകുട്ടി (വൈദ്യുതി വകുപ്പു മന്ത്രി)
(എ) സ്മാർട്ട് സിറ്റി പദ്ധതിയുടെ ഭാഗമായി തിരുവനന്തപുരം ട്രൈറ്റാനിയത്തിൽ എത്ര മെഗാവാട്ട് സോളാർ പവർ പ്ലാന്റ് സ്ഥാപിക്കുന്നതിനായി ടെൻഡർ ക്ഷണിച്ചുവെന്നും, ഏത് കമ്പനിക്കാണ് വർക്ക് ഓർഡർ നൽകിയതെന്നും അറിയിക്കുമോ, പ്രസ്തുത വർക്ക് ഓർഡറിന്റെ പകർപ്പ് ലഭ്യമാക്കാമോ;	(എ) സ്മാർട്ട് സിറ്റി പദ്ധതിയുടെ ഭാഗമായി തിരുവനന്തപുരം ട്രൈറ്റാനിയത്തിൽ 2 മെഗാവാട്ട് സോളാർ പവർ പ്ലാന്റ് സ്ഥാപിക്കുന്നതിനായി ടെൻഡർ ക്ഷണിച്ചു, M/s. Enerture Technologies Pvt. Ltd. എന്ന കമ്പനിക്കാണ് വർക്ക് ഓർഡർ നൽകിയത്. പ്രസ്തുത വർക്ക് ഓർഡറിന്റെ പകർപ്പ് അനുബന്ധം (1) ആയി ചേർക്കുന്നു.
(ബി) പ്രസ്തുത ടെൻഡറുമായി ബന്ധപ്പെട്ട നോട്ട് ഫയലിന്റെയും കറസ്പോണ്ടൻസ് ഫയലിന്റെയും പകർപ്പുകൾ ലഭ്യമാക്കാമോ;	(ബി) പ്രസ്തുത ടെൻഡറുമായി ബന്ധപ്പെട്ട നോട്ട് ഫയലിന്റെയും കറസ്പോണ്ടൻസ് ഫയലിന്റെയും പകർപ്പുകൾ അനുബന്ധം (2) ആയി ചേർക്കുന്നു.
(സി) ടെൻഡർ ലഭിച്ച കമ്പനി അനൈർട്ടിൽ ആദ്യം സമർപ്പിച്ച ബാങ്ക് ഗ്യാരന്റിയുടെ പകർപ്പ് ലഭ്യമാക്കാമോ, ഇതുമായി ബന്ധപ്പെട്ട് പ്രസ്തുത ബാങ്കിലേക്ക് അയച്ച കത്തുകളും ബാങ്കിന്റെ മറുപടി കത്തുകളും ലഭ്യമാക്കാമോ;	(സി) പകർപ്പുകൾ അനുബന്ധം (3) ആയി ചേർക്കുന്നു.
(ഡി) സ്മാർട്ട് സിറ്റി പദ്ധതിയുടെ ഭാഗമായി നാളിതുവരെ എത്ര തുകയുടെ സോളാർ പദ്ധതി നടപ്പാക്കി കഴിഞ്ഞുവെന്നും, ഇതിൽ സംസ്ഥാന വിഹിതം, കേന്ദ്ര വിഹിതം എന്നിവ എത്രയെന്നും വിശദമാക്കുമോ?	(ഡി) സ്മാർട്ട് സിറ്റി പദ്ധതിയുടെ ഭാഗമായി അനൈർട്ട് നാളിതുവരെ 101,79,64,980.64 രൂപയുടെ സോളാർ പദ്ധതി നടപ്പിലാക്കി വരുന്നു. സ്മാർട്ട് സിറ്റിയുടെ ഫണ്ട് ഉപയോഗിച്ചുകൊണ്ട് അനൈർട്ട് പ്രൊജക്ട് മാനേജ്മെന്റ് കൺസൾട്ടന്സി ആയാണ് ഈ പദ്ധതി നടപ്പിലാക്കിയത്. സ്മാർട്ട്

സിറ്റി പദ്ധതി തുക 50:50 അനുപാതത്തിൽ
കേന്ദ്ര-സംസ്ഥാന ഗവൺമെന്റുകൾ
ലഭ്യമാക്കിയിട്ടുള്ളതാണ്. ഓരോ പ്രവൃത്തിക്കും
കേന്ദ്ര-സംസ്ഥാന വിഹിതമായി ചെലവ് ബുക്ക്
ചെയ്യാറില്ല.



സെക്ഷൻ ഓഫീസർ



അനേർട്ട്
ANERT

Agency for New and renewable Energy Research and Technology
നവീനവും പുനരുപയോഗയോഗ്യമായ ഊർജ്ജ ഗവേഷണങ്ങൾക്കും സാങ്കേതിക വിദ്യകൾക്കുമുള്ള ഏജൻസി
DEPARTMENT OF POWER, GOVERNMENT OF KERALA
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No. ANERT-TECH/99/2022-PE2(RTS)

16-05-2023

To

M/s Enerture Technologies Pvt Ltd
ABL Workspaces, Celebration Gardens NH 8,
next to Shiv Murti, Mahipalpur,
New Delhi-110037

WORK ORDER

Sir,

Sub: ANERT – Work Order for the Design, Engineering, Manufacture, Supply, Testing, Energisation of plant and Commissioning of the 2 MWp Grid connected Solar Power Plant including 10 years warranty from Commercial Operation Date (COD) at Travancore Titanium Products Ltd., Kochuveli, Thiruvananthapuram, under Solar City Project funded by Smart City Thiruvananthapuram Ltd - reg

Ref: 1: Tender ID: 2023_ANERT_571678_1
2: Your Bid No. 1540957 dtd 01/05/2023

Attention is invited to the references cited. Your offer for the Design, Engineering, Manufacture, Supply, Storage, Erection, Testing, Electrical Inspectorate certification for Energisation of plant and associated electrical works, Commissioning of the 2 MWp Grid connected Solar Power Plant including 10 years warranty from Commercial Operation Date (COD) at Travancore Titanium Products Ltd., Kochuveli, Thiruvananthapuram is accepted. You are requested to carry out the work as detailed below subject to the following terms and conditions.

SN	Site of Installation	Rate	Capacity (kW)	Total
Travancore Titanium Products Ltd., Kochuveli, Thiruvananthapuram				
1	Ground Mounted Solar	55,182	1500	8,27,73,000
2	Roof Top Solar	56,320	500	2,81,60,000
TOTAL			2000	11,09,33,000 /-

Rupees Eleven Crores Nine Lakh Thirty-Three Thousand only

A tripartite agreement has to be executed by you in the prescribed form (enclosed as Annexure - I) on Kerala Stamp paper as per the Kerala Government order - G.O.(P) No.113/2019/TD dtd 24/07/2019 (One rupee for every Rs 1000 or part thereof on the contract amount, subject to a minimum of rupees 200 and a maximum of rupees one lakh) within 7 days of the receipt of this work order for the fulfilment of the contract along with a security deposit of **Rs. 33,27,990/- (Rupees Thirty-Three Lakh Twenty-Seven Thousand Nine Hundred & Ninety only)** being the 3% of contract value of **Rs. 11,09,33,000/-** on Demand Draft/Bank Guarantee/NEFT transfer in favour of CEO, ANERT. You have to pay all expenses incidental to the execution of the above agreement. Another agreement must be provided before the start of the O&M period upon issue of separate work order and the formats shall be provided during the commissioning of the SPV Power Plant.

1. SCOPE OF WORKS

The Works to be performed by the contractor shall include but not limited to

- a. Works of any kind necessary for the due and satisfactory construction, completion and maintenance of the works to the intent and meaning of the drawings adopted, technical specifications, to best Engineering standards and orders that may be issued by the Engineer from time to time, compliance by the agency with all Conditions of Contract,
- b. Design, Manufacture, Supply, Installation, Testing and Commissioning of 2 MWp Grid connected SPV power plants. All the necessary approvals from KSEBL/Electrical Inspectorate, feasibility study, necessary civil work, Mounting of Module Structures, PV Module Installation, Inverter Installation, DC/AC Cabling and interconnections, Installation of Lightning Arresters and Earthing System as per the standards, Arranging all the necessary inspections from KSEBL/Electrical Inspectorate/ANERT District Office as part of Pre-Commissioning, if any, Commissioning of the PV Power Plant along with warranty and Operation and Maintenance (O&M) of the project under CAPEX model for 10 years after Commercial Operation Date (COD)
- c. Liasoning with KSEBL for grid connectivity, Electrical Inspectorate certification for Energization of plant and associated electrical, Complete Design, Engineering, Manufacture, Supply, Storage, works excluding foundation works for MMS, Erection, Testing & Commissioning of the 2 MWp Grid connected Solar PV Power Plant for 10 years after Commercial Operation Date (COD).

2. SCHEDULE OF WORKS:

- i. The items should be delivered and installed at the Ground / Roof tops within Travancore Titanium Products Ltd as specified by ANERT/TTPL authorities, under prior intimation and supervision. The contractor to finalise the buildings/ground area and within the campus with permission of the TTPL authorities and prior approval from ANERT for installation of the above capacity
- ii. If the successful bidder fails to deliver the materials within the days mentioned below, the order stands cancelled and ANERT will award the work to the next bidder and penalty as decided by ANERT will be levied.

SN	Material Delivery (Days)	Completion Period (Days)
1	25	45

- iii. The detailed Engineering drawings as mentioned in the tender also be submitted prior to start of works. The rates mentioned above is inclusive of all additional works required for the successful commissioning of the power plant and no request for enhancement of rates will be entertained.
- iv. Supply of the SPV module must be from the ALMM list issued by MNRE from time to time. It is required to use Mono PERC Half cut cells – 500 Wp or above for the works. The Solar PCU and charge controller should meet the General and Technical specifications as mentioned in the tender.
- v. The agency shall submit the timeline for completion along with the agreement and security deposit. This timeline must be followed and no extension of time for completing the installation will be granted. Although, time extension may be granted for things beyond the control of your agency.
- vi. The detailed Bill of Materials along with datasheets & Test certificates of PV Modules (Mono PERC), Grid Tie Inverter etc must be provided well in advance and must be approved by ANERT before material despatch. ANERT reserves the right to reject the materials if the same are not in compliance with the requirements of the tender. In case, the successful bidder delivers the materials without BoM approval, they may have to take back the materials at their own cost and no time extension without penalty will be provided for completion of works.
- vii. The Supply, Installation and Commissioning of the Power Plant must be completed within the timeline mentioned above. This is the time period for handing over the system to ANERT with Grid connectivity.
- viii. In case of no valid reason, extension of time of completion that can be granted at a time shall will be 25% of the original time. The maximum extension that can be granted for a work shall be limited to half the original time of completion.

- ix. When the contract period has to be extended wholly or partly due to default on the part of the bidder, the Agreement Authority may sanction extension of time after imposing fine as mentioned below;

Period	Rate of Fine
First Extension	1% of the work order amount subject to a minimum of Rs. 1000/- and maximum of Rs. 50,000/-.
Second Extension	2% of the work order amount subject to a minimum of Rs. 2000/- and maximum of Rs. 1,00,000/-

- x. Penalty for delay in supply and installation will be imposed at 0.5 % per week up to a maximum 10%. In case of delay in supply and installation, CEO, ANERT may cancel the contract and take recourse to other action as deemed appropriate.

3. INSTALLATION

- i. The Design, Engineering, Manufacture, Supply, Installation, Testing and Performance of the equipment shall be in accordance with latest appropriate IEC/Indian Standards as detailed in the tender document. Where appropriate Indian Standards and Codes are not available, other suitable standards and codes as approved by the MNRE / authorised Government agency shall be used.
- ii. Any supplies which have not been specifically mentioned in this Contract but which are necessary for the design, engineering, manufacture, supply & performance or completeness of the project shall be provided by the Bidder without any extra cost and within the time schedule for efficient and smooth operation and maintenance of the SPV plant. The installation work of the solar power plant must be in compliance with the Technical Requirements and Standards as mentioned in the Tender.
- iii. A display board with contents to be provided by the concerned official at ANERT is to be placed at the site.
- iv. The vendor is to bear the fee for KSEBL feasibility, Registration and all other expenses along with additional costs for site specific cabling works, earthing, mounting structure modifications, Electrical panel modification, access ladders, pathway facility in case required are also under the scope of the vendor. The scope of enhancing load, phase conversion wherever necessary is also under the scope.
- v. In case the installations require the replacement of CTs (Class 0.2s), PT (Class 0.2) of rating for commissioning of the power plant, it is under the scope of the vendor. The rates for Supply of tested transformers & Replacement at the site of these items are under the vendor scope.
- vi. Any other work required for the successful commissioning of the power plant

which are not mentioned in this document and are required as per prevailing laws & regulations in the country

4. PAYMENT

4.1 No advance payment will be given. All the documents submitted should be certified by the concerned personnel of ANERT.

4.2 The terms of payment shall be:

4.2.1 EPC Payment

- i. Upon delivery of major components (PV Modules, Inverter etc) at the site/warehouse, a maximum of 60% of the contract value can be released through Running Accounts Bills of min 10% of the contract value. The supplier shall submit the part invoice for the materials (including serial numbers and delivery chalan) for the materials duly certified by the concerned District Office along with a report regarding the supply of materials. Each RAB shall be accompanied with an item wise statement of work completion with qty, rate & the actual expenditure incurred audited by a Chartered Accountant.
- ii. On completion of installation of the power plant, a maximum of 20% of the contract value can be released as Running Account Bills of min 10% of the contract value. The supplier shall submit the invoice for the materials supplied and all documents related including the Project Completion Report to the completion of the work certified by the district office shall be submitted for the release of the amount. The second part invoice can be raised only after submitting application for energization to the Electrical Inspectorate. Each RAB shall be accompanied with an item wise statement of work completion with qty, rate & the actual expenditure incurred audited by a Chartered Accountant.
- iii. After the Inspection and Approval of the Electrical Inspectorate, 5% of the contract value will be released. All documents related to the completion of the work including commissioning report shall be submitted for the release of the amount.
- iv. The date of Energisation to the Grid by the DISCOM will be considered as the official Date of Commissioning (CoD) of the project and this will be treated as the commissioning of the system. On commissioning of the grid connected system, 5% of the contract value will be released after proving the Performance ratio (AC). The PR report as per standard is to be provided for release of the amount.
- v. The balance 10% shall be retained as performance security and will be released

in five equal parts - 2% after 1 year of operation, 2% after 3 years of operation, 2% after 5 years of operation, 2% after 7 years of operation and last 2% after the 10 years of warranty. For releasing these payment, Performance ratio (AC) shall be proved within a period of 7 consecutive days at the end of each year for release of payment. **The plant shall be handed over at the end of 10 years after commissioning after proving the performance ratio (AC).** This period will be considered only from the date of commissioning.

- vi. The security deposit of 3% furnished along with the contract agreement shall be released on successful completion of supply, installation and commissioning.

4.2.2 Maintenance Payment

- i. The amount shall be released on annual basis after completion of the period of the previous year. The start of maintenance period will be considered from the scheduled date of operation.
- ii. The preventive maintenance reports along with receipt of premium of insurance and generation reports are to be submitted for the release of payments.
- iii. The payment shall be released after the inspection by the authorised personnel of ANERT on annual basis.

- 4.3 Income tax, contribution to workers' welfare fund and other statutory deductions shall be made from the payment as per prevailing norms.

5. REMOTE MONITORING SYSTEM

A dedicated Remote Monitoring System (Hardware and software) for monitoring the plant shall be provided even if the inverter has embedded data logging system. The following weather parameters are to be measured as part of the datalogging system.

a) Solar Irradiance: A Pyranometer/ Solar cell-based irradiation sensor (along with calibration certificate) shall be provided, with the sensor mounted in the plane of the array. Readout shall be integrated with data logging system.

b) Temperature: Integrated temp, sensors for measuring the module surface temp., inverter inside enclosure temp, and ambient temp to be provided complete with readouts integrated with the data logging system.

It is recommended that the following important parameters shall be accessible through the Data Logging Facility.

- a. AC Voltage
- b. AC Output current

- c. Output Power
- d. Energy in kWh
- e. DC Input Voltage
- f. DC Input Current
- g. Temperatures (C)
- h. Invertor Status
- i. Irradiation
- j. Module temperature

Provision for Internet monitoring and download of historical data shall be incorporated. GSM Modem/Wi Fi modem in case GSM connectivity is used or Wireless Router + modem in case Ethernet connection is being used for remote access must be provided. The data is to be transmitted to ANERT server as well as to the Integrated Command and Control Centre (ICCC) developed by Smart City Thiruvananthapuram Ltd. The successful bidder has to undertake all the works required for such deployment including software and arrange for APIs etc.

6. WARRANTY

- i. 10 years' warranty should be provided by the supplier for the system and components or part of the system has to be provided for the Solar Power plant
- ii. The SPV modules used must be warranted for their output peak watt capacity, which should not be less than 90 % at the end of 10 years and 80% at the end of 25 years
- iii. The Warranty Card to be supplied must contain all the details of the system supplied. The OEM warranty card of all the equipment must also be submitted along with the warranty certificate issued in your letter head.

7. OPERATION & MAINTENANCE

- i. The bidder shall be responsible for Operation and Maintenance of the Solar PV system for the 5-year period, during which ANERT will monitor the project for effective performance in line with conditions specified in the bid document. A separate work order will be issued for the O&M part at the rates quoted by the bidder. During this period, the bidder shall be responsible for supply of all spare parts as required from time to time for scheduled and preventive maintenance, major overhauling of the plant, replacement of defective modules, inverters, PCU's etc and maintaining log sheets for operation detail, deployment of staff for continuous operations and qualified engineer for supervision of O&M work, complaint logging & its attending.
- ii. If any Operation & Maintenance issues are not resolved within 2 days, then

complaint may be raised to ANERT, pursuant to which a penalty as decided by CEO, ANERT will be imposed.

- iii. If the outage of the plant is more than 30 days continuously, then the 50% PBG amount shall be encashed by ANERT.
- iv. If the outage is exceedingly more than 60 days than complete PBG amount shall be encashed by ANERT. (This will be applicable till 10 years of O&M)

8. PROJECT INSPECTION

The project progress will be monitored by ANERT and the projects will be inspected for quality at any time during commissioning or after the completion of the project either by officer(s) from ANERT/HFT PFT / SCTL or any authorized agency/ experts.

9. TESTING & COMMISSIONING

- a. The contractor shall provide necessary drawings and documents required by statutory authorities and obtain the approval before taking up erection.
- b. Any modification in the equipment or installation that may be demanded by the inspecting authorities shall be carried out by the contractor at no additional cost to the KSEBL
- c. In accordance with the specific installation instruction as per the manufacturers drawings or as directed by the KSEBL, the successful Bidder shall unload, assemble, erect, install test, commission and hand over all electrical equipments included in this contract after O&M of 10 years.
- d. Erection materials including all consumables, tools, testing instruments or any other equipment required for successful commissioning shall be arranged by the successful Bidder in a timely manner.
- e. All equipment and instruments, indoor and outdoor, shall be marked with No. and provided with danger boards before commissioning.
- f. All Power equipments shall be handled and erected as per the relevant codes of practice and manufacturer's drawings and instruction manuals.
- g. The Contractor, if required shall obtain the temporary Electrical connection for construction purposes and the same has to be dismantled off the premises after completion of erection of plant.

10. PERFORMANCE RATIO TEST (PR TEST)

The Plant should run minimum two weeks without any major equipment failure to start the PR test. The EPC Contractor shall submit two copies of O&M manual with soft copy before the start of PR Test. Depending on the requirement, capacity and

suitable Pyranometer shall be installed at locations suggested by ANERT or else METEONORM data shall be considered for calculating PR.

- i. The PR test shall be conducted at site by the Contractor in presence of the ANERT / MILMA officials as per IEC 61724. The PR test procedure shall be submitted by the Contractor for review and approval. Any special equipment, instrumentation tools and tackles required for the successful completion of the performance test shall be arranged by the Contractor at his own cost.
- ii. The procedure for PR demonstration test shall be as follows:

The Weather monitoring station installed in the plant shall be in working condition for minimum 2 weeks and all the parameters shall be available for analysis and verification. The test report for the calibration shall be submitted by the Contractor for approval. After the successful verification of the initial parameters by ANERT, PR test shall be conducted. The Following factors shall be excluded for calculation;

- Generation loss due to grid outage.
- Irradiance below 250 W/m²
- The measured global solar radiation of the period of the outage of the power evacuation system shall be excluded to calculate average global solar radiation for the period of PR test.

PR is to be calculated as per the below formula:

$$PR = \frac{\text{Measured output in kW}}{(\text{Installed Plant capacity in kW} * (1000 / \text{Measured radiation intensity in W/m}^2))}$$

The EPC Contractor shall demonstrate minimum PR of 75% (measured at output of the inverter/solar meter level) in the initial PR test within 7 consecutive days. If the contractor fails to prove the desired performance ratio at the time of completion and during any of the consecutive years of defect liability period, he will be given a second chance to demonstrate the PR within another 7 consecutive days. Still if it is not achieved, the same shall be demonstrated within another 7 consecutive days and still if it is not achieved, EPC contractor shall improve the quality of the plant by replacement of module/other components with all suitable modification requirements on balance of systems at his own cost to achieve the performance ratio. After obtaining Energisation Approval from Electrical Inspectorate and demonstration of minimum specified PR, the solar plant shall be commissioned which shall be the date of completion of the project.

11. DATE OF COMMISSIONING

After the Inspection and approval of the Electrical Inspectorate, date of

Energisation to the Grid will be considered as the official Date of Commissioning (CoD) of the project. To ensure PR, the bidder will be allowed EPC contractor shall improve the quality of the plant by replacement of any components with all suitable modification requirements on balance of systems at his own cost to achieve the performance ratio.

12. SCADA / PLANT MONITORING

Integrated SCADA shall be supplied which should be capable of communicating with all inverters and provide information of each PCU. The SCADA shall also provide information of the instantaneous output energy and cumulative energy for each of the inverters. The SCADA system shall perform the following operations, which include the measurement and continuous recording of:

- i. Data Logging Provision for plant control and monitoring, time and date stamped system data logs for analysis with the high quality, suitable PC, Metering and Instrumentation for display of systems parameters and status indication to be provided.
- ii. Solar Irradiance: An integrating Pyranometer / Solar cell-based irradiation sensor (along with calibration certificate) provided with the sensor mounted in the plane of the array and integrated software to readout with data logging system.
- iii. Temperature: Temperature probes for recording the Solar panel temperature and/or ambient temperature to be provided complete with readouts integrated with the data logging system
- iv. The following parameters are accessible via the operating interface display in real time separately for solar power plant:
 - a. AC Voltage.
 - b. AC Output current.
 - c. Output Power
 - d. Power factor.
 - e. DC Input Voltage.
 - f. DC Input Current.
 - g. Time Active.
 - h. Time disabled.
 - i. Time Idle.
 - j. Power produced
 - k. Protective function limits (Viz. - AC Over voltage, AC Under voltage, over frequency, under frequency ground fault, PV starting voltage, PV stopping voltage).

- v. All major parameters available on the digital bus and logging facility for energy auditing through the internal microprocessor and read on the digital front panel at any time) and logging facility (the current values, previous values for up to a month and the average values) should be made available for energy auditing through the internal microprocessor and should be read on the digital front panel.
- vi. PV array energy production: Digital Energy Meters to log the actual value of AC/DC voltage, Current & Energy generated by the PV system provided. Energy meter along with CT/PT should be of 0.5 accuracy class.
- vii. Computerized Array monitoring and AC output monitoring shall be provided as part of the inverter and/or string/array combiner box or separately.
- viii. Array DC Voltage, Current and Power, Inverter AC output voltage and current (All 3 phases and lines), AC power (Active, Reactive and Apparent), Power Factor and AC energy (All 3 phases and cumulative) and frequency shall be monitored.
- ix. Computerized AC energy monitoring shall be in addition to the digital AC energy meter.
- x. The data shall be recorded in a common work sheet chronologically date wise. The data file shall be MS Excel compatible. The data shall be represented in both tabular and graphical form.
- xi. All instantaneous data shall be shown on the computer screen.
- xii. Software shall be provided for USB download and analysis of DC and AC parametric data for individual plant.
- xiii. Provision for Internet monitoring and download of data shall be also incorporated.
- xiv. Remote Server and Software for centralized Internet monitoring system shall be also provided for download and analysis of cumulative data of all the plants and the data of the solar radiation and temperature monitoring system.
- xv. Ambient / Solar PV module back surface temperature shall be also monitored on continuous basis.
- xvi. Simultaneous monitoring of DC and AC electrical voltage, current, power, energy and other data of the plant for correlation with solar and environment data shall be provided.

SCADA shall store the daily energy produced by the plant, monthly energy and the annual energy. SCADA shall be provided with a reliable power supply and have internal reliable battery backup to record all sorts of data simultaneously round the clock. Further SCADA shall also display the Performance Ratio (PR) of the plant. All the trend and cumulative graphs shall be able to be viewed and stored. Also, all the

events including outages and faults shall be logged and stored with time and date stamped. SCADA should also have provision for off line viewing of daily, monthly and annual average of the above parameters. Representation of monitored data shall be displayed in graphics mode or in tabulation form. All instantaneous data can be shown in the computer screen. Provision should be available for remote monitoring through GPRS system.

The SCADA shall have the feature to be integrated with the Network system as well as remotely via the web using either a standard modem or a GSM/ WIFI modem. Compatible software and hardware are to be provided so that data can be transmitted via standard modem. The SCADA system shall conform to IEC 61724 (Photo voltaic system performance monitoring – Guidelines for Measurement) standard.

- **Communication Software:** Graphical user interface software for real time communication and control
- **Data acquisition & logging:** RS232/RS485. MOD Bus/WiFi

Power generation and performance of the solar power plant to be monitored through online system to capture electrical parameters from multiple devices such as meters, Inverters, String Combiner boxes to capture parameters such as AC/DC voltage, power, energy as well as monitoring of Breaker, Performance Ratio (PR) of the plant, daily, monthly, yearly generation summary etc.

13. SOLAR PV SYSTEM FOR MEETING THE ANNUAL ENERGY REQUIREMENT

Key Performance Indicators

The following KPIs would be monitored by the ANERT/Owner throughout the contract tenure and the contractor shall furnish monthly/quarterly reports on above, without fail.

- PV Array Energy Yield
- Final System Yield
- PV System Efficiency (DC/AC)
- Performance Ratio (PR): The performance ratio test as per IS/IEC 61724 has to be carried out at site by the agency in presence of authorized officials of ANERT, deriving sample data within a period of 7 consecutive days sufficient to provide operational data representing insolation and ambient conditions as desired by the agreement authority to prove the Performance ratio of 75%. If a Solar Plant achieves the Minimum Performance Ratio, then the ANERT will issue Commercial Operation Date Certificate.
- Capacity Utilization Factor (CUF)

I/17720/2023

- Plant uptime
- Reactive Power Consumption
- Auxiliary Energy Consumption
- CO₂ Savings
- Environment, Health & Safety

14. INSURANCE

- The Bidder shall be responsible and take an Insurance Policy for transit-cum-storage-cum-erection for all the materials to cover all risks and liabilities for supply of materials on site basis, storage of materials at site, erection, testing and commissioning. The bidder shall also take appropriate insurance during O&M period.
- The Bidder shall also take insurance for Third Party Liability covering loss of human life, engineers and workmen and also covering the risks of damage to the third party/material/equipment/properties during execution of the Contract. Before commencement of the work, the Bidder will ensure that all its employees and representatives are covered by suitable insurance against any damage, loss, injury or death arising out of the execution of the work or in carrying out the Contract. Liquidation, Death, Bankruptcy etc., shall be the responsibility of bidder.
- The insurance coverage of the system must include all conditions of **Standard Fire and Special Perils Policy (Material Damage)**. In addition, the damages from wildlife and natural calamity are also to be covered.
- The insurance premium for the 5 years of warranty is to be paid by your agency. On handing over of the system, the original insurance policy is to be handed over to the authorised person at ANERT District Office. The annual premium payment receipt must be handed to the authorised person at the District Office of ANERT.

Not Withstanding the terms and conditions stipulated above, it is to be noted that the conditions in the tender document shall prevail;

Yours faithfully



NARENDRA NATH VELURI I F S
CEO ANERT

കേരള സർക്കാർ
GOVERNMENT OF KERALA

Agency for New and renewable Energy Research & Technology
AGENCY FOR NEW AND RENEWABLE ENERGY RESEARCH & TECHNOLOGY
TECHNICAL ANERT

SUBJECT

Main Category :
Sub Category :
Description : Project Proposal to Travancore Titanium Products Limited

OTHER DETAILS

Language : English
Remarks :
Previous References :
Later References :

Note # 1

As directed, Site survey conducted at Travancore Titanium Products Limited, Preliminary report is prepared and submitted for approval

17/05/2022 11:45 AM

**JOSE T J
PI1 ANERT**

Note # 2

15/03/2023 01:23 PM

**RADHIKA J M
PE2(RTS)ANERT**

Note # 3

10/04/2023 07:56 PM

**ABHIN CHAND C S
APE2(CTM) ANERT**

Note # 4

Sub: - Solarisation of TTL under Solar city scheme funded by Smart City Thiruvananthapuram Ltd

- i. The Smart City Thiruvananthapuram Ltd has accorded Administrative Sanction for the implementation of 2 MWp Solar Power plant at Travancore Titanium Ltd. The site survey was completed and there is space for 870 kWp Rooftop Solar, 250 kWp floating and 1500 kWp Ground mounted Solar Power plant.
- ii. For the tender, Ground Mounted solar of 1500 kWp can be considered and balance 500 KWp can be accommodated in the selected rooftops nearer to the 66 kV substation. Draft tender document for the 2 MWp Solar power plant at TTL is prepared and attached. The rate per kW for Ground and Rooftop may be collected and the work need to be completed before June 2023. The tender may be limited to vendors having ICRA grading of 1A, 1B, 1C, 2A, 2B, 2C & 3A along with a condition that the vendor should have completed a single plant capacity of 1 MW or 2 Nos of 500 kW or above.
- iii. Draft tender document and NIT along with abstract is attached.

For orders;

11/04/2023 12:28 PM

VINAY P

Note # 5

Draft tender document may be approved.

11/04/2023 02:27 PM

**KALA K.G.
TH(T2) ANERT**

Note # 6

May be approved

11/04/2023 03:01 PM

**ANEESH S PRASAD
CTM ANERT**

Note # 7

Approved

11/04/2023 04:59 PM

**NARENDRA NATH VELURI I F S
CEO ANERT**

Note # 8

12/04/2023 10:55 AM

**CENTRAL REGISTRY UNIT
CRU ANERT**

Note # 9

- i. The tender for the 2 MW Solar Power plant at Travancore Titanium Products was published in the Kerala tenders portal and there are 6 bidders - M/s Enerture Technologies, M/s INKEL Ltd, M/s Wattsun Energy, M/s Oakridge Energy, M/s Power One Micro Systems and M/s Solgen Energy. The bids are attached in the reference section.
- ii. As per tender, the bidders must have working experience of atleast 3 MW solar power plant and single plant capacity of 1 MW or above OR 2 Nos of 500 kW or above. Also, the bidder should have a Minimum Average Annual Turnover of at least 8 Crores in any two out of last 5 years or a Net worth of Rs. 10 Crores. The draft Technical evaluation sheet is prepared and attached.
- iii. Among the bidders, M/s Wattsun Energy and M/s Solgen Energy are not meeting the experience criteria, whereas M/s Wattsun doesn't also meet the Financial Criteria. They have attached the un-audited statement for the FY 2022-23, which cannot be considered as per tender and has not considered. If the same is considered, then the bidder will be meet the financial criteria. This particular tender was floated as an open tender and

since the above two vendors are registered vendors of ANERT, relaxations if any can be provided, may be considered.

- iv. If not, these two bidders will not qualify and the other 4 bidders are technically qualified (2 registered vendors and 2 others). Draft technical evaluation summary without considering the above is attached.

For information, Guidance and orders;

08/05/2023 04:44 PM

**VINAY P
PE1(RTS) ANERT**

Note # 10

For kind advice

08/05/2023 05:02 PM

**KALA K.G.
TH(T2) ANERT**

Note # 11

Those who meets experience criteria may only qualified. In the case of financials , turn over of 2022-23 may also be considered if they are submitting provisional statement by a registered Chartered accountant.

08/05/2023 05:46 PM

**ANEESH S PRASAD
CTM ANERT**

Note # 12

Agreed with Note11. A small financial consideration shall be given as they have been engaged in ANERT works for long and we know their effectiveness

09/05/2023 10:46 AM

**NARENDRA NATH VELURI I F S
CEO ANERT**

Note # 13

09/05/2023 02:03 PM

**CENTRAL REGISTRY UNIT
CRU ANERT**

Note # 14

- i. The financial bids of the technically qualified bidders are opened and M/s Enerture Technologies, New Delhi is the L1 bidder which had quoted Rs. 48,490 per kW excl GST for Ground mounted and Rs. 49,490 per kW excl GST. The financial opening summary is attached.
- ii. The rates quoted and the total amount required for the 2 MWp Solar Power plant are as follows:

iii.

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Item	Rate	Capacity	Total	Amount incl GST
Rate / kW for the Installation of Ground Mounted Solar - approx 1500 kW	48,490	1,500	7,27,35,000	8,27,72,430
Rate / kW for the Installation of Rooftop Solar - approx 500 kW	49,490	500	2,47,45,000	2,81,59,810
Total		2,000	9,74,80,000	11,09,32,240

- iv. Draft work order to be issued to the L1 bidder for Rs. 11,09,32,240/- is prepared and attached. We may also write to TTL informing the issue of work order and ask them to submit the application for connectivity under Captive consumer category.

For orders;

15/05/2023 10:52 AM

**VINAY P
PE1(RTS) ANERT**

Note # 15

Draft work order may be approved.

15/05/2023 03:48 PM

**KALA K.G.
TH(T2) ANERT**

Note # 16

May be approved

15/05/2023 05:12 PM

**ANEESH S PRASAD
CTM ANERT**

Note # 17

Approved

16/05/2023 10:01 AM

**NARENDRA NATH VELURI I F S
CEO ANERT**

Note # 18

18/05/2023 06:22 PM

**CENTRAL REGISTRY UNIT
CRU ANERT**

Note # 19

- i. M/s Enerture Technologies Pvt Ltd have submitted detailed Engineering drawings and Preliminary BoM for approval. The work order of 2 MWp was split into 1.5 MWp on ground and 0.5 MWp on Rooftop, whereas they

have reassessed the there is space available for 1.7 MWp on Ground and only 0.3 MWp need to be on the Rooftop. Since, the rates quoted by them for RTS and Ground are different, the total amount will be reduced by Rs. 2,27,600/-. A revised work order may be issued to them for the same.

- ii. The PV layout proposed is already approved by Travancore Titanium Ltd and the land clearing works along with foundation works for RTS installation is started. The technical approval of the Structural diagram for RTS installation and the PV layout may be provided from our end, so that the fabrication works can be started.
- iii. We may also, ask them to submit application to the Electrical inspectorate for Scheme approval in parallel, since the metering arrangement will not be there with KSEBL and the installation will function as an internal captive generation plant without grid export. Since, the capacity is above 1 MWp, there is no provision to get Net Metering for the plant as per regulation and this will come under Captive Consumer category. For captive consumers, there is 5% grid charges, whereas the generation from this plant will be hardly 30% of their total daily consumption. Further, Special Energy Meters will need to be installed by TTL at the generation point as well as the injection points and data at 15 min interval need to be installed. Hence, the plant may be permitted to function as an Internal Captive Plant without grid export.
- iv. Permission is requested for revision of work order and approval for the proposed PV layout and Structural diagrams.

For orders;

21/08/2023 10:39 AM

**VINAY P
PE1(RTS) ANERT**

Note # 20

The proposal may be approved.

21/08/2023 04:15 PM

**KALA K.G.
TH(T2) ANERT**

Note # 21

May be approved

21/08/2023 04:40 PM

**ANEESH S PRASAD
CTM ANERT**

Note # 22

Approved

21/08/2023 04:49 PM

NARENDRA NATH VELURI I F S

Note # 23

21/08/2023 05:35 PM

**ANEESH S PRASAD
CTM ANERT**

List of Correspondences							
Receipt No. / Issue No.	Subject	Type	Marked As	Attached On	Issued On	Pages	Remarks
I/17558/2023	NIT and Abstract	Issue			03/10/2024 12:54 PM	315-317	
I/17683/2023	Technical Evaluation	Issue			03/10/2024 12:49 PM	313-314	
I/17559/2023	Tender Document	Issue			03/10/2024 12:47 PM	194-312	
90555/2024/RTS ANERT	Module Approval	Receipt		23/07/2024 12:29 PM		78-193	File
90551/2024/RTS ANERT	Drawings	Receipt		23/07/2024 12:11 PM		44-77	File
79477/2023/RTS ANERT	Structural Diagram for RTS	Receipt		18/08/2023 01:29 PM		41-43	file
79476/2023/RTS ANERT	PV Layout and SLD from RTS	Receipt		18/08/2023 01:27 PM		33-40	file
79475/2023/RTS ANERT	Preliminary BoM	Receipt		18/08/2023 01:13 PM		17-32	file
I/17720/2023	WO - TTL - Enerture	Issue			18/05/2023 06:22 PM	4-16	
75880/2023/RTS ANERT	Financial Sumary	Receipt		14/05/2023 12:17 PM		2-3	File
75618/2023/RTS ANERT	Tender Status	Receipt		07/05/2023 02:35 PM		1-1	file

**Kerala
Tenders****eTendering System Government of Kerala****Bid List Details**

Date : 04-May-2023 06:02 PM

Print

Organisation Chain :	ANERT
Tender ID :	2023_ANERT_571678_1
Tender Ref No :	ANERT-TECH/99/2022-T2
Tender Title :	Request for Selection (RFS) of agency for the Implementation of 2 MW Solar Power Plant at Travancore Titanium Products Ltd., Kochuvelli, Thiruvananthapuram under Solar City project funded by Smart City Thiruvananthapuram Ltd.

Bids List							
S.No	Packet Type	Bidder Number	Bidder Name	Submitted Date	Status	Reason	Status Updated On
1	Fee/PreQual /Technical	1540957	Enerture Technologies Pvt Ltd	01-May-2023 06:02 PM	Admitted-Fee/PreQual /Technical		04-May-2023 05:35 PM
2	Fee/PreQual /Technical	1537136	INKEL LIMITED	04-May-2023 12:58 PM	Admitted-Fee/PreQual /Technical		04-May-2023 05:35 PM
3	Fee/PreQual /Technical	1542904	M/s WattSun Energy India Private Limited	04-May-2023 01:14 PM	Admitted-Fee/PreQual /Technical		04-May-2023 05:36 PM
4	Fee/PreQual /Technical	1537727	Oakridge Energy Private Limited	04-May-2023 03:02 PM	Admitted-Fee/PreQual /Technical		04-May-2023 05:35 PM
5	Fee/PreQual /Technical	1545396	POWER ONE MICRO SYSTEMS P LTD	04-May-2023 03:28 PM	Admitted-Fee/PreQual /Technical		04-May-2023 05:38 PM
6	Fee/PreQual /Technical	1545027	SOLGEN ENERGY PVT LTD	03-May-2023 05:55 PM	Admitted-Fee/PreQual /Technical		04-May-2023 05:37 PM

eTendering System Government of Kerala Created By: Vinay P Created Date/Time: 09-May-2023 05:04 PM Tender Title: Request for Selection (RFS) of agency for the Implementation of 2 MW Solar Power Plant at Travancore Titanium Products Ltd., Kochuveli, Thiruvananthapuram under Solar City project funded by Smart City Thiruvananthapuram Ltd. Tender ID: 2023_ANERT_571678_1					
Tender Inviting Authority: CEO, ANERT					
Name of Work : Request for Selection (RFS) of agency for the Implementation of 2 MW Solar Power Plant at Travancore Titanium Products Ltd., Kochuveli, Thiruvananthapuram under Solar City project funded by Smart City Thiruvananthapuram Ltd					
Contract No: ANERT-TECH/99/2022-T2					
SCHEDULE OF WORK / ITEM(S)					
Sl.No	Description of Work / Item(s)	INKEL LIMITED(GSTN-32AABCI6802JIZ Amount	Oakridge Energy Private Limited(GSTN- Amount	POWER ONE MICRO SYSTEMS P LTD(GSTN- Amount	Enerture Technologies Pvt Ltd(GSTN-NA) Amount
1.00	Request for Selection (RFS) of agency for the Implementation of 2 MW Solar Power Plant at Travancore Titanium Products Ltd., Kochuveli, Thiruvananthapuram under Solar City project funded by Smart City Thiruvananthapuram Ltd Design, Engineering, Manufacture, Supply, Storage, Civil works excluding foundation works for MMS, Erection, Testing , Obtaining No Objection Certificates (NOC) from Distribution Company (DISCOM) as well as Transmission wing of KSEBL for grid connectivity , Electrical Inspectorate certification for Energisation of plant and associated electrical works, Commissioning of the 2 MWp Ground Mounted & Floating solar Grid connected PV Power Plant including 10 years warranty from Commercial Operation Date (COD)				
1.01	Rate / kW for the Installation of Ground Mounted Solar - approx 1500 kW	56,940	56,350	60,219	48,490
1.02	Rate / kW for the Installation of Rooftop Solar - approx 500 kW	56,500	61,005	60,219	49,490

L1 Amount	L1 Vendor
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48,490	Enerture Technologies Pvt Ltd
49,490	Enerture Technologies Pvt Ltd

Validate Print Help

Item Rate BoQ

Tender Inviting Authority: CEO, ANERT

Name of Work : Request for Selection (RFS) of agency for the Implementation of 2 MW Solar Power Plant at Travancore Titanium Products Ltd., Kochuvelli, Thiruvananthapuram under Solar City project funded by Smart City Thiruvananthapuram Ltd

Contract No: ANERT-TECH/99/2022-T2

Name of the Bidder/ Bidding Firm / Company :	Enerture Technologies Private Limited					
PRICE SCHEDULE (This BOQ template must not be modified/replaced by the bidder and the same should be uploaded after filling the relevent columns, else the bidder is liable to be rejected for this tender. Bidders are allowed to enter the Bidder Name and Values only)						
NUMBER #	TEXT #	NUMBER #	NUMBER #	NUMBER #	NUMBER #	TEXT #
Sl. No.	Item Description	ESTIMATED RATE INCLUDING ADDITIONAL EXPENSES In Figures To be entered by the Bidder in Rs. P	GST RATE In Figures To be entered by the Bidder in Rs. P	TOTAL AMOUNT Without Taxes in Rs. P	TOTAL AMOUNT With Taxes Rs. P	TOTAL QUOTED RATE In Words
1	2	13	13	53	54	55
1	Request for Selection (RFS) of agency for the Implementation of 2 MW Solar Power Plant at Travancore Titanium Products Ltd., Kochuvelli, Thiruvananthapuram under Solar City project funded by Smart City Thiruvananthapuram Ltd Design, Engineering, Manufacture, Supply, Storage, Civil works excluding foundation works for MMS, Erection, Testing , Obtaining No Objection Certificates (NOC) from Distribution Company (DISCOM) as well as Transmission wing of KSEBL for grid connectivity , Electrical Inspectorate certification for Energisation of plant and associated electrical works, Commissioning of the 2 MWp Ground Mounted & Floating solar Grid connected PV Power Plant including 10 years warranty from Commercial Operation Date (COD)					
1.01	Rate / kW for the Installation of Ground Mounted Solar - <i>approx 1500 kW</i>	48490.00	6692.00	48490.00	55182.00	INR Fifty Five Thousand One Hundred & Eighty Two Only
1.02	Rate / kW for the Installation of Rooftop Solar - <i>approx 500 kW</i>	49490.00	6830.00	49490.00	56320.00	INR Fifty Six Thousand Three Hundred & Twenty Only
Total in Figures				97980.00	111502.00	INR One Lakh Eleven Thousand Five Hundred & Two Only
Quoted Rate in Words		INR One Lakh Eleven Thousand Five Hundred & Two Only				

1/17/20/2023



അനേർട്ട്
ANERT

Agency for New and renewable Energy Research and Technology

നവീനവും പുനരുപയോഗയോഗ്യമായ ഊർജ്ജ ഗവേഷണങ്ങൾക്കും സാങ്കേതിക വിദ്യകൾക്കുമുള്ള ഏജൻസി
DEPARTMENT OF POWER, GOVERNMENT OF KERALA
Law College Road, PMG, Thiruvananthapuram 695033 • director@anert.in • www.anert.gov.in
Tel.: (+91-471) 2338077, 2334122, 2335124, 2331803 • Fax: (+91-471) 2329853



No. ANERT-TECH/99/2022-PE2(RTS)

16-05-2023

To

M/s Enerture Technologies Pvt Ltd
ABL Workspaces, Celebration Gardens NH 8,
next to Shiv Murti, Mahipalpur,
New Delhi-110037

WORK ORDER

Sir,

Sub: ANERT - Work Order for the Design, Engineering, Manufacture, Supply, Testing, Energisation of plant and Commissioning of the 2 MWp Grid connected Solar Power Plant including 10 years warranty from Commercial Operation Date (COD) at Travancore Titanium Products Ltd., Kochuveli, Thiruvananthapuram, under Solar City Project funded by Smart City Thiruvananthapuram Ltd - reg

Ref: 1: Tender ID: 2023_ANERT_571678_1
2: Your Bid No. 1540957 dtd 01/05/2023

Attention is invited to the references cited. Your offer for the Design, Engineering, Manufacture, Supply, Storage, Erection, Testing, Electrical Inspectorate certification for Energisation of plant and associated electrical works, Commissioning of the 2 MWp Grid connected Solar Power Plant including 10 years warranty from Commercial Operation Date (COD) at Travancore Titanium Products Ltd., Kochuveli, Thiruvananthapuram is accepted. You are requested to carry out the work as detailed below subject to the following terms and conditions.

SN	Site of Installation	Rate	Capacity (kW)	Total
Travancore Titanium Products Ltd., Kochuveli, Thiruvananthapuram				
1	Ground Mounted Solar	55,182	1500	8,27,73,000
2	Roof Top Solar	56,320	500	2,81,60,000
TOTAL			2000	11,09,33,000 /-

1/17/20/2023

Rupees Eleven Crores Nine Lakh Thirty-Three Thousand only

A tripartite agreement has to be executed by you in the prescribed form (enclosed as Annexure - I) on Kerala Stamp paper as per the Kerala Government order - G.O.(P) No.113/2019/TD dtd 24/07/2019 (One rupee for every Rs 1000 or part thereof on the contract amount, subject to a minimum of rupees 200 and a maximum of rupees one lakh) within 7 days of the receipt of this work order for the fulfilment of the contract along with a security deposit of **Rs. 33,27,990/- (Rupees Thirty-Three Lakh Twenty-Seven Thousand Nine Hundred & Ninety only)** being the 3% of contract value of **Rs. 11,09,33,000/-** on Demand Draft/Bank Guarantee/NEFT transfer in favour of CEO, ANERT. You have to pay all expenses incidental to the execution of the above agreement. Another agreement must be provided before the start of the O&M period upon issue of separate work order and the formats shall be provided during the commissioning of the SPV Power Plant.

1. SCOPE OF WORKS

The Works to be performed by the contractor shall include but not limited to

- a. Works of any kind necessary for the due and satisfactory construction, completion and maintenance of the works to the intent and meaning of the drawings adopted, technical specifications, to best Engineering standards and orders that may be issued by the Engineer from time to time, compliance by the agency with all Conditions of Contract,
- b. Design, Manufacture, Supply, Installation, Testing and Commissioning of 2 MWp Grid connected SPV power plants. All the necessary approvals from KSEBL/Electrical Inspectorate, feasibility study, necessary civil work, Mounting of Module Structures, PV Module Installation, Inverter Installation, DC/AC Cabling and interconnections, Installation of Lightning Arresters and Earthing System as per the standards, Arranging all the necessary inspections from KSEBL/Electrical Inspectorate/ANERT District Office as part of Pre-Commissioning, if any, Commissioning of the PV Power Plant along with warranty and Operation and Maintenance (O&M) of the project under CAPEX model for 10 years after Commercial Operation Date (COD)
- c. Liasoning with KSEBL for grid connectivity, Electrical Inspectorate certification for Energization of plant and associated electrical, Complete Design, Engineering, Manufacture, Supply, Storage, works excluding foundation works for MMS, Erection, Testing & Commissioning of the 2 MWp Grid connected Solar PV Power Plant for 10 years after Commercial Operation Date (COD).

1/17/20/2023

2. SCHEDULE OF WORKS:

- i. The items should be delivered and installed at the Ground / Roof tops within Travancore Titanium Products Ltd as specified by ANERT/TTPL authorities, under prior intimation and supervision. The contractor to finalise the buildings/ground area and within the campus with permission of the TTPL authorities and prior approval from ANERT for installation of the above capacity
- ii. If the successful bidder fails to deliver the materials within the days mentioned below, the order stands cancelled and ANERT will award the work to the next bidder and penalty as decided by ANERT will be levied.

SN	Material Delivery (Days)	Completion Period (Days)
1	25	45

- iii. The detailed Engineering drawings as mentioned in the tender also be submitted prior to start of works. The rates mentioned above is inclusive of all additional works required for the successful commissioning of the power plant and no request for enhancement of rates will be entertained.
- iv. Supply of the SPV module must be from the ALMM list issued by MNRE from time to time. It is required to use Mono PERC Half cut cells – 500 Wp or above for the works. The Solar PCU and charge controller should meet the General and Technical specifications as mentioned in the tender.
- v. The agency shall submit the timeline for completion along with the agreement and security deposit. This timeline must be followed and no extension of time for completing the installation will be granted. Although, time extension may be granted for things beyond the control of your agency.
- vi. The detailed Bill of Materials along with datasheets & Test certificates of PV Modules (Mono PERC), Grid Tie Inverter etc must be provided well in advance and must be approved by ANERT before material despatch. ANERT reserves the right to reject the materials if the same are not in compliance with the requirements of the tender. In case, the successful bidder delivers the materials without BoM approval, they may have to take back the materials at their own cost and no time extension without penalty will be provided for completion of works.
- vii. The Supply, Installation and Commissioning of the Power Plant must be completed within the timeline mentioned above. This is the time period for handing over the system to ANERT with Grid connectivity.
- viii. In case of no valid reason, extension of time of completion that can be granted at a time shall will be 25% of the original time. The maximum extension that can be granted for a work shall be limited to half the original time of completion.

1/17/20/2023

- ix. When the contract period has to be extended wholly or partly due to default on the part of the bidder, the Agreement Authority may sanction extension of time after imposing fine as mentioned below;

Period	Rate of Fine
First Extension	1% of the work order amount subject to a minimum of Rs. 1000/- and maximum of Rs. 50,000/-.
Second Extension	2% of the work order amount subject to a minimum of Rs. 2000/- and maximum of Rs. 1,00,000/-

- x. Penalty for delay in supply and installation will be imposed at 0.5 % per week up to a maximum 10%. In case of delay in supply and installation, CEO, ANERT may cancel the contract and take recourse to other action as deemed appropriate.

3. INSTALLATION

- i. The Design, Engineering, Manufacture, Supply, Installation, Testing and Performance of the equipment shall be in accordance with latest appropriate IEC/Indian Standards as detailed in the tender document. Where appropriate Indian Standards and Codes are not available, other suitable standards and codes as approved by the MNRE / authorised Government agency shall be used.
- ii. Any supplies which have not been specifically mentioned in this Contract but which are necessary for the design, engineering, manufacture, supply & performance or completeness of the project shall be provided by the Bidder without any extra cost and within the time schedule for efficient and smooth operation and maintenance of the SPV plant. The installation work of the solar power plant must be in compliance with the Technical Requirements and Standards as mentioned in the Tender.
- iii. A display board with contents to be provided by the concerned official at ANERT is to be placed at the site.
- iv. The vendor is to bear the fee for KSEBL feasibility, Registration and all other expenses along with additional costs for site specific cabling works, earthing, mounting structure modifications, Electrical panel modification, access ladders, pathway facility in case required are also under the scope of the vendor. The scope of enhancing load, phase conversion wherever necessary is also under the scope.
- v. In case the installations require the replacement of CTs (Class 0.2s), PT (Class 0.2) of rating for commissioning of the power plant, it is under the scope of the vendor. The rates for Supply of tested transformers & Replacement at the site of these items are under the vendor scope.
- vi. Any other work required for the successful commissioning of the power plant

which are not mentioned in this document and are required as per prevailing laws & regulations in the country

4. PAYMENT

4.1 No advance payment will be given. All the documents submitted should be certified by the concerned personnel of ANERT.

4.2 The terms of payment shall be:

4.2.1 EPC Payment

- i. Upon delivery of major components (PV Modules, Inverter etc) at the site/warehouse, a maximum of 60% of the contract value can be released through Running Accounts Bills of min 10% of the contract value. The supplier shall submit the part invoice for the materials (including serial numbers and delivery chalan) for the materials duly certified by the concerned District Office along with a report regarding the supply of materials. Each RAB shall be accompanied with an item wise statement of work completion with qty, rate & the actual expenditure incurred audited by a Chartered Accountant.
- ii. On completion of installation of the power plant, a maximum of 20% of the contract value can be released as Running Account Bills of min 10% of the contract value. The supplier shall submit the invoice for the materials supplied and all documents related including the Project Completion Report to the completion of the work certified by the district office shall be submitted for the release of the amount. The second part invoice can be raised only after submitting application for energization to the Electrical Inspectorate. Each RAB shall be accompanied with an item wise statement of work completion with qty, rate & the actual expenditure incurred audited by a Chartered Accountant.
- iii. After the Inspection and Approval of the Electrical Inspectorate, 5% of the contract value will be released. All documents related to the completion of the work including commissioning report shall be submitted for the release of the amount.
- iv. The date of Energisation to the Grid by the DISCOM will be considered as the official Date of Commissioning (CoD) of the project and this will be treated as the commissioning of the system. On commissioning of the grid connected system, 5% of the contract value will be released after proving the Performance ratio (AC). The PR report as per standard is to be provided for release of the amount.
- v. The balance 10% shall be retained as performance security and will be released

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in five equal parts - 2% after 1 year of operation, 2% after 3 years of operation, 2% after 5 years of operation, 2% after 7 years of operation and last 2% after the 10 years of warranty. For releasing these payment, Performance ratio (AC) shall be proved within a period of 7 consecutive days at the end of each year for release of payment. **The plant shall be handed over at the end of 10 years after commissioning after proving the performance ratio (AC).** This period will be considered only from the date of commissioning.

- vi. The security deposit of 3% furnished along with the contract agreement shall be released on successful completion of supply, installation and commissioning.

4.2.2 Maintenance Payment

- i. The amount shall be released on annual basis after completion of the period of the previous year. The start of maintenance period will be considered from the scheduled date of operation.
- ii. The preventive maintenance reports along with receipt of premium of insurance and generation reports are to be submitted for the release of payments.
- iii. The payment shall be released after the inspection by the authorised personnel of ANERT on annual basis.

- 4.3 Income tax, contribution to workers' welfare fund and other statutory deductions shall be made from the payment as per prevailing norms.

5. REMOTE MONITORING SYSTEM

A dedicated Remote Monitoring System (Hardware and software) for monitoring the plant shall be provided even if the inverter has embedded data logging system. The following weather parameters are to be measured as part of the datalogging system.

a) Solar Irradiance: A Pyranometer/ Solar cell-based irradiation sensor (along with calibration certificate) shall be provided, with the sensor mounted in the plane of the array. Readout shall be integrated with data logging system.

b) Temperature: Integrated temp, sensors for measuring the module surface temp., inverter inside enclosure temp, and ambient temp to be provided complete with readouts integrated with the data logging system.

It is recommended that the following important parameters shall be accessible through the Data Logging Facility.

- a. AC Voltage
- b. AC Output current

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- c. Output Power
- d. Energy in kWh
- e. DC Input Voltage
- f. DC Input Current
- g. Temperatures (C)
- h. Invertor Status
- i. Irradiation
- j. Module temperature

Provision for Internet monitoring and download of historical data shall be incorporated. GSM Modem/Wi Fi modem in case GSM connectivity is used or Wireless Router + modem in case Ethernet connection is being used for remote access must be provided. The data is to be transmitted to ANERT server as well as to the Integrated Command and Control Centre (ICCC) developed by Smart City Thiruvananthapuram Ltd. The successful bidder has to undertake all the works required for such deployment including software and arrange for APIs etc.

6. WARRANTY

- i. 10 years' warranty should be provided by the supplier for the system and components or part of the system has to be provided for the Solar Power plant
- ii. The SPV modules used must be warranted for their output peak watt capacity, which should not be less than 90 % at the end of 10 years and 80% at the end of 25 years
- iii. The Warranty Card to be supplied must contain all the details of the system supplied. The OEM warranty card of all the equipment must also be submitted along with the warranty certificate issued in your letter head.

7. OPERATION & MAINTENANCE

- i. The bidder shall be responsible for Operation and Maintenance of the Solar PV system for the 5-year period, during which ANERT will monitor the project for effective performance in line with conditions specified in the bid document. A separate work order will be issued for the O&M part at the rates quoted by the bidder. During this period, the bidder shall be responsible for supply of all spare parts as required from time to time for scheduled and preventive maintenance, major overhauling of the plant, replacement of defective modules, inverters, PCU's etc and maintaining log sheets for operation detail, deployment of staff for continuous operations and qualified engineer for supervision of O&M work, complaint logging & its attending.
- ii. If any Operation & Maintenance issues are not resolved within 2 days, then

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complaint may be raised to ANERT, pursuant to which a penalty as decided by CEO, ANERT will be imposed.

- iii. If the outage of the plant is more than 30 days continuously, then the 50% PBG amount shall be encashed by ANERT.
- iv. If the outage is exceedingly more than 60 days than complete PBG amount shall be encashed by ANERT. (This will be applicable till 10 years of O&M)

8. PROJECT INSPECTION

The project progress will be monitored by ANERT and the projects will be inspected for quality at any time during commissioning or after the completion of the project either by officer(s) from ANERT/HFT PFT / SCTL or any authorized agency/experts.

9. TESTING & COMMISSIONING

- a. The contractor shall provide necessary drawings and documents required by statutory authorities and obtain the approval before taking up erection.
- b. Any modification in the equipment or installation that may be demanded by the inspecting authorities shall be carried out by the contractor at no additional cost to the KSEBL
- c. In accordance with the specific installation instruction as per the manufacturers drawings or as directed by the KSEBL, the successful Bidder shall unload, assemble, erect, install test, commission and hand over all electrical equipments included in this contract after O&M of 10 years.
- d. Erection materials including all consumables, tools, testing instruments or any other equipment required for successful commissioning shall be arranged by the successful Bidder in a timely manner.
- e. All equipment and instruments, indoor and outdoor, shall be marked with No. and provided with danger boards before commissioning.
- f. All Power equipments shall be handled and erected as per the relevant codes of practice and manufacturer's drawings and instruction manuals.
- g. The Contractor, if required shall obtain the temporary Electrical connection for construction purposes and the same has to be dismantled off the premises after completion of erection of plant.

10. PERFORMANCE RATIO TEST (PR TEST)

The Plant should run minimum two weeks without any major equipment failure to start the PR test. The EPC Contractor shall submit two copies of O&M manual with soft copy before the start of PR Test. Depending on the requirement, capacity and

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suitable Pyranometer shall be installed at locations suggested by ANERT or else METEONORM data shall be considered for calculating PR.

- i. The PR test shall be conducted at site by the Contractor in presence of the ANERT / MILMA officials as per IEC 61724. The PR test procedure shall be submitted by the Contractor for review and approval. Any special equipment, instrumentation tools and tackles required for the successful completion of the performance test shall be arranged by the Contractor at his own cost.
- ii. The procedure for PR demonstration test shall be as follows:

The Weather monitoring station installed in the plant shall be in working condition for minimum 2 weeks and all the parameters shall be available for analysis and verification. The test report for the calibration shall be submitted by the Contractor for approval. After the successful verification of the initial parameters by ANERT, PR test shall be conducted. The Following factors shall be excluded for calculation;

- Generation loss due to grid outage.
- Irradiance below 250 W/m²
- The measured global solar radiation of the period of the outage of the power evacuation system shall be excluded to calculate average global solar radiation for the period of PR test.

PR is to be calculated as per the below formula:

$$PR = \frac{\text{Measured output in kW}}{(\text{Installed Plant capacity in kW} * (1000 / \text{Measured radiation intensity in W/m}^2))}$$

The EPC Contractor shall demonstrate minimum PR of 75% (measured at output of the inverter/solar meter level) in the initial PR test within 7 consecutive days. If the contractor fails to prove the desired performance ratio at the time of completion and during any of the consecutive years of defect liability period, he will be given a second chance to demonstrate the PR within another 7 consecutive days. Still if it is not achieved, the same shall be demonstrated within another 7 consecutive days and still if it is not achieved, EPC contractor shall improve the quality of the plant by replacement of module/other components with all suitable modification requirements on balance of systems at his own cost to achieve the performance ratio. After obtaining Energisation Approval from Electrical Inspectorate and demonstration of minimum specified PR, the solar plant shall be commissioned which shall be the date of completion of the project.

11. DATE OF COMMISSIONING

After the Inspection and approval of the Electrical Inspectorate, date of

Energisation to the Grid will be considered as the official Date of Commissioning (CoD) of the project. To ensure PR, the bidder will be allowed EPC contractor shall improve the quality of the plant by replacement of any components with all suitable modification requirements on balance of systems at his own cost to achieve the performance ratio.

12. SCADA / PLANT MONITORING

Integrated SCADA shall be supplied which should be capable of communicating with all inverters and provide information of each PCU. The SCADA shall also provide information of the instantaneous output energy and cumulative energy for each of the inverters. The SCADA system shall perform the following operations, which include the measurement and continuous recording of:

- i. Data Logging Provision for plant control and monitoring, time and date stamped system data logs for analysis with the high quality, suitable PC, Metering and Instrumentation for display of systems parameters and status indication to be provided.
- ii. Solar Irradiance: An integrating Pyranometer / Solar cell-based irradiation sensor (along with calibration certificate) provided with the sensor mounted in the plane of the array and integrated software to readout with data logging system.
- iii. Temperature: Temperature probes for recording the Solar panel temperature and/or ambient temperature to be provided complete with readouts integrated with the data logging system
- iv. The following parameters are accessible via the operating interface display in real time separately for solar power plant:
 - a. AC Voltage.
 - b. AC Output current.
 - c. Output Power
 - d. Power factor.
 - e. DC Input Voltage.
 - f. DC Input Current.
 - g. Time Active.
 - h. Time disabled.
 - i. Time Idle.
 - j. Power produced
 - k. Protective function limits (Viz. - AC Over voltage, AC Under voltage, over frequency, under frequency ground fault, PV starting voltage, PV stopping voltage).

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- v. All major parameters available on the digital bus and logging facility for energy auditing through the internal microprocessor and read on the digital front panel at any time) and logging facility (the current values, previous values for up to a month and the average values) should be made available for energy auditing through the internal microprocessor and should be read on the digital front panel.
- vi. PV array energy production: Digital Energy Meters to log the actual value of AC/DC voltage, Current & Energy generated by the PV system provided. Energy meter along with CT/PT should be of 0.5 accuracy class.
- vii. Computerized Array monitoring and AC output monitoring shall be provided as part of the inverter and/or string/array combiner box or separately.
- viii. Array DC Voltage, Current and Power, Inverter AC output voltage and current (All 3 phases and lines), AC power (Active, Reactive and Apparent), Power Factor and AC energy (All 3 phases and cumulative) and frequency shall be monitored.
- ix. Computerized AC energy monitoring shall be in addition to the digital AC energy meter.
- x. The data shall be recorded in a common work sheet chronologically date wise. The data file shall be MS Excel compatible. The data shall be represented in both tabular and graphical form.
- xi. All instantaneous data shall be shown on the computer screen.
- xii. Software shall be provided for USB download and analysis of DC and AC parametric data for individual plant.
- xiii. Provision for Internet monitoring and download of data shall be also incorporated.
- xiv. Remote Server and Software for centralized Internet monitoring system shall be also provided for download and analysis of cumulative data of all the plants and the data of the solar radiation and temperature monitoring system.
- xv. Ambient / Solar PV module back surface temperature shall be also monitored on continuous basis.
- xvi. Simultaneous monitoring of DC and AC electrical voltage, current, power, energy and other data of the plant for correlation with solar and environment data shall be provided.

SCADA shall store the daily energy produced by the plant, monthly energy and the annual energy. SCADA shall be provided with a reliable power supply and have internal reliable battery backup to record all sorts of data simultaneously round the clock. Further SCADA shall also display the Performance Ratio (PR) of the plant. All the trend and cumulative graphs shall be able to be viewed and stored. Also, all the

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events including outages and faults shall be logged and stored with time and date stamped. SCADA should also have provision for off line viewing of daily, monthly and annual average of the above parameters. Representation of monitored data shall be displayed in graphics mode or in tabulation form. All instantaneous data can be shown in the computer screen. Provision should be available for remote monitoring through GPRS system.

The SCADA shall have the feature to be integrated with the Network system as well as remotely via the web using either a standard modem or a GSM/ WIFI modem. Compatible software and hardware are to be provided so that data can be transmitted via standard modem. The SCADA system shall conform to IEC 61724 (Photo voltaic system performance monitoring – Guidelines for Measurement) standard.

- **Communication Software:** Graphical user interface software for real time communication and control
- **Data acquisition & logging:** RS232/RS485. MOD Bus/WiFi

Power generation and performance of the solar power plant to be monitored through online system to capture electrical parameters from multiple devices such as meters, Inverters, String Combiner boxes to capture parameters such as AC/DC voltage, power, energy as well as monitoring of Breaker, Performance Ratio (PR) of the plant, daily, monthly, yearly generation summary etc.

13. SOLAR PV SYSTEM FOR MEETING THE ANNUAL ENERGY REQUIREMENT

Key Performance Indicators

The following KPIs would be monitored by the ANERT/Owner throughout the contract tenure and the contractor shall furnish monthly/quarterly reports on above, without fail.

- PV Array Energy Yield
- Final System Yield
- PV System Efficiency (DC/AC)
- Performance Ratio (PR): The performance ratio test as per IS/IEC 61724 has to be carried out at site by the agency in presence of authorized officials of ANERT, deriving sample data within a period of 7 consecutive days sufficient to provide operational data representing insolation and ambient conditions as desired by the agreement authority to prove the Performance ratio of 75%. If a Solar Plant achieves the Minimum Performance Ratio, then the ANERT will issue Commercial Operation Date Certificate.
- Capacity Utilization Factor (CUF)

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- Plant uptime
- Reactive Power Consumption
- Auxiliary Energy Consumption
- CO₂ Savings
- Environment, Health & Safety

14. INSURANCE

- The Bidder shall be responsible and take an Insurance Policy for transit-cum-storage-cum-erection for all the materials to cover all risks and liabilities for supply of materials on site basis, storage of materials at site, erection, testing and commissioning. The bidder shall also take appropriate insurance during O&M period.
- The Bidder shall also take insurance for Third Party Liability covering loss of human life, engineers and workmen and also covering the risks of damage to the third party/material/equipment/properties during execution of the Contract. Before commencement of the work, the Bidder will ensure that all its employees and representatives are covered by suitable insurance against any damage, loss, injury or death arising out of the execution of the work or in carrying out the Contract. Liquidation, Death, Bankruptcy etc., shall be the responsibility of bidder.
- The insurance coverage of the system must include all conditions of **Standard Fire and Special Perils Policy (Material Damage)**. In addition, the damages from wildlife and natural calamity are also to be covered.
- The insurance premium for the 5 years of warranty is to be paid by your agency. On handing over of the system, the original insurance policy is to be handed over to the authorised person at ANERT District Office. The annual premium payment receipt must be handed to the authorised person at the District Office of ANERT.

Not Withstanding the terms and conditions stipulated above, it is to be noted that the conditions in the tender document shall prevail;

Yours faithfully



NARENDRA NATH VELURI I F S
CEO ANERT



RE: !! For BG, Tripartite agreement signing, detailed AC SLD & Project Schedule, Project BOM, open points approval Regd. !! TRAVANCORE TITANIUM PRODUCTS LTD

shubham@enerture.co.in <shubham@enerture.co.in>

24 June 2023 at 16:47

To: ANERT Projects <projects@anert.in>

Cc: ANERT 2K2K <anert2020@anert.in>, FIROZ N <firozttpl@gmail.com>, solarcity tvn <solarcitytvn@gmail.com>, Bhairaw Mandal <bhairaw@enerture.co.in>, Apar Chitransh <Apar.chitransh@enerture.co.in>, ankur <ankur.gupta@enerture.co.in>, Parvendar Singh <parvendar.singh@enerture.co.in>, Akshayraj K <akshayraj.k@enerture.co.in>, Mahesh <mahesh@enerture.co.in>, Santosh Kumar <santosh@enerture.co.in>, Chief Technical Manager ANERT <ctm@anert.in>, rampintu150@gmail.com, arman.malik@enerture.co.in

Dear Sir,

Please find herewith attached open points sheet along with Enerture responses. Kindly have a look.

Furthermore, please also find herewith attached following drawings & documents for your kind approvals:

1. Module mounting structure layouts for rooftop & Ground mount solar plants.
2. Inverters datasheet, Sungrow – For Ground Mount Projects & Growatt – For Rooftop Projects.
3. Modules Datasheet – Vikram 540 / 545 wp

Also, as per our discussion, please find below mentioned BBU (Bill Breakup Units) for your kind considerations:-

Supply:-

1. On Modules deliveries – 40% of contract value amount will be release.
2. On Inverters deliveries – 20% of contract value amount will be release.

Service:-

3. Installation – 20% on pro-rata basis on submission of RA bills.
4. CEIG Approval – 5%
5. Discom approval & COD – 5%
6. On submission of Performance Bank Guarantee (PBG) – 10%

We kindly request your confirmation / approval regarding the aforementioned design, documents, and statements.



Shubham Kr. Kashyap

Project Manager

Enerture Technologies Pvt Ltd

(MNRE Channel partner &
MSME registered)

Mob: +91-7007609924 Tel: +91-
1146024024

E.mail: shubham@enerture.co.in
Web: <http://enerture.co.in>

Add. : ABL Workspace, Celebration
Garden, NH-8, Mahipalpur, New Delhi-
110037

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Best regards,

Santosh Kumar

Enerture Technologies Pvt Ltd

(MNRE Channel partner & MSME registered)

Mob: +91-9891076898 Tel: +91- 1146024024

E.mail: santosh@enerture.co.in Web: <http://enerture.co.in>

Add. : ABL Workspace, Celebration Garden, NH-8, Mahipalpur, New Delhi-110037

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Thanks & Regards

Projects Team

ANERT

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Best regards,

Santosh Kumar

Enerture Technologies Pvt Ltd

(MNRE Channel partner & MSME registered)

Mob: +91-9891076898 Tel: +91- 1146024024

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Best regards,

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Add. : ABL Workspace, Celebration Garden, NH-8,
Mahipalpur, New Delhi-110037

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9 attachments



ANERT - CUSTOMER OPEN POINTS.xlsx

13K



Growatt 70000-80000TL3 MAX LV Datasheet.pdf

1271K



Growatt 30000-40000 TL3-X MID Datasheet.pdf

93K



Growatt 50000-60000TL3-X MAC LV Datasheet.pdf

618K



DS_20220722_SG320HX_Datasheet_V16i_EN1.pdf

201K



Sungrow SG250HX-IN.pdf

208K



Somera-M10-E2022-144_R01- All.pdf

2302K



STRUCTURE LAYOUT-GROUND MOUNT-1700kWp.pdf

1306K



STRUCTURE LAYOUT-ROOFTOP-300kWp.pdf

1180K

somera

SERIES 10

Monocrystalline Solar PV Modules, Monofacial, MBB, M10 Half-Cell, SOMERA VSMH.72.AAA.05

POWER OUTPUT WATT

525-550

MAXIMUM EFFICIENCY %

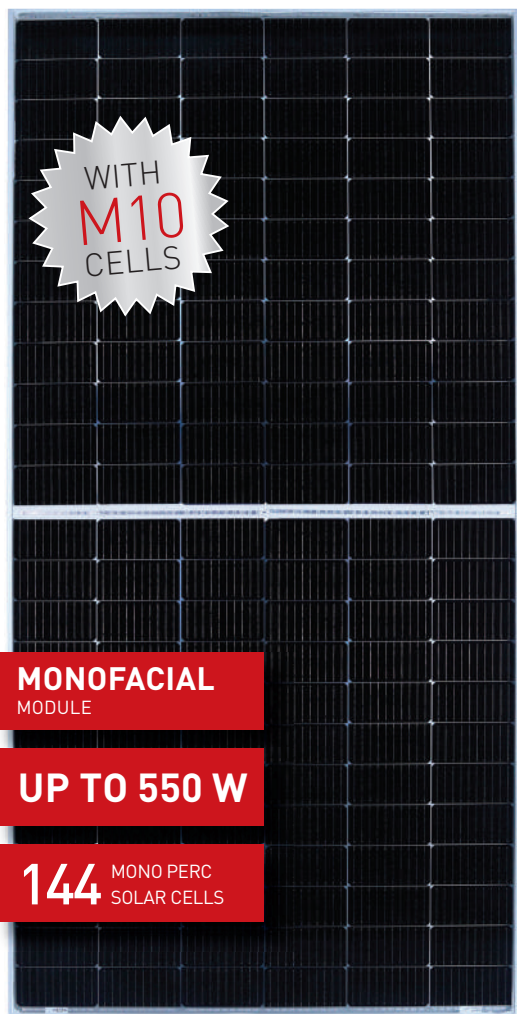
21.33

POSITIVE POWER TOLERANCE WP

0~+4.99

CELLS (HALF CUT)

M10 144



CYLINDRICAL TABBING WIRE is used to reduce the shadow on cell active area



Implementation of bypass diodes in split JB series-parallel connections enable the module to perform in **PARTIAL SHADOW CONDITIONS** with respect to full-cell module



HIGHER NUMBER OF BUSBAR makes the PV modules less prone to loss in efficiency and increase tolerance to micro cracks



FIELD RELIABILITY is improved due to multiple contact points on the cell which lowers the cell stress during module fabrication



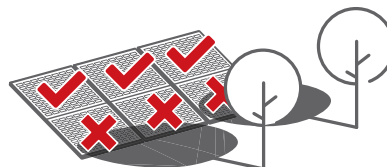
LCOE IS CUT BACK by using M10 size solar cell with adding more power output than lower size cell module



LOWER INTERNAL RESISTANCE boosts module power helping to achieve minimal power loss with respect to previous variant modules



SHADE TOLERANCE



HALF-CELL MODULE

Functions like two parallel modules, enabling the half-cell string to work in partial shading which is absent in full cell module

APPLICATIONS

- On-grid large scale utility systems
- On-grid rooftop industrial and commercial systems
- Rooftop residential systems

FRAME

SILVER

BLACK

BACKSHEET

WHITE

BLACK

THIS DATASHEET IS APPLICABLE FOR: SOMERA VSMH.72.AAA.05 (AAA=525-550)

Electrical Data^{1,2} All data refers to STC (AM 1.5, 1000 W/m², 25°C)

Peak Power P _{max} (Wp)	525	530	535	540	545	550
Maximum Voltage V _{mpp} (V)	41.4	41.5	41.6	41.7	41.8	41.9
Maximum Current I _{mp} (A)	12.69	12.78	12.87	12.95	13.04	13.13
Open Circuit Voltage V _{oc} (V)	49.2	49.3	49.4	49.5	49.6	49.7
Short Circuit Current I _{sc} (A)	13.4	13.48	13.56	13.64	13.73	13.82
Module Efficiency η[%]	20.36	20.55	20.75	20.94	21.13	21.33

1) STC: 1000 W/m² irradiance, 25°C cell temperature, AM1.5g spectrum according to EN 60904-3. | 2) Power measurement uncertainty is within +/- 2%.

Electrical Parameters at NOCT³

Power (W)	387	393	397	399	402	407
V@P _{max} (V)	38.2	38.3	38.4	38.5	38.6	38.7
I@P _{max} (A)	10.14	10.29	10.34	10.37	10.43	10.52
V _{oc} (V)	45.7	45.9	46	46.1	46.2	46.3
I _{sc} (A)	10.83	10.89	10.96	11.03	11.09	11.15

3) NOCT irradiance 800 W/m², ambient temperature 20°C, wind speed 1 m/sec

Temperature Coefficients (Tc) permissible operating conditions

Tc of Open Circuit Voltage (β)	-0.27%/°C
Tc of Short Circuit Current (α)	0.050%/°C
Tc of Power (γ)	-0.35%/°C
Maximum System Voltage	1500V
NOCT	45°C ± 2°C
Temperature Range	-40°C to + 85°C

Mechanical Data

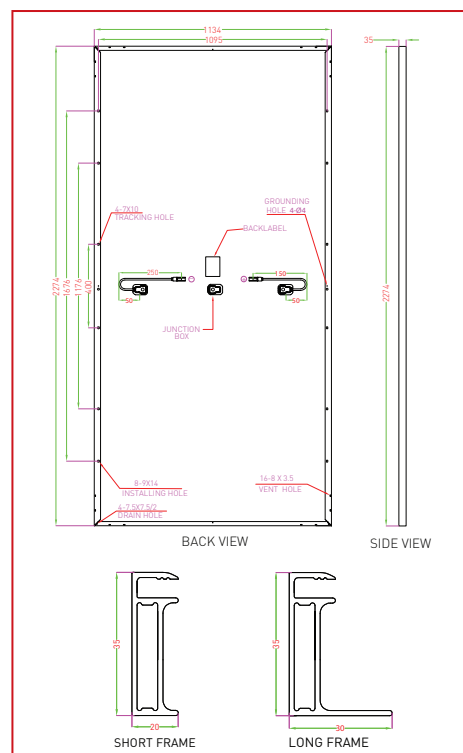
Length × Width × Height	2274 × 1134 × 35mm (89.53 × 44.65 × 1.38 inches)
Weight	28.2 Kg (62.17 lbs)
Junction Box	IP68, Split Junction Box with individual bypass diodes
Cable & Connectors [#]	200 mm (+ve terminal) and 300 mm (-ve terminal) length cables, MC4 Compatible/MC4 Connectors
Application Class	Class A (Safety class II)
Superstrate	3.2 mm (0.125 inches) high transmission low iron tempered glass, AR coated
Cells	72 Mono PERC (144 half-cells) P-Type solar cells
Back Sheet	Composite film
Frame	Anodized aluminium frame with twin wall profile
Mechanical Load Test	5400 Pa (Snow load), 2400 Pa (Wind load)
Maximum Series Fuse Rating	25A

Warranty and Certifications

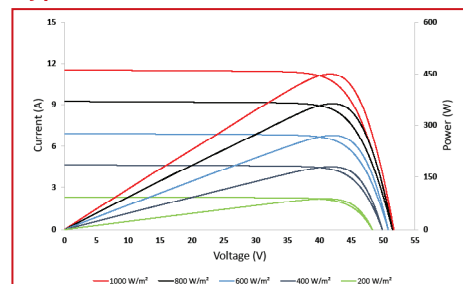
Product Warranty**	12 years
Performance Warranty**	Linear Power Warranty for 27 years with 2% for 1st year degradation and 0.55% from year 2 to year 27
Approvals and Certificates^	IEC 61215 : 2016, IEC 61730 : 2016, IEC 61701, IEC 62716, IEC 60068-2-68, IEC 62804, CE, CEC (California), UL 61215, UL 61730, CAN-CSA

^ All (*) certifications under progress. | ** Refer to Vikram Solar's warranty document for terms and conditions. | # 400mm(15.75 inches), 1000mm(39.37 inches), 1200mm (47.24 inches) cable lengths are also available

Dimensions in mm

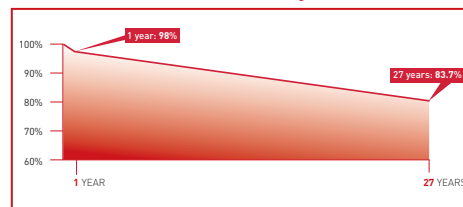


Typical I-V Curves⁴



4) Average relative efficiency reduction of 5% at 200 W/m² according to EN 60904-1.

Performance Warranty



Packaging Information

Quantity /Pallet	31
Pallets/Container (40'HC)	20
Quantity/Container (40'HC)	620

CAUTION: READ SAFETY AND INSTALLATION MANUAL BEFORE USING THE PRODUCT.

Specifications included in this datasheet are subject to change without notice. Electrical data without guarantee. Please confirm your exact requirement with the company representative while placing your order.

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SG250HX-IN

Multi-MPPT String Inverter for 1500 Vdc System

SUNGROW

Clean power for all



HIGH YIELD

- 12 MPPTs with max. efficiency 99%
- 30A MPPT compatible with 500Wp+ module
- Built-in Anti-PID and PID recovery function

LOW COST

- Compatible with Al and Cu AC cables
- DC 2 in 1 connection enabled
- Power line communication (PLC)

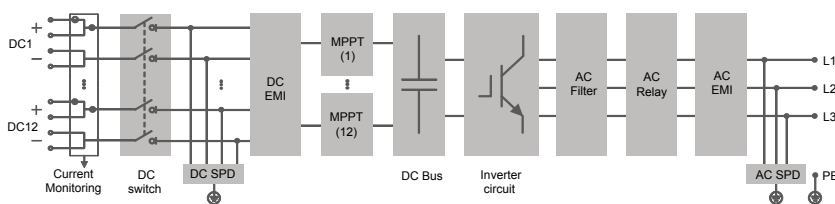
SMART O&M

- Touch free commissioning and remote firmware upgrade
- Smart IV Curve diagnosis*
- Fuse free design with smart string current monitoring

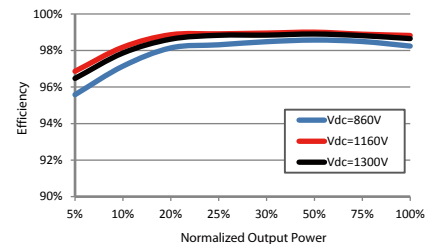
PROVEN SAFETY

- IP66 and C5 anti-corrosion
- Type II SPD for both DC and AC
- Compliant with global safety and grid code

CIRCUIT DIAGRAM



EFFICIENCY CURVE



Type designation	SG250HX-IN
Input (DC)	
Max. PV input voltage	1500 V
Min. PV input voltage / Startup input voltage	500 V / 500 V
Nominal PV input voltage	1160 V
MPP voltage range	500 V – 1500 V
MPP voltage range for nominal power	860 V – 1300 V
No. of independent MPP inputs	12
Max. number of input connector per MPPT	2
Max. PV input current	30 A *12
Max. DC short-circuit current	50 A *12
Output (AC)	
AC output power	250 kVA @ 30 °C / 200 kVA @50 °C
Nominal AC output current	144.3 A
Nominal AC voltage	3 / PE, 800 V
AC voltage range	680 – 880V
Nominal grid frequency / Grid frequency range	50 Hz / 45 – 55 Hz, 60 Hz / 55 – 65 Hz
THD	< 3 % (at nominal power)
DC current injection	< 0.5 % In
Power factor at nominal power / Adjustable power factor	> 0.99 / 0.8 leading – 0.8 lagging
Feed-in phases / connection phases	3 / 3
Efficiency	
Max. efficiency	99.0 %
European efficiency	98.8 %
Protection	
DC reverse connection protection	Yes
AC short circuit protection	Yes
Leakage current protection	Yes
Grid monitoring	Yes
Ground fault monitoring	Yes
DC switch/ AC switch	Yes / No
PV String current monitoring	Yes
Anti-PID and PID recovery function	Yes
Overvoltage protection	DC Type II / AC Type II
General Data	
Dimensions (W*H*D)	1051 * 660 * 363 mm
Weight	99kg
Isolation method	Transformerless
Ingress protection rating	IP66
Night power consumption	< 2 W
Operating ambient temperature range	-30 to 60 °C (> 50 °C derating)
Allowable relative humidity range (non-condensing)	0 – 100 %
Cooling method	Smart forced air cooling
Max. operating altitude	5000 m (> 4000 m derating)
Display	LED, Bluetooth+APP
Communication	RS485 / PLC
DC connection type	MC-Evo2 (Max. 6 mm ² , optional 10mm ²)
AC connection type	OT / DT terminal (Max. 300 mm ²)
Compliance	IEC 62109, IEC 61727, IEC 62116, IEC 60068, IEC 61683
Grid Support	LVRT, HVRT, active & reactive power control and power ramp rate control

*: Optional. Only compatible with Sungrow logger and iSolarCloud

SG320HX

Multi-MPPT String Inverter for 1500 Vdc System



HIGH YIELD

- Up to 16 MPPT with 99% efficiency
- 40A MPPT compatible with 500Wp+ module
- DC 2 in 1 connection



LOW COST

- Compatible with Al and Cu AC cables
- Less than 30ms reactive power response
- PLC communication to save the cable cost



SMART O&M

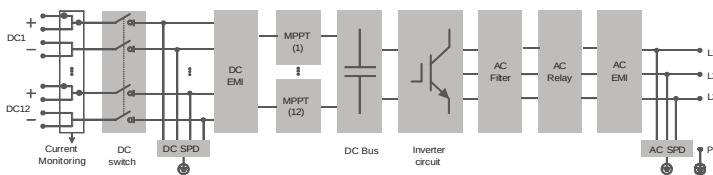
- Touch free commissioning and remote firmware upgrade
- Smart string detection and IV scanning
- Fuse free design with smart string current monitoring



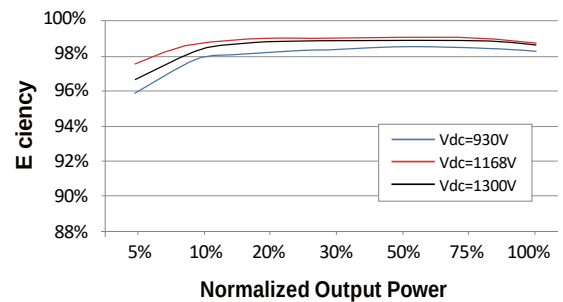
PROVEN SAFETY

- IP66 protection and C5 anti-corrosion grade
- Type II SPD for both DC and AC

CIRCUIT DIAGRAM



EFFICIENCY CURVE



Type designation	SG320HX
Input (DC)	
Max. PV input voltage	1500 V
Min. PV input voltage / Startup input voltage	500 V / 550 V
Nominal PV input voltage	1080 V
MPP voltage range	500 V – 1500 V
No. of independent MPP inputs	12
Max. number of PV strings per MPPT	2
Max. PV input current per MPPT	40 A
Max. DC short-circuit current per MPPT	60 A
Output (AC)	
AC output power	352 kVA @ 30 °C / 320 kVA @ 40 °C / 295 kVA @ 50 °C
Max. AC output current	254 A
Nominal AC voltage	3 / PE, 800 V
AC voltage range	720 – 880V
Nominal grid frequency / Grid frequency range	50 Hz / 45 – 55 Hz, 60 Hz / 57 – 63 Hz
THD	< 3 % (at nominal power)
DC current injection	< 0.5 % In
Power factor at nominal power / Adjustable power factor	> 0.99 / 0.8 leading – 0.8 lagging
Feed-in phases / Connection phases	3 / 3
Efficiency	
Max. efficiency / European efficiency	99.02 % / 98.8 %
Protection	
DC reverse connection protection	Yes
AC short circuit protection	Yes
Leakage current protection	Yes
Grid monitoring	Yes
Ground fault monitoring	Yes
DC switch / AC switch	Yes / No
PV string current monitoring	Yes
Q at night function*	Yes
Surge protection	DC Type II / AC Type II
General Data	
Dimensions (W*H*D)	1136 * 870 * 361 mm
Weight	≤116 kg
Isolation method	Transformerless
Degree of protection	IP66
Power consumption at night	< 6 W
Operating ambient temperature range	-30 to 60 °C
Allowable relative humidity range	0 – 100 %
Cooling method	Smart forced air cooling
Max. operating altitude	4000 m (> 3000 m derating)
Display	LED, Bluetooth+APP
Communication	RS485 / PLC
DC connection type	MC4-Evo2 (Max. 6 mm ² , optional 10mm ²)
AC connection type	Support OT/DT terminal (Max. 400 mm ²)
Compliance	IEC 62109, IEC 61727, IEC 62116, IEC 60068, IEC 61683
Grid Support	Q at night function*, LVRT, HVRT, active & reactive power control and power ramp rate control

* Need uninterrupted grid supply

MAC 30~60KTL3-X LV

- 3 MPPTs
- Smart diagnosis
- High efficiency up to 98.8%
- Local WIFI connection
- OLED display and touch button
- AC&DC type II SPD
- Data storage up to 25 years
- DC side 2 in 1 connection enabled



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Datasheet	MAC 30KTL3-X LV	MAC 40KTL3-X LV	MAC 50KTL3-X LV	MAC 60KTL3-X LV
Input Data				
Max.DC power	39000W	52000W	65000W	78000W
Max.DC voltage	1100V	1100V	1100V	1100V
Start voltage	250V	250V	250V	250V
Nominal voltage	600V	600V	600V	600V
MPPT voltage range	200V-1000V	200V-1000V	200V-1000V	200V-1000V
Max. input current per MPPT	37.5A/37.5A/25A	37.5A/37.5A/37.5A	50A/37.5A/37.5A	50A/50A/50A
Number of MPP trackers/ strings per MPP tracker	3/3+3+2	3/3+3+3	3/4+3+3	3/4+4+4
Output(AC)				
Rated AC output power	30000W	40000W	50000W	60000W
Max. AC apparent power	33300VA	44400VA	55500VA	66600VA
AC nominal voltage	230V/400V	230V/400V	230V/400V	230V/400V
AC grid frequency	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz
Max. output current	48.3A	64.4A	80.5A	96.6A
Power factor	0.8leading ...0.8lagging	0.8leading ...0.8lagging	0.8leading ...0.8lagging	0.8leading ...0.8lagging
THDi	<3%	<3%	<3%	<3%
AC grid connection type	3W+N+PE	3W+N+PE	3W+N+PE	3W+N+PE
Efficiency				
Max. efficiency	98.7%	98.7%	98.7%	98.8%
Euro-eta	98.4%	98.5%	98.5%	98.5%
MPPT efficiency	99.9%	99.9%	99.9%	99.9%
Protection Devices				
DC reverse polarity protection	yes	yes	yes	yes
DC switch	yes	yes	yes	yes
DC surge protection	Typell	Typell	Typell	Typell
Ground fault monitoring	yes	yes	yes	yes
Output short circuit protection	yes	yes	yes	yes
AC surge protection	Typell	Typell	Typell	Typell
General Data				
Dimensions(W / H / D) in mm	680/508/281	680/508/281	680/508/281	680/508/281
Weight	≤52kg	≤52kg	≤52kg	≤52kg
Operating temperature range	- 25°C ... +60°C	- 25°C ... +60°C	- 25°C ... +60°C	- 25°C ... +60°C
Noise emission(Typical)	≤60dB(A)	≤60dB(A)	≤60dB(A)	≤60dB(A)
Relative humidity	0~100%	0~100%	0~100%	0~100%
Altitude	4000m	4000m	4000m	4000m
Self-consumption	< 1W	< 1W	< 1W	< 1W
Topology	Transformerless	Transformerless	Transformerless	Transformerless
Cooling concept	Smart cooling	Smart cooling	Smart cooling	Smart cooling
Environmental Protection Rating	IP65	IP65	IP65	IP65
Features				
Display	OLED+LED/WIFI+APP	OLED+LED/WIFI+APP	OLED+LED/WIFI+APP	OLED+LED/WIFI+APP
Interfaces:USB/RS485/GPRS /WIFI/4G	yes/yes/opt/opt/opt	yes/yes/opt/opt/opt	yes/yes/opt/opt/opt	yes/yes/opt/opt/opt
Warranty: 5 years / 10 years	yes/opt	yes/opt	yes/opt	yes/opt
EN 61000-3, EN 61000-6, EN/IEC 62109-1, EN/IEC 62109-2, IEC 60068, IEC61683, IEC62116, IEC 61727				

MID 25~40KTL3-X

- The maximum efficiency is up to 98.8%
- 40% compact and lighter
- AFCI function optional
- Self-consumption monitoring
- Touch key and OLED display
- Type II SPD on DC and AC side



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Datasheet	MID 25KTL3-X	MID 30KTL3-X	MID 33KTL3-X	MID 36KTL3-X	MID 40KTL3-X
Input Data (DC)					
Max. recommended PV power	37500W	45000W	49500W	54000W	60000W
Max. DC voltage	1100V	1100V	1100V	1100V	1100V
Start Voltage	250V	250V	250V	250V	250V
Normal Voltage	600V	600V	600V	600V	600V
MPPT voltage range	200-1000V	200-1000V	200-1000V	200-1000V	200-1000V
Number of MPP trackers	3	3	3	4	4
Max. Strings per MPP tracker	2/2/2	2/2/2	2/2/2	2/2/2/2	2/2/2/2
Max. input current per MPPT	26/26/26	26/26/26	26/26/26	26/26/26/26	26/26/26/26
Max. short circuit current per MPPT	32/32/32	32/32/32	32/32/32	32/32/32/32	32/32/32/32
Output Data (AC)					
Rated AC output power	25000W	30000W	33000W	36000W	40000W
Max. AC apparent power	27700VA	33300VA*	36600VA	39600VA	44000VA
AC nominal voltage; range	220/380V,230V/400V 340-440V	220/380V,230V/400V 340-440V	220/380V,230V/400V 340-440V	220/380V,230V/400V 340-440V	220/380V,230V/400V 340-440V
AC grid frequency; range	50/60 Hz 45~55Hz/55-65 Hz	50/60 Hz; 45~55Hz/55-65 Hz	50/60 Hz; 45~55Hz/55-65 Hz	50/60 Hz; 45~55Hz/55-65 Hz	50/60 Hz; 45~55Hz/55-65 Hz
Max. output current	40A	50.5A	55.5A	60.0A	66.6A
Power factor	0.8 leading - 0.8 lagging	0.8 leading - 0.8 lagging	0.8 leading - 0.8 lagging	0.8 leading - 0.8 lagging	0.8 leading - 0.8 lagging
THDI	<3%	<3%	<3%	<3%	<3%
AC grid connection type	3W+N+PE	3W+N+PE	3W+N+PE	3W+N+PE	3W+N+PE
Efficiency					
Max.efficiency	98.8%	98.8%	98.8%	98.8%	98.8%
Euro.efficiency	98.50%	98.50%	98.50%	98.50%	98.50%
Protection Devices					
DC reverse polarity protection	yes	yes	yes	yes	yes
DC Switch	yes	yes	yes	yes	yes
DC Surge protection	typell	typell	typell	typell	typell
Insulation resistance monitoring	yes	yes	yes	yes	yes
AC Surge protection	typell	typell	typell	typell	typell
Output short circuit protection	yes	yes	yes	yes	yes
Ground fault monitoring	yes	yes	yes	yes	yes
Grid Monitoring	yes	yes	yes	yes	yes
Anti-islanding protection	yes	yes	yes	yes	yes
Residual-current monitoring	yes	yes	yes	yes	yes
Anti-PID protection	opt	opt	opt	opt	opt
String monitoring	opt	opt	opt	opt	opt
AFCI protection	opt	opt	opt	opt	opt
General Data					
Dimensions (W / H / D) in mm	575*420*225	575*420*225	575*420*225	575*420*225	575*420*225
Weight	30kg	30kg	30kg	30kg	30kg
Operating temperature range	- 35°C ... +60°C	- 35°C ... +60°C	- 35°C ... +60°C	- 35°C ... +60°C	- 35°C ... +60°C
Noise emission (typical)	≤50dB(A)	≤50dB(A)	≤50dB(A)	≤50dB(A)	≤50dB(A)
Altitude	4000m	4000m	4000m	4000m	4000m
Self-Consumption (night)	1W	1W	1W	1W	1W
Topology	Transformerless	Transformerless	Transformerless	Transformerless	Transformerless
Cooling	Smart cooling	Smart cooling	Smart cooling	Smart cooling	Smart cooling
Degree of protection	Ip65	Ip65	Ip65	Ip65	Ip65
Relative Humidity	0~100%	0~100%	0~100%	0~100%	0~100%
DC connection	H4/MC4(opt)	H4/MC4(opt)	H4/MC4(opt)	H4/MC4(opt)	H4/MC4(opt)
AC connection	Waterproof PG terminal + OT connector	Waterproof PG terminal + OT connector	Waterproof PG terminal + OT connector	Waterproof PG terminal + OT connector	Waterproof PG terminal + OT connector
Display and Communication					
Display	OLED+LED	OLED+LED	OLED+LED	OLED+LED	OLED+LED
USB/RS485	yes	yes	yes	yes	yes
WIFI/GPRS/4G/LAN	opt	opt	opt	opt	opt
CE, EN50549, VDE-AR-N4105, VDE 0126-1-1, C10/C11, VFR2014, CEI 0-21, CEI 0-16, IEC 62116, IEC 61727, G99, AS4777, PO12.2, UNE206007					

* For Belgium C10/C11 and VDE-AR-N4105, MID 30KTL3-SX max. output power is limit to 30KVA.

MAX 50~80KTL3 LV

- 6 / 7 MPPTs
- Smart diagnosis
- High efficiency up to 99%
- Local WIFI connection
- String monitoring
- AC&DC type II SPD
- AFCI protection
- Data storage up to 25 years
- DC side 2 in 1 connection enabled

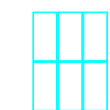
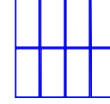


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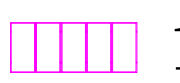
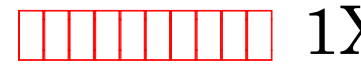
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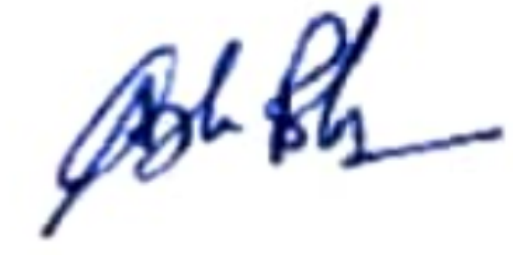
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ROOFTOP TABLE DETAILS			
ROOF	Table Size	No. of Table	No. of Modules
NP CONTROL BUILDING	2PX3	5	28
	2PX5	15	150
FILTER PRESS	2PX3	8	48
	2PX5	4	40
LIME STORAGE	2PX3	2	12
	2PX5	10	100
CANTEEN	2PX3	5	28
	2PX5	15	150
		64	556

 2PX3 - TABLE
 2PX5 - TABLE

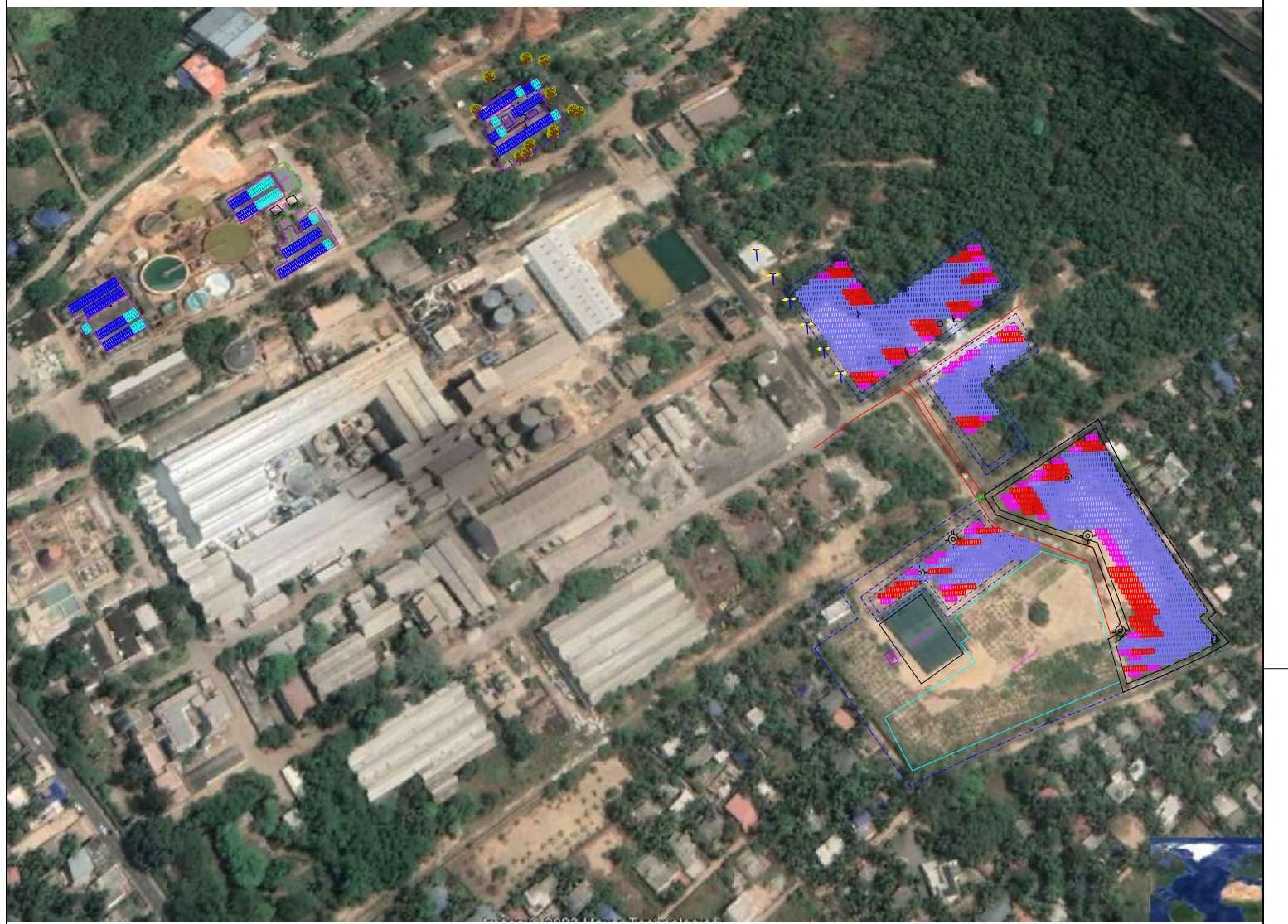
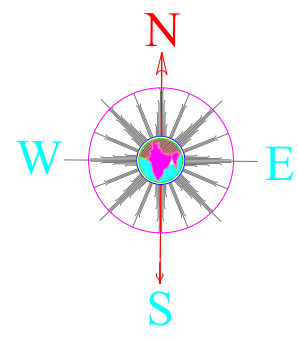
GROUND MOUNT TABLE DETAILS			
Area	Table Size	No. of Table	No. of Modules
Area 1 & 2	1X20	65	1300
	1X10	33	330
	1X05	30	150
Area -3	1X20	14	280
	1X10	4	40
	1X05	8	40
Area-4	1X20	38	760
	1X10	18	180
	1X05	14	70
			3150

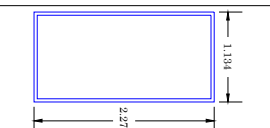
 1X5 - TABLE
 1X10 - TABLE
 1X20 - TABLE

checked by 
ABHILASH RAJWANSHI
CHARTERED ENGINEER
MECHANICAL
MEMBERSHIP NO-AM150761-6

BUILDING AREA					
S.NO	NAME	AREA			REMARKS
		SQ.MT	SQ.FT	ACRE	
1	BUILDING - 1	549.869	5918.740	0.136	
2	BUILDING - 2	333.885	3593.908	0.083	
3	BUILDING - 3	647.197	6966.370	0.160	
4	BUILDING - 4	433.160	4662.490	0.107	
5	BUILDING - 5	672.235	7235.877	0.166	
6	BUILDING - 6	554.592	5969.573	0.137	
7	BUILDING - 7	533.587	5743.478	0.132	
8	BUILDING - 8	500.226	5384.389	0.124	
9	BUILDING - 9	226.326	2436.152	0.056	
10	BUILDING - 10	1056.020	11366.909	0.261	
11	BUILDING - 11	64.954	699.159	0.016	
12	BUILDING - 12	239.028	2572.875	0.059	
TOTAL AREA		5811.078	62549.920	1.436	

COMPOUND WALL AREA					
S.NO	NAME	AREA			REMARKS
		SQ.MT	SQ.FT	ACRE	
1	AREA - 1	1969.838	21203.156	0.487	
2	AREA - 2	6206.521	66806.433	1.534	
3	AREA - 3	2271.201	24447.004	0.561	
4	AREA - 4	1652.950	17792.201	0.408	
TOTAL AREA		12100.509	130248.794	2.990	



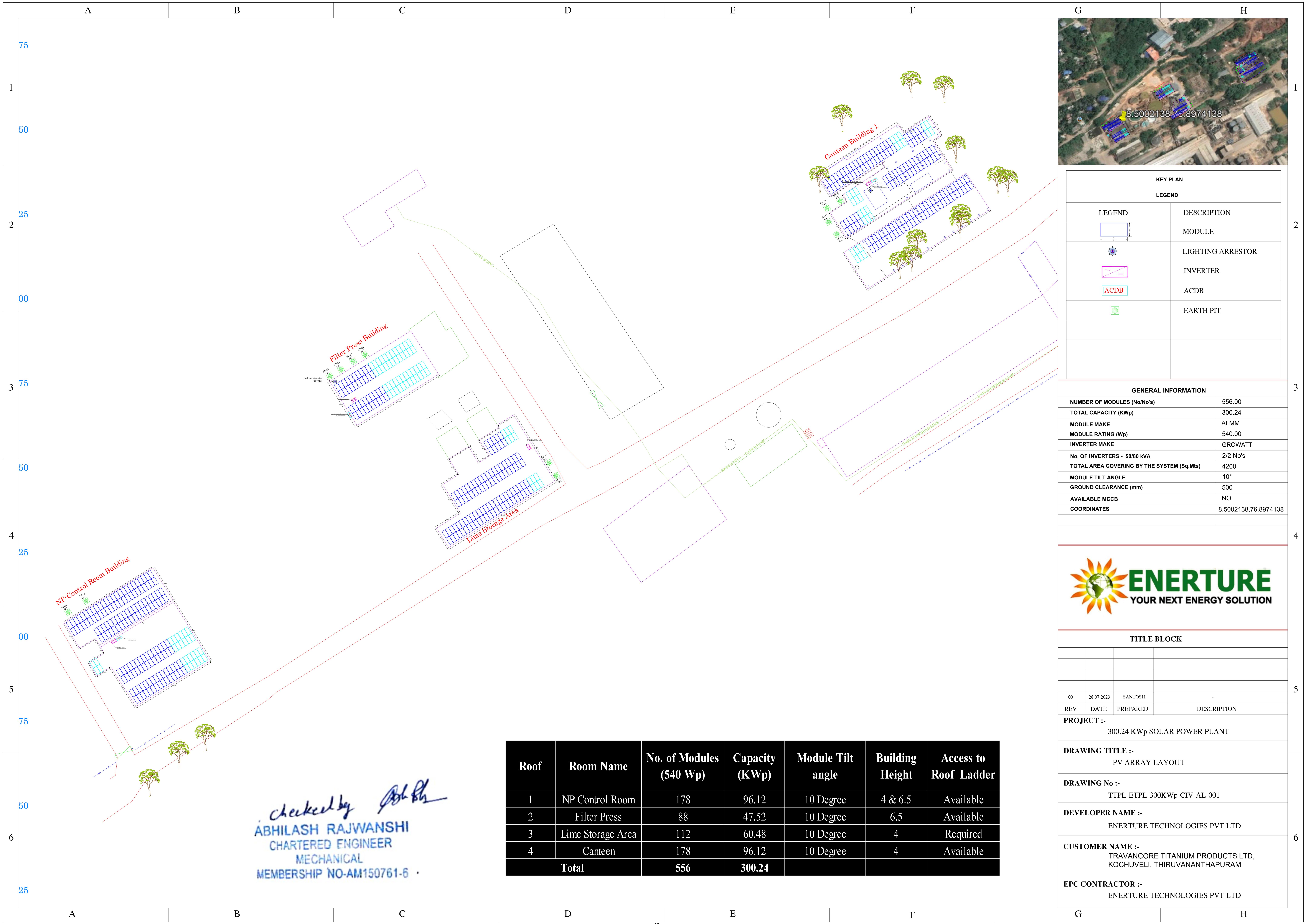
KEY PLAN	
LEGEND	
LEGEND	DESCRIPTION
	MODULE
	LIGHTING ARRESTOR
	PROPOSED CABLE/TL LINE OF SPV PLANT

GENERAL INFORMATION	
NUMBER OF MODULES (No/No's)	3704.00
TOTAL CAPACITY (KWp)	2000.16
MODULE MAKE	ALMM
MODULE RATING (Wp)	540.00
INVERTER MAKE	GROWATT
No. OF INVERTERS - 50/80/295 kVA	2/2/5 No's
TOTAL AREA COVERING BY THE SYSTEM (Sq.Mts)	XXXX
MODULE TILT ANGLE	10°
GROUND CLEARANCE (mm)	500
AVAILABLE MCCB	NO
COORDINATES	8.5002138,76.8974138



TITLE BLOCK			
00	03.08.2023	SANTOSH	
REV	DATE	PREPARED	DESCRIPTION

PROJECT :- 2000.16 KWp SOLAR POWER PLANT			
DRAWING TITLE :- PV ARRAY LAYOUT			
DRAWING No :- TTPL-ETPL-2000KWp-CIV-AL-001			
DEVELOPER NAME :- ENERTURE TECHNOLOGIES PVT LTD			
CUSTOMER NAME :- TRAVANCORE TITANIUM PRODUCTS LTD, KOCHUVELI, THIRUVANANTHAPURAM			
EPC CONTRACTOR :- ENERTURE TECHNOLOGIES PVT LTD			



KEY PLAN	
LEGEND	
LEGEND	DESCRIPTION
	MODULE
	LIGHTING ARRESTOR
	INVERTER
	ACDB
	EARTH PIT

GENERAL INFORMATION	
NUMBER OF MODULES (No/No's)	556.00
TOTAL CAPACITY (KWp)	300.24
MODULE MAKE	ALMM
MODULE RATING (Wp)	540.00
INVERTER MAKE	GROWATT
No. OF INVERTERS - 50/80 kVA	2/2 No's
TOTAL AREA COVERING BY THE SYSTEM (Sq.Mts)	4200
MODULE TILT ANGLE	10°
GROUND CLEARANCE (mm)	500
AVAILABLE MCCB	NO
COORDINATES	8.5002138,76.8974138



TITLE BLOCK			
00	28.07.2023	SANTOSH	
REV	DATE	PREPARED	DESCRIPTION

PROJECT :-
300.24 KWp SOLAR POWER PLANT

DRAWING TITLE :-
PV ARRAY LAYOUT

DRAWING No :-
TTPL-ETPL-300KWp-CIV-AL-001

DEVELOPER NAME :-
ENERTURE TECHNOLOGIES PVT LTD

CUSTOMER NAME :-
TRAVANCORE TITANIUM PRODUCTS LTD,
KOCHUVELI, THIRUVANANTHAPURAM

EPC CONTRACTOR :-
ENERTURE TECHNOLOGIES PVT LTD

checked by *Abh Bh*
ABHILASH RAJWANSHI
CHARTERED ENGINEER
MECHANICAL
MEMBERSHIP NO-AM150761-6

Roof	Room Name	No. of Modules (540 Wp)	Capacity (KWp)	Module Tilt angle	Building Height	Access to Roof Ladder
1	NP Control Room	178	96.12	10 Degree	4 & 6.5	Available
2	Filter Press	88	47.52	10 Degree	6.5	Available
3	Lime Storage Area	112	60.48	10 Degree	4	Required
4	Canteen	178	96.12	10 Degree	4	Available
Total		556	300.24			



KEY PLAN	
LEGEND	
LEGEND	DESCRIPTION
	MODULE
	LIGHTING ARRESTOR
	INVERTER
	ACDB
	EARTH PIT

GENERAL INFORMATION	
NUMBER OF MODULES (No/No's)	556.00
TOTAL CAPACITY (KWp)	300.24
MODULE MAKE	ALMM
MODULE RATING (Wp)	540.00
INVERTER MAKE	GROWATT
No. OF INVERTERS - 50/80 kVA	2/2 No's
TOTAL AREA COVERING BY THE SYSTEM (Sq.Mts)	4200
MODULE TILT ANGLE	10°
GROUND CLEARANCE (mm)	500
AVAILABLE MCCB	NO
COORDINATES	8.5002138,76.8974138

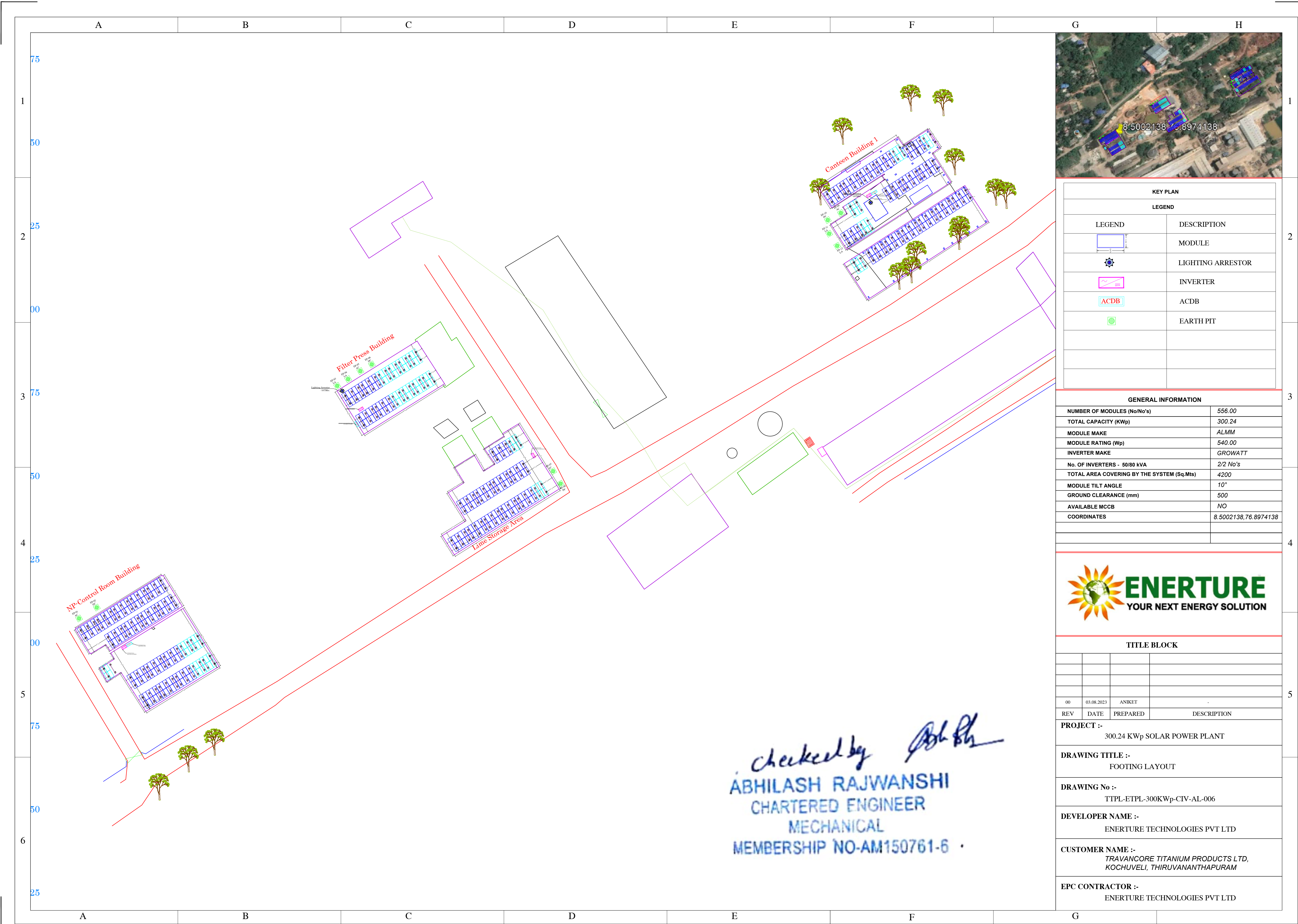


TITLE BLOCK			
00	31.07.2023	ANIKET	
REV	DATE	PREPARED	DESCRIPTION

PROJECT :- 300.24 KWp SOLAR POWER PLANT			
DRAWING TITLE :- EQUIPMENT LAYOUT			
DRAWING No :- TTPL-ETPL-300KWp-CIV-AL-002			
DEVELOPER NAME :- ENERTURE TECHNOLOGIES PVT LTD			
CUSTOMER NAME :- TRAVANCORE TITANIUM PRODUCTS LTD, KOCHUVELI, THIRUVANANTHAPURAM			
EPC CONTRACTOR :- ENERTURE TECHNOLOGIES PVT LTD			

checked by *Abh Bh*
ABHILASH RAJWANSHI
CHARTERED ENGINEER
MECHANICAL
MEMBERSHIP NO-AM150761-6

Roof	Room Name	No. of Modules (540 Wp)	Capacity (KWp)	Inverter	ACDB	Earthpit
1	NP Control Room	178	96.12	80 kWp, 1 Nos.	1 IN 1 OUT	2 Nos.
2	Filter Press	88	47.52	50 kWp, 1 Nos.	2 IN 1 OUT	4 Nos.
3	Lime Storage Area	112	60.48	50 kWp, 1 Nos.	0	2 Nos.
4	Canteen	178	96.12	80 kWp, 1 Nos.	1 IN 1 OUT	4 Nos.
Total		556	300.24			



KEY PLAN	
LEGEND	
LEGEND	DESCRIPTION
	MODULE
	LIGHTING ARRESTOR
	INVERTER
	ACDB
	EARTH PIT

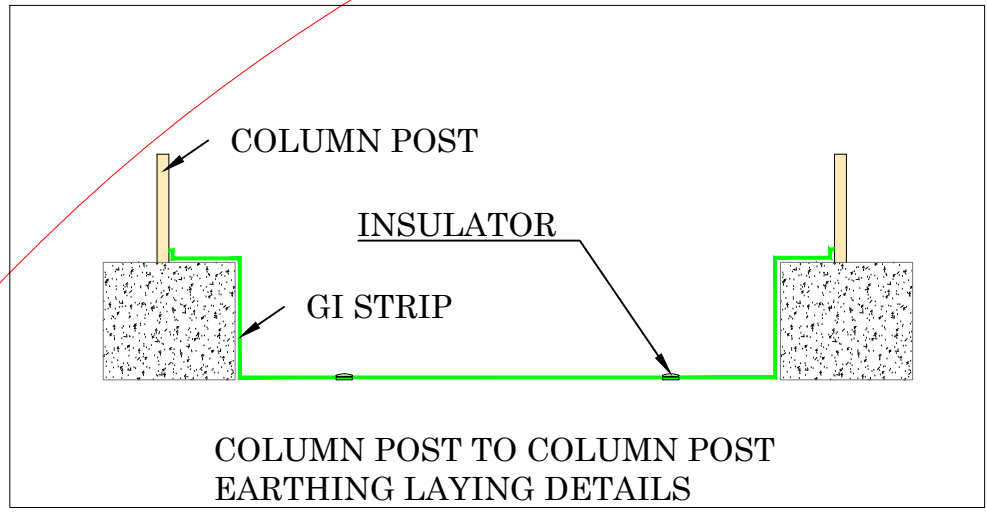
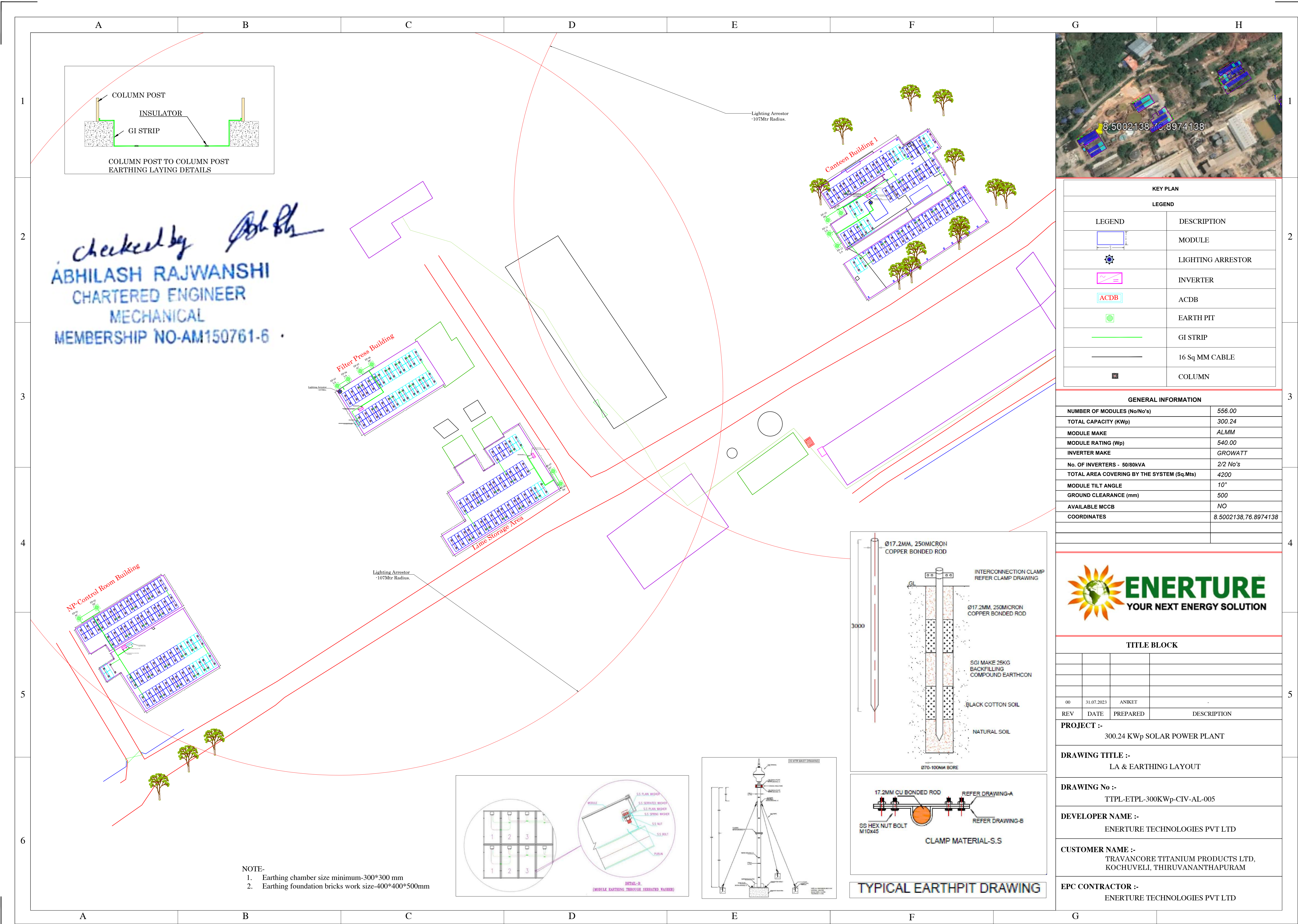
GENERAL INFORMATION	
NUMBER OF MODULES (No/No's)	556.00
TOTAL CAPACITY (KWp)	300.24
MODULE MAKE	ALMM
MODULE RATING (Wp)	540.00
INVERTER MAKE	GROWATT
No. OF INVERTERS - 50/80 kVA	2/2 No's
TOTAL AREA COVERING BY THE SYSTEM (Sq.Mts)	4200
MODULE TILT ANGLE	10°
GROUND CLEARANCE (mm)	500
AVAILABLE MCCB	NO
COORDINATES	8.5002138, 76.8974138



TITLE BLOCK			
00	03.08.2023	ANIKET	
REV	DATE	PREPARED	DESCRIPTION

PROJECT :-	300.24 KWp SOLAR POWER PLANT
DRAWING TITLE :-	FOOTING LAYOUT
DRAWING No :-	TTPL-ETPL-300KWp-CIV-AL-006
DEVELOPER NAME :-	ENERTURE TECHNOLOGIES PVT LTD
CUSTOMER NAME :-	TRAVANCORE TITANIUM PRODUCTS LTD, KOCHUVELI, THIRUVANANTHAPURAM
EPC CONTRACTOR :-	ENERTURE TECHNOLOGIES PVT LTD

checked by *Abh Bh*
ABHILASH RAJWANSHI
CHARTERED ENGINEER
MECHANICAL
MEMBERSHIP NO-AM150761-6



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ABHILASH RAJWANSHI
CHARTERED ENGINEER
MECHANICAL
MEMBERSHIP NO-AM150761-6



KEY PLAN	
LEGEND	
LEGEND	DESCRIPTION
	MODULE
	LIGHTING ARRESTOR
	INVERTER
	ACDB
	EARTH PIT
	GI STRIP
	16 Sq MM CABLE
	COLUMN

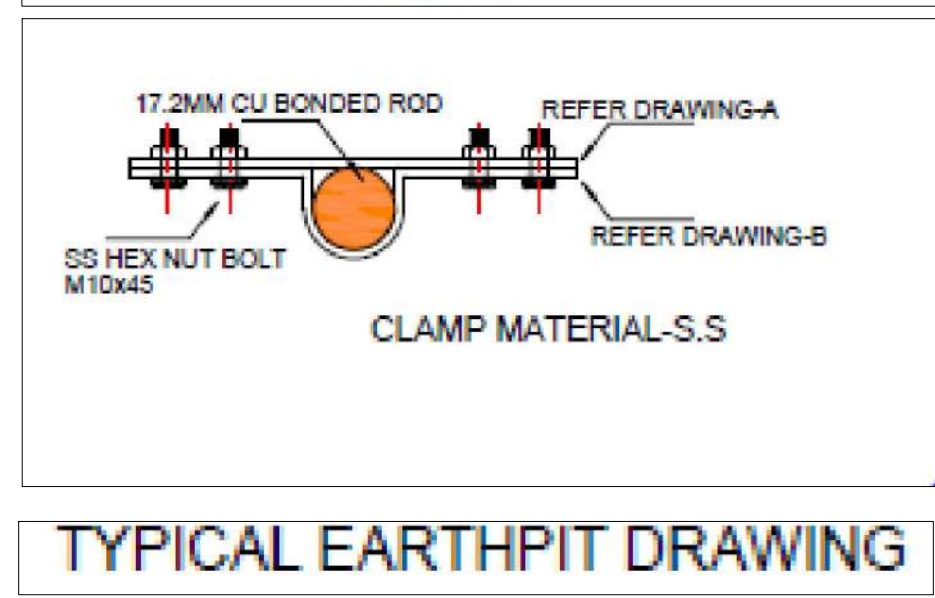
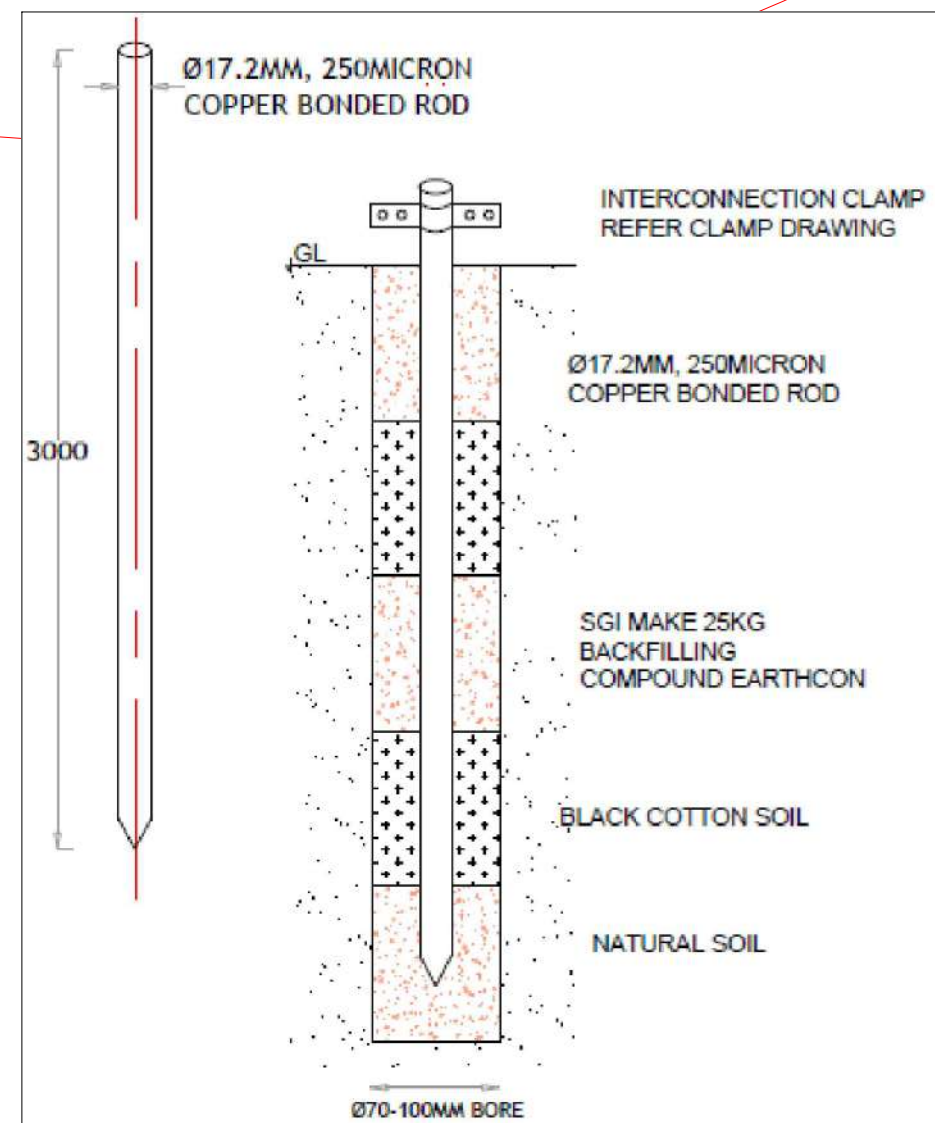
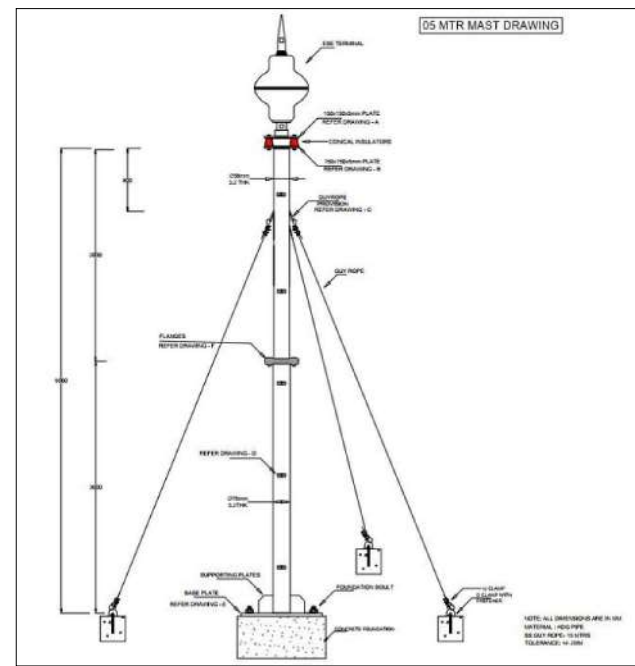
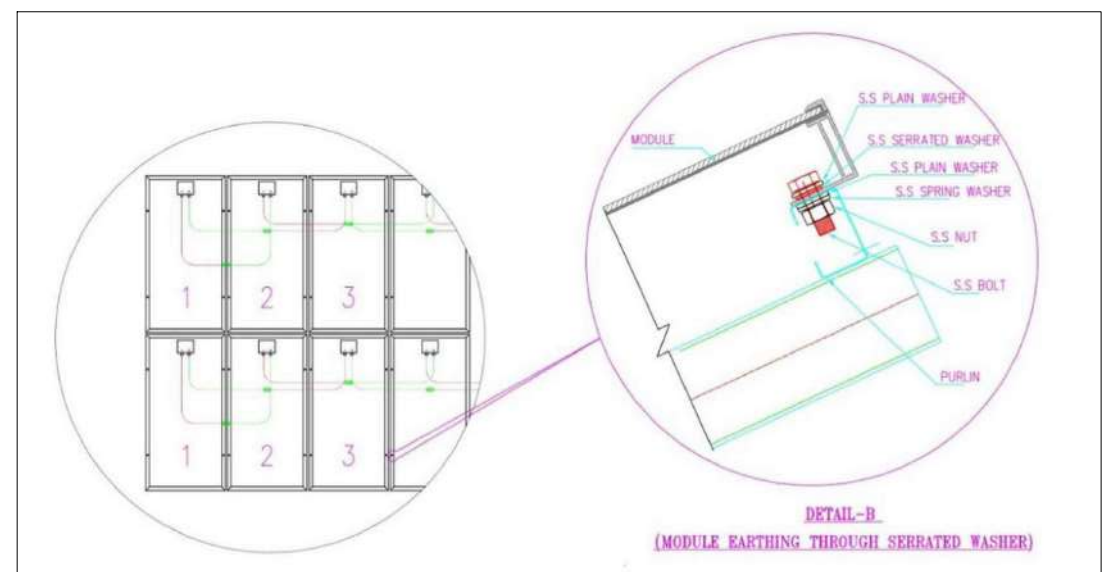
GENERAL INFORMATION	
NUMBER OF MODULES (No/No's)	556.00
TOTAL CAPACITY (KWp)	300.24
MODULE MAKE	ALMM
MODULE RATING (Wp)	540.00
INVERTER MAKE	GROWATT
No. OF INVERTERS - 50/80KVA	2/2 No's
TOTAL AREA COVERING BY THE SYSTEM (Sq.Mts)	4200
MODULE TILT ANGLE	10°
GROUND CLEARANCE (mm)	500
AVAILABLE MCCB	NO
COORDINATES	8.5002138, 76.8974138

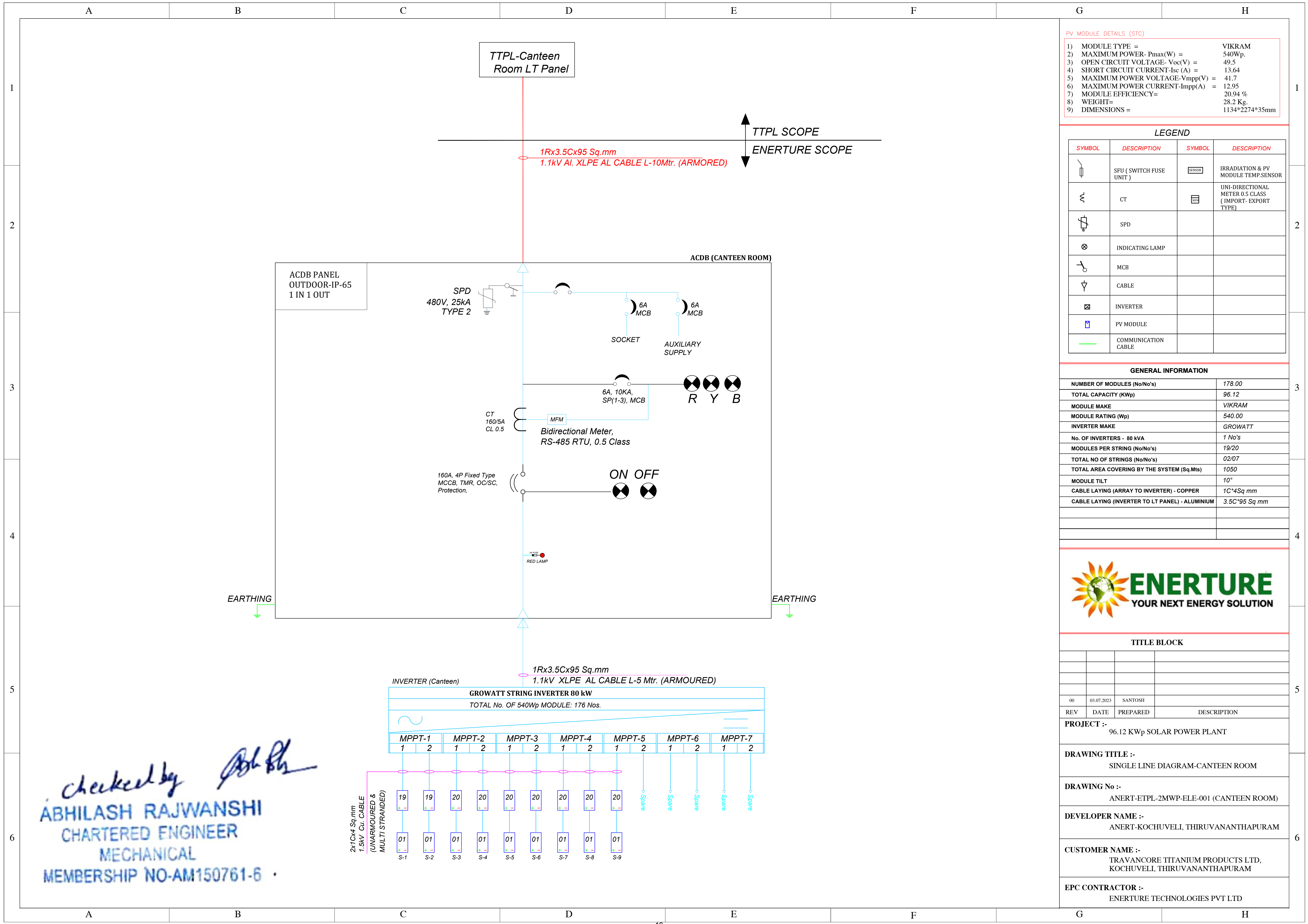


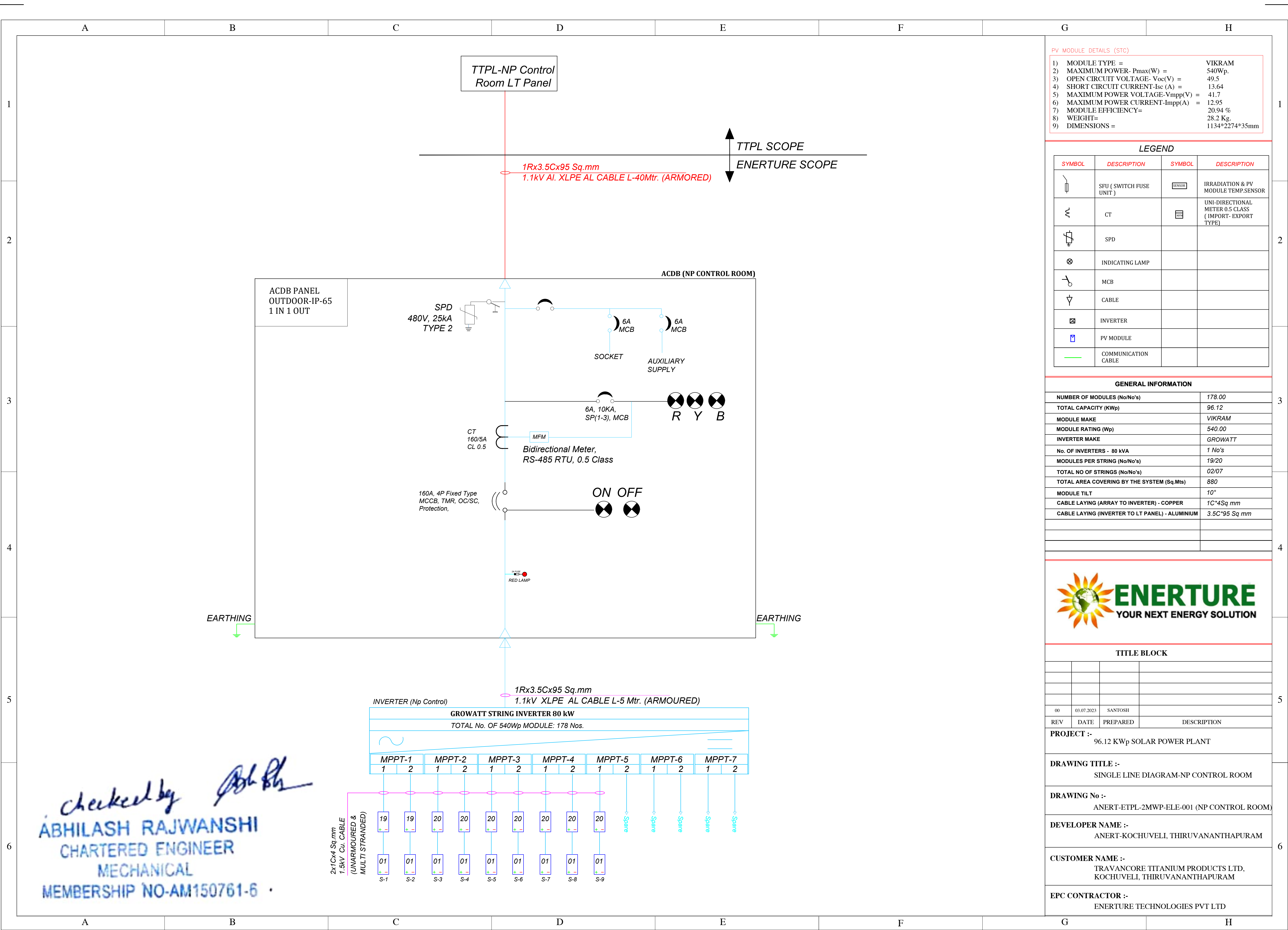
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00	31.07.2023	ANIKET	
REV	DATE	PREPARED	DESCRIPTION

PROJECT :- 300.24 KWp SOLAR POWER PLANT
DRAWING TITLE :- LA & EARTHING LAYOUT
DRAWING No :- TIPL-ETPL-300KWp-CIV-AL-005
DEVELOPER NAME :- ENERTURE TECHNOLOGIES PVT LTD
CUSTOMER NAME :- TRAVANCORE TITANIUM PRODUCTS LTD, KOCHUVELI, THIRUVANANTHAPURAM
EPC CONTRACTOR :- ENERTURE TECHNOLOGIES PVT LTD

- NOTE-
1. Earthing chamber size minimum-300*300 mm
 2. Earthing foundation bricks work size-400*400*500mm







PV MODULE DETAILS (STC)			
1) MODULE TYPE =	VIKRAM		
2) MAXIMUM POWER- Pmax(W) =	540Wp.		
3) OPEN CIRCUIT VOLTAGE- Voc(V) =	49.5		
4) SHORT CIRCUIT CURRENT- Isc (A) =	13.64		
5) MAXIMUM POWER VOLTAGE-Vmpp(V) =	41.7		
6) MAXIMUM POWER CURRENT-Impp(A) =	12.95		
7) MODULE EFFICIENCY=	20.94 %		
8) WEIGHT=	28.2 Kg.		
9) DIMENSIONS =	1134*2274*35mm		

LEGEND			
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	SFU (SWITCH FUSE UNIT)		IRRADIATION & PV MODULE TEMP.SENSOR
	CT		UNI-DIRECTIONAL METER 0.5 CLASS (IMPORT- EXPORT TYPE)
	SPD		
	INDICATING LAMP		
	MCB		
	CABLE		
	INVERTER		
	PV MODULE		
	COMMUNICATION CABLE		

GENERAL INFORMATION	
NUMBER OF MODULES (No/No's)	178.00
TOTAL CAPACITY (KWp)	96.12
MODULE MAKE	VIKRAM
MODULE RATING (Wp)	540.00
INVERTER MAKE	GROWATT
No. OF INVERTERS - 80 kVA	1 No's
MODULES PER STRING (No/No's)	19/20
TOTAL NO OF STRINGS (No/No's)	02/07
TOTAL AREA COVERING BY THE SYSTEM (Sq.Mts)	880
MODULE TILT	10°
CABLE LAYING (ARRAY TO INVERTER) - COPPER	1C*4Sq mm
CABLE LAYING (INVERTER TO LT PANEL) - ALUMINIUM	3.5C*95 Sq mm

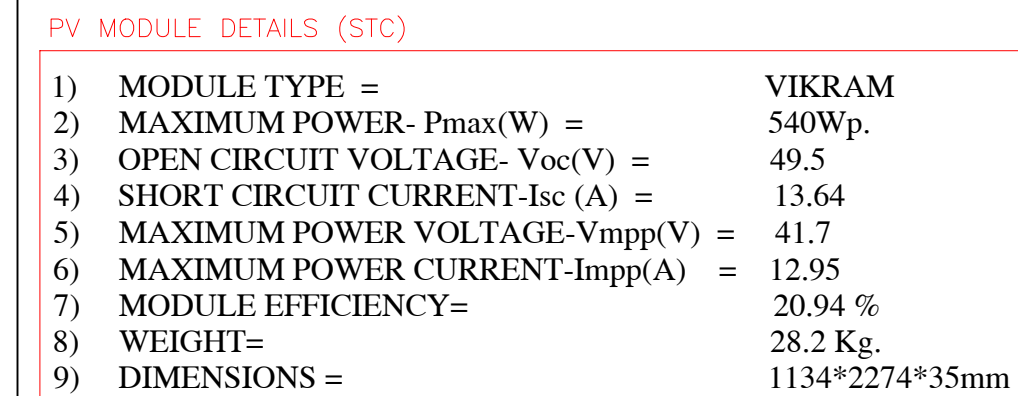


TITLE BLOCK			
00	03.07.2023	SANTOSH	
REV	DATE	PREPARED	DESCRIPTION

PROJECT :- 96.12 KWp SOLAR POWER PLANT			
DRAWING TITLE :- SINGLE LINE DIAGRAM-NP CONTROL ROOM			
DRAWING No :- ANERT-ETPL-2MWP-ELE-001 (NP CONTROL ROOM)			
DEVELOPER NAME :- ANERT-KOCHUVELI, THIRUVANANTHAPURAM			
CUSTOMER NAME :- TRAVANCORE TITANIUM PRODUCTS LTD, KOCHUVELI, THIRUVANANTHAPURAM			
EPC CONTRACTOR :- ENERTURE TECHNOLOGIES PVT LTD			

checked by

ABHILASH RAJWANSHI
CHARTERED ENGINEER
MECHANICAL
MEMBERSHIP NO-AM150761-6



LEGEND			
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	SFU (SWITCH FUSE UNIT)		IRRADIATION & PV MODULE TEMP.SENSOR
	CT		UNI-DIRECTIONAL METER 0.5 CLASS (IMPORT- EXPORT TYPE)
	SPD		
	INDICATING LAMP		
	MCB		
	CABLE		
	INVERTER		
	PV MODULE		
	COMMUNICATION CABLE		

GENERAL INFORMATION	
NUMBER OF MODULES (No/No's)	200.00
TOTAL CAPACITY (KWp)	108
MODULE MAKE	VIKRAM
MODULE RATING (Wp)	540.00
INVERTER MAKE	GROWATT
No. OF INVERTERS - 50 kVA	2 No's
MODULES PER STRING (No/No's)	17/18/20
TOTAL NO OF STRINGS (No/No's)	02/07/02
TOTAL AREA COVERING BY THE SYSTEM (Sq.Mts)	1100
MODULE TILT	10°
CABLE LAYING (ARRAY TO INVERTER) - COPPER	1C'4Sq mm
CABLE LAYING (INVERTER TO LT PANEL) - ALUMINIUM	3.5C'50 & 95 Sq m



TITLE BLOCK			
00	04.07.2023	ANIKET	
REV	DATE	PREPARED	DESCRIPTION

PROJECT :-	108 KW _p SOLAR POWER PLANT
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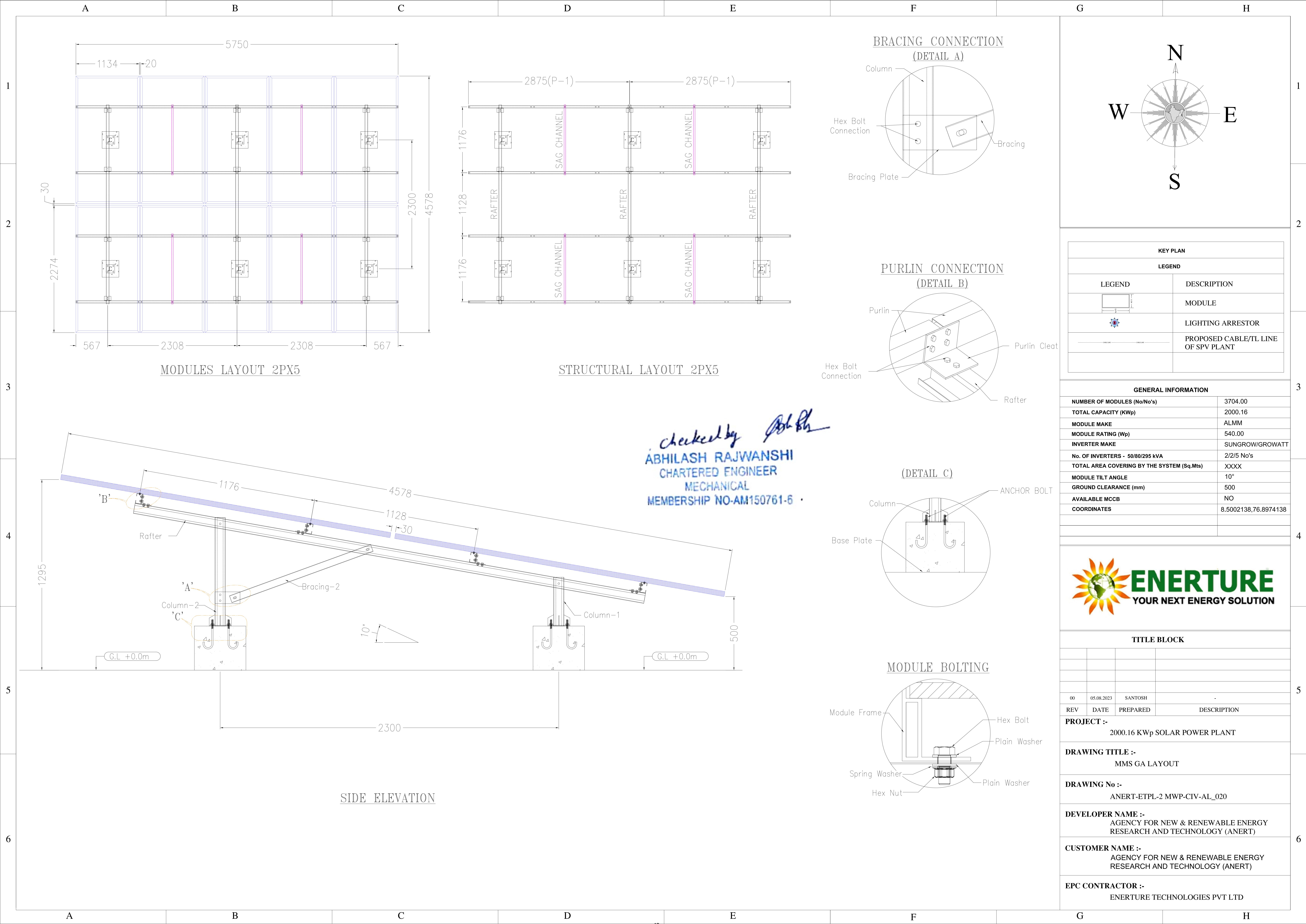
DRAWING TITLE :-
SINGLE LINE DIAGRAM-FILLTER PRESS

DRAWING No :-
ANERT-ETPL-2MWP-ELE-001 (FILLTER PRESS)

DEVELOPER NAME :-
ANERT-KOCHUVELI, THIRUVANANTHAPURAM

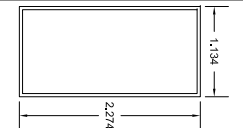
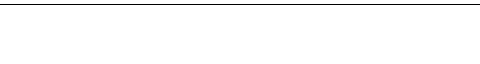
CUSTOMER NAME :-
TRAVANCORE TITANIUM PRODUCTS LTD,
KOCHUVELI, THIRUVANANTHAPURAM

EPC CONTRACTOR :-
ENERTURE TECHNOLOGIES PVT LTD



checked by *Abhilash*
ABHILASH RAJWANSHI
CHARTERED ENGINEER
MECHANICAL
MEMBERSHIP NO-AM150761-6

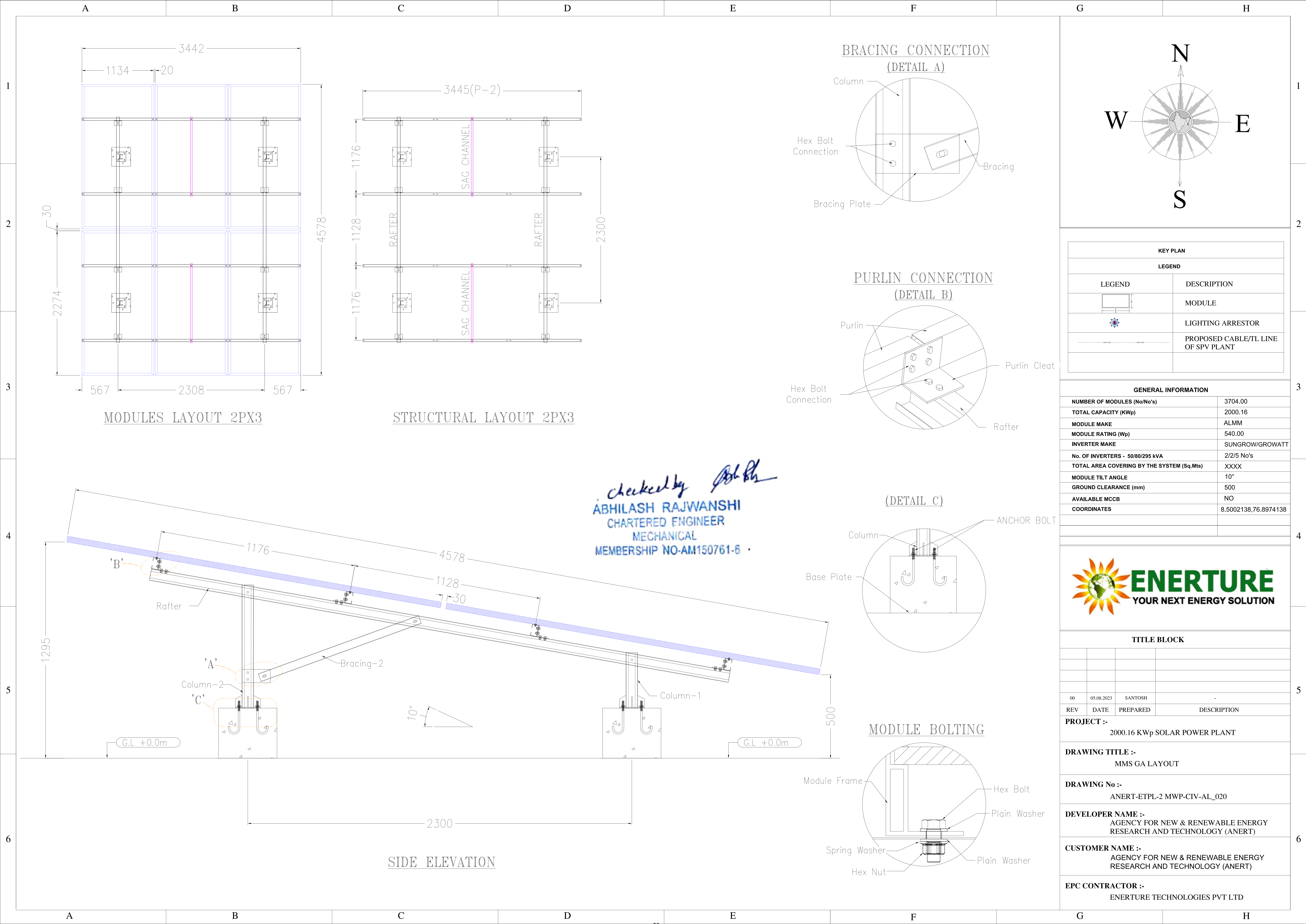


KEY PLAN	
LEGEND	
	MODULE
	LIGHTING ARRESTOR
	PROPOSED CABLE/TL LINE OF SPV PLANT

GENERAL INFORMATION	
NUMBER OF MODULES (No/No's)	3704.00
TOTAL CAPACITY (KWp)	2000.16
MODULE MAKE	ALMM
MODULE RATING (Wp)	540.00
INVERTER MAKE	SUNGROW/GROWATT
No. OF INVERTERS - 50/80/295 kVA	2/2/5 No's
TOTAL AREA COVERING BY THE SYSTEM (Sq.Mts)	XXXX
MODULE TILT ANGLE	10°
GROUND CLEARANCE (mm)	500
AVAILABLE MCCB	NO
COORDINATES	8.5002138,76.8974138

TITLE BLOCK			
00	05.08.2023	SANTOSH	-
REV	DATE	PREPARED	DESCRIPTION

PROJECT :- 2000.16 KWp SOLAR POWER PLANT			
DRAWING TITLE :- MMS GA LAYOUT			
DRAWING No :- ANERT-ETPL-2 MWP-CIV-AL_020			
DEVELOPER NAME :- AGENCY FOR NEW & RENEWABLE ENERGY RESEARCH AND TECHNOLOGY (ANERT)			
CUSTOMER NAME :- AGENCY FOR NEW & RENEWABLE ENERGY RESEARCH AND TECHNOLOGY (ANERT)			
EPC CONTRACTOR :- ENERTURE TECHNOLOGIES PVT LTD			



KEY PLAN	
LEGEND	
LEGEND	DESCRIPTION
	MODULE
	LIGHTING ARRESTOR
	PROPOSED CABLE/TL LINE OF SPV PLANT

GENERAL INFORMATION	
NUMBER OF MODULES (No/No's)	3704.00
TOTAL CAPACITY (KWp)	2000.16
MODULE MAKE	ALMM
MODULE RATING (Wp)	540.00
INVERTER MAKE	SUNGROW/GROWATT
No. OF INVERTERS - 50/80/295 kVA	2/2/5 No's
TOTAL AREA COVERING BY THE SYSTEM (Sq.Mts)	XXXX
MODULE TILT ANGLE	10°
GROUND CLEARANCE (mm)	500
AVAILABLE MCCB	NO
COORDINATES	8.5002138,76.8974138



TITLE BLOCK			
00	05.08.2023	SANTOSH	-
REV	DATE	PREPARED	DESCRIPTION

PROJECT :- 2000.16 KWp SOLAR POWER PLANT			
DRAWING TITLE :- MMS GA LAYOUT			
DRAWING No :- ANERT-ETPL-2 MWP-CIV-AL_020			
DEVELOPER NAME :- AGENCY FOR NEW & RENEWABLE ENERGY RESEARCH AND TECHNOLOGY (ANERT)			
CUSTOMER NAME :- AGENCY FOR NEW & RENEWABLE ENERGY RESEARCH AND TECHNOLOGY (ANERT)			
EPC CONTRACTOR :- ENERTURE TECHNOLOGIES PVT LTD			

BOM	PV MOUNTING SYSTEMS	SUPPLIER NAME:	ENERTURE TECHNOLOGIES PVT. LTD.		
		CLIENT NAME:	TTPL		

PROJECT INFORMATION							
PROJECT DESCRIPTION		Ground Mount PV Mounting system mounted is assembly of colled rolled steel sections. ALL members are hot dip galvanized to min of 80 microns.				 KEY PLAN	
TOTAL PROJECT CAPACITY		300.24 kW	MODULE (Wp)	540			
TOTAL NO. OF MODULES		556	MODULE DIMENSION	2284X1137X35			
PROJECT LOCATION		ROOFTOP	2PX5	44			
STRUCTURE TILT ANGLE		10	2PX3	20			
CIVIL FOUNDATIONS SIZE		300mm x 300mm x 300mm		 ABHILASH RAJWANSHI CHARTERED ENGINEER MECHANICAL MEMBERSHIP NO-AM150761-6			
TOTAL CAPACITY:- 300.24KW							

STRUCTURE MEMBERS							
P.NO.	DESCRIPTION	SIZE(MM)	LENGTH (MM)	MATERIAL	ACTUAL QTY	SPARES	TOTAL QTY
1	COLUMN	CS70X40X15X2MM	626	E 350-HOT. DIP GALVANIZED	172	0	172
2	COLUMN-2	CS70X40X15X2MM	1032	E 350-HOT. DIP GALVANIZED	172	0	172
3	RAFTER-1	CS70X40X15X2MM	3550	E 350-HOT. DIP GALVANIZED	172	0	172
4	BRACING-1	CU50X25X2MM	500	E 350-HOT. DIP GALVANIZED	172	0	172
4	BRACING-2	CU50X25X2MM	1020	E 350-HOT. DIP GALVANIZED	172	0	172
5	BRACING PLATE	PL80X4MM	170	E 250-HOT. DIP GALVANIZED	344	0	344
6	PURLIN RAFTER CONNECTOR	L70X70X4MM	120	E 250-HOT. DIP GALVANIZED	688	0	688
7	PURLIN-1	CS70X40X15X2MM	2875	E 350-HOT. DIP GALVANIZED	352	0	352
8	PURLIN-2	CS70X40X15X2MM	3445	E 350-HOT. DIP GALVANIZED	80	0	80
9	SAG CHANNEL	CU40X40X2	1250	E 350-HOT. DIP GALVANIZED	216	0	216
10	BASE PLATE	PL150X5MM	150	E 250-HOT. DIP GALVANIZED	344	0	344

CLAMPS/FASTENERS							
S.NO.	DESCRIPTION	SIZE(MM)	LENGTH (MM)	MATERIAL	ACTUAL QTY	SPARES	TOTAL QTY
1	HEX BOLT FOR MODULE	M8	20	HDG / SS	2240	23	2263
2	SPRING WASHER	M8	-	HDG / SS	2240	23	2263
3	PLAIN WASHER	M8	-	HDG / SS	4480	45	4525
4	HEX NUT	M8	-	HDG / SS	2240	23	2263
5	HEX BOLT FOR STRUCTURE	M10	30	HDG / SS	2064	21	2085
6	SPRING WASHER	M10	-	HDG / SS	2064	21	2085
7	PLAIN WASHER	M10	-	HDG / SS	4128	42	4170
8	HEX NUT	M10	-	HDG / SS	2064	21	2085
9	HEX BOLT FOR PURLIN-RAFTER	M8	25	HDG / SS	4560	46	4606
10	SPRING WASHER	M8	-	HDG / SS	4560	46	4606
11	PLAIN WASHER	M8	-	HDG / SS	9120	92	9212
12	HEX NUT	M8	-	HDG / SS	4560	46	4606
13	ANCHOR BOLT	M12	125	ELECTO. GALV.	1376	14	1390



GUARANTEED TECHNICAL PARTICULARS

S.No	PATICULARS	Details
1	Manufacturer's Name and Address	ABC TRANSFORMERS PVT LTD
2	Reference Standard	IS:2026
3	Installation	Outdoor
4	Type	Inverter Duty
5	Continuous max. Rating	1500 KVA
6	Winding Material	Aluminium
7	Rated Voltage : HV/LV	11000 V / 800 V
8	Rated Current : HV/LV	78.73 / 1082.56 A
9	No of Phases & rated frequency	3 Phase & 50 Hz
10	Vector group reference	Ynd-11
11	Connection	
11.1	HV Side	Star
11.2	LV Side	Delta
12	Class of insulation	A Class
13	Tapping Range & no. of steps	+10% to -10% /@2.5% steps 8
14	Type of Tapping Switch	Off Circuit
15	Type of cooling	ONAN
16	Insulation Class	A Class
17	Ambient Temperature	50°C
18	Maximum Temperature rise of top oil / winding	50°C / 55°C
19	Max. flux density at rated voltage and rated frequency	1.69 Tesla (Max)
20	No Load Losses at rated voltage and rated frequency	1500 W
	Load Losses at rated current at principal tapping(@ 75 °C)	15000 W
21	Efficiency at 75°C :- i) At 100% of full load ii) At 75% of full load iii) At 50% of full load	At U.P.F. At 0.8 P.F. 98.91 % 98.64 % 99.12 % 98.91 % 99.30 % 99.13 %
22	% regulation at full load & at 75°C: a) At unity power factor b) At 0.8 power factor	1.030 % 4.350 %
23	Percentage Impedance at full load and at 75°C	6.0 % (Tol. as per IS)
24	Insulation level of transformer : HV/LV	28 KV, 75KVp / 10 KV, 40 KVp
25	Weight of Core & winding assembly	2260 Kg



Unit I : A-41, SECTOR-28, NOIDA - 201301,
Unit II : B-38, SECTOR-27, NOIDA - 201301,
G.B. NAGAR (U.P.) INDIA

PHONE : 0120-2582203, 4325811 FAX : 2581989

E-mail: info@abc-transformers.in Website: abc-transformers.in





ABC TRANSFORMERS PVT. LTD.

Mfrg. of : Power / Distribution / Furnace / Dry Type Transformers & Servo Stabilizer
10 KVA to 50,000 KVA (50 MVA) IN UP-TO 132 KV CLASS



26	Weight of tank & fittings	1440 Kg
27	Weight / volume of oil	1000 Kg / 1230 Ltrs.
28	Total weight of complete transformer	4700 Kg
29	Overloading Capacity	As per IS-6600
30	Induced Over Voltage	
30.1	HV Side	22 KV
30.2	LV Side	1.6 KV
31	Thickness of transformer tank plate (mm)	
31.1	Sides	5 mm
31.2	Bottom	6 mm
31.3	Cover	6 mm
31.4	Thickness of Radiator sheet	1.2 mm
32	Core Grade	M-4 Grade or better
33	Core Lamination Material	CRGO
34	Thickness of lamination	0.27 mm or better
35	Insulation of lamination	Carlite
36	Type Of Oil	Mineral Oil
37	First filling of oil	Conforms to IS-335



Unit I : A-41, SECTOR-28, NOIDA - 201301,
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E-mail : info@abc-transformers.in Website : abc-transformers.in





ABC TRANSFORMERS PVT. LTD.

Mfrg. of : Power / Distribution / Furnace / Dry Type Transformers & Servo Stabilizer
10 KVA to 50,000 KVA (50 MVA) IN UP-TO 132 KV CLASS



38	Accessories	
	1. Name, Rating & Diagram Plate	1 No.
	2. 12 KV, 250 A porcelain bushing	4 Nos.
	3. 3.6 KV, 1100 A epoxy bushing	3 Nos.
	4. Thermometer Pocket	2 Nos.
	5. Conservator with filling hole	1 No.
	6. Off Circuit Tap Changer	1 No.
	7. Breather (silica gel)	1 No.
	8. Plain oil level gauge	1 No.
	9. Lifting lugs	1 set
	10. Earthing terminals	2 Nos.
	11. Drain cum Filter valve	1 No.
	12. Top Filter Valve	1 No.
	13. Air release plug	1 No.
	14. Base Channel	2 Nos.
	15. Rollers	4 Nos.
	16. Radiators	APD
	17. Marshalling Box	1 No.
	18. WTI scada enabled	1 No.
	19. OTI scada enabled	1 No.
	20. Buchholz Relay	1 No.
	21. MOG	1 No.
	22. Inspection Cover	1 No.
	23. HV Cable Box	1 No.
	24. LV Cable Box	1 No.
	25. Explosion Vent/ PRV	1 No.
	26. CT for WTI	1 No.
	27. Jacking Pads	1 Set
	28. Shield bushing	1 No.
	29. Paint	RAL-7032, 110 micron

- Note:**
1. All electrical performances are subject to tolerance as per IS-1180, IS-2026, IEC-76.
 2. Weights & dimensions are subject to tolerance of $\pm 10\%$.
 3. Shielding Provided Between HV & LV.
 4. Special design parameter have been considered to reduce the effect of harmonics.

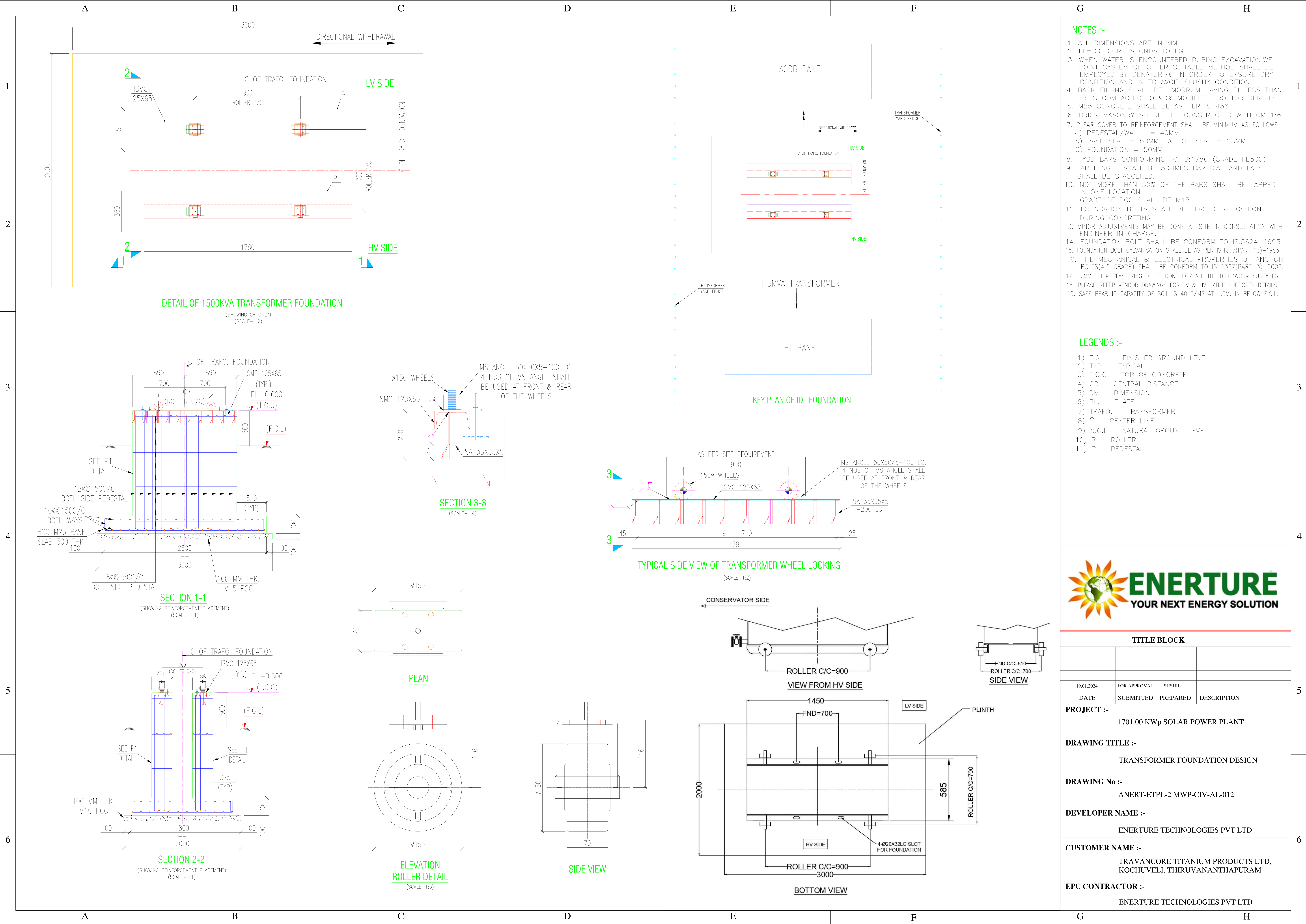


Unit I : A-41, SECTOR-58, NOIDA - 201301,
Unit II : B-38, SECTOR-57, NOIDA - 201301,
G.B. NAGAR (U.P.) INDIA

PHONE : 0120-2582203, 4325811 FAX : 2581989

E-mail : info@abc-transformers.in Website : abc-transformers.in



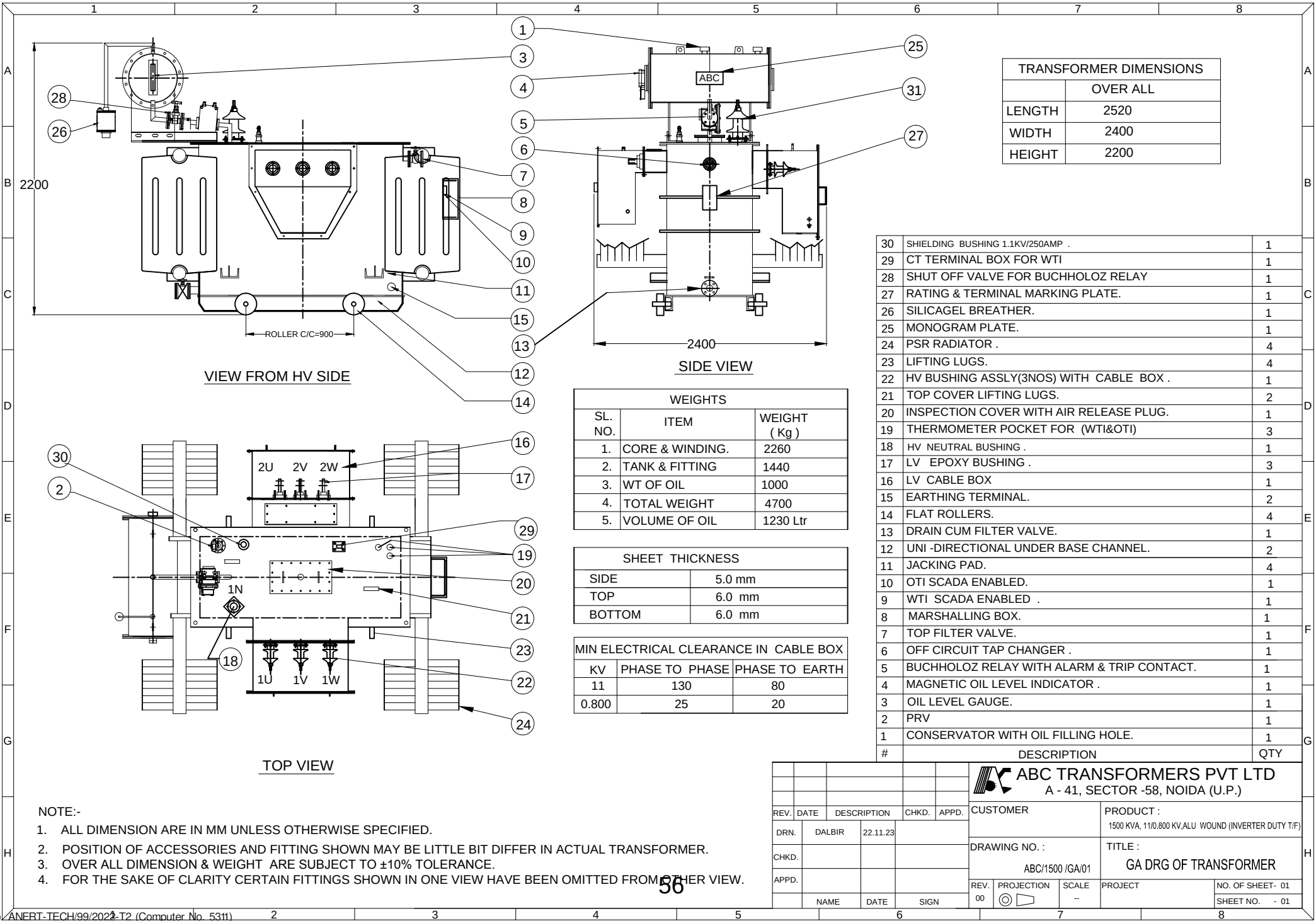


- NOTES :-**
1. ALL DIMENSIONS ARE IN MM.
 2. EL.±0.0 CORRESPONDS TO FGL
 3. WHEN WATER IS ENCOUNTERED DURING EXCAVATION, WELL POINT SYSTEM OR OTHER SUITABLE METHOD SHALL BE EMPLOYED BY DENATURING IN ORDER TO ENSURE DRY CONDITION AND IN TO AVOID SLUSHY CONDITION.
 4. BACK FILLING SHALL BE MORRUM HAVING PI LESS THAN 5 IS COMPACTED TO 90% MODIFIED PROCTOR DENSITY.
 5. M25 CONCRETE SHALL BE AS PER IS 456
 6. BRICK MASONRY SHOULD BE CONSTRUCTED WITH CM 1:6
 7. CLEAR COVER TO REINFORCEMENT SHALL BE MINIMUM AS FOLLOWS
 - a) PEDESTAL/WALL = 40MM
 - b) BASE SLAB = 50MM & TOP SLAB = 25MM
 - c) FOUNDATION = 50MM
 8. HYSD BARS CONFORMING TO IS:1786 (GRADE FE500)
 9. LAP LENGTH SHALL BE 50TIMES BAR DIA AND LAPS SHALL BE STAGGERED.
 10. NOT MORE THAN 50% OF THE BARS SHALL BE LAPPED IN ONE LOCATION
 11. GRADE OF PCC SHALL BE M15
 12. FOUNDATION BOLTS SHALL BE PLACED IN POSITION DURING CONCRETING.
 13. MINOR ADJUSTMENTS MAY BE DONE AT SITE IN CONSULTATION WITH ENGINEER IN CHARGE.
 14. FOUNDATION BOLT SHALL BE CONFORM TO IS:5624-1993
 15. FOUNDATION BOLT GALVANISATION SHALL BE AS PER IS:1367(PART 13)-1983
 16. THE MECHANICAL & ELECTRICAL PROPERTIES OF ANCHOR BOLTS(4.6 GRADE) SHALL BE CONFORM TO IS 1367(PART-3)-2002.
 17. 12MM THICK PLASTERING TO BE DONE FOR ALL THE BRICKWORK SURFACES.
 18. PLEASE REFER VENDOR DRAWINGS FOR LV & HV CABLE SUPPORTS DETAILS.
 19. SAFE BEARING CAPACITY OF SOIL IS 40 T/M2 AT 1.5M. IN BELOW F.G.L.

- LEGENDS :-**
- 1) F.G.L. - FINISHED GROUND LEVEL
 - 2) TYP. - TYPICAL
 - 3) T.O.C - TOP OF CONCRETE
 - 4) CD - CENTRAL DISTANCE
 - 5) DM - DIMENSION
 - 6) PL. - PLATE
 - 7) TRAFQ. - TRANSFORMER
 - 8) CL - CENTER LINE
 - 9) N.G.L - NATURAL GROUND LEVEL
 - 10) R - ROLLER
 - 11) P - PEDESTAL



TITLE BLOCK			
19.01.2024	FOR APPROVAL	SUSHIL	
DATE	SUBMITTED	PREPARED	DESCRIPTION
PROJECT :-			
1701.00 KWp SOLAR POWER PLANT			
DRAWING TITLE :-			
TRANSFORMER FOUNDATION DESIGN			
DRAWING No :-			
ANERT-ETPL-2 MWP-CIV-AL-012			
DEVELOPER NAME :-			
ENERTURE TECHNOLOGIES PVT LTD			
CUSTOMER NAME :-			
TRAVANCORE TITANIUM PRODUCTS LTD, KOCHUVELI, THIRUVANANTHAPURAM			
EPC CONTRACTOR :-			
ENERTURE TECHNOLOGIES PVT LTD			



TRANSFORMER DIMENSIONS	
OVER ALL	
LENGTH	2520
WIDTH	2400
HEIGHT	2200

30	SHIELDING BUSHING 1.1KV/250AMP .	1
29	CT TERMINAL BOX FOR WTI	1
28	SHUT OFF VALVE FOR BUCHHOLOZ RELAY	1
27	RATING & TERMINAL MARKING PLATE.	1
26	SILICAGEL BREATHER.	1
25	MONOGRAM PLATE.	1
24	PSR RADIATOR .	4
23	LIFTING LUGS.	4
22	HV BUSHING ASSLY(3NOS) WITH CABLE BOX .	1
21	TOP COVER LIFTING LUGS.	2
20	INSPECTION COVER WITH AIR RELEASE PLUG.	1
19	THERMOMETER POCKET FOR (WTI&OTI)	3
18	HV NEUTRAL BUSHING .	1
17	LV EPOXY BUSHING .	3
16	LV CABLE BOX	1
15	EARTHING TERMINAL.	2
14	FLAT ROLLERS.	4
13	DRAIN CUM FILTER VALVE.	1
12	UNI -DIRECTIONAL UNDER BASE CHANNEL.	2
11	JACKING PAD.	4
10	OTI SCADA ENABLED.	1
9	WTI SCADA ENABLED .	1
8	MARSHALLING BOX.	1
7	TOP FILTER VALVE.	1
6	OFF CIRCUIT TAP CHANGER .	1
5	BUCHHOLOZ RELAY WITH ALARM & TRIP CONTACT.	1
4	MAGNETIC OIL LEVEL INDICATOR .	1
3	OIL LEVEL GAUGE.	1
2	PRV	1
1	CONSERVATOR WITH OIL FILLING HOLE.	1
#	DESCRIPTION	QTY

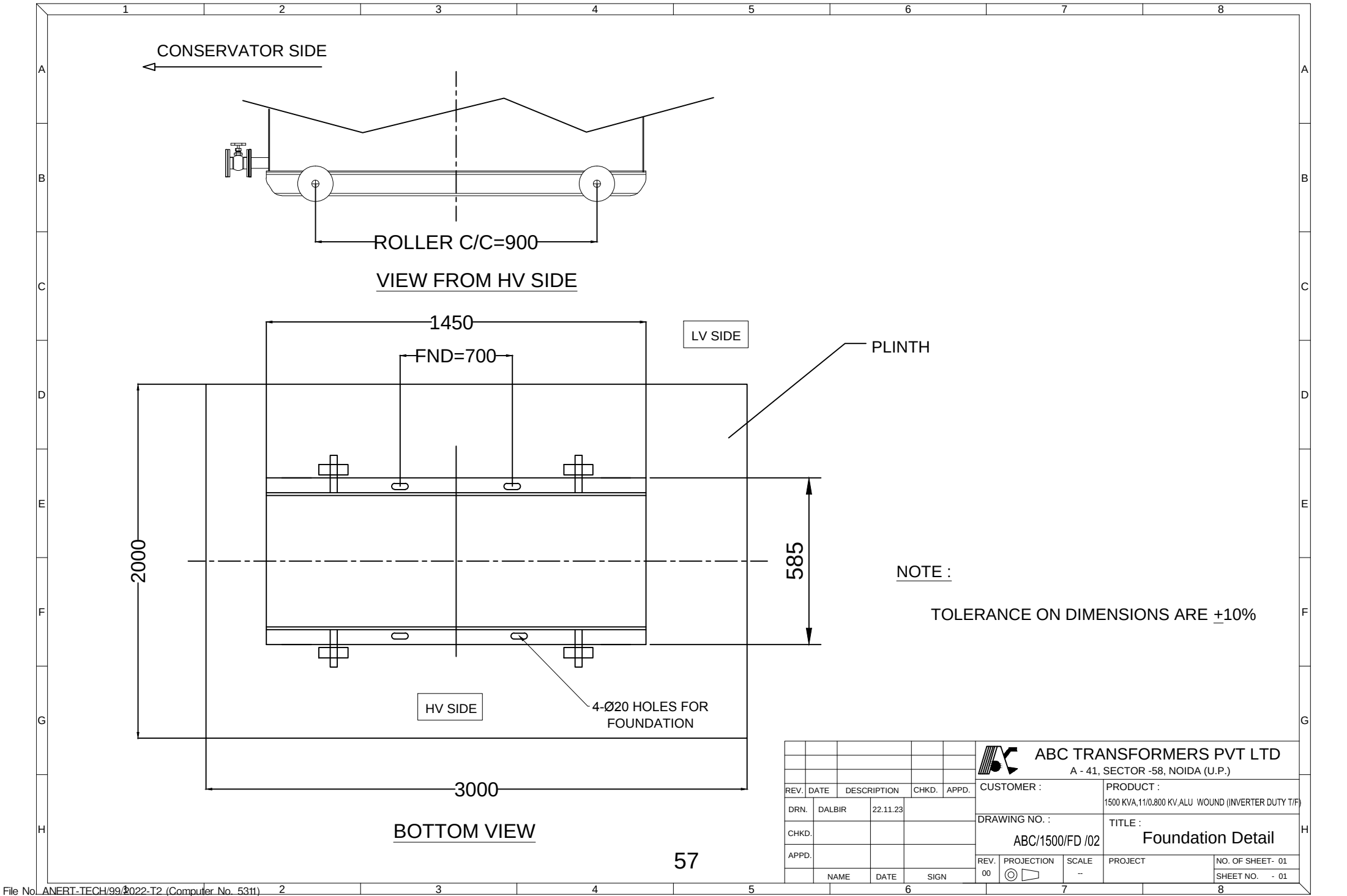
WEIGHTS		
SL. NO.	ITEM	WEIGHT (Kg)
1.	CORE & WINDING.	2260
2.	TANK & FITTING	1440
3.	WT OF OIL	1000
4.	TOTAL WEIGHT	4700
5.	VOLUME OF OIL	1230 Ltr

SHEET THICKNESS	
SIDE	5.0 mm
TOP	6.0 mm
BOTTOM	6.0 mm

MIN ELECTRICAL CLEARANCE IN CABLE BOX		
KV	PHASE TO PHASE	PHASE TO EARTH
11	130	80
0.800	25	20

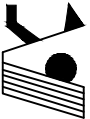
- NOTE:-
- ALL DIMENSION ARE IN MM UNLESS OTHERWISE SPECIFIED.
 - POSITION OF ACCESSORIES AND FITTING SHOWN MAY BE LITTLE BIT DIFFER IN ACTUAL TRANSFORMER.
 - OVER ALL DIMENSION & WEIGHT ARE SUBJECT TO $\pm 10\%$ TOLERANCE.
 - FOR THE SAKE OF CLARITY CERTAIN FITTINGS SHOWN IN ONE VIEW HAVE BEEN OMITTED FROM OTHER VIEW.

				ABC TRANSFORMERS PVT LTD A - 41, SECTOR -58, NOIDA (U.P.)			
REV. DATE		DESCRIPTION		CHKD. APPD.		CUSTOMER	
DRN.		DALBIR		22.11.23		PRODUCT :	
CHKD.						1500 KVA, 11/0.800 KV,ALU WOUND (INVERTER DUTY T/F)	
APPD.						DRAWING NO. :	
						ABC/1500 /GA/01	
						TITLE :	
						GA DRG OF TRANSFORMER	
						PROJECT	
						NO. OF SHEET- 01	
						SHEET NO. - 01	



						ABC TRANSFORMERS PVT LTD			
						A - 41, SECTOR -58, NOIDA (U.P.)			
REV.	DATE	DESCRIPTION	CHKD.	APPD.	CUSTOMER :			PRODUCT :	
DRN.	DALBIR	22.11.23						1500 KVA, 11/0.800 KV,ALU WOUND (INVERTER DUTY T/F)	
CHKD.					DRAWING NO. :			TITLE :	
					ABC/1500/FD /02			Foundation Detail	
APPD.					REV.	PROJECTION	SCALE	PROJECT	NO. OF SHEET- 01
	NAME	DATE	SIGN		00		--		SHEET NO. - 01

- NOTE :-
1. ALL DIMENSIONS ARE IN mm.
 2. TOLERANCE : ALL DIMENSIONS , WEIGHTS AND VOLUME +10%

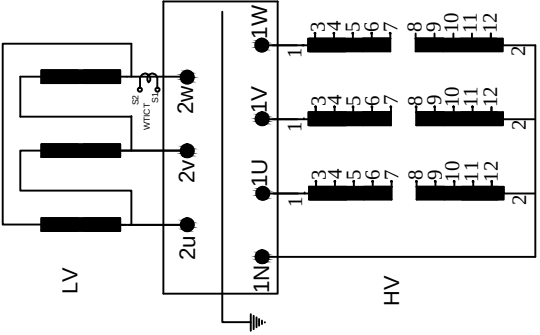


ABC TRANSFORMERS PVT. LTD.

A- 41, SECTOR -58, NOIDA (U.P). Phone :120-2582203,120-4325219
E-Mail : info@abctransformers.in Web. : abctransformers.in

SPECIFICATION REF		ISL. CLASS	
KVA	1500	TYPE OF COOLING	ONAN
VOLTS AT NO LOAD	HV 11000 LV 800	FREQUENCY	50
INSL. LEVEL	HV 12/28 /75KV(P) LV 3.6/10 /40KV(P)	TEMPERATURE RISE	50 °C 55 °C
AMPERES	HV 78.73 LV 1082.56	WT OF CORE & WDG	2260 Kg
WINDING MATERIAL	ALUMINIUM	TANK& FITTINGS	1440 Kg
VECTOR GROUP	Ynd 11	WT OF OIL	1000 Kg
IMPEDANCE VOLT %	6.0	VOLUME OF OIL	4700 Kg
TAPPIINGS	OCTC	MONTH&YEAR OF MFG	Ltr 1230
FROM HV VARIATION IN	2.5% STEPS FROM +10% TO -10%	SERIAL NO	/23
CUSTOMER			
P.O			

OFF-CIRCUIT TAP CHANGER		NO LOAD VOLTAGE	
SWITCH POSITION.	CONNECTION	H.V	L.V
1	7 - 8	12100	800
2	8 - 6	11825	
3	6 - 9	11550	
4	9 - 5	11275	
5	5 - 10	11000	
6	10 - 4	10725	
7	4 - 11	10450	
8	11 - 3	10175	
9	3 - 12	9900	



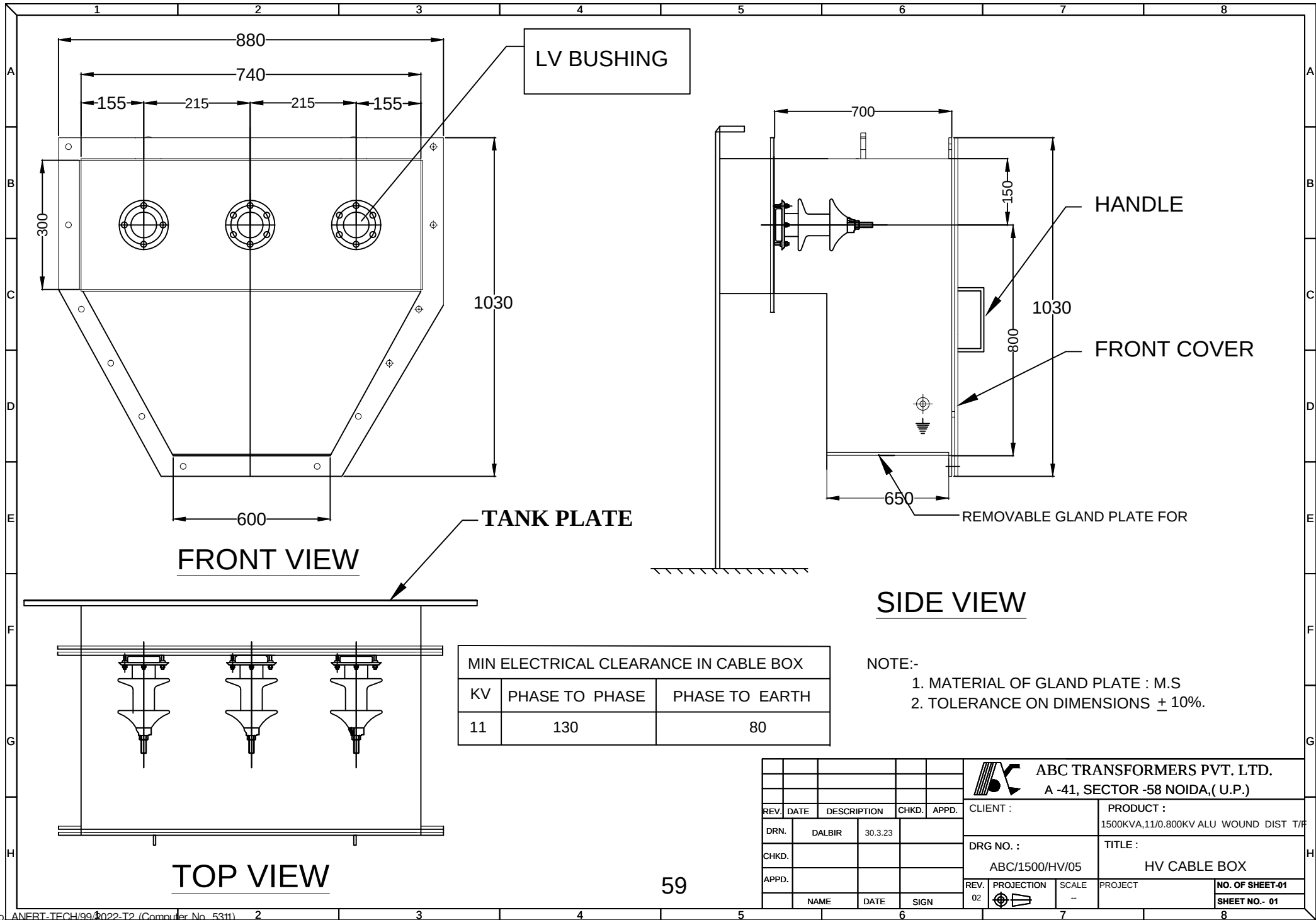
VECTOR GROUP : Ynd 11

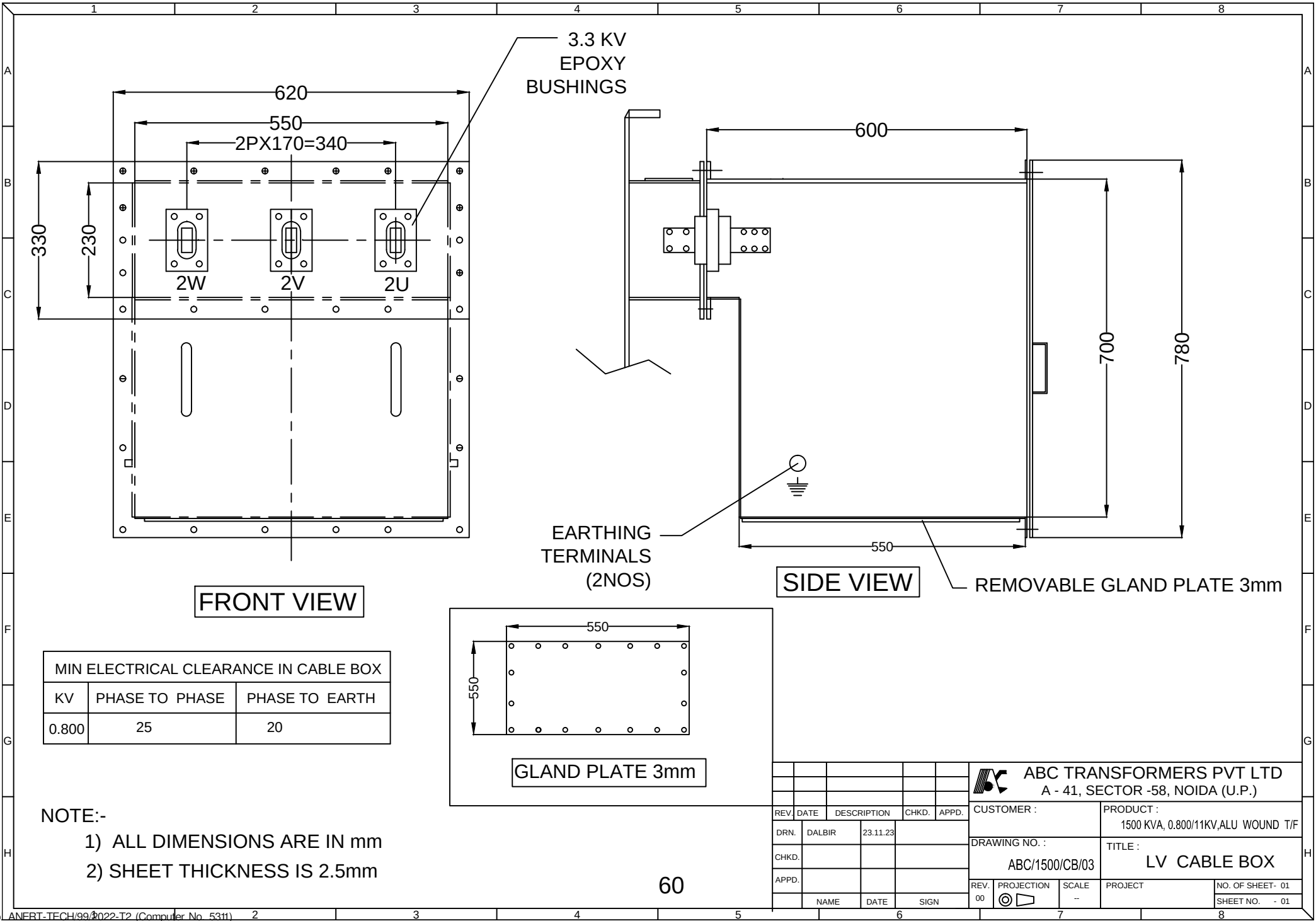
CAUTION
OCTC SWITCH SHALL BE OPERATED ONLY
WHEN THE TRANSFORMER HAS BEEN DE-ENERGISED

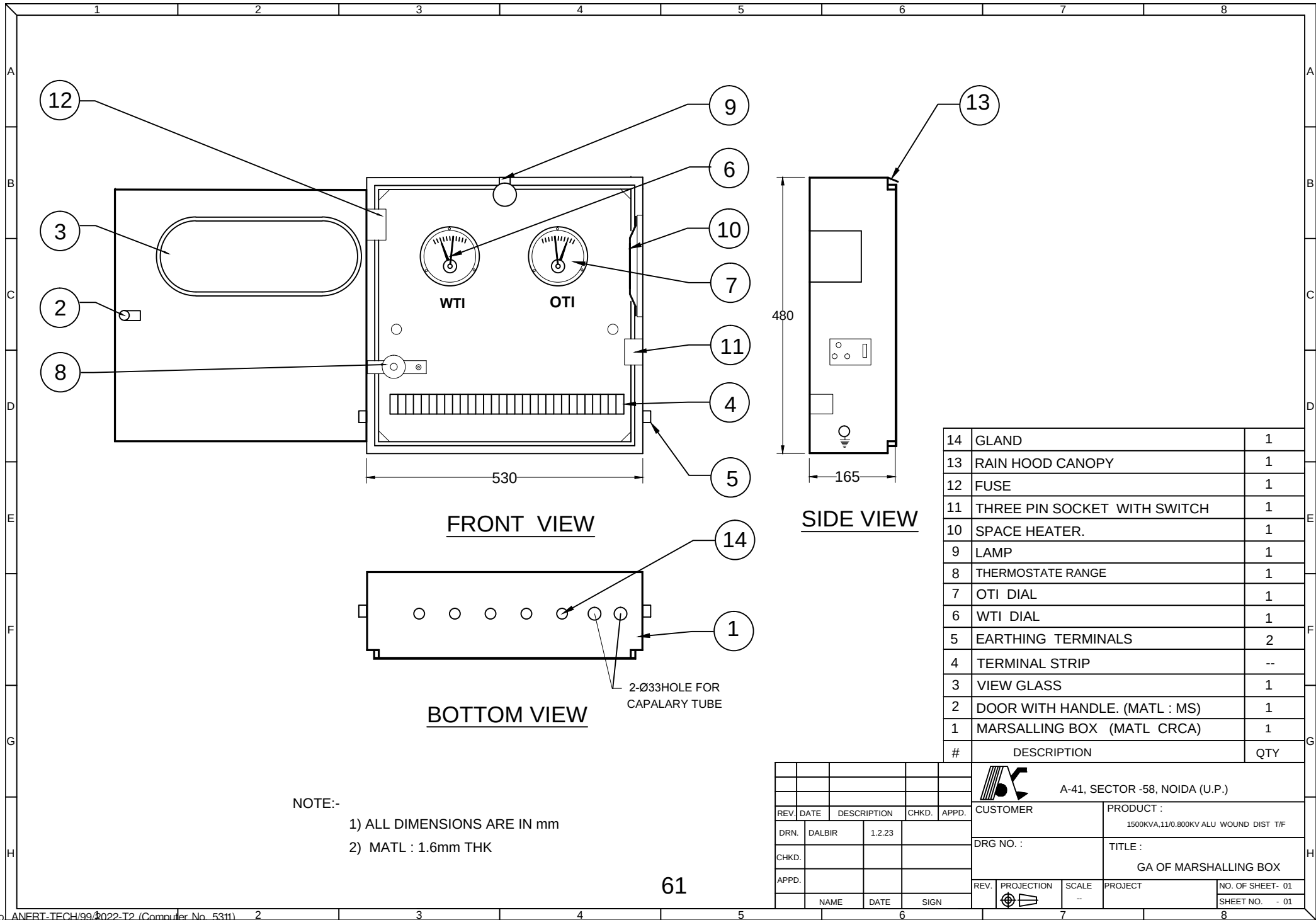
210

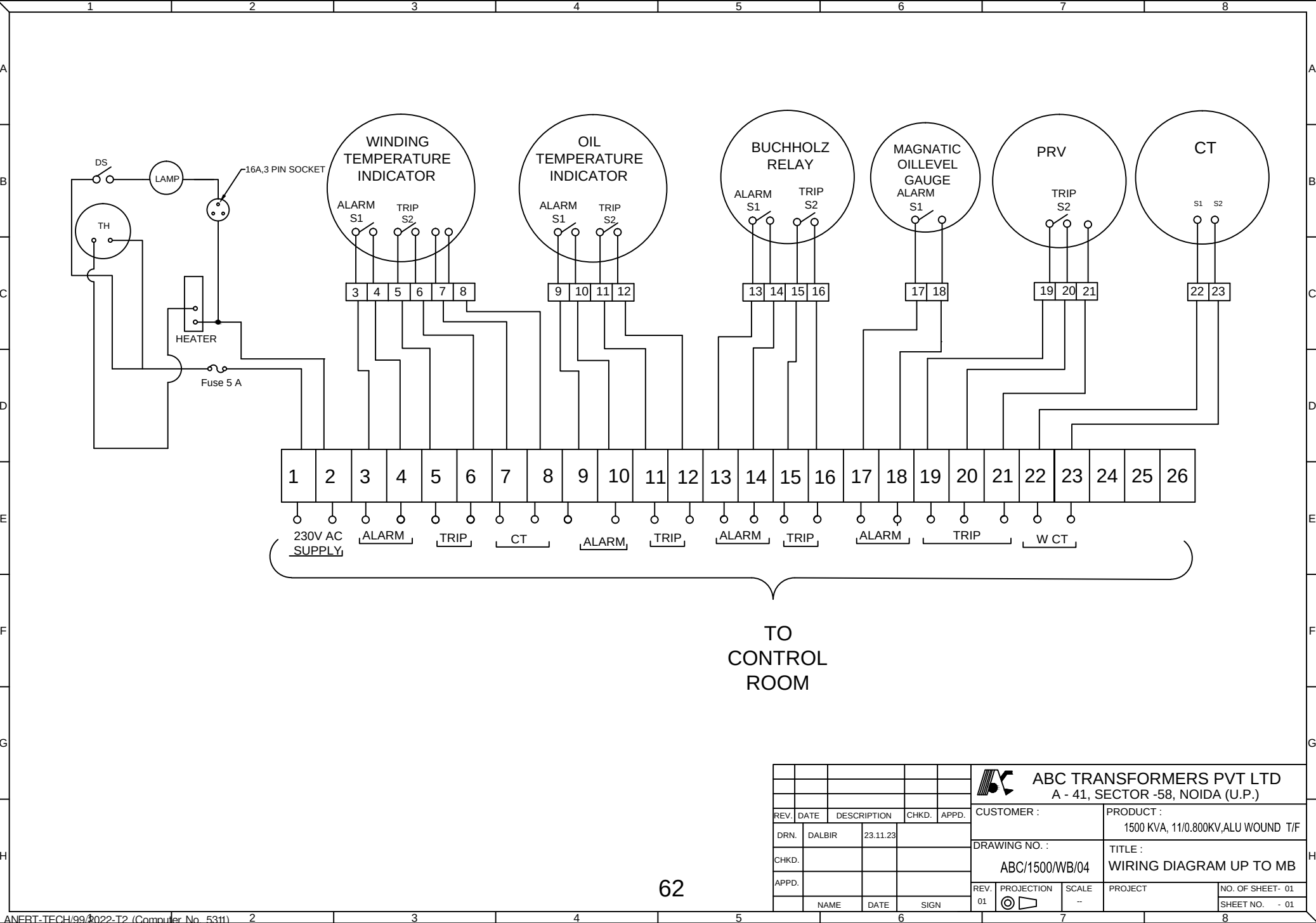
135

					ABC TRANSFORMERS PVT. LTD. A - 41, SECTOR - 58, NOIDA (U.P.)								
REV.		DATE		DESCRIPTION		CHKD.		APPD.		CUSTOMER		PRODUCT :	
DRN		DALBIR		23.11.23						DRG NO. :		1500KVA,11/0.800 KV ALU WOUND DIST.T/F	
CHKD										ABC/1500/NP/03		TITLE :	
APPD										PROJECT		RATING & DIAGRAM PLATE.	
		NAME		DATE		SIGN		REV. 00		PROJECTION		SCALE	
										PROJECT		NO. OF SHEET	
												SHEET NO.	

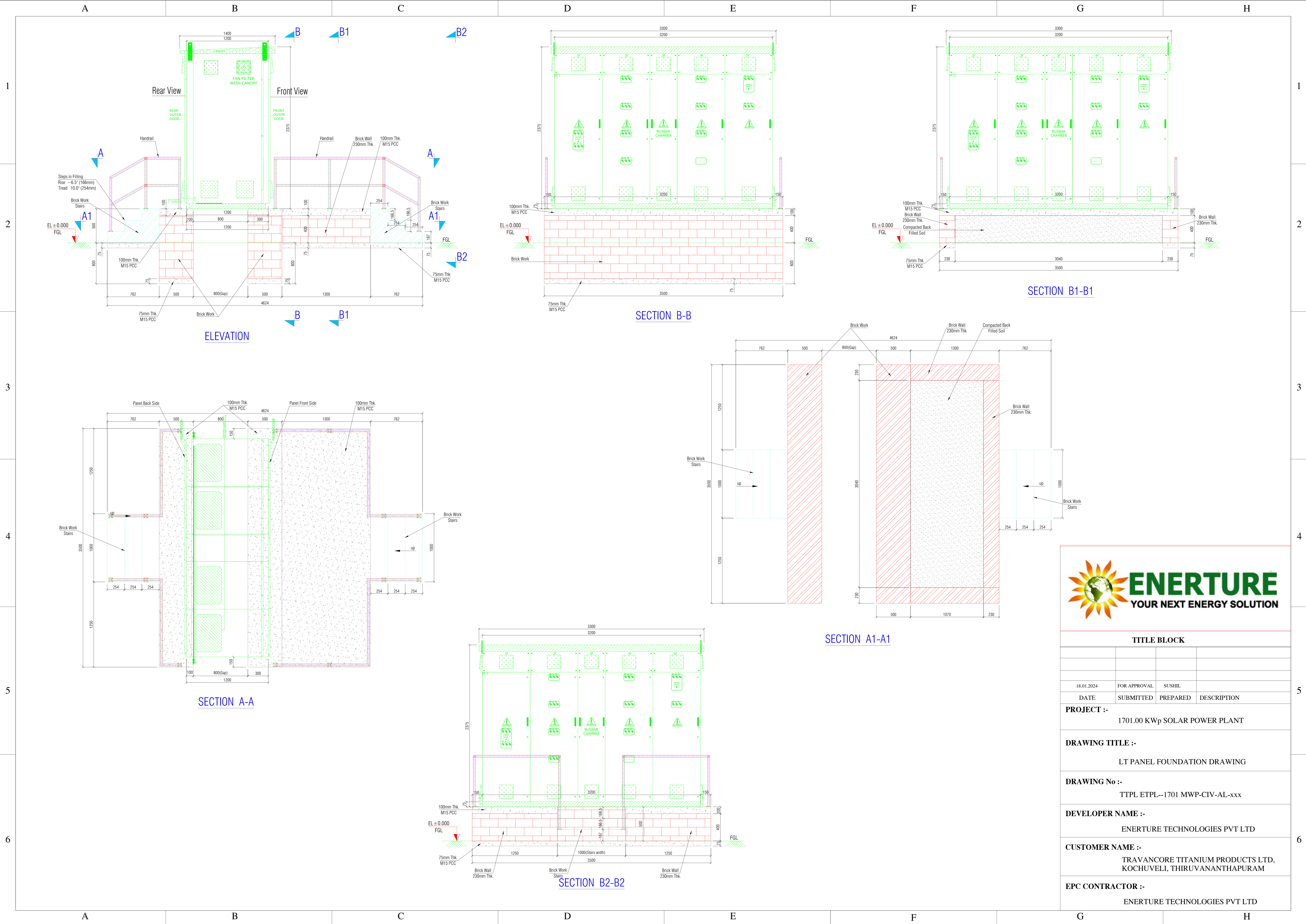




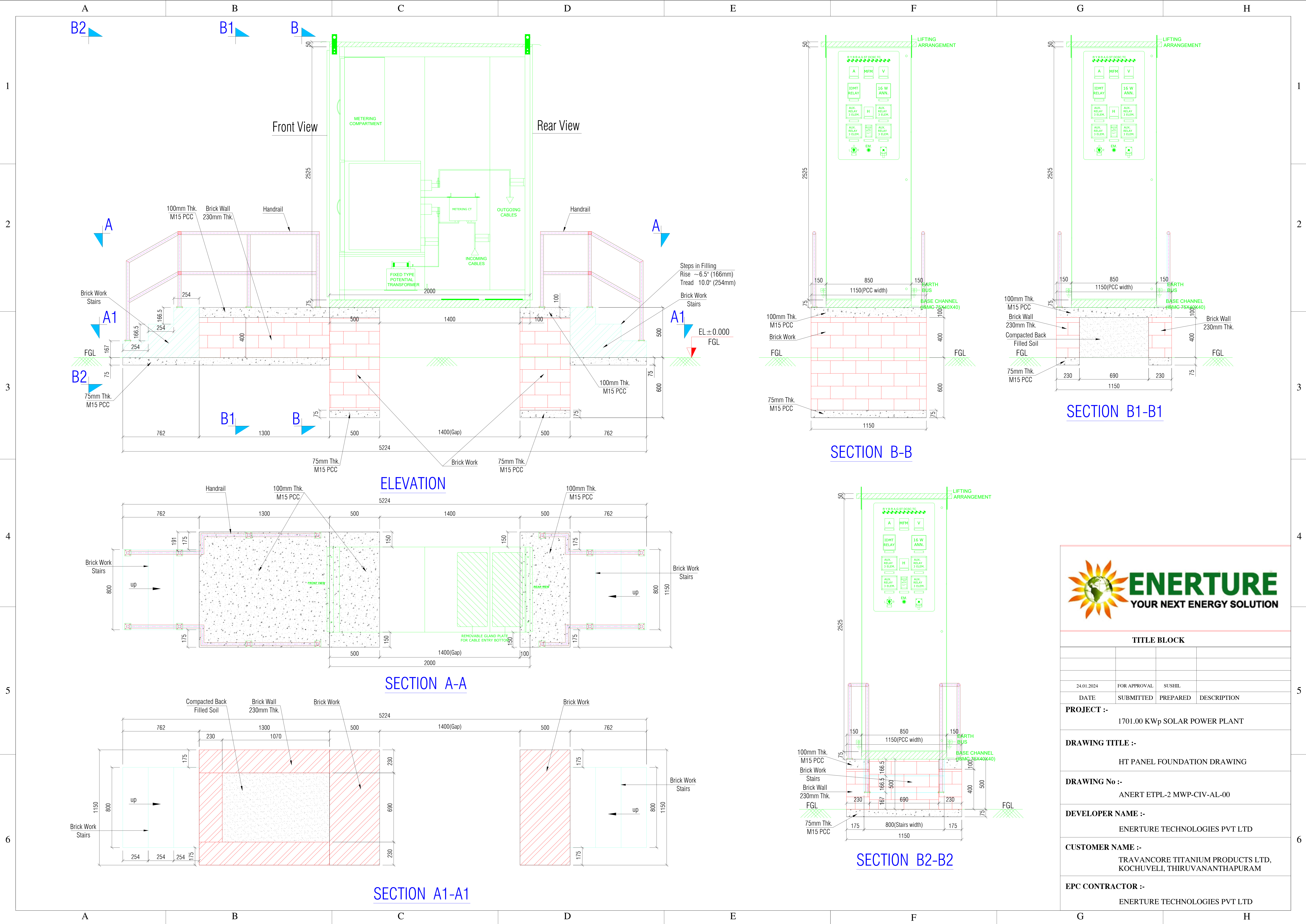




					 ABC TRANSFORMERS PVT LTD A - 41, SECTOR -58, NOIDA (U.P.)			
REV.	DATE	DESCRIPTION	CHKD.	APPD.	CUSTOMER :		PRODUCT :	
DRN.	DALBIR	23.11.23			DRAWING NO. :		1500 KVA, 11/0.800KV, ALU WOUND T/F	
CHKD.					ABC/1500/WB/04		TITLE :	
APPD.					PROJECT		NO. OF SHEET- 01	
		NAME	DATE	SIGN	REV. 01	PROJECTION	SCALE	SHEET NO. - 01



TITLE BLOCK			
18.01.2024	FOR APPROVAL	SUSHIL	
DATE	SUBMITTED	PREPARED	DESCRIPTION
PROJECT :-			
1701.00 KWp SOLAR POWER PLANT			
DRAWING TITLE :-			
LT PANEL FOUNDATION DRAWING			
DRAWING No :-			
TTPL ETPL--1701 MWP-CIV-AL-xxx			
DEVELOPER NAME :-			
ENERTURE TECHNOLOGIES PVT LTD			
CUSTOMER NAME :-			
TRAVANCORE TITANIUM PRODUCTS LTD, KOCHUVELI, THIRUVANANTHAPURAM			
EPC CONTRACTOR :-			
ENERTURE TECHNOLOGIES PVT LTD			



DRAWING OF ELECTRICAL PANEL

3PH. 3 WIRE,800V AC 36KA FOR 1 SEC

**PROJECT -1.7MWp SOLAR POWER PLANT
AT KERELA SMART CITY**

CLIENT -ANERT

EPC CONT. - ENERTURE TECHNOLOGIES PVT. LTD



R.M.CONTROLS (P) LTD.

13/3, MATHURA ROAD, NEAR NHPC , FARIDABAD-121003

Tel. : [0129] - 4317529,9818813140,9311046606

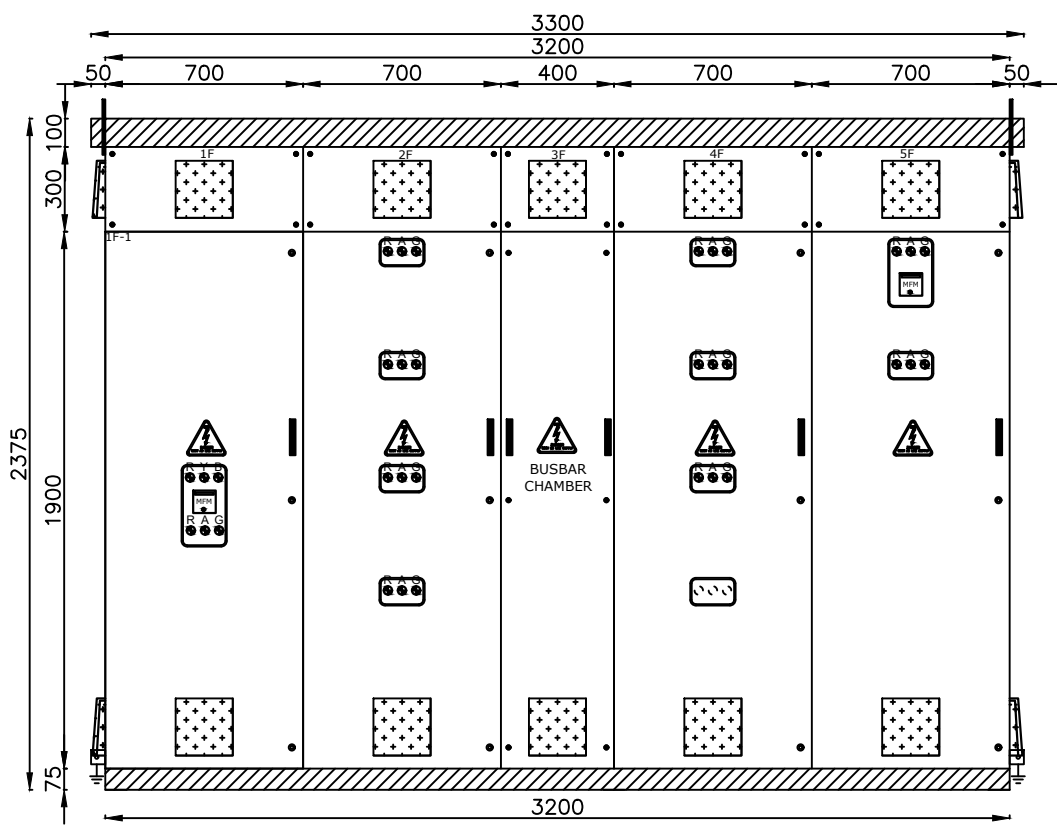
E-mail : rmcpl.vardhney@gmail.com

Website: www.rmcontrols.co.in

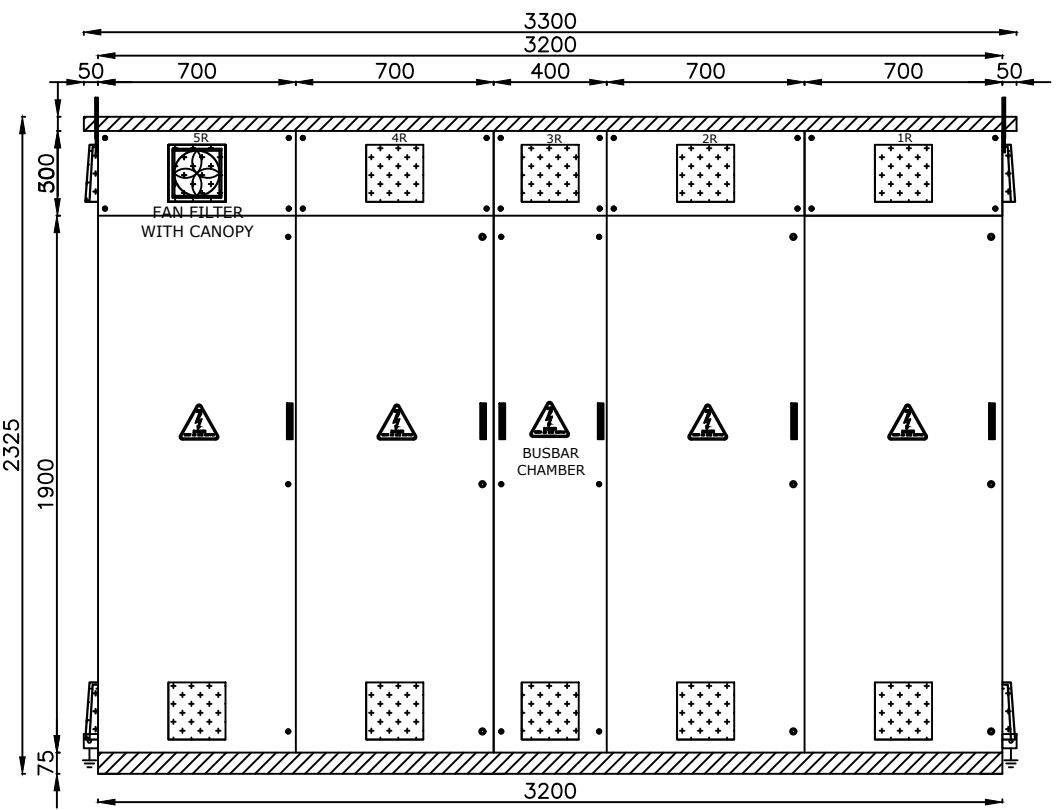
90551/2024/RTS 1		2		3		4		5		6		7		8	
ALL DIMENSIONS ARE IN mm.															
GENERAL NOTES:-															
1. ALL DIMENSIONS ARE IN mm.															
2. ALL PANELS ARE FREE STANDING, DOUBLE DOOR , DOUBLE FRONT, FORM 3B AND SUITABLE FOR OUTDOOR INSTALLATION (IP55).															
3. THE PANEL IS FABRICATED WITH:-															
a. MAIN FRAME AND LOAD BEARING MEMBERS - 2.0 mm CRCA TOP CANOPY															
b. OUTER DOORS (FRONT AND REAR) - 2.0 mm CRCA															
c. INNER MCCB DOORS INNER PARTITION - 1.6 mm CRCA															
d. BASE FRAME - ISMC (ISI) (75X40X40X5MM)															
e. REMOVABLE UNDRILLED GLAND PLATE - 3.0 mm MS															
4. THE PANEL WILL HAVE NEOPRENE GASKET ON OUTER FRAMES TO MAKE IT DUST & VERMIN PROOF & SUITABLE FOR IP-55 DEGREE OF PROTECTION															
5. THE PANEL IS SUITABLE FOR 3-PHASE 3-WIRE OPERATIONAL VOLTAGE 800V AC, 50Hz SUPPLY OPERATION.															
6. THE PANEL IS POWDER COATED WITH:-															
a. MAIN FRAME, DOORS & COVERS - SIEMENS GREY RAL 7032															
b. MOUNTING PLATE - SIEMENS GREY RAL 7032															
c. BASE FRAME - BLACK															
d. PAINT THICKNESS - MIN 80. MICRONS															
7. ELECTROLYTIC GRADE ALUMINIUM BUS BAR WITH RED, YELLOW, & BLUE COLOUR CODED HEAT SHRINKABLE SLEEVES															
8. THE MINIMUM CLEARANCE IN MAIN BUSBAR SHALL BE AS FOLLOWS															
a. BETWEEN PHASE TO PHASE : 30mm															
b. BETWEEN PHASE TO EARTH : 30mm (PHASE BARRIERS ARE USED WHEREVER NOT POSSIBLE TO MAINTAIN THE REQUIRED CLEARANCE)															
9. ALL CABLE ENTRIES SHALL BE FROM BOTTOM OF PANEL AS DESCRIBED IN THE GA DRAWING.															
10. ALUMINIUM EARTH BUS IS PROVIDED THROUGHOUT THE LENGTH OF PANEL.															
11. ALL HARDWARE FOR ASSEMBLY BUSBAR WILL BE SS304 ZINC FLAKE 10.9 GRADE FOR CABLE LUGS TERMINATION															
12. CONTROL WIRING ARE CARRIED OUT WITH FRLS CABLE AS PER POWER & CONTROL SCHEMATICS DRAWING															
13. ALL HINGED DOORS ARE EARTHED TO MAIN FRAME WITH 2.5sqmm COPPER FLEXIBLE WIRE PROVIDED WITH LUGS AT BOTH ENDS.															
14. ALL INVERTER INCOMING MCCB'S ARE PROVIDED WITH DOOR INTERLOCKED OPERATING HANDLE.															
REV. PTS.		01		REV. DATE		PROJECT		1.7MWp SOLAR POWER PLANT AT KERELA SMART CITY		DRN.		D.S		QTY. 01 NO.	
		01				CLIENT		ANERT		CKD.		S.V		SCALE NTS	
		R.M.CONTROLS (P) LTD. 13/3, MATHURA ROAD, FARIDABAD-121003 Tel. : [0129] - 4317529 501, Shivam Complex, R.C. AGENCY FOR NEW ENERGY RESEARCH & TECHNOLOGY on 03/10/2024 Website: www.rmcontrols.co.in		EPC CONT.		ENERTURE TECHNOLOGIES PVT. LTD		APPR.		R.V		JOB NO.		RMC-1665	
				TITLE		MAIN LT PANEL		DATE		02.01.2024		DRG NO.		RMC/ETPL/P-01GN	
						800V 1600A ACB OUTDOOR TYPE IP 55		WEIGHT OF PANEL						SHEET 1 OF 2	
File No. ANERT-TECH/99/2022-T2 (Computer No. 5311)		GENERAL NOTES													

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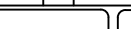
ALL DIMENSIONS ARE IN mm.

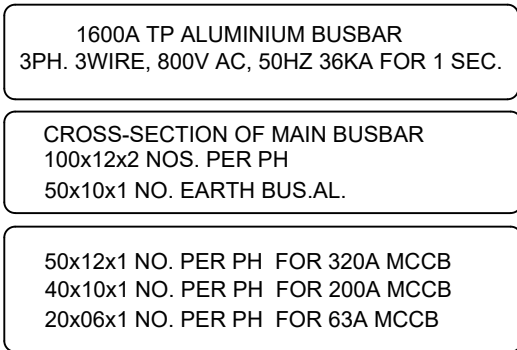


FRONT VIEW



REAR VIEW : OUTDOOR

PANEL SIZE mm	WIDTH	3300	PAINT SHADE	REV. PTS.	01	REV. DATE	PROJECT	1.7MWp SOLAR POWER PLANT AT KERELA	DRN.	D.S		QTY. 01 NO.				
	HEIGHT	2375			01						CKD.	S.V		SCALE	NTS	
	DEPTH	1200														
CABLE ENTRY	TOP	NO	OUTER: RAL- 7032		R.M.CONTROLS (P) LTD. 13/3, MATHURA ROAD, FARIDABAD-121003 Tel. : [0129] - 4317529 Email: info@rcontrols.co.in Website: www.rcontrols.co.in	67	CLIENT	ANERT	APPR.	R.V		JOB NO.	RMC-1665			
	BOTTOM	YES					TECH-99/2022-12 (Computer No. 5311)	EPC CONT.	ENERTURE TECHNOLOGIES PVT. LTD	DATE	02.01.2024	DRG NO.	RMC/ETPL/P-01GA			
File No. ANERT	Generated from eOffice by MATHURA ROAD, FARIDABAD-121003 Tel. : [0129] - 4317529 Email: info@rcontrols.co.in Website: www.rcontrols.co.in		AGENCY FOR NEW ENERGY RESEARCH & TECHNOLOGY on 03/10/2024				TITLE	MAIN LT PANEL 6000 1600A ACB OUTDOOR TYPE IP 55	PO/23-24/0372	SHEET 1 OF 2						
GA DRAWING																



PANEL SIZE mm	WIDTH	3300	PAINT SHADE	REV. PTS.	01	REV.DATE	PROJECT	1.7MWp SOLAR POWER PLANT AT KERELA	DRN.	D.S		QTY. 01 NO.			
	HEIGHT	2375			01					CKD.	S.V		SCALE	NTS	
	DEPTH	1200													
CABLE ENTRY File No. ANERT-TECH/99/2022-12 (Computer No. 531f)	TOP	NO	OUTER: RAL- 7032		R.M.CONTROLS (P) LTD. 13/3, MATHURA ROAD, FARIDABAD-121003 Tel. : [0129] - 4317529 E mail : rmc@rmcontrols.in Website : www.rmcontrols.co.in			CLIENT	ANERT	APPR.	R.V		JOB NO.	RMC-1665	
	BOTTOM	YES						EPC CONT.	ENERTURE TECHNOLOGIES PVT. LTD	DATE	02.01.2024	DRG NO.	RMC/ETPL/P-01GA		
								TITLE	MAIN LT PANEL	PO/23-24/0372					
Generated from e-CAD (RMC) ANERT, PE (RMC) ANERT, AGENCY FOR NEW ENERGY RESEARCH & TECHNOLOGY on 03/10/2024 15:51 PM						1600A ACB OUTDOOR TYPE IP 55						SHEET 2 OF 2			

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E

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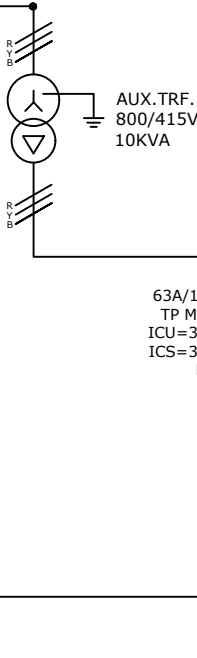
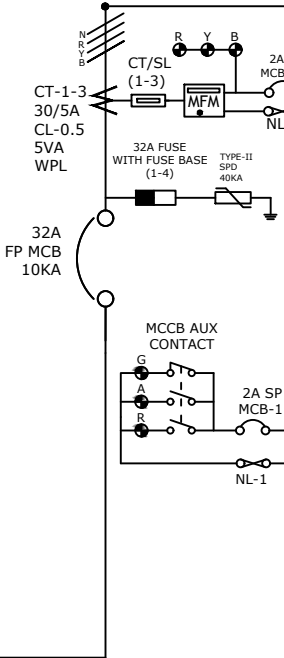
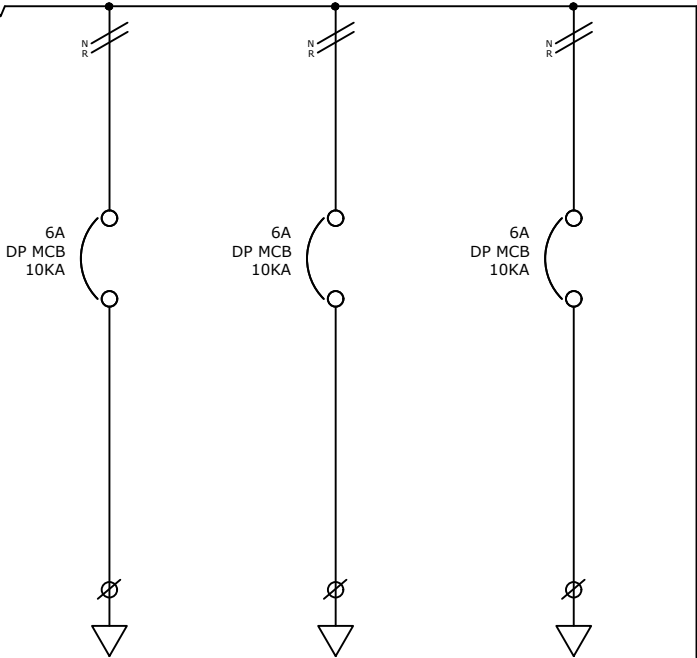
8

ALL DIMENSIONS ARE IN mm.

32A DP ALUMINIUM BUSBAR
1PH. 2WIRE, 415V AC, 50HZ 10KA FOR 1 SEC.

CROSS-SECTION OF BUSBAR
20x06x1 NO. PER PH. & NEUTRAL

CONTD. FROM
SHEET 1 OF 4



CONTD. TO
SHEET 3 OF 4

CONTD. TO
SHEET 3 OF 4

COMPARTMENT	1F-2	1F-2	1F-2	1F-2	1F-1	2F-4
RATING	6A	6A	6A	32A	800/415V 10KVA	63A
EQUIPMENT	DP MCB	DP MCB	DP MCB	FP MCB		TP MCCB, MCCB OFF, TRIP ON IND. LAMPS MCB,NL MFM , CT, CT SHORTING TERMINAL
FEEDER	SPARE	SPARE	SPARE	OUTGOING TO AUX. TRFO.	AUX. TRF. 800/415V 10KVA	OUTGOING TO ACDB
CABLE SIZE						

REV.
PTS.

00
00

REV.DATE

PROJECT

1.7MWp SOLAR POWER PLANT
AT KERELA

DRN.
CKD.

D.S
S.V

QTY. 01 NO.
SCALE NTS

CLIENT
EPIC CONT.

ANERT
ENERTURE TECHNOLOGIES PVT. LTD

APPR.
DATE

R.V
02.01.2024

JOB NO. RMC-1665
DRG NO. RMC/ETPL/P-01SLD

TITLE

MAIN LT PANEL
800V 6 IN 1 OUT 1600A ACB
OUTDOOR TYPE IP 55

PO/23-24/0372

SHEET 2 OF 4



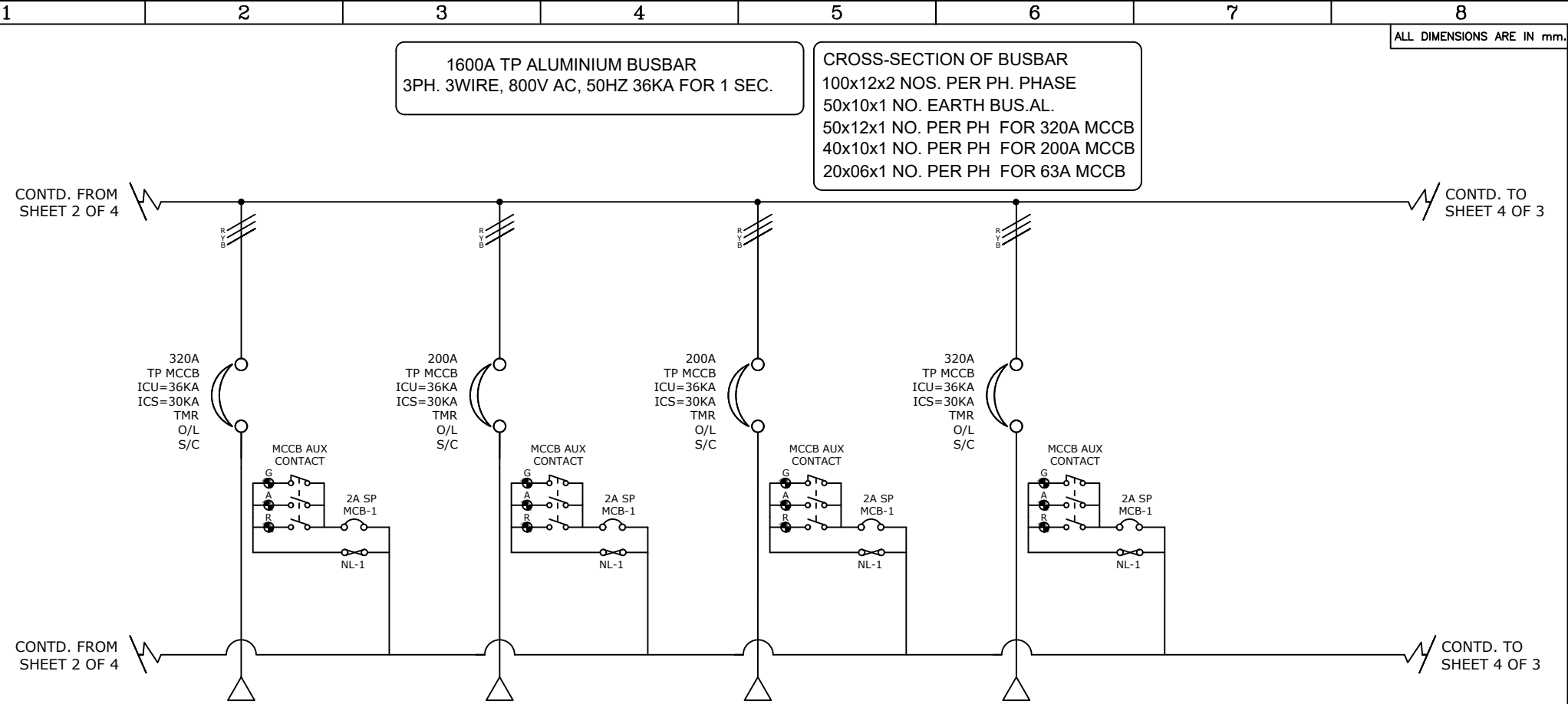
R.M.CONTROLS (P) LTD.

13/3, MATHURA ROAD,
FARIDABAD-121003
Tel. : [0129] - 4317529
E-mail : info@rmcontrols.co.in
Website: www.rmcontrols.co.in

SINGLE LINE DIAGRAM

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E



COMPARTMENT	2F-1	2F-2	2F-3	4F-1
RATING	320A	200A	200A	320A
EQUIPMENT	TP MCCB, MCCB OFF, TRIP ON IND. LAMPS MCB,NL	TP MCCB, MCCB OFF, TRIP ON IND. LAMPS MCB,NL	TP MCCB, MCCB OFF, TRIP ON IND. LAMPS MCB,NL	TP MCCB, MCCB OFF, TRIP ON IND. LAMPS MCB,NL
FEEDER	INCOMING SUPPLY FROM 295KW INVERTER-1	INCOMING SUPPLY FROM 200KW INVERTER-2	INCOMING SUPPLY FROM 200KW INVERTER-3	INCOMING SUPPLY FROM 295KW INVERTER-4
CABLE SIZE	1.9/3.3KV 1R x 3C x 240SQ.MM, XLPE AL. AR. CABLE	1.9/3.3KV 1R x 3C x 150SQ.MM, XLPE AL. AR. CABLE	1.9/3.3KV 1R x 3C x 150SQ.MM, XLPE AL. AR. CABLE	1.9/3.3KV 1R x 3C x 240SQ.MM, XLPE AL. AR. CABLE

REV. 00
PTS. 00

REV. DATE

PROJECT

1.7MWp SOLAR POWER PLANT AT KERELA

DRN. D.S.

QTY. 01 NO.



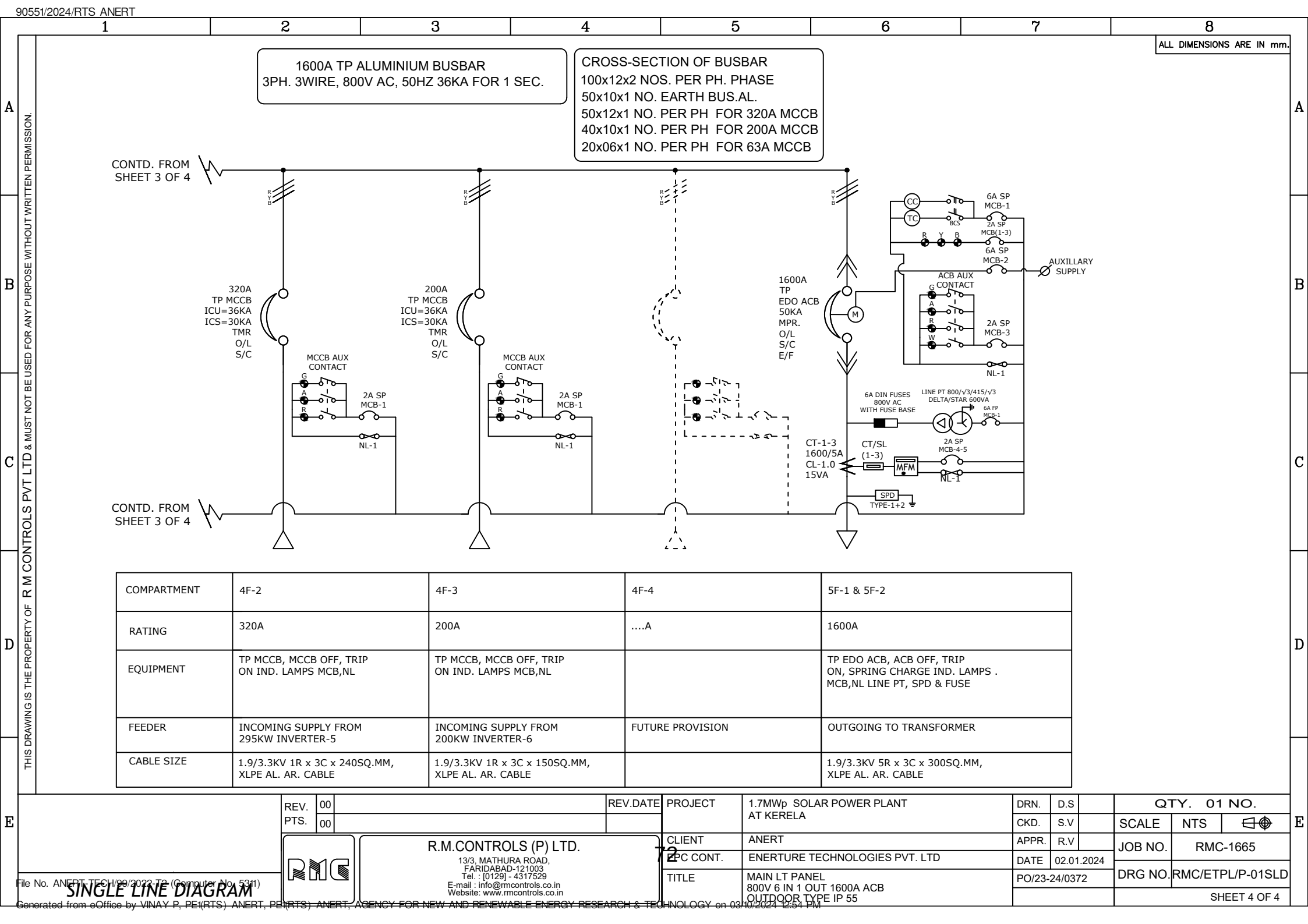
R.M.CONTROLS (P) LTD.
13/3, MATHURA ROAD,
FARIDABAD-121003
Tel. : [0129] - 4317529
E-mail : info@rmcontrols.co.in
Website: www.rmcontrols.co.in

CLIENT
EPC CONT.
TITLE

ANERT
ENERTURE TECHNOLOGIES PVT. LTD
MAIN LT PANEL
800V 6 IN 1 OUT 1600A ACB
OUTDOOR TYPE IP 55

CKD. S.V.
APPR. R.V.
DATE 02.01.2024
PO/23-24/0372

SCALE NTS
JOB NO. RMC-1665
DRG NO. RMC/ETPL/P-01SLD
SHEET 3 OF 4



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A

B

C

D

E

1	2	3	4	5	6	7	8
A	A	Incoming Supply					
	*	295W Invertor (1-3) : 1.9/3.3KV 1R x 3C x 240 sqmm Al.Ar.XLPE Cable				3	
	*	200W Invertor (4-6) : 1.9/3.3KV 1R x 3C x 150 sqmm Al.Ar.XLPE Cable				3	
B	1	320A TP MCCB , 800V AC , Icu = 36KA , Ics = 30KA with Thermal Magnetic Based Release for O/L & S/C Protection, Insulation Voltage 1250V AC			L&T:DZ6	3	
	*	Spreader Links for 320A TP MCCB			L&T:DZ6	3	
	*	Extended Handle for 320A TP MCCB			L&T:DZ6	3	
	*	Auxiliary Switch with 1C/O			L&T:DZ6	3	
	*	Trip Alarm Contact with 1C/O			L&T:DZ6	3	
	*	Indicating Lamp 'MCCB Off Green 230VAC LED			L&T:Esbee	3	
	*	Indicating Lamp 'MCCB Trip Amber 230VAC LED			L&T:Esbee	3	
	*	Indicating Lamp 'MCCB ON Red 230VAC LED			L&T:Esbee	3	
	*	2A SP MCB 10KA'C Curve' for MCCB Control Circuit			L&T:Exora	3	
	*	6Way Connector for MCCB Auxiliary Switch + Trip Alarm Contact			Reputed	3	
	*	Neutral Link			Phoenix	3	
	2	200A TP MCCB , 800V AC , Icu = 36KA , Ics = 30KA with Thermal Magnetic Based Release for O/L & S/C Protection, Insulation Voltage 1250V AC			L&T:DZ6	3	
	*	Spreader Links for 200A TP MCCB			L&T:DZ6	3	
	*	Extended Handle for 200A TP MCCB			L&T:DZ6	3	
	*	Auxiliary Switch with 1C/O			L&T:DZ6	3	
C	*	Trip Alarm Contact with 1C/O			L&T:DZ6	3	
	*	Indicating Lamp 'MCCB Off Green 230VAC LED			L&T:Esbee	3	
	*	Indicating Lamp 'MCCB Trip Amber 230VAC LED			L&T:Esbee	3	
	*	Indicating Lamp 'MCCB ON Red 230VAC LED			L&T:Esbee	3	
	*	2A SP MCB 10KA'C Curve' for MCCB Control Circuit			L&T:Exora	3	
	*	6Way Connector for MCCB Auxiliary Switch + Trip Alarm Contact			Reputed	3	
	*	Neutral Link			Phoenix	3	
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REV. 00
PTS. 00

REV.DATE

PROJECT

1.7MWp SOLAR POWER PLANT
AT KERELA

DRN. D.S
CKD. S.V

QTY. 01 NO.

SCALE NTS



R.M.CONTROLS (P) LTD.
13/3, MATHURA ROAD,
FARIDABAD-121003
Tel. : [0129] - 4317529
E-mail : info@rmcontrols.co.in
Website: www.rmcontrols.co.in

CLIENT
ANERT
3C CONT.
ENERTURE TECHNOLOGIES PVT. LTD
TITLE
MAIN LT PANEL
800V 6 IN 1 OUT 1600A ACB
OUTDOOR TYPE IP 55

APPR. R.V
DATE 02.01.2024
PO/23-24/0372

JOB NO. RMC-1665
DRG NO. RMC/ETPL/P-01BOM
SHEET 1 OF 4

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1	2	3	4	5	6	7	8
B.1	Outgoing To Auxillary Transfromer 10KVA						1
	1	63A/125A TP MCCB , 800V AC , Icu = 36KA , Ics = 30KA with Microprocess Based Release for O/L & S/C Protection, Insulation Voltage 1250V AC			L&T:DZ6		1
	*	Spreader Links for 63A TP MCCB			L&T:DZ6		1
	*	Rotatry Handle for 63A TP MCCB			L&T:DZ6		1
	*	Auxiliary Switch with 1C/O			L&T:DZ6		1
	*	Trip Alarm Contact with 1C/O			L&T:DZ6		1
	*	Indicating Lamp 'MCCB Off Green 230VAC LED			L&T:Esbee		1
	*	Indicating Lamp 'MCCB Trip Amber 230VAC LED			L&T:Esbee		1
	*	Indicating Lamp 'MCCB ON Red 230VAC LED			L&T:Esbee		1
	*	2A SP MCB 10KA'C Curve' for MCCB Control Circuit			L&T:Exora		1
	*	6Way Connector for MCCB Auxiliary Switch + Trip Alarm Contact			Reputed		1
	*	Neutral Link			Phoenix		1
A.2	Incoming Supply from 63A TP MCCB - 1						1
	*	Auxiliary Transformer 800V/415V/ AC 10KVA			Unikon		1
	1	32A FP MCB 10KA 'C Curve'			L&T:Exora		1
	*	Auxiliary Switch with 1C/O			L&T:Dsine		1
	*	Trip Alarm Contact with 1C/O			L&T:Dsine		1
	*	Indicating Lamp 'MCB Off Green 230VAC LED			L&T:Esbee		1
	*	Indicating Lamp 'MCB Trip Amber 230VAC LED			L&T:Esbee		1
	*	Indicating Lamp 'MCB ON Red 230VAC LED			L&T:Esbee		1
	*	2A SP MCCB 10KA'C Curve' for MCCB Control Circuit			L&T:Exora		1
	*	6Way Connector for MCB Auxiliary Switch + Trip Alarm Contact			Reputed		1
	*	Neutral Link			Phoenix		1
	*	Digital Multifunction Meter CL-0.5 with RS 485 Port			L&T		1
	*	Metering CT 30/5A, CL-0.5, 5VA WPL			AE/Reputed		3
	*	CT Shorting Terminal			Phoenix/Reputed		3

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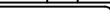
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1	2	3	4	5	6	7	8
A	*	Phase Indicating Lamp 'Red' 230V AC LED			L&T:Esbee	1	
	*	Phase Indicating Lamp 'Yellow' 230V AC LED			L&T:Esbee	1	
	*	Phase Indicating Lamp 'Blue' 230V AC LED			L&T:Esbee	1	
	*	Control MCB 2A SP 10KA C Curve for Phase Ind. & Metering			L&T:Exora	3	
	*	Neutral Link			Phoenix	1	
	*	SPD Type 2 I _{max} 40KA 415V AC			Citel	1	
	*	32A Fuses with Fuse Base			Siemens	4	
B							
	B.2	Outgoing					
	1	6A DP MCB 10KA 'C Curve'			L&T:Exora	11	
	*	Power Terminal blocks			Phoenix	22	
	B.2	Outgoing Supply : To Transformer				1	
		1.9/3.3KV 5R x 3C x 300 sqmm Al.Ar.XLPE Cable				1	
C							
	1	1600A TP EDO ACB , 800V AC , 50KA with Microprocessor Release for O/L, S/C Protection Insulation Voltage 1250V AC, Closing Coil 230V AC & Motor 230V AC			L&T:Upower	1	
	*	Micro Switch for Spring Charge Indication			L&T:Upower	1	
	*	Phase Indicating Lamp 'Red' 230V AC LED			L&T:Esbee	1	
	*	Phase Indicating Lamp 'Yellow' 230V AC LED			L&T:Esbee	1	
	*	Phase Indicating Lamp 'Blue' 230V AC LED			L&T:Esbee	1	
	*	Control MCB 2A SP 10KA C Curve			L&T:Exora	3	
	*	Neutral Link			Phoenix/Reputed	1	
	*	Indicating Lamp 'ACB Off Green 230VAC LED			L&T:Esbee	1	
	*	Indicating Lamp 'ACB Trip' Amber 230VAC LED			L&T:Esbee	1	
	*	Indicating Lamp 'ACB ON Red 230VAC LED			L&T:Esbee	1	
	*	Indicating Lamp 'Spring Charge 230V AC			L&T:Esbee	1	
	*	Control MCB 2A SP 10KA C Curve for ACB Control Circuit			L&T:Exora	1	
	*	Control Terminal Blocks			Phoenix/Reputed	5	
	*	Neutral Link			Phoenix/Reputed	1	

 R.M.CONTROLS (P) LTD. 13/3, MATHURA ROAD, FARIDABAD-121003 Tel.: [0129]- 4317529 E-mail : info@rmcontrols.co.in Website: www.rmcontrols.co.in	REV. PTS.	00	REV.DATE	PROJECT	1.7MWp SOLAR POWER PLANT AT KERELA	DRN.	D.S	QTY. 01 NO.		
		00				KCD.	S.V	SCALE	NTS	
				CLIENT	ANERT	APPR.	R.V	JOB NO.	RMC-1665	
				5% CONT.	ENERTURE TECHNOLOGIES PVT. LTD	DATE	02.01.2024	DRG NO.	RMC/ETPL/P-01BOM	
				TITLE	MAIN LT PANEL 800V 6 IN 1 OUT 1600A ACB OUTDOOR TYPE IP 55	PO/23-24/0372		SHEET 3 OF 4		

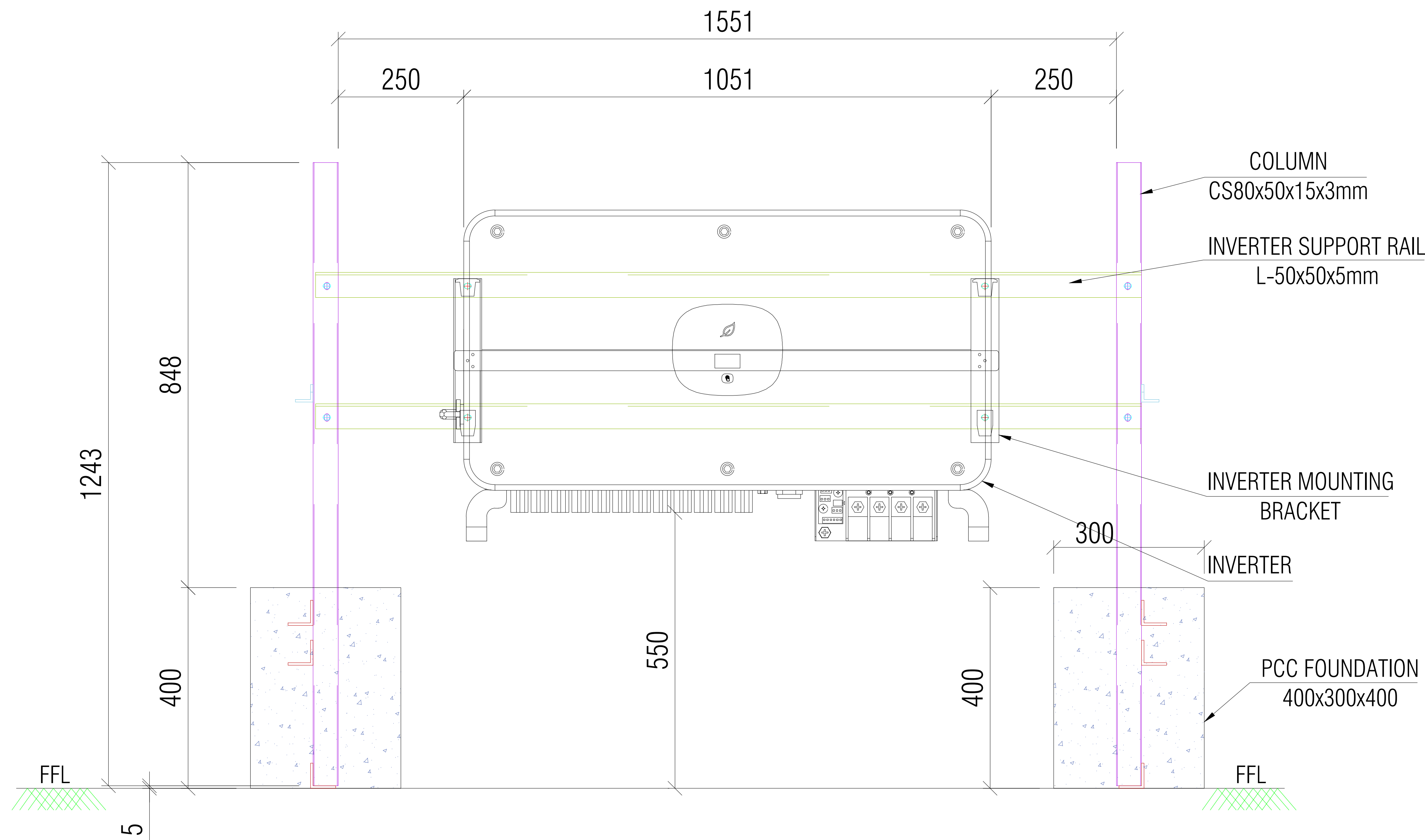
File No. ANERT/TECH/99/2022-T2 (Contract No. 5311)
 Generated from eOffice by VINAY P. PEI(RTS), ANERT, PEI(RTS), ANERT AGENCY FOR NEW AND RENEWABLE ENERGY RESEARCH & TECHNOLOGY on 03/01/2024 12:54 PM

1	2	3	4	5	6	7	8
*	Breaker Control Switch				L&T:Salzer	1	
*	6A SP MCB for Motor Charging/ Closing Trip				L&T:Exora	2	
*	SPD Type 1+2 I _{max} 50KA 800V AC				Citel/Pheonix/L&T	1	
C	Accessories						
*	Line PT 800V/√3/415/√3Vac, Delta-Star , 600VA Delta/Starter 3 Phase Control Circuit				Unikon	1	
*	6A Fuse with Fuse Base, 800V AC				Siba	3	
*	6A FP MCB 10KA 'C Curve'				L&T:Exora	1	
*	2A SP MCB 10KA C Curve for Indication Circuit				L&T:Exora	3	
*	Control Terminal Blocks with Shorting Link				Phoenix	1	
*	Tubelight 230V AC				Reputed	4	
*	Door Switch				Reputed	4	
*	100W Space Heater				Reputed	4	
*	Thermostat (30-110 Deg C)				Reputed	4	
*	2A SP MCB 10KA C Curve for Tubelight				L&T:Exora	4	
*	2A Control Fuse with 20A Fuse Base for Space Heater				Siemens	4	
*	Neutral Link				Phoenix	8	
*	Ventilation 6 inch Fan				EBM Plast	3	
*	Ventilation 8 inch Filter				Encoz	26	
*	Thermostat (30-110 Deg C)				GIC	2	
*	2A SP MCB 10KA C Curve for Ventilation Fans				L&T:Exora	3	
*	20A DP MCB 10KA C Curve				L&T:Exora	1	
*	Control Terminal Blocks with Shorting Link				Phoenix	1	
*	2Way Connector				Reputed	3	
*	Neutral Link				Phoenix	3	

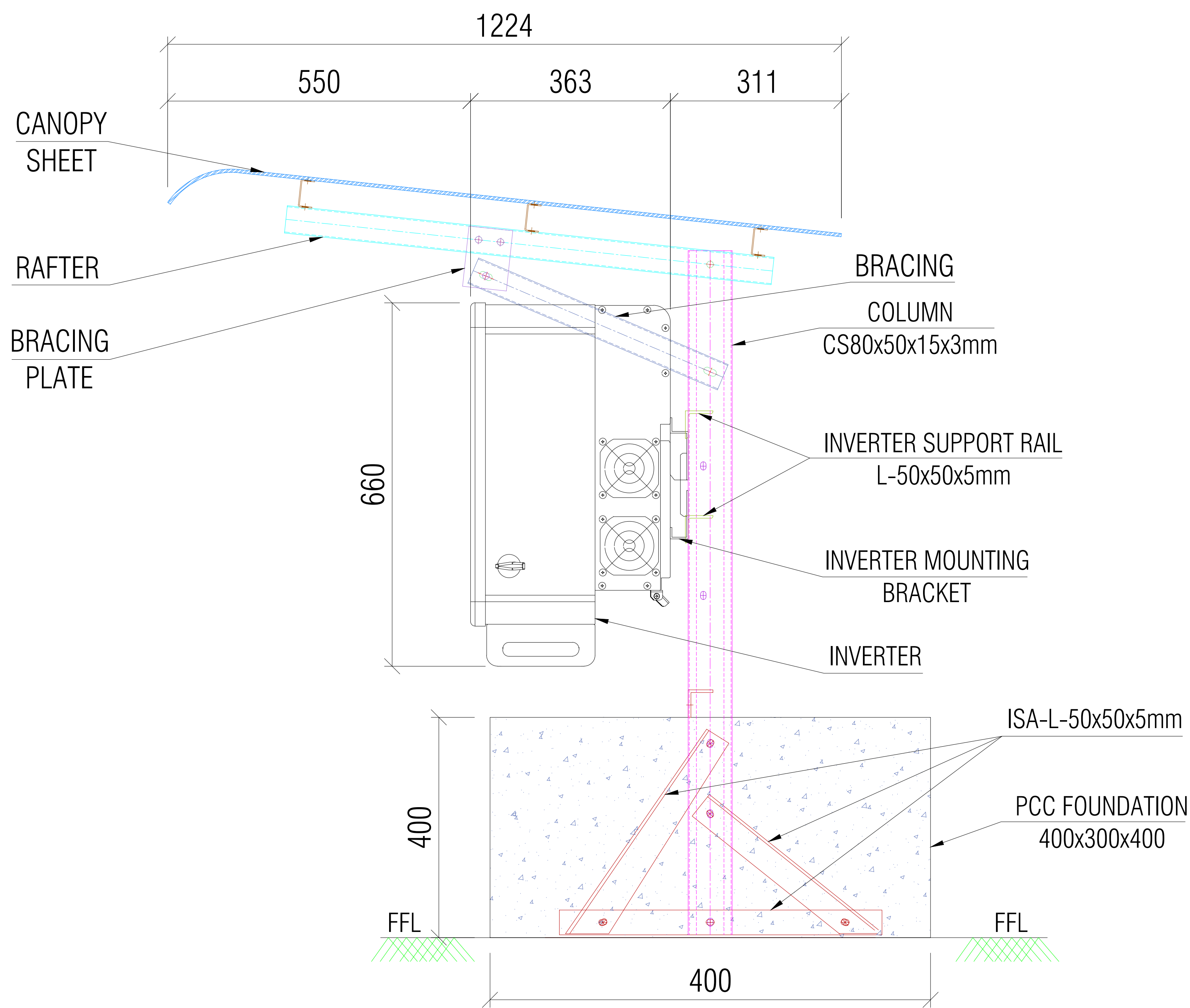
REV. PTS. 00	REV. DATE	PROJECT 1.7MWp SOLAR POWER PLANT AT KERELA	DRN. D.S	CKD. S.V	QTY. 01 NO.					
					APPR. R.V	JOB NO. RMC-1665	DRG NO. RMC/ETPL/P-01BOM			
								DATE 02.01.2024	PO/23-24/0372	SHEET 4 OF 4
REV. PTS. 00	REV. DATE	CLIENT ANERT	5 PC CONT. ENERTURE TECHNOLOGIES PVT. LTD	TITLE MAIN LT PANEL 800V 6 IN 1 OUT 1600A ACB OUTDOOR TYPE IP 55	PO/23-24/0372	JOB NO. RMC-1665	DRG NO. RMC/ETPL/P-01BOM	SHEET 4 OF 4		
R.M.CONTROLS (P) LTD. 13/3, MATHURA ROAD, FARIDABAD-121003 Tel.: [0129]- 4317529 E-mail: info@rmcontrols.co.in Website: www.rmcontrols.co.in										
13/3, MATHURA ROAD, FARIDABAD-121003 Tel.: [0129]- 4317529 E-mail: info@rmcontrols.co.in Website: www.rmcontrols.co.in										

File No. ANERT/TECH/99/2022-T2 (Computer No. 5311)

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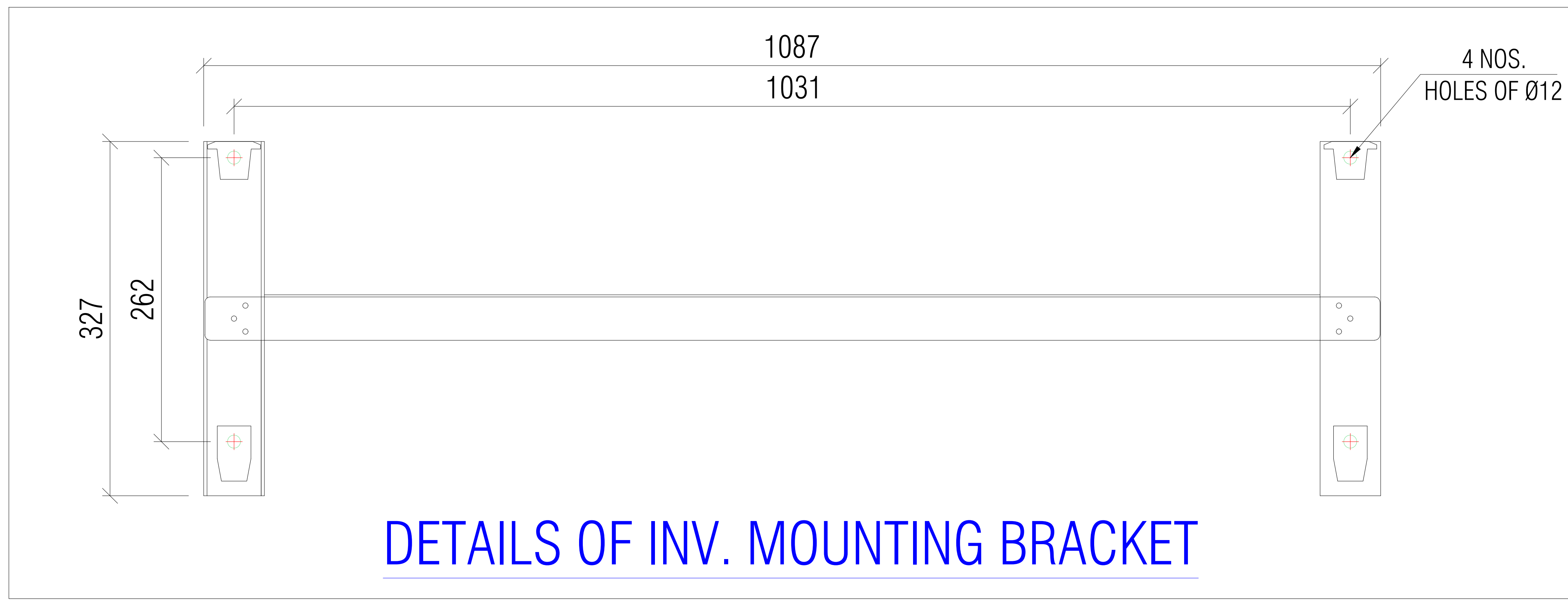


FRONT ELEVATION



SIDE ELEVATION

SUNGROW INVERTER - 200 & 250 KW

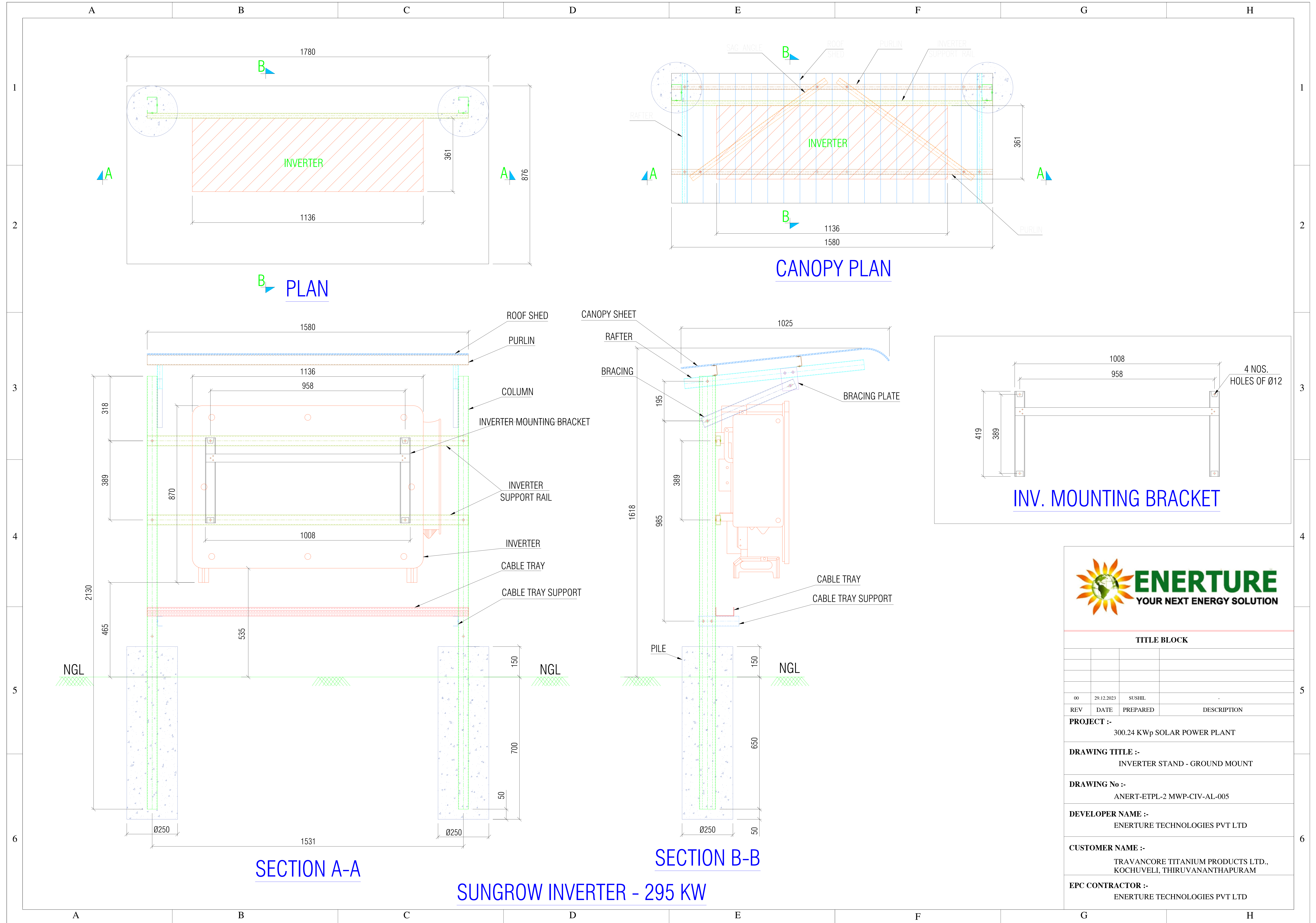


DETAILS OF INV. MOUNTING BRACKET

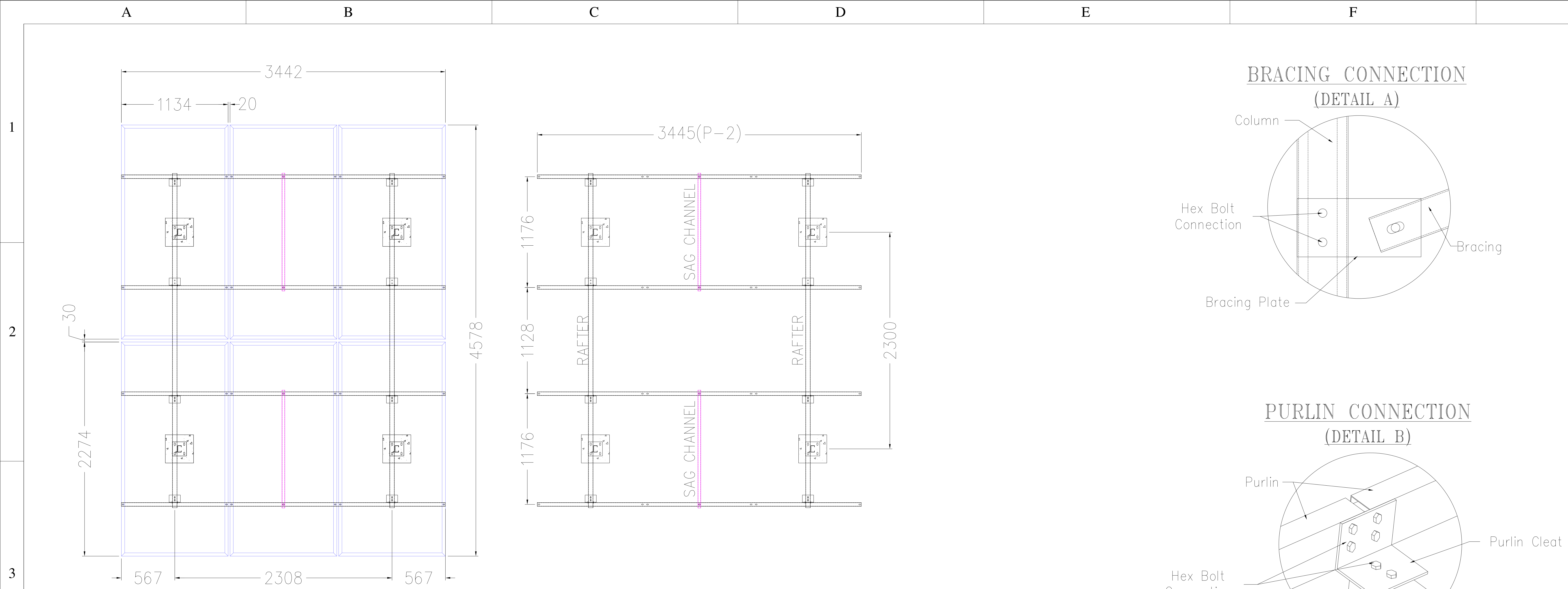


TITLE BLOCK

00	29.12.2023	SUSHIL	-
REV	DATE	PREPARED	DESCRIPTION
PROJECT :- 300.24 KWp SOLAR POWER PLANT			
DRAWING TITLE :- INVERTER STAND - GROUND MOUNT			
DRAWING No :- ANERT-ETPL-2 MWP-CIV-AL-005			
DEVELOPER NAME :- ENERTURE TECHNOLOGIES PVT LTD			
CUSTOMER NAME :- TRAVANCORE TITANIUM PRODUCTS LTD., KOCHUVELI, THIRUVANANTHAPURAM			
EPC CONTRACTOR :- ENERTURE TECHNOLOGIES PVT LTD			





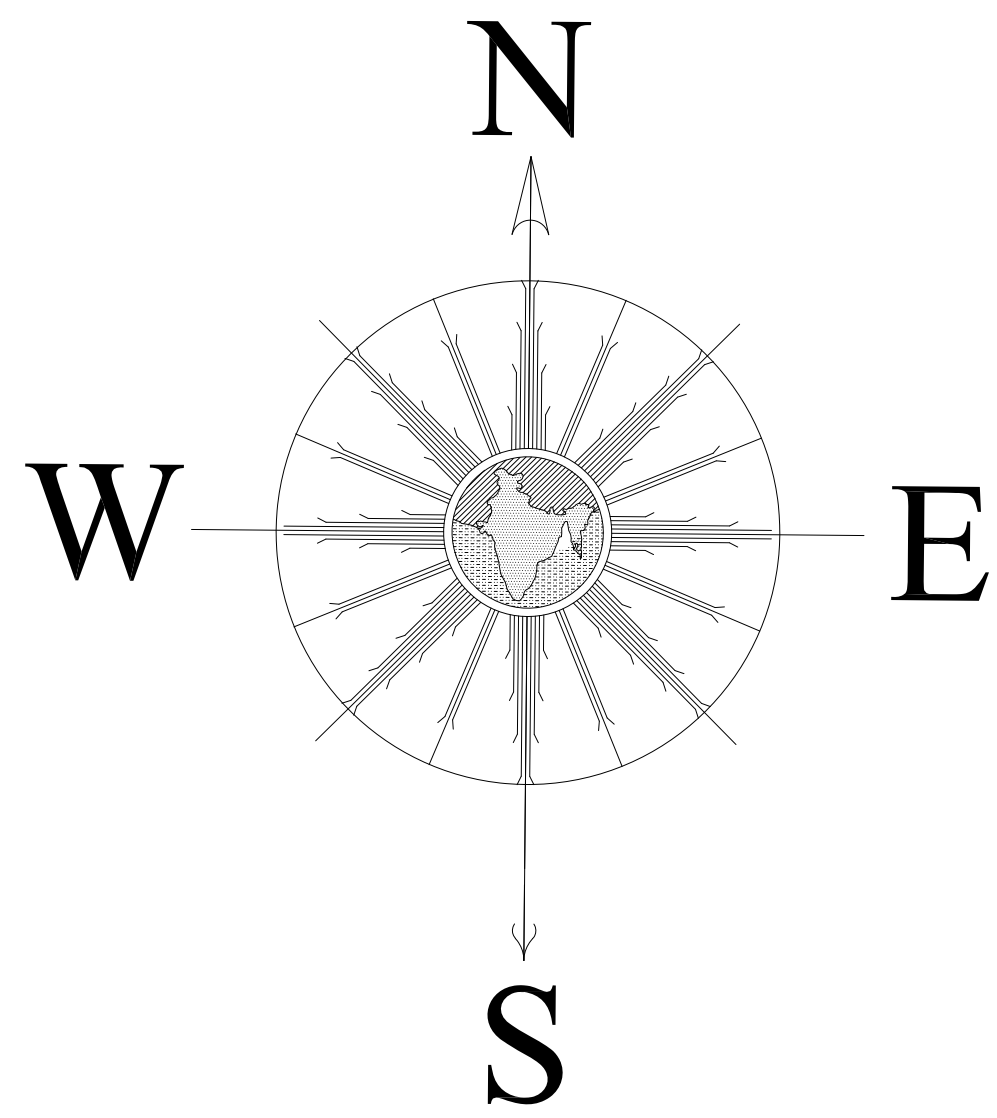


MODULES LAYOUT 2PX3

STRUCTURAL LAYOUT 2PX3

SIDE ELEVATION

checked by *Abhilash*
ABHILASH RAJWANSHI
CHARTERED ENGINEER
MECHANICAL
MEMBERSHIP NO-AM150761-6



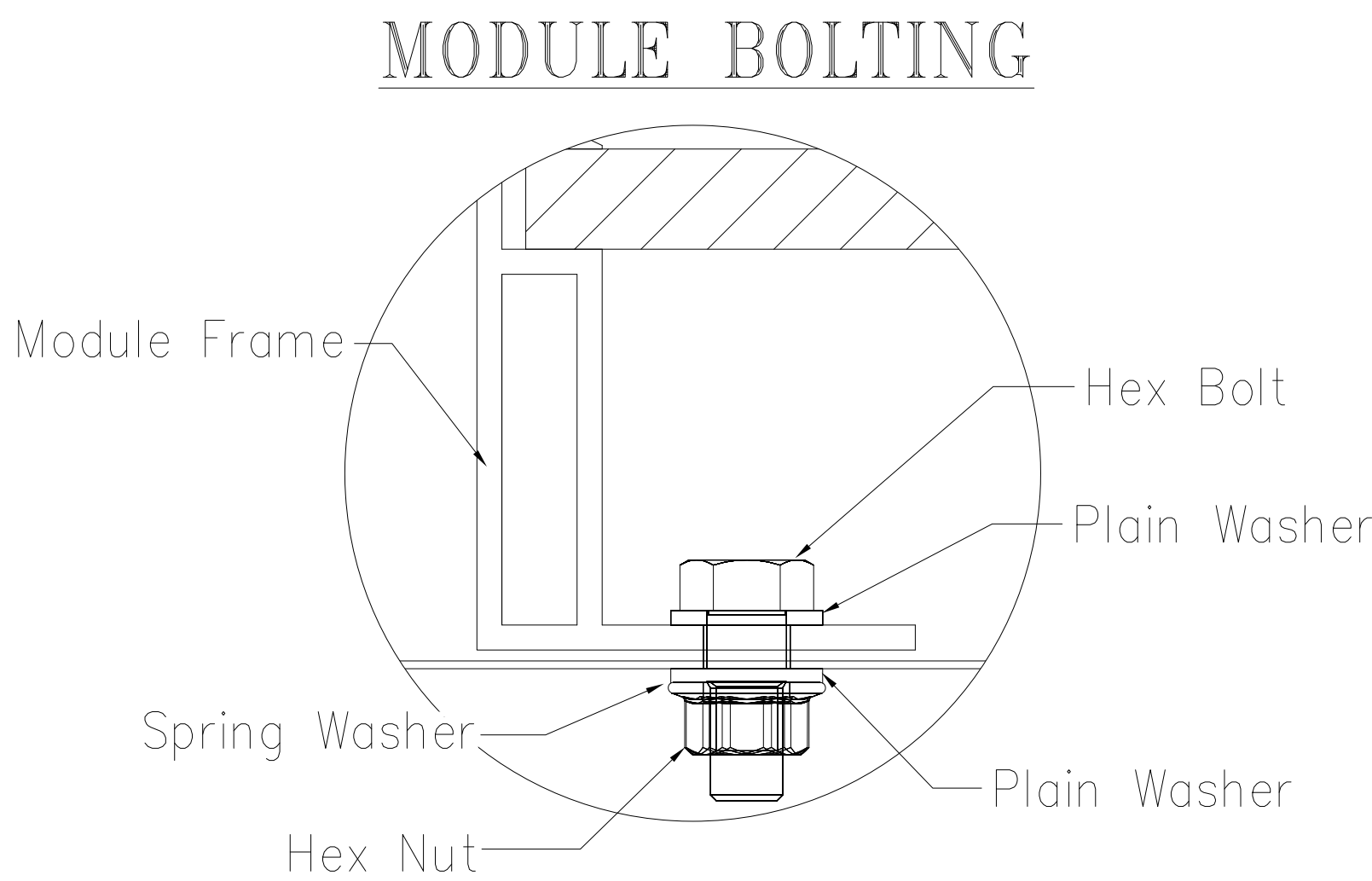
KEY PLAN	
LEGEND	
LEGEND	DESCRIPTION
	MODULE
	LIGHTING ARRESTOR
	PROPOSED CABLE/TL LINE OF SPV PLANT

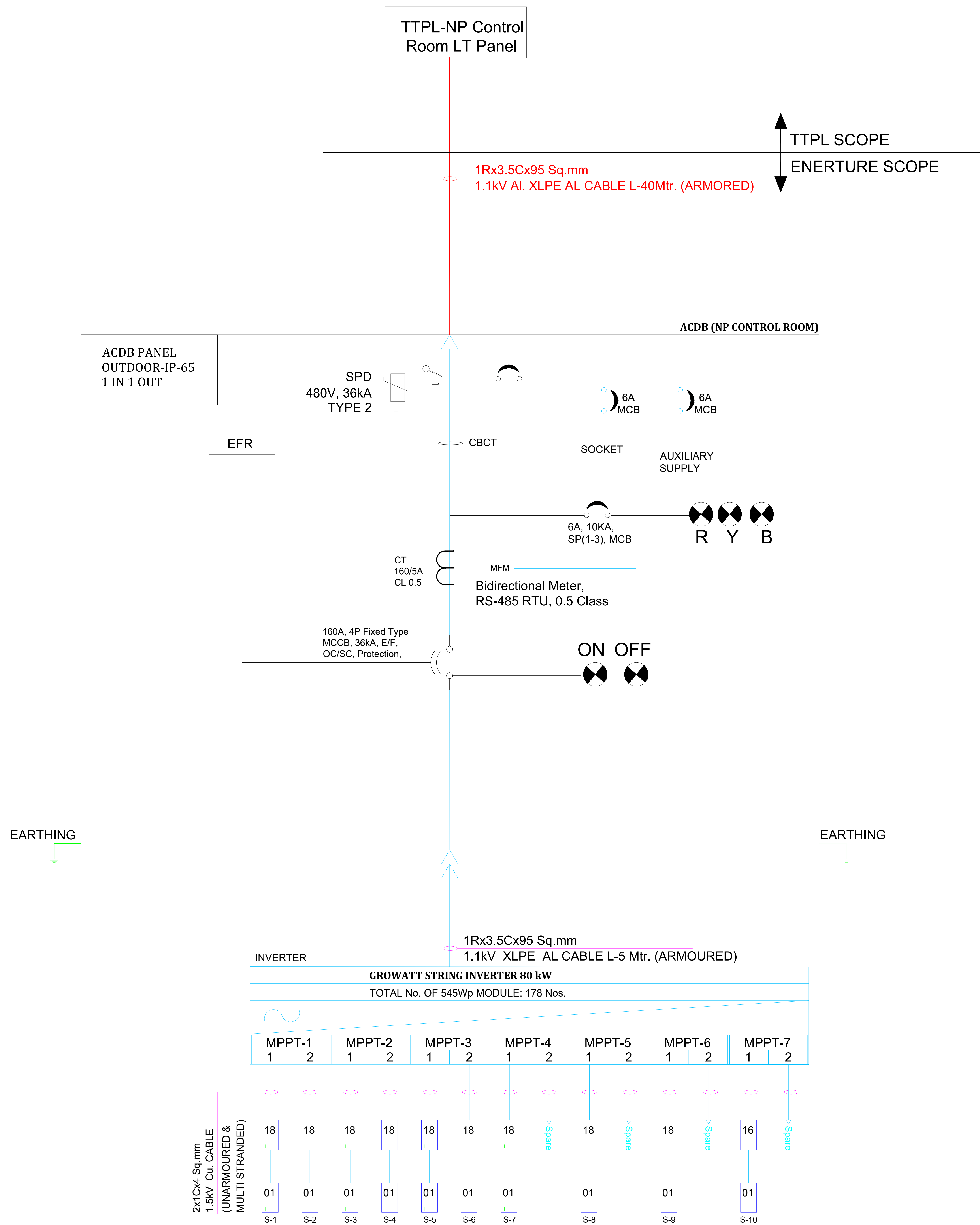
GENERAL INFORMATION	
NUMBER OF MODULES (No/No's)	3704.00
TOTAL CAPACITY (KWp)	2000.16
MODULE MAKE	ALMM
MODULE RATING (Wp)	540.00
INVERTER MAKE	SUNGROW/GROWATT
No. OF INVERTERS - 50/80/295 kVA	2/2/5 No's
TOTAL AREA COVERING BY THE SYSTEM (Sq.Mts)	XXXX
MODULE TILT ANGLE	10°
GROUND CLEARANCE (mm)	500
AVAILABLE MCCB	NO
COORDINATES	8.5002138,76.8974138



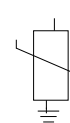
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00	05.08.2023	SANTOSH	-
REV	DATE	PREPARED	DESCRIPTION

PROJECT :- 2000.16 KWp SOLAR POWER PLANT			
DRAWING TITLE :- MMS GA LAYOUT			
DRAWING No :- ANERT-ETPL-2 MWP-CIV-AL_020			
DEVELOPER NAME :- AGENCY FOR NEW & RENEWABLE ENERGY RESEARCH AND TECHNOLOGY (ANERT)			
CUSTOMER NAME :- AGENCY FOR NEW & RENEWABLE ENERGY RESEARCH AND TECHNOLOGY (ANERT)			
EPC CONTRACTOR :- ENERTURE TECHNOLOGIES PVT LTD			





PV MODULE DETAILS (STC)		
1)	MODULE TYPE =	RAYZON SOLAR
2)	MAXIMUM POWER- Pmax(W) =	545Wp.
3)	OPEN CIRCUIT VOLTAGE- Voc(V) =	49.45
4)	SHORT CIRCUIT CURRENT-Isc (A) =	13.51
5)	MAXIMUM POWER VOLTAGE-Vmpp(V) =	42.45
6)	MAXIMUM POWER CURRENT-Imp(A) =	12.85
7)	MODULE EFFICIENCY=	21.1. %
8)	WEIGHT=	28.6 Kg.
9)	DIMENSIONS =	1133*2278*40mm

LEGEND			
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	SFU (SWITCH FUSE UNIT)		UNI-DIRECTIONAL METER 0.5 CLASS (IMPORT-EXPORT TYPE)
	CT		
	SPD		
	INDICATING LAMP		
	MCB		
	CABLE		
	INVERTER		
	PV MODULE		
	COMMUNICATION CABLE		

GENERAL INFORMATION	
NUMBER OF MODULES (No/No's)	178.00
TOTAL CAPACITY (KWp)	97.01
MODULE MAKE	ZAYZON SOLAR
MODULE RATING (Wp)	545.00
INVERTER MAKE	GROWATT
No. OF INVERTERS - 80 kVA	1 No's
MODULES PER STRING (No/No's)	16/18
TOTAL NO OF STRINGS (No/No's)	01/09
TOTAL AREA COVERING BY THE SYSTEM (Sq.Mts)	880
MODULE TILT	10°
CABLE LAYING (ARRAY TO INVERTER) - COPPER	1C*4Sq mm
CABLE LAYING (INVERTER TO LT PANEL) - ALUMINIUM	3.5C*95 Sq mm



TITLE BLOCK			
02	23.10.2023	ANIKET	Update module make & changed no of module in string
01	15.09.2023	SANTOSHI	
00	03.07.2023	SANTOSH	
REV	DATE	PREPARED	DESCRIPTION

PROJECT :-	97.01 KW _p SOLAR POWER PLANT
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DRAWING TITLE :-
SINGLE LINE DIAGRAM-NP CONTROL ROOM

DRAWING No :-
TTPL-ETPL-2MWP-ELE-001 (NP CONTROL ROOM)

DEVELOPER NAME :-
ANERT-KOCHUVELI, THIRUVANANTHAPURAM

CUSTOMER NAME :-
TRAVANCORE TITANIUM PRODUCTS LTD,
KOCHUVELI, THIRUVANANTHAPURAM

EPC CONTRACTOR :-
ENERTURE TECHNOLOGIES PVT LTD

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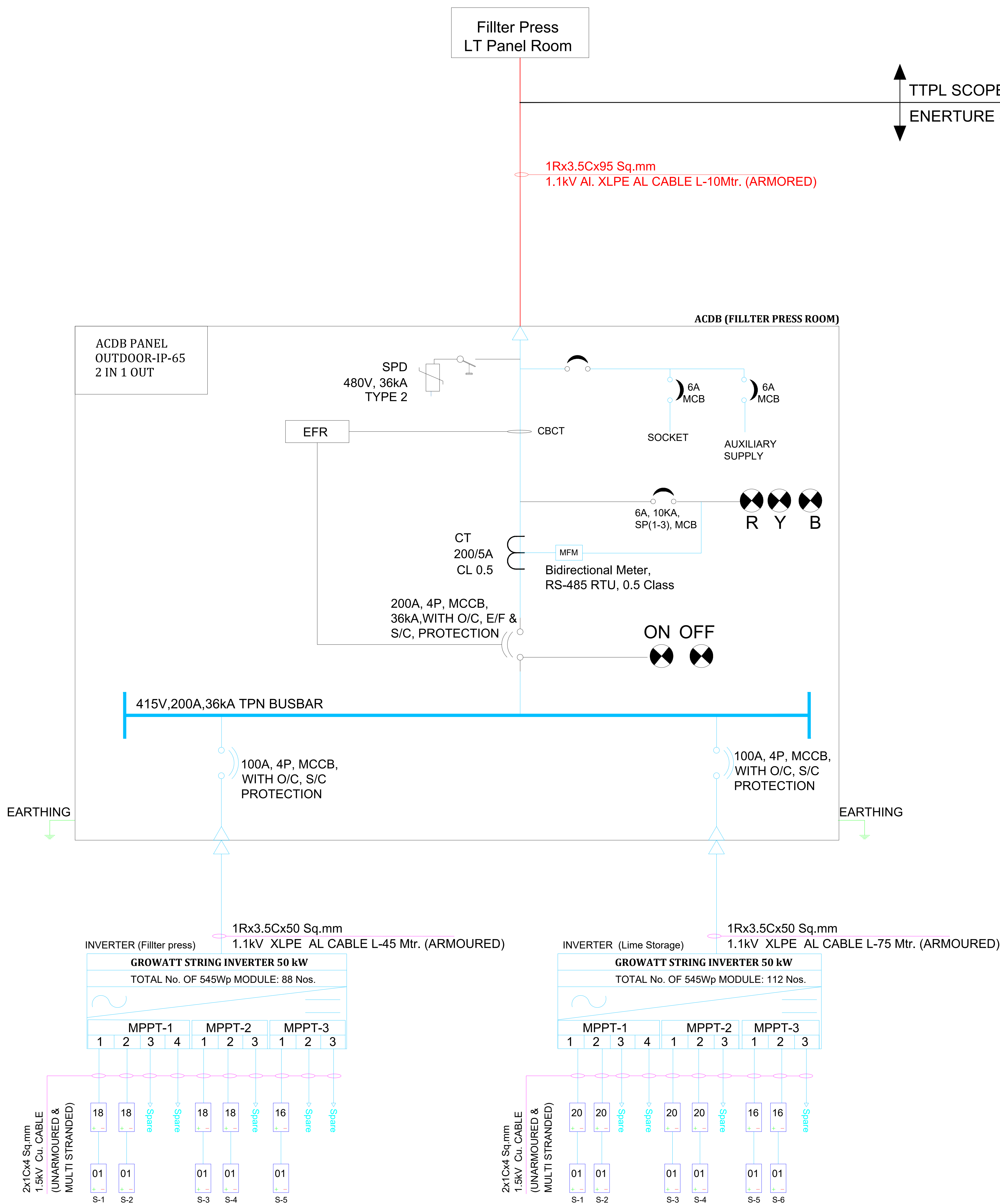
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PV MODULE DETAILS (STC)

1) MODULE TYPE =	RAYZON SOLAR
2) MAXIMUM POWER- Pmax(W) =	545Wp.
3) OPEN CIRCUIT VOLTAGE- Voc(V) =	49.45
4) SHORT CIRCUIT CURRENT-IsC (A) =	13.51
5) MAXIMUM POWER VOLTAGE-Vmpp(V) =	42.45
6) MAXIMUM POWER CURRENT-Impp(A) =	12.85
7) MODULE EFFICIENCY=	21.1 %
8) WEIGHT=	28.6 Kg.
9) DIMENSIONS =	1133*2278*40mm

LEGEND

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	SFU (SWITCH FUSE UNIT)		UNI-DIRECTIONAL METER 0.5 CLASS (IMPORT-EXPORT TYPE)
	CT		
	SPD		
	INDICATING LAMP		
	MCB		
	CABLE		
	INVERTER		
	PV MODULE		
	COMMUNICATION CABLE		

GENERAL INFORMATION

NUMBER OF MODULES (No/No's)	200.00
TOTAL CAPACITY (KWp)	109.00
MODULE MAKE	ZAYZON SOLAR
MODULE RATING (Wp)	545.00
INVERTER MAKE	GROWATT
No. OF INVERTERS - 50 kVA	2 No's
MODULES PER STRING (No/No's)	16/18/20
TOTAL NO OF STRINGS (No/No's)	01/06/04
TOTAL AREA COVERING BY THE SYSTEM (Sq.Mts)	1100
MODULE TILT	10°
CABLE LAYING (ARRAY TO INVERTER) - COPPER	1C*4Sq mm
CABLE LAYING (INVERTER TO LT PANEL) - ALUMINIUM	3.5C*50 & 95 Sq mm



TITLE BLOCK

02	23.10.2023	ANIKET	Update module make & changed no of module in string
01	15.09.2023	SANTOSH	
00	04.07.2023	ANIKET	
REV	DATE	PREPARED	DESCRIPTION

PROJECT :-
109 KWp SOLAR POWER PLANT

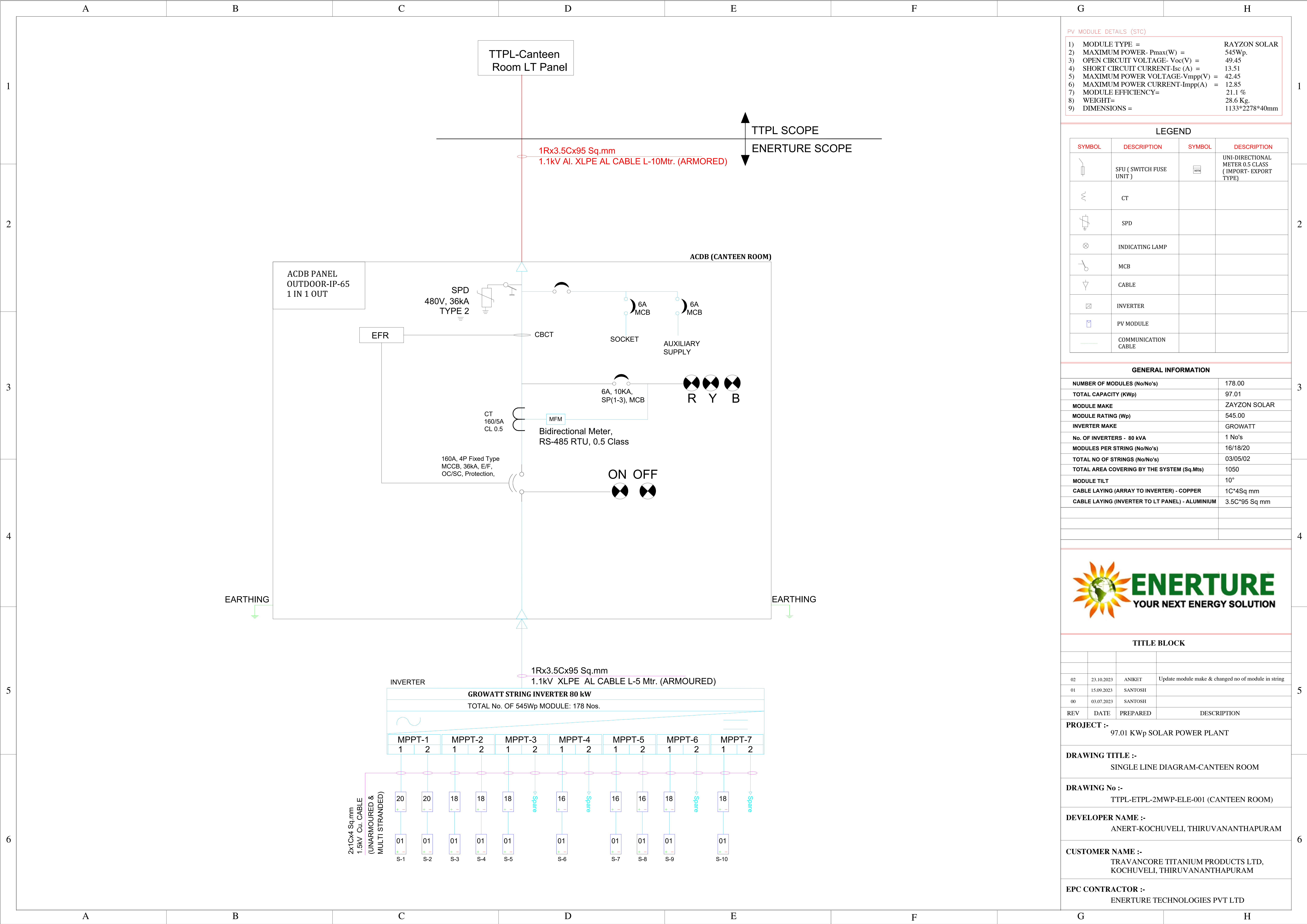
DRAWING TITLE :-
SINGLE LINE DIAGRAM-FILLTER PRESS

DRAWING No :-
TTPL-ETPL-2MWP-ELE-001 (FILLTER PRESS)

DEVELOPER NAME :-
ANERT-KOCHUVELI, THIRUVANANTHAPURAM

CUSTOMER NAME :-
TRAVANCORE TITANIUM PRODUCTS LTD,
KOCHUVELI, THIRUVANANTHAPURAM

EPC CONTRACTOR :-
ENERTURE TECHNOLOGIES PVT LTD



PV MODULE DETAILS (STC)			
1) MODULE TYPE =	RAYZON SOLAR		
2) MAXIMUM POWER- Pmax(W) =	545Wp.		
3) OPEN CIRCUIT VOLTAGE- Voc(V) =	49.45		
4) SHORT CIRCUIT CURRENT-IsC (A) =	13.51		
5) MAXIMUM POWER VOLTAGE-Vmpp(V) =	42.45		
6) MAXIMUM POWER CURRENT-Impp(A) =	12.85		
7) MODULE EFFICIENCY=	21.1 %		
8) WEIGHT=	28.6 Kg.		
9) DIMENSIONS =	1133*2278*40mm		

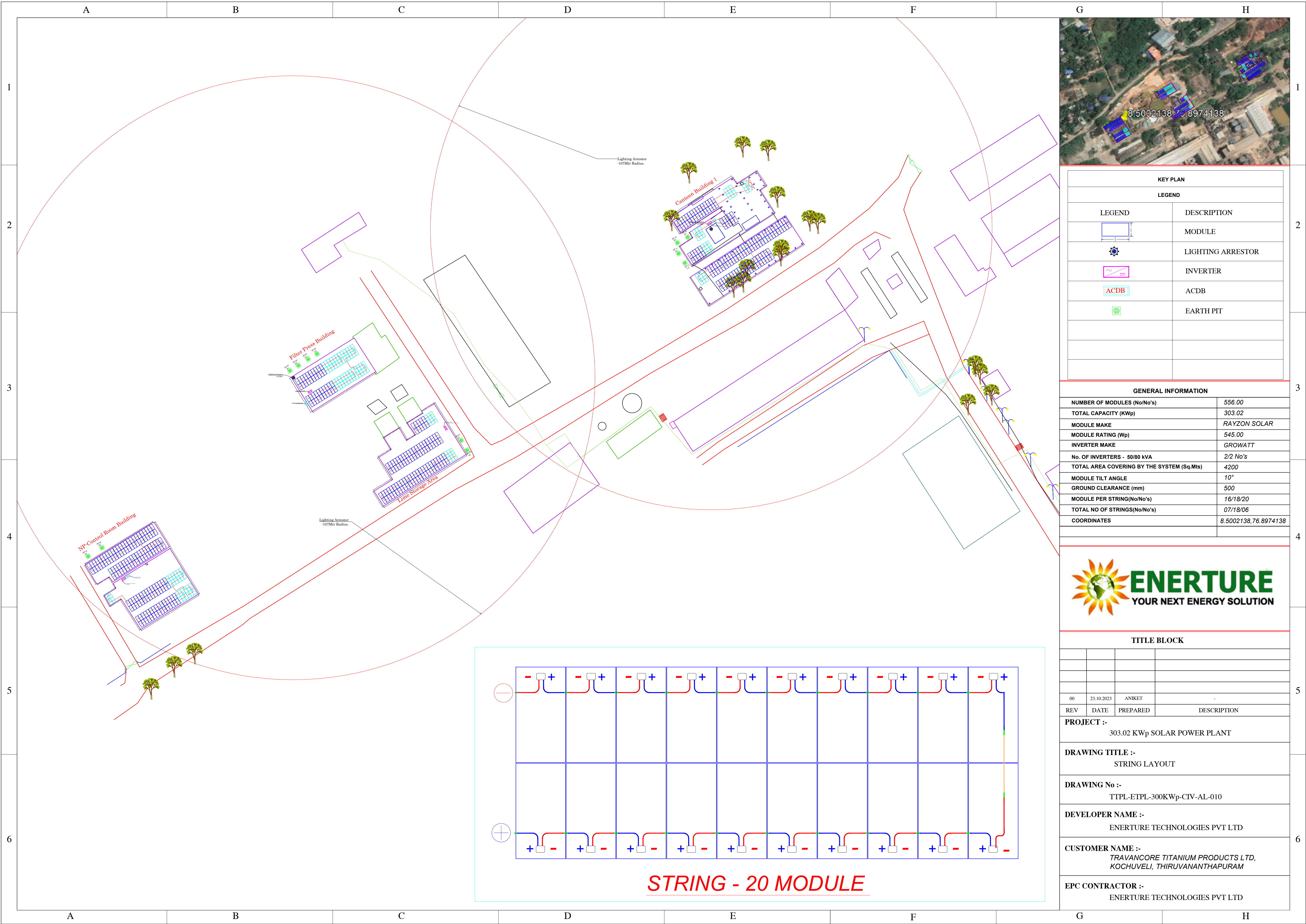
LEGEND			
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	SFU (SWITCH FUSE UNIT)		UNI-DIRECTIONAL METER 0.5 CLASS (IMPORT- EXPORT TYPE)
	CT		
	SPD		
	INDICATING LAMP		
	MCB		
	CABLE		
	INVERTER		
	PV MODULE		
	COMMUNICATION CABLE		

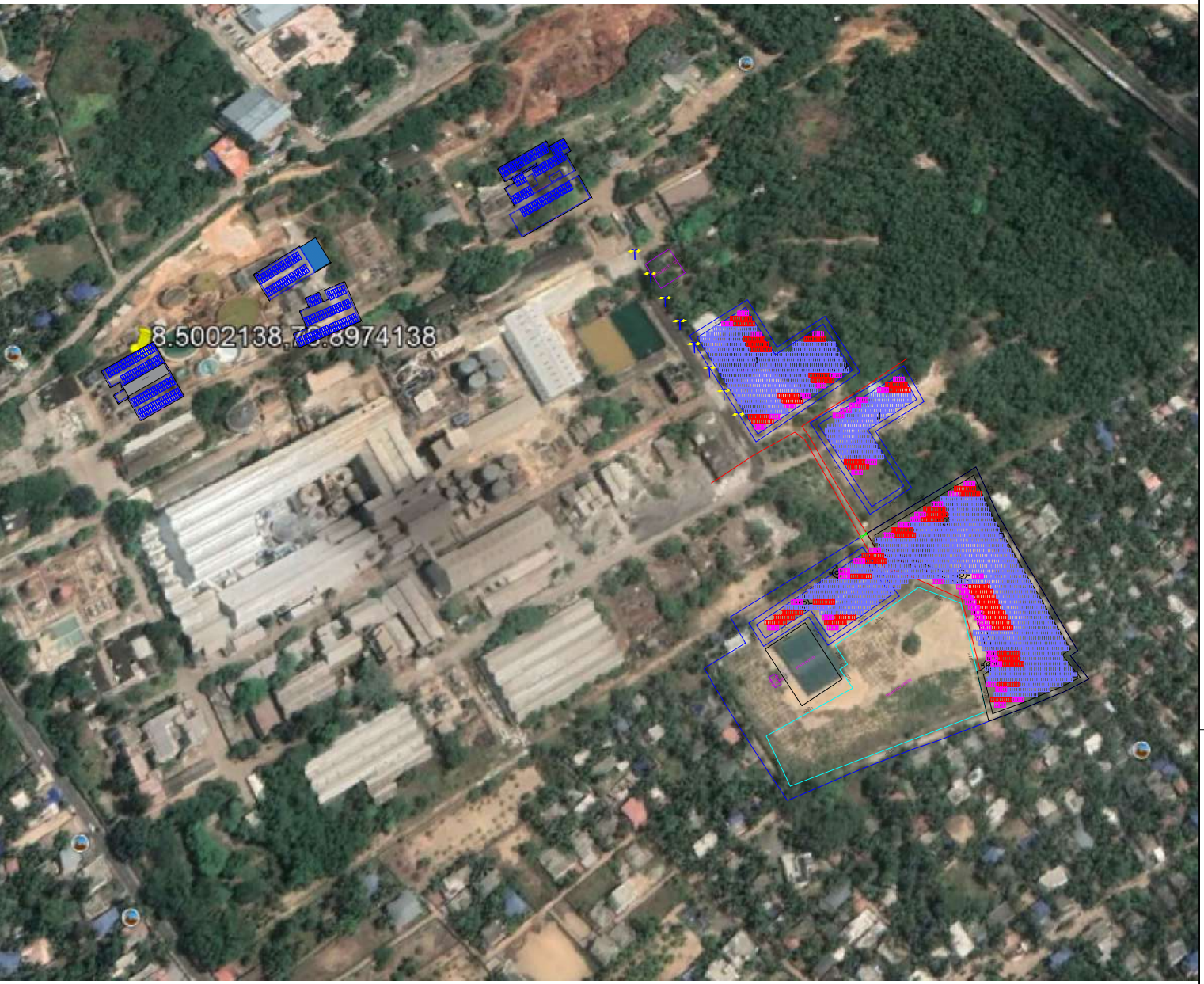
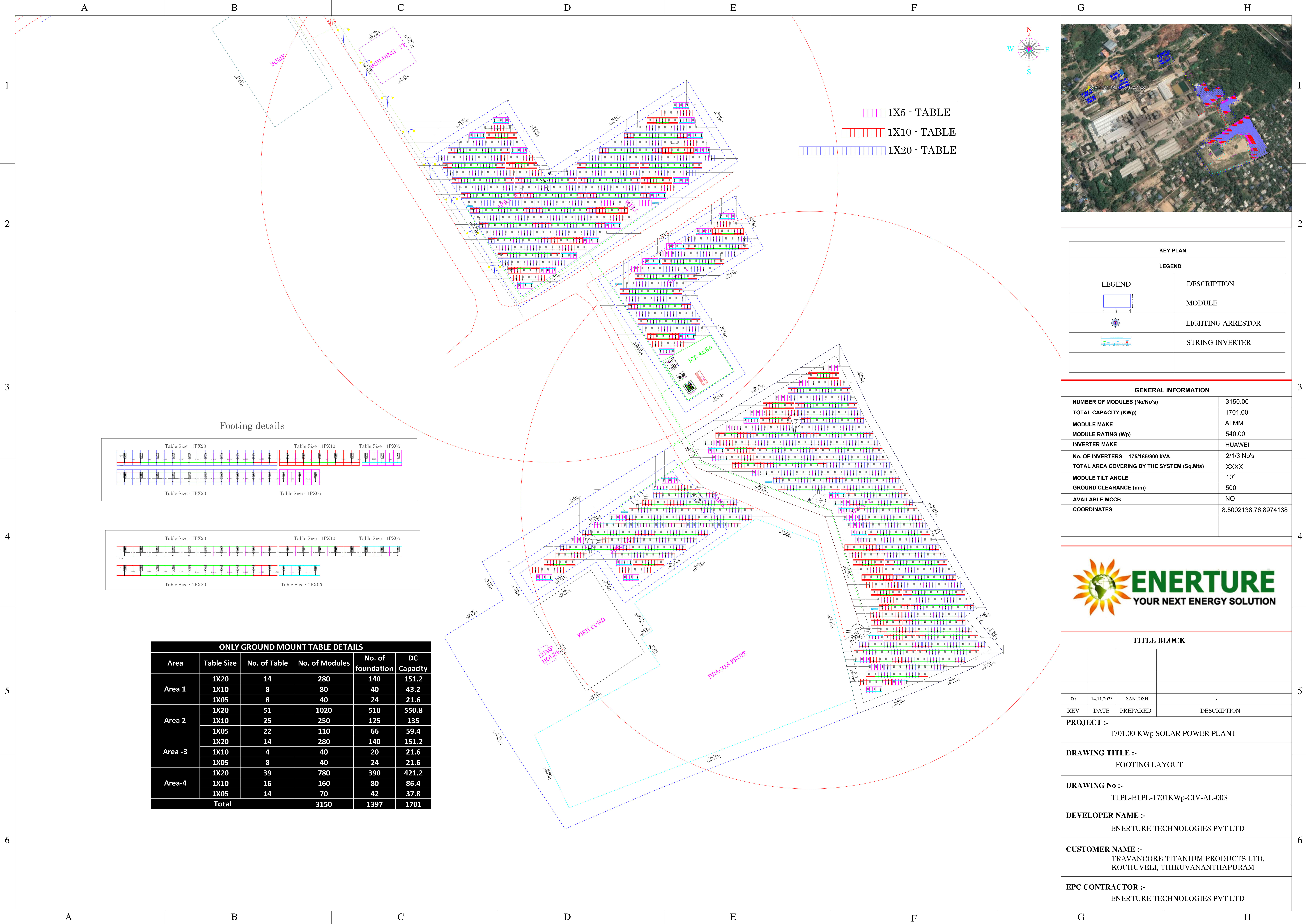
GENERAL INFORMATION	
NUMBER OF MODULES (No/No's)	178.00
TOTAL CAPACITY (KWp)	97.01
MODULE MAKE	ZAYZON SOLAR
MODULE RATING (Wp)	545.00
INVERTER MAKE	GROWATT
No. OF INVERTERS - 80 kVA	1 No's
MODULES PER STRING (No/No's)	16/18/20
TOTAL NO OF STRINGS (No/No's)	03/05/02
TOTAL AREA COVERING BY THE SYSTEM (Sq.Mts)	1050
MODULE TILT	10°
CABLE LAYING (ARRAY TO INVERTER) - COPPER	1C*4Sq mm
CABLE LAYING (INVERTER TO LT PANEL) - ALUMINIUM	3.5C*95 Sq mm



TITLE BLOCK			
02	23.10.2023	ANIKET	Update module make & changed no of module in string
01	15.09.2023	SANTOSH	
00	03.07.2023	SANTOSH	
REV	DATE	PREPARED	DESCRIPTION

PROJECT :- 97.01 KWp SOLAR POWER PLANT			
DRAWING TITLE :- SINGLE LINE DIAGRAM-CANTEEN ROOM			
DRAWING No :- TTPL-ETPL-2MWP-ELE-001 (CANTEEN ROOM)			
DEVELOPER NAME :- ANERT-KOCHUVELI, THIRUVANANTHAPURAM			
CUSTOMER NAME :- TRAVANCORE TITANIUM PRODUCTS LTD, KOCHUVELI, THIRUVANANTHAPURAM			
EPC CONTRACTOR :- ENERTURE TECHNOLOGIES PVT LTD			





KEY PLAN	
LEGEND	
LEGEND	DESCRIPTION
	MODULE
	LIGHTING ARRESTOR
	STRING INVERTER

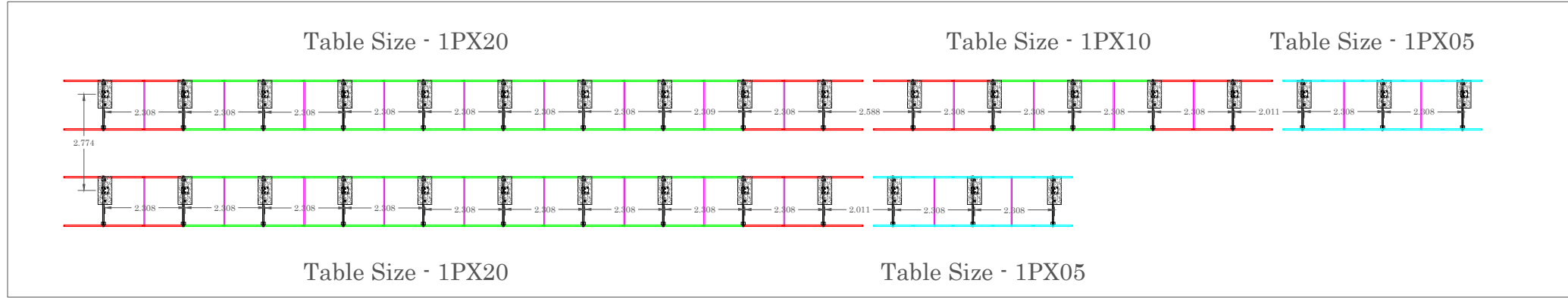
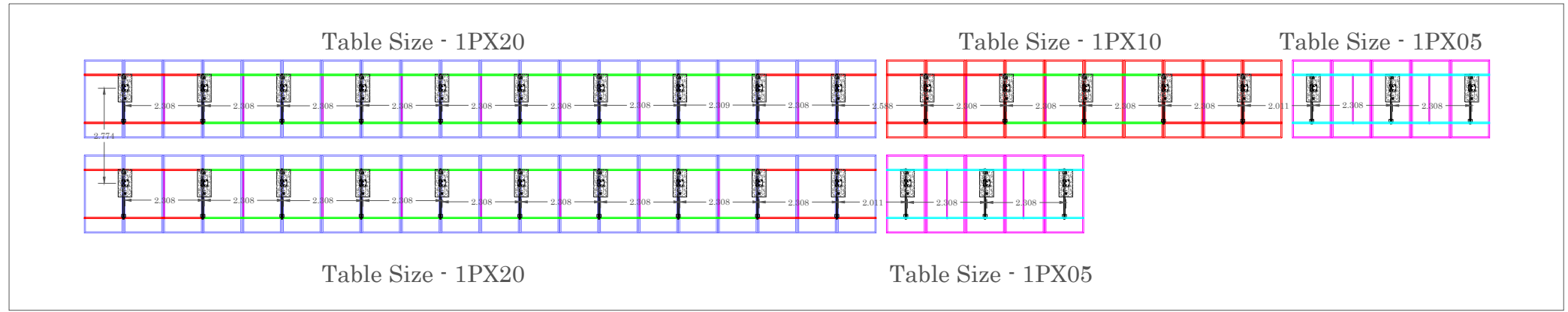
GENERAL INFORMATION	
NUMBER OF MODULES (No/No's)	3150.00
TOTAL CAPACITY (KWp)	1701.00
MODULE MAKE	ALMM
MODULE RATING (Wp)	540.00
INVERTER MAKE	HUAWEI
No. OF INVERTERS - 175/185/300 KVA	2/1/3 No's
TOTAL AREA COVERING BY THE SYSTEM (Sq.Mts)	XXXX
MODULE TILT ANGLE	10°
GROUND CLEARANCE (mm)	500
AVAILABLE MCCB	NO
COORDINATES	8.5002138,76.8974138



TITLE BLOCK			
00	14.11.2023	SANTOSH	
REV	DATE	PREPARED	DESCRIPTION

PROJECT :- 1701.00 KWp SOLAR POWER PLANT			
DRAWING TITLE :- FOOTING LAYOUT			
DRAWING No :- TTPL-ETPL-1701KWp-CIV-AL-003			
DEVELOPER NAME :- ENERTURE TECHNOLOGIES PVT LTD			
CUSTOMER NAME :- TRAVANCORE TITANIUM PRODUCTS LTD, KOCHUVELI, THIRUVANANTHAPURAM			
EPC CONTRACTOR :- ENERTURE TECHNOLOGIES PVT LTD			

Footing details



ONLY GROUND MOUNT TABLE DETAILS					
Area	Table Size	No. of Table	No. of Modules	No. of foundation	DC Capacity
Area 1	1X20	14	280	140	151.2
	1X10	8	80	40	43.2
	1X05	8	40	24	21.6
Area 2	1X20	51	1020	510	550.8
	1X10	25	250	125	135
	1X05	22	110	66	59.4
Area -3	1X20	14	280	140	151.2
	1X10	4	40	20	21.6
	1X05	8	40	24	21.6
Area-4	1X20	39	780	390	421.2
	1X10	16	160	80	86.4
	1X05	14	70	42	37.8
Total			3150	1397	1701



RE: Request for Virtual Pre-Dispatch Inspection Call for Solar Modules on December 26th

ANERT Projects <projects@anert.in>

Thu, Dec 28, 2023 at 9:33 AM

To: akshayraj.k@enerture.co.in

Cc: shubham@enerture.co.in, Bhairaw Mandal <bhairaw@enerture.co.in>, Parvendar Singh <parvendar.singh@enerture.co.in>, Mahesh <mahesh@enerture.co.in>, mayank@enerture.co.in, Santosh Kumar <santosh@enerture.co.in>, ANERT 2K2K <anert2020@anert.in>, solarcity tvn <solarcitytvn@gmail.com>, Chief Technical Manager ANERT <ctm@anert.in>, rampintu150@gmail.com, pintu@enerture.co.in, amanjeet@enerture.co.in, ramchandra@enerture.co.in

Dear All,

In continuation to the PDI done on 27/12/2023, clearance is herewith provided for delivery of modules for the lot of modules which the inspection was carried out

On Wed, 27 Dec 2023 at 18:51, Akshay Raj <akshayraj.k@enerture.co.in> wrote:

Dear Sir,

Kindly find the attached Pre dispatch inspection report, request you to kindly approve the same.

Best Regards,

Akshay Raj

From: Akshay Raj <akshayraj.k@enerture.co.in>

Sent: 26 December 2023 15:25

To: 'ANERT Projects' <projects@anert.in>

Cc: 'shubham@enerture.co.in' <shubham@enerture.co.in>; 'Bhairaw Mandal' <bhairaw@enerture.co.in>; 'Parvendar Singh' <parvendar.singh@enerture.co.in>; 'Mahesh' <mahesh@enerture.co.in>; 'mayank@enerture.co.in' <mayank@enerture.co.in>; 'Santosh Kumar' <santosh@enerture.co.in>; 'ANERT 2K2K' <anert2020@anert.in>; 'solarcity tvn' <solarcitytvn@gmail.com>; 'Chief Technical Manager ANERT' <ctm@anert.in>; 'rampintu150@gmail.com' <rampintu150@gmail.com>; 'pintu@enerture.co.in' <pintu@enerture.co.in>; 'mayank@enerture.co.in' <mayank@enerture.co.in>; 'amanjeet@enerture.co.in' <amanjeet@enerture.co.in>; 'ramchandra@enerture.co.in' <ramchandra@enerture.co.in>

Subject: RE: Request for Virtual Pre-Dispatch Inspection Call for Solar Modules on December 26th

Dear Sir/Madam,

Kindly provide samples and also the timings for inspection.

Looking forward.

Best Regards,

Akshay Raj

From: Akshay Raj <akshayraj.k@enerture.co.in>

Sent: 26 December 2023 10:53

To: 'ANERT Projects' <projects@anert.in>

Cc: 'shubham@enerture.co.in' <shubham@enerture.co.in>; 'Bhairaw Mandal' <bhairaw@enerture.co.in>; 'Parvendar Singh'

<parvendar.singh@enerture.co.in>; 'Mahesh' <mahesh@enerture.co.in>; 'mayank@enerture.co.in' <mayank@enerture.co.in>; 'Santosh Kumar' <santosh@enerture.co.in>; 'ANERT 2K2K' <anert2020@anert.in>; 'solarcity tvn' <solarcitytvn@gmail.com>; 'Chief Technical Manager ANERT' <ctm@anert.in>; 'rampintu150@gmail.com' <rampintu150@gmail.com>; 'pintu@enerture.co.in' <pintu@enerture.co.in>; 'mayank@enerture.co.in' <mayank@enerture.co.in>; 'amanjeet@enerture.co.in' <amanjeet@enerture.co.in>; 'ramchandra@enerture.co.in' <ramchandra@enerture.co.in>

Subject: RE: Request for Virtual Pre-Dispatch Inspection Call for Solar Modules on December 26th

Dear Madam,

Kindly find the attached FTR for Virtual inspection,

Please arrange to select samples for inspection purpose also share us the comfortable timings for today.

Thank you

Thanks and Regards,

Akshay Raj Kulshreshtha

Sr. Procurement Manager

Enerture Technologies Pvt Ltd.

ABL Workspaces, Celebration Gardens, NH 8, Adjoining Shiv
Murti, Opp IGI Airport, New Delhi, Delhi 110037

M: +91 9999399307 • E-mail: akshayraj.k@enerture.co.in



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From: ANERT Projects <projects@anert.in>

Sent: 21 December 2023 15:39

To: Akshayraj K <akshayraj.k@enerture.co.in>

Cc: shubham@enerture.co.in; Bhairaw Mandal <bhairaw@enerture.co.in>; Parvendar Singh <parvendar.singh@enerture.co.in>; Mahesh <mahesh@enerture.co.in>; Santosh Kumar <santosh@enerture.co.in>; ANERT 2K2K <anert2020@anert.in>; solarcity tvn <solarcitytvn@gmail.com>; Chief Technical Manager ANERT <ctm@anert.in>; rampintu150@gmail.com; Arman Malik <arman.malik@enerture.co.in>; pintu@enerture.co.in; mayank@enerture.co.in; amanjeet@enerture.co.in; ramchandra@enerture.co.in

Subject: Re: Request for Virtual Pre-Dispatch Inspection Call for Solar Modules on December 22nd or 23rd

Dear Akshay,

The PDI may be arranged on 22/12/2023, preferably afternoon. Kindly share the list of modules with serial numbers.

On Wed, 20 Dec 2023 at 15:53, Akshay Raj <akshayraj.k@enerture.co.in> wrote:

Dear Madam

I hope this message finds you well. We are excited about the upcoming dispatch of the solar modules of 1.7 Mw, and as part of our quality assurance process, we would like to schedule a virtual pre-dispatch inspection call. We propose conducting the inspection on either December 22nd or 23rd, and we would appreciate it if you could confirm your availability for this important stage of the process.

Furthermore, we understand the significance of the flash test report in assuring the quality of the solar modules. Rest assured, once we receive the report, we will promptly share it with you for your review.

Your participation in the virtual inspection call is vital to ensuring that the solar modules meet and exceed your expectations. **Kindly confirm your availability for either of the proposed dates, and we will coordinate the details accordingly.**

Thank you for your attention to this matter, and we look forward to your confirmation.

Thanks and Regards,

Akshay Raj Kulshreshtha

Sr. Procurement Manager

Enerture Technologies Pvt Ltd.

ABL Workspaces, Celebration Gardens, NH 8, Adjoining Shiv Murti, Opp IGI Airport, New Delhi, Delhi 110037

M: +91 9999399307 • E-mail: akshayraj.k@enerture.co.in



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From: Akshay Raj <akshayraj.k@enerture.co.in>

Sent: 25 October 2023 10:32

To: 'ANERT Projects' <projects@anert.in>

Cc: 'shubham@enerture.co.in' <shubham@enerture.co.in>; 'Bhairaw Mandal' <bhairaw@enerture.co.in>; 'Apar Chitransh' <Apar.chitransh@enerture.co.in>; 'ankur' <ankur.gupta@enerture.co.in>; 'Parvendar Singh' <parvendar.singh@enerture.co.in>; 'Mahesh' <mahesh@enerture.co.in>; 'Santosh Kumar' <santosh@enerture.co.in>; 'ANERT 2K2K' <anert2020@anert.in>; 'solarcity tvn' <solarcitytvn@gmail.com>; 'Chief Technical Manager ANERT' <ctm@anert.in>; 'rampintu150@gmail.com' <rampintu150@gmail.com>; 'Arman Malik' <arman.malik@enerture.co.in>; 'pintu@enerture.co.in' <pintu@enerture.co.in>

Subject: Solar Modules Virtual Inspection Regd. Lot - 2 !! TRAVANCORE TITANIUM PRODUCTS LTD

Dear Madam

We have arranged a virtual PDI on **25th Oct 2023 sharp 2:30PM**. Link of the inspection is given below

FTR attached for your reference,

kindly share 2 Modules serial numbers for inspection, your early response will be highly appreciated,

I am mentioning manufacturer QC head details

Mr. Jainesh Shah

Mob. – 7600512728

Thanks and Regards,

Akshay Raj Kulshreshtha

Sr. Procurement Manager

Enerture Technologies Pvt Ltd.

ABL Workspaces, Celebration Gardens, NH 8, Adjoining Shiv
Murti, Opp IGI Airport, New Delhi, Delhi 110037

M: +91 9999399307 • E-mail: akshayraj.k@enerture.co.in



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From: ANERT Projects <projects@anert.in>

Sent: 12 October 2023 11:06

To: akshayraj.k@enerture.co.in

Cc: shubham@enerture.co.in; Bhairaw Mandal <bhairaw@enerture.co.in>; Apar Chitransh <Apar.chitransh@enerture.co.in>; ankur <ankur.gupta@enerture.co.in>; Parvendar Singh <parvendar.singh@enerture.co.in>; Mahesh <maresh@enerture.co.in>; Santosh Kumar <santosh@enerture.co.in>; ANERT 2K2K <anert2020@anert.in>; solarcity tvn <solarcitytvm@gmail.com>; Chief Technical Manager ANERT <ctm@anert.in>; rampintu150@gmail.com; Arman Malik <arman.malik@enerture.co.in>; pintu@enerture.co.in

Subject: Re: !! Solar Modules Virtual Inspection Regd. !! TRAVANCORE TITANIUM PRODUCTS LTD

Dear Akshay,

With reference to the tests done on 10/10/2023 and reports forwarded, clearance is herewith provided for dispatch of solar modules to the site for installation.

On Wed, 11 Oct 2023 at 16:57, Akshay Raj <akshayraj.k@enerture.co.in> wrote:

Dear Sir/Madam,

Kindly find the attached Inspection report. Request you to kindly approve the same so that we can dispatch it immediately.

Thanks and Regards,

Akshay Raj Kulshreshtha

Sr. Procurement Manager

Enerture Technologies Pvt Ltd.

ABL Workspaces, Celebration Gardens, NH 8, Adjoining Shiv Murti, Opp IGI Airport, New Delhi, Delhi 110037

M: +91 9999399307 • E-mail: akshayraj.k@enerture.co.in



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From: Akshay Raj <akshayraj.k@enerture.co.in>

Sent: 10 October 2023 13:07

To: 'ANERT Projects' <projects@anert.in>; 'shubham@enerture.co.in' <shubham@enerture.co.in>

Cc: 'Bhairaw Mandal' <bhairaw@enerture.co.in>; 'Apar Chitransh' <Apar.chitransh@enerture.co.in>; 'ankur' <ankur.gupta@enerture.co.in>; 'Parvendar Singh' <parvendar.singh@enerture.co.in>; 'Mahesh' <mahesh@enerture.co.in>; 'Santosh Kumar' <santosh@enerture.co.in>; 'ANERT 2K2K' <anert2020@anert.in>; 'solarcity tvn' <solarcitytvn@gmail.com>; 'Chief Technical Manager ANERT' <ctm@anert.in>; 'rampintu150@gmail.com' <rampintu150@gmail.com>; 'Arman Malik' <arman.malik@enerture.co.in>; 'pintu@enerture.co.in' <pintu@enerture.co.in>

Subject: RE: !! Solar Modules Virtual Inspection Regd. !! TRAVANCORE TITANIUM PRODUCTS LTD

Dear Sir,

Kindly find the link for meeting, request you to please join for module inspection,

Topic: Enerture PDI

Time: Oct 10, 2023 02:45 PM Mumbai, Kolkata, New Delhi

Join Zoom Meeting

<https://us04web.zoom.us/j/9214495255?pwd=ZVBvc0NEQ3R3VjJnU1U4dnkvR2l1UT09>

Meeting ID: 921 449 5255

Passcode: pqrW7d

Please share the Module serial number from FTR which was shared with you so that we can ready the module at inspection place to save precious time.

Thanks and Regards,

Akshay Raj Kulshreshtha

Sr. Procurement Manager

Enerture Technologies Pvt Ltd.

ABL Workspaces, Celebration Gardens, NH 8, Adjoining Shiv Murti, Opp IGI Airport, New Delhi, Delhi 110037

M: +91 9999399307 • E-mail: akshayraj.k@enerture.co.in



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From: Akshay Raj <akshayraj.k@enerture.co.in>

Sent: 09 October 2023 14:38

To: 'ANERT Projects' <projects@anert.in>; 'shubham@enerture.co.in' <shubham@enerture.co.in>

Cc: 'Bhairaw Mandal' <bhairaw@enerture.co.in>; 'Apar Chitransh' <Apar.chitransh@enerture.co.in>; 'ankur' <ankur.gupta@enerture.co.in>; 'Parvendar Singh' <parvendar.singh@enerture.co.in>; 'Mahesh' <mahesh@enerture.co.in>; 'Santosh Kumar' <santosh@enerture.co.in>; 'ANERT 2K2K' <anert2020@anert.in>; 'solarcity tvn' <solarcitytvn@gmail.com>; 'Chief Technical Manager ANERT' <ctm@anert.in>; 'rampintu150@gmail.com' <rampintu150@gmail.com>; 'Arman Malik' <arman.malik@enerture.co.in>; 'pintu@enerture.co.in' <pintu@enerture.co.in>

Subject: RE: !! Solar Modules Virtual Inspection Regd. !! TRAVANCORE TITANIUM PRODUCTS LTD

Dear Sir

We have arranged a virtual PDI on **10th Oct 2023 sharp 2:45PM**. Link of the inspection will be shared with you before inspection.

I am mentioning manufacturer QC head details

Mr. Jainesh Shah

Mob. - 7600512728

Also, mentioning of your details from Enerture side

Mr. Akshay Raj Kulshreshtha

Sr. Manager - Procurement

Mob. - 9999399307

PDI will be done on the following parameters

1. Visual Inspection Test
2. Flash Test
3. Dimension Verification
4. Dielectric / HV Test
5. Electro Lumenese Test

6. Insulation Resistance Test
7. Light Induced Degradation Test
8. Robustness Test
9. Wet Leakage Test

FTR Attached

Thanks and Regards,

Akshay Raj Kulshreshtha

Sr. Procurement Manager

Enerture Technologies Pvt Ltd.

ABL Workspaces, Celebration Gardens, NH 8, Adjoining Shiv
Murti, Opp IGI Airport, New Delhi, Delhi 110037

M: +91 9999399307 • E-mail: akshayraj.k@enerture.co.in



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From: ANERT Projects <projects@anert.in>

Sent: 07 October 2023 14:19

To: shubham@enerture.co.in

Cc: Bhairaw Mandal <bhairaw@enerture.co.in>; Apar Chitransh <Apar.chitransh@enerture.co.in>; ankur <ankur.gupta@enerture.co.in>; Parvendar Singh <parvendar.singh@enerture.co.in>; Mahesh <mahesh@enerture.co.in>; Santosh Kumar <santosh@enerture.co.in>; ANERT 2K2K <anert2020@anert.in>; solarcity tvn <solarcitytvn@gmail.com>; Chief Technical Manager ANERT <ctm@anert.in>; rampintu150@gmail.com; Arman Malik <arman.malik@enerture.co.in>; pintu@enerture.co.in; Akshayraj K <akshayraj.k@enerture.co.in>

Subject: Re: !! Solar Modules Virtual Inspection Regd. !! TRAVANCORE TITANIUM PRODUCTS LTD

Dear Shubham,

The Online FAT can be scheduled on 09/10/2023 (Monday) afternoon. The link for the same may be shared in the first half and the following tests are to be conducted on selected modules from the lot provided.

1. Visual Inspection Test
2. Flash Test
3. Dimension Verification
4. Dielectric / HV Test
5. Electro Lumenese Test
6. Insulation Resistance Test
7. Light Induced Degradation Test
8. Robustness Test
9. Wet Leakage Test

On Fri, 6 Oct 2023 at 14:42, <shubham@enerture.co.in> wrote:

Dear Sir,

Building on our previous email thread, we have attached the modules FTR (Factory Test Report) sheet as per your request.

We kindly request that you provide us with the details for the modules' inspection, including the contact information for the responsible individual and a suggested time slot that is convenient for you.

Your prompt response in this regard will be greatly appreciated.

Thank you for your cooperation.

Best regards,

Shubham Kr. Kashyap

Project Manager

Enerture Technologies Pvt Ltd

(MNRE Channel partner &
MSME registered)

Mob: +91-7007609924 Tel: +91-
1146024024

E.mail: shubham@enerture.co.in
Web: <http://enerture.co.in>

Add. : ABL Workspace, Celebration
Garden, NH-8, Mahipalpur, New Delhi-
110037

From: ANERT Projects <projects@anert.in>
Sent: 27 September 2023 22:22
To: Akshayraj K <akshayraj.k@enerture.co.in>
Cc: shubham@enerture.co.in; Bhairaw Mandal <bhairaw@enerture.co.in>; Apar Chitransh <Apar.chitransh@enerture.co.in>;
ankur <ankur.gupta@enerture.co.in>; Parvendar Singh <parvendar.singh@enerture.co.in>; Mahesh <mahesh@enerture.co.in>;
Santosh Kumar <santosh@enerture.co.in>; ANERT 2K2K <anert2020@anert.in>; solarcity tvn <solarcitytvn@gmail.com>;
Chief Technical Manager ANERT <ctm@anert.in>; rampintu150@gmail.com; Arman Malik <arman.malik@enerture.co.in>;
pintu@enerture.co.in
Subject: Re: !! For BG, Tripartite agreement signing, detailed AC SLD & Project Schedule, Project BOM, open points approval
Regd. !! TRAVANCORE TITANIUM PRODUCTS LTD

Dear Akshay & Shubham,

In continuation to the telecon with Mr. Shubham, Pls see the responses for the below mentioned:

1. The Factory Acceptance Test will be online through Google Meet/Zoom
2. The details of the lot along with serial numbers of Solar Modules to be shared in advance and ANERT will select a few modules in random for various tests
3. Please share a few tentative date and time slots, we will confirm the same based on availability of our QT team

On Tue, 26 Sept 2023 at 14:47, Akshay Raj <akshayraj.k@enerture.co.in> wrote:

Dear Sir,

Request you to kindly confirm the below

1. Inspection Type – Virtual/Offline
2. Product inspection/Factory Inspection
3. Date we are planning is 29th September – Please confirm suitable date and time

Also share the documents required for inspection.

Please confirm your presence so that we can confirm to our supplier and raise inspection call accordingly.

Thanks and Regards,

Akshay Raj Kulshreshtha

Sr. Procurement Manager

95

Enerture Technologies Pvt Ltd.

ABL Workspaces, Celebration Gardens, NH 8, Adjoining Shiv
Murti, Opp IGI Airport, New Delhi, Delhi 110037

M: +91 9999399307 • E-mail: akshayraj.k@enerture.co.in

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From: ANERT Projects <projects@anert.in>

Sent: 18 August 2023 12:46

To: shubham@enerture.co.in

Cc: ANERT 2K2K <anert2020@anert.in>; solarcity tvn <solarcitytvn@gmail.com>; Bhairaw Mandal <bhairaw@enerture.co.in>; Apar Chitransh <Apar.chitransh@enerture.co.in>; ankur <ankur.gupta@enerture.co.in>; Parvendar Singh <parvendar.singh@enerture.co.in>; Akshayraj K <akshayraj.k@enerture.co.in>; Mahesh <maresh@enerture.co.in>; Santosh Kumar <santosh@enerture.co.in>; Chief Technical Manager ANERT <ctm@anert.in>; rampintu150@gmail.com; Arman Malik <arman.malik@enerture.co.in>; pintu@enerture.co.in

Subject: Re: !! For BG, Tripartite agreement signing, detailed AC SLD & Project Schedule, Project BOM, open points approval Regd. !! TRAVANCORE TITANIUM PRODUCTS LTD

Dear Shubham,

Please share the updated schedule of work. Also, we would like to conduct a Factory Acceptance Test (Online/Offline) of PV modules before dispatch and hence arrange for the same on an immediate date. Further, only PV modules with Dispatch Clearance Certificate issued by ANERT will be accepted by Smart City Thiruvananthapuram Ltd for release of payment. Accordingly, you are requested to make arrangements for the FAT on a sooner date.

On Mon, 26 Jun 2023 at 17:13, ANERT Projects <projects@anert.in> wrote:

Dear Shubham,

As discussed over the phone, the make and model of PV modules and Inverters are approved. Also, the structure layout for Rooftop is approved;

In case of Ground Mounted systems, the soil test reports done from ANERT end are attached. You can rely on the same, or do a detailed soil survey from your end. The required modification, site wise in the structure foundation may be done and get it certified by a Certified Structural Engineer / Professor from any National level institute along with STAAD report. The same may be forwarded for approval before fabrication.

On Sat, 24 Jun 2023 at 16:47, <shubham@enerture.co.in> wrote:

Dear Sir,

Please find herewith attached open points sheet along with Enerture responses. Kindly have a look.

Furthermore, please also find herewith attached following drawings & documents for your kind approvals:

1. Module mounting structure layouts for rooftop & Ground mount solar plants.
2. Inverters datasheet, Sungrow – For Ground Mount Projects & Growatt – For Rooftop Projects.
3. Modules Datasheet – Vikram 540 / 545 wp

Also, as per our discussion, please find below mentioned BBU (Bill Breakup Units) for your kind considerations:-

Supply:-

1. On Modules deliveries – 40% of contract value amount will be release.
2. On Inverters deliveries – 20% of contract value amount will be release.

Service:-

3. Installation – 20% on pro-rata basis on submission of RA bills.
4. CEIG Approval – 5%
5. Discom approval & COD – 5%
6. On submission of Performance Bank Guarantee (PBG) – 10%

We kindly request your confirmation / approval regarding the aforementioned design, documents, and statements.

Shubham Kr. Kashyap

Project Manager

Enerture Technologies Pvt Ltd

(MNRE Channel partner &
MSME registered)

Mob: +91-7007609924 Tel: +91-1146024024

E.mail: shubham@enerture.co.in
Web: <http://enerture.co.in>

Add. : ABL Workspace, Celebration
Garden, NH-8, Mahipalpur, New Delhi-110037

From: ANERT Projects <projects@anert.in>

Sent: Friday, June 23, 2023 6:34 PM

To: shubham@enerture.co.in

Cc: ANERT 2K2K <anert2020@anert.in>; FIROZ N <firozttpl@gmail.com>; solarcity tvn <solarcitytvm@gmail.com>; Bhairaw Mandal <bhairaw@enerture.co.in>; Apar Chitransh <Apar.chitransh@enerture.co.in>; ankur <ankur.gupta@enerture.co.in>; Parvendar Singh <parvendar.singh@enerture.co.in>; Akshayraj K <akshayraj.k@enerture.co.in>; Mahesh <mahesh@enerture.co.in>; Santosh Kumar <santosh@enerture.co.in>; Chief Technical Manager ANERT <ctm@anert.in>; rampintu150@gmail.com

Subject: Re: !! For BG, Tripartite agreement signing, detailed AC SLD & Project Schedule, Project BOM, open points approval Regd. !! TRAVANCORE TITANIUM PRODUCTS LTD

Dear Mr. Shubham,

Please see the responses marked in the sheet attached and also the project schedule mentioned is also accepted. For the BoM, you may submit the particular **make and model of PV modules and Inverters** proposed for the project. The rest of the items in the Preliminary BoM are accepted.

Dear Sir,

We would like to inform you that we are planning to commence land cleaning work within the project land premises starting tomorrow. To ensure smooth progress without any work stoppages due to documentation issues, please let us know if there are any gate pass or approval processes in place that we need to comply with. This will enable us to complete the necessary documentation and avoid any unnecessary delays. Your prompt response in this matter would be greatly appreciated.

Furthermore, we are waiting for your important response regarding the **Project schedule, Project Preliminary BOM, and Customer Open Points sheet**, as mentioned in the previous email. Please provide your approval on these documents so that we can proceed with the next steps.

Additionally, we kindly ask you to share the ANERT communication matrix with us. This will facilitate the sharing and discussion of information with the designated personal involved individually.

Shubham Kr. Kashyap

Project Manager

Enerture Technologies Pvt Ltd

(MNRE Channel partner &
MSME registered)

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1146024024

E.mail: shubham@enerture.co.in
Web: <http://enerture.co.in>

Add. : ABL Workspace, Celebration
Garden, NH-8, Mahipalpur, New Delhi-
110037

From: shubham@enerture.co.in <shubham@enerture.co.in>
Sent: Monday, June 19, 2023 5:01 PM
To: 'ANERT 2K2K' <anert2020@anert.in>; 'firozttpl@gmail.com' <firozttpl@gmail.com>; 'ANERT Projects' <projects@anert.in>
Cc: 'solarcity tvn' <solarcitytv@gmail.com>; 'Bhairaw Mandal' <bhairaw@enerture.co.in>; 'Apar Chitransh' <Apar.chitransh@enerture.co.in>; 'ankur' <ankur.gupta@enerture.co.in>; 'Parvendar Singh' <parvendar.singh@enerture.co.in>; 'Akshayraj K' <akshayraj.k@enerture.co.in>; 'Mahesh' <mahesh@enerture.co.in>; 'santosh@enerture.co.in' <santosh@enerture.co.in>; 'Chief Technical Manager ANERT' <ctm@anert.in>
Subject: RE: !! For detailed AC SLD & Project Schedule, Project BOM, open points approval Regd. !! TRAVANCORE TITANIUM PRODUCTS LTD
Importance: High

Dear Sir,

Greeting from Enerture Technologies.....!!

Following our previous email thread, please find attached the **Project schedule** and **Project Preliminary BOM** for your reference and perusal. Enerture kindly requests your approval to proceed with further processing.

We have also attached an excel sheet titled "**Customer Open Points**" that lists the open points requiring ANERT's approval / response to finalize matters and proceed accordingly.

Additionally, in adherence with trail mail, we are eagerly awaiting the detailed AC SLD of TRAVANCORE TITANIUM PRODUCTS LTD. This information is essential for our reference and to proceed with our work. We kindly request you to provide the same also, as soon as it becomes available.

We would greatly appreciate your prompt response to these documents.

If you have any questions or need any clarification, please let us know.

Shubham Kr. Kashyap

Project Manager

Enerture Technologies Pvt Ltd

(MNRE Channel partner &
MSME registered)

Mob: +91-7007609924 Tel: +91-
1146024024

E.mail: shubham@enerture.co.in
Web: <http://enerture.co.in>

Add. : ABL Workspace, Celebration
Garden, NH-8, Mahipalpur, New Delhi-
110037

From: ANERT 2K2K <anert2020@anert.in>

Sent: Saturday, June 17, 2023 5:00 PM

To: firoztp@gmail.com

Cc: solarcity tvn <solarcitytv@gmail.com>; Bhairaw Mandal <bhairaw@enerture.co.in>; Apar Chitransh <Apar.chitransh@enerture.co.in>; ankur <ankur.gupta@enerture.co.in>; Parvendar Singh <parvendar.singh@enerture.co.in>; Akshayraj K <akshayraj.k@enerture.co.in>; Mahesh <mahesh@enerture.co.in>; Shubham Kashyap <shubham@enerture.co.in>; ANERT Projects <projects@anert.in>; santosh@enerture.co.in; Chief Technical Manager ANERT <ctm@anert.in>

Subject: Re: FOR DETAILED AC SLD TRAVANCORE TITANIUM PRODUCTS LTD

Dear Sir

Please recall the discussion today, we are glad to inform you that the 2 MW work has been awarded to M/s Enerture Technologies Pvt Ltd. The WO is attached herewith for your ready reference. You are requested to provide all the support to the M/s Enerture Technologies Pvt Ltd for the successful commissioning of the project

On Sat, 17 Jun 2023 at 16:53, Santosh Kumar <santosh@enerture.co.in> wrote:

Dear Sir,

As per the discussion with you on call, we required the detailed AC SLD of TRAVANCORE TITANIUM PRODUCTS LTD for 2 MWp Solar Power Plant designing prospective because we have not clear the evacuation points where we will evacuate the Solar Power into the your existing system.

So, Kindly request you please provide the AC SLD.

Regards,

Santosh kumar

On 09/06/2023 13:05, Santosh Kumar wrote:

Dear Sir,

kindly find the attached revised pv array layout, we are installing 1.5 MW on Ground mount and bringing 500kWp on Rooftop (NP-Control Room Building, Filter Press Building, Lime Storage Area, Canteen Building 1 & 2, Locker room, Clss Building, Time office). please check and approval for further process.

On 07/06/2023 17:47, Santosh Kumar wrote:

Dear Sir,

kindly find the attached pv array layout, we are installing 1.7 MW on Ground mount and bringing 300kWp on Rooftop (NP-Control Room Building, Filter Press Building, Lime Storage Area, Canteen Building 1 & 2). can we do ground mount 1.7MW and 300kWp installation, please check and approval for further process.

As per Tender details,

On 05/06/2023 12:46, ANERT Projects wrote:

Dear All,

The proposed Layout is approved. It may be noted that the provision for providing access ladder to roof for buildings with rooftop installations, Extension of Bus bar for accommodating bus bar etc are under the scope of the vendor. You are also requested to submit the detailed BoM and work schedule at the earliest.

On Mon, 5 Jun 2023 at 11:02, Santosh Kumar <santosh@enerture.co.in> wrote:

Dear Sir,

please check and approval for further process.

On 03/06/2023 17:06, Santosh Kumar wrote:

Dear Sir,

Kindly find the attached Pv array layout 2MW Rooftop and Ground mount, please check and approval for further process.

On 01/06/2023 21:45, Santosh Kumar wrote:

Dear Sir,

The plant layout is being discussed for the last four days, please share the plant layout.

On 29/05/2023 08:52, Santosh Kumar wrote:

Dear Sir,

As per discuss please share plant layout of Travancore Titanium Product Ltd Kochuveli, Thiruvananthapuram, please mark the new additional land in plant layout,

Best regards,

100

Santosh Kumar

Enerture Technologies Pvt Ltd

(MNRE Channel partner & MSME registered)

Mob: +91-9891076898 Tel: +91- 1146024024

E.mail: santosh@enerture.co.in Web: <http://enerture.co.in>

Add. : ABL Workspace, Celebration Garden, NH-8, Mahipalpur, New Delhi-110037

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Best regards,

Santosh Kumar

Enerture Technologies Pvt Ltd

(MNRE Channel partner & MSME registered)

Mob: +91-9891076898 Tel: +91- 1146024024

E.mail: santosh@enerture.co.in Web: <http://enerture.co.in>

Add. : ABL Workspace, Celebration Garden, NH-8, Mahipalpur, New Delhi-110037

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Best regards,

Santosh Kumar

Enerture Technologies Pvt Ltd

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Add. : ABL Workspace, Celebration Garden, NH-8, Mahipalpur, New Delhi-110037

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Best regards,

Santosh Kumar

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E.mail: santosh@enerture.co.in Web: <http://enerture.co.in>

Add. : ABL Workspace, Celebration Garden, NH-8, Mahipalpur, New Delhi-110037

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Thanks & Regards

Projects Team

ANERT

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Best regards,

Santosh Kumar

Enerture Technologies Pvt Ltd

(MNRE Channel partner & MSME registered)

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E.mail: santosh@enerture.co.in Web: <http://enerture.co.in>

Add. : ABL Workspace, Celebration Garden, NH-8, Mahipalpur, New Delhi-110037

--

Best regards,

Santosh Kumar

Enerture Technologies Pvt Ltd

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Add. : ABL Workspace, Celebration Garden, NH-8, Mahipalpur, New Delhi-110037

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Best regards,

Santosh Kumar

Enerture Technologies Pvt Ltd

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Mob: +91-9891076898 Tel: +91- 1146024024

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Add. : ABL Workspace, Celebration Garden, NH-8, Mahipalpur, New Delhi-110037

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Thanks & Regards

Projects Team

ANERT

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Thanks & Regards

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Projects Team

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Projects Team

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	RAYZON SOLAR	DATE: 10-10-2023
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FACTORY ACCEPTANCE TEST REPORT

	RAYZON SOLAR	DATE: 10-10-2023
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1. Inspection Information and Conclusion

INSPECTION INFORMATION	
Customer	SOLVEIG SOLAR
Inspection Agency	ANERT
Inspector Name	Radhika J M
Factory Address	Rayzon Solar Pvt Ltd Block No 105, B/H Aron Pipes, Kim Mandvi Road, Karanj, Surat -394110, Gujarat
Factory Contact Person	Mr.Jainesh Shah Phone: 7600512729 Email:qc@rayzonenergies.com
Date of Inspection	10/10/2023
Inspection Mode	Video Call
CONCLUSION	
FAT conducted of PV modules conducted on 10.10.2023 was found Satisfactory and in accordance with the approved QAP. Hence Rayzon Solar Pvt. Ltd. Is eligible for supplying solar panels to SOLVEIG SOLAR.	

2. Inspection Summary

M/s.ANERT has made an inspection call for 2 Nos of RS545WC modules on 10.10.2023. Considering the extra-ordinary situation that has arisen across the country due to COVID-19, it was decided to conduct an online inspection on the PV modules and to give dispatch clearance with the condition that the final acceptance shall be made based on the physical inspection at the site.

The online inspection for the offered modules of M/s Rayzon Solar Pvt Ltd was done on 10.10.2023 and the ANERT officials witnessed the test online through Google zoom Platform. All the tests were done at the manufacturing plant of Rayzon Solar Pvt Ltd, in accordance with the approved

QAP. 2 modules from the offered lot had been selected randomly for the inspection.

3. Instrument Calibration Details

All instruments used in the testing are calibrated from NABL accredited lab and the calibration details of all instruments is provided in Annexure III.


RAYZON SOLAR
DATE: 10-10-2023

4. Test Summary

The summary of tests has given in Annexure S4.

5. Maximum Power Determination Detailed Results

Flash test have been done on 2 samples, which were selected for testing. The test was done using sun simulator at standard test conditions. The flash test gives the electrical parameters of a module like Vmp, Imp, Voc, Isc, Pmp, efficiency, fill-factor, series and shunt-resistance etc. All the samples meet the technical requirements of ANERT of efficiency greater than 20% and fill factor greater than 0.8 with maximum power tolerance within 2%.

6. Insulation Resistance, Wet Leakage & Dielectric Withstand Test

The insulation resistance test is an electrical safety test and shows whether a solar module offers adequate insulation. As per approved QAP, the module insulation resistance will be greater than $40\text{M}\Omega\text{m}^2$ when applied a high DC voltage of 1.5 KV for 2 min The test has been conducted for Two sample holding number. While conducting test, a high DC voltage of 4.5kV has been applied for 1 min and the insulation resistance of each module is noted as $> 1\text{G}\Omega$

Wet leakage test has been conducted for two sample on which insulation resistance test was conducted. Pre-condition for this test was done by immersing the sample in water and then applied a voltage of 1.5kV between the terminals of the module and the insulation resistance of each module is noted as $> 1\text{G}\Omega$. As per the approved QAP the insulation resistance required is $40\text{M}\Omega\text{m}^2$.

7. Dimension Verification

Dimension verification was done and measured length as 2.278m, width 1.133m and thickness as 40 mm.

For Inspection Agency:	For Rayzon Solar Pvt Ltd:
Radhika J M (Project Lead) Auditor	 Mr. Jainesh Shah QC Manager

		RAYZON SOLAR					Document No.	RS/QC/QAP/01
							Revision No.	001
		INCOMING MATERIAL INSPECTION QUALITY PLAN					Revision Date	01-03-2022
Sr. No.	Raw Material	Type of Checking	Characteristics	Quantum of Check	Reference Doc.	Acceptance Norms	Documented Information	Document No.
1	Solar Cell	Visual Verification	Packing Condition & Label Content Check	100%	PO/Invoice	As per Cell Inspection Criteria	Solar Cell Incoming Quality Inspection Report	RS/QC/SOP/01, RS/QC/IC/01, RS/QC/SOP/01, RS/QC/SOP/55, RS/QC/SOP/39, RS/QC/RT/23
			Visual Inspection	As per Sampling Plan	Material Datasheet, SOP for Incoming Material Quality Inspection			
		Measurement	Dimension Check (L X W X T)	As per Sampling Plan	Material Datasheet, SOP for Incoming Material Quality Check	As Per Material Datasheet/Test Certificate.		
			Electrical Test Cell Tester	As per Sampling Plan	SOP for Incoming Material Quality Check	As per SOP for LID Testing of Module		
			LID (Light Induced Degradation)	One Module per Supplier	SOP for LID Testing of Module	As per SOP for Soldering Peel Test		
			Soldering Peel Test	5 Cells /Lot	SOP for Soldering Peel Test	As per SOP for Soldering Peel Test		
2	Glass	Visual Verification	Packing Condition & Label Content Check	100%	PO/Invoice	As per Glass Inspection Criteria	Glass Incoming Quality Inspection Report	RS/QC/RT/24, RS/QC/SOP/56, RS/QC/SOP/01, RS/QC/IC/04, RS/QC/SOP/58, RS/QC/SOP/49
			Visual Inspection	As per Sampling Plan	Material Datasheet, SOP for Incoming Material Quality Check			
		Measurement	Dimension (L X W X T X D1 X D2)	As per Sampling Plan	Material Datasheet/Test Certificate, SOP for Incoming Material Quality Check	As per SOP for Fragenmatation Test		
			Fragmentation Test	1 Glass per Lot	SOP for Fragmentation Test	As per SOP for Ball Drop Test		
			Ball Drop Test	1 Glass per Lot	SOP for Ball Drop Test	As per SOP for Transmittivity Check of Glass		
			Light Transmittivity Check	As per Sampling Plan	SOP for Transmittivity Check of Glass, SOP for Incoming Material Quality Check	As per SOP for Transmittivity Check of Glass		
3	EVA	Visual Verification	Packing Condition & Label Content Check	100%	PO/Invoice	As per SOP of Incoming Material Quality Check	EVA Incoming Quality Inspection Report	RS/QC/SOP/01, RS/QC/SOP/42, RS/QC/SOP/38, RS/QC/SOP/43, RS/QC/SOP/57, RS/QC/RT/25
		Measurement	Dimension Check (W X T)	As per Sampling Plan	Material Datasheet/Test Certificate, SOP for Incoming Material Quality Check	As Per Material Datasheet/Test Certificate.		
			Gram per SQM	One Sample Per Lot				
		Measurement	Gel Content Test	One Sample Per Lot	SOP for Gel Content Test	As per SOP for Gel Content Test		
			Shrinkage Test	One Sample Per Lot	SOP for Shrinkage Test	As per SOP for Shrinkage Test		
			Adhesion Test	One Sample Per Lot	SOP for Adhesion Test	As per SOP for Adhesion Test		
			Tensile And Elongation Test	One Sample Per Lot	SOP for Tensile and Elongation Test	As per SOP for Tensile and Elongation Test		
4	Back Sheet	Visual Verification	Packing Condition & Label Content Check	100%	PO/Invoice	As per SOP of Incoming Material Quality Check	Back Sheet Incoming Quality Inspection Report	RS/QC/SOP/01, RS/QC/SOP/43, RS/QC/SOP/38, RS/QC/SOP/57, RS/QC/RT/26
		Measurement	Dimension Check (W X T)	As per Sampling Plan	Material Datasheet/Test Certificate, SOP for Incoming Material Quality Check	As Per Material Datasheet/Test Certificate.		
			Gram per SQM	One Sample Per Lot				
			Adhesion Test	One Sample Per Lot	SOP for Adhesion Test	As per SOP for Adhesion Test		
			Shrinkage Test	One Sample Per Lot	SOP for Shrinkage Test	As per SOP for Shrinkage Test		
			Tensile And Elongation Test	One Sample Per Lot	SOP for Tensile and Elongation Test	As per SOP for Tensile and Elongation Test		
5	Cell Interconnect Ribbon	Visual Verification	Packing Condition & Label Content Check	100%	PO/Invoice	As per SOP of Incoming Material Quality Check	Cell Interconnect Ribbon Incoming Quality Inspection Report	RS/QC/SOP/01, RS/QC/RT/27, RS/QC/SOP/39, RS/QC/SOP/40, RS/QC/SOP/57
		Measurement	Dimension Check (W X T)	As per Sampling Plan	Material Datasheet/Test Certificate, SOP for Incoming Material Quality Check	As Per Material Datasheet/Test Certificate.		
			Coating Thickness	As per Sampling Plan				
			Soldering Peel Test	One Sample Per lot.	SOP for Soldering Peel Test	As per SOP for Peel Tester		
			Camber Test	One Sample Per lot.	SOP for Camber Test	As per SOP for Camber Test		
			Tensile And Elongation Test	One Sample Per Lot	SOP for Tensile and Elongation Test	As per SOP for Tensile and Elongation Test		
6	String Interconnect Ribbon	Visual Verification	Packing Condition & Label Content Check	100%	PO/Invoice	As per SOP of Incoming Material Quality Check	String Interconnect Ribbon Incoming Quality Inspection Report	RS/QC/SOP/01, RS/QC/RT/28, RS/QC/SOP/57
		Measurement	Dimension Check (W X T)	As per Sampling Plan	Material Datasheet/Test Certificate, SOP for Incoming Material Quality Check	As Per Material Datasheet/Test Certificate.		
			Coating Thickness	As per Sampling Plan				
			Tensile And Elongation Test	One Sample Per Lot	SOP for Tensile and Elongation Test	As per SOP for Tensile and Elongation Test		

RAYZON SOLAR		RAYZON SOLAR				Document No.		RS/QC/QAP/01
						Revision No.		001
		INCOMING MATERIAL INSPECTION QUALITY PLAN				Revision Date		01-03-2022
Sr. No.	Raw Material	Type of Checking	Characteristics	Quantum of Check	Reference Doc.	Acceptance Norms	Documented Information	Document No.
7	Junction Box	Visual Verification	Packing Condition & Label Content Check	100%	PO/Invoice	As per SOP of Incoming Material Quality Check	Junction Box Incoming Quality Inspection Report	RS/QC/SOP/01, RS/QC/RT/29, RS/QC/SOP/46
			Connector Size and Type, Gland Tightness, No. of Diodes	As per Sampling Plan	Material Datasheet/Test Certificate, SOP for Incoming Material Quality Check	As Per Material Datasheet/Test Certificate.		
		Measurement	Dimension Check (L x W), Cable Length	As per Sampling Plan	Material Datasheet/Test Certificate, SOP for Incoming Material Quality Check	As Per Material Datasheet/Test Certificate.		
			Robustness Test	1 Sample per Lot	SOP for Robustness Test	As per SOP for Robustness Test		
		Electrical	Polarity of the Diodes	As per Sampling Plan	Material Datasheet/Test Certificate, SOP for Incoming Material Quality Check	As Per Material Datasheet/Test Certificate.		
8	Alluminum Frame	Visual Verification	Packing Condition & Label Content Check	100%	PO/Invoice	As per SOP of Incoming Material Quality Check	Alluminum Frame Incoming Quality Inspection Report	RS/QC/SOP/01, RS/QC/RT/30, RS/QC/SOP/51
			Visual Inspection	As per Sampling Plan	Material Datasheet/Test Certificate, SOP for Incoming Material Quality Check	Alluminium Frame Inspection Criteria		
		Measurement	Dimensions (L X W x T), Weight Per Meter, Anodizing Coating Thickness	As per Sampling Plan	Material Datasheet/Test Certificate, SOP for Incoming Material Quality Check	Alluminium Frame Inspection Criteria		
			Mechanical Load Test	1 Sample per Lot	SOP for Mechanical Load Test	As per SOP for Mechanical Load Test		
9	Alluminum L-Key	Visual Verification	Packing Condition & Label Content Check	100%	PO/Invoice	As per SOP of Incoming Material Quality Check	Alluminum L-Key Incoming Quality Inspection Report	RS/QC/SOP/01, RS/QC/RT/31
			Visual Inspection	As per Sampling Plan	Material Datasheet/Test Certificate, SOP for Incoming Material Quality Check	As Per Material Datasheet/Test Certificate.		
		Measurement	Dimensions (L X W x T), Weight Per Meter	As per Sampling Plan	Material Datasheet/Test Certificate, SOP for Incoming Material Quality Check	As Per Material Datasheet/Test Certificate.		
10	Flux	Visual Verification	Packing Condition & Label Content Check	100%	Material Datasheet/Test Certificate, SOP for Incoming Material Quality Check	As per SOP of Incoming Material Quality Check	Flux Incoming Quality Inspection Report	RS/QC/SOP/01, RS/QC/RT/32
11	Sealant	Visual Verification	Packing Condition & Label Content Check	100%	PO/Invoice	As per SOP of Incoming Material Quality Check	Sealant Incoming Quality Inspection Report	RS/QC/SOP/01, RS/QC/RT/33, RS/QC/SOP/45, RS/QC/SOP/44, RS/QC/SOP/57
		Measurement	Curing time	As per Sampling Plan	Material Datasheet/Test Certificate, SOP for Incoming Material Quality Check	As Per Material Datasheet/Test Certificate.		
			Take free Time	As per Sampling Plan	Material Datasheet/Test Certificate, SOP for Incoming Material Quality Check	As Per Material Datasheet/Test Certificate.		
			Adhesion With J-box	One Sample Per lot.	Material Datasheet/Test Certificate, SOP for Incoming Material Quality Check, SOP for JB Pull Test	As per SOP for JB Pull Test		
			Adhesion With Al-frame	One Sample Per lot.	Material Datasheet/Test Certificate, SOP for Incoming Material Quality Check, SOP for Frame Pull Test	As per SOP for Frame Pull Test		
			Tensile And Elongation Test	One Sample Per lot.	Material Datasheet/Test Certificate, SOP for Incoming Material Quality Check, SOP for Tensile and Elongation Test	As per SOP for Tensile and Elongation Test		
12	Corrugated Box	Visual Verification	Packing Condition & Label Content Check	100%	PO/Invoice	As per SOP of Incoming Material Quality Check	Corrugated Box Incoming Quality Inspection Report	RS/QC/SOP/01, RS/QC/RT/34
			Visual Inspection	As per Sampling Plan	Material Datasheet/Test Certificate, SOP for Incoming Material Quality Check	As per Packing Material Inspection Criteria		
		Measurement	Dimensions (L X W x T), Moisture Content	As per Sampling Plan	Material Datasheet/Test Certificate, SOP for Incoming Material Quality Check	As Per Material Datasheet/Test Certificate.		
13	Cell Fixing Tape	Visual Verification	Packing Condition & Label Content Check	100%	Material Datasheet/Test Certificate, SOP for Incoming Material Quality Check	As per SOP of Incoming Material Quality Check	Cell Fixing Tape Incoming Quality Inspection Report	RS/QC/SOP/01, RS/QC/RT/35, RS/QC/SOP/38, RS/QC/SOP/59
		Measurement	Dimensions (W x T)	As per Sampling Plan	Material Datasheet/Test Certificate, SOP for Incoming Material Quality Check	As Per Material Datasheet/Test Certificate.		
			Shrinkage Test	1 Sample per Lot	Material Datasheet/Test Certificate, SOP for Incoming Material Quality Check, SOP for Shrinkage Test	As per SOP for Shrinkage Test		
			Cell to Tape Adhesion Test	1 Sample per Lot	SOP for Cell to Tape Adhesion Test	As per SOP for Cell to Tape Adhesion Test		

RAYZON SOLAR		RAYZON SOLAR				Document No.		RS/QC/QAP/01
						Revision No.		001
		INCOMING MATERIAL INSPECTION QUALITY PLAN					Revision Date	
Sr. No.	Raw Material	Type of Checking	Characteristics	Quantum of Check	Reference Doc.	Acceptance Norms	Documented Information	Document No.
14	Barcode Label	Visual Verification	Visual Inspection	As per Sampling Plan	Material Datasheet/Test Certificate, SOP for Incoming Material Quality Check	As per SOP of Incoming Material Quality Check	Barcode Label Incoming Quality Inspection Report	RS/QC/SOP/01, RS/QC/RT/36, RS/QC/SOP/38
		Measurement	Dimensions (L x W)	As per Sampling Plan	Material Datasheet/Test Certificate, SOP for Incoming Material Quality Check	As Per Material Datasheet/Test Certificate.		
			Shrinkage Test	5 Pcs/Lot	SOP for Shrinkage Test	As per SOP for Shrinkage Test		
15	Back Label	Visual Verification	Visual Inspection	As per Sampling Plan	Material Datasheet/Test Certificate, SOP for Incoming Material Quality Check	As per SOP of Incoming Material Quality Check	Back Label Incoming Quality Inspection Report	RS/QC/SOP/01, RS/QC/RT/37
		Measurement	Dimensions (L x W)	As per Sampling Plan	Material Datasheet/Test Certificate, SOP for Incoming Material Quality Check	As Per Material Datasheet/Test Certificate.		
16	RFID	Visual Verification	Visual Inspection, Working	As per Sampling Plan	Material Datasheet/Test Certificate, SOP for Incoming Material Quality Check	As per SOP of Incoming Material Quality Check	RFID Incoming Quality Inspection Report	RS/QC/SOP/01, RS/QC/RT/38, RS/QC/SOP/38
		Measurement	Dimensions (L x W)	As per Sampling Plan	Material Datasheet/Test Certificate, SOP for Incoming Material Quality Check	As Per Material Datasheet/Test Certificate.		
			Shrinkage Test	5 Pcs/Lot	SOP for Shrinkage Test	As per SOP for Shrinkage Test		
17	Strech Film (Wrapping Roll)	Visual Verification	Visual Inspection	1 Sample per Lot	PO/Invoice	As per SOP of Incoming Material Quality Check	Strech Film (Wrapping Roll) Incoming Quality Inspection Report	RS/QC/SOP/01, RS/QC/RT/39
		Measurement	Dimensions (Width)	1 Sample per Lot	Material Datasheet/Test Certificate, SOP for Incoming Material Quality Check	As Per Material Datasheet/Test Certificate.		
18	Soldering Wire	Visual Verification	Visual Inspection	1 Sample per Lot	PO/Invoice	As per SOP of Incoming Material Quality Check	Soldering Wire Incoming Quality Inspection Report	RS/QC/SOP/01, RS/QC/RT/40
		Measurement	Dimensions (Diameter)	1 Sample per Lot	Material Datasheet/Test Certificate, SOP for Incoming Material Quality Check	As Per Material Datasheet/Test Certificate.		
19	Strapping Roll	Visual Verification	Visual Inspection	1 Sample per Lot	PO/Invoice	As per SOP of Incoming Material Quality Check	Strapping Roll Incoming Quality Inspection Report	RS/QC/SOP/01, RS/QC/RT/41
		Measurement	Dimensions (W x T)	1 Sample per Lot	Material Datasheet/Test Certificate, SOP for Incoming Material Quality Check	As Per Material Datasheet/Test Certificate.		
20	Wooden Pallat	Visual Verification	Visual Inspection	100%	PO/Invoice	As per SOP of Incoming Material Quality Check	Wooden Pallat Incoming Quality Inspection Report	RS/QC/SOP/01, RS/QC/RT/42
		Measurement	Dimensions (L x W x T), Dimension of Each Wooden Part	5 Pcs/Lot	Material Datasheet/Test Certificate, SOP for Incoming Material Quality Check	As Per Material Datasheet/Test Certificate.		
21	Separator	Visual Verification	Visual Inspection	5 Pcs/Lot	PO/Invoice	As per SOP of Incoming Material Quality Check	Separator Incoming Quality Inspection Report	RS/QC/SOP/01, RS/QC/RT/43
		Measurement	Dimensions (L x W x T)	5 Pcs/Lot	Material Datasheet/Test Certificate, SOP for Incoming Material Quality Check	As Per Material Datasheet/Test Certificate.		
22	Angle Board	Visual Verification	Visual Inspection	5 Pcs/Lot	PO/Invoice	As per SOP of Incoming Material Quality Check	Angle Board Incoming Quality Inspection Report	RS/QC/SOP/01, RS/QC/RT/44
		Measurement	Dimensions (L x W x T)	5 Pcs/Lot	Material Datasheet/Test Certificate, SOP for Incoming Material Quality Check	As Per Material Datasheet/Test Certificate.		
23	Company Logo	Visual Verification	Visual Inspection	As per Sampling Plan	PO/Invoice	As per SOP of Incoming Material Quality Check	Company Logo Incoming Quality Inspection Report	RS/QC/SOP/01, RS/QC/RT/45, RS/QC/SOP/38
		Measurement	Dimensions (L x W)	As per Sampling Plan	Material Datasheet/Test Certificate, SOP for Incoming Material Quality Check	As Per Material Datasheet/Test Certificate.		
			Shrinkage Test	5 Pcs/Lot	SOP for Shrinkage Test	As per SOP for Shrinkage Test		
24	Packing Tape	Visual Verification	Visual Inspection	5 Pcs/Lot	PO/Invoice	As per SOP of Incoming Material Quality Check	Packing Tape Incoming Quality Inspection Report	RS/QC/SOP/01, RS/QC/RT/46
		Measurement	Dimensions (Width)	5 Pcs/Lot	Material Datasheet/Test Certificate, SOP for Incoming Material Quality Check	As Per Material Datasheet/Test Certificate.		
25	Corner Protector	Visual Verification	Visual Inspection	5 Pcs/Lot	PO/Invoice	As per SOP of Incoming Material Quality Check	Corner Protector Incoming Quality Inspection Report	RS/QC/SOP/01, RS/QC/RT/47
		Measurement	Dimensions (L x W)	5 Pcs/Lot	Material Datasheet/Test Certificate, SOP for Incoming Material Quality Check	As Per Material Datasheet/Test Certificate.		
Prepare By Balvant Dharajiya				Verify By Jainesh Shah		Approve By Bhargavbhai Savaliya		

			RAYZON SOLAR					Document No.	RS/QC/QAP/02
								Revision No.	001
								Revision Date	01-03-2022
Sr. No.	Stage	Raw Material	Type of Checking	Quantum of Check	Reference Document	Measuring Tool	Acceptance Norms	Documented Information	Document No.
1	Auto Glass Loading	Solar Glass	Visual Verification	1 Sample per Shift	SOP for Glass Loading	-	As per Glass Inspection Criteria	BOM Verification Checksheet, IPQC Checksheet	RS/PRD/SOP/01, RS/PRD/RT/01, RS/QC/IC/04, RS/QC/CS/02, RS/QC/CS/01
			Dimension Check		Job Card	Measuring Tape, Vernier Calliper	As per Job Card		
2	Front EVA Auto Cutting and Loading	EVA	Visual Verification	1 Sample per Shift	SOP For Front EVA Auto Cutting and Loading	-	As per SOP For Front EVA Auto Cutting and Loading	BOM Verification Checksheet, IPQC Checksheet	RS/PRD/SOP/02, RS/PRD/RT/01, RS/QC/CS/01, RS/QC/CS/02
			Dimension Check		Job Card	Measuring Tape, Vernier Calliper	As per Job Card		
			Shrinkage Test	2 Sample per Week	SOP for Shrinkage Test	Heating Owen, Vernier Calliper	As per SOP for Shrinkage Test	EVA Shrinkage Test Report	RS/QC/SOP/38, RS/QC/RT/06
3	Cell Cutting	Solar Cell	Visual Verification	100%	SOP for Auto Cell Cutting	-	As per Cell Visual Inspection Criteria	BOM Verification Checksheet, IPQC Checksheet	RS/QC/IC/01, RS/PRD/SOP/03, RS/PRD/RT/01, RS/QC/CS/01,
			Dimension Check	1 Sample per shift	Job Card	Vernier Calliper	As per Job Card		
3	Tabber &Stringer	Solar Cell	Visual Verification	3 sample per Track per Tabber Stringer per Shift	Job Card	-	As per Cell Visual Inspection Criteria	BOM Verification Checksheet, IPQC Checksheet	RS/QC/IC/01, RS/PRD/RT/01, RS/QC/CS/01, RS/QC/CS/02
			Dimension Check			Measuring Tape, Vernier Calliper	As per Job Card		
			Soldering Peel Strength	1 sample per Track per Tabber Stringer per Shift	SOP for Soldering Peel Test	Portable Force Gauge	As per SOP for Soldering Peel Test	Soldering Peel Test Report	RS/QC/SOP/39, RS/QC/RT/07
			EL Inspection	100%	SOP For Tabber Stringer Operation	-	String EL Inspection Criteria	Rework String Checksheet	RS/PRD/SOP/04, RS/QC/IC/03, RS/PRD/RT/02
		Flux	Visual Verification	1 Times per Tabber Stringer in a Shift	Job Card	-	As Per Job Card	BOM Verification Checksheet, IPQC Checksheet	RS/PRD/RT/01, RS/QC/CS/01, RS/QC/CS/02
		Ribbon	Visual Verification	1 Sample per Tabber Stringer in a Shift		-			
			Dimension Check	1 Sample per Tabber Stringer in a Shift		-			
			Camber Test	10 Sample per Week	SOP for Camber Test	-	As per SOP for Camber Test	Camber Test Report	RS/QC/SOP/40, RS/QC/RT/08
4	Auto Lay-up	String Assembly, Busbar	Visual Verification	3 Sample per Shift	SOP for Auto Lay-up	-	As per SOP For Auto Layup	IPQC Checksheet	RS/PRD/SOP/06, RS/PRD/RT/01, RS/QC/CS/02
			Dimension Check	3 Sample per Shift	Job Card	Measuring Tape, Vernier Calliper	As per JOB Card		

			RAYZON SOLAR					Document No.	RS/QC/QAP/02
								Revision No.	001
								Revision Date	01-03-2022
Sr. No.	Stage	Raw Material	Type of Checking	Quantum of Check	Reference Document	Measuring Tool	Acceptance Norms	Documented Information	Document No.
5	Auto Bussing	String Assembly, Busbar	Visual Verification	Once per Shift	SOP for Auto Bussing	-	As per SOP for Auto Bussing	IPQC Checksheet	RS/PRD/SOP/05, RS/QC/CS/02
			Ribbon to Busbar Peel Test	Once in a Month	SOP for Ribbon to Busbar Peel Test	Portable Force Gauge	As per SOP for Ribbon to Busbar Peel Test	Ribbon to Busbar Peel test Report	RS/QC/SOP/41, RS/QC/RT/09
6	Back EVA Auto Cutting and Loading	EVA	Visual Verification	1 Sample per Shift	SOP for Back EVA Auto Cutting and Loading	-	As per SOP For Back EVA Auto Cutting and Loading	BOM Verification Checksheet, IPQC Checksheet	RS/PRD/SOP/07, RS/PRD/RT/01, RS/QC/CS/01, RS/QC/CS/02
			Dimension Check		Job Card	Measuring Tape, Vernier Calliper	As per JOB Card		
			Shrinkage Test	2 Sample per Week	SOP for Shrinkage Test	Heating Owen, Vernier Calliper	As per SOP for Shrinkage Test	EVA Shrinkage Test Report	RS/QC/SOP/38, RS/QC/RT/06
7	Auto Backsheet Cutting	Backsheet	Visual Verification	1 Sample per Shift	SOP For Backsheet Auto Cutting and Loading	-	As per SOP For Auto Backsheet Cutting and Loading	BOM Verification Checksheet, IPQC Checksheet	RS/QC/CS/01, RS/QC/CS/02, RS/PRD/SOP/08, RS/PRD/RT/01
			Dimension Check		Job Card	Measuring Tape, Vernier Calliper	As per JOB Card		
			Shrinkage Test	2 Sample per Week	SOP for Shrinkage Test	Heating Owen, Vernier Calliper	As per SOP for Shrinkage Test	Backsheet Shrinkage Test Report	RS/QC/SOP/38, RS/QC/RT/10
8	Pre EL and Visual Inspection	Solar module	Current & Voltage Verification	Once per Shift	SOP for Pre EL and Visual Inspection of Module	-	As per SOP for Pre EL and Visual Inspection of Module	IPQC Checksheet	RS/QC/SOP/04, RS/QC/CS/02
			Visual Verification	100%		-	As per Pre EL Inspection Criteria	Daily Pre EL and Visual Inspection Report	RS/QC/SOP/04, RS/QC/RT/01, RS/QC/IC/05
			Electrical Inspection	100%		-			
9	Laminator	Solar Module	Visual Verification	Once per Shift	SOP for Laminator	-	As per Laminator Recipe change Logbook	IPQC Checksheet	RS/PRD/SOP/09, RS/QC/CS/02
			Temperature Verification	Once per Month	SOP for Checking Temperature Uniformity of Laminator	-	As per SOP for Checking Temperature Uniformity of Laminator	Laminator Uniformity Check Record	RS/QC/SOP/05, RS/QC/CS/03
		EVA	Gel Content Test	Once per week per Laminator	SOP for Gel Content Test	Heating Owen, Weight Scale	As per SOP for Gel Content Test	Gel Content and Adhesion Test Report	RS/QC/SOP/42, RS/QC/RT/11
		EVA, Backsheet	Adhesion Test		SOP for Adhesion Test	Portable Force Gauge	As per SOP for Adhesion Test		RS/QC/SOP/43, RS/QC/RT/11

			RAYZON SOLAR					Document No.	RS/QC/QAP/02
								Revision No.	001
								Revision Date	01-03-2022
Sr. No.	Stage	Raw Material	Type of Checking	Quantum of Check	Reference Document	Measuring Tool	Acceptance Norms	Documented Information	Document No.
10	Auto Trimming	Solar module	Visual Verification	Once per Shift	SOP for Auto Trimming	-	As per SOP for Module Auto Trimming	IPQC Checksheet	RS/PRD/SOP/10, RS/QC/CS/02
11	Post Visual Quality Inspection	Solar module	Visual Verification	100%	SOP for Post Visual Inspection of Module	Measuring Scale	As per Visual Quality Inspection Criteria	Post Visual Inspection Report	RS/QC/SOP/06, RS/QC/RT/02
12	Auto Framing	Aluminium Frame	Visual Verification	3 Sample per Shift	SOP for Auto Framing	-	As per Final Quality Inspection Criteria	BOM Verification Checksheet	RS/PRD/SOP/11, RS/QC/CS/01
			Dimension Check		Job Card	Measuring Tape, Vernier Calliper	As per Job Card	Framing Checksheet	RS/PRD/RT/01, RS/QC/CS/05
		Frame Fixing Sealant	Weight Measurement			Weight Scale	As per SOP for Auto Framing		RS/PRD/RT/01, RS/PRD/SOP/11, RS/QC/CS/05
		Aluminium Frame, Frame Fixing Sealant	Frame Pull Test	Once Per Month	SOP for Frame Pull Test	Frame Pull Tester	As per SOP for Frame Pull Test	Frame pull Test Report	RS/QC/SOP/44, RS/QC/RT/12
13	Junction Box fixing and Potting	Junction Box	Visual Verification	3 Sample per Shift	SOP For JB Fixing and Potting	-	As per SOP For JB Fixing and Potting	BOM Verification	RS/PRD/SOP/12, RS/QC/CS/01
		JB Fixing Sealant	Weight Measurement			Weight Scale		Framing Checksheet	RS/PRD/SOP/12, RS/QC/CS/05
		Potting Sealant	Visual Verification			-			
		Junction Box, JB Cable	JB Pull Test	Once Per Week	SOP for JB Pull Test	JB Pull Tester	As per SOP for JB Pull Test	JB pull Test Report	RS/QC/SOP/45, RS/QC/RT/13
			Robustness Test		SOP for Robustness Test	Robustness Test Set-up	As per SOP for Robustness Test	Robustness Test Report	RS/QC/SOP/46, RS/QC/RT/14
14	Curing Belt	Solar Module	Visual Verification	3 Sample per Shift	SOP for Curing Belt	-	As per SOP for Curing Belt	IPQC Checksheet	RS/PRD/SOP/13, RS/QC/CS/02
15	Auto Corner Finishing	Solar Module	Visual Verification	3 Sample per Shift	SOP for Auto Corner Finishing	-	As per Final Quality Inspection Criteria	Framing Checksheet	RS/PRD/SOP/14, RS/QC/CS/05
16	Module Cleaning	Solar Module	Visual Verification	Once per Shift	SOP for Module Cleaning	-	As per Final Quality Inspection Criteria	IPQC Checksheet	RS/PRD/SOP/15, RS/QC/CS/02
17	Sun Simulator	Reference Module	Storage Condition Verification	Once per Shift	SOP for Calibration of Sun Simulator, SOP for Making Silver Module	-	As per SOP for Calibration of Sun Simulator	Sun Simulator Calibration Record	RS/PRD/SOP/16, RS/QC/SOP/07, RS/PRD/RT/03
			Visual Verification			-			
		Solar Module	Electrical Inspection	100%	SOP for Sun Simulator	-	As per SOP for Sun Simulator	Flash Test Report	RS/PRD/SOP/17, RS/PRD/RT/04
		Low Irradiation	Electrical Inspection	5 Sample per Month	SOP for Low Irradiation Test	-	As per SOP for Low Irradiation Test	Low Irradiation Test Report	RS/QC/SOP/47, RS/QC/RT/15

			RAYZON SOLAR					Document No.	RS/QC/QAP/02
								Revision No.	001
								Revision Date	01-03-2022
Sr. No.	Stage	Raw Material	Type of Checking	Quantum of Check	Reference Document	Measuring Tool	Acceptance Norms	Documented Information	Document No.
18	Post EL Inspection	Reference Module	Electrical Inspection	Once per Shift	SOP for Post EL Inspection, SOP for Calibration of Sun Simulator	-	As per Post EL Inspection Criteria	Refrance Module EL Inspection Record	RS/QC/SOP/08, RS/PRD/SOP/16, RS/QC/RT/03, RS/QC/CS/02, RS/QC/RT/04
		Solar Module	Current & Voltage Verification	Once per Shift		-	As per SOP for Post EL Inspection of Module	IPQC Checksheet	
			Electrical Inspection	100%		-	As per Post EL Inspection Criteria	Post EL Inspection Report	
19	Hi-Pot Tester	Solar Module	Electrical Inspection (DCW Test)	100%	SOP for In Line DCW Test	-	As per SOP for In Line DCW Test	In Line DCW Test Report	RS/QC/SOP/48, RS/QC/CS/06, RS/QC/CS/07, RS/QC/CS/08
			Electrical Inspection (IR Test)	100%	SOP for In Line IR Test	-	As per SOP for In Line IR Test	In Line IR Test Report	
			Electrical Inspection (GND Test)	100%	SOP for Ground Continuity Test	-	As per SOP for Ground Continuity Test	In Line GND Test Report	
20	QC Lab	Solar Module	Mechanical Load Test	1 Sample per Month	SOP for Mechanical Load Test	-	As per SOP for Mechanical Load Test	Mechanical Load Test Report	RS/QC/SOP/51, RS/QC/RT/16
21	QC Lab	Solar Module	Off-Line Hi-Pot Testing	5 Sample per Week	SOP for Offline Hi-Pot Test	Hi-Pot Tester	As per SOP for Off-Line Hi-Pot Testing	Offline Hi-Pot Test Report	RS/QC/SOP/52, RS/QC/RT/17
22	Outdoor Exposure Structure	Solar Module	Sun Soaking Test	1 Sample per Month	SOP for Sun Soaking Test	-	As per SOP for Sun Soaking Test	Sun Soaking Test Report	RS/QC/SOP/53, RS/QC/RT/18
Prepare By Balvant Dharajiya				Verify By Jainesh Shah			Approve By Bhargavbhai Savaliya		

			RAYZON SOLAR				Document No.	RS/QC/QAP/03
			QAP for Final Quality Control				Revision No.	02
							Revision Date	25-01-2023
Sr. No.	Stage	Type of Checking	Quantum of Check	Reference Document	Measuring Tool	Acceptance Norms	Documented Information	Document No.
1	FQC	Visual Verification	100%	SOP for Final Quality Inspection of Module	-	As per Final Module Quality Acceptance Criteria	Daily FQC Report	RS/QC/SOP/03, RS/QC/IC/08
2	FQC Pallet Approval	Dimension Check	1 module/Pallet	JOB Card	Measuring Tape, Vernier Calliper	As per Final Module Quality Acceptance Criteria	Final Quality Inspection Checksheet	RS/PRD/RT/01, RS/QC/CS/10, RS/QC/IC/08
		Visual Verification	100%	SOP for Pallet Approval of Module	-		FQC Pallet Approval Record	RS/PRD/SOP/18, RS/QC/SOP/09
3	OBA	Visual Verification	1 Pallet per Month	SOP for OBA, SOP for Unpacking of Packed Pallet	-	As per Final Quality Inspection Criteria	OBA Report	RS/PRD/RT/01, RS/QC/IC/08, RS/QC/IC/07, RS/QC/SOP/10, RS/PRD/SOP/19, RS/QC/SOP/52, RS/PRD/SOP/17, RS/QC/SOP/48
		Dimension Check			Measuring Tape, Vernier Calliper	As per JOB Card		
		Electrical Inspection (EL Inspection)			EL Tester	As per EL Acceptance Criteria		
		Electrical Inspection (IV Inspection)			Sun Simulator	As per SOP for Sun Simulator		
		Inline Hi-Pot			Inline Hipot Tester	As per SOP for Inline Hi-Pot		
		Offline Hi-Pot	5 Modules per Pallet		Offline Hi-Pot Tester	As per SOP for Offline Hi-Pot		
4	Vehicle Loading	Visual Verification	100%	SOP for Vehicle Loading Inspection	-	As per SOP for Vehicle Loading Inspection	Vehicle Loading Record	RS/QC/SOP/11, RS/QC/CS/12
Prepare By Kenan Vankawala				Review By Mr. Dhaval Fudnawala		Approve By Mr. Bhargav Savaliya		



ENPRO
Calibration And
Validation Services

ENPRO Enviro Tech and Engineers Pvt. Ltd.

Calibration and Validation Laboratory and Services for Mass,
Electrical, Thermal, Volume, Flow, Pressure, Dimension

Laboratory : Plot no. D/29/16, & D/29/17, Road No. 17, Hojiwala Industrial Estate,
Sachin Palsana Road, Sachin, Surat- 394 230 Gujarat, INDIA.
Calibration Lab Ph. : +91-93275 00920 E-mail : callab@enpro.co.in



CALIBRATION CERTIFICATE

Calibration Certificate No :	ENP2301040164-L	ULR NO :	CC295923000000164F
Date of Receipt :	03/01/2023	Name of Customer and Address Rayzon Green Energy 105, B/H Aron Pipes, Kim Mandavi Road, Karjan, Surat-394110	
Date of Calibration :	04/01/2023		
Due Date of Calibration : (Recommended by Customer)	03/01/2024		
Date of Issue :	06/01/2023		
Format No :	QR/7.8/01		

Details of UUC to be Calibrate :

Nomenclature of UUC	I.D. No. / Sr. No.	Make / Model	Least Count	Range	Accuracy	Type
Coating Thickness Gauge	16264 / 16261	ACCURATE / CTM-16FN	0.1 μ m	0 to 2000 μ m	NA	Digital

Description of Standard Instrument Used :

Nomenclature	I.D. No. / Sr. No.	Certificate No	Certified By	Valid Up To
Coating Thickness Foils	ENP/FOILS/01--	2022/08/022	ACTC	07/08/2023

Environmental Condition :		CSR No :	230103005-L
Temperature (° C) :	20.4	Condition of Item :	OK
Relative Humidity (% RH) :	55	Calibration Location :	In Lab
Parameter :	Dimension	Calibration Procedure :	ENP/WI/M-11
Location/Department :	Quality Lab	Calibration Standard Used :	Comparison Method

Result of Calibration

SrNo	Nominal Value in mm	UUC Value in mm	Error in mm
1	10.0	10.2	0.2
2	25.0	25.3	0.3
3	51.0	51.2	0.2
4	126.0	126.5	0.5
5	261.0	261.4	0.4
6	499.0	499.8	0.8
7	690.0	690.5	0.5

Expanded Uncertainty ($\pm$) : 16.5 μ m

Notes :

- The reported expanded uncertainty is at coverage factor k=2 which corresponds to a coverage probability or level of confidence of approximately 95.45% for a normal distribution.
- The Certificate is issued subject to conditions stated overleaf.
- Standards are Traceable to National/International Standard
- Recommended due date is suggested by customer.
- The calibration results reported in the certificate are valid at the time of and under stated condition of measurement.
- This Document is Digitally Signed and does not require Signature

Approved and Reviewed By

Technical Manager
Vaishali Kapadiya



14198

Calibrated By Rahul Kosambiya

File No. ANERT-TECH/99/2022-T2 (Computer No. 5311)

** End Of The Report **

Vadsar Bridge (West End), Nr. Bharat Petrol Pump, Vadodara - 390 010. M.: 9712578788, 9824389873 M.: 8866064026, 9033064026 E-mail : info@actionengineers.com Website : www.actionengineers.com	 ACTION ENGINEERS ISO 17025 CALIBRATION LAB	 CC-2419
	CALIBRATION CERTIFICATE	

CERTI. NO : 20230302-12035-18	ULR NO : CC241923000004157F	DATE : 06-03-2023	PAGE NO : 1 OF 3
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CUSTOMER NAME : RAYZON SOLAR PVT LTD.
ADDRESS : BLOCK NO. 105, B/H HARIYA TALAV, KIM MANDAVI ROAD, KARANJ, SURAT - 394110, GUJARAT, INDIA.
INSTRUMENT : ELECTRICAL SAFETY ANALYZER **LOCATION** : -
INSTRUMENT CODE : - **MAKE** : EXTECH ELECTRONICS CO.
CONDITION ON RECEIPT : VISUALLY FOUND GOOD **MODEL NO.** : EPV-540
RECEIVED ON : 02-03-2023 **RANGE** : AS PER MANUAL
CALIBRATED ON : 02-03-2023 **LEAST COUNT** : AS PER MANUAL
CALIBRATION DUE ON : 01-03-2024 **SERIAL NO.** : 1740021

CALIBRATION CARRIED OUT AT	SITE
ENVIRONMENTAL CONDITIONS	TEMPERATURE : 25 ± 2°C HUMIDITY.: [45 to 75] % RH
SOP NO.	01, 02, 05, 11 & 13

STANDARD INSTRUMENTS USED FOR CALIBRATION TRACEABLE TO NATIONAL STANDARDS THROUGH NABL ACCREDITED LAB.

Description	Make / Model	Serial number / Identification No.	Traceability (ULR No.)	Valid upto
5 ½ Digit Multimeter	Fluke / 8808A	2707100 / AE / E / 64	ACTION ENGINEERS (CC241923000000791F)	12/01/2024
Digital Time Interval Meter	PEA / L105S	1933 / AE/E/65	ERDA (CC216222000013946F)	16-05-2023
AC / DC H.V. Divider with Digital Display	Wuhan Goldhome Hipot Electrical Co. Ltd. / HMFRC-150	1812041 / AE / E / 77	BARODA CALIBRATION SERVICES (CC201022000002398F)	02/12/2023
High Resistance Box	Moon Light Electricals / ---	03/08/230 / AE / E / 70	ERDA CC216222000032878F	23/12/2023
DC Shunt (100 A/100 mV)	Rishabh / ---	47021 / AE / E / 68	AUTOCAL (CC238222000020192F)	20/10/2024
			IDEMI (CC228721100001610F)	11/10/2023

 Scan QR Code to verify certificate	1. The results reported here are valid only at the time of and under stated conditions of measurements. 2. The results related only to the item (s) calibrated. 3. This certificate shall not be reproduced except in full without written approval of the proprietor of laboratory. 4. The suitability of the instrument for its required use is to be decided by user. 5. Instrument is calibrated as in received condition; adjustment/repair is not done unless it is stated. 6. This Calibration Certificate is meant for scientific and industrial purpose only. However, if used for commercial trading, additional recognition / approval No. 631117 is complied as required by Regulatory Bodies.	AUTHORIZED SIGNATORY Signature valid Upadhyaya Pares Kumar Kantilal (FOR ACTION ENGINEERS)
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Vadsar Bridge (West End), Nr. Bharat Petrol Pump, Vadodara - 390 010. M.: 9712578788, 9824389873 M.: 8866064026, 9033064026 E-mail : info@actionengineers.com Website : www.actionengineers.com	 ACTION ENGINEERS ISO 17025 CALIBRATION LAB	 CC-2419
	CALIBRATION CERTIFICATE	

CERTI. NO : 20230302-12035-18	ULR NO : CC241923000004157F	DATE : 06-03-2023	PAGE NO : 2 OF 3
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ELECTRO TECHNICAL CALIBRATION : Electrical equipment
CALIBRATION RESULTS : DC HIGH VOLTAGE

RANGE / L.C	SMR [AVG] in KV	UUC [AVG] In KV	% ERROR OF RDGS.	± Expanded Uncertainty at 95.45% CL with k = 2 (± in %)
0-8 KV / 0.01 KV	1.01	1.00	-0.990	2.6
	3.00	3.00	0.000	2.6
	3.99	4.00	0.251	2.6
	4.99	5.00	0.200	2.6
	5.98	6.00	0.334	2.6
	6.98	7.00	0.287	2.6
	7.97	8.00	0.376	2.6

DC CURRENT

RANGE / L.C	UUC [AVG] in mA	SMR [AVG] in mA	% ERROR OF RDGS.	± Expanded Uncertainty at 95.45% CL with k = 2 (± in %)
0-20 mA /0.001 / 0.01 mA	3.053	3.0672	-0.463	0.20
	5.08	5.1056	-0.501	0.18
	10.17	10.1792	-0.090	0.11
	15.32	15.321	-0.007	0.09
	18.36	18.358	0.011	0.08

SOURCE MODE:-
DC VOLTAGE

RANGE	UUC [AVG] in Volts	SMR [AVG] in Volts	% ERROR OF RDGS.	± Expanded Uncertainty at 95.45% CL with k = 2 (± in %)
1000 V DC	1000	1000.21	-0.021	0.06

MEASURE MODE:-
INSULATION RESISTANCE

RANGE	UUC in MΩ	SMR [AVG] in MΩ	% ERROR OF RDGS.	± Expanded Uncertainty at 95.45% CL with k = 2 (± in %)
AUTO	10.02	9.88663	1.349	0.62
	29.92	29.7585	0.543	0.62
	100.6	99.3965	1.211	0.62

 Scan QR Code to verify certificate	1. The results reported here are valid only at the time of and under stated conditions of measurements. 2. The results related only to the item (s) calibrated. 3. This certificate shall not be reproduced except in full without written approval of the proprietor of laboratory. 4. The suitability of the instrument for its required use is to be decided by user. 5. Instrument is calibrated as in received condition; adjustment/repair is not done unless it is stated. 6. This Calibration Certificate is meant for scientific and industrial purpose only. However, if used for commercial trading, additional recognition / approval No. 531118, complied as required by Regulatory Bodies.	AUTHORIZED SIGNATORY
		Signature valid Upadhyaya Pares Kumar Kantilal (FOR ACTION ENGINEERS)

Vadsar Bridge (West End), Nr. Bharat Petrol Pump, Vadodara - 390 010. M.: 9712578788, 9824389873 M.: 8866064026, 9033064026 E-mail : info@actionengineers.com Website : www.actionengineers.com	 ACTION ENGINEERS ISO 17025 CALIBRATION LAB	 CC-2419
CALIBRATION CERTIFICATE		

CERTI. NO : 20230302-12035-18	ULR NO : CC241923000004157F	DATE : 06-03-2023	PAGE NO : 3 OF 3
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DC GROUND BOND TEST				
RANGE / L.C	UUC [AVG] in Amps	SMR [AVG] in Amps	% ERROR OF RDGS.	± Expanded Uncertainty at 95.45% CL with k = 2 (± in %)
0-40 A DC / 0.01 A DC	10.00	10.000	0.000	0.75
	20.00	20.012	-0.060	0.75
	30.00	30.009	-0.030	0.75
	40.00	40.021	-0.052	0.75

DC HIGH VOLTAGE				
RANGE	UUC in KV	SMR [AVG] In KV	% ERROR OF RDGS.	± Expanded Uncertainty at 95.45% CL with k = 2 (± in %)
AUTO	1.00	1.00	0.000	2.6
	2.00	2.00	0.000	2.6

TIME				
RANGE / L.C	UUC in sec	SMR [AVG] In sec	% ERROR OF RDGS.	± Expanded Uncertainty at 95.45% CL with k = 2 (± in Sec)
0.5 to 999.9 sec / 0.1 sec	1.0	1.0005	-0.050	0.058
	5.0	5.0008	-0.016	0.074
	10.0	10.003	-0.030	0.162
	30.0	30.005	-0.017	0.236
	60.0	60.006	-0.010	0.354

UUC : UNIT UNDER CALIBRATION, SMR : STANDARD METER READING

REMARKS: READINGS ARE SPECIFIED BY THE CUSTOMER.

 Scan QR Code to verify certificate	1. The results reported here are valid only at the time of and under stated conditions of measurements. 2. The results related only to the item (s) calibrated. 3. This certificate shall not be reproduced except in full without written approval of the proprietor of laboratory. 4. The suitability of the instrument for its required use is to be decided by user. 5. Instrument is calibrated as in received condition; adjustment/repair is not done unless it is stated. 6. This Calibration Certificate is meant for scientific and industrial purpose only. However, if used for commercial trading, additional recognition / approval is required as required by Regulatory Bodies.	AUTHORIZED SIGNATORY Signature valid Upadhyaya Pares Kumar Kantilal (FOR ACTION ENGINEERS)
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ENPRO
Calibration And
Validation Services

ENPRO Enviro Tech and Engineers Pvt. Ltd.

Calibration and Validation Laboratory and Services for Mass,
Electrical, Thermal, Volume, Flow, Pressure, Dimension

Laboratory : Plot no. D/29/16, & D/29/17, Road No. 17, Hojiwala Industrial Estate,
Sachin Palsana Road, Sachin, Surat- 394 230 Gujarat, INDIA.
Calibration Lab Ph. : +91-93275 00920 E-mail : callab@enpro.co.in



CALIBRATION CERTIFICATE

Calibration Certificate No :	ENP2301040163-L	ULR NO :	CC295923000000163F
Date of Receipt :	03/01/2023	Name of Customer and Address Rayzon Green Energy 105, B/H Aron Pipes, Kim Mandavi Road, Karjan, Surat-394110	
Date of Calibration :	04/01/2023		
Due Date of Calibration : (Recommended by Customer)	03/01/2024		
Date of Issue :	06/01/2023		
Format No :	QR/7.8/01		

Details of UUC to be Calibrate :

Nomenclature of UUC	I.D. No. / Sr. No.	Make / Model	Least Count	Range	Accuracy	Type
Micrometer	66921027 / 66921027	Mitutoyo / ---	0.001 mm	0 to 25 mm	NA	Digital

Description of Standard Instrument Used :

Nomenclature	I.D. No. / Sr. No.	Certificate No	Certified By	Valid Up To
Micrometer Caliper Checker	ENP/OMCC/D/01-5078	SG 3544	Mikronix	02/11/2024

Environmental Condition :		CSR No :	230103005-L
Temperature (° C) :	20.4	Condition of Item :	OK
Relative Humidity (% RH) :	55	Calibration Location :	In Lab
Parameter :	Dimension	Calibration Procedure :	ENP/WI/M-02
Location/Department :	Quality Lab	Calibration Standard Used :	IS: 2967:1983

Result of Calibration

SrNo	Nominal Value in mm	UUC Value in mm	Error in mm
1	2.5	2.502	0.002
2	5.1	5.102	0.002
3	7.7	7.701	0.001
4	10.3	10.301	0.001
5	12.9	12.902	0.002
6	15.0	15.005	0.005
7	17.6	17.605	0.005
8	20.2	20.205	0.005
9	22.8	22.805	0.005
10	25.0	25.006	0.006

Expanded Uncertainty (±) : 1.85 µm

Notes :

- The reported expanded uncertainty is at coverage factor k=2 which corresponds to a coverage probability or level of confidence of approximately 95.45% for a normal distribution.
- The Certificate is issued subject to conditions stated overleaf.
- Recommended due date is suggested by customer.
- The calibration results reported in the certificate are valid at the time of and under stated condition of measurement.
- Item Under Calibration Complies.
- This Document is Digitally Signed and does not require Signature

14197

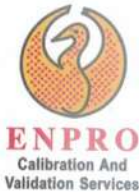
Calibrated By Rahul Kosambiya



Approved and Reviewed By

Technical Manager
Vaishali Kapadiya

ECL222302



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Calibration and Validation Laboratory and Services for Mass,
Electrical, Thermal, Volume, Flow, Pressure, Dimension

Laboratory : Plot no. D/29/16, & D/29/17, Road No. 17, Hojiwala Industrial Estate,
Sachin Palsana Road, Sachin, Surat- 394 230 Gujarat, INDIA.
Calibration Lab Ph. : +91-93275 00920 E-mail : callab@enpro.co.in



CALIBRATION CERTIFICATE

Calibration Certificate No :	ENP2301040162-L	ULR NO :	CC295923000000162F
Date of Receipt :	03/01/2023	Name of Customer and Address	
Date of Calibration :	04/01/2023	Rayzon Green Energy 105, B/H Aron Pipes, Kim Mandavi Road,Karjan, Surat-394110	
Due Date of Calibration : (Recommended by Customer)	03/01/2024		
Date of Issue :	06/01/2023		
Format No :	QR/7.8/01		

Details of UUC to be Calibrate :

Nomenclature of UUC	I.D. No. / Sr. No.	Make / Model	Least Count	Range	Accuracy	Type
Temperature indicator with sensor	201708096892 / 201708096892	SOLDRON / SL-300	0.1 °C	0 to 600 °C	NA	Digital

Description of Standard Instrument Used :

Nomenclature	I.D. No. / Sr. No.	Certificate No	Certified By	Valid Up To
PT-100X1, Simplex 4 Wire RTD With Indicator	ENP/TS/01-1060	22080801/02	Baumer	07/08/2023

Environmental Condition :		CSR No :	230103005-L
Temperature (°C) :	25.6	Condition of Item :	OK
Relative Humidity (%RH) :	55	Calibration Location :	In Lab
Parameter :	Thermal	Calibration Procedure :	ENP/WI/T-07
Location/Department :	Production	Calibration Standard Used :	DKD- R 5-1

Result of Calibration

SrNo	Calibration Point in °C	Measure Value on Std. °C	Measure Value on UUC °C	(±) Deviation In °C	(±) Uncertainty in °C
1	50	50.3	50.7	0.4	2.51
2	100	100.4	100.8	0.4	2.51
3	200	200.5	200.9	0.4	2.51
4	400	400.6	401.0	0.4	2.51
5	600	600.6	601.2	0.6	2.51

Notes :					
1.	The reported expanded uncertainty is at coverage factor k=2 which corresponds to a coverage probability or level of confidence of approximately 95.45% for a normal distribution.				
2.	The Certificate is issued subject to conditions stated overleaf.				
3.	Recommended due date is suggested by customer.				
4.	International Temperature Scale 1990(ITS-90) is Followed.				
5.	The calibration results reported in the certificate are valid at the time of and under stated condition of measurement.				
6.	This Document is Digitally Signed and does not require Signature				

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Calibrated By: **Rahul Kosambiya**



Approved and Reviewed By

[Signature]
Technical Manager
Vaishali Kapadiya

CALIBRATION CERTIFICATE

Calibration Certificate No :	ENP2301040160-L	ULR NO :	CC295923000000160F
Date of Receipt :	03/01/2023	Name of Customer and Address Rayzon Green Energy 105, B/H Aron Pipes, Kim Mandavi Road, Karjan, Surat-394110	
Date of Calibration :	04/01/2023		
Due Date of Calibration : (Recommended by Customer)	03/01/2024		
Date of Issue :	06/01/2023		
Format No :	QR/7.8/01		

Details of UUC to be Calibrate :

Nomenclature of UUC	I.D. No. / Sr. No.	Make / Model	Least Count	Range	Accuracy	Type
Digital Vernier Caliper	A17087961 / A17087961	Mitutoyo / ---	0.02 mm	0 to 200 mm	NA	Digital

Description of Standard Instrument Used :

Nomenclature	I.D. No. / Sr. No.	Certificate No	Certified By	Valid Up To
Slip Gauge Set	ENP/SGS/D/01-5079	SG 3543	Mikronix	02/11/2024
Long Slip Gauge Set	ENP/LSGS/D/01-5080	SSG 3546	Mikronix	02/11/2024
Caliper Checker	ENP/CC/D/01-2735	CC 3547	Mikronix	02/11/2024

Environmental Condition :	CSR No :	230103005-L
Temperature (° C) :	Condition of Item :	OK
Relative Humidity (%RH) :	Calibration Location :	In Lab
Parameter :	Calibration Procedure :	ENP/WI/M-01
Location/Department :	Calibration Standard Used :	IS: 16491 (Part-1) 2016

Result of Calibration

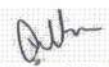
External Jaw				Internal Jaw			Depth Jaw		
SrNo	Nominal Value in mm	UUC Value in mm	Error In mm	Nominal Value in mm	UUC Value in mm	Error In mm	Nominal Value in mm	UUC Value in mm	Error In mm
1	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00
2	2	2.00	0.00	20	20.00	0.00	20	20.00	0.00
3	5	5.00	0.00	50	50.00	0.00	50	50.00	0.00
4	10	10.00	0.00	100	100.00	0.00	100	100.00	0.00
5	20	20.00	0.00	200	200.00	0.00	200	200.00	0.00
6	50	50.00	0.00	* Parallelism of External Measuring faces is 0.00 mm					
7	100	100.00	0.00	* Parallelism of Internal Measuring faces is 0.00 mm					
8	120	120.00	0.00	* Parallelism of Depth Measuring faces is 0.00 mm					
9	150	150.02	0.02						
10	200	200.02	0.02						

Expanded Uncertainty (±) : 10.3 µm

Notes

- The reported expanded uncertainty is at coverage factor k=2 which corresponds to a coverage probability or level of confidence of approximately 95.45% for a normal distribution.
- The Certificate is issued subject to conditions stated overleaf.
- Standards are Traceable to National/International Standard
- Recommended due date is suggested by customer.
- Result is the average of Five readings.
- The calibration results reported in the certificate are valid at the time of and under stated condition of measurement.
- This Document is Digitally Signed and does not require Signature

Approved and Reviewed By


Technical Manager
Vaishali Kapadiya



14191

Calibrated By **Rahul Kosambiya**

RAYZON SOLAR		Rayzon Solar							
		Flash Test Dimention & Visual Report							
Sr. No.	Pallet ID	Module ID	Pmax (Wp)	Voc (V)	Isc (A)	Vmp (V)	Imp (A)	FF	% Efficiency
1	26806	RSBL1M0290923209186	548.27	47.27	13.83	42.23	12.98	83.89	21.24
2	26806	RSBL1M0021023209287	546.67	47.42	13.87	42.30	12.92	83.13	21.18
3	26806	RSBL1M0021023209487	547.47	47.36	13.82	42.63	12.84	83.66	21.21
4	26806	RSBL1M0021023209496	549.28	47.37	13.82	42.37	12.96	83.91	21.28
5	26806	RSBL1M0021023209527	549.26	47.29	13.84	42.42	12.95	83.93	21.28
6	26806	RSBL1M0021023209531	545.47	47.23	13.82	42.12	12.95	83.56	21.13
7	26806	RSBL1M0021023209545	548.14	47.17	13.81	42.36	12.94	84.16	21.24
8	26806	RSBL1M0021023209548	549.15	47.24	13.84	42.28	12.99	84.01	21.28
9	26806	RSBL1M0021023209553	549.10	47.25	13.82	42.34	12.97	84.12	21.28
10	26806	RSBL1M0021023209568	548.80	47.18	13.83	42.46	12.93	84.12	21.26
11	26806	RSBL1M0021023209579	545.54	47.38	13.82	42.42	12.86	83.35	21.14
12	26806	RSBL1M0021023209636	546.38	47.69	13.73	42.38	12.89	83.47	21.17
13	26806	RSBL1M0021023209670	548.44	47.28	13.86	42.33	12.96	83.72	21.25
14	26806	RSBL1M0021023209685	548.65	47.60	13.84	42.61	12.88	83.30	21.26
15	26806	RSBL1M0021023209699	548.45	47.58	13.78	42.46	12.92	83.65	21.25
16	26806	RSBL1M0021023209710	546.96	47.32	13.76	42.52	12.86	84.04	21.19
17	26806	RSBL1M0021023209723	548.84	47.49	13.70	42.43	12.94	84.38	21.26
18	26806	RSBL1M0021023209990	549.42	47.36	13.73	42.44	12.95	84.48	21.29
19	26806	RSBL1M0021023210003	548.37	47.52	13.70	42.34	12.95	84.24	21.25
20	26806	RSBL1M0021023210006	548.25	47.34	13.80	42.50	12.90	83.95	21.24
21	26806	RSBL1M0021023210015	549.17	47.46	13.93	42.33	12.98	83.06	21.28
22	26806	RSBL1M0021023210019	546.75	47.62	13.70	42.76	12.79	83.80	21.18
23	26806	RSBL1M0021023210025	546.42	47.53	13.72	42.69	12.80	83.82	21.17
24	26806	RSBL1M0021023210028	548.10	47.85	13.71	42.75	12.82	83.55	21.24
25	26808	RSBL1M0290923208677	548.58	47.23	13.86	42.26	12.98	83.78	21.26
26	26808	RSBL1M0290923208962	549.50	47.37	13.73	42.84	12.83	84.48	21.29
27	26808	RSBL1M0290923208964	548.45	47.29	13.87	42.23	12.99	83.63	21.25
28	26808	RSBL1M0021023209367	547.35	47.51	13.73	42.36	12.92	83.92	21.21
29	26808	RSBL1M0021023209368	548.77	47.28	13.91	42.21	13.00	83.45	21.26
30	26808	RSBL1M0021023209837	548.41	47.34	13.93	42.24	12.98	83.18	21.25
31	26808	RSBL1M0021023209937	546.31	47.55	13.72	42.51	12.85	83.72	21.17
32	26808	RSBL1M0021023209945	548.92	47.70	13.79	42.27	12.99	83.43	21.27
33	26808	RSBL1M0021023209974	547.50	47.40	13.80	42.29	12.95	83.67	21.21
34	26808	RSBL1M0021023209983	545.87	47.41	13.70	42.53	12.83	84.03	21.15
35	26808	RSBL1M0021023209988	548.45	47.27	13.87	42.20	13.00	83.66	21.25
36	26808	RSBL1M0021023209992	548.35	47.31	13.71	42.83	12.80	84.52	21.25
37	26808	RSBL1M0021023209999	547.93	47.72	13.81	42.61	12.86	83.17	21.23
38	26808	RSBL1M0021023210014	546.43	46.99	13.84	42.03	13.00	84.02	21.17
39	26808	RSBL1M0021023210020	546.55	46.95	13.83	42.12	12.98	84.17	21.18
40	26808	RSBL1M0021023210021	549.42	47.69	13.87	42.82	12.83	83.07	21.29
41	26808	RSBL1M0021023210033	548.87	47.34	13.94	42.55	12.90	83.20	21.27
42	26808	RSBL1M0021023210036	547.38	47.01	13.84	42.13	12.99	84.15	21.21
43	26808	RSBL1M0021023210059	546.23	46.97	13.83	42.07	12.98	84.07	21.16
44	26808	RSBL1M0021023210060	548.70	47.61	13.77	42.67	12.86	83.71	21.26
45	26808	RSBL1M0021023210066	548.64	47.00	13.83	42.24	12.99	84.42	21.26
46	26808	RSBL1M0021023210078	549.37	47.08	13.86	42.40	12.96	84.20	21.29
47	26808	RSBL1M0021023210107	548.79	47.85	13.77	42.45	12.93	83.31	21.26
48	26808	RSBL1M0021023210112	547.36	47.56	13.82	42.22	12.97	83.30	21.21
49	26809	RSBL1M0021023209989	548.70	47.67	13.74	42.41	12.94	83.78	21.26
50	26809	RSBL1M0021023209993	546.79	47.71	13.76	42.20	12.96	83.29	21.19
51	26809	RSBL1M0021023209996	546.80	47.66	13.73	42.63	12.83	83.55	21.19
52	26809	RSBL1M0021023209998	548.41	47.84	13.70	42.50	12.91	83.67	21.25
53	26809	RSBL1M0021023210005	546.77	47.33	13.86	42.27	12.94	83.35	21.18
54	26809	RSBL1M0021023210024	546.47	47.65	13.76	42.34	12.91	83.37	21.17
55	26809	RSBL1M0021023210031	548.60	47.41	13.90	42.30	12.97	83.22	21.26
56	26809	RSBL1M0021023210034	548.10	47.54	13.87	42.68	12.84	83.11	21.24
57	26809	RSBL1M0021023210038	545.69	47.55	13.70	42.15	12.95	83.79	21.14
58	26809	RSBL1M0021023210039	546.39	47.74	13.76	42.41	12.89	83.19	21.17
59	26809	RSBL1M0021023210042	545.60	47.55	13.81	42.48	12.84	83.11	21.14
60	26809	RSBL1M0021023210044	546.19	47.32	13.79	42.56	12.84	83.68	21.16
61	26809	RSBL1M0021023210048	547.39	47.84	13.74	42.71	12.82	83.30	21.21
62	26809	RSBL1M0021023210053	547.92	47.76	13.69	42.56	12.87	83.81	21.23
63	26809	RSBL1M0021023210055	546.38	47.84	13.70	42.19	12.95	83.34	21.17
64	26809	RSBL1M0021023210058	548.86	47.73	13.84	42.34	12.96	83.10	21.27
65	26809	RSBL1M0021023210061	546.67	47.51	13.73	42.75	12.79	83.83	21.18
66	26809	RSBL1M0021023210064	546.03	47.56	13.82	42.23	12.93	83.10	21.16
67	26809	RSBL1M0021023210068	547.23	47.61	13.80	42.22	12.96	83.29	21.20
68	26809	RSBL1M0021023210069	547.23	47.05	13.87	42.24	12.96	83.84	21.20
69	26809	RSBL1M0021023210071	548.73	47.58	13.82	42.53	12.90	83.45	21.26
70	26809	RSBL1M0021023210079	545.26	47.49	13.78	42.30	12.89	83.33	21.13
71	26809	RSBL1M0021023210080	545.51	47.56	13.73	42.56	12.82	83.56	21.14
72	26809	RSBL1M0021023210082	547.85	47.70	13.78	42.36	12.93	83.37	21.23
73	26810	RSBL1M0021023209357	547.42	47.45	13.76	42.75	12.80	83.84	21.21
74	26810	RSBL1M0021023209362	546.13	47.42	13.82	42.64	12.81	83.33	21.16
75	26810	RSBL1M0021023209363	546.45	47.35	13.79	42.67	12.81	83.69	21.17
76	26810	RSBL1M0021023209997	546.82	47.33	13.71	42.50	12.87	84.26	21.19
77	26810	RSBL1M0021023210016	547.05	47.63	13.80	42.26	17.94	83.23	21.20
78	26810	RSBL1M0021023210030	549.24	47.34	13.78	42.35	12.97	84.19	21.28
79	26810	RSBL1M0021023210032	549.11	47.48	13.80	42.32	12.98	84.30	21.28
80	26810	RSBL1M0021023210037	547.15	46.98	13.86	42.22	12.95	84.01	21.20
81	26810	RSBL1M0021023210041	549.22	47.44	13.74	42.53	12.95	84.25	21.28

RAYZON SOLAR		Rayzon Solar							
		Flash Test Dimention & Visual Report							
Sr. No.	Pallet ID	Module ID	Pmax (Wp)	Voc (V)	Isc (A)	Vmp (V)	Imp (A)	FF	% Efficiency
82	26810	RSBL1M0021023210045	547.36	47.68	13.82	42.16	12.98	83.06	21.21
83	26810	RSBL1M0021023210047	549.13	47.61	13.85	42.47	12.93	83.26	21.28
84	26810	RSBL1M0021023210050	546.36	47.55	13.75	42.62	12.82	83.55	21.17
85	26810	RSBL1M0021023210056	545.72	47.85	13.69	42.19	12.94	83.29	21.14
86	26810	RSBL1M0021023210057	548.46	47.46	13.89	42.62	12.87	83.18	21.25
87	26810	RSBL1M0021023210062	547.78	47.60	13.86	42.34	12.94	83.02	21.22
88	26810	RSBL1M0021023210087	549.24	47.78	13.78	42.62	12.89	83.40	21.28
89	26810	RSBL1M0021023210097	547.58	47.45	13.70	42.74	12.81	84.21	21.22
90	26810	RSBL1M0021023210099	549.42	47.45	13.84	42.72	12.86	83.63	21.29
91	26810	RSBL1M0021023210101	547.63	47.34	13.78	42.30	12.95	83.97	21.22
92	26810	RSBL1M0021023210105	548.39	47.56	13.74	42.82	12.81	83.90	21.25
93	26810	RSBL1M0021023210137	548.70	47.37	13.92	42.33	12.96	83.23	21.26
94	26810	RSBL1M0021023210139	546.45	47.39	13.71	42.21	12.95	84.12	21.17
95	26810	RSBL1M0021023210143	547.07	47.36	13.85	42.72	12.81	83.38	21.20
96	26810	RSBL1M0021023210145	546.08	47.41	13.70	42.58	12.83	84.06	21.16
97	26811	RSBL1M0021023209804	548.53	47.58	13.70	42.47	12.92	84.13	21.25
98	26811	RSBL1M0021023209886	548.76	47.34	13.88	42.31	12.97	83.49	21.26
99	26811	RSBL1M0021023209893	547.30	47.49	13.71	42.70	12.82	84.05	21.21
100	26811	RSBL1M0021023209901	546.35	47.55	13.82	42.61	12.82	83.13	21.17
101	26811	RSBL1M0021023209906	546.12	47.45	13.73	42.67	12.80	83.82	21.16
102	26811	RSBL1M0021023209977	548.48	47.51	13.71	42.80	12.81	84.24	21.25
103	26811	RSBL1M0021023209981	548.62	47.35	13.84	42.29	12.97	83.72	21.26
104	26811	RSBL1M0021023210018	547.93	47.77	13.78	42.76	12.81	83.26	21.23
105	26811	RSBL1M0021023210023	546.99	47.57	13.85	42.26	12.94	83.04	21.19
106	26811	RSBL1M0021023210029	546.80	46.96	13.89	42.10	12.99	83.87	21.19
107	26811	RSBL1M0021023210046	546.35	46.94	13.88	42.07	12.99	83.84	21.17
108	26811	RSBL1M0021023210054	546.94	46.97	13.86	42.09	12.99	83.99	21.19
109	26811	RSBL1M0021023210075	547.91	47.00	13.86	42.27	12.96	84.13	21.23
110	26811	RSBL1M0021023210077	547.78	47.75	13.80	42.71	12.83	83.13	21.22
111	26811	RSBL1M0021023210083	546.31	47.13	13.86	42.13	12.97	83.64	21.17
112	26811	RSBL1M0021023210093	547.71	47.73	13.77	42.84	12.79	83.34	21.22
113	26811	RSBL1M0021023210095	546.51	47.00	13.83	42.15	12.97	84.05	21.18
114	26811	RSBL1M0021023210098	547.18	47.02	13.85	42.23	12.96	84.00	21.20
115	26811	RSBL1M0021023210106	548.65	47.53	13.76	42.26	12.98	83.88	21.26
116	26811	RSBL1M0021023210117	549.19	47.46	13.78	42.46	12.93	83.95	21.28
117	26811	RSBL1M0021023210119	548.71	47.42	13.87	42.27	12.98	83.43	21.26
118	26811	RSBL1M0021023210132	549.04	47.34	13.84	42.64	12.88	83.82	21.27
119	26811	RSBL1M0021023210150	547.48	47.78	13.78	42.56	12.86	83.17	21.21
120	26811	RSBL1M0021023210177	547.14	47.34	13.71	42.37	12.91	84.28	21.20
121	26812	RSBL1M0021023209337	546.25	47.85	13.73	42.47	12.86	83.13	21.16
122	26812	RSBL1M0021023209372	549.01	47.35	13.83	42.77	12.84	83.86	21.27
123	26812	RSBL1M0021023209815	549.21	47.73	13.81	42.37	12.96	83.34	21.28
124	26812	RSBL1M0021023209929	545.90	47.58	13.82	42.33	12.90	83.02	21.15
125	26812	RSBL1M0021023209933	549.40	47.43	13.77	42.42	12.95	84.11	21.29
126	26812	RSBL1M0021023209938	548.91	47.48	13.69	42.38	12.95	84.47	21.27
127	26812	RSBL1M0021023209952	548.61	47.82	13.81	42.76	12.83	83.10	21.26
128	26812	RSBL1M0021023209956	549.07	47.35	13.90	42.45	12.93	83.43	21.27
129	26812	RSBL1M0021023209985	547.46	47.40	13.84	42.36	12.92	83.45	21.21
130	26812	RSBL1M0021023210002	547.04	47.58	13.82	42.66	12.82	83.17	21.20
131	26812	RSBL1M0021023210076	548.07	47.75	13.71	42.74	12.82	83.71	21.24
132	26812	RSBL1M0021023210100	546.28	47.48	13.74	42.31	12.91	83.75	21.17
133	26812	RSBL1M0021023210110	546.33	47.04	13.88	42.07	12.99	83.65	21.17
134	26812	RSBL1M0021023210113	549.37	47.07	13.91	42.30	12.99	83.92	21.29
135	26812	RSBL1M0021023210122	549.07	47.30	13.90	42.30	12.98	83.49	21.27
136	26812	RSBL1M0021023210124	545.22	47.67	13.77	42.61	12.80	83.06	21.12
137	26812	RSBL1M0021023210125	547.05	47.08	13.90	42.16	12.98	83.59	21.20
138	26812	RSBL1M0021023210128	548.25	47.03	13.87	42.19	12.99	84.02	21.24
139	26812	RSBL1M0021023210129	546.88	47.84	13.71	42.50	12.87	83.35	21.19
140	26812	RSBL1M0021023210140	549.42	47.12	13.91	42.33	12.98	83.83	21.29
141	26812	RSBL1M0021023210144	548.70	47.24	13.84	42.27	12.98	83.93	21.26
142	26812	RSBL1M0021023210146	547.49	47.14	13.89	42.14	12.99	83.61	21.21
143	26812	RSBL1M0021023210155	548.96	47.74	13.76	42.65	12.87	83.56	21.27
144	26812	RSBL1M0021023210157	548.85	47.13	13.90	42.21	13.00	83.78	21.27
145	26813	RSBL1M0021023209994	548.20	47.37	13.82	42.75	12.83	83.78	21.24
146	26813	RSBL1M0021023210017	549.58	47.07	13.91	42.29	13.00	83.95	21.29
147	26813	RSBL1M0021023210027	546.41	47.78	13.70	42.53	12.85	83.51	21.17
148	26813	RSBL1M0021023210043	548.05	47.12	13.88	42.15	13.00	83.79	21.23
149	26813	RSBL1M0021023210052	545.38	47.72	13.72	42.63	12.79	83.31	21.13
150	26813	RSBL1M0021023210065	548.26	47.65	13.86	42.77	12.82	83.04	21.24
151	26813	RSBL1M0021023210067	547.91	47.48	13.89	42.40	12.92	83.10	21.23
152	26813	RSBL1M0021023210070	547.02	47.54	13.80	42.74	12.80	83.38	21.19
153	26813	RSBL1M0021023210073	548.49	47.75	13.79	42.28	12.97	83.28	21.25
154	26813	RSBL1M0021023210074	548.53	47.60	13.71	42.60	12.88	84.09	21.25
155	26813	RSBL1M0021023210081	549.46	47.33	13.89	42.80	12.84	83.59	21.29
156	26813	RSBL1M0021023210084	546.62	47.31	13.76	42.32	12.92	83.94	21.18
157	26813	RSBL1M0021023210086	548.98	47.82	13.75	42.71	12.85	83.49	21.27
158	26813	RSBL1M0021023210088	548.35	47.35	13.71	42.42	12.93	84.49	21.25
159	26813	RSBL1M0021023210089	549.14	47.42	13.91	42.51	12.92	83.23	21.28
160	26813	RSBL1M0021023210091	545.68	47.41	13.76	42.14	12.95	83.67	21.14
161	26813	RSBL1M0021023210102	545.11	47.06	13.85	42.06	12.96	83.76	21.12
162	26813	RSBL1M0021023210108	548.81	47.67	13.70	42.47	12.94	84.87	21.26

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Sr. No.	Pallet ID	Module ID	Pmax (Wp)	Voc (V)	Isc (A)	Vmp (V)	Imp (A)	FF	% Efficiency
163	26813	RSBL1M0021023210114	548.26	47.84	13.80	42.68	12.85	83.03	21.24
164	26813	RSBL1M0021023210120	547.20	47.73	13.75	42.79	12.79	83.39	21.20
165	26813	RSBL1M0021023210121	549.35	47.36	13.87	42.49	12.93	83.62	21.28
166	26813	RSBL1M0021023210131	547.33	47.35	13.71	42.61	12.85	84.31	21.21
167	26813	RSBL1M0021023210134	546.69	47.76	13.71	42.51	12.86	83.48	21.18
168	26813	RSBL1M0021023210168	546.80	47.44	13.81	42.35	12.91	83.48	21.19
169	26814	RSBL1M0021023209910	548.97	47.44	13.84	42.81	12.82	83.64	21.27
170	26814	RSBL1M0021023209949	545.44	47.32	13.72	42.38	12.87	84.02	21.13
171	26814	RSBL1M0021023210109	547.22	47.74	13.71	42.49	12.88	83.63	21.20
172	26814	RSBL1M0021023210111	545.64	47.81	13.73	42.36	12.88	83.12	21.14
173	26814	RSBL1M0021023210115	547.29	47.50	13.79	42.24	12.96	83.53	21.20
174	26814	RSBL1M0021023210127	547.30	47.31	13.73	42.69	12.82	84.28	21.21
175	26814	RSBL1M0021023210135	548.05	47.54	13.85	42.64	12.85	83.25	21.23
176	26814	RSBL1M0021023210151	547.14	47.73	13.74	42.62	12.84	83.42	21.20
177	26814	RSBL1M0021023210166	547.00	47.49	13.85	42.69	12.81	83.14	21.19
178	26814	RSBL1M0021023210176	546.64	47.79	13.72	42.52	12.86	83.38	21.18
179	26814	RSBL1M0021023210178	548.18	47.80	13.74	42.59	12.87	83.48	21.24
180	26814	RSBL1M0021023210184	546.69	47.38	13.83	42.68	12.81	83.42	21.18
181	26814	RSBL1M0021023210185	548.94	47.72	13.71	42.75	12.84	83.90	21.27
182	26814	RSBL1M0021023210186	548.45	47.76	13.71	42.60	12.88	83.79	21.25
183	26814	RSBL1M0021023210187	548.55	47.34	13.88	42.38	12.94	83.50	21.25
184	26814	RSBL1M0021023210192	547.18	47.54	13.73	42.61	12.84	83.80	21.20
185	26814	RSBL1M0021023210193	546.76	47.46	13.80	42.37	12.91	83.48	21.18
186	26814	RSBL1M0021023210199	547.06	47.61	13.78	42.64	12.83	83.36	21.20
187	26814	RSBL1M0021023210218	547.23	47.48	13.77	42.54	12.86	83.69	21.20
188	26814	RSBL1M0021023210219	547.38	47.81	13.70	42.51	12.88	83.55	21.21
189	26814	RSBL1M0021023210222	548.89	47.32	13.73	42.31	12.97	84.48	21.27
190	26814	RSBL1M0021023210223	547.92	47.67	13.82	42.64	12.85	83.18	21.23
191	26814	RSBL1M0021023210227	545.89	47.56	13.69	42.59	12.82	83.83	21.15
192	26814	RSBL1M0021023210237	546.91	47.73	13.76	42.65	12.82	83.25	21.19
193	26815	RSBL1M0021023209978	548.81	47.51	13.77	42.78	12.83	83.87	21.26
194	26815	RSBL1M0021023210092	546.35	47.61	13.77	42.55	12.84	83.35	21.17
195	26815	RSBL1M0021023210104	548.75	47.55	13.73	42.57	12.89	84.05	21.26
196	26815	RSBL1M0021023210142	549.13	47.39	13.80	42.63	12.88	83.94	21.28
197	26815	RSBL1M0021023210154	548.19	47.37	13.81	42.40	12.93	83.79	21.24
198	26815	RSBL1M0021023210156	548.68	47.80	13.76	42.63	12.87	83.39	21.26
199	26815	RSBL1M0021023210158	546.39	47.51	13.81	42.57	12.84	83.28	21.17
200	26815	RSBL1M0021023210164	547.74	47.44	13.94	41.96	13.06	82.86	21.22
201	26815	RSBL1M0021023210171	548.70	47.52	13.90	42.29	12.98	83.06	21.26
202	26815	RSBL1M0021023210173	545.43	47.78	13.72	42.66	12.79	83.19	21.13
203	26815	RSBL1M0021023210175	547.91	47.47	13.90	42.65	12.85	83.05	21.23
204	26815	RSBL1M0021023210181	549.41	47.61	13.85	42.71	12.87	83.32	21.29
205	26815	RSBL1M0021023210182	548.93	47.69	13.78	42.49	12.92	83.52	21.27
206	26815	RSBL1M0021023210196	545.91	47.42	13.73	42.53	12.84	83.84	21.15
207	26815	RSBL1M0021023210203	546.48	47.61	13.73	42.57	12.84	83.60	21.17
208	26815	RSBL1M0021023210205	547.72	47.39	13.76	42.63	12.85	83.98	21.22
209	26815	RSBL1M0021023210206	548.93	47.56	13.80	42.54	12.90	83.65	21.27
210	26815	RSBL1M0021023210207	545.50	47.76	13.71	42.36	12.88	83.31	21.14
211	26815	RSBL1M0021023210209	546.01	47.33	13.80	42.68	12.79	83.58	21.16
212	26815	RSBL1M0021023210210	548.62	47.47	13.73	42.40	12.94	84.16	21.26
213	26815	RSBL1M0021023210213	547.64	47.59	13.81	42.17	12.99	83.32	21.22
214	26815	RSBL1M0021023210216	546.39	47.44	13.74	42.29	12.92	83.84	21.17
215	26815	RSBL1M0021023210221	547.03	47.62	13.71	42.23	12.95	83.81	21.19
216	26815	RSBL1M0021023210257	547.94	47.35	13.71	42.65	12.85	84.40	21.23
217	26816	RSBL1M0021023210072	549.49	47.20	13.86	42.31	12.99	83.98	21.29
218	26816	RSBL1M0021023210090	547.90	47.12	13.87	42.27	12.96	83.82	21.23
219	26816	RSBL1M0021023210133	546.72	47.12	13.91	42.16	12.97	83.40	21.18
220	26816	RSBL1M0021023210160	547.81	47.35	13.92	42.41	12.92	83.14	21.22
221	26816	RSBL1M0021023210174	546.73	47.82	13.74	42.16	12.97	83.22	21.18
222	26816	RSBL1M0021023210183	546.64	47.60	13.78	42.19	12.96	83.35	21.18
223	26816	RSBL1M0021023210195	548.56	47.47	13.72	42.72	12.84	84.21	21.25
224	26816	RSBL1M0021023210201	547.95	47.18	13.92	42.18	12.99	83.45	21.23
225	26816	RSBL1M0021023210208	547.66	47.14	13.91	42.23	12.97	83.53	21.22
226	26816	RSBL1M0021023210220	547.20	47.21	13.88	42.17	12.98	83.51	21.20
227	26816	RSBL1M0021023210224	549.51	47.36	13.76	42.65	12.88	84.31	21.29
228	26816	RSBL1M0021023210228	546.71	47.45	13.69	42.44	12.88	84.18	21.18
229	26816	RSBL1M0021023210229	546.67	47.59	13.83	42.52	12.86	83.07	21.18
230	26816	RSBL1M0021023210231	547.19	47.43	13.88	42.46	12.89	83.11	21.20
231	26816	RSBL1M0021023210235	547.61	47.79	13.73	42.13	13.00	83.47	21.22
232	26816	RSBL1M0021023210236	547.47	47.09	13.81	42.36	12.92	84.19	21.21
233	26816	RSBL1M0021023210240	547.61	47.39	13.84	42.43	12.91	83.48	21.22
234	26816	RSBL1M0021023210245	547.36	47.08	13.88	42.29	12.94	83.77	21.21
235	26816	RSBL1M0021023210250	545.55	47.03	13.79	42.19	12.93	84.13	21.14
236	26816	RSBL1M0021023210251	546.09	47.39	13.86	42.12	12.97	83.12	21.16
237	26816	RSBL1M0021023210271	546.19	47.35	13.73	42.39	12.89	83.99	21.16
238	26816	RSBL1M0021023210276	547.99	47.15	13.83	42.29	12.96	84.00	21.23
239	26816	RSBL1M0021023210281	545.79	47.49	13.77	42.17	12.94	83.48	21.15
240	26816	RSBL1M0021023210284	546.37	47.34	13.72	42.52	12.85	84.13	21.17
241	26817	RSBL1M0021023210085	547.77	47.64	13.79	42.29	12.95	83.79	21.22
242	26817	RSBL1M0021023210147	549.08	47.50	13.77	42.40	12.95	83.75	21.27
243	26817	RSBL1M0021023210148	548.77	47.51	13.78	42.44	12.95	83.85	21.26

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Sr. No.	Pallet ID	Module ID	Pmax (Wp)	Voc (V)	Isc (A)	Vmp (V)	Imp (A)	FF	% Efficiency
244	26817	RSBL1M0021023210153	549.21	47.17	13.88	42.35	12.97	83.89	21.28
245	26817	RSBL1M0021023210159	547.51	47.61	13.81	42.15	12.99	83.26	21.21
246	26817	RSBL1M0021023210163	547.98	47.61	13.86	42.79	12.81	83.02	21.23
247	26817	RSBL1M0021023210188	548.11	47.37	13.73	42.25	12.97	84.30	21.24
248	26817	RSBL1M0021023210200	548.69	47.73	13.72	42.80	12.82	83.82	21.26
249	26817	RSBL1M0021023210202	548.71	47.46	13.70	42.69	12.85	84.37	21.26
250	26817	RSBL1M0021023210204	546.58	47.79	13.76	42.38	12.90	83.12	21.18
251	26817	RSBL1M0021023210212	547.63	47.83	13.75	42.49	12.89	83.28	21.22
252	26817	RSBL1M0021023210215	546.98	47.33	13.80	42.79	12.78	83.72	21.19
253	26817	RSBL1M0021023210226	548.86	47.76	13.80	42.70	12.86	83.27	21.27
254	26817	RSBL1M0021023210230	547.79	47.41	13.78	42.16	12.99	83.84	21.22
255	26817	RSBL1M0021023210233	546.84	47.81	13.74	42.45	12.88	83.24	21.19
256	26817	RSBL1M0021023210243	548.38	47.53	13.80	42.73	12.84	83.61	21.25
257	26817	RSBL1M0021023210261	547.98	47.80	13.80	42.17	13.00	83.09	21.23
258	26817	RSBL1M0021023210262	549.19	47.40	13.90	42.33	12.97	83.35	21.28
259	26817	RSBL1M0021023210264	547.09	47.74	13.79	42.19	12.97	83.13	21.20
260	26817	RSBL1M0021023210267	548.25	47.57	13.75	42.28	12.97	83.83	21.24
261	26817	RSBL1M0021023210274	548.51	47.72	13.76	42.67	12.85	83.53	21.25
262	26817	RSBL1M0021023210297	545.79	47.36	13.85	42.29	12.91	83.21	21.15
263	26817	RSBL1M0021023210301	547.07	47.53	13.71	42.46	12.88	83.93	21.20
264	26817	RSBL1M0021023210302	547.29	46.95	13.88	42.05	13.02	84.00	21.21
265	26818	RSBL1M0021023210152	546.99	47.67	13.72	42.27	12.94	83.64	21.19
266	26818	RSBL1M0021023210191	547.13	46.99	13.87	42.19	12.97	83.96	21.20
267	26818	RSBL1M0021023210234	548.19	47.17	13.87	42.21	12.99	83.78	21.24
268	26818	RSBL1M0021023210241	546.74	47.47	13.84	42.14	12.98	83.21	21.18
269	26818	RSBL1M0021023210263	545.44	47.46	13.71	42.49	12.84	83.85	21.13
270	26818	RSBL1M0021023210268	549.10	47.35	13.87	42.32	12.97	83.60	21.27
271	26818	RSBL1M0021023210269	547.17	46.95	13.85	42.37	12.91	84.15	21.20
272	26818	RSBL1M0021023210270	547.59	47.50	13.76	42.25	12.96	83.80	21.22
273	26818	RSBL1M0021023210278	548.08	47.59	13.83	42.34	12.95	83.30	21.24
274	26818	RSBL1M0021023210279	546.49	46.99	13.83	42.23	12.94	84.12	21.17
275	26818	RSBL1M0021023210282	547.66	47.15	13.83	42.26	12.96	83.96	21.22
276	26818	RSBL1M0021023210283	547.15	47.54	13.76	42.38	12.91	83.67	21.20
277	26818	RSBL1M0021023210287	545.88	46.98	13.86	42.17	12.95	83.83	21.15
278	26818	RSBL1M0021023210290	546.32	47.06	13.81	42.11	12.97	84.07	21.17
279	26818	RSBL1M0021023210291	545.08	47.81	13.69	42.18	12.92	83.28	21.12
280	26818	RSBL1M0021023210306	547.71	47.25	13.89	42.20	12.98	83.45	21.22
281	26818	RSBL1M0021023210308	548.95	47.71	13.86	42.30	12.98	83.01	21.27
282	26818	RSBL1M0021023210312	545.53	47.84	13.71	42.14	12.95	83.18	21.14
283	26818	RSBL1M0021023210314	545.18	47.04	13.82	42.13	12.94	83.86	21.12
284	26818	RSBL1M0021023210323	546.13	46.93	13.84	42.19	12.94	84.08	21.16
285	26818	RSBL1M0021023210325	545.18	46.94	13.82	42.11	12.95	84.07	21.12
286	26818	RSBL1M0021023210327	548.43	47.62	13.78	42.83	12.81	83.56	21.25
287	26818	RSBL1M0021023210331	546.24	46.88	13.85	42.20	12.94	84.14	21.16
288	26818	RSBL1M0021023210334	546.99	47.46	13.73	42.22	12.96	83.97	21.19
289	26819	RSBL1M0021023210149	547.45	47.32	13.84	42.81	12.79	83.62	21.21
290	26819	RSBL1M0021023210211	549.15	47.13	13.85	42.23	13.01	84.12	21.28
291	26819	RSBL1M0021023210214	546.18	47.49	13.74	42.26	12.92	83.71	21.16
292	26819	RSBL1M0021023210217	548.30	47.24	13.87	42.32	12.96	83.68	21.24
293	26819	RSBL1M0021023210232	549.16	47.37	13.88	42.28	12.99	83.52	21.28
294	26819	RSBL1M0021023210238	548.91	47.70	13.81	42.62	12.88	83.34	21.27
295	26819	RSBL1M0021023210239	547.73	47.18	13.82	42.27	12.96	84.03	21.22
296	26819	RSBL1M0021023210244	547.93	47.45	13.83	42.48	12.90	83.53	21.23
297	26819	RSBL1M0021023210248	549.39	47.41	13.89	42.34	12.98	83.42	21.29
298	26819	RSBL1M0021023210252	545.16	47.42	13.71	42.23	12.91	83.83	21.12
299	26819	RSBL1M0021023210254	546.31	47.51	13.79	42.69	12.80	83.40	21.17
300	26819	RSBL1M0021023210255	546.83	47.82	13.69	42.18	12.96	83.51	21.19
301	26819	RSBL1M0021023210256	548.87	47.21	13.83	42.40	12.95	84.08	21.27
302	26819	RSBL1M0021023210258	548.24	47.56	13.88	42.79	12.81	83.03	21.24
303	26819	RSBL1M0021023210259	548.84	47.42	13.87	42.33	12.97	83.46	21.27
304	26819	RSBL1M0021023210266	548.74	47.10	13.86	42.35	12.96	84.09	21.26
305	26819	RSBL1M0021023210272	548.74	47.77	13.71	42.55	12.90	83.75	21.26
306	26819	RSBL1M0021023210275	546.08	47.35	13.74	42.33	12.90	83.91	21.16
307	26819	RSBL1M0021023210277	548.20	47.68	13.79	42.39	12.93	83.37	21.24
308	26819	RSBL1M0021023210280	547.29	47.60	13.70	42.35	12.92	83.93	21.20
309	26819	RSBL1M0021023210286	546.34	47.43	13.80	42.70	12.80	83.49	21.17
310	26819	RSBL1M0021023210293	546.66	47.10	13.84	42.25	12.94	83.86	21.18
311	26819	RSBL1M0021023210295	549.31	47.38	13.93	42.43	12.95	83.23	21.28
312	26819	RSBL1M0021023210299	547.09	47.18	13.85	42.46	12.88	83.75	21.20
313	26820	RSBL1M0021023210103	545.34	47.49	13.70	42.32	12.89	83.80	21.13
314	26820	RSBL1M0021023210165	548.30	47.35	13.70	42.76	12.82	84.55	21.24
315	26820	RSBL1M0021023210167	548.11	47.13	13.86	42.25	12.97	83.94	21.24
316	26820	RSBL1M0021023210170	547.99	47.03	13.87	42.16	13.00	84.04	21.23
317	26820	RSBL1M0021023210194	547.71	47.17	13.84	42.26	12.96	83.89	21.22
318	26820	RSBL1M0021023210247	548.74	47.35	13.69	42.35	12.96	84.64	21.26
319	26820	RSBL1M0021023210273	548.99	47.11	13.84	42.40	12.95	84.23	21.27
320	26820	RSBL1M0021023210303	547.62	47.83	13.72	42.48	12.89	83.46	21.22
321	26820	RSBL1M0021023210304	546.60	47.38	13.72	42.28	12.93	84.10	21.18
322	26820	RSBL1M0021023210305	545.23	47.48	13.83	42.27	12.90	83.01	21.12
323	26820	RSBL1M0021023210307	546.37	47.42	13.84	42.53	12.85	83.72	21.17
324	26820	RSBL1M0021023210309	549.31	47.07	13.83	42.32	12.90	84.40	21.28

RAYZON SOLAR		Rayzon Solar							
		Flash Test Dimention & Visual Report							
Sr. No.	Pallet ID	Module ID	Pmax (Wp)	Voc (V)	Isc (A)	Vmp (V)	Imp (A)	FF	% Efficiency
325	26820	RSBL1M0021023210310	549.33	47.73	13.75	42.32	12.98	83.67	21.28
326	26820	RSBL1M0021023210311	547.12	47.38	13.71	42.51	12.87	84.24	21.20
327	26820	RSBL1M0021023210316	547.06	47.52	13.80	42.79	12.79	83.46	21.20
328	26820	RSBL1M0021023210318	545.73	47.02	13.83	42.17	12.94	83.95	21.14
329	26820	RSBL1M0021023210320	545.84	47.49	13.73	42.19	12.94	83.72	21.15
330	26820	RSBL1M0021023210321	547.04	47.01	13.85	42.31	12.93	83.99	21.20
331	26820	RSBL1M0021023210329	547.94	47.46	13.79	42.73	12.82	83.72	21.23
332	26820	RSBL1M0021023210330	546.05	47.51	13.72	42.45	12.86	83.81	21.16
333	26820	RSBL1M0021023210332	547.95	47.82	13.70	42.61	12.86	83.64	21.23
334	26820	RSBL1M0021023210333	545.84	47.84	13.74	42.56	12.83	83.06	21.15
335	26820	RSBL1M0021023210335	546.96	46.93	13.81	42.38	12.91	84.41	21.19
336	26820	RSBL1M0021023210337	546.45	47.77	13.78	42.20	12.95	83.05	21.17
337	26828	RSBL1M0290923208681	548.17	47.14	13.84	42.60	12.87	84.04	21.24
338	26828	RSBL1M0290923208689	546.58	47.63	13.82	42.36	12.90	83.02	21.18
339	26828	RSBL1M0290923208698	546.86	47.18	13.89	42.39	12.90	83.46	21.19
340	26828	RSBL1M0290923208727	549.39	47.53	13.90	42.29	12.99	83.17	21.29
341	26828	RSBL1M0290923208783	546.34	47.45	13.87	42.14	12.96	83.04	21.17
342	26828	RSBL1M0290923208800	545.66	47.32	13.82	42.60	12.81	83.46	21.14
343	26828	RSBL1M0290923208817	549.19	47.26	13.86	42.46	12.93	83.84	21.28
344	26828	RSBL1M0290923208832	548.50	47.49	13.78	42.38	12.94	83.80	21.25
345	26828	RSBL1M0290923208864	549.28	47.81	13.78	42.35	12.97	83.39	21.28
346	26828	RSBL1M0290923208874	548.58	47.29	13.83	42.51	12.90	83.87	21.26
347	26828	RSBL1M0290923208942	545.59	47.20	13.85	42.17	12.94	83.49	21.14
348	26828	RSBL1M0290923208969	549.58	47.34	13.85	42.56	12.91	83.83	21.29
349	26828	RSBL1M0290923208998	545.57	47.53	13.80	42.33	12.89	83.15	21.14
350	26828	RSBL1M0290923209200	548.43	47.28	13.81	42.38	12.94	84.01	21.25
351	26828	RSBL1M0290923209253	548.30	47.23	13.80	42.35	12.95	84.15	21.24
352	26828	RSBL1M0021023209292	546.96	47.13	13.77	42.28	12.94	84.25	21.19
353	26828	RSBL1M0021023209351	548.90	47.21	13.80	42.49	12.92	84.26	21.27
354	26828	RSBL1M0021023209410	547.59	47.34	13.88	42.25	12.96	83.32	21.22
355	26828	RSBL1M0021023209456	545.48	47.37	13.77	42.32	12.89	83.65	21.14
356	26828	RSBL1M0021023209457	547.24	47.31	13.77	42.54	12.87	83.99	21.20
357	26828	RSBL1M0021023210161	548.48	47.53	13.84	42.48	12.91	83.38	21.25
358	26828	RSBL1M0021023210180	545.96	47.08	13.88	42.07	12.98	83.58	21.15
359	26828	RSBL1M0021023210289	545.37	47.47	13.79	42.52	12.83	83.31	21.13
360	26828	RSBL1M0021023210328	546.38	46.93	13.82	42.24	12.94	84.28	21.17
361	26835	RSBL1M0021023209674	548.38	47.63	13.75	42.80	12.81	83.76	21.25
362	26835	RSBL1M0021023209987	548.45	47.61	13.69	42.29	12.97	84.13	21.25
363	26835	RSBL1M0021023210001	549.32	47.47	13.72	42.35	12.97	84.34	21.28
364	26835	RSBL1M0021023210012	547.26	47.40	13.74	42.78	12.79	84.04	21.20
365	26835	RSBL1M0021023210022	547.13	47.54	13.69	42.59	12.85	84.05	21.20
366	26835	RSBL1M0021023210035	545.28	47.50	13.72	42.14	12.94	83.68	21.13
367	26835	RSBL1M0021023210051	548.93	47.60	13.76	42.71	12.85	83.84	21.27
368	26835	RSBL1M0021023210094	546.57	47.09	13.85	42.15	12.97	83.81	21.18
369	26835	RSBL1M0021023210096	548.74	47.79	13.69	42.52	12.91	83.87	21.26
370	26835	RSBL1M0021023210116	545.36	47.02	13.86	42.17	12.93	83.69	21.13
371	26835	RSBL1M0021023210123	549.39	47.12	13.85	42.33	12.98	84.17	21.29
372	26835	RSBL1M0021023210130	546.90	47.78	13.75	42.60	12.84	83.25	21.19
373	26835	RSBL1M0021023210141	547.72	47.16	13.88	42.14	13.00	83.67	21.22
374	26835	RSBL1M0021023210169	546.45	47.77	13.74	42.13	12.97	83.26	21.17
375	26835	RSBL1M0021023210172	548.26	47.41	13.74	42.34	12.95	84.18	21.24
376	26835	RSBL1M0021023210179	548.10	47.33	13.91	42.25	12.97	83.29	21.24
377	26835	RSBL1M0021023210190	548.98	47.63	13.80	42.82	12.82	83.52	21.27
378	26835	RSBL1M0021023210198	547.90	47.44	13.69	42.31	12.95	84.36	21.23
379	26835	RSBL1M0021023210225	546.32	47.70	13.76	42.13	12.97	83.23	21.17
380	26835	RSBL1M0021023210253	548.34	47.57	13.84	42.51	12.90	83.30	21.25
381	26835	RSBL1M0021023210265	547.35	47.42	13.72	42.72	12.81	84.11	21.21
382	26835	RSBL1M0021023210285	547.33	47.75	13.72	42.47	12.89	83.54	21.21
383	26835	RSBL1M0021023210298	548.52	47.64	13.79	42.29	12.97	83.51	21.25
384	26835	RSBL1M0021023210300	546.73	47.37	13.71	42.65	12.82	84.17	21.18

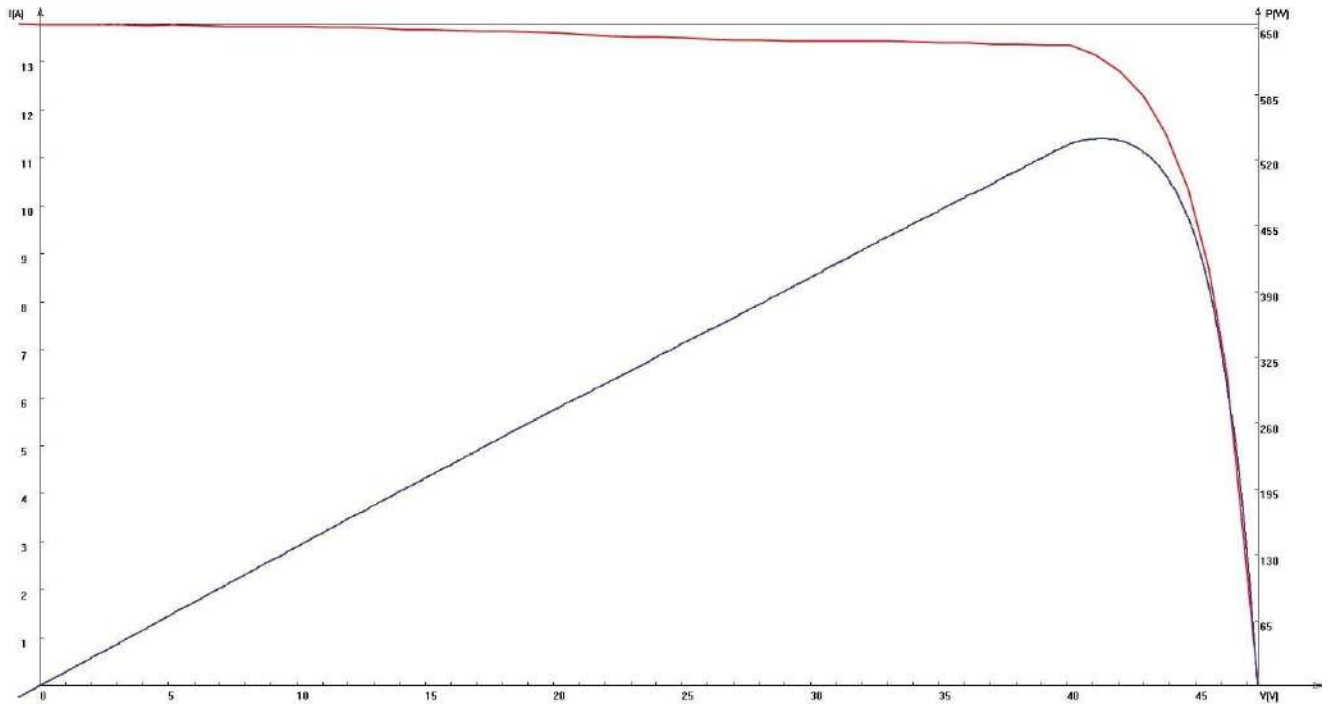


RAYZON SOLAR		RAYZON SOLAR								
		Flash Test Dimension & Visual Report							Date: 10-10-2023	
Sr. No.	Module ID	Isc(A)	Voc(V)	Pm(W)	Ipm(A)	Vpm(V)	Efficiency	F.F.	Dimesion(mm)	Visual
1	RSBL1M0021023209710	13.865	47.601	549.081	13.124	41.838	21.27	83.694	2278*1133*40	Ok
2	RSBL1M0021023210258	13.844	47.656	549.88	13.098	41.982	21.3	83.195	2278*1133*40	Ok



FileName: RSBL1M0021023209710.PDF
Date Created: 2023-10-10

HSPV Solar Simulator
Version 11



ModuleID: RSBL1M0021023209710
Irradiance: 1000.7 W/M2
Tdut: 25.9deg.c

Company: RAYZON

Pmax: 549.081 W
Voc: 47.601 V
Isc: 13.865 A
Vm: 41.838 V
Im: 13.124 A
FF: 83.69%
Rs: 0.270 ohm
Rsh: 29.533 ohm

CellType: Mono
ProductName: Mono PV Module

ModuleArea: 2580974.0mm2

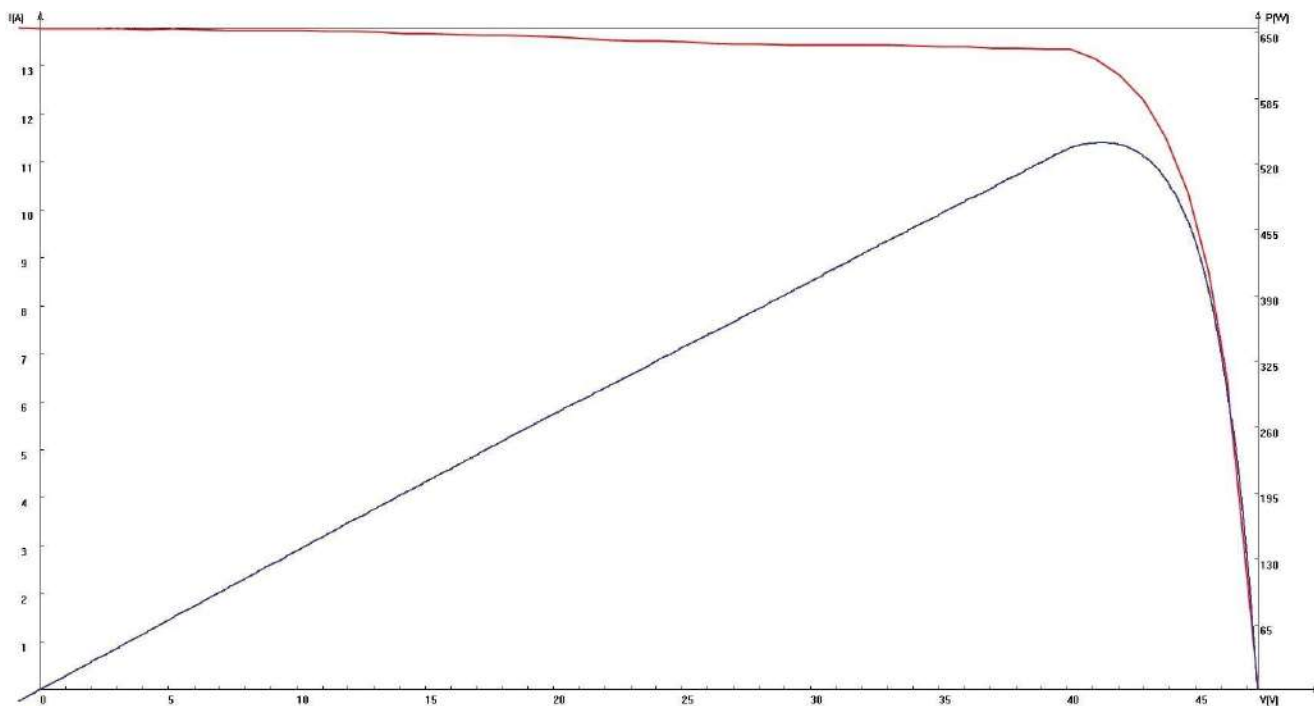
TestDate: 2023-10-10

Eff(Mod): 21.27%



FileName: RSBL1M0021023210258.PDF
Date Created: 2023-10-10

HSPV Solar Simulator
Version 11



ModuleID: RSBL1M0021023210258
Irradiance: 1000.7 W/M2
Tdut: 25.9deg.c

Company: RAYZON

Pmax: 549.88 W
Voc: 47.656 V
Isc: 13.844 A
Vm: 41.982 V
Im: 13.098 A
FF: 83.19%
Rs: 0.263 ohm
Rsh: 32.584 ohm

CellType: Mono
ProductName: Mono PV Module

ModuleArea: 2580974.0mm2

TestDate: 2023-10-10

Eff(Mod): 21.30%



RAYZON SOLAR		Rayzon Solar											
		Hi-Pot & Wet leakage Test Data										Date :-10-10-2023	
Sr. No.	Module ID	DC Test			IR Test			GD Test			Wet Leakage		
		Applied Voltage (V)	Leakage Current (µA)	Test Result	Applied Voltage (V)	Insulation Resistance (GΩ)	Test Result	Applied Current (A)	Resistance (mΩ)	Test Result	Applied Voltage (V)	Insulation Resistance (GΩ)	Test Result
1	RSBL1M0021023209710	4500	0.30	Pass	1500	28.45	Pass	40	11.97	Pass	1500	13.38	Pass
2	RSBL1M0021023210258	4500	0.50	Pass	1500	17.28	Pass	40	11.84	Pass	1500	28.62	Pass

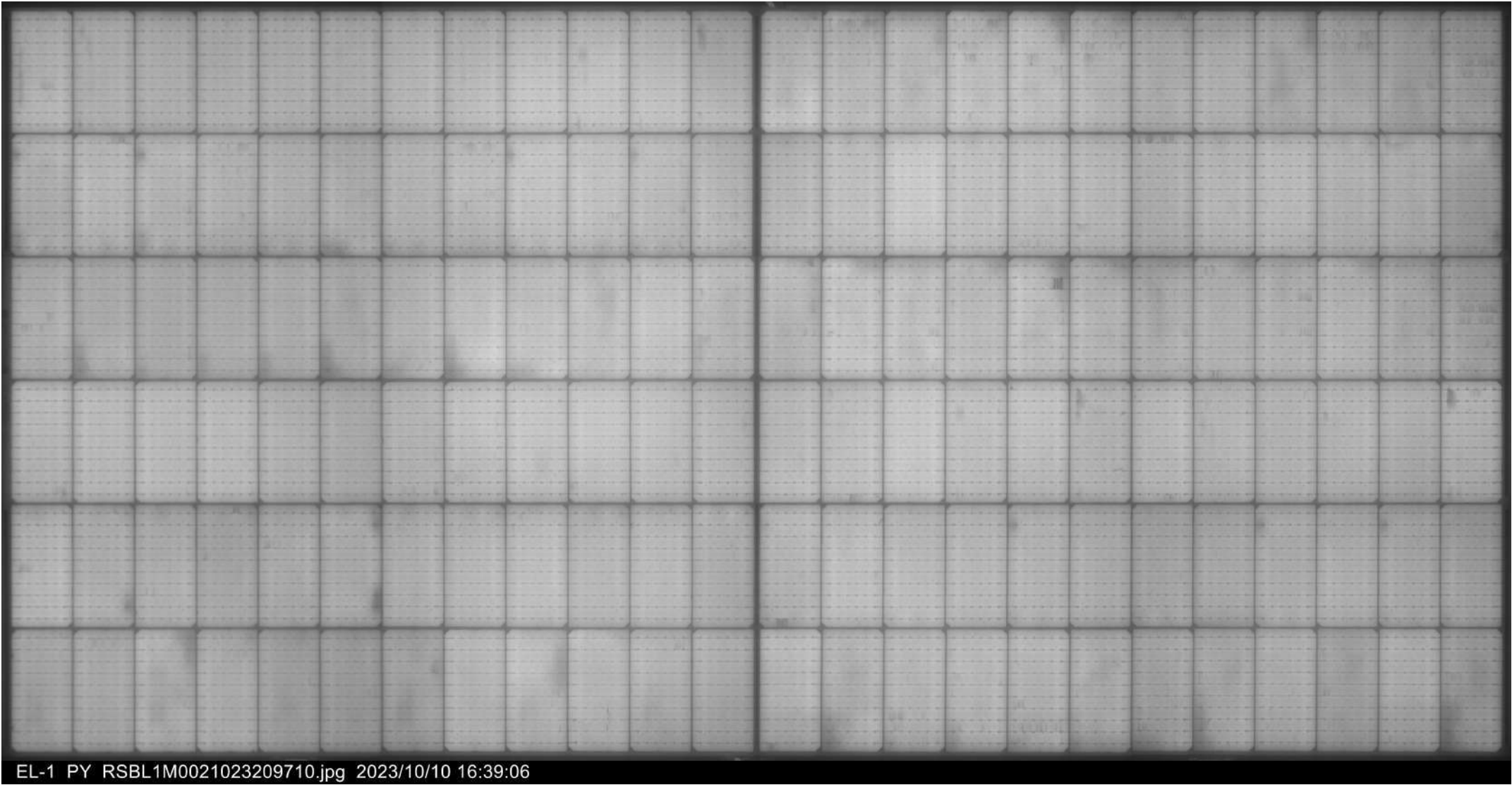


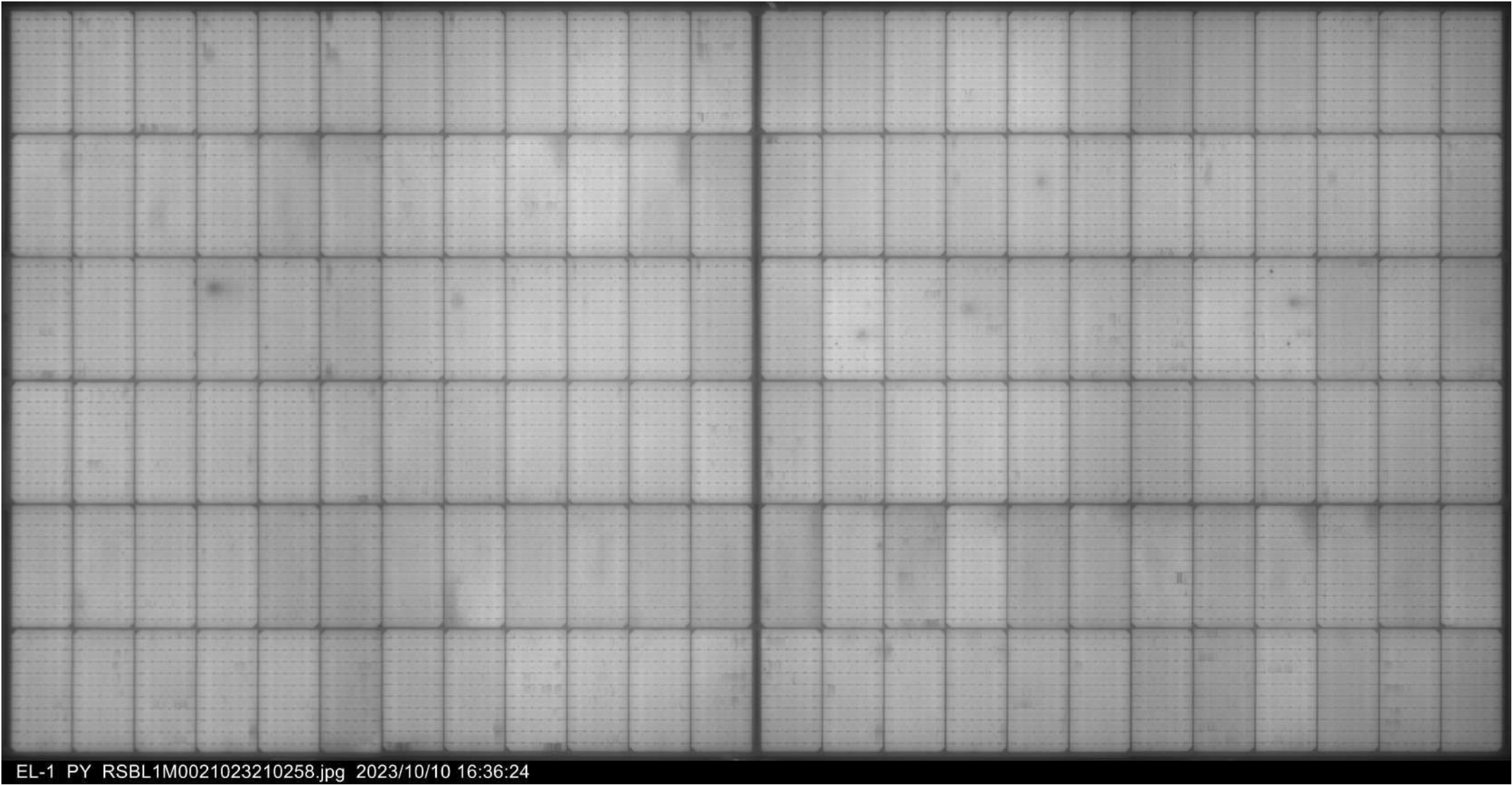
	RAYZON SOLAR		DOC. No.:RS/QC/RT/14	
	Robustness of Terminal Test Report		REV.No./Date: 00/01-04-2022	
			TEST DATE: 10-10-2023	
TYPE OF TEST :		Robustness of Terminal Test		
MODULE SERIAL NO : RSBL1M0021023209710		MODULE TYPE: RS545WC		
APPLIED LOAD FOR TENSILE TEST :		4 kg		
PASSING CRITERIA :	NO EVIDENCE OF MECHANICAL DAMAGE, DEGRADATION OF MODULE SHALL NOT EXCEED 5% OF THE MEASURED VALUE BEFORE TEST, INSULATION SHALL MEET REQUIREMENTS			
TEST PERFORMED		BEFORE TEST	AFTER TEST	REMARKS
	VISUAL INSPECTION	OK	OK	OK
	SUN SIMULATOR TEST	549.081	548.265	OK
OUTPUT POWER DEGRADATION: 0.14%				
Test Done By : Vaibhav			Varification By : Jainesh Shah	



	RAYZON SOLAR		DOC. No.:RRS/QC/RT/15		
	LID Test Report		REV.No./Date: 00/01-04-2022		
			TEST DATE: 10-10-2023		
MODULE SERIAL NO : RSBL1M0021023210258			MODULE TYPE: RS545WC		
CELL MAKE :	YINGFA				
CELL EFFE.	22.90%				
PASSING CRITERIA :	To check module power output not less then 2% of the measured				
TEST PERFORMED		BEFORE TEST	AFTER TEST	DIFFERENT	
	Pmax	549.88	548.12	1.76 W	
	Module Effeciency	21.3	21.23	0.07	
Test Done By: Vaibhav		Varification By : Jainesh Shah			







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Rayzon Solar

Flash Test Report

Sr. No.	Pallet ID	Module ID	Pmax (Wp)	Voc (V)	Isc (A)	Vmp (V)	Imp (A)	FF	% Efficiency
1	26806	RSBL1M0290923209186	548.27	47.27	13.83	42.23	12.98	83.89	21.24
2	26806	RSBL1M0021023209287	546.67	47.42	13.87	42.30	12.92	83.13	21.18
3	26806	RSBL1M0021023209487	547.47	47.36	13.82	42.63	12.84	83.66	21.21
4	26806	RSBL1M0021023209496	549.28	47.37	13.82	42.37	12.96	83.91	21.28
5	26806	RSBL1M0021023209527	549.26	47.29	13.84	42.42	12.95	83.93	21.28
6	26806	RSBL1M0021023209531	545.47	47.23	13.82	42.12	12.95	83.56	21.13
7	26806	RSBL1M0021023209545	548.14	47.17	13.81	42.36	12.94	84.16	21.24
8	26806	RSBL1M0021023209548	549.15	47.24	13.84	42.28	12.99	84.01	21.28
9	26806	RSBL1M0021023209553	549.10	47.25	13.82	42.34	12.97	84.12	21.28
10	26806	RSBL1M0021023209568	548.80	47.18	13.83	42.46	12.93	84.12	21.26
11	26806	RSBL1M0021023209579	545.54	47.38	13.82	42.42	12.86	83.35	21.14
12	26806	RSBL1M0021023209636	546.38	47.69	13.73	42.38	12.89	83.47	21.17
13	26806	RSBL1M0021023209670	548.44	47.28	13.86	42.33	12.96	83.72	21.25
14	26806	RSBL1M0021023209685	548.65	47.60	13.84	42.61	12.88	83.30	21.26
15	26806	RSBL1M0021023209699	548.45	47.58	13.78	42.46	12.92	83.65	21.25
16	26806	RSBL1M0021023209710	546.96	47.32	13.76	42.52	12.86	84.04	21.19
17	26806	RSBL1M0021023209723	548.84	47.49	13.70	42.43	12.94	84.38	21.26
18	26806	RSBL1M0021023209990	549.42	47.36	13.73	42.44	12.95	84.48	21.29
19	26806	RSBL1M0021023210003	548.37	47.52	13.70	42.34	12.95	84.24	21.25
20	26806	RSBL1M0021023210006	548.25	47.34	13.80	42.50	12.90	83.95	21.24
21	26806	RSBL1M0021023210015	549.17	47.46	13.93	42.33	12.98	83.06	21.28
22	26806	RSBL1M0021023210019	546.75	47.62	13.70	42.76	12.79	83.80	21.18
23	26806	RSBL1M0021023210025	546.42	47.53	13.72	42.69	12.80	83.82	21.17
24	26806	RSBL1M0021023210028	548.10	47.85	13.71	42.75	12.82	83.55	21.24
25	26808	RSBL1M0290923208677	548.58	47.23	13.86	42.26	12.98	83.78	21.26
26	26808	RSBL1M0290923208962	549.50	47.37	13.73	42.84	12.83	84.48	21.29
27	26808	RSBL1M0290923208964	548.45	47.29	13.87	42.23	12.99	83.63	21.25
28	26808	RSBL1M0021023209367	547.35	47.51	13.73	42.36	12.92	83.92	21.21
29	26808	RSBL1M0021023209368	548.77	47.28	13.91	42.21	13.00	83.45	21.26
30	26808	RSBL1M0021023209837	548.41	47.34	13.93	42.24	12.98	83.18	21.25
31	26808	RSBL1M0021023209937	546.31	47.55	13.72	42.51	12.85	83.72	21.17
32	26808	RSBL1M0021023209945	548.92	47.70	13.79	42.27	12.99	83.43	21.27
33	26808	RSBL1M0021023209974	547.50	47.40	13.80	42.29	12.95	83.67	21.21
34	26808	RSBL1M0021023209983	545.87	47.41	13.70	42.53	12.83	84.03	21.15
35	26808	RSBL1M0021023209988	548.45	47.27	13.87	42.20	13.00	83.66	21.25
36	26808	RSBL1M0021023209992	548.35	47.31	13.71	42.83	12.80	84.52	21.25
37	26808	RSBL1M0021023209999	547.93	47.72	13.81	42.61	12.86	83.17	21.23
38	26808	RSBL1M0021023210014	546.43	46.99	13.84	42.03	13.00	84.02	21.17
39	26808	RSBL1M0021023210020	546.55	46.95	13.83	42.12	12.98	84.17	21.18
40	26808	RSBL1M0021023210021	549.42	47.69	13.87	42.82	12.83	83.07	21.29
41	26808	RSBL1M0021023210033	548.87	47.34	13.94	42.55	12.90	83.20	21.27
42	26808	RSBL1M0021023210036	547.38	47.01	13.84	42.13	12.99	84.15	21.21
43	26808	RSBL1M0021023210059	546.23	46.97	13.83	42.07	12.98	84.07	21.16
44	26808	RSBL1M0021023210060	548.70	47.61	13.77	42.67	12.86	83.71	21.26
45	26808	RSBL1M0021023210066	548.64	47.00	13.83	42.24	12.99	84.42	21.26
46	26808	RSBL1M0021023210078	549.37	47.08	13.86	42.40	12.96	84.20	21.29
47	26808	RSBL1M0021023210107	548.79	47.85	13.77	42.45	12.93	83.31	21.26
48	26808	RSBL1M0021023210112	547.36	47.56	13.82	42.22	12.97	83.30	21.21
49	26809	RSBL1M0021023209989	548.70	47.67	13.74	42.41	12.94	83.78	21.26
50	26809	RSBL1M0021023209993	546.79	47.71	13.76	42.20	12.96	83.29	21.19
51	26809	RSBL1M0021023209996	546.80	47.66	13.73	42.63	12.83	83.55	21.19
52	26809	RSBL1M0021023209998	548.41	47.84	13.70	42.50	12.91	83.67	21.25
53	26809	RSBL1M0021023210005	546.77	47.33	13.86	42.27	12.94	83.35	21.18
54	26809	RSBL1M0021023210024	546.47	47.65	13.76	42.34	12.91	83.37	21.17
55	26809	RSBL1M0021023210031	548.60	47.41	13.90	42.30	12.97	83.22	21.26
56	26809	RSBL1M0021023210034	548.10	47.54	13.87	42.68	12.84	83.11	21.24
57	26809	RSBL1M0021023210038	545.69	47.55	13.70	42.15	12.95	83.79	21.14
58	26809	RSBL1M0021023210039	546.39	47.74	13.76	42.41	12.89	83.19	21.17
59	26809	RSBL1M0021023210042	545.60	47.55	13.81	42.48	12.84	83.11	21.14
60	26809	RSBL1M0021023210044	546.19	47.32	13.79	42.56	12.84	83.68	21.16
61	26809	RSBL1M0021023210048	547.39	47.84	13.74	42.71	12.82	83.30	21.21
62	26809	RSBL1M0021023210053	547.92	47.76	13.69	42.56	12.87	83.81	21.23
63	26809	RSBL1M0021023210055	546.38	47.84	13.70	42.19	12.95	83.34	21.17
64	26809	RSBL1M0021023210058	548.86	47.73	13.84	42.34	12.96	83.10	21.27
65	26809	RSBL1M0021023210061	546.67	47.51	13.73	42.75	12.79	83.83	21.18
66	26809	RSBL1M0021023210064	546.03	47.56	13.82	42.23	12.93	83.10	21.16
67	26809	RSBL1M0021023210068	547.23	47.61	13.80	42.22	12.96	83.29	21.20
68	26809	RSBL1M0021023210069	547.23	47.05	13.87	42.24	12.96	83.84	21.20
69	26809	RSBL1M0021023210071	548.73	47.58	13.82	42.53	12.90	83.45	21.26
70	26809	RSBL1M0021023210079	545.26	47.49	13.78	42.30	12.89	83.33	21.13
71	26809	RSBL1M0021023210080	545.51	47.56	13.73	42.56	12.82	83.56	21.14
72	26809	RSBL1M0021023210082	547.85	47.70	13.78	42.36	12.93	83.37	21.23
73	26810	RSBL1M0021023209357	547.42	47.45	13.76	42.75	12.80	83.84	21.21

74	26810	RSBL1M0021023209362	546.13	47.42	13.82	42.64	12.81	83.33	21.16
75	26810	RSBL1M0021023209363	546.45	47.35	13.79	42.67	12.81	83.69	21.17
76	26810	RSBL1M0021023209997	546.82	47.33	13.71	42.50	12.87	84.26	21.19
77	26810	RSBL1M0021023210016	547.05	47.63	13.80	42.26	12.94	83.23	21.20
78	26810	RSBL1M0021023210030	549.24	47.34	13.78	42.35	12.97	84.19	21.28
79	26810	RSBL1M0021023210032	549.11	47.48	13.80	42.32	12.98	83.81	21.28
80	26810	RSBL1M0021023210037	547.15	46.98	13.86	42.22	12.96	84.01	21.20
81	26810	RSBL1M0021023210041	549.22	47.44	13.74	42.53	12.91	84.25	21.28
82	26810	RSBL1M0021023210045	547.36	47.68	13.82	42.16	12.98	83.06	21.21
83	26810	RSBL1M0021023210047	549.13	47.61	13.85	42.47	12.93	83.26	21.28
84	26810	RSBL1M0021023210050	546.36	47.55	13.75	42.62	12.82	83.55	21.17
85	26810	RSBL1M0021023210056	545.72	47.85	13.69	42.19	12.94	83.29	21.14
86	26810	RSBL1M0021023210057	548.46	47.46	13.89	42.62	12.87	83.18	21.25
87	26810	RSBL1M0021023210062	547.78	47.60	13.86	42.34	12.94	83.02	21.22
88	26810	RSBL1M0021023210087	549.24	47.78	13.78	42.62	12.89	83.40	21.28
89	26810	RSBL1M0021023210097	547.58	47.45	13.70	42.74	12.81	84.21	21.22
90	26810	RSBL1M0021023210099	549.42	47.45	13.84	42.72	12.86	83.63	21.29
91	26810	RSBL1M0021023210101	547.63	47.34	13.78	42.30	12.95	83.97	21.22
92	26810	RSBL1M0021023210105	548.39	47.56	13.74	42.82	12.81	83.90	21.25
93	26810	RSBL1M0021023210137	548.70	47.37	13.92	42.33	12.96	83.23	21.26
94	26810	RSBL1M0021023210139	546.45	47.39	13.71	42.21	12.95	84.12	21.17
95	26810	RSBL1M0021023210143	547.07	47.36	13.85	42.72	12.81	83.38	21.20
96	26810	RSBL1M0021023210145	546.08	47.41	13.70	42.58	12.83	84.06	21.16
97	26811	RSBL1M0021023209804	548.53	47.58	13.70	42.47	12.92	84.13	21.25
98	26811	RSBL1M0021023209886	548.76	47.34	13.88	42.31	12.97	83.49	21.26
99	26811	RSBL1M0021023209893	547.30	47.49	13.71	42.70	12.82	84.05	21.21
100	26811	RSBL1M0021023209901	546.35	47.55	13.82	42.61	12.82	83.13	21.17
101	26811	RSBL1M0021023209906	546.12	47.45	13.73	42.67	12.80	83.82	21.16
102	26811	RSBL1M0021023209977	548.48	47.51	13.71	42.80	12.81	84.24	21.25
103	26811	RSBL1M0021023209981	548.62	47.35	13.84	42.29	12.97	83.72	21.26
104	26811	RSBL1M0021023210018	547.93	47.77	13.78	42.76	12.81	83.26	21.23
105	26811	RSBL1M0021023210023	546.99	47.57	13.85	42.26	12.94	83.04	21.19
106	26811	RSBL1M0021023210029	546.80	46.96	13.89	42.10	12.99	83.87	21.19
107	26811	RSBL1M0021023210046	546.35	46.94	13.88	42.07	12.99	83.84	21.17
108	26811	RSBL1M0021023210054	546.94	46.97	13.86	42.09	12.99	83.99	21.19
109	26811	RSBL1M0021023210075	547.91	47.00	13.86	42.27	12.96	84.13	21.23
110	26811	RSBL1M0021023210077	547.78	47.75	13.80	42.71	12.83	83.13	21.22
111	26811	RSBL1M0021023210083	546.31	47.13	13.86	42.13	12.97	83.64	21.17
112	26811	RSBL1M0021023210093	547.71	47.73	13.77	42.84	12.79	83.34	21.22
113	26811	RSBL1M0021023210095	546.51	47.00	13.83	42.15	12.97	84.05	21.18
114	26811	RSBL1M0021023210098	547.18	47.02	13.85	42.23	12.96	84.00	21.20
115	26811	RSBL1M0021023210106	548.65	47.53	13.76	42.26	12.98	83.88	21.26
116	26811	RSBL1M0021023210117	549.19	47.46	13.78	42.46	12.93	83.95	21.28
117	26811	RSBL1M0021023210119	548.71	47.42	13.87	42.27	12.98	83.43	21.26
118	26811	RSBL1M0021023210132	549.04	47.34	13.84	42.64	12.88	83.82	21.27
119	26811	RSBL1M0021023210150	547.48	47.78	13.78	42.56	12.86	83.17	21.21
120	26811	RSBL1M0021023210177	547.14	47.34	13.71	42.37	12.91	84.28	21.20
121	26812	RSBL1M0021023209337	546.25	47.85	13.73	42.47	12.86	83.13	21.16
122	26812	RSBL1M0021023209372	549.01	47.35	13.83	42.77	12.84	83.86	21.27
123	26812	RSBL1M0021023209815	549.21	47.73	13.81	42.37	12.96	83.34	21.28
124	26812	RSBL1M0021023209929	545.90	47.58	13.82	42.33	12.90	83.02	21.15
125	26812	RSBL1M0021023209933	549.40	47.43	13.77	42.42	12.95	84.11	21.29
126	26812	RSBL1M0021023209938	548.91	47.48	13.69	42.38	12.95	84.47	21.27
127	26812	RSBL1M0021023209952	548.61	47.82	13.81	42.76	12.83	83.10	21.26
128	26812	RSBL1M0021023209956	549.07	47.35	13.90	42.45	12.93	83.43	21.27
129	26812	RSBL1M0021023209985	547.46	47.40	13.84	42.36	12.92	83.45	21.21
130	26812	RSBL1M0021023210002	547.04	47.58	13.82	42.66	12.82	83.17	21.20
131	26812	RSBL1M0021023210076	548.07	47.75	13.71	42.74	12.82	83.71	21.24
132	26812	RSBL1M0021023210100	546.28	47.48	13.74	42.31	12.91	83.75	21.17
133	26812	RSBL1M0021023210110	546.33	47.04	13.88	42.07	12.99	83.65	21.17
134	26812	RSBL1M0021023210113	549.37	47.07	13.91	42.30	12.99	83.92	21.29
135	26812	RSBL1M0021023210122	549.07	47.30	13.90	42.30	12.98	83.49	21.27
136	26812	RSBL1M0021023210124	545.22	47.67	13.77	42.61	12.80	83.06	21.12
137	26812	RSBL1M0021023210125	547.05	47.08	13.90	42.16	12.98	83.59	21.20
138	26812	RSBL1M0021023210128	548.25	47.03	13.87	42.19	12.99	84.02	21.24
139	26812	RSBL1M0021023210129	546.88	47.84	13.71	42.50	12.87	83.35	21.19
140	26812	RSBL1M0021023210140	549.42	47.12	13.91	42.33	12.98	83.83	21.29
141	26812	RSBL1M0021023210144	548.70	47.24	13.84	42.27	12.98	83.93	21.26
142	26812	RSBL1M0021023210146	547.49	47.14	13.89	42.14	12.99	83.61	21.21
143	26812	RSBL1M0021023210155	548.96	47.74	13.76	42.65	12.87	83.56	21.27
144	26812	RSBL1M0021023210157	548.85	47.13	13.90	42.21	13.00	83.78	21.27
145	26813	RSBL1M0021023209994	548.20	47.37	13.82	42.75	12.83	83.78	21.24
146	26813	RSBL1M0021023210017	549.58	47.07	13.91	42.29	13.00	83.95	21.29
147	26813	RSBL1M0021023210027	546.41	47.78	13.70	42.53	12.85	83.51	21.17
148	26813	RSBL1M0021023210043	548.05	47.12	13.88	42.15	13.00	83.79	21.23
149	26813	RSBL1M0021023210052	545.38	47.72	13.72	42.63	12.79	83.31	21.13
150	26813	RSBL1M0021023210065	548.26	47.65	13.86	42.77	12.82	83.04	21.24
151	26813	RSBL1M0021023210067	547.91	47.48	13.89	42.40	12.92	83.10	21.23

152	26813	RSBL1M0021023210070	547.02	47.54	13.80	42.74	12.80	83.38	21.19
153	26813	RSBL1M0021023210073	548.49	47.75	13.79	42.28	12.97	83.28	21.25
154	26813	RSBL1M0021023210074	548.53	47.60	13.71	42.60	12.88	84.09	21.25
155	26813	RSBL1M0021023210081	549.46	47.33	13.89	42.80	12.84	83.59	21.29
156	26813	RSBL1M0021023210084	546.62	47.31	13.76	42.32	12.92	83.94	21.18
157	26813	RSBL1M0021023210086	548.98	47.82	13.75	42.71	12.85	83.49	21.27
158	26813	RSBL1M0021023210088	548.35	47.35	13.71	42.42	12.93	84.49	21.25
159	26813	RSBL1M0021023210089	549.14	47.42	13.91	42.51	12.92	83.23	21.28
160	26813	RSBL1M0021023210091	545.68	47.41	13.76	42.14	12.95	83.67	21.14
161	26813	RSBL1M0021023210102	545.11	47.06	13.85	42.06	12.96	83.66	21.12
162	26813	RSBL1M0021023210108	548.81	47.67	13.70	42.47	12.92	84.07	21.26
163	26813	RSBL1M0021023210114	548.26	47.84	13.80	42.68	12.85	83.03	21.24
164	26813	RSBL1M0021023210120	547.20	47.73	13.75	42.79	12.79	83.39	21.20
165	26813	RSBL1M0021023210121	549.35	47.36	13.87	42.49	12.93	83.62	21.28
166	26813	RSBL1M0021023210131	547.33	47.35	13.71	42.61	12.85	84.31	21.21
167	26813	RSBL1M0021023210134	546.69	47.76	13.71	42.51	12.86	83.48	21.18
168	26813	RSBL1M0021023210168	546.80	47.44	13.81	42.35	12.91	83.48	21.19
169	26814	RSBL1M0021023209910	548.97	47.44	13.84	42.81	12.82	83.64	21.27
170	26814	RSBL1M0021023209949	545.44	47.32	13.72	42.38	12.87	84.02	21.13
171	26814	RSBL1M0021023210109	547.22	47.74	13.71	42.49	12.88	83.63	21.20
172	26814	RSBL1M0021023210111	545.64	47.81	13.73	42.36	12.88	83.12	21.14
173	26814	RSBL1M0021023210115	547.29	47.50	13.79	42.24	12.96	83.53	21.20
174	26814	RSBL1M0021023210127	547.30	47.31	13.73	42.69	12.82	84.28	21.21
175	26814	RSBL1M0021023210135	548.05	47.54	13.85	42.64	12.85	83.25	21.23
176	26814	RSBL1M0021023210151	547.14	47.73	13.74	42.62	12.84	83.42	21.20
177	26814	RSBL1M0021023210166	547.00	47.49	13.85	42.69	12.81	83.14	21.19
178	26814	RSBL1M0021023210176	546.64	47.79	13.72	42.52	12.86	83.38	21.18
179	26814	RSBL1M0021023210178	548.18	47.80	13.74	42.59	12.87	83.48	21.24
180	26814	RSBL1M0021023210184	546.69	47.38	13.83	42.68	12.81	83.42	21.18
181	26814	RSBL1M0021023210185	548.94	47.72	13.71	42.75	12.84	83.90	21.27
182	26814	RSBL1M0021023210186	548.45	47.76	13.71	42.60	12.88	83.79	21.25
183	26814	RSBL1M0021023210187	548.55	47.34	13.88	42.38	12.94	83.50	21.25
184	26814	RSBL1M0021023210192	547.18	47.54	13.73	42.61	12.84	83.80	21.20
185	26814	RSBL1M0021023210193	546.76	47.46	13.80	42.37	12.91	83.48	21.18
186	26814	RSBL1M0021023210199	547.06	47.61	13.78	42.64	12.83	83.36	21.20
187	26814	RSBL1M0021023210218	547.23	47.48	13.77	42.54	12.86	83.69	21.20
188	26814	RSBL1M0021023210219	547.38	47.81	13.70	42.51	12.88	83.55	21.21
189	26814	RSBL1M0021023210222	548.89	47.32	13.73	42.31	12.97	84.48	21.27
190	26814	RSBL1M0021023210223	547.92	47.67	13.82	42.64	12.85	83.18	21.23
191	26814	RSBL1M0021023210227	545.89	47.56	13.69	42.59	12.82	83.83	21.15
192	26814	RSBL1M0021023210237	546.91	47.73	13.76	42.65	12.82	83.25	21.19
193	26815	RSBL1M0021023209978	548.81	47.51	13.77	42.78	12.83	83.87	21.26
194	26815	RSBL1M0021023210092	546.35	47.61	13.77	42.55	12.84	83.35	21.17
195	26815	RSBL1M0021023210104	548.75	47.55	13.73	42.57	12.89	84.05	21.26
196	26815	RSBL1M0021023210142	549.13	47.39	13.80	42.63	12.88	83.94	21.28
197	26815	RSBL1M0021023210154	548.19	47.37	13.81	42.40	12.93	83.79	21.24
198	26815	RSBL1M0021023210156	548.68	47.80	13.76	42.63	12.87	83.39	21.26
199	26815	RSBL1M0021023210158	546.39	47.51	13.81	42.57	12.84	83.28	21.17
200	26815	RSBL1M0021023210164	547.74	47.44	13.94	41.96	13.06	82.86	21.22
201	26815	RSBL1M0021023210171	548.70	47.52	13.90	42.29	12.98	83.06	21.26
202	26815	RSBL1M0021023210173	545.43	47.78	13.72	42.66	12.79	83.19	21.13
203	26815	RSBL1M0021023210175	547.91	47.47	13.90	42.65	12.85	83.05	21.23
204	26815	RSBL1M0021023210181	549.41	47.61	13.85	42.71	12.87	83.32	21.29
205	26815	RSBL1M0021023210182	548.93	47.69	13.78	42.49	12.92	83.52	21.27
206	26815	RSBL1M0021023210196	545.91	47.42	13.73	42.53	12.84	83.84	21.15
207	26815	RSBL1M0021023210203	546.48	47.61	13.73	42.57	12.84	83.60	21.17
208	26815	RSBL1M0021023210205	547.72	47.39	13.76	42.63	12.85	83.98	21.22
209	26815	RSBL1M0021023210206	548.93	47.56	13.80	42.54	12.90	83.65	21.27
210	26815	RSBL1M0021023210207	545.50	47.76	13.71	42.36	12.88	83.31	21.14
211	26815	RSBL1M0021023210209	546.01	47.33	13.80	42.68	12.79	83.58	21.16
212	26815	RSBL1M0021023210210	548.62	47.47	13.73	42.40	12.94	84.16	21.26
213	26815	RSBL1M0021023210213	547.64	47.59	13.81	42.17	12.99	83.32	21.22
214	26815	RSBL1M0021023210216	546.39	47.44	13.74	42.29	12.92	83.84	21.17
215	26815	RSBL1M0021023210221	547.03	47.62	13.71	42.23	12.95	83.81	21.19
216	26815	RSBL1M0021023210257	547.94	47.35	13.71	42.65	12.85	84.40	21.23
217	26816	RSBL1M0021023210072	549.49	47.20	13.86	42.31	12.99	83.98	21.29
218	26816	RSBL1M0021023210090	547.90	47.12	13.87	42.27	12.96	83.82	21.23
219	26816	RSBL1M0021023210133	546.72	47.12	13.91	42.16	12.97	83.40	21.18
220	26816	RSBL1M0021023210160	547.81	47.35	13.92	42.41	12.92	83.14	21.22
221	26816	RSBL1M0021023210174	546.73	47.82	13.74	42.16	12.97	83.22	21.18
222	26816	RSBL1M0021023210183	546.64	47.60	13.78	42.19	12.96	83.35	21.18
223	26816	RSBL1M0021023210195	548.56	47.47	13.72	42.72	12.84	84.21	21.25
224	26816	RSBL1M0021023210201	547.95	47.18	13.92	42.18	12.99	83.45	21.23
225	26816	RSBL1M0021023210208	547.66	47.14	13.91	42.23	12.97	83.53	21.22
226	26816	RSBL1M0021023210220	547.20	47.21	13.88	42.17	12.98	83.51	21.20
227	26816	RSBL1M0021023210224	549.51	47.36	13.76	42.65	12.88	84.31	21.29
228	26816	RSBL1M0021023210228	546.71	47.45	13.69	42.44	12.88	84.18	21.18
229	26816	RSBL1M0021023210229	546.67	47.59	13.83	42.52	12.86	83.07	21.18

230	26816	RSBL1M0021023210231	547.19	47.43	13.88	42.46	12.89	83.11	21.20
231	26816	RSBL1M0021023210235	547.61	47.79	13.73	42.13	13.00	83.47	21.22
232	26816	RSBL1M0021023210236	547.47	47.09	13.81	42.36	12.92	84.19	21.21
233	26816	RSBL1M0021023210240	547.61	47.39	13.84	42.43	12.91	83.48	21.22
234	26816	RSBL1M0021023210245	547.36	47.08	13.88	42.29	12.94	83.77	21.21
235	26816	RSBL1M0021023210250	545.55	47.03	13.79	42.19	12.93	84.13	21.14
236	26816	RSBL1M0021023210251	546.09	47.39	13.86	42.12	12.97	83.12	21.16
237	26816	RSBL1M0021023210271	546.19	47.35	13.73	42.39	12.89	83.99	21.16
238	26816	RSBL1M0021023210276	547.99	47.15	13.83	42.29	12.96	84.00	21.23
239	26816	RSBL1M0021023210281	545.79	47.49	13.77	42.17	12.94	83.48	21.15
240	26816	RSBL1M0021023210284	546.37	47.34	13.72	42.52	12.85	84.13	21.17
241	26817	RSBL1M0021023210085	547.77	47.64	13.79	42.29	12.95	83.39	21.22
242	26817	RSBL1M0021023210147	549.08	47.50	13.77	42.40	12.95	83.95	21.27
243	26817	RSBL1M0021023210148	548.77	47.51	13.78	42.44	12.93	83.83	21.26
244	26817	RSBL1M0021023210153	549.21	47.17	13.88	42.35	12.97	83.89	21.28
245	26817	RSBL1M0021023210159	547.51	47.61	13.81	42.15	12.99	83.26	21.21
246	26817	RSBL1M0021023210163	547.98	47.61	13.86	42.79	12.81	83.02	21.23
247	26817	RSBL1M0021023210188	548.11	47.37	13.73	42.25	12.97	84.30	21.24
248	26817	RSBL1M0021023210200	548.69	47.73	13.72	42.80	12.82	83.82	21.26
249	26817	RSBL1M0021023210202	548.71	47.46	13.70	42.69	12.85	84.37	21.26
250	26817	RSBL1M0021023210204	546.58	47.79	13.76	42.38	12.90	83.12	21.18
251	26817	RSBL1M0021023210212	547.63	47.83	13.75	42.49	12.89	83.28	21.22
252	26817	RSBL1M0021023210215	546.98	47.33	13.80	42.79	12.78	83.72	21.19
253	26817	RSBL1M0021023210226	548.86	47.76	13.80	42.70	12.86	83.27	21.27
254	26817	RSBL1M0021023210230	547.79	47.41	13.78	42.16	12.99	83.84	21.22
255	26817	RSBL1M0021023210233	546.84	47.81	13.74	42.45	12.88	83.24	21.19
256	26817	RSBL1M0021023210243	548.38	47.53	13.80	42.73	12.84	83.61	21.25
257	26817	RSBL1M0021023210261	547.98	47.80	13.80	42.17	13.00	83.09	21.23
258	26817	RSBL1M0021023210262	549.19	47.40	13.90	42.33	12.97	83.35	21.28
259	26817	RSBL1M0021023210264	547.09	47.74	13.79	42.19	12.97	83.13	21.20
260	26817	RSBL1M0021023210267	548.25	47.57	13.75	42.28	12.97	83.83	21.24
261	26817	RSBL1M0021023210274	548.51	47.72	13.76	42.67	12.85	83.53	21.25
262	26817	RSBL1M0021023210297	545.79	47.36	13.85	42.29	12.91	83.21	21.15
263	26817	RSBL1M0021023210301	547.07	47.53	13.71	42.46	12.88	83.93	21.20
264	26817	RSBL1M0021023210302	547.29	46.95	13.88	42.05	13.02	84.00	21.21
265	26818	RSBL1M0021023210152	546.99	47.67	13.72	42.27	12.94	83.64	21.19
266	26818	RSBL1M0021023210191	547.13	46.99	13.87	42.19	12.97	83.96	21.20
267	26818	RSBL1M0021023210234	548.19	47.17	13.87	42.21	12.99	83.78	21.24
268	26818	RSBL1M0021023210241	546.74	47.47	13.84	42.14	12.98	83.21	21.18
269	26818	RSBL1M0021023210263	545.44	47.46	13.71	42.49	12.84	83.85	21.13
270	26818	RSBL1M0021023210268	549.10	47.35	13.87	42.32	12.97	83.60	21.27
271	26818	RSBL1M0021023210269	547.17	46.95	13.85	42.37	12.91	84.15	21.20
272	26818	RSBL1M0021023210270	547.59	47.50	13.76	42.25	12.96	83.80	21.22
273	26818	RSBL1M0021023210278	548.08	47.59	13.83	42.34	12.95	83.30	21.24
274	26818	RSBL1M0021023210279	546.49	46.99	13.83	42.23	12.94	84.12	21.17
275	26818	RSBL1M0021023210282	547.66	47.15	13.83	42.26	12.96	83.96	21.22
276	26818	RSBL1M0021023210283	547.15	47.54	13.76	42.38	12.91	83.67	21.20
277	26818	RSBL1M0021023210287	545.88	46.98	13.86	42.17	12.95	83.83	21.15
278	26818	RSBL1M0021023210290	546.32	47.06	13.81	42.11	12.97	84.07	21.17
279	26818	RSBL1M0021023210291	545.08	47.81	13.69	42.18	12.92	83.28	21.12
280	26818	RSBL1M0021023210306	547.71	47.25	13.89	42.20	12.98	83.45	21.22
281	26818	RSBL1M0021023210308	548.95	47.71	13.86	42.30	12.98	83.01	21.27
282	26818	RSBL1M0021023210312	545.53	47.84	13.71	42.14	12.95	83.18	21.14
283	26818	RSBL1M0021023210314	545.18	47.04	13.82	42.13	12.94	83.86	21.12
284	26818	RSBL1M0021023210323	546.13	46.93	13.84	42.19	12.94	84.08	21.16
285	26818	RSBL1M0021023210325	545.18	46.94	13.82	42.11	12.95	84.07	21.12
286	26818	RSBL1M0021023210327	548.43	47.62	13.78	42.83	12.81	83.56	21.25
287	26818	RSBL1M0021023210331	546.24	46.88	13.85	42.20	12.94	84.14	21.16
288	26818	RSBL1M0021023210334	546.99	47.46	13.73	42.22	12.96	83.97	21.19
289	26819	RSBL1M0021023210149	547.45	47.32	13.84	42.81	12.79	83.62	21.21
290	26819	RSBL1M0021023210211	549.15	47.13	13.85	42.23	13.01	84.12	21.28
291	26819	RSBL1M0021023210214	546.18	47.49	13.74	42.26	12.92	83.71	21.16
292	26819	RSBL1M0021023210217	548.30	47.24	13.87	42.32	12.96	83.68	21.24
293	26819	RSBL1M0021023210232	549.16	47.37	13.88	42.28	12.99	83.52	21.28
294	26819	RSBL1M0021023210238	548.91	47.70	13.81	42.62	12.88	83.34	21.27
295	26819	RSBL1M0021023210239	547.73	47.18	13.82	42.27	12.96	84.03	21.22
296	26819	RSBL1M0021023210244	547.93	47.45	13.83	42.48	12.90	83.53	21.23
297	26819	RSBL1M0021023210248	549.39	47.41	13.89	42.34	12.98	83.42	21.29
298	26819	RSBL1M0021023210252	545.16	47.42	13.71	42.23	12.91	83.83	21.12
299	26819	RSBL1M0021023210254	546.31	47.51	13.79	42.69	12.80	83.40	21.17
300	26819	RSBL1M0021023210255	546.83	47.82	13.69	42.18	12.96	83.51	21.19
301	26819	RSBL1M0021023210256	548.87	47.21	13.83	42.40	12.95	84.08	21.27
302	26819	RSBL1M0021023210258	548.24	47.56	13.88	42.79	12.81	83.03	21.24
303	26819	RSBL1M0021023210259	548.84	47.42	13.87	42.33	12.97	83.46	21.27
304	26819	RSBL1M0021023210266	548.74	47.10	13.86	42.35	12.96	84.09	21.26
305	26819	RSBL1M0021023210272	548.74	47.77	13.71	42.55	12.90	83.75	21.26
306	26819	RSBL1M0021023210275	546.08	47.35	13.74	42.33	12.90	83.91	21.16
307	26819	RSBL1M0021023210277	548.20	47.68	13.79	42.39	12.93	83.37	21.24

308	26819	RSBL1M0021023210280	547.29	47.60	13.70	42.35	12.92	83.93	21.20
309	26819	RSBL1M0021023210286	546.34	47.43	13.80	42.70	12.80	83.49	21.17
310	26819	RSBL1M0021023210293	546.66	47.10	13.84	42.25	12.94	83.86	21.18
311	26819	RSBL1M0021023210295	549.31	47.38	13.93	42.43	12.95	83.23	21.28
312	26819	RSBL1M0021023210299	547.09	47.18	13.85	42.46	12.88	83.75	21.20
313	26820	RSBL1M0021023210103	545.34	47.49	13.70	42.32	12.89	83.80	21.13
314	26820	RSBL1M0021023210165	548.30	47.35	13.70	42.76	12.82	84.55	21.24
315	26820	RSBL1M0021023210167	548.11	47.13	13.86	42.25	12.97	83.94	21.24
316	26820	RSBL1M0021023210170	547.99	47.03	13.87	42.16	13.00	84.04	21.23
317	26820	RSBL1M0021023210194	547.71	47.17	13.84	42.26	12.96	83.89	21.22
318	26820	RSBL1M0021023210247	548.74	47.35	13.69	42.35	12.96	84.64	21.26
319	26820	RSBL1M0021023210273	548.99	47.11	13.84	42.40	12.95	84.23	21.27
320	26820	RSBL1M0021023210303	547.62	47.83	13.72	42.48	12.89	83.46	21.22
321	26820	RSBL1M0021023210304	546.60	47.38	13.72	42.28	12.93	84.10	21.18
322	26820	RSBL1M0021023210305	545.23	47.48	13.83	42.27	12.90	83.01	21.12
323	26820	RSBL1M0021023210307	546.37	47.42	13.84	42.53	12.85	83.22	21.17
324	26820	RSBL1M0021023210309	549.31	47.07	13.83	42.32	12.98	84.40	21.28
325	26820	RSBL1M0021023210310	549.33	47.73	13.75	42.32	12.98	83.67	21.28
326	26820	RSBL1M0021023210311	547.12	47.38	13.71	42.51	12.87	84.24	21.20
327	26820	RSBL1M0021023210316	547.06	47.52	13.80	42.79	12.79	83.46	21.20
328	26820	RSBL1M0021023210318	545.73	47.02	13.83	42.17	12.94	83.95	21.14
329	26820	RSBL1M0021023210320	545.84	47.49	13.73	42.19	12.94	83.72	21.15
330	26820	RSBL1M0021023210321	547.04	47.01	13.85	42.31	12.93	83.99	21.20
331	26820	RSBL1M0021023210329	547.94	47.46	13.79	42.73	12.82	83.72	21.23
332	26820	RSBL1M0021023210330	546.05	47.51	13.72	42.45	12.86	83.81	21.16
333	26820	RSBL1M0021023210332	547.95	47.82	13.70	42.61	12.86	83.64	21.23
334	26820	RSBL1M0021023210333	545.84	47.84	13.74	42.56	12.83	83.06	21.15
335	26820	RSBL1M0021023210335	546.96	46.93	13.81	42.38	12.91	84.41	21.19
336	26820	RSBL1M0021023210337	546.45	47.77	13.78	42.20	12.95	83.05	21.17
337	26828	RSBL1M0290923208681	548.17	47.14	13.84	42.60	12.87	84.04	21.24
338	26828	RSBL1M0290923208689	546.58	47.63	13.82	42.36	12.90	83.02	21.18
339	26828	RSBL1M0290923208698	546.86	47.18	13.89	42.39	12.90	83.46	21.19
340	26828	RSBL1M0290923208727	549.39	47.53	13.90	42.29	12.99	83.17	21.29
341	26828	RSBL1M0290923208783	546.34	47.45	13.87	42.14	12.96	83.04	21.17
342	26828	RSBL1M0290923208800	545.66	47.32	13.82	42.60	12.81	83.46	21.14
343	26828	RSBL1M0290923208817	549.19	47.26	13.86	42.46	12.93	83.84	21.28
344	26828	RSBL1M0290923208832	548.50	47.49	13.78	42.38	12.94	83.80	21.25
345	26828	RSBL1M0290923208864	549.28	47.81	13.78	42.35	12.97	83.39	21.28
346	26828	RSBL1M0290923208874	548.58	47.29	13.83	42.51	12.90	83.87	21.26
347	26828	RSBL1M0290923208942	545.59	47.20	13.85	42.17	12.94	83.49	21.14
348	26828	RSBL1M0290923208969	549.58	47.34	13.85	42.56	12.91	83.83	21.29
349	26828	RSBL1M0290923208998	545.57	47.53	13.80	42.33	12.89	83.15	21.14
350	26828	RSBL1M0290923209200	548.43	47.28	13.81	42.38	12.94	84.01	21.25
351	26828	RSBL1M0290923209253	548.30	47.23	13.80	42.35	12.95	84.15	21.24
352	26828	RSBL1M0021023209292	546.96	47.13	13.77	42.28	12.94	84.25	21.19
353	26828	RSBL1M0021023209351	548.90	47.21	13.80	42.49	12.92	84.26	21.27
354	26828	RSBL1M0021023209410	547.59	47.34	13.88	42.25	12.96	83.32	21.22
355	26828	RSBL1M0021023209456	545.48	47.37	13.77	42.32	12.89	83.65	21.14
356	26828	RSBL1M0021023209457	547.24	47.31	13.77	42.54	12.87	83.99	21.20
357	26828	RSBL1M0021023210161	548.48	47.53	13.84	42.48	12.91	83.38	21.25
358	26828	RSBL1M0021023210180	545.96	47.08	13.88	42.07	12.98	83.58	21.15
359	26828	RSBL1M0021023210289	545.37	47.47	13.79	42.52	12.83	83.31	21.13
360	26828	RSBL1M0021023210328	546.38	46.93	13.82	42.24	12.94	84.28	21.17
361	26835	RSBL1M0021023209674	548.38	47.63	13.75	42.80	12.81	83.76	21.25
362	26835	RSBL1M0021023209987	548.45	47.61	13.69	42.29	12.97	84.13	21.25
363	26835	RSBL1M0021023210001	549.32	47.47	13.72	42.35	12.97	84.34	21.28
364	26835	RSBL1M0021023210012	547.26	47.40	13.74	42.78	12.79	84.04	21.20
365	26835	RSBL1M0021023210022	547.13	47.54	13.69	42.59	12.85	84.05	21.20
366	26835	RSBL1M0021023210035	545.28	47.50	13.72	42.14	12.94	83.68	21.13
367	26835	RSBL1M0021023210051	548.93	47.60	13.76	42.71	12.85	83.84	21.27
368	26835	RSBL1M0021023210094	546.57	47.09	13.85	42.15	12.97	83.81	21.18
369	26835	RSBL1M0021023210096	548.74	47.79	13.69	42.52	12.91	83.87	21.26
370	26835	RSBL1M0021023210116	545.36	47.02	13.86	42.17	12.93	83.69	21.13
371	26835	RSBL1M0021023210123	549.39	47.12	13.85	42.33	12.98	84.17	21.29
372	26835	RSBL1M0021023210130	546.90	47.78	13.75	42.60	12.84	83.25	21.19
373	26835	RSBL1M0021023210141	547.72	47.16	13.88	42.14	13.00	83.67	21.22
374	26835	RSBL1M0021023210169	546.45	47.77	13.74	42.13	12.97	83.26	21.17
375	26835	RSBL1M0021023210172	548.26	47.41	13.74	42.34	12.95	84.18	21.24
376	26835	RSBL1M0021023210179	548.10	47.33	13.91	42.25	12.97	83.29	21.24
377	26835	RSBL1M0021023210190	548.98	47.63	13.80	42.82	12.82	83.52	21.27
378	26835	RSBL1M0021023210198	547.90	47.44	13.69	42.31	12.95	84.36	21.23
379	26835	RSBL1M0021023210225	546.32	47.70	13.76	42.13	12.97	83.23	21.17
380	26835	RSBL1M0021023210253	548.34	47.57	13.84	42.51	12.90	83.30	21.25
381	26835	RSBL1M0021023210265	547.35	47.42	13.72	42.72	12.81	84.11	21.21
382	26835	RSBL1M0021023210285	547.33	47.75	13.72	42.47	12.89	83.54	21.21
383	26835	RSBL1M0021023210298	548.52	47.64	13.79	42.29	12.97	83.51	21.25
384	26835	RSBL1M0021023210300	546.73	47.37	13.71	42.65	12.82	84.17	21.18



RE: !! Solar Modules Virtual Inspection Regd. !! TRAVANCORE TITANIUM PRODUCTS LTD

ANERT Projects <projects@anert.in>

Thu, Oct 12, 2023 at 11:06 AM

To: akshayraj.k@enerture.co.in

Cc: shubham@enerture.co.in, Bhairaw Mandal <bhairaw@enerture.co.in>, Apar Chitransh <Apar.chitransh@enerture.co.in>, ankur <ankur.gupta@enerture.co.in>, Parvendar Singh <parvendar.singh@enerture.co.in>, Mahesh <mahesh@enerture.co.in>, Santosh Kumar <santosh@enerture.co.in>, ANERT 2K2K <anert2020@anert.in>, solarcity tvn <solarcitytvn@gmail.com>, Chief Technical Manager ANERT <ctm@anert.in>, rampintu150@gmail.com, Arman Malik <arman.malik@enerture.co.in>, pintu@enerture.co.in

Dear Akshay,

With reference to the tests done on 10/10/2023 and reports forwarded, clearance is herewith provided for dispatch of solar modules to the site for installation.

On Wed, 11 Oct 2023 at 16:57, Akshay Raj <akshayraj.k@enerture.co.in> wrote:

Dear Sir/Madam,

Kindly find the attached Inspection report. Request you to kindly approve the same so that we can dispatch it immediately.

Thanks and Regards,

Akshay Raj Kulshreshtha

Sr. Procurement Manager

Enerture Technologies Pvt Ltd.

ABL Workspaces, Celebration Gardens, NH 8, Adjoining Shiv Murti, Opp IGI Airport, New Delhi, Delhi 110037

M: +91 9999399307 • E-mail: akshayraj.k@enerture.co.in



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From: Akshay Raj <akshayraj.k@enerture.co.in>

Sent: 10 October 2023 13:07

To: 'ANERT Projects' <projects@anert.in>; 'shubham@enerture.co.in' <shubham@enerture.co.in>

Cc: 'Bhairaw Mandal' <bhairaw@enerture.co.in>; 'Apar Chitransh' <Apar.chitransh@enerture.co.in>; 'ankur' <ankur.gupta@enerture.co.in>; 'Parvendar Singh' <parvendar.singh@enerture.co.in>; 'Mahesh' <mahesh@enerture.co.in>; 'Santosh Kumar' <santosh@enerture.co.in>; 'ANERT 2K2K' <anert2020@anert.in>; 'solarcity tvn' <solarcitytvn@gmail.com>; 'Chief Technical Manager ANERT' <ctm@anert.in>; 'rampintu150@gmail.com' <rampintu150@gmail.com>; 'Arman Malik'

<arman.malik@enerture.co.in>; 'pintu@enerture.co.in' <pintu@enerture.co.in>

Subject: RE: !! Solar Modules Virtual Inspection Regd. !! TRAVANCORE TITANIUM PRODUCTS LTD

Dear Sir,

Kindly find the link for meeting, request you to please join for module inspection,

Topic: Enerture PDI

Time: Oct 10, 2023 02:45 PM Mumbai, Kolkata, New Delhi

Join Zoom Meeting

<https://us04web.zoom.us/j/9214495255?pwd=ZVBvc0NEQ3R3VjJnU1U4dnkvR2I1UT09>

Meeting ID: 921 449 5255

Passcode: pqrW7d

Please share the Module serial number from FTR which was shared with you so that we can ready the module at inspection place to save precious time.

Thanks and Regards,

Akshay Raj Kulshreshtha

Sr. Procurement Manager

Enerture Technologies Pvt Ltd.

ABL Workspaces, Celebration Gardens, NH 8, Adjoining Shiv
Murti, Opp IGI Airport, New Delhi, Delhi 110037

M: +91 9999399307 • E-mail: akshayraj.k@enerture.co.in



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From: Akshay Raj <akshayraj.k@enerture.co.in>

Sent: 09 October 2023 14:38

To: 'ANERT Projects' <projects@anert.in>; 'shubham@enerture.co.in' <shubham@enerture.co.in>

Cc: 'Bhairaw Mandal' <bhairaw@enerture.co.in>; 'Apar Chitransh' <Apar.chitransh@enerture.co.in>; 'ankur' <ankur.gupta@enerture.co.in>; 'Parvendar Singh' <parvendar.singh@enerture.co.in>; 'Mahesh' <mahesh@enerture.co.in>; 'Santosh Kumar' <santosh@enerture.co.in>; 'ANERT 2K2K' <anert2020@anert.in>; 'solarcity tvn' <solarcitytvn@gmail.com>; 'Chief Technical Manager ANERT' <ctm@anert.in>; 'rampintu150@gmail.com' <rampintu150@gmail.com>; 'Arman Malik' <arman.malik@enerture.co.in>; 'pintu@enerture.co.in' <pintu@enerture.co.in>

Subject: RE: !! Solar Modules Virtual Inspection Regd. !! TRAVANCORE TITANIUM PRODUCTS LTD

Dear Sir

We have arranged a virtual PDI on **10th Oct 2023 sharp 2:45PM**. Link of the inspection will be shared with you before inspection.

I am mentioning manufacturer QC head details

Mr. Jainesh Shah

Mob. - 7600512728

Also, mentioning of your details from Enerture side

Mr. Akshay Raj Kulshreshtha

Sr. Manager - Procurement

Mob. - 9999399307

PDI will be done on the following parameters

1. Visual Inspection Test
2. Flash Test
3. Dimension Verification
4. Dielectric / HV Test
5. Electro Lumesense Test
6. Insulation Resistance Test
7. Light Induced Degradation Test
8. Robustness Test
9. Wet Leakage Test

FTR Attached

Thanks and Regards,

Akshay Raj Kulshreshtha

Sr. Procurement Manager

Enerture Technologies Pvt Ltd.

ABL Workspaces, Celebration Gardens, NH 8, Adjoining Shiv
Murti, Opp IGI Airport, New Delhi, Delhi 110037

M: +91 9999399307 • E-mail: akshayraj.k@enerture.co.in



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From: ANERT Projects <projects@anert.in>

Sent: 07 October 2023 14:19

To: shubham@enerture.co.in

Cc: Bhairaw Mandal <bhairaw@enerture.co.in>; Apar Chitransh <Apar.chitransh@enerture.co.in>; ankur <ankur.gupta@enerture.co.in>; Parvendar Singh <parvendar.singh@enerture.co.in>; Mahesh <mahesh@enerture.co.in>; Santosh Kumar <santosh@enerture.co.in>; ANERT 2K2K <anert2020@anert.in>; solarcity tvn <solarcitytvn@gmail.com>; Chief Technical Manager ANERT <ctm@anert.in>; rampintu150@gmail.com; Arman Malik <arman.malik@enerture.co.in>; pintu@enerture.co.in; Akshayraj K <akshayraj.k@enerture.co.in>

Subject: Re: !! Solar Modules Virtual Inspection Regd. !! TRAVANCORE TITANIUM PRODUCTS LTD

Dear Shubham,

The Online FAT can be scheduled on 09/10/2023 (Monday) afternoon. The link for the same may be shared in the first half and the following tests are to be conducted on selected modules from the lot provided.

1. Visual Inspection Test
2. Flash Test
3. Dimension Verification
4. Dielectric / HV Test
5. Electro Lumesense Test
6. Insulation Resistance Test
7. Light Induced Degradation Test
8. Robustness Test
9. Wet Leakage Test

On Fri, 6 Oct 2023 at 14:42, <shubham@enerture.co.in> wrote:

Dear Sir,

Building on our previous email thread, we have attached the modules FTR (Factory Test Report) sheet as per your request.

We kindly request that you provide us with the details for the modules' inspection, including the contact information for the responsible individual and a suggested time slot that is convenient for you.

Your prompt response in this regard will be greatly appreciated.

Thank you for your cooperation.



Best regards,

Shubham Kr. Kashyap

Project Manager

Enerture Technologies Pvt Ltd

(MNRE Channel partner &
MSME registered)

Mob: +91-7007609924 Tel: +91-
1146024024

E.mail: shubham@enerture.co.in
Web: <http://enerture.co.in>

Add. : ABL Workspace, Celebration
Garden, NH-8, Mahipalpur, New Delhi-
110037

From: ANERT Projects <projects@anert.in>

Sent: 27 September 2023 22:22

To: Akshayraj K <akshayraj.k@enerture.co.in>

Cc: shubham@enerture.co.in; Bhairaw Mandal <bhairaw@enerture.co.in>; Apar Chitransh <Apar.chitransh@enerture.co.in>;
ankur <ankur.gupta@enerture.co.in>; Parvendar Singh <parvendar.singh@enerture.co.in>; Mahesh <mahesh@enerture.co.in>;
Santosh Kumar <santosh@enerture.co.in>; ANERT 2K2K <anert2020@anert.in>; solarcity tvn <solarcitytvn@gmail.com>;
Chief Technical Manager ANERT <ctm@anert.in>; rampintu150@gmail.com; Arman Malik <arman.malik@enerture.co.in>;
pintu@enerture.co.in

Subject: Re: !! For BG, Tripartite agreement signing, detailed AC SLD & Project Schedule, Project BOM, open points approval
Regd. !! TRAVANCORE TITANIUM PRODUCTS LTD

Dear Akshay & Shubham,

In continuation to the telecon with Mr. Shubham, Pls see the responses for the below mentioned:

1. The Factory Acceptance Test will be online through Google Meet/Zoom
2. The details of the lot along with serial numbers of Solar Modules to be shared in advance and ANERT will select a few modules in random for various tests
3. Please share a few tentative date and time slots, we will confirm the same based on availability of our QT team

On Tue, 26 Sept 2023 at 14:47, Akshay Raj <akshayraj.k@enerture.co.in> wrote:

Dear Sir,

Request you to kindly confirm the below

1. Inspection Type – Virtual/Offline
2. Product inspection/Factory Inspection
3. Date we are planning is 29th September – Please confirm suitable date and time

Also share the documents required for inspection.

Please confirm your presence so that we can confirm to our supplier and raise inspection call accordingly.

Thanks and Regards,

Akshay Raj Kulshreshtha

Sr. Procurement Manager

Enerture Technologies Pvt Ltd.

ABL Workspaces, Celebration Gardens, NH 8, Adjoining Shiv
Murti, Opp IGI Airport, New Delhi, Delhi 110037

M: +91 9999399307 • E-mail: akshayraj.k@enerture.co.in

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From: ANERT Projects <projects@anert.in>

Sent: 18 August 2023 12:46

To: shubham@enerture.co.in

Cc: ANERT 2K2K <anert2020@anert.in>; solarcity tvn <solarcitytvn@gmail.com>; Bhairaw Mandal <bhairaw@enerture.co.in>; Apar Chitransh <Apar.chitransh@enerture.co.in>; ankur <ankur.gupta@enerture.co.in>; Parvendar Singh <parvendar.singh@enerture.co.in>; Akshayraj K <akshayraj.k@enerture.co.in>; Mahesh <mahesh@enerture.co.in>; Santosh Kumar <santosh@enerture.co.in>; Chief Technical Manager ANERT <ctm@anert.in>; rampintu150@gmail.com; Arman Malik <arman.malik@enerture.co.in>; pintu@enerture.co.in

Subject: Re: !! For BG, Tripartite agreement signing, detailed AC SLD & Project Schedule, Project BOM, open points approval Regd. !! TRAVANCORE TITANIUM PRODUCTS LTD

Dear Shubham,

Please share the updated schedule of work. Also, we would like to conduct a Factory Acceptance Test (Online/Offline) of PV modules before dispatch and hence arrange for the same on an immediate date. Further, only PV modules with Dispatch Clearance Certificate issued by ANERT will be accepted by Smart City Thiruvananthapuram Ltd for release of payment. Accordingly, you are requested to make arrangements for the FAT on a sooner date.

On Mon, 26 Jun 2023 at 17:13, ANERT Projects <projects@anert.in> wrote:

Dear Shubham,

As discussed over the phone, the make and model of PV modules and Inverters are approved. Also, the structure layout for Rooftop is approved;

In case of Ground Mounted systems, the soil test reports done from ANERT end are attached. You can rely on the same, or do a detailed soil survey from your end. The required modification, site wise in the structure foundation may be done and get it certified by a Certified Structural Engineer / Professor from any National level institute along with STAAD report. The same may be forwarded for approval before fabrication.

On Sat, 24 Jun 2023 at 16:47, <shubham@enerture.co.in> wrote:

Dear Sir,

Please find herewith attached open points sheet along with Enerture responses. Kindly have a look.

Furthermore, please also find herewith attached following drawings & documents for your kind approvals:

1. Module mounting structure layouts for rooftop & Ground mount solar plants.
2. Inverters datasheet, Sungrow – For Ground Mount Projects & Growatt – For Rooftop Projects.
3. Modules Datasheet – Vikram 540 / 545 wp

Also, as per our discussion, please find below mentioned BBU (Bill Breakup Units) for your kind considerations:-

Supply:-

1. On Modules deliveries – 40% of contract value amount will be release.
2. On Inverters deliveries – 20% of contract value amount will be release.

Service:-

3. Installation – 20% on pro-rata basis on submission of RA bills.
4. CEIG Approval – 5%
5. Discom approval & COD – 5%
6. On submission of Performance Bank Guarantee (PBG) – 10%

We kindly request your confirmation / approval regarding the aforementioned design, documents, and statements.

Shubham Kr. Kashyap

Project Manager

Enerture Technologies Pvt Ltd

(MNRE Channel partner &
MSME registered)

Mob: +91-7007609924 Tel: +91-
1146024024

E.mail: shubham@enerture.co.in
Web: <http://enerture.co.in>

Add. : ABL Workspace, Celebration
Garden, NH-8, Mahipalpur, New Delhi-
110037

From: ANERT Projects <projects@anert.in>
Sent: Friday, June 23, 2023 6:34 PM

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To: shubham@enerture.co.in

Cc: ANERT 2K2K <anert2020@anert.in>; FIROZ N <firozttpl@gmail.com>; solarcity tvm <solarcitytvm@gmail.com>; Bhairaw Mandal <bhairaw@enerture.co.in>; Apar Chitransh <Apar.chitransh@enerture.co.in>; ankur <ankur.gupta@enerture.co.in>; Parvendar Singh <parvendar.singh@enerture.co.in>; Akshayraj K <akshayraj.k@enerture.co.in>; Mahesh <mahesh@enerture.co.in>; Santosh Kumar <santosh@enerture.co.in>; Chief Technical Manager ANERT <ctm@anert.in>; rampintu150@gmail.com

Subject: Re: !! For BG, Tripartite agreement signing, detailed AC SLD & Project Schedule, Project BOM, open points approval Regd. !! TRAVANCORE TITANIUM PRODUCTS LTD

Dear Mr. Shubham,

Please see the responses marked in the sheet attached and also the project schedule mentioned is also accepted. For the BoM, you may submit the particular **make and model of PV modules and Inverters** proposed for the project. The rest of the items in the Preliminary BoM are accepted.

On Wed, 21 Jun 2023 at 16:24, <shubham@enerture.co.in> wrote:

Dear Sir,

We would like to inform you that we are planning to commence land cleaning work within the project land premises starting tomorrow. To ensure smooth progress without any work stoppages due to documentation issues, please let us know if there are any gate pass or approval processes in place that we need to comply with. This will enable us to complete the necessary documentation and avoid any unnecessary delays. Your prompt response in this matter would be greatly appreciated.

Furthermore, we are waiting for your important response regarding the **Project schedule, Project Preliminary BOM, and Customer Open Points sheet**, as mentioned in the previous email. Please provide your approval on these documents so that we can proceed with the next steps.

Additionally, we kindly ask you to share the ANERT communication matrix with us. This will facilitate the sharing and discussion of information with the designated personal involved individually.

Shubham Kr. Kashyap

Project Manager

Enerture Technologies Pvt Ltd

(MNRE Channel partner &
MSME registered)

Mob: +91-7007609924 Tel: +91-
1146024024

E.mail: shubham@enerture.co.in
Web: <http://enerture.co.in>

Add. : ABL Workspace, Celebration
Garden, NH-8, Mahipalpur, New Delhi-
110037

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From: shubham@enerture.co.in <shubham@enerture.co.in>
Sent: Monday, June 19, 2023 5:01 PM
To: 'ANERT 2K2K' <anert2020@anert.in>; 'firozttpl@gmail.com' <firozttpl@gmail.com>; 'ANERT Projects' <projects@anert.in>
Cc: 'solarcity tvn' <solarcitytvn@gmail.com>; 'Bhairaw Mandal' <bhairaw@enerture.co.in>; 'Apar Chitransh' <Apar.chitransh@enerture.co.in>; 'ankur' <ankur.gupta@enerture.co.in>; 'Parvendar Singh' <parvendar.singh@enerture.co.in>; 'Akshayraj K' <akshayraj.k@enerture.co.in>; 'Mahesh' <mahesh@enerture.co.in>; 'santosh@enerture.co.in' <santosh@enerture.co.in>; 'Chief Technical Manager ANERT' <ctm@anert.in>
Subject: RE: !! For detailed AC SLD & Project Schedule, Project BOM, open points approval Regd. !! TRAVANCORE TITANIUM PRODUCTS LTD
Importance: High

Dear Sir,

Greeting from Enerture Technologies.....!!

Following our previous email thread, please find attached the **Project schedule** and **Project Preliminary BOM** for your reference and perusal. Enerture kindly requests your approval to proceed with further processing.

We have also attached an excel sheet titled "**Customer Open Points**" that lists the open points requiring ANERT's approval / response to finalize matters and proceed accordingly.

Additionally, in adherence with trail mail, we are eagerly awaiting the detailed AC SLD of TRAVANCORE TITANIUM PRODUCTS LTD. This information is essential for our reference and to proceed with our work. We kindly request you to provide the same also, as soon as it becomes available.

We would greatly appreciate your prompt response to these documents.

If you have any questions or need any clarification, please let us know.

Shubham Kr. Kashyap

Project Manager

Enerture Technologies Pvt Ltd

(MNRE Channel partner &
MSME registered)

Mob: +91-7007609924 Tel: +91-
1146024024

E.mail: shubham@enerture.co.in
Web: <http://enerture.co.in>

151

Add. : ABL Workspace, Celebration
Garden, NH-8, Mahipalpur, New Delhi-
110037

From: ANERT 2K2K <anert2020@anert.in>

Sent: Saturday, June 17, 2023 5:00 PM

To: firoztptl@gmail.com

Cc: solarcitytvm@gmail.com; Bhairaw Mandal <bhairaw@enerture.co.in>; Apar Chitransh <Apar.chitransh@enerture.co.in>; ankur <ankur.gupta@enerture.co.in>; Parvendar Singh <parvendar.singh@enerture.co.in>; Akshayraj K <akshayraj.k@enerture.co.in>; Mahesh <mahesh@enerture.co.in>; Shubham Kashyap <shubham@enerture.co.in>; ANERT Projects <projects@anert.in>; santosh@enerture.co.in; Chief Technical Manager ANERT <ctm@anert.in>

Subject: Re: FOR DETAILED AC SLD TRAVANCORE TITANIUM PRODUCTS LTD

Dear Sir

Please recall the discussion today, we are glad to inform you that the 2 MW work has been awarded to M/s Enerture Technologies Pvt Ltd. The WO is attached herewith for your ready reference. You are requested to provide all the support to the M/s Enerture Technologies Pvt Ltd for the successful commissioning of the project

On Sat, 17 Jun 2023 at 16:53, Santosh Kumar <santosh@enerture.co.in> wrote:

Dear Sir,

As per the discussion with you on call, we required the detailed AC SLD of TRAVANCORE TITANIUM PRODUCTS LTD for 2 MWp Solar Power Plant designing prospective because we have not clear the evacuation points where we will evacuate the Solar Power into the your existing system.

So, Kindly request you please provide the AC SLD.

Regards,

Santosh kumar

On 09/06/2023 13:05, Santosh Kumar wrote:

Dear Sir,

kindly find the attached revised pv array layout, we are installing 1.5 MW on Ground mount and bringing 500kWp on Rooftop (NP-Control Room Building, Filter Press Building, Lime Storage Area, Canteen Building 1 & 2, Locker room, Clss Building, Time office). please check and approval for further process.

On 07/06/2023 17:47, Santosh Kumar wrote:

Dear Sir,

kindly find the attached pv array layout, we are installing 1.7 MW on Ground mount and bringing 300kWp on Rooftop (NP-Control Room Building, Filter Press Building, Lime Storage Area, Canteen Building 1 & 2). can we do ground mount 1.7MW and 300kWp installation, please check and approval for further process.

As per Tender details,

On 05/06/2023 12:46, ANERT Projects wrote:

Dear All,

The proposed Layout is approved. It may be noted that the provision for providing access ladder to roof for buildings with rooftop installations, Extension of Bus bar for accommodating

bus bar etc are under the scope of the vendor. You are also requested to submit the detailed BoM and work schedule at the earliest.

On Mon, 5 Jun 2023 at 11:02, Santosh Kumar <santosh@enerture.co.in> wrote:

Dear Sir,

please check and approval for further process.

On 03/06/2023 17:06, Santosh Kumar wrote:

Dear Sir,

Kindly find the attached Pv array layout 2MW Rooftop and Ground mount, please check and approval for further process.

On 01/06/2023 21:45, Santosh Kumar wrote:

Dear Sir,

The plant layout is being discussed for the last four days, please share the plant layout.

On 29/05/2023 08:52, Santosh Kumar wrote:

Dear Sir,

As per discuss please share plant layout of Travancore Titanium Product Ltd Kochuveli, Thiruvananthapuram, please mark the new additional land in plant layout,

Best regards,

Santosh Kumar

Enerture Technologies Pvt Ltd

(MNRE Channel partner & MSME registered)

Mob: +91-9891076898 Tel: +91- 1146024024

E.mail: santosh@enerture.co.in Web: <http://enerture.co.in>

Add. : ABL Workspace, Celebration Garden, NH-8, Mahipalpur, New Delhi-110037

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Best regards,

Santosh Kumar

Enerture Technologies Pvt Ltd

(MNRE Channel partner & MSME registered)

Mob: +91-9891076898 Tel: +91- 1146024024

E.mail: santosh@enerture.co.in Web: <http://enerture.co.in>

Add. : ABL Workspace, Celebration Garden, NH-8, Mahipalpur, New Delhi-110037

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Best regards,

Santosh Kumar

Enerture Technologies Pvt Ltd

(MNRE Channel partner & MSME registered)

Mob: +91-9891076898 Tel: +91- 1146024024

E.mail: santosh@enerture.co.in Web: <http://enerture.co.in>

Add. : ABL Workspace, Celebration Garden, NH-8, Mahipalpur, New Delhi-110037

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Best regards,

Santosh Kumar

Enerture Technologies Pvt Ltd

(MNRE Channel partner & MSME registered)

Mob: +91-9891076898 Tel: +91- 1146024024

E.mail: santosh@enerture.co.in Web: <http://enerture.co.in>

Add. : ABL Workspace, Celebration Garden, NH-8, Mahipalpur, New Delhi-110037

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Thanks & Regards

Projects Team

ANERT

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Best regards,

Santosh Kumar

Enerture Technologies Pvt Ltd

(MNRE Channel partner & MSME registered)

Mob: +91-9891076898 Tel: +91- 1146024024

E.mail: santosh@enerture.co.in Web: <http://enerture.co.in>

Add. : ABL Workspace, Celebration Garden, NH-8, Mahipalpur, New Delhi-110037

--

Best regards,

Santosh Kumar

Enerture Technologies Pvt Ltd

(MNRE Channel partner & MSME registered)

Mob: +91-9891076898 Tel: +91- 1146024024

E.mail: santosh@enerture.co.in Web: <http://enerture.co.in>

Add. : ABL Workspace, Celebration Garden, NH-8, Mahipalpur, New Delhi-110037

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Best regards,

Santosh Kumar

Enerture Technologies Pvt Ltd

(MNRE Channel partner & MSME registered)

Mob: +91-9891076898 Tel: +91- 1146024024

E.mail: santosh@enerture.co.in Web: <http://enerture.co.in>

Add. : ABL Workspace, Celebration Garden, NH-8, Mahipalpur, New Delhi-110037

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Thanks & Regards

Projects Team

ANERT

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Thanks & Regards

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 CUSTOMER INSPECTION REPORT			
Client	Enerture Technologies Pvt Ltd	Lot No.:	O1
Module Type	VSMH.72.545.05		
Place of Inspection	Vikram Solar LTD, Indospace Park,Oragadam, Tamil Nadu, India		
Date of Inspection	27.12.2023	Sample Quantity	05 NO'S
CUSTOMER		Wp	Offered Qty
Enerture Technologies Pvt Ltd		545	3627
			MWp
			1.977
Total		3627	1.977
Inspection Result	Satisfactory		
Visual Inspection	05 nos. of modules Visual Inspection has been performed and result is satisfactory."		
	Detail mentioned in Annexure A.		
Electrical Test	05 nos. of modules Electrical Parameters has been captured and result is satisfactory."		
	Detail mentioned in Annexure A.		
Electro Luminance Test	05 nos. of modules EL Images has been captured and result found satisfactory."		
	Detail mentioned in Annexure A.		
Wet Leakage Test	1 nos. of module Wet leakage Test has been done and result is satisfactory.		
HV Performance	Detail mentioned in Annexure B.		
Is the Shipment qualified to be released , Yes or No :- Inspected items released for next operation.			
 Mr. Syed Ziaul Haque Vikram Solar Limited		Enerture Technologies Pvt Ltd	

Annexure A

Vikram Solar Ltd.

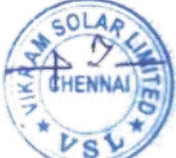
Electrical & Visual Inspection Result SPV Modules (Testing has been done at STC Condition)

Customer : Enerture Technologies Pvt Ltd

LOT NO.: 01

Date: 27.12.2023

No	Pallet No	Module ID	Pnom	PRD Pmax	Electrical inspection result								Flasher Inspection Result	EL Check Result	Visual Check Result	Remarks
					Witness Pmax	Voc	Isc	Vmp	Imp	FF	M.Eff	Dev				
1	1000295156	51199524	545	547.538	545.662	49.870	13.590	42.177	12.937	80.510	21.160	-0.34%	OK	OK	OK	Pass
2	1000295224	51200259	545	547.494	549.814	50.207	13.579	42.435	12.957	80.645	21.321	0.42%	OK	OK	OK	Pass
3	1000295190	51199875	545	545.909	547.774	50.224	13.574	42.333	12.940	80.351	21.242	0.34%	OK	OK	OK	Pass
4	1000294494	51195797	545	547.480	548.883	50.220	13.568	42.462	12.926	80.554	21.285	0.26%	OK	OK	OK	Pass
5	1000294415	51195216	545	547.622	547.916	50.242	13.567	42.380	12.929	80.382	21.248	0.05%	OK	OK	OK	Pass



Mr. Syed Ziaul Haque
Vikram Solar Limited

Enerture Technologies Pvt Ltd

Annexure B				
Vikram Solar Ltd. IR Continuity Inspection Result SPV Modules Customer : Enerture Technologies Pvt Ltd Lot No.: O1 Date: 27.12.2023				
IR Continuity Inspection Result SPV Modules		WET LEAKAGE		
Serial No	Module ID	IR @ 1.5 kV (MΩ)		Remarks
		Measured Value MΩ	Pass Criteria >40 MΩ/m ²	
1	51195797	466	181	PASS
				
 Mr. Syed Ziaul Haque Vikram Solar Limited			Enerture Technologies Pvt Ltd	

VIKRAM SOLAR LIMITED								1.701 MWp				
FLASHING TEST REPORT OF SOLAR PHOTOVOLTAIC MODULES								 vikramsolar CREATING CLIMATE FOR CHANGE				
Customer :												
DO No.:						Module Wp :					545 Wp	
Invoice No.:						Total Quantity :					3121 Nos	
Sl No.	Pallet No	Module ID	Pnom	Pmax	Voc	Isc	Vmp	Imp	FF	M. Eff %		
1	1000295047	51184635	545	547.900	50.104	13.829	41.551	13.186	79.075	21.247		
2	1000295047	51184663	545	547.546	50.035	13.812	41.566	13.173	79.232	21.233		
3	1000295047	51185431	545	547.647	50.164	13.846	41.489	13.200	78.845	21.237		
4	1000295047	51185435	545	545.657	49.993	13.852	41.309	13.209	78.791	21.160		
5	1000295047	51185487	545	548.763	50.116	13.766	41.785	13.133	79.541	21.280		
6	1000295047	51185518	545	546.004	50.008	13.854	41.511	13.153	78.811	21.173		
7	1000293876	51188359	545	548.785	50.091	13.813	41.668	13.171	79.312	21.281		
8	1000293876	51188794	545	547.66	50.192	13.97	41.195	13.294	78.107	21.238		
9	1000293876	51189843	545	546.803	50.02	13.797	41.568	13.154	79.235	21.204		
10	1000293876	51189901	545	547.1	50.129	13.979	41.164	13.291	78.073	21.216		
11	1000293876	51189952	545	549.093	50.116	13.799	41.693	13.17	79.401	21.293		
12	1000294035	51190043	545	548.306	50.069	13.813	41.651	13.164	79.283	21.263		
13	1000295047	51190049	545	546.903	50.049	13.793	41.525	13.170	79.226	21.208		
14	1000295047	51190133	545	548.318	50.111	13.759	41.773	13.126	79.529	21.263		
15	1000293876	51190135	545	546.911	50.027	13.810	41.607	13.145	79.165	21.209		
16	1000295047	51190147	545	547.005	50.047	13.790	41.553	13.164	79.261	21.212		
17	1000295047	51190195	545	546.448	50.006	13.796	41.549	13.152	79.209	21.191		
18	1000295047	51190205	545	545.991	50.066	13.813	41.413	13.184	78.951	21.173		
19	1000295047	51190211	545	547.385	50.029	13.790	41.596	13.160	79.344	21.227		
20	1000295047	51190216	545	548.642	50.186	13.770	41.795	13.127	79.389	21.276		
21	1000295047	51190225	545	549.860	50.116	13.782	41.853	13.138	79.612	21.323		
22	1000293876	51190228	545	547.690	50.022	13.814	41.554	13.180	79.260	21.239		
23	1000295047	51190236	545	548.275	50.073	13.763	41.695	13.150	79.560	21.262		
24	1000295047	51190248	545	545.000	49.921	13.790	41.391	13.167	79.167	21.135		
25	1000293876	51190284	545	549.088	50.150	13.784	41.726	13.159	79.435	21.293		
26	1000294035	51190303	545	548.602	50.094	13.810	41.636	13.176	79.298	21.274		
27	1000293876	51190306	545	547.601	50.031	13.803	41.715	13.127	79.298	21.235		
28	1000293876	51190331	545	548.393	50.118	13.789	41.747	13.136	79.352	21.266		
29	1000294035	51190342	545	548.805	50.097	13.817	41.678	13.168	79.286	21.282		
30	1000293876	51190347	545	546.972	50.016	13.793	41.584	13.153	79.289	21.211		
31	1000293876	51190367	545	546.970	50.024	13.787	41.577	13.156	79.306	21.211		
32	1000293876	51190394	545	549.194	50.164	13.787	41.748	13.155	79.410	21.297		
33	1000293876	51190440	545	548.373	49.866	13.859	41.521	13.207	79.348	21.265		
34	1000293876	51190452	545	545.538	50.010	13.792	41.431	13.168	79.094	21.155		
35	1000293876	51190459	545	547.450	50.031	13.793	41.668	13.138	79.330	21.230		
36	1000293876	51190465	545	547.721	50.056	13.817	41.594	13.168	79.191	21.240		
37	1000293876	51190472	545	549.663	50.146	13.950	41.291	13.312	78.578	21.315		
38	1000293876	51190546	545	549.604	50.062	13.828	41.724	13.172	79.394	21.313		
39	1000293876	51190590	545	547.889	50.064	13.812	41.597	13.172	79.233	21.247		
40	1000293876	51190622	545	547.865	50.045	13.801	41.714	13.134	79.324	21.246		
41	1000293876	51190628	545	547.874	50.171	13.964	41.227	13.289	78.201	21.246		
42	1000293876	51190647	545	547.267	50.010	13.788	41.690	13.127	79.370	21.222		
43	1000293876	51190658	545	548.074	50.071	13.806	41.616	13.170	79.283	21.254		
44	1000293876	51190659	545	547.046	50.034	13.804	41.649	13.135	79.207	21.214		
45	1000293876	51190660	545	547.251	50.021	13.794	41.611	13.152	79.313	21.222		
46	1000293876	51190661	545	548.165	50.075	13.809	41.589	13.181	79.273	21.257		
47	1000293876	51190662	545	547.210	50.033	13.793	41.570	13.163	79.291	21.220		
48	1000293876	51190664	545	547.306	50.041	13.805	41.596	13.158	79.224	21.224		
49	1000293876	51190667	545	547.170	50.032	13.807	41.582	13.159	79.210	21.219		
50	1000293876	51190672	545	546.290	50.034	13.796	41.549	13.148	79.144	21.185		
51	1000294035	51190674	545	548.056	50.184	13.799	41.743	13.129	79.142	21.253		
52	1000294035	51190675	545	548.590	50.202	13.791	41.781	13.130	79.236	21.274		
53	1000294224	51190676	545	547.929	49.957	13.816	41.657	13.153	79.389	21.248		
54	1000294035	51190679	545	548.533	50.086	13.896	41.278	13.289	78.815	21.272		
55	1000294035	51190680	545	548.687	50.089	13.889	41.322	13.278	78.869	21.278		
56	1000294954	51190682	545	546.112	50.140	14.044	40.912	13.348	77.555	21.178		
57	1000294968	51190683	545	547.978	50.278	13.997	41.161	13.313	77.864	21.250		
58	1000294951	51190684	545	549.139	50.330	13.967	41.335	13.285	78.117	21.295		
59	1000294968	51190685	545	548.044	50.280	13.986	41.171	13.311	77.935	21.253		
60	1000294951	51190686	545	547.042	50.259	13.953	41.157	13.292	78.008	21.214		
61	1000294954	51190687	545	545.086	50.272	13.956	41.116	13.257	77.689	21.138		
62	1000294954	51190688	545	548.454	50.322	14.004	41.184	13.317	77.829	21.269		
63	1000294954	51190689	545	547.800	50.332	13.915	41.327	13.255	78.217	21.243		
64	1000294954	51190690	545	547.890	50.265	13.985	41.219	13.292	77.938	21.247		
65	1000294954	51190692	545	547.862	50.286	13.971	41.274	13.274	77.985	21.246		
66	1000294954	51190693	545	547.886	50.271	13.992	41.157	13.312	77.892	21.246		
67	1000294968	51190695	545	548.471	50.252	14.031	41.093	13.347	77.788	21.269		
68	1000294968	51190697	545	549.280	50.251	14.009	41.281	13.306	78.025	21.301		
69	1000294968	51190698	545	548.562	50.253	14.030	41.104	13.346	77.805	21.273		
70	1000294968	51190699	545	547.780	50.269	13.986	41.156	13.310	77.916	21.242		
71	1000294951	51190701	545	546.338	50.302	14.003	41.100	13.293	77.561	21.186		
72	1000294954	51190702	545	547.004	50.229	13.969	41.130	13.299	77.959	21.212		
73	1000294968	51190703	545	546.886	50.149	13.986	41.221	13.267	77.975	21.208		
74	1000294968	51190704	545	547.859	50.176	13.970	41.315	13.260	78.156	21.245		
75	1000294951	51190705	545	546.400	50.304	13.994	41.072	13.304	77.621	21.189		
76	1000294951	51190706	545	545.595	50.339	14.029	41.056	13.289	77.259	21.158		
77	1000294951	51190707	545	546.105	50.269	14.010	41.096	13.288	77.543	21.177		
78	1000294951	51190708	545	547.369	50.233	13.991	41.188	13.290	77.881	21.226		
79	1000294951	51190709	545	546.029	50.221	13.990	41.250	13.237	77.715	21.174		
80	1000294951	51190710	545	549.893	50.160	14.002	41.372	13.292	78.039	21.324		

81	1000294951	51190711	545	546.000	50.223	13.982	41.268	13.231	77.754	21.173
82	1000294951	51190712	545	547.455	50.335	13.960	41.301	13.255	77.912	21.230
83	1000294954	51190715	545	549.481	50.211	13.991	41.325	13.296	78.220	21.308
84	1000294954	51190716	545	546.883	50.239	14.046	40.974	13.347	77.500	21.208
85	1000294954	51190717	545	548.559	50.241	13.964	41.352	13.265	78.191	21.273
86	1000294954	51190718	545	547.870	50.278	13.987	41.202	13.297	77.908	21.246
87	1000294954	51190719	545	547.655	50.272	13.983	41.206	13.291	77.909	21.237
88	1000294954	51190720	545	546.677	50.234	13.987	41.019	13.327	77.806	21.200
89	1000294951	51190721	545	547.844	50.380	14.011	41.310	13.262	77.614	21.245
90	1000294954	51190722	545	547.559	50.247	13.971	41.260	13.271	78.002	21.234
91	1000294954	51190723	545	548.036	50.266	13.997	41.273	13.278	77.894	21.252
92	1000294954	51190724	545	547.409	50.241	13.967	41.237	13.275	78.012	21.228
93	1000294954	51190725	545	548.071	50.271	13.989	41.258	13.284	77.934	21.254
94	1000294954	51190726	545	547.919	50.272	13.986	41.234	13.288	77.929	21.248
95	1000294035	51193228	545	548.696	50.163	13.805	41.806	13.125	79.236	21.278
96	1000294035	51193229	545	548.880	50.174	13.805	41.822	13.124	79.242	21.285
97	1000294056	51193230	545	547.477	50.139	13.789	41.613	13.156	79.186	21.231
98	1000294035	51193233	545	548.074	50.003	13.826	41.632	13.165	79.275	21.254
99	1000294035	51193234	545	549.164	50.181	13.734	41.929	13.097	79.686	21.296
100	1000294035	51193235	545	549.143	50.197	13.735	41.942	13.093	79.648	21.295
101	1000294035	51193236	545	548.964	50.185	13.738	41.924	13.094	79.626	21.288
102	1000294035	51193237	545	548.936	50.164	13.732	41.905	13.099	79.688	21.287
103	1000295016	51193238	545	546.674	49.585	13.93	41.272	13.246	79.145	21.199
104	1000294146	51193239	545	547.237	49.991	13.797	41.634	13.144	79.341	21.221
105	1000294026	51193240	545	548.409	49.964	13.912	41.374	13.255	78.895	21.267
106	1000294112	51193242	545	547.688	50.031	13.777	41.666	13.145	79.460	21.239
107	1000294026	51193244	545	549.353	50.032	13.956	41.380	13.276	78.675	21.303
108	1000294026	51193245	545	547.777	50.026	13.901	41.302	13.263	78.767	21.242
109	1000294157	51193246	545	547.436	50.037	13.796	41.645	13.145	79.302	21.229
110	1000294035	51193247	545	548.768	50.146	13.754	41.905	13.096	79.567	21.281
111	1000295047	51193248	545	546.674	50.228	13.802	41.651	13.125	78.857	21.199
112	1000295016	51193250	545	546.675	50.13	13.901	41.267	13.247	78.449	21.200
113	1000295047	51193251	545	546.675	49.993	13.891	41.366	13.216	78.722	21.200
114	1000294026	51193252	545	547.898	49.998	13.934	41.296	13.268	78.644	21.247
115	1000294026	51193253	545	547.214	50.114	13.961	41.302	13.249	78.217	21.220
116	1000295047	51193254	545	546.675	50.088	13.889	41.319	13.231	78.581	21.200
117	1000294076	51193255	545	547.037	49.941	13.811	41.542	13.168	79.308	21.214
118	1000295016	51193256	545	546.676	50.097	13.886	41.305	13.235	78.583	21.200
119	1000294026	51193257	545	547.870	50.012	13.777	41.692	13.141	79.515	21.246
120	1000295016	51193258	545	546.677	50.075	13.88	41.282	13.242	78.656	21.200
121	1000294035	51193259	545	548.596	50.171	13.732	41.879	13.099	79.629	21.274
122	1000294157	51193260	545	547.412	50.014	13.805	41.643	13.145	79.282	21.228
123	1000295047	51193261	545	546.677	50.234	13.987	41.019	13.327	77.806	21.200
124	1000294056	51193262	545	547.185	50.116	13.794	41.604	13.152	79.152	21.219
125	1000295047	51193263	545	546.677	50.021	13.913	41.273	13.245	78.552	21.200
126	1000294937	51193264	545	547.773	50.309	13.947	41.226	13.287	78.069	21.242
127	1000295016	51193266	545	546.677	49.879	14.011	41.517	13.168	78.227	21.200
128	1000295016	51193267	545	546.678	50.191	13.883	41.419	13.199	78.457	21.200
129	1000295016	51193268	545	546.678	50.227	13.81	41.556	13.155	78.813	21.200
130	1000294026	51193269	545	547.424	49.720	14.004	41.136	13.308	78.623	21.229
131	1000294035	51193270	545	548.535	50.170	13.733	41.866	13.102	79.618	21.272
132	1000294026	51193271	545	546.560	49.939	13.949	41.209	13.263	78.463	21.195
133	1000294026	51193272	545	547.543	49.905	13.940	41.190	13.293	78.706	21.233
134	1000295047	51193273	545	546.679	50.1	13.999	41.04	13.321	77.948	21.200
135	1000294026	51193274	545	547.678	50.032	13.797	41.692	13.136	79.339	21.238
136	1000295016	51193275	545	546.679	49.9	13.916	41.265	13.248	78.728	21.200
137	1000294026	51193276	545	547.665	50.035	13.800	41.650	13.149	79.316	21.238
138	1000294026	51193277	545	547.604	50.024	13.781	41.662	13.144	79.435	21.236
139	1000294026	51193278	545	547.499	50.033	13.801	41.660	13.142	79.288	21.231
140	1000294026	51193279	545	546.244	49.940	13.952	41.209	13.255	78.397	21.183
141	1000294026	51193280	545	547.098	50.056	13.828	41.661	13.132	79.042	21.216
142	1000294026	51193281	545	547.492	50.039	13.813	41.638	13.149	79.207	21.231
143	1000294026	51193282	545	547.531	50.039	13.810	41.631	13.152	79.232	21.233
144	1000294026	51193283	545	547.821	50.031	13.835	41.608	13.166	79.143	21.244
145	1000294026	51193284	545	549.115	49.997	13.908	41.374	13.272	78.967	21.294
146	1000294026	51193285	545	545.545	50.085	13.805	41.475	13.153	78.903	21.156
147	1000294937	51193286	545	548.460	50.383	14.007	41.240	13.299	77.718	21.269
148	1000294026	51193287	545	547.327	50.025	13.814	41.612	13.153	79.200	21.225
149	1000294026	51193288	545	547.979	50.020	13.891	41.418	13.230	78.863	21.250
150	1000294026	51193289	545	549.178	50.142	13.971	41.378	13.272	78.396	21.297
151	1000294026	51193290	545	549.867	50.006	13.932	41.426	13.274	78.928	21.323
152	1000294026	51193292	545	548.653	49.911	13.939	41.287	13.289	78.864	21.276
153	1000294026	51193293	545	546.550	49.999	13.934	41.203	13.265	78.449	21.195
154	1000294076	51193294	545	545.823	49.883	13.919	41.100	13.280	78.614	21.166
155	1000294076	51193295	545	545.558	49.936	13.930	41.120	13.268	78.428	21.156
156	1000294035	51193296	545	547.663	50.034	13.821	41.589	13.168	79.197	21.238
157	1000294026	51193297	545	549.583	50.034	13.947	41.453	13.258	78.759	21.312
158	1000294076	51193298	545	547.450	50.051	13.922	41.301	13.255	78.563	21.230
159	1000294026	51193299	545	549.245	49.973	13.925	41.381	13.273	78.927	21.299
160	1000294026	51193300	545	546.826	49.941	13.950	41.216	13.267	78.491	21.205
161	1000294076	51193301	545	549.878	50.258	13.819	41.796	13.156	79.173	21.324
162	1000294076	51193303	545	547.742	50.069	13.815	41.590	13.170	79.188	21.241
163	1000294076	51193304	545	548.714	50.130	13.945	41.465	13.233	78.493	21.279
164	1000294056	51193305	545	547.009	50.349	13.782	41.789	13.090	78.831	21.212
165	1000294026	51193306	545	549.236	50.066	13.950	41.400	13.267	78.637	21.299
166	1000294076	51193307	545	548.502	50.074	13.958	41.371	13.258	78.476	21.270
167	1000294076	51193309	545	548.098	50.135	13.840	41.583	13.181	78.993	21.255
168	1000294076	51193312	545	547.728	49.990	13.881	41.381	13.236	78.931	21.240
169	1000294026	51193314	545	546.790	50.161	13.921	41.363	13.219	78.733	21.204

170	1000294104	51193315	545	547.624	50.131	13.844	41.537	13.184	78.905	21.236
171	1000294477	51193316	545	548.617	50.022	13.921	41.303	13.283	78.786	21.275
172	1000294076	51193317	545	546.062	49.952	13.908	41.174	13.262	78.598	21.176
173	1000294937	51193318	545	547.742	50.265	13.985	41.120	13.321	77.921	21.241
174	1000294035	51193320	545	547.637	50.198	13.756	41.962	13.051	79.305	21.237
175	1000294041	51193322	545	546.623	50.005	13.813	41.467	13.182	79.137	21.198
176	1000294937	51193323	545	548.595	50.282	14.001	41.216	13.310	77.929	21.274
177	1000294035	51193324	545	549.743	50.210	13.840	41.706	13.182	79.109	21.318
178	1000294041	51193325	545	548.393	50.197	13.820	41.673	13.159	79.048	21.266
179	1000294041	51193326	545	546.429	50.147	13.770	41.585	13.140	79.131	21.190
180	1000294076	51193327	545	549.084	50.110	13.895	41.452	13.246	78.860	21.293
181	1000294076	51193328	545	545.971	49.938	13.905	41.149	13.268	78.624	21.172
182	1000294076	51193329	545	547.920	50.205	13.822	41.588	13.175	78.959	21.248
183	1000294076	51193330	545	547.527	50.029	13.820	41.636	13.150	79.188	21.233
184	1000294076	51193331	545	547.464	49.998	13.891	41.392	13.226	78.824	21.230
185	1000294041	51193332	545	547.516	49.993	13.812	41.591	13.164	79.291	21.232
186	1000294076	51193333	545	547.269	49.993	13.844	41.706	13.122	79.074	21.223
187	1000294243	51193334	545	547.921	49.985	13.879	41.424	13.227	78.980	21.248
188	1000294076	51193335	545	549.867	50.082	13.791	41.840	13.142	79.609	21.323
189	1000294035	51193336	545	547.945	50.082	13.804	41.602	13.171	79.262	21.249
190	1000294076	51193337	545	547.296	50.047	13.792	41.619	13.150	79.288	21.224
191	1000294076	51193338	545	548.869	50.013	13.803	41.722	13.155	79.507	21.285
192	1000294035	51193339	545	548.553	50.255	13.726	42.024	13.053	79.527	21.272
193	1000294035	51193340	545	545.054	50.081	13.804	41.456	13.148	78.846	21.137
194	1000294035	51193341	545	546.909	50.004	13.786	41.612	13.143	79.339	21.209
195	1000295047	51193342	545	546.921	50.030	13.888	41.305	13.241	78.715	21.209
196	1000294076	51193343	545	547.840	50.045	13.809	41.876	13.082	79.274	21.245
197	1000294076	51193344	545	547.643	50.220	13.818	41.645	13.150	78.918	21.237
198	1000294035	51193345	545	547.423	50.048	13.814	41.561	13.172	79.181	21.229
199	1000294076	51193346	545	547.311	50.126	13.798	41.583	13.162	79.134	21.224
200	1000294076	51193347	545	546.572	50.167	13.851	41.513	13.166	78.660	21.196
201	1000294041	51193349	545	548.242	50.155	13.733	41.884	13.089	79.595	21.260
202	1000294076	51193350	545	545.348	49.954	13.915	41.184	13.242	78.455	21.148
203	1000294035	51193351	545	549.511	50.151	13.732	41.925	13.107	79.792	21.309
204	1000294076	51193352	545	547.484	50.035	13.798	41.633	13.150	79.300	21.231
205	1000294076	51193353	545	545.135	49.859	13.938	41.078	13.271	78.443	21.140
206	1000294076	51193354	545	547.794	49.886	13.786	41.650	13.152	79.654	21.243
207	1000294156	51193355	545	547.627	50.029	13.797	41.780	13.107	79.336	21.236
208	1000294041	51193356	545	547.340	50.023	13.814	41.617	13.152	79.210	21.225
209	1000295047	51193357	545	547.618	50.191	13.580	42.332	13.936	80.342	21.236
210	1000294035	51193358	545	548.449	50.113	13.733	41.882	13.095	79.695	21.268
211	1000294035	51193359	545	548.490	50.131	13.735	41.861	13.103	79.661	21.270
212	1000294041	51193360	545	545.285	49.899	13.792	41.485	13.144	79.232	21.146
213	1000294076	51193362	545	548.134	50.056	13.808	41.624	13.169	79.307	21.256
214	1000294035	51193363	545	547.342	50.051	13.791	41.600	13.157	79.296	21.225
215	1000294076	51193364	545	548.654	50.198	13.708	41.914	13.090	79.735	21.276
216	1000294035	51193365	545	547.249	50.042	13.804	41.609	13.152	79.226	21.222
217	1000294041	51193366	545	548.838	50.232	13.816	41.788	13.134	79.083	21.283
218	1000294041	51193370	545	549.958	50.307	13.750	41.973	13.103	79.506	21.327
219	1000294121	51193371	545	546.962	50.046	13.834	41.543	13.166	79.004	21.211
220	1000294041	51193372	545	549.450	50.066	13.843	41.697	13.177	79.281	21.307
221	1000294041	51193374	545	548.571	50.068	13.796	41.679	13.162	79.418	21.273
222	1000294041	51193375	545	547.429	49.992	13.808	41.629	13.150	79.306	21.229
223	1000294041	51193376	545	548.197	50.129	13.828	41.585	13.183	79.085	21.259
224	1000294035	51193377	545	549.852	50.067	13.820	41.710	13.183	79.466	21.323
225	1000294041	51193378	545	548.001	49.989	13.834	41.514	13.200	79.245	21.251
226	1000294041	51193379	545	546.412	50.017	13.788	41.602	13.134	79.231	21.189
227	1000294104	51193380	545	547.472	49.746	13.793	41.493	13.194	79.789	21.230
228	1000294041	51193381	545	547.827	50.025	13.857	41.484	13.206	79.027	21.244
229	1000294041	51193382	545	545.629	49.794	13.786	41.429	13.170	79.482	21.159
230	1000294056	51193384	545	547.349	50.163	13.788	41.622	13.150	79.137	21.226
231	1000294104	51193385	545	547.276	50.165	13.768	41.776	13.124	79.384	21.262
232	1000294041	51193386	545	545.437	49.893	13.763	41.524	13.135	79.434	21.151
233	1000294041	51193387	545	548.875	49.976	13.804	41.709	13.160	79.565	21.285
234	1000294041	51193388	545	546.861	49.812	13.813	41.520	13.171	79.480	21.207
235	1000294041	51193390	545	547.004	50.020	13.794	41.595	13.151	79.281	21.212
236	1000294041	51193391	545	546.814	49.977	13.798	41.552	13.160	79.299	21.205
237	1000294157	51193392	545	545.884	50.033	13.831	41.426	13.177	78.887	21.169
238	1000294056	51193393	545	546.114	49.977	13.837	41.535	13.148	78.971	21.178
239	1000294041	51193394	545	546.691	49.858	13.868	41.425	13.197	79.066	21.200
240	1000294056	51193395	545	547.400	50.026	13.784	41.659	13.140	79.382	21.228
241	1000294056	51193396	545	548.951	50.201	13.780	41.765	13.144	79.356	21.288
242	1000294041	51193398	545	547.051	50.024	13.806	41.550	13.166	79.208	21.214
243	1000294041	51193399	545	547.849	50.036	13.773	41.730	13.128	79.496	21.245
244	1000294056	51193400	545	547.595	50.165	13.796	41.631	13.154	79.123	21.235
245	1000294041	51193402	545	547.217	50.043	13.798	41.601	13.154	79.253	21.221
246	1000294056	51193403	545	548.000	49.960	13.776	41.774	13.118	79.621	21.251
247	1000294041	51193404	545	545.521	49.969	13.765	41.519	13.139	79.314	21.155
248	1000294056	51193407	545	547.503	50.004	13.750	41.700	13.130	79.632	21.232
249	1000294104	51193409	545	547.600	50.040	13.797	41.716	13.127	79.313	21.235
250	1000294104	51193410	545	547.558	50.010	13.793	41.620	13.156	79.383	21.234
251	1000294104	51193411	545	547.218	49.962	13.795	41.610	13.151	79.394	21.221
252	1000294056	51193412	545	547.486	50.025	13.812	41.613	13.157	79.236	21.231
253	1000294041	51193413	545	546.943	50.010	13.822	41.570	13.157	79.126	21.210
254	1000294056	51193414	545	547.813	50.166	13.793	41.641	13.155	79.173	21.244
255	1000294056	51193415	545	545.167	49.932	13.799	41.450	13.152	79.122	21.141
256	1000294056	51193416	545	545.933	49.937	13.742	41.524	13.147	79.556	21.171
257	1000294104	51193417	545	547.443	50.009	13.783	41.636	13.148	79.421	21.229
258	1000294076	51193418	545	546.593	50.162	13.768	41.677	13.115	79.385	21.196

259	1000294056	51193419	545	547.485	50.136	13.813	41.639	13.148	79.059	21.231
260	1000294056	51193421	545	548.349	50.114	13.785	41.739	13.137	79.379	21.264
261	1000294056	51193422	545	547.046	50.039	13.801	41.609	13.147	79.216	21.214
262	1000294056	51193423	545	546.238	50.007	13.759	41.634	13.120	79.388	21.183
263	1000294041	51193424	545	548.451	50.213	13.839	41.653	13.167	78.924	21.268
264	1000294056	51193427	545	548.937	50.101	13.778	41.765	13.144	79.526	21.287
265	1000294056	51193428	545	548.242	50.056	13.760	41.771	13.125	79.599	21.260
266	1000294041	51193429	545	547.418	50.008	13.799	41.610	13.156	79.331	21.228
267	1000294157	51193430	545	547.386	50.039	13.805	41.622	13.151	79.240	21.227
268	1000294157	51193431	545	547.288	50.013	13.808	41.608	13.154	79.253	21.223
269	1000294056	51193432	545	545.426	49.974	13.767	41.564	13.123	79.281	21.151
270	1000294104	51193433	545	547.458	50.001	13.795	41.564	13.171	79.371	21.230
271	1000294056	51193434	545	547.221	50.061	13.748	41.743	13.109	79.509	21.221
272	1000294056	51193435	545	547.121	50.046	13.760	41.805	13.088	79.449	21.217
273	1000294056	51193436	545	547.503	50.050	13.797	41.590	13.164	79.285	21.232
274	1000294056	51193438	545	547.272	50.009	13.821	41.641	13.143	79.181	21.223
275	1000294056	51193439	545	547.541	49.994	13.786	41.669	13.140	79.444	21.233
276	1000294056	51193440	545	547.315	50.061	13.796	41.615	13.152	79.249	21.224
277	1000294056	51193441	545	547.018	50.052	13.780	41.551	13.165	79.311	21.213
278	1000294135	51193442	545	547.448	49.442	13.904	41.282	13.261	79.635	21.229
279	1000294104	51193443	545	547.412	50.033	13.801	41.710	13.124	79.278	21.228
280	1000294056	51193445	545	547.927	50.066	13.754	41.781	13.114	79.571	21.248
281	1000294104	51193446	545	547.954	49.778	13.788	41.499	13.204	79.837	21.249
282	1000294104	51193447	545	545.651	49.782	13.807	41.324	13.204	79.387	21.160
283	1000294056	51193448	545	547.410	50.060	13.734	41.753	13.111	79.620	21.228
284	1000294104	51193449	545	547.931	50.155	13.793	41.654	13.154	79.207	21.248
285	1000294041	51193450	545	546.145	49.925	13.741	41.570	13.138	79.607	21.179
286	1000294056	51193451	545	548.575	50.149	13.732	41.888	13.096	79.662	21.273
287	1000294112	51193452	545	547.245	50.034	13.808	41.573	13.163	79.213	21.222
288	1000294104	51193453	545	545.426	49.554	13.788	41.402	13.174	79.827	21.151
289	1000294104	51193454	545	545.482	50.030	13.776	41.595	13.114	79.144	21.153
290	1000294112	51193455	545	546.854	50.013	13.783	41.615	13.141	79.331	21.206
291	1000294104	51193456	545	545.631	49.744	13.797	41.351	13.195	79.499	21.159
292	1000294121	51193457	545	547.510	49.903	13.844	41.512	13.189	79.252	21.232
293	1000294104	51193459	545	546.112	49.920	13.770	41.514	13.155	79.445	21.178
294	1000294104	51193460	545	547.608	50.015	13.790	41.707	13.130	79.396	21.236
295	1000294112	51193461	545	547.242	49.917	13.799	41.603	13.154	79.446	21.221
296	1000294112	51193462	545	547.773	50.047	13.799	41.669	13.146	79.320	21.242
297	1000294104	51193464	545	547.414	50.035	13.809	41.584	13.164	79.227	21.228
298	1000294112	51193465	545	547.426	49.933	13.828	41.598	13.160	79.283	21.229
299	1000294104	51193466	545	546.060	50.081	13.780	41.830	13.126	79.560	21.292
300	1000294104	51193467	545	545.945	49.984	13.826	41.492	13.158	78.999	21.171
301	1000294104	51193469	545	547.791	50.025	13.806	41.600	13.168	79.316	21.243
302	1000294121	51193470	545	547.211	49.996	13.792	41.643	13.140	79.356	21.220
303	1000294104	51193471	545	548.213	50.040	13.759	41.786	13.120	79.626	21.259
304	1000294104	51193472	545	548.261	49.901	13.833	41.553	13.194	79.425	21.261
305	1000294112	51193473	545	546.662	50.071	13.809	41.530	13.163	79.064	21.199
306	1000294112	51193474	545	548.636	50.174	13.800	41.706	13.155	79.236	21.276
307	1000294112	51193475	545	547.304	50.026	13.781	41.636	13.145	79.386	21.224
308	1000294112	51193476	545	547.456	50.049	13.824	41.593	13.162	79.129	21.230
309	1000294112	51193477	545	547.907	50.061	13.793	41.660	13.152	79.353	21.247
310	1000294104	51193478	545	547.335	50.065	13.804	41.514	13.184	79.199	21.225
311	1000294104	51193479	545	547.475	49.998	13.799	41.790	13.101	79.351	21.231
312	1000294112	51193480	545	547.949	50.076	13.790	41.678	13.147	79.353	21.249
313	1000294112	51193481	545	547.910	50.065	13.795	41.677	13.147	79.334	21.247
314	1000294183	51193482	545	548.718	50.143	13.759	41.767	13.138	79.533	21.279
315	1000294146	51193483	545	547.374	50.163	13.726	41.859	13.077	79.495	21.227
316	1000294112	51193484	545	548.330	50.130	13.762	41.759	13.131	79.478	21.264
317	1000294112	51193486	545	545.728	50.065	13.784	41.691	13.090	79.079	21.163
318	1000295016	51193487	545	546.68	50.191	13.822	41.55	13.157	78.8	21.200
319	1000294104	51193488	545	547.251	50.014	13.803	41.512	13.183	79.272	21.222
320	1000294104	51193489	545	547.928	50.104	13.824	41.677	13.147	79.107	21.248
321	1000294104	51193490	545	548.761	50.132	13.791	41.865	13.108	79.374	21.280
322	1000294124	51193491	545	545.141	49.840	13.807	41.431	13.158	79.221	21.140
323	1000294121	51193492	545	547.124	50.068	13.838	41.538	13.172	78.966	21.217
324	1000294112	51193493	545	547.715	50.063	13.820	41.588	13.170	79.167	21.240
325	1000294121	51193494	545	545.703	50.155	13.799	41.431	13.171	78.850	21.162
326	1000294124	51193495	545	547.212	50.067	13.823	41.563	13.166	79.068	21.220
327	1000294937	51193496	545	547.957	50.267	13.988	41.237	13.288	77.934	21.249
328	1000294121	51193497	545	547.300	50.003	13.802	41.571	13.166	79.302	21.224
329	1000294121	51193499	545	547.934	50.073	13.801	41.671	13.149	79.288	21.248
330	1000294104	51193500	545	546.983	50.073	13.818	41.592	13.151	79.051	21.211
331	1000294157	51193501	545	547.624	50.040	13.782	41.681	13.139	79.407	21.236
332	1000294104	51193503	545	545.267	49.928	13.828	41.432	13.161	78.980	21.145
333	1000294104	51193504	545	546.903	49.967	13.791	41.620	13.140	79.367	21.208
334	1000294157	51193505	545	548.179	50.018	13.785	41.706	13.144	79.506	21.258
335	1000294112	51193506	545	547.458	49.951	13.832	41.620	13.154	79.235	21.230
336	1000294112	51193507	545	545.464	49.743	13.860	41.279	13.214	79.115	21.153
337	1000294112	51193508	545	547.655	50.016	13.774	41.692	13.136	79.495	21.237
338	1000294112	51193509	545	547.763	50.065	13.790	41.681	13.142	79.340	21.242
339	1000294112	51193510	545	545.561	49.814	13.839	41.358	13.191	79.138	21.156
340	1000294112	51193511	545	547.993	50.051	13.790	41.677	13.149	79.397	21.251
341	1000294112	51193513	545	547.913	50.150	13.848	41.555	13.185	78.898	21.248
342	1000294121	51193514	545	547.345	50.066	13.794	41.790	13.098	79.254	21.225
343	1000294243	51193515	545	547.032	50.077	13.926	41.193	13.280	78.443	21.213
344	1000294135	51193516	545	545.723	49.516	13.930	41.341	13.201	79.118	21.163
345	1000294121	51193517	545	545.136	49.906	13.792	41.541	13.123	79.200	21.140
346	1000294112	51193519	545	545.144	49.884	13.829	41.447	13.153	79.024	21.140
347	1000294112	51193522	545	547.511	50.063	13.804	41.630	13.152	79.079	21.232

348	1000294121	51193523	545	548.010	49.912	13.827	41.561	13.186	79.406	21.251
349	1000294112	51193524	545	547.228	50.032	13.797	41.622	13.148	79.275	21.221
350	1000294121	51193525	545	547.346	50.023	13.802	41.615	13.153	79.275	21.226
351	1000294112	51193526	545	547.302	50.014	13.790	41.648	13.141	79.356	21.224
352	1000294112	51193527	545	548.428	50.065	13.786	41.675	13.160	79.462	21.267
353	1000294121	51193529	545	548.593	50.058	13.812	41.793	13.127	79.343	21.274
354	1000294146	51193530	545	547.226	50.021	13.800	41.603	13.154	79.278	21.221
355	1000294124	51193531	545	548.759	50.146	13.800	41.773	13.137	79.300	21.280
356	1000294124	51193532	545	547.761	50.029	13.818	41.581	13.174	79.237	21.242
357	1000294157	51193533	545	545.956	49.919	13.804	41.450	13.172	79.227	21.172
358	1000294121	51193534	545	547.417	50.036	13.806	41.552	13.174	79.246	21.228
359	1000294124	51193535	545	547.361	49.923	13.812	41.539	13.177	79.379	21.226
360	1000294157	51193536	545	548.666	49.891	13.806	41.678	13.164	79.655	21.277
361	1000294124	51193537	545	547.381	50.079	13.824	41.587	13.162	79.068	21.227
362	1000294157	51193538	545	548.346	50.027	13.804	41.703	13.149	79.407	21.264
363	1000294121	51193539	545	548.430	50.069	13.820	41.685	13.157	79.260	21.268
364	1000294124	51193540	545	545.208	49.962	13.798	41.454	13.152	79.089	21.143
365	1000294112	51193541	545	547.347	50.009	13.789	41.691	13.129	79.373	21.226
366	1000294112	51193542	545	545.675	49.849	13.794	41.516	13.144	79.359	21.161
367	1000294112	51193543	545	548.083	50.001	13.859	41.580	13.182	79.090	21.254
368	1000294121	51193544	545	545.989	49.833	13.859	41.414	13.184	79.054	21.173
369	1000294121	51193545	545	548.708	49.915	13.838	41.636	13.179	79.440	21.278
370	1000294121	51193546	545	546.447	49.874	13.803	41.497	13.168	79.381	21.191
371	1000294157	51193547	545	548.392	50.041	13.794	41.738	13.139	79.449	21.266
372	1000294124	51193548	545	545.631	49.804	13.824	41.493	13.150	79.252	21.159
373	1000294121	51193549	545	545.641	50.166	13.795	41.418	13.174	78.844	21.159
374	1000294121	51193550	545	545.635	50.276	13.804	41.417	13.174	78.619	21.159
375	1000294146	51193551	545	547.088	50.036	13.796	41.591	13.154	79.252	21.216
376	1000294121	51193552	545	547.144	50.057	13.788	41.550	13.168	79.274	21.218
377	1000294937	51193553	545	547.914	50.262	13.988	41.240	13.286	77.932	21.248
378	1000294121	51193554	545	547.212	50.006	13.789	41.566	13.165	79.363	21.220
379	1000294121	51193555	545	547.267	50.049	13.800	41.582	13.161	79.234	21.222
380	1000294124	51193557	545	546.470	49.980	13.780	41.592	13.139	79.345	21.192
381	1000294124	51193558	545	545.618	49.916	13.802	41.439	13.167	79.196	21.159
382	1000294121	51193559	545	545.151	49.981	13.816	41.480	13.142	78.947	21.140
383	1000294121	51193560	545	547.262	50.038	13.800	41.577	13.163	79.250	21.222
384	1000294121	51193561	545	546.518	50.128	13.775	41.628	13.128	79.148	21.193
385	1000294121	51193562	545	546.745	50.032	13.800	41.526	13.166	79.186	21.202
386	1000294124	51193563	545	547.337	50.037	13.801	41.568	13.167	79.262	21.225
387	1000294124	51193564	545	547.233	50.039	13.827	41.567	13.165	79.094	21.221
388	1000294124	51193565	545	548.153	49.986	13.804	41.651	13.161	79.442	21.257
389	1000294184	51193566	545	547.237	49.997	13.800	41.662	13.135	79.315	21.221
390	1000294121	51193567	545	547.152	50.072	13.789	41.789	13.093	79.243	21.218
391	1000294124	51193568	545	548.169	49.483	13.931	41.301	13.273	79.519	21.257
392	1000294124	51193569	545	546.810	50.114	13.858	41.455	13.191	78.738	21.205
393	1000294124	51193570	545	547.194	50.008	13.798	41.581	13.160	79.303	21.220
394	1000294937	51193571	545	547.824	50.265	13.993	41.432	13.222	77.885	21.244
395	1000294121	51193572	545	547.144	49.913	13.803	41.541	13.171	79.416	21.218
396	1000294124	51193573	545	549.279	50.098	13.803	41.700	13.172	79.434	21.300
397	1000294183	51193574	545	547.146	50.004	13.811	41.558	13.166	79.228	21.218
398	1000294177	51193575	545	549.530	50.182	13.754	41.972	13.093	79.621	21.310
399	1000294146	51193577	545	546.834	50.235	13.737	41.672	13.122	79.244	21.206
400	1000294177	51193579	545	549.304	50.402	13.802	41.790	13.145	78.960	21.301
401	1000294184	51193580	545	547.024	49.938	13.788	41.605	13.148	79.445	21.213
402	1000294156	51193581	545	547.633	49.976	13.852	41.521	13.189	79.109	21.237
403	1000294121	51193582	545	547.267	50.005	13.795	41.652	13.139	79.335	21.222
404	1000294124	51193583	545	547.380	50.033	13.806	41.600	13.158	79.242	21.227
405	1000294157	51193584	545	548.022	50.016	13.793	41.719	13.136	79.440	21.252
406	1000294146	51193585	545	547.524	49.889	13.796	41.505	13.192	79.550	21.232
407	1000294121	51193587	545	545.165	50.133	13.813	41.424	13.161	78.727	21.141
408	1000294124	51193588	545	548.217	50.017	13.746	41.817	13.110	79.738	21.259
409	1000294135	51193589	545	549.005	49.646	13.925	41.412	13.257	79.414	21.290
410	1000294121	51193591	545	545.580	49.989	13.783	41.547	13.132	79.187	21.157
411	1000294124	51193592	545	546.504	50.134	13.780	41.607	13.135	79.106	21.193
412	1000294146	51193593	545	548.167	50.015	13.854	41.536	13.197	79.113	21.257
413	1000294146	51193594	545	547.861	50.178	13.721	41.840	13.094	79.575	21.245
414	1000294146	51193595	545	546.641	50.045	13.802	41.615	13.136	79.143	21.198
415	1000294124	51193596	545	545.686	50.014	13.834	41.535	13.138	78.867	21.161
416	1000294124	51193597	545	547.305	49.986	13.794	41.651	13.140	79.376	21.224
417	1000294124	51193598	545	545.957	49.881	13.812	41.436	13.176	79.245	21.172
418	1000294169	51193599	545	547.597	50.155	13.844	41.610	13.160	78.865	21.235
419	1000294124	51193600	545	547.381	50.043	13.796	41.647	13.143	79.288	21.227
420	1000294124	51193601	545	547.401	50.007	13.796	41.657	13.141	79.348	21.228
421	1000294157	51193602	545	547.371	50.028	13.807	41.609	13.155	79.241	21.226
422	1000294124	51193604	545	547.535	50.050	13.806	41.642	13.149	79.241	21.233
423	1000294124	51193605	545	546.857	50.113	13.770	41.657	13.128	79.250	21.207
424	1000294157	51193606	545	548.569	50.025	13.791	41.721	13.148	79.513	21.273
425	1000294183	51193607	545	546.249	50.174	13.774	41.665	13.111	79.043	21.183
426	1000294124	51193608	545	545.688	50.016	13.838	41.408	13.178	78.841	21.161
427	1000294124	51193609	545	547.327	49.987	13.877	41.448	13.205	78.902	21.225
428	1000294135	51193610	545	548.493	49.659	13.889	41.404	13.247	79.526	21.270
429	1000294177	51193612	545	548.606	50.318	13.748	41.835	13.114	79.306	21.274
430	1000294156	51193614	545	545.332	49.985	13.789	41.521	13.134	79.122	21.147
431	1000294156	51193615	545	547.425	50.019	13.782	41.696	13.129	79.413	21.229
432	1000294124	51193617	545	547.513	50.036	13.807	41.557	13.175	79.251	21.232
433	1000294157	51193618	545	548.776	50.011	13.793	41.758	13.142	79.558	21.281
434	1000294177	51193619	545	549.606	50.249	13.796	41.783	13.154	79.279	21.313
435	1000294146	51193620	545	547.132	50.194	13.742	41.781	13.095	79.324	21.217
436	1000294157	51193621	545	548.404	50.064	13.854	41.587	13.187	79.099	21.267

437	1000294135	51193623	545	547.413	49.704	13.892	41.313	13.250	79.278	21.228
438	1000294124	51193624	545	545.333	49.816	13.819	41.451	13.156	79.219	21.147
439	1000294177	51193625	545	548.180	50.186	13.795	41.716	13.141	79.182	21.258
440	1000294157	51193626	545	548.468	50.036	13.851	41.574	13.192	79.138	21.269
441	1000294135	51193627	545	548.648	49.659	13.879	41.391	13.255	79.603	21.276
442	1000294156	51193628	545	548.823	50.231	13.846	41.635	13.182	78.910	21.283
443	1000294135	51193629	545	547.502	49.683	13.909	41.318	13.251	79.229	21.232
444	1000294135	51193630	545	546.711	49.453	13.894	41.233	13.259	79.568	21.201
445	1000294156	51193632	545	547.497	50.008	13.796	41.576	13.169	79.360	21.231
446	1000294146	51193633	545	548.114	50.199	13.714	41.837	13.101	79.616	21.255
447	1000294156	51193634	545	546.086	50.096	13.745	41.686	13.100	79.310	21.177
448	1000294169	51193635	545	547.136	49.799	13.826	41.487	13.188	79.466	21.217
449	1000294135	51193636	545	547.723	49.470	13.921	41.277	13.269	79.532	21.240
450	1000294135	51193637	545	547.690	49.424	13.902	41.301	13.261	79.709	21.239
451	1000294135	51193638	545	546.707	49.533	13.915	41.297	13.238	79.318	21.201
452	1000294157	51193639	545	548.557	49.993	13.855	41.590	13.190	79.193	21.272
453	1000294156	51193640	545	548.646	50.085	13.829	41.627	13.180	79.211	21.276
454	1000294937	51193641	545	548.017	50.279	13.985	41.243	13.287	77.935	21.252
455	1000294146	51193643	545	546.502	50.226	13.756	41.697	13.107	79.102	21.193
456	1000294135	51193644	545	546.674	49.353	13.917	41.245	13.254	79.591	21.199
457	1000294135	51193645	545	547.170	49.451	13.918	41.239	13.268	79.500	21.219
458	1000294146	51193646	545	547.274	50.103	13.743	41.728	13.115	79.481	21.223
459	1000294157	51193647	545	548.391	50.033	13.858	41.561	13.195	79.091	21.266
460	1000294135	51193648	545	546.483	49.552	13.921	41.254	13.247	79.222	21.192
461	1000294135	51193649	545	549.515	49.651	13.914	41.501	13.241	79.545	21.310
462	1000294135	51193650	545	546.973	49.451	13.941	41.194	13.278	79.340	21.211
463	1000294157	51193651	545	548.543	50.032	13.851	41.561	13.198	79.158	21.272
464	1000294135	51193652	545	546.600	49.463	13.926	41.187	13.271	79.356	21.197
465	1000294135	51193653	545	548.009	49.601	13.939	41.343	13.255	79.264	21.251
466	1000294135	51193654	545	549.714	49.619	13.902	41.474	13.255	79.689	21.317
467	1000294135	51193655	545	548.595	49.508	13.925	41.344	13.269	79.572	21.274
468	1000294135	51193656	545	545.662	49.566	13.903	41.206	13.242	79.182	21.160
469	1000294135	51193657	545	548.414	49.651	13.885	41.399	13.247	79.551	21.267
470	1000294157	51193658	545	548.623	50.010	13.852	41.562	13.200	79.196	21.275
471	1000294135	51193659	545	546.418	49.546	13.909	41.251	13.246	79.290	21.190
472	1000294135	51193660	545	549.055	49.617	13.914	41.438	13.250	79.530	21.292
473	1000294157	51193661	545	548.551	50.017	13.850	41.608	13.184	79.183	21.272
474	1000294135	51193662	545	547.553	49.413	13.923	41.284	13.263	79.589	21.234
475	1000294157	51193663	545	548.731	50.032	13.870	41.600	13.191	79.076	21.279
476	1000294156	51193664	545	547.624	49.986	13.779	41.687	13.137	79.507	21.236
477	1000294135	51193665	545	547.064	49.343	13.918	41.223	13.271	79.658	21.215
478	1000294135	51193666	545	549.831	49.531	13.930	41.503	13.248	79.689	21.322
479	1000294135	51193667	545	549.223	49.470	13.927	41.379	13.273	79.715	21.298
480	1000294135	51193668	545	545.007	49.292	13.902	41.135	13.249	79.533	21.135
481	1000294157	51193669	545	548.737	50.041	13.862	41.603	13.190	79.105	21.279
482	1000294135	51193671	545	546.648	49.489	13.893	41.191	13.271	79.504	21.198
483	1000294146	51193672	545	547.594	50.090	13.805	41.507	13.193	79.191	21.235
484	1000294146	51193673	545	546.566	50.129	13.775	41.688	13.111	79.153	21.195
485	1000294157	51193675	545	548.734	50.043	13.877	41.580	13.197	79.017	21.279
486	1000294937	51193676	545	548.748	50.267	13.933	41.369	13.265	78.353	21.280
487	1000294157	51193677	545	547.344	50.049	13.798	41.616	13.152	79.259	21.225
488	1000294135	51193678	545	548.188	49.537	13.880	41.391	13.244	79.729	21.258
489	1000294156	51193680	545	546.346	49.926	13.762	41.665	13.113	79.518	21.187
490	1000294146	51193681	545	547.475	50.049	13.740	41.767	13.108	79.615	21.231
491	1000294937	51193682	545	547.872	50.264	13.986	41.220	13.291	77.932	21.246
492	1000294156	51193683	545	546.960	50.008	13.798	41.530	13.170	79.268	21.211
493	1000294156	51193685	545	545.213	49.955	13.745	41.581	13.112	79.405	21.143
494	1000294157	51193687	545	548.833	50.067	13.864	41.594	13.195	79.070	21.283
495	1000294157	51193690	545	547.417	50.064	13.797	41.640	13.147	79.253	21.228
496	1000294169	51193692	545	545.782	49.943	13.806	41.475	13.159	79.153	21.165
497	1000294157	51193694	545	547.417	50.048	13.793	41.678	13.134	79.300	21.228
498	1000294169	51193696	545	547.445	49.793	13.823	41.505	13.190	79.534	21.229
499	1000294157	51193697	545	547.375	50.018	13.792	41.720	13.120	79.347	21.227
500	1000294146	51193698	545	546.856	50.034	13.797	41.641	13.133	79.218	21.207
501	1000294156	51193699	545	547.316	50.043	13.797	41.596	13.158	79.269	21.224
502	1000294146	51193700	545	547.340	50.004	13.801	41.570	13.167	79.311	21.225
503	1000294905	51193701	545	547.044	50.229	14.009	41.046	13.328	77.741	21.214
504	1000294156	51193703	545	545.685	50.049	13.828	41.462	13.161	78.849	21.161
505	1000294157	51193705	545	545.105	50.020	13.758	41.607	13.101	79.209	21.139
506	1000294146	51193706	545	547.344	50.035	13.799	41.659	13.139	79.273	21.225
507	1000294951	51193708	545	547.703	50.277	13.988	41.167	13.304	77.880	21.239
508	1000294146	51193709	545	547.523	50.039	13.795	41.757	13.112	79.321	21.232
509	1000294146	51193710	545	548.476	50.176	13.750	41.944	13.076	79.501	21.269
510	1000294146	51193711	545	547.322	50.052	13.799	41.628	13.148	79.245	21.225
511	1000294146	51193712	545	545.998	49.903	13.803	41.527	13.148	79.264	21.173
512	1000294184	51193713	545	547.155	50.022	13.793	41.625	13.145	79.305	21.218
513	1000294184	51193716	545	546.361	50.014	13.772	41.700	13.102	79.320	21.187
514	1000294177	51193717	545	545.754	49.882	13.800	41.592	13.122	79.284	21.164
515	1000294184	51193718	545	547.748	49.948	13.816	41.636	13.156	79.374	21.241
516	1000294146	51193719	545	547.363	50.013	13.791	41.553	13.173	79.358	21.226
517	1000294177	51193720	545	549.421	50.170	13.767	41.760	13.157	79.544	21.306
518	1000294146	51193723	545	545.892	50.173	13.750	41.655	13.105	79.132	21.169
519	1000294184	51193724	545	547.714	49.953	13.814	41.642	13.153	79.372	21.240
520	1000294146	51193726	545	548.366	49.947	13.810	41.667	13.161	79.503	21.265
521	1000294146	51193727	545	545.193	49.943	13.859	41.438	13.157	78.769	21.142
522	1000294156	51193728	545	547.396	49.999	13.792	41.743	13.113	79.378	21.227
523	1000294951	51193730	545	548.087	50.396	14.012	41.317	13.265	77.616	21.254
524	1000294146	51193731	545	545.588	49.947	13.782	41.533	13.136	79.257	21.157
525	1000294184	51193733	545	546.865	50.065	13.762	41.733	13.104	79.243	21.207

526	1000294156	51193734	545	548.305	49.973	13.829	41.683	13.154	79.339	21.263
527	1000294184	51193736	545	547.208	50.005	13.821	41.606	13.152	79.178	21.220
528	1000294146	51193737	545	547.383	50.043	13.808	41.639	13.146	79.218	21.227
529	1000294355	51193738	545	547.608	50.002	13.912	41.489	13.199	78.718	21.236
530	1000294156	51193741	545	546.973	49.997	13.741	41.733	13.107	79.618	21.211
531	1000294156	51193743	545	547.933	50.089	13.867	41.500	13.203	78.885	21.248
532	1000294184	51193744	545	546.643	50.166	13.758	41.706	13.107	79.204	21.198
533	1000294156	51193745	545	548.994	50.229	13.845	41.656	13.179	78.945	21.289
534	1000294184	51193746	545	547.234	49.453	13.928	41.316	13.245	79.449	21.221
535	1000294184	51193747	545	548.100	49.392	13.906	41.414	13.235	79.800	21.255
536	1000294156	51193748	545	546.103	50.018	13.825	41.372	13.200	78.975	21.177
537	1000294184	51193749	545	547.511	50.021	13.806	41.632	13.151	79.279	21.232
538	1000294184	51193750	545	545.282	50.036	13.808	41.552	13.123	78.923	21.145
539	1000294184	51193751	545	545.433	49.970	13.837	41.416	13.170	78.882	21.151
540	1000294156	51193752	545	547.459	50.048	13.812	41.629	13.151	79.195	21.230
541	1000294184	51193753	545	547.076	50.001	13.810	41.595	13.152	79.231	21.215
542	1000294146	51193754	545	545.525	49.396	13.916	41.201	13.241	79.363	21.155
543	1000294156	51193755	545	547.345	50.015	13.803	41.628	13.148	79.285	21.225
544	1000294177	51193756	545	547.470	49.893	13.816	41.643	13.147	79.421	21.230
545	1000294146	51193757	545	547.325	50.008	13.806	41.605	13.155	79.273	21.225
546	1000294184	51193758	545	546.901	50.142	13.779	41.724	13.108	79.159	21.208
547	1000294184	51193759	545	546.618	49.450	13.925	41.328	13.226	79.385	21.197
548	1000294156	51193762	545	546.574	49.960	13.877	41.386	13.207	78.835	21.196
549	1000294371	51193764	545	548.170	49.849	13.958	41.139	13.325	78.784	21.257
550	1000294184	51193765	545	547.690	50.050	13.805	41.693	13.136	79.266	21.239
551	1000294184	51193766	545	545.097	50.041	13.849	41.300	13.199	78.657	21.138
552	1000294156	51193767	545	546.324	50.074	13.813	41.500	13.164	78.988	21.186
553	1000294156	51193768	545	547.214	50.006	13.801	41.537	13.174	79.294	21.220
554	1000294156	51193769	545	546.722	49.913	13.852	41.423	13.199	79.077	21.201
555	1000294156	51193770	545	545.294	50.013	13.826	41.423	13.164	78.862	21.146
556	1000294156	51193771	545	547.925	50.019	13.849	41.530	13.193	79.097	21.248
557	1000294156	51193772	545	547.464	49.963	13.851	41.544	13.178	79.109	21.230
558	1000294184	51193773	545	547.248	49.983	13.793	41.605	13.153	79.379	21.222
559	1000294276	51193774	545	548.574	49.504	14.029	41.049	13.364	78.992	21.273
560	1000294177	51193775	545	547.682	49.874	13.818	41.602	13.165	79.470	21.239
561	1000294177	51193776	545	546.466	50.063	13.807	41.539	13.155	79.059	21.191
562	1000294177	51193777	545	549.390	50.413	13.776	41.802	13.143	79.109	21.305
563	1000294197	51193778	545	545.330	49.896	13.825	41.481	13.147	79.053	21.147
564	1000294184	51193779	545	545.698	50.009	13.834	41.383	13.186	78.876	21.162
565	1000294156	51193781	545	547.622	50.030	13.790	41.607	13.162	79.377	21.236
566	1000294234	51193783	545	547.791	50.138	13.845	41.613	13.164	78.915	21.243
567	1000294184	51193784	545	547.819	50.125	13.849	41.556	13.183	78.917	21.244
568	1000294177	51193785	545	545.351	49.842	13.778	41.478	13.148	79.413	21.148
569	1000294169	51193786	545	547.267	50.067	13.803	41.550	13.171	79.191	21.222
570	1000294169	51193787	545	547.388	49.855	13.788	41.604	13.157	79.632	21.227
571	1000294183	51193788	545	546.590	50.061	13.785	41.527	13.162	79.207	21.196
572	1000294169	51193789	545	545.192	49.830	13.819	41.424	13.161	79.174	21.142
573	1000294177	51193790	545	549.334	50.336	13.745	41.869	13.120	79.399	21.303
574	1000294197	51193791	545	546.525	50.041	13.812	41.547	13.154	79.071	21.194
575	1000294169	51193792	545	548.431	50.198	13.805	41.749	13.137	79.138	21.268
576	1000294169	51193793	545	545.767	49.875	13.823	41.421	13.176	79.165	21.164
577	1000294169	51193794	545	548.295	49.969	13.829	41.624	13.173	79.344	21.262
578	1000294169	51193795	545	547.404	50.031	13.801	41.593	13.161	79.282	21.228
579	1000294184	51193796	545	547.295	50.022	13.810	41.591	13.159	79.225	21.224
580	1000294184	51193797	545	547.220	50.017	13.789	41.728	13.114	79.345	21.221
581	1000294177	51193798	545	547.785	50.000	13.785	41.670	13.146	79.477	21.243
582	1000294184	51193799	545	547.279	50.006	13.800	41.578	13.163	79.306	21.223
583	1000294169	51193800	545	547.803	50.141	13.851	41.640	13.156	78.877	21.243
584	1000294184	51193802	545	546.798	49.978	13.788	41.708	13.110	79.351	21.204
585	1000294184	51193803	545	547.478	50.018	13.794	41.679	13.136	79.352	21.231
586	1000294246	51193804	545	547.368	50.007	13.801	41.680	13.133	79.311	21.226
587	1000294169	51193805	545	547.067	50.031	13.801	41.680	13.125	79.230	21.215
588	1000294156	51193806	545	546.023	49.841	13.842	41.384	13.194	79.148	21.174
589	1000294184	51193808	545	548.555	50.037	13.763	41.848	13.108	79.658	21.272
590	1000294184	51193809	545	545.985	49.826	13.845	41.352	13.203	79.148	21.173
591	1000294184	51193810	545	547.259	49.991	13.788	41.632	13.145	79.394	21.222
592	1000294184	51193811	545	547.290	50.029	13.802	41.670	13.134	79.257	21.223
593	1000294287	51193812	545	549.923	49.956	13.958	41.392	13.286	78.867	21.325
594	1000294169	51193813	545	548.283	50.123	13.843	41.662	13.160	79.022	21.262
595	1000294287	51193814	545	545.469	50.014	13.937	41.158	13.253	78.255	21.153
596	1000294197	51193815	545	546.539	50.063	13.802	41.554	13.152	79.096	21.194
597	1000294169	51193816	545	547.334	50.024	13.795	41.659	13.138	79.315	21.225
598	1000294169	51193817	545	548.933	50.153	13.842	41.712	13.160	79.075	21.287
599	1000294197	51193819	545	545.605	49.978	13.791	41.484	13.152	79.161	21.158
600	1000294169	51193821	545	548.498	50.013	13.831	41.638	13.173	79.294	21.270
601	1000294169	51193822	545	547.256	50.031	13.793	41.669	13.133	79.306	21.222
602	1000294291	51193823	545	545.107	50.109	13.876	41.259	13.212	78.397	21.139
603	1000294486	51193824	545	547.629	50.064	13.914	41.302	13.259	78.617	21.236
604	1000294197	51193825	545	547.332	50.049	13.787	41.605	13.155	79.322	21.225
605	1000294169	51193826	545	546.842	49.960	13.846	41.557	13.159	79.053	21.206
606	1000294177	51193827	545	546.286	50.021	13.751	41.567	13.142	79.423	21.184
607	1000294169	51193828	545	548.934	50.164	13.845	41.714	13.159	79.041	21.287
608	1000294169	51193829	545	547.217	50.025	13.789	41.680	13.129	79.329	21.221
609	1000294177	51193830	545	549.423	50.091	13.813	41.733	13.165	79.405	21.306
610	1000294169	51193831	545	547.480	50.030	13.797	41.694	13.131	79.316	21.231
611	1000294234	51193833	545	549.051	50.101	13.921	41.383	13.268	78.724	21.292
612	1000294169	51193835	545	547.577	49.989	13.800	41.602	13.162	79.379	21.234
613	1000294177	51193836	545	545.956	50.123	13.796	41.589	13.127	78.954	21.172
614	1000294183	51193837	545	548.254	50.166	13.796	41.637	13.168	79.115	21.261

615	1000294169	51193838	545	547.452	50.030	13.789	41.675	13.136	79.354	21.230
616	1000294177	51193839	545	547.367	49.992	13.791	41.652	13.141	79.394	21.226
617	1000294169	51193840	545	547.285	49.996	13.803	41.617	13.151	79.307	21.223
618	1000294177	51193841	545	549.067	50.289	13.786	41.829	13.127	79.198	21.292
619	1000294177	51193842	545	549.601	50.101	13.786	41.804	13.147	79.571	21.313
620	1000294177	51193843	545	546.342	49.930	13.794	41.543	13.151	79.325	21.187
621	1000294197	51193845	545	545.843	49.912	13.798	41.474	13.161	79.257	21.167
622	1000294177	51193846	545	547.913	50.083	13.794	41.669	13.149	79.312	21.248
623	1000294177	51193847	545	549.541	50.400	13.802	41.807	13.145	78.998	21.311
624	1000294274	51193848	545	547.539	50.019	13.783	41.704	13.129	79.419	21.233
625	1000294169	51193849	545	547.198	50.084	13.801	41.541	13.172	79.166	21.220
626	1000294169	51193850	545	547.378	50.038	13.783	41.603	13.157	79.369	21.227
627	1000294169	51193851	545	547.601	50.041	13.786	41.507	13.193	79.377	21.235
628	1000294169	51193852	545	547.413	50.090	13.786	41.608	13.156	79.274	21.228
629	1000294169	51193853	545	547.650	50.006	13.792	41.693	13.135	79.407	21.237
630	1000294197	51193854	545	547.666	50.021	13.811	41.660	13.146	79.274	21.238
631	1000294177	51193855	545	547.875	50.085	13.788	41.660	13.151	79.334	21.246
632	1000294183	51193856	545	547.679	49.990	13.765	41.756	13.116	79.591	21.238
633	1000294905	51193857	545	547.138	50.304	13.976	41.218	13.274	77.823	21.217
634	1000294183	51193858	545	547.397	50.055	13.795	41.643	13.145	79.274	21.228
635	1000294183	51193859	545	547.699	50.185	13.803	41.640	13.153	79.069	21.239
636	1000294209	51193860	545	547.347	50.027	13.811	41.540	13.177	79.219	21.226
637	1000294183	51193861	545	546.613	50.034	13.800	41.667	13.119	79.165	21.197
638	1000294169	51193862	545	547.490	49.792	13.831	41.514	13.188	79.498	21.231
639	1000294177	51193864	545	546.090	49.841	13.778	41.538	13.147	79.522	21.177
640	1000294177	51193865	545	546.642	49.940	13.832	41.653	13.124	79.135	21.198
641	1000294183	51193866	545	547.313	50.091	13.807	41.583	13.162	79.134	21.224
642	1000294177	51193867	545	545.810	49.843	13.770	41.514	13.148	79.523	21.166
643	1000294276	51193868	545	548.046	49.484	14.015	41.102	13.334	79.026	21.253
644	1000294197	51193869	545	547.490	49.979	13.784	41.803	13.097	79.471	21.231
645	1000294177	51193870	545	549.906	50.401	13.800	41.833	13.145	79.060	21.325
646	1000294190	51193871	545	547.299	49.973	13.798	41.649	13.141	79.371	21.224
647	1000294183	51193872	545	548.274	50.044	13.804	41.678	13.155	79.365	21.262
648	1000294177	51193873	545	549.629	50.378	13.801	41.811	13.146	79.054	21.314
649	1000294183	51193874	545	545.538	50.092	13.740	41.786	13.056	79.265	21.155
650	1000294197	51193875	545	546.941	50.069	13.813	41.570	13.157	79.083	21.210
651	1000294177	51193876	545	545.966	49.934	13.778	41.549	13.140	79.355	21.172
652	1000294183	51193877	545	546.726	50.221	13.767	41.691	13.114	79.078	21.201
653	1000294177	51193878	545	547.785	49.949	13.781	41.705	13.135	79.580	21.243
654	1000294280	51193880	545	546.617	49.374	14.019	40.908	13.362	78.972	21.197
655	1000294183	51193881	545	546.536	50.119	13.764	41.641	13.125	79.228	21.194
656	1000294183	51193882	545	545.923	50.012	13.793	41.572	13.132	79.141	21.170
657	1000294287	51193883	545	546.088	50.066	13.904	41.230	13.245	78.450	21.177
658	1000294183	51193884	545	547.466	50.026	13.792	41.630	13.151	79.350	21.230
659	1000294183	51193885	545	545.128	50.073	13.797	41.463	13.147	78.905	21.140
660	1000294197	51193886	545	547.011	50.044	13.803	41.575	13.157	79.191	21.213
661	1000294197	51193887	545	545.790	49.644	13.801	41.480	13.158	79.661	21.165
662	1000294183	51193889	545	548.926	50.060	13.839	41.583	13.201	79.233	21.287
663	1000294190	51193890	545	547.274	50.164	13.780	41.690	13.127	79.169	21.223
664	1000294183	51193891	545	547.268	50.012	13.804	41.638	13.143	79.273	21.222
665	1000294183	51193892	545	545.934	50.066	13.807	41.523	13.148	78.973	21.171
666	1000294183	51193893	545	545.129	49.831	13.802	41.467	13.146	79.260	21.140
667	1000294183	51193894	545	545.222	49.995	13.791	41.549	13.122	79.075	21.143
668	1000294183	51193895	545	545.613	49.969	13.769	41.595	13.117	79.304	21.158
669	1000294190	51193896	545	547.394	50.044	13.802	41.615	13.154	79.250	21.227
670	1000294190	51193897	545	547.887	49.949	13.784	41.726	13.130	79.576	21.246
671	1000294190	51193898	545	547.500	49.844	13.803	41.649	13.146	79.576	21.232
672	1000294280	51193899	545	547.569	50.021	13.913	41.399	13.227	78.680	21.234
673	1000294197	51193900	545	547.194	50.027	13.780	41.650	13.138	79.375	21.220
674	1000294183	51193901	545	547.101	49.979	13.796	41.564	13.163	79.344	21.216
675	1000294183	51193902	545	546.878	49.844	13.810	41.558	13.159	79.447	21.207
676	1000294183	51193903	545	545.015	49.825	13.804	41.480	13.139	79.242	21.135
677	1000294371	51193904	545	545.346	50.040	13.903	41.181	13.243	78.385	21.148
678	1000294183	51193906	545	547.452	49.971	13.802	41.613	13.156	79.377	21.230
679	1000294183	51193907	545	546.699	49.846	13.805	41.614	13.137	79.445	21.200
680	1000294183	51193908	545	546.155	49.762	13.809	41.426	13.184	79.482	21.179
681	1000294276	51193909	545	549.329	49.486	14.031	41.054	13.381	79.114	21.302
682	1000294274	51193910	545	545.714	49.667	13.790	41.514	13.145	79.679	21.162
683	1000294190	51193911	545	547.161	50.036	13.736	41.737	13.110	79.612	21.218
684	1000294905	51193912	545	547.737	50.312	14.074	40.999	13.360	77.352	21.241
685	1000294280	51193913	545	548.389	50.015	13.868	41.440	13.233	79.062	21.266
686	1000294274	51193914	545	547.063	50.178	13.797	41.604	13.149	79.023	21.215
687	1000294274	51193915	545	546.856	49.756	13.769	41.655	13.128	79.823	21.207
688	1000294276	51193916	545	546.568	49.541	14.008	40.958	13.345	78.760	21.195
689	1000294274	51193917	545	546.655	49.963	13.829	41.475	13.180	79.115	21.199
690	1000294190	51193918	545	546.957	49.999	13.794	41.712	13.113	79.307	21.210
691	1000294274	51193919	545	547.438	50.007	13.784	41.798	13.097	79.418	21.229
692	1000294190	51193920	545	545.243	49.988	13.755	41.548	13.123	79.296	21.144
693	1000294190	51193921	545	546.711	50.043	13.786	41.597	13.143	79.248	21.201
694	1000294190	51193922	545	545.735	50.014	13.825	41.461	13.163	78.926	21.163
695	1000294190	51193923	545	547.271	50.018	13.802	41.626	13.147	79.274	21.223
696	1000294190	51193924	545	547.729	49.954	13.767	41.771	13.113	79.643	21.240
697	1000294190	51193925	545	547.369	50.010	13.803	41.365	13.233	79.299	21.226
698	1000294190	51193926	545	547.403	50.036	13.804	41.672	13.136	79.254	21.228
699	1000294190	51193927	545	547.580	50.036	13.799	41.701	13.131	79.306	21.235
700	1000294190	51193928	545	545.439	50.173	13.796	41.475	13.151	78.801	21.152
701	1000294190	51193929	545	546.682	49.964	13.839	41.517	13.168	79.066	21.200
702	1000294190	51193930	545	548.739	49.950	13.784	41.725	13.151	79.699	21.280
703	1000294190	51193931	545	546.148	50.067	13.772	41.655	13.111	79.227	21.179

704	1000294183	51193932	545	546.700	50.156	13.821	41.612	13.138	78.868	21.200
705	1000294274	51193933	545	545.581	50.068	13.769	41.693	13.086	79.140	21.157
706	1000294190	51193934	545	546.006	50.009	13.746	41.685	13.098	79.429	21.174
707	1000294190	51193935	545	547.064	49.920	13.751	41.796	13.089	79.694	21.215
708	1000294274	51193936	545	546.459	50.005	13.743	41.689	13.108	79.520	21.191
709	1000294190	51193937	545	547.436	50.045	13.793	41.650	13.144	79.309	21.229
710	1000294190	51193938	545	545.404	50.053	13.807	41.478	13.149	78.919	21.150
711	1000294190	51193939	545	545.662	50.089	13.806	41.489	13.152	78.908	21.160
712	1000294276	51193940	545	548.057	49.502	13.994	41.108	13.332	79.116	21.253
713	1000294183	51193941	545	548.207	50.196	13.781	41.685	13.151	79.250	21.259
714	1000294190	51193942	545	547.194	50.091	13.835	41.487	13.190	78.956	21.220
715	1000294287	51193943	545	547.335	49.989	13.909	41.495	13.190	78.719	21.225
716	1000294190	51193944	545	547.313	50.034	13.801	41.622	13.149	79.259	21.224
717	1000294276	51193945	545	548.333	49.519	13.999	41.105	13.340	79.103	21.264
718	1000294276	51193946	545	548.308	49.549	14.030	41.049	13.357	78.875	21.263
719	1000294190	51193947	545	548.657	49.976	13.832	41.617	13.183	79.370	21.276
720	1000294190	51193948	545	547.205	50.066	13.797	41.614	13.150	79.219	21.220
721	1000294190	51193949	545	547.282	50.033	13.805	41.651	13.140	79.237	21.223
722	1000294280	51193950	545	547.230	49.590	13.997	41.123	13.307	78.839	21.221
723	1000294190	51193951	545	547.985	49.872	13.806	41.656	13.155	79.589	21.250
724	1000294276	51193952	545	549.435	49.473	14.045	41.034	13.390	79.075	21.307
725	1000294905	51193953	545	546.185	50.219	13.993	41.019	13.315	77.722	21.180
726	1000294276	51193954	545	546.428	49.537	14.018	40.941	13.347	78.691	21.190
727	1000294280	51193955	545	547.739	49.510	14.004	41.017	13.354	79.001	21.241
728	1000294287	51193956	545	549.257	50.189	13.899	41.436	13.255	78.738	21.300
729	1000294197	51193957	545	546.811	49.994	13.807	41.522	13.169	79.219	21.205
730	1000294291	51193958	545	546.262	50.109	13.885	41.319	13.221	78.514	21.183
731	1000294280	51193959	545	546.848	49.570	14.028	40.945	13.356	78.639	21.206
732	1000294280	51193960	545	546.921	49.615	13.956	41.086	13.311	78.987	21.209
733	1000294280	51193961	545	549.386	49.596	14.027	41.095	13.369	78.972	21.305
734	1000294197	51193962	545	547.288	49.938	13.818	41.604	13.155	79.310	21.223
735	1000294280	51193963	545	549.166	49.468	14.008	41.108	13.359	79.250	21.296
736	1000294197	51193964	545	545.368	49.606	13.806	41.442	13.160	79.631	21.149
737	1000294197	51193966	545	545.463	49.693	13.809	41.511	13.140	79.488	21.153
738	1000294276	51193967	545	547.369	49.482	14.021	41.059	13.331	78.898	21.226
739	1000294197	51193968	545	547.622	50.021	13.803	41.662	13.144	79.313	21.236
740	1000294280	51193969	545	545.801	49.492	14.033	40.875	13.353	78.588	21.166
741	1000294197	51193970	545	547.363	50.009	13.796	41.679	13.133	79.336	21.226
742	1000294276	51193971	545	548.105	49.531	14.027	41.031	13.358	78.890	21.255
743	1000294280	51193972	545	549.494	49.588	14.024	41.109	13.367	79.015	21.309
744	1000294209	51193974	545	548.745	50.194	13.787	41.759	13.141	79.296	21.280
745	1000294276	51193975	545	545.276	49.526	14.001	40.927	13.323	78.635	21.145
746	1000294287	51193977	545	546.126	50.078	13.875	41.350	13.207	78.601	21.178
747	1000294197	51193978	545	547.334	50.052	13.792	41.664	13.137	79.285	21.225
748	1000294190	51193979	545	547.306	50.025	13.788	41.599	13.157	79.349	21.224
749	1000294197	51193981	545	547.182	50.016	13.783	41.652	13.137	79.376	21.219
750	1000294209	51193982	545	546.888	49.988	13.746	41.686	13.119	79.587	21.208
751	1000294197	51193983	545	548.638	50.114	13.793	41.737	13.145	79.375	21.276
752	1000294197	51193984	545	547.196	49.937	13.832	41.614	13.149	79.222	21.220
753	1000294197	51193985	545	545.960	50.020	13.804	41.556	13.138	79.073	21.172
754	1000294905	51193986	545	547.644	50.253	14.013	41.116	13.319	77.769	21.237
755	1000294197	51193987	545	546.550	50.026	13.804	41.638	13.126	79.147	21.195
756	1000294212	51193989	545	546.159	50.056	13.797	41.486	13.165	79.082	21.179
757	1000294355	51193990	545	547.692	50.029	13.908	41.498	13.198	78.715	21.239
758	1000294270	51193991	545	545.357	50.224	13.891	41.282	13.210	78.171	21.148
759	1000294209	51193992	545	547.478	50.021	13.794	41.658	13.142	79.346	21.231
760	1000294197	51193993	545	547.368	49.992	13.813	41.641	13.145	79.266	21.226
761	1000294197	51193994	545	546.396	49.975	13.827	41.539	13.154	79.071	21.189
762	1000294197	51193995	545	546.137	49.999	13.806	41.575	13.136	79.117	21.179
763	1000294209	51193996	545	546.240	50.090	13.784	41.577	13.138	79.118	21.183
764	1000294209	51193997	545	546.725	50.069	13.782	41.704	13.110	79.226	21.201
765	1000294937	51193998	545	547.779	50.274	13.984	41.099	13.328	77.915	21.242
766	1000294905	51193999	545	547.966	50.317	13.988	41.206	13.298	77.856	21.250
767	1000294197	51194000	545	546.468	49.825	13.781	41.601	13.136	79.583	21.191
768	1000294197	51194001	545	547.662	50.008	13.801	41.661	13.146	79.356	21.238
769	1000294950	51194002	545	548.209	50.258	13.959	41.240	13.293	78.142	21.259
770	1000294950	51194003	545	547.172	50.306	13.985	41.123	13.306	77.772	21.219
771	1000294197	51194005	545	545.243	50.010	13.800	41.583	13.112	79.005	21.144
772	1000294212	51194006	545	546.411	49.863	13.809	41.487	13.171	79.354	21.189
773	1000294234	51194007	545	546.157	50.042	13.899	41.273	13.233	78.524	21.179
774	1000294234	51194008	545	548.584	49.543	14.041	41.047	13.365	78.858	21.274
775	1000294209	51194010	545	547.331	50.083	13.800	41.595	13.159	79.189	21.225
776	1000294212	51194011	545	547.414	50.039	13.798	41.560	13.172	79.287	21.228
777	1000294212	51194012	545	549.076	49.956	13.836	41.710	13.164	79.441	21.293
778	1000294212	51194013	545	546.309	50.093	13.734	41.721	13.094	79.410	21.185
779	1000294197	51194014	545	547.352	50.039	13.785	41.591	13.160	79.349	21.226
780	1000294209	51194016	545	547.417	50.034	13.795	41.654	13.142	79.311	21.228
781	1000294243	51194017	545	545.961	50.018	13.891	41.245	13.237	78.580	21.172
782	1000294209	51194018	545	547.606	50.203	13.822	41.686	13.137	78.917	21.236
783	1000294209	51194019	545	546.623	49.942	13.742	41.686	13.113	79.649	21.197
784	1000294209	51194020	545	547.403	50.189	13.797	41.630	13.149	79.053	21.228
785	1000294270	51194021	545	546.544	50.261	13.864	41.384	13.207	78.436	21.194
786	1000294209	51194024	545	547.116	50.017	13.797	41.639	13.140	79.281	21.217
787	1000294311	51194027	545	547.362	50.056	13.899	41.368	13.232	78.676	21.226
788	1000294229	51194028	545	548.594	50.062	13.829	41.643	13.174	79.242	21.274
789	1000294209	51194029	545	548.494	50.179	13.843	41.611	13.181	78.962	21.270
790	1000294209	51194031	545	545.722	50.037	13.770	41.558	13.132	79.207	21.163
791	1000294212	51194032	545	545.964	50.095	13.788	41.545	13.142	79.045	21.172
792	1000294209	51194033	545	547.304	50.08	13.806	41.580	13.163	79.284	21.224

793	1000294209	51194034	545	546.843	50.005	13.801	41.555	13.159	79.239	21.206
794	1000294209	51194035	545	548.785	50.081	13.828	41.655	13.175	79.245	21.281
795	1000294950	51194036	545	547.613	50.270	13.980	41.105	13.322	77.918	21.236
796	1000294209	51194037	545	548.176	50.028	13.859	41.568	13.187	79.062	21.258
797	1000294224	51194038	545	549.841	50.237	13.769	41.915	13.118	79.490	21.322
798	1000294212	51194040	545	545.193	50.201	13.778	41.546	13.123	78.822	21.142
799	1000294209	51194041	545	545.545	49.962	13.772	41.610	13.111	79.284	21.156
800	1000294209	51194042	545	545.092	49.956	13.818	41.369	13.176	78.966	21.138
801	1000294274	51194043	545	547.608	50.041	13.791	41.666	13.143	79.348	21.236
802	1000294209	51194044	545	548.047	49.986	13.800	41.704	13.141	79.448	21.253
803	1000294950	51194045	545	547.729	50.271	13.997	41.195	13.296	77.842	21.240
804	1000294224	51194048	545	545.331	49.862	13.775	41.485	13.145	79.398	21.147
805	1000294212	51194049	545	548.575	49.956	13.829	41.666	13.166	79.405	21.273
806	1000294209	51194050	545	547.479	50.016	13.804	41.619	13.155	79.295	21.231
807	1000294209	51194051	545	547.243	50.055	13.850	41.515	13.182	78.936	21.222
808	1000294209	51194052	545	545.324	49.970	13.766	41.607	13.107	79.276	21.147
809	1000294209	51194056	545	547.902	49.989	13.794	41.722	13.132	79.457	21.247
810	1000294209	51194057	545	547.528	49.965	13.837	41.570	13.171	79.195	21.233
811	1000294209	51194058	545	547.311	50.003	13.814	41.589	13.160	79.233	21.224
812	1000294209	51194059	545	545.016	49.936	13.873	41.327	13.188	78.671	21.135
813	1000294212	51194060	545	548.104	50.151	13.784	41.707	13.142	79.286	21.255
814	1000294209	51194062	545	548.504	50.286	13.826	41.769	13.132	78.892	21.270
815	1000294212	51194063	545	548.762	50.019	13.831	41.701	13.159	79.321	21.280
816	1000294209	51194064	545	546.225	50.159	13.780	41.633	13.120	79.027	21.182
817	1000294209	51194065	545	547.288	50.019	13.805	41.642	13.143	79.258	21.223
818	1000294229	51194066	545	546.207	49.959	13.799	41.586	13.134	79.231	21.181
819	1000294212	51194067	545	546.549	50.057	13.813	41.567	13.149	79.047	21.195
820	1000294212	51194068	545	548.117	50.003	13.847	41.618	13.170	79.163	21.255
821	1000294212	51194069	545	545.977	49.928	13.794	41.517	13.151	79.274	21.172
822	1000294937	51194070	545	547.862	50.277	14.105	40.881	13.401	77.255	21.246
823	1000294212	51194071	545	546.032	49.926	13.810	41.573	13.134	79.196	21.175
824	1000294224	51194072	545	546.724	50.015	13.802	41.656	13.125	79.199	21.201
825	1000294212	51194073	545	547.425	50.033	13.807	41.643	13.146	79.243	21.229
826	1000294950	51194074	545	547.622	50.274	13.989	41.178	13.299	77.867	21.236
827	1000294274	51194076	545	547.026	50.005	13.849	41.494	13.183	78.993	21.213
828	1000294274	51194077	545	546.732	49.940	13.851	41.575	13.150	79.042	21.202
829	1000294212	51194078	545	545.288	49.884	13.867	41.310	13.200	78.829	21.146
830	1000294212	51194079	545	547.318	49.885	13.852	41.486	13.193	79.204	21.224
831	1000294212	51194080	545	547.720	50.096	13.844	41.547	13.183	78.976	21.240
832	1000294212	51194082	545	548.850	49.934	13.824	41.679	13.168	79.509	21.284
833	1000294224	51194083	545	549.634	50.098	13.791	41.797	13.150	79.553	21.314
834	1000294950	51194084	545	545.307	50.278	13.988	40.997	13.301	77.535	21.146
835	1000294224	51194086	545	546.214	50.134	13.786	41.563	13.142	79.033	21.182
836	1000294212	51194087	545	547.228	49.991	13.811	41.640	13.142	79.257	21.221
837	1000294224	51194088	545	545.863	49.895	13.812	41.455	13.168	79.207	21.168
838	1000294212	51194089	545	547.271	49.974	13.805	41.645	13.141	79.326	21.223
839	1000294274	51194091	545	547.184	50.064	13.799	41.523	13.178	79.208	21.219
840	1000294212	51194092	545	546.514	50.041	13.762	41.673	13.114	79.358	21.193
841	1000294270	51194094	545	547.530	50.139	13.964	41.248	13.274	78.205	21.233
842	1000294212	51194095	545	547.508	50.005	13.799	41.616	13.156	79.346	21.232
843	1000294212	51194096	545	546.968	49.995	13.804	41.612	13.144	79.254	21.211
844	1000294224	51194097	545	548.514	50.115	13.825	41.643	13.172	79.171	21.271
845	1000294212	51194098	545	547.746	49.954	13.780	41.693	13.138	79.574	21.241
846	1000294212	51194099	545	547.922	50.032	13.797	41.621	13.164	79.374	21.248
847	1000294212	51194100	545	547.448	50.002	13.792	41.641	13.147	79.381	21.229
848	1000294280	51194102	545	549.716	49.611	14.019	41.122	13.368	79.038	21.317
849	1000294212	51194104	545	547.466	50.005	13.842	41.550	13.176	79.096	21.230
850	1000294212	51194105	545	547.156	50.063	13.793	41.667	13.132	79.235	21.218
851	1000294301	51194106	545	546.657	50.038	13.870	41.408	13.202	78.765	21.199
852	1000294224	51194107	545	546.503	49.961	13.817	41.511	13.165	79.167	21.193
853	1000294276	51194108	545	545.325	50.066	13.900	41.146	13.253	78.358	21.147
854	1000294229	51194110	545	547.084	50.043	13.868	41.411	13.211	78.831	21.215
855	1000294229	51194111	545	549.023	50.098	13.925	41.401	13.261	78.700	21.291
856	1000294229	51194112	545	547.346	50.054	13.789	41.686	13.130	79.301	21.226
857	1000294212	51194113	545	548.171	49.988	13.794	41.716	13.140	79.499	21.258
858	1000294276	51194114	545	547.614	49.988	13.898	41.377	13.235	78.821	21.236
859	1000294212	51194115	545	548.501	50.044	13.844	41.627	13.177	79.169	21.270
860	1000294224	51194116	545	547.320	49.987	13.903	41.395	13.222	78.753	21.225
861	1000294229	51194117	545	547.375	50.057	13.789	41.715	13.122	79.304	21.227
862	1000294224	51194118	545	545.455	49.948	13.807	41.439	13.163	79.093	21.152
863	1000294224	51194119	545	547.866	49.993	13.801	41.646	13.155	79.404	21.246
864	1000294224	51194120	545	547.425	49.994	13.805	41.574	13.167	79.318	21.229
865	1000294224	51194121	545	549.462	50.043	13.827	41.672	13.185	79.411	21.308
866	1000294224	51194122	545	545.902	50.120	13.788	41.563	13.134	78.997	21.170
867	1000294274	51194123	545	548.804	50.055	13.775	41.836	13.118	79.593	21.282
868	1000294224	51194124	545	545.611	50.058	13.726	41.642	13.102	79.405	21.158
869	1000294224	51194125	545	547.683	49.987	13.833	41.560	13.178	79.204	21.239
870	1000294224	51194126	545	547.318	50.007	13.802	41.604	13.155	79.302	21.224
871	1000294291	51194128	545	546.583	50.042	13.873	41.381	13.208	78.733	21.196
872	1000294905	51194129	545	546.908	50.222	14.010	41.040	13.326	77.731	21.209
873	1000294274	51194130	545	548.063	50.112	13.891	41.382	13.244	78.730	21.253
874	1000294224	51194131	545	545.521	49.904	13.766	41.535	13.134	79.406	21.155
875	1000294224	51194133	545	546.976	49.953	13.812	41.573	13.157	79.276	21.211
876	1000294224	51194134	545	546.849	50.117	13.725	41.750	13.098	79.501	21.206
877	1000294224	51194135	545	547.217	50.092	13.817	41.595	13.156	79.063	21.221
878	1000294224	51194136	545	546.927	50.132	13.763	41.660	13.128	79.267	21.209
879	1000294224	51194137	545	546.257	50.097	13.799	41.542	13.150	79.022	21.183
880	1000294224	51194138	545	549.346	50.045	13.823	41.691	13.176	79.409	21.303
881	1000294229	51194139	545	547.952	50.069	13.775	41.713	13.136	79.443	21.249

882	1000294937	51194140	545	548.067	50.267	14.045	41.095	13.337	77.631	21.253
883	1000294937	51194141	545	547.675	50.273	13.997	41.179	13.300	77.828	21.238
884	1000294224	51194142	545	545.590	50.148	13.761	41.575	13.123	79.060	21.157
885	1000294229	51194144	545	546.621	49.941	13.803	41.536	13.160	79.295	21.197
886	1000294229	51194145	545	548.298	50.127	13.771	41.733	13.138	79.427	21.262
887	1000294224	51194146	545	549.659	50.276	13.753	41.857	13.132	79.496	21.315
888	1000294229	51194147	545	548.139	50.105	13.778	41.713	13.141	79.403	21.256
889	1000294303	51194148	545	547.126	49.769	13.935	41.196	13.281	78.890	21.217
890	1000294229	51194150	545	547.258	50.007	13.874	41.333	13.240	78.876	21.222
891	1000294229	51194151	545	549.696	50.010	13.791	41.877	13.126	79.699	21.317
892	1000294229	51194152	545	546.725	49.985	13.796	41.610	13.139	79.283	21.201
893	1000295016	51194153	545	546.681	50.043	13.803	41.543	13.159	79.142	21.200
894	1000294229	51194154	545	547.607	50.045	13.786	41.705	13.131	79.374	21.236
895	1000294316	51194155	545	545.994	50.140	13.842	41.421	13.181	78.668	21.173
896	1000294229	51194156	545	547.355	50.054	13.814	41.661	13.138	79.162	21.226
897	1000294229	51194158	545	547.678	50.097	13.871	41.478	13.204	78.815	21.238
898	1000294229	51194159	545	549.530	50.050	13.793	41.754	13.161	79.603	21.310
899	1000294274	51194162	545	547.016	50.032	13.891	41.402	13.212	78.709	21.213
900	1000294229	51194163	545	549.758	50.165	13.904	41.575	13.223	78.817	21.319
901	1000294234	51194164	545	545.814	50.188	13.896	41.227	13.239	78.262	21.166
902	1000294229	51194165	545	547.589	50.053	13.797	41.690	13.135	79.295	21.235
903	1000294234	51194166	545	547.894	50.233	13.928	41.294	13.268	78.308	21.247
904	1000294274	51194167	545	545.937	50.041	13.889	41.287	13.223	78.548	21.171
905	1000294234	51194168	545	547.635	50.148	13.885	41.375	13.236	78.647	21.237
906	1000294229	51194169	545	547.525	49.902	13.798	41.616	13.157	79.520	21.232
907	1000294229	51194170	545	547.627	49.884	13.798	41.585	13.169	79.561	21.236
908	1000294234	51194171	545	545.459	50.206	13.842	41.369	13.185	78.486	21.152
909	1000294229	51194173	545	549.663	50.131	13.780	41.825	13.142	79.567	21.315
910	1000294274	51194174	545	545.144	50.059	13.855	41.338	13.188	78.599	21.140
911	1000294224	51194176	545	547.520	50.044	13.808	41.620	13.155	79.232	21.232
912	1000294274	51194177	545	546.170	50.000	13.916	41.277	13.232	78.495	21.180
913	1000294229	51194178	545	549.643	50.172	13.783	41.825	13.142	79.483	21.315
914	1000294229	51194180	545	548.317	50.028	13.897	41.481	13.218	78.867	21.263
915	1000294229	51194181	545	549.448	50.057	13.759	41.885	13.118	79.776	21.307
916	1000294229	51194182	545	547.788	50.146	13.790	41.719	13.131	79.217	21.243
917	1000294234	51194185	545	546.405	50.022	13.879	41.321	13.223	78.703	21.189
918	1000294234	51194186	545	548.568	50.034	13.880	41.469	13.228	78.992	21.273
919	1000294229	51194187	545	546.855	50.110	13.775	41.642	13.132	79.224	21.206
920	1000294229	51194189	545	545.344	49.944	13.882	41.152	13.252	78.657	21.148
921	1000294224	51194190	545	547.459	49.999	13.807	41.641	13.147	79.302	21.230
922	1000294224	51194191	545	547.257	50.026	13.792	41.596	13.157	79.317	21.222
923	1000294224	51194192	545	547.512	49.996	13.798	41.621	13.155	79.367	21.232
924	1000294234	51194193	545	547.611	50.057	13.870	41.413	13.223	78.875	21.236
925	1000294234	51194194	545	545.182	50.096	13.889	41.231	13.223	78.353	21.142
926	1000294274	51194195	545	545.636	50.086	13.883	41.260	13.224	78.470	21.159
927	1000294274	51194196	545	548.669	50.102	13.886	41.475	13.229	78.862	21.277
928	1000294229	51194197	545	546.895	50.065	13.869	41.394	13.212	78.765	21.208
929	1000294235	51194199	545	548.356	50.067	13.918	41.390	13.249	78.693	21.265
930	1000294274	51194200	545	546.047	49.994	13.886	41.308	13.219	78.656	21.175
931	1000294235	51194202	545	545.160	49.852	13.933	41.028	13.287	78.486	21.141
932	1000294234	51194203	545	549.457	50.107	13.909	41.500	13.240	78.837	21.307
933	1000294301	51194204	545	546.543	50.073	13.907	41.269	13.243	78.485	21.194
934	1000294229	51194206	545	547.261	49.977	13.865	41.412	13.215	78.977	21.222
935	1000294235	51194207	545	546.427	49.879	13.946	41.163	13.275	78.554	21.190
936	1000294234	51194208	545	547.582	49.991	13.893	41.364	13.238	78.842	21.235
937	1000294243	51194209	545	547.399	49.962	13.914	41.342	13.241	78.742	21.228
938	1000294229	51194211	545	545.066	49.966	13.880	41.243	13.216	78.592	21.137
939	1000294234	51194212	545	549.344	50.080	13.905	41.446	13.255	78.887	21.303
940	1000294234	51194213	545	548.634	50.096	13.881	41.431	13.242	78.898	21.275
941	1000294235	51194214	545	547.496	49.978	13.900	41.349	13.241	78.814	21.231
942	1000294234	51194216	545	545.206	50.083	13.895	41.210	13.230	78.348	21.143
943	1000294234	51194217	545	546.663	50.115	13.896	41.386	13.209	78.496	21.199
944	1000294937	51194219	545	547.770	50.269	13.995	41.091	13.331	77.860	21.242
945	1000294264	51194220	545	548.241	49.734	13.988	41.143	13.325	78.806	21.260
946	1000294234	51194221	545	547.625	50.193	13.877	41.359	13.241	78.620	21.236
947	1000294234	51194222	545	548.265	50.072	13.885	41.423	13.236	78.859	21.261
948	1000294234	51194223	545	547.999	50.099	13.898	41.369	13.247	78.703	21.251
949	1000294905	51194224	545	547.297	50.257	13.922	41.260	13.265	78.224	21.224
950	1000294235	51194226	545	547.751	49.880	13.912	41.322	13.256	78.935	21.241
951	1000294243	51194227	545	545.847	49.922	13.886	41.250	13.233	78.739	21.167
952	1000294235	51194228	545	548.955	50.080	13.908	41.483	13.233	78.813	21.288
953	1000294234	51194229	545	546.997	50.001	13.889	41.330	13.235	78.766	21.212
954	1000294234	51194230	545	547.239	50.028	13.913	41.350	13.234	78.622	21.221
955	1000294234	51194231	545	546.470	49.539	14.016	41.000	13.329	78.703	21.192
956	1000294235	51194232	545	549.876	50.067	13.905	41.524	13.242	78.986	21.324
957	1000294235	51194234	545	547.395	49.863	13.910	41.301	13.254	78.923	21.227
958	1000294234	51194235	545	546.649	50.010	13.852	41.386	13.209	78.911	21.198
959	1000294235	51194236	545	549.399	50.125	13.872	41.596	13.208	79.013	21.305
960	1000294234	51194237	545	546.766	50.044	13.867	41.383	13.212	78.789	21.203
961	1000294234	51194239	545	548.540	50.050	13.888	41.450	13.234	78.915	21.272
962	1000294235	51194240	545	546.876	49.902	13.949	41.160	13.286	78.565	21.207
963	1000294234	51194241	545	549.611	50.080	13.900	41.431	13.266	78.953	21.313
964	1000294243	51194242	545	545.245	49.940	13.915	41.199	13.234	78.465	21.144
965	1000294235	51194243	545	548.038	50.113	13.869	41.478	13.213	78.851	21.252
966	1000294270	51194244	545	547.203	50.027	13.900	41.300	13.250	78.693	21.220
967	1000294264	51194245	545	549.723	49.711	14.012	41.221	13.336	78.920	21.318
968	1000294264	51194246	545	546.118	49.773	13.966	41.016	13.315	78.565	21.178
969	1000294246	51194247	545	549.986	50.120	13.942	41.372	13.294	78.706	21.328
970	1000294235	51194248	545	549.555	50.170	13.893	41.535	13.231	78.938	21.311

971	1000294235	51194249	545	547.548	50.033	13.887	41.399	13.226	78.804	21.233
972	1000294234	51194250	545	545.409	50.118	13.877	41.287	13.210	78.420	21.150
973	1000294235	51194251	545	548.433	50.005	13.893	41.462	13.227	78.941	21.268
974	1000294235	51194252	545	548.148	50.123	13.903	41.400	13.240	78.659	21.257
975	1000294235	51194253	545	546.423	49.847	13.927	41.155	13.277	78.711	21.190
976	1000294235	51194254	545	547.193	49.978	13.918	41.221	13.275	78.664	21.220
977	1000294235	51194255	545	547.159	50.080	13.936	41.228	13.272	78.398	21.218
978	1000294235	51194256	545	545.860	49.886	13.961	41.088	13.285	78.375	21.168
979	1000294235	51194257	545	547.797	50.026	13.894	41.388	13.236	78.815	21.243
980	1000294235	51194258	545	548.911	50.022	13.903	41.441	13.246	78.930	21.286
981	1000294234	51194259	545	547.596	50.034	13.888	41.358	13.240	78.807	21.235
982	1000294235	51194260	545	549.476	50.165	13.881	41.554	13.223	78.907	21.308
983	1000294235	51194261	545	546.878	50.072	13.898	41.336	13.230	78.588	21.207
984	1000294243	51194263	545	548.235	50.050	13.898	41.405	13.241	78.816	21.260
985	1000294243	51194264	545	546.088	49.859	13.900	41.125	13.279	78.796	21.177
986	1000294235	51194265	545	549.665	49.969	13.865	41.536	13.234	79.339	21.315
987	1000294235	51194267	545	546.626	49.878	13.979	41.130	13.290	78.399	21.198
988	1000294235	51194268	545	547.860	50.023	13.899	41.382	13.239	78.798	21.245
989	1000294235	51194269	545	547.244	49.831	13.951	41.139	13.302	78.719	21.222
990	1000294235	51194270	545	546.969	49.879	13.953	41.169	13.286	78.593	21.211
991	1000294243	51194271	545	549.701	50.146	13.888	41.484	13.251	78.932	21.317
992	1000294243	51194272	545	545.577	50.149	13.875	41.241	13.229	78.409	21.157
993	1000294234	51194273	545	547.413	49.960	13.897	41.287	13.259	78.845	21.228
994	1000294243	51194274	545	547.978	50.012	13.915	41.380	13.243	78.742	21.250
995	1000294243	51194275	545	546.738	50.033	13.925	41.250	13.254	78.475	21.202
996	1000294243	51194276	545	545.899	49.962	13.905	41.245	13.236	78.581	21.169
997	1000294937	51194277	545	547.691	50.254	14.014	41.113	13.321	77.771	21.239
998	1000294274	51194278	545	548.549	49.948	13.890	41.438	13.238	79.068	21.272
999	1000294243	51194279	545	547.164	49.964	13.901	41.265	13.260	78.777	21.218
1000	1000294274	51194281	545	547.373	49.947	13.915	41.254	13.268	78.759	21.227
1001	1000294937	51194282	545	547.233	50.255	13.903	41.185	13.287	78.320	21.221
1002	1000294243	51194283	545	548.194	49.982	13.922	41.365	13.253	78.780	21.258
1003	1000294235	51194284	545	546.894	49.941	13.925	41.168	13.284	78.642	21.208
1004	1000294243	51194285	545	545.621	49.879	13.899	41.180	13.250	78.703	21.159
1005	1000294243	51194286	545	547.330	50.006	13.899	41.304	13.251	78.747	21.225
1006	1000294243	51194287	545	545.721	49.881	13.885	41.212	13.242	78.792	21.163
1007	1000294243	51194288	545	548.024	50.056	13.879	41.398	13.238	78.882	21.252
1008	1000294243	51194289	545	545.964	49.955	13.896	41.157	13.265	78.650	21.172
1009	1000294243	51194290	545	548.265	50.050	13.917	41.412	13.239	78.714	21.261
1010	1000294243	51194291	545	548.270	50.095	13.883	41.361	13.256	78.834	21.261
1011	1000294235	51194292	545	547.200	49.934	13.908	41.242	13.268	78.796	21.220
1012	1000294246	51194293	545	547.588	50.072	13.886	41.420	13.220	78.756	21.235
1013	1000294274	51194294	545	548.151	50.023	13.880	41.371	13.250	78.950	21.257
1014	1000294253	51194295	545	545.841	50.032	13.912	41.260	13.229	78.418	21.167
1015	1000294235	51194296	545	547.353	50.023	13.913	41.287	13.257	78.648	21.226
1016	1000294243	51194297	545	545.385	50.027	13.958	41.079	13.276	78.104	21.149
1017	1000294264	51194298	545	547.573	49.604	13.968	41.114	13.319	79.028	21.234
1018	1000294243	51194299	545	547.519	49.859	13.924	41.212	13.286	78.866	21.232
1019	1000294246	51194301	545	547.566	50.022	13.883	41.461	13.207	78.848	21.234
1020	1000294303	51194303	545	548.358	50.091	13.935	41.379	13.252	78.557	21.265
1021	1000294311	51194304	545	548.544	50.083	13.937	41.386	13.254	78.589	21.272
1022	1000294270	51194306	545	547.400	50.151	13.895	41.318	13.248	78.553	21.228
1023	1000294243	51194307	545	545.013	49.989	13.908	41.102	13.260	78.392	21.135
1024	1000294246	51194308	545	547.314	50.037	13.880	41.361	13.233	78.805	21.224
1025	1000294264	51194309	545	547.726	49.696	13.977	41.109	13.324	78.856	21.240
1026	1000294246	51194310	545	547.395	50.023	13.909	41.220	13.280	78.676	21.227
1027	1000294243	51194311	545	547.433	50.048	13.902	41.340	13.242	78.683	21.229
1028	1000294243	51194312	545	547.113	50.011	13.878	41.471	13.193	78.829	21.216
1029	1000294246	51194314	545	547.289	50.042	13.895	41.327	13.243	78.711	21.223
1030	1000294287	51194316	545	547.361	50.140	13.925	41.182	13.291	78.397	21.226
1031	1000294253	51194317	545	548.004	49.525	14.023	41.014	13.361	78.909	21.251
1032	1000294246	51194318	545	546.285	50.025	13.892	41.265	13.239	78.606	21.184
1033	1000294246	51194319	545	547.163	50.034	13.893	41.293	13.251	78.713	21.218
1034	1000294246	51194320	545	545.303	50.019	13.883	41.150	13.252	78.528	21.146
1035	1000294246	51194322	545	546.868	49.960	13.928	41.150	13.290	78.591	21.207
1036	1000294270	51194323	545	547.417	50.033	13.894	41.317	13.249	78.747	21.228
1037	1000294274	51194324	545	546.928	49.968	13.893	41.222	13.268	78.785	21.209
1038	1000294246	51194325	545	547.208	50.096	13.902	41.307	13.247	78.575	21.220
1039	1000294311	51194327	545	547.448	50.030	13.885	41.382	13.229	78.809	21.229
1040	1000294243	51194328	545	545.162	50.041	13.955	41.078	13.271	78.066	21.141
1041	1000294246	51194329	545	547.417	50.026	13.891	41.321	13.248	78.777	21.228
1042	1000294246	51194330	545	549.564	50.078	13.919	41.424	13.267	78.844	21.312
1043	1000294243	51194331	545	546.872	49.991	13.888	41.236	13.262	78.767	21.207
1044	1000294243	51194332	545	547.336	50.069	13.903	41.234	13.274	78.626	21.225
1045	1000294253	51194333	545	549.496	50.083	13.935	41.376	13.281	78.737	21.309
1046	1000294264	51194334	545	546.802	49.427	14.007	40.951	13.352	78.979	21.204
1047	1000294264	51194335	545	546.934	49.532	13.968	41.107	13.305	79.051	21.210
1048	1000294253	51194336	545	547.330	49.558	13.949	41.096	13.318	79.178	21.225
1049	1000294246	51194338	545	546.285	49.808	13.898	41.170	13.269	78.916	21.184
1050	1000294905	51194339	545	547.708	50.207	14.001	41.110	13.323	77.916	21.240
1051	1000294253	51194340	545	545.113	49.897	13.903	41.093	13.265	78.576	21.139
1052	1000294274	51194341	545	545.616	49.683	13.941	41.021	13.301	78.777	21.158
1053	1000294246	51194342	545	546.926	49.941	13.928	41.257	13.257	78.632	21.209
1054	1000294264	51194343	545	546.099	49.668	13.946	41.045	13.305	78.842	21.177
1055	1000294253	51194344	545	545.326	49.893	13.910	41.143	13.254	78.574	21.147
1056	1000294246	51194345	545	546.963	49.812	13.926	41.230	13.266	78.849	21.211
1057	1000294246	51194346	545	547.799	50.036	13.866	41.437	13.220	78.957	21.243
1058	1000294246	51194347	545	547.510	50.006	13.917	41.324	13.249	78.672	21.232
1059	1000294905	51194349	545	547.800	50.161	14.027	41.038	13.349	77.851	21.243

1060	1000294264	51194351	545	549.545	49.684	13.971	41.213	13.334	79.167	21.311
1061	1000294426	51194352	545	547.845	50.069	13.885	41.418	13.227	78.805	21.245
1062	1000294246	51194353	545	547.174	49.861	13.890	41.258	13.262	79.005	21.219
1063	1000294246	51194354	545	546.595	49.811	13.904	41.234	13.256	78.921	21.196
1064	1000294253	51194357	545	548.079	49.916	13.901	41.361	13.251	78.989	21.254
1065	1000294246	51194359	545	546.201	49.813	13.911	41.194	13.259	78.822	21.181
1066	1000294243	51194360	545	545.494	49.806	13.908	41.238	13.228	78.750	21.154
1067	1000294253	51194361	545	546.807	50.001	13.888	41.234	13.261	78.746	21.205
1068	1000294246	51194362	545	545.241	49.898	13.886	41.173	13.243	78.690	21.144
1069	1000294246	51194363	545	546.324	49.967	13.913	41.215	13.256	78.587	21.186
1070	1000294253	51194364	545	547.290	50.100	13.891	41.410	13.216	78.638	21.223
1071	1000294264	51194365	545	545.626	49.681	13.991	40.982	13.314	78.495	21.159
1072	1000294253	51194366	545	548.032	50.006	13.893	41.355	13.252	78.884	21.252
1073	1000294246	51194367	545	548.601	49.906	13.938	41.265	13.294	78.869	21.274
1074	1000294253	51194369	545	547.885	49.986	13.895	41.351	13.250	78.885	21.246
1075	1000294954	51194370	545	549.133	50.395	13.958	41.261	13.309	78.066	21.295
1076	1000294246	51194371	545	545.952	49.869	13.935	41.132	13.273	78.563	21.171
1077	1000294246	51194372	545	545.305	49.855	13.932	41.108	13.265	78.508	21.146
1078	1000294253	51194373	545	546.149	49.943	13.897	41.229	13.247	78.689	21.179
1079	1000294270	51194374	545	547.446	50.033	13.961	41.211	13.284	78.375	21.229
1080	1000294270	51194375	545	545.271	49.948	13.872	41.178	13.242	78.693	21.145
1081	1000294274	51194376	545	547.371	49.910	13.901	41.268	13.264	78.894	21.227
1082	1000294274	51194377	545	548.124	49.675	13.998	41.121	13.330	78.829	21.256
1083	1000294291	51194378	545	548.441	50.194	13.887	41.458	13.229	78.680	21.268
1084	1000294246	51194379	545	547.244	49.899	13.910	41.213	13.279	78.845	21.222
1085	1000294246	51194380	545	548.314	50.017	13.886	41.400	13.244	78.944	21.263
1086	1000294287	51194381	545	547.010	50.040	13.887	41.286	13.249	78.716	21.212
1087	1000294253	51194382	545	548.398	50.068	13.948	41.304	13.277	78.529	21.266
1088	1000294270	51194383	545	549.525	50.082	13.959	41.279	13.313	78.607	21.310
1089	1000294379	51194384	545	545.413	49.589	14.020	40.948	13.319	78.452	21.151
1090	1000294276	51194385	545	549.954	50.348	13.932	41.383	13.290	78.404	21.327
1091	1000294246	51194386	545	549.804	50.023	13.939	41.408	13.278	78.848	21.321
1092	1000294253	51194387	545	548.559	49.659	13.958	41.173	13.323	79.141	21.273
1093	1000294905	51194388	545	546.835	50.192	14.015	40.934	13.359	77.737	21.206
1094	1000294276	51194389	545	547.001	50.078	13.939	41.243	13.263	78.365	21.212
1095	1000294253	51194390	545	549.485	49.934	13.946	41.323	13.297	78.908	21.308
1096	1000294246	51194391	545	548.394	50.048	13.933	41.263	13.290	78.646	21.266
1097	1000294355	51194392	545	547.412	50.015	13.907	41.396	13.224	78.700	21.228
1098	1000294270	51194393	545	545.910	49.872	13.869	41.215	13.246	78.925	21.170
1099	1000294937	51194394	545	547.483	50.189	14.019	41.046	13.338	77.810	21.231
1100	1000294253	51194395	545	547.700	49.888	13.944	41.213	13.290	78.736	21.239
1101	1000294270	51194396	545	545.502	50.034	13.899	41.240	13.227	78.442	21.154
1102	1000294253	51194397	545	546.764	49.936	13.889	41.316	13.234	78.833	21.203
1103	1000294270	51194398	545	546.973	50.022	13.884	41.302	13.243	78.759	21.211
1104	1000294264	51194399	545	547.373	50.017	13.906	41.357	13.235	78.699	21.227
1105	1000294253	51194400	545	546.098	49.974	13.904	41.223	13.247	78.590	21.177
1106	1000294270	51194401	545	549.385	50.177	13.881	41.551	13.222	78.880	21.305
1107	1000294415	51194402	545	547.637	49.892	13.950	41.253	13.275	78.684	21.237
1108	1000294379	51194404	545	549.733	49.576	14.005	41.218	13.337	79.177	21.318
1109	1000294253	51194405	545	548.756	49.916	13.915	41.395	13.256	79.003	21.280
1110	1000294253	51194406	545	545.964	49.980	13.894	41.262	13.232	78.619	21.172
1111	1000294253	51194407	545	545.404	49.935	13.863	41.208	13.235	78.787	21.150
1112	1000294253	51194408	545	545.689	49.928	13.914	41.151	13.261	78.550	21.161
1113	1000294253	51194410	545	549.409	49.948	13.933	41.344	13.289	78.945	21.306
1114	1000294253	51194411	545	547.137	49.910	13.929	41.224	13.272	78.702	21.217
1115	1000294253	51194413	545	546.334	49.916	13.900	41.275	13.237	78.742	21.186
1116	1000294264	51194414	545	547.516	49.446	13.975	40.971	13.363	79.235	21.232
1117	1000294264	51194415	545	546.109	49.538	13.990	41.143	13.274	78.798	21.178
1118	1000294253	51194416	545	545.889	50.028	13.915	41.295	13.219	78.417	21.169
1119	1000294264	51194417	545	546.714	49.596	13.998	40.982	13.340	78.747	21.201
1120	1000294264	51194418	545	546.947	49.414	14.012	40.958	13.354	78.995	21.210
1121	1000295016	51194420	545	548.719	50.034	13.943	41.270	13.296	78.654	21.279
1122	1000294355	51194422	545	547.389	50.042	13.906	41.350	13.238	78.662	21.227
1123	1000294905	51194423	545	547.091	50.172	14.041	40.963	13.356	77.660	21.216
1124	1000294355	51194425	545	548.534	50.027	13.900	41.629	13.177	78.884	21.272
1125	1000294337	51194427	545	546.602	49.984	13.884	41.280	13.241	78.766	21.197
1126	1000294371	51194428	545	546.610	50.077	13.800	41.432	13.193	79.099	21.197
1127	1000294512	51194430	545	546.950	49.805	13.908	41.287	13.247	78.963	21.210
1128	1000294968	51194431	545	549.786	50.238	14.022	41.305	13.310	78.046	21.320
1129	1000294379	51194432	545	546.053	50.077	13.861	41.359	13.203	78.667	21.175
1130	1000294264	51194433	545	546.246	49.454	13.998	40.918	13.350	78.908	21.183
1131	1000294303	51194435	545	546.020	50.056	13.897	41.264	13.232	78.491	21.174
1132	1000294264	51194436	545	547.995	50.028	13.905	41.340	13.256	78.774	21.251
1133	1000294270	51194440	545	546.004	49.849	13.929	41.182	13.258	78.637	21.173
1134	1000294264	51194442	545	547.418	49.996	13.910	41.413	13.218	78.713	21.228
1135	1000294253	51194443	545	545.123	49.466	13.962	41.006	13.294	78.928	21.139
1136	1000294270	51194444	545	545.787	50.204	13.894	41.291	13.218	78.246	21.165
1137	1000294264	51194445	545	548.034	50.262	13.902	41.315	13.265	78.429	21.252
1138	1000294253	51194446	545	545.890	49.470	14.028	40.916	13.342	78.660	21.169
1139	1000294253	51194447	545	547.846	49.575	14.010	41.090	13.333	78.876	21.245
1140	1000294264	51194448	545	546.027	49.576	14.002	40.938	13.338	78.663	21.174
1141	1000294253	51194449	545	545.871	49.472	14.033	40.918	13.341	78.630	21.168
1142	1000294274	51194450	545	547.542	50.030	13.901	41.345	13.243	78.733	21.233
1143	1000294291	51194451	545	548.051	50.192	13.791	41.624	13.167	79.175	21.253
1144	1000294253	51194452	545	549.306	49.609	13.962	41.301	13.300	79.309	21.302
1145	1000294264	51194453	545	549.474	50.167	13.892	41.500	13.240	78.840	21.308
1146	1000294274	51194454	545	548.155	50.309	13.847	41.468	13.219	78.690	21.257
1147	1000294270	51194455	545	547.746	50.131	13.906	41.417	13.225	78.573	21.241
1148	1000294264	51194456	545	545.197	49.472	14.001	40.900	13.330	78.780	21.142

1149	1000294264	51194458	545	546.442	50.067	13.924	41.210	13.260	78.386	21.190
1150	1000294264	51194459	545	545.208	50.043	13.835	41.607	13.104	78.749	21.143
1151	1000294264	51194460	545	546.719	50.042	13.885	41.660	13.123	78.685	21.201
1152	1000294274	51194461	545	549.335	50.313	13.866	41.622	13.198	78.740	21.303
1153	1000294264	51194462	545	547.405	49.999	13.905	41.340	13.242	78.737	21.228
1154	1000294276	51194463	545	546.608	49.881	13.936	41.143	13.286	78.631	21.197
1155	1000294291	51194464	545	546.772	50.232	13.777	41.528	13.166	79.009	21.203
1156	1000294264	51194465	545	547.375	49.996	13.880	41.490	13.193	78.876	21.227
1157	1000294264	51194466	545	547.336	50.026	13.900	41.373	13.229	78.711	21.225
1158	1000294319	51194468	545	546.288	50.002	13.923	41.180	13.266	78.467	21.184
1159	1000294287	51194469	545	547.598	50.121	13.906	41.267	13.270	78.565	21.235
1160	1000294270	51194470	545	546.322	49.861	13.889	41.266	13.239	78.889	21.186
1161	1000294280	51194471	545	547.621	49.566	13.994	41.060	13.337	78.949	21.236
1162	1000294270	51194472	545	545.321	49.922	13.888	41.186	13.240	78.655	21.147
1163	1000294291	51194473	545	547.691	50.156	13.789	41.519	13.191	79.189	21.239
1164	1000294287	51194474	545	547.093	50.015	13.886	41.278	13.254	78.774	21.216
1165	1000294270	51194475	545	545.114	49.969	13.909	41.131	13.253	78.428	21.139
1166	1000294276	51194476	545	548.058	49.626	13.983	41.069	13.345	78.983	21.253
1167	1000294280	51194477	545	548.670	49.502	14.003	41.129	13.340	79.151	21.277
1168	1000294287	51194479	545	547.921	50.084	13.909	41.342	13.253	78.655	21.248
1169	1000294905	51194481	545	548.708	50.196	14.026	41.116	13.345	77.934	21.278
1170	1000294905	51194484	545	547.579	50.137	14.027	40.957	13.369	77.862	21.235
1171	1000294270	51194485	545	547.600	50.027	13.913	41.293	13.261	78.673	21.235
1172	1000294276	51194486	545	545.403	49.557	13.985	40.918	13.329	78.695	21.150
1173	1000294280	51194487	545	548.187	49.578	14.014	41.093	13.340	78.900	21.258
1174	1000294270	51194489	545	547.606	49.993	13.900	41.286	13.264	78.802	21.236
1175	1000294270	51194491	545	547.208	50.049	13.865	41.422	13.211	78.857	21.220
1176	1000294270	51194492	545	548.438	49.990	13.949	41.262	13.292	78.651	21.268
1177	1000294276	51194493	545	546.927	49.621	13.990	41.064	13.319	78.785	21.209
1178	1000294270	51194494	545	546.527	50.063	13.877	41.357	13.215	78.669	21.194
1179	1000294270	51194495	545	548.337	49.981	13.957	41.200	13.309	78.603	21.264
1180	1000294280	51194496	545	546.584	49.398	14.020	40.933	13.353	78.924	21.196
1181	1000294264	51194497	545	545.044	49.903	13.898	41.158	13.243	78.587	21.136
1182	1000294287	51194498	545	547.110	50.068	13.893	41.284	13.252	78.653	21.216
1183	1000294270	51194499	545	547.325	50.016	13.913	41.296	13.254	78.654	21.225
1184	1000294270	51194500	545	547.290	50.015	13.869	41.406	13.218	78.898	21.223
1185	1000294264	51194501	545	547.759	50.058	13.892	41.395	13.233	78.768	21.242
1186	1000294270	51194502	545	548.320	50.022	13.942	41.224	13.301	78.621	21.263
1187	1000294276	51194503	545	547.455	50.023	13.904	41.417	13.218	78.712	21.230
1188	1000294270	51194504	545	547.810	50.064	13.895	41.388	13.236	78.747	21.244
1189	1000294270	51194505	545	545.880	49.885	13.937	41.093	13.284	78.518	21.169
1190	1000294264	51194506	545	547.648	50.050	13.891	41.355	13.243	78.771	21.237
1191	1000294276	51194507	545	547.121	50.020	13.900	41.297	13.249	78.690	21.217
1192	1000294276	51194508	545	547.081	49.570	14.008	41.054	13.326	78.790	21.215
1193	1000294270	51194510	545	547.495	50.138	13.889	41.576	13.168	78.622	21.231
1194	1000294276	51194512	545	547.265	50.019	13.894	41.310	13.248	78.747	21.222
1195	1000294276	51194513	545	549.829	49.508	13.970	41.125	13.370	79.501	21.322
1196	1000294379	51194514	545	548.895	50.183	13.812	41.709	13.160	79.188	21.286
1197	1000294280	51194515	545	547.417	49.684	14.016	41.016	13.346	78.610	21.228
1198	1000294287	51194516	545	548.657	50.018	13.903	41.571	13.198	78.896	21.276
1199	1000294276	51194518	545	548.372	50.180	13.901	41.383	13.251	78.615	21.265
1200	1000294276	51194519	545	545.005	50.064	13.900	41.153	13.243	78.316	21.135
1201	1000294280	51194522	545	547.828	49.661	14.022	41.036	13.350	78.670	21.244
1202	1000294276	51194524	545	549.594	50.106	13.966	41.341	13.294	78.540	21.313
1203	1000294276	51194525	545	547.333	50.029	13.895	41.351	13.236	78.737	21.225
1204	1000294280	51194526	545	547.999	49.674	14.013	41.059	13.347	78.725	21.251
1205	1000294276	51194527	545	547.304	50.023	13.905	41.289	13.255	78.685	21.224
1206	1000294276	51194528	545	547.384	50.012	13.899	41.294	13.256	78.746	21.227
1207	1000294280	51194529	545	547.382	50.021	13.913	41.376	13.229	78.655	21.227
1208	1000294287	51194531	545	547.142	50.028	13.897	41.443	13.202	78.697	21.218
1209	1000294280	51194532	545	547.224	49.982	13.898	41.407	13.216	78.776	21.221
1210	1000294280	51194534	545	547.080	50.121	13.897	41.405	13.213	78.545	21.215
1211	1000294291	51194535	545	545.374	50.169	13.890	41.278	13.212	78.264	21.149
1212	1000294280	51194536	545	545.548	50.169	13.873	41.349	13.194	78.384	21.156
1213	1000294280	51194537	545	547.395	49.990	13.909	41.472	13.199	78.724	21.227
1214	1000294280	51194538	545	545.629	50.090	13.862	41.358	13.193	78.581	21.159
1215	1000294280	51194539	545	547.777	50.046	13.904	41.409	13.228	78.723	21.242
1216	1000294280	51194541	545	545.237	49.328	14.012	40.887	13.335	78.887	21.144
1217	1000294280	51194543	545	547.107	49.961	13.869	41.584	13.157	78.957	21.216
1218	1000294280	51194544	545	547.745	50.031	13.898	41.398	13.231	78.774	21.241
1219	1000294291	51194545	545	548.064	50.174	13.798	41.649	13.159	79.163	21.253
1220	1000294291	51194546	545	545.170	50.162	13.879	41.237	13.221	78.309	21.141
1221	1000294291	51194547	545	548.657	50.099	13.903	41.413	13.248	78.769	21.276
1222	1000294291	51194548	545	546.784	50.165	13.855	41.318	13.234	78.670	21.204
1223	1000294291	51194549	545	545.180	50.187	13.892	41.327	13.192	78.196	21.142
1224	1000294311	51194550	545	548.023	50.085	13.926	41.345	13.255	78.573	21.252
1225	1000294287	51194551	545	546.875	50.092	13.863	41.393	13.212	78.755	21.207
1226	1000294280	51194552	545	547.970	50.086	13.846	41.501	13.204	79.015	21.250
1227	1000294287	51194553	545	548.735	50.016	13.852	41.580	13.197	79.203	21.279
1228	1000294287	51194555	545	547.907	50.118	13.803	41.584	13.176	79.201	21.247
1229	1000294291	51194556	545	545.923	50.074	13.893	41.259	13.232	78.472	21.170
1230	1000294287	51194557	545	548.581	49.922	13.832	41.604	13.186	79.446	21.273
1231	1000294280	51194558	545	545.502	50.019	13.876	41.490	13.148	78.593	21.154
1232	1000294498	51194559	545	547.921	49.963	13.946	41.225	13.291	78.634	21.248
1233	1000294287	51194562	545	546.409	50.030	13.878	41.553	13.150	78.695	21.189
1234	1000294287	51194563	545	548.444	49.950	13.889	41.432	13.237	79.054	21.268
1235	1000294291	51194564	545	545.952	50.026	13.904	41.280	13.226	78.492	21.171
1236	1000294287	51194565	545	546.944	49.874	13.883	41.366	13.222	78.994	21.210
1237	1000294287	51194566	545	548.232	49.913	13.889	41.444	13.228	78.978	21.260

1238	1000294303	51194567	545	545.836	49.778	13.958	41.094	13.283	78.557	21.167
1239	1000294287	51194568	545	547.035	50.149	13.910	41.266	13.256	78.422	21.213
1240	1000294287	51194569	545	548.586	49.953	13.928	41.476	13.227	78.847	21.274
1241	1000294287	51194570	545	546.880	50.050	13.895	41.344	13.228	78.635	21.207
1242	1000294291	51194571	545	547.690	50.040	13.897	41.322	13.254	78.759	21.239
1243	1000294301	51194572	545	545.841	50.120	13.869	41.284	13.221	78.526	21.167
1244	1000294301	51194573	545	545.434	50.075	13.844	41.359	13.188	78.680	21.151
1245	1000294287	51194574	545	548.971	49.951	13.921	41.522	13.221	78.945	21.289
1246	1000294287	51194575	545	545.520	50.101	13.895	41.221	13.234	78.363	21.155
1247	1000294291	51194576	545	546.595	50.037	13.878	41.399	13.203	78.716	21.196
1248	1000294379	51194577	545	549.218	50.016	13.881	41.698	13.171	79.105	21.298
1249	1000294291	51194578	545	547.316	50.246	13.806	41.578	13.164	78.900	21.224
1250	1000294287	51194579	545	546.487	49.897	13.915	41.157	13.278	78.710	21.192
1251	1000294287	51194580	545	549.922	49.978	13.926	41.474	13.259	79.011	21.325
1252	1000294291	51194581	545	545.764	50.080	13.853	41.334	13.204	78.670	21.164
1253	1000294291	51194582	545	548.691	50.087	13.904	41.398	13.254	78.789	21.278
1254	1000294291	51194583	545	548.561	50.248	13.851	41.529	13.209	78.819	21.273
1255	1000294287	51194584	545	547.600	50.018	13.867	41.573	13.172	78.949	21.235
1256	1000294287	51194586	545	545.364	50.068	13.873	41.265	13.216	78.519	21.149
1257	1000294301	51194587	545	545.561	50.048	13.830	41.396	13.179	78.819	21.156
1258	1000294291	51194588	545	547.376	49.963	13.851	41.435	13.211	79.098	21.227
1259	1000294291	51194589	545	546.696	50.233	13.821	41.400	13.205	78.742	21.200
1260	1000294379	51194590	545	548.949	50.117	13.865	41.553	13.211	78.999	21.288
1261	1000294301	51194591	545	547.924	50.064	13.912	41.368	13.245	78.669	21.248
1262	1000294301	51194592	545	547.804	50.034	13.867	41.394	13.234	78.954	21.243
1263	1000294301	51194593	545	546.036	50.193	13.905	41.310	13.218	78.233	21.175
1264	1000294291	51194594	545	547.662	50.172	13.791	41.502	13.196	79.151	21.238
1265	1000294291	51194595	545	547.398	50.220	13.807	41.532	13.180	78.946	21.228
1266	1000294291	51194596	545	548.764	50.062	13.903	41.417	13.250	78.845	21.281
1267	1000294291	51194597	545	548.091	50.221	13.812	41.609	13.173	79.017	21.254
1268	1000294301	51194598	545	545.806	50.189	13.909	41.297	13.217	78.186	21.166
1269	1000294337	51194599	545	548.276	49.928	13.863	41.466	13.222	79.213	21.262
1270	1000294311	51194600	545	546.191	49.922	13.889	41.295	13.227	78.775	21.181
1271	1000294379	51194601	545	548.932	50.214	13.883	41.522	13.220	78.745	21.287
1272	1000294379	51194603	545	546.092	50.204	13.909	41.290	13.226	78.204	21.177
1273	1000294291	51194604	545	547.246	50.012	13.906	41.539	13.174	78.688	21.222
1274	1000294291	51194605	545	548.668	50.279	13.860	41.523	13.214	78.735	21.277
1275	1000294301	51194606	545	546.196	50.102	13.915	41.219	13.251	78.346	21.181
1276	1000294379	51194607	545	546.997	50.134	13.895	41.320	13.238	78.521	21.212
1277	1000294291	51194608	545	548.756	50.022	13.918	41.558	13.205	78.822	21.280
1278	1000294291	51194609	545	547.553	50.032	13.885	41.342	13.244	78.818	21.234
1279	1000294301	51194610	545	547.783	49.911	13.871	41.455	13.214	79.124	21.242
1280	1000294498	51194611	545	545.468	49.983	13.900	41.201	13.239	78.513	21.153
1281	1000294379	51194612	545	546.994	50.132	13.894	41.320	13.238	78.533	21.212
1282	1000294303	51194613	545	547.720	50.023	13.905	41.350	13.246	78.743	21.240
1283	1000294301	51194614	545	548.005	50.079	13.879	41.411	13.233	78.843	21.251
1284	1000294301	51194615	545	545.521	49.858	13.929	41.194	13.243	78.553	21.155
1285	1000294303	51194616	545	548.063	50.060	13.918	41.370	13.248	78.661	21.253
1286	1000294303	51194617	545	547.458	50.068	13.902	41.300	13.256	78.651	21.230
1287	1000294301	51194618	545	545.370	50.066	13.897	41.133	13.259	78.383	21.149
1288	1000294301	51194619	545	546.647	50.006	13.935	41.286	13.240	78.445	21.198
1289	1000294301	51194621	545	545.315	49.927	13.893	41.203	13.235	78.615	21.147
1290	1000294303	51194622	545	545.825	49.807	13.940	41.091	13.283	78.615	21.167
1291	1000294301	51194623	545	547.240	50.053	13.902	41.307	13.248	78.648	21.221
1292	1000294301	51194624	545	548.027	50.106	13.881	41.419	13.231	78.796	21.252
1293	1000294301	51194625	545	547.641	50.080	13.933	41.289	13.264	78.485	21.237
1294	1000294301	51194626	545	547.369	50.001	13.897	41.314	13.249	78.771	21.226
1295	1000294379	51194627	545	547.317	50.035	13.890	41.324	13.244	78.750	21.224
1296	1000294303	51194628	545	546.089	49.945	13.943	41.143	13.273	78.419	21.177
1297	1000294301	51194629	545	546.331	49.951	13.922	41.166	13.271	78.565	21.186
1298	1000294301	51194630	545	546.940	50.144	13.885	41.365	13.222	78.554	21.210
1299	1000294301	51194632	545	547.734	50.060	13.902	41.389	13.234	78.703	21.241
1300	1000294303	51194633	545	548.558	50.056	13.938	41.372	13.259	78.628	21.273
1301	1000294303	51194634	545	547.990	50.024	13.907	41.336	13.257	78.771	21.250
1302	1000294301	51194635	545	547.288	49.963	13.911	41.331	13.242	78.741	21.223
1303	1000294301	51194636	545	545.664	49.826	13.927	41.205	13.243	78.636	21.160
1304	1000294301	51194637	545	546.510	50.141	13.883	41.337	13.221	78.510	21.193
1305	1000294303	51194638	545	547.831	50.216	13.885	41.417	13.227	78.573	21.244
1306	1000294303	51194640	545	545.744	49.813	13.955	41.125	13.270	78.511	21.163
1307	1000294301	51194641	545	545.746	49.983	13.913	41.170	13.256	78.476	21.163
1308	1000294303	51194642	545	547.720	49.975	13.924	41.276	13.270	78.711	21.240
1309	1000294379	51194643	545	547.900	50.250	13.864	41.457	13.216	78.649	21.247
1310	1000294303	51194644	545	546.119	49.981	13.945	41.147	13.272	78.354	21.178
1311	1000294303	51194645	545	548.397	49.937	13.919	41.298	13.279	78.896	21.266
1312	1000294303	51194646	545	547.995	50.023	13.925	41.304	13.267	78.670	21.251
1313	1000294303	51194647	545	545.796	50.021	13.896	41.223	13.240	78.520	21.165
1314	1000294303	51194648	545	547.060	50.000	13.915	41.279	13.253	78.630	21.214
1315	1000294303	51194649	545	545.426	50.086	13.905	41.155	13.253	78.317	21.151
1316	1000294303	51194650	545	546.523	50.000	13.892	41.299	13.233	78.683	21.194
1317	1000294319	51194651	545	546.925	49.974	13.913	41.257	13.257	78.659	21.209
1318	1000294301	51194652	545	546.938	50.126	13.892	41.309	13.240	78.542	21.210
1319	1000294301	51194653	545	546.833	50.097	13.883	41.325	13.232	78.624	21.206
1320	1000294301	51194654	545	546.077	50.099	13.904	41.272	13.231	78.395	21.176
1321	1000294301	51194655	545	545.703	50.128	13.916	41.288	13.217	78.227	21.162
1322	1000294379	51194656	545	547.905	50.067	13.895	41.393	13.237	78.757	21.247
1323	1000294303	51194657	545	546.102	50.047	13.900	41.219	13.249	78.504	21.177
1324	1000294303	51194658	545	547.797	49.891	13.903	41.290	13.267	78.972	21.243
1325	1000294311	51194659	545	547.253	50.069	13.905	41.299	13.251	78.603	21.222
1326	1000294303	51194660	545	548.482	49.964	13.985	41.214	13.308	78.548	21.270

1327	1000294311	51194661	545	548.569	50.228	13.881	41.446	13.236	78.679	21.273
1328	1000294303	51194662	545	545.917	49.883	13.984	41.100	13.283	78.259	21.170
1329	1000294319	51194663	545	546.513	50.058	13.908	41.249	13.249	78.496	21.193
1330	1000294303	51194665	545	547.021	49.930	13.928	41.237	13.265	78.662	21.213
1331	1000294303	51194666	545	546.219	49.966	13.932	41.151	13.273	78.467	21.182
1332	1000294326	51194667	545	547.849	50.188	13.866	41.512	13.197	78.724	21.245
1333	1000294326	51194668	545	547.375	50.037	13.909	41.486	13.194	78.651	21.227
1334	1000294303	51194669	545	548.247	49.889	13.980	41.240	13.294	78.608	21.260
1335	1000294311	51194670	545	547.665	49.952	13.879	41.359	13.242	78.997	21.238
1336	1000294311	51194673	545	545.972	50.128	13.878	41.257	13.233	78.481	21.172
1337	1000294311	51194674	545	546.473	49.983	13.890	41.288	13.236	78.713	21.192
1338	1000294303	51194675	545	546.980	49.934	13.923	41.223	13.269	78.674	21.211
1339	1000294303	51194676	545	548.700	49.864	13.957	41.261	13.298	78.840	21.278
1340	1000294303	51194677	545	548.567	50.034	13.957	41.339	13.270	78.553	21.273
1341	1000294311	51194678	545	547.326	50.076	13.906	41.318	13.247	78.599	21.225
1342	1000294311	51194679	545	547.879	50.198	13.902	41.391	13.237	78.508	21.246
1343	1000294311	51194680	545	546.122	49.897	13.890	41.279	13.230	78.800	21.178
1344	1000294495	51194682	545	548.480	50.025	13.898	41.359	13.262	78.891	21.270
1345	1000294311	51194683	545	548.125	50.111	13.912	41.370	13.249	78.623	21.256
1346	1000294311	51194684	545	547.372	50.075	13.907	41.321	13.247	78.601	21.227
1347	1000294311	51194685	545	545.613	50.009	13.889	41.271	13.220	78.552	21.158
1348	1000294319	51194686	545	545.923	49.942	13.938	41.137	13.271	78.427	21.170
1349	1000294387	51194687	545	546.776	50.045	13.880	41.298	13.240	78.715	21.203
1350	1000294311	51194688	545	547.637	49.989	13.885	41.332	13.250	78.900	21.237
1351	1000294316	51194690	545	548.773	49.987	13.925	41.371	13.265	78.841	21.281
1352	1000294316	51194691	545	546.077	49.981	13.910	41.385	13.195	78.544	21.176
1353	1000294311	51194692	545	547.457	49.974	13.908	41.322	13.248	78.766	21.230
1354	1000294319	51194693	545	548.292	50.241	13.881	41.566	13.191	78.619	21.262
1355	1000294311	51194694	545	547.708	50.027	13.897	41.356	13.244	78.779	21.240
1356	1000294311	51194695	545	547.683	50.064	13.890	41.326	13.253	78.757	21.239
1357	1000294316	51194696	545	548.044	50.014	13.897	41.407	13.236	78.851	21.253
1358	1000294316	51194697	545	547.185	49.927	13.902	41.311	13.245	78.834	21.219
1359	1000294311	51194698	545	547.479	50.014	13.896	41.321	13.249	78.774	21.231
1360	1000294319	51194701	545	546.054	50.066	13.915	41.252	13.237	78.383	21.175
1361	1000294311	51194702	545	547.980	49.888	13.921	41.349	13.253	78.903	21.250
1362	1000294316	51194704	545	547.694	50.031	13.900	41.290	13.265	78.755	21.239
1363	1000294319	51194705	545	546.028	50.185	13.895	41.268	13.231	78.303	21.174
1364	1000294311	51194706	545	547.361	50.008	13.875	41.362	13.233	78.889	21.226
1365	1000294316	51194708	545	547.823	50.001	13.926	41.334	13.254	78.677	21.244
1366	1000294311	51194709	545	547.252	49.990	13.903	41.292	13.253	78.738	21.222
1367	1000294495	51194710	545	546.977	50.040	13.897	41.575	13.156	78.658	21.211
1368	1000294316	51194711	545	548.688	50.201	13.877	41.507	13.219	78.761	21.278
1369	1000294319	51194713	545	547.663	50.060	13.902	41.336	13.249	78.697	21.238
1370	1000294311	51194714	545	545.400	49.803	13.922	41.113	13.266	78.661	21.150
1371	1000294337	51194715	545	547.062	49.990	13.877	41.380	13.220	78.857	21.214
1372	1000294316	51194716	545	547.483	50.050	13.905	41.287	13.260	78.671	21.231
1373	1000294316	51194717	545	547.571	50.043	13.900	41.301	13.258	78.718	21.234
1374	1000294316	51194718	545	545.110	49.919	13.907	41.118	13.257	78.519	21.139
1375	1000294311	51194719	545	545.933	50.085	13.884	41.313	13.214	78.510	21.171
1376	1000294319	51194720	545	545.730	49.883	13.928	41.088	13.282	78.549	21.163
1377	1000294311	51194721	545	547.858	50.046	13.890	41.384	13.238	78.813	21.245
1378	1000294379	51194722	545	546.896	50.026	13.915	41.234	13.263	78.564	21.208
1379	1000294316	51194723	545	547.884	50.135	13.865	41.430	13.224	78.820	21.246
1380	1000294311	51194724	545	547.727	50.028	13.890	41.363	13.242	78.821	21.240
1381	1000294311	51194725	545	547.874	50.043	13.893	41.406	13.232	78.802	21.246
1382	1000294311	51194726	545	545.368	49.823	13.923	41.102	13.269	78.617	21.149
1383	1000294319	51194727	545	546.443	50.088	13.938	41.159	13.276	78.272	21.190
1384	1000294311	51194728	545	546.307	50.075	13.907	41.276	13.235	78.446	21.185
1385	1000294316	51194729	545	548.848	50.014	13.944	41.389	13.261	78.698	21.284
1386	1000294319	51194730	545	547.356	50.011	13.915	41.272	13.262	78.656	21.226
1387	1000294316	51194731	545	547.461	50.018	13.899	41.283	13.261	78.746	21.230
1388	1000294319	51194732	545	546.129	50.048	13.911	41.393	13.194	78.444	21.178
1389	1000294316	51194733	545	547.065	50.051	13.904	41.336	13.235	78.609	21.215
1390	1000294495	51194734	545	547.158	50.026	13.897	41.384	13.221	78.705	21.218
1391	1000294316	51194735	545	548.136	50.068	13.930	41.351	13.256	78.594	21.256
1392	1000294494	51194736	545	548.400	49.954	13.949	41.274	13.287	78.700	21.266
1393	1000294316	51194737	545	548.733	49.985	13.898	41.448	13.239	78.986	21.279
1394	1000294316	51194738	545	548.669	50.145	13.912	41.446	13.238	78.652	21.277
1395	1000294319	51194739	545	546.276	49.881	13.939	41.162	13.271	78.565	21.184
1396	1000294316	51194740	545	547.133	50.083	13.898	41.345	13.233	78.603	21.217
1397	1000294326	51194741	545	547.051	50.214	13.901	41.513	13.178	78.373	21.214
1398	1000294316	51194742	545	547.017	50.050	13.896	41.348	13.230	78.653	21.213
1399	1000294316	51194743	545	547.885	49.982	13.925	41.348	13.250	78.720	21.246
1400	1000294319	51194744	545	546.609	50.254	13.891	41.470	13.181	78.302	21.197
1401	1000294316	51194745	545	545.072	49.911	13.924	41.140	13.249	78.431	21.137
1402	1000294326	51194746	545	547.112	50.183	13.872	41.435	13.204	78.592	21.216
1403	1000294319	51194747	545	548.357	49.957	13.902	41.342	13.264	78.956	21.265
1404	1000294495	51194748	545	547.281	50.032	13.886	41.577	13.163	78.771	21.223
1405	1000294316	51194749	545	548.687	49.951	13.870	41.466	13.232	79.197	21.278
1406	1000294316	51194750	545	547.914	50.020	13.901	41.349	13.251	78.801	21.248
1407	1000294319	51194751	545	545.511	50.076	13.924	41.159	13.254	78.237	21.154
1408	1000294316	51194752	545	547.405	50.017	13.902	41.264	13.266	78.723	21.228
1409	1000294337	51194753	545	545.628	49.921	13.862	41.275	13.219	78.847	21.159
1410	1000294355	51194754	545	548.835	49.959	13.889	41.769	13.140	79.099	21.283
1411	1000294316	51194756	545	546.559	49.916	13.907	41.309	13.231	78.735	21.195
1412	1000294316	51194757	545	547.389	50.036	13.903	41.326	13.246	78.687	21.227
1413	1000294319	51194758	545	547.195	49.971	13.915	41.261	13.262	78.697	21.220
1414	1000294495	51194759	545	546.690	50.008	13.881	41.286	13.242	78.755	21.200
1415	1000294316	51194761	545	547.257	50.075	13.899	41.327	13.242	78.722	21.222

1416	1000294968	51194762	545	549.628	50.157	13.963	41.365	13.287	78.479	21.314
1417	1000294316	51194763	545	547.580	50.026	13.894	41.259	13.272	78.784	21.235
1418	1000294316	51194764	545	547.621	50.019	13.919	41.530	13.186	78.655	21.236
1419	1000294326	51194765	545	546.779	50.170	13.923	41.225	13.263	78.275	21.204
1420	1000294319	51194766	545	547.035	49.950	13.904	41.229	13.268	78.768	21.213
1421	1000294319	51194767	545	546.802	50.013	13.925	41.227	13.263	78.515	21.204
1422	1000294319	51194768	545	547.782	49.977	13.902	41.342	13.250	78.843	21.242
1423	1000294316	51194769	545	546.313	49.998	13.880	41.267	13.238	78.723	21.185
1424	1000294326	51194770	545	546.426	50.195	13.872	41.302	13.230	78.474	21.190
1425	1000294319	51194771	545	547.376	50.127	13.914	41.462	13.202	78.479	21.227
1426	1000294319	51194772	545	548.277	50.245	13.892	41.393	13.246	78.548	21.262
1427	1000294415	51194773	545	546.811	50.022	13.956	41.204	13.271	78.327	21.205
1428	1000294495	51194774	545	547.701	50.042	13.892	41.339	13.249	78.788	21.239
1429	1000294905	51194776	545	547.996	50.265	14.019	41.014	13.361	77.765	21.251
1430	1000294950	51194777	545	545.557	50.309	14.005	41.090	13.277	77.430	21.156
1431	1000294326	51194778	545	547.487	50.012	13.909	41.468	13.203	78.708	21.231
1432	1000294319	51194779	545	547.436	50.130	13.902	41.480	13.198	78.551	21.229
1433	1000294397	51194781	545	546.889	50.083	13.915	41.322	13.235	78.474	21.208
1434	1000294319	51194782	545	547.813	50.040	13.894	41.326	13.256	78.792	21.244
1435	1000294326	51194783	545	547.346	49.983	13.907	41.344	13.239	78.743	21.226
1436	1000294495	51194784	545	547.434	50.068	13.883	41.558	13.173	78.759	21.229
1437	1000294319	51194785	545	545.081	50.183	13.935	41.310	13.195	77.947	21.138
1438	1000294319	51194786	545	547.585	50.005	13.929	41.260	13.272	78.616	21.235
1439	1000294337	51194787	545	546.001	50.069	13.924	41.155	13.267	78.318	21.173
1440	1000294319	51194788	545	546.351	50.212	13.899	41.461	13.177	78.282	21.187
1441	1000294337	51194792	545	547.110	50.086	13.940	41.648	13.137	78.360	21.216
1442	1000294495	51194793	545	546.830	50.077	13.936	41.632	13.135	78.357	21.206
1443	1000294326	51194796	545	546.306	50.040	13.915	41.237	13.248	78.459	21.185
1444	1000294326	51194797	545	545.307	50.102	13.884	41.220	13.229	78.390	21.146
1445	1000294319	51194798	545	548.868	50.169	13.920	41.388	13.261	78.595	21.285
1446	1000294319	51194799	545	548.725	50.158	13.927	41.363	13.266	78.552	21.279
1447	1000294319	51194800	545	547.738	50.001	13.898	41.295	13.264	78.818	21.241
1448	1000294379	51194801	545	547.311	50.018	13.902	41.349	13.236	78.713	21.224
1449	1000294319	51194802	545	547.427	50.011	13.909	41.300	13.255	78.701	21.229
1450	1000294326	51194804	545	547.927	50.094	13.898	41.426	13.227	78.703	21.248
1451	1000294379	51194805	545	545.644	50.021	13.879	41.295	13.213	78.597	21.160
1452	1000294379	51194806	545	547.238	50.008	13.901	41.330	13.241	78.723	21.221
1453	1000294379	51194807	545	547.401	50.033	13.911	41.450	13.206	78.652	21.228
1454	1000294379	51194808	545	547.331	50.061	13.896	41.342	13.239	78.679	21.225
1455	1000294326	51194809	545	547.277	50.050	13.904	41.278	13.258	78.643	21.223
1456	1000294326	51194810	545	546.997	50.087	13.940	41.260	13.257	78.342	21.212
1457	1000294326	51194811	545	547.423	50.129	13.928	41.278	13.262	78.406	21.229
1458	1000294937	51194812	545	547.840	50.270	13.984	41.148	13.314	77.932	21.245
1459	1000294326	51194813	545	545.919	50.051	13.913	41.229	13.241	78.397	21.170
1460	1000294326	51194815	545	547.707	49.984	13.877	41.415	13.225	78.963	21.240
1461	1000294326	51194818	545	546.486	50.165	13.915	41.221	13.258	78.290	21.192
1462	1000294326	51194819	545	546.183	50.163	13.934	41.141	13.276	78.139	21.180
1463	1000294326	51194820	545	546.664	50.165	13.928	41.253	13.251	78.238	21.199
1464	1000294326	51194821	545	545.067	50.146	13.881	41.218	13.224	78.303	21.137
1465	1000294326	51194822	545	546.158	50.018	13.933	41.192	13.259	78.371	21.179
1466	1000294326	51194823	545	548.781	50.278	13.927	41.368	13.266	78.373	21.281
1467	1000294326	51194826	545	548.630	50.331	13.928	41.330	13.274	78.260	21.275
1468	1000294337	51194827	545	546.739	50.151	13.878	41.373	13.215	78.558	21.202
1469	1000294337	51194828	545	548.149	50.108	13.894	41.411	13.237	78.733	21.257
1470	1000294337	51194829	545	547.145	50.051	13.889	41.420	13.210	78.710	21.218
1471	1000294379	51194830	545	546.581	49.911	13.917	41.131	13.289	78.687	21.196
1472	1000294326	51194831	545	547.513	50.107	13.911	41.389	13.228	78.547	21.232
1473	1000294379	51194833	545	547.155	50.281	13.905	41.345	13.234	78.260	21.218
1474	1000294337	51194834	545	548.195	50.175	13.867	41.472	13.218	78.789	21.258
1475	1000294355	51194835	545	545.138	49.988	13.891	41.243	13.218	78.506	21.140
1476	1000294326	51194836	545	546.325	50.028	13.882	41.278	13.235	78.668	21.186
1477	1000294355	51194837	545	547.504	50.054	13.893	41.574	13.169	78.734	21.232
1478	1000294326	51194838	545	547.148	50.045	13.900	41.345	13.234	78.656	21.218
1479	1000294379	51194839	545	547.333	50.063	13.895	41.380	13.227	78.680	21.225
1480	1000294379	51194840	545	545.863	49.787	13.902	41.224	13.241	78.865	21.168
1481	1000294326	51194841	545	546.225	49.993	13.883	41.299	13.226	78.701	21.182
1482	1000294337	51194842	545	545.055	50.001	13.862	41.242	13.216	78.637	21.137
1483	1000294326	51194843	545	547.242	50.033	13.902	41.372	13.227	78.674	21.221
1484	1000294326	51194844	545	546.586	49.920	13.908	41.306	13.233	78.727	21.196
1485	1000294326	51194845	545	546.377	49.925	13.902	41.294	13.231	78.721	21.188
1486	1000294326	51194846	545	545.449	49.993	13.886	41.269	13.217	78.575	21.152
1487	1000294379	51194847	545	545.211	49.924	13.903	41.479	13.144	78.548	21.143
1488	1000294337	51194849	545	546.945	50.007	13.875	41.314	13.239	78.829	21.210
1489	1000294444	51194850	545	547.198	49.995	13.900	41.311	13.246	78.740	21.220
1490	1000294379	51194851	545	547.376	50.022	13.896	41.346	13.239	78.747	21.227
1491	1000294337	51194852	545	545.638	49.985	13.904	41.258	13.225	78.513	21.159
1492	1000294379	51194853	545	545.129	49.869	13.904	41.152	13.247	78.621	21.140
1493	1000294379	51194856	545	545.688	49.878	13.956	41.061	13.290	78.390	21.161
1494	1000294355	51194857	545	547.454	49.950	13.910	41.385	13.228	78.791	21.230
1495	1000294379	51194858	545	547.576	49.825	13.927	41.241	13.278	78.912	21.234
1496	1000294337	51194860	545	546.083	49.825	13.892	41.220	13.248	78.893	21.177
1497	1000294495	51194861	545	547.272	49.962	13.921	41.256	13.265	78.685	21.223
1498	1000295016	51194863	545	547.247	50.075	13.873	41.278	13.258	78.775	21.222
1499	1000294337	51194865	545	547.376	50.024	13.894	41.301	13.254	78.757	21.227
1500	1000294379	51194867	545	546.656	49.849	13.915	41.253	13.251	78.810	21.199

1000294495	51194869	545	547.358	49.964	13.908	41.227	13.277	78.767	21.226
1000294379	51194871	545	547.657	49.844	13.903	41.208	13.29	79.032	21.238
1000294337	51194872	545	547.352	1576	13.885	41.615	13.153	78.81	21.226

1000294337	51194874	545	545.257	49.918	13.856	41.299	13.203	78.834	21.145
1000294355	51194877	545	545.154	49.882	13.928	41.063	13.276	78.467	21.141
1000294954	51194879	545	548.947	50.293	14.012	41.206	13.322	77.896	21.288
1000294905	51194880	545	548.447	50.282	14	41.264	13.291	77.908	21.268
1000294905	51194883	545	547.445	50.268	13.988	41.127	13.311	77.858	21.229
1000294337	51194884	545	546.259	49.633	14.013	41.225	13.251	78.539	21.183
1000294379	51194885	545	547.609	50.047	13.908	41.505	13.194	78.675	21.236
1000295016	51194886	545	547.22	50.045	13.907	41.403	13.217	78.628	21.221
1000295016	51194887	545	547.108	50.027	13.904	41.452	13.199	78.657	21.216
1000294905	51194888	545	548.667	50.268	13.996	41.356	13.267	77.986	21.277
1000294337	51194889	545	547.384	49.952	13.902	41.537	13.178	78.825	21.227
1000294337	51194890	545	546.71	49.705	14.07	40.975	13.343	78.174	21.201
1000294937	51194892	545	547.778	50.267	13.988	41.164	13.307	77.905	21.242
1000294337	51194894	545	548.496	50.017	13.881	41.436	13.237	79.003	21.27
1000294337	51194896	545	546.541	50.009	13.887	41.289	13.237	78.696	21.194
1000295016	51194897	545	546.977	49.983	13.956	41.13	13.299	78.415	21.211
1000294355	51194898	545	547.374	49.911	13.93	41.203	13.285	78.727	21.227
1000294355	51194901	545	547.532	50.044	13.893	41.572	13.171	78.751	21.233
1000294371	51194904	545	547.717	50.019	13.905	41.484	13.203	78.749	21.24
1000294371	51194906	545	548.115	49.901	13.926	41.33	13.262	78.872	21.255
1000294355	51194907	545	548.086	49.982	13.912	41.297	13.272	78.822	21.254
1000294337	51194909	545	547.065	50.019	13.899	41.355	13.229	78.691	21.215
1000294337	51194910	545	547.387	50.048	13.889	41.562	13.17	78.749	21.227
1000294950	51194911	545	545.494	50.282	13.974	41.054	13.287	77.632	21.154
1000294905	51194913	545	546.967	50.277	13.99	41.164	13.288	77.76	21.211
1000294355	51194915	545	548.341	49.954	13.917	41.311	13.273	78.873	21.264
1000294355	51194917	545	548.82	49.983	13.887	41.371	13.266	79.067	21.283
1000294937	51194918	545	548.29	50.25	14.011	41.188	13.312	77.876	21.262
1000294337	51194919	545	547.139	50.081	13.934	41.651	13.136	78.405	21.217
1000294337	51194920	545	548.252	50.002	13.893	41.422	13.236	78.923	21.261
1000294950	51194922	545	547.8	50.285	13.987	41.213	13.292	77.883	21.243
1000294337	51194924	545	545.915	49.965	13.919	41.185	13.255	78.498	21.17
1000294950	51194928	545	547.606	50.262	13.988	41.089	13.327	77.886	21.236
1000294337	51194929	545	548.451	49.989	13.901	41.398	13.248	78.925	21.268
1000294950	51194933	545	545.296	50.305	13.957	41.077	13.275	77.668	21.146
1000294905	51194935	545	545.736	50.222	14.057	40.993	13.313	77.305	21.163
1000294337	51194936	545	547.307	49.939	13.892	41.639	13.144	78.891	21.224
1000294337	51194937	545	546.626	50.012	13.889	41.351	13.219	78.696	21.198
1000294371	51194938	545	547.816	50.004	13.922	41.362	13.244	78.694	21.244
1000294426	51194943	545	547.534	50.007	13.889	41.488	13.197	78.833	21.233
1000294950	51194944	545	545.747	50.175	14.002	41.068	13.289	77.68	21.164
1000294371	51194945	545	545.904	50	13.943	41.243	13.236	78.308	21.17
1000294355	51194946	545	545.31	49.682	13.959	41.218	13.23	78.631	21.147
1000294371	51194947	545	546.719	49.879	13.92	41.173	13.278	78.744	21.201
1000294355	51194948	545	547.361	50.047	13.905	41.475	13.197	78.657	21.226
1000294905	51194951	545	545.715	50.312	14.052	40.858	13.356	77.188	21.162
1000294337	51194954	545	545.503	50.022	13.895	41.272	13.217	78.483	21.154
1000294355	51194955	545	547.346	50.045	13.9	41.496	13.19	78.686	21.226
1000294371	51194956	545	548.457	49.844	13.958	41.11	13.341	78.834	21.269
1000294375	51194959	545	546.842	49.993	13.895	41.533	13.166	78.725	21.206
1000294355	51194960	545	546.225	50.026	13.895	41.357	13.207	78.578	21.182
1000294937	51194961	545	545.384	50.363	13.981	41.021	13.295	77.454	21.149
1000294950	51194963	545	545.577	50.298	13.997	41.08	13.281	77.493	21.157
1000294905	51194964	545	545.742	50.314	14.044	40.861	13.356	77.231	21.163
1000294355	51194965	545	548.853	49.786	13.927	41.338	13.277	79.156	21.284
1000294450	51194966	545	547.483	50.049	13.9	41.427	13.216	78.699	21.231
1000294415	51194968	545	547.101	49.942	13.96	41.199	13.279	78.47	21.216
1000294405	51194969	545	547.662	49.981	13.904	41.327	13.252	78.807	21.238
1000294426	51194970	545	547.379	50.015	13.909	41.385	13.227	78.688	21.227
1000294426	51194971	545	547.944	50.025	13.919	41.273	13.276	78.693	21.249
1000294450	51194973	545	547.181	50.029	13.903	41.472	13.194	78.665	21.219
1000294450	51194974	545	547.065	50.042	13.884	41.309	13.243	78.738	21.215
1000294450	51194975	545	547.442	50.016	13.894	41.433	13.213	78.777	21.229
1000294456	51194976	545	548.738	50.16	13.905	41.387	13.259	78.675	21.28
1000294547	51194977	545	548.042	50.066	13.946	41.31	13.267	78.488	21.253

1000294950	51194978	545	548.026	50.308	13.944	41.398	13.238	78.124	21.252
1000294547	51194979	545	546.899	49.948	13.886	41.271	13.251	78.853	21.208
1000294355	51194981	545	546.016	49.802	13.914	41.229	13.243	78.796	21.174
1000294387	51194982	545	546.928	50.005	13.903	41.339	13.23	78.668	21.209
1000294375	51194983	545	547.125	50.056	13.903	41.339	13.235	78.616	21.217
1000294375	51194984	545	547.823	50.081	13.892	41.414	13.228	78.741	21.244
1000294387	51194985	545	547.076	50.02	13.885	41.278	13.254	78.768	21.215
1000294355	51194986	545	548.39	50.055	13.902	41.641	13.17	78.805	21.266
1000294375	51194987	545	546.95	50	13.895	41.51	13.176	78.726	21.21
1000294371	51194988	545	546.97	50.039	13.935	41.409	13.209	78.44	21.211
1000294375	51194989	545	545.276	49.955	13.906	41.183	13.24	78.493	21.145
1000294355	51194993	545	548.598	50.04	13.915	41.508	13.217	78.788	21.274
1000294355	51194994	545	548.835	49.912	13.919	41.579	13.2	79	21.283
1000294905	51194995	545	545.491	50.146	13.994	40.957	13.319	77.732	21.154
1000294355	51194997	545	548.061	50.06	13.883	41.565	13.186	78.858	21.253
1000294355	51194999	545	547.771	49.759	13.946	41.394	13.233	78.938	21.242
1000294355	51195002	545	547.195	49.901	13.913	41.421	13.211	78.819	21.22
1000294397	51195003	545	546.252	49.99	13.942	41.211	13.255	78.377	21.183
1000294355	51195004	545	547.203	50.058	13.897	41.47	13.195	78.662	21.22
1000294355	51195007	545	546.186	49.997	13.912	41.485	13.166	78.526	21.181
1000294415	51195009	545	548.15	50.052	13.915	41.358	13.254	78.704	21.257
1000294371	51195010	545	548.721	50.08	13.936	41.337	13.274	78.623	21.279
1000294371	51195011	545	548.229	50.178	13.917	41.664	13.158	78.507	21.26
1000294355	51195012	545	548.097	50.027	13.904	41.442	13.226	78.797	21.255
1000294371	51195013	545	546.082	49.939	13.883	41.32	13.216	78.768	21.177
1000294397	51195014	545	547.988	50.034	13.917	41.312	13.265	78.696	21.25
1000294355	51195015	545	546.967	49.985	13.893	41.388	13.216	78.766	21.211
1000294371	51195016	545	546.505	49.928	13.926	41.2	13.265	78.599	21.193
1000294397	51195018	545	547.652	50.011	13.902	41.411	13.225	78.773	21.237
1000294375	51195019	545	548.815	50.1	13.86	41.721	13.155	79.039	21.282
1000294371	51195020	545	548.05	50	13.921	41.358	13.251	78.736	21.253
1000294371	51195022	545	547.626	50.151	13.906	41.627	13.156	78.524	21.236
1000294371	51195023	545	546.846	50.013	13.888	41.536	13.166	78.73	21.206
1000294371	51195024	545	547.762	50.072	13.888	41.537	13.187	78.767	21.242
1000294371	51195025	545	546.872	49.925	13.867	41.31	13.238	78.992	21.207
1000294371	51195026	545	547.751	50.036	13.912	41.524	13.191	78.689	21.241
1000294905	51195027	545	547.661	50.273	13.989	41.144	13.311	77.872	21.238
1000294375	51195028	545	548.568	50.111	13.852	41.616	13.182	79.03	21.273
1000294375	51195030	545	546.414	50.012	13.896	41.489	13.17	78.626	21.189
1000294371	51195031	545	547.276	49.988	13.901	41.611	13.152	78.761	21.223
1000294371	51195034	545	547.535	49.95	13.903	41.415	13.221	78.846	21.233
1000294371	51195036	545	547.876	49.95	13.937	41.415	13.229	78.698	21.246
1000294371	51195037	545	546.478	50.007	13.899	41.554	13.151	78.624	21.192
1000294371	51195039	545	545.54	49.947	13.876	41.621	13.107	78.712	21.156
1000294495	51195040	545	546.451	49.993	13.874	41.694	13.106	78.787	21.191
1000294371	51195042	545	547.017	50.049	13.885	41.818	13.081	78.715	21.213
1000294371	51195043	545	545.645	50.005	13.926	41.381	13.186	78.357	21.16
1000294371	51195045	545	546.975	49.938	13.866	41.316	13.239	78.994	21.211
1000294371	51195046	545	545.979	50.007	13.911	41.305	13.218	78.483	21.173
1000294375	51195047	545	545.416	50.045	13.83	41.624	13.104	78.804	21.151
1000294371	51195048	545	547.9	50.001	13.878	41.369	13.244	78.958	21.247
1000294415	51195049	545	548.334	50.164	13.867	41.521	13.206	78.826	21.264
1000294375	51195051	545	546.725	50.025	13.895	41.514	13.17	78.657	21.201
1000294950	51195052	545	547.896	50.29	13.985	41.211	13.295	77.905	21.247
1000294968	51195053	545	547.974	50.268	13.997	41.16	13.313	77.882	21.25
1000294495	51195054	545	547.07	50.025	13.909	41.32	13.24	78.627	21.215
1000294375	51195055	545	546.693	50.032	13.849	41.4	13.205	78.898	21.2
1000294375	51195056	545	547.601	50.061	13.875	41.508	13.193	78.834	21.235
1000294375	51195057	545	546.074	50.164	13.831	41.372	13.199	78.708	21.176
1000294397	51195058	545	548.293	50.037	13.898	41.348	13.26	78.847	21.262
1000294371	51195059	545	546.404	49.947	13.9	41.418	13.192	78.699	21.189
1000294375	51195061	545	548.812	50.051	13.883	41.823	13.122	78.982	21.282
1000294375	51195062	545	546.858	50.025	13.842	41.423	13.202	78.974	21.207
1000294375	51195063	545	547.953	50.113	13.856	41.445	13.221	78.914	21.249
1000294397	51195064	545	547.768	50.044	13.917	41.381	13.237	78.65	21.242

1000294375	51195066	545	546.842	50.027	13.893	41.506	13.175	78.679	21.206
1000294397	51195067	545	548.357	50.06	13.902	41.471	13.223	78.792	21.265
1000294375	51195068	545	547.345	49.977	13.905	41.249	13.269	78.763	21.225
1000294375	51195069	545	547.771	50.051	13.892	41.393	13.233	78.781	21.242
1000294375	51195070	545	547.338	49.983	13.912	41.227	13.276	78.713	21.225
1000294375	51195072	545	546.587	49.971	13.88	41.352	13.218	78.807	21.196
1000294375	51195074	545	546.986	50.022	13.891	41.5	13.18	78.722	21.212
1000294397	51195075	545	547.598	50.036	13.915	41.374	13.235	78.652	21.235
1000294375	51195076	545	547.821	50.083	13.88	41.754	13.12	78.807	21.244
1000294950	51195077	545	548.718	50.201	14.025	41.205	13.317	77.935	21.279
1000294375	51195078	545	547.969	50.093	13.888	41.424	13.228	78.766	21.25
1000294375	51195079	545	547.497	50.069	13.904	41.413	13.221	78.643	21.231
1000294387	51195080	545	548.994	50.125	13.906	41.52	13.222	78.759	21.289
1000294397	51195081	545	547.98	49.997	13.905	41.559	13.186	78.823	21.25
1000294375	51195082	545	546.858	49.981	13.889	41.333	13.231	78.775	21.207
1000294375	51195083	545	548.698	50.127	13.875	41.462	13.234	78.893	21.278
1000294375	51195086	545	547.744	50.145	13.869	41.449	13.215	78.758	21.241
1000294387	51195088	545	548.938	49.872	13.915	41.38	13.266	79.1	21.287
1000294950	51195091	545	548.727	50.211	14.025	41.23	13.309	77.923	21.279
1000295047	51195092	545	547.912	50.267	13.993	41.124	13.323	77.895	21.247
1000295047	51195094	545	547.956	50.266	13.994	41.148	13.317	77.898	21.249
1000294387	51195095	545	547.327	50.022	13.901	41.36	13.233	78.714	21.225
1000294950	51195096	545	547.767	50.267	13.989	41.33	13.253	77.897	21.242
1000294375	51195097	545	548.987	49.903	13.889	41.469	13.238	79.206	21.289
1000294375	51195098	545	547.131	50.039	13.892	41.391	13.219	78.707	21.217
1000294375	51195099	545	545.488	49.956	13.869	41.297	13.209	78.731	21.153
1000294950	51195100	545	547.872	50.264	13.993	41.302	13.265	77.896	21.246
1000294387	51195101	545	546.212	50.1	13.899	41.249	13.242	78.438	21.182
1000294450	51195103	545	546.681	50.003	13.869	41.339	13.224	78.831	21.2
1000294397	51195104	545	545.535	50.133	13.906	41.188	13.245	78.255	21.155
1000294905	51195105	545	547.438	50.257	13.924	41.258	13.269	78.227	21.229
1000294415	51195107	545	547.368	50.158	13.835	41.52	13.183	78.876	21.226
1000294905	51195108	545	547.316	50.245	14.003	41.036	13.337	77.787	21.224
1000294387	51195109	545	545.264	49.978	13.908	41.134	13.256	78.446	21.145
1000294387	51195110	545	547.488	50.018	13.899	41.363	13.236	78.754	21.231
1000294397	51195111	545	546.903	50.203	13.887	41.388	13.214	78.449	21.208
1000294387	51195112	545	547.952	49.876	13.915	41.343	13.254	78.955	21.249
1000294405	51195113	545	545.866	50.115	13.961	41.149	13.265	78.017	21.168
1000294387	51195114	545	547.035	50.022	13.881	41.527	13.173	78.78	21.213
1000294968	51195115	545	547.722	50.271	13.989	41.169	13.304	77.885	21.24
1000294968	51195116	545	547.799	50.311	13.993	41.223	13.289	77.81	21.243
1000294937	51195117	545	547.132	50.255	13.928	41.251	13.264	78.169	21.217
1000294905	51195118	545	547.38	50.26	13.925	41.25	13.27	78.213	21.227
1000294397	51195119	545	546.006	50.044	13.856	41.36	13.201	78.741	21.174
1000294397	51195120	545	548.258	50.188	13.924	41.347	13.26	78.452	21.261
1000294905	51195121	545	547.406	50.26	13.923	41.265	13.266	78.227	21.228
1000294387	51195122	545	547.312	50.089	13.897	41.339	13.239	78.626	21.224
1000294495	51195123	545	548.298	50.028	13.894	41.372	13.253	78.884	21.262
1000294387	51195124	545	546.654	50.187	13.945	41.242	13.255	78.107	21.199
1000294397	51195125	545	548.432	50.108	13.886	41.4	13.247	78.821	21.268
1000294387	51195126	545	547.634	50.058	13.874	41.439	13.215	78.854	21.237
1000294387	51195127	545	546.903	49.986	13.876	41.363	13.222	78.851	21.208
1000294387	51195128	545	547.477	50.036	13.916	41.519	13.186	78.627	21.231
1000294387	51195129	545	547.541	50.018	13.872	41.436	13.214	78.916	21.233
1000294950	51195130	545	549.743	50.24	14.058	41.251	13.327	77.838	21.318
1000294397	51195131	545	546.253	50.033	13.848	41.337	13.215	78.839	21.183
1000294387	51195133	545	548.241	50.008	13.903	41.388	13.247	78.854	21.26
1000294387	51195134	545	548.97	50.058	13.895	41.426	13.252	78.922	21.289
1000294387	51195135	545	547.469	50.036	13.906	41.442	13.211	78.68	21.23
1000294387	51195136	545	546.308	49.896	13.908	41.3	13.228	78.724	21.185
1000294426	51195137	545	545.699	49.972	13.909	41.191	13.248	78.51	21.162
1000294450	51195138	545	547.122	49.916	13.854	41.409	13.213	79.119	21.217
1000294415	51195139	545	547.576	50.05	13.937	41.308	13.256	78.501	21.234
1000294387	51195140	545	547.327	50.09	13.904	41.364	13.232	78.586	21.225
1000294397	51195141	545	548.18	50.089	13.932	41.327	13.264	78.555	21.258

1000294397	51195142	545	548.905	50.171	13.916	41.454	13.241	78.622	21.286
1000294387	51195143	545	547.553	49.975	13.875	41.424	13.218	78.967	21.234
1000294387	51195144	545	547.088	50.006	13.916	41.368	13.225	78.617	21.216
1000294937	51195145	545	547.922	50.27	13.994	41.279	13.274	77.888	21.248
1000294397	51195146	545	548.417	50.101	13.892	41.429	13.238	78.794	21.267
1000294397	51195147	545	547.932	50.243	13.891	41.383	13.241	78.511	21.248
1000294426	51195148	545	547.562	49.633	13.998	41.077	13.33	78.81	21.234
1000294387	51195149	545	548.128	50.08	13.936	41.36	13.252	78.537	21.256
1000294387	51195150	545	546.619	50.023	13.911	41.262	13.248	78.555	21.197
1000294387	51195153	545	547.157	49.886	13.913	41.302	13.248	78.835	21.218
1000294397	51195154	545	547.61	50.021	13.891	41.371	13.237	78.812	21.236
1000294397	51195155	545	547.111	49.877	13.901	41.321	13.241	78.91	21.216
1000294937	51195156	545	547.902	50.246	13.976	41.198	13.299	78.026	21.247
1000294387	51195157	545	547.23	50.062	13.888	41.297	13.251	78.707	21.221
1000294415	51195158	545	547.21	50.009	13.904	41.407	13.215	78.696	21.22
1000294387	51195160	545	547.14	50.032	13.891	41.546	13.169	78.728	21.218
1000294495	51195161	545	547.107	50.163	13.901	41.344	13.233	78.458	21.216
1000294937	51195164	545	548.657	50.29	13.978	41.303	13.284	78.052	21.276
1000294397	51195165	545	547.492	50.102	13.934	41.321	13.25	78.425	21.231
1000294397	51195166	545	546.563	50.024	13.882	41.344	13.22	78.705	21.195
1000294397	51195167	545	547.074	49.908	13.908	41.312	13.243	78.813	21.215
1000294397	51195168	545	547.325	50.024	13.898	41.441	13.207	78.725	21.225
1000294415	51195169	545	546.527	50.003	13.879	41.378	13.208	78.752	21.194
1000294405	51195170	545	548.847	50.103	13.943	41.326	13.281	78.568	21.284
1000294387	51195172	545	546.008	49.912	13.921	41.212	13.249	78.584	21.174
1000294415	51195174	545	547.491	50.021	13.909	41.335	13.245	78.689	21.231
1000294387	51195175	545	546.555	49.907	13.929	41.275	13.242	78.621	21.195
1000294426	51195177	545	548.73	49.911	13.938	41.407	13.252	78.88	21.279
1000294450	51195178	545	547.575	49.971	13.895	41.411	13.223	78.86	21.234
1000294397	51195179	545	549.911	49.875	13.908	41.58	13.225	79.279	21.325
1000294405	51195180	545	545.024	50.195	13.944	41.314	13.192	77.871	21.135
1000294937	51195181	545	547.847	50.289	13.981	41.244	13.283	77.922	21.245
1000294415	51195182	545	548.334	50.118	13.875	41.475	13.221	78.854	21.264
1000294415	51195183	545	546.671	50.01	13.913	41.289	13.24	78.567	21.199
1000294415	51195184	545	547.15	50.015	13.884	41.399	13.216	78.797	21.218
1000294415	51195185	545	547.37	49.999	13.897	41.39	13.225	78.777	21.226
1000294405	51195187	545	546.959	50.114	13.926	41.261	13.256	78.372	21.211
1000294435	51195188	545	548.435	50.07	13.872	41.461	13.228	78.962	21.268
1000295016	51195189	545	547.086	49.944	13.904	41.331	13.237	78.782	21.215
1000294405	51195190	545	547.591	50.038	13.88	41.344	13.245	78.843	21.235
1000294405	51195191	545	547.495	50.176	13.939	41.174	13.297	78.278	21.231
1000294495	51195192	545	548.153	49.972	13.855	41.481	13.215	79.169	21.257
1000294405	51195193	545	546.786	50.08	13.907	41.26	13.252	78.509	21.204
1000294405	51195194	545	546.843	50.056	13.869	41.353	13.224	78.771	21.206
1000294415	51195195	545	547.441	50.178	13.88	41.392	13.226	78.604	21.229
1000294397	51195196	545	547.22	50.052	13.894	41.429	13.209	78.687	21.221
1000294397	51195197	545	547.2	49.995	13.9	41.378	13.224	78.742	21.22
1000294426	51195198	545	546.076	50.041	13.917	41.19	13.257	78.41	21.176
1000294397	51195199	545	547.85	50.028	13.893	41.369	13.243	78.822	21.245
1000294415	51195200	545	547.452	49.821	13.879	41.416	13.219	79.17	21.23
1000294415	51195201	545	546.651	50.071	13.898	41.289	13.24	78.555	21.199
1000294426	51195202	545	548.544	50.149	13.924	41.353	13.265	78.56	21.272
1000294415	51195203	545	548.599	49.996	13.91	41.394	13.253	78.887	21.274
1000295016	51195204	545	547.995	50.122	13.936	41.302	13.268	78.452	21.251
1000294415	51195205	545	548.946	49.919	13.907	41.466	13.238	79.071	21.288
1000294405	51195207	545	546.347	49.795	13.937	41.236	13.249	78.726	21.187
1000294937	51195208	545	547.998	50.347	14.016	41.157	13.315	77.655	21.251
1000294495	51195209	545	546.799	49.931	13.916	41.268	13.25	78.698	21.204
1000294435	51195210	545	547.481	50.039	13.887	41.413	13.22	78.788	21.231
1000294397	51195211	545	547.647	49.886	13.913	41.336	13.249	78.903	21.237
1000294548	51195212	545	548.55	50.035	13.903	41.312	13.278	78.858	21.272
1000294415	51195213	545	547.368	49.985	13.895	41.398	13.222	78.811	21.226
1000294405	51195214	545	548.534	50.147	13.949	41.285	13.286	78.417	21.272
1000294435	51195215	545	547.66	50.052	13.895	41.403	13.228	78.744	21.238
1000294415	51195216	545	547.622	49.988	13.891	41.424	13.22	78.866	21.236

1000294397	51195217	545	548.499	49.889	13.91	41.404	13.248	79.038	21.27
1000294405	51195218	545	548.571	49.799	13.936	41.293	13.285	79.047	21.273
1000294405	51195219	545	548.767	50.183	13.943	41.263	13.299	78.431	21.281
1000294426	51195220	545	546.746	49.767	14.01	41.011	13.332	78.415	21.202
1000294405	51195221	545	546.789	50.003	13.954	41.219	13.265	78.366	21.204
1000294405	51195223	545	547.265	49.995	13.93	41.187	13.287	78.583	21.222
1000294426	51195224	545	548.729	49.881	13.907	41.444	13.24	79.104	21.279
1000294405	51195225	545	547.477	50.106	13.946	41.274	13.265	78.348	21.231
1000294405	51195226	545	548.846	50.102	13.965	41.298	13.29	78.441	21.284
1000294405	51195227	545	546.524	49.959	13.897	41.27	13.243	78.715	21.194
1000294405	51195228	545	547.372	50.026	13.897	41.346	13.239	78.732	21.227
1000294435	51195229	545	547.44	50.064	13.899	41.367	13.234	78.676	21.229
1000294426	51195230	545	548.973	49.767	13.987	41.228	13.315	78.864	21.289
1000294405	51195231	545	547.333	50.079	13.922	41.327	13.244	78.505	21.225
1000294405	51195232	545	548.005	50.058	13.935	41.295	13.27	78.563	21.251
1000294435	51195235	545	546.001	50.005	13.894	41.259	13.233	78.584	21.173
1000294426	51195236	545	547.436	50.048	13.91	41.329	13.246	78.637	21.229
1000294405	51195237	545	546.493	49.979	13.901	41.274	13.241	78.662	21.192
1000294405	51195238	545	547.807	49.94	13.943	41.233	13.285	78.675	21.243
1000294426	51195241	545	547.435	50.029	13.916	41.328	13.246	78.63	21.229
1000294405	51195242	545	546.423	50.014	13.873	41.326	13.222	78.753	21.19
1000294405	51195243	545	547.618	50.098	13.925	41.292	13.262	78.498	21.236
1000294405	51195245	545	546.129	50.071	13.933	41.291	13.226	78.284	21.178
1000294954	51195247	545	548.095	50.272	14.001	41.257	13.285	77.871	21.255
1000294426	51195248	545	548.567	49.846	13.919	41.416	13.245	79.069	21.273
1000294405	51195250	545	546.365	50.028	13.909	41.201	13.261	78.517	21.187
1000294415	51195251	545	546.544	50.028	13.96	41.205	13.264	78.259	21.194
1000294426	51195252	545	547.068	50.035	13.903	41.376	13.222	78.643	21.215
1000294450	51195253	545	547.154	49.959	13.909	41.247	13.265	78.741	21.218
1000294405	51195254	545	546.728	49.969	13.912	41.299	13.238	78.648	21.202
1000294426	51195255	545	546.205	50.013	13.903	41.35	13.209	78.554	21.181
1000294405	51195256	545	547.657	50.016	13.915	41.348	13.245	78.689	21.238
1000294405	51195257	545	546.034	50.084	13.924	41.266	13.232	78.297	21.175
1000294495	51195258	545	546.73	49.516	14.039	40.883	13.373	78.646	21.202
1000294415	51195259	545	547.807	50.071	13.864	41.416	13.227	78.915	21.243
1000294405	51195261	545	547.588	50.013	13.886	41.35	13.243	78.849	21.235
1000294415	51195262	545	547.601	49.98	13.899	41.344	13.245	78.83	21.235
1000294426	51195263	545	547.038	50.036	13.895	41.374	13.222	78.681	21.214
1000294415	51195264	545	547.38	50.04	13.899	41.336	13.242	78.702	21.227
1000294415	51195266	545	547.307	49.993	13.889	41.344	13.238	78.822	21.224
1000294415	51195267	545	547.592	50.022	13.899	41.353	13.242	78.759	21.235
1000294426	51195268	545	546.955	49.706	14.008	41.039	13.328	78.551	21.21
1000294426	51195269	545	547.571	50.024	13.885	41.369	13.236	78.834	21.234
1000294415	51195270	545	547.137	50.11	13.92	41.36	13.229	78.439	21.217
1000294450	51195276	545	547.074	50.008	13.878	41.39	13.218	78.828	21.215
1000294547	51195277	545	547.294	49.994	13.897	41.276	13.259	78.774	21.223
1000294415	51195278	545	547.536	50.014	13.912	41.404	13.224	78.693	21.233
1000294415	51195279	545	547.314	50.016	13.896	41.373	13.229	78.75	21.224
1000294435	51195280	545	546.649	50.069	13.91	41.217	13.263	78.489	21.198
1000294968	51195282	545	547.728	50.276	13.983	41.141	13.314	77.909	21.24
1000294435	51195283	545	546.633	49.943	13.913	41.232	13.257	78.671	21.198
1000294435	51195284	545	547.805	49.887	13.888	41.43	13.222	79.067	21.243
1000294426	51195285	545	548.963	50.001	13.864	41.546	13.213	79.192	21.288
1000294426	51195286	545	547.336	49.988	13.895	41.352	13.236	78.803	21.225
1000294426	51195287	545	547.571	50.02	13.887	41.335	13.247	78.828	21.234
1000294426	51195288	545	546.186	49.992	13.873	41.524	13.153	78.751	21.181
1000294548	51195289	545	546.71	50.014	13.876	41.344	13.224	78.774	21.201
1000294426	51195290	545	546.384	49.999	13.889	41.352	13.213	78.682	21.188
1000294444	51195291	545	547.556	49.407	13.978	41.093	13.325	79.286	21.234
1000294435	51195292	545	547.307	50.01	13.898	41.531	13.178	78.744	21.224
1000294456	51195293	545	547.188	49.99	13.896	41.309	13.246	78.771	21.219
1000294444	51195295	545	546.256	50.188	13.821	41.641	13.118	78.751	21.183
1000294426	51195296	545	547.206	50.024	13.888	41.324	13.242	78.765	21.22
1000294426	51195297	545	546.992	49.919	13.883	41.306	13.242	78.928	21.212
1000294547	51195298	545	547.492	50.081	13.88	41.279	13.263	78.764	21.231

1000294426	51195300	545	547.454	50.062	13.912	41.581	13.166	78.604	21.23
1000294456	51195301	545	545.605	50.218	13.895	41.221	13.236	78.194	21.158
1000294444	51195302	545	547.157	49.963	13.905	41.264	13.26	78.754	21.218
1000294435	51195304	545	547.719	49.997	13.888	41.433	13.22	78.881	21.24
1000294426	51195306	545	546.984	49.841	13.926	41.23	13.267	78.804	21.211
1000294547	51195307	545	547.759	50.162	13.894	41.394	13.233	78.591	21.242
1000294415	51195308	545	547.31	49.931	13.918	41.289	13.256	78.756	21.224
1000294547	51195309	545	548.751	50.035	13.904	41.312	13.283	78.881	21.28
1000294426	51195310	545	547.673	49.862	13.97	41.243	13.279	78.626	21.238
1000294444	51195311	545	546.449	49.946	13.933	41.176	13.271	78.523	21.191
1000294509	51195313	545	547.585	50.142	13.886	41.401	13.227	78.643	21.235
1000294426	51195315	545	546.555	49.852	13.927	41.206	13.264	78.722	21.195
1000294435	51195316	545	548.983	50.106	13.911	41.42	13.254	78.762	21.289
1000294435	51195317	545	546.235	49.949	13.924	41.209	13.255	78.538	21.182
1000294435	51195318	545	547.618	50.034	13.9	41.536	13.184	78.739	21.236
1000294450	51195320	545	547.012	50.247	13.913	41.291	13.248	78.247	21.213
1000294435	51195321	545	547.388	49.91	13.854	41.596	13.16	79.166	21.227
1000294444	51195322	545	548.621	50.152	13.9	41.519	13.214	78.699	21.275
1000294435	51195323	545	546.572	50.007	13.938	41.265	13.245	78.416	21.195
1000294444	51195324	545	546.213	49.362	14.016	40.995	13.324	78.951	21.182
1000294435	51195325	545	548.785	50.078	13.902	41.385	13.26	78.826	21.281
1000295016	51195326	545	547.166	50.012	13.912	41.522	13.178	78.642	21.219
1000294435	51195328	545	546.383	49.929	13.898	41.462	13.178	78.742	21.188
1000294435	51195330	545	547.596	50.059	13.878	41.46	13.208	78.822	21.235
1000294444	51195331	545	546.245	49.388	14.011	40.954	13.338	78.942	21.183
1000294435	51195332	545	547.975	50.025	13.849	41.525	13.196	79.094	21.25
1000294435	51195335	545	549.049	50.123	13.923	41.43	13.253	78.677	21.292
1000294905	51195336	545	547.286	50.254	13.921	41.258	13.265	78.23	21.223
1000294444	51195337	545	547.167	50.165	13.935	41.304	13.247	78.273	21.219
1000294905	51195339	545	548.089	50.356	13.989	41.11	13.332	77.809	21.254
1000294547	51195340	545	546.814	50.091	13.877	41.287	13.244	78.666	21.205
1000294547	51195342	545	547.306	50.007	13.898	41.273	13.261	78.751	21.224
1000295016	51195343	545	546.737	50.009	13.901	41.233	13.26	78.648	21.202
1000295047	51195345	545	549.654	50.293	13.983	41.241	13.328	78.158	21.315
1000294548	51195346	545	547.209	50.037	13.898	41.329	13.24	78.691	21.22
1000294444	51195347	545	548.683	50.183	13.809	41.675	13.166	79.177	21.277
1000294444	51195348	545	547.018	50.149	13.82	41.529	13.172	78.929	21.213
1000294435	51195349	545	548.325	49.919	13.903	41.536	13.201	79.007	21.263
1000294435	51195350	545	547.552	50.041	13.893	41.392	13.229	78.761	21.234
1000294444	51195352	545	545.364	50.204	13.829	41.59	13.113	78.552	21.149
1000294435	51195353	545	547.501	49.944	13.911	41.372	13.234	78.804	21.232
1000294905	51195354	545	548.089	50.293	14.035	41.094	13.337	77.649	21.254
1000295047	51195355	545	549.83	50.234	14.04	41.195	13.347	77.96	21.322
1000294548	51195356	545	548.627	50.094	13.914	41.406	13.25	78.712	21.275
1000294450	51195357	545	548.322	49.896	13.88	41.477	13.22	79.173	21.263
1000295047	51195358	545	549.966	50.257	14.055	41.156	13.363	77.858	21.327
1000295047	51195359	545	547.028	50.239	13.988	41.055	13.324	77.84	21.213
1000294435	51195361	545	546.104	49.937	13.899	41.295	13.225	78.68	21.177
1000294495	51195362	545	546.402	49.516	13.993	40.971	13.336	78.861	21.189
1000294456	51195363	545	546.718	50.054	13.915	41.214	13.265	78.494	21.201
1000294450	51195365	545	548.656	50.121	13.928	41.326	13.276	78.593	21.276
1000294444	51195366	545	547.578	50.155	13.849	41.513	13.191	78.836	21.235
1000294435	51195367	545	547.413	50.018	13.898	41.407	13.22	78.749	21.228
1000294450	51195368	545	548.298	50.272	13.896	41.446	13.229	78.487	21.262
1000294444	51195369	545	546.041	50.023	13.908	41.246	13.239	78.485	21.175
1000294548	51195370	545	548.342	50.026	13.91	41.329	13.268	78.802	21.264
1000294435	51195371	545	545.925	50.031	13.899	41.174	13.259	78.509	21.17
1000294444	51195372	545	548.763	50.182	13.814	41.661	13.172	79.162	21.28
1000294435	51195373	545	547.636	50.028	13.868	41.459	13.209	78.932	21.237
1000294435	51195374	545	548.898	49.973	13.916	41.427	13.25	78.927	21.286
1000294435	51195375	545	548.162	50.035	13.853	41.544	13.195	79.082	21.257
1000294444	51195376	545	548.851	49.359	14.004	41.049	13.371	79.403	21.284
1000294456	51195377	545	547.265	50.059	13.891	41.415	13.214	78.7	21.222
1000294450	51195378	545	546.81	49.986	13.899	41.284	13.245	78.707	21.205
1000294435	51195379	545	546.914	50.044	13.911	41.293	13.245	78.61	21.209

1000294473	51195380	545	546.038	49.984	13.903	41.27	13.231	78.573	21.175
1000294495	51195381	545	547.213	50.145	13.884	41.327	13.241	78.598	21.22
1000294951	51195383	545	546.324	50.121	14.063	41.068	13.303	77.512	21.186
1000294547	51195384	545	547.819	50.126	13.866	41.456	13.215	78.817	21.244
1000294435	51195385	545	548.497	50.091	13.912	41.37	13.258	78.706	21.27
1000295016	51195387	545	546.258	49.998	13.909	41.465	13.174	78.553	21.183
1000294444	51195388	545	547.736	49.552	13.993	41.103	13.326	78.996	21.241
1000294444	51195389	545	548.171	49.827	13.928	41.368	13.251	78.989	21.258
1000295016	51195390	545	547.019	49.991	13.913	41.225	13.269	78.649	21.213
1000294444	51195391	545	548.832	49.47	13.97	41.218	13.315	79.414	21.283
1000294444	51195392	545	545.035	50.213	13.831	41.534	13.123	78.478	21.136
1000294444	51195393	545	546.234	50.184	13.805	41.629	13.121	78.844	21.182
1000294444	51195394	545	546.329	49.405	14.012	40.954	13.34	78.922	21.186
1000294456	51195395	545	546.131	50.157	13.873	41.433	13.181	78.49	21.178
1000295016	51195396	545	547.33	50.037	13.896	41.327	13.244	78.717	21.225
1000295016	51195399	545	547.415	50.037	13.889	41.278	13.262	78.77	21.228
1000294461	51195400	545	549.226	49.8	13.909	41.418	13.261	79.289	21.298
1000294477	51195401	545	548.28	50.109	13.926	41.369	13.254	78.569	21.262
1000294444	51195402	545	546.57	49.496	13.982	41.091	13.301	78.981	21.195
1000294444	51195405	545	547.392	49.885	13.852	41.473	13.199	79.214	21.227
1000294954	51195406	545	547.469	50.26	13.993	41.128	13.311	77.847	21.23
1000294450	51195408	545	547.315	49.906	13.905	41.285	13.257	78.871	21.224
1000294509	51195409	545	547.921	49.981	13.929	41.279	13.274	78.704	21.248
1000294954	51195410	545	547.887	50.367	14.056	41.196	13.299	77.391	21.246
1000294951	51195411	545	546.246	50.128	14.01	41.164	13.27	77.782	21.183
1000294444	51195412	545	546.561	50.001	13.916	41.327	13.225	78.551	21.195
1000294467	51195413	545	549.09	49.935	13.929	41.394	13.265	78.945	21.293
1000294450	51195414	545	547.605	50.1	13.923	41.31	13.256	78.505	21.236
1000294456	51195415	545	548.883	50.319	13.874	41.539	13.214	78.624	21.285
1000294444	51195416	545	546.966	50.058	13.908	41.327	13.235	78.564	21.211
1000294547	51195417	545	546.082	50.086	13.85	41.374	13.199	78.722	21.177
1000294937	51195418	545	545.666	50.28	13.989	41.15	13.26	77.578	21.16
1000294473	51195419	545	545.056	50.009	13.901	41.208	13.227	78.407	21.137
1000294450	51195420	545	546.394	50.078	13.9	41.246	13.247	78.495	21.189
1000294473	51195421	545	545.286	50.02	13.893	41.268	13.213	78.469	21.146
1000294444	51195423	545	547.386	49.994	13.895	41.261	13.267	78.8	21.227
1000294950	51195427	545	546.068	50.325	13.905	41.313	13.218	78.035	21.176
1000295016	51195428	545	546.298	49.979	13.829	41.356	13.21	79.042	21.185
1000295016	51195430	545	546.823	50.016	13.927	41.225	13.265	78.504	21.205
1000294520	51195431	545	548.319	49.885	13.881	41.461	13.225	79.187	21.263
1000294520	51195432	545	545.796	49.965	13.913	41.197	13.248	78.513	21.165
1000294547	51195433	545	547.65	50.071	13.864	41.601	13.164	78.89	21.237
1000294954	51195434	545	546.099	50.142	13.938	41.189	13.258	78.138	21.177
1000294461	51195435	545	547.189	49.803	13.933	41.277	13.256	78.855	21.219
1000294450	51195436	545	547.653	50.028	13.943	41.332	13.25	78.51	21.237
1000294456	51195437	545	545.654	50.1	13.895	41.432	13.17	78.384	21.16
1000294450	51195438	545	547.038	49.949	13.844	41.405	13.212	79.109	21.214
1000294450	51195439	545	546.033	49.99	13.897	41.197	13.254	78.596	21.175
1000294456	51195440	545	545.123	49.949	13.943	41.112	13.26	78.273	21.139
1000294450	51195441	545	546.122	50.057	13.968	41.208	13.253	78.105	21.178
1000294461	51195442	545	548.906	49.908	13.948	41.325	13.283	78.855	21.286
1000294444	51195443	545	546.699	50.006	13.953	41.371	13.215	78.353	21.2
1000294450	51195444	545	547.928	50.269	13.894	41.423	13.228	78.447	21.248
1000294520	51195445	545	548.523	49.93	13.887	41.462	13.23	79.11	21.271
1000294547	51195446	545	546.74	49.953	13.902	41.23	13.261	78.733	21.202
1000294450	51195447	545	548.036	50.003	13.913	41.351	13.253	78.774	21.252
1000294456	51195448	545	547.331	50.177	13.908	41.301	13.252	78.431	21.225
1000294477	51195449	545	548.017	49.699	13.979	41.272	13.278	78.879	21.252
1000294450	51195450	545	548.61	50.027	13.89	41.459	13.233	78.954	21.275
1000294450	51195451	545	547.97	49.881	13.879	41.441	13.223	79.155	21.25
1000294450	51195452	545	548.241	50.112	13.917	41.452	13.226	78.611	21.26
1000294450	51195454	545	546.847	50.001	13.897	41.336	13.229	78.702	21.206
1000294450	51195456	545	545.628	50.095	13.889	41.418	13.174	78.418	21.159
1000294450	51195457	545	548.172	50.129	13.925	41.455	13.223	78.528	21.258
1000294456	51195458	545	547.929	50.066	13.898	41.399	13.235	78.841	21.248

1000294444	51195459	545	548.515	49.843	13.929	41.369	13.259	79.006	21.271
1000294444	51195460	545	546.375	49.75	13.901	41.269	13.239	79.007	21.188
1000294456	51195461	545	545.074	50.133	13.895	41.211	13.227	78.247	21.137
1000294456	51195462	545	547.562	50	13.884	41.432	13.216	78.879	21.234
1000294473	51195463	545	545.624	49.913	13.925	41.13	13.266	78.501	21.159
1000294444	51195464	545	548.341	50.027	13.902	41.615	13.177	78.844	21.264
1000294461	51195465	545	548.619	49.956	13.961	41.254	13.299	78.661	21.275
1000294450	51195466	545	547.163	50.055	13.942	41.302	13.248	78.405	21.218
1000294951	51195468	545	548.359	50.139	14.032	41.171	13.319	77.941	21.265
1000294450	51195469	545	548.508	49.937	13.902	41.475	13.225	79.007	21.271
1000294456	51195471	545	547.015	49.884	13.913	41.359	13.226	78.813	21.213
1000294512	51195472	545	548.161	49.948	13.882	41.541	13.196	79.054	21.257
1000294456	51195473	545	548.295	50.139	13.936	41.316	13.271	78.47	21.262
1000294477	51195474	545	548.457	49.986	13.926	41.293	13.282	78.788	21.269
1000294461	51195476	545	545.729	49.929	13.914	41.321	13.207	78.554	21.163
1000294487	51195477	545	548.069	49.964	13.855	41.404	13.237	79.173	21.254
1000294520	51195479	545	546.912	49.929	13.909	41.364	13.222	78.752	21.209
1000294456	51195480	545	546.143	49.928	13.882	41.354	13.207	78.795	21.179
1000294548	51195481	545	548.002	49.995	13.945	41.272	13.278	78.602	21.251
1000294520	51195483	545	547.496	50.023	13.914	41.321	13.25	78.663	21.231
1000294456	51195485	545	547.349	50.027	13.89	41.346	13.238	78.767	21.226
1000294512	51195486	545	547.494	49.883	13.898	41.358	13.238	78.971	21.231
1000294456	51195488	545	547.229	50.037	13.903	41.395	13.22	78.662	21.221
1000294461	51195489	545	546.768	49.861	13.905	41.245	13.257	78.863	21.203
1000294473	51195490	545	547.223	50.034	13.896	41.355	13.232	78.707	21.221
1000294461	51195491	545	545.698	49.938	13.916	41.331	13.203	78.524	21.162
1000294461	51195492	545	548.971	49.916	13.927	41.388	13.264	78.97	21.289
1000294456	51195493	545	547.381	49.998	13.891	41.326	13.245	78.816	21.227
1000294456	51195494	545	546.323	49.969	13.876	41.281	13.234	78.792	21.186
1000294461	51195495	545	547.959	49.947	13.942	41.42	13.229	78.691	21.249
1000294456	51195497	545	548.609	49.99	13.896	41.489	13.223	78.972	21.275
1000294456	51195498	545	547.934	49.944	13.884	41.409	13.232	79.017	21.248
1000294461	51195499	545	548.733	49.922	13.916	41.378	13.262	78.988	21.279
1000294467	51195500	545	547.82	49.942	13.925	41.335	13.253	78.775	21.244
1000294456	51195502	545	547.522	50	13.905	41.364	13.237	78.751	21.232
1000294456	51195503	545	545.897	49.957	13.909	41.256	13.232	78.564	21.169
1000294461	51195504	545	546.349	49.879	13.93	41.189	13.264	78.631	21.187
1000294456	51195505	545	548.849	49.987	13.91	41.512	13.221	78.933	21.284
1000294477	51195506	545	547.19	50.057	13.903	41.289	13.253	78.627	21.219
1000294456	51195507	545	546.178	50.02	13.882	41.321	13.218	78.656	21.18
1000294467	51195508	545	549.634	49.877	13.934	41.357	13.29	79.089	21.314
1000294477	51195509	545	546.336	50.067	13.888	41.261	13.241	78.57	21.186
1000294456	51195510	545	548.54	49.902	13.886	41.476	13.226	79.163	21.272
1000294456	51195511	545	546.132	49.94	13.909	41.263	13.235	78.623	21.178
1000294461	51195512	545	546.834	49.846	13.91	41.283	13.246	78.864	21.206
1000294461	51195513	545	548.613	49.909	13.928	41.317	13.278	78.922	21.275
1000294547	51195514	545	547.853	49.929	13.885	41.349	13.249	79.027	21.245
1000294456	51195515	545	547.926	50.135	13.914	41.34	13.254	78.546	21.248
1000294461	51195516	545	546.591	49.877	13.909	41.231	13.257	78.788	21.196
1000294461	51195517	545	548.166	49.798	13.947	41.322	13.266	78.928	21.257
1000294456	51195518	545	547.389	50.021	13.902	41.361	13.235	78.717	21.227
1000294456	51195519	545	547.981	50.054	13.925	41.363	13.248	78.621	21.25
1000294477	51195520	545	547.106	49.988	13.919	41.387	13.219	78.631	21.216
1000294461	51195521	545	548.095	49.936	13.949	41.421	13.232	78.688	21.255
1000294461	51195522	545	547.318	50.023	13.899	41.329	13.243	78.718	21.224
1000294461	51195523	545	546.421	49.996	13.909	41.217	13.257	78.575	21.19
1000294951	51195524	545	548.821	50.177	14.043	41.149	13.337	77.885	21.283
1000294477	51195525	545	547.528	49.904	13.953	41.145	13.307	78.632	21.233
1000294547	51195526	545	547.565	50.026	13.905	41.419	13.22	78.718	21.234
1000294461	51195527	545	548.021	49.782	13.981	41.197	13.302	78.739	21.252
1000294461	51195528	545	548.856	49.89	13.922	41.408	13.255	79.021	21.284
1000294461	51195529	545	547.65	49.94	13.938	41.268	13.27	78.677	21.237
1000294494	51195531	545	545.912	49.997	13.917	41.19	13.253	78.457	21.17
1000294547	51195532	545	546.533	49.954	13.9	41.292	13.236	78.712	21.194
1000294461	51195533	545	548.803	49.829	13.957	41.296	13.289	78.911	21.282

1000294461	51195534	545	548.325	49.748	13.935	41.303	13.276	79.094	21.264
1000295016	51195537	545	546.258	49.989	13.916	41.209	13.256	78.527	21.183
1000294486	51195538	545	547.327	50.03	13.913	41.405	13.219	78.629	21.225
1000294467	51195539	545	546.324	49.844	13.936	41.227	13.252	78.649	21.186
1000294495	51195540	545	545.244	50.036	13.926	41.208	13.231	78.25	21.144
1000294473	51195541	545	547.42	50.012	13.905	41.339	13.242	78.721	21.228
1000294461	51195542	545	548.961	49.969	13.962	41.309	13.289	78.685	21.288
1000294467	51195543	545	546.429	49.89	13.88	41.486	13.171	78.908	21.19
1000294467	51195544	545	547.833	49.851	13.963	41.201	13.297	78.706	21.244
1000294467	51195545	545	549.21	50.002	13.941	41.335	13.287	78.788	21.298
1000294461	51195546	545	549.083	49.84	13.96	41.277	13.302	78.918	21.293
1000294461	51195547	545	548.873	50.02	13.9	41.419	13.252	78.942	21.285
1000294461	51195548	545	547.313	49.705	13.94	41.225	13.276	78.989	21.224
1000294477	51195549	545	547.918	49.715	13.978	41.258	13.28	78.845	21.248
1000294473	51195550	545	545.341	49.975	13.875	41.336	13.193	78.648	21.148
1000294473	51195551	545	547.87	50.093	13.898	41.347	13.25	78.693	21.246
1000294461	51195552	545	548.33	49.865	13.893	41.379	13.251	79.152	21.264
1000294494	51195553	545	547.797	50.064	13.937	41.289	13.267	78.511	21.243
1000294467	51195554	545	546.47	49.906	13.933	41.186	13.268	78.59	21.192
1000294547	51195555	545	546.281	50.051	13.884	41.262	13.239	78.615	21.184
1000294473	51195557	545	546.343	50.05	13.908	41.275	13.237	78.489	21.187
1000294467	51195558	545	546.376	49.956	13.899	41.284	13.234	78.691	21.188
1000294461	51195559	545	549.19	49.911	13.93	41.369	13.275	78.991	21.297
1000294951	51195560	545	548.832	50.082	14.041	41.179	13.328	78.05	21.283
1000294467	51195561	545	545.165	49.791	13.945	41.115	13.26	78.515	21.141
1000294467	51195562	545	548.003	49.947	13.921	41.348	13.254	78.812	21.251
1000294467	51195563	545	548.336	49.941	13.92	41.342	13.263	78.879	21.264
1000294467	51195564	545	549.016	50.01	13.946	41.297	13.294	78.717	21.29
1000294467	51195565	545	549.682	49.882	13.951	41.339	13.297	78.99	21.316
1000294467	51195566	545	546.797	49.77	13.937	41.242	13.258	78.827	21.204
1000294467	51195567	545	548.16	49.846	13.932	41.343	13.259	78.934	21.257
1000294950	51195568	545	547.861	50.268	14.005	41.225	13.29	77.819	21.245
1000294547	51195569	545	548.58	50.088	13.874	41.532	13.209	78.939	21.273
1000294467	51195570	545	547.976	49.86	13.958	41.235	13.289	78.738	21.25
1000294473	51195571	545	547.547	50.133	13.895	41.375	13.234	78.606	21.233
1000294467	51195572	545	548.639	49.88	13.925	41.334	13.273	78.988	21.276
1000294467	51195573	545	549.122	49.833	13.935	41.372	13.273	79.074	21.294
1000294951	51195575	545	547.474	50.123	14.025	41.056	13.335	77.88	21.23
1000294467	51195576	545	545.364	49.864	13.907	41.292	13.207	78.643	21.149
1000294486	51195577	545	545.766	50.235	13.877	41.295	13.216	78.293	21.164
1000294467	51195579	545	549.114	49.894	13.922	41.396	13.265	79.051	21.294
1000294461	51195580	545	549.812	50.011	13.949	41.452	13.264	78.813	21.321
1000294473	51195581	545	547.061	50.092	13.908	41.248	13.263	78.523	21.214
1000294477	51195582	545	548.761	50.03	13.888	41.509	13.22	78.979	21.28
1000294461	51195583	545	548.16	49.881	13.946	41.237	13.293	78.796	21.257
1000294477	51195584	545	546.137	49.953	13.902	41.329	13.214	78.644	21.179
1000294477	51195585	545	546.745	49.919	13.867	41.396	13.208	78.984	21.202
1000294473	51195586	545	547.737	50.049	13.912	41.331	13.253	78.667	21.241
1000294477	51195587	545	547.286	50.175	13.914	41.362	13.232	78.393	21.223
1000294473	51195588	545	547.329	50.122	13.869	41.418	13.215	78.738	21.225
1000294495	51195589	545	546.144	49.96	13.892	41.389	13.196	78.689	21.179
1000294467	51195590	545	548.783	50.027	13.942	41.294	13.29	78.684	21.281
1000294467	51195591	545	549.314	49.886	13.929	41.336	13.289	79.052	21.302
1000294487	51195592	545	547.696	50.148	13.879	41.477	13.205	78.692	21.239
1000294520	51195594	545	547.71	50.085	13.891	41.247	13.279	78.722	21.24
1000294473	51195595	545	547.386	50.039	13.909	41.293	13.256	78.65	21.227
1000294473	51195596	545	548.818	50.069	13.916	41.423	13.249	78.765	21.283
1000294467	51195597	545	546.823	49.866	13.952	41.167	13.283	78.599	21.205
1000294473	51195598	545	546.865	49.915	13.85	41.411	13.206	79.106	21.207
1000294473	51195599	545	548.11	49.951	13.911	41.339	13.259	78.879	21.255
1000294473	51195600	545	547.476	50.034	13.89	41.317	13.251	78.777	21.231
1000294467	51195601	545	546.41	49.975	13.895	41.291	13.233	78.688	21.189
1000294467	51195602	545	549.444	49.963	13.929	41.399	13.272	78.951	21.307
1000294473	51195603	545	547.341	50.038	13.887	41.29	13.256	78.768	21.225
1000294486	51195604	545	547.357	50.044	13.901	41.309	13.25	78.731	21.226

1000294473	51195605	545	548.973	50.193	13.927	41.394	13.262	78.531	21.289
1000294467	51195606	545	548.878	49.931	13.944	41.35	13.274	78.834	21.285
1000294473	51195607	545	545.938	50.058	13.9	41.266	13.23	78.459	21.171
1000294467	51195608	545	547.692	50.038	13.9	41.346	13.247	78.743	21.239
1000294467	51195609	545	549.401	49.871	13.922	41.399	13.271	79.127	21.305
1000294467	51195610	545	549.08	49.986	13.913	41.392	13.265	78.95	21.293
1000294467	51195611	545	549.683	49.857	13.915	41.473	13.254	79.234	21.316
1000294473	51195612	545	545.849	49.994	13.92	41.099	13.281	78.434	21.167
1000294520	51195613	545	545.159	50.078	13.919	41.163	13.244	78.213	21.141
1000294547	51195614	545	549.476	50.149	13.911	41.412	13.268	78.765	21.308
1000294473	51195615	545	546.215	50.024	13.896	41.255	13.24	78.578	21.182
1000294487	51195616	545	547.601	50.104	13.866	41.452	13.211	78.822	21.235
1000294486	51195617	545	547.551	50.048	13.909	41.32	13.252	78.656	21.233
1000294473	51195618	545	546.875	49.933	13.848	41.418	13.204	79.091	21.207
1000294473	51195620	545	545.193	50.023	13.93	41.139	13.253	78.242	21.142
1000294486	51195622	545	547.205	49.983	13.904	41.286	13.254	78.74	21.22
1000294951	51195623	545	547.499	50.113	14.062	41.038	13.341	77.692	21.231
1000294477	51195624	545	546.827	50.051	13.908	41.28	13.247	78.552	21.205
1000294473	51195625	545	547.283	49.975	13.98	41.148	13.3	78.334	21.223
1000294495	51195626	545	545.214	49.906	13.892	41.266	13.212	78.642	21.143
1000294477	51195627	545	549.42	50.092	13.895	41.491	13.242	78.938	21.306
1000294473	51195628	545	547.072	50.016	13.936	41.228	13.27	78.486	21.215
1000294520	51195630	545	547.505	50.02	13.955	41.141	13.308	78.436	21.232
1000294495	51195631	545	547.07	50.006	13.898	41.306	13.244	78.715	21.215
1000294477	51195632	545	547.218	50.03	13.892	41.372	13.227	78.731	21.221
1000294473	51195633	545	547.404	50.012	13.93	41.175	13.295	78.575	21.228
1000294547	51195634	545	547.744	50.011	13.912	41.24	13.282	78.725	21.241
1000294486	51195635	545	547.373	50.099	13.89	41.363	13.233	78.659	21.227
1000294473	51195636	545	545.961	49.965	13.957	41.098	13.284	78.289	21.172
1000294473	51195637	545	549.546	49.594	13.993	41.18	13.345	79.186	21.311
1000294477	51195638	545	547.464	50.164	13.911	41.36	13.237	78.45	21.23
1000294477	51195639	545	547.966	50.122	13.928	41.344	13.254	78.493	21.25
1000294477	51195641	545	547.139	50.004	13.891	41.35	13.232	78.768	21.218
1000294495	51195642	545	546.019	49.965	13.915	41.233	13.242	78.536	21.174
1000294477	51195643	545	546.913	50.024	13.905	41.326	13.234	78.626	21.209
1000294486	51195644	545	547.506	50.022	13.9	41.302	13.256	78.746	21.232
1000294473	51195645	545	546.046	50.023	13.891	41.264	13.233	78.581	21.175
1000294495	51195646	545	548.309	50.194	13.901	41.394	13.246	78.586	21.263
1000294477	51195647	545	548.611	50.232	13.957	41.252	13.299	78.252	21.275
1000294477	51195648	545	548.334	50.192	13.953	41.218	13.303	78.299	21.264
1000294477	51195649	545	547.795	50.283	13.923	41.24	13.283	78.249	21.243
1000294477	51195650	545	546.689	50.04	13.911	41.258	13.25	78.537	21.2
1000294477	51195651	545	547.202	50.018	13.907	41.271	13.259	78.663	21.22
1000294495	51195652	545	545.033	49.976	13.899	41.185	13.234	78.465	21.136
1000294477	51195653	545	547.933	50.092	13.869	41.472	13.212	78.873	21.248
1000294477	51195654	545	546.307	49.982	13.895	41.343	13.214	78.662	21.185
1000294477	51195655	545	548.153	50.086	13.859	41.467	13.219	78.967	21.257
1000294486	51195656	545	547.463	50.187	13.912	41.357	13.238	78.413	21.23
1000294477	51195657	545	549.576	49.505	14.084	40.994	13.406	78.823	21.312
1000294951	51195658	545	549.43	50.156	14.049	41.113	13.364	77.972	21.306
1000294520	51195659	545	549.008	49.94	13.895	41.462	13.241	79.119	21.29
1000294495	51195660	545	546.065	49.904	13.921	41.229	13.245	78.602	21.176
1000294487	51195661	545	547.482	49.987	13.901	41.34	13.243	78.789	21.231
1000294486	51195662	545	545.235	50.005	13.93	41.132	13.256	78.275	21.144
1000294512	51195663	545	545.973	49.975	13.855	41.299	13.22	78.853	21.172
1000294950	51195664	545	549.7	50.231	14.074	41.123	13.367	77.754	21.317
1000294486	51195665	545	545.86	50.228	13.876	41.275	13.225	78.321	21.168
1000294486	51195666	545	549.219	49.966	13.854	41.53	13.225	79.34	21.298
1000294509	51195667	545	549.461	50.187	13.98	41.327	13.296	78.314	21.308
1000294477	51195668	545	547.599	49.926	13.942	41.186	13.296	78.67	21.235
1000294950	51195669	545	547.877	50.341	14.065	41.084	13.335	77.38	21.246
1000294486	51195670	545	545.433	50.027	13.946	41.055	13.285	78.181	21.151
1000294486	51195671	545	545.781	50.02	13.867	41.282	13.221	78.687	21.165
1000294495	51195673	545	545.793	49.895	13.909	41.214	13.243	78.647	21.165
1000294486	51195674	545	546.681	50.048	13.9	41.309	13.234	78.584	21.2

1000294495	51195675	545	545.425	49.934	13.929	41.155	13.253	78.419	21.151
1000294548	51195676	545	547.921	50.007	13.904	41.348	13.251	78.806	21.248
1000294950	51195677	545	547.713	50.269	13.996	41.22	13.288	77.849	21.24
1000294487	51195678	545	547.646	49.94	13.867	41.356	13.242	79.079	21.237
1000294495	51195679	545	548.744	49.993	13.856	41.434	13.244	79.216	21.28
1000294495	51195680	545	548.803	50.03	13.859	41.498	13.225	79.152	21.282
1000294520	51195681	545	545.703	50.03	13.902	41.139	13.265	78.458	21.162
1000294477	51195682	545	546.682	50.048	13.905	41.299	13.237	78.555	21.2
1000294486	51195684	545	547.71	49.961	13.942	41.244	13.28	78.632	21.24
1000294486	51195685	545	546.121	49.969	13.9	41.283	13.229	78.628	21.178
1000294487	51195686	545	547.963	49.97	13.893	41.386	13.24	78.929	21.249
1000294486	51195688	545	548.495	50.046	13.941	41.335	13.269	78.614	21.27
1000294486	51195689	545	546.804	50.054	13.941	41.232	13.262	78.361	21.205
1000294486	51195690	545	546.156	50.033	13.936	41.199	13.256	78.327	21.179
1000294486	51195691	545	546.22	49.931	13.895	41.27	13.235	78.728	21.182
1000294486	51195692	545	547.297	50.038	13.905	41.285	13.257	78.657	21.224
1000294486	51195693	545	548.501	49.986	13.96	41.296	13.282	78.602	21.27
1000294487	51195694	545	547.905	50.034	13.889	41.415	13.23	78.842	21.247
1000294486	51195696	545	546.006	50.077	13.906	41.435	13.177	78.408	21.174
1000294486	51195697	545	546.95	50.029	13.925	41.407	13.209	78.513	21.21
1000294487	51195698	545	547.619	50.019	13.899	41.395	13.229	78.769	21.236
1000294487	51195699	545	547.404	49.975	13.908	41.333	13.244	78.757	21.228
1000294486	51195700	545	545.076	49.976	13.941	41.078	13.269	78.233	21.137
1000294486	51195701	545	547.084	50.026	13.933	41.167	13.289	78.492	21.215
1000294487	51195702	545	546.028	50.104	13.865	41.514	13.153	78.6	21.174
1000294509	51195704	545	548.473	50.036	13.912	41.386	13.252	78.793	21.269
1000294486	51195705	545	545.202	50.02	13.939	41.055	13.28	78.196	21.142
1000294487	51195706	545	545.455	50.006	13.868	41.301	13.207	78.656	21.152
1000294486	51195707	545	545.768	49.878	13.9	41.22	13.24	78.721	21.164
1000294548	51195708	545	549.795	49.858	13.87	41.597	13.217	79.506	21.321
1000294509	51195709	545	546.962	49.957	13.921	41.248	13.26	78.649	21.211
1000294512	51195710	545	546.878	49.949	13.875	41.374	13.218	78.909	21.207
1000294502	51195711	545	547.842	49.969	13.925	41.251	13.281	78.732	21.245
1000294487	51195712	545	548.877	50.35	13.824	41.684	13.168	78.856	21.285
1000294509	51195713	545	545.84	49.885	13.913	41.187	13.253	78.648	21.167
1000294512	51195714	545	546.799	50.023	13.919	41.26	13.253	78.531	21.204
1000294520	51195716	545	548.236	49.85	13.928	41.323	13.267	78.959	21.26
1000294487	51195717	545	549.449	50.093	13.896	41.492	13.242	78.933	21.307
1000294486	51195718	545	545.725	49.875	13.894	41.175	13.254	78.752	21.163
1000294486	51195719	545	546.114	49.941	13.901	41.263	13.235	78.667	21.178
1000294951	51195720	545	549.571	50.179	14.051	41.282	13.313	77.944	21.312
1000294487	51195721	545	547.289	50.052	13.873	41.498	13.188	78.816	21.223
1000294951	51195723	545	548.846	50.308	14.033	41.112	13.35	77.743	21.284
1000294487	51195724	545	545.049	49.969	13.844	41.326	13.189	78.788	21.136
1000294487	51195725	545	548.994	50.174	13.846	41.612	13.193	79.025	21.289
1000294487	51195726	545	548.252	50.029	13.859	41.458	13.224	79.071	21.261
1000294487	51195727	545	547.884	50.092	13.856	41.541	13.189	78.938	21.246
1000294487	51195728	545	546.696	50.016	13.861	41.431	13.195	78.859	21.2
1000294509	51195729	545	547.907	50.181	13.892	41.452	13.218	78.597	21.247
1000294547	51195730	545	547.653	50.18	13.908	41.285	13.265	78.471	21.237
1000294487	51195731	545	545.438	50.079	13.849	41.332	13.196	78.647	21.152
1000294498	51195732	545	545.871	49.979	13.896	41.293	13.219	78.602	21.168
1000294487	51195733	545	548.045	50.049	13.908	41.431	13.228	78.731	21.253
1000294487	51195734	545	545.065	49.999	13.884	41.392	13.168	78.517	21.137
1000294502	51195735	545	548.385	50.024	13.911	41.432	13.236	78.806	21.266
1000294512	51195736	545	547.576	50.055	13.863	41.445	13.212	78.913	21.234
1000294548	51195737	545	547.705	50.052	13.903	41.335	13.25	78.709	21.239
1000294547	51195738	545	547.131	50.184	13.939	41.217	13.274	78.217	21.217
1000294487	51195739	545	547.709	50.033	13.874	41.416	13.225	78.904	21.24
1000295047	51195741	545	549.397	50.34	14.015	41.112	13.364	77.874	21.305
1000294494	51195743	545	546.132	50.026	13.898	41.181	13.262	78.553	21.178
1000295016	51195744	545	546.924	50.01	13.913	41.222	13.268	78.605	21.209
1000295016	51195746	545	548.861	50.17	13.898	41.555	13.208	78.719	21.284
1000294520	51195747	545	547.681	49.989	13.905	41.259	13.274	78.794	21.239
1000294520	51195748	545	548.078	49.96	13.923	41.348	13.255	78.79	21.254

1000294494	51195750	545	547.333	49.932	13.978	41.166	13.296	78.417	21.225
1000294548	51195751	545	549.353	49.854	13.871	41.724	13.166	79.44	21.303
1000294487	51195752	545	547.346	50.018	13.904	41.369	13.231	78.701	21.226
1000294548	51195754	545	547.023	50.025	13.902	41.298	13.246	78.656	21.213
1000294487	51195755	545	547.166	50.071	13.855	41.401	13.216	78.871	21.219
1000294548	51195756	545	548.749	49.835	13.867	41.692	13.162	79.409	21.28
1000294548	51195758	545	547.199	50.018	13.874	41.532	13.175	78.853	21.22
1000294548	51195759	545	547.558	50.179	13.926	41.315	13.253	78.359	21.234
1000294487	51195760	545	547.838	49.97	13.867	41.539	13.189	79.059	21.245
1000294487	51195761	545	548.245	49.841	13.853	41.521	13.204	79.403	21.26
1000294548	51195763	545	548.722	49.867	13.86	41.71	13.156	79.393	21.279
1000294494	51195764	545	549.959	50.058	13.939	41.387	13.288	78.816	21.327
1000294548	51195765	545	545.304	49.957	13.876	41.321	13.197	78.662	21.146
1000294494	51195766	545	549.109	50.094	13.906	41.343	13.282	78.826	21.294
1000294487	51195767	545	548.777	49.885	13.851	41.542	13.21	79.423	21.281
1000294487	51195768	545	548.266	49.858	13.906	41.415	13.238	79.079	21.261
1000294548	51195769	545	547.496	50.046	13.896	41.318	13.251	78.729	21.231
1000294951	51195770	545	545.717	50.223	13.996	41.217	13.24	77.638	21.162
1000294494	51195771	545	549.945	49.651	14.004	41.224	13.341	79.094	21.326
1000294498	51195772	545	546.977	50.104	13.89	41.193	13.278	78.598	21.211
1000294548	51195773	545	546.839	49.894	13.996	41.101	13.305	78.306	21.206
1000294494	51195774	545	547.72	49.826	13.933	41.277	13.27	78.897	21.24
1000294494	51195775	545	547.321	50.052	13.9	41.341	13.239	78.669	21.225
1000294502	51195776	545	548.302	50.042	13.927	41.373	13.253	78.672	21.263
1000294951	51195777	545	549.697	50.317	14.015	41.238	13.33	77.948	21.317
1000294487	51195778	545	545.497	49.799	13.86	41.577	13.12	79.034	21.154
1000294487	51195781	545	549.567	49.925	13.842	41.647	13.196	79.524	21.312
1000294494	51195782	545	547.17	50.031	13.899	41.308	13.246	78.688	21.219
1000294494	51195783	545	547.476	50.049	13.891	41.368	13.234	78.748	21.231
1000294520	51195784	545	549.756	50.088	13.895	41.514	13.243	78.991	21.319
1000294498	51195785	545	545.092	50.134	13.883	41.336	13.187	78.318	21.138
1000294494	51195786	545	545.451	49.854	13.92	41.106	13.269	78.6	21.152
1000294498	51195787	545	546.309	49.935	13.888	41.257	13.242	78.774	21.185
1000294512	51195788	545	548.107	50.015	13.851	41.496	13.209	79.122	21.255
1000295016	51195790	545	547.96	50.109	13.933	41.228	13.291	78.486	21.249
1000294498	51195791	545	547.701	49.914	13.946	41.186	13.298	78.679	21.239
1000294520	51195792	545	549.592	50.094	13.89	41.518	13.238	78.985	21.313
1000294498	51195793	545	547.732	50.153	13.85	41.503	13.197	78.853	21.241
1000294494	51195794	545	548.125	49.854	13.949	41.228	13.295	78.819	21.256
1000294520	51195795	545	545.345	50.137	13.876	41.238	13.224	78.387	21.148
1000294548	51195796	545	548.649	49.921	13.922	41.389	13.256	78.94	21.276
1000294494	51195797	545	547.48	50.031	13.901	41.342	13.243	78.721	21.231
1000294494	51195798	545	549.824	49.856	13.948	41.368	13.291	79.066	21.322
1000294520	51195799	545	546.071	49.998	13.899	41.153	13.269	78.579	21.176
1000294494	51195800	545	549.718	50.032	13.89	41.482	13.252	79.103	21.318
1000294494	51195801	545	546.654	49.879	13.977	41.057	13.315	78.412	21.199
1000294494	51195802	545	547.674	49.914	13.938	41.295	13.262	78.723	21.238
1000295016	51195803	545	548.856	50.179	13.901	41.493	13.228	78.688	21.284
1000294494	51195805	545	547.527	49.955	13.993	41.043	13.34	78.328	21.233
1000294498	51195806	545	545.342	50.13	13.888	41.248	13.221	78.333	21.148
1000294494	51195807	545	547.476	49.982	13.911	41.31	13.253	78.739	21.231
1000294494	51195808	545	547.927	50.181	13.864	41.41	13.232	78.757	21.248
1000294509	51195809	545	548.961	50.222	13.881	41.531	13.218	78.748	21.288
1000294494	51195811	545	546.715	49.927	13.921	41.239	13.257	78.661	21.201
1000294494	51195812	545	546.93	49.891	13.922	41.257	13.257	78.744	21.209
1000294520	51195814	545	545.078	50.163	13.888	41.252	13.213	78.242	21.138
1000294498	51195815	545	545.507	49.97	13.931	41.15	13.257	78.365	21.154
1000294494	51195816	545	547.17	50.042	13.95	41.255	13.263	78.38	21.219
1000294498	51195817	545	548.58	50.053	13.893	41.441	13.238	78.887	21.273
1000294502	51195818	545	546.019	49.978	13.849	41.348	13.206	78.888	21.174
1000294502	51195819	545	549.312	50.187	13.849	41.614	13.2	79.033	21.302
1000294520	51195821	545	547.935	50.146	13.875	41.424	13.227	78.754	21.248
1000294968	51195822	545	548.664	50.244	14.038	41.09	13.353	77.79	21.277
1000294494	51195823	545	545.181	49.933	13.901	41.166	13.244	78.546	21.142
1000294494	51195824	545	547.873	50.047	13.898	41.353	13.249	78.766	21.246

1000294498	51195825	545	546.386	49.855	13.91	41.241	13.249	78.789	21.188
1000294498	51195826	545	546.12	49.917	13.902	41.214	13.251	78.697	21.178
1000294520	51195827	545	549.585	50.119	13.901	41.461	13.255	78.883	21.312
1000294498	51195829	545	546.255	49.999	13.937	41.301	13.226	78.39	21.183
1000294520	51195830	545	545.483	50.024	13.909	41.153	13.255	78.401	21.153
1000294520	51195831	545	547.309	50.068	13.913	41.275	13.26	78.57	21.224
1000294498	51195832	545	549.711	49.986	13.911	41.482	13.252	79.053	21.317
1000294498	51195833	545	545.159	49.998	13.905	41.362	13.18	78.413	21.141
1000294512	51195834	545	548.231	50.009	13.847	41.517	13.205	79.17	21.26
1000294502	51195835	545	548.422	50.191	13.89	41.437	13.235	78.664	21.267
1000294498	51195836	545	546.356	49.996	13.884	41.268	13.239	78.71	21.187
1000294498	51195837	545	547.385	50.007	13.887	41.355	13.236	78.822	21.227
1000294547	51195838	545	549.09	50.155	13.888	41.43	13.254	78.83	21.293
1000294494	51195839	545	547.105	49.908	13.923	41.292	13.25	78.733	21.216
1000294502	51195841	545	548.412	50.006	13.883	41.57	13.192	78.993	21.267
1000294512	51195842	545	546.763	49.945	13.876	41.41	13.204	78.894	21.203
1000294494	51195843	545	548.34	49.965	13.891	41.374	13.253	79.002	21.264
1000294548	51195844	545	546.993	49.974	13.885	41.266	13.255	78.828	21.212
1000294494	51195845	545	548.957	50.106	13.896	41.502	13.227	78.844	21.288
1000294498	51195846	545	547.564	50.169	13.862	41.468	13.205	78.735	21.234
1000294502	51195847	545	548.088	50.023	13.932	41.332	13.261	78.645	21.254
1000294512	51195848	545	548.843	50.098	13.872	41.464	13.236	78.976	21.284
1000294498	51195849	545	547.125	50.011	13.893	41.383	13.221	78.749	21.217
1000294968	51195850	545	547.763	50.27	13.983	41.17	13.305	77.926	21.242
1000294502	51195851	545	546.635	50.07	13.861	41.318	13.23	78.763	21.198
1000294498	51195852	545	547.599	49.975	13.899	41.447	13.212	78.838	21.235
1000294512	51195853	545	547.936	50.121	13.901	41.421	13.228	78.646	21.248
1000294502	51195854	545	547.924	49.969	13.893	41.527	13.194	78.927	21.248
1000294512	51195855	545	549.345	50.075	13.871	41.499	13.237	79.088	21.303
1000294512	51195856	545	549.508	50.117	13.893	41.484	13.246	78.924	21.309
1000294498	51195857	545	547.344	49.997	13.907	41.396	13.222	78.721	21.225
1000294498	51195858	545	547.636	50.171	13.859	41.469	13.206	78.762	21.237
1000294520	51195859	545	549.507	50.102	13.894	41.523	13.234	78.936	21.309
1000294502	51195860	545	548.521	50.03	13.893	41.451	13.233	78.916	21.271
1000294498	51195861	545	547.04	50.022	13.89	41.322	13.238	78.731	21.214
1000294502	51195863	545	547.364	50.039	13.898	41.428	13.212	78.706	21.226
1000294502	51195864	545	546.959	50.02	13.923	41.257	13.257	78.537	21.211
1000294498	51195865	545	547.021	50.036	13.895	41.305	13.244	78.679	21.213
1000294498	51195866	545	547.285	50.024	13.904	41.288	13.255	78.686	21.223
1000294509	51195867	545	546.26	50.142	13.89	41.271	13.236	78.432	21.183
1000294498	51195868	545	546.771	50.013	13.884	41.244	13.257	78.739	21.203
1000294548	51195869	545	547.023	49.989	13.91	41.288	13.249	78.669	21.213
1000294494	51195870	545	546.554	49.912	13.883	41.294	13.236	78.873	21.195
1000294502	51195871	545	545.884	50.09	13.895	41.255	13.232	78.431	21.169
1000294502	51195872	545	548.435	49.988	13.938	41.373	13.256	78.712	21.268
1000294498	51195873	545	548.217	50.01	13.935	41.379	13.249	78.668	21.259
1000294502	51195874	545	547.972	50.108	13.934	41.355	13.25	78.483	21.25
1000294548	51195875	545	546.642	49.962	13.882	41.295	13.237	78.816	21.198
1000294548	51195876	545	548.996	49.978	13.926	41.371	13.27	78.879	21.29
1000294498	51195878	545	545.054	49.895	13.873	41.199	13.23	78.743	21.137
1000294502	51195879	545	549.767	50.207	13.909	41.486	13.252	78.728	21.319
1000294509	51195882	545	549.616	50.11	13.974	41.292	13.31	78.492	21.314
1000294509	51195883	545	547.376	50.002	13.899	41.376	13.229	78.762	21.227
1000294548	51195884	545	546.773	49.913	13.878	41.374	13.215	78.936	21.203
1000294509	51195885	545	548.462	50.201	13.854	41.551	13.2	78.86	21.269
1000294509	51195887	545	546.961	50.127	13.923	41.197	13.277	78.371	21.211
1000294548	51195888	545	545.96	50.077	13.869	41.312	13.216	78.609	21.172
1000294512	51195889	545	546.53	49.939	13.86	41.374	13.21	78.96	21.194
1000294509	51195890	545	547.34	49.962	13.897	41.337	13.241	78.832	21.225
1000294509	51195892	545	547.501	50.123	13.887	41.328	13.248	78.655	21.232
1000294498	51195893	545	546.156	50.062	13.874	41.302	13.223	78.632	21.179
1000294498	51195894	545	545.872	50.07	13.871	41.286	13.222	78.598	21.168
1000294954	51195895	545	549.26	50.359	13.958	41.21	13.328	78.143	21.3
1000294509	51195896	545	547.841	50.158	13.896	41.419	13.227	78.601	21.245
1000294509	51195897	545	548.428	50.031	13.874	41.405	13.245	79.008	21.267

1000294502	51195898	545	546.621	49.955	13.906	41.251	13.251	78.686	21.197
1000294950	51195899	545	548.797	50.258	14.036	41.222	13.313	77.797	21.282
1000294548	51195900	545	547.442	50.012	13.9	41.36	13.236	78.749	21.229
1000294502	51195901	545	547.468	50.058	13.903	41.459	13.205	78.665	21.23
1000294502	51195902	545	546.392	49.939	13.888	41.267	13.241	78.782	21.189
1000294548	51195903	545	547.814	50.138	13.88	41.447	13.217	78.717	21.244
1000294502	51195904	545	548.814	50.199	13.901	41.493	13.227	78.647	21.282
1000294509	51195905	545	549.078	50.005	13.908	41.365	13.274	78.949	21.293
1000294502	51195906	545	549.642	50.09	13.899	41.486	13.249	78.951	21.315
1000294502	51195907	545	547.92	50.135	13.926	41.303	13.266	78.477	21.248
1000294502	51195908	545	547.895	50.079	13.903	41.434	13.223	78.69	21.247
1000294502	51195909	545	548.894	50.033	13.956	41.395	13.26	78.612	21.286
1000294502	51195910	545	546.677	50.075	13.88	41.282	13.242	78.656	21.2
1000294509	51195911	545	547.591	50.01	13.858	41.41	13.223	79.011	21.235
1000294502	51195912	545	545.145	50.018	13.919	41.247	13.217	78.302	21.14
1000294502	51195913	545	545.444	49.995	13.907	41.159	13.252	78.452	21.152
1000294502	51195914	545	547.134	49.948	13.908	41.244	13.266	78.763	21.217
1000294509	51195915	545	546.898	50.03	13.901	41.274	13.251	78.635	21.208
1000294502	51195916	545	545.472	49.99	13.847	41.306	13.206	78.802	21.153
1000294502	51195917	545	547.088	50.01	13.917	41.303	13.246	78.606	21.216
1000294509	51195919	545	548.348	50.044	13.965	41.299	13.278	78.46	21.264
1000294937	51195920	545	549.109	50.255	14.018	41.294	13.298	77.944	21.294
1000294509	51195922	545	547.469	49.955	13.928	41.382	13.23	78.685	21.23
1000294509	51195923	545	548.13	50.004	13.907	41.364	13.251	78.822	21.256
1000294509	51195924	545	546.938	49.936	13.907	41.281	13.249	78.758	21.21
1000294512	51195925	545	547.425	50.034	13.88	41.313	13.251	78.824	21.229
1000294509	51195926	545	546.047	50.005	13.879	41.324	13.214	78.682	21.175
1000294950	51195928	545	549.46	50.25	14.027	41.262	13.316	77.956	21.307
1000294954	51195929	545	547.533	50.361	14.049	41.169	13.3	77.388	21.233
1000294512	51195930	545	546.91	49.987	13.881	41.358	13.224	78.82	21.209
1000294509	51195931	545	547.705	50	13.907	41.384	13.235	78.767	21.239
1000294950	51195932	545	546.397	50.291	13.972	41.295	13.231	77.758	21.189
1000294950	51195933	545	549.562	50.281	13.934	41.499	13.243	78.441	21.311
1000294512	51195934	545	546.901	49.896	13.857	41.369	13.22	79.098	21.208
1000294548	51195936	545	547.094	49.995	13.862	41.453	13.198	78.942	21.216
1000294512	51195937	545	545.52	49.935	13.879	41.261	13.221	78.71	21.155
1000294512	51195938	545	548.993	49.948	13.914	41.456	13.243	78.993	21.289
1000294512	51195939	545	547.031	49.989	13.872	41.437	13.202	78.885	21.213
1000294954	51195940	545	547.693	50.136	14.008	41.182	13.299	77.985	21.239
1000294509	51195941	545	546.835	50.03	13.889	41.294	13.242	78.693	21.206
1000294547	51195942	545	548.018	50.092	13.916	41.283	13.275	78.617	21.252
1000294509	51195943	545	546.782	50.172	13.925	41.294	13.241	78.263	21.204
1000294509	51195944	545	547.926	49.979	13.898	41.414	13.23	78.886	21.248
1000295016	51195945	545	547.301	50.058	13.906	41.236	13.272	78.623	21.224
1000294509	51195947	545	545.232	49.885	13.914	41.174	13.242	78.553	21.144
1000294512	51195948	545	548.097	49.851	13.901	41.316	13.266	79.092	21.255
1000294509	51195949	545	549.83	50.234	13.962	41.457	13.263	78.395	21.322
1000294950	51195950	545	549.957	50.31	14.008	41.244	13.334	78.035	21.327
1000294548	51195951	545	547.984	49.963	13.952	41.237	13.289	78.608	21.25
1000294950	51195955	545	546.132	50.304	13.976	41.289	13.227	77.679	21.178
1000294512	51195956	545	547.687	50.061	13.864	41.661	13.146	78.912	21.239
1000294520	51195960	545	547.632	50.051	13.91	41.386	13.232	78.66	21.237
1000294512	51195962	545	545.358	49.901	13.907	41.177	13.244	78.584	21.148
1000294547	51195963	545	547.509	50.071	13.899	41.429	13.216	78.674	21.232
1000294512	51195966	545	549.675	49.978	13.921	41.479	13.252	79.007	21.316
1000294512	51195967	545	547.968	49.884	13.865	41.487	13.208	79.227	21.25
1000294548	51195968	545	546.894	49.97	13.893	41.397	13.211	78.778	21.208
1000294937	51195970	545	547.464	50.027	13.899	41.399	13.224	78.737	21.23
1000294548	51195971	545	547.467	50.014	13.882	41.386	13.228	78.854	21.23
1000294520	51195972	545	548.983	49.972	13.902	41.455	13.243	79.026	21.289
1000294512	51195973	545	546.631	49.949	13.872	41.312	13.232	78.889	21.198
1000294547	51195974	545	548.169	50.151	13.884	41.385	13.245	78.727	21.257
1000294512	51195976	545	547.39	49.946	13.841	41.436	13.211	79.179	21.227
1000294547	51195977	545	547.591	50.121	13.85	41.59	13.166	78.883	21.235
1000294520	51195978	545	549.278	49.978	13.887	41.473	13.244	79.141	21.3

1000294520	51195979	545	547.786	49.964	13.886	41.613	13.164	78.953	21.243
1000294520	51195980	545	549.022	49.854	13.902	41.475	13.237	79.217	21.291
1000294520	51195981	545	549.705	50.151	13.889	41.492	13.248	78.917	21.317
1000294547	51195983	545	548.409	49.985	13.876	41.371	13.256	79.07	21.267
1000294512	51195984	545	546.443	49.862	13.873	41.463	13.179	78.996	21.191
1000294512	51195985	545	548.862	50.03	13.879	41.525	13.218	79.043	21.284
1000294512	51195986	545	547.73	49.97	13.861	41.643	13.153	79.076	21.24
1000294520	51195987	545	545	50.154	13.878	41.221	13.221	78.302	21.135
1000294520	51195988	545	546.158	50	13.902	41.269	13.234	78.57	21.179
1000294547	51195990	545	547.57	50.021	13.905	41.412	13.223	78.727	21.234
1000294547	51195991	545	546.845	50.081	13.863	41.531	13.167	78.765	21.206
1000294547	51195992	545	548.209	50.115	13.878	41.385	13.246	78.823	21.259
1000294547	51195993	545	547.245	50.172	13.901	41.278	13.258	78.463	21.222
1000294968	51195994	545	549.592	50.154	13.972	41.337	13.295	78.43	21.313
1000294968	51195995	545	545.964	50.147	13.944	41.302	13.219	78.076	21.172
1000294968	51195996	545	547.87	50.12	13.976	41.269	13.275	78.215	21.246
1000294968	51195997	545	547.673	50.161	13.96	41.375	13.237	78.213	21.238
1000294968	51195998	545	546.287	50.298	14.018	41.085	13.297	77.477	21.184
1000294951	51195999	545	548.933	50.302	14.012	41.225	13.316	77.884	21.287
1000294968	51196000	545	547.956	50.272	13.992	41.16	13.313	77.903	21.249
1000294968	51196002	545	547.257	50.114	13.961	41.271	13.26	78.222	21.222
1000294951	51196003	545	549.515	50.321	13.961	41.327	13.297	78.219	21.31
1000294951	51196004	545	548.742	50.305	14.019	41.185	13.324	77.81	21.28
1000294968	51196005	545	549.907	50.35	14.061	41.209	13.344	77.672	21.325
1000294951	51196006	545	549.228	50.316	14.016	41.234	13.32	77.879	21.298
1000294951	51196007	545	546.097	50.353	14.006	40.953	13.335	77.434	21.177
1000294968	51196011	545	545.937	50.134	13.953	41.208	13.248	78.047	21.171
1000294968	51196012	545	547.756	50.085	13.966	41.332	13.253	78.308	21.241
1000294968	51196014	545	546.011	50.352	13.921	41.152	13.268	77.897	21.174
1000294954	51196016	545	547.088	50.218	13.967	41.125	13.303	78	21.216
1000294954	51196017	545	546.951	50.252	13.955	41.198	13.276	77.996	21.21
1000294968	51196018	545	549.898	50.224	14.004	41.311	13.311	78.182	21.324
1000294968	51196019	545	547.69	50.27	13.99	41.136	13.314	77.877	21.239
1000294954	51196020	545	548.1	50.271	13.992	41.236	13.292	77.924	21.255
1000294968	51196021	545	547.75	50.27	13.985	41.152	13.311	77.912	21.241
1000294968	51196024	545	549.611	50.296	14.049	41.162	13.352	77.781	21.313
1000295170	51199427	545	546.435	49.954	13.776	41.685	13.109	79.406	21.19
1000295181	51199428	545	547.454	49.99	13.801	41.556	13.174	79.351	21.23
1000295212	51199430	545	547.486	50.014	13.854	41.477	13.2	79.014	21.231
1000295181	51199431	545	545.297	49.85	13.789	41.497	13.141	79.33	21.146
1000295212	51199432	545	545.698	50.004	13.819	41.443	13.167	78.969	21.162
1000295168	51199433	545	547.093	50.021	13.852	41.466	13.194	78.956	21.216
1000295190	51199434	545	545.534	49.98	13.818	41.492	13.148	78.994	21.155
1000295190	51199435	545	549.082	49.897	13.817	41.7	13.167	79.646	21.293
1000295168	51199436	545	547.454	50.037	13.856	41.476	13.199	78.962	21.23
1000295205	51199437	545	546.876	50.157	13.783	41.538	13.166	79.105	21.207
1000295176	51199439	545	548.222	50.052	13.799	41.699	13.147	79.376	21.259
1000295168	51199440	545	547.821	50.159	13.86	41.55	13.184	78.798	21.244
1000295176	51199441	545	546.636	50.054	13.813	41.557	13.154	79.062	21.198
1000295176	51199442	545	548.224	49.938	13.753	41.813	13.111	79.821	21.26
1000295168	51199443	545	546.796	50.097	13.88	41.448	13.192	78.638	21.204
1000295181	51199444	545	547.001	50.004	13.873	41.471	13.19	78.854	21.212
1000295168	51199445	545	547.669	50.169	13.832	41.547	13.182	78.922	21.238
1000295176	51199446	545	547.116	50.023	13.826	41.556	13.166	79.11	21.217
1000295176	51199447	545	546.169	50.011	13.801	41.441	13.179	79.132	21.18
1000295170	51199448	545	547.885	50.043	13.79	41.609	13.168	79.39	21.246
1000295168	51199449	545	548.852	49.979	13.866	41.542	13.212	79.197	21.284
1000295210	51199450	545	548.265	50.031	13.84	41.595	13.181	79.182	21.261
1000295156	51199451	545	546.391	49.973	13.825	41.617	13.129	79.087	21.188
1000295215	51199452	545	547.674	49.994	13.816	41.542	13.184	79.289	21.238
1000295205	51199454	545	545.94	49.994	13.812	41.405	13.185	79.061	21.171
1000295190	51199455	545	546.048	50.087	13.794	41.584	13.131	79.032	21.175
1000295210	51199456	545	547.386	50.052	13.811	41.572	13.167	79.188	21.227
1000295215	51199457	545	546.508	50.062	13.732	41.649	13.122	79.497	21.193
1000295222	51199458	545	547.01	49.949	13.776	41.626	13.141	79.513	21.212

1000295221	51199459	545	548.326	50.131	13.855	41.597	13.182	78.948	21.264
1000295222	51199460	545	545.729	49.991	13.767	41.56	13.131	79.295	21.163
1000295222	51199461	545	546.641	49.932	13.81	41.535	13.161	79.274	21.198
1000295222	51199462	545	548.389	50.003	13.782	41.728	13.142	79.573	21.266
1000295222	51199463	545	546.787	50.021	13.846	41.428	13.198	78.948	21.204
1000295222	51199465	545	547.936	50.101	13.787	41.706	13.138	79.329	21.248
1000295170	51199466	545	547.327	50.014	13.856	41.427	13.212	78.982	21.225
1000295222	51199467	545	548.27	50.048	13.807	41.554	13.194	79.342	21.261
1000295222	51199470	545	547.517	50.058	13.752	41.716	13.125	79.533	21.232
1000295210	51199471	545	546.825	50.025	13.801	41.588	13.149	79.202	21.205
1000295181	51199472	545	545.74	49.979	13.778	41.62	13.112	79.256	21.163
1000295210	51199473	545	546.19	50	13.78	41.619	13.124	79.271	21.181
1000295222	51199474	545	547.672	49.947	13.789	41.688	13.137	79.518	21.238
1000295190	51199475	545	547.495	50.032	13.806	41.496	13.194	79.265	21.231
1000295211	51199476	545	547.378	50.022	13.805	41.587	13.162	79.27	21.227
1000295210	51199477	545	547.486	49.975	13.806	41.585	13.166	79.352	21.231
1000295210	51199478	545	545.756	50.026	13.781	41.57	13.129	79.161	21.164
1000295210	51199479	545	547.208	50.005	13.785	41.555	13.168	79.383	21.22
1000295210	51199481	545	546.187	50.005	13.779	41.544	13.147	79.268	21.181
1000295160	51199483	545	546.097	49.903	13.804	41.532	13.149	79.275	21.177
1000295205	51199484	545	549.607	50.102	13.821	41.742	13.167	79.373	21.313
1000295210	51199485	545	547.884	50.038	13.819	41.671	13.148	79.232	21.246
1000295170	51199486	545	547.286	49.875	13.81	41.576	13.163	79.46	21.223
1000295156	51199490	545	545.549	50.048	13.793	41.562	13.126	79.03	21.156
1000295210	51199491	545	546.848	50.01	13.809	41.578	13.152	79.184	21.206
1000295186	51199493	545	548.77	50.05	13.848	41.679	13.167	79.174	21.281
1000295156	51199494	545	545.304	49.994	13.814	41.488	13.144	78.959	21.146
1000295156	51199495	545	548.482	50.036	13.804	41.747	13.138	79.41	21.27
1000295156	51199497	545	549.821	50.291	13.929	41.422	13.274	78.492	21.322
1000295168	51199498	545	549.12	50.056	13.905	41.56	13.213	78.892	21.294
1000295170	51199501	545	546.632	49.781	13.832	41.398	13.204	79.387	21.198
1000295222	51199505	545	547.728	50.047	13.805	41.572	13.175	79.278	21.24
1000295156	51199507	545	549.741	50.289	13.925	41.406	13.277	78.501	21.318
1000295170	51199508	545	547.602	49.879	13.805	41.534	13.185	79.528	21.235
1000295156	51199511	545	549.848	50.288	13.926	41.419	13.275	78.513	21.323
1000295181	51199514	545	546.495	50.165	13.838	41.554	13.151	78.726	21.193
1000295170	51199515	545	547.144	49.864	13.817	41.509	13.181	79.416	21.218
1000295156	51199517	545	548.408	49.988	13.811	41.72	13.145	79.435	21.267
1000295170	51199521	545	545.642	50.02	13.84	41.555	13.131	78.819	21.159
1000295170	51199522	545	549.598	49.897	13.795	41.773	13.157	79.845	21.313
1000295156	51199524	545	547.538	49.992	13.81	41.677	13.138	79.306	21.233
1000295170	51199526	545	548.825	49.991	13.844	41.752	13.145	79.299	21.283
1000295168	51199528	545	547.756	50.05	13.876	41.585	13.172	78.874	21.241
1000295168	51199530	545	545.339	49.999	13.836	41.446	13.158	78.832	21.148
1000295170	51199532	545	547.719	50.02	13.805	41.611	13.163	79.319	21.24
1000295170	51199533	545	549.191	49.875	13.804	41.713	13.166	79.77	21.297
1000295168	51199534	545	548.316	50.067	13.901	41.523	13.205	78.782	21.263
1000295156	51199535	545	547.12	50.018	13.804	41.528	13.175	79.238	21.217
1000295222	51199536	545	546.687	50.078	13.764	41.64	13.129	79.316	21.2
1000295170	51199537	545	546.997	49.855	13.83	41.365	13.224	79.335	21.212
1000295156	51199538	545	547.36	50.016	13.843	41.542	13.176	79.053	21.226
1000295211	51199540	545	547.245	49.966	13.79	41.644	13.141	79.426	21.222
1000295170	51199541	545	547.591	50.02	13.849	41.606	13.161	79.049	21.235
1000295211	51199542	545	546.829	50.028	13.799	41.559	13.158	79.21	21.205
1000295210	51199543	545	547.68	50.07	13.801	41.626	13.157	79.26	21.238
1000295208	51199545	545	548.344	50.076	13.78	41.682	13.156	79.466	21.264
1000295208	51199546	545	547.164	50.072	13.813	41.501	13.184	79.112	21.218
1000295181	51199547	545	545.169	50.153	13.789	41.531	13.127	78.831	21.141
1000295170	51199548	545	547.639	50.01	13.802	41.613	13.16	79.34	21.237
1000295160	51199549	545	547.544	50.053	13.794	41.554	13.177	79.302	21.233
1000295170	51199551	545	545.835	49.984	13.797	41.52	13.146	79.147	21.167
1000295170	51199553	545	547.176	50.017	13.844	41.531	13.175	79.024	21.219
1000295156	51199554	545	547.27	50.013	13.854	41.431	13.209	78.988	21.223
1000295181	51199555	545	549.159	49.999	13.801	41.796	13.139	79.586	21.296
1000295170	51199558	545	546.765	50.01	13.729	41.821	13.074	79.638	21.203

1000295181	51199560	545	545.97	49.939	13.785	41.594	13.126	79.31	21.172
1000295170	51199562	545	546.239	50.075	13.862	41.417	13.189	78.696	21.183
1000295210	51199563	545	548.323	49.981	13.804	41.573	13.189	79.477	21.263
1000295160	51199564	545	547.547	49.911	13.8	41.602	13.162	79.496	21.233
1000295156	51199565	545	546.846	50.016	13.812	41.527	13.169	79.159	21.206
1000295210	51199566	545	546.313	50.025	13.823	41.489	13.168	79.004	21.185
1000295156	51199567	545	547.149	50.013	13.841	41.54	13.172	79.042	21.218
1000295160	51199568	545	546.743	49.787	13.855	41.416	13.201	79.262	21.202
1000295168	51199572	545	547.449	50.14	13.834	41.546	13.177	78.924	21.23
1000295170	51199573	545	547.226	49.984	13.834	41.506	13.184	79.14	21.221
1000295160	51199575	545	547.148	50.043	13.787	41.669	13.131	79.304	21.218
1000295170	51199577	545	548.288	50.045	13.836	41.614	13.176	79.186	21.262
1000295160	51199578	545	547.763	50.067	13.792	41.804	13.103	79.328	21.242
1000295156	51199581	545	547.353	50.017	13.857	41.416	13.216	78.974	21.226
1000295160	51199582	545	547.127	50.028	13.841	41.496	13.185	79.012	21.217
1000295168	51199585	545	547.178	50.017	13.854	41.501	13.185	78.964	21.219
1000295160	51199586	545	547.32	50.003	13.787	41.565	13.168	79.391	21.225
1000295160	51199587	545	546.864	49.983	13.829	41.552	13.161	79.115	21.207
1000295160	51199588	545	549.411	50.014	13.769	41.755	13.158	79.784	21.306
1000295156	51199589	545	548.305	49.965	13.838	41.628	13.171	79.303	21.263
1000295160	51199590	545	549.273	50.02	13.828	41.647	13.189	79.411	21.3
1000295181	51199591	545	546.214	50.258	13.827	41.56	13.143	78.604	21.182
1000295160	51199592	545	546.864	49.971	13.723	41.794	13.085	79.749	21.207
1000295205	51199593	545	547.448	50.001	13.785	41.59	13.163	79.422	21.229
1000295168	51199595	545	547.388	50.077	13.83	41.58	13.165	79.035	21.227
1000295156	51199596	545	546.189	50.061	13.865	41.422	13.186	78.691	21.181
1000295156	51199597	545	549.966	49.975	13.808	41.845	13.143	79.7	21.327
1000295170	51199598	545	547.504	50.034	13.845	41.604	13.16	79.037	21.232
1000295160	51199599	545	546.175	49.992	13.781	41.668	13.108	79.278	21.18
1000295156	51199600	545	547.256	50.015	13.852	41.43	13.209	78.99	21.222
1000295160	51199602	545	547.784	50.072	13.783	41.644	13.154	79.373	21.243
1000295168	51199604	545	549.518	50.138	13.844	41.706	13.176	79.167	21.31
1000295160	51199605	545	549.263	50.035	13.78	41.733	13.161	79.66	21.3
1000295168	51199606	545	547.005	50.094	13.806	41.57	13.159	79.09	21.212
1000295176	51199608	545	547.488	49.992	13.788	41.685	13.134	79.429	21.231
1000295170	51199609	545	547.625	50.018	13.818	41.703	13.132	79.235	21.236
1000295170	51199611	545	547.692	50.029	13.855	41.508	13.195	79.015	21.239
1000295156	51199612	545	546.089	49.949	13.857	41.491	13.162	78.9	21.177
1000295182	51199614	545	548.54	50.071	13.825	41.56	13.199	79.243	21.272
1000295156	51199616	545	545.6	49.976	13.815	41.532	13.137	79.023	21.158
1000295156	51199617	545	547.091	50.054	13.81	41.586	13.156	79.146	21.216
1000295156	51199618	545	549.815	50.292	13.927	41.417	13.275	78.499	21.321
1000295176	51199620	545	548.419	49.923	13.821	41.64	13.17	79.481	21.267
1000295207	51199621	545	546.412	49.962	13.8	41.529	13.157	79.252	21.189
1000295156	51199622	545	546.696	49.99	13.835	41.552	13.157	79.049	21.2
1000295168	51199623	545	547.44	50.025	13.848	41.506	13.189	79.023	21.229
1000295176	51199624	545	546.594	50.17	13.83	41.512	13.167	78.776	21.196
1000295181	51199625	545	547.963	50.025	13.794	41.68	13.147	79.408	21.249
1000295170	51199626	545	547.471	50.043	13.816	41.655	13.143	79.183	21.23
1000295160	51199627	545	547.352	50.055	13.788	41.648	13.142	79.308	21.226
1000295176	51199628	545	546.764	50.094	13.842	41.435	13.196	78.851	21.203
1000295168	51199629	545	545.476	50.09	13.874	41.383	13.181	78.49	21.153
1000295170	51199632	545	549.637	50.004	13.805	41.738	13.169	79.623	21.314
1000295160	51199633	545	545.816	49.987	13.86	41.404	13.183	78.783	21.166
1000295168	51199634	545	545.959	50.036	13.873	41.372	13.196	78.653	21.172
1000295160	51199635	545	546.732	49.977	13.815	41.502	13.174	79.187	21.202
1000295176	51199636	545	545.095	49.796	13.826	41.425	13.159	79.175	21.138
1000295156	51199637	545	547.803	50.023	13.85	41.813	13.101	79.071	21.243
1000295181	51199638	545	546.838	50.267	13.829	41.629	13.136	78.666	21.206
1000295160	51199639	545	547.59	50.009	13.795	41.718	13.126	79.376	21.235
1000295170	51199640	545	549.205	50.068	13.794	41.878	13.114	79.522	21.298
1000295181	51199641	545	548.548	50.082	13.768	41.809	13.12	79.556	21.272
1000295156	51199642	545	547.712	50.02	13.849	41.776	13.111	79.067	21.24
1000295156	51199643	545	545.426	49.923	13.833	41.469	13.153	78.98	21.151
1000295181	51199644	545	546.9	50.084	13.864	41.484	13.184	78.749	21.208

1000295181	51199646	545	548.532	50.026	13.864	41.579	13.193	79.089	21.272
1000295181	51199647	545	547.593	50.084	13.832	41.546	13.18	79.048	21.235
1000295170	51199648	545	547.045	49.995	13.808	41.639	13.138	79.244	21.214
1000295216	51199649	545	547.042	50.173	13.777	41.677	13.126	79.141	21.214
1000295186	51199650	545	546.661	50.24	13.818	41.483	13.178	78.744	21.199
1000295168	51199651	545	548.708	50.1	13.866	41.574	13.198	78.987	21.278
1000295176	51199652	545	547.865	50.215	13.808	41.604	13.169	79.016	21.246
1000295176	51199653	545	546.41	49.859	13.828	41.515	13.162	79.256	21.189
1000295176	51199654	545	546.533	49.997	13.781	41.542	13.156	79.32	21.194
1000295160	51199655	545	549.675	50.102	13.816	41.727	13.173	79.407	21.316
1000295156	51199656	545	547.109	49.956	13.836	41.546	13.169	79.152	21.216
1000295170	51199657	545	547.353	50.06	13.841	41.501	13.189	78.998	21.226
1000295160	51199658	545	548.425	50.058	13.786	41.779	13.127	79.471	21.267
1000295170	51199661	545	547.392	49.952	13.733	41.826	13.087	79.795	21.227
1000295170	51199662	545	547.638	50.036	13.795	41.569	13.174	79.338	21.237
1000295168	51199663	545	546.877	50.053	13.873	41.524	13.17	78.756	21.207
1000295156	51199664	545	546.303	49.971	13.831	41.615	13.128	79.046	21.185
1000295176	51199665	545	546.989	49.992	13.796	41.83	13.077	79.311	21.212
1000295181	51199666	545	546.831	49.853	13.781	41.64	13.132	79.595	21.206
1000295168	51199667	545	545.425	50.022	13.87	41.312	13.203	78.616	21.151
1000295176	51199668	545	547.052	50.069	13.802	41.625	13.142	79.161	21.214
1000295182	51199669	545	547.959	49.89	13.861	41.564	13.184	79.241	21.249
1000295156	51199670	545	547.511	49.981	13.884	41.414	13.22	78.9	21.232
1000295156	51199671	545	545.437	50.062	13.842	41.448	13.159	78.708	21.151
1000295181	51199674	545	547.232	50.02	13.849	41.482	13.192	78.996	21.221
1000295181	51199675	545	546.918	50.007	13.87	41.479	13.185	78.852	21.209
1000295176	51199676	545	547.47	50.044	13.873	41.429	13.215	78.859	21.23
1000295182	51199677	545	546.751	50.037	13.785	41.6	13.143	79.268	21.202
1000295176	51199678	545	549.914	50.107	13.807	41.836	13.144	79.485	21.325
1000295168	51199679	545	547.374	50.037	13.851	41.449	13.206	78.979	21.227
1000295176	51199681	545	548.155	50.054	13.801	41.713	13.141	79.351	21.257
1000295181	51199682	545	548.132	50.027	13.858	41.572	13.185	79.067	21.256
1000295168	51199683	545	547.755	50.025	13.866	41.584	13.172	78.97	21.241
1000295176	51199684	545	545.694	50.006	13.805	41.445	13.167	79.048	21.161
1000295168	51199685	545	547.058	50.041	13.839	41.452	13.197	78.994	21.214
1000295168	51199686	545	549.644	49.998	13.879	41.599	13.213	79.209	21.315
1000295181	51199687	545	547.688	50.114	13.828	41.603	13.164	79.035	21.239
1000295176	51199688	545	547.296	50.15	13.776	41.634	13.145	79.221	21.224
1000295168	51199689	545	548.621	49.978	13.865	41.528	13.211	79.17	21.275
1000295207	51199690	545	547.674	50.013	13.863	41.507	13.195	78.99	21.238
1000295176	51199691	545	547.742	50.14	13.775	41.688	13.139	79.308	21.241
1000295181	51199693	545	545.982	49.99	13.791	41.582	13.13	79.195	21.173
1000295168	51199694	545	549.65	50.072	13.875	41.593	13.215	79.117	21.315
1000295176	51199695	545	548.436	49.952	13.739	41.798	13.121	79.915	21.268
1000295168	51199696	545	546.852	50.014	13.848	41.476	13.185	78.959	21.206
1000295168	51199697	545	549.013	50.091	13.866	41.602	13.197	79.045	21.29
1000295207	51199698	545	547.672	49.843	13.804	41.708	13.131	79.599	21.238
1000295181	51199699	545	547.575	49.984	13.793	41.735	13.12	79.425	21.234
1000295181	51199702	545	547.202	50.017	13.845	41.524	13.178	79.019	21.22
1000295182	51199703	545	545.025	49.883	13.829	41.399	13.165	79.009	21.136
1000295207	51199704	545	547.445	50.064	13.81	41.642	13.147	79.18	21.229
1000295168	51199705	545	547.488	50.019	13.851	41.574	13.169	79.025	21.231
1000295207	51199706	545	547.634	50.104	13.802	41.686	13.137	79.19	21.237
1000295181	51199707	545	547.566	50.012	13.84	41.644	13.149	79.109	21.234
1000295186	51199708	545	546.993	50.211	13.82	41.562	13.161	78.826	21.212
1000295190	51199709	545	545.776	49.833	13.837	41.457	13.165	79.148	21.165
1000295168	51199710	545	547.607	50.038	13.842	41.532	13.185	79.061	21.236
1000295212	51199711	545	547.272	50.019	13.85	41.598	13.156	78.996	21.223
1000295176	51199712	545	547.175	50.14	13.836	41.394	13.219	78.876	21.219
1000295212	51199713	545	547.174	50.023	13.856	41.489	13.189	78.947	21.219
1000295186	51199714	545	547.106	50.022	13.856	41.382	13.221	78.937	21.216
1000295210	51199715	545	548.88	50.027	13.833	41.581	13.2	79.317	21.285
1000295181	51199716	545	547.938	50.057	13.787	41.734	13.129	79.394	21.248
1000295182	51199717	545	545.102	49.851	13.804	41.575	13.111	79.211	21.138
1000295182	51199718	545	548.41	50.125	13.816	41.583	13.188	79.191	21.267

1000295182	51199719	545	545.58	49.806	13.83	41.4	13.178	79.203	21.157
1000295181	51199720	545	546.895	50.009	13.846	41.552	13.162	78.98	21.208
1000295176	51199721	545	545.675	49.776	13.853	41.337	13.201	79.133	21.161
1000295182	51199722	545	547.877	49.941	13.823	41.503	13.201	79.366	21.246
1000295186	51199723	545	546.669	50.239	13.821	41.498	13.173	78.729	21.199
1000295182	51199724	545	548.388	49.93	13.809	41.637	13.171	79.538	21.266
1000295182	51199725	545	547.826	49.882	13.832	41.601	13.169	79.399	21.244
1000295186	51199726	545	548.133	50.001	13.868	41.55	13.192	79.049	21.256
1000295176	51199727	545	547.082	49.888	13.843	41.493	13.185	79.216	21.215
1000295186	51199728	545	545.052	50.249	13.843	41.429	13.156	78.359	21.137
1000295181	51199729	545	547.929	50.039	13.849	41.587	13.176	79.069	21.248
1000295207	51199731	545	547.446	50.027	13.853	41.493	13.194	78.994	21.229
1000295182	51199733	545	545.738	49.963	13.798	41.454	13.165	79.162	21.163
1000295210	51199734	545	546.915	50.008	13.812	41.541	13.166	79.182	21.209
1000295182	51199735	545	546.57	49.858	13.822	41.487	13.175	79.314	21.195
1000295176	51199736	545	546.456	49.963	13.788	41.547	13.153	79.326	21.191
1000295176	51199737	545	547.394	49.87	13.792	41.722	13.12	79.586	21.227
1000295182	51199738	545	546.621	49.982	13.81	41.557	13.153	79.19	21.197
1000295176	51199739	545	545.146	49.88	13.787	41.465	13.147	79.268	21.14
1000295186	51199740	545	546.556	50.129	13.816	41.674	13.115	78.914	21.195
1000295190	51199741	545	547.716	50.139	13.784	41.667	13.145	79.254	21.24
1000295190	51199742	545	548.447	49.916	13.838	41.631	13.174	79.403	21.268
1000295176	51199743	545	546.686	49.97	13.784	41.663	13.122	79.369	21.2
1000295207	51199744	545	547.255	49.895	13.792	41.592	13.158	79.525	21.222
1000295186	51199745	545	545.431	50.24	13.839	41.412	13.171	78.446	21.151
1000295181	51199746	545	547.129	50.028	13.847	41.544	13.17	78.984	21.217
1000295181	51199748	545	547.986	50.041	13.845	41.601	13.172	79.096	21.25
1000295207	51199749	545	547.444	50.026	13.798	41.592	13.162	79.313	21.229
1000295181	51199750	545	547.623	50.023	13.787	41.724	13.125	79.404	21.236
1000295182	51199751	545	549.482	50.014	13.784	41.824	13.138	79.703	21.308
1000295182	51199752	545	547.505	49.905	13.798	41.608	13.159	79.511	21.232
1000295182	51199753	545	546.403	50.042	13.809	41.524	13.159	79.073	21.189
1000295181	51199754	545	547.896	50.094	13.791	41.749	13.124	79.309	21.247
1000295182	51199755	545	545.839	50.011	13.776	41.54	13.14	79.225	21.167
1000295176	51199756	545	547.346	49.902	13.842	41.516	13.184	79.243	21.226
1000295182	51199758	545	547.666	50.009	13.808	41.677	13.141	79.314	21.238
1000295205	51199759	545	547.054	50.018	13.832	41.475	13.19	79.072	21.214
1000295182	51199760	545	548.835	49.959	13.813	41.734	13.151	79.531	21.283
1000295182	51199761	545	547.178	49.766	13.813	41.666	13.132	79.598	21.219
1000295186	51199762	545	548.646	50.264	13.863	41.617	13.183	78.736	21.276
1000295182	51199763	545	548.572	49.927	13.843	41.615	13.182	79.37	21.273
1000295176	51199764	545	545.48	49.861	13.808	41.401	13.175	79.23	21.153
1000295186	51199765	545	548.384	50.021	13.854	41.669	13.161	79.134	21.266
1000295182	51199766	545	546.339	50.115	13.765	41.618	13.127	79.198	21.186
1000295182	51199767	545	547.138	50	13.788	41.628	13.143	79.362	21.217
1000295182	51199768	545	546.826	50.077	13.797	41.608	13.142	79.146	21.205
1000295182	51199769	545	549.455	49.975	13.817	41.71	13.173	79.575	21.307
1000295186	51199770	545	549.323	50.091	13.838	41.787	13.146	79.251	21.302
1000295182	51199771	545	547.338	50.035	13.8	41.665	13.137	79.266	21.225
1000295211	51199772	545	546.763	49.985	13.801	41.527	13.166	79.26	21.203
1000295216	51199773	545	549.495	50.14	13.821	41.664	13.189	79.293	21.309
1000295182	51199774	545	547.6	50.036	13.811	41.653	13.147	79.242	21.235
1000295210	51199775	545	547.459	50.008	13.8	41.539	13.179	79.33	21.23
1000295207	51199776	545	548.013	49.961	13.829	41.594	13.175	79.32	21.251
1000295182	51199777	545	546.823	49.955	13.807	41.606	13.143	79.28	21.205
1000295186	51199778	545	546.216	49.96	13.855	41.444	13.18	78.908	21.182
1000295205	51199779	545	545.218	49.992	13.81	41.426	13.161	78.974	21.143
1000295186	51199780	545	549.273	50.077	13.832	41.701	13.172	79.298	21.3
1000295190	51199781	545	547.519	49.911	13.809	41.629	13.152	79.439	21.232
1000295186	51199782	545	548.544	50.275	13.85	41.659	13.167	78.779	21.272
1000295186	51199783	545	545.076	50.287	13.861	41.374	13.174	78.199	21.137
1000295182	51199784	545	545.856	49.983	13.813	41.474	13.161	79.062	21.168
1000295182	51199785	545	545.919	50.012	13.793	41.559	13.136	79.137	21.17
1000295215	51199786	545	546.186	50.044	13.789	41.593	13.132	79.15	21.181
1000295186	51199787	545	547.341	50.023	13.848	41.562	13.169	79.011	21.225

1000295190	51199788	545	545.285	49.774	13.793	41.388	13.175	79.426	21.146
1000295207	51199789	545	545.611	49.949	13.79	41.547	13.133	79.214	21.158
1000295212	51199790	545	547.235	50.016	13.844	41.486	13.191	79.03	21.221
1000295207	51199791	545	546.58	49.99	13.805	41.591	13.142	79.201	21.196
1000295207	51199792	545	548.112	50.021	13.824	41.582	13.181	79.262	21.255
1000295182	51199793	545	548.136	50.064	13.798	41.676	13.152	79.351	21.256
1000295207	51199794	545	547.831	50.093	13.769	41.772	13.115	79.424	21.244
1000295190	51199795	545	546.366	50.026	13.784	41.437	13.185	79.234	21.188
1000295212	51199796	545	548.292	50.069	13.883	41.536	13.2	78.877	21.262
1000295190	51199797	545	547.655	50.121	13.777	41.677	13.141	79.31	21.238
1000295186	51199800	545	548.45	49.985	13.831	41.651	13.168	79.334	21.268
1000295186	51199803	545	547.539	50.019	13.851	41.568	13.172	79.032	21.233
1000295207	51199805	545	545.484	49.903	13.816	41.417	13.171	79.116	21.153
1000295212	51199807	545	546.79	50.047	13.828	41.528	13.167	79.013	21.204
1000295207	51199808	545	548.562	49.987	13.866	41.657	13.169	79.146	21.273
1000295186	51199809	545	548.319	49.983	13.826	41.702	13.149	79.346	21.263
1000295190	51199810	545	549.265	50.036	13.823	41.767	13.151	79.414	21.3
1000295186	51199811	545	547.14	50.021	13.853	41.406	13.214	78.958	21.218
1000295212	51199812	545	547.499	50.023	13.849	41.566	13.172	79.031	21.231
1000295207	51199813	545	548.503	50.033	13.855	41.613	13.181	79.128	21.27
1000295205	51199820	545	547.819	50.124	13.796	41.668	13.147	79.222	21.244
1000295210	51199826	545	547.204	49.997	13.795	41.603	13.153	79.339	21.22
1000295190	51199827	545	547.26	49.897	13.822	41.479	13.194	79.35	21.222
1000295207	51199828	545	546.596	49.857	13.846	41.508	13.168	79.178	21.196
1000295186	51199829	545	549.234	50.002	13.817	41.78	13.146	79.495	21.299
1000295186	51199830	545	548.339	49.935	13.857	41.616	13.176	79.244	21.264
1000295190	51199831	545	546.858	50	13.794	41.541	13.164	79.291	21.207
1000295190	51199834	545	548.41	49.891	13.803	41.697	13.152	79.633	21.267
1000295186	51199835	545	547.512	50.024	13.833	41.642	13.148	79.12	21.232
1000295195	51199836	545	547.681	50.016	13.809	41.559	13.178	79.298	21.239
1000295186	51199837	545	547.635	50.023	13.831	41.645	13.15	79.151	21.237
1000295205	51199838	545	547.185	50.043	13.827	41.488	13.189	79.079	21.219
1000295205	51199839	545	549.331	49.968	13.796	41.78	13.148	79.689	21.303
1000295205	51199840	545	547.866	50.049	13.81	41.576	13.178	79.264	21.246
1000295205	51199841	545	546.094	49.919	13.804	41.457	13.172	79.251	21.177
1000295186	51199842	545	545.551	50.03	13.872	41.511	13.142	78.605	21.156
1000295190	51199843	545	545.962	50.057	13.813	41.426	13.179	78.96	21.172
1000295190	51199844	545	549.498	49.977	13.826	41.639	13.197	79.527	21.309
1000295205	51199845	545	547.985	49.963	13.821	41.564	13.184	79.356	21.25
1000295210	51199846	545	548.113	49.982	13.83	41.602	13.175	79.291	21.255
1000295210	51199847	545	547.217	49.947	13.833	41.4	13.218	79.204	21.221
1000295190	51199848	545	547.6	50.04	13.807	41.665	13.143	79.259	21.235
1000295190	51199849	545	545.65	50.05	13.812	41.501	13.148	78.93	21.16
1000295190	51199850	545	547.151	49.95	13.806	41.619	13.147	79.339	21.218
1000295186	51199851	545	546.889	49.994	13.833	41.461	13.191	79.082	21.208
1000295207	51199852	545	545.736	49.839	13.84	41.467	13.161	79.116	21.163
1000295212	51199853	545	547.467	50.025	13.859	41.491	13.195	78.963	21.23
1000295190	51199854	545	546.502	50.044	13.808	41.462	13.181	79.088	21.193
1000295190	51199855	545	549.733	49.878	13.878	41.599	13.215	79.417	21.318
1000295186	51199856	545	547.782	50.031	13.873	41.469	13.21	78.92	21.242
1000295186	51199857	545	547.254	50.032	13.845	41.599	13.156	79.001	21.222
1000295190	51199858	545	547.048	49.944	13.812	41.657	13.132	79.301	21.214
1000295190	51199859	545	546.768	50.03	13.792	41.504	13.174	79.241	21.203
1000295205	51199860	545	546.719	50.007	13.82	41.57	13.152	79.108	21.201
1000295190	51199861	545	545.465	49.824	13.862	41.462	13.156	78.977	21.153
1000295190	51199862	545	547.384	50	13.799	41.542	13.177	79.336	21.227
1000295207	51199863	545	549.672	49.842	13.804	41.785	13.155	79.894	21.316
1000295186	51199864	545	547.149	50.006	13.846	41.53	13.175	79.022	21.218
1000295205	51199865	545	546.492	50.145	13.777	41.555	13.151	79.107	21.192
1000295205	51199866	545	546.167	49.993	13.812	41.54	13.148	79.098	21.18
1000295212	51199867	545	549.258	50.032	13.877	41.587	13.207	79.109	21.3
1000295186	51199868	545	545.589	50.01	13.854	41.343	13.197	78.747	21.157
1000295212	51199869	545	547.06	49.991	13.89	41.372	13.223	78.783	21.214
1000295212	51199871	545	546.165	50.004	13.894	41.295	13.226	78.612	21.18
1000295190	51199872	545	546.492	50.188	13.825	41.557	13.15	78.886	21.192

1000295210	51199873	545	547.604	49.973	13.831	41.534	13.184	79.227	21.236
1000295190	51199875	545	545.909	50.016	13.828	41.488	13.158	78.935	21.17
1000295205	51199877	545	547.67	49.998	13.824	41.529	13.188	79.236	21.238
1000295207	51199878	545	546.023	49.903	13.818	41.472	13.166	79.185	21.174
1000295212	51199879	545	547.354	50.054	13.851	41.504	13.188	78.952	21.226
1000295190	51199880	545	545.016	49.995	13.81	41.424	13.157	78.936	21.135
1000295190	51199881	545	545.922	50.147	13.793	41.499	13.155	78.929	21.17
1000295208	51199882	545	546.425	50.034	13.798	41.469	13.177	79.149	21.19
1000295205	51199883	545	549.295	49.825	13.821	41.65	13.188	79.768	21.301
1000295195	51199885	545	545.947	50.008	13.814	41.468	13.166	79.03	21.171
1000295215	51199886	545	548.258	50.17	13.801	41.623	13.172	79.184	21.261
1000295212	51199888	545	547.418	50.065	13.858	41.489	13.194	78.9	21.228
1000295205	51199890	545	548.501	49.878	13.809	41.721	13.147	79.635	21.27
1000295205	51199891	545	547.816	49.841	13.828	41.531	13.191	79.484	21.244
1000295208	51199892	545	548.018	50.205	13.803	41.648	13.158	79.082	21.252
1000295216	51199893	545	545.842	50.019	13.803	41.422	13.178	79.059	21.167
1000295212	51199894	545	546.938	49.841	13.886	41.432	13.201	79.028	21.21
1000295208	51199895	545	546.765	50.039	13.774	41.575	13.151	79.327	21.203
1000295216	51199896	545	546.998	50.059	13.806	41.53	13.171	79.146	21.212
1000295205	51199897	545	548.528	49.941	13.849	41.53	13.208	79.309	21.271
1000295195	51199898	545	545.99	49.995	13.857	41.408	13.186	78.811	21.173
1000295208	51199899	545	545.96	49.878	13.882	41.294	13.221	78.851	21.172
1000295212	51199900	545	548.798	49.961	13.837	41.63	13.183	79.388	21.282
1000295195	51199901	545	545.885	49.864	13.801	41.401	13.185	79.326	21.169
1000295215	51199902	545	546.494	49.998	13.782	41.577	13.144	79.309	21.193
1000295195	51199903	545	547.319	49.996	13.808	41.519	13.183	79.281	21.224
1000295216	51199904	545	547.054	49.799	13.884	41.259	13.259	79.123	21.214
1000295205	51199905	545	545.131	49.988	13.842	41.381	13.174	78.781	21.14
1000295195	51199906	545	547.576	50.047	13.793	41.63	13.154	79.323	21.234
1000295195	51199907	545	546.625	49.946	13.807	41.474	13.18	79.264	21.198
1000295208	51199908	545	547.314	50.03	13.814	41.52	13.182	79.193	21.224
1000295208	51199909	545	547.009	50.021	13.845	41.378	13.22	78.985	21.212
1000295216	51199910	545	548.242	49.999	13.863	41.447	13.228	79.097	21.26
1000295195	51199911	545	547.234	50.067	13.795	41.532	13.176	79.234	21.221
1000295208	51199912	545	547.339	50.003	13.803	41.493	13.191	79.304	21.225
1000295205	51199913	545	546.318	49.885	13.82	41.434	13.185	79.247	21.186
1000295195	51199914	545	547.466	50.028	13.8	41.619	13.154	79.301	21.23
1000295195	51199915	545	546.138	50.016	13.806	41.536	13.148	79.092	21.179
1000295195	51199916	545	546.444	49.86	13.854	41.32	13.225	79.109	21.191
1000295205	51199917	545	547.003	49.962	13.783	41.634	13.138	79.435	21.212
1000295205	51199918	545	547.61	49.879	13.812	41.547	13.18	79.485	21.236
1000295195	51199919	545	547.444	49.995	13.808	41.543	13.178	79.301	21.229
1000295195	51199920	545	545.903	49.971	13.833	41.373	13.195	78.971	21.17
1000295195	51199921	545	547.447	50.068	13.805	41.51	13.188	79.205	21.229
1000295205	51199923	545	547.196	49.97	13.839	41.403	13.216	79.128	21.22
1000295207	51199924	545	547.693	50.001	13.821	41.527	13.189	79.252	21.239
1000295205	51199925	545	546.75	49.921	13.811	41.458	13.188	79.302	21.202
1000295204	51199926	545	547.925	50.026	13.798	41.614	13.167	79.382	21.248
1000295205	51199927	545	546.076	49.974	13.809	41.447	13.175	79.129	21.176
1000295190	51199928	545	547.967	50.034	13.807	41.556	13.186	79.32	21.25
1000295195	51199929	545	546.941	49.966	13.834	41.42	13.205	79.124	21.21
1000295208	51199930	545	547.189	50.014	13.791	41.57	13.163	79.333	21.219
1000295195	51199931	545	546.462	49.929	13.804	41.46	13.18	79.285	21.191
1000295195	51199932	545	547.241	49.969	13.796	41.575	13.163	79.38	21.221
1000295204	51199933	545	545.686	49.85	13.835	41.429	13.172	79.122	21.161
1000295195	51199934	545	545.385	49.933	13.82	41.407	13.171	79.03	21.149
1000295195	51199935	545	547.444	50.007	13.826	41.532	13.181	79.177	21.229
1000295195	51199936	545	548.63	49.945	13.826	41.548	13.205	79.451	21.275
1000295195	51199937	545	546.918	49.905	13.794	41.491	13.182	79.452	21.209
1000295195	51199938	545	546.231	49.952	13.816	41.476	13.17	79.147	21.182
1000295207	51199939	545	546.736	49.882	13.793	41.504	13.173	79.464	21.202
1000295195	51199940	545	548.557	49.867	13.825	41.573	13.195	79.566	21.272
1000295195	51199941	545	546.647	49.919	13.817	41.461	13.185	79.253	21.198
1000295205	51199942	545	547.776	49.918	13.832	41.509	13.197	79.336	21.242
1000295211	51199943	545	547.254	49.983	13.832	41.382	13.225	79.157	21.222

1000295205	51199944	545	545.367	49.854	13.77	41.446	13.158	79.444	21.149
1000295195	51199945	545	545.767	49.894	13.872	41.372	13.192	78.851	21.164
1000295195	51199946	545	545.065	49.953	13.829	41.358	13.179	78.901	21.137
1000295195	51199947	545	545.078	49.813	13.797	41.423	13.159	79.312	21.138
1000295205	51199948	545	545.473	50.001	13.836	41.37	13.185	78.845	21.153
1000295207	51199949	545	546.974	49.929	13.812	41.559	13.161	79.315	21.211
1000295195	51199950	545	547.367	50.06	13.808	41.575	13.166	79.188	21.226
1000295205	51199951	545	547.212	49.874	13.812	41.53	13.176	79.436	21.22
1000295204	51199952	545	548.418	49.986	13.814	41.614	13.179	79.422	21.267
1000295207	51199954	545	547.335	49.826	13.789	41.594	13.159	79.662	21.225
1000295204	51199955	545	546.256	49.954	13.821	41.512	13.159	79.117	21.183
1000295207	51199956	545	546.129	49.743	13.818	41.433	13.181	79.454	21.178
1000295195	51199957	545	546.78	50.003	13.831	41.537	13.164	79.062	21.204
1000295216	51199958	545	548.195	50.001	13.792	41.741	13.133	79.492	21.258
1000295204	51199959	545	546.737	50.031	13.8	41.559	13.156	79.19	21.202
1000295204	51199960	545	545.888	50.039	13.779	41.509	13.151	79.172	21.169
1000295204	51199962	545	546.178	49.792	13.82	41.475	13.169	79.372	21.18
1000295207	51199963	545	546.458	50.047	13.81	41.55	13.152	79.066	21.191
1000295204	51199964	545	546.838	50.011	13.797	41.563	13.157	79.251	21.206
1000295204	51199965	545	546.145	49.89	13.801	41.458	13.173	79.323	21.179
1000295195	51199966	545	545.328	49.853	13.816	41.409	13.169	79.176	21.147
1000295204	51199967	545	547.102	49.836	13.84	41.484	13.188	79.319	21.216
1000295207	51199968	545	546.642	49.906	13.832	41.412	13.2	79.19	21.198
1000295212	51199969	545	548.913	49.842	13.909	41.481	13.233	79.179	21.286
1000295204	51199970	545	547.104	49.851	13.832	41.6	13.152	79.342	21.216
1000295204	51199971	545	546.274	49.804	13.813	41.514	13.159	79.41	21.184
1000295204	51199974	545	547.285	49.823	13.848	41.492	13.19	79.325	21.223
1000295204	51199975	545	547.229	49.862	13.8	41.574	13.163	79.529	21.221
1000295204	51199977	545	546.807	49.798	13.868	41.465	13.187	79.18	21.205
1000295207	51199978	545	545.538	49.869	13.807	41.444	13.163	79.229	21.155
1000295211	51199979	545	547.053	50.028	13.798	41.503	13.181	79.253	21.214
1000295204	51199980	545	548.325	49.882	13.831	41.639	13.169	79.478	21.264
1000295212	51199981	545	545.443	49.818	13.882	41.254	13.221	78.867	21.152
1000295208	51199982	545	548.752	50.031	13.808	41.701	13.159	79.435	21.28
1000295204	51199983	545	546.177	49.814	13.823	41.4	13.193	79.322	21.18
1000295204	51199984	545	546.709	49.988	13.83	41.567	13.153	79.078	21.201
1000295208	51199985	545	546.911	50.089	13.767	41.581	13.153	79.313	21.209
1000295204	51199986	545	546.853	49.988	13.813	41.586	13.15	79.199	21.206
1000295207	51199987	545	546.907	49.928	13.8	41.536	13.167	79.374	21.209
1000295195	51199988	545	548.504	49.956	13.83	41.567	13.196	79.389	21.27
1000295212	51199989	545	545.718	49.764	13.948	41.137	13.266	78.622	21.162
1000295208	51199990	545	547.268	50.052	13.795	41.601	13.155	79.264	21.223
1000295212	51199991	545	548.379	50.014	13.857	41.536	13.202	79.125	21.266
1000295207	51199992	545	545.415	50.097	13.81	41.441	13.161	78.837	21.151
1000295204	51199993	545	546.699	49.947	13.805	41.572	13.15	79.287	21.2
1000295212	51199994	545	546.674	49.585	13.93	41.272	13.246	79.145	21.199
1000295212	51199995	545	545.803	49.559	13.921	41.176	13.256	79.113	21.166
1000295211	51199996	545	547.104	50.039	13.791	41.676	13.128	79.283	21.216
1000295208	51199997	545	547.278	50.024	13.81	41.593	13.158	79.22	21.223
1000295204	51199998	545	546.849	49.979	13.813	41.594	13.147	79.213	21.206
1000295207	51199999	545	547.094	49.99	13.8	41.576	13.159	79.303	21.216
1000295212	51200000	545	547.49	50.055	13.859	41.491	13.195	78.924	21.231
1000295204	51200001	545	547.468	50.046	13.792	41.619	13.154	79.318	21.23
1000295212	51200002	545	545.146	50.094	13.816	41.448	13.153	78.769	21.14
1000295204	51200003	545	545.505	49.853	13.807	41.418	13.171	79.253	21.154
1000295204	51200005	545	547.648	50.033	13.792	41.612	13.161	79.364	21.237
1000295204	51200006	545	547.344	49.998	13.786	41.685	13.131	79.407	21.225
1000295204	51200007	545	547.259	50.062	13.774	41.602	13.155	79.362	21.222
1000295208	51200008	545	545.002	49.783	13.904	41.088	13.264	78.736	21.135
1000295204	51200009	545	545.749	49.876	13.82	41.444	13.168	79.176	21.164
1000295212	51200010	545	547.31	50.037	13.849	41.471	13.197	78.981	21.224
1000295204	51200011	545	547.332	50.064	13.786	41.641	13.144	79.304	21.225
1000295211	51200012	545	548.237	49.961	13.817	41.614	13.174	79.42	21.26
1000295212	51200013	545	548.33	49.959	13.835	41.598	13.182	79.335	21.264
1000295212	51200014	545	548.472	49.984	13.855	41.553	13.199	79.181	21.269

1000295216	51200015	545	546.643	50.013	13.808	41.628	13.131	79.158	21.198
1000295204	51200017	545	545.24	50.095	13.825	41.443	13.156	78.729	21.144
1000295215	51200018	545	545.022	50.098	13.85	41.335	13.186	78.548	21.135
1000295208	51200019	545	545.561	50.012	13.812	41.423	13.17	78.98	21.156
1000295204	51200020	545	547.367	50.006	13.806	41.614	13.153	79.284	21.226
1000295208	51200022	545	546.77	50.018	13.797	41.546	13.161	79.232	21.203
1000295208	51200024	545	546.839	50.07	13.782	41.57	13.155	79.245	21.206
1000295204	51200025	545	546.297	49.899	13.799	41.475	13.172	79.338	21.185
1000295211	51200026	545	547.094	50.122	13.799	41.646	13.137	79.101	21.216
1000295211	51200027	545	548.009	49.933	13.871	41.484	13.21	79.123	21.251
1000295208	51200028	545	545.856	50.034	13.81	41.469	13.163	79.001	21.168
1000295216	51200029	545	547.115	49.97	13.787	41.62	13.145	79.411	21.217
1000295208	51200030	545	548.788	50.105	13.823	41.672	13.169	79.236	21.281
1000295208	51200031	545	548.224	50.07	13.804	41.666	13.157	79.317	21.26
1000295208	51200032	545	548.463	50.142	13.82	41.574	13.192	79.148	21.269
1000295211	51200034	545	547.219	50.032	13.785	41.729	13.113	79.346	21.221
1000295211	51200035	545	547.823	50.036	13.8	41.618	13.163	79.34	21.244
1000295216	51200036	545	547.325	50.017	13.81	41.6	13.157	79.24	21.225
1000295211	51200037	545	546.88	50.148	13.781	41.643	13.132	79.133	21.207
1000295212	51200038	545	547.279	50.014	13.852	41.405	13.218	78.995	21.223
1000295216	51200040	545	546.44	50.152	13.772	41.643	13.122	79.114	21.19
1000295216	51200041	545	547.883	50.098	13.798	41.743	13.125	79.263	21.246
1000295211	51200043	545	548.182	49.952	13.767	41.794	13.116	79.714	21.258
1000295208	51200044	545	547.189	50.041	13.781	41.662	13.134	79.345	21.219
1000295216	51200045	545	547.414	50.027	13.791	41.536	13.179	79.346	21.228
1000295216	51200046	545	547.002	50.182	13.771	41.683	13.123	79.154	21.212
1000295216	51200047	545	548.331	49.785	13.8	41.651	13.165	79.81	21.264
1000295211	51200048	545	547.006	50.062	13.804	41.575	13.157	79.154	21.212
1000295216	51200049	545	548.825	50.122	13.779	41.717	13.156	79.469	21.283
1000295216	51200050	545	548.005	50.13	13.77	41.786	13.115	79.386	21.251
1000295216	51200051	545	547.288	50.046	13.793	41.587	13.16	79.288	21.223
1000295211	51200052	545	546.379	50.033	13.759	41.657	13.116	79.367	21.188
1000295216	51200053	545	545.213	50.106	13.767	41.558	13.119	79.039	21.143
1000295208	51200056	545	548.253	50.043	13.795	41.706	13.146	79.421	21.261
1000295216	51200057	545	548.557	50.002	13.79	41.712	13.151	79.554	21.272
1000295212	51200058	545	547.307	50.034	13.848	41.44	13.207	78.988	21.224
1000295216	51200059	545	547.363	50.013	13.796	41.597	13.159	79.329	21.226
1000295216	51200061	545	545.25	50.02	13.772	41.539	13.126	79.148	21.144
1000295208	51200063	545	547.275	49.999	13.759	41.648	13.14	79.556	21.223
1000295216	51200064	545	547.595	49.963	13.772	41.739	13.119	79.58	21.235
1000295211	51200065	545	546.694	49.94	13.866	41.394	13.207	78.95	21.2
1000295216	51200070	545	547.762	50.002	13.807	41.702	13.135	79.343	21.242
1000295211	51200071	545	547.566	50.024	13.845	41.495	13.196	79.062	21.234
1000295211	51200072	545	548.664	49.958	13.784	41.749	13.142	79.675	21.277
1000295222	51200073	545	546.138	49.991	13.939	41.241	13.242	78.373	21.179
1000295216	51200074	545	546.933	50.001	13.786	41.5	13.179	79.346	21.21
1000295208	51200075	545	547.15	50.01	13.775	41.624	13.145	79.422	21.218
1000295221	51200076	545	546.558	49.997	13.9	41.379	13.208	78.649	21.195
1000295215	51200077	545	547.742	50.003	13.787	41.705	13.134	79.451	21.241
1000295221	51200078	545	545.513	50.116	13.915	41.289	13.212	78.222	21.154
1000295216	51200079	545	547.551	50.169	13.788	41.678	13.138	79.156	21.233
1000295221	51200080	545	547.535	50.019	13.97	41.232	13.279	78.358	21.233
1000295221	51200082	545	545.944	49.988	13.899	41.308	13.216	78.579	21.171
1000295216	51200083	545	547.819	50.142	13.755	41.741	13.124	79.427	21.244
1000295211	51200084	545	547.674	50.144	13.753	41.745	13.119	79.417	21.238
1000295211	51200086	545	548.658	50.179	13.813	41.735	13.146	79.157	21.276
1000295221	51200087	545	545.835	49.979	13.911	41.264	13.228	78.506	21.167
1000295216	51200089	545	546.937	49.914	13.781	41.646	13.133	79.514	21.21
1000295221	51200091	545	547.343	50.017	13.854	41.434	13.21	78.991	21.225
1000295221	51200095	545	545.794	50.005	13.905	41.224	13.24	78.494	21.165
1000295215	51200101	545	545.867	49.89	13.806	41.479	13.16	79.25	21.168
1000295216	51200102	545	545.745	49.897	13.807	41.446	13.168	79.216	21.163
1000295216	51200103	545	545.1	49.877	13.775	41.522	13.128	79.339	21.138
1000295215	51200104	545	547.089	50.067	13.784	41.589	13.155	79.277	21.216
1000295221	51200107	545	546.22	50.047	13.883	41.332	13.215	78.663	21.182

1000295211	51200108	545	547.365	50.019	13.844	41.523	13.182	79.049	21.226
1000295222	51200109	545	545.576	49.989	13.815	41.42	13.172	79.001	21.157
1000295221	51200110	545	546.051	50.009	13.909	41.261	13.234	78.501	21.175
1000295221	51200112	545	545.891	50.013	13.875	41.346	13.203	78.667	21.169
1000295211	51200114	545	547.768	50.01	13.795	41.688	13.14	79.399	21.242
1000295208	51200115	545	546.72	49.891	13.827	41.473	13.183	79.255	21.201
1000295221	51200116	545	545.907	49.886	13.844	41.45	13.17	79.045	21.17
1000295215	51200117	545	547.633	49.919	13.797	41.644	13.15	79.512	21.237
1000295224	51200118	545	547.49	49.97	13.751	41.691	13.132	79.676	21.231
1000295216	51200119	545	546.418	49.853	13.775	41.535	13.155	79.57	21.19
1000295210	51200120	545	547.597	50.045	13.804	41.768	13.11	79.268	21.235
1000295215	51200121	545	545.494	49.994	13.805	41.558	13.126	79.039	21.154
1000295215	51200122	545	545.72	49.869	13.753	41.536	13.138	79.568	21.162
1000295208	51200123	545	547.513	50.056	13.802	41.65	13.146	79.248	21.232
1000295215	51200124	545	545.994	49.825	13.822	41.477	13.164	79.28	21.173
1000295221	51200131	545	547.434	49.931	13.823	41.478	13.198	79.314	21.229
1000295221	51200132	545	546.356	49.825	13.845	41.27	13.239	79.202	21.187
1000295215	51200133	545	548.127	49.759	13.838	41.592	13.179	79.604	21.256
1000295215	51200135	545	545.149	50.109	13.832	41.316	13.195	78.651	21.14
1000295221	51200136	545	546.913	50.216	13.844	41.441	13.197	78.669	21.209
1000295212	51200137	545	546.53	49.942	13.83	41.414	13.197	79.129	21.194
1000295215	51200139	545	546.269	49.746	13.82	41.468	13.173	79.461	21.184
1000295221	51200140	545	546.164	49.789	13.873	41.441	13.179	79.071	21.18
1000295215	51200141	545	545.689	49.839	13.826	41.345	13.198	79.192	21.161
1000295221	51200144	545	546.901	49.964	13.813	41.522	13.171	79.242	21.208
1000295211	51200145	545	548.068	49.863	13.832	41.529	13.197	79.461	21.254
1000295208	51200146	545	547.485	49.918	13.807	41.612	13.157	79.439	21.231
1000295215	51200147	545	547.296	50.179	13.845	41.489	13.191	78.779	21.224
1000295210	51200148	545	546.052	49.968	13.8	41.416	13.185	79.187	21.175
1000295215	51200149	545	546.291	49.852	13.816	41.465	13.175	79.318	21.185
1000295210	51200150	545	547.193	49.988	13.829	41.587	13.158	79.156	21.22
1000295224	51200152	545	546.329	50.06	13.739	41.862	13.051	79.436	21.186
1000295212	51200153	545	547.609	49.958	13.817	41.56	13.176	79.334	21.236
1000295211	51200154	545	545.322	50.068	13.824	41.54	13.128	78.786	21.147
1000295211	51200155	545	547.626	49.917	13.814	41.627	13.155	79.417	21.236
1000295215	51200156	545	546.869	50.148	13.818	41.59	13.149	78.92	21.207
1000295211	51200157	545	545.888	50.119	13.822	41.344	13.203	78.802	21.169
1000295211	51200158	545	547.952	50.154	13.792	41.636	13.161	79.215	21.249
1000295215	51200159	545	547.042	50.044	13.8	41.51	13.179	79.21	21.214
1000295222	51200160	545	546.289	49.967	13.843	41.392	13.198	78.978	21.185
1000295211	51200161	545	547.723	50.016	13.806	41.584	13.172	79.32	21.24
1000295210	51200162	545	546.376	49.949	13.789	41.58	13.14	79.331	21.188
1000295215	51200164	545	545.173	49.98	13.85	41.315	13.195	78.756	21.141
1000295210	51200165	545	546.254	49.968	13.817	41.579	13.138	79.12	21.183
1000295222	51200166	545	545.635	49.975	13.855	41.429	13.17	78.8	21.159
1000295222	51200167	545	545.858	49.965	13.831	41.339	13.205	78.988	21.168
1000295208	51200168	545	548.005	50.019	13.793	41.707	13.14	79.433	21.251
1000295215	51200169	545	547.302	50.01	13.806	41.66	13.137	79.27	21.224
1000295215	51200170	545	547.325	49.977	13.799	41.597	13.158	79.366	21.225
1000295208	51200171	545	547.133	50	13.79	41.65	13.136	79.35	21.217
1000295221	51200173	545	547.676	50.004	13.787	41.664	13.145	79.441	21.238
1000295224	51200174	545	546.793	50.061	13.74	41.739	13.1	79.493	21.204
1000295222	51200175	545	546.715	50.024	13.841	41.473	13.182	78.958	21.201
1000295211	51200177	545	547.481	49.99	13.802	41.632	13.15	79.35	21.231
1000295222	51200178	545	545.958	50.028	13.825	41.477	13.163	78.937	21.172
1000295222	51200179	545	548.75	50	13.815	41.629	13.182	79.441	21.28
1000295211	51200180	545	547.656	50.088	13.797	41.622	13.158	79.246	21.238
1000295210	51200182	545	547.523	50.058	13.796	41.616	13.157	79.28	21.232
1000295215	51200183	545	545.514	49.938	13.812	41.616	13.108	79.091	21.154
1000295221	51200184	545	548.991	50.024	13.81	41.806	13.132	79.469	21.289
1000295210	51200185	545	548.22	50.038	13.852	41.553	13.193	79.092	21.259
1000295221	51200186	545	547.289	50.009	13.8	41.547	13.173	79.303	21.223
1000295221	51200187	545	548.685	50.082	13.803	41.761	13.139	79.372	21.277
1000295222	51200188	545	547.213	50.011	13.795	41.555	13.169	79.316	21.22
1000295210	51200189	545	547.563	50.057	13.811	41.593	13.165	79.201	21.234

1000295210	51200190	545	547.023	50.035	13.8	41.607	13.147	79.222	21.213
1000295221	51200191	545	547.316	49.974	13.784	41.665	13.136	79.453	21.224
1000295215	51200192	545	547.397	49.931	13.809	41.591	13.161	79.39	21.228
1000295210	51200193	545	546.921	50.009	13.8	41.613	13.143	79.252	21.209
1000295215	51200194	545	546.141	49.986	13.785	41.527	13.152	79.26	21.179
1000295222	51200195	545	547.247	50.022	13.764	41.69	13.127	79.485	21.222
1000295222	51200196	545	545.824	49.925	13.806	41.531	13.143	79.189	21.167
1000295210	51200198	545	548.701	50.03	13.83	41.684	13.163	79.302	21.278
1000295215	51200199	545	547.442	49.925	13.771	41.733	13.118	79.623	21.229
1000295222	51200201	545	547.235	50.086	13.767	41.684	13.128	79.361	21.221
1000295215	51200203	545	547.097	49.91	13.79	41.713	13.116	79.49	21.216
1000295215	51200204	545	547.088	49.969	13.779	41.67	13.129	79.456	21.216
1000295221	51200205	545	547.165	50.03	13.798	41.732	13.111	79.264	21.218
1000295222	51200206	545	546.211	49.906	13.842	41.544	13.148	79.072	21.181
1000295221	51200207	545	546.902	50.043	13.793	41.727	13.107	79.236	21.208
1000295215	51200209	545	547.875	49.936	13.803	41.703	13.138	79.486	21.246
1000295221	51200210	545	547.387	50.049	13.789	41.651	13.142	79.316	21.227
1000295221	51200212	545	545.084	49.727	13.853	41.247	13.215	79.13	21.138
1000295222	51200216	545	545.146	49.902	13.807	41.471	13.145	79.119	21.14
1000295222	51200217	545	547.229	49.937	13.791	41.736	13.112	79.459	21.221
1000295221	51200218	545	545.35	49.733	13.853	41.284	13.21	79.156	21.148
1000295221	51200221	545	548.089	49.501	13.867	41.497	13.208	79.846	21.254
1000295222	51200222	545	545.711	49.937	13.79	41.477	13.157	79.247	21.162
1000295224	51200223	545	545.063	50.021	13.758	41.664	13.082	79.202	21.137
1000295222	51200224	545	547.17	49.96	13.776	41.639	13.141	79.503	21.219
1000295224	51200226	545	545.429	50.075	13.777	41.565	13.122	79.058	21.151
1000295221	51200227	545	546.545	50.021	13.797	41.589	13.141	79.193	21.194
1000295224	51200228	545	546.037	49.958	13.762	41.626	13.118	79.424	21.175
1000295224	51200230	545	547.072	50.041	13.792	41.689	13.123	79.266	21.215
1000295222	51200231	545	548.271	50.138	13.757	41.815	13.112	79.487	21.261
1000295224	51200232	545	546.998	49.969	13.778	41.761	13.098	79.452	21.212
1000295224	51200233	545	547.587	50.061	13.759	41.725	13.124	79.5	21.235
1000295224	51200234	545	546.664	50.018	13.773	41.708	13.107	79.354	21.199
1000295221	51200236	545	546.988	50.031	13.804	41.531	13.171	79.2	21.212
1000295221	51200237	545	546.523	49.813	13.787	41.617	13.132	79.579	21.194
1000295224	51200238	545	547.004	49.735	13.801	41.556	13.163	79.692	21.212
1000295224	51200239	545	548.913	50.002	13.725	41.864	13.112	79.987	21.286
1000295224	51200240	545	546.207	50.061	13.727	41.801	13.067	79.483	21.181
1000295224	51200241	545	547.395	49.783	13.746	41.78	13.102	79.989	21.227
1000295224	51200242	545	547.838	50.022	13.774	41.758	13.119	79.514	21.245
1000295222	51200243	545	547.395	49.787	13.782	41.679	13.133	79.775	21.227
1000295224	51200245	545	545.595	49.793	13.8	41.546	13.132	79.399	21.158
1000295224	51200246	545	547.455	50.069	13.794	41.775	13.105	79.268	21.23
1000295224	51200248	545	545.717	49.749	13.778	41.546	13.135	79.616	21.162
1000295224	51200250	545	545.206	49.931	13.769	41.576	13.113	79.301	21.143
1000295224	51200251	545	547.884	49.816	13.798	41.541	13.189	79.709	21.246
1000295224	51200253	545	547.363	50.056	13.742	41.791	13.098	79.576	21.226
1000295224	51200255	545	545.768	49.766	13.808	41.497	13.152	79.425	21.164
1000295224	51200258	545	547.911	49.868	13.802	41.713	13.135	79.606	21.247
1000295224	51200259	545	547.494	49.97	13.76	41.7	13.129	79.622	21.231
1000295224	51200261	545	547.963	49.815	13.721	41.813	13.105	80.168	21.249
1000295224	51200269	545	548.376	50.005	13.745	41.855	13.102	79.786	21.265
1000295224	51200273	545	545.473	49.789	13.787	41.498	13.145	79.463	21.153
1000295224	51200274	545	546.543	49.937	13.742	41.762	13.087	79.642	21.194
1000295224	51200275	545	548.657	50.138	13.76	41.794	13.128	79.527	21.276
1000295222	51200285	545	547.046	49.909	13.787	41.786	13.092	79.501	21.214
1000295224	51200286	545	545.043	50.001	13.747	41.646	13.087	79.295	21.136
1000295224	51200293	545	546.87	49.924	13.765	41.677	13.122	79.581	21.207



**AGENCY FOR NEW & RENEWABLE ENERGY
RESEARCH AND TECHNOLOGY (ANERT)**

Department of Power, Government of Kerala
Thiruvananthapuram, Kerala – 695 033;
www.anert.gov.in , projects@anert.in

E-TENDER DOCUMENT

***Request for Selection (RFS) of agency for the
Implementation of 2 MW Solar Power Plant at
Travancore Titanium Products Ltd., Kochuveli,
Thiruvananthapuram under Solar City project
funded by Smart City Thiruvananthapuram Ltd***

Ref. No.: ANERT-TECH/99/2022-T2

Date of Publishing of Bids : - 12/04/2023

Last Date of Submission of Bids : - 26/04/2023

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**AGENCY FOR NEW & RENEWABLE ENERGY
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E-TENDER DOCUMENT

***Request for Selection (RFS) of agency for the
Implementation of 2 MW Solar Power Plant at
Travancore Titanium Products Ltd., Kochuveli,
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funded by Smart City Thiruvananthapuram Ltd***

Ref. No.: ANERT-TECH/99/2022-T2

VOL – 1: GENERAL CONDITIONS

Date of Publishing of Bids : - 11/04/2023

Last Date of Submission of Bids : - 22/04/2023

E-TENDER NOTICE

Competitive e-tenders in two cover system with Earnest Money Deposit (EMD) and Price Bid are invited from experience and eligible bidders to participate in the ***Request for Selection (RFS) of agency for the Implementation of 2 MW Solar Power Plant at Travancore Titanium Products Ltd., Kochuveli, Thiruvananthapuram under Solar City project funded by Smart City Thiruvananthapuram Ltd.*** The e-tender documents can be downloaded from the e-tendering website of Govt. of Kerala. Tender form will not be available in any other form.

Bid documents which include Eligibility criteria, "Technical Specifications", various conditions of contract, formats, etc. can be downloaded from website www.etenders.kerala.gov.in. Any amendment (s)/corrigendum/clarifications with respect to this Bid shall be uploaded on the above website only. The Bidder should regularly follow up for any Amendment/Corrigendum/Clarification on the above website.

Thiruvananthapuram

CEO

12/04/2023

TENDER ABSTRACT

Ref. No.	ANERT-TECH/99/2022-T2
Document Description	Implementation of 2 MWp Grid Connected Solar PV Power Plant at Travancore Titanium Products Ltd., Kochuveli, Thiruvananthapuram
Name of Work	Design, Supply, Engineering, Erection Testing, Commissioning of SPV Power Plant of cumulative capacity of 1 MWp with Grid connectivity along with 10 years of Operation & Maintenance at various
Site	Travancore Titanium Products Ltd., Kochuveli, Thiruvananthapuram
Download of Tender Form	http://www.etenders.kerala.gov.in
Last date of submission of Tender	26/04/2023 @ 03.00 PM
Date and Time of Bid opening (Techno-Commercial)	27/04/2023 @ 03.30 PM
Cost of Tender form	Rs. 11,800/- (Including GST)
EMD	Rs. 2,00,000/-
Warranty period	10-year warranty and complete Operation & Maintenance. Minimum guaranteed PR and CUF of the plant as specified in the Technical Specification to be maintained.
Availability of Tender Forms	Website http://www.etenders.kerala.gov.in
Place of opening of tender	Office of CEO, ANERT Law College Road, Vikas Bhavan. PO, Thiruvananthapuram – 695 033, Kerala
Thiruvananthapuram 12/04/2023	Sd/- CEO

Important Note: Prospective Bidders are requested to remain updated for any notices/amendments/clarifications etc. to the RFS document through the website www.anert.gov.in/www.etenders.kerala.gov.in. No separate notifications will be issued for such notices/amendments/clarification etc. in the print media or individually.

DISCLAIMER

1. Though adequate care has been taken while preparing the NIT document, the Bidders shall satisfy themselves that the document is complete in all respect. Intimation regarding any discrepancy shall be given to this office immediately. If no intimation is received from any Bidder within Ten (10) days from the date of notification of NIT / issuance of e-Tender documents, it shall be considered that the document is complete in all respect and has been received / acknowledged by the Bidder(s).
2. Agency for New and Renewable Energy Research and Technology (ANERT) reserves the right to modify, amend or supplement this document.
3. While this tender document has been prepared in good faith, neither ANERT nor their employees or advisors make any representation or warranty, express or implied, or accept any responsibility or liability, whatsoever, in respect of any statements or omissions herein, or the accuracy, completeness or reliability of information, and shall incur no liability under any law, statute, rules or regulations as to the accuracy, reliability or completeness of this document, even if any loss or damage is caused by any act or omission on their part.

GENERAL TERMS AND CONDITIONS FOR E-PROCUREMENT

This e-Tender is being published as the Request for Selection (RFS) of agency for the Implementation of 2 MW Solar Power Plant at Travancore Titanium Products Ltd., Kochuveli, Thiruvananthapuram under Solar City project funded by Smart City Thiruvananthapuram Ltd. The tender is invited in two cover system from experienced manufacturers / EPC contractors through e-procurement portal of Government of Kerala (www.etenders.kerala.gov.in). Prospective bidders willing to participate in this tender shall necessarily register themselves with above mentioned e-procurement portal.

The tender timeline is available in the critical date section of this tender published in www.etenders.kerala.gov.in

1. ONLINE BIDDER REGISTRATION PROCESS:

- 1.1 Bidders should have a Class III or above Digital Signature Certificate (DSC) to be procured from any Registration Authorities (RA) under the Certifying Agency of India. Details of RAs will be available on www.cca.gov.in. Once, the DSC is obtained, bidders have to register on www.etenders.kerala.gov.in website for participating in this tender. Website registration is a one-time process without any registration fees. However, bidders have to procure DSC at their own cost.
- 1.2 Bidders may contact e-Procurement support desk of Kerala State IT Mission over telephone at 0471- 2577088, 2577188, 2577388 or 0484 – 2336006, 2332262 - through email: helpetender@gmail.com/etendershelp@kerala.gov.in for assistance in this regard

2. ONLINE TENDER PROCESS:

The tender process shall consist of the following stages:

- i. Downloading of tender document: Tender document will be available for free download on www.etenders.kerala.gov.in. However, tender document fees shall be payable at the time of bid submission as stipulated in this tender document.

- ii. Publishing of Corrigendum: All corrigenda shall be published on www.etenders.kerala.gov.in and shall not be available elsewhere.
- iii. Bid submission: Bidders have to submit their bids along with supporting documents to support their eligibility, as required in this tender document on www.etenders.kerala.gov.in. No manual submission of bid is allowed and manual bids shall not be accepted under any circumstances.
- iv. In case bidder encounters any technical issues pertaining to e-Procurement system while acting on the tender, computer screen shot of the error message with date & time stamp on the web-browser along with the query shall be e-mailed by the bidder to the help desk (**helpetender@gmail.com/etendershelp@kerala.gov.in**), for resolution of the problem. At the same time, problem must be intimated to the concerned Tender Inviting Authority via email.
- v. The time taken to ascertain, evaluate and suggest a solution for the problem reported by bidder may vary from case to case. Hence bidders are advised to submit the bid **at least 2 working days before the due date** and time of bid submission to avoid any last-minute issues that may come up.
- vi. Opening of Bid and Bidder short-listing: The single cover bids will be opened, evaluated and shortlisted as per the eligibility. Failure to submit the required documents online will attract disqualification. Price bids of the qualified bidders will open on the day to be intimated to all bidders and the work will be awarded.

3. DOCUMENTS COMPRISING BID:

- 3.1 The 2-cover bid shall contain the scanned copies of the following documents which every bidder has to upload:
- i. The tender document duly signed and sealed downloaded from the website.
 - ii. Pre-Agreement in the prescribed format (Annexure A) on Govt. of Kerala stamp paper worth Rs. 200/-
 - iii. Copy of Registration Certificate of the bidder firm
 - iv. Copy of PAN card

- v. The bidder must have an experience of successful commissioning of at least 5 MW SPV Power Plants in India.
 - vi. Documentary evidence to support the bidders experience in any completed or ongoing SPV contract with a Govt. Department / Govt. undertaking / PSU / Private sector for having a single plant capacity not less than 1 MW. The plant shall be in operation at least 3 months before the date of opening of this bid proposal.
 - vii. Documents to prove the annual Turnover of the bidder (audited statement)
 - viii. Certifications required for proving technical compliance
 - ix. Summary of bidders Technical Information (Annexure B)
 - x. Declaration by the Bidder (format as in Annexure C)
 - xi. Declaration of relationship with ANERT employee (format as in Annexure D)
 - xii. The Price Schedule as per BOQ in Excel format for this tender to be downloaded from e-tender website, duly digitally signed by the tenderer/authorized signatory of the tender.
 - xiii. Bill of Material
- 3.2 The department doesn't take any responsibility for any technical snag or failure that has taken place during document upload.
- 3.3 The Bidder shall complete the Price bid as per format given for download along with this tender.

Note: The blank price bid should be downloaded and saved on bidder's computer without changing file-name otherwise price bid will not get uploaded. The bidder should fill in the details in the same file and upload the same back to the website.

4. TENDER DOCUMENT FEES AND EARNEST MONEY DEPOSIT (EMD)

- 4.1 The Bidder shall pay, a tender document fee of Rs. 17,850/- and Earnest Money Deposit or Bid Security or Bid Bond of Rs. 2,00,000/-. The Bid security is required to protect the purchaser against risk of Bidder's conduct, which would warrant the forfeiture of security.

4.2 Online Payment modes: The tender document fees and EMD can be paid in through e-Payment facility provided by the e-Procurement system. Bidders can make payment only via Internet banking facility

State Bank of India Multi Option Payment System (SBI MOPS Gateway): Bidders are required to avail Internet Banking Facility in any of below banks for making tender remittances in eProcurement System.

A) Internet Banking Options (Retail)			
1	Allahabad Bank	32	Kotak Mahindra Bank
2	Axis Bank	33	Lakshmi Vilas Bank
3	Andhra Bank	34	Mehsana Urban Co-op Bank
4	Bandan Bank	35	NKGSB Co-operative Bank
5	Bank of Bahrain and Kuwait	36	Oriental Bank of Commerce
6	Bank of Baroda	37	Punjab and Maharashtra Cooperative Bank
7	Bank of India	38	Punjab National Bank
8	Bank of Maharashtra	39	Punjab and Sind Bank
9	Bassein Catholic Co-operative Bank	40	RBL Bank
10	BNP Paribas	41	Saraswat Cooperative Bank
11	Canara Bank	42	Shamrao Vithal Cooperative Bank
12	Catholic Syrian Bank	43	South Indian Bank
13	Central Bank of India	44	Standard Chartered Bank
14	City Union Bank	45	State Bank of India
15	Corporation Bank	46	Syndicate Bank
16	Cosmos Bank	47	Tamil Nadu Mercantile Bank
17	DCB Bank	48	Tamil Nadu Cooperative Bank
18	Dena Bank	49	The Kalyan Janata Sahakari Bank
19	Deutsche Bank	50	TJSB Bank
20	Dhanalaxmi Bank	51	UCO Bank
21	Federal Bank	52	Union Bank of India
22	HDFC Bank	53	United Bank of India
23	ICICI Bank	54	Vijaya Bank

24	IDBI Bank	55	YES Bank
25	Indian Bank		
26	Indian Overseas Bank		
27	IndusInd Bank		
28	Jammu & Kashmir Bank		
29	Janata Sahakari Bank		
30	Karnataka Bank		
31	Karur Vysya Bank		
B) Internet Banking Options (Corporate)			
1	Bank of Baroda	21	Laxmi Vilas Bank
2	Bank of India	22	Oriental Bank of Commerce
3	Bank of Maharashtra	23	Punjab & Maharashtra Coop Bank
4	BNP Paribas	24	Punjab & Sind Bank
5	Canara Bank	25	Punjab National Bank
6	Catholic Syrian Bank	26	RBL Bank
7	City Union Bank	27	Shamrao Vitthal Co-operative Bank
8	Corporation Bank	28	South Indian Bank
9	Cosmos Bank	29	State Bank of India
10	Deutsche Bank	30	Syndicate Bank
11	Development Credit Bank	31	UCO Bank
12	Dhanalaxmi Bank	32	Union Bank of India
13	Federal Bank	33	UPPCL
14	HDFC Bank	34	Vijaya Bank
15	ICICI Bank	35	Axis Bank
16	Indian Overseas Bank		
17	Janta Sahakari Bank		
18	Jammu & Kashmir Bank		
19	Karur Vysya Bank		
20	Kotak Bank		

During the online bid submission process, bidder shall select **SBI MOPS** option and submit the page, to view the **Terms and Conditions** page. On further submitting the same, the e-Procurement system will re-direct the bidder to MOPS Gateway, where two options namely **SBI** and **Other Banks*** will be shown. Here, Bidder may proceed as per below:

- a) SBI Account Holders shall click **SBI** option to with its Net Banking Facility., where bidder can enter their internet banking credentials and transfer the Tender Fee and EMD amount.
- b) Other Bank Account Holders may click **Other Banks** option to view the bank selection page. Here, bidders can select from any of the 54 Banks to proceed with its Net Banking Facility, for remitting tender payments.

**Transaction Charges for Other Banks vide SBI Letter No. LHO/TVM/AC/2016-17/47 – 1% of transaction value subject to a minimum of Rs. 50/- and maximum of Rs. 150/-*

** Bidders who are using Other Banks option under SBI MOPS Payment Gateway, are advised by SBI to make online payment 72 hours in advance before tender closing time.*

5. SUBMISSION PROCESS:

- 5.1 For submission of bids, all interested bidders have to register online as explained above in this document. After registration, bidders shall submit their Technical bid and Financial bid online on www.etenders.kerala.gov.in along with online payment of tender document fees and EMD.
- 5.2 For page-by-page instructions on bid submission process, please visit www.etenders.kerala.gov.in and click “Bidders Manual Kit” link on the home page.
- 5.3 It is necessary to click on “Freeze bid” link/ icon to complete the process of bid submission otherwise the bid will not get submitted online and the same shall not be available for viewing/ opening during bid opening process.

6. VALIDITY

- 6.1 The tender offer shall be kept valid for acceptance for a period of 3 months from the date of opening of offers. The offers with lower validity period are liable for rejection.
- 6.2 Further, the tenderer may extend the validity of the Bids without altering the substance and prices of their Bid for further periods, if so required

7. DEVIATIONS

- 7.1 The offers of the bidders with Deviations in Commercial terms and Technical Terms of the Tender Document are liable for rejection.

8. BLACK LIST

- 8.1 All the intending tenderers shall agree that in the event of the documents furnished with the offer being found to be bogus or the documents contain false particulars, they shall be blacklisted for future tenders/ association with ANERT and EMD shall be forfeited against any losses incurred by ANERT.

9. BIDDER'S LOCATION

- 9.1 The tenderers are requested to furnish the exact location of their factories/godown with detailed postal address and pin code, telephone and fax nos. etc. in their tenders to arrange inspection by ANERT, if considered necessary.
- 9.2 All communication shall be made to the registered email of the bidder in the e-tendering systems and ANERT shall not be responsible for non-receipt or delay of any such communication.

CONDITIONS OF CONTRACT

10. GENERAL CONDITIONS

- 10.1 The tenders should be submitted online at www.etenders.kerala.gov.in.
- 10.2 The tenders should be as per the prescribed form which should be downloaded from the e-tender website. The cost of tender forms should be paid online, and once paid will not be refunded. Tender forms are not transferable. Tenders that are not in the prescribed form are liable to be rejected.
- 10.3 Intending tenderers should submit their tenders on or before the due date and time mentioned in the tender abstract. Late tender will not be accepted.
- 10.4 The rates quoted should be only in Indian currency. Tenders in any other currency are liable to rejection. The rates quoted should be for the unit specified in the schedule attached.
- 10.5 The tenderer shall submit a copy of PAN card of the authorised signatory along with tender.
- 10.6 Tenders subject to conditions will not be considered. They are liable to be rejected on that sole ground.
- 10.7 The tenders will be opened on the specified day and time in the office of the CEO, ANERT in the presence of such of those tenderer's representatives who may be present with proper authorisation issued by the tenderer.
- 10.8 Every tenderer should send along with his tender an Earnest Money Deposit. This may be paid online at the e-tenders website.
- 10.9 If any tenderer withdraws from his e-tender before the expiry of the period fixed for keeping the rates firm for acceptance, the earnest money if any, deposited by him, will be forfeited.
- 10.10 The final acceptance/rejection of the tenders rests entirely with CEO, ANERT who do not bind themselves to accept the lowest or any tender.
- 10.11 In the case of materials of technical nature, the successful tenderer should be prepared to guarantee satisfactory performance for a period of guarantee under a definite penalty. Communication of acceptance of the e-tender normally constitutes a concluded contract. Nevertheless, the successful tenderer shall also

execute an agreement for the due fulfilment of the contract within the period to be specified in the letter of acceptance. The contractor shall have to pay all stamp duty, Lawyer's charges and other expenses incidental to the execution of the agreement. Failure to execute the agreement within the period specified will entail the penalties set out below:

- 10.11.1 The successful tenderer shall **a) deposit a sum @ 3% of the contract till the completion of Installation works. The deposit shall be in the form of a BG which shall be returned after COD (Commercial Operation Date).** There will be no exemption for MSE's in depositing this security amount. If the successful bidder fails to deposit the security and execute the agreement as stated above, the earnest money deposited by him will be forfeited to ANERT; and contract arranged elsewhere at the defaulter's risk and any loss incurred by ANERT on account of the purchase will be recovered from the defaulter who will however not be entitled to any gain accruing thereby.
- 10.11.2 In cases where a successful tenderer, after having made partial supplies fails to fulfil the contracts in full, all or any of the materials not supplied may at the discretion of the Purchasing Officer be purchased by means of another tender/quotation or by negotiation or from the next higher tenderer who had offered to supply already, and the loss if any caused to ANERT shall thereby together with such sums as may be fixed by ANERT towards damages be recovered from the defaulting tenderer.
- 10.12 Return the Security deposit shall, subject to the conditions specified herein to the contractor within three months after the expiration of the contract. But in the event of any dispute arising between ANERT and the contractor, ANERT shall be entitled to deduct out of the deposits or the balance thereof, until such dispute is determined the amount of such damages, costs, charges and expenses as may be claimed. The same may also be deducted from any other sum, which may be due at any time from ANERT to the contractor. In all cases where there are guarantee for the goods supplied, the security deposit will be released only after the expiry of the guarantee period.

(a) All payments to the contractors will be made by CEO ANERT in due course by NEFT transfer only

(b) All incidental expenses incurred by ANERT for making payments outside the State in which the claim arises shall be borne by the contractor.

10.13 The contractor shall not assign or make over the contract on the benefits or burdens thereof to any other person or body corporate. The contractor shall not underlet or sublet to any person or persons or body corporate the execution of the contract or any part thereof without the consent in writing of the purchasing officer who shall have absolute power to refuse such consent or to rescind such consent (if given) at any time if he is not satisfied with the manner in which the contract is being executed and no allowance or compensation shall be made to the contractor or the subcontractor upon such rescission. Provided always that if such consent be given at any time, the contractor shall not be relieved from any obligation, duty or responsibility under this contract.

10.14 In case the contractor becomes insolvent or goes into liquidation, or makes or proposes to make any assignment for the benefit of his creditors or proposes any composition with his creditors for the settlement of his debts, carries on his business or the contract under inspection or behalf of or his creditors or in case any receiving order(s) for the administration of his estate are made against him or in case the contractor shall commit any act of insolvency or in case in which under any clause or clauses any act of insolvency or in case in which under any clause(s) of this contract the contractor shall have rendered himself liable to damages amounting to the whole of his security deposits, the contract shall, thereupon, after notice given by the Purchasing Officer to the contractor, be determined and ANERT may complete the contract in such time and manner and by such persons as ANERT shall think fit. But such determination of the contract shall be without any prejudice to any right or remedy of ANERT against the contractor or his sureties in respect of any breach of contract committed by the contractor. All expenses and damages caused to ANERT by any breach of contract by the contractor shall be paid by the contractor to ANERT and may be recovered from him under the provisions of the Revenue Recovery Act in force in the State.

- 10.15 Any sum of money due and payable to the contractor (including security deposit returnable to him) under this contract may be appropriated by the CEO or any other person authorised by ANERT and set off against any claim of ANERT for the payment of a sum of money arising out of or under any other contract made by the contractor with ANERT or any other person authorised by ANERT. Any sum of money due and payable to the successful tenderer or contractor from ANERT shall be adjusted against any sum of money due to ANERT from him under any other contracts.
- 10.16 Every notice hereby required or authorised to be given may be either given to the contractor personally or left at his residence or last known place of abode or business, or may be handed over to his agent personally, or may be addressed to the contractor by post at his usual or last known place of abode or business and if so addressed and posted, shall be deemed to have been served on the contractor on the date on which in the ordinary course of post, a letter so addressed and posted would reach his place of abode or business.
- 10.17 The tenderer shall undertake the installation and commissioning of the system according to the standards and specification.
- 10.18 No representation for enhancement of rate once accepted will be considered.
- 10.19 Special conditions, if any, of the tenderers attached with the tenders will not be applicable to the contract unless they are expressly accepted in writing by the purchaser.
- 10.20 The tenderer should send along with this tender an agreement executed and signed in Kerala Stamp Paper of value Rs.200/-. A specimen form of agreement is given as Annexure A to this tender. Tenders without the agreement in stamped paper will be rejected outright.
- 10.21 Conditions in the technical document, technical specifications and special conditions of this tender document would override these general conditions, wherever applicable.
- 10.22 ANERT, by notice sent to the Supplier, may terminate the contract, in whole or in part, at any time for its convenience. The notice of termination shall specify that termination be for ANERT's convenience, the extent to which performance of the

Supplier under the contract is terminated, and the date upon which such termination becomes effective.

- 10.23 The E-tender shall be opened at the time and date announced in the tender notice, and the price bid will be evaluated as intimated vide auto generated email only.
- 10.24 In case any difference or dispute arises in connection with the contract, all legal proceedings relating to the matter shall be instituted in the Court within whose jurisdiction the CEO, ANERT voluntarily resides.
- 10.25 The Courts situated at the place where the headquarters of ANERT is situated viz, Thiruvananthapuram alone will have jurisdiction to entertain civil suits and all other legal pertaining to this contract.

11. SPECIAL CONDITIONS

- 11.1 Each bidder should submit only one (1) bid. Any bidder who submits/participates in more than one bid for the work shall be disqualified.
- 11.2 The tenders will be opened at the date and time advised in the Bidding Document. If the due date for receiving and opening the tender happens to be declared holiday, then the tender will be received and opened on the very next day, for which no prior intimation will be given.
- 11.3 If the bidder has NOT submitted the requisite EMD OR Agreement, OR if the price bid is not submitted along with the tender, such tenders will be summarily rejected.
- 11.4 During the tender evaluation, ANERT may seek more clarifications/details from any or all of the tenderers, if felt necessary.
- 11.5 The price bids of the tenderers, which submitted the required documents only will be opened and the L1 bidder will be awarded the work of supply and installation of items after fulfilling all the requirements.
- 11.6 If found essential, ANERT reserves the right, in the interest of completion of work within the time limit, to award portion/portions of the Work order to next higher bidders, called for negotiation in the increasing order of their price offers, if they agree to supply at the L1 price.

- 11.7 **The rate quoted should be all-inclusive including delivery of materials at the location to be specified, and the cost of materials and labour for the civil works, installation and commissioning, Warranties, Application fees, O&M charges, GST and all other expenses.**
- 11.8 The tender offer shall be kept valid for acceptance for a period of 6 months from the date of opening of bid. The offers with lower validity period are liable for rejection.
- 11.9 The evaluation of the price bid will be based on the grand total of all-inclusive amount quoted excluding GST.

Request for Selection (RFS) of agency for the Implementation of 2 MW Solar Power Plant at Travancore Titanium Products Ltd.,
Kochuveli, Thiruvananthapuram under Solar City project funded by Smart City Thiruvananthapuram Ltd

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**AGENCY FOR NEW & RENEWABLE ENERGY
RESEARCH AND TECHNOLOGY (ANERT)**

Department of Power, Government of Kerala
Thiruvananthapuram, Kerala – 695 033;
www.anert.gov.in , projects@anert.in

E-TENDER DOCUMENT

***Request for Selection (RFS) of agency for the
Implementation of 2 MW Solar Power Plant at
Travancore Titanium Products Ltd., Kochuveli,
Thiruvananthapuram under Solar City project funded
by Smart City Thiruvananthapuram Ltd***

Ref. No.: ANERT-TECH/99/2022-T2

VOL – 2: SCHEDULE AND SCOPE OF WORKS

Date of Publishing of Bids : - 12/04/2023

Last Date of Submission of Bids : - 26/04/2023

REQUEST FOR SELECTION (RFS)

FOR

12. Implementation of 2 MWp Grid Connected Solar PV System to be installed at multiple locations within the Travancore Titanium Products Ltd., Kochuveli, Thiruvananthapuram

- 12.1 ANERT, therefore, invites bids from eligible bidders to participate in the Request for Selection in the e-tendering platform for Design, Manufacture, Supply, Erection, Testing and Commissioning including Warranty, Operation and Maintenance of Solar PV Power System at proposed location.
- 12.2 For the implementation of above-mentioned work, Bidders should submit their bid proposal online complete in all aspect on or before Last date of Bid Submission.
- 12.3 Bid documents, which include Eligibility Criteria, Technical Specifications, various Conditions of Contract, and Formats etc., can be downloaded from website www.anert.gov.in. It is mandatory to download official copy of E-TENDER Document from Kerala Tenders Portal. Any amendment(s)/corrigendum/clarification(s) with respect to this Bid shall be uploaded on www.etenders.kerala.gov.in. The Bidder should regularly check for any Amendment(s)/Corrigendum/Clarification(s) on the above website only.
- 12.4 The scope of work includes:
- 12.4.1 Design, Engineering, Manufacture, Supply, Storage, Civil work, Erection, Testing & Commissioning of the Grid connected PV Project including Power evacuation, Operation and Maintenance (O & M) of the project for a period of 10 years for after commissioning of project.

13. DEFINITIONS & ABBREVIATIONS

a) In this “Bid / RFS Document” the following words and expression will have the meaning as herein defined where the context so admits:

13.1 **“Affiliate”** shall mean a company that either directly or indirectly

- a. controls or
 - b. is controlled by or
 - c. is under common control with
- 13.2 A Bidding Company and **“control”** means ownership by one company of at least twenty-six percent (26%) of the voting rights of the other company.
- 13.3 **“B.I.S”** shall mean specifications of Bureau of Indian Standards (BIS);
- 13.4 **“Bid”** shall mean the Techno Commercial and Price Bid submitted by the Bidder along with all documents/credentials/attachments annexure etc., in response to this RFS, in accordance with the terms and conditions hereof.
- 13.5 **“Bidder/Bidding Company”** shall mean Bidding Company submitting the Bid. Any reference to the Bidder includes Bidding Company / including its successors, executors and permitted assigns as the context may require;
- 13.6 **“Bid Deadline”** shall mean the last date and time for submission of Bid in response to this RFS as specified in the Tender Abstract;
- 13.7 **“Bid Capacity”** shall mean capacity offered by the bidder in his Bid.
- 13.8 **“CEA”** shall mean Central Electricity Authority.
- 13.9 **“Chartered Accountant”** shall mean a person practicing in India or a firm whereof all the partners practicing in India as a Chartered Accountant(s) within the meaning of the Chartered Accountants Act, 1949;
- 13.10 **“Competent Authority”** shall mean (Designation of Competent Authority) of [Name of the Organization] himself and/or a person or group of persons nominated by MD for the mentioned purpose herein;
- 13.11 **“Commissioning,”** means Successful operation of the Project / Works by the Contractor, for carrying out Performance Test(s) as defined in RFS.
- 13.12 **“Company”** shall mean a body incorporated in India under the Companies Act, 1956 or Companies Act, 2013 including any amendment thereto;
- 13.13 **Commercial Operation Date:** The date of successful conducting field acceptance tests and injection of power at delivery point shall be the "Commercial Operation Date"
- 13.14 **“Capacity Utilization Factor” (CUF)** shall mean the ratio of actual energy generated by SPV project over the year to the equivalent energy output at its

rated capacity over the yearly period.

$$CUF = \frac{\text{actual annual energy generated from the plant in kWh}}{(\text{installed plant capacity in kW} * 365 * 24)}$$

13.15 **"Eligibility Criteria"** shall mean the Eligibility Criteria as set forth in Clause 16 of this RFS;

13.16 **"Financially Evaluated Entity"** shall mean the company which has been evaluated for the satisfaction of the Financial Eligibility Criteria set forth in Clause 16.3 hereof;

13.17 **"IEC"** shall mean specifications of International Electro-Technical Commission;

13.18 **"kWp"** shall mean kilo-Watt Peak;

13.19 **"kWh"** shall mean kilo-Watt-hour;

13.20 **"MNRE"** shall mean Ministry of New and Renewable Energy, Government of India;

13.21 **"O&M"** shall mean Operation & Maintenance of Solar PV system for PPA period.

13.22 **"Owner of the project"** shall mean MILMA Ernakulam Dairy, shall mean anyone who has ownership (including lease ownership also) of the land / roof and is the legal owner of all equipments of the project. Owner of the project can enter into a PPA with the consumer (s) of power for supply of solar power for agreed time (years) from the date of Commissioning of project.

13.23 **"Project Cost / Project Price"** shall mean the price offered by the Bidder for the Scope of work as per RFS document for the site.

13.24 **"Project capacity"** means Capacity in kWp offered by the Bidder. The project capacity specified is on "DC" output Side only.

13.25 **"Performance Ratio" (PR) means**

"Performance Ratio" (PR) means the ratio of plant output versus installed plant capacity at any instance with respect to the radiation measured.

$$PR = \frac{\text{Measured output in kW}}{\text{Installed Plant capacity in kW} * (1000 / \text{Measured radiation intensity in W/m}^2)}$$

13.26 **"Parent"** shall mean a company, which holds more than 51% equity either directly or indirectly in the Bidding Company or Project Company or a Member in a Consortium developing the Project

13.27 **"Project Company"** shall mean Company incorporated by the bidder as per

Indian Laws in accordance with Clause no 16.1.

13.28 **"Price Bid"** shall mean BoQ, containing the Bidder's quoted Price as per the Volume- IV of this RFS;

13.29 **"Qualified Bidder"** shall mean the Bidder(s) who, after evaluation of their Techno Commercial Bid stand qualified for opening and evaluation of their Price Bid;

13.30 **"RFS"** shall mean Request for Selection (RFS)/Bid document/Tender document

13.31 **"Statutory Auditor"** shall mean the auditor of a Company appointed under the provisions of the Companies Act, 1956 or under the provisions of any other applicable governing law;

13.32 **"Successful Bidder(s) /Contractor/Project Developers(s)"** shall mean the Bidder(s) selected by Owner pursuant to this RFS for Implementation of Grid Connected Ground mounted Solar PV System as per the terms of the RFS Documents, and to whom an Allocation Letter has been issued;

13.33 **"Site"** shall mean the project location at the address mentioned below.

MILMA Ernakulam Dairy, Thrippunithura PO., Ernakulam-682 301

13.34 **"SNA"** shall mean State Nodal Agency, ANERT.

13.35 **"Tendered Capacity"** shall mean the Total aggregate capacity in MW proposed to be tendered by ANERT to the Successful Bidder through this bidding process as per terms and conditions specified therein;

13.36 **"Ultimate Parent"** shall mean a company, which owns at least more than fifty percent (51%) equity either directly or indirectly in the Parent and Affiliates.

13.37 **"Wp"** shall mean Watt Peak.

13.38 **2MWp** for the purpose of conversion in **kWp** shall be considered as 2000kWp.

b) INTERPRETATIONS

- i. Words comprising the singular shall include the plural & vice versa
- ii. An applicable law shall be construed as reference to such applicable law including its amendments or re-enactments from time to time.
- iii. A time of day shall save as otherwise provided in any agreement or document be construed as a reference to Indian Standard Time.
- iv. Different parts of this contract are to be taken as mutually explanatory and

supplementary to each other and if there is any differentiation between or among the parts of this contract, they shall be interpreted in a harmonious manner to give effect to each part.

- v. The table of contents and any headings or sub headings in the contract has been inserted for case of reference only & shall not affect the interpretation of this agreement.

INTRODUCTION, BID DETAILS AND INSTRUCTIONS TO THE BIDDERS

14. INTRODUCTION

- 14.1 ANERT, on behalf of Smart City Thiruvananthapuram Ltd, hereby invites interested companies to participate in the bidding process for the selection of Successful Bidder(s) for implementation of grid-connected Solar Photovoltaic Project under CAPEX model in Travancore Titanium Products Ltd., Kochuveli, Thiruvananthapuram.
- 14.2 The Bidders are advised to read carefully all instructions and conditions appearing in this document and understand them fully. All information and documents required as per the bid document must be furnished. Failure to provide the information and / or documents as required may render the bid technically unacceptable.
- 14.3 The bidder shall be deemed to have examined the bid document, to have obtained his own information in all matters whatsoever that might affect the carrying out the works in line with the scope of work specified elsewhere in the document at the offered rates and to have satisfied himself to the sufficiency of his bid. The bidder shall be deemed to know the scope, nature and magnitude of the works and requirement of materials, equipment, tools and labour involved, wage structures and as to what all works, he has to complete in accordance with the bid documents irrespective of any defects, omissions or errors that may be found in the bid documents.

15. BID DETAILS

- 15.1 The bidding process under this RFS is for a 2 MWp cumulative capacity of SPV Power Plant at Travancore Titanium Products Ltd., Kochuveli, Thiruvananthapuram. This includes 1.5 MWp installation to be done in Ground and 500 kWp in the Rooftop of various buildings within TTL campus.

BID QUALIFICATION REQUIREMENTS

16. ELIGIBILITY CRITERIA

16.1 General

- i. The Bidder should be either a body incorporated in India under the Companies Act, 1956 or 2013 including any amendment thereto, Sole Proprietorship, Partnership company and engaged in the business of Solar Power.
- ii. A copy of certificate of incorporation shall be furnished along with the bid in support of above.

16.2 Technical Eligibility Criteria:

The Bidder should have installed & commissioned Grid connected Solar PV Power Project having a capacity of single plant not less than 1 MW and cumulative capacity of above 5 MW, which should have been commissioned at least two months prior to Techno-Commercial Bid Opening date. The list of projects commissioned at least 2 months prior to Techno-Commercial Bid Opening date, indicating whether the project is grid connected, along with a copy of the Commissioning certificate and Work order / Contract / Agreement/ from the Client/Owner shall be submitted in support of Clause 16.2.

16.3 Financial eligibility criteria

The Bidder should have an Annual Turnover or Net worth as indicated below.

- i. The Minimum Average Annual turnover of Rupees 8 Crores in any two of the last 5 financial years preceding the Bid Deadline subject to the condition that the Bidder should at least have completed two financial years.

OR

- ii. Net worth equals to or greater than the value calculated at rate of Rs. 10 Crores. The Computation of Net worth shall be based on unconsolidated audited annual accounts of the last financial year immediately preceding the Bid Deadline. Share

premium can be included in the Net-worth calculation in case of listed companies in India only.

The formula of calculation of net-worth shall be as follows:

Net-worth = (Paid up share capital) + {(Free reserves - Share premium) + Share premium of listed companies}} - (Revaluation of reserves)- (Intangible assets) - (Miscellaneous expenditure to the extent not written off and carry forward losses).

For the purposes of meeting financial requirements, only unconsolidated audited annual accounts shall be used. Bidders shall furnish documentary evidence as per the Format - 5, duly certified by Authorized Signatory and the Statutory Auditor / Practising Chattered Accountant of the Bidding Company in support of their financial capability.

16.4 Bid submission by the bidder

16.4.1 The Bidder shall submit the information and/or documents as per the formats specified in Volume-IV.

16.4.2 Strict adherence to the formats wherever specified, is required. Wherever, information has been sought in specified formats, the Bidder shall refrain from referring to brochures /pamphlets. Non-adherence to formats and / or submission of incomplete information may be a ground for declaring the Bid as non-responsive. Each format has to be duly signed and stamped by the authorized signatory of the Bidder.

16.4.3 The Bidder shall furnish documentary evidence in support of meeting Eligibility Criteria as indicated in Clause no. 16.1, 16.2 and 16.3 to the satisfaction of ANERT. They shall also furnish unconsolidated/consolidated audited annual accounts in support of meeting financial requirement, which shall consist of balance sheet, profit and loss account, profit appropriation account, auditors report, etc., as the case may be of Bidding Company or Financially Evaluated Entity for any of the last three(3) financial years immediately preceding the Bid Deadline which are used by the bidder for the purpose of calculation of Annual Turnover or of last Financial Year in case of Net Worth.

16.4.4 In case the annual accounts for the latest financial year are not audited and therefore the bidder cannot make it available, the applicant shall give certificate to this effect from their CEOs. In such a case, the Applicant shall provide the Audited Annual Reports for 3 (Three) years preceding the year or from the date of incorporation if less than 3 years for which the Audited Annual Report is not being provided.

16.5 Amendments to RFS

16.5.1 At any time prior to the deadline for submission of Bids, ANERT may, for any reason, whether at its own initiative or in response to a clarification requested by a prospective Bidder, modify the RFS document by issuing clarification(s) and/or amendment(s).

16.5.2 The clarification(s) / amendment(s) (if any) may be notified on Kerala Tenders website www.etenders.kerala.gov.in at least Two (2) days before the proposed date of submission of the Bid. If any amendment is required to be notified within Two (2) days of the proposed date of submission of the Bid, the Bid Deadline may be extended for a suitable period.

16.5.3 ANERT will not bear any responsibility or liability arising out of non-receipt of the information regarding Amendments in time or otherwise. Bidders must check the website for any such amendment before submitting their Bid.

16.5.4 In case any amendment is notified after submission of the Bid (prior to the opening of Techno-Commercial Bid.

16.5.5 All the notices related to this Bid which are required to be publicized shall be uploaded on website www.etenders.kerala.gov.in

16.6 Bidding process

16.6.1 Bid formats

The Bid shall comprise of the following:

(A) Cover I - Techno-Commercial documents

i. Covering Letter as per the prescribed Format-1

- ii. Copy of PAN and TAN certificates of Bidding company
- iii. Original power of attorney issued by the Bidding Company in favour of the authorized person signing the Bid, in the form attached hereto as Format-2 or standard power of attorney in favour of authorized person signing the Bid. (Power of Attorney must be supplemented by Board Resolution to above effect for the company). However, ANERT may accept general Power of Attorney executed in favour of Authorised signatory of the Bidder, if it shall conclusively establish that the signatory has been authorized by the Board of CEOs to execute all documents on behalf of the Bidding Company.
- iv. General particulars of bidders as per Format-3
- v. Document in support of meeting Eligibility Criteria as per Clause no. 16.1 & 16.2.
- vi. Certificates of incorporation of Bidding company
- viii. Details for meeting Financial Eligibility Criteria as per Clause no. 16.3 along with documentary evidence for the same as per Format -4
- ix. Board resolution for Authorised signatory
- x. Signed and stamped Copy of RFS Documents including amendments & clarifications by Authorised signatory on each page.

(B) Cover II- Price bid

The Bidder shall inter-alia take into account the following while preparing and submitting the Price Bid digitally signed by the authorized signatory. The Bidder shall submit Price Bid in excel BoQ file downloaded from the e-tender website.

16.7 Validity of Bid

- 16.7.1 The bid and the Price Schedule included shall remain valid for a period of 3 months from the date of techno-commercial bid opening, with bidder having no right to withdraw, revoke or cancel his offer or unilaterally vary the offer submitted or any terms thereof. In case of the bidder revoking or cancelling his offer or varying any term & conditions in regard thereof or not accepting letter of allocation, ANERT shall forfeit the Bid Bond furnished by him.

16.7.2 In exceptional circumstances when letter of acceptance is not issued, ANERT may solicit the Bidder's consent to an extension of the period of validity. The request and the responses thereto shall be made in writing. The EMD provided shall also be suitably extended. A Bidder may refuse the request without forfeiting its Bid Bond. A Bidder granting the request will neither be required nor permitted to modify its Bid in any manner.

16.8 Cost of bidding

The bidder shall bear all the costs associated with the preparation and submission of his offer, and ANERT will in no case be responsible or liable for those costs, under any conditions. The Bidder shall not be entitled to claim any costs, charges and expenses of and incidental to or incurred by him through or in connection with his submission of bid even though ANERT may elect to modify / withdraw the invitation of Bid.

16.9 Performance Security / Performance Bank Guarantee (PBG)

16.9.1 Within 30 days from the date of issue of Allocation letter, Successful Bidder shall furnish the Performance Security @ 3% of the total contract value.

16.9.2 The Performance Security shall be denominated in Indian Rupees and shall be in one of the following forms:

- a. A demand draft, or a bank guarantee in the format given in Format-4 from any nationalised bank.
- b. Be confirmed for payment by the branch of the bank giving the bank guarantee at Thiruvananthapuram.

16.9.3 The PBG shall be forfeited as follows without prejudice to the Bidder being liable for any further consequential loss or damage incurred to ANERT, if the Successful Bidder is not able to commission the projects to the satisfaction of ANERT.

16.9.4 The Performance Security shall be valid for a minimum period of 6 months from the date of issue of LoA

16.10 Right to withdraw the RFS and to reject any bid

16.10.1 This RFS may be withdrawn or cancelled by ANERT at any time without assigning any reasons thereof. ANERT further reserves the right, at its

complete discretion, to reject any or all of the Bids without assigning any reasons whatsoever and without incurring any liability on any account.

16.10.2 ANERT reserve the right to interpret the Bid submitted by the Bidder in accordance with the provisions of the RFS and make its own judgment regarding the interpretation of the same. In this regard ANERT shall have no liability towards any Bidder and no Bidder shall have any recourse to ANERT with respect to the selection process. ANERT shall evaluate the Bids using the evaluation process specified in Volume - III, at its sole discretion. ANERT's decision in this regard shall be final and binding on the Bidders.

16.10.3 ANERT reserves its right to vary, modify, revise, amend or change any of the terms and conditions of the Bid before submission. The decision regarding acceptance or rejection of bid by ANERT will be final.

16.11 Zero Deviation

This is a ZERO Deviation Bidding Process. Bidder is to ensure compliance of all provisions of the Bid Document and submit their Bid accordingly. Tenders with any deviation to the bid conditions shall be liable for rejection.

16.12 Examination of Bid document

16.12.1 The Bidder is required to carefully examine the Technical Specification, terms and Conditions of Contract, and other details relating to supplies as given in the Bid Document.

16.12.2 The Bidder shall be deemed to have examined the bid document including the agreement/contract, to have obtained information on all matters whatsoever that might affect to execute the project activity and to have satisfied himself as to the adequacy of his bid. The bidder shall be deemed to have known the scope, nature and magnitude of the supplies and the requirements of material and labour involved etc. and as to all supplies he has to complete in accordance with the Bid document.

16.12.3 Bidder is advised to submit the bid on the basis of conditions stipulated in the Bid Document. Bidder's standard terms and conditions if any will not be considered. The cancellation / alteration / amendment / modification in Bid documents shall not be accepted by ANERT.

16.12.4 Bid not submitted as per the instructions to bidders is liable to be rejected. Bid shall confirm in all respects with requirements and conditions referred in this bid document.

SCOPE OF WORK

17. SCOPE OF WORKS

The scope includes the Supply, Installation, Testing and Commissioning of Rooftop On-Grid SPV power plants. All the necessary approvals from KSEBL/Electrical Inspectorate, feasibility study, necessary civil work, Mounting of Module Structures, PV Module Installation, Inverter Installation, DC/AC Cabling and interconnections, Installation of Lightning Arresters and Earthing System as per the standards, Arranging all the necessary inspections from KSEBL/Electrical Inspectorate/ANERT District Office as part of Pre-Commissioning, if any, Commissioning of the PV Power Plant along with warranty and Operation and Maintenance (O&M) of the project under CAPEX model for 10 years after Commercial Operation Date (COD) are coming under the scope of the bidder.

The total project comprises of 500 kWp Rooftop Solar Power plant and 1500 kWp Ground Mounted Solar Power plant. The successful bidder reserves the right to finalise the capacity being installed at these locations identified within the area available with due approval of ANERT/TTL authorities.

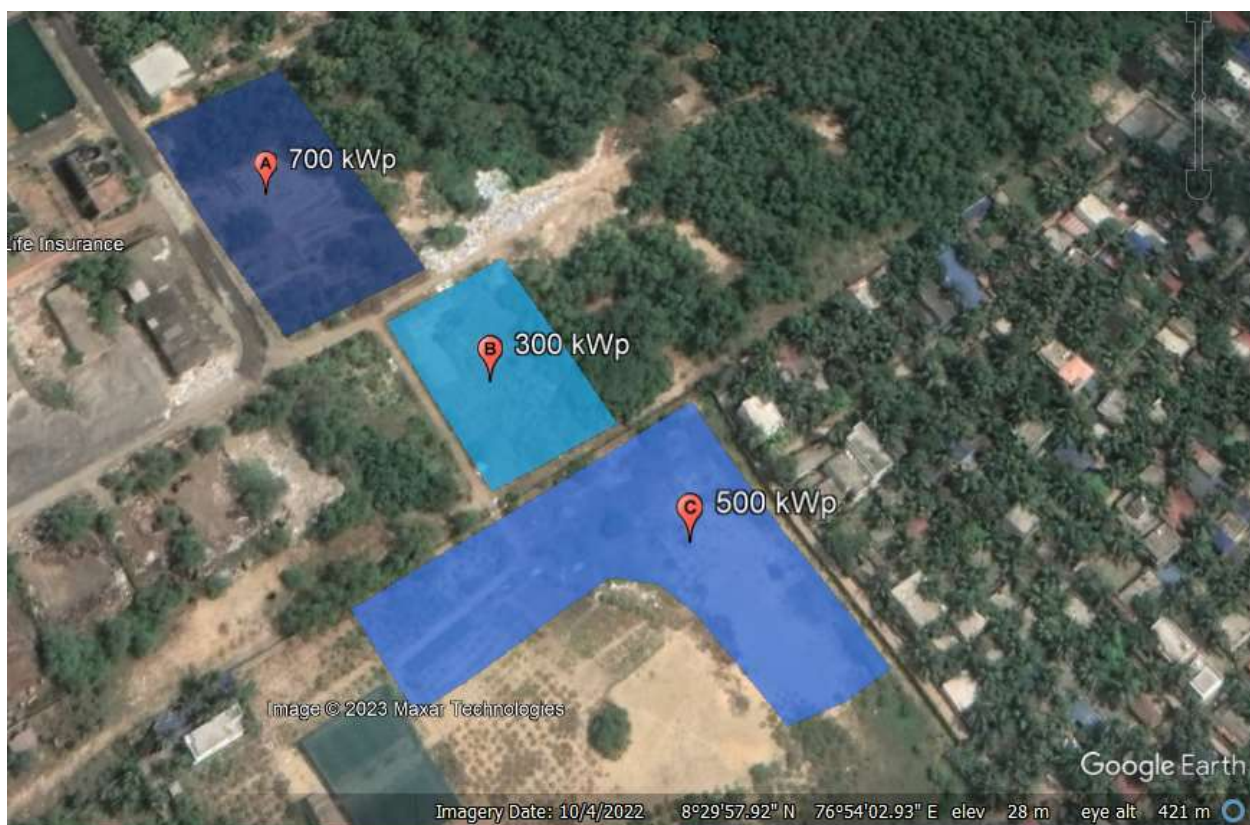
17.1 LOCATION DETAILS

The location of installation of the proposed 2 MWp Solar Power plant is at Travancore Titanium Products Ltd., Kochuveli, Thiruvananthapuram, Kerala.

Site Name	Travancore Titanium Products Ltd., Kochuveli
Area available	Rooftop (Various buildings as listed below) and Ground of area 13000 Sqm.
District	Thiruvananthapuram
State	Kerala
Latitude	8°29'57.73"N
Longitude	76°54'5.13"E
Nearest National Highway	NH-66
Nearest Village/Town	Veli

Nearest Railway Station	Kochuveli (3 km from the site)
Nearest Airport	Trivandrum International Airport (5 km from the site)
Nearest KSEB Substation	Within the Campus

The Proposed 1.5 MW Solar Power Plant is to be installed on the area marked below



The balance 500 kWp is to be installed at the Rooftops of Buildings listed below:

#	Name of Block / Building	Capacity (kW)
1	Canteen	200
2	Locker Room	75
3	CLSS	75
4	Lime Storage Area	50
5	Filter Press	50
6	Time Office	25
7	66 kV Substation	25
TOTAL		500

The bidders are to quote the per kW cost for the successful Supply, Testing, Installation and Commissioning of the Power plants as per the capacity mentioned for Rooftop as well as Ground mounted system. The full work will be awarded to the lowest bidder for the 2000 kWp. The cost of O&M will not form part of the selection of the L1 bidder.

17.2 ADDITIONAL WORKS

- i. The successful bidder is to borne the fee for KSEBL feasibility, Registration and all other expenses. The additional costs for site specific cabling works, earthing, mounting structure modifications, required civil works etc to meet the technical criteria as detailed in this document are under the scope of the bidder.
- ii. The scope of enhancing load, phase conversion, changing of CTs, PT, modification of Panel boards, extension of bus bars, replacement of metering panel boards etc wherever necessary is under the scope of the bidder. The rates for the same are to be considered in the bid for each site.
- iii. In case of installations to be made in sites with HT connection, the replacement of CTs (Class 0.2s), PT (Class 0.2) of rating is under the scope of the vendor. The rates for Supply of tested transformers & Replacement at the site of these items to be quoted along with the bid.
- iv. It is mandatory that the bidders are to visit the sites and quote the rates considering all the requirements as mentioned in this tender document. No requests for revision of rates will be entertained. In case, the successful bidder is not undertaking the specific work, the work will be cancelled and disciplinary proceedings will be initiated against the bidder and all payments due will be withheld. Hence, Bidders are requested to visit the site before quoting and the rate for successful commissioning in all aspects is to be quoted.
- v. **The rate quoted should be all inclusive including delivery of materials, the cost of materials and labour for the civil works, Installation and Commissioning, 10-year Warranty, fee for approval from the KSEBL, Electrical Inspectorate if any, Solar Meter, Remote monitoring facility, Insurance, GST and all other expenses deemed necessary for the proper**

implementation of the conditions and specification as in-incorporated in the tender.

- vi. The Operation and Maintenance of the Power plant for the whole period of warranty will be duty of the vendor. The rates for O&M per year need to be quoted in the BoQ file provided.**
- vii. The Component wise split up of the costs in percentage for each capacity is to be included as part of the technical bid (included as format 6).**
- viii. Any other work required for the successful commissioning of the power plant which are not mentioned in this document and are required as per prevailing laws & regulations in the country**

17.3 SUBMITTALS

On commencement of the Project, the Contractor shall submit the following to ANERT:

- a. Prior to the technical submittals, the contractor shall submit detailed baseline program and methodology indicating the proposed overall schedule for documentation such as calculations, shop/ working drawings, plan/ procedures and records. Submission of samples, process of fabrication / delivery to site storage yard for the approval of the Employer. Also, Contractor shall submit Method statements and Quality Assurance plan for each activity to be done and get approval from ANERT before commencing the work. Contractor shall maintain the necessary Quality and Quantity documentation. All the documents shall be submitted to Employer for their review and records.
- b. Detailed work procedures and schedules shall be submitted by contractor at least one month before start of work and shall get necessary approval from ANERT authorities and various entities. If required meeting shall be called to settle all the open issues. Contractor to ensure that all issues are closed one month prior to start of work.
- c. Complete fabrication drawings, materials list, cutting lists, bolt lists, welding schedules and QC schedules, based on the design drawing furnished to him and in accordance with the approved schedule. It is highlighted that structural steel

members, dimensions thereof indicated in tender drawings are tentative only, and may be modified during final design stage.

- d. Results of any tests, as and when conducted and as required by Employer.
- e. A detailed list of all constructional Plant & Equipment, such as cranes, derricks, winches, welding sets etc. their makes, model, present condition and location, available to the contractor and the ones he will employ on the job to maintain the progress of work in accordance with the contract.
- f. The total number of experienced personnel of each category, like fitters, welders, riggers etc., which he intends to deploy on the project.
- g. The contractor shall submit complete design calculations for any alternative sections proposed by him, for the approval of Employer and records of Owner.

18. PROJECT COST

- 18.1 The Project cost shall include all the costs related to above Scope of Work. Bidder shall quote for the entire facilities on a “single responsibility” basis such that the total Bid Price covers all the obligations mentioned in the Bidding Documents in respect of Design, Supply, Erection, Testing and Commissioning including Warranty, Operation & Maintenance for a period 10 years under CAPEX model, goods and services including spares required if any during O&M period. The Bidder has to take all permits, approvals and licenses, Insurance etc., provide training and such other items and services required to complete the scope of work mentioned above.
- 18.2 The Project cost shall remain firm and fixed and shall be binding on the Successful Bidder till completion of work. No escalation will be granted on any reason whatsoever. The bidder shall not be entitled to claim any additional charges, even though it may be necessary to extend the completion period for any reasons whatsoever.
- 18.3 The cost shall be inclusive of all duties and taxes, insurance etc. The prices quoted by the firm shall be complete in all respect and no price variation /adjustment shall be payable during the 10-year period.
- 18.4 The Operation & Maintenance of Solar Photovoltaic Power Plant would include wear, tear, overhauling, machine breakdown, insurance, and replacement of

defective modules, invertors / Power Conditioning Unit (PCU), spares, consumables & other parts for a period of 10 years.

- 18.5 The cost shall be specified in sanction letter based on Successful Bidder's quote for the project. The project cost shall be in accordance with all terms, conditions, specifications and other conditions of the Contract as accepted by ANERT and incorporated into the sanction letter.

19. INSURANCE

- 20.1 The Bidder shall be responsible and take an Insurance Policy for transit-cum-storage-cum-erection for all the materials to cover all risks and liabilities for supply of materials on site basis, storage of materials at site, erection, testing and commissioning. The bidder shall also take appropriate insurance during O&M period.
- 20.2 The Bidder shall also take insurance for Third Party Liability covering loss of human life, engineers and workmen and also covering the risks of damage to the third party/material/equipment/properties during execution of the Contract. Before commencement of the work, the Bidder will ensure that all its employees and representatives are covered by suitable insurance against any damage, loss, injury or death arising out of the execution of the work or in carrying out the Contract. Liquidation, Death, Bankruptcy etc., shall be the responsibility of bidder.

20. WARRANTIES AND GUARANTEES

The Bidder shall warrant that the goods supplied under this contract are new, unused, of the most recent or latest technology and incorporate all recent improvements in design and materials. The bidder shall provide system warrantee covering the rectification of any and all defects in the design of equipment, materials and workmanship including spare parts for a period of the 10-years from the date of commissioning. The successful bidder has to transfer all the Guarantees /Warrantees of the different components to the Owner of the project. The responsibility of operation of Warrantee and Guarantee clauses and Claims/ Settlement of issues arising out of said clauses shall be

joint responsibility of the Successful bidder and the owner of the project and ANERT will not be responsible in any way for any claims whatsoever on account of the above.

21. TYPE AND QUALITY OF MATERIALS AND WORKMANSHIP

- 22.1 The Design, Engineering, Manufacture, Supply, Installation, Testing and Performance of the equipment shall be in accordance with latest appropriate IEC/Indian Standards as detailed in the Vol- III (Technical specifications) of the bid document. Where appropriate Indian Standards and Codes are not available, other suitable standards and codes as approved by the MNRE / authorised Government agency shall be used.
- 22.2 The specifications of the components should meet the technical specifications mentioned in Volume III.
- 22.3 Any supplies which have not been specifically mentioned in this Contract but which are necessary for the design, engineering, manufacture, supply & performance or completeness of the project shall be provided by the Bidder without any extra cost and within the time schedule for efficient and smooth operation and maintenance of the SPV plant.

22. OPERATION & MAINTENANCE

- i. The bidder shall be responsible for Operation and Maintenance of the Solar PV system for the 10-year period, during which ANERT will monitor the project for effective performance in line with conditions specified elsewhere in the bid document. During this period, the bidder shall be responsible for supply of all spare parts as required from time to time for scheduled and preventive maintenance, major overhauling of the plant, replacement of defective modules, inverters, PCU's etc and maintaining log sheets for operation detail, deployment of staff for continuous operations and qualified engineer for supervision of O&M work, complaint logging & its attending.
- ii. If any Operation & Maintenance issues are not resolved within 7 days, then complaint may be raised to ANERT, pursuant to which a penalty as decided by CEO, ANERT will be imposed.

- iii. If the outage of the plant is more than 30 days continuously, then the 50% PBG amount shall be encashed by ANERT.
- iv. If the outage is exceedingly more than 60 days then complete PBG amount shall be encashed by Owner. (This will be applicable till 10 years of O&M as per the Scope of the RFS.) Legal proceedings and other as deemed necessary by CEO, ANERT will be initiated against the defaulted contractor.

23. METERING AND GRID CONNECTIVITY

Metering and grid connectivity of the solar PV system under this project would be the responsibility of the Bidder in accordance with the prevailing guidelines of the concerned DISCOM and / or CEA (if available by the time of implementation). The bidder need to connectivity and the entire responsibility lies with bidder only. This particular power plant will be connected to the 11 kV bus at the 66 kV Substation under Captive consumer category.

24. PLANT PERFORMANCE EVALUATION

The successful bidder shall be required to meet minimum guaranteed generation with Performance Ratio (PR) at the time of commissioning and related Capacity Utilization Factor (CUF) as per the GHI levels of the location during the O&M period. PR should be shown minimum of 75% at the time of inspection for initial commissioning acceptance. Minimum CUF shall not be less than 21% for a period of 10 years. The bidder should send the periodic plant output details to ANERT for ensuring the CUF. The PR will be measured at Inverter output level during peak radiation conditions.

25. PROGRESS REPORT

The bidder shall submit the progress report monthly to ANERT in Prescribed Proforma. ANERT will have the right to depute his/their representatives to ascertain the progress of contract at the premises of works of the bidder.

26. SCHEDULE OF SUPPLY

- i. The items should be delivered and installed at the sites of institution for which work order shall be given and specified by ANERT, under prior intimation and supervision of ANERT. The list of sites is listed below:
- ii. If the successful bidder fails to deliver the materials within the days mentioned below, the order stands cancelled and ANERT will award the work to the next bidder and penalty as decided by ANERT will be levied.

#	Capacity of Solar Plant	Material Delivery (Days)	Completion Period (Days)
1	2 MWp	25	45

- iii. For any delay in Installation and Commissioning beyond the period mentioned above, the ANERT will charge penalty of 0.5% of the order value/week or part thereof, subject to the cost not exceeding 10% of the total cost. Order will be cancelled if the delay of service is more than this time period and work will be issued to the second successful bidder
- iv. Bidders are to submit their quotes only after visiting the site and the details of additional works required for the successful commissioning of the power plant is to be mentioned in the technical bid. No additional amount for any works will be provided under any circumstance, even if the site requires additional work other than quoted by the bidder. Hence, special care must be taken while submitting the bids.
- v. Supply of the SPV module must be from the ALMM list issued by MNRE from time to time. The test certificates and reports of the inverters being used for the project must be submitted along with the bid. ANERT reserves the right to reject the bid based on the non-conformity of the inverter being supplied.
- vi. The successful bidder shall submit the detailed BoM and the timeline for completion along with the agreement and security deposit. This timeline must be followed and no extension of time for completing the installation will be granted. Although, time extension may be granted for things beyond the control of the bidder.

- vii. In case of no valid reason, extension of time of completion that can be granted at a time shall will be 25% of the original time. The maximum extension that can be granted for a work shall be limited to half the original time of completion.
- viii. When the contract period has to be extended wholly or partly due to default on the part of the bidder, the Agreement Authority may sanction extension of time after imposing fine as mentioned below;

Period	Rate of Fine
First Extension	1% of the PAC subject to a minimum of Rs. 1000/- and maximum of Rs. 50,000/-.
Second Extension	2% of the PAC subject to a minimum of Rs. 2000/- and maximum of Rs. 1,00,000/-

27. PAYMENT

- 27.1 No advance payment will be given. All the documents submitted should be certified by the concerned personnel of ANERT.
- 27.2 The quotes for the Design, Supply, Installation & Commissioning including 10 years of warranty (EPC Part) to be provided by the bidders. The L1 bidder will be selected on the basis of their quotes on the EPC part with 10-year warranty and the O&M quote will not be part of bid evaluation.
- 27.3 The terms of payment shall be:

27.3.1 EPC Payment

- i. Upon delivery of major components (PV Modules, Inverter etc) at the site/warehouse, a maximum of 60% of the contract value can be released through Running Accounts Bills of min 10% of the contract value. The supplier shall submit the part invoice for the materials (including serial numbers and delivery chalan) for the materials duly certified by the concerned District Office along with a report regarding the supply of materials. Each RAB shall be accompanied with an item wise statement of work completion with qty, rate & the actual expenditure incurred audited by a Chartered Accountant.
- ii. On completion of installation of the power plant, a maximum of 20% of the contract value can be released as Running Account Bills of min 10% of the

contract value. The supplier shall submit the invoice for the materials supplied and all documents related including the Project Completion Report to the completion of the work certified by the district office shall be submitted for the release of the amount. The second part invoice can be raised only after submitting application for energization to the Electrical Inspectorate. Each RAB shall be accompanied with an item wise statement of work completion with qty, rate & the actual expenditure incurred audited by a Chartered Accountant.

- iii. After the Inspection and Approval of the Electrical Inspectorate, 5% of the contract value will be released. All documents related to the completion of the work including commissioning report shall be submitted for the release of the amount.
- iv. The date of Energisation to the Grid by the DISCOM will be considered as the official Date of Commissioning (CoD) of the project and this will be treated as the commissioning of the system. On commissioning of the grid connected system, 5% of the contract value will be released after proving the Performance ratio (AC). The PR report as per standard is to be provided for release of the amount.
- v. The balance 10% shall be retained as performance security and will be released in five equal parts - 2% after 1 year of operation, 2% after 3 years of operation, 2% after 5 years of operation, 2% after 7 years of operation and last 2% after the 10 years of warranty. For releasing these payment, Performance ratio (AC) shall be proved within a period of 7 consecutive days at the end of each year for release of payment. **The plant shall be handed over at the end of 10 years after commissioning after proving the performance ratio (AC).** This period will be considered only from the date of commissioning.
- vi. The security deposit of 3% furnished along with the contract agreement shall be released on successful completion of supply, installation and commissioning.

27.3.2 Maintenance Payment

- i. The amount shall be released on annual basis after completion of the period of the previous year. The start of maintenance period will be considered from the scheduled date of operation.
- ii. The preventive maintenance reports along with receipt of premium of insurance and generation reports are to be submitted for the release of payments.
- iii. The payment shall be released after the inspection by the authorised personnel of ANERT on annual basis.

27.4 Income tax, contribution to workers' welfare fund and other statutory deductions shall be made from the payment as per prevailing norms.

28. PROJECT INSPECTION

The project progress will be monitored by ANERT and the projects will be inspected for quality at any time during commissioning or after the completion of the project either by officer(s) from ANERT or any authorized agency/ experts.

29. APPLICABLE LAW

The Contract shall be interpreted in accordance with the laws of the Union of India and in the Jurisdiction of Thiruvananthapuram, Kerala.

30. SETTLEMENT OF DISPUTE

29.1 If any dispute of any kind whatsoever arises between ANERT and Successful bidder in connection with or arising out of the contract including without prejudice to the generality of the foregoing, any question regarding the existence, validity or termination, the parties shall seek to resolve any such dispute or difference by mutual consent. If the same cannot be resolved, the courts in the jurisdiction will be approached and finalised by the appropriate court after legal proceedings.

31. FORCE MAJEURE

30.1 Notwithstanding the provisions of clauses contained in this RFS document; the contractor shall not be liable to forfeit (a) Security deposit for delay and (b)

termination of contract; if he is unable to fulfill his obligation under this contract due to force majeure conditions.

30.2 For purpose of this clause, "Force Majeure" means an event beyond the control of the contractor and not involving the contractor's fault or negligence and not foreseeable, either in its sovereign or contractual capacity. Such events may include but are not restricted to Acts of God, wars or revolutions, fires, floods, epidemics, quarantine restrictions and fright embargoes etc. Whether a "Force majeure" situation exists or not, shall be decided by ANERT and its decision shall be final and binding on the contractor and all other concerned.

30.3 In the event that the contractor is not able to perform his obligations under this contract on account of force majeure, he will be relieved of his obligations during the force majeure period. In the event that such force majeure extends beyond six months, ANERT has the right to terminate the contract in which case, the security deposit shall be refunded to him.

30.4 If a force majeure situation arises, the contractor shall notify ANERT in writing promptly, not later than 14 days from the date such situation arises. The contractor shall notify ANERT not later than 3 days of cessation of force majeure conditions. After examining the cases, ANERT shall decide and grant suitable additional time for the completion of the work, if required.

32. LANGUAGE

All documents, drawings, instructions, design data, calculations, operation, maintenance and safety manuals, reports, labels and any other data shall be in English Language. The contract agreement and all correspondence between ANERT and the bidder shall be in English language.

33. OTHER CONDITIONS

32.1 The Successful bidder shall not transfer, assign or sublet the work under this contract or any substantial part thereof to any other party without the prior consent of ANERT in writing.

32.2 The Successful bidder shall not display the photographs of the work and not take advantage through publicity of the work without written permission of ANERT.

32.3 The Successful bidder shall not make any other use of any of the documents or information of this contract, except for the purposes of performing the contract.

32.4 Successors and Assigns:

In case ANERT or Successful bidder may undergo any merger or amalgamation or a scheme of arrangement or similar re-organization & this contract is assigned to any entity (ies) partly or wholly, the contract shall be binding mutatis mutandis upon the successor entities & shall continue to remain valid with respect to obligation of the successor entities.

32.5 Severability:

It is stated that each paragraph, clause, sub-clause, schedule or annexure of this contract shall be deemed severable & in the event of the unenforceability of any paragraph, clause sub-clause, schedule or the remaining part of the paragraph, clause, sub-clause, schedule annexure & rest of the contract shall continue to be in full force & effect.

32.6 Counterparts

This contract may be executed in one or more counterparts, each of which shall be deemed an original & all of which collectively shall be deemed one of the same instruments.

32.7 Rights and Remedies under the contract only for the parties

This contract is not intended & shall not be construed to confer on any person other than the ANERT & Successful bidder hereto, any rights and / or remedies herein.

BID EVALUATION

34. BID EVALUATION

The evaluation process comprises the following four steps:

Step I - Responsiveness check of Techno Commercial Bid

Step II - Evaluation of Bidder's fulfilment of Eligibility Criteria as per Clause 16

Step III - Evaluation of Price Bid

Step IV - Successful Bidders(s) selection

I. Responsiveness check of Techno Commercial Bid

The Techno Commercial Bid submitted by Bidders shall be scrutinized to establish responsiveness to the requirements laid down in the RFS subject to Clause 16.1 and Clause 16.2. Any of the following may cause the Bid to be considered "non-responsive", at the sole discretion of ANERT:

- a. Bids that are incomplete, i.e. not accompanied by any of the applicable formats inter alia covering letter, power of attorney supported by a board resolution, applicable undertakings, format for disclosure, etc.;
- b. Bid not signed by authorized signatory and /or stamped in the manner indicated in this RFS;
- c. Material inconsistencies in the information /documents submitted by the Bidder, affecting the Eligibility Criteria;
- d. Information not submitted in the formats specified in this RFS;
- e. Bid being conditional in nature;
- f. Bid having Conflict of Interest;
- g. More than one Member of a Bidding Company using the credentials of the same Parent Company /Affiliate;
- h. Bidder delaying in submission of additional information or clarifications sought by ANERT as applicable;
- i. Bidder makes any misrepresentation.

Each Bid shall be checked for compliance with the submission requirements set forth in this RFS before the evaluation of Bidder's fulfilment of Eligibility Criteria is taken up. Clause 16.2 shall be used to check whether each Bidder meets the stipulated requirement.

33.1 Preliminary Examination

33.1.1 ANERT will examine the Bids to determine whether they are complete, whether any computational errors have been made, whether required sureties have been furnished, whether the documents have been properly signed and stamped and whether the Bids are otherwise in order.

33.1.2 Arithmetical errors will be rectified on the following basis. If there is a discrepancy between the unit price and the total Amount that is obtained by multiplying the unit price and quantity, the unit price shall prevail and the total amount shall be corrected. If there is a discrepancy between words and figures, the amount written in words will prevail.

II. Evaluation of Bidder's fulfilment of eligibility criteria

Evaluation of Bidder's Eligibility will be carried out based on the information furnished by the Bidder as per the prescribed Formats and related documentary evidence in support of meeting the Eligibility Criteria as specified in Clause 16.2. Non-availability of information and related documentary evidence for the satisfaction of Eligibility Criteria may cause the Bid to be non-responsive.

III. Evaluation of Price Bid

The Price Bid of only the Qualified Bidders shall be opened in presence of the representatives of such Qualified Bidders, who wish to be present, on a date as may be intimated by ANERT to the Bidders through ANERT. The evaluation of Price Bid shall be carried out based on the information furnished in the BoQ. The Price Bid submitted by the Bidders shall be scrutinized to ensure conformity with the RFS. Any Bid not meeting any of the requirements of this RFS may cause the Bid to be considered "non-responsive" at the sole decision of the ANERT.

IV. Successful Bidder(s) Selection

- i. Bids qualifying in Clause 16.2 shall only be evaluated in this stage.
- ii. The Price Bids of Qualified Bidders shall be ranked from the lowest to the highest. The lowest bidder will be declared as the successful bidder.
- iii. Letter of Acceptance (LOA): The Letter of Acceptance (LOA) shall be issued to Successful Bidder selected as per the provisions of this Clause 33
- iv. The Successful Bidder shall acknowledge the LoA and return duplicate copy with signature & stamp of the authorized signatory of the Successful Bidder to ANERT within Seven (7) days of issue of LoA.
- v. If the Successful Bidder, to whom the Letter of Acceptance has been issued does not fulfil any of the conditions specified in Bid document, ANERT reserves the right to annul/cancel the award of the Letter of Acceptance of the Successful Bidder and forfeit the Bid security.
- vi. ANERT at its own discretion, has the right to reject any or all the Bids without assigning any reason whatsoever, at its sole discretion

35. NOTIFICATION TO SUCCESSFUL BIDDERS

The name of Successful Bidder shall be notified indicating the awarded project price individually through letter of acceptance.

36. REQUIREMENT OF APPROVALS ON MAKES OF THE COMPONENTS:

The modules should be manufactured in India only. Rest of the components can be procured from any source. However, these items should meet the Technical specification and standards mentioned in RFS.

37. OPERATION OF THE SYSTEM DURING WEEKENDS AND GENERAL HOLIDAYS AND CALCULATION OF CUF:

During grid failure, the SPV system stops generating. Any instances of grid failure need to be mentioned in the monthly report and those instances need to be authorised by local DISCOM. Then the period will be excluded in calculation of CUF.

38. COMMERCIAL OPERATION DATE:

38.1 Document Submission for Issue Commissioning/ Completion Certificate:

The following documents will be deemed to form the completion documents:

- a. Project completion report from successful bidder as per ANERT format
- b. Project completion/satisfaction certificate from ANERT.

38.2 Commercial Operation Date

If the results of system acceptance testing indicate that the System is capable of generating electric energy (at full rated kWp) for 3 continuous days using such instruments and meters as have been installed for such purposes, then the power producer shall send a written notice to Employer to that effect, and the date of successful conducting such tests and injection of power at delivery point shall be the "Commercial Operation Date"

39. CORRUPT OR FRAUDULENT PRACTICES

The Successful Bidders/ Contractors should follow the highest standard of ethics during the execution of contract. In pursuance of this policy, ANERT:

39.1 defines, for the purposes of this provision, the terms set forth as follows:

- a. "corrupt practice" means the offering, giving, receiving or soliciting of anything of value to influence the action of a public official in the bid process or in contract execution; and
- b. "fraudulent practice" means a misrepresentation of facts in order to influence a bid process or the execution of a contract to the detriment of ANERT/Govt. scheme, and includes collusive practice among Bidders (prior to or after Bid submission) designed to establish Bid prices at artificial non-competitive levels and to deprive ANERT of the benefits of free and open competition;
- c. will declare a firm ineligible/debarred, either indefinitely or for a specific period of time, a GOVT contract if at any time it is found that the firm has engaged in corrupt or fraudulent practices in competing for, or in executing, a Government/ ANERT schemes.



**AGENCY FOR NEW & RENEWABLE ENERGY
RESEARCH AND TECHNOLOGY (ANERT)**

Department of Power, Government of Kerala
Thiruvananthapuram, Kerala – 695 033;
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E-TENDER DOCUMENT

***Request for Selection (RFS) of agency for the
Implementation of 2 MW Solar Power Plant at
Travancore Titanium Products Ltd., Kochuveli,
Thiruvananthapuram under Solar City project funded
by Smart City Thiruvananthapuram Ltd***

Ref. No.: ANERT-TECH/99/2022-T2

VOL – 3: TECHNICAL SPECIFICATIONS

Date of Publishing of Bids : - 12/04/2023

Last Date of Submission of Bids : - 26/04/2023

TECHNICAL SPECIFICATIONS

The proposed projects shall be commissioned as per the technical specifications given below.

40. DEFINITION

A Grid Tied Solar Photo Voltaic (SPV) power plant consists of SPV array, Module Mounting Structure, Power Conditioning Unit (PCU) consisting of Maximum Power Point Tracker (MPPT), Inverter, and Controls & Protections, interconnect cables and switches. PV Array is mounted on a suitable structure. Grid tied SPV system do not have battery backup and should be designed with necessary features to supplement the grid power during day time. Components and parts used in the SPV power plants including the PV modules, metallic structures, cables, junction box, switches, PCUs etc., should conform to the BIS or IEC or international specifications, wherever such specifications are available and applicable.

Solar PV system shall consist of following equipments/components.

- Solar PV modules consisting of required number of **Crystalline** PV modules.
- Grid interactive Power Conditioning Unit with Remote Monitoring System
- Mounting structures
- String Monitoring Units / Junction Boxes.
- Power evacuation system
- Earthing and lightening protections.
- IR/UV protected PVC Cables, pipes and accessories
- RTTU / Metering

The detailed list of certifications and standards to be followed are given in annexure – F

41. SYSTEM COMPONENTS - TECHNICAL COMPLIANCE FOR SYSTEM COMPONENTS

S/N	System Component	Capacity/ rating	Minimum Technical Compliance
1.	Solar panel (MONO PERC Half cut of capacity 500 Wp or above)	As per the required capacity	IS 14286 - Design Qualification and Type Approval for Crystalline Silicon Terrestrial Photovoltaic (PV) Modules
			IEC/IS 61730: Part I & II;
2.	Grid Tied Inverter (DC to AC ratio of 1.2 to be maintained at all sites)	As per the required capacity	IS 16221: Part 1 &2 - Safety of Power Converters for use in Photovoltaic Power Systems
			IS 16169 - Test Procedure of Islanding Prevention Measures for Utility-Interconnected Photovoltaic Inverters
3.	Module Mounting Structure	As per the required capacity	IS 2062 - Hot Rolled Medium and High Tensile structural Steel
			IS 4759 - Hot-dip Zinc Coatings on structural steel and other products
4.	Cables	As required	IEC 60227 / IS 694
			IEC 60502 / IS 1554 (Pt. I & II)
5.	Switches/ Circuit Breakers	As required	IEC 60947 part I, II, III / IS 60947 Part I, II, III
6.	Connectors		EN 50521
7.	Surge Protection Device		IEC 60364-5-53 / IS 15086-5
8.	Junction Boxes/Enclosures for Inverters/ Charge Controllers	As required	IP 54 (for outdoor) or IP 65 / IP 21(for indoor) as per IEC 529
9.	Energy Meter for Recording Solar Electricity Generated & Two-way meter for Distribution Licensee grid connection		As per CEA Regulations; IEC 60687/ IEC 62052-11 / IEC 62053-22 / IS 14697
10.	Lightning Protection	As required	As per IEC 62305 / IEC 62561
11.	Electrical Grounding (Earthing)	As required	As per IS 3043

42. SOLAR PHOTOVOLTAIC MODULES:

42.1 The PV modules used should be made in India and should be from the ALMM list issued by MNRE from time to time of Mono PERC type having module capacity of 500Wp or above.

42.2 The PV modules used must qualify to the latest edition BIS standards for Crystalline Silicon Solar Cell Modules - IS 14286. In addition, the modules must conform to IEC 61730 Part-2- requirements for construction & Part 2 – requirements for testing, for safety qualification or equivalent IS.

- i. For the PV modules to be used in a highly corrosive atmosphere throughout their lifetime, they must qualify to IEC 61701/IS 61701
- ii. The total solar PV array capacity should not be less than 2 MWp and should comprise of solar crystalline modules of MONO PERC type of minimum 525 Wp and above wattage. Module capacity less than minimum 525 watts shall not be accepted. Inspection of testing of PV array will be conducted by the Tendering Authority including identification of panels ready for dispatch to be confirmed with details provided in RFID tag using RFID reader at site during FAT. The RFID details of each module shall be issued to the employer during FAT.
- iii. Protective devices against surges at the PV module shall be provided. Low voltage drop bypass diodes shall be provided.
- iv. PV modules must be tested and approved by one of the BIS approved test centers.
- v. The module frame shall be made of corrosion resistant materials, preferably having anodized aluminum.
- vi. The bidder shall carefully design & accommodate requisite numbers of the modules to achieve the rated power in his bid. ANERT shall allow only minor changes at the time of execution.
- vii. Other general requirement for the PV modules and subsystems shall be the Following:
 - a. The rated output power of any supplied module shall have tolerance of $\pm 3\%$.
 - b. The peak-power point voltage and the peak-power point current of any supplied module and/or any module string (series connected modules) shall

not vary by more than 2 (two) per cent from the respective arithmetic means for all modules and/or for all module strings, as the case may be.

- c. The module shall be provided with a junction box with either provision of external screw terminal connection or sealed type and with arrangement for provision of by-pass diode. The box shall have hinged, weather proof lid with captive screws and cable gland entry points or may be of sealed type and IP-65 rated.
 - d. IV curves at STC should be provided by bidder.
- 42.3 Modules deployed must use a RF identification tag. The following information must be mentioned in the RFID used on each module (This can be inside or outside the laminate, but must be able to withstand harsh environmental conditions).
- a. Name of the manufacturer of the PV module
 - b. Name of the manufacturer of Solar Cells.
 - c. Month & year of the manufacture (separate for solar cells and modules)
 - d. Country of origin (separately for solar cells and module)
 - e. I-V curve for the module Wattage, I_m , V_m and FF for the module
 - f. Unique Serial No and Model No of the module
 - g. Date and year of obtaining BIS PV module qualification certificate.
 - h. Name of the test lab issuing BIS certificate.
 - i. Other relevant information on traceability of solar cells and module as per ISO 9001 and ISO 14001

42.4 Warranties:

A. Material Warranty:

- i. Material Warranty is defined as: The manufacturer should warrant the Solar Module(s) to be free from the defects and/or failures specified below for a period not less than five (10) years from the date of sale to the original customer ("Customer")
- ii. Defects and/or failures due to manufacturing
- iii. Defects and/or failures due to quality of materials

- iv. Non conformity to specifications due to faulty manufacturing and/or inspection processes. If the solar Module(s) fails to conform to this warranty, the manufacturer will repair or replace the solar module(s), at the Owners sole option

B. Performance Warranty:

- i. The predicted electrical degradation of power generated not more than 10% after ten years' period and not exceeding 20% of the minimum rated power over the 25-year period and of the full rated original output.

42.5 Use of advance cell technologies

- a. The Contractor shall try to maximize the output within the allocated area. The contractor is allowed to propose use of new and better technology. (Eg. Bifacial Modules)
- b. Additionally, the bidder at bidding stage may propose modern methods for maintenance & cleaning of the plant. Technology employing drone, cleaning methods without water, which will automate the maintenance and reduce the cost of maintenance may be proposed.
- c. Based on the technology employed, the contractor has to design, Electrical System Features, Architecture and Structural requirement and the same shall be implemented with the prior approval of ANERT. The tenderer at tender stage shall submit the details of the technology proposed. The tender submission shall also include the proposed modified structure also. The capacity mentioned in the tender is indicative and extra capacity over and above the indicative capacity mentioned will be permitted, based on the technology proposed and employed.

43. ARRAY STRUCTURE

43.1 For Ground Mounted:

- a. Hot dip galvanized MS as per specifications BIS 2062 or shall be cold formed light gauge structural steel sections with IS 811: 1987/IS 801: 1975 having galvanization thickness as per BIS 4759 -amended upto date; may be used for mounting the modules/ panels/arrays. Each structure should have angle of inclination as per the

site conditions to take maximum insolation. However, to accommodate more capacity the angle inclination may be reduced until the plant meets the specified performance ratio requirements.

- b. The Mounting structure shall be so designed to withstand the speed for the wind zone of the location where a PV system is proposed to be installed (min wind speed of 150 km/ hour). It may be ensured that the design has been certified by a recognized Lab/ Institution in this regard and submit wind loading calculation sheet to ANERT. Suitable fastening arrangement such as grouting and calming should be provided to secure the installation against the specific wind speed. The array design shall be submitted with the STAAD structural design report for the materials used with relevant IS.
- c. Structural material shall be corrosion resistant and electrolytically compatible with the materials used in the module frame, its fasteners, nuts and bolts. Aluminium structures also can be used which can withstand the wind speed of respective wind zone. Necessary protection towards rusting need to be provided either by coating or anodization.
- d. The fasteners used should be made up of stainless steel. The structures shall be designed to allow easy replacement of any module. The array structure shall be so designed that it will occupy minimum space without sacrificing the output from the SPV panels
- e. Regarding civil structures, the bidder needs to take care of the load bearing capacity of the soil at the site of installation. The soil is fine sand and specific care is to be taken while designing the foundation. The foundation design must be submitted to ANERT duly certified by a chartered structural engineer before start of works.
- f. The minimum clearance of the structure from the ground level should be 200 mm for ground mounted installations
- g. The array will be installed on steel racking structures that are anchored in the ground. Racks will be laid out in parallel matrices allowing for individuals to access the area between the racks for cleaning and other maintenance needs. In between the row of solar panels sufficient gap need to be provided to avoid falling of shadow

of previous row on the next row. Seismic factors for the site will be considered while making the design of the foundation.

43.2 For Ground Mounted:

- a. Photovoltaic arrays must be mounted on a stable, durable structure that can support the array and withstand wind, rain, and other adverse conditions. The modules will be fixed on structures with fixed arrangement.
- b. The module mounting structures shall have adequate strength and appropriate design suitable to the locations, which can withstand the load and high wind velocities. Stationary structures shall support PV modules at a given orientation, absorb and transfer the mechanical loads to the surface properly.
- c. Wherever required, suitable number of PV panel structures shall be provided. Structures shall be of flat-plate design using minimum size of C (75 x 40 x 5mm) or L (55 x 55 x 5mm) or I (60x 40x 4mm) sections or higher dimensions for respective sections.
- d. Each structure with fixed tilt should have a tilt angle as per the site conditions to take maximum insolation which will be approximately equal to the latitude of the location facing true South with a North - South orientation. The tilt angle can vary from 9 degree to 12 degree based on the location's latitude in Kerala
- e. The PV module mounting structure shall have a capacity to withstand a wind velocity of 150 km/hr unless specified for dedicated requirements
- f. Suitable fastening arrangement such as grouting and calming should be provided to secure the installation against the specific wind speed. The PV array structure design shall be appropriate with a factor of safety of min 1.5.
- g. The materials used for structures shall be Hot dip Galvanized Mild Steel conformed to IS 2062:1992 or aluminium of suitable grade minimum alloy 6063 or better.
- h. The minimum thickness of galvanization for hot dip Galvanized Mild Steel should be at least 80 microns as per IS 4759. The galvanisation thickness will be checked during inspection and the vendor is to arrange the equipment needed for the same at the site.

- i. The Bolts, Nuts, fasteners, and clamps used for panel mounting shall be of Stainless-Steel SS 304.
- j. Structures shall be supplied complete with all members to be compatible for allowing easy installation at the site. Additional Structures/Frames for required for the installation of modules if any need to be provided by the bidder.
- k. The structures shall be designed to allow easy replacement of any module, repairing and cleaning of any module. No Welding is allowed on the mounting structure. Adequate spacing shall be provided between two panel frames and rows of panels to facilitate personnel protection, ease of installation, replacement, cleaning of panels and electrical maintenance
- l. Aluminium structures used shall be protected against rusting either by coating or anodization. Aluminium frames should be avoided for installations in coastal areas.
- m. The structure shall be designed to withstand operating environmental conditions for a period of minimum 25 years. And shall be free from corrosion while installation.
- n. Screw fasteners shall use existing mounting holes provided by module manufacturer. No additional holes shall be drilled on module frames
- o. The total load of the structure (when installed with PV modules) on the roof should be less than 60 kg/m².
- p. Minimum distance between the lower level of PV Module and the ground shall be 0.6m from the ground level.
- q. The PV Panel area shall be accessible for cleaning and for any repair work.
- r. Sufficient gap needs to be provided between the rows to avoid falling of shadow of one row on the next row. Seismic factors for the site will be considered while making the design of the foundation.
- s. Adequate spacing shall be provided between any two modules secured on PV panel for improved wind resistance.
- t. Installation of structure for solar PV mounting should not tamper with the water proofing of the roofs.

43.3 The Rooftop Structures maybe classified in three broad categories as follows (drawings at **Annexure-G**). The bidders are required to quote the rates for each separately in the financial bid:

i. Ballast structure

- a. The mounting structure must be Non-invasive ballast type and any sort of penetration of roof to be avoided.
- b. The minimum clearance of the structure from the roof level should be in between 70 - 150 mm to allow ventilation for cooling, also ease of cleaning and maintenance of panels as well as cleaning of terrace.
- c. The structures should be suitably loaded with reinforced concrete blocks of appropriate weight made out of M25 concrete mixture.

ii. Tin shed

- a. The structure design should be as per the slope of the tin shed.
- b. The inclination angle of structure can be done in two ways
 - b.1. Parallel to the tin shed (flat keeping zero-degree tiling angle), if the slope of shed in Proper south direction
 - b.2. With same tilt angle based on the slope of tin shed to get the maximum output.
- c. The minimum clearance of the lowest point from the tin shade should be more than 100mm.
- d. The base of structure should be connected on the Purlin of tin shed with the proper riveting. e. All structure member should be of minimum 2 mm thickness.

iii. RCC Elevated structure: It can be divided into further three categories:

A. Minimum Ground clearance (300MM – 1000 MM)

- a. The structure shall be designed to allow easy replacement of any module and shall be in line with site requirement. The gap between module should be minimum 30MM.
- b. Base Plate – Base plate thickness of the Structure should be 5MM for this segment.
- c. Column – Structure Column should be minimum 2MM in Lip section / 3MM in C Channel section. The minimum section should be 70MM in Web side and 40MM in flange side in Lip section.

- d. Rafter - Structure rafter should be minimum 2MM in Lip section / 3MM in C Channel section. The minimum section should be 70MM in Web side (y-axis) and 40MM in flange side (x-axis).
- e. Purlin - Structure purlin should be minimum 2MM in Lip section. The minimum section should be 60MM in Web side and 40MM in flange side in Lip section.
- f. Front/back bracing – The section for bracing part should be minimum 2MM thickness.
- g. Connection – The structure connection should be bolted completely. Leg to rafter should be connected with minimum 12 diameter bolt. Rafter and purlin should be connected with minimum 10 diameter bolt. Module mounting fasteners should be SS-304 only and remaining fasteners either SS-304 or HDG 8.8 Grade.
- h. For single portrait structure the minimum ground clearance should be 500MM.

B. Medium Ground clearance (1000MM – 2000 MM)

- a. Base Plate – Base plate thickness of the Structure should be Minimum 6MM for this segment.
- b. Column – Structure Column should be minimum 2MM in Lip section / 3MM in C-Channel section. The minimum section should be 80MM in Web side and 50MM in flange side in Lip section.
- c. Rafter - Structure rafter should be minimum 2MM in Lip section / 3MM in C Channel section. The minimum section should be 70MM in Web side and 40MM in flange side in Lip section.
- d. Purlin - Structure purlin should be minimum 2MM in Lip section. The minimum section should be 70MM in Web side and 40MM in flange side in Lip section.
- e. Front/back bracing – The section for bracing part should be minimum 2MM thickness.
- f. Connection – The structure connection should be bolted completely. Leg to rafter should be connected with minimum 12 diameter bolt. Rafter and purlin should be connected with minimum 10 diameter bolt. Module mounting fasteners should be SS-304 only and remaining fasteners either SS-304 or HDG 8.8 Grade.

C. Maximum Ground clearance (2000MM – 3000 MM)

- a. Base Plate – Base plate thickness of the Structure should be minimum 8 MM for this segment.
- b. Column – Structure Column thickness should be minimum 2.6MM in square hollow section (minimum 50x50) or rectangular hollow section (minimum 60x40) or 3MM in C-Channel section.
- c. Rafter - Structure rafter should be minimum 2MM in Lip section / 3MM in Channel section. The minimum section should be 80MM in Web side and 50MM in flange side in Lip section.
- d. Purlin - Structure purlin should be minimum 2MM in Lip section. The minimum section should be 80MM in Web side and 50MM in flange side in Lip section.
- e. Front/back bracing – The section for bracing part should be minimum 3MM thickness.
- f. Connection – The structure connection should be bolted completely. Leg to rafter should be connected with minimum 12 diameter bolt. Rafter and purlin should be connected with minimum 10 diameter bolt. Module mounting fasteners should be SS-304 only and remaining fasteners either SS-304 or HDG 8.8 Grade.

D. Super elevated structure (More than 3000 MM)

i. Base structure

- b. Base Plate – Base plate thickness of the Structure should be 10MM for this segment.
- c. Column – Structure Column minimum thickness should be minimum 2.9MM in square hollow section (minimum 60x60) or rectangular hollow section (minimum 80x40).
- d. Rafter - Structure Rafter minimum thickness should be minimum 2.9MM in square hollow section (minimum 60x60) or rectangular hollow section (minimum 80x40)

- e. Cross bracing – Bracing for the connection of rafter and column should be of minimum thickness of 4mm L-angle with the help of minimum bolt diameter of 10mm.

ii. Upper structure of super elevated structure

- a. Base Plate – Base plate thickness of the Structure should be minimum 5MM for this segment.
 - b. Column – Structure Column should be minimum 2MM in Lip section / 3MM in Channel section. The minimum section should be 70MM in Web side and 40MM in flange side in Lip section.
 - c. Rafter - Structure rafter should be minimum 2MM in Lip section / 3MM in Channel section. The minimum section should be 70MM in Web side and 40MM in flange side in Lip section.
 - d. Purlin - Structure purlin should be minimum 2MM in Lip section. The minimum section should be 60MM in Web side and 40MM in flange side in Lip section.
 - e. Front/back bracing – The section for bracing part should be minimum 2MM thickness.
 - f. Connection – The structure connection should be bolted completely. Leg to rafter should be connected with minimum 12 diameter bolt. Rafter and purlin should be connected with minimum 10 diameter bolt. Module mounting fasteners should be SS-304 only and remaining fasteners either SS-304 or HDG 8.8 Grade.
- iii. If distance between two legs in X-Direction is more than 3M than sag angle/Bar should be provide for purlin to avoid deflection failure. The sag angle should be minimum 2MM thick, and bar should be minimum 12Dia.
- iv. Degree - The Module alignment and tilt angle shell be calculated to provide the maximum annual energy output. This shall be decided on the location of array installation
- v. Foundation – Foundation should be as per the roof condition; two types of the foundation can be done- either penetrating the roof or without penetrating the roof.
- a) If penetration on the roof is allowed (based on the client requirement) then minimum 12MM diameter anchor fasteners with minimum length 100MM can

be used with proper chipping. The minimum RCC size should be 400x400x300 cubic mm. Material grade of foundation should be minimum M20.

- b) If penetration on roof is not allowed, then foundation can be done with the help of 'J Bolt' (refer IS 5624 for foundation hardware). Proper Neto bond solution should be used to adhere the Foundation block with the RCC roof. Foundation J - bolt length should be minimum 12MM diameter and length should be minimum 300MM.

44. ARRAY JUNCTION BOXES (JBs)

- a. The junction boxes are to be provided in the PV array for termination of connecting cables. The J. Boxes (JBs) shall be made of GRP/FRP/Powder Coated Aluminum /cast aluminum alloy with full dust, water & vermin proof arrangement. All wires/cables must be terminated through cable lugs. The JB's shall be such that input & output termination can be made through suitable cable glands.
- b. Copper bus bars/terminal blocks housed in the junction box with suitable termination threads Conforming to IP65 standard and IEC 62208 Hinged door with EPDM rubber gasket to prevent water entry. Single / double compression cable glands, Provision for earthing the box must be provided.
- c. Each Junction Box shall have High quality Suitable Capacity Metal Oxide Varistors (MOVs) / SPDs, suitable Reverse Blocking Diodes. The Junction Boxes shall have suitable arrangement monitoring and disconnection for each of the groups. Each string combiner box/ junction box will have suitable Reverse Blocking Diodes of maximum DC blocking voltage of 600 / 1000V or as per the system requirement with suitable arrangement for its connecting.
- d. Suitable markings shall be provided on the bus bar for easy identification and the cable ferrules must be fitted at the cable termination points for identification
- e. The junction boxes/ enclosures should be IP 65(for outdoor)/ IP 54 (indoor) and as per IEC 529 specifications. The Junction boxes / string combiner boxes shall conform to IEC 60529 (Degrees of Protection provided by Enclosures (IP Code))

45. DC DISTRIBUTION BOARD:

- a. DC Distribution panel to receive the DC output from the array field. DC generated by the solar modules is transmitted through the appropriate cables from Array Yard to Control facility. DC bus & panel should be provided for the incoming DC supply from array yard. The panel should consist of adequate size.
- b. DC DPBs shall have sheet from enclosure of dust & vermin proof conform to IP 65 protection. The bus bars are made of copper of desired size. Suitable capacity MCBs/MCCB shall be provided for controlling the DC power output to the PCU along with necessary surge arrestors.

46. AC DISTRIBUTION PANEL BOARD:

- a. AC Distribution Panel Board (DPB) shall control the AC power from PCU/ inverter, and should have necessary surge arrestors. Output from the inverter shall be fed to the ACDB through 4 pole MCCB of suitable current rating and multifunction export solar meter.
- b. All switches and the circuit breakers, connectors should conform to IEC 60947, part I, II and III/ IS60947 part I, II and III.
- c. The changeover switches, cabling work should be undertaken by the bidder as part of the project.
- d. All the Panel's shall be metal clad, totally enclosed, rigid, floor mounted, air - insulated, cubical type suitable for operation on three phase / single phase, 415 or 230 volts, 50 Hz
- e. The panels shall be designed for minimum expected ambient temperature of 45 degrees Celsius, 80 percent humidity and dusty weather.
- f. All indoor panels will have protection of IP54 or better. All outdoor panels will have protection of IP65 or better.
- g. Should conform to Indian Electricity Act and rules (till last amendment).
- h. All the 415 AC or 230 volts' devices / equipment like bus support insulators, circuit breakers, SPDs, VTs etc., mounted inside the switchgear shall be suitable for

continuous operation and satisfactory performance under the following supply conditions

Variation in supply voltage +/- 10 %

Variation in supply frequency +/- 3 Hz

47. PCU/ARRAY SIZE RATIO:

- a. The combined wattage of all inverters should not be less than 80% of rated capacity of DC power of the plant under STC.
- b. Maximum power point tracker shall be integrated in the PCU/inverter to maximize energy drawn from the array.

48. PCU/ INVERTER:

The Power Conditioning Unit shall be String Inverter with power exporting facility to the Grid. The DC to AC ratio of 1.25 is to be maintained at all sites. (For eg. – For DC capacity of 100 kWp, the AC capacity of minimum 80 kW is to be maintained). Preferred Makes – Fronius / ABB / SMA

General Specifications:

48.1 All the Inverters should contain the following clear and indelible Marking Label & Warning Label as per IS16221 Part II, clause 5. The equipment shall, as a minimum, be permanently marked with:

- a. The name or trademark of the manufacturer or supplier.
- b. A model number, name or other means to identify the equipment.
- c. A serial number, code or other markings allowing identification of manufacturing location and the manufacturing batch or date within a three-month time period.
- d. Input voltage, type of voltage (A.C. or D.C.), frequency, and maximum continuous current for each input.
- e. Output voltage, type of voltage (A.C. or D.C.), frequency, maximum continuous current, and for A.C. outputs, either the power or power factor for each output.
- f. The Ingress Protection (IP) rating

- 48.2 The inverter output shall be 415 VAC, 50 Hz, 3 phase.
- 48.3 The inverter shall include appropriate self-protective and self-diagnostic feature to protect itself and the PV array from damage in the event of inverter component failure or from parameters beyond the inverter's safe operating range due to internal or external causes.
- 48.4 PCU shall have the dynamic and efficient MPPT algorithm behaviour which finds maximum power point even in low light conditions. The PCU Company should be able to display this feature.
- 48.5 The PCU shall be supplied with in-built advanced grid feed-in feature along with dynamic feed-in control considering self-consumption. The PCU shall also include control functions for optimum feed-in of reactive power and effective power. The amount of reactive power injection and absorption can be controlled depending upon under/over excited systems.
- 48.6 The PCU shall have a provision of external shutdown via remote signal separately with an in-built floating-point contact or similar option using any minimum interface which is to ensure the emergency stop function in the inverter
- 48.7 The PCU shall have a higher degree of ingress protection of IP 65 to handle robust environment conditions from dust and water ingress under complete outdoor installations.
- 48.8 The data logger should possess the feature of extracting the data externally with open protocols like Modbus TCP/RTU. The manufacturer should provide the Modbus register mapping file to utilise this feature
- 48.9 **The inverter shall have an efficient cooling concept with better power derating feature to handle higher temperatures and ensure the best efficiency. The inverter shall be able to provide full rated output power even at ambient temperatures of 50°C. The manufacturer to provide the power derating curves to demonstrate the same.**
- 48.10 The inverter shall be flexible in terms of the installation and should be capable for installation in a horizontal position facilitating easy installation for site specific requirements.

- 48.11 The inverter shall have an integrated feature of emergency stop to halt the inverter from operation considering safety scenarios
- 48.12 The PCU manufacturer should have an authorised service centre in Kerala. The details of the service centre along with the spare list must be submitted along with the bid.
- 48.13 **PCU should be able to respond smoothly to the voltage fluctuations on the low-tension grid via active & reactive power control/ support. The PCU should be able to respond separately to fulfil below mentioned:**
- 48.13.1 Finding out optimisation of the system**
- 48.13.2 Optimal power distribution on each phase**
- 48.13.3 Prevent PCU from unnecessary disconnections**
- 48.14 The PCU Company should have grid connected solar plants running in the country with inverters at least 7 years from the time of bidding to showcase the service reliability and long-term presence. Also, the PCU should have local presence in the county for at least last 5 years. The PCU manufacturer to provide details to authenticate the same.
- 48.15 The Technical Specification of On-Grid Inverters are summarized below:

Specifications of Inverters	
Parameters	Detailed specification
Nominal voltage	230V/415V
Voltage Band	Between 80% and 110% of V nominal
Nominal Frequency	50 Hz
Operating Frequency Range	47.5 to 50.5 Hz
Waveform	Sine wave
Harmonics	AC side total harmonic current distortion < 3%
Ripple	DC Voltage ripple content shall be not more than 1%
Efficiency	Efficiency shall be >98%
Casing protection levels	Degree of protection: Min IP-65
Operating ambient Temp range	-10 to + 60 degree Celsius
Operation	Completely automatic including wakeup, synchronization (phase locking) and shut down
MPPT	MPPT range must be suitable to individual array voltages

Specifications of Inverters	
Parameters	Detailed specification
Protection Class	1
Protections	Over voltage: both input and output Over current: both input and output Over / Under grid frequency Over temperature Short circuit Lightning Surge voltage induced at output due to external source Islanding
Ingress Protection	IP 65
Recommended LED indications	ON Grid ON Under/ Over voltage Overload Over temperature
Recommended LCD Display on front Panel	DC input voltage DC current AC Voltage (all 3 phases) AC current (all 3 phases) Frequency Ambient Temperature Instantaneous power Cumulative output energy Cumulative hours of operation Daily DC energy produced
Communication Interface	RS485/ RS232/Wi-Fi (with or without USB)

48.16 The Technical Specification for Interconnection are summarized below:

Sl No	Parameters	Requirements	Reference
1	Overall conditions of service	Reference to regulations	Conditions for Supply of Electricity
2	Overall Grid Standards	Reference to regulations	Central Electricity Authority (Grid standards) Regulations 2010

3	Equipment	Applicable industry standards	IEC/EN standards
4	Safety and Supply	Reference to regulations, (General safety requirements	Central Electricity Authority (Measures of safety and electricity supply) Regulations, 2010 and subsequent amendments
5	Meters	Reference to regulations and additional conditions issued by the commission.	Central Electricity Authority (Installation & operation of meters) regulations 2006 and subsequent amendments
6	Harmonic current	Harmonic current injections from a generating station shall not exceed the limits specified in IEEE 519	IEEE 519 relevant CEA (Technical Standards for connectivity of the distributed generation resource) Regulations 2013 and subsequent amendments
7	Synchronization	Photovoltaic system must be equipped with a grid frequency synchronization device, if the system is using synchronizer inherently built in to the inverter, then no separate synchronizer is required	Relevant CEA (Technical Standards for Connectivity of the distributed generation resources) regulations 2013 and subsequent amendments.
8	Voltage	The voltage-operating window should minimize nuisance tripping and should be under operating range of 80% to 110% of the nominal connected voltage. beyond the clearing time of 2 seconds, the Photovoltaic system must isolate itself from the grid	
9	Flicker	Operation of Photovoltaic system should not cause	Relevant CEA regulations 2013 and subsequent if

		voltage flicker in excess of the limits stated in IEC 61000 or other equivalent Indian standards if any	any, (Technical standards for connectivity of the distributed generation resource)
10	Frequency	When the distribution system frequency deviates outside the specified limits (50.5 Hz on upper side and 47.5 Hz on lower side) up to 0.2 sec, the Photovoltaic systems shall automatically disconnect from grid and be in island mode.	
11	DC injection	Photovoltaic system shall not inject DC current greater than 0.5% of full rated output at the interconnection point or 1% rated inverter output current into distribution system under any operating conditions.	
12	Power Factor	While the output of the inverter is greater than 50%, a lagging power factor greater than 0.9 shall be maintained.	
13	Islanding and Disconnection	The photovoltaic system in the event of voltage or frequency variations must island/disconnect itself with the time stipulated as per IEC standards	
14	Overload and overheat	The inverter should have the facility to automatically switch off in case of overload or overheat and should restart when normal conditions are restored	

48.17 The Certifications of On-Grid Inverters are summarized below:

Standard	Description
IS 16221-2	Safety of Power Converters for use in Photovoltaic Power Systems Part 2 (Particular Requirements for Inverters)
IEC 61683	Photovoltaic systems - Power conditioners - Procedure for measuring efficiency
IEC 61727	Photovoltaic (PV) systems- Characteristics of the utility interface
IEC/EN 62109-1	Safety of power converters for use in photovoltaic power systems - Part 1: General requirements
IEC/EN 62109-2	Safety of power converters for use in photovoltaic power systems - Part 2: Particular requirements for inverters
IEC/EN 61000-3-3/ 3-11/ 3-5	Electromagnetic compatibility (EMC) - Part 3-11; Limits; Limitation of Voltage Change, Voltage Fluctuations and Flicker in Public Low- Voltage Supply Systems; Rated Current <16A / >16A and <75A / >75A per Phase respectively
IEC/EN 61000-3-2/ -3-12/ -3-4	Electromagnetic compatibility (EMC) - Part 3-12; Limits; Limits for Harmonic Currents produced by equipment connected to the public low voltage systems with Rated Current <16A / >16A and <75A / >75A per Phase respectively
*IEC/EN 61000-6-1 / 6-2	Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity standard for residential and commercial / industrial environments
*IEC/EN 61000-6-3 / 6-4	Electromagnetic compatibility (EMC) - Part 6-4: Generic standards - Emission standard for residential and commercial / industrial environments
IEC 62116 / IS 16169	Utility-interconnected photovoltaic inverters - Test procedure of islanding prevention measures
IEC 60068-2-1	Environmental testing - Part 2-1: Tests - Test A: Cold
IEC 60068-2-2	Environmental testing - Part 2-2: Tests - Test B: Dry heat
IEC 60068-2-14	Environmental testing - Part 2-14: Tests - Test N: Change of temperature
IEC 60068-2-30	Environmental testing - Part 2-30: Tests - Test Db; Damp heat, cyclic (12 h + 12 h cycle)

***Recommended but not mandatory**

49. INTEGRATION OF PV POWER WITH GRID:

The output power from SPV would be fed to the inverters which converts DC produced by SPV array to AC and feeds it into the main electricity grid after synchronization. In case of grid failure, or low or high voltage, solar PV system shall be out of synchronization and shall be disconnected from the grid.

50. REMOTE MONITORING SYSTEM

A dedicated Remote Monitoring System (Hardware and software) for monitoring the plant shall be provided even if the inverter has embedded data logging system. The following weather parameters are to be measured as part of the datalogging system.

a) Solar Irradiance:

A Pyranometer/ Solar cell-based irradiation sensor (along with calibration certificate) shall be provided, with the sensor mounted in the plane of the array.

b) Temperature: Integrated temp, sensors for measuring the module surface temp., inverter inside enclosure temp, and ambient temp to be provided complete with readouts integrated with the data logging system.

It is recommended that the following important parameters shall be accessible through the Data Logging Facility.

- i. AC Voltage
- ii. AC Output current
- iii. Output Power
- iv. Energy in kWh
- v. DC Input Voltage
- vi. DC Input Current
- vii. Ambient Temperatures
- viii. Inverter Status
- ix. Irradiation
- x. Module temperature

Provision for Internet monitoring and download of historical data shall be incorporated. GSM Modem/Wi Fi modem in case GSM connectivity is used or Wireless Router + modem in case Ethernet connection is being used for remote access must be provided. The data is to be transmitted to ANERT server as well as to the Integrated Command and Control Centre (ICCC) developed by Smart City Thiruvananthapuram Ltd. The successful bidder has to undertake all the works required for such deployment including software and arrange for APIs etc.

51. PROTECTIONS

The system should be provided with all necessary protections like earthing, Lightning, and grid islanding as follows:

51.1 LIGHTNING PROTECTION

The SPV power plants shall be provided with lightning & overvoltage protection. The main aim in this protection shall be to reduce the over voltage to a tolerable value before it reaches the PV or other sub system components. The source of over voltage can be lightning, atmosphere disturbances etc. The entire space occupying the SPV array shall be suitably protected against Lightning by deploying required number of Lightning Arrestors. Lightning protection should be provided as per IS/IEC 62305 standard. The protection against induced high-voltages shall be provided by the use of metal oxide varistors (MOVs) and suitable earthing such that induced transients find an alternate route to earth.

51.2 SURGE PROTECTION

The system should have installed with Surge Protection Device (SPD) for higher withstand of the continuous PV-DC voltage during earth fault condition. SPD shall have safe disconnection and short circuit interruption arrangements through integrated DC in-built bypass fuse (parallel) which should get tripped driving failure mode of MOV, extinguishing DC arc safely in order to protect the installation against fire hazards. The SPD should be provided in the AC Distribution Box as well.

51.3 EARTHING PROTECTION

- i. Each array structure of the PV yard should be grounded/ earthed properly as per IS:3043-1987. In addition, the lighting arrester/masts should also be earthed inside the array field. Earth Resistance shall be tested in presence of the representative of ANERT as and when required after earthing by calibrated earth tester. PCU, ACDB and DCDB should also be earthed properly.
- ii. Earth resistance shall not be more than 5 ohms. It shall be ensured that all the earthing points are bonded together to make them at the same potential.
- iii. Earthing System shall connect all non-current carrying metal receptacles, electrical boxes, appliance frames, chassis and PV module mounting structures in one long run. The earth strips should not be bolted. Earthing GI strips shall be interconnected by proper welding.
- iv. Masonry enclosure with the earth pit of size not less than 400mm X 400mm (width) complete with cemented brick work (1:6) of minimum 500 mm depth duly plastered with cement mortar (inside), shall be provided. Hinged inspection covers of size not less than 300mm X 300mm with locking arrangement shall be provided. Suitable handle shall be provided on the cover by means of welding a rod on top of the cover for future maintenance.
- v. Earthing system must be interconnected through GI strip to arrive equipotential bonding. The size of the GI earth strip must be minimum 25mm X 6mm.
- vi. The complete earthing system shall be mechanically and electrically connected to provide independent return to earth. All three-phase equipment shall have two distinct earth connections. An earth bus shall be provided inside the control facility. For each earth pit, necessary test point shall have to be provided.

51.4 GRID ISLANDING:

- i. In the event of a power failure on the electric grid, it is required that any independent power-producing inverters attached to the grid turn off in a short period of time. This prevents the DC-to-AC inverters from continuing to feed power into small sections of the grid, known as "islands." Powered islands present a risk to workers who may expect the area to be unpowered, and they may also damage grid-tied equipment. The PV system shall be equipped with islanding protection.

In addition to disconnection from the grid (due to islanding protection) disconnection due to under and over voltage conditions shall also be provided.

- ii. A manual disconnect 4pole isolation switch beside automatic disconnection to grid would have to be provided at utility end to isolate the grid connection by the utility personnel to carry out any maintenance. This switch shall be locked by the utility personnel

52. CABLES

Cables of appropriate size to be used in the system shall have the following characteristics:

- i. Shall meet IEC 60227/IS 694, IEC 60502/IS1554 standards
- ii. Temp. Range: -10°C to $+80^{\circ}\text{C}$.
- iii. Voltage rating 660/1000V
- iv. Excellent resistance to heat, cold, water, oil, abrasion, UV radiation
- v. Flexible
- vi. Sizes of cables between array interconnections, array to junction boxes, junction boxes to Inverter etc. shall be so selected to keep the voltage drop (power loss) of the entire solar system to the minimum. The cables (as per IS) should be insulated with a special grade PVC compound formulated for outdoor use.
- vii. Cable Routing/ Marking: All cable/wires are to be routed in a GI cable tray and suitably tagged and marked with proper manner by good quality ferrule or by other means so that the cable easily identified.
- viii. The Cable should be so selected that it should be compatible up to the life of the solar PV panels i.e. 25years.
- ix. The ratings given are approximate. Bidder to indicate size and length as per system design requirement. All the cables required for the plant provided by the bidder. Any change in cabling sizes if desired by the bidder/approved after citing appropriate reasons. All cable schedules/layout drawings approved prior to installation.
- x. Multi Strand, annealed high conductivity copper conductor PVC type 'A' pressure extruded insulation or XLPE insulation. Overall PVC/XLPE insulation for UV

protection Armored cable for underground laying. All cable trays including covers to be provided. All cables conform to latest edition of IEC/ equivalent BIS Standards as specified below: BoS item / component Standard

Description Standard Number Cables General Test and Measuring Methods, PVC/XLPE insulated cables for working Voltage up to and including 1100 V, UV resistant for outdoor installation IS /IEC 69947.

- xi. For the DC cabling, XLPE or XLPO insulated and sheathed, UV stabilized single core flexible copper cables shall be used; For the AC cabling, PVC or XLPE insulated and PVC sheathed single or, multi-core flexible Aluminium cables shall be used, Outdoor AC cables shall have a UV -stabilized outer sheath.
- xii. The size of each type of DC cable selected shall be based on minimum voltage drop however; the maximum drop shall be limited to 1%.
- xiii. The size of each type of AC cable selected shall be based on minimum voltage drop however; the maximum drop shall be limited to 2 %.
- xiv. The minimum DC cables size shall be 4.0mm² copper; The minimum AC cable size shall be 4.0mm² copper. In three phase systems, the size of the neutral wire shall be equal to the size of the phase wires.
- xv. The following colour code shall be used for cable wires and shall confirm to IEC 69947
 - DC positive: red (the outer PVC sheath can be black with a red line marking)
 - DC negative: black
 - AC single phase: Phase: Red; Neutral: Black
 - AC three phase: phases: Red, Yellow, Blue; Neutral: Black
 - Earth wires: Green

53. CABLING PRACTICE

Cable Cabling is required for wiring from AC output of inverter/PCU to the Grid Interconnection point. It includes the DC cabling from Solar Array to AJB and from AJB to inverter input.

53.1 All cables of appropriate size to be used in the system shall have the following characteristic:

- a. Shall conform to IEC 60227 / IS 694 & IEC 60502 / IS 1554 standards.
 - b. Temperature Range: -10 degree Celsius to +80 degree Celsius
 - c. Voltage rating: 660/1000V
 - d. Excellent resistance to heat, cold, water, oil, abrasion, UV radiation
 - e. Flexible
- 53.2 Sizes of cables between any array interconnections, array to junction boxes, junction boxes to inverter etc. shall be so selected to keep the voltage drop (power loss) of the entire solar system to the minimum (2%).
- 53.3 For the DC cabling, XLPE or XLPO insulated and sheathed, UV stabilized single core flexible copper cables shall be used; multi-core cables shall not be used.
- 53.4 For the AC cabling, PVC or XLPE insulated and PVC sheathed single or, multi-core flexible copper cables shall be used. However, for above 10kWp systems, XLPE insulated Aluminium cable of suitable area of cross section can be used in the AC side subject to a minimum area of cross section of 10 sq.mm. Outdoor AC cables shall have a UV -stabilized outer sheath IS/IEC 69947.
- 53.5 All LT XLPE cables shall conform to IS:7098 part I&II.
- 53.6 The total voltage drop on the cable segments from the solar PV modules to the solar grid inverter shall not exceed 2.0%
- 53.7 The total voltage drop on the cable segments from the solar grid inverter to the building distribution board shall not exceed 2.0%
- 53.8 The DC cables from the SPV module array shall run through a UV-stabilized PVC conduit pipe of adequate diameter with a minimum wall thickness of 1.5mm
- 53.9 Cables and wires used for the interconnection of solar PV modules shall be provided with solar PV connectors (MC4) and couplers
- 53.10 All cables and conduit pipes shall be clamped to the rooftop, walls and ceilings with thermo-plastic clamps at intervals not exceeding 50cm; the minimum DC cables size shall be 4.0mm² copper; the minimum AC cable size shall be 4.0mm² copper. In three phase systems, the size of the neutral wire size shall be equal to the size of the phase wires. Conduits for taking outdoor cables shall be UV treated.

53.11 Cable Marking: All cable/wires are to be marked in proper manner by good quality ferule or by other means so that the cable can be easily identified. The following colour code shall be used for cable wires

- a. DC positive: red (the outer PVC sheath can be black with a red line marking)
- b. DC negative: black
- c. AC single phase: Phase: red; Neutral: black
- d. AC three phase: phases: red, yellow, blue; neutral: black
- e. Earth wires: green

53.12 Cables and conduits that have to pass through walls or ceilings shall be taken through PVC pipe sleeve.

53.13 Cable conductors shall be terminated with tinned copper end ferrules to prevent fraying and breaking of individual wire strands. The termination of the DC and AC cables at the Solar Grid Inverter shall be done as per instructions of the manufacturer, which in most cases will include the use of special connectors.

53.14 All cables and connectors used for installation of solar field must be of solar grade which can withstand harsh environment conditions including high temperatures, UV radiation, rain, humidity, dirt, salt, burial and attack by moss and microbes for 25 years and voltages as per latest IEC standards. DC cables used from solar modules to array junction box shall solar grade copper (Cu) with XLPO insulation and rated for 1.1 kV as per relevant standards only.

53.15 Bending radii for cables shall be as per manufactures recommendations and IS: 1255.

53.16 For laying/termination of cables latest BIS/IEC Codes/ standards shall be followed.

54. FACTORY TESTING

- a. PCU shall be tested prior to shipment and factory test certificate for relevant parameters should be provided with the PCU supplied. ANERT or authorised representative of ANERT may be allowed to witness the tests if required.
- b. Factory testing shall not only be limited to measurement of phase currents, efficiencies, harmonic content and power factor, but shall also include all other

necessary tests/simulation required and requested by the Purchasers Engineers. Tests may be performed at 25, 50, 75 and 100 percent of the rated nominal power.

55 NET METERING AND UTILITY INTERCONNECTION

- a. Net metering equipment (an Import-Export Energy Meter) approved and tested by the electrical utility based on the accuracy class required for the proposed capacity of the system must be provided with the necessary data cables if required.
- b. Net Metering and Utility Interconnection should be accomplished according the Kerala State Electricity Regulatory Commission (Grid Interactive Distributed Solar Energy Systems) Regulations 2014 Clauses (8) & (9) (Notification No. 2096/KSERC/CT/2014 dt. 10th June 2014)

56 INTER CONNECTION OF INVERTER OUTPUT WITH UTILITY GRID

- a. The interconnection of load with inverter output should be done after obtaining permission from Electrical Inspectorate and Electrical Utility.
- b. The plan scheme and drawing related to interconnection details should be submitted to Electrical Inspectorate through a licensed Electrical contractor with the guidance appropriate Engineering Authority.
- c. Licenced contractor has to be engaged for preparation of plan scheme to be submitted to the Kerala State Electricity Licensing Board and necessary fee should be remitted for energisation of Solar Power Plant.
- d. The panel board and distribution board required for AC interconnection should be done as per specification/ instruction given appropriate Engineering Authority.
- e. All the electrical works required for the interconnection of load with inverter output should be done by the successful bidder as a part of the Solar Power Plant installation.
- f. Bidder should visit the actual site and ensure the exact place for providing Solar Modules and Inverter etc. in presence of technical representative from the ANERT.
- g. Net Metering Equipment shall be installed and maintained in accordance with the provisions of The Central Electricity Authority (Installation and Operation of

Meters) Regulations, 2006 as amended from time to time. The Contractor shall maintain the Metering System as per metering code and CEA guidelines. The defective meter shall be immediately tested and calibrated.

- h. The accuracy class of the Net Metering Equipment will be selected so that all levels of energy produced or taken by the Solar Power Plant will be measured accurately, and this equipment has applicable accuracy class.
- i. Net Metering Equipment shall be microprocessor-based conforming to the relevant IEC standards with Advanced Metering Infrastructure (AMI) with RS232 cable facility.
- j. Net Metering Equipment shall measure active energy (both import and export) and reactive energy (import) by 3 ph, 4 wire principle suitable for balanced / unbalanced 3 phase load (With KVAR, KWh, KVA measuring registers). Tri-vector based energy meter shall have an accuracy class of energy measurement of at least Class 0.2 for active energy and at least 0.5 Class for reactive energy according to IEC 60687.
- k. Display parameters: LCD test, KWH import, KWH export, MD in KW export, MD in KW import, Date & Time, AC current and voltages and power factor (Cumulative KWH will be indicated continuously by default)

57 WARRANTY

- a. 10 years' warranty should be provided by the supplier for the system and components or part of the system has to be provided as per the special conditions of the contract.
- b. PV modules used in solar power plants/ systems must be warranted for their output peak watt capacity, which should not be less than 90 % at the end of 10 years and 80% at the end of 25 years
- c. The Warranty Card to be supplied with the system must contain the details of the all the components supplied including serial numbers accompanied with the OEM warranty card

58. OPERATION & MAINTENANCE OF THE PLANT

58.1 For the optimal operation of a PV plant, maintenance must be carried out on a regular basis. All the components should be kept clean. It should be ensured that all the components are fastened well at their due place. The O&M Charges for 10-year period is to be quoted by the bidders

58.2 The service personnel should visit the installations at least once a month for preventive maintenance even if no faults are reported. **Reports of these preventive maintenance visits and generation data should be submitted to the concerned ANERT District Offices on a quarterly basis.**

58.3 Maintenance guidelines for various components viz. solar panels, inverter, wiring etc. are discussed below:

58.3.1 SOLAR PV PANELS

Although the cleaning frequency for the panels will vary from site to site depending on soiling, it is recommended that

- a) The panels are cleaned at least once every thirty days.
- b) Use water and a soft sponge or cloth for cleaning.
- c) Do not use detergent or any abrasive material for panel cleaning.
- d) Iso-propyl alcohol may be used to remove oil or grease stains.
- e) Do not spray water on the panel if the panel glass is cracked or the back side is perforated.
- f) Wipe water from module as soon as possible.
- g) Use proper safety belts while cleaning modules at inclined roofs etc.
- h) The modules should not be cleaned when they are excessively hot. Early morning is particularly good time for module cleaning.
- i) Check if there are any shade problems due to vegetation or new building. If there are, make arrangements for removing the vegetation or moving the panels to a shade-free place.
- j) Ensure that the module terminal connections are not exposed while cleaning; this poses a risk of electric shock.

- k) Never use panels for any unintended use, e. g. drying clothes, chips etc.) Ensure that monkeys or other animals do not damage the panels.

58.3.2 CABLES AND CONNECTION BOXES

- a) Check the connections for corrosion and tightness.
- b) Check the connection box to make sure that the wires are tight, and the water seals are not damaged.
- c) There should be no vermin inside the box.
- d) Check the cable insulating sheath for cracks, breaks or burns. If the insulation is damaged, replace the wire.
- e) If the wire is outside the building, use wire with weather-resistant insulation.
- f) Make sure that the wire is clamped properly and that it should not rub against any sharp edges or corners.
- g) If some wire needs to be changed, make sure it is of proper rating and type.

58.3.3 INVERTER

- a) The inverter should be installed in a clean, dry, and ventilated area.
- b) Remove any excess dust in heat sinks and ventilations. This should only be done with a dry cloth or brush.
- c) Check that vermin have not infested the inverter. Typical signs of this include spider webs on ventilation grills or wasps' nests in heat sinks.
- d) Check functionality, e.g., automatic disconnection upon loss of grid power supply, at least once a month.
- e) Verify the state of DC/AC surge arrestors, cable connections, and circuit breakers.

58.4 Inspection and Maintenance Schedule

Component	Activity	Description	Interval
PV Module	Cleaning	- Clean PV modules with plain water or mild dishwashing detergent. - Do not use brushes, any types of solvents, abrasives, or harsh detergents.	Monthly or as per site conditions
PV Array	Inspection	Check the PV modules and rack for any damage.	Annual

Component	Activity	Description	Interval
		Note down location and serial number of damaged modules.	
	Inspection	Determine if any new objects, such as vegetation growth, are causing shading of the array and move them if possible.	Half Yearly
	Vermin Removal	Remove bird nests or vermin from array and rack area.	Half Yearly
Junction Boxes	Inspection	- Inspect electrical boxes for corrosion or intrusion of water or insects. Seal boxes if required. - Check position of switches and breakers. - Check operation of all protection devices.	Annual
Wiring	Inspection	Inspect cabling for signs of cracks, defects, loose connections, overheating, arcing, short or open circuits, and ground faults.	Annual
Inverter	Inspection Service	- Observe instantaneous operational indicators on the faceplate of the inverter to ensure that the amount of power being generated is typical of the conditions. - Inspect Inverter housing or shelter for physical maintenance, if required.	Monthly
Plant	Monitoring	Operation and Performance Monitoring	Monthly
Spare Parts	Management	Manage inventory of spare parts.	As needed

58.5 The faulty system or components should be replaced/ repaired within 7 days of fault reporting. The servicing should be carried out at the site of installation. If any of the components are to be taken out from the site for repair, a standby must be provided to ensure un-interrupted power generation and the systems functions smoothly.

58.6 Any Delay in servicing beyond 7 days of fault reporting would attract penalty at the rate of at the rate fixed by CEO, ANERT and further actions will be initiated against the agency.

58.7 A designated contact Telephone Number and address should be submitted for reporting faults during the O&M period of 5 years.

59. CIVIL WORKS

While installing solar power plants on rooftops, the physical condition of the rooftop, chances of shading, chances water level rise in the rooftop during raining due improper drainage in the roof-top should be taken in to consideration.

- a. PV array shall be installed in the terrace space free from any obstruction and/or shadow and to minimize effects of shadows due to adjacent PV panel rows.
- b. PV array shall be oriented in the south direction in order to maximize annual energy yield of the plant.
- c. The solar PV array must be installed on the rooftop in such a way that there is sufficient space on the rooftop for maintenance etc.
- d. There should not be any damage what so ever to the rooftop due to setting up of the solar power plant so that on a later day there is leakage of rainwater, etc. from the rooftop.
- e. Some civil works are inevitable for erecting the footings for the module mounting structure as discussed in Module Mounting Structure section. The roof top may be given a suitable grading plaster with suitable leak proof compound so as to render the roof entirely leak proof.
- f. Ample clearance shall be provided in the layout of the inverter and DC/AC distribution boxes for adequate cooling and ease of maintenance.
- g. While cabling the array, care must be taken such that no loose cables lie on the rooftops.
- h. The roof top should look clean and tidy after installation of the array.
- i. Neatness, tidiness and aesthetics must be observed while installing the systems.
- j. RCC Works - All RCC works shall be as per IS 456 and the materials used viz. Cement reinforcement, steel etc. shall be as per relevant IS standards. Reinforcement shall be high strength TMT Fe 415 or Fe 500 conforming to IS: 1786-1985.
- k. Brick Works (If any) - All brick works shall be using 1st class bricks of approved

quality as per IS 3102.

- l. Plastering - Plastering in cement mortar 1:5, 1:6 and 1:3 shall be applied to all.
- m. Display of mandatory items- Single Line Diagram and layout diagram of modules and interconnection at installation site shall be provided near the inverter.
- n. For painting on concrete, masonry and plastered surface IS:2395 shall be followed. For distempering IS 427 shall be followed referred. For synthetic enamel painting IS 428 shall be followed. For cement painting IS 5410 shall be followed.
- o. All Civil works required for the installation of the PV Plant and other civil and electrical work in evacuation infrastructure, wherever necessary, shall be within the scope of the bidder

The layout of Inverter accommodation shall be designed to enable adequate heat dissipation and availability. Mount within the existing infrastructure available in consultation with the Site in charge. String Inverters may be installed with Canopy type structure over it to protect it from frequent monsoon and weather changes.

60. TESTING & COMMISSIONING

- a. The contractor shall provide necessary drawings and documents required by statutory authorities and obtain the approval before taking up erection.
- b. Any modification in the equipment or installation that may be demanded by the inspecting authorities shall be carried out by the contractor at no additional cost to the KSEBL
- c. In accordance with the specific installation instruction as per the manufacturers drawings or as directed by the KSEBL, the successful Bidder shall unload, assemble, erect, install test, commission and hand over all electrical equipments included in this contract after O&M of 10 years.
- d. Erection materials including all consumables, tools, testing instruments or any other equipment required for successful commissioning shall be arranged by the successful Bidder in a timely manner.
- e. All equipment and instruments, indoor and outdoor, shall be marked with No. and provided with danger boards before commissioning.
- f. All Power equipments shall be handled and erected as per the relevant codes of practice and manufacturer's drawings and instruction manuals.

- g. The Contractor shall obtain the temporary Electrical connection for construction purposes and the same has to be dismantled off the premises after completion of erection of plant.

61. PERFORMANCE RATIO TEST (PR TEST)

The Plant should run minimum two weeks without any major equipment failure to start the PR test. The EPC Contractor shall submit two copies of O&M manual with soft copy before the start of PR Test. Depending on the requirement, capacity and suitable Pyranometer shall be installed at locations suggested by ANERT or else METEONORM data shall be considered for calculating PR.

- i. The PR test shall be conducted at site by the Contractor in presence of the ANERT officials as per IEC 61724. The PR test procedure shall be submitted by the Contractor for review and approval. Any special equipment, instrumentation tools and tackles required for the successful completion of the performance test shall be arranged by the Contractor at his own cost.
- ii. The procedure for PR demonstration test shall be as follows:

The Weather monitoring station installed in the plant shall be in working condition for minimum 2 weeks and all the parameters shall be available for analysis and verification. The test report for the calibration shall be submitted by the Contractor for approval. After the successful verification of the initial parameters by ANERT, PR test shall be conducted. The Following factors shall be excluded for calculation;

- Generation loss due to grid outage.
- Irradiance below 250 W/m²
- The measured global solar radiation of the period of the outage of the power evacuation system shall be excluded to calculate average global solar radiation for the period of PR test.

PR is to be calculated as per the below formula:

$$PR = \frac{\text{Measured output in kW}}{\text{Installed Plant capacity in kW} * (1000 / \text{Measured radiation intensity in W/m}^2)}$$

The EPC Contractor shall demonstrate minimum PR of 75% (measured at output of the inverter/solar meter level) in the initial PR test within 7 consecutive days. If the contractor fails to prove the desired performance ratio at the time of completion and during any of the consecutive years of defect liability period, he will be given a second chance to demonstrate the PR within another 7 consecutive days. Still if it is not achieved, the same shall be demonstrated within another 7 consecutive days and still if it is not achieved, EPC contractor shall improve the quality of the plant by replacement of module/other components with all suitable modification requirements on balance of systems at his own cost to achieve the performance ratio. After obtaining Energisation Approval from Electrical Inspectorate and demonstration of minimum specified PR, the solar plant shall be commissioned which shall be the date of completion of the project.

62. DATE OF COMMISSIONING

After the Inspection and approval of the Electrical Inspectorate, date of Energisation to the Grid will be considered as the official Date of Commissioning (CoD) of the project. To ensure PR, the bidder will be allowed EPC contractor shall improve the quality of the plant by replacement of any components with all suitable modification requirements on balance of systems at his own cost to achieve the performance ratio.

63. SOLAR PV SYSTEM FOR MEETING THE ANNUAL ENERGY REQUIREMENT

Key Performance Indicators (For installations above 50 kW)

The following KPIs would be monitored by the ANERT/Owner throughout the contract tenure and the contractor shall furnish monthly reports on above, without fail.

- PV Array Energy Yield
- Final System Yield
- PV System Efficiency (DC/AC)
- Performance Ratio (PR): The performance ratio test as per IS/IEC 61724 has to be carried out at site by the agency in presence of authorized officials of ANERT, deriving sample data within a period of 7 consecutive days sufficient to provide operational data representing insolation and ambient conditions as desired by the

agreement authority to prove the Performance ratio of 75%. If a Solar Plant achieves the Minimum Performance Ratio, then the ANERT will issue Commercial Operation Date Certificate.

- Capacity Utilization Factor (CUF)
- Plant uptime
- Reactive Power Consumption
- Auxiliary Energy Consumption
- CO₂ Savings
- Environment, Health & Safety

64. DANGER BOARDS AND SIGNAGES:

Danger boards should be provided as and where necessary as per IE Act. /IE rules as amended up to date. Three signage shall be provided one each at battery –cum- control room, solar array area and main entry from administrative block. Text of the signage may be finalized in consultation with ANERT/ owner.

65. DRAWINGS & MANUALS:

- i. Two sets of Electrical drawings installation and O&M manuals are to be supplied. Bidders shall provide complete technical data sheets for each equipment giving details of the specifications along with make/makes in their bid along with basic design of the power plant and power evacuation, synchronization along with protection equipment.
- ii. Approved ISI and reputed makes for equipment be used.
- iii. For complete electro-mechanical works, bidders shall supply complete design, details and drawings for approval to ANERT before progressing with the installation work

67. BILL OF MATERIAL

The bidder should provide the bill of material mentioning the quantity of each of the item consisting in the system, along with the offer in the format as show below for each capacity:

Sl. No.	Item	Make (if any)	Model & Individual Capacity (If any)	Qty (Nos)	Rating / Capacity
1.	PV Module				
2.	PCU/Inverter				
3.	DC Cables				
4.	AC Cables				
5.	AJB/SCB				
6.	Module Mounting Structure (MMS)				
7.	ACDB				
8.	Lightning Arrester				
9.	Earthing System Details and No. of Earth pits				
10.	Data Acquisition System				

68. SITE INSPECTON

It is recommended that the bidders visit all the sites listed here for the physical verification and for correctly estimating the quantity, especially related to structure and cabling, before submitting the bids. **Bidder must include all the AC/DC wiring cost, replacement of instrument transformers, panel boards etc only after visiting the proposed site. The quoted amount will be for all the site-specific works and no additional amount will be allotted for any sort of works.**

The site-specific requirement of ladders for accessing PV modules, pathway facility along with handrails in case of sheet roofs are under the scope of the bidder. The Fabrication of Permanent Ladder should be of GI (min14 SWG), coated with Epoxy steel primer with rung spacing not be more than 10 inches and rung width of min 50 inches. Side Handrails / Grab Bars welded on both sides for safety purpose with an extension of

Min 50 inches above the landing or access level. The pathway can be either of GI or FRP material and shall include handrails for safety without causing shade on the PV modules.

69. CLEANING

The bidder shall provide permanent arrangement for module washing in the SPV Plant. Water lines may be drawn to feed water from the available resources. Contractor has to provide additional facility including pipeline, motor for pumping to the additional overhead tank, if required.

70. DISPLAY BOARD

The vendor has to display a board of size at the project site of size minimum 60 cm x 30 cm including the following details

- Plant Name, Capacity, Location, Type of Renewable Energy plant (solar), Date of commissioning etc. The logo of ANERT and details of the scheme as specified in the work order.

71. INSURANCE

- i. The power plant must be insured at every stage of operation – from Material dispatch, storage, completion of installation and till 5 years after commissioning. The insurance coverage on handing over of the system must include all conditions of **Standard Fire and Special Perils Policy (Material Damage)**.
- ii. The insurance premium for the 10 years of warranty is to be paid by the bidder. Only the system components are to be insured. On handing over of the system, the original insurance policy is to be handed over to the authorised person at the site of installation and a copy to ANERT District Office. The annual premium payment receipt must be handed to the authorised person at the site of installation.

72. ENGINEERING DRAWINGS

The bidder should submit and get the necessary approval of the following detailed Engineering Drawings before execution of the project:

- i. Schematic drawing showing the PV panels, Power conditioning Unit(s)/Inverter, Array Junction Boxes (AJBs)/String Combiner Boxes (SJB), AC and DC Distribution Box, Net meters, MSB etc.
- ii. Layout of solar PV Array
- iii. Single Line Diagram (SLD) with specification of all components.
- iv. Design document for Module Mounting Structure (MMS) including certificate showing wind speed withstanding capacity of the structure (STAAD/Equivalent).
- v. Module Mounting Structure (MMS) drawing along with foundation details for the structure.
- vi. Sizes and specification of cables for PV Module interconnections, PV Array to Array Junction Boxes, Array Junction Boxes to Inverter, Inverter to ACDB/ Grid Connection point etc. shall be furnished.

The Vendor shall submit a PVsyst report for PV power plants from 25kWp and above. All PV plant design should contain the following details which should be approved by the concerned officer before installation.

- i. Design of strings including the number of PV modules
- ii. AC Protection (Circuit Breaker, Switches, Fuses, SPD)
- iii. DC Protection (Switches, Fuses, SPD)
- iv. AJB / SCB details
- v. DC Cable size and length from point to point
- vi. AC Cable size and length from point to point
- vii. Earthing system details and number of pits
- viii. Lightning protection details/specification
- ix. PV Syst / Any other software-based Simulation Report

73. SAFETY MEASURES

The bidder shall take entire responsibility for electrical safety of the installation(s) including connectivity with the grid and follow all the safety rules & regulations applicable as per Electricity Act, 2003 and CEA guidelines etc. Adequate firefighting equipment and extinguishing agents of sufficient capacity and quantity must always be available at site

and kept ready for immediate use. The installation of Fire Extinguishers should confirm to BIS standards.

The fire extinguishers shall be provided in the control room housing inverters as well as on the Roof or site where the PV arrays have been installed. One liquefied CO2 fire extinguisher upright type of capacity 8 kg having IS: 2171 -7, IS: 10658 marked per installation of 100kWp shall be supplied by the Successful bidder and kept near the Inverter accommodation and shall also be responsible for periodic renewal during the maintenance period. The fire extinguisher shall be suitable for fighting fire of oils, solvents, gases, paints, varnishes, electrical wiring, live machinery fires and all flammable liquid & gas.



**AGENCY FOR NEW & RENEWABLE ENERGY
RESEARCH AND TECHNOLOGY (ANERT)**

Department of Power, Government of Kerala

Thiruvananthapuram, Kerala – 695 033;

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E-TENDER DOCUMENT

***Request for Selection (RFS) of agency for the
Implementation of 2 MW Solar Power Plant at
Travancore Titanium Products Ltd., Kochuveli,
Thiruvananthapuram under Solar City project funded
by Smart City Thiruvananthapuram Ltd***

Ref. No.: ANERT-TECH/99/2022-T2

VOL – 4: ANNEXURES

Date of Publishing of Bids : - 12/04/2023

Last Date of Submission of Bids : - 26/04/2023

FORMAT 1 - COVERING LETTER

(This letter to be submitted on the official letter head of the tenderer, signed by the authorised signatory.)

Sir,

I/We hereby e-tender to supply, under annexed terms and conditions of contract, the whole of the articles referred to and described in the attached specification and quantity decided by the Agency for New and Renewable Energy Research & Technology (ANERT), at the rates quoted against each item. The articles will be delivered and installed/commissioned operated and maintained for 10 years thereafter within the time and at the place(s) specified in the schedule.

I am/We are remitting herewith the required amount of Rs. towards the cost of e-tender and Earnest Money Deposit by electronic payment vide transaction No dtd.....

Yours faithfully,

Place:

Signature

Date:

Name

Designation

(Office Seal)

FORMAT 2 - POWER OF ATTORNEY

(To be on non-judicial Kerala stamp paper of appropriate value as per Stamp Act relevant to place of execution)

Power of Attorney to be provided by the Bidding Company in favour of its representative as evidence of authorized signatory's authority.

Know all men by these presents, We (name and address of the registered office of the Bidding Company as applicable) do hereby constitute, appoint and authorize Mr./Ms. (name & residential address) who is presently employed with us and holding the position of as our true and lawful attorney, to do in our name and on our behalf, all such acts, deeds and things necessary in connection with or incidental to submission of our Bid for Implementation of 2 MW Solar Power Plant at Travancore Titanium Products Ltd., Kochuveli, Thiruvananthapuram, Kerala in response to the RFS. No dated issued by ANERT including signing and submission of the Bid and all other documents related to the Bid, including but not limited to undertakings, letters, certificates, acceptances, clarifications, guarantees or any other document which the ANERT may require us to submit. The aforesaid Attorney is further authorized for making representations to the ANERT and providing information / responses to ANERT representing us in all matters before ANERT and generally dealing with ANERT in all matters in connection with this Bid till the completion of the bidding process as per the terms of the above mentioned RFS.

We hereby agree to ratify all acts, deeds and things done by our said attorney pursuant to this Power of Attorney and that all acts, deeds and things done by our aforesaid attorney shall be binding on us and shall always be deemed to have been done by us.

All the terms used herein but not defined shall have the meaning ascribed to such terms under the RFS.

Signed by the within named

..... **(Insert the name of the executant company)**

through the hand of Mr.

duly authorized by the Board (vide Board Resolution No____) to issue such Power of Attorney

Dated this day of

Accepted

.....

Signature of Attorney

(Name, designation and address of the Attorney)

Attested

.....

(Signature of the executant)

(Name, designation and address of the executant)

.....

Signature and stamp of Notary of the place of execution

Common seal of has been affixed in my/our presence pursuant to Board of CEO's Resolution dated.....(Board of CEO's Resolution is also enclosed)

WITNESS

1.

(Signature)

Name.....

Designation

2.

(Signature)

Name.....

Designation

Notes:

The mode of execution of the power of attorney should be in accordance with the procedure, if any, laid down by the applicable law and the charter documents of the executant(s) and the same should be under common seal of the executant affixed in accordance with the applicable procedure. Further, the person whose signatures are to be provided on the power of attorney shall be duly authorized by the executant(s) in this regard.

The person authorized under this Power of Attorney, in the case of the Bidding Company / Lead Member being a public company, or a private company which is a subsidiary of a public company, in terms of the Companies Act, 1956, with a paid up share capital of more than Rupees Five crores, should be the Managing CEO / whole time CEO/manager appointed under section 269 of the Companies Act, 1956. In all other cases the person authorized should be a CEO duly authorized by a board resolution duly passed by the Company. Also, wherever required, the executant(s) should submit for verification the extract of the chartered documents and documents such as a Board resolution / power of attorney, in favour of the person executing this power of attorney for delegation of power hereunder on behalf of the executant(s).

FORMAT 3 – GENERAL PARTICULARS

(This letter to be submitted on the official letter head of the tenderer, signed by the authorised signatory.)

Name of the Agency	
Registered Office	
Nature of Agency (Ltd. Co., Partnership etc.) Attach Copy of partnership Deed/ Certification of Incorporation	
Year of Establishment	
Registration of Number	
Address for Communication	
Telephone number of Contact person(Mobile if any)	
Name of CEOs/ Proprietor/Partners(with address and Telephone No)	
GST Registration Number (Copy to be Attached)	
PAN Number	
TAN Number	
Whether the bidder wishes to form a project company for execution of work	
Whether any Civil Suit / Litigation arisen in the contract executed during the last five years/being executed. If yes, please furnish the name of the Contract, employer nature of work, contract value,	

work order and date and brief details of litigation.	
Details of Total Experience in general since inception(Details of similar systems installed till the date of bid)	
Details of Turnover for last Two years. (Copy Audited Statements has to be submitted for last two financial years)	
Details of offices in Kerala, India and abroad- address and contact details	

Documentary evidence for the bid qualification requirements are submitted along with this document and the details furnished above are true and correct.

Signature
of authorised signatory

Name

Designation

Date:

(office seal)

FORMAT 4 – FINANCIAL CRITERIA

(certified by Authorized Signatory and the Statutory Auditor / Practising Chartered Accountant of the Bidding Company)

Financial Qualification Certificate

(Rupees in Crores)

S/N	Financial parameters	FY 17-18	FY 18-19	FY 19-20	FY 20-21	FY 21-22
1.	Net Worth					
a)	Paid up Capital					
b)	Free Reserves and Surplus*					
c)	Misc expenses to the extent not written off					
	Net Worth (a+b-c)					
2.	Annual Turnover **					

* Free Reserve and Surplus shall be Exclusive of Revaluation Reserve, written back of Depreciation Provision and Amalgamation.

** Annual total Income/ turnover as incorporated in the Profit and Loss Account excluding non-recurring income, i.e., sale of fixed asset etc.

It is certified that all the figures are based on audited accounts read with auditors report and Notes to Accounts etc.

(Signature & Seal of Authorized Signatory

Name of Authorized Signatory:

Designation:

Date:

Place:

Certifying Chartered Accountant:

Name of Firm:

UDIN No:

Date:

Place:

Note:

1. In addition to above certificate from Chartered Accountant, Bidder is required to submit Firm's Annual Audit Report, Balance sheet, Profit & Loss and Income Tax Returns / CA certificate for last Five years i.e., F.Y: 2017-18, 2018-19, 2019-20, 2020-21 & 2021-22.

FORMAT 5 - PERFORMANCE SECURITY GUARANTEE

(To be on non-judicial Kerala stamp paper of appropriate value as per Stamp Act relevant to place of execution)

BG No. :

Amount :

Date :

Valid up to :

In consideration of the Agency for New & Renewable Energy Research and Technology, therein after called "ANERT") have allotted work to M/s..... (hereinafter called the said Contractor) under the terms and conditions of Supply Order No..... issued by ANERT and the agreement dated made between (name of contractor) and ANERT for covering (hereinafter called the said agreement) of Security Deposit for the due fulfilment by the said contractor of the terms and conditions.

Contained in the said agreement, on production of the Bank Guarantee for Rs..... (Rupees..... only) we,Bank having our Head Office at (herein after referred to as "the Bank") at the request of M/s.(name of contractor) do hereby undertake to pay to the ANERT an amount not exceeding Rs..... (Rupees only), against any loss or damage caused to or suffered or would be caused to or suffered by the ANERT by reason of any breach by the said contractor of any of the terms and conditions contained in the said agreement

We,Bank, do hereby undertake to pay the amount due and payable under this Guarantee without any demur, merely on a demand from the ANERT stating that the amount claimed is due by way of loss or damage caused to or would be caused to or suffered by the ANERT by reasons of breach by the said contractor of any of the terms or conditions contained in the said agreement. Any such demand made on the Bank shall be conclusive as regards the amount due and payable by the Bank under this guarantee. However, our liability under this guarantee shall be restricted to an amount not exceeding Rs. (Rupees only).

This guarantee will not be discharged due to change in the constitution of the bank or the contractor/supplier.

Notwithstanding anything contained hereinbefore:

- 1) Our liability under this Bank Guarantee shall not exceed Rs.....(Rupees only)
- 2) This Bank Guarantee shall be valid upto
- 3) We are liable to pay the guaranteed amount or any part thereof under this Bank Guarantee amount only and only if you serve us a written claim or demand on or before.....

Dated at this ... day of 2023

FORMAT 6 – COMPONENT WISE SPLIT UP OF COSTS

(On Letterhead of the respective entity for which the below details are provided.)

To be provided for all capacity quoted by the bidder

S/N	Component	Percentage (%)
1	SPV Modules	
2	Module Mounting Structure	
3	Grid Tied Inverter as per specification	
4	Balance of System	
5	Cost for 10 Year Warranty and Preventive Maintenance	
6	Installation and Commissioning Charges	
7	Insurance (From Material dispatch till 10 years warranty period)	
8	Any miscellaneous expenses required for the successful commissioning of the plant	
9	Remote Monitoring and associated costs	
Total		100%

ANNEXURE A – PRE-AGREEMENT

(To be on non-judicial Kerala stamp paper of value Rs. 200)

ARTICLES OF AGREEMENT executed on this the day of
Two thousand andbetween the **Agency for
New & Renewable Energy Research and Technology** (hereinafter referred to as
ANERT) of the one part and Sri
(Name and Address of the tenderer) hereinafter referred to as “the Bounden”) of the other
part.

WHEREAS in response to the Notification No.
dated the bounden has submitted to ANERT a e-tender for the ***Request for
Selection (RFS) of agency for the Implementation of 2 MW Solar Power Plant at
Travancore Titanium Products Ltd., Kochuveli, Thiruvananthapuram under Solar
City project funded by Smart City Thiruvananthapuram Ltd*** specified therein subject to
the terms and conditions contained in the said e-tender.

AND WHEREAS the bounden has furnished to ANERT a sum of Rs. as
Earnest Money Deposit for execution of an agreement undertaking the due fulfilment of
the contract in case his e-tender is accepted by ANERT. NOW THESE PRESENTS WITNESS
and it is hereby mutually agreed as follows: -

In case the e-tender submitted by the bounden is accepted by ANERT and the contract
for is
awarded to the bounden, the bounden shall within Fifteen days of acceptance of this e-
tender, execute an agreement with ANERT incorporating all the terms and conditions
under which ANERT accepts this e-tender.

In case the bounden fails to execute the agreement as aforesaid incorporating the terms
and conditions governing the contract, ANERT shall have power and authority to recover

from the bounden any loss or damage caused to ANERT by such breach as may be determined by ANERT by appropriating the moneys inclusive of Earnest Money deposited by the bounden and if the Earnest Money is found to be inadequate the deficit amount may be recovered from the bounden and his properties movable and immovable in the manner hereinafter contained.

All sums found due to ANERT under or by virtue of this agreement shall be recoverable from the bounden and his properties movable and immovable under the provisions of the Revenue Recovery Act for the time being in force as though such sums are arrears of land revenue and in such other manner as ANERT may deem fit.

In witness whereof Sri (Name and Designation) for and on behalf of the Agency for New & Renewable Energy Research and Technology and Sri the bounden have hereunto set their hands the day and year shown against their respective signature.

Signed by Sri Signed by Sri

(Date) (Date)

in the presence of witnesses in the presence of witnesses

1. 1.

2. 2.

ANNEXURE B – BIDDERS TECHNICAL INFORMATION

TECHNICAL PARTICULAR DATA

Solar PV Module

Sl. No	Particulars	Required	Offered
1	PV Module Manufacture name & Country of origin	Manufacture name to be specified	
2	PV Module type	Poly/Mono Crystalline, Mono PERC	
3	No. of PV cells per Module		
4	Total number of PV modules		
5	Max. Power, P_{mp} @STC	330 Wp or above	
6	Max. Power tolerance (%)	Not more than 3%	
7	Max. Power voltage (V_{mp}) @STC	To be specified	
8	Max. Power current (I_{mp}) @STC	To be specified	
9	Open circuit voltage, V_{oc} @ STC	To be specified	
10	Short circuit current, I_{sc} @STC	To be specified	
11	Nominal voltage	To be specified	
12	Nominal Wattage	To be specified	
13	Fill Factor	Not less than 0.7	
14	Temp. coefficient of V_{oc} (%/C)		
15	Temp. coefficient of P_{mp} (%/C)		
16	Temperature Co-efficient of I_{sc} (%/°C)		
17	Normal Operating Cell Temperature (NOCT) (°C)		
18	Operating Temperature (°C)		
19	Module efficiency	$\geq 17\%$	
20	No. of By-pass Diodes		
21	Mounting arrangement for Solar Module	Fixed Arrangement	

Sl. No	Particulars	Required	Offered
22	Solar Module frame material	Anodized Aluminium	
23	Module dimensions' cm (L x W x H)	To be specified	
24	PV panel Weight (kg)	To be specified	
25	Output Cables	Polarized, UV protected & Weather Proof DC rated multi-contact connector	
26	Output Terminal	PV Connectors	
27	Junction Box	Weather resistant HDPE (IP65)	
28	Copies of test certificates	IS 14286/IEC 61215,61730 part 1&2, IEC 61701	

INVERTER

Sl. No.	Particulars	Required	Offered
1	Manufacturer		
2	Model name/No.		
3	Number of units		
4	Nominal AC power		
5	Nominal AC voltage		
6	Nominal AC Current		
7	AC grid Frequency range	50Hz $\pm$ 0.5%	
8	AC grid voltage range		
9	Power Factor (+ and -)		

Sl. No.	Particulars	Required	Offered
10	Total Harmonic Distortion	As per IEEE-519 2014	
11	AC over / under voltage over / under frequency protection		
12	Max PV input power		
13	Maximum DC voltage	Less than 1000 V	
14	MPPT voltage range		
15	Maximum DC current		
16	No. of DC input ports		
17	Maximum Efficiency	as per IEC61683	
18	DC voltage ripple		
19	Ambient temperature range		
20	Humidity (non-condensing)	95%, non-condensing	
21	Protective functions - AC over/under voltage, AC over/under frequency, over temperature, AC and DC overcurrent, DC over-voltage, against Islanding		
22	Communication Interface	RS485, MPI Profi-Bus/Telephone Modem/WiFi	
22	User-display standard	LCD panel with membrane keypad	
23	Enclosure environment rating		
24	Safety and EMC		
25	Anti-islanding feature	IEEE1547/UL1741/IEC62116	

ANNEXURE C – DECLARATION BY THE BIDDER

e-Tender Notification No:, dtd for Request for Selection (RFS) of agency for the Implementation of 2 MW Solar Power Plant at Travancore Titanium Products Ltd., Kochuveli, Thiruvananthapuram under Solar City project funded by Smart City Thiruvananthapuram Ltd

To

The CEO
ANERT

We, the undersigned, declare that:

1. We have examined and have no reservations to the Bidding Document, including Addenda No.: (if any)
2. We offer to supply in conformity with the Bidding Document and in accordance with the delivery schedule
3. Our Bid shall be valid for a period of 6 months from the date fixed as deadline for the submission of tenders in accordance with the Bidding Document, and it shall remain binding upon us and may be accepted at any time before the expiration of that period;
4. If our Bid is accepted, we commit to submit a Security Deposit in the amount of 5 percent of the Contract Price for the due performance of the Contract;
5. We are not participating, as Bidders, in more than one Bid in this bidding process;
6. Our firm, its affiliates or subsidiaries, including any subcontractors or suppliers for any part of the Contract, has not been declared ineligible by the ANERT or Government of Kerala;
7. We understand that this Bid, together with your written acceptance thereof included in your notification of award, shall constitute a binding contract between us, until a formal Contract is prepared and executed.
8. Our firm has obtained the certifications from MNRE or NABL approved Test laboratories that the goods and services are satisfying the technical criteria specified in the bid.

Signature

Date

Name

ANNEXURE D – DECLARATION OF RELATIONSHIP WITH ANERT EMPLOYEE

(to be signed and submitted by the bidder along with the bid)

Tender Notification No.:

Request for Selection (RFS) of agency for the Implementation of 2 MW Solar Power Plant at Travancore Titanium Products Ltd., Kochuveli, Thiruvananthapuram under Solar City project funded by Smart City Thiruvananthapuram Ltd

To

The CEO
ANERT

Name of the ANERT employee with Designation:

Name of the bidder related to the employee:

This is to put on record that Shri/Smt
currently working as in ANERT is related
to, who is the bidder in the bid. We are aware of
the Anti-corruption policy of ANERT and will observe the highest standards during the
procurement and the execution of contract and shall retain from corrupt, fraudulent,
collusive or coercive practices on competing for the contract.

Signature

Name

Date

ANNEXURE F – CERTIFICATIONS & STANDARDS

QUALITY CERTIFICATION, STANDARDS AND TESTING FOR GRID-CONNECTED SOLAR PV POWER PLANTS

Solar PV Modules/Panels	
IEC 61215	<i>Design Qualification and Type Approval for Crystalline Silicon Terrestrial Photovoltaic (PV) Modules</i>
IS 14286	<i>Design Qualification and Type Approval for Crystalline Silicon Terrestrial Photovoltaic (PV) Modules</i>
IEC 61646	<i>Design Qualification and Type Approval for Thin-Film Terrestrial Photovoltaic (PV) Modules</i>
IS 16077	<i>Design Qualification and Type Approval for Thin-Film Terrestrial Photovoltaic (PV) Modules</i>
IEC 62108	<i>Design Qualification and Type Approval for Concentrator Photovoltaic (CPV) Modules and Assemblies</i>
IEC 61701	<i>Salt Mist Corrosion Testing of Photovoltaic (PV) Modules</i>
IEC 61725	<i>Analytical expression for Daily Solar Profiles</i>
IEC 61853-1	<i>Photovoltaic (PV) Module performance testing and energy rating Part-1: Irradiance and temperature performance measurements, and power rating</i>
IS 16170: Part 1	<i>Photovoltaic (PV) Module performance testing and energy rating Part-1: Irradiance and temperature performance measurements, and energy rating</i>
IEC 62716	<i>Photovoltaic (PV) Modules - Ammonia (NH₃) Corrosion Testing</i>
IEC 60721-2-1	<i>Classification of environmental conditions - Part 2-1 : Environmental conditions appearing in nature - Temperature and humidity</i>
IEC 61730-1	<i>Photovoltaic (PV) Module Safety Qualification - Part 1: Requirements for Construction</i>
IEC 61730-2	<i>Photovoltaic (PV) Module Safety Qualification - Part 2: Requirements for Testing</i>
IEC 60904-2	<i>Photovoltaic devices - Part 2: Requirements for photovoltaic reference devices (STC Performance, 1-V)</i>
IEC 60891	<i>Photovoltaic devices - Procedures for temperature and irradiance corrections to measured I-V characteristics (STC Performance)</i>
IEC TS 62548	<i>Photovoltaic (PV) Arrays - Design requirements</i>
IEC 61829	<i>Crystalline silicon photovoltaic (PV) array- on-site measurement of I-V characteristics</i>

Solar PV String Inverters/INVERTERS	
IEC 62109-1, IEC 62109-2	<i>Safety of power converters for use in photovoltaic power systems- Part 1: General requirements, and Safety of power converters for use in photovoltaic power systems - part 2 : Particular requirements for inverters. Safety compliance (Protection degree IP 65 for outdoor mounting, IP 54 for indoor mounting)</i>
IEC/IS 61683	<i>Photovoltaic systems - Power conditioners: Procedure for measuring Efficiency (10%, 25%, 50%, 75% & 90-100% loading conditions)</i>
IEC 62093	<i>Balance-of-system components for photovoltaic systems – Design qualification natural environments for solar inverters (grid-connected)</i>
IEC 62116	<i>Utility-interconnected photovoltaic inverters- Test procedure of Islanding prevention measures Standard for Inverters, Converters, Controllers and</i>
UL1741	<i>interconnection system Equipment for use with Distributed Energy Resources</i>
IEEE 1547	<i>Standard for interconnecting Distributed Resources with Electric Power Systems</i>
IEEE 1547.1	<i>Standard for Conformance Test procedures for</i>
	<i>Equipment interconnecting Distributed Resources with Electric Power Systems</i>
IEC 60255-27	<i>Measuring relays and protection equipment - Part 27 : Product safety requirements</i>
IEC 60068-2 (1,2,14,27,30 & 64)	<i>Environmental Testing of PV System – Power Conditioners and Inverters IEC 60068 -2-1: Environmental testing - part 2-1: Tests - Test A: Cold IEC 60068 -2-2: Environmental testing - part 2-2: Tests - Test B: Dry heat IEC 60068 -2-14: Environmental testing - part 2-14: Tests - Test N: Change of temperature IEC 60068 -2-27: Environmental testing - part 2-27: Tests - Test Ea and guidance: shock IEC 60068 -2-30: Environmental testing - part 2-30: Tests - Test Db: Damp heat, cyclic (12h+12h cycle) IEC 60068 -2-64: Environmental testing - part 2-64: Tests - Test Fh : Vibration, broadband random and guidance</i>
IEC 61727	<i>Photovoltaic (PV) systems - characteristics of the utility interface (Parallel operation)</i>
CEA Guidelines / Regulations	<i>Technical standards for connectivity of the distributed Generation Resources at Voltage - level of below 33kV</i>
IEC 62103	<i>Electronic equipment for use in power installations</i>
BS EN 50438	<i>Requirements for micro-generating plants to be connected in parallel with public low-voltage distribution networks</i>

IEC 61000 Series	<i>Electromagnetic Interference (EMI), and Electromagnetic Compatibility (EMC) testing of PV inverters</i>
IEC61850	<i>Inverters with Reactive Power Control</i>
IEC 62124	<i>Photovoltaic (PV) Stand -alone systems- Design verification</i>
Fuses	
IS/IEC 60947 (Part 1,2 &3) EN 50521	<i>General safety requirements for connectors, switches, circuit breakers (AC/DC) Low-voltage switchgear and Control-gear, Part-1: General rules Low-voltage switchgear and Control-gear, Part-2: Circuit Breakers Low-voltage switchgear and Control-gear, Part-3: Switches, disconnectors, switch-disconnectors and fuse- combination units EN. 50521: Connectors for photovoltaic systems - Safety requirement</i>
Surge Arrestors	
IEC 60364-5-53	<i>DC surge protection device (SPD), class 2</i>
IEC 60364-5-53	<i>AC surge protection device (SPD), class 2</i>
IEC 60364-5-53	<i>Electrical installations of buildings-Part 5-53: Selection and erection of electrical equipment - Isolation, switching and control</i>
IS 15086-5	<i>Surge Arresters, Part 5: Selection and Application Recommendations</i>
Cables	
IEC 60227/IS 694, IEC 60502/IS 1554 (Part 1 & 2)	<i>General test and measuring method for PVC (Polyvinyl chloride) insulated cables (for working voltage up to and including 1100V, and UV resistant for outdoor installation)</i>
Earthing	
IS 3043-1986	<i>Earthing shall be done in accordance with IS-3043-1986, provided that earthing conductors shall have a minimum size of 6.0 mm² copper, 10 mm² aluminum or 70mm² hot dip galvanized steel</i>
IEC 60364-5-53	<i>The SPDs earthing terminal shall be connected to earth through the above-mentioned dedicated earthing system; The SPDs shall be of type 2 as per IEC 60364-5-53</i>
IS 3043	<i>Code of practice for earthing (ETD 20: Electrical Installation)</i>
IEC 62561 Series	<i>IEC 62561-1 - Lightning protection system components (LPSC)- Part 1: Requirements for connection components IEC 62561-2 - Lightning protection system components (LPSC)- Part 2: Requirements for conductors and earth electrodes IEC 62561-7 - Lightning protection system components (LPSC)- Part 2:</i>

	<i>Requirements for earthing enhancing compounds</i>
<i>Junction Boxes</i>	
<i>IEC 529</i>	<i>Junction boxes and solar panel terminal boxes shall be of the thermo plastic type with IP 65 protection for outdoor use, and IP 54 protection for indoor use</i>
<i>IE 62208, IP 54 as per IEC 529</i>	<i>General requirements for junction boxes, charge controllers</i>
<i>CEA Regulations</i>	<i>Energy Meter Installation and operation of Energy Meters Regulations 2006, and as amended in 2010 & 2014</i>
<i>IS 13779</i>	<i>AC Static watt-hour Meters Class 1 and 2 - specification</i>
<i>IS 14697</i>	<i>AC Static Transformer Operated Watt-hour and Var- hour Meters, Class 0.2 S and 0.5 S - specification</i>
<i>IS 15884</i>	<i>Alternating Current Direct connected static Prepayment Meters for Active Energy (Class 1 and 2) - Specification</i>
<i>IS 15959</i>	<i>Data exchange for electricity meter reading, tariff and load control- companion specification</i>
<i>IS 16444</i>	<i>AC Static direct connected watt-hour Smart Meter Class 1 and 2 specifications (with Import & Export/Net energy measurements)</i>
<i>System Performance Monitoring</i>	
<i>IS/IEC 61724</i>	<i>Guidelines for PV System Performance Monitoring- measurement, Data Exchange, and Analysis</i>
<i>Rooftop PV System/Power Plant inspection</i>	
<i>IEC 62446</i>	<i>Grid connected Solar PV Systems-Minimum requirements for system Documentation, Commissioning Tests, and Inspection</i>
<i>IEC 61557-1</i>	<i>Electrical Safety in low voltage distribution systems up to 1000 V AC. and 1500 V DC - Equipment for testing, measuring or monitoring of protective measures – Part 1: General requirements</i>
<i>IEC 60364-6</i>	<i>Low-voltage electrical installations - part 6: Verification</i>
<i>IEC 61829</i>	<i>Crystalline silicon photovoltaic (PV) array- on-site measurement of I-V characteristics</i>



അനേർട്ട്
ANERT

Agency for New and renewable Energy Research and Technology

നവീനവും പുനരുപയോഗയോഗ്യവുമായ ഊർജ്ജ ഗവേഷണങ്ങൾക്കും സാങ്കേതിക വിദ്യകൾക്കുമുള്ള ഏജൻസി

DEPARTMENT OF POWER, GOVERNMENT OF KERALA

Law College Road, PMG, Thiruvananthapuram 695033 • director@anert.in • www.anert.gov.in

Tel.: (+91-471) 2338077, 2334122, 2333124, 2331803 • Fax: (+91-471) 2329853



Technical Evaluation Summary								
Tender ID :		2023_ANERT_571678_1						
Tender Title :		Request for Selection (RFS) of agency for the Implementation of 2 MW Solar Power Plant at Travancore Titanium Products Ltd., Kochuveli, Thiruvananthapuram under Solar City project funded by Smart City Thiruvananthapuram Ltd.						
S/N	Bidder	Registration Certificate	GST Registration	PAN Details	Bidder should have installed a single Power Plant of 1 No of 1 MW OR 2 Nos of 500 kW or above OR 4 Nos of 200 kW or above	The bidder should have completed atleast 5 MW Solar Power Plants	Minimum Annual Average Turonver of Rs 8 Crores in any 2 out of past 5 years OR Net worth above 10 crores	Remarks
1	Enerture Technologies Pvt Ltd	Y	Y	Y	Y	Y	Y	Qualified for financial opening
2	INKEL Ltd	Y	Y	Y	Y	Y	Y	Qualified for financial opening
3	Wattsun Energy India Pvt Ltd	Y	Y	Y	N	Y	N	Not Qualified for financial opening
4	Oakridge Energy Private Limited	Y	Y	Y	Y	Y	Y	Qualified for financial opening
5	Power One Micro Systems P Ltd	Y	Y	Y	Y	Y	Y	Qualified for financial opening
								Not

I/17683/2023

6	Solgen Energy Pvt Ltd	Y	Y	Y	N	Y	Y	Qualified for financial opening
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CEO ANERT

E-TENDER NOTICE

Competitive e-tenders in two cover system with Earnest Money Deposit (EMD) and Price Bid are invited from experience and eligible bidders to participate in the ***Request for Selection (RFS) of agency for the Implementation of 2 MW Solar Power Plant at Travancore Titanium Products Ltd., Kochuveli, Thiruvananthapuram under Solar City project funded by Smart City Thiruvananthapuram Ltd.*** The e-tender documents can be downloaded from the e-tendering website of Govt. of Kerala. Tender form will not be available in any other form.

Bid documents which include Eligibility criteria, "Technical Specifications", various conditions of contract, formats, etc. can be downloaded from website www.etenders.kerala.gov.in. Any amendment (s)/corrigendum/clarifications with respect to this Bid shall be uploaded on the above website only. The Bidder should regularly follow up for any Amendment/Corrigendum/Clarification on the above website.

Thiruvananthapuram

CEO

12/04/2023

TENDER ABSTRACT

Ref. No.	ANERT-TECH/99/2022-T2
Document Description	Implementation of 2 MWp Grid Connected Solar PV Power Plant at Travancore Titanium Products Ltd., Kochuveli, Thiruvananthapuram
Name of Work	Design, Supply, Engineering, Erection Testing, Commissioning of SPV Power Plant of cumulative capacity of 1 MWp with Grid connectivity along with 10 years of Operation & Maintenance at various
Site	Travancore Titanium Products Ltd., Kochuveli, Thiruvananthapuram
Download of Tender Form	http://www.etenders.kerala.gov.in
Last date of submission of Tender	26/04/2023 @ 03.00 PM
Date and Time of Bid opening (Techno-Commercial)	27/04/2023 @ 03.30 PM
Cost of Tender form	Rs. 11,800/- (Including GST)
EMD	Rs. 2,00,000/-
Warranty period	10-year warranty and complete Operation & Maintenance. Minimum guaranteed PR and CUF of the plant as specified in the Technical Specification to be maintained.
Availability of Tender Forms	Website http://www.etenders.kerala.gov.in
Place of opening of tender	Office of CEO, ANERT Law College Road, Vikas Bhavan. PO, Thiruvananthapuram – 695 033, Kerala
Thiruvananthapuram 12/04/2023	Sd/- CEO

Important Note: Prospective Bidders are requested to remain updated for any notices/amendments/clarifications etc. to the RFS document through the website www.anert.gov.in/www.etenders.kerala.gov.in. No separate notifications will be issued for such notices/amendments/clarification etc. in the print media or individually.

DISCLAIMER

1. Though adequate care has been taken while preparing the NIT document, the Bidders shall satisfy themselves that the document is complete in all respect. Intimation regarding any discrepancy shall be given to this office immediately. If no intimation is received from any Bidder within Ten (10) days from the date of notification of NIT / issuance of e-Tender documents, it shall be considered that the document is complete in all respect and has been received / acknowledged by the Bidder(s).
2. Agency for New and Renewable Energy Research and Technology (ANERT) reserves the right to modify, amend or supplement this document.
3. While this tender document has been prepared in good faith, neither ANERT nor their employees or advisors make any representation or warranty, express or implied, or accept any responsibility or liability, whatsoever, in respect of any statements or omissions herein, or the accuracy, completeness or reliability of information, and shall incur no liability under any law, statute, rules or regulations as to the accuracy, reliability or completeness of this document, even if any loss or damage is caused by any act or omission on their part.

Local References List		
Reference Attached	Attached By	Attached On
Solgen.pdf	VINAY P, ROOF TOP SOLAR ANERT	07/05/2023 02:27 PM
PowerONe.pdf	VINAY P, ROOF TOP SOLAR ANERT	07/05/2023 02:28 PM
Inkel1.pdf	VINAY P, ROOF TOP SOLAR ANERT	07/05/2023 02:30 PM
Inkel2.pdf	VINAY P, ROOF TOP SOLAR ANERT	07/05/2023 02:30 PM
Oakridge1.pdf	VINAY P, ROOF TOP SOLAR ANERT	07/05/2023 02:31 PM
Oakridge2.pdf	VINAY P, ROOF TOP SOLAR ANERT	07/05/2023 02:32 PM
Wattsun1.pdf	VINAY P, ROOF TOP SOLAR ANERT	07/05/2023 02:33 PM
Wattsun2.pdf	VINAY P, ROOF TOP SOLAR ANERT	07/05/2023 02:33 PM
Enerture.pdf	VINAY P, ROOF TOP SOLAR ANERT	08/05/2023 04:28 PM

Solgen Energy Pvt. Ltd.

22/314-B, Kuttanallur P.O, Thrissur - 680014, Kerala, India.



COVERING LETTER

Sir,

I/We hereby e-tender to supply, under annexed terms and conditions of contract, the whole of the articles referred to and described in the attached specification and quantity decided by the Agency for New & Renewable Energy Research and Technology (ANERT), at the rates quoted against each item.

I am/We are remitting herewith the required amount of Rs. NIL (Exemption Allowed, MSME Certificate Attached) towards the cost of e-tender and Earnest Money Deposit by electronic payment vide transactionNo dtd.....

Yours faithfully,



Lajo Davis

Thrissur

18.04.2023

Manager Design & Technical



കേരളം KERALA

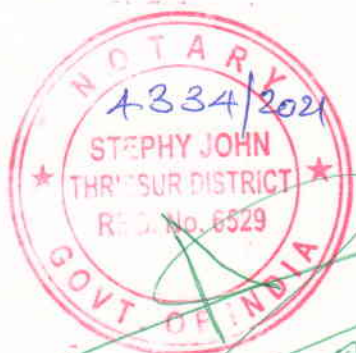
DB 769777

POWER OF ATTORNEY

I, Christo George, Managing Director, Solgen Energy Pvt Ltd, 22/314-B, Kuttanellur P.O, Thrissur-680014, do hereby constitute appoint and authorise Sri. Lajo Davis, aged 52 years, residing at Moyalan House, Ollur P.O, Thrissur-680306, who is presently employed with us holding the position of Manager Design & Technical, Solgen Energy Pvt Ltd, for signing all the documents related to the Tender.

[Handwritten Signature]

SOLGEN ENERGY PRIVATE LIMITED
THRISUR



no 13486 to 100 7/10/2021

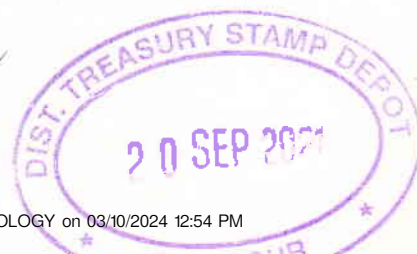
[Handwritten Signature]

Solgen Energy Pvt Ltd

328

[Handwritten Signature]

SIMI SEBASTIAN
(K.R. SEBASTIAN)
MANAGER DESIGN & TECHNICAL
KUTTANELLUR





കേരളം KERALA

DB 769778

I hereby also undertake that I will be responsible for all actions of Sri .Lajo Davis, undertaken by him during the tender process and thereafter on award of the contract. His signature is attested below.

Duly authorised by Solgen Energy Pvt Ltd
Dated 30th day of September 2021


Christo George
Managing Director
Solgen Energy Pvt Ltd



EXECUTED & SIGNED IN MY PRESENCE

ON 7/10/2021 AT Thrissur, Kerala.

ATTESTED

Accepted



Lajo Davis
Manager Design & Technical
Solgen Energy Pvt Ltd.




STEPHY JOHN
ADVOCATE & NOTARY
ATTOKKARAN, ANCHERY
KURIACHIRA. P.O., THRISUR
KERALA, S. INDIA



18487- 10 108

329

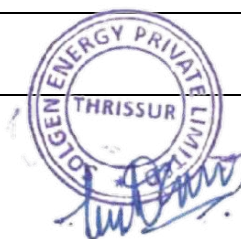

SIMI SEBASTIAN
(K.R. SEBASTIAN)
VENDOR NO. 1
KURIACHIRA

Solgen Energy Pvt. Ltd.

22/314-B, Kuttanallur P.O, Thrissur - 680014, Kerala, India.

**FORMAT 3 - GENERAL PARTICULARS**

Name of the Agency	SOLGEN ENRGY PVT LTD
Registered Office	Door No. 14/19, Sidco Industrial Estate, P O Peringadoor, Thrissur - 680581, Kerala, INDIA
Nature of Agency (Ltd. Co., Partnership etc.) Attach Copy of partnership Deed/ Certification of Incorporation	Pvt Ltd (Incorporation Attached)
Year of Establishment	2014
Registration of Number	U40300KL2014PTC037446
Address for Communication	22/314-B, Kuttanellur P.O, Thrissur-680014
Telephone number of Contact person (Mobile if any)	7025076662
Name of CEOs/ Proprietor/Partners(with address and Telephone No)	Attached Separately
GST Registration Number (Copy to be Attached)	32AAVCS0866L1ZR Attached
PAN Number	AAVCS0866L
TAN Number	
Whether the bidder wishes to form a project company for execution of work	No
Whether any Civil Suit / Litigation arisen in the contract executed during the last five years/being executed. If yes, please furnish the name of the Contract, employer nature of work, contract value, work order and date and brief details of litigation.	No
Details of Total Experience in general since inception(Details of similar systems installed till the date of bid)	Attached
Details of Turnover for last Two years.(Copy Audited Statements has to be submitted for last two financial years)	Attached
Details of offices in Kerala, India and abroad- address and contact details	Attached



Lajo Davis
Manager Design & Technical

Regd. Office : **Solgen Energy Pvt. Ltd.** 14/19, Sidco Industrial Estate, P.O. Peringadoor, Thrissur - 680 581, Kerala, India. Email: info@solgenindia.com, www.solgenindia.com
Tel: 0487- 2351919, 2322120, 8111830000 | CIN No. U40300KL2014PTC037446

joint venture of :
Hykon
Powering the Nation



SERVICE CENTRE

Service Centre – North Kerala:-

Address: Solgen Energy Pvt Ltd, Room No: 15

Super Corner, Near Training School, Kannur

- Contact Person: Mithun K.K
- Tel No: 7034030375
- Email ID : service@solgenindia.com

Service Centre – Central Kerala:-

Address: Solgen Energy Pvt Ltd, 22/314-B,

Kuttanellur P.O, Thrissur-680014

- Contact Person: Abhilash M.G
- Tel No:7034030009
- Email ID :enginst@solgenindia.com

Service Centre – South Kerala Kerala :-

Address: Solgen Energy Pvt Ltd, TC-2/1420/3,

Vydhuthi Bhavan Road, Pattom, Thiruvananthapuram

- Contact Person: Ragesh K
- Tel No: 7034030362
- Email ID : installation@solgenindia.com



ANNEXURE C – DECLARATION BY THE BIDDER

e-Tender Notification No: ANERT-TECH/99/2022-T2, dtd 12.04.2023 for
Request for Selection (RFS) of agency for the Implementation of 2 MW Solar Power Plant
at Travancore Titanium Products Ltd., Kochuveli, Thiruvananthapuram under Solar City
project funded by Smart City Thiruvananthapuram Ltd

To

The CEO
ANERT

We, the undersigned, declare that:

1. We have examined and have no reservations to the Bidding Document, including Addenda No. (if any)
2. We offer to supply in conformity with the Bidding Document and in accordance with the delivery schedule
3. Our Bid shall be valid for a period of 6 months from the date fixed as deadline for the submission of tenders in accordance with the Bidding Document, and it shall remain binding upon us and may be accepted at any time before the expiration of that period;
4. If our Bid is accepted, we commit to submit a Security Deposit in the amount of 5 percent of the Contract Price for the due performance of the Contract;
5. We are not participating, as Bidders, in more than one Bid in this bidding process;
6. Our firm, its affiliates or subsidiaries, including any subcontractors or suppliers for any part of the Contract, has not been declared ineligible by the ANERT or Government of Kerala;
7. We understand that this Bid, together with your written acceptance thereof included in your notification of award, shall constitute a binding contract between us, until a formal Contract is prepared and executed.
8. Our firm has obtained the certifications from MNRE or NABL approved Test laboratories that the goods and services are satisfying the technical criteria specified in the bid.



Lajo Davis
Manager Design & Technical

ANNEXURE D – DECLARATION OF RELATIONSHIP WITH ANERT EMPLOYEE

Tender Notification No.: ANERT-TECH/99/2022-T2, dtd 12.04.2023

Request for Selection (RFS) of agency for the Implementation of 2 MW Solar Power Plant at Travancore Titanium Products Ltd., Kochuveli, Thiruvananthapuram under Solar City project funded by Smart City Thiruvananthapuram Ltd

To

The CEO
ANERT

Name of the ANERT employee with Designation: Nil

Name of the bidder related to the employee: Nil

This is to put on record that Shri/SmtNil..... currently working asNil... in ANERT is related to M/s Solgen Energy Pvt Ltd, who is the bidder in the bid. We are aware of the Anti-corruption policy of ANERT and will observe the highest standards during the procurement and the execution of contract and shall retain from corrupt, fraudulent, collusive or coercive practices on competing for the contract.



20.04.2023
Thrissur

Lajo Davis
Manager Design & Technical



Ref.

Date..17/11/2022

TURNOVER & NETWORTH CERTIFICATE

We hereby certify that **SOLGEN ENERGY PRIVATE LTD** residing at DOOR NO.14/19 , SIDCO INDUSTRIAL ESTATE P.O.PERINGANDOOR , THRISSUR - 680581 , KERALA CIN : U40300KL2014PTCO37446 has Turnover and Net worth for the Financial Years as under:

Financial Statement (in Indian Rupees)						
a. Information as per audited Balance Sheet						
Year	2021-22	2020-21	2019-20	2018-19	2017-18	2016-17
Total Assets	11,44,64,400	95,884,097	77,097,953	103,991,207	96,463,504	123,308,283
Total Liabilities	11,30,18,062	9,55,11,032	8,46,92,967	10,18,74,556	9,49,24,121	11,82,36,919
Net Worth (Capital+Reserve)	14,46,339	3,73,065	(75,95,014)	21,16,651	15,39,383	50,71,364
Current Assets	11,15,83,971	9,26,06,891	7,55,73,102	10,20,23,645	9,39,29,612	11,67,03,836
Current Liabilities	9,05,18,062	7,54,11,032	6,45,92,967	8,67,74,556	7,78,24,121	10,54,36,919



(...2)



MAHADEVAN & HARI

Chartered Accountants

Ref.

Date: 17/11/2022

-2-

b. Information as per audited profit & loss statement						
Year	2021-22	2020-21	2019-20	2018-19	2017-18	2016-17
Total Revenue	9,45,38,499	112,368,006	47,291,589	107,621,762	63,558,670	133,142,220
Profit before Tax	12,71,653	9,408,146	(9,726,814)	636,154	(3,732,640)	461,780
Profit after Tax	10,73,275	7,968,079	(9,711,666)	577,267	(3,531,981)	187,969
Turnover	9,13,12,984	111,626,521	47,058,934	107,104,441	60,614,328	132,414,926

The above certificate is issued exclusively for participating in Government & Semi Government tenders.

For MAHADEVAN & SIVARAJAN
Chartered Accountants (R.No: 006388S)

N.V. Mahadevan
N.V. MAHADEVAN, F.C.A. (M.No: 24597)
PARTNER

UDIN: 22024597BDKRXI4165

Solgen Energy Pvt. Ltd.

22/314-B, Kuttanallur P.O, Thrissur - 680014, Kerala, India.

**FORMAT 6-COMPONENT WISE SPLIT UP OF COSTS**

SI No	Description	2000kW System(Rs./kW)
1	SPV Module (Rs/KW)	54%
2	MMS	10%
3	Inverter	11%
4	Balance of System	6%
5	CAMC	7%
6	Installation & commissioning	4%
7	Insurance(from Material dispatch till 5 years warranty period)	2%
8	Any Miscellaneous expenses required	5%
9	Remote Monitoring & Associated costs	1%
	Total cost	100%



Lajo Davis
Manager Design & Technical

Regd. Office : **Solgen Energy Pvt. Ltd.** 14/19, Sidco Industrial Estate, P.O. Peringadoor, Thrissur - 680 581, Kerala, India. Email: info@solgenindia.com, www.solgenindia.com
Tel: 0487- 2351919, 2322120, 8111 83 00 00 | CIN No. U40300KL2014PTCO37446

joint venture of :
Hykon
Powering the Nation





**Government of India
And
Government of Kerala
Form GST REG-25**

Certificate of Provisional Registration

1.	GSTIN	32AAVCS0866L1ZR
2.	PAN	AAVCS0866L
3.	Legal Name	SOLGEN ENERGY PRIVATE LIMITED
4.	Trade Name	SOLGEN ENERGY PVT.LTD.
5.	Registration Details under Existing Law	
	Act	Registration Number
(a)	TIN under Value Added Tax	32080718193
(b)	Corporate Identity Number / Foreign Company Registration Number	U40300KL2014PTC037446
(c)	Service Tax Registration Number	AAVCS0866LSD001
(d)	Importer / Exporter Code Number	1014015693
Date	28/06/2017	

This is a Certificate of Provisional Registraion issued under the provisions of the Act.



GOVERNMENT OF INDIA

MINISTRY OF CORPORATE AFFAIRS

Registrar of Companies, Ernakulam
1st Floor , Company Law Bhawan , BMC Road , Thrikkakara (PO)

Certificate of Incorporation

[Pursuant to sub-section (2) of section 7 of the Companies Act, 2013 and rule 8 of the Companies (Incorporation) Rules, 2014]

I hereby certify that SOLGEN ENERGY PRIVATE LIMITED is incorporated on this Fourth day of November Two Thousand Fourteen under the Companies Act, 2013 and that the company is limited by shares.

The CIN of the company is U40300KL2014PTC037446.

Given under my hand at Ernakulam this Fourth day of November Two Thousand Fourteen.

Signature Not Verified
Digitally signed by
Josekutty V P
Date: 2014.11.04
12:14:16 GMT+05:30

A SEHAR PONRAJ
Registrar of Companies
Kerala

Mailing Address as per record available in Registrar of Companies office:

SOLGEN ENERGY PRIVATE LIMITED
DOOR NO. 14/19, SIDCO INDUSTRIAL ESTATE, P O PERINGADOOR,
THRISSUR - 680581,
Kerala, INDIA



BOM

System Component	Make	Model/ Quantity
Solar Modules	Waaree/ Adani/ Longi/ Sova	525Wp or above
Grid Tied Inverter	Fronius / ABB	As per std
Module Mounting Structure	GP/GI/ Aluminum	1 lot
AC Cables	Polycab/ Apar/ equivalent	1 lot
DC Cables	Polycab/ Jainflex/ Apar/ equivalent	1 lot
Switches / Circuit Breakers / Connectors	L&T / Secure/ Equivalent	1 lot
Array Junction Boxes	Solgen Energy Pvt Ltd	As per std
Energy Meter for recording Solar Electricity Generated	ensez	1 No
Lightning Protection	Excel	56 Nos
Electrical Grounding	Excel	65 Nos



Solgen Energy Pvt. Ltd.

22/314-B, Kuttanallur P.O, Thrissur - 680014, Kerala, India.

**List of names and addresses of Directors**

Sl No	Name	Designation	Addresses
1	THANDASSERY RAGHAVAN RAGHULAL	CHAIRMAN	S/O THANDASSERY RAMAN RAGHAVAN 6/494 A, ELITE GARDENIA PUZHAKKAL P O THRISSUR - 680553 KERALA
2	CHRISTO GEORGE	DIRECTOR	S/O KATTUKARAN GEORGE PAUL KATTUKARAN HOUSE TRISSUR - 680306 KERALA
3	DANESA RAGHULAL	MANAGING DIRECTOR	S/O THANDASSERY RAMAN RAGHAVAN 6/494 A, ELITE GARDENIA PUZHAKKAL P O THRISSUR - 680553 KERALA



Solar inverters

ABB central inverters PVS800 100 to 1000 kW



ABB central inverters raise reliability, efficiency and ease of installation to new levels. The inverters are aimed at system integrators and end users who require high performance solar inverters for large photovoltaic (PV) power plants. The inverters are available from 100 up to 1000 kW, and are optimized for cost-efficient multi-megawatt power plants.

World's leading inverter platform

The ABB central inverters have been developed on the basis of decades of experience in the industry and proven technology platform. Unrivalled expertise from the world's market and technology leader in frequency converters is the hallmark of this solar inverter series.

Based on ABB's highly successful platform and the most widely used frequency converters on the market – the inverters are the most efficient and cost-effective way to convert the direct current (DC) generated by solar modules into high-quality and CO₂-free alternating current (AC) that can be fed into the power distribution network.

Solar inverters from ABB

ABB central inverters are ideal for large PV power plants but are also suitable for large-sized power plants installed in commercial or industrial buildings. High efficiency, proven components, compact and modular design and a host of life cycle services ensures ABB central inverters provide a rapid return on investment.

Highlights

- High total performance
- Modular and compact product design
- Extensive DC and AC side protection
- Full grid support functionality
- Fast and easy installation
- Complete range of industrial-type data communication options, including remote monitoring
- Life cycle service and support through ABB's extensive global service network

Maximize yields without losing a watt



Maximum energy and feed-in revenues

ABB central inverters have a high total efficiency level. Optimized and accurate system control and a maximum power point tracking (MPPT) algorithm together with high efficiency power converter design ensure that maximum energy is delivered to the power distribution network from the PV modules. For end users this generates the highest possible revenues from the feed-in tariffs.

Proven ABB components

The inverters comprise proven ABB components with a long track record of performance excellence in demanding applications and harsh environments. Equipped with extensive electrical and mechanical protection, the inverters are engineered to provide a long and reliable service life of at least 20 years.

Compact and modular design

The inverters are designed for fast and easy installation. The industrial design and modular platform provides a wide range of options like remote monitoring, fieldbus connection and modular and flexible DC input cabinet. The integrated DC cabinet saves space and costs as the solar array junction boxes can be connected directly to the inverter DC cabinet fused busbars. The inverters are customized to meet end user needs and are available with short delivery times.

Effective connectivity to power distribution network

ABB's transformerless central inverter series enables system integrators to design the PV power plant using optimum combination of different power rating inverters. Inverters are connected to the medium voltage (MV) power distribution network either centrally or in a distributed manner depending on the plant size and shape and network connection position.

Advanced grid support features

ABB central inverter software includes all the latest grid support and monitoring features including active power limitation, low voltage ride through (LVRT) with current feed-in and reactive power control. Active and reactive power output can be limited by using an external source. Active power can also be limited automatically as a function of grid frequency.

All grid support functions are parameterized allowing easy adjusting for local utility requirements. ABB central inverters are also able to support grid stability even at night by providing reactive power with the DC input disconnected.

ABB central inverters

PVS800

100 to 1000 kW



High total performance

- High efficiency
- Low auxiliary power consumption
- Efficient maximum power point tracking
- Long and reliable service life of at least 20 years

Modular industrial design

- Compact and easy-to-maintain product design
- Fast and easy installation
- Integrated and flexible DC input cabinet

Full grid support functionality

- Reactive power compensation also during the night time
- Active power limitation
- Low voltage ride through with current feed in

Extensive protections

- DC and AC side protection with built-in fuses, surge protection and filters
- Increased reliability and safety with DC and AC side contactors
- Heavy-duty surge protection

Grid code compatibility

- Wide country-specific grid code compliance
- Adjustability to various local utility requirements

Proven technology

- Based on ABB's market-leading technology platform used in frequency converters

Life cycle service and support

- ABB's extensive global service network
- Extended warranties
- Service contracts
- Technical support throughout the service life

Wide communication options

- Complete range of industrial-type data communication options
- Ethernet/Internet protocol
- Remote monitoring

ABB central inverters

PVS800

100 to 1000 kW



Technical data and types

Type designation PVS800-57	-0100kW-A	-0250kW-A	-0315kW-B	-0500kW-A	-0630kW-B	-0875kW-B	-1000kW-C
	100 kW	250 kW	315 kW	500 kW	630 kW	875 kW	1000 kW
Input (DC)							
Maximum input power ($P_{PV, max}$) ¹⁾	120 kWp	300 kWp	378 kWp	600 kWp	756 kWp	1050 kWp	1200 kWp
DC voltage range, mpp ($U_{DC, mpp}$)	450 to 825 V	450 to 825 V	525 to 825 V	450 to 825 V	525 to 825 V	525 to 825 V	600 to 850 V
Maximum DC voltage ($U_{max (DC)}$)	1000 V	1000 V	1000 V	1100 V	1100 V	1100 V	1100 V
Maximum DC current ($I_{max (DC)}$)	245 A	600 A	615 A	1145 A	1230 A	1710 A	1710 A
Number of protected DC inputs	1 (+/-) / 4 ²⁾	2, 4, 8 (+/-)	2, 4, 8 (+/-)	4 to 15 (+/-)	4 to 15 (+/-)	8 to 20 (+/-)	8 to 20 (+/-)
Output (AC)							
Nominal power ($P_{N(AC)}$) ³⁾	100 kW	250 kW	315 kW	500 kW	630 kW	875 kW	1000 kW
Maximum output power ⁴⁾	100 kW	250 kW	345 kW	600 kW	700 kW	1050 kW	1200 kW
Power at $\cos\phi = 0.95$ ³⁾	96 kW	240 kW	300 kW	475 kW	600 kW	830 kW	950 kW
Nominal AC current ($I_{N(AC)}$)	195 A	485 A	520 A	965 A	1040 A	1445 A	1445 A
Nominal output voltage ($U_{N(AC)}$) ⁵⁾	300 V	300 V	350 V	300 V	350 V	350 V	400 V
Output frequency	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz
Harmonic distortion, current ⁶⁾	< 3%	< 3%	< 3%	< 3%	< 3%	< 3%	< 3%
Distribution network type ⁷⁾	TN and IT	TN and IT	TN and IT	TN and IT	TN and IT	TN and IT	TN and IT
Efficiency							
Maximum ⁸⁾	98.0%	98.0%	98.6%	98.6%	98.6%	98.7%	98.8%
Euro-eta ⁸⁾	97.5%	97.6%	98.3%	98.2%	98.4%	98.5%	98.6%
Power consumption							
Own consumption in operation	310 W	310 W	310 W	490 W	490 W	650 W	650 W
Standby operation consumption	60 W	60 W	60 W	65 W	65 W	65 W	65 W
External auxiliary voltage ⁹⁾	230 V, 50 Hz	230 V, 50 Hz	230 V, 50 Hz	230 V, 50 Hz	230 V, 50 Hz	230 V, 50 Hz	230 V, 50 Hz
Dimensions and weight							
Width/Height/Depth, mm (W/H/D)	1030/2130/690	1830/2130/680	1830/2130/680	2630/2130/708	2630/2130/708	3630/2130/708	3630/2130/708
Weight appr. ¹⁰⁾	550	1100	1100	1800	1800	2320	2320

¹⁾ Recommended maximum input power

²⁾ Optional MCB inputs, 80 A inputs

³⁾ 100 and 250 kW units at 40 °C. 315 and 630 kW at 45 °C. 500, 875 and 1000 kW at 50 °C.

⁴⁾ At 25 °C. See the user manual for details.

⁵⁾ +/- 10%

⁶⁾ At nominal power

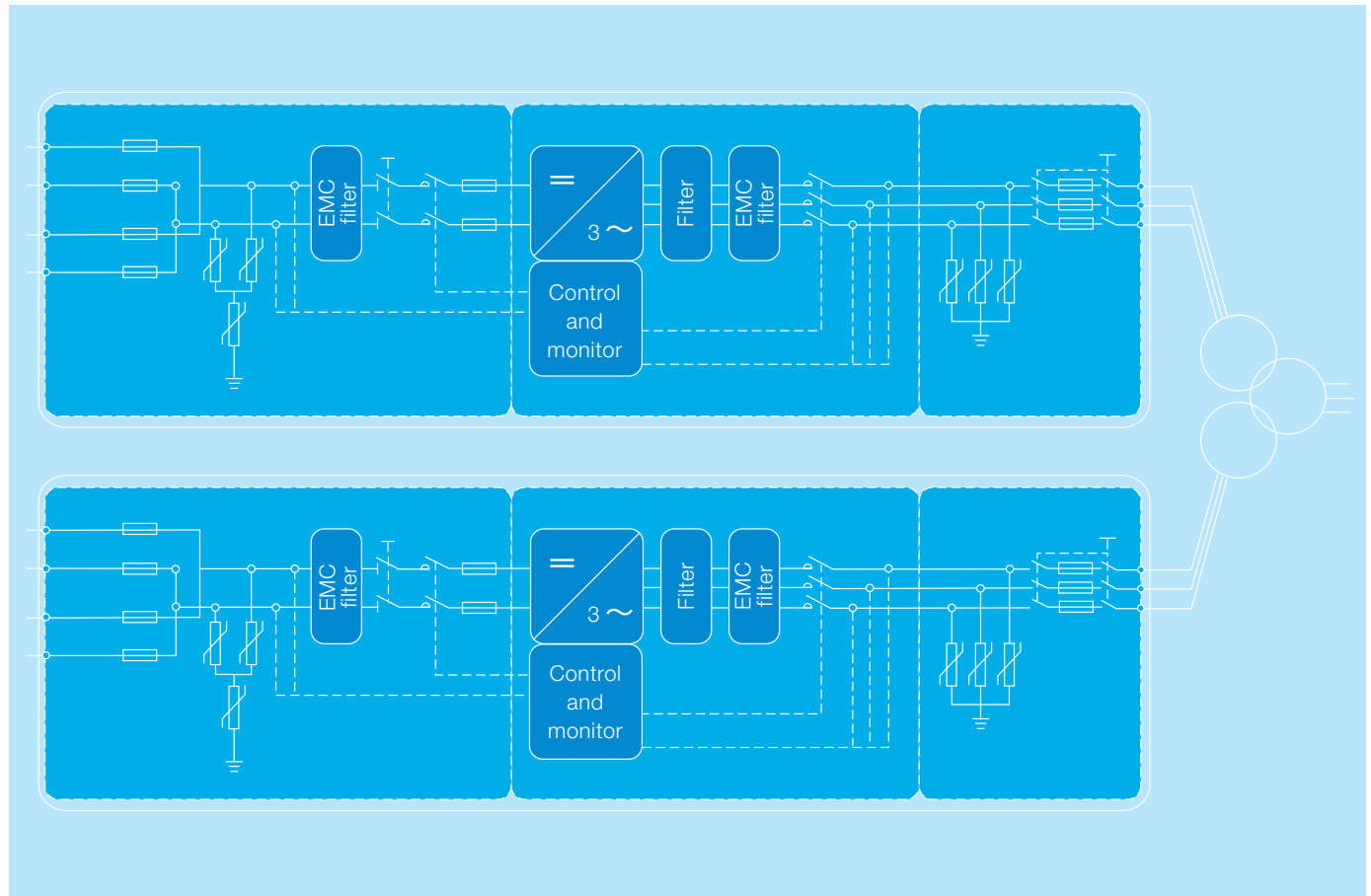
⁷⁾ Inverter side must be IT type

⁸⁾ Without auxiliary power consumption at min U_{DC}

⁹⁾ 115 V, 60 Hz optional

¹⁰⁾ For the smallest number of protected inputs. See the user manual for details.

ABB central inverter design and power network connection



Technical data and types

Type designation PVS800-57	-0100kW-A	-0250kW-A	-0315kW-B	-0500kW-A	-0630kW-B	-0875kW-B	-1000kW-C
	100 kW	250 kW	315 kW	500 kW	630 kW	875 kW	1000 kW
Environmental limits							
Degree of protection	IP42	IP42	IP42	IP42	IP42	IP42	IP42
Ambient temp. range (nom. ratings) ¹¹⁾	-15 to +40 °C	-15 to +40 °C	-15 to +45 °C	-15 to +50 °C	-15 to +45 °C	-15 to +50 °C	-15 to +50 °C
Maximum ambient temperature ¹²⁾	+50 °C	+50 °C	+55 °C	+55 °C	+55 °C	+55 °C	+55 °C
Relative humidity, not condensing	15 to 95%	15 to 95%	15 to 95%	15 to 95%	15 to 95%	15 to 95%	15 to 95%
Maximum altitude (above sea level) ¹³⁾	2000 m ¹⁴⁾	2000 m ¹⁴⁾	2000 m ¹⁴⁾	4000 m	4000 m	4000 m	4000 m
Maximum noise level	75 dBA	75 dBA ¹⁵⁾	75 dBA ¹⁵⁾	75 dBA ¹⁵⁾	75 dBA ¹⁵⁾	75 dBA ¹⁵⁾	75 dBA ¹⁵⁾
Maximum air flow of the inverter section	1300 m³/h	2500 m³/h	2500 m³/h	5000 m³/h	5000 m³/h	7950 m³/h	7950 m³/h
Protection							
Ground fault monitoring ¹⁶⁾	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Grid monitoring	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Anti-islanding	Yes	Yes	Yes	Yes	Yes	Yes	Yes
DC reverse polarity	Yes	Yes	Yes	Yes	Yes	Yes	Yes
AC and DC short circuit and over current	Yes	Yes	Yes	Yes	Yes	Yes	Yes
AC and DC over voltage and temperature	Yes	Yes	Yes	Yes	Yes	Yes	Yes
User interface and communications							
Local user interface	ABB local control panel						
Analog inputs/outputs	1/2	1/2	1/2	1/2	1/2	1/2	1/2
Digital inputs/relay outputs	3/1	3/1	3/1	3/1	3/1	3/1	3/1
Fieldbus connectivity	Modbus, PROFIBUS, EtherNet						
Product compliance							
Safety and EMC	CE conformity according to LV and EMC directives						
Certifications and approvals ¹⁷⁾	VDE, CEI, UNE, RD, EDF, P.O. 12.3, BDEW, GOST, AS, ZA						
Grid support and grid functions	Reactive power compensation ¹⁸⁾ , Power reduction, LVRT, HVRT, Anti-islanding						

¹¹⁾ Frosting is not allowed. May need optional cabinet heating.

¹²⁾ Power derating after 40 °C/45 °C/50 °C

¹³⁾ Power derating above 1000 m

¹⁴⁾ With option 2000 to 4000 m

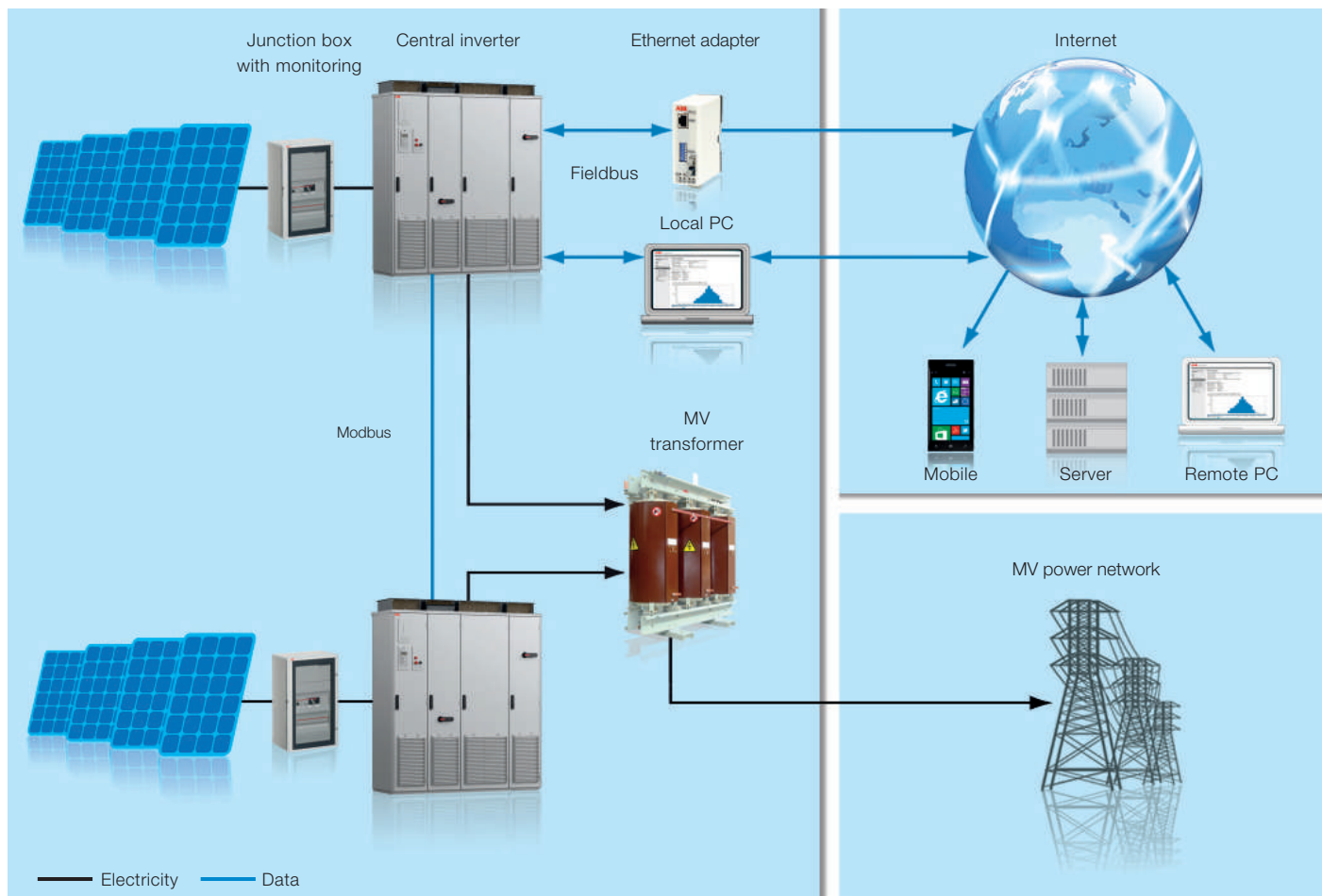
¹⁵⁾ At partial power typically < 70 dBA

¹⁶⁾ Optional

¹⁷⁾ More detailed information, please contact ABB

¹⁸⁾ Also during the night

Data communication principle for ABB central inverters



Options

- Integrated and flexible DC input extension cabinets
- Cabinet heating
- I/O extensions
- DC grounding (negative and positive)
- Fieldbus and Ethernet connections
- Current measurement to each DC input
- Warranty extensions
- Solar inverter care contracts

Accessories

- Solar array junction boxes with string monitoring
- Remote monitoring solutions

Support and service

ABB supports its customers with a dedicated service network in more than 60 countries and provides a complete range of life cycle services from installation and commissioning to preventative maintenance, spare parts, repairs and recycling.

For more information please contact your local ABB representative or visit:

www.abb.com/solarinverters
www.abb.com

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/ Perfect Welding / Solar Energy / Perfect Charging



FRONIUS TAURO

Direct variant.



System design flexibility



Max. performance up to 50°C



Direct sunlight



Optimizing costs



Active Double Wall Cooling



Power stage replacement

The three-phase Fronius Tauro in the 50 and 100 kW power classes promises maximum performance for decentral systems even under the harshest conditions.

With its smart hardware design, it offers not just BOS cost optimization but unprecedented flexibility in system design. Simple installation and the fastest service on the market ensure maximum yield.

TECHNICAL DATA FRONIUS TAURO

INPUT DATA	TAURO 50-3-D	TAURO ECO 50-3-D	TAURO ECO 99-3-D	TAURO ECO 100-3-D
Number of MPP trackers	3		1	
Max. input current ($I_{dc\ max}$)	134 A	87.5 A		175 A
Max. input current module field (PV1 / PV2 / PV3)	36 / 36 / 72 A	75 / 75 / - A		75 / 75 / 75 A
Max. short circuit current (PV1 / PV2 / PV3)	72 / 72 / 125	125 / 125 / -		125 / 125 / 125
Max. short circuit current ($I_{sc\ max}$, inverter)	240	178		355
DC input voltage range ($U_{dc\ min} - U_{dc\ max}$)	200 - 1000 V		580 - 1000 V	
Feed-in start voltage ($U_{dc\ start}$)	200 V		650 V	
Usable MPP voltage range ($U_{mpp\ min} - U_{mpp\ max}$)	400 - 870 V		580 - 930 V	
Number of DC connections (PV1 / PV2 / PV3)	4 / 3 / 7	7 / 7 / -		7 / 7 / 8
Max. PV generator power ($P_{dc\ max}$)		75 kW _{peak}		150 kW _{peak}

OUTPUT DATA	TAURO 50-3-D	TAURO ECO 50-3-D	TAURO ECO 99-3-D	TAURO ECO 100-3-D
AC nominal output ($P_{ac\ n}$)		50,000 W	99,990 W	100,000 W
Max. output power		50,000 VA	99,990 VA	100,000 VA
AC output current ($I_{ac\ nom}$)		76 A		152 A
Grid connection ($U_{ac\ n}$)		3~ NPE 400/230 V ; 3~ NPE 380/220 V		
Frequency (frequency range $f_{min} - f_{max}$)		50 Hz / 60 Hz (45 - 65 Hz)		
Power factor ($\cos \phi_{ac\ n}$)		0 - 1 ind. / cap.		

GENERAL DATA	TAURO 50-3-D	TAURO ECO 50-3-D	TAURO ECO 99-3-D	TAURO ECO 100-3-D
Dimensions (height x width x depth)		755 x 1109 x 346 mm (without wall mount)		
Weight	92 kg	74 kg		103 kg
Degree of protection		IP 65		
Protection class		1		
Night-time consumption		< 16 W		
Cooling		Active cooling technology and double wall system		
Installation		Indoor and outdoor ¹		
Ambient temperature range		- 40 bis + 65 °C ²		
Certificates and compliance with standards ³		AS/NZS 4777.2:2020, IEC62109-1/-2, VDE-AR-N 4105:2018, IEC62116, EN50549-1:2019 & EN50549-2:2019, VDE-AR-N 4110:2018, CEI 0-16:2019, CEI 0-21:2019		

¹ Direct under the sun is possible

² Optional AC-disconnect mounted inside the inverter: from -30 to +65 °C

³ These are planned certificates. For the current certificates, please see www.fronius.com/tauro-cert

TECHNICAL DATA FRONIUS TAURO

AC CONNECTION TECHNOLOGY	TAURO 50-3-D	TAURO ECO 50-3-D	TAURO ECO 99-3-D	TAURO ECO 100-3-D
Cable cross section	35 - 240 mm ²		70 - 240 mm ²	
AC conductor material	Al and Cu			
Connection terminals	Cable lug or V clamps			
Single core option (single core cable)	Cable gland: 5 x M40			
Multi core option (multi core cable)	Cable gland: 1 x multi core connection ø 16 - 61.4 mm + 1 x M32			
AC Daisy Chaining option (single core cable)	Cable gland: 10 x M32			

DC CONNECTION TECHNOLOGY	TAURO 50-3-D	TAURO ECO 50-3-D	TAURO ECO 99-3-D	TAURO ECO 100-3-D
Cable cross section	4 - 6 mm ²			
AC conductor material	Cu			
Connection terminals	DC-direct connection Stäubli Multi Contact MC4			

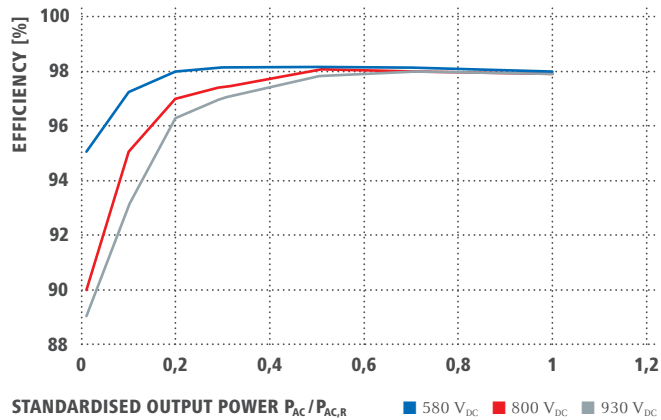
EFFICIENCY	TAURO 50-3-D	TAURO ECO 50-3-D	TAURO ECO 99-3-D	TAURO ECO 100-3-D
Max. efficiency	98.6 %	98.5 %		
European efficiency (ηEU)	98.1 %	98.2 %		
MPP adaptation efficiency	> 99.9 %			

PROTECTION DEVICES	TAURO 50-3-D	TAURO ECO 50-3-D	TAURO ECO 99-3-D	TAURO ECO 100-3-D
DC disconnect	integrated			
Overload behaviour	Operating point shift, power limitation			
Reverse polarity protection	integrated			
RCMU	integrated			
DC insulation measurement	integrated			
DC/AC surge protection	Type 1 + 2 integrated, Type 2 optional			
DC string fusing	integrated, 15 A or 20 A			

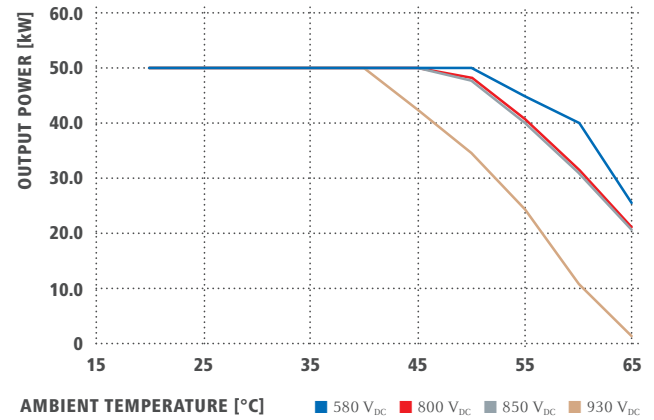
INTERFACES	TAURO 50-3-D	TAURO ECO 50-3-D	TAURO ECO 99-3-D	TAURO ECO 100-3-D
Wi-Fi	Fronius Solar.web, Modbus TCP Sunspec, Fronius Solar API (JSON)			
2x Ethernet LAN RJ45	10/100Mbit; max. 100m Fronius Solar.web, Modbus TCP Sunspec, Fronius Solar API (JSON)			
USB (type A socket)	1A @5V max. ³			
Wired Shutdown (WSD)	Emergency stop			
2x RS485	Modbus RTU SunSpec			
6 digital inputs / 6 digital I/Os	Programmable interface for ripple control receiver, energy management, load control			
Datalogger and Webserver	Integrated			

³ for power supply only

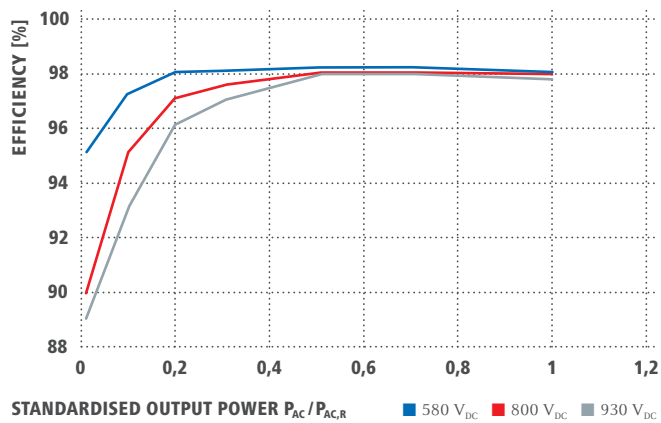
FRONIUS TAURO ECO 50-3-D EFFICIENCY CURVE



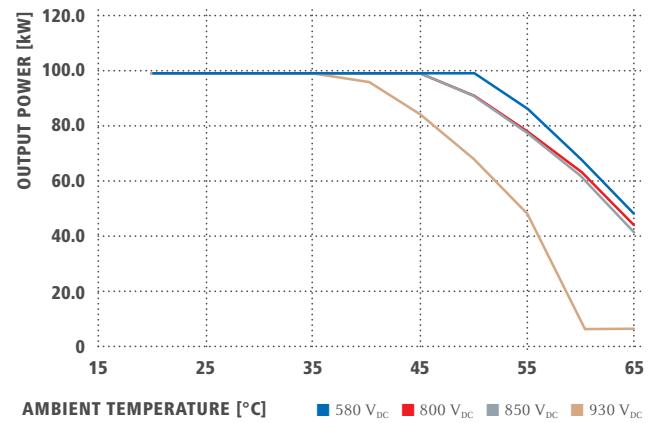
FRONIUS TAURO ECO 50-3-D TEMPERATURE DERATING



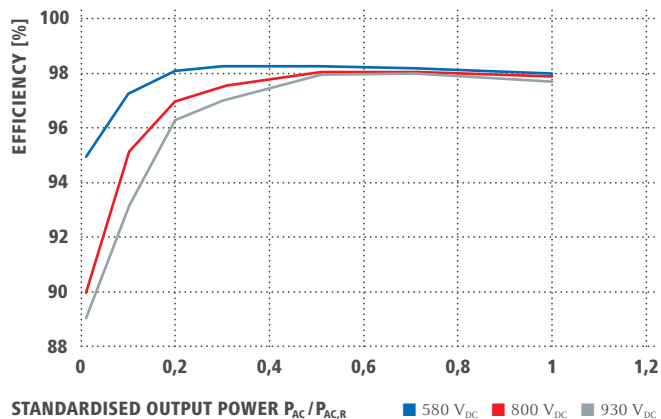
FRONIUS TAURO ECO 99-3-D EFFICIENCY CURVE



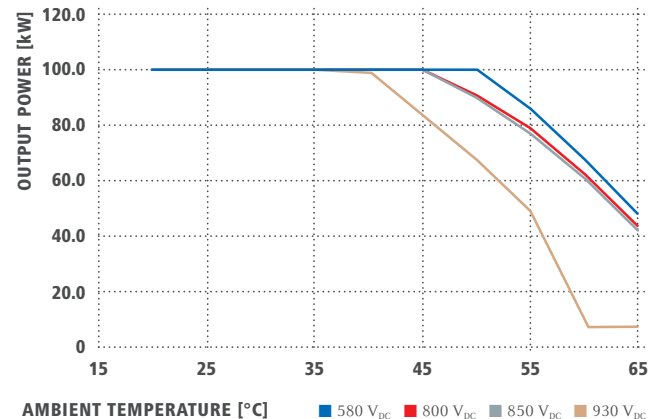
FRONIUS TAURO ECO 99-3-D TEMPERATURE DERATING



FRONIUS TAURO ECO 100-3-D EFFICIENCY CURVE



FRONIUS TAURO ECO 100-3-D TEMPERATURE DERATING



THREE BUSINESS UNITS, ONE GOAL: TO SET THE STANDARD THROUGH TECHNOLOGICAL ADVANCEMENT.

What began in 1945 as a one-man operation now sets technological standards in the fields of welding technology, photovoltaics and battery charging. Today, the company has around 5,440 employees worldwide and 1,264 patents for product development show the innovative spirit within the company. Sustainable development means for us to implement environmentally relevant and social aspects equally with economic factors. Our goal has remained constant throughout: to be the innovation leader.

PERFECT WELDING

Our mission is Perfect Welding; a task we have approached with passion and skill for decades in order that our customers can join materials with the perfect weld seam. With our outstanding technologies and services and together with our customer's applications, not only do we solve their specific welding technology problems, but we also make a substantial contribution to increasing their productivity.

SOLAR ENERGY

Our mission is to achieve 24 hours of sun. Day after day we are hard at work turning this vision of a future in which 100% of the world's energy needs are covered by renewable sources into a reality. We are therefore concentrating on solutions to intelligently, efficiently and economically generate, store, distribute and consume solar energy.

PERFECT CHARGING

As know-how leaders in the world of battery charging, we deliver exceptional solutions to create the maximum benefit for our customers. For the intralogistics sector, we are committed to energy flow optimisation for electric forklift trucks and are constantly striving for the next innovation. Our powerful charging systems for vehicle workshops guarantee safe and reliable processes.

Further information about all Fronius products and our global sales partners and representatives can be found at www.fronius.com

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www.fronius.com

SOLGEN EXPERIENCE					
DETAILS OF ONGRID/OFFGRID SOLAR POWER PLANT SYSTEMS					
SL NO.	Work Order Date	NAME	CAPACITY	TOTAL AMOUNT	TYPE
1	27-03-2015	DURO PACK INDUSTRIES	3	3,00,000.00	ONGRID
2	30-04-2015	RejiKumar,Maradu,Ernakulam	3	3,44,999.84	ONGRID
3	05-05-2015	Hykon India P Ltd	6	7,10,816.00	OFFGRID
4	12-05-2015	Chipset Computers Systems & Services	1.5	2,34,222.00	OFFGRID
5	21-05-2015	Global Power Solutions	10	15,41,512.50	OFFGRID
6	28-05-2015	Rajiven V R,Ernakulam	4	4,00,000.00	ONGRID
7	28-05-2015	Sunil Subramoniam	1	1,00,000.00	ONGRID
8	29-05-2015	Global Power Solutions	2	1,40,390.00	ONGRID
9	16-06-2015	POSITIVE -PALAKKAD	3	1,89,880.00	OFFGRID
10	27-06-2015	D.S ELECTRICALS	6	9,00,000.00	OFFGRID
11	30-06-2015	Exe.Engineer,PWD,TVM	6	5,14,045.51	ONGRID
12	30-06-2015	Exe.Engineer,PWD,TVM	6	5,14,045.51	ONGRID
13	30-06-2015	LUKE MAVELIKKARA	10	8,00,000.00	ONGRID
14	30-06-2015	SHOBHA SAREE HOUSE	10	8,00,000.00	ONGRID
15	20-07-2015	Chipset Computers Systems & Services	1	2,20,722.00	OFFGRID
16	23-07-2015	Tejas Kiran Chavan-Nashik	30	25,20,000.00	ONGRID
17	31-07-2015	MANJU GEORGE PALAKKAD	10	8,00,000.00	ONGRID
18	31-07-2015	AJITH EKM	10	8,00,000.00	ONGRID
19	05-08-2015	GLOBAL POWER	0.6	76,208.00	ONGRID
20	10-08-2015	T.R RAGHULAL	6	4,29,078.30	ONGRID
21	11-08-2015	HYKON INDIA	5	2,76,298.00	OFFGRID
22	25-08-2015	GLOBAL POWER	1.2	1,05,000.00	ONGRID
23	31-08-2015	OUSEPH CHAKOLA	10	8,00,000.00	ONGRID
24	31-08-2015	RUTRONIX	1	1,06,698.00	OFFGRID

25	05-09-2015	GLOBAL POWER	1	1,56,550.00	OFFGRID
26	08-09-2015	GLOBAL POWER	1	3,83,800.00	OFFGRID
27	14-09-2015	GLOBAL POWER	1	2,12,100.00	OFFGRID
28	18-09-2015	Parameshwaran,Ollukara	1.2	1,19,180.00	ONGRID
29	30-09-2015	TORQ,coimbatore	1	2,12,100.00	OFFGRID
30	20-10-2015	POSITIVE BUSINESS	1	73,613.85	OFFGRID
31	21-10-2015	D.V PATHY	5	4,54,500.00	ONGRID
32	24-10-2015	RATHISH.P.	2	1,75,000.00	ONGRID
33	14-11-2015	Chacko Antony	1.5	2,16,852.00	OFFGRID
34	17-11-2015	Thankachie Francis	3	2,21,940.00	ONGRID
35	24-11-2015	MUJEEB RAHMAN	10	8,00,000.00	ONGRID
36	25-11-2015	HYKON INDIA P LTD	1	2,22,200.00	OFFGRID
37	30-11-2015	D. Srinivasulu,Hydrabad	3	5,05,000.00	ONGRID
38	30-11-2015	CHACHI	30	25,00,148.19	ONGRID
39	21-12-2015	St.Paul's Public School, Kuriachira	3	5,90,850.00	OFFGRID
40	23-12-2015	FIAZ FUELS,Edavanna	4	5,25,200.00	OFFGRID
41	28-12-2015	IOCL-KOCHI	10	7,34,815.50	ONGRID
42	28-12-2015	IOCL-CHELARI	10	7,34,815.50	ONGRID
43	29-12-2015	Global Power Solutions P Ltd	1.2	1,49,480.00	OFFGRID
44	18-02-2016	MEENJA PANCHAYATH	5	6,23,230.60	OFFGRID
45	02-01-2016	110006 - ILLKAL	80	50,00,000.00	ONGRID
46	09-01-2016	IOCL-KOLLAM	10	7,34,815.50	ONGRID
47	09-01-2016	SURYA KIRAN,KOLLAM	3	1,89,880.00	ONGRID
48	20-01-2016	Executive Engineer,PWD,TRIVANDRUM	3	3,90,000.00	ONGRID
49	30-01-2016	KFRA - PEECHI	20	19,91,851.30	ONGRID
50	23-02-2016	HPCL - PUDUPALAYAM	6	1,80,000.00	ONGRID
51	23-02-2016	HPCL - ODRAPALAYAM	6	1,80,000.00	ONGRID
52	29-02-2016	HESTER BIOSCIENCES LIMITED,GUJARAT	100	59,00,000.00	ONGRID

53	11-03-2016	A.P MADHU, Thrissur	12	9,69,600.00	ONGRID
54	12-03-2016	Prime Associates,Kannur	3	2,06,898.00	ONGRID
55	14-03-2016	MILMA BLANTHOLE	27	18,55,168.00	ONGRID
56	21-03-2016	Global Power solutions	1.2	1,66,650.00	OFFGRID
57	26-03-2016	RUTRONIX,TVM	2	3,33,300.00	OFFGRID
58	30-03-2016	kasarkod muncipality	10	17,72,952.00	OFFGRID
59	30-03-2016	C-DIT	1	6,26,124.00	OFFGRID
60	30-03-2016	C-DIT	1	9,00,786.00	OFFGRID
61	30-03-2016	C-DIT	2	3,24,563.00	OFFGRID
62	31-03-2016	SIVAGIRI VARKALA	10	8,00,000.00	ONGRID
63	31-03-2016	KERALA AGRICULTURAL UNIVERSITY COLLEGE,KAZARGOD	1	9,99,999.00	OFFGRID
64	09-04-2016	HYKON INDIA P LTD	3	3,64,862.50	OFFGRID
65	13-04-2016	Global Power Solutions,Ollur	2	1,66,650.00	OFFGRID
66	11-04-2016	HPC - SATHOOR	6	1,80,000.00	ONGRID
67	25-04-2016	HPC - POTTANERI	6	1,75,085.02	ONGRID
68	25-04-2016	HPC - SOOLAGIRI	6	1,75,085.02	ONGRID
69	27-04-2016	Surya Kiran,Kollam	2	2,51,540.50	OFFGRID
70	29-04-2016	Suresh Babu,Edappal	0.30	23,411.00	OFFGRID
71	04-05-2016	MYTHILI KUTTAN	10	8,00,000.00	ONGRID
72	09-05-2016	Prime Associates,Kannur	10	2,89,023.00	OFFGRID
73	31-05-2016	Dr. C.V Krishnakumar	3	3,18,150.00	ONGRID
74	31-05-2016	principal College Of Eng Kidangoor	3	2,62,598.99	ONGRID
75	31-05-2016	M.L ENTERPRISES	4	3,70,000.00	OFFGRID
76	31-05-2016	principal College Of Eng Kidangoor	1	1,99,998.18	OFFGRID
77	11-06-2016	VYDYUTHI BHAVAN - TVM	30	22,72,500.00	ONGRID
78	11-06-2016	IOCL - KOCHI	10	7,57,500.00	ONGRID
79	13-06-2016	NAGENDRAN	2	94,600.00	OFFGRID
80	17-06-2016	MR.RAVINDRANATH	2.5	3,28,250.00	OFFGRID

81	20-06-2016	C-DIT	3	4,25,740.00	OFFGRID
82	25-06-2016	Mrs.Jolly Chacko	6	3,89,596.39	ONGRID
83	28-06-2016	Global Power Solution	1.2	1,43,420.00	OFFGRID
84	05-07-2016	PRINCIPAL ST.MARY'S SCHOOL MAVOOR	5	4,09,050.00	ONGRID
85	05-07-2016	GLOBAL POWER SOLUTION	3	3,53,500.00	OFFGRID
86	09-07-2016	KERALA STATE CO-OPERATIVE INSTITUTE OF INFORMATIO	2	1,94,999.99	ONGRID
87	09-07-2016	PMS COLLGE OF DENTAL SCIENCES & RESEARCH	3	5,07,799.99	OFFGRID
88	14-07-2016	KLF NIRMAL INDUTRIES PVT LTD	2	2,78,520.00	ONGRID
89	15-07-2016	PRINCIPAL ST.MARY'S SCHOOL MAVOOR	8	5,85,800.00	ONGRID
90	15-07-2016	PRIME ASSOCIATES	1	1,92,191.00	OFFGRID
91	22-07-2016	DR. R KASI VISWESWARAN	3	2,39,449.99	ONGRID
92	03-08-2016	PRIME ASSOCIATES	2.5	2,62,878.00	OFFGRID
93	06-08-2016	MR. BENOY THOMAS	2	2,55,000.00	OFFGRID
94	11-08-2016	PRIME ASSOCIATES	3	1,79,556.00	OFFGRID
95	16-08-2016	KOSSY VARGHES	10	7,99,999.99	ONGRID
96	17-08-2016	GLOBAL POWER SOLUTION	1	3,42,000.00	OFFGRID
97	17-08-2016	PRIME ASSOCIATES	1	99,790.32	OFFGRID
98	19-08-2016	PAUL JOSEPH	3	2,22,500.00	ONGRID
99	20-08-2016	VISHRAAM BUILDERS	5	4,90,000.00	ONGRID
100	31-08-2016	SASEEDHARAN PILLAI	10	7,99,999.99	ONGRID
101	31-08-2016	CHRISTY ALEX	10	7,99,999.99	ONGRID
102	31-08-2016	PRINCIPAL HOLY ANGESL	3	2,24,725.00	ONGRID
103	31-08-2016	AMMAD	10	7,99,999.99	ONGRID
104	08-09-2016	ST.JOSEPH COLLEGE	2	2,95,930.00	OFFGRID
105	08-09-2016	PRIME ASSOCIATES	5	5,43,016.00	OFFGRID
106	17-09-2016	Mrs. SAVITHRI R MENON	5	4,31,238.00	ONGRID
107	17-09-2016	ROY MATHEW	10	7,99,999.99	ONGRID
108	26-09-2016	MOHAMMED	5	3,85,050.38	ONGRID

109	05-10-2016	THOMAS	2	1,90,000.00	ONGRID
110	19-10-2016	KAILASANADHA SCHOOL	10	7,99,999.99	ONGRID
111	19-10-2016	Global Power Solution	3	3,50,000.00	OFFGRID
112	25-10-2016	DEEPAK SURESHCHANDRA SHETH	2	1,38,000.00	ONGRID
113	25-10-2016	DHARMENDRA SHANTILAL PANCHAL	2	1,38,000.00	ONGRID
114	26-10-2016	LIGHT HOUSE KANDLA	37	24,76,976.00	ONGRID
115	28-10-2016	SONETEC POWER SOLUTIONS,	3	2,67,680.30	ONGRID
116	31-10-2016	ANNA JOHN	5	4,32,238.00	ONGRID
117	31-10-2016	Global Power Solution	5	4,99,950.00	OFFGRID
118	31-10-2016	KSE LIMITED	5	4,14,100.00	OFFGRID
119	10-11-2016	DR. E MOHANDAS	5	4,86,009.98	ONGRID
120	10-11-2016	MRS.CAROL	2	2,76,810.00	ONGRID
121	12-11-2016	XAVI THEKKATH	10	7,99,999.99	ONGRID
122	24-11-2016	CHENNAI POLICE	15	9,63,485.00	ONGRID
123	24-11-2016	CHENNAI POLICE	5	7,34,015.00	OFFGRID
124	30-11-2016	DGLL PONDICHERY,	25	1673250	ONGRID
125	30-11-2016	DGLL RAMESWARAM	12	1034564	ONGRID
126	30-11-2016	DIVISIONAL EXECUTIVE ENGINEER, SOUTHERN RAILWAY	3	3,95,000.00	OFFGRID
127	30-11-2016	CHENNAI LIGHT HOUSE-MADRAS	3	4,62,690.00	OFFGRID
128	30-11-2016	CHENNAI LIGHT HOUSE - KANYAKUMARI	3	4,62,690.00	OFFGRID
129	30-11-2016	CHENNAI LIGHT HOUSE, KILAKARI	4	6,09,160.00	OFFGRID
130	30-11-2016	CHENNAI LIGHT HOUSE AMMAPATTINAM	4	6,09,160.00	OFFGRID
131	12-12-2016	UMMER E.P	5	4,99,500.00	ONGRID
132	22-12-2016	VIJAY P MENON	2	1,67,000.00	ONGRID
133	24-12-2016	CHARTERED CORPORATE SOLUTION	3	3,10,000.00	OFFGRID
134	27-12-2016	SHAH HETAL MANISHKUMAR	3	2,07,000.01	ONGRID
135	27-12-2016	Manubhai Dahyabhai Patel	4	2,76,000.00	ONGRID
136	27-12-2016	Patel Arvidhbhai Bhagvanbhai	4	2,76,000.00	ONGRID

137	27-12-2016	Dr Narendrabhai Purushottambhai Patel	3	2,07,000.00	ONGRID
138	28-12-2016	GOPI	10	8,00,000.00	ONGRID
139	31-12-2016	DGLL - GANDIDAM	50	30,36,500.00	ONGRID
140	31-12-2016	P.D FRANCIS	3	2,78,760.00	ONGRID
141	13-01-2017	C.K GEORGE	1	1,70,690.00	OFFGRID
142	17-01-2017	Global Power Solution	0.5	79,000.00	OFFGRID
143	18-01-2017	ELSOL	2	1,67,000.00	ONGRID
144	23-01-2017	ABOBACKER	3	2,84,260.00	ONGRID
145	28-01-2017	KSEB KUTTIPURAM	500	3,11,97,500.00	ONGRID
146	30-01-2017	BENJAMIN	5	4,79,750.00	ONGRID
147	31-01-2017	Deshpande Madhav Aniruddbhai	2	1,38,000.00	ONGRID
148	31-01-2017	Kantaben Nirajbhai Taparia	5	3,45,000.00	ONGRID
149	31-01-2017	George Mathew	15	11,36,250.00	ONGRID
150	10-02-2017	VENERINI HIGHER SECONDARY SCHOOL	10	8,32,038.00	ONGRID
151	22-02-2017	VAIDYARATNAM NURSING HOME	1	58,171.09	OFFGRID
152	25-02-2017	YUSUF	5	4,79,750.00	ONGRID
153	25-02-2017	ALPHA PAUL	1	3,03,000.00	OFFGRID
154	25-02-2017	GLOBAL POWER SOLUTION	1	1,77,000.00	OFFGRID
155	28-02-2017	BYJU C.P	5	4,79,750.00	ONGRID
156	28-02-2017	K.C GEORGE	5	4,79,750.00	ONGRID
157	28-02-2017	ELSY MATHEW	5	4,79,750.00	ONGRID
158	28-02-2017	DR.E.F VARGHESE	2	2,02,000.00	ONGRID
159	28-02-2017	KERALA AGRICULTURAL UNIVERSITY	0.5	99,000.00	OFFGRID
160	28-02-2017	KERALA AGRICULTURAL UNIVERSITY	2.25	2,92,000.00	OFFGRID
161	28-02-2017	KERALA AGRICULTURAL UNIVERSITY	1.25	99,000.00	OFFGRID
162	28-02-2017	CLETUS	2	3,03,000.00	OFFGRID
163	07-03-2017	Mr. Sulochana	10	7,99,899.00	ONGRID
164	10-03-2017	Gangamma	1	1,70,690.00	OFFGRID

165	13-03-2017	JACOB MATHEW	5	4,79,750.00	ONGRID
166	13-03-2017	K NADARAJAN	3	3,48,450.00	OFFGRID
167	13-03-2017	Mr.Vijayan C	1	1,70,690.00	OFFGRID
168	13-03-2017	KANNATH SANKARANUNNI MENON	3	3,48,450.00	OFFGRID
169	14-03-2017	Mr. M PRABHAKARAN	1	1,70,690.00	OFFGRID
170	14-03-2017	Mr. PATRIK KADAMALA	3	4,39,350.00	OFFGRID
171	20-03-2017	DILEESH DAMODHARAN	1	1,70,690.00	OFFGRID
172	20-03-2017	N.I VARGHESE	2	3,03,000.00	OFFGRID
173	23-03-2017	MANOJ	3	4,34,861.00	OFFGRID
174	23-03-2017	VALSAN	3	4,34,861.00	OFFGRID
175	24-03-2017	PALAKKAD MUNICIPALITY	50	29,84,100.00	ONGRID
176	24-03-2017	NARAYANAN	3	4,34,861.00	OFFGRID
177	24-03-2017	BHATT	3	4,34,861.00	OFFGRID
178	24-03-2017	GANGADHARAN	3	3,19,630.00	OFFGRID
179	27-03-2017	C-DIT	15	12,18,349.00	ONGRID
180	28-03-2017	ANERT - PULAYANARKOTTA	10	15,51,474.26	OFFGRID
181	30-03-2017	BAASUBRAMANIAN	3	3,34,844.00	OFFGRID
182	30-03-2017	REV. P.C JOSEPH	3	4,39,350.00	OFFGRID
183	31-03-2017	Moosa K	3	2,78,760.00	ONGRID
184	31-03-2017	Thankamani	3	2,78,760.00	ONGRID
185	31-03-2017	Rossy George	5	4,79,750.00	ONGRID
186	31-03-2017	Pranesh	15	11,36,250.00	ONGRID
187	31-03-2017	Lead Management	50	31,78,090.00	ONGRID
188	31-03-2017	Sahrudaya College Kodakara	80	51,52,000.00	ONGRID
189	31-03-2017	IOCL PONDICHERY	40	23,86,046.00	ONGRID
190	31-03-2017	THODUPUZHA MUNICIPALITY	30	18,26,000.00	ONGRID
191	31-03-2017	IOCL MANNARGUDI	40	23,86,046.00	ONGRID
192	31-03-2017	IOCL COIMBATORE	35	21,01,163.00	ONGRID

193	31-03-2017	Yohannan Geevarghese	10	7,84,899.00	ONGRID
194	31-03-2017	Irvin Mascarenhas	2	2,02,000.00	ONGRID
195	31-03-2017	Mala Vincent	3	2,73,760.00	ONGRID
196	31-03-2017	Kozhinjapara	15	11,16,865.00	ONGRID
197	31-03-2017	Abby John	10	7,89,899.00	ONGRID
198	31-03-2017	ST.Thomas School	10	8,32,038.00	ONGRID
199	31-03-2017	HARICHANDRAN	1	1,67,528.70	OFFGRID
200	31-03-2017	Shyamala Devi Panikar	3	4,39,350.00	OFFGRID
201	31-03-2017	Padmanabha Iyyengar	1	1,70,690.00	OFFGRID
202	31-03-2017	Dr. Sheela	1	1,70,690.00	OFFGRID
203	31-03-2017	Raju	2	3,03,000.00	OFFGRID
204	31-03-2017	Lalitha Devi	2	2,93,000.00	OFFGRID
205	31-03-2017	Mariamamma Roy	1	1,70,690.00	OFFGRID
206	31-03-2017	Hussian Kutty	1	1,70,690.00	OFFGRID
207	31-03-2017	Veera Raghavan	1	1,70,690.00	OFFGRID
208	31-03-2017	Jayapalal	3	4,39,350.00	OFFGRID
209	31-03-2017	Muraleedharan P.N	2	3,03,000.00	OFFGRID
210	31-03-2017	Meera Somarajan	1	1,70,690.00	OFFGRID
211	31-03-2017	Varghese C.V	5	7,47,400.00	OFFGRID
212	31-03-2017	Sabu Joseph	3	4,39,350.00	OFFGRID
213	31-03-2017	Roslind Thomas	3	4,39,350.00	OFFGRID
214	31-03-2017	Babu Nahas	2	3,03,000.00	OFFGRID
215	31-03-2017	JAMES N.L	3	3,34,844.00	OFFGRID
216	31-03-2017	NAZRUTH	3	4,55,561.01	OFFGRID
217	31-03-2017	BENNY	1	1,70,690.00	OFFGRID
218	31-03-2017	N.U John	3	4,39,350.00	OFFGRID
219	18-04-2017	Mr. Thankachan S	3	2,78,760.00	ONGRID
220	28-04-2017	Sreejith Menon	3	4,39,350.00	ONGRID

221	29-04-2017	Rugmavathy	1	1,70,690.00	OFFGRID
222	04-05-2017	CIJO DAVID	2	2,02,000.00	ONGRID
223	04-05-2017	SHIVAKUMAR	2	2,02,000.00	ONGRID
224	04-05-2017	SRI RAMA KRISHNA MISSION - TVM	100	57,84,545.00	ONGRID
225	04-05-2017	ANTONY T.V	10	8,32,038.00	ONGRID
226	04-05-2017	P.V NARENDRA RAO	5	4,79,750.00	ONGRID
227	04-05-2017	M J GEORGE	2	2,02,000.00	ONGRID
228	04-05-2017	GEORGE MATHEWS	3	2,78,760.00	ONGRID
229	04-05-2017	THODUPUZHA MUNICIPALITY	18	10,14,160.00	ONGRID
230	04-05-2017	SHANTO K K	2	3,03,000.00	OFFGRID
231	04-05-2017	VENUGOPALAN NAIR	1	1,70,690.00	OFFGRID
232	04-05-2017	HARISH	3	3,19,629.00	OFFGRID
233	04-05-2017	STEPHEN PADAMANA	2	3,08,611.00	OFFGRID
234	04-05-2017	SACRED HEART SCHOOL	3	4,34,861.00	OFFGRID
235	04-05-2017	Nakshatra Solar Energy	2	1,67,450.00	OFFGRID
236	11-05-2017	Ramsing V.S	3	2,78,760.00	ONGRID
237	11-05-2017	JAMES KUDILIL	3	4,34,861.00	OFFGRID
238	16-05-2017	Ravikumar S	5	4,79,750.00	ONGRID
239	16-05-2017	PARAMESWARA SHARMA	1	1,59,917.00	OFFGRID
240	16-05-2017	Aji V.S	1	1,70,690.00	OFFGRID
241	17-05-2017	Dr. Rajnikanth P Patel	7.50	5,17,500.00	ONGRID
242	17-05-2017	Mistry Ushaben Jayntilal	2	1,38,000.00	ONGRID
243	18-05-2017	JOHNSON P.L	1	1,70,690.00	OFFGRID
244	23-05-2017	Krishnadas P.B	3	2,78,760.00	ONGRID
245	26-05-2017	DR. ANITHA	5	4,49,909.00	ONGRID
246	26-05-2017	PRASANNAN	1	1,59,917.00	OFFGRID
247	26-05-2017	Varky George	1	1,70,690.00	OFFGRID
248	30-05-2017	MADHUSOODHANAN	1	1,59,917.00	OFFGRID

249	31-05-2017	Lalith Mohan	3	2,78,760.00	ONGRID
250	31-05-2017	MALLIKA PURUSHOTHAMAN	10	8,32,038.00	ONGRID
251	31-05-2017	Venugopal Nair	2	2,02,000.00	ONGRID
252	31-05-2017	BISHOP HOUSE IRINJALAKUDA	15	9,92,605.00	ONGRID
253	31-05-2017	NUJUME	3	4,39,350.00	OFFGRID
254	06-06-2017	Bharatiya Vidya Bhavan	20	11,26,000.00	ONGRID
255	24-06-2017	Gopinathan	3	2,64,436.00	ONGRID
256	24-06-2017	Gopinathan	3	2,64,436.00	ONGRID
257	27-06-2017	Pathuvana Kunju Mohammed	3	4,39,350.00	OFFGRID
258	30-06-2017	Enmakaje Grama Panchayath	10	6,89,000.00	ONGRID
259	31-07-2017	HYKON 5+5 KW BANGLORE	10	5,75,437.00	ONGRID
260	09-08-2017	K BABY	10	7,00,320.00	ONGRID
261	10-08-2017	THEYAMMA PAUL	10	7,12,910.00	ONGRID
262	17-08-2017	DELSTAR	1	1,18,125.00	OFFGRID
263	18-08-2017	PAULOSE	3	4,91,240.00	OFFGRID
264	18-09-2017	MERGY GEORGE	10	7,12,910.00	ONGRID
265	22-09-2017	K V SASIDHARAN	1	1,60,970.00	OFFGRID
266	30-09-2017	Damodaran Namboodiri	3	2,27,412.00	ONGRID
267	30-09-2017	GEORGE K.J	3	2,27,412.00	ONGRID
268	07-10-2017	Manoharan	1	1,60,760.00	OFFGRID
269	07-10-2017	Anandarajan	1	1,60,760.00	OFFGRID
270	14-10-2017	AJU P A	2	2,98,625.00	OFFGRID
271	17-10-2017	K.D JOSE	3	4,55,597.00	OFFGRID
272	24-10-2017	DR. A J JOY	3	2,27,412.00	ONGRID
273	26-10-2017	MATTATHOOR PHC THRISSUR	3	4,02,550.00	OFFGRID
274	30-10-2017	Jose P.T	1	1,28,776.00	OFFGRID
275	30-10-2017	Santhula Trust Hospital	25	17,16,812.00	ONGRID
276	31-10-2017	Dr. Prasannam	1	1,60,970.00	OFFGRID

277	31-10-2017	Manoj K R	1	1,60,970.00	OFFGRID
278	06-11-2017	Mujeeb Rahman	1	1,60,970.00	OFFGRID
279	16-11-2017	Rasheed	3	3,53,177.00	OFFGRID
280	16-11-2017	Alex Thomas	3	4,55,597.00	OFFGRID
281	18-11-2017	Revathy Velloth	1	1,60,970.00	OFFGRID
282	18-11-2017	Palakunnu Sree Bhagavathy Kshethra Samrakshana Samit	15	11,50,000.00	ONGRID
283	20-11-2017	Saraswathy N	1	1,60,970.00	OFFGRID
284	20-11-2017	Suji Gopinath	1	1,60,970.00	OFFGRID
285	22-11-2017	George Mathew	1	1,19,776.00	OFFGRID
286	22-11-2017	Resmi L B	1	1,60,970.00	OFFGRID
287	22-11-2017	ALEYAS	1	1,39,950.00	OFFGRID
288	22-11-2017	SURESH KUMAR	3	4,05,480.00	OFFGRID
289	22-11-2017	SOBHA	5	4,19,519.00	ONGRID
290	25-11-2017	FAIZAL	1	1,60,970.00	OFFGRID
291	30-11-2017	Shaji Francis	2	2,50,715.00	OFFGRID
292	30-11-2017	A.K MURALEEDHARAN NAIR	2	2,50,715.00	OFFGRID
293	30-11-2017	MURALEEDHARAN V	3	3,53,177.00	OFFGRID
294	18-12-2017	E.P Ravindran	1	1,60,970.00	OFFGRID
295	18-12-2017	Ranjith	1	1,60,970.00	OFFGRID
296	23-12-2017	Udayan M.P	1	1,60,970.00	OFFGRID
297	28-12-2017	Jithu Aboobacker	1	1,60,500.00	OFFGRID
298	28-12-2017	Thankamani	1	1,07,318.00	OFFGRID
299	28-12-2017	Omana Babu	3	2,40,833.00	ONGRID
300	05-01-2018	Vijayanadh Karunakaran	2	2,98,625.00	OFFGRID
301	09-01-2018	K C Zackariah	3	3,53,177.00	OFFGRID
302	09-01-2018	Ajesh	1	1,28,776.00	OFFGRID
303	10-01-2018	Hykon -GEC TSR	50	30,93,990.00	ONGRID
304	11-01-2018	Grace James	2	2,50,715.00	OFFGRID

305	22-01-2018	Secretary, Vallathol Nagar GP	3	3,60,270.00	OFFGRID
306	25-01-2018	C.P CHANDRAN NAIR	3	3,53,177.00	OFFGRID
307	25-01-2018	RADHAMANIAMMA	2	2,50,715.00	OFFGRID
308	30-01-2018	ITHIKKARA BLOCK PANCHAYATH OFFICE	10	6,12,770.00	ONGRID
309	30-01-2018	Sree Kandeswaram Temple	5	5,85,522.00	OFFGRID
310	30-01-2018	SALMA	1	1,28,776.40	OFFGRID
311	30-01-2018	PADMANABHAN J	2	2,98,625.50	OFFGRID
312	03-02-2018	SECRETARY ,PAMPAKUDA BLOCK PANCHAYATH	10	6,34,900.00	ONGRID
313	10-02-2018	K P SHANTHA	3	4,55,597.00	OFFGRID
314	10-02-2018	SIDDIQUE	1	1,60,970.50	OFFGRID
315	10-02-2018	SAJEEVAN K B	1	1,28,802.40	OFFGRID
316	10-02-2018	ANURAG SIVASANKAR	3	3,33,176.60	OFFGRID
317	20-02-2018	Thomas Mathew	5	3,79,019.00	ONGRID
318	20-02-2018	Ramesh	3	2,27,412.00	ONGRID
319	21-02-2018	Senior Suprendent CDRF	5	5,33,000.00	OFFGRID
320	21-02-2018	Sajeev Kumar R	3	2,27,412.00	ONGRID
321	23-02-2018	Jessy Lanse	5	3,79,019.38	ONGRID
322	27-02-2018	Prakassan	3	2,27,412.74	ONGRID
323	27-02-2018	Prakassan	1	1,60,970.50	OFFGRID
324	28-02-2018	Sivadasan	5	3,79,019.38	ONGRID
325	06-03-2018	Brother Thomas - Malabar Missionary	5	3,79,019.38	ONGRID
326	07-03-2018	K R Jayanthan	3	3,53,177.00	OFFGRID
327	07-03-2018	Noby M Jose	1	1,28,776.40	OFFGRID
328	09-03-2018	Suresh Kumar R	5	3,79,019.38	ONGRID
329	09-03-2018	Shajahan	3	2,27,412.74	ONGRID
330	12-03-2018	Siju Rajappan	5	3,79,019.38	ONGRID
331	12-03-2018	Rajasree S.	2	1,51,607.75	ONGRID
332	14-03-2018	Mathew Philip	3	2,27,412.74	ONGRID

333	15-03-2018	Shyamala Devi	3	2,22,412.75	ONGRID
334	15-03-2018	Binu Jayaraj	3	2,27,412.74	ONGRID
335	16-03-2018	Usha Dileep	3	2,27,412.74	ONGRID
336	16-03-2018	Haridas Kandoth Poyil	1	1,60,970.50	OFFGRID
337	17-03-2018	T J Mathew	2	1,51,607.75	ONGRID
338	17-03-2018	Lilly Koshi	5	3,79,019.38	ONGRID
339	21-03-2018	Balakrishnan	5	3,79,019.38	ONGRID
340	22-03-2018	ASOK	1	1,39,950.30	OFFGRID
341	23-03-2018	Paul B D	5	3,79,019.38	ONGRID
342	24-03-2018	Thankamma Kossi	3	2,27,412.74	ONGRID
343	26-03-2018	Subha Kadamala	3	4,05,479.55	OFFGRID
344	27-03-2018	Reji Nair	3	2,27,412.74	ONGRID
345	27-03-2018	J Mohammed Siyad	1	1,60,970.50	OFFGRID
346	27-03-2018	Sreedharan Nair P	3	2,27,412.74	ONGRID
347	28-03-2018	Sreekala	3	2,27,412.74	ONGRID
348	28-03-2018	Gopi	3	2,27,412.74	ONGRID
349	29-03-2018	Chandran Moosad	3	2,27,412.74	ONGRID
350	29-03-2018	Sis. Annakutty V M	5	5,95,522.60	OFFGRID
351	31-03-2018	Joseph matew	2	92,400.00	ONGRID
352	31-03-2018	Balachandran	3	2,27,412.74	ONGRID
353	31-03-2018	George Thomas	2	2,50,715.00	OFFGRID
354	31-03-2018	Lohidakshan Unnithan	3	2,17,412.00	ONGRID
355	31-03-2018	Lakshmi	3	2,17,412.00	ONGRID
356	31-03-2018	Chandran Poovanpallil	5	3,79,019.38	ONGRID
357	31-03-2018	Jullie Mammen	3	3,53,177.00	OFFGRID
358	31-03-2018	AVJ Emporium	5	5,95,522.60	OFFGRID
359	31-03-2018	Krishnadas C K	3	2,27,412.74	ONGRID
360	31-03-2018	Sreekanthan K N	3	2,27,412.74	ONGRID

361	31-03-2018	The Vicar , ST. Xavier Church	10	6,76,771.00	ONGRID
362	31-03-2018	Jolly Bakery	10	6,70,000.00	ONGRID
363	31-03-2018	Achaamkulangara Nalini	3	2,13,914.74	ONGRID
364	31-03-2018	Saju Simon	3	2,27,412.74	ONGRID
365	31-03-2018	Mary Jose	10	7,14,550.00	ONGRID
366	31-03-2018	Dr. Thomas Varghese	3	2,27,412.74	ONGRID
367	31-03-2018	Joseph Jacob	3	2,27,412.74	ONGRID
368	31-03-2018	Midlaj T A	1	1,48,499.50	OFFGRID
369	31-03-2018	Harikumar	2	1,51,607.75	ONGRID
370	31-03-2018	Dr. Ramakrishnan	3	2,27,412.74	ONGRID
371	31-03-2018	Abraham	5	3,79,019.38	ONGRID
372	31-03-2018	Renju N Varghese	2	2,50,715.00	OFFGRID
373	31-03-2018	Ajish Kuriakose	3	3,53,177.00	OFFGRID
374	31-03-2018	Ajay Vinod	3	2,27,412.74	ONGRID
375	31-03-2018	Punnath Usha	2	1,51,607.75	ONGRID
376	31-03-2018	Sudhir	3	2,27,412.74	ONGRID
377	31-03-2018	Viswanathan	3	2,27,412.74	ONGRID
378	31-03-2018	Trikalangode GP	5	3,64,019.00	ONGRID
379	31-03-2018	Trikalangode GP	3	2,15,410.00	ONGRID
380	31-03-2018	ST.JOHN CONVET PARAPOOR	10	6,60,665.25	ONGRID
381	31-03-2018	PADMAVATHIAMMA	2	1,47,490.35	ONGRID
382	31-03-2018	SR FUELS	10	7,17,363.50	ONGRID
383	19-04-2018	Alex Ommen	1	1,39,950.30	OFFGRID
384	27-04-2018	Comtech Systems	2	2,50,715.00	OFFGRID
385	27-04-2018	Shelton Joseph	5	3,79,020.49	ONGRID
386	28-04-2018	Joseph M J	2	1,51,607.75	ONGRID
387	28-04-2018	Khalid P M	2	1,51,607.75	ONGRID
388	28-04-2018	Geo K John	3	2,27,412.74	ONGRID

389	30-04-2018	Alekutty K T	5	3,79,020.49	ONGRID
390	30-04-2018	Shally Devassia	3	2,27,412.74	ONGRID
391	30-04-2018	Abdulla E M	3	2,27,412.74	ONGRID
392	30-04-2018	Grace public School	2	1,51,607.75	ONGRID
393	02-05-2018	Gracy	3	2,27,412.74	ONGRID
394	02-05-2018	Shajahan M	1	1,60,970.50	OFFGRID
395	02-05-2018	Ripeesh P Pillai	1	1,60,970.50	OFFGRID
396	02-05-2018	Neethu Krishna	5	3,79,020.49	ONGRID
397	03-05-2018	Muhammed Shafeek	5	3,79,020.49	ONGRID
398	05-05-2018	Vikas	3	2,27,412.74	ONGRID
399	07-05-2018	ANERT-Palakkad-Ottapalam Municipality	10	6,34,900.00	ONGRID
400	07-05-2018	G Raramachandran	3	2,27,412.74	ONGRID
401	07-05-2018	Jerald P A	5	3,79,020.49	ONGRID
402	10-05-2018	Adv. K P Krishnakumar	1	1,28,776.40	OFFGRID
403	10-05-2018	Thomas Paniker	5	3,79,020.49	ONGRID
404	11-05-2018	Simon K A	5	3,79,020.49	ONGRID
405	11-05-2018	PMS COLLEGE	15	9,25,275.75	ONGRID
406	14-05-2018	Distrct Engineer Pathanamthitta - Malayalapuzha PHC	1	3,69,900.00	OFFGRID
407	14-05-2018	The Director ANERT - Kayar Service Society	2	2,09,000.00	OFFGRID
408	22-05-2018	Sobhana Kollam	3	2,14,122.30	ONGRID
409	22-05-2018	Sebastian (Shiny)	1	1,60,970.50	OFFGRID
410	23-05-2018	Liju Kollam	5	3,58,619.10	ONGRID
411	24-05-2018	DCE Transmision Circle Poovanthuruthu - 66 KV SS Kuruvi	15	10,27,349.99	ONGRID
412	24-05-2018	EE Transmision Division Pathanamthitta- 110 KV SS Kozhe	15	10,27,349.99	ONGRID
413	24-05-2018	EE Transmision Division Pathanamthitta- 66 KV SS Thiruv	15	10,27,349.99	ONGRID
414	24-05-2018	DCE Electrical Circle Pathanamthitta- Vyduthi Bhavan Pat	25	17,12,249.98	ONGRID
415	24-05-2018	DCE Transmission Circle Kottarakkara- 110 KV SS Kavanad	20	13,69,799.99	ONGRID
416	24-05-2018	DCE Transmission Circle Trivandrum- 66 KV SS Balaramap	15	10,27,349.99	ONGRID

417	24-05-2018	DCE Transmission Circle Trivandrum- 66 KV SS Neyattinka	15	10,27,349.99	ONGRID
418	24-05-2018	DCE Transmission Circle Trivandrum- 66 KV SS Nedumang	15	10,27,349.99	ONGRID
419	24-05-2018	DCE Transmission Circle Trivandrum- 66 KV SS Vattiyoork	15	10,27,349.99	ONGRID
420	24-05-2018	DCE Transmission Circle Trivandrum- Power House TVM	10	6,84,900.00	ONGRID
421	24-05-2018	CE Renewable Energy & Energy Savings TVM- 220 KV SS P	30	20,54,699.98	ONGRID
422	24-05-2018	CE Renewable Energy & Energy Savings TVM- Vyduthi Bh	35	23,97,149.98	ONGRID
423	24-05-2018	DCE Transmission Circle TSR- 110 KV SS Ollur	20	13,69,799.99	ONGRID
424	24-05-2018	DCE Transmission Circle TSR- 110 KV SS Wadakanchery	15	10,27,349.99	ONGRID
425	24-05-2018	DCE Transmission Circle TSR- 110 KV SS Ayyampuzha	20	13,69,799.99	ONGRID
426	24-05-2018	DCE Transmission Circle TSR- 66 KV SS Angamally	30	20,54,699.98	ONGRID
427	24-05-2018	DCE Transmission Circle Thodupuzha- 110 KV SS Rayonpu	15	10,27,349.99	ONGRID
428	24-05-2018	DCE Transmission Circle Thodupuzha- 110 KV SS Mylore	20	13,69,799.99	ONGRID
429	24-05-2018	DCE Transmission Circle Thodupuzha- 110 KV SS Udumba	15	10,27,349.99	ONGRID
430	24-05-2018	DCE Transmission Circle Kalamassery - 110 KV SS Kadavar	25	17,12,249.98	ONGRID
431	24-05-2018	DCE Transmission Circle Kalamassery - 110 KV SS Kandana	25	17,12,249.98	ONGRID
432	24-05-2018	DCE Transmision Circle Alapuzha - 66 KV SS Alapuzha	15	10,27,349.99	ONGRID
433	24-05-2018	DCE Transmision Circle Alapuzha - 110 KV SS Mavelikkara	20	13,69,799.99	ONGRID
434	26-05-2018	Kabeerkutty A	5	3,79,020.49	ONGRID
435	28-05-2018	John Mathew	3	2,27,412.74	ONGRID
436	28-05-2018	Jacob Chacko	3	2,27,412.74	ONGRID
437	28-05-2018	P V Mathew	1	1,71,130.50	OFFGRID
438	02-06-2018	Dr. K M Kuriakose	2	1,51,607.75	ONGRID
439	02-06-2018	Dr. Ajitha	1	1,60,970.50	OFFGRID
440	02-06-2018	Abdul Gafoor	2	1,51,607.75	ONGRID
441	02-06-2018	Jacob George	5	3,79,020.49	ONGRID
442	05-06-2018	Radhakrishnan Nair G	10	6,80,000.00	ONGRID
443	05-06-2018	Lalithambika	5	3,79,020.49	ONGRID
444	09-06-2018	Deena Dayalo	5	3,58,621.00	ONGRID

445	09-06-2018	Sreekumar V Pillai	3	2,23,914.74	ONGRID
446	09-06-2018	Manoj Lal	3	2,27,412.74	ONGRID
447	09-06-2018	PNP Panicker	3	3,50,000.00	OFFGRID
448	09-06-2018	Viju Antony	3	2,27,412.74	ONGRID
449	09-06-2018	Raja A Kareem	1	1,60,970.50	OFFGRID
450	09-06-2018	Skaarialalu	3	3,53,177.00	OFFGRID
451	20-06-2018	BCM COLLEGE	10	6,60,666.30	ONGRID
452	26-06-2018	MOOSA	2	1,47,491.40	ONGRID
453	03-07-2018	ANERT - PALAKKAD - KOZHINJAPARA AYURVEDA DISPENS	2	1,92,926.00	OFFGRID
454	04-07-2018	Lonappan James	5	3,58,619.10	ONGRID
455	17-07-2018	Bindhu Kollam	3	2,14,121.25	ONGRID
456	17-07-2018	Ranjith	1	1,61,000.00	OFFGRID
457	21-07-2018	Distrct Engineer ANERT EKM - Pampakuda CHC	3	3,23,177.00	OFFGRID
458	21-07-2018	Director ANERT TVM - Alapuzha ANERT	2	2,09,000.00	OFFGRID
459	21-07-2018	Director ANERT TVM - Iduki ANERT	2	2,09,000.00	OFFGRID
460	21-07-2018	Director ANERT TVM - Palakkad ANERT	2	2,09,000.00	OFFGRID
461	21-07-2018	Director ANERT TVM - Kozhikode ANERT	1	1,18,776.00	OFFGRID
462	26-07-2018	Chandrika	5	3,79,019.00	ONGRID
463	30-07-2018	Manoharan Kollam	3	2,14,121.25	ONGRID
464	30-07-2018	Neena Kollam	2	1,47,490.35	ONGRID
465	02-08-2018	Subhash Babu T	10	6,95,770.99	ONGRID
466	02-08-2018	BDO Kanjikuzhi	10	7,40,000.00	ONGRID
467	22-08-2018	Trinethran P.V	2	2,52,000.00	OFFGRID
468	06-09-2018	Director ANERT TVM - Wayanad	2	2,09,000.00	OFFGRID
469	21-09-2018	Shoukathali	5	4,03,055.00	ONGRID
470	26-09-2018	Br. Superior, Alvernia Boys Home	3	2,95,000.00	OFFGRID
471	29-09-2018	GeorgeKutty Mathew	5	3,79,019.31	ONGRID
472	29-09-2018	Lilly Ben	2	1,51,607.00	ONGRID

473	03-10-2018	Philipgi T Kanatt	5	3,79,019.00	ONGRID
474	06-10-2018	Adv. Harris P	5	3,79,019.00	ONGRID
475	08-10-2018	Vinson	1	73,266.00	OFFGRID
476	09-10-2018	Vijayan A K	2	1,51,607.00	ONGRID
477	11-10-2018	Vilangad Fuels	3	3,17,713.20	OFFGRID
478	11-10-2018	Janardhanan K K	10	7,39,550.00	ONGRID
479	12-10-2018	Jaya Gopinath	5	3,58,619.10	ONGRID
480	12-10-2018	Shine Edward	3	2,27,412.00	ONGRID
481	16-10-2018	Vipin P M	5	3,79,019.00	ONGRID
482	20-10-2018	USHADEVI A	5	3,79,019.00	ONGRID
483	20-10-2018	HARIDASAN M N	2	1,51,607.00	ONGRID
484	22-10-2018	Confident Projects (India) P Ltd	3	3,50,000.00	OFFGRID
485	23-10-2018	Mohammed Koya	5	3,79,019.00	ONGRID
486	25-10-2018	Hykon India P Ltd - anert tvn	1	1,39,950.30	OFFGRID
487	23-10-2018	Amal E Xavier	3	2,27,412.00	ONGRID
488	27-10-2018	The Director ANERT - Malappuram	2	2,09,000.00	OFFGRID
489	27-10-2018	Sukumaran C H	3	2,27,412.00	ONGRID
490	31-10-2018	Ajay Kuamr	5	3,58,619.10	ONGRID
491	31-10-2018	Servosonic	3	4,85,825.55	OFFGRID
492	01-11-2018	Nassar Kassim	5	3,79,019.00	ONGRID
493	05-11-2018	Marthoma Public School	15	10,47,500.00	ONGRID
494	16-11-2018	Rajan TSR	3	214121.25	ONGRID
495	19-11-2018	Mathew Kossi	2	147490.35	ONGRID
496	23-11-2018	M J Mathew	10	674194	ONGRID
497	23-11-2018	Maria P.P	5	379019	ONGRID
498	23-11-2018	Beekutty K K	2	151607	ONGRID
499	24-11-2018	Babu J Panikulam	3	227412	ONGRID
500	24-11-2018	Sanu S Unni	3	227412	ONGRID

501	24-11-2018	Sarah Chirayath	3	227412	ONGRID
502	24-11-2018	Harikumar	2	151607	ONGRID
503	26-11-2018	Sreevalsam Fuels	12	1209403.65	OFFGRID
504	26-11-2018	Saju Jose	2	151607	ONGRID
505	26-11-2018	Prince Jose	2	151607	ONGRID
506	26-11-2018	Davis C.P	5	364019	ONGRID
507	29-11-2018	ADAM KUTTY	20	1140744	ONGRID
508	29-11-2018	E.S KESAVAN NAMBOODIRI	5	379019	ONGRID
509	30-11-2018	Thomas G	2	151607	ONGRID
510	30-11-2018	Babukutty M G	2	151607	ONGRID
511	07-12-2018	ANERT-KANUR-Pariyaram Ayurveda College Mens Hostal	2	243684.9975	OFFGRID
512	08-12-2018	Jayaprakash D	2	151607	ONGRID
513	19-12-2018	Ponnappan	5	379019	ONGRID
514	19-12-2018	Vijayakumaran K	3	227412	ONGRID
515	19-12-2018	Velayudhan Nair	2	146618	ONGRID
516	20-12-2018	SANDHAY RAJKUMAR	3	227412	ONGRID
517	21-12-2018	EASO KUTTICKATTU	3	227412	ONGRID
518	21-12-2018	M J Annamma	5	379019	ONGRID
519	21-12-2018	MaryKutty Biju	3	335340	OFFGRID
520	21-12-2018	Hykon India Ltd - VTS NSS College TVM	5	358619.1	ONGRID
521	22-12-2018	Lekha Unnikrishnan	5	379019	ONGRID
522	22-12-2018	Meera Bai	2	151607	ONGRID
523	24-12-2018	Vasanthy V M	3	227412	ONGRID
524	27-12-2018	Antony P V	10	689549.9975	ONGRID
525	29-12-2018	Hykon India Ltd - SIDCO	5	358619.1	ONGRID
526	01-01-2019	Chacko K M	5	379018.5	ONGRID
527	05-01-2019	Hykon India Ltd - P V Thomas	2	147490	ONGRID
528	05-01-2019	Hykon India Ltd - Jose Kurian	2	147490	ONGRID

529	05-01-2019	Rama Pai Raghunath	3	227412.9395	ONGRID
530	07-01-2019	Sunny A A	5	364044.5025	ONGRID
531	10-01-2019	K C Praseetha	3	227412.9395	ONGRID
532	10-01-2019	Sunny Joseph	5	379018.5	ONGRID
533	11-01-2019	Siby Jose	5	379018.5	ONGRID
534	14-01-2019	Salim Kumar P.V	3	227412.9395	ONGRID
535	16-01-2019	Sankara Narayanan Nambiar	5	520542	HYBRID
536	19-01-2019	Hykon India Ltd - Ravendran Ayyappan Pillai	3	222073.875	ONGRID
537	19-01-2019	Gopalan Sasidharan	3	227412.9395	ONGRID
538	19-01-2019	Sathi Devi	5	379018.5	ONGRID
539	21-01-2019	District Engineer ANERT-Vanitha Visrama Kendra CLT	5	323999.683	ONGRID
540	23-01-2019	Abdul Sathar K	3	227412.9395	ONGRID
541	23-01-2019	C M Balakrishnan	2	151607.6	ONGRID
542	24-01-2019	Hykon India Limited - Anidhya Petro Café	10	653998.96	ONGRID
543	30-01-2019	Hykon India Limited - Sudhakaran	2	152969.66	ONGRID
544	31-01-2019	Bessy Thomas	3	227411.7	ONGRID
545	05-02-2019	K J Raphel	3	227412	ONGRID
546	05-02-2019	Abdul Rasheed	3	227412	ONGRID
547	05-02-2019	Rajesh Kumar B	3	227412	ONGRID
548	06-02-2019	Raphel M A	10	739550	ONGRID
549	13-02-2019	MALABAR SCHOOL	20	1373450	ONGRID
550	19-02-2019	THANKAMMA DAVIS	3	227412	ONGRID
551	20-02-2019	DR.Manimaran	2	184153	ONGRID
552	20-02-2019	Sister Immaculate	2	295000	OFFGRID
553	23-02-2019	Gopakumar	3	227412	ONGRID
554	23-02-2019	Anjanadevi S	3	227412	ONGRID
555	23-02-2019	Krishnakumar G	3	227412	ONGRID
556	25-02-2019	Sajish E K	5	379019	ONGRID

557	26-02-2019	Kalakrishnan Taliyan	3	227412	ONGRID
558	26-02-2019	Krishnan R	3	227412	ONGRID
559	26-02-2019	Dr. George Joseph	5	379019	ONGRID
560	26-02-2019	Amson	3	227412	ONGRID
561	26-02-2019	Jeena K.P	5	379019	ONGRID
562	26-02-2019	Jithin Sankar	10	692736	ONGRID
563	26-02-2019	Satheesan Nair	5	379019	ONGRID
564	26-02-2019	Sakeena	5	379019	ONGRID
565	28-02-2019	Hykon India Ltd - Sree Sastha Fuels	15	952112	ONGRID
566	05-03-2019	KSEB-The Deputy Chief Engineer, Electrical Circle, Pallom	50	3523500	ONGRID
567	07-03-2019	ANERT-TVM - Pangode GP	5	621600	OFFGRID
568	13-03-2019	Aneed C A	2	220000	OFFGRID
569	13-03-2019	The Secretary Mannamangalam Milk Soccity	10	799420	ONGRID
570	13-03-2019	Hykon India Ltd - ST. Peter HSS	10	685205	ONGRID
571	15-03-2019	Hykon India Ltd - Jyothi Agencies	10	632656.66	ONGRID
572	18-03-2019	Poonjar G P - Anganavadi	2	167706	ONGRID
573	18-03-2019	Poonjar G P - CHC	2	148104	ONGRID
574	22-03-2019	BDO, Ponnani Block Panchayath	5	450367	OFFGRID
575	26-03-2019	Nambeesan C P K	2	120000	ONGRID
576	28-03-2019	Babu Oomen	10	600000	ONGRID
577	28-03-2019	Manappuram Finance Limited	30	2115771	ONGRID
578	28-03-2019	Haridas	5	300000	ONGRID
579	28-03-2019	Abdul Rahman	2	120000	ONGRID
580	28-03-2019	ROSHNI M S	5	300000	ONGRID
581	28-03-2019	PRAMOD K V	3	185000	ONGRID
582	28-03-2019	MATHEW KALLUMKATHARA	5	305000	ONGRID
583	28-03-2019	Alley Sam	2	120000	ONGRID
584	28-03-2019	Jeffry Padmadan	3	185000	ONGRID

585	28-03-2019	Babu Janardhanan	3	185000	ONGRID
586	28-03-2019	Deepa Cinema	50	3139609	ONGRID
587	29-03-2019	ANERT Wayanadu - Noolpuzha GP	2	265716	OFFGRID
588	29-03-2019	Dr. Manimaran	3	203787	ONGRID
589	29-03-2019	Dr. Abdul Rasheed	3	185000	ONGRID
590	29-03-2019	Ciby Thomas	10	570000	ONGRID
591	29-03-2019	Sajeev V	2	125000	ONGRID
592	29-03-2019	Jayaprakash P	2	125000	ONGRID
593	30-03-2019	ANERT Alapuzha - Nedumudy GP	5	445074	OFFGRID
594	30-03-2019	ANERT Kanur - Payyanur Municipality	5	476546	OFFGRID
595	30-03-2019	ANERT Wayanadu - Thondarnadu GP	5	579784	OFFGRID
596	26-04-2019	The Headmistress, Mar Augen High School	3	210939	ONGRID
597	16-05-2019	Changannur Taluk Residents Cooperative Socieity	1	127000	OFFGRID
598	16-05-2019	Panackavayalil Bankers	3	300000	OFFGRID
599	21-05-2019	Sreedevi Chandrakumar	5	151959	ONGRID
600	22-05-2019	Secretary Nannambra Gramapanchayath	5	502377	OFFGRID
601	22-05-2019	Sajeev P.R	3	203316	ONGRID
602	28-05-2019	VKM Ayurveda Hospital	1	190000	OFFGRID
603	08-06-2019	Muhammed Ali	3	193316	ONGRID
604	13-06-2019	Vinod E.K	3	203316.01	ONGRID
605	13-06-2019	Vinod Kumar	3	196020	ONGRID
606	26-06-2019	AM Varghese	3	210722	ONGRID
607	26-06-2019	O V BABU	2	132749	ONGRID
608	04-07-2019	Surya Kiran	2	103772	ONGRID
609	04-07-2019	Prabha Electricals (Mazhuvanur)	3	333000	OFFGRID
610	04-07-2019	M S Building Products	2	228382	OFFGRID
611	10-07-2019	Sarath Chandran K	3	193316	ONGRID
612	16-07-2019	Mariyamma Zakaria	5	340000	ONGRID

613	17-07-2019	Ayoob K P	2	125000	ONGRID
614	22-07-2019	District Engineer Kanur - Madayo AEO Office	3	209687	ONGRID
615	24-07-2019	The University Engineer KUFOS	3	214632	ONGRID
616	25-07-2019	The Kanur Town Service Co Operative Bank Ltd	25	1780000	ONGRID
617	31-07-2019	Eapen J Kariyattil	3	193316	ONGRID
618	31-07-2019	Deepa Padmakumar	3	203589	ONGRID
619	31-07-2019	Shema Santhosh	5	355961	ONGRID
620	06-08-2019	Bharathiya Vidya Bhavan - Valanchery	5	340937	ONGRID
621	21-08-2019	Benny Joseph	3	2,00,000.00	ONGRID
622	23-08-2019	Hykon India limited - NF Fuels	20	10,85,000.00	ONGRID
623	13-09-2019	Mr. M G Sunny Kutty	3	2,03,316.00	ONGRID
624	13-09-2019	Mr. Sukhiyan G	3	3,80,000.00	OFFGRID
625	17-09-2019	John Aluka	5	3,27,600.00	ONGRID
626	17-09-2019	Viswambaran O P	2	1,26,466.00	ONGRID
627	17-09-2019	Sasidharan S K	5	3,27,600.00	ONGRID
628	17-09-2019	Mohanan	3	1,96,560.00	ONGRID
629	17-09-2019	Ravikumar P Sivaramapillai	3	1,86,500.00	ONGRID
630	17-09-2019	Ravikumar Sreedharan Pillai	5	3,12,500.00	ONGRID
631	17-09-2019	Jayalekha B	3	1,96,560.00	ONGRID
632	17-09-2019	Soman C	3	1,96,560.00	ONGRID
633	17-09-2019	Jaya Anand Roy	3	1,96,560.00	ONGRID
634	18-09-2019	Jacob Mathew M	5	3,30,000.00	ONGRID
635	18-09-2019	Badarudheen N A	10	6,04,264.00	ONGRID
636	18-09-2019	George Thomas	5	3,27,600.00	ONGRID
637	19-09-2019	Raju John	5	3,27,600.00	ONGRID
638	19-09-2019	N Krishnan	3	1,75,000.00	ONGRID
639	19-09-2019	Dinraj Sreedhar E	3	1,61,291.00	ONGRID
640	19-09-2019	Surendran O V	2	1,33,115.00	ONGRID

641	20-09-2019	Radhakrishnan Pillai	3	1,96,560.00	ONGRID
642	21-09-2019	Dr. Suresh Kuruvila	5	3,27,600.00	ONGRID
643	21-09-2019	Rajesh R	3	1,96,560.00	ONGRID
644	21-09-2019	Vasudevan V M	2	1,25,615.00	ONGRID
645	21-09-2019	Usha Ramachandran	5	3,27,600.00	ONGRID
646	23-09-2019	Abraham George	10	6,04,264.00	ONGRID
647	23-09-2019	Majeed B	5	3,27,600.00	ONGRID
648	23-09-2019	Vijayakumar K G	2	1,33,115.00	ONGRID
649	23-09-2019	Shaju Sebastian	5	3,27,600.00	ONGRID
650	24-09-2019	Divya V	10	6,00,000.00	ONGRID
651	24-09-2019	Soman D	3	1,96,560.00	ONGRID
652	24-09-2019	Jojo John	5	2,68,817.00	ONGRID
653	26-09-2019	Hari Sri Vidya Nidhi	24	14,46,463.00	ONGRID
654	26-09-2019	P C Jose	6	3,69,787.00	ONGRID
655	26-09-2019	ANERT-PTA , Aruvappulam GP	3	3,37,481.00	OFFGRID
656	16-10-2019	Akshay Granites	3	3,82,670.00	OFFGRID
657	17-10-2019	Remadevi	2	1,25,249.00	ONGRID
658	29-10-2019	Pavitrana Puthukudy	2	1,33,000.00	ONGRID
659	30-10-2019	ST. Joseph Granites	1	2,15,015.00	OFFGRID
660	30-10-2019	ANERT PTA - DEO Kozhenchery	3	2,10,000.00	ONGRID
661	02-11-2019	Jacob Kunjappu	10	6,06,344.00	ONGRID
662	09-11-2019	Green Power Controls	3	1,35,000.00	ONGRID
663	11-11-2019	Thulasi	8	4,77,390.00	ONGRID
664	20-11-2019	Dr. Joseph P A	5	3,20,000.00	ONGRID
665	29-11-2019	ANERT-TSR, Kizhakkekara Cultural Society Manalithara	3	2,04,634.00	ONGRID
666	30-11-2019	Thalam Cinema	30	17,82,144.00	ONGRID
667	03-12-2019	Dr. Indrani B	10	5,53,000.00	ONGRID
668	04-12-2019	Mrs. Rasika C K	5	3,12,000.00	ONGRID

669	06-12-2019	Mr.Tony Varghese	2	1,19,738.00	ONGRID
670	06-12-2019	District Engineer ANERT PTA- Kalanjoor GP	6	4,05,620.00	ONGRID
671	16-12-2019	Antony C G	2	1,30,000.00	ONGRID
672	24-12-2019	Surya Kiran-Joseph Antony	3	1,65,207.00	ONGRID
673	24-12-2019	Ajith P.R	5	2,95,000.00	ONGRID
674	27-12-2019	P K Ibrahim	3	1,91,810.00	ONGRID
675	27-12-2019	Hussian E K	3	1,91,810.00	ONGRID
676	31-12-2019	Santhosh Prasannan	5	2,81,900.00	ONGRID
677	01-01-2020	Srees Petroleum	10	5,86,404.00	ONGRID
678	02-01-2020	COSTEK - Sam Vydyanath	3	1,84,560.00	ONGRID
679	03-01-2020	Asharaf M A	10	5,70,000.02	ONGRID
680	10-01-2020	Mathew Abraham	3	1,90,000.00	ONGRID
681	21-01-2020	Sasidharan P.K	3	1,93,224.00	OFFGRID
682	27-01-2020	KAU - WAYANAD	11.1	10,43,608.00	OFFGRID
683	29-01-2020	ANERT-PTA-Pandalam Municipality	4	5,79,903.00	OFFGRID
684	29-01-2020	Dr.Geetha	6	3,57,498.00	ONGRID
685	31-01-2020	Ananya Tower	34	31,00,000.00	ONGRID
686	31-01-2020	Ananya Tower	5		OFFGRID
687	05-02-2020	Secretary Edayur GP	5	3,71,948.00	ONGRID
688	05-02-2020	Secretary Edayur GP	5	3,82,218.00	ONGRID
689	20-02-2020	Mrs. Majju John	3	1,76,000.00	ONGRID
690	20-02-2020	Dr. Usha John	5	3,15,000.00	ONGRID
691	24-02-2020	NC John & Sons Pvt Ltd	65	30,42,055.00	ONGRID
692	25-02-2020	Chandini K M	2	1,32,000.00	ONGRID
693	28-02-2020	Secretary Arpooraka GP	6	4,09,910.00	ONGRID
694	29-02-2020	Mr. Gopalakrishnan Nair	3	1,91,100.00	ONGRID
695	29-02-2020	Mrs.Padmavathy Amma	3	1,91,100.00	ONGRID
696	05-03-2020	Secretary Anthikkad Milk Soccity	13	7,94,970.00	ONGRID

697	06-03-2020	Radhakrishnan Pillai	2	1,28,000.00	ONGRID
698	06-03-2020	Shaji C John	3	1,86,000.00	ONGRID
699	06-03-2020	Mathew Joseph	3	1,90,000.00	ONGRID
700	12-03-2020	Mr. Thomas P Tharayil	3	1,73,400.00	ONGRID
701	12-03-2020	ANERT-ALPY-Kanjikuzhy Ayurveda Hospital	3	3,30,129.00	OFFGRID
702	12-03-2020	ANERT-ALPY-Kanjikuzhy LP School Ayyappanchery	3	3,30,129.00	OFFGRID
703	12-03-2020	ANERT-ALPY-Kanjikuzhy LP School Putthnambalam	3	3,16,626.00	OFFGRID
704	13-03-2020	ANERT-ALPY-Kanjikuzhy PHC	5	6,81,187.00	OFFGRID
705	13-03-2020	ANERT-ALPY-Kanjikuzhy Anganavadi	1	1,64,997.00	OFFGRID
706	13-03-2020	ANERT-ALPY-Kanjikuzhy GP	5	4,93,081.00	OFFGRID
707	13-03-2020	ANERT-ALPY-Kanjikuzhy Vettinary Hospital	2	2,33,902.00	OFFGRID
708	13-03-2020	ANERT-ALPY-Mararikulam Ayurveda Hospital	5	6,90,497.00	OFFGRID
709	13-03-2020	ANERT-ALPY-Mararikulam PHC	5	6,81,185.00	OFFGRID
710	16-03-2020	ANERT-ALPY-Mararikulam - Peronoormangalam	3	3,30,130.00	OFFGRID
711	16-03-2020	ANERT-ALPY-Mararikulam - Pokkassery	3	3,30,130.00	OFFGRID
712	16-03-2020	ANERT-ALPY-Mararikulam - LP School	3	3,30,130.00	OFFGRID
713	16-03-2020	ANERT-ALPY-Mararikulam - BUDS School	2	2,33,901.00	OFFGRID
714	16-03-2020	Deepak Kumar	5	5,54,343.00	OFFGRID
715	18-03-2020	Soni Mechery	5	3,61,780.00	ONGRID
716	18-03-2020	Jania Wilson	3	1,91,000.00	ONGRID
717	18-03-2020	ANERT KNR - Cherupuzha Gp	3	1,77,622.00	ONGRID
718	31-03-2020	Inkel Ltd	2	1,93,769.00	OFFGRID
719	31-03-2020	Inkel Ltd	3	2,56,268.00	OFFGRID
720	31-03-2020	Dr. Radha P N	4	2,27,136.00	ONGRID
721	31-03-2020	Prasad Karunan	10	5,87,518.00	ONGRID
722	31-03-2020	Dr. P N Vijayan	7	5,13,895.00	ONGRID
723	31-03-2020	Ohh!Baby	60	25,60,838.00	ONGRID
724	31-03-2020	The Director ANERT, Ambedkar MMRS Alapuzha	5	3,00,317.00	ONGRID

725	31-03-2020	The Director ANERT, GHSS Kayamkulam	5	3,17,673.00	ONGRID
726	31-03-2020	The Director ANERT, GHSS Ayamparambu	2	1,29,867.00	ONGRID
727	31-03-2020	The Director ANERT, GHSS Kalavoor	10	5,89,098.00	ONGRID
728	31-03-2020	The Director ANERT, GHSS Kodamthuruthu	5	3,01,338.00	ONGRID
729	31-03-2020	The Director ANERT, GHSS Mulakuzha	3	1,78,204.00	ONGRID
730	31-03-2020	The Director ANERT, VRVM GHSS vayalar	5	3,31,285.00	ONGRID
731	31-03-2020	The Director ANERT, G ITI Kattapana	10	5,81,237.00	ONGRID
732	31-03-2020	The Director ANERT, GEM G HSS Santhigram	5	3,15,631.00	ONGRID
733	31-03-2020	The Director ANERT, G HS Adimaly	5	2,92,151.00	ONGRID
734	31-03-2020	The Director ANERT, GBHSS Malappuram	5	2,93,172.00	ONGRID
735	31-03-2020	The Director ANERT, GHSS KUTTIPPURAM	3	1,84,288.00	ONGRID
736	31-03-2020	The Director ANERT, GHSS ATHUKUNGAL	5	2,85,072.00	ONGRID
737	31-03-2020	The Director ANERT, G VHSS KIZHUPARAMBU	10	6,29,322.00	ONGRID
738	31-03-2020	The Director ANERT, G ITI MALAMPUZHA	10	5,67,625.00	ONGRID
739	31-03-2020	The Director ANERT, GHS ELANTHUR	3	1,80,886.00	ONGRID
740	31-03-2020	The Director ANERT, GHSS CHITTAR	3	1,85,704.00	ONGRID
741	31-03-2020	The Director ANERT, GHSS KADUMEENCHIRA	5	2,96,683.00	ONGRID
742	31-03-2020	The Director ANERT, GHSS Kodungallur	10	5,63,235.00	ONGRID
743	31-03-2020	The Director ANERT, GHSS MUPLIYAM	3	1,79,198.00	ONGRID
744	31-03-2020	The Director ANERT, GHSS VALAPPAD	5	3,02,087.00	ONGRID
745	31-03-2020	The Director ANERT, GHSS VILLADAM	10	5,61,602.00	ONGRID
746	31-03-2020	The Director ANERT, SMT HGSS CHELAKKARA	5	2,91,537.00	ONGRID
747	31-03-2020	The Director ANERT, KKM GITI KALPATTU	10	6,23,196.00	ONGRID
748	25-05-2020	Green Energia	3	1,39,838.00	ONGRID
749	30-05-2020	Salomy Betty	3	1,86,000.00	ONGRID
750	30-05-2020	Arun Vasudeva Menon	2	1,21,040.00	ONGRID
751	04-06-2020	Green Energia	2	98,628.00	ONGRID
752	12-06-2020	Green Energia	5	2,18,264.00	ONGRID

753	17-06-2020	Rosmi Ranji	3	1,68,168.00	ONGRID
754	18-06-2020	Mr. Thomas George	3	3,90,000.00	OFFGRID
755	25-06-2020	Mr. K E Mathew	3	1,85,891.00	ONGRID
756	25-06-2020	Rosy Joseph	3	1,96,560.00	ONGRID
757	26-06-2020	Ouseph Chakola	10	5,85,820.00	ONGRID
758	29-06-2020	High Grid Associaes - Munderi	100	43,60,000.00	ONGRID
759	29-06-2020	ANERT-ALPY-Mavelikkara Municipality	10	6,11,615.00	ONGRID
760	29-06-2020	ANERT-ALPY-Mavelikkara Municipality	10	6,19,423.00	ONGRID
761	08-07-2020	The Local Superior-Little Flower Convent	3	3,59,000.00	OFFGRID
762	14-07-2020	V D Clement	5	2,93,000.00	ONGRID
763	17-07-2020	Rugmani Unnikrishnan	5	3,20,948.00	ONGRID
764	18-07-2020	Liyakath Ali Abdulla	5	2,70,000.00	ONGRID
765	18-07-2020	Green Energia	5	1,39,576.00	ONGRID
766	28-07-2020	Rajiv Gandhi Hospital	400	1,96,00,000.00	ONGRID
767	28-07-2020	ANERT - KTYM - Uzhavoor GP	5	3,84,041.00	ONGRID
768	06-08-2020	Dr. Koshy Eapen	5	3,05,000.00	ONGRID
769	07-08-2020	Mr. Viswambaran P. K	2	1,20,000.00	ONGRID
770	07-08-2020	Mr. Ratheesh Vijaya Mohan	3	1,88,000.00	ONGRID
771	07-08-2020	Mr. Biju Mathew	5	3,00,000.00	ONGRID
772	13-08-2020	Mr. James N L	5	2,68,977.00	ONGRID
773	20-08-2020	Surya Kiran	5	1,80,000.00	ONGRID
774	20-08-2020	Ganesh S	5	2,80,644.00	ONGRID
775	24-08-2020	C A Asok Hastagiri FCA	5	1,89,989.00	ONGRID
776	04-09-2020	Dr. Rani Memorial Hospital	50	25,50,000.00	ONGRID
777	05-09-2020	Hotel Liwa Tower	50	23,41,350.00	ONGRID
778	07-09-2020	Neethu Mol	3	1,77,197.00	ONGRID
779	07-09-2020	ANERT-KTYM- THALAYALAM GP	5	3,60,862.00	ONGRID
780	08-09-2020	ANERT-TSR-Alagappa Nagar	5	6,96,696.00	OFFGRID

781	09-09-2020	Shaji TC	5	2,79,740.00	ONGRID
782	09-09-2020	Universal Power Solutions	5	2,18,264.00	ONGRID
783	10-09-2020	Dany Antony	8	3,93,120.00	ONGRID
784	12-09-2020	Thomas K G	5	2,89,713.00	ONGRID
785	12-09-2020	ANERT-ALPY-Vettackal	2	2,68,703.00	ONGRID
786	12-09-2020	ANERT-ALPY-Perumpilly	2	2,48,703.00	ONGRID
787	18-09-2020	ANERT-MLPM- Police Malappuram	10	5,17,935.00	ONGRID
788	22-09-2020	ANERT-TVM-Sumanusham Bugalow	5	2,96,892.00	ONGRID
789	22-09-2020	Adcom Systems	3	1,70,000.00	ONGRID
790	22-09-2020	ANERT-D TVM-Pozhiyoor PHC	3	3,73,055.00	OFFGRID
791	22-09-2020	ANERT-D TVM-Pozhiyoor PHC	3	3,73,055.00	OFFGRID
792	28-09-2020	ANERT-TSR-Thalikulam	15	7,70,330.00	ONGRID
793	06-10-2020	ANERT-PKD - Veterinary Hospital Cherpulassery	2	2,48,703.00	OFFGRID
794	07-10-2020	Nabeel N	5	2,60,000.00	ONGRID
795	07-10-2020	Prabhakaran U N	3	1,77,197.00	ONGRID
796	07-10-2020	Radhakrishnan K	3	1,55,000.00	ONGRID
797	14-10-2020	Francy Mechery	5	3,55,916.00	ONGRID
798	15-10-2020	Sreeju C A	2	1,28,000.00	ONGRID
799	15-10-2020	Reetha K	3	1,75,000.00	ONGRID
800	15-10-2020	Signature Systems	10	4,34,112.00	ONGRID
801	17-10-2020	ANERT-PTA-Applied Science	5	6,03,967.00	OFFGRID
802	22-10-2020	Dr. Rani Menon	5	85,000.00	ONGRID
803	27-10-2020	Signature Systems	3	1,55,000.00	ONGRID
804	27-10-2020	TNAU-OOTTY	6	5,71,921.00	OFFGRID
805	28-10-2020	ANERT-TSR-Pampoor PHC	5	6,50,000.00	OFFGRID
806	28-10-2020	Issac Sunny	5	2,99,790.00	ONGRID
807	10-10-2020	ANERT-TVM-Capex Perinad	3	95,663.00	ONGRID
808	13-10-2020	ANERT-TVM-Capex Eravipuram	3	79,007.00	ONGRID

809	13-10-2020	ANERT-TVM-Capex Chathanoor	3	79,007.00	ONGRID
810	17-10-2020	ANERT-TVM-Capex CHENGAMANAD	3	79,007.00	ONGRID
811	17-10-2020	ANERT-TVM-Capex ERUVA	6	1,46,219.00	ONGRID
812	17-10-2020	ANERT-TVM-Capex PERUMPUZHA	3	94,684.00	ONGRID
813	17-10-2020	ANERT-TVM-Capex PATHIYOOR	3	1,05,135.00	ONGRID
814	22-09-2020	ANERT-TVM-Capex-Kilikollur	3	79,007.00	ONGRID
815	22-09-2020	ANERT-TVM-Capex-Chathinakulam	3	79,007.00	ONGRID
816	05-11-2020	ANERT-TVM-37 KW IDUKKI - AMARAVATHY	5	3,05,299.00	ONGRID
817	05-11-2020	ANERT-TVM-37 KW IDUKKI - TRIBAL HSS KATTAPANA	5	3,07,736.00	ONGRID
818	05-11-2020	ANERT-TVM-37 KW IDUKKI - MUNNAR	3	1,77,796.00	ONGRID
819	05-11-2020	ANERT-TVM-37 KW IDUKKI - VATTAVADA	2	1,31,028.00	ONGRID
820	07-11-2020	Leelamma Lues Paul	2	93,030.00	ONGRID
821	09-11-2020	ANERT-TVM-37 KW IDUKKI - APJ ABDUL KALAM THODUP	10	5,08,559.00	ONGRID
822	09-11-2020	ANERT-TVM-37 KW IDUKKI - MUTTOM	2	1,30,376.00	ONGRID
823	11-11-2020	Denny K Alappat	5	3,37,975.00	ONGRID
824	11-11-2020	B R Jacob	5	3,05,760.00	ONGRID
825	11-11-2020	Edappally bank	10	5,60,000.00	ONGRID
826	12-11-2020	ANERT TVM-EMC	7	9,23,304.00	HYBRID
827	19-11-2020	ANERT-TVM-37 KW Malappuram , Karakkunu 10 kW	10	5,08,559.00	ONGRID
828	19-11-2020	ANERT - KKD - Thamarassery	5	3,09,557.00	ONGRID
829	20-11-2020	ANERT - KKD - Melody	5	3,08,857.00	ONGRID
830	21-11-2020	Rohini Hospital	30	15,53,991.00	ONGRID
831	23-11-2020	Joseph C R	5	3,32,380.00	ONGRID
832	25-11-2020	Green Energia	3	1,28,100.00	ONGRID
833	25-11-2020	Green Energia	3	1,28,100.00	ONGRID
834	26-11-2020	ANERT-TSR-Kunnamkulam Taluk Hospital	35	16,78,238.01	ONGRID
835	27-11-2020	ANERT-TSR-Kunnamkulam Muncipal Town Hall	15	7,40,967.00	ONGRID
836	27-11-2020	Shanmugan T K	3	1,70,413.00	ONGRID

837	01-12-2020	ANERT-KOLLAM-Aryankavu GLP School	3	1,99,206.00	ONGRID
838	03-12-2020	ANERT-TSR-Asharikkad Drinking Water Pond	10	5,77,840.00	ONGRID
839	11-12-2020	INKEL LTD- GVHS School Aryad	10	7,25,701.00	ONGRID
840	14-12-2020	Cochin Shipyard	70	29,84,194.00	ONGRID
841	14-12-2020	INKEL LTD- GMBHS Alapuzha	10	7,10,554.38	ONGRID
842	14-12-2020	INKEL LTD- GMGHS Alapuzha	10	8,44,659.44	ONGRID
843	15-12-2020	INKEL LTD- GGHS School Alapuzha	10	8,41,803.69	ONGRID
844	21-12-2020	Mr. Gangadharan Edaukoth	3	2,28,000.00	ONGRID
845	22-12-2020	Positive Business Solutions	3	1,31,250.00	ONGRID
846	22-12-2020	Mr. Thomas Luke	5	3,06,000.00	ONGRID
847	22-12-2020	Mr. Sreedharan Nair	3	1,79,999.60	ONGRID
848	22-12-2020	ANERT KNR - Valappatinam GP	5	5,78,377.33	OFFGRID
849	28-12-2020	ANERT TRS- Kandanassery- PHC Mattom	5	3,21,785.44	ONGRID
850	28-12-2020	ANERT TRS- Kandanassery- GHD Ariyanoor	2	1,36,414.50	ONGRID
851	07-01-2021	Hykon India Ltd - GLP School Oyoor	4	1,98,632.70	ONGRID
852	12-01-2021	Universal Power Solutions-Premkumar M	5	2,10,000.00	ONGRID
853	12-01-2021	Universal Power Solutions-Sreenivasan	5	2,10,000.00	ONGRID
854	18-01-2021	ANERT PTA-GOVT UP School Pandalam	5	2,19,824.00	ONGRID
855	18-01-2021	ANERT PTA-GOVT VHSS Keezhvaipur	5	2,17,424.01	ONGRID
856	18-01-2021	ANERT PTA-GOVT UP School Poozhikkad	5	2,19,824.00	ONGRID
857	20-01-2021	Pramod George	5	2,64,999.99	ONGRID
858	25-01-2021	Mani Sons General Merchants and Commission Agent	30	12,64,922.00	ONGRID
859	27-01-2021	George Varghese	3	1,95,000.00	ONGRID
860	29-01-2021	KESNIK - Carmel College Mala	40	16,65,620.74	ONGRID
861	04-02-2021	Alukkas Realtors India Pvt Ltd	1	1,46,927.99	OFFGRID
862	05-02-2021	Mr. Paulose	2	1,26,166.00	ONGRID
863	05-02-2021	Dr. Varghese Joseph	3	1,90,300.99	ONGRID
864	05-02-2021	Vypin Block Development Office	5	4,32,599.00	OFFGRID

865	06-02-2021	Sravia Advertising Pvt Ltd.	6	3,80,000.01	ONGRID
866	06-02-2021	Benzigar Peter	5	2,87,999.99	ONGRID
867	10-02-2021	Tee Aar Associates	10	5,72,776.00	ONGRID
868	16-02-2021	ANERT TSR - Madavana PHC	5	2,19,224.00	ONGRID
869	19-02-2021	ANERT KNR-PAYYANUR BLOCK PANCHAYATH	3	3,87,180.00	OFFGRID
870	19-02-2021	ANERT KNR-PAYYANUR BLOCK PANCHAYATH	5	6,20,903.98	OFFGRID
871	24-02-2021	K G Mathew	3	2,13,464.99	ONGRID
872	24-02-2021	Warm N Cool	5	2,36,000.00	ONGRID
873	25-02-2021	Lawance Chittilappilly	5	3,15,000.00	ONGRID
874	27-02-2021	Ramesh Kumar	3	1,95,478.92	ONGRID
875	27-02-2021	Susmitha	2	1,25,000.02	ONGRID
876	27-02-2021	ANERT-KKD-Kuttiyadi irrigation	2	2,44,785.02	OFFGRID
877	27-02-2021	Elite Natural Pvt Ltd	90	51,18,300.00	ONGRID
878	04-03-2021	P Viswambaran	10	5,79,088.01	ONGRID
879	05-03-2021	Southern Railway TVM (Alapuzha)	5	2,66,305.00	ONGRID
880	05-03-2021	ANERT-WAYANAD-THOLPETTY	5	6,21,758.01	OFFGRID
881	05-03-2021	ANERT-WAYANAD-THOLPETTY	3	3,73,055.02	OFFGRID
882	05-03-2021	ANERT-WAYANAD-AMBALAVAYIL	5	6,21,758.01	OFFGRID
883	05-03-2021	ANERT-WAYANAD-AMBALAVAYIL	5	3,73,055.02	OFFGRID
884	15-03-2021	K M Valsan	3	1,68,000.02	ONGRID
885	15-03-2021	TNAU-Madurai Middle Wing Building	40	24,41,406.24	ONGRID
886	15-03-2021	TNAU-Madurai South Wing Buiding	40	24,41,406.24	ONGRID
887	17-03-2021	Hykon India Ltd - IOCL Kokkallur	10	5,54,400.06	ONGRID
888	22-03-2021	Sunil Kuamr	6	5,04,199.99	ONGRID
889	22-03-2021	Fibre World	40	18,48,250.99	ONGRID
890	23-03-2021	Sawaswathy Pathy	10	6,50,000.01	ONGRID
891	24-03-2021	ANERT-TSR-Wadakkanchery Block Panchayat	2	2,57,485.01	OFFGRID
892	24-03-2021	ANERT-TSR-Alagappa Nagar Panchayat	2	2,47,702.98	OFFGRID

893	24-03-2021	ANERT-TSR-Seed Chembukavu	5	6,06,214.01	OFFGRID
894	25-03-2021	ANERT-PTA-Thiruvalla	5	2,16,224.01	ONGRID
895	25-03-2021	ANERT-PTA-Adoor	5	2,19,224.00	ONGRID
896	26-03-2021	TNAU- Cenetary Building CBE	40	24,38,705.92	ONGRID
898	26-03-2021	TNAU- South Wing Building AC & RI Killikulam	40	24,21,621.44	ONGRID
899	29-03-2021	Jacob K V	3	2,09,999.99	ONGRID
900	29-03-2021	INKEL-Community Halls Kasarkode	24	42,83,873.04	HYBRID
901	30-03-2021	Thidanad Grama Panchayath	13	8,25,076.00	ONGRID
902	30-03-2021	Thidanad Grama Panchayath	5	3,35,063.01	ONGRID
903	31-03-2021	ANERT - KTYM - Teekoy GP	5	6,48,714.00	OFFGRID
904	31-03-2021	ANERT - KTYM - Teekoy GP	2	2,51,410.01	OFFGRID
905	31-03-2021	Organic Renewable Energy System	5	2,30,000.00	ONGRID
906	31-03-2021	Organic Renewable Energy System	3	1,35,000.01	ONGRID
907	31-03-2021	Mohammed Kunji Mayyala	20	10,95,805.00	ONGRID
908	31-03-2021	Amal Dev	5	3,45,000.01	ONGRID
909	31-03-2021	Floor Gardens	60	25,99,999.99	ONGRID
910	31-03-2021	ANERT-TSR-Kavilkadavu	2	1,09,389.99	ONGRID
911	31-03-2021	TNAU- North Wing Building AC & RI Madurai	40	24,41,406.24	ONGRID
912	31-03-2021	Vipin Mohan	10	5,19,999.98	ONGRID
913	31-03-2021	Babu K T	2	1,29,000.01	ONGRID
914	31-03-2021	Sakthan Manner Apartment	10	4,79,068.00	ONGRID
915	31-03-2021	Central Bazar India P Ltd	40	25,11,615.00	ONGRID
916	31-03-2021	Central Bazar India P Ltd	50	28,36,137.00	ONGRID
917	15-04-2021	Surya Kiran (Shivadasan)	5	2,55,000.00	ONGRID
918	15-04-2021	Surya Kiran (Prabhakaran)	3	1,39,999.99	ONGRID
919	22-04-21	ANERT KTYM (Ettumanoor BP)	5	6,50,214.01	OFFGRID
920	22-04-21	ANERT KTYM (Ettumanoor BP)	3	2,69,484.99	OFFGRID
921	29-06-2021	Vaisak	3	1,89,999.99	ONGRID

922	29-06-2021	Kuruvilangad GP	10	4,93,605.00	ONGRID
923	29-06-2021	Mariyama Zakaria	5	2,63,000.00	OFFGRID
924	29-06-2021	Surya Kiran	3	1,55,000.01	ONGRID
925	06-08-2021	Carmel Central School	3	2,16,282.00	OFFGRID
926	06-08-2021	Sherin Wood Palace	5	3,70,471.00	ONGRID
927	06-08-2021	Sherin Wood Palace	10	7,03,504.00	ONGRID
928	10-08-2021	Aravindhakshan	3	2,16,859.99	ONGRID
929	18-08-2021	Mr. Baburajan N N	5	3,40,000.00	ONGRID
930	18-08-2021	Jupitar Auto & Spares		69,220.01	OFFGRID
931	18-08-2021	Surya Kiran (Nazeer)	5	2,20,000.01	ONGRID
932	19-08-2021	A E Saidu	3	2,17,000.00	ONGRID
933	27-08-2021	Lilly P I	5	3,05,788.00	ONGRID
934	15-09-2021	Jacob Joseph	5	3,37,000.00	ONGRID
935	16-09-2021	Sivadas	10	5,49,999.98	ONGRID
936	17-09-2021	Chackochan & Sons - Kochaniayan Pattikkad	2	1,16,420.00	OFFGRID
937	23-09-2021	ANERT-KANNUR- Karivellur CHC	3	3,68,498.00	OFFGRID
938	23-09-2021	ANERT-Wayanad - Diary Development Office	3	3,87,054.98	OFFGRID
939	23-09-2021	ANERT - TVM - Vakkom Gramapanchayath	3	3,69,101.00	OFFGRID
940	30-09-2021	TNAU- Newly Constructed 1st & 2nd Floor NABL Building	40	24,46,651.20	ONGRID
941	30-09-2021	TNAU- Newly Constructed Western Side of CPMB&B Build	40	24,46,651.20	ONGRID
942	30-09-2021	Mary Paul	5	3,10,365.00	ONGRID
943	30-09-2021	Thenkurissi GP	10	5,07,024.00	ONGRID
944	30-09-2021	Meenchatty Hottel	10	6,49,999.63	ONGRID
945	30-09-2021	NUALS Kalamassery	100	52,49,000.01	ONGRID
947	30-09-2021	Surya Kiran	3	3,16,081.88	ONGRID
948	30-09-2021	Sunilkumar	5	3,35,000.01	ONGRID
949	30-09-2021	Ramesh	10	5,90,427.50	ONGRID
951	30-09-2021	KSEB 110 kW - Malappuram Schools	110	64,66,924.53	ONGRID

952	13-10-2021	TNAU - Pathology Building	40	24,46,651.20	ONGRID
953	13-10-2021	TNAU - Agriculture & Rural Mgt	40	24,46,651.20	ONGRID
954	13-10-2021	TNAU - West Wing Cenetary Building	40	24,46,640.00	ONGRID
955	13-10-2021	TNAU - Pathology Building	40	24,46,651.20	ONGRID
956	13-10-2021	TNAU - Agriculture & Rural Mgt	40	24,46,651.20	ONGRID
957	13-10-2021	TNAU - West Wing Cenetary Building	40	24,46,640.00	ONGRID
958	03-12-2021	FILATEX VCT LTD - VINOD THOMAS	10	6,05,255.98	ONGRID
959	23-12-2021	Intelligent Innovations - Sudhakaran Trikaripur	3	1,79,849.60	ONGRID
960	23-12-2021	Intelligent Innovations - Unnikrishnan Manna Kannur	3	2,05,387.84	ONGRID
961	08-01-2022	Asst. General Manager-Solar, INKEL Ltd- Kasarkode Munc	9.6	11,23,369.99	HYBRID
963	02-02-2022	TEDA - Highways Research Station Training Centre Guindy	65	26,67,541.00	ONGRID
964	05-02-2022	Mahadevan V	3	1,90,498.62	ONGRID
965	05-02-2022	Ramakrishnan V	3	1,90,498.62	ONGRID
966	05-02-2022	Gopin P N	3	1,90,498.62	ONGRID
967	05-02-2022	Pauly M J	3	1,90,498.62	ONGRID
968	05-02-2022	C J John	3	1,90,498.62	ONGRID
969	05-02-2022	Kochappan	3	1,90,498.62	ONGRID
970	05-02-2022	Issac K A	3	1,90,498.62	ONGRID
971	07-02-2022	Vineetha Deleep	3	1,90,498.62	ONGRID
972	08-02-2022	ANERT-Wayanad - Panamaram	3	4,60,462.00	HYBRID
973	08-02-2022	Raveendran Nair	3	1,90,498.62	ONGRID
974	08-02-2022	Veena Krishnakumar	3	1,90,498.62	ONGRID
975	08-02-2022	Prime	2	2,00,778.00	ONGRID
976	10-02-2022	Cyber Park	25	13,10,517.39	ONGRID
977	11-02-2022	Francis A T	3	1,90,498.62	ONGRID
978	11-02-2022	Babeena	3	1,90,498.62	ONGRID
979	11-02-2022	Haridas	3	1,90,498.62	ONGRID
980	11-02-2022	Rajesh M R	3	1,90,498.62	ONGRID

981	12-02-2022	Joby Francis	3	1,90,498.62	ONGRID
982	12-02-2022	Anvar	3	1,90,498.62	ONGRID
983	14-02-2022	TEDA - TAMPCOL Thiruporur & Chegalpattu	110	45,14,301.00	ONGRID
984	15-02-2022	T G Niranjan	3	1,90,498.62	ONGRID
985	23-02-2022	ANERT - KASARKODE - GLPS KAYYUR	3	4,55,162.01	HYBRID
986	24-02-2022	Ramadas	3	1,90,498.62	ONGRID
987	24-02-2022	Saresh Vijayan	3	1,90,498.62	ONGRID
988	24-02-2022	Babu Mathew	3	1,90,498.62	ONGRID
989	24-02-2022	Sameer Ambalath	3	1,90,498.62	ONGRID
990	24-02-2022	Ramakrishnan Nair	3	1,90,498.62	ONGRID
991	24-02-2022	Ferdinant Nellangara	3	1,90,498.62	ONGRID
992	24-02-2022	Lalithadevi	3	1,90,498.62	ONGRID
993	26-02-2022	INKEL- Kanjagad Municipality (Kasarkode)	7.5	2,72,344.00	OFFGRID
994	05-03-2022	Dr. Kurian Sachria	6	4,12,817.01	ONGRID
995	08-03-2022	ANERT - KOZHIKODE- GLPS CHAMAL	3	4,55,162.01	HYBRID
996	08-03-2022	ANERT - IDUKI - VIGILANCE	5	6,69,648.00	HYBRID
997	18-03-2022	ANERT - KNR- GUPS MUZHUKKUNNU	3	4,55,162.01	HYBRID
998	22-03-2022	ANERT-MLPM-GUPS Eranhimangad	3	4,55,162.01	HYBRID
999	25-03-2022	Elite Tasty Toast P Ltd	180	89,90,141.00	ONGRID
1000	25-03-2022	Yamuna Roller Flour Mills P Ltd	331	2,04,99,754.01	ONGRID
1001	26-03-2022	Thejus Petroleum	10	7,52,333.00	ONGRID
1002	31-03-2022	Sunil V M	3	1,90,498.62	ONGRID
1003	31-03-2022	Geevarghese Panicker	3	1,90,498.62	ONGRID
1004	31-03-2022	Sunny	3	1,90,498.62	ONGRID
1005	31-03-2022	Ammukutty	3	1,90,498.62	ONGRID
1006	31-03-2022	C D Varghese	3	1,90,498.62	ONGRID
1007	31-03-2022	Joshy Varghese	3	1,90,498.62	ONGRID
1008	31-03-2022	Vincent T P	3	1,90,498.62	ONGRID

1009	31-03-2022	Mary Ouseph	3	1,90,498.62	ONGRID
1010	31-03-2022	Vijayakrishnan	3	1,90,498.62	ONGRID
1011	31-03-2022	Jayathilakan P K	3	1,90,498.62	ONGRID
1012	31-03-2022	Mathew George	3	1,90,498.62	ONGRID
1013	31-03-2022	Padmanabhan	3	1,90,498.62	ONGRID
1014	31-03-2022	Sinto Joy	3	1,90,498.62	ONGRID
1015	31-03-2022	Srikala Ranjith	3	1,90,498.62	ONGRID
1016	31-03-2022	Balram	3	1,90,498.62	ONGRID
1017	31-03-2022	Manikandan T (ELITE)	3	1,90,498.62	ONGRID
1018	31-03-2022	Muhammed Siyad	3	1,90,498.62	ONGRID
1019	31-03-2022	Ananathalakshmi Ammal	3	1,90,498.62	ONGRID
1020	31-03-2022	Chenjulaakshmi	3	1,90,498.62	ONGRID
1021	31-03-2022	Suresh Menon	3	1,90,498.62	ONGRID
1022	31-03-2022	Sreeraman	3	1,90,498.62	ONGRID
1023	31-03-2022	ANERT WYD - Pulppally Milk Soccity	20	11,37,011.01	ONGRID
1024	31-03-2022	KAU Vellanikkara	15	9,77,123.01	ONGRID
1025	31-03-2022	Ephaphtha	30	16,50,000.01	ONGRID
1026	31-03-2022	Prime Roof	15	7,29,999.99	ONGRID
1027	31-03-2022	Pratheeksha	50	29,11,773.25	ONGRID
1028	31-03-2022	Pazhayannur	20	30,73,533.00	OFFGRID
1029	31-03-2022	Adv. Bindhu	3	1,90,498.62	ONGRID
1030	31-03-2022	Tharavad Properties	5	3,29,000.01	ONGRID
1031	31-03-2022	Madhusoodhanan (SOURA)	3	1,90,498.62	ONGRID
1032	31-03-2022	Vaidhyarathnam (SOURA)	3	1,90,498.62	ONGRID
1033	31-03-2022	Vineeth (SOURA)	3	1,90,498.62	ONGRID
1034	31-03-2022	PAUL D N (SOURA) Ramesh	3	1,90,498.62	ONGRID
1035	31-03-2022	Christo George (SOURA)	3	1,90,498.62	ONGRID
1036	31-03-2022	Sobha S	10	6,15,808.00	ONGRID

1037	31-03-2022	ANRT KNR - Kalliassery BP	5	6,37,155.00	OFFGRID
		TOTAL	8,954.60	61,16,40,834.21	



PURCHASE ORDER

Invoice To HYKON INDIA (P) LTD "HYKON HOUSE" IKKANDA WARRIER ROAD THRISSUR CIN: U52599KL1998PTC012330 E-Mail :accounts@hykonindia.com		Voucher No. 1060		Dated 28-Jan-2017	
Despatch To HYKON INDIA (P) LTD "HYKON HOUSE" IKKANDA WARRIER ROAD THRISSUR E-Mail :accounts@hykonindia.com		Supplier's Ref./Order No. 1060		Mode/Terms of Payment BACK TO BACK	
		Despatch through		Other Reference(s) CSB	
Supplier SOLGEN ENERGY PVT LTD 22/344 B, KUTTANELLUR P O THRISSUR 680 014		Terms of Delivery 28-01-2017		Destination OLLUR	

Sl No.	Description of Goods	Quantity	Rate	per	Amount
1	500 KW GRIDE CONNECTED POWER PLANT WITH ACCESSORIES INPUT VAT 1%	1 NOS	2,98,02,955.67	NOS	2,98,02,955.67
				1 %	2,98,029.56
Total		1 NOS			₹ 3,01,00,985.23

Amount Chargeable (in words) E. & O.E
INR Three Crore One Lakh Nine Hundred Eighty Five and Twenty Three paise Only

Remarks:
 INVOICE SHOULD BE MENTIONED SERIAL NUMBER & WARRANTY DETAILS
 Company's VAT TIN : 32081430655
 Company's CST No. : 32081430655C
 Supplier's VAT TIN : 32080718193

for HYKON INDIA (P) LTD

 Authorised Signatory

Hykon India Ltd.

Hykon House, Ikkandawarrier Road, Thrissur-1

Ph : 0487-2444163, 2444183

ho@hykonindia.com, www.hykonindia.com

CIN: U52599KL1998PLC012330

FORM T-4

PERFORMANCE REPORT OF WORKS

1	Name of work/ Project & Location	Design, Installation, Testing & Commissioning of 0.5MW grid interactive Ground Mounted solar PV Plant on turn-key basis at 110kw substation, Kuttipuram, Malappuram District.
2	Agreement No:	1060 Dated 28 th January 2017
3	Estimated Cost	Nil
4	Tendered Cost	Rs.3,01,00,985.23
5	Date of Start	28.01.2017
6	Date of Completion	
	i) Stipulated date of Commission (As mentioned in work order)	4 Months
	ii) Actual date of completion	01/10/2018
7	a)Whether case of Levi of compensation for delay has been decided or not	No
	b) If decided amount of compensation levied for delayed completion, if any	
8	Amount of reduced rate items, if any	
9	Performance report	
	1)Quality of work	Outstanding
	2)Financial Soundness	Outstanding
	3)Technical Proficiency	Outstanding
	4)Resourcefulness	Outstanding
	5)General Behaviour	Outstanding
10	Remarks (If any)	

Dated: 22.12.2022

Christo George
Managing Director



www.hykonindia.com

Corporate Office: Hykon India Ltd., Hykon House, Ikkandawarrier Road, Thrissur-1, Ph : 0487-2444163, 2444183

UPS | Inverter | Solar Water Heater | Tubular Battery | Solar Power Plant | 3 in 1 Solar Street Light | Servo Stabilizer | Lithium Ion Battery | SS Water Tank

File No: ANERT/TECH/09/2022/72 (Computer No: 5311) B. T. M. Tech, Kottayam, Kerala, Thrissur | Calicut | Kannur | Coimbatore | Chennai | Mysore | Mangalore | Bangalore | Hyderabad | Pune | Mumbai

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KERALA STATE ELECTRICITY BOARD LIMITED

Office of the Chief Engineer (Renewable Energy & Energy Savings)
9th Floor, Vidyuthi Bhavanam, Pattom, Thiruvananthapuram – 695 004, Kerala
Phone: +91 471 2447404, 9446008007 Fax: 0471 2558340
E-mail: ceees@kseb.in

By Registered post with A/D

LETTER OF AWARD

To

**Solgen Energy Pvt Ltd
22/314-B, Kuttanellur P.O,
Thrissur, Kerala,
India- 680 014**

W.O No.	08/ 2017 -18/2507
Date	06.02.2018
Order type	Installation and commissioning of Grid Tied Rooftop Solar PV Power plants under IPDS scheme for Kerala launched by Ministry of Power, Government of India, on the Rooftop of buildings owned by Kerala State Electricity Board Limited to generate and deliver 445 kWp (as per STC conditions) in total at 23 locations in the south and central region of Kerala including Operation for first year & Maintenance of the plants for the first 5 years from the date of commissioning
Reference file	CE(REES)/IPDS/North&South/2017-18
e -Tender No	KSEBL/REES/IPDS07/2016-17 dated 06-08-2016
Value	INR 3,04,78,050/-(Rupees Three Crore Four Lakhs Seventy Eight Thousand and Fifty only)
Price	Fixed

Sir,

Sub Installation, testing and commissioning of 445 kWp (as per STC conditions) Grid tied Rooftop Solar PV project under IPDS scheme in 23 locations of South and Central region - **Award of contract – reg.**

- Ref**
- 1 Note No. CE(CAPs&S)/P2/IPDS/General/2016-17/120 dated 1/7/2016 of Chief Engineer (CAPs&Safety), KSEBL
 - 2 B.O.(FTD)No2598/2016(CE(CAPs&Safety)/P2/IPDS/General/201617) TVM dated 06.09.2016
 - 3 E tender No. KSEBL/REES/IPDS07/2016-17 with Tender ID : 2016_KSEB_79548_1 dated 06-08-2016 and its addendums
 - 4 Remarks of FA vide no. Tender-I/59/2017 dt 03.08.2017
 - 5 Revised price schedule furnished by M/s Solgen Energy Pvt Ltd SEPL/IPDS 02/201718 dt 05.08.2017

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Registered Office: Vidyuthi Bhavanam, Pattom, Thiruvananthapuram – 695004 Website: www.kseb.in

- 6 B.O (FTD) No.2036/2017/KSEBL/ CE(REES)/ Engineer-in-charge /solar/2017-18 / Tvpm dtd 07.8.2017
- 7 Remarks of FA vide note no. FA/Tax cell/GST/CE(REES)/Rooftop-solar/2017-18 dt 09.10.2017
- 8 Letter No. SEPL/KSEB_IPDS/005/2017-18 dt 17.10.2017 of M/s Solgen Energy Pvt. Ltd.
- 9 B.O (FTD)no.105/CE(REES)/IPDS/North&South/2017-18 Tvpm dated 10.01.2018
- 10 CERC (Terms and Conditions for Tariff determination from Renewable Energy Sources) (Fifth amendment) Regulations, 2016

Kerala State Electricity Board Limited is pleased to accept your financial and technical offer and place this Letter of Award (LoA) to your offer for Appointment of EPC contractor for the design as per site conditions, erection, testing & commissioning of Grid Tied Rooftop Solar PV Power plants under IPDS scheme for Kerala launched by Ministry of Power, Government of India, on the Roof of buildings owned by Kerala State Electricity Board Limited to generate and deliver 445 kWp in total 23 locations in Trivandrum, Kollam, Kottayam, Pathanamthitta, Alappuzha, Ernakulam, Idukki and Thrissur including Operation for first year & Maintenance of the plant for the first 5 years from the date of commissioning utilizing the IPDS fund.

The contract shall be strictly in accordance with provisions contained in the bid documents cited under reference (3) above. This LoA, tender documents will form part of the contract agreement.

Additional conditions/modifications if any, stated in your offer or elsewhere, which are not agreed to by KSEBL or not in accordance with any of the provisions covered by the bid documents referred shall stand withdrawn/nullified.

1. Scope of work:

The work includes design, planning, investigation, survey, engineering, manufacture/procurement, manufacturer's quality assurance, shop testing (including type testing where specified/required), transportation, handling storage, erection including all civil/structural works, electrical and general works, piping, cabling, instrumentation, installation, testing and commissioning, training, services, permits and insurance at all stages on composite supply basis of Grid-tied solar photovoltaic system on the rooftop of buildings under KSEBL to install the solar PV plant in 23 locations to produce and deliver 445 kWp in various districts of South and Central region of Kerala and handing over the SPV Plants to KSEBL to its full satisfaction. The contractor shall be responsible for obtaining consents, clearances, including Electrical Inspectorate sanction, permit and approval from appropriate authorities and KSEBL for grid connection.

The generated output power from the solar panels at low voltage shall be grid tied to Voltage levels available at the existing grid infrastructure at the various locations. The EPC Integrator shall also be responsible for the operation and maintenance of the plant for the first year after commissioning and do maintenance of the plant for the next 4 years. The plant shall be designed for a project life of 25 years.

The contractor shall be responsible for the performance to attain the net minimum guaranteed generation (NMGG) specified in the Table-1 below for five years from the date of

commissioning. To ensure this NMGG, the contractor shall erect additional number of solar modules if any without extra cost to KSEBL.

Any material or works which have not been specifically mentioned in the specifications/schedule but which are found necessary and essential for the proper fulfillment of the contract during execution will also form part of the work. This shall also deem to be covered by the rates and prices quoted for the work and no additional payment will be made to the contractor for such unspecified but essential work elements.

Table 1

Sl.No	Location of the project	Total capacity (KWp)	Yearwise Net Minimum Guarantee Generation (NMGG) in kWh				
			1st year	2nd year	3rd year	4th year	5th year
1	66 kV Substation Kuravilangadu	15	17739	17562	17386	17212	17040
2	110 kV Kozhencherry	15	17739	17562	17386	17212	17040
3	66 KV Substation Thiruvalla	15	17739	17562	17386	17212	17040
4	Vydyuthi Bhavanam Pathanamthitta	25	29565	29269	28977	28687	28400
5	110 KV Substation Kavanad	20	23652	23415	23181	22950	22720
6	66 KV Substation Balaramapuram	15	17739	17562	17386	17212	17040
7	66 KV Substation Neyyattinkara	15	17739	17562	17386	17212	17040
8	110 KV Substation Nedumangad	15	17739	17562	17386	17212	17040
9	66 KV Substation Vattiyoorkavu	15	17739	17562	17386	17212	17040
10	IB, Paruthippara	35	41391	40977	40567	40162	39760
11	Powerhouse Thiruvananthapuram	10	11826	11708	11591	11475	11360
12	Vydyuthi Bhavanam, Pattom, Loc.2	30	35478	35123	34772	34424	34080
13	110 kV S/s Ollur	20	23652	23415	23181	22950	22720
14	110 kV S/s, Wadakkancherry	15	17739	17562	17386	17212	17040
15	110kV S/s Ayyampuzha	20	23652	23415	23181	22950	22720
16	66kV S/s Angamaly	30	35478	35123	34772	34424	34080
17	110KV Substation Rayonpuram	15	17739	17562	17386	17212	17040
18	110 kV S/s Myloor	20	23652	23415	23181	22950	22720
19	110 kV S/s Kadavanthra	25	29565	29269	28977	28687	28400
20	110 kV S/s Kandanad	25	29565	29269	28977	28687	28400
21	66 kV S/s Alappuzha	15	17739	17562	17386	17212	17040
22	110 kV S/s Mabelikkara	20	23652	23415	23181	22950	22720
23	110 kV S/s Udumbanoor	15	17739	17562	17386	17212	17040
Total		445	526257	520994	515784	510626	505520

The contractor shall be responsible for obtaining consents, clearances, including Electrical Inspectorate sanction, permit and approval from appropriate authorities and KSEBL for grid connection. As the projects are under IPDS, the installations shall be satisfactory with the appropriate authorities/Project monitoring agency of IPDS in line with the tender conditions. Sign boards in accordance with the specification for the IPDS projects have to be provided in each location indicating the name of the project, name of implementation agency and capacity. The sign board should be put up immediately when the plant is commissioned.

All statutory approvals/permissions related to installation of the solar power plant and carrying out its operation & maintenance (O&M) as may be required under applicable law/ rules shall be obtained by the contractor. All fees for such statutory approvals for installation, commissioning and operation for the first year and maintenance for first five years from the date of commissioning shall be borne by the Contractor.

2. Name of the Project:

Design, Installation, testing and commissioning of 445 kWp Grid tied Rooftop Solar PV project on composite supply basis under IPDS scheme in 23 locations of South and Central region of Kerala using IPDS fund and operation of the plant for the first year and maintenance of the plant for the first 5 years from the date of commissioning of the plant herein after called "the project".

3. Name of the Utility:

Kerala State Electricity Board Ltd, having its Registered Office at Vydyuthi Bhavanam, Pattom, Thiruvananthapuram-695004, Kerala, India. Website: www.kseb.in herein after called "KSEBL"

4. Name of the Contractor:

M/s. Solgen Energy Pvt Ltd, 22/314-B, Kuttanellur P.O, Thrissur, Kerala, India-680 014 herein after called "Contractor".

5. Contract Amount:

The Total Contract Amount is INR 3,04,78,050/- (Rupees Three Crore Four Lakhs Seventy Eight Thousand and Fifty only) for design, engineering, manufacturing, procurement, supply (including spares), handling storage, civil works, erection, installation, testing & commissioning, training of personnel, along with operation and maintenance charges of the project as all inclusive Price under composite supply with 5% GST payable by the contractor for successful completion, operation and maintenance of the project as per the financial proposal submitted by you and as detailed in the Price Schedule attached as Annexure 1.

Freight and Insurance charges for transportation of material/equipment to destination project site and up to complete installation and commissioning should be arranged by the contractor at their own cost. KSEBL will not entertain or bear any charge for the same.

Contract amount shall be governed as per provisions under Clause 4.1 of Volume 1 of the tender document and as per B.O vide ref(9) above. This amount shall be firm during the period of contract and shall not be varied or adjusted on whatsoever reason on any account.

6. Taxes & Duties:

The Contract Amount as indicated in clause 5 of this document is inclusive of 5% GST. All Taxes and duties will be as per the latest orders of KSEBL and prevailing rules of State/Central Government. No separate claim on this behalf will be entertained and future claims on any taxes and duties will not be admitted and also all statutory recoveries will be deducted by K.S.E.B Ltd from the work bill. No future claims on unquoted taxes and duties will be allowed. Any hike in tax rate will be admitted during the contract period only if the contract is executed as per contract schedule and benefits of reduction in tax rates shall be passed on to KSEBL. The contractor shall submit a clear tax invoice containing all details prescribed as per GST Act and Rules for effecting Payments.

7. Insurance:

All equipment, machinery, works etc. which are furnished, installed, constructed and handed over/to be handed over to the KSEBL under this contract for the completion of project shall be insured by the Contractor for the period of contract i.e for 5 years. The entire cost on account of this shall be borne by the Contractor. Losses or damage if occurred to such machinery, equipment and work shall be made good at the risk of Contractor. It shall be the responsibility of the Contractor to maintain adequate insurance coverage at all times.

The machinery, equipment and other valuable material of the Contractor at work site shall be insured by the contractor so that any loss or damage due to force majeure situation can be taken up by the Contractor with the insurance companies for getting their claims. The KSEBL will not give any financial assistance on this account.

All the personnel employed/engaged by the contractor shall have adequate insurance coverage. Any claim due to mishap/accidence or otherwise to personnel/equipment, shall be taken up by the contractor, directly with the insurance company. KSEBL will not have any liability in this respect whatsoever.

The Contractor, without limiting KSEBL's obligations and responsibilities shall insure:

- (a) the works, together with materials and plant to the full replacement cost and third party liability at site.
- (b) an additional sum of 15% of such replacement cost to cover additional costs and incidental to the rectification of loss or damage including professional fees and cost of demolishing and removing any part of works and of removing debris of whatsoever nature, and
- (c) the Contractor's equipment and other things brought to site, for a sum sufficient to provide for their replacement at the site.
- (d) The insurance against third party liability at site shall be ensured before commencing the execution of work, against any damage or loss or injury which may occur to the equipment being shifted/ installed or to any property or person (including property and employees of the Employer) by or arising out of the execution of works or temporary works in carrying out of the Contract. The insurance coverage shall be revalidated till the certification of project.

The insurances under item (a) and (b) shall be in the joint names of Contractor and KSEBL and shall cover:

- (i) KSEBL and the Contractor against all losses or damage, from whatsoever cause arising from the start of work at the site until the date of issue of the relevant taking over certificate in respect of the works or any section or part thereof as the case may be, and
- ii) The Contractor for his liability :
 1. during the Defects Liability Period for loss or damage arising from a cause occurring prior to the commencement of Defect Liability Period,
 2. for loss or damage caused by the Contractor in the course of any operations carried out by him under the terms of the Contract, and
 3. for loss or damage caused by the Contractor in the course of any operation carried out by him during execution of works to the neighbouring habitats , life and property in an area of 200 metres around the boundary of the site.

If the Contractor fails to effect in force the insurances referred in the above clauses, or any other insurance which he may be required to effect under the terms of the contract, then and in any such case, the KSEBL may effect and keep in force any such insurance and pay such premium or premiums as may be necessary for that purpose and from time to time deduct the amount so paid by the KSEBL as aforesaid from any amounts due or which may become due to the Contractor, or recover the same as a debt due from the Contractor.

8. Work commencement, Period of Completion and Date of Commissioning:

The Contractor shall complete the implementation in all respect within 6 months from the official date of commencement of work which shall be on or before 15 days from the date of executing Agreement or the date of handing over the site, even if not in full, but in a manner the work can be commenced and proceeded with in accordance with the programme of works, whichever is later.

The site shall be handed over to the contractor by the Engineer-in-Charge within 15 days from the date of execution of Agreement. All the works stipulated under the scope of the Contract shall be completed in all respects, supplies made, services provided and final cleaning up done and required testing shall be completed and commissioned before the expiry of the Time of Completion thus worked out, unless the time of completion is postponed and period of completion is extended by a written letter from the Agreement Authority.

All Commissioning test shall be conducted by the contractor in presence of KSEBL officers delegated by the Engineer-in-Charge and the approvals will be given only if the same is satisfactory.

The date of commissioning shall be the date on which the solar plant is synchronized into KSEBL grid after obtaining clearance from all statutory bodies and after conducting necessary grid interfacing tests and measurements by the KSEBL found satisfactory. The Engineer in Charge should issue a certificate indicating the date of commissioning and an authorization certificate/commissioning report after the successful synchronization and commissioning of the plant with the grid.

On completion of all works stipulated in the scope of work and after testing and commissioning of the Project and if there are no obligations to arise out of the Contract, the Engineer in charge shall furnish a certificate to the Contractor to the effect that all works are completed satisfactorily and no works remains incomplete as per the terms of contract. The issue of this certificate does not relieve the contractor from the obligations during the defect liability period and the execution of Operation for first year and Maintenance for 5 years.

As the projects comes under IPDS, the installations shall be satisfactory with the appropriate authorities/Project monitoring agency of IPDS and necessary rectifications if any proposed against the defects shall be done based on the inspection in line with the tender conditions. The contractor shall also prepare and handover the as-built drawing, Operational manuals and Maintenance manuals of the plant after completion of the project.

9. Price Escalation due to Extension Of Completion Date:

The contractor shall not claim any price escalation, in case the completion period is extended for any reason, including litigation or force majeure conditions.

10. Liquidated Damage:

Any delay in commissioning a Project will adversely affect the total planning which in turn will affect the State and the public exchequer. Hence, for any damage or loss caused to the KSEBL due to the failure from the part of the Contractor in completing the Work in all respects within the stipulated period of completion, the Contractor shall compensate for the same. The Liquidated Damages (not as penalty) is to be realised at the end of the period of completion. The maximum amount of Liquidated Damages shall be limited to 10% of the accepted Contract Amount in proportionate to the capacity for each location. The rate of Liquidated Damages shall be 0.05% of accepted Contract Amount in proportionate to the capacity for each location per day of delay subject to a maximum of 10% accepted contract amount in proportionate to the capacity of each location.

Penalty imposed, if any, shall be deducted from the amount of Liquidated Damages. If the delay prolongs in excess of 200 days from the agreed date of completion as per the original agreement, the Work is liable to be terminated and balance works will be arranged to be completed at the risk and cost of the Contractor as per clause 5.3.8 of volume 1 of the tender document.

11. Performance security deposit:

The Contractor shall submit a Bank Guarantee for an amount equal to 10% of the total Contract amount INR 30,48,000/- (Rs. Thirty lakh forty eight thousand only) as the Performance security deposit at the time of execution of agreement and shall be in the prescribed format in Annexure 2 - Contract forms A - of this document. Failure of the successful bidder to submit the required Performance Guarantee shall constitute sufficient grounds for termination of Contract & forfeiting the EMD.

In order to cover the liabilities under the contract and to ensure sufficient guarantee to cover all possible liabilities pertaining to defects, shortfalls including the NMGG, remedial measures arising out of poor workmanship, materials, loss, excess amount, risk and cost of Contractor in case of alternate arrangements and any type of dues to the KSEBL, the Performance Security deposit for the Contract shall be collected and retained from the Contractor.

The Bank Guarantee shall be initially valid from the signing of contract and for a period of 2 years and be kept renewed from time to time. This Performance security deposit BG equivalent to 10% of the total contract amount will be released on proving the Net Minimum Guaranteed Generation (NMGG) specified for the 1st year in the Table-1 (page 3) of this LoA, within one year from the date of commissioning for each plant and subject to the submission of a B.G equivalent to 5% of the total Contract Amount which shall be valid for a period of 5 years to cover the entire defects liability period.

This remaining 5% of the contract amount furnished as performance security deposit will be released after the defect liability period of 5 years subject to the following.

Contractor shall be responsible for performance of the plant to attain net minimum guaranteed generation as offered for succeeding 4 years after commissioning and proving the capacity. Proper operation and maintenance of the plant shall be carried out in this regard. As the 100% of the total contract amount is released after satisfactory completion, testing and commissioning of the plant which includes the O&M cost of the plant. For any shortfall in attaining the net minimum guaranteed generation for the 2nd, 3rd, 4th and 5th years as specified in the Table-1 (page 3) of this LoA, a compensation equivalent to existing O&M cost for each year as defined by the CERC Regulation 2016 vide ref(10) above shall be recovered from the contractor as per the decision of the agreement authority vide clause 1.2 of volume 3 of the tender document. This compensation shall be 12.5% of the Performance Security Deposit (i.e., Rs. 3,80,000) for each 2nd, 3rd, 4th and 5th years which shall be deducted from the Performance Security Deposit.

No interest shall be paid by KSEBL at any stage of contract on this Performance Security Deposit.

12. Agreement:

A contract agreement has to be executed by the contractor within 15 days from the date of issue of this LoA, in the prescribed format in Annexure 2-Contract form B of this document, in Kerala State Government Stamp paper worth INR 200/- (Indian Rupees Two Hundred only), along with the performance security deposit at the Office of the Chief Engineer (Renewable Energy & Energy Savings), on a date and time to be mutually agreed:

The contractor shall provide the original contract agreement and Bank Guarantee in lieu of Performance security deposit, appropriate power of Attorney in original and other requisite documents for signing of the contract. All the documents cited in clause no.30 of this document will form part of the agreement. Power of Attorney shall be in stamp paper attested by a registered Notary Public.

Failure of the Contractor to comply with the above requirement shall constitute sufficient grounds for cancellation of award of contract and to re-arrange the Work including re-bidding at the risk and cost of the Contractor. If due to the default of the Bidder/Contractor to furnish requisite Performance Security deposit, execute Contract Agreement or to take possession of the site and execute the Work with proper diligence, the Work will be arranged otherwise by Engineer-in-Charge at the risk and cost of the Contractor and if any loss to KSEBL results due to this, the same will be recovered from the Contractor. Recoveries on this or on any other account will be made from the sum that may be due to the Contractor on this or any other subsisting contracts or under the Revenue Recovery Act or otherwise as the KSEBL may decide.

13. Construction Programme:

Within 15 days from the date of award, the contractor shall submit a programme showing the general method, arrangements, order and timing for all the activities involved in the work in a systematic manner based on planning technique and tool like PERT /CPM in MS (Projects) and GANTT chart indicating the critical events/paths and milestones to KSEBL for approval.

The contractor shall carry out the works in accordance with this programme and as approved by KSEBL, and complete them in all respects to the full satisfaction of KSEBL. Any change to the approved work plan due to unavoidable circumstances shall be made only with the prior approval of KSEBL.

14. Terms of Payment:

- a. The contractor shall submit a clear tax invoice containing all details prescribed as per GST ACT and RULES for effecting Payment.
- b. The Contractor has to produce Bank Guarantee for an amount specified in the clause 11 of this LoA as Performance Security Deposit at the time of executing Contract Agreement.
- c. Up to 10% of the Total Contract amount will be released to the contractor as Mobilisation advance, after execution of the Contract agreement and production of a Bank Guarantee for 10% of the contract amount after site mobilisation as per clause no. 15 of this LoA.
- d. 30% of Contract value proportionate to capacity of each location excluding O&M, will be released to the contractor after delivery of major components (PV Modules, Inverters, and Module Mounting Structures) at sites after site inspection and acceptance tests and verification by authorized departmental officers and production of insurance certificates for the materials delivered at site.
- e. 100% of the total Contract amount proportionate to capacity of each location will be released after satisfactory completion, testing & commissioning as specified in the clause 8 (page 6) of this LoA. Bank Guarantee submitted for availing Mobilization advance, if any availed, can be released along with 100% payment after deducting Interest.
- f. The Performance security deposit BG equivalent to 10% of the total contract amount will be released on proving the Net Minimum Guaranteed Generation (NMGG) specified for the 1st year in the Table-1 (page 3) of this LoA, within one year from the date of commissioning for each plant and subject to the submission of a B.G equivalent to 5% of the total Contract Amount which shall be valid for a period of 5 years to cover the entire defects liability period. This remaining 5% of the contract amount furnished as performance security deposit will be released after the defect liability period of 5 years.

15. Advance Payment:

10% of the contract amount INR 30,47,805/- (Rs. Thirty lakh forty seven thousand eight hundred and five only) carrying an interest rate of 12% will be released as "Mobilization Advance" after signing the contract only on request of the contractor. The following shall be ascertained before release of payment:-

- Submission of necessary Bank Guarantee/Guarantees of 10% of Contract Amount.
- Submission of agreed project implementation schedule.
- Submission of all drawings and major components for approval.

This Bank Guarantee shall be valid till the completion and commissioning of work and shall be extended if required. The BG (10% of contract amount) towards advance payment will be released after the satisfactory completion and commissioning of the project.

The KSEDL may, if requested by the Contractor, allow multiple Bank Guarantees towards Security for the advance granted. The interest on advance paid shall be calculated

from the date of payment to the date of recovery, both days inclusive, on the outstanding amount of advance. Recovery of such sums shall be done at the time of completion of work and final payment of the contract amount.

The Contractor shall indemnify the KSEBL against all losses that the KSEBL may suffer due to theft or destruction or pilferage or any other cause on this account.

This Bank Guarantee shall be extended as mutually agreed upon, if situation requires.

The Advance Bank Guarantee should be submitted strictly as per prescribed format enclosed in Annexure 2-Contract form C.

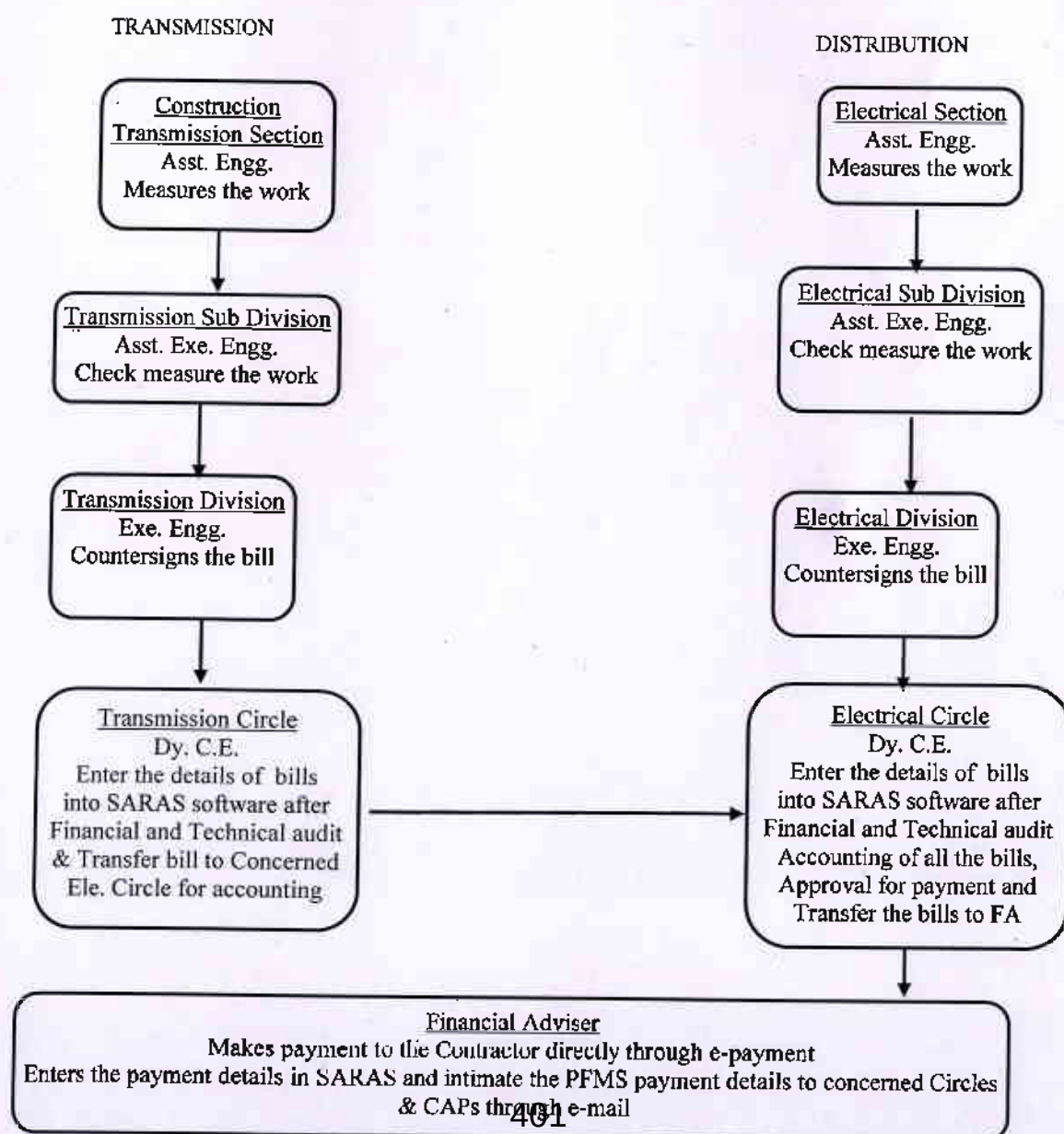
16. Payment Authority and Engineer-in-Charge:

The details of Engineer-in-Charge of all locations are furnished below for the proper monitoring of the project.

Sl. No	Location of the project	Engineer-In-Charge	Total capacity (KWp)	IPDS Ele.Circle
1	66 kV Substation Kuravilangadu	Deputy Chief Engineer Trn.Circle, Poovanthuruth	15	Kottayam
2	110 kV Kozhencherry	Executive Engineer Trn.Division, Pathanamthitta	15	Pathanamthitta
3	66 KV Substation Thiruvalla	Executive Engineer Trn.Division, Pathanamthitta	15	Pathanamthitta
4	Vydyuthi Bhavanam Pathanamthitta	Executive Engineer Trn.Division, Pathanamthitta	25	Pathanamthitta
5	110 KV Substation Kavanad	Deputy Chief Engineer Trn.Circle, Kottarakkara	20	Kollam
6	66 KV Substation Balaramapuram	Deputy Chief Engineer Trn.Circle, Thiruvananthapuram	15	Kattakkada
7	66 KV Substation Neyyattinkara	Deputy Chief Engineer Trn.Circle, Thiruvananthapuram	15	Kattakkada
8	110 KV Substation Nedumangad	Deputy Chief Engineer Trn.Circle, Thiruvananthapuram	15	Thiruvananthapuram
9	66 KV Substation Vattiyoorkavu	Deputy Chief Engineer Trn.Circle, Thiruvananthapuram	15	Thiruvananthapuram
10	Powerhouse Thiruvananthapuram	Deputy Chief Engineer Trn.Circle, Thiruvananthapuram	10	Thiruvananthapuram
11	IB, Paruthippara	Executive Engineer Civil Division, Thiruvananthapuram	35	Thiruvananthapuram
12	Vydyuthi Bhavanam, Pattom, Loc.2	Executive Engineer Civil Division, Thiruvananthapuram	30	Thiruvananthapuram
13	110 kV S/s Ollur	Deputy Chief Engineer Trn.Circle, Thrissur	20	Thrissur
14	110 kV S/s, Wadakkancherry	Deputy Chief Engineer Trn.Circle, Thrissur	15	Thrissur
15	110kV S/s Ayyampuzha	Deputy Chief Engineer Trn.Circle, Thrissur	20	Thrissur
16	66kV S/s Angamaly	Deputy Chief Engineer Trn.Circle, Thrissur	30	Thrissur

17	110KV Substation Rayonpuram	Deputy Chief Engineer Trn.Circle, Thodupuzha	15	Thodupuzha
18	110 kV S/s Myloor	Deputy Chief Engineer Trn.Circle, Thodupuzha	20	Thodupuzha
19	110 kV S/s Kadavanthra	Deputy Chief Engineer Trn.Circle, Kalamassery	25	Ernakulam
20	110 kV S/s Kandanad	Deputy Chief Engineer Trn.Circle, Kalamassery	25	Ernakulam
21	66 kV S/s Alappuzha	Deputy Chief Engineer Trn.Circle, Alappuzha	15	Alappuzha
22	110 kV S/s Mabelikkara	Deputy CE Trn.Circle, Alappuzha	20	Harippad
23	110 kV S/s Udumbanoor	Deputy CE Trn.Circle, Thodupuzha	15	Thodupuzha

The Engineer-in Charge may delegate powers to subordinate officers in respect of execution of work such as Site supervision of Electrical works and arrangements for interconnection facility, Technical support and civil supervision. The following flow chart indicates the work flow and payment for distribution and transmission works under IPDS.



The contractor shall submit bills in Triplicate to the Engineer in Charge with all supporting documents as specified in the bid document for preliminary audit. Measurement, check measurement and other certifications of the bills shall be done by the respective Engineers, along with necessary Invoices and other mandatory documents, after preliminary audit, shall be forwarded to the Engineer in Charge of each location. The work order and bill details shall be entered in SARAS software, and the bill shall be audited and passed. The duly certified and audited bills for payment of each location are to be forwarded to the respective IPDS Electrical Circle.

The Deputy Chief Engineer of IPDS Electrical Circle shall approve the bill and transfer the bills to FA and will make payment directly to the contractor through e- payment and intimate the payment details to the concerned circles and CAPs. The Engineer-in-Charge shall inform the status and details of payment effected to the agreement authority.

17. Manufacturing Schedule:

Contractor shall specify all basic design details, including details of the PV modules and the support structures, inverters, cables, integration and power evacuation details with existing power system, with appropriate diagram and drawings. The drawings along with detailed structure design and material selected as per the relevant standards, All guaranteed technical particulars, details of each items, make, model number and specification conforming to relevant standards, entire drawings, detailed valid test reports, list of O & M spares for major materials, detailed Bill of materials (site specific BOM) and Priced Bill of Quantities in respect of materials/equipments and works for the entire Project shall be submitted within 15 days of receipt of this LoA.

All materials and equipments required for successful completion and commissioning of the project must be included. The design details and other accessories should adhere to and match with the technical specification provided in the volume III of the tender document and as per the Guaranteed Technical Particulars offered by you.

The Contractor shall submit all the appropriate diagram and drawings to the agreement authority for approval. Also specifications of major items such as PV modules, inverters, module mounting structures etc shall be submitted to the Agreement authority for approval. Approvals for Layout of Power Plant Installation shall be provided by the Engineer- in- Charge in prior to the submission of all the drawings.

Solar meter and bi directional Net meter has to be provided by the contractor for the grid connected Solar Roof Top systems with accuracy class as per the Central Electricity Authority (Installation and Operation of Meters) Regulations, 2006. Three phase 4 wire, whole current, Bi-directional 10-60A static Tri vector energy meter of accuracy class 1S with LCD and ToD facility suitable for measurement of active kWh, reactive energy kVARh and apparent energy kVAh, kVA MD and kW MD at frequency in the range of 47.5 Hz to 52.5 Hz in balanced as well as unbalanced load conditions.

Energy meter provided for the installation of the solar PV plant shall be in accordance with the prevailing regulations and technical specifications of KSEBL.

For the goods supplied from outside the purchaser's country, the supplier shall be entirely responsible for all taxes, duties, ~~202~~ duties, license fees, and other such levies

imposed outside the purchaser's country.

The contractor shall provide all MAFs (Manufacturer's Authorization Forms) for all the components specified in the bid within 15 days and before executing the Contract Agreement.

18. Drawings and documents

The design documents to be submitted by the contractor will include but not limited to:

- I. DC cable size calculation
- II. DC cable specification
- III. DC cable schedule, voltage drop and power loss calculation
- IV. String monitoring unit specification
- V. DC earthing & pit calculation
- VI. Lightning protection details/specification
- VII. All technical specification of AC components
- VIII. Cable schedules

Contractor shall furnish the following drawings under this contract and has to obtain approvals.

- a. Shadow analysis of the roof
- b. General arrangement and dimensional layout
- c. Schematic drawing showing the SPV panels, Power conditioning Unit(s)/ inverter, Junction Boxes, AC and DC Distribution Boards, meters etc.
- d. Layout of solar PV Array and Single line diagram.
- e. Mounting structure drawing
- f. Structural drawing along with foundation details for the structure.
- g. Location specific Itemized bill of material for complete SPV plant covering all the components and associated accessories.
- h. Sizes and specification of cables between array interconnections, array to junction boxes, junction boxes to Inverter etc. shall be furnished
- i. PVSyst simulation report of the combination offered PV modules with the offered inverters shall be furnished to the agreement authority for approval.

The drawings along with detailed structure design and material selected and their standards shall be submitted to agreement authority for approval before starting the execution work. The work will be carried out as per the approved design.

The contractor shall provide necessary drawings and documents required by statutory authorities and obtain the approval before taking up erection.

19. Quality Assurance and Inspection/Acceptance tests:

Strict compliance with the approved and proven & established quality assurance systems and procedures during the different stages of the project starting from sizing, selection of make, storage (at site), during erection, testing and commissioning have to be ensured by the contractor.

PV modules should have valid qualification test certificate as per IEC 61215 and IEC 61730 -1&2 and IEC 61701. The power conditioning units / inverters should comply with applicable IEC/ equivalent BIS standard for efficiency measurements and environmental tests, safety standards and characteristics of the utility interface (Parallel operation) as per standard codes IEC 61683 and IEC 60068 2(1,2,14,30) and IEC 62109-1&2 and IEC 61727 respectively. Inverter shall be provided with protection against islanding of Grid as per IEEE

1547/UL1741/62116 to isolate it from the grid in case of no supply, under voltage and over voltage conditions so that in no case there is any chance of accident. The module mounting structure shall be as per latest BIS 2062 and galvanisation of mounting structure shall be in compliance of BIS 4759 (amended up to date)/IS2629.

The type test certificates shall be verified by KSEBL while conducting factory inspection tests. The contractor shall furnish detailed quality procedures for the major components for approval prior to the Factory inspection call. The agreement authority will provide the approvals regarding the test to be conducted during the inspection.

The following minimum tests shall be conducted during the Factory inspection:

➤ For PV modules:

1. Visual inspection
2. Dimensional Check
3. Insulation Resistance
4. Leakage Current
5. Electrical Test(with sun simulator)
6. RFID verification
7. Electro luminous tests
8. Robustness of termination

➤ For inverters:

1. Visual inspection
2. Dimensional and Power Wiring Check.
3. Auxiliary functional check.
4. Fan direction of rotation, On-Off control, etc
5. Functionality test of relays
6. Command checks.
7. Protection function checks.
8. AC under voltage, AC over voltage, AC under frequency, AC over frequency
9. Load tests simulation 25%, 50%, 70% and 100%
10. Load test performed at variable MPPT voltage @100% load on the specified voltage range.
11. Over temperature, ground fault simulation

➤ For isolation transformer:

1. Visual inspection
2. Routine test as per IS-2026/ IEC 60601-1/IEC 61558-1

➤ For Module mounting structures:

1. Visual inspection
2. Dimensional Inspection
3. Functional fitment

The contractor shall submit letters of inspection calls sufficiently in advance specifying the date and venue of inspection to the agreement authority through Engineer-in-Charge. All the major components should undergo factory inspection tests.

The agreement authority shall arrange inspection of material/ equipment and upon

satisfactory completion of the inspection and tests, the Material Despatch Clearance Certificate will be issued.

The test and Inspection shall be done in accordance with the relevant standards and the Manufacturer's standard before the delivery to site as well as after the erection and commission at site.

All acceptance and routine tests of equipment as per the specification and relevant standards shall be carried out by the contractor. Agreement authority or authorized officials may undertake the quality checks during the manufacturing stages also. Functional testing and erection of equipments shall be carried out by the contractor in presence of KSEBL officers delegated by the Engineer-in-Charge and the approvals will be given only if the same is satisfactory.

Engineer-in-Charge shall conduct visual inspection including dimensional checks, verification of serial numbers, RFID reading of PV modules etc for the Site Acceptance of the delivered materials based on the BOM. Any materials or work found to be defective or which does not meet the requirements of the specification will be rejected and shall be replaced at contractor's cost.

20. Review and Progress report:

The contractor shall submit monthly progress report to Engineer-in-Charge and all concerned personnel in connection with this order, with a copy to this office.

Monthly Review Meeting shall be held in the office of the Engineer –in charge, between KSEBL and Contractor to monitor the progress of the works and review the plans for remaining works and to deal with matters that would rise in accordance with the early warning procedure.

The Engineer-in-Charge will co-ordinate and monitor all activities of the project. These progress report formats may be changed as and when required by KSEBL.

The contractor shall produce an updated Activity Schedule within 14 days of being instructed by the KSEBL.

21. Technical parameters for getting grid connectivity:

- a. Harmonic current injections from a plant shall not exceed the limits specified in IEEE 519 as per CEA technical standard for connectivity of the distributed generation resources.

Individual voltage harmonics distortion	< 3 %
Total voltage DistortionTHD	< 5%
Total Current harmonic Distortion	<8%
Output frequency	= 50Hz +/- 0.5Hz

- b. Photovoltaic system should not inject DC power more than 0.5% of full rated output at the interconnection point or 1% of rated inverter output current into distribution system under any operating conditions
- c. Operation of Photovoltaic system shouldn't cause voltage flicker in excess of the limits stated in IEC 61000 or other equivalent Indian standards, if any
- d. While the output of the inverter is greater than 50%, a lagging power factor of greater than 0.9 shall be maintained.

- e. The Photovoltaic system in the event of voltage or frequency variations must island/disconnect itself within IEC standard on stipulated period.
- f. The voltage-operating window should minimize nuisance tripping and should be under operating range of 80% to 110% of the nominal connected voltage beyond a clearing time of 2 seconds, the Photovoltaic system must isolate itself from the grid.
- g. When the Distribution system frequency deviates outside the specified conditions (50.5 Hz on upper side and 47.5 Hz on lower side up to 0.2 sec), the Photovoltaic system shouldn't energize the grid and should shift to island mode.
- h. While the output of the inverter is greater than 50%, a lagging power factor of greater than 0.9 shall be maintained

22. Operation and Maintenance (O&M):

The Contractor shall be responsible for Operation of the plant at each location for the first year from the date of commissioning, and Maintenance of Solar PV plant at each location for the first five years from the date of commissioning. The date of commissioning is described under in clause no.8 of this LoA.

The scope of the contractor shall be, including but not limited to

- i) Cleaning of module surface on regular basis as and when required.
- ii) Normal and preventive maintenance of the plant
- iii) The contractor is responsible for supply of all spare parts, repairs / replacement of any defective equipment(s) at his own cost as required from time to time during the O&M period.
- iv) The O&M of the project during this period shall cover the tools and tackles, spare parts, any consumables, and any systems such as modules, inverter, PCU, remote monitoring etc. required for proper functioning of the SPV system as a whole.
- v) During the comprehensive O&M period, the contractor shall at his cost maintain the spares for minimising system outage due to time required in getting replacements of defective part(s) of equipment from the manufacturer. The contractor has to use the mandatory spare(s) available at site for replacing defective part(s) of equipment for minimising system outage temporarily and top up the quantity of spares so that the required quantity of spares shall be made available at site at all the times and same shall be handed over at the end of O&M period.

A maintenance record is to be maintained by the operator/engineer-in-charge to record the regular maintenance work carried out as well as any breakdown maintenance along with the date of maintenance reasons for the breakdowns steps have taken to attend the breakdown duration of the breakdown etc. Contractor shall submit monthly reports to the Engineer in charge, Agreement authority on the energy generation and operating conditions of the solar plant.

23. Annual Maintenance Contract (AMC):

The plant shall then be handed over to KSEBL at the end of 5 years. After five years from the date of commissioning, the EPC contractor may be asked to execute the AMC for another 5 years on mutual agreement at mutually agreed price. The EPC contractor shall execute the AMC agreement as per conditions stipulated at that time.

24. Performance & Warrantee:

The mechanical structures, electrical works and overall workmanship of the solar power plant must be warranted for a minimum of 10 years. PV modules used in solar power plant must be warranted for output wattage, which should not be less than 90% at the end of 10 years and 80% at the end of 25 years.

The PV Power Plant should be designed and simulated with the offered quality components by the bidder (PV Modules, Inverters etc.) so as to obtain the minimum capacity specified for each location. The electrical degradation of power generated shall not exceed 5% of the minimum rated power over the 5 year period and not more than 10% after ten years.

EPC contractor shall ensure the specified Energy as the Net Minimum Guaranteed Generation output as per Table 1 (page 3) of this LoA

25. Handing over:

The plant shall be handed over to KSEB Ltd in the best working condition at the end of first year after commissioning with the following conditions,

- After proving the specified Energy generation (NMGG) of the plant for the first year.
- After satisfying the DC output (kWp) of each plant measuring at the input side of the inverter as specified in the Table 1 of page 3 of this LoA.
- Handing over of all items and materials with required tools and minimum spares as listed below.
- After providing basic training to the employer personnel with the concurrence of the site Engineer in Charge

The contractor shall provide the tools specified below with the required number of spare for each locations. The list ensuring sufficient number of spares shall be approved by the agreement authority. KSEBL will carry out operation of the plant after taking over of the plant. If required, spares during life period shall be arranged by the contractor after Guaranty Period at the cost of KSEBL.

List of tools & Spares

Tools

Spanner set
Small cable cutters
nose pliers
Wire strippers
Nut drivers
Screw driver
Knife
Electric tester
Clamp meter-ac- dc clamp-on meter/
AC/DC multimeter(AC&DC 1000V)

Spares

PV modules
Junction Boxes
Fuse and fuse holder
MOVs / arrestors
MCBs
DC connectors
DC cables
DC SPD
Nuts and bolts
Diodes
Different Clamps for MMS

Contractor shall conduct the maintenance and supply of necessary spares as and when required for the smooth functioning of the plant with its associated equipments and materials, as described in "Price Schedule" attached as Annexure 1, including all associated items and activities that though not exclusively specified herein but are required for the completion of entire works under this contract. 407

Any component found defective/inefficient/worn out shall be rectified/ replaced/ made good at contractor's cost before handing over the system to the KSEBL. In order to ensure longevity & safety of the core equipment and optimum performance of the system the Contractor should use only genuine spares of high quality standards. Contractor has to maintain the rooftop SPV plant till the end of the contract period of five years.

The Contractor shall hand over the complete system and shall transfer all Guarantees and warranties of the different components of the project to KSEBL.

26. Termination of Contract:

Termination of Contract will be guided strictly in accordance with clause 5.3.8 of volume 1 of the tender document.

27. Force Majeure:

Force Majeure shall be governed by Clause.5.3.5 of volume 1 of the tender document.

28. Defects Liability Period:

The Defect Liability Period shall be governed by Clause.5.1.10 of volume 1 of the tender document.

The Contractor is liable to rectify any defect or damage notified by the Engineer - in - Charge, at Contractors cost during the Defect Liability Period, which shall be 5 years reckoned from the date of commissioning of the project, ie; to cover the entire O& M period. The Contractor shall guarantee for the performance of the entire project and its components during this period. If any defect, cracks, shrinkage or other faults in the works appear at any time prior to the end of the Defects Liability Period, the Engineer may instruct the Contractor to rectify the defects immediately. If the Contractor fails to carry out the directions given by the Engineer-in-Charge and does not rectify the defects within a reasonable time, the Engineer-in-Charge shall make alternate arrangements for making good the defects through other agencies and the cost thereof plus 21% shall be recovered from the Contractor from the amounts payable to the Contractor by way of forfeiting Performance Security deposit or any other means.

If the drawings, specifications and contract documents do not contain particulars of materials and work which are obviously necessary for the proper completion of the work and intention to include which is nevertheless to be inferred, all such materials and works shall be supplied and executed by the Contractor without any extra charge. The Contractor is bound to furnish information and data including the data in support of his quoted amount to the KSEBL if called upon to do so.

29. Law and Jurisdiction:

Any suit or legal proceedings arising out of this contract shall be governed by the laws of India and Kerala and shall be subject to the exclusive jurisdiction of the Courts at Thiruvananthapuram only.

30. Contract Documents.

1. Agreement executed in Kerala Government Stamp Paper
2. Letter of Award (duly signed and seal affixed on all pages)
3. Correspondences between the KSEBL and the selected bidder included in the Agreement.
4. Special Conditions of Contract.
5. General Conditions of Contract.
6. Technical specifications.
7. Accepted Schedule of Technical Particulars and construction programme & Manufacturer Authorization form of Components.
8. Accepted Schedule of Prices
9. General Bid conditions
10. Instructions to bidders.
11. Information to bidders.
12. Detailed Structural Drawings including approved drawing issued from time to time.
13. Approved List of spares that will be supplied
14. All volumes of bid with Tender No. KSEBL/REES/IPDS07/2016-17 dated 06-08-2016 and its Addendums along with clarifications and related documents issued by the Tendering Authority.
15. Response (proposal) of Solgen Energy Pvt Ltd, 22/314-B, Kuttanellur P.O, Thrissur, Kerala, India- 680 014, including the Bid, Clarification documents and the accepted rate submitted.

31. Acknowledgment by the Contractor:

This Letter of Award is issued subject to the documents referred above and terms and conditions contained therein. You will also be deemed to be fully aware of KSEBL's **General conditions of contract** which is applicable to this contract also and ignorance of these conditions will not exempt you from your liability to abide by the same.

If there is any contradiction/conflict between the tender documents and LoA, conditions in the LoA will prevail.

The documents specified in Cl. 13 and 17 shall be submitted within 15 days from the date of issue of this LoA

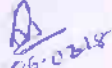
A copy of the LoA attached is to be returned immediately duly signed and seal affixed on all pages as token of acceptance and for incorporation in the Contract Agreement preferably within 15 days in any case from the date of issue of this Letter of award.




Chief Engineer

(Renewable Energy & Energy Savings)

CHIEF ENGINEER
Renewable Energy and Energy Savings
KSEB Board Ltd., Vidyuthi Bhavanam,
Palam, Thiruvananthapuram-4


GG-0218

Acc:-

1. Annexure 1: Price schedule
2. Annexure 2: Contract Forms

409

- A.** Performance Security deposit BG
- B.** Form of contract agreement
- C.** BG for Advance payment

3. Annexure 3: Copy of LoA

Copy to:-

- 1. The Secretary K.S.E.B Ltd, Thiruvananthapuram.
- 2. The Chief Engineer Distribution (South, Central)/ Civil Construction (South)
- 3. The Deputy Chief Engineer- Electrical Circle Kottayam, Pathanamthitta, Kollam, Kattakkada, Thiruvananthapuram, Thrissur, Thodupuzha, Ernakulam, Alappuzha, Harippad
- 4. The Deputy Chief Engineer- Transmission Circle Poovanthuruth, Kottarakkara, Thiruvananthapuram, Thrissur, Thodupuzha, Kalamassery, Alappuzha
- 5. The Executive Engineer- Transmission Division Pathanamthitta, Civil division Thiruvananthapuram
- 6. The LA and DEO K.S.E.B Ltd, Thiruvananthapuram.
- 7. The Financial Advisor, KSEBL.
- 8. TA to The Chairman & Managing Director, KSEBL, Thiruvananthapuram/
- 9. TA to Director (Distribution &IT)/Director (Trn & Sys. Operation)/Director(CP,GE, SCM & Safety & SCM)/Director(Generation Civil & HRM)
- 10. PA to The Director (Finance)
- 11. Sr.CA to Chief Vigilance Officer
- 12. The Main Income Tax Officer, Thiruvananthapuram, Kerala.
- 13. The Accountant General, Thiruvananthapuram, Kerala
- 14.** Stock file



കേരളാ വൈദ്യുത ബോർഡ്



KERALA STATE ELECTRICITY BOARD LIMITED

(Incorporated under the Companies Act, 1956)

Office of the Chief Engineer (Renewable Energy & Energy Savings)

Reg office: Vidyuthi Bhavanam, Pattom, Thiruvananthapuram – 695 004,

Kerala CIN :U40100KL2011SGC027424 website : www.kseb.in.

Phone: +91 471 2447404, Fax: 0471 2558340, E-mail: cerees@kseb.in

TO WHOM IT MAY CONCERN

This is to certify M/S Solgen Energy Pvt Ltd, 22/314-B, Kuttanellur P.O, Thrissur-680014 has completed and commissioned the following work satisfactory.

- | | | | |
|---|-----------------------------------|---|--|
| 1 | Name of work/ Project & Location | : | Installation, Testing & Commissioning of 445kWp Grid Tied Rooftop Solar PV Power Plant in 23 locations and its Operation for first year & Maintenance of the plant for the first 5 years from the date of commissioning under IPDS |
| 2 | Work Order No | : | 08/2017-18/2507 Dated 06.02.2018 |
| 3 | Tendered Cost | : | Rs.3,04,78,050/- |
| 4 | Agreement No. | : | 26/2017-18 dated 19.03.2018 |
| 5 | Date of Start | : | 16.04.2018 |
| 6 | Date of Completion | : | 26.06.2019 |
| 7 | Performance report | | |
| | 1)Quality of work | | Outstanding |
| | 2)Financial Soundness | | Outstanding |
| | 3)Technical Proficiency | | Outstanding |
| | 4)Resourcefulness | | Outstanding |
| | 5)General Behaviour | | Outstanding |
| 8 | Work Amount at time of Completion | : | Rs.3,04,78,050/- |

Dated: 05.11.2022

Chief Engineer (REES)

CHIEF ENGINEER

Renewable Energy and Energy Savings
KSEB Ltd. Vidyuthi Bhavanam
Pattom, Thiruvananthapuram





RAJIV GANDHI CO-OPERATIVE HOSPITAL

(A Unit of The Palakkad Dist. Co-operative Hospital & Research Centre. No. P 878)

Kallekkad, Kodunthirapully P.O., Palakkad - 678 004., Ph : 0491 - 2509000

Email id : rajivgandhicooperativehospital@gmail.com



No: 144

Date: 05.05.2024

TO,

**SOLGEN ENERGY PVT LTD,
22/314-B, KUTTANELLUR P.O
THRISSUR-680014**

Sir,

Sub: Order for Supply, Installation, Testing & Commissioning of 400kVA Solar Power Plant at Rajiv Gandhi Co-operative Hospital, Kallekkad, Palakkad District

With reference to your captioned quotation, we are pleased to place our order with you for the work of Supply, Installation, Testing & Commissioning of 400kVA Solar Power Plant at Rajiv Gandhi Co-operative Hospital, Kallekkad, Palakkad District for an amount of **Rs.1,96,00,000/- (Rupees One Crore Ninety six lakh only)** inclusive of GST.

PAYMENT TERMS:

25% - Advance

50%- Material Delivery

25%- Installation

Please acknowledge receipt of this Work Order as a token of acceptance.

Thanking You

Managing Director

Rajiv Gandhi Co-operative Hospital





RAJIV GANDHI CO-OPERATIVE HOSPITAL

(A Unit of The Palakkad Dist. Co-operative Hospital & Research Centre. No. P 878)

Kallekkad, Kodunthirapully P.O., Palakkad - 678 004., Ph : 0491 - 2509000

Email id : rajivgandhicooperativehospital@gmail.com



Date:.....

TO WHOM SO IT MAY CONCERN

This is to certify **M/S Solgen Energy Pvt Ltd, 22/314-B, Kuttanellur P.O, Thrissur-680014** has completed and commissioned the following work satisfactory.

1	Name of work/Project & Location	Supply, Installation, Testing & Commissioning of 400kVA Solar Power Plant at Rajiv Gandhi Co-operative Hospital, Kallekkad, Palakkad District.
2	Work Order No & Date	144 & 05.05.2020
3	Tendered Cost	Rs.1,96,00,000/-
4	Agreement Date	14.05.2020
5	Date of Start	28.07.2020
6	Date of Completion	06.03.2021
7	Performance report	
	1)Quality of work-	Outstanding
	2)Financial Soundness	Outstanding
	3)Technical Proficiency	Outstanding
	4)Resourcefulness	Outstanding
	5)General Behaviour	Outstanding
8	Work Amount at time of Completion	Rs.1,96,00,000/-

Dated: 26.10.2022

Managing Director
Rajiv Gandhi Co-operative Hospital



32452/2020/TAPAL ANERT

File No. ANERT-TECH/261/2019-PO(CKC)

അനേർട്ട്-മാതൃകാ



അനേർട്ട്
ANERT

AGENCY FOR NON-CONVENTIONAL ENERGY & RURAL TECHNOLOGY
(DEPARTMENT OF POWER, GOVT. OF KERALA)



No.ANERT-TECH/261/2019-PO(CKC)

03/02/2020

M/s Solgen Energy Pvt.Ltd.,
Kuttanallur, Thrissur

Sir,

Sub: ANERT- Order for Supply, Installation and Commissioning of Grid connected SPV Power Plants at 24 Government Educational Institutions (21 Schools and 3 ITI's) for a cumulative capacity of 142 kWp in 7 Districts of Kerala (Plan Scheme 2019-2020) - reg

Ref : Tender ID: 2020_ANERT_334175_1

Attention is invited to the references cited. Your offer for the Supply, Installation and Commissioning of Grid connected SPV Power Plants at 24 Government Educational Institutions (21 Schools and 3 ITIs) for a cumulative capacity of 142 kWp in 8 Districts of Kerala is accepted. You are requested to carry out the work as detailed below subject to the following terms and conditions.

S/N	District	Site	Capacity	Amount
1	Alappuzha	GHSS, Kalavoor	10	₹ 5,89,097.67
2		VRVM GHSS, Vayalar	5	₹ 3,31,284.82
3		Govt. VHSS Kodamthuruthu	5	₹ 3,01,337.95
4		Dr. Ambedker MMRS	5	₹ 3,00,317.14
5		Govt. Girls HSS Kayamkulam	5	₹ 3,17,673.01
6		Govt. VHSS, Mulakuzha	3	₹ 1,78,203.75
7		Govt. HSS Ayaparambu	2	₹ 1,29,866.79

Law College Road, Vikas Bhavan P.O., Thiruvananthapuram, Kerala - 695 033
Phone: +91 471 - 2338077, 2334122, 2333124, 2331803 Fax: +91 471 - 2329853
Web: www.anert.gov.in E-mail: info@anert.in
e-Market place: www.buymysun.com

8		Govt. HSS, Kadumeenchira	5	₹ 2,96,682.78
9	Pathanamthitta	Govt. HS, Elanthur	3	₹ 1,80,885.60
10		Govt. HSS, Chittar	3	₹ 1,85,704.19
11		Govt. ITI Kattappana	10	₹ 5,81,236.82
12	Idukki	G E M GHS Santhigram	5	₹ 3,15,631.41
13		Govt. High School Adimaly	5	₹ 2,92,150.73
14		Govt. GHS Kodungallur	10	₹ 5,63,235.12
15		Govt. HSS, Villadom	10	₹ 5,61,602.06
16	Thrissur	Govt. HSS, Valappad	5	₹ 3,02,086.76
17		SMT HGSS, Chelakkara	5	₹ 2,91,537.36
18		Govt. HSS, Mupliyam	3	₹ 1,79,197.69
19	Palakkad	Govt. ITI, Malampuzha	10	₹ 5,67,625.02
20		GVHSS Kizhuparamba	10	₹ 6,29,321.95
21	Malappuram	GHSS Othukkungal	5	₹ 2,85,072.28
22		GBHSS Malappuram	5	₹ 2,93,171.53
23		GHSS Kuttippuram	3	₹ 1,84,288.27
24	Wayanad	KMM Govt. ITI, Kalpetta	10	₹ 6,23,196.02
TOTAL			142	₹ 84,80,407
Rupees Eight-Four Lakh Eighty Thousand Four Hundred and Seven only				
<i>Amount inclusive of GST and all other expenses</i>				

The components of the Solar Power Plant including the Solar Modules, Battery and PCU, already accepted, alone will be considered for installation work.

An agreement has to be executed by you in the prescribed form (enclosed) on Kerala Stamp paper worth Rs. 200/- within a week time for the fulfilment of the contract along with a security deposit of **Rs. 4,24,020/- (Rupees Four Lakh Twenty-Four Thousand and Twenty only)** being the 5 % of contract value of **Rs. 84,80,407/-** on Demand Draft in favour of Director, ANERT. You have to pay all expenses incidental to the execution of the above agreement.

SCHEDULE OF SUPPLY

The items should be Delivered, Installed and commissioned at the Rooftop of the aforementioned Government Educational Institutions (21 Schools & 3 ITI's) as specified by ANERT, under prior intimation and supervision of ANERT.

- The Supply, Installation and Commissioning of the entire system shall be completed within **2 months of the date of supply order.**
- The supply and installation must be completed within **1 month from the date of supply order** and must be properly informed to the work order issuing authority.

- iii. Supply of the main components such as SPV module, PCU and charge controller should be from the approved component list published in ANERT Website.
- iv. Penalty for delay in supply and installation will be imposed at 0.5 % per week up to a maximum 10 %. In case of delay in supply and installation, Director, ANERT may cancel the contract and take recourse to other action as deemed appropriate.

PAYMENT

- i. No advance payment will be given. Payment will be released on receipt of invoices and successful installation and commissioning of power plant along with **satisfying the clause 15.1, 37 and 40**, certified by the concerned District Office of ANERT.
- ii. The terms of payment shall be:
 - a. 2.5 % of the invoice amount shall be charged by ANERT as non-refundable license fee.
 - b. Upon delivery of items at all sites, 30 % of the remaining contract value will be released as first part payment.
 - c. On completion of the installation of power plant and filing application for connectivity, 60% of the remaining contract value shall be released as second part payment.
 - d. On commissioning of the grid connected system, 30% of the remaining contract value will be released.
 - e. The remaining 10% shall be retained as performance security as given below.
 - a. 50% of performance security shall be paid after one year
 - b. The remaining 50% shall be paid after the five-year warranty periodPerformance security shall not be released against bank guarantee.
- iii. The security deposit of 5% furnished along with the contract agreement shall be released on completion of supply, installation and commissioning.
- iv. Income tax, contribution to workers' welfare fund and other statutory deductions shall be made from the payment as per prevailing norms.

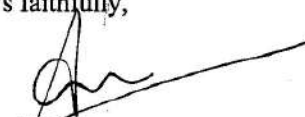
SERVICE AND MAINTENANCE

- i. The faulty system or components should be replaced/ repaired within 10 days of fault

reporting. The servicing should be carried out at the site of installation. The service personnel should visit the installations at least once in 4 months for preventive maintenance even if no faults are reported. **Reports of these preventive maintenance visits and generation data should be submitted to the concerned ANERT District Offices** . Delay in servicing beyond 15 days of fault reporting would attract penalty at The rate of at the rate fixed by Director, ANERT and further actions will be initiated against the agency.

- ii. A designated contact Telephone Number and address should be submitted for reporting faults during the warranty period.

Your's faithfully,


Director



അനേർട്ട്
ANERT

Agency for New and renewable Energy Research and Technology

നവീനവും പുനരുപയോഗയോഗ്യവുമായ ഊർജ്ജ ഗവേഷണങ്ങൾക്കും സാങ്കേതിക വിദ്യകൾക്കുമുള്ള ഏജൻസി

DEPARTMENT OF POWER, GOVERNMENT OF KERALA

Law College Road, PMG, Thiruvananthapuram 695033 • director@anert.in • www.anert.gov.in

Tel.: (+91-471) 2338077, 2334122, 2333124, 2331803 • Fax: (+91-471) 2329853



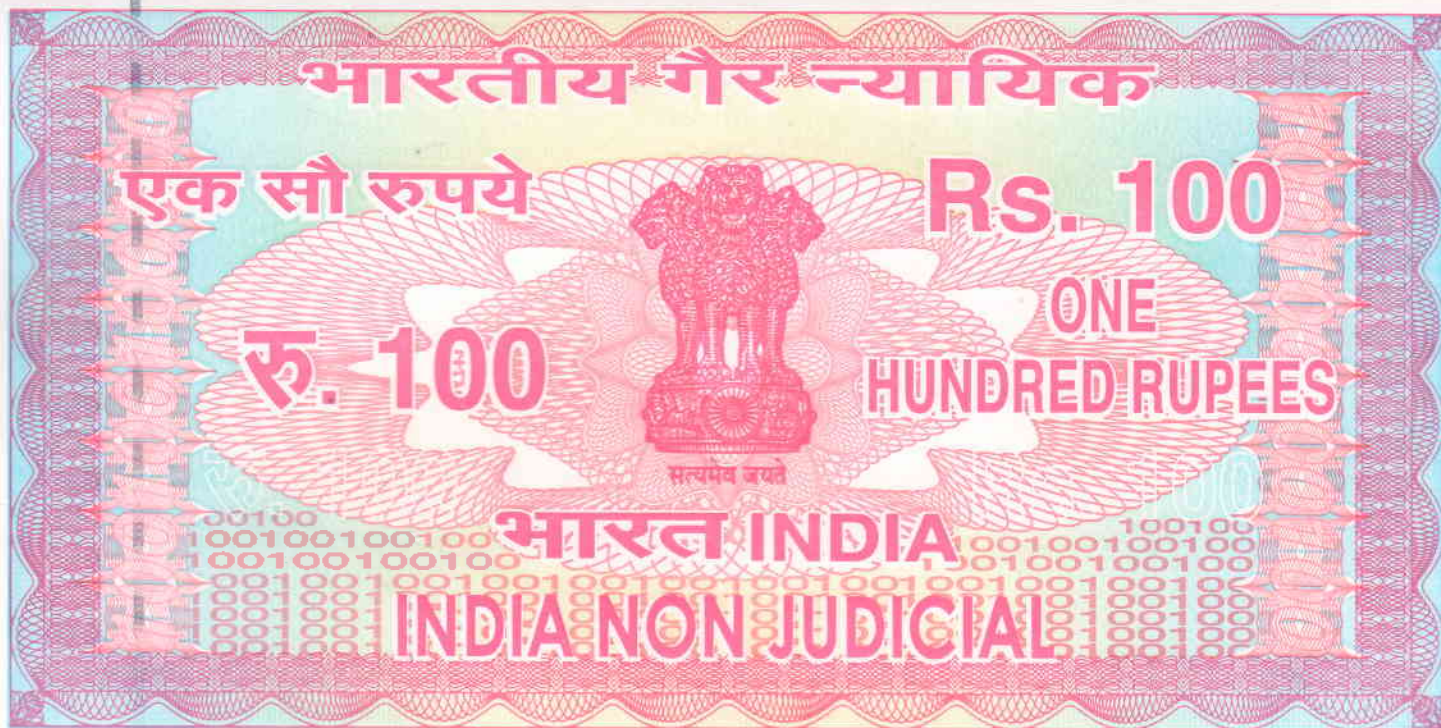
TO WHOM IT MAY CONCERN

This is to certify **M/s Solgen Energy, 22/314-B, Kuttanellur P.O, Thrissur-680014** has completed and commissioned the following work satisfactory.

1	Name of work/ Project & Location	:	Supply, Installation, Testing & Commissioning of Grid connected SPV Power Plant at 24 Government Educational Institutions (21 schools and 3 ITI's) for a cumulative capacity of 142kWp in 7 districts of Kerala.
2	Work Order No	:	ANERT-TECH/261/2019-PO(CKC) dated 03/02/2020
3	Tendered Cost	:	Rs. 84,80,407/-
4	Agreement dated	:	10/03/2020
5	Date of Start	:	22/06/2020
6	Date of Completion	:	30/07/2021
7	Work Amount at time of Completion	:	Rs. 84,80,407/-
	Dated: 26/12/2022		 Smt. Kala K G, Additional Chief Technical Manager ANERT



K.G. KALA
Additional Chief Technical Manager
ANERT



കേരളം KERALA

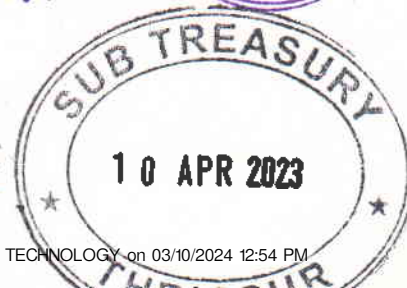
DV 989560

ANNEXURE A- PRE- AGREEMENT

ARTICLES OF AGREEMENT executed on this the day of 20th April Two thousand and twenty three between the Agency for Non-conventional Energy and Rural Technology (hereinafter referred to as ANERT) of the one part and Sri Solgen Energy PVT Ltd. 14/19, Sidco Industrial Estate, P.O Peringadoor, Thrissur-680581, Kerala . (Name and Address of the tenderer) hereinafter referred to as "the Bounden") of the other part.

WHEREAS in response to the Notification No ANERT-TECH/99/2022-T2 dated 12.04.2023 the bounden has submitted to ANERT a e-tender for the Request for Selection (RFS) of agency for the Implementation of 2MW Solar Power Plant at Travancore Titanium Products Ltd., Kochuveli, Thiruvananthapuram under Solar City project funded by Smart City Thiruvananthapuram Ltd specified therein subject to the terms and conditions contained in the said e-tender.

AND WHEREAS the bounden has furnished to ANERT a sum of Rs. NIL (exemption allowed) as Earnest Money Deposit for execution of an agreement undertaking the due fulfilment of the contract in case his e-tender is accepted by ANERT.



419



കേരളം KERALA

DV 989561

NOW THESE PRESENTS WITNESS and it is hereby mutually agreed as follows: -

In case the e-tender submitted by the bounden is accepted by ANERT and the contract for M/s Solgen Energy PVT Ltd. 14/19, Sidco Industrial Estate, P.O Peringadoor, Thrissur-680581, Kerala is awarded to the bounden, the bounden shall within Fifteen days of acceptance of this e- tender, execute an agreement with ANERT incorporating all the terms and conditions under which ANERT accepts this e-tender.

In case the bounden fails to execute the agreement as aforesaid incorporating the terms and conditions governing the contract, ANERT shall have power and authority to recover from the bounden any loss or damage caused to ANERT by such breach as may be determined by ANERT by appropriating the moneys inclusive of Earnest Money deposited by the bounden and if the Earnest Money is found to be inadequate the deficit amount may be recovered from the bounden and his properties movable and immovable in the manner hereinafter contained.

All sums found due to ANERT under or by virtue of this agreement shall be recoverable from the bounden and his properties movable and immovable under the provisions of the Revenue Recovery Act for the time being in force as though such sums are arrears of land revenue and in such other manner as ANERT may deem fit.



No 1222 Value Rs. 100

420

P. R. SURABHI
VENDOR No : 42

In witness whereof Sri (Name and Designation) for and on behalf of the Agency for Non-conventional Energy and Rural Technology and Sri Lajo Davis, Manager Technical & Design the bounden have hereunto set their hands the day and year shown against their respective signature.

Signed by Sri

(Date)

In the presence of witnesses

1.

2.

Signed by Sri Lajo Davis, Manager Design & Technical

(Date) 20-04-2023

In the presence of witnesses

1. Jini Devassy
Tender Executive



2. Prima Johny Anup
Costing Executive



E-TENDER NOTICE

Competitive e-tenders in two cover system with Earnest Money Deposit (EMD) and Price Bid are invited from experience and eligible bidders to participate in the ***Request for Selection (RFS) of agency for the Implementation of 2 MW Solar Power Plant at Travancore Titanium Products Ltd., Kochuveli, Thiruvananthapuram under Solar City project funded by Smart City Thiruvananthapuram Ltd.*** The e-tender documents can be downloaded from the e-tendering website of Govt. of Kerala. Tender form will not be available in any other form.

Bid documents which include Eligibility criteria, "Technical Specifications", various conditions of contract, formats, etc. can be downloaded from website www.etenders.kerala.gov.in. Any amendment (s)/corrigendum/clarifications with respect to this Bid shall be uploaded on the above website only. The Bidder should regularly follow up for any Amendment/Corrigendum/Clarification on the above website.

Thiruvananthapuram

CEO

12/04/2023



TENDER ABSTRACT

Ref. No.	ANERT-TECH/99/2022-T2
Document Description	Implementation of 2 MWp Grid Connected Solar PV Power Plant at Travancore Titanium Products Ltd., Kochuveli, Thiruvananthapuram
Name of Work	Design, Supply, Engineering, Erection Testing, Commissioning of SPV Power Plant of cumulative capacity of 1 MWp with Grid connectivity along with 10 years of Operation & Maintenance at various
Site	Travancore Titanium Products Ltd., Kochuveli, Thiruvananthapuram
Download of Tender Form	http://www.etenders.kerala.gov.in
Last date of submission of Tender	26/04/2023 @ 03.00 PM
Date and Time of Bid opening (Techno-Commercial)	27/04/2023 @ 03.30 PM
Cost of Tender form	Rs. 11,800/- (Including GST)
EMD	Rs. 2,00,000/-
Warranty period	10-year warranty and complete Operation & Maintenance. Minimum guaranteed PR and CUF of the plant as specified in the Technical Specification to be maintained.
Availability of Tender Forms	Website http://www.etenders.kerala.gov.in
Place of opening of tender	Office of CEO, ANERT Law College Road, Vikas Bhavan. PO, Thiruvananthapuram – 695 033, Kerala
Thiruvananthapuram 12/04/2023	Sd/- CEO



Important Note: Prospective Bidders are requested to remain updated for any notices/amendments/clarifications etc. to the RFS document through the website www.anert.gov.in/www.etenders.kerala.gov.in. No separate notifications will be issued for such notices/amendments/clarification etc. in the print media or individually.

DISCLAIMER

1. Though adequate care has been taken while preparing the NIT document, the Bidders shall satisfy themselves that the document is complete in all respect. Intimation regarding any discrepancy shall be given to this office immediately. If no intimation is received from any Bidder within Ten (10) days from the date of notification of NIT / issuance of e-Tender documents, it shall be considered that the document is complete in all respect and has been received / acknowledged by the Bidder(s).
2. Agency for New and Renewable Energy Research and Technology (ANERT) reserves the right to modify, amend or supplement this document.
3. While this tender document has been prepared in good faith, neither ANERT nor their employees or advisors make any representation or warranty, express or implied, or accept any responsibility or liability, whatsoever, in respect of any statements or omissions herein, or the accuracy, completeness or reliability of information, and shall incur no liability under any law, statute, rules or regulations as to the accuracy, reliability or completeness of this document, even if any loss or damage is caused by any act or omission on their part.

Signature Not Verified

Digitally signed by VINAY P
Date: 2023.04.12 16:04:27 IST
Location: Kerala-KL



**AGENCY FOR NEW & RENEWABLE ENERGY
RESEARCH AND TECHNOLOGY (ANERT)**

Department of Power, Government of Kerala
Thiruvananthapuram, Kerala – 695 033;
www.anert.gov.in , projects@anert.in

E-TENDER DOCUMENT

***Request for Selection (RFS) of agency for the
Implementation of 2 MW Solar Power Plant at
Travancore Titanium Products Ltd., Kochuveli,
Thiruvananthapuram under Solar City project
funded by Smart City Thiruvananthapuram Ltd***

Ref. No.: ANERT-TECH/99/2022-T2

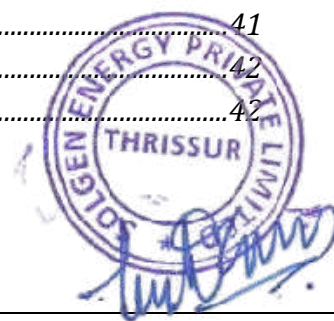
Date of Publishing of Bids : - 12/04/2023

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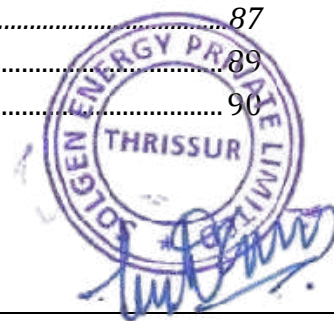


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**AGENCY FOR NEW & RENEWABLE ENERGY
RESEARCH AND TECHNOLOGY (ANERT)**

Department of Power, Government of Kerala
Thiruvananthapuram, Kerala – 695 033;
www.anert.gov.in , projects@anert.in

E-TENDER DOCUMENT

***Request for Selection (RFS) of agency for the
Implementation of 2 MW Solar Power Plant at
Travancore Titanium Products Ltd., Kochuveli,
Thiruvananthapuram under Solar City project
funded by Smart City Thiruvananthapuram Ltd***

Ref. No.: ANERT-TECH/99/2022-T2

VOL – 1: GENERAL CONDITIONS

Date of Publishing of Bids : - 12/04/2023

Last Date of Submission of Bids : - 26/04/2023



E-TENDER NOTICE

Competitive e-tenders in two cover system with Earnest Money Deposit (EMD) and Price Bid are invited from experience and eligible bidders to participate in the ***Request for Selection (RFS) of agency for the Implementation of 2 MW Solar Power Plant at Travancore Titanium Products Ltd., Kochuveli, Thiruvananthapuram under Solar City project funded by Smart City Thiruvananthapuram Ltd.*** The e-tender documents can be downloaded from the e-tendering website of Govt. of Kerala. Tender form will not be available in any other form.

Bid documents which include Eligibility criteria, "Technical Specifications", various conditions of contract, formats, etc. can be downloaded from website www.etenders.kerala.gov.in. Any amendment (s)/corrigendum/clarifications with respect to this Bid shall be uploaded on the above website only. The Bidder should regularly follow up for any Amendment/Corrigendum/Clarification on the above website.

Thiruvananthapuram

CEO

12/04/2023



TENDER ABSTRACT

Ref. No.	ANERT-TECH/99/2022-T2
Document Description	Implementation of 2 MWp Grid Connected Solar PV Power Plant at Travancore Titanium Products Ltd., Kochuveli, Thiruvananthapuram
Name of Work	Design, Supply, Engineering, Erection Testing, Commissioning of SPV Power Plant of cumulative capacity of 1 MWp with Grid connectivity along with 10 years of Operation & Maintenance at various
Site	Travancore Titanium Products Ltd., Kochuveli, Thiruvananthapuram
Download of Tender Form	http://www.etenders.kerala.gov.in
Last date of submission of Tender	26/04/2023 @ 03.00 PM
Date and Time of Bid opening (Techno-Commercial)	27/04/2023 @ 03.30 PM
Cost of Tender form	Rs. 11,800/- (Including GST)
EMD	Rs. 2,00,000/-
Warranty period	10-year warranty and complete Operation & Maintenance. Minimum guaranteed PR and CUF of the plant as specified in the Technical Specification to be maintained.
Availability of Tender Forms	Website http://www.etenders.kerala.gov.in
Place of opening of tender	Office of CEO, ANERT Law College Road, Vikas Bhavan. PO, Thiruvananthapuram – 695 033, Kerala
Thiruvananthapuram 12/04/2023	Sd/- CEO

Request for Selection (RFS) of agency for the Implementation of 2 MW Solar Power Plant at Travancore Titanium Products Ltd., Kochuveli, Thiruvananthapuram under Solar City project funded by Smart City Thiruvananthapuram Ltd.

Important Note: Prospective Bidders are requested to remain updated for any notices/amendments/clarifications etc. to the RFS document through the website www.anert.gov.in/www.etenders.kerala.gov.in. No separate notifications will be issued for such notices/amendments/clarification etc. in the print media or individually.

DISCLAIMER

1. Though adequate care has been taken while preparing the NIT document, the Bidders shall satisfy themselves that the document is complete in all respect. Intimation regarding any discrepancy shall be given to this office immediately. If no intimation is received from any Bidder within Ten (10) days from the date of notification of NIT / issuance of e-Tender documents, it shall be considered that the document is complete in all respect and has been received / acknowledged by the Bidder(s).
2. Agency for New and Renewable Energy Research and Technology (ANERT) reserves the right to modify, amend or supplement this document.
3. While this tender document has been prepared in good faith, neither ANERT nor their employees or advisors make any representation or warranty, express or implied, or accept any responsibility or liability, whatsoever, in respect of any statements or omissions herein, or the accuracy, completeness or reliability of information, and shall incur no liability under any law, statute, rules or regulations as to the accuracy, reliability or completeness of this document, even if any loss or damage is caused by any act or omission on their part.



GENERAL TERMS AND CONDITIONS FOR E-PROCUREMENT

This e-Tender is being published as the Request for Selection (RFS) of agency for the Implementation of 2 MW Solar Power Plant at Travancore Titanium Products Ltd., Kochuveli, Thiruvananthapuram under Solar City project funded by Smart City Thiruvananthapuram Ltd. The tender is invited in two cover system from experienced manufacturers / EPC contractors through e-procurement portal of Government of Kerala (www.etenders.kerala.gov.in). Prospective bidders willing to participate in this tender shall necessarily register themselves with above mentioned e-procurement portal.

The tender timeline is available in the critical date section of this tender published in www.etenders.kerala.gov.in

1. ONLINE BIDDER REGISTRATION PROCESS:

- 1.1 Bidders should have a Class III or above Digital Signature Certificate (DSC) to be procured from any Registration Authorities (RA) under the Certifying Agency of India. Details of RAs will be available on www.cca.gov.in. Once, the DSC is obtained, bidders have to register on www.etenders.kerala.gov.in website for participating in this tender. Website registration is a one-time process without any registration fees. However, bidders have to procure DSC at their own cost.
- 1.2 Bidders may contact e-Procurement support desk of Kerala State IT Mission over telephone at 0471- 2577088, 2577188, 2577388 or 0484 – 2336006, 2332262 - through email: helpetender@gmail.com/etendershelp@kerala.gov.in for assistance in this regard

2. ONLINE TENDER PROCESS:

The tender process shall consist of the following stages:

- i. Downloading of tender document: Tender document will be available for free download on www.etenders.kerala.gov.in. However, tender document fees shall be payable at the time of bid submission as stipulated in this tender document.



- ii. Publishing of Corrigendum: All corrigenda shall be published on www.etenders.kerala.gov.in and shall not be available elsewhere.
- iii. Bid submission: Bidders have to submit their bids along with supporting documents to support their eligibility, as required in this tender document on www.etenders.kerala.gov.in. No manual submission of bid is allowed and manual bids shall not be accepted under any circumstances.
- iv. In case bidder encounters any technical issues pertaining to e-Procurement system while acting on the tender, computer screen shot of the error message with date & time stamp on the web-browser along with the query shall be e-mailed by the bidder to the help desk (**helpetender@gmail.com/etendershelp@kerala.gov.in**), for resolution of the problem. At the same time, problem must be intimated to the concerned Tender Inviting Authority via email.
- v. The time taken to ascertain, evaluate and suggest a solution for the problem reported by bidder may vary from case to case. Hence bidders are advised to submit the bid **at least 2 working days before the due date** and time of bid submission to avoid any last-minute issues that may come up.
- vi. Opening of Bid and Bidder short-listing: The single cover bids will be opened, evaluated and shortlisted as per the eligibility. Failure to submit the required documents online will attract disqualification. Price bids of the qualified bidders will open on the day to be intimated to all bidders and the work will be awarded.

3. DOCUMENTS COMPRISING BID:

- 3.1 The 2-cover bid shall contain the scanned copies of the following documents which every bidder has to upload:
- i. The tender document duly signed and sealed downloaded from the website.
 - ii. Pre-Agreement in the prescribed format (Annexure A) on Govt. of Kerala stamp paper worth Rs. 200/-
 - iii. Copy of Registration Certificate of the bidder firm
 - iv. Copy of PAN card



- v. The bidder must have an experience of successful commissioning of at least 5 MW SPV Power Plants in India.
 - vi. Documentary evidence to support the bidders experience in any completed or ongoing SPV contract with a Govt. Department / Govt. undertaking / PSU / Private sector for having a single plant capacity not less than 1 MW. The plant shall be in operation at least 3 months before the date of opening of this bid proposal.
 - vii. Documents to prove the annual Turnover of the bidder (audited statement)
 - viii. Certifications required for proving technical compliance
 - ix. Summary of bidders Technical Information (Annexure B)
 - x. Declaration by the Bidder (format as in Annexure C)
 - xi. Declaration of relationship with ANERT employee (format as in Annexure D)
 - xii. The Price Schedule as per BOQ in Excel format for this tender to be downloaded from e-tender website, duly digitally signed by the tenderer/authorized signatory of the tender.
 - xiii. Bill of Material
- 3.2 The department doesn't take any responsibility for any technical snag or failure that has taken place during document upload.
- 3.3 The Bidder shall complete the Price bid as per format given for download along with this tender.

Note: The blank price bid should be downloaded and saved on bidder's computer without changing file-name otherwise price bid will not get uploaded. The bidder should fill in the details in the same file and upload the same back to the website.

4. TENDER DOCUMENT FEES AND EARNEST MONEY DEPOSIT (EMD)

- 4.1 The Bidder shall pay, a tender document fee of Rs. 17,850/- and Earnest Money Deposit or Bid Security or Bid Bond of Rs. 2,00,000/-. The Bid security is required to protect the purchaser against risk of Bidder's conduct, which would warrant the forfeiture of security.

4.2 Online Payment modes: The tender document fees and EMD can be paid in through e-Payment facility provided by the e-Procurement system. Bidders can make payment only via Internet banking facility

State Bank of India Multi Option Payment System (SBI MOPS Gateway): Bidders are required to avail Internet Banking Facility in any of below banks for making tender remittances in eProcurement System.

A) Internet Banking Options (Retail)			
1	Allahabad Bank	32	Kotak Mahindra Bank
2	Axis Bank	33	Lakshmi Vilas Bank
3	Andhra Bank	34	Mehsana Urban Co-op Bank
4	Bandan Bank	35	NKGSB Co-operative Bank
5	Bank of Bahrain and Kuwait	36	Oriental Bank of Commerce
6	Bank of Baroda	37	Punjab and Maharashtra Cooperative Bank
7	Bank of India	38	Punjab National Bank
8	Bank of Maharashtra	39	Punjab and Sind Bank
9	Bassein Catholic Co-operative Bank	40	RBL Bank
10	BNP Paribas	41	Saraswat Cooperative Bank
11	Canara Bank	42	Shamrao Vithal Cooperative Bank
12	Catholic Syrian Bank	43	South Indian Bank
13	Central Bank of India	44	Standard Chartered Bank
14	City Union Bank	45	State Bank of India
15	Corporation Bank	46	Syndicate Bank
16	Cosmos Bank	47	Tamil Nadu Mercantile Bank
17	DCB Bank	48	Tamil Nadu Cooperative Bank
18	Dena Bank	49	The Kalyan Janata Sahakari Bank
19	Deutsche Bank	50	TJSB Bank
20	Dhanalaxmi Bank	51	UCO Bank
21	Federal Bank	52	Union Bank of India
22	HDFC Bank	53	United Bank of India
23	ICICI Bank	54	Vijaya Bank

24	IDBI Bank	55	YES Bank
25	Indian Bank		
26	Indian Overseas Bank		
27	IndusInd Bank		
28	Jammu & Kashmir Bank		
29	Janata Sahakari Bank		
30	Karnataka Bank		
31	Karur Vysya Bank		
B) Internet Banking Options (Corporate)			
1	Bank of Baroda	21	Laxmi Vilas Bank
2	Bank of India	22	Oriental Bank of Commerce
3	Bank of Maharashtra	23	Punjab & Maharashtra Coop Bank
4	BNP Paribas	24	Punjab & Sind Bank
5	Canara Bank	25	Punjab National Bank
6	Catholic Syrian Bank	26	RBL Bank
7	City Union Bank	27	Shamrao Vitthal Co-operative Bank
8	Corporation Bank	28	South Indian Bank
9	Cosmos Bank	29	State Bank of India
10	Deutsche Bank	30	Syndicate Bank
11	Development Credit Bank	31	UCO Bank
12	Dhanalaxmi Bank	32	Union Bank of India
13	Federal Bank	33	UPPCL
14	HDFC Bank	34	Vijaya Bank
15	ICICI Bank	35	Axis Bank
16	Indian Overseas Bank		
17	Janta Sahakari Bank		
18	Jammu & Kashmir Bank		
19	Karur Vysya Bank		
20	Kotak Bank		

During the online bid submission process, bidder shall select **SBI MOPS** option and submit the page, to view the **Terms and Conditions** page. On further submitting the same, the e-Procurement system will re-direct the bidder to MOPS Gateway, where two options namely **SBI** and **Other Banks*** will be shown. Here, Bidder may proceed as per below:

- a) SBI Account Holders shall click **SBI** option to with its Net Banking Facility., where bidder can enter their internet banking credentials and transfer the Tender Fee and EMD amount.
- b) Other Bank Account Holders may click **Other Banks** option to view the bank selection page. Here, bidders can select from any of the 54 Banks to proceed with its Net Banking Facility, for remitting tender payments.

**Transaction Charges for Other Banks vide SBI Letter No. LHO/TVM/AC/2016-17/47 – 1% of transaction value subject to a minimum of Rs. 50/- and maximum of Rs. 150/-*

** Bidders who are using Other Banks option under SBI MOPS Payment Gateway, are advised by SBI to make online payment 72 hours in advance before tender closing time.*

5. SUBMISSION PROCESS:

- 5.1 For submission of bids, all interested bidders have to register online as explained above in this document. After registration, bidders shall submit their Technical bid and Financial bid online on www.etenders.kerala.gov.in along with online payment of tender document fees and EMD.
- 5.2 For page-by-page instructions on bid submission process, please visit www.etenders.kerala.gov.in and click “Bidders Manual Kit” link on the home page.
- 5.3 It is necessary to click on “Freeze bid” link/ icon to complete the process of bid submission otherwise the bid will not get submitted online and the same shall not be available for viewing/ opening during bid opening process.

6. VALIDITY

- 6.1 The tender offer shall be kept valid for acceptance for a period of 3 months from the date of opening of offers. The offers with lower validity period are liable for rejection.
- 6.2 Further, the tenderer may extend the validity of the Bids without altering the substance and prices of their Bid for further periods, if so required

7. DEVIATIONS

- 7.1 The offers of the bidders with Deviations in Commercial terms and Technical Terms of the Tender Document are liable for rejection.

8. BLACK LIST

- 8.1 All the intending tenderers shall agree that in the event of the documents furnished with the offer being found to be bogus or the documents contain false particulars, they shall be blacklisted for future tenders/ association with ANERT and EMD shall be forfeited against any losses incurred by ANERT.

9. BIDDER'S LOCATION

- 9.1 The tenderers are requested to furnish the exact location of their factories/godown with detailed postal address and pin code, telephone and fax nos. etc. in their tenders to arrange inspection by ANERT, if considered necessary.
- 9.2 All communication shall be made to the registered email of the bidder in the e-tendering systems and ANERT shall not be responsible for non-receipt or delay of any such communication.

CONDITIONS OF CONTRACT

10. GENERAL CONDITIONS

- 10.1 The tenders should be submitted online at www.etenders.kerala.gov.in.
- 10.2 The tenders should be as per the prescribed form which should be downloaded from the e-tender website. The cost of tender forms should be paid online, and once paid will not be refunded. Tender forms are not transferable. Tenders that are not in the prescribed form are liable to be rejected.
- 10.3 Intending tenderers should submit their tenders on or before the due date and time mentioned in the tender abstract. Late tender will not be accepted.
- 10.4 The rates quoted should be only in Indian currency. Tenders in any other currency are liable to rejection. The rates quoted should be for the unit specified in the schedule attached.
- 10.5 The tenderer shall submit a copy of PAN card of the authorised signatory along with tender.
- 10.6 Tenders subject to conditions will not be considered. They are liable to be rejected on that sole ground.
- 10.7 The tenders will be opened on the specified day and time in the office of the CEO, ANERT in the presence of such of those tenderer's representatives who may be present with proper authorisation issued by the tenderer.
- 10.8 Every tenderer should send along with his tender an Earnest Money Deposit. This may be paid online at the e-tenders website.
- 10.9 If any tenderer withdraws from his e-tender before the expiry of the period fixed for keeping the rates firm for acceptance, the earnest money if any, deposited by him, will be forfeited.
- 10.10 The final acceptance/rejection of the tenders rests entirely with CEO, ANERT who do not bind themselves to accept the lowest or any tender.
- 10.11 In the case of materials of technical nature, the successful tenderer should be prepared to guarantee satisfactory performance for a period of guarantee under a definite penalty. Communication of acceptance of the e-tender normally constitutes a concluded contract. Nevertheless, the successful tenderer shall also

execute an agreement for the due fulfilment of the contract within the period to be specified in the letter of acceptance. The contractor shall have to pay all stamp duty, Lawyer's charges and other expenses incidental to the execution of the agreement. Failure to execute the agreement within the period specified will entail the penalties set out below:

- 10.11.1 The successful tenderer shall **a) deposit a sum @ 3% of the contract till the completion of Installation works. The deposit shall be in the form of a BG which shall be returned after COD (Commercial Operation Date).** There will be no exemption for MSE's in depositing this security amount. If the successful bidder fails to deposit the security and execute the agreement as stated above, the earnest money deposited by him will be forfeited to ANERT; and contract arranged elsewhere at the defaulter's risk and any loss incurred by ANERT on account of the purchase will be recovered from the defaulter who will however not be entitled to any gain accruing thereby.
- 10.11.2 In cases where a successful tenderer, after having made partial supplies fails to fulfil the contracts in full, all or any of the materials not supplied may at the discretion of the Purchasing Officer be purchased by means of another tender/quotation or by negotiation or from the next higher tenderer who had offered to supply already, and the loss if any caused to ANERT shall thereby together with such sums as may be fixed by ANERT towards damages be recovered from the defaulting tenderer.
- 10.12 Return the Security deposit shall, subject to the conditions specified herein to the contractor within three months after the expiration of the contract. But in the event of any dispute arising between ANERT and the contractor, ANERT shall be entitled to deduct out of the deposits or the balance thereof, until such dispute is determined the amount of such damages, costs, charges and expenses as may be claimed. The same may also be deducted from any other sum, which may be due at any time from ANERT to the contractor. In all cases where there are guarantee for the goods supplied, the security deposit will be released only after the expiry of the guarantee period.



(a) All payments to the contractors will be made by CEO ANERT in due course by NEFT transfer only

(b) All incidental expenses incurred by ANERT for making payments outside the State in which the claim arises shall be borne by the contractor.

10.13 The contractor shall not assign or make over the contract on the benefits or burdens thereof to any other person or body corporate. The contractor shall not underlet or sublet to any person or persons or body corporate the execution of the contract or any part thereof without the consent in writing of the purchasing officer who shall have absolute power to refuse such consent or to rescind such consent (if given) at any time if he is not satisfied with the manner in which the contract is being executed and no allowance or compensation shall be made to the contractor or the subcontractor upon such rescission. Provided always that if such consent be given at any time, the contractor shall not be relieved from any obligation, duty or responsibility under this contract.

10.14 In case the contractor becomes insolvent or goes into liquidation, or makes or proposes to make any assignment for the benefit of his creditors or proposes any composition with his creditors for the settlement of his debts, carries on his business or the contract under inspection or behalf of or his creditors or in case any receiving order(s) for the administration of his estate are made against him or in case the contractor shall commit any act of insolvency or in case in which under any clause or clauses any act of insolvency or in case in which under any clause(s) of this contract the contractor shall have rendered himself liable to damages amounting to the whole of his security deposits, the contract shall, thereupon, after notice given by the Purchasing Officer to the contractor, be determined and ANERT may complete the contract in such time and manner and by such persons as ANERT shall think fit. But such determination of the contract shall be without any prejudice to any right or remedy of ANERT against the contractor or his sureties in respect of any breach of contract committed by the contractor. All expenses and damages caused to ANERT by any breach of contract by the contractor shall be paid by the contractor to ANERT and may be recovered from him under the provisions of the Revenue Recovery Act in force in the State.

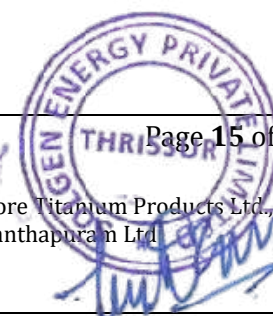
- 10.15 Any sum of money due and payable to the contractor (including security deposit returnable to him) under this contract may be appropriated by the CEO or any other person authorised by ANERT and set off against any claim of ANERT for the payment of a sum of money arising out of or under any other contract made by the contractor with ANERT or any other person authorised by ANERT. Any sum of money due and payable to the successful tenderer or contractor from ANERT shall be adjusted against any sum of money due to ANERT from him under any other contracts.
- 10.16 Every notice hereby required or authorised to be given may be either given to the contractor personally or left at his residence or last known place of abode or business, or may be handed over to his agent personally, or may be addressed to the contractor by post at his usual or last known place of abode or business and if so addressed and posted, shall be deemed to have been served on the contractor on the date on which in the ordinary course of post, a letter so addressed and posted would reach his place of abode or business.
- 10.17 The tenderer shall undertake the installation and commissioning of the system according to the standards and specification.
- 10.18 No representation for enhancement of rate once accepted will be considered.
- 10.19 Special conditions, if any, of the tenderers attached with the tenders will not be applicable to the contract unless they are expressly accepted in writing by the purchaser.
- 10.20 The tenderer should send along with this tender an agreement executed and signed in Kerala Stamp Paper of value Rs.200/-. A specimen form of agreement is given as Annexure A to this tender. Tenders without the agreement in stamped paper will be rejected outright.
- 10.21 Conditions in the technical document, technical specifications and special conditions of this tender document would override these general conditions, wherever applicable.
- 10.22 ANERT, by notice sent to the Supplier, may terminate the contract, in whole or in part, at any time for its convenience. The notice of termination shall specify that termination be for ANERT's convenience, the extent to which performance of the

Supplier under the contract is terminated, and the date upon which such termination becomes effective.

- 10.23 The E-tender shall be opened at the time and date announced in the tender notice, and the price bid will be evaluated as intimated vide auto generated email only.
- 10.24 In case any difference or dispute arises in connection with the contract, all legal proceedings relating to the matter shall be instituted in the Court within whose jurisdiction the CEO, ANERT voluntarily resides.
- 10.25 The Courts situated at the place where the headquarters of ANERT is situated viz, Thiruvananthapuram alone will have jurisdiction to entertain civil suits and all other legal pertaining to this contract.

11. SPECIAL CONDITIONS

- 11.1 Each bidder should submit only one (1) bid. Any bidder who submits/participates in more than one bid for the work shall be disqualified.
- 11.2 The tenders will be opened at the date and time advised in the Bidding Document. If the due date for receiving and opening the tender happens to be declared holiday, then the tender will be received and opened on the very next day, for which no prior intimation will be given.
- 11.3 If the bidder has NOT submitted the requisite EMD OR Agreement, OR if the price bid is not submitted along with the tender, such tenders will be summarily rejected.
- 11.4 During the tender evaluation, ANERT may seek more clarifications/details from any or all of the tenderers, if felt necessary.
- 11.5 The price bids of the tenderers, which submitted the required documents only will be opened and the L1 bidder will be awarded the work of supply and installation of items after fulfilling all the requirements.
- 11.6 If found essential, ANERT reserves the right, in the interest of completion of work within the time limit, to award portion/portions of the Work order to next higher bidders, called for negotiation in the increasing order of their price offers, if they agree to supply at the L1 price.

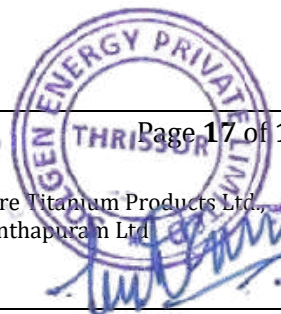


- 11.7 **The rate quoted should be all-inclusive including delivery of materials at the location to be specified, and the cost of materials and labour for the civil works, installation and commissioning, Warranties, Application fees, O&M charges, GST and all other expenses.**
- 11.8 The tender offer shall be kept valid for acceptance for a period of 6 months from the date of opening of bid. The offers with lower validity period are liable for rejection.
- 11.9 The evaluation of the price bid will be based on the grand total of all-inclusive amount quoted excluding GST.



Request for Selection (RFS) of agency for the Implementation of 2 MW Solar Power Plant at Travancore Titanium Products Ltd.,
Kochuveli, Thiruvananthapuram under Solar City project funded by Smart City Thiruvananthapuram Ltd

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**AGENCY FOR NEW & RENEWABLE ENERGY
RESEARCH AND TECHNOLOGY (ANERT)**

Department of Power, Government of Kerala
Thiruvananthapuram, Kerala – 695 033;
www.anert.gov.in , projects@anert.in

E-TENDER DOCUMENT

***Request for Selection (RFS) of agency for the
Implementation of 2 MW Solar Power Plant at
Travancore Titanium Products Ltd., Kochuveli,
Thiruvananthapuram under Solar City project funded
by Smart City Thiruvananthapuram Ltd***

Ref. No.: ANERT-TECH/99/2022-T2

VOL – 2: SCHEDULE AND SCOPE OF WORKS

Date of Publishing of Bids : - 12/04/2023

Last Date of Submission of Bids : - 26/04/2023



REQUEST FOR SELECTION (RFS)

FOR

12. Implementation of 2 MWp Grid Connected Solar PV System to be installed at multiple locations within the Travancore Titanium Products Ltd., Kochuveli, Thiruvananthapuram

- 12.1 ANERT, therefore, invites bids from eligible bidders to participate in the Request for Selection in the e-tendering platform for Design, Manufacture, Supply, Erection, Testing and Commissioning including Warranty, Operation and Maintenance of Solar PV Power System at proposed location.
- 12.2 For the implementation of above-mentioned work, Bidders should submit their bid proposal online complete in all aspect on or before Last date of Bid Submission.
- 12.3 Bid documents, which include Eligibility Criteria, Technical Specifications, various Conditions of Contract, and Formats etc., can be downloaded from website www.anert.gov.in. It is mandatory to download official copy of E-TENDER Document from Kerala Tenders Portal. Any amendment(s)/corrigendum/clarification(s) with respect to this Bid shall be uploaded on www.etenders.kerala.gov.in. The Bidder should regularly check for any Amendment(s)/Corrigendum/Clarification(s) on the above website only.
- 12.4 The scope of work includes:
- 12.4.1 Design, Engineering, Manufacture, Supply, Storage, Civil work, Erection, Testing & Commissioning of the Grid connected PV Project including Power evacuation, Operation and Maintenance (O & M) of the project for a period of 10 years for after commissioning of project.

13. DEFINITIONS & ABBREVIATIONS

a) In this “Bid / RFS Document” the following words and expression will have the meaning as herein defined where the context so admits:

13.1 **“Affiliate”** shall mean a company that either directly or indirectly

- a. controls or
 - b. is controlled by or
 - c. is under common control with
- 13.2 A Bidding Company and **“control”** means ownership by one company of at least twenty-six percent (26%) of the voting rights of the other company.
- 13.3 **“B.I.S”** shall mean specifications of Bureau of Indian Standards (BIS);
- 13.4 **“Bid”** shall mean the Techno Commercial and Price Bid submitted by the Bidder along with all documents/credentials/attachments annexure etc., in response to this RFS, in accordance with the terms and conditions hereof.
- 13.5 **“Bidder/Bidding Company”** shall mean Bidding Company submitting the Bid. Any reference to the Bidder includes Bidding Company / including its successors, executors and permitted assigns as the context may require;
- 13.6 **“Bid Deadline”** shall mean the last date and time for submission of Bid in response to this RFS as specified in the Tender Abstract;
- 13.7 **“Bid Capacity”** shall mean capacity offered by the bidder in his Bid.
- 13.8 **“CEA”** shall mean Central Electricity Authority.
- 13.9 **“Chartered Accountant”** shall mean a person practicing in India or a firm whereof all the partners practicing in India as a Chartered Accountant(s) within the meaning of the Chartered Accountants Act, 1949;
- 13.10 **“Competent Authority”** shall mean (Designation of Competent Authority) of [Name of the Organization] himself and/or a person or group of persons nominated by MD for the mentioned purpose herein;
- 13.11 **“Commissioning,”** means Successful operation of the Project / Works by the Contractor, for carrying out Performance Test(s) as defined in RFS.
- 13.12 **“Company”** shall mean a body incorporated in India under the Companies Act, 1956 or Companies Act, 2013 including any amendment thereto;
- 13.13 **Commercial Operation Date:** The date of successful conducting field acceptance tests and injection of power at delivery point shall be the "Commercial Operation Date"
- 13.14 **“Capacity Utilization Factor” (CUF)** shall mean the ratio of actual energy generated by SPV project over the year to the equivalent energy output at its

rated capacity over the yearly period.

$$CUF = \frac{\text{actual annual energy generated from the plant in kWh}}{(\text{installed plant capacity in kW} * 365 * 24)}$$

13.15 **"Eligibility Criteria"** shall mean the Eligibility Criteria as set forth in Clause 16 of this RFS;

13.16 **"Financially Evaluated Entity"** shall mean the company which has been evaluated for the satisfaction of the Financial Eligibility Criteria set forth in Clause 16.3 hereof;

13.17 **"IEC"** shall mean specifications of International Electro-Technical Commission;

13.18 **"kWp"** shall mean kilo-Watt Peak;

13.19 **"kWh"** shall mean kilo-Watt-hour;

13.20 **"MNRE"** shall mean Ministry of New and Renewable Energy, Government of India;

13.21 **"O&M"** shall mean Operation & Maintenance of Solar PV system for PPA period.

13.22 **"Owner of the project"** shall mean MILMA Ernakulam Dairy, shall mean anyone who has ownership (including lease ownership also) of the land / roof and is the legal owner of all equipments of the project. Owner of the project can enter into a PPA with the consumer (s) of power for supply of solar power for agreed time (years) from the date of Commissioning of project.

13.23 **"Project Cost / Project Price"** shall mean the price offered by the Bidder for the Scope of work as per RFS document for the site.

13.24 **"Project capacity"** means Capacity in kWp offered by the Bidder. The project capacity specified is on "DC" output Side only.

13.25 **"Performance Ratio" (PR) means**

"Performance Ratio" (PR) means the ratio of plant output versus installed plant capacity at any instance with respect to the radiation measured.

$$PR = \frac{\text{Measured output in kW}}{\text{Installed Plant capacity in kW} * (1000 / \text{Measured radiation intensity in W/m}^2)}$$

13.26 **"Parent"** shall mean a company, which holds more than 51% equity either directly or indirectly in the Bidding Company or Project Company or a Member in a Consortium developing the Project

13.27 **"Project Company"** shall mean Company incorporated by the bidder as per

Indian Laws in accordance with Clause no 16.1.

13.28 **"Price Bid"** shall mean BoQ, containing the Bidder's quoted Price as per the Volume- IV of this RFS;

13.29 **"Qualified Bidder"** shall mean the Bidder(s) who, after evaluation of their Techno Commercial Bid stand qualified for opening and evaluation of their Price Bid;

13.30 **"RFS"** shall mean Request for Selection (RFS)/Bid document/Tender document

13.31 **"Statutory Auditor"** shall mean the auditor of a Company appointed under the provisions of the Companies Act, 1956 or under the provisions of any other applicable governing law;

13.32 **"Successful Bidder(s) /Contractor/Project Developers(s)"** shall mean the Bidder(s) selected by Owner pursuant to this RFS for Implementation of Grid Connected Ground mounted Solar PV System as per the terms of the RFS Documents, and to whom an Allocation Letter has been issued;

13.33 **"Site"** shall mean the project location at the address mentioned below.

MILMA Ernakulam Dairy, Thrippunithura PO., Ernakulam-682 301

13.34 **"SNA"** shall mean State Nodal Agency, ANERT.

13.35 **"Tendered Capacity"** shall mean the Total aggregate capacity in MW proposed to be tendered by ANERT to the Successful Bidder through this bidding process as per terms and conditions specified therein;

13.36 **"Ultimate Parent"** shall mean a company, which owns at least more than fifty percent (51%) equity either directly or indirectly in the Parent and Affiliates.

13.37 **"Wp"** shall mean Watt Peak.

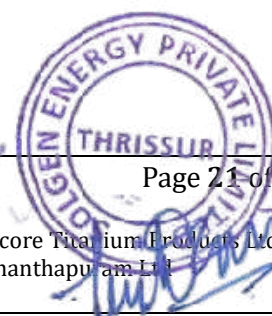
13.38 **2MWp** for the purpose of conversion in **kWp** shall be considered as 2000kWp.

b) INTERPRETATIONS

- i. Words comprising the singular shall include the plural & vice versa
- ii. An applicable law shall be construed as reference to such applicable law including its amendments or re-enactments from time to time.
- iii. A time of day shall save as otherwise provided in any agreement or document be construed as a reference to Indian Standard Time.
- iv. Different parts of this contract are to be taken as mutually explanatory and

supplementary to each other and if there is any differentiation between or among the parts of this contract, they shall be interpreted in a harmonious manner to give effect to each part.

- v. The table of contents and any headings or sub headings in the contract has been inserted for case of reference only & shall not affect the interpretation of this agreement.



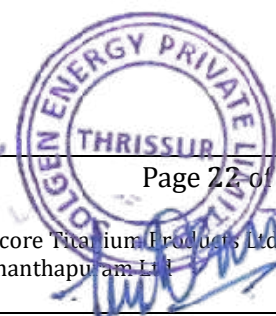
INTRODUCTION, BID DETAILS AND INSTRUCTIONS TO THE BIDDERS

14. INTRODUCTION

- 14.1 ANERT, on behalf of Smart City Thiruvananthapuram Ltd, hereby invites interested companies to participate in the bidding process for the selection of Successful Bidder(s) for implementation of grid-connected Solar Photovoltaic Project under CAPEX model in Travancore Titanium Products Ltd., Kochuveli, Thiruvananthapuram.
- 14.2 The Bidders are advised to read carefully all instructions and conditions appearing in this document and understand them fully. All information and documents required as per the bid document must be furnished. Failure to provide the information and / or documents as required may render the bid technically unacceptable.
- 14.3 The bidder shall be deemed to have examined the bid document, to have obtained his own information in all matters whatsoever that might affect the carrying out the works in line with the scope of work specified elsewhere in the document at the offered rates and to have satisfied himself to the sufficiency of his bid. The bidder shall be deemed to know the scope, nature and magnitude of the works and requirement of materials, equipment, tools and labour involved, wage structures and as to what all works, he has to complete in accordance with the bid documents irrespective of any defects, omissions or errors that may be found in the bid documents.

15. BID DETAILS

- 15.1 The bidding process under this RFS is for a 2 MWp cumulative capacity of SPV Power Plant at Travancore Titanium Products Ltd., Kochuveli, Thiruvananthapuram. This includes 1.5 MWp installation to be done in Ground and 500 kWp in the Rooftop of various buildings within TTL campus.



BID QUALIFICATION REQUIREMENTS

16. ELIGIBILITY CRITERIA

16.1 General

- i. The Bidder should be either a body incorporated in India under the Companies Act, 1956 or 2013 including any amendment thereto, Sole Proprietorship, Partnership company and engaged in the business of Solar Power.
- ii. A copy of certificate of incorporation shall be furnished along with the bid in support of above.

16.2 Technical Eligibility Criteria:

The Bidder should have installed & commissioned Grid connected Solar PV Power Project having a capacity of single plant not less than 1 MW and cumulative capacity of above 5 MW, which should have been commissioned at least two months prior to Techno-Commercial Bid Opening date. The list of projects commissioned at least 2 months prior to Techno-Commercial Bid Opening date, indicating whether the project is grid connected, along with a copy of the Commissioning certificate and Work order / Contract / Agreement/ from the Client/Owner shall be submitted in support of Clause 16.2.

16.3 Financial eligibility criteria

The Bidder should have an Annual Turnover or Net worth as indicated below.

- i. The Minimum Average Annual turnover of Rupees 8 Crores in any two of the last 5 financial years preceding the Bid Deadline subject to the condition that the Bidder should at least have completed two financial years.

OR

- ii. Net worth equals to or greater than the value calculated at rate of Rs. 10 Crores. The Computation of Net worth shall be based on unconsolidated audited annual accounts of the last financial year immediately preceding the Bid Deadline. Share

premium can be included in the Net-worth calculation in case of listed companies in India only.

The formula of calculation of net-worth shall be as follows:

Net-worth = (Paid up share capital) + {(Free reserves - Share premium) + Share premium of listed companies} - (Revaluation of reserves) - (Intangible assets) - (Miscellaneous expenditure to the extent not written off and carry forward losses).

For the purposes of meeting financial requirements, only unconsolidated audited annual accounts shall be used. Bidders shall furnish documentary evidence as per the Format - 5, duly certified by Authorized Signatory and the Statutory Auditor / Practising Chattered Accountant of the Bidding Company in support of their financial capability.

16.4 Bid submission by the bidder

16.4.1 The Bidder shall submit the information and/or documents as per the formats specified in Volume-IV.

16.4.2 Strict adherence to the formats wherever specified, is required. Wherever, information has been sought in specified formats, the Bidder shall refrain from referring to brochures /pamphlets. Non-adherence to formats and / or submission of incomplete information may be a ground for declaring the Bid as non-responsive. Each format has to be duly signed and stamped by the authorized signatory of the Bidder.

16.4.3 The Bidder shall furnish documentary evidence in support of meeting Eligibility Criteria as indicated in Clause no. 16.1, 16.2 and 16.3 to the satisfaction of ANERT. They shall also furnish unconsolidated/consolidated audited annual accounts in support of meeting financial requirement, which shall consist of balance sheet, profit and loss account, profit appropriation account, auditors report, etc., as the case may be of Bidding Company or Financially Evaluated Entity for any of the last three(3) financial years immediately preceding the Bid Deadline which are used by the bidder for the purpose of calculation of Annual Turnover or of last Financial Year in case of Net Worth.

16.4.4 In case the annual accounts for the latest financial year are not audited and therefore the bidder cannot make it available, the applicant shall give certificate to this effect from their CEOs. In such a case, the Applicant shall provide the Audited Annual Reports for 3 (Three) years preceding the year or from the date of incorporation if less than 3 years for which the Audited Annual Report is not being provided.

16.5 Amendments to RFS

16.5.1 At any time prior to the deadline for submission of Bids, ANERT may, for any reason, whether at its own initiative or in response to a clarification requested by a prospective Bidder, modify the RFS document by issuing clarification(s) and/or amendment(s).

16.5.2 The clarification(s) / amendment(s) (if any) may be notified on Kerala Tenders website www.etenders.kerala.gov.in at least Two (2) days before the proposed date of submission of the Bid. If any amendment is required to be notified within Two (2) days of the proposed date of submission of the Bid, the Bid Deadline may be extended for a suitable period.

16.5.3 ANERT will not bear any responsibility or liability arising out of non-receipt of the information regarding Amendments in time or otherwise. Bidders must check the website for any such amendment before submitting their Bid.

16.5.4 In case any amendment is notified after submission of the Bid (prior to the opening of Techno-Commercial Bid.

16.5.5 All the notices related to this Bid which are required to be publicized shall be uploaded on website www.etenders.kerala.gov.in

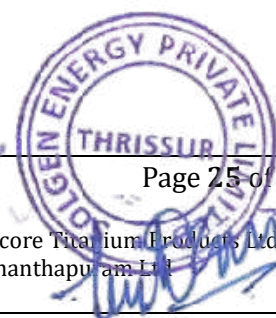
16.6 Bidding process

16.6.1 Bid formats

The Bid shall comprise of the following:

(A) Cover I - Techno-Commercial documents

i. Covering Letter as per the prescribed Format-1



- ii. Copy of PAN and TAN certificates of Bidding company
- iii. Original power of attorney issued by the Bidding Company in favour of the authorized person signing the Bid, in the form attached hereto as Format-2 or standard power of attorney in favour of authorized person signing the Bid. (Power of Attorney must be supplemented by Board Resolution to above effect for the company). However, ANERT may accept general Power of Attorney executed in favour of Authorised signatory of the Bidder, if it shall conclusively establish that the signatory has been authorized by the Board of CEOs to execute all documents on behalf of the Bidding Company.
- iv. General particulars of bidders as per Format-3
- v. Document in support of meeting Eligibility Criteria as per Clause no. 16.1 & 16.2.
- vi. Certificates of incorporation of Bidding company
- viii. Details for meeting Financial Eligibility Criteria as per Clause no. 16.3 along with documentary evidence for the same as per Format -4
- ix. Board resolution for Authorised signatory
- x. Signed and stamped Copy of RFS Documents including amendments & clarifications by Authorised signatory on each page.

(B) Cover II- Price bid

The Bidder shall inter-alia take into account the following while preparing and submitting the Price Bid digitally signed by the authorized signatory. The Bidder shall submit Price Bid in excel BoQ file downloaded from the e-tender website.

16.7 Validity of Bid

- 16.7.1 The bid and the Price Schedule included shall remain valid for a period of 3 months from the date of techno-commercial bid opening, with bidder having no right to withdraw, revoke or cancel his offer or unilaterally vary the offer submitted or any terms thereof. In case of the bidder revoking or cancelling his offer or varying any term & conditions in regard thereof or not accepting letter of allocation, ANERT shall forfeit the Bid Bond furnished by him.

16.7.2 In exceptional circumstances when letter of acceptance is not issued, ANERT may solicit the Bidder's consent to an extension of the period of validity. The request and the responses thereto shall be made in writing. The EMD provided shall also be suitably extended. A Bidder may refuse the request without forfeiting its Bid Bond. A Bidder granting the request will neither be required nor permitted to modify its Bid in any manner.

16.8 Cost of bidding

The bidder shall bear all the costs associated with the preparation and submission of his offer, and ANERT will in no case be responsible or liable for those costs, under any conditions. The Bidder shall not be entitled to claim any costs, charges and expenses of and incidental to or incurred by him through or in connection with his submission of bid even though ANERT may elect to modify / withdraw the invitation of Bid.

16.9 Performance Security / Performance Bank Guarantee (PBG)

16.9.1 Within 30 days from the date of issue of Allocation letter, Successful Bidder shall furnish the Performance Security @ 3% of the total contract value.

16.9.2 The Performance Security shall be denominated in Indian Rupees and shall be in one of the following forms:

- a. A demand draft, or a bank guarantee in the format given in Format-4 from any nationalised bank.
- b. Be confirmed for payment by the branch of the bank giving the bank guarantee at Thiruvananthapuram.

16.9.3 The PBG shall be forfeited as follows without prejudice to the Bidder being liable for any further consequential loss or damage incurred to ANERT, if the Successful Bidder is not able to commission the projects to the satisfaction of ANERT.

16.9.4 The Performance Security shall be valid for a minimum period of 6 months from the date of issue of LoA

16.10 Right to withdraw the RFS and to reject any bid

16.10.1 This RFS may be withdrawn or cancelled by ANERT at any time without assigning any reasons thereof. ANERT further reserves the right, at its

complete discretion, to reject any or all of the Bids without assigning any reasons whatsoever and without incurring any liability on any account.

16.10.2 ANERT reserve the right to interpret the Bid submitted by the Bidder in accordance with the provisions of the RFS and make its own judgment regarding the interpretation of the same. In this regard ANERT shall have no liability towards any Bidder and no Bidder shall have any recourse to ANERT with respect to the selection process. ANERT shall evaluate the Bids using the evaluation process specified in Volume - III, at its sole discretion. ANERT's decision in this regard shall be final and binding on the Bidders.

16.10.3 ANERT reserves its right to vary, modify, revise, amend or change any of the terms and conditions of the Bid before submission. The decision regarding acceptance or rejection of bid by ANERT will be final.

16.11 Zero Deviation

This is a ZERO Deviation Bidding Process. Bidder is to ensure compliance of all provisions of the Bid Document and submit their Bid accordingly. Tenders with any deviation to the bid conditions shall be liable for rejection.

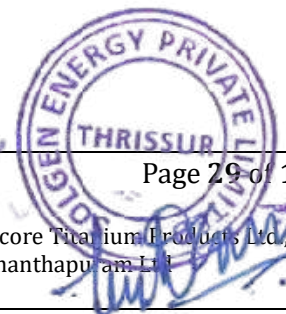
16.12 Examination of Bid document

16.12.1 The Bidder is required to carefully examine the Technical Specification, terms and Conditions of Contract, and other details relating to supplies as given in the Bid Document.

16.12.2 The Bidder shall be deemed to have examined the bid document including the agreement/contract, to have obtained information on all matters whatsoever that might affect to execute the project activity and to have satisfied himself as to the adequacy of his bid. The bidder shall be deemed to have known the scope, nature and magnitude of the supplies and the requirements of material and labour involved etc. and as to all supplies he has to complete in accordance with the Bid document.

16.12.3 Bidder is advised to submit the bid on the basis of conditions stipulated in the Bid Document. Bidder's standard terms and conditions if any will not be considered. The cancellation / alteration / amendment / modification in Bid documents shall not be accepted by ANERT.

16.12.4 Bid not submitted as per the instructions to bidders is liable to be rejected. Bid shall confirm in all respects with requirements and conditions referred in this bid document.



SCOPE OF WORK

17. SCOPE OF WORKS

The scope includes the Supply, Installation, Testing and Commissioning of Rooftop On-Grid SPV power plants. All the necessary approvals from KSEBL/Electrical Inspectorate, feasibility study, necessary civil work, Mounting of Module Structures, PV Module Installation, Inverter Installation, DC/AC Cabling and interconnections, Installation of Lightning Arresters and Earthing System as per the standards, Arranging all the necessary inspections from KSEBL/Electrical Inspectorate/ANERT District Office as part of Pre-Commissioning, if any, Commissioning of the PV Power Plant along with warranty and Operation and Maintenance (O&M) of the project under CAPEX model for 10 years after Commercial Operation Date (COD) are coming under the scope of the bidder.

The total project comprises of 500 kWp Rooftop Solar Power plant and 1500 kWp Ground Mounted Solar Power plant. The successful bidder reserves the right to finalise the capacity being installed at these locations identified within the area available with due approval of ANERT/TTL authorities.

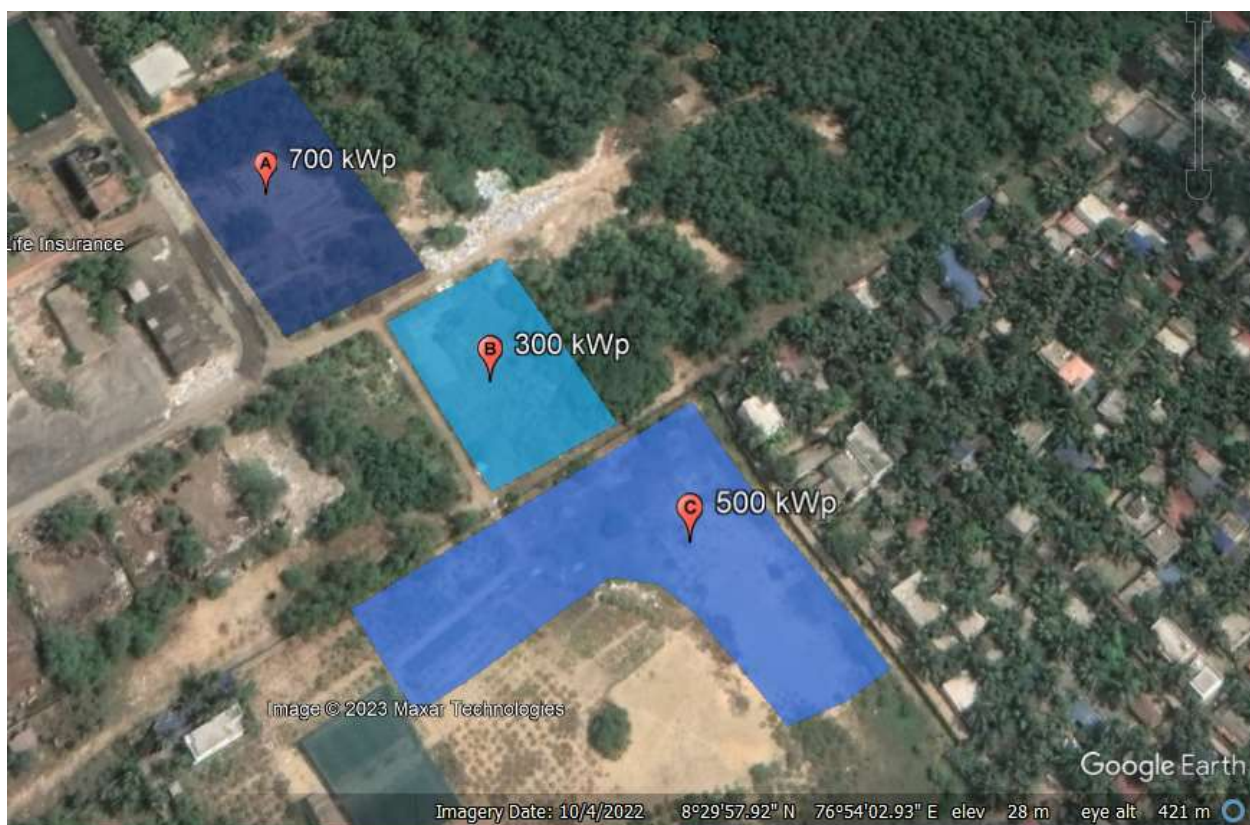
17.1 LOCATION DETAILS

The location of installation of the proposed 2 MWp Solar Power plant is at Travancore Titanium Products Ltd., Kochuveli, Thiruvananthapuram, Kerala.

Site Name	Travancore Titanium Products Ltd., Kochuveli
Area available	Rooftop (Various buildings as listed below) and Ground of area 13000 Sqm.
District	Thiruvananthapuram
State	Kerala
Latitude	8°29'57.73"N
Longitude	76°54'5.13"E
Nearest National Highway	NH-66
Nearest Village/Town	Veli

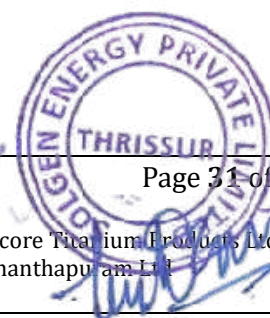
Nearest Railway Station	Kochuveli (3 km from the site)
Nearest Airport	Trivandrum International Airport (5 km from the site)
Nearest KSEB Substation	Within the Campus

The Proposed 1.5 MW Solar Power Plant is to be installed on the area marked below



The balance 500 kWp is to be installed at the Rooftops of Buildings listed below:

#	Name of Block / Building	Capacity (kW)
1	Canteen	200
2	Locker Room	75
3	CLSS	75
4	Lime Storage Area	50
5	Filter Press	50
6	Time Office	25
7	66 kV Substation	25
TOTAL		500



The bidders are to quote the per kW cost for the successful Supply, Testing, Installation and Commissioning of the Power plants as per the capacity mentioned for Rooftop as well as Ground mounted system. The full work will be awarded to the lowest bidder for the 2000 kWp. The cost of O&M will not form part of the selection of the L1 bidder.

17.2 ADDITIONAL WORKS

- i. The successful bidder is to borne the fee for KSEBL feasibility, Registration and all other expenses. The additional costs for site specific cabling works, earthing, mounting structure modifications, required civil works etc to meet the technical criteria as detailed in this document are under the scope of the bidder.
- ii. The scope of enhancing load, phase conversion, changing of CTs, PT, modification of Panel boards, extension of bus bars, replacement of metering panel boards etc wherever necessary is under the scope of the bidder. The rates for the same are to be considered in the bid for each site.
- iii. In case of installations to be made in sites with HT connection, the replacement of CTs (Class 0.2s), PT (Class 0.2) of rating is under the scope of the vendor. The rates for Supply of tested transformers & Replacement at the site of these items to be quoted along with the bid.
- iv. It is mandatory that the bidders are to visit the sites and quote the rates considering all the requirements as mentioned in this tender document. No requests for revision of rates will be entertained. In case, the successful bidder is not undertaking the specific work, the work will be cancelled and disciplinary proceedings will be initiated against the bidder and all payments due will be withheld. Hence, Bidders are requested to visit the site before quoting and the rate for successful commissioning in all aspects is to be quoted.
- v. **The rate quoted should be all inclusive including delivery of materials, the cost of materials and labour for the civil works, Installation and Commissioning, 10-year Warranty, fee for approval from the KSEBL, Electrical Inspectorate if any, Solar Meter, Remote monitoring facility, Insurance, GST and all other expenses deemed necessary for the proper**

implementation of the conditions and specification as in-incorporated in the tender.

- vi. The Operation and Maintenance of the Power plant for the whole period of warranty will be duty of the vendor. The rates for O&M per year need to be quoted in the BoQ file provided.**
- vii. The Component wise split up of the costs in percentage for each capacity is to be included as part of the technical bid (included as format 6).**
- viii. Any other work required for the successful commissioning of the power plant which are not mentioned in this document and are required as per prevailing laws & regulations in the country**

17.3 SUBMITTALS

On commencement of the Project, the Contractor shall submit the following to ANERT:

- a. Prior to the technical submittals, the contractor shall submit detailed baseline program and methodology indicating the proposed overall schedule for documentation such as calculations, shop/ working drawings, plan/ procedures and records. Submission of samples, process of fabrication / delivery to site storage yard for the approval of the Employer. Also, Contractor shall submit Method statements and Quality Assurance plan for each activity to be done and get approval from ANERT before commencing the work. Contractor shall maintain the necessary Quality and Quantity documentation. All the documents shall be submitted to Employer for their review and records.
- b. Detailed work procedures and schedules shall be submitted by contractor at least one month before start of work and shall get necessary approval from ANERT authorities and various entities. If required meeting shall be called to settle all the open issues. Contractor to ensure that all issues are closed one month prior to start of work.
- c. Complete fabrication drawings, materials list, cutting lists, bolt lists, welding schedules and QC schedules, based on the design drawing furnished to him and in accordance with the approved schedule. It is highlighted that structural steel

members, dimensions thereof indicated in tender drawings are tentative only, and may be modified during final design stage.

- d. Results of any tests, as and when conducted and as required by Employer.
- e. A detailed list of all constructional Plant & Equipment, such as cranes, derricks, winches, welding sets etc. their makes, model, present condition and location, available to the contractor and the ones he will employ on the job to maintain the progress of work in accordance with the contract.
- f. The total number of experienced personnel of each category, like fitters, welders, riggers etc., which he intends to deploy on the project.
- g. The contractor shall submit complete design calculations for any alternative sections proposed by him, for the approval of Employer and records of Owner.

18. PROJECT COST

18.1 The Project cost shall include all the costs related to above Scope of Work. Bidder shall quote for the entire facilities on a “single responsibility” basis such that the total Bid Price covers all the obligations mentioned in the Bidding Documents in respect of Design, Supply, Erection, Testing and Commissioning including Warranty, Operation & Maintenance for a period 10 years under CAPEX model, goods and services including spares required if any during O&M period. The Bidder has to take all permits, approvals and licenses, Insurance etc., provide training and such other items and services required to complete the scope of work mentioned above.

18.2 The Project cost shall remain firm and fixed and shall be binding on the Successful Bidder till completion of work. No escalation will be granted on any reason whatsoever. The bidder shall not be entitled to claim any additional charges, even though it may be necessary to extend the completion period for any reasons whatsoever.

18.3 The cost shall be inclusive of all duties and taxes, insurance etc. The prices quoted by the firm shall be complete in all respect and no price variation /adjustment shall be payable during the 10-year period.

18.4 The Operation & Maintenance of Solar Photovoltaic Power Plant would include wear, tear, overhauling, machine breakdown, insurance, and replacement of

defective modules, invertors / Power Conditioning Unit (PCU), spares, consumables & other parts for a period of 10 years.

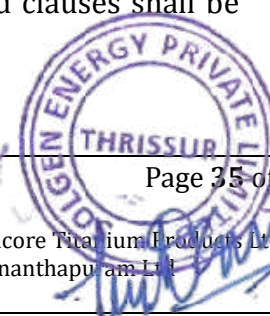
- 18.5 The cost shall be specified in sanction letter based on Successful Bidder's quote for the project. The project cost shall be in accordance with all terms, conditions, specifications and other conditions of the Contract as accepted by ANERT and incorporated into the sanction letter.

19. INSURANCE

- 20.1 The Bidder shall be responsible and take an Insurance Policy for transit-cum-storage-cum-erection for all the materials to cover all risks and liabilities for supply of materials on site basis, storage of materials at site, erection, testing and commissioning. The bidder shall also take appropriate insurance during O&M period.
- 20.2 The Bidder shall also take insurance for Third Party Liability covering loss of human life, engineers and workmen and also covering the risks of damage to the third party/material/equipment/properties during execution of the Contract. Before commencement of the work, the Bidder will ensure that all its employees and representatives are covered by suitable insurance against any damage, loss, injury or death arising out of the execution of the work or in carrying out the Contract. Liquidation, Death, Bankruptcy etc., shall be the responsibility of bidder.

20. WARRANTIES AND GUARANTEES

The Bidder shall warrant that the goods supplied under this contract are new, unused, of the most recent or latest technology and incorporate all recent improvements in design and materials. The bidder shall provide system warrantee covering the rectification of any and all defects in the design of equipment, materials and workmanship including spare parts for a period of the 10-years from the date of commissioning. The successful bidder has to transfer all the Guarantees /Warrantees of the different components to the Owner of the project. The responsibility of operation of Warrantee and Guarantee clauses and Claims/ Settlement of issues arising out of said clauses shall be



joint responsibility of the Successful bidder and the owner of the project and ANERT will not be responsible in any way for any claims whatsoever on account of the above.

21. TYPE AND QUALITY OF MATERIALS AND WORKMANSHIP

- 22.1 The Design, Engineering, Manufacture, Supply, Installation, Testing and Performance of the equipment shall be in accordance with latest appropriate IEC/Indian Standards as detailed in the Vol- III (Technical specifications) of the bid document. Where appropriate Indian Standards and Codes are not available, other suitable standards and codes as approved by the MNRE / authorised Government agency shall be used.
- 22.2 The specifications of the components should meet the technical specifications mentioned in Volume III.
- 22.3 Any supplies which have not been specifically mentioned in this Contract but which are necessary for the design, engineering, manufacture, supply & performance or completeness of the project shall be provided by the Bidder without any extra cost and within the time schedule for efficient and smooth operation and maintenance of the SPV plant.

22. OPERATION & MAINTENANCE

- i. The bidder shall be responsible for Operation and Maintenance of the Solar PV system for the 10-year period, during which ANERT will monitor the project for effective performance in line with conditions specified elsewhere in the bid document. During this period, the bidder shall be responsible for supply of all spare parts as required from time to time for scheduled and preventive maintenance, major overhauling of the plant, replacement of defective modules, inverters, PCU's etc and maintaining log sheets for operation detail, deployment of staff for continuous operations and qualified engineer for supervision of O&M work, complaint logging & its attending.
- ii. If any Operation & Maintenance issues are not resolved within 7 days, then complaint may be raised to ANERT, pursuant to which a penalty as decided by CEO, ANERT will be imposed.

- iii. If the outage of the plant is more than 30 days continuously, then the 50% PBG amount shall be encashed by ANERT.
- iv. If the outage is exceedingly more than 60 days then complete PBG amount shall be encashed by Owner. (This will be applicable till 10 years of O&M as per the Scope of the RFS.) Legal proceedings and other as deemed necessary by CEO, ANERT will be initiated against the defaulted contractor.

23. METERING AND GRID CONNECTIVITY

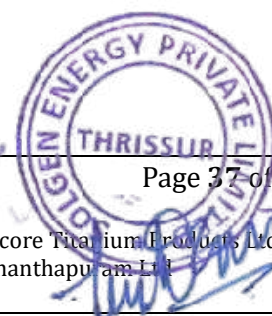
Metering and grid connectivity of the solar PV system under this project would be the responsibility of the Bidder in accordance with the prevailing guidelines of the concerned DISCOM and / or CEA (if available by the time of implementation). The bidder need to connectivity and the entire responsibility lies with bidder only. This particular power plant will be connected to the 11 kV bus at the 66 kV Substation under Captive consumer category.

24. PLANT PERFORMANCE EVALUATION

The successful bidder shall be required to meet minimum guaranteed generation with Performance Ratio (PR) at the time of commissioning and related Capacity Utilization Factor (CUF) as per the GHI levels of the location during the O&M period. PR should be shown minimum of 75% at the time of inspection for initial commissioning acceptance. Minimum CUF shall not be less than 21% for a period of 10 years. The bidder should send the periodic plant output details to ANERT for ensuring the CUF. The PR will be measured at Inverter output level during peak radiation conditions.

25. PROGRESS REPORT

The bidder shall submit the progress report monthly to ANERT in Prescribed Proforma. ANERT will have the right to depute his/their representatives to ascertain the progress of contract at the premises of works of the bidder.

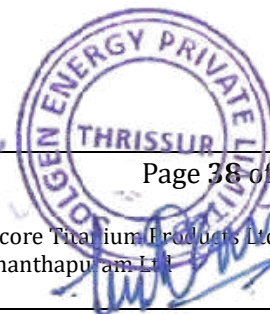


26. SCHEDULE OF SUPPLY

- i. The items should be delivered and installed at the sites of institution for which work order shall be given and specified by ANERT, under prior intimation and supervision of ANERT. The list of sites is listed below:
- ii. If the successful bidder fails to deliver the materials within the days mentioned below, the order stands cancelled and ANERT will award the work to the next bidder and penalty as decided by ANERT will be levied.

#	Capacity of Solar Plant	Material Delivery (Days)	Completion Period (Days)
1	2 MWp	25	45

- iii. For any delay in Installation and Commissioning beyond the period mentioned above, the ANERT will charge penalty of 0.5% of the order value/week or part thereof, subject to the cost not exceeding 10% of the total cost. Order will be cancelled if the delay of service is more than this time period and work will be issued to the second successful bidder
- iv. Bidders are to submit their quotes only after visiting the site and the details of additional works required for the successful commissioning of the power plant is to be mentioned in the technical bid. No additional amount for any works will be provided under any circumstance, even if the site requires additional work other than quoted by the bidder. Hence, special care must be taken while submitting the bids.
- v. Supply of the SPV module must be from the ALMM list issued by MNRE from time to time. The test certificates and reports of the inverters being used for the project must be submitted along with the bid. ANERT reserves the right to reject the bid based on the non-conformity of the inverter being supplied.
- vi. The successful bidder shall submit the detailed BoM and the timeline for completion along with the agreement and security deposit. This timeline must be followed and no extension of time for completing the installation will be granted. Although, time extension may be granted for things beyond the control of the bidder.



- vii. In case of no valid reason, extension of time of completion that can be granted at a time shall will be 25% of the original time. The maximum extension that can be granted for a work shall be limited to half the original time of completion.
- viii. When the contract period has to be extended wholly or partly due to default on the part of the bidder, the Agreement Authority may sanction extension of time after imposing fine as mentioned below;

Period	Rate of Fine
First Extension	1% of the PAC subject to a minimum of Rs. 1000/- and maximum of Rs. 50,000/-.
Second Extension	2% of the PAC subject to a minimum of Rs. 2000/- and maximum of Rs. 1,00,000/-

27. PAYMENT

- 27.1 No advance payment will be given. All the documents submitted should be certified by the concerned personnel of ANERT.
- 27.2 The quotes for the Design, Supply, Installation & Commissioning including 10 years of warranty (EPC Part) to be provided by the bidders. The L1 bidder will be selected on the basis of their quotes on the EPC part with 10-year warranty and the O&M quote will not be part of bid evaluation.
- 27.3 The terms of payment shall be:

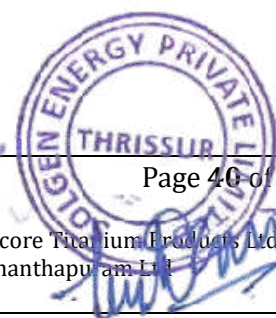
27.3.1 EPC Payment

- i. Upon delivery of major components (PV Modules, Inverter etc) at the site/warehouse, a maximum of 60% of the contract value can be released through Running Accounts Bills of min 10% of the contract value. The supplier shall submit the part invoice for the materials (including serial numbers and delivery chalan) for the materials duly certified by the concerned District Office along with a report regarding the supply of materials. Each RAB shall be accompanied with an item wise statement of work completion with qty, rate & the actual expenditure incurred audited by a Chartered Accountant.
- ii. On completion of installation of the power plant, a maximum of 20% of the contract value can be released as Running Account Bills of min 10% of the

contract value. The supplier shall submit the invoice for the materials supplied and all documents related including the Project Completion Report to the completion of the work certified by the district office shall be submitted for the release of the amount. The second part invoice can be raised only after submitting application for energization to the Electrical Inspectorate. Each RAB shall be accompanied with an item wise statement of work completion with qty, rate & the actual expenditure incurred audited by a Chartered Accountant.

- iii. After the Inspection and Approval of the Electrical Inspectorate, 5% of the contract value will be released. All documents related to the completion of the work including commissioning report shall be submitted for the release of the amount.
- iv. The date of Energisation to the Grid by the DISCOM will be considered as the official Date of Commissioning (CoD) of the project and this will be treated as the commissioning of the system. On commissioning of the grid connected system, 5% of the contract value will be released after proving the Performance ratio (AC). The PR report as per standard is to be provided for release of the amount.
- v. The balance 10% shall be retained as performance security and will be released in five equal parts - 2% after 1 year of operation, 2% after 3 years of operation, 2% after 5 years of operation, 2% after 7 years of operation and last 2% after the 10 years of warranty. For releasing these payment, Performance ratio (AC) shall be proved within a period of 7 consecutive days at the end of each year for release of payment. **The plant shall be handed over at the end of 10 years after commissioning after proving the performance ratio (AC).** This period will be considered only from the date of commissioning.
- vi. The security deposit of 3% furnished along with the contract agreement shall be released on successful completion of supply, installation and commissioning.

27.3.2 Maintenance Payment



- i. The amount shall be released on annual basis after completion of the period of the previous year. The start of maintenance period will be considered from the scheduled date of operation.
- ii. The preventive maintenance reports along with receipt of premium of insurance and generation reports are to be submitted for the release of payments.
- iii. The payment shall be released after the inspection by the authorised personnel of ANERT on annual basis.

27.4 Income tax, contribution to workers' welfare fund and other statutory deductions shall be made from the payment as per prevailing norms.

28. PROJECT INSPECTION

The project progress will be monitored by ANERT and the projects will be inspected for quality at any time during commissioning or after the completion of the project either by officer(s) from ANERT or any authorized agency/ experts.

29. APPLICABLE LAW

The Contract shall be interpreted in accordance with the laws of the Union of India and in the Jurisdiction of Thiruvananthapuram, Kerala.

30. SETTLEMENT OF DISPUTE

29.1 If any dispute of any kind whatsoever arises between ANERT and Successful bidder in connection with or arising out of the contract including without prejudice to the generality of the foregoing, any question regarding the existence, validity or termination, the parties shall seek to resolve any such dispute or difference by mutual consent. If the same cannot be resolved, the courts in the jurisdiction will be approached and finalised by the appropriate court after legal proceedings.

31. FORCE MAJEURE

30.1 Notwithstanding the provisions of clauses contained in this RFS document; the contractor shall not be liable to forfeit (a) Security deposit for delay and (b)

termination of contract; if he is unable to fulfill his obligation under this contract due to force majeure conditions.

30.2 For purpose of this clause, "Force Majeure" means an event beyond the control of the contractor and not involving the contractor's fault or negligence and not foreseeable, either in its sovereign or contractual capacity. Such events may include but are not restricted to Acts of God, wars or revolutions, fires, floods, epidemics, quarantine restrictions and fright embargoes etc. Whether a "Force majeure" situation exists or not, shall be decided by ANERT and its decision shall be final and binding on the contractor and all other concerned.

30.3 In the event that the contractor is not able to perform his obligations under this contract on account of force majeure, he will be relieved of his obligations during the force majeure period. In the event that such force majeure extends beyond six months, ANERT has the right to terminate the contract in which case, the security deposit shall be refunded to him.

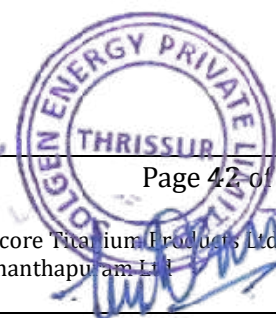
30.4 If a force majeure situation arises, the contractor shall notify ANERT in writing promptly, not later than 14 days from the date such situation arises. The contractor shall notify ANERT not later than 3 days of cessation of force majeure conditions. After examining the cases, ANERT shall decide and grant suitable additional time for the completion of the work, if required.

32. LANGUAGE

All documents, drawings, instructions, design data, calculations, operation, maintenance and safety manuals, reports, labels and any other data shall be in English Language. The contract agreement and all correspondence between ANERT and the bidder shall be in English language.

33. OTHER CONDITIONS

32.1 The Successful bidder shall not transfer, assign or sublet the work under this contract or any substantial part thereof to any other party without the prior consent of ANERT in writing.



32.2 The Successful bidder shall not display the photographs of the work and not take advantage through publicity of the work without written permission of ANERT.

32.3 The Successful bidder shall not make any other use of any of the documents or information of this contract, except for the purposes of performing the contract.

32.4 Successors and Assigns:

In case ANERT or Successful bidder may undergo any merger or amalgamation or a scheme of arrangement or similar re-organization & this contract is assigned to any entity (ies) partly or wholly, the contract shall be binding mutatis mutandis upon the successor entities & shall continue to remain valid with respect to obligation of the successor entities.

32.5 Severability:

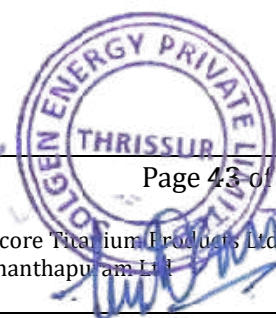
It is stated that each paragraph, clause, sub-clause, schedule or annexure of this contract shall be deemed severable & in the event of the unenforceability of any paragraph, clause sub-clause, schedule or the remaining part of the paragraph, clause, sub-clause, schedule annexure & rest of the contract shall continue to be in full force & effect.

32.6 Counterparts

This contract may be executed in one or more counterparts, each of which shall be deemed an original & all of which collectively shall be deemed one of the same instruments.

32.7 Rights and Remedies under the contract only for the parties

This contract is not intended & shall not be construed to confer on any person other than the ANERT & Successful bidder hereto, any rights and / or remedies herein.



BID EVALUATION

34. BID EVALUATION

The evaluation process comprises the following four steps:

Step I - Responsiveness check of Techno Commercial Bid

Step II - Evaluation of Bidder's fulfilment of Eligibility Criteria as per Clause 16

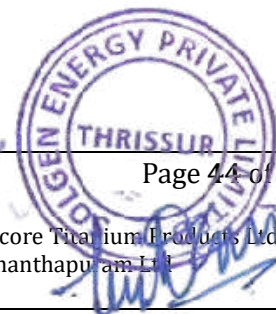
Step III - Evaluation of Price Bid

Step IV - Successful Bidders(s) selection

I. Responsiveness check of Techno Commercial Bid

The Techno Commercial Bid submitted by Bidders shall be scrutinized to establish responsiveness to the requirements laid down in the RFS subject to Clause 16.1 and Clause 16.2. Any of the following may cause the Bid to be considered "non-responsive", at the sole discretion of ANERT:

- a. Bids that are incomplete, i.e. not accompanied by any of the applicable formats inter alia covering letter, power of attorney supported by a board resolution, applicable undertakings, format for disclosure, etc.;
- b. Bid not signed by authorized signatory and /or stamped in the manner indicated in this RFS;
- c. Material inconsistencies in the information /documents submitted by the Bidder, affecting the Eligibility Criteria;
- d. Information not submitted in the formats specified in this RFS;
- e. Bid being conditional in nature;
- f. Bid having Conflict of Interest;
- g. More than one Member of a Bidding Company using the credentials of the same Parent Company /Affiliate;
- h. Bidder delaying in submission of additional information or clarifications sought by ANERT as applicable;
- i. Bidder makes any misrepresentation.



Each Bid shall be checked for compliance with the submission requirements set forth in this RFS before the evaluation of Bidder's fulfilment of Eligibility Criteria is taken up. Clause 16.2 shall be used to check whether each Bidder meets the stipulated requirement.

33.1 Preliminary Examination

33.1.1 ANERT will examine the Bids to determine whether they are complete, whether any computational errors have been made, whether required sureties have been furnished, whether the documents have been properly signed and stamped and whether the Bids are otherwise in order.

33.1.2 Arithmetical errors will be rectified on the following basis. If there is a discrepancy between the unit price and the total Amount that is obtained by multiplying the unit price and quantity, the unit price shall prevail and the total amount shall be corrected. If there is a discrepancy between words and figures, the amount written in words will prevail.

II. Evaluation of Bidder's fulfilment of eligibility criteria

Evaluation of Bidder's Eligibility will be carried out based on the information furnished by the Bidder as per the prescribed Formats and related documentary evidence in support of meeting the Eligibility Criteria as specified in Clause 16.2. Non-availability of information and related documentary evidence for the satisfaction of Eligibility Criteria may cause the Bid to be non-responsive.

III. Evaluation of Price Bid

The Price Bid of only the Qualified Bidders shall be opened in presence of the representatives of such Qualified Bidders, who wish to be present, on a date as may be intimated by ANERT to the Bidders through ANERT. The evaluation of Price Bid shall be carried out based on the information furnished in the BoQ. The Price Bid submitted by the Bidders shall be scrutinized to ensure conformity with the RFS. Any Bid not meeting any of the requirements of this RFS may cause the Bid to be considered "non-responsive" at the sole decision of the ANERT.

IV. Successful Bidder(s) Selection

- i. Bids qualifying in Clause 16.2 shall only be evaluated in this stage.
- ii. The Price Bids of Qualified Bidders shall be ranked from the lowest to the highest. The lowest bidder will be declared as the successful bidder.
- iii. Letter of Acceptance (LOA): The Letter of Acceptance (LOA) shall be issued to Successful Bidder selected as per the provisions of this Clause 33
- iv. The Successful Bidder shall acknowledge the LoA and return duplicate copy with signature & stamp of the authorized signatory of the Successful Bidder to ANERT within Seven (7) days of issue of LoA.
- v. If the Successful Bidder, to whom the Letter of Acceptance has been issued does not fulfil any of the conditions specified in Bid document, ANERT reserves the right to annul/cancel the award of the Letter of Acceptance of the Successful Bidder and forfeit the Bid security.
- vi. ANERT at its own discretion, has the right to reject any or all the Bids without assigning any reason whatsoever, at its sole discretion

35. NOTIFICATION TO SUCCESSFUL BIDDERS

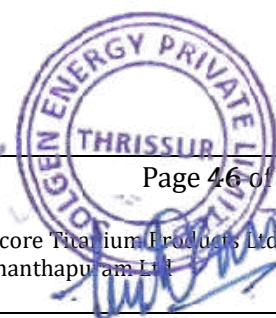
The name of Successful Bidder shall be notified indicating the awarded project price individually through letter of acceptance.

36. REQUIREMENT OF APPROVALS ON MAKES OF THE COMPONENTS:

The modules should be manufactured in India only. Rest of the components can be procured from any source. However, these items should meet the Technical specification and standards mentioned in RFS.

37. OPERATION OF THE SYSTEM DURING WEEKENDS AND GENERAL HOLIDAYS AND CALCULATION OF CUF:

During grid failure, the SPV system stops generating. Any instances of grid failure need to be mentioned in the monthly report and those instances need to be authorised by local DISCOM. Then the period will be excluded in calculation of CUF.



38. COMMERCIAL OPERATION DATE:

38.1 Document Submission for Issue Commissioning/ Completion Certificate:

The following documents will be deemed to form the completion documents:

- a. Project completion report from successful bidder as per ANERT format
- b. Project completion/satisfaction certificate from ANERT.

38.2 Commercial Operation Date

If the results of system acceptance testing indicate that the System is capable of generating electric energy (at full rated kWp) for 3 continuous days using such instruments and meters as have been installed for such purposes, then the power producer shall send a written notice to Employer to that effect, and the date of successful conducting such tests and injection of power at delivery point shall be the "Commercial Operation Date"

39. CORRUPT OR FRAUDULENT PRACTICES

The Successful Bidders/ Contractors should follow the highest standard of ethics during the execution of contract. In pursuance of this policy, ANERT:

39.1 defines, for the purposes of this provision, the terms set forth as follows:

- a. "corrupt practice" means the offering, giving, receiving or soliciting of anything of value to influence the action of a public official in the bid process or in contract execution; and
- b. "fraudulent practice" means a misrepresentation of facts in order to influence a bid process or the execution of a contract to the detriment of ANERT/Govt. scheme, and includes collusive practice among Bidders (prior to or after Bid submission) designed to establish Bid prices at artificial non-competitive levels and to deprive ANERT of the benefits of free and open competition;
- c. will declare a firm ineligible/debarred, either indefinitely or for a specific period of time, a GOVT contract if at any time it is found that the firm has engaged in corrupt or fraudulent practices in competing for, or in executing, a Government/ ANERT schemes.



**AGENCY FOR NEW & RENEWABLE ENERGY
RESEARCH AND TECHNOLOGY (ANERT)**

Department of Power, Government of Kerala
Thiruvananthapuram, Kerala – 695 033;
www.ANERT.gov.in , projects@ANERT.in

E-TENDER DOCUMENT

***Request for Selection (RFS) of agency for the
Implementation of 2 MW Solar Power Plant at
Travancore Titanium Products Ltd., Kochuveli,
Thiruvananthapuram under Solar City project funded
by Smart City Thiruvananthapuram Ltd***

Ref. No.: ANERT-TECH/99/2022-T2

VOL – 3: TECHNICAL SPECIFICATIONS

Date of Publishing of Bids : - 12/04/2023

Last Date of Submission of Bids : - 26/04/2023



TECHNICAL SPECIFICATIONS

The proposed projects shall be commissioned as per the technical specifications given below.

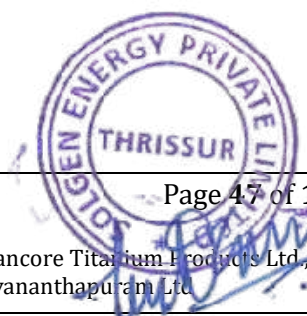
40. DEFINITION

A Grid Tied Solar Photo Voltaic (SPV) power plant consists of SPV array, Module Mounting Structure, Power Conditioning Unit (PCU) consisting of Maximum Power Point Tracker (MPPT), Inverter, and Controls & Protections, interconnect cables and switches. PV Array is mounted on a suitable structure. Grid tied SPV system do not have battery backup and should be designed with necessary features to supplement the grid power during day time. Components and parts used in the SPV power plants including the PV modules, metallic structures, cables, junction box, switches, PCUs etc., should conform to the BIS or IEC or international specifications, wherever such specifications are available and applicable.

Solar PV system shall consist of following equipments/components.

- Solar PV modules consisting of required number of **Crystalline** PV modules.
- Grid interactive Power Conditioning Unit with Remote Monitoring System
- Mounting structures
- String Monitoring Units / Junction Boxes.
- Power evacuation system
- Earthing and lightening protections.
- IR/UV protected PVC Cables, pipes and accessories
- RTTU / Metering

The detailed list of certifications and standards to be followed are given in annexure – F



41. SYSTEM COMPONENTS - TECHNICAL COMPLIANCE FOR SYSTEM COMPONENTS

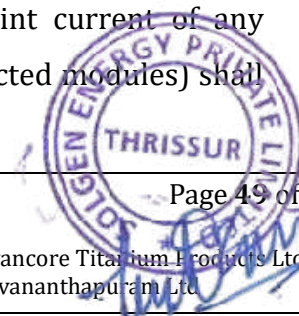
S/N	System Component	Capacity/ rating	Minimum Technical Compliance
1.	Solar panel (MONO PERC Half cut of capacity 600 Wp or above)	As per the required capacity	IS 14286 - Design Qualification and Type Approval for Crystalline Silicon Terrestrial Photovoltaic (PV) Modules IEC/IS 61730: Part I & II;
2.	Grid Tied Inverter (DC to AC ratio of 1.2 to be maintained at all sites)	As per the required capacity	IS 16221: Part 1 & 2 - Safety of Power Converters for use in Photovoltaic Power Systems IS 16169 - Test Procedure of Islanding Prevention Measures for Utility-Interconnected Photovoltaic Inverters
3.	Module Mounting Structure	As per the required capacity	IS 2062 - Hot Rolled Medium and High Tensile structural Steel IS 4759 - Hot-dip Zinc Coatings on structural steel and other products
4.	Cables	As required	IEC 60227 / IS 694 IEC 60502 / IS 1554 (Pt. I & II)
5.	Switches/ Circuit Breakers	As required	IEC 60947 part I, II, III / IS 60947 Part I, II, III
6.	Connectors		EN 50521
7.	Surge Protection Device		IEC 60364-5-53 / IS 15086-5
8.	Junction Boxes/Enclosures for Inverters/ Charge Controllers	As required	IP 54 (for outdoor) or IP 65 / IP 21(for indoor) as per IEC 529
9.	Energy Meter for Recording Solar Electricity Generated & Two-way meter for Distribution Licensee grid connection		As per CEA Regulations; IEC 60687/ IEC 62052-11 / IEC 62053-22 / IS 14697
10.	Lightning Protection	As required	As per IEC 62305 / IEC 62561
11.	Electrical Grounding (Earthing)	As required	As per IS 3043

42. SOLAR PHOTOVOLTAIC MODULES:

42.1 The PV modules used should be made in India and should be from the ALMM list issued by MNRE from time to time of Mono PERC type having module capacity of 600Wp or above.

42.2 The PV modules used must qualify to the latest edition BIS standards for Crystalline Silicon Solar Cell Modules - IS 14286. In addition, the modules must conform to IEC 61730 Part-2- requirements for construction & Part 2 – requirements for testing, for safety qualification or equivalent IS.

- i. For the PV modules to be used in a highly corrosive atmosphere throughout their lifetime, they must qualify to IEC 61701/IS 61701
- ii. The total solar PV array capacity should not be less than 2 MWp and should comprise of solar crystalline modules of MONO PERC type of minimum 525 Wp and above wattage. Module capacity less than minimum 525 watts shall not be accepted. Inspection of testing of PV array will be conducted by the Tendering Authority including identification of panels ready for dispatch to be confirmed with details provided in RFID tag using RFID reader at site during FAT. The RFID details of each module shall be issued to the employer during FAT.
- iii. Protective devices against surges at the PV module shall be provided. Low voltage drop bypass diodes shall be provided.
- iv. PV modules must be tested and approved by one of the BIS approved test centers.
- v. The module frame shall be made of corrosion resistant materials, preferably having anodized aluminum.
- vi. The bidder shall carefully design & accommodate requisite numbers of the modules to achieve the rated power in his bid. ANERT shall allow only minor changes at the time of execution.
- vii. Other general requirement for the PV modules and subsystems shall be the Following:
 - a. The rated output power of any supplied module shall have tolerance of $\pm 3\%$.
 - b. The peak-power point voltage and the peak-power point current of any supplied module and/or any module string (series connected modules) shall



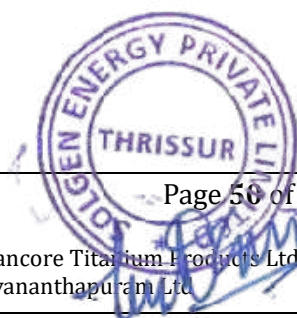
not vary by more than 2 (two) per cent from the respective arithmetic means for all modules and/or for all module strings, as the case may be.

- c. The module shall be provided with a junction box with either provision of external screw terminal connection or sealed type and with arrangement for provision of by-pass diode. The box shall have hinged, weather proof lid with captive screws and cable gland entry points or may be of sealed type and IP-65 rated.
 - d. IV curves at STC should be provided by bidder.
- 42.3 Modules deployed must use a RF identification tag. The following information must be mentioned in the RFID used on each module (This can be inside or outside the laminate, but must be able to withstand harsh environmental conditions).
- a. Name of the manufacturer of the PV module
 - b. Name of the manufacturer of Solar Cells.
 - c. Month & year of the manufacture (separate for solar cells and modules)
 - d. Country of origin (separately for solar cells and module)
 - e. I-V curve for the module Wattage, I_m , V_m and FF for the module
 - f. Unique Serial No and Model No of the module
 - g. Date and year of obtaining BIS PV module qualification certificate.
 - h. Name of the test lab issuing BIS certificate.
 - i. Other relevant information on traceability of solar cells and module as per ISO 9001 and ISO 14001

42.4 Warranties:

A. Material Warranty:

- i. Material Warranty is defined as: The manufacturer should warrant the Solar Module(s) to be free from the defects and/or failures specified below for a period not less than five (10) years from the date of sale to the original customer ("Customer")
- ii. Defects and/or failures due to manufacturing
- iii. Defects and/or failures due to quality of materials



- iv. Non conformity to specifications due to faulty manufacturing and/or inspection processes. If the solar Module(s) fails to conform to this warranty, the manufacturer will repair or replace the solar module(s), at the Owners sole option

B. Performance Warranty:

- i. The predicted electrical degradation of power generated not more than 10% after ten years' period and not exceeding 20% of the minimum rated power over the 25-year period and of the full rated original output.

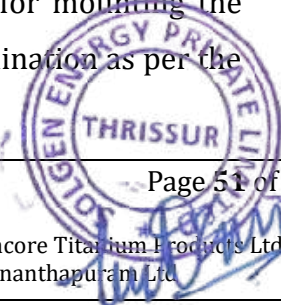
42.5 Use of advance cell technologies

- a. The Contractor shall try to maximize the output within the allocated area. The contractor is allowed to propose use of new and better technology. (Eg. Bifacial Modules)
- b. Additionally, the bidder at bidding stage may propose modern methods for maintenance & cleaning of the plant. Technology employing drone, cleaning methods without water, which will automate the maintenance and reduce the cost of maintenance may be proposed.
- c. Based on the technology employed, the contractor has to design, Electrical System Features, Architecture and Structural requirement and the same shall be implemented with the prior approval of ANERT. The tenderer at tender stage shall submit the details of the technology proposed. The tender submission shall also include the proposed modified structure also. The capacity mentioned in the tender is indicative and extra capacity over and above the indicative capacity mentioned will be permitted, based on the technology proposed and employed.

43. ARRAY STRUCTURE

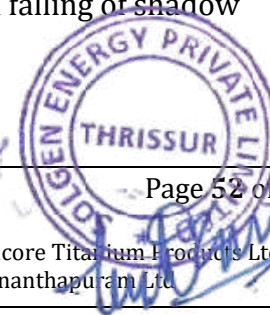
43.1 For Ground Mounted:

- a. Hot dip galvanized MS as per specifications BIS 2062 or shall be cold formed light gauge structural steel sections with IS 811: 1987/IS 801: 1975 having galvanization thickness as per BIS 4759 -amended upto date; may be used for mounting the modules/ panels/arrays. Each structure should have angle of inclination as per the



site conditions to take maximum insolation. However, to accommodate more capacity the angle inclination may be reduced until the plant meets the specified performance ratio requirements.

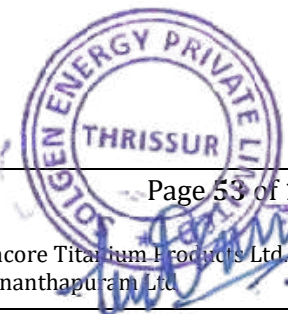
- b. The Mounting structure shall be so designed to withstand the speed for the wind zone of the location where a PV system is proposed to be installed (min wind speed of 150 km/ hour). It may be ensured that the design has been certified by a recognized Lab/ Institution in this regard and submit wind loading calculation sheet to ANERT. Suitable fastening arrangement such as grouting and calming should be provided to secure the installation against the specific wind speed. The array design shall be submitted with the STAAD structural design report for the materials used with relevant IS.
- c. Structural material shall be corrosion resistant and electrolytically compatible with the materials used in the module frame, its fasteners, nuts and bolts. Aluminium structures also can be used which can withstand the wind speed of respective wind zone. Necessary protection towards rusting need to be provided either by coating or anodization.
- d. The fasteners used should be made up of stainless steel. The structures shall be designed to allow easy replacement of any module. The array structure shall be so designed that it will occupy minimum space without sacrificing the output from the SPV panels
- e. Regarding civil structures, the bidder needs to take care of the load bearing capacity of the soil at the site of installation. The soil is fine sand and specific care is to be taken while designing the foundation. The foundation design must be submitted to ANERT duly certified by a chartered structural engineer before start of works.
- f. The minimum clearance of the structure from the ground level should be 200 mm for ground mounted installations
- g. The array will be installed on steel racking structures that are anchored in the ground. Racks will be laid out in parallel matrices allowing for individuals to access the area between the racks for cleaning and other maintenance needs. In between the row of solar panels sufficient gap need to be provided to avoid falling of shadow



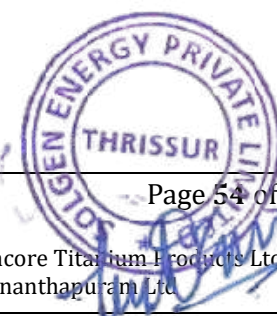
of previous row on the next row. Seismic factors for the site will be considered while making the design of the foundation.

43.2 For Ground Mounted:

- a. Photovoltaic arrays must be mounted on a stable, durable structure that can support the array and withstand wind, rain, and other adverse conditions. The modules will be fixed on structures with fixed arrangement.
- b. The module mounting structures shall have adequate strength and appropriate design suitable to the locations, which can withstand the load and high wind velocities. Stationary structures shall support PV modules at a given orientation, absorb and transfer the mechanical loads to the surface properly.
- c. Wherever required, suitable number of PV panel structures shall be provided. Structures shall be of flat-plate design using minimum size of C (75 x 40 x 5mm) or L (55 x 55 x 5mm) or I (60x 40x 4mm) sections or higher dimensions for respective sections.
- d. Each structure with fixed tilt should have a tilt angle as per the site conditions to take maximum insolation which will be approximately equal to the latitude of the location facing true South with a North - South orientation. The tilt angle can vary from 9 degree to 12 degree based on the location's latitude in Kerala
- e. The PV module mounting structure shall have a capacity to withstand a wind velocity of 150 km/hr unless specified for dedicated requirements
- f. Suitable fastening arrangement such as grouting and calming should be provided to secure the installation against the specific wind speed. The PV array structure design shall be appropriate with a factor of safety of min 1.5.
- g. The materials used for structures shall be Hot dip Galvanized Mild Steel conformed to IS 2062:1992 or aluminium of suitable grade minimum alloy 6063 or better.
- h. The minimum thickness of galvanization for hot dip Galvanized Mild Steel should be at least 80 microns as per IS 4759. The galvanisation thickness will be checked during inspection and the vendor is to arrange the equipment needed for the same at the site.



- i. The Bolts, Nuts, fasteners, and clamps used for panel mounting shall be of Stainless-Steel SS 304.
- j. Structures shall be supplied complete with all members to be compatible for allowing easy installation at the site. Additional Structures/Frames for required for the installation of modules if any need to be provided by the bidder.
- k. The structures shall be designed to allow easy replacement of any module, repairing and cleaning of any module. No Welding is allowed on the mounting structure. Adequate spacing shall be provided between two panel frames and rows of panels to facilitate personnel protection, ease of installation, replacement, cleaning of panels and electrical maintenance
- l. Aluminium structures used shall be protected against rusting either by coating or anodization. Aluminium frames should be avoided for installations in coastal areas.
- m. The structure shall be designed to withstand operating environmental conditions for a period of minimum 25 years. And shall be free from corrosion while installation.
- n. Screw fasteners shall use existing mounting holes provided by module manufacturer. No additional holes shall be drilled on module frames
- o. The total load of the structure (when installed with PV modules) on the roof should be less than 60 kg/m².
- p. Minimum distance between the lower level of PV Module and the ground shall be 0.6m from the ground level.
- q. The PV Panel area shall be accessible for cleaning and for any repair work.
- r. Sufficient gap needs to be provided between the rows to avoid falling of shadow of one row on the next row. Seismic factors for the site will be considered while making the design of the foundation.
- s. Adequate spacing shall be provided between any two modules secured on PV panel for improved wind resistance.
- t. Installation of structure for solar PV mounting should not tamper with the water proofing of the roofs.



43.3 The Rooftop Structures may be classified in three broad categories as follows (drawings at **Annexure-G**). The bidders are required to quote the rates for each separately in the financial bid:

i. Ballast structure

- a. The mounting structure must be Non-invasive ballast type and any sort of penetration of roof to be avoided.
- b. The minimum clearance of the structure from the roof level should be in between 70 - 150 mm to allow ventilation for cooling, also ease of cleaning and maintenance of panels as well as cleaning of terrace.
- c. The structures should be suitably loaded with reinforced concrete blocks of appropriate weight made out of M25 concrete mixture.

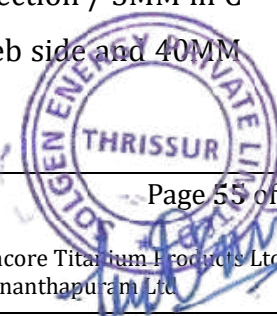
ii. Tin shed

- a. The structure design should be as per the slope of the tin shed.
- b. The inclination angle of structure can be done in two ways
 - b.1. Parallel to the tin shed (flat keeping zero-degree tiling angle), if the slope of shed in Proper south direction
 - b.2. With same tilt angle based on the slope of tin shed to get the maximum output.
- c. The minimum clearance of the lowest point from the tin shade should be more than 100mm.
- d. The base of structure should be connected on the Purlin of tin shed with the proper riveting. e. All structure member should be of minimum 2 mm thickness.

iii. RCC Elevated structure: It can be divided into further three categories:

A. Minimum Ground clearance (300MM – 1000 MM)

- a. The structure shall be designed to allow easy replacement of any module and shall be in line with site requirement. The gap between module should be minimum 30MM.
- b. Base Plate – Base plate thickness of the Structure should be 5MM for this segment.
- c. Column – Structure Column should be minimum 2MM in Lip section / 3MM in C Channel section. The minimum section should be 70MM in Web side and 40MM in flange side in Lip section.



- d. Rafter - Structure rafter should be minimum 2MM in Lip section / 3MM in C Channel section. The minimum section should be 70MM in Web side (y-axis) and 40MM in flange side (x-axis).
- e. Purlin - Structure purlin should be minimum 2MM in Lip section. The minimum section should be 60MM in Web side and 40MM in flange side in Lip section.
- f. Front/back bracing – The section for bracing part should be minimum 2MM thickness.
- g. Connection – The structure connection should be bolted completely. Leg to rafter should be connected with minimum 12 diameter bolt. Rafter and purlin should be connected with minimum 10 diameter bolt. Module mounting fasteners should be SS-304 only and remaining fasteners either SS-304 or HDG 8.8 Grade.
- h. For single portrait structure the minimum ground clearance should be 500MM.

B. Medium Ground clearance (1000MM – 2000 MM)

- a. Base Plate – Base plate thickness of the Structure should be Minimum 6MM for this segment.
- b. Column – Structure Column should be minimum 2MM in Lip section / 3MM in C-Channel section. The minimum section should be 80MM in Web side and 50MM in flange side in Lip section.
- c. Rafter - Structure rafter should be minimum 2MM in Lip section / 3MM in C Channel section. The minimum section should be 70MM in Web side and 40MM in flange side in Lip section.
- d. Purlin - Structure purlin should be minimum 2MM in Lip section. The minimum section should be 70MM in Web side and 40MM in flange side in Lip section.
- e. Front/back bracing – The section for bracing part should be minimum 2MM thickness.
- f. Connection – The structure connection should be bolted completely. Leg to rafter should be connected with minimum 12 diameter bolt. Rafter and purlin should be connected with minimum 10 diameter bolt. Module mounting fasteners should be SS-304 only and remaining fasteners either SS-304 or HDG 8.8 Grade.

C. Maximum Ground clearance (2000MM – 3000 MM)



- a. Base Plate – Base plate thickness of the Structure should be minimum 8 MM for this segment.
- b. Column – Structure Column thickness should be minimum 2.6MM in square hollow section (minimum 50x50) or rectangular hollow section (minimum 60x40) or 3MM in C-Channel section.
- c. Rafter - Structure rafter should be minimum 2MM in Lip section / 3MM in Channel section. The minimum section should be 80MM in Web side and 50MM in flange side in Lip section.
- d. Purlin - Structure purlin should be minimum 2MM in Lip section. The minimum section should be 80MM in Web side and 50MM in flange side in Lip section.
- e. Front/back bracing – The section for bracing part should be minimum 3MM thickness.
- f. Connection – The structure connection should be bolted completely. Leg to rafter should be connected with minimum 12 diameter bolt. Rafter and purlin should be connected with minimum 10 diameter bolt. Module mounting fasteners should be SS-304 only and remaining fasteners either SS-304 or HDG 8.8 Grade.

D. Super elevated structure (More than 3000 MM)

i. Base structure

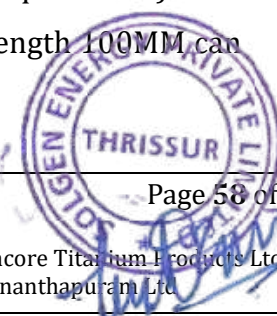
- b. Base Plate – Base plate thickness of the Structure should be 10MM for this segment.
- c. Column – Structure Column minimum thickness should be minimum 2.9MM in square hollow section (minimum 60x60) or rectangular hollow section (minimum 80x40).
- d. Rafter - Structure Rafter minimum thickness should be minimum 2.9MM in square hollow section (minimum 60x60) or rectangular hollow section (minimum 80x40)



- e. Cross bracing – Bracing for the connection of rafter and column should be of minimum thickness of 4mm L-angle with the help of minimum bolt diameter of 10mm.

ii. Upper structure of super elevated structure

- a. Base Plate – Base plate thickness of the Structure should be minimum 5MM for this segment.
 - b. Column – Structure Column should be minimum 2MM in Lip section / 3MM in Channel section. The minimum section should be 70MM in Web side and 40MM in flange side in Lip section.
 - c. Rafter - Structure rafter should be minimum 2MM in Lip section / 3MM in Channel section. The minimum section should be 70MM in Web side and 40MM in flange side in Lip section.
 - d. Purlin - Structure purlin should be minimum 2MM in Lip section. The minimum section should be 60MM in Web side and 40MM in flange side in Lip section.
 - e. Front/back bracing – The section for bracing part should be minimum 2MM thickness.
 - f. Connection – The structure connection should be bolted completely. Leg to rafter should be connected with minimum 12 diameter bolt. Rafter and purlin should be connected with minimum 10 diameter bolt. Module mounting fasteners should be SS-304 only and remaining fasteners either SS-304 or HDG 8.8 Grade.
- iii. If distance between two legs in X-Direction is more than 3M than sag angle/Bar should be provide for purlin to avoid deflection failure. The sag angle should be minimum 2MM thick, and bar should be minimum 12Dia.
- iv. Degree - The Module alignment and tilt angle shell be calculated to provide the maximum annual energy output. This shall be decided on the location of array installation
- v. Foundation – Foundation should be as per the roof condition; two types of the foundation can be done- either penetrating the roof or without penetrating the roof.
- a) If penetration on the roof is allowed (based on the client requirement) then minimum 12MM diameter anchor fasteners with minimum length 100MM can

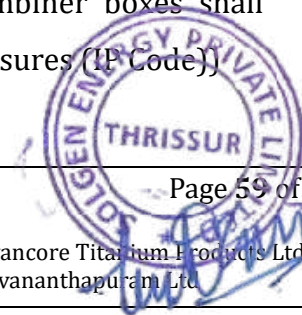


be used with proper chipping. The minimum RCC size should be 400x400x300 cubic mm. Material grade of foundation should be minimum M20.

- b) If penetration on roof is not allowed, then foundation can be done with the help of 'J Bolt' (refer IS 5624 for foundation hardware). Proper Neto bond solution should be used to adhere the Foundation block with the RCC roof. Foundation J - bolt length should be minimum 12MM diameter and length should be minimum 300MM.

44. ARRAY JUNCTION BOXES (JBs)

- a. The junction boxes are to be provided in the PV array for termination of connecting cables. The J. Boxes (JBs) shall be made of GRP/FRP/Powder Coated Aluminum /cast aluminum alloy with full dust, water & vermin proof arrangement. All wires/cables must be terminated through cable lugs. The JB's shall be such that input & output termination can be made through suitable cable glands.
- b. Copper bus bars/terminal blocks housed in the junction box with suitable termination threads Conforming to IP65 standard and IEC 62208 Hinged door with EPDM rubber gasket to prevent water entry. Single / double compression cable glands, Provision for earthing the box must be provided.
- c. Each Junction Box shall have High quality Suitable Capacity Metal Oxide Varistors (MOVs) / SPDs, suitable Reverse Blocking Diodes. The Junction Boxes shall have suitable arrangement monitoring and disconnection for each of the groups. Each string combiner box/ junction box will have suitable Reverse Blocking Diodes of maximum DC blocking voltage of 600 / 1000V or as per the system requirement with suitable arrangement for its connecting.
- d. Suitable markings shall be provided on the bus bar for easy identification and the cable ferrules must be fitted at the cable termination points for identification
- e. The junction boxes/ enclosures should be IP 65(for outdoor)/ IP 54 (indoor) and as per IEC 529 specifications. The Junction boxes / string combiner boxes shall conform to IEC 60529 (Degrees of Protection provided by Enclosures (IP Code))

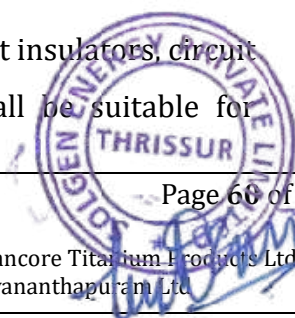


45. DC DISTRIBUTION BOARD:

- a. DC Distribution panel to receive the DC output from the array field. DC generated by the solar modules is transmitted through the appropriate cables from Array Yard to Control facility. DC bus & panel should be provided for the incoming DC supply from array yard. The panel should consist of adequate size.
- b. DC DPBs shall have sheet from enclosure of dust & vermin proof conform to IP 65 protection. The bus bars are made of copper of desired size. Suitable capacity MCBs/MCCB shall be provided for controlling the DC power output to the PCU along with necessary surge arrestors.

46. AC DISTRIBUTION PANEL BOARD:

- a. AC Distribution Panel Board (DPB) shall control the AC power from PCU/ inverter, and should have necessary surge arrestors. Output from the inverter shall be fed to the ACDB through 4 pole MCCB of suitable current rating and multifunction export solar meter.
- b. All switches and the circuit breakers, connectors should conform to IEC 60947, part I, II and III/ IS60947 part I, II and III.
- c. The changeover switches, cabling work should be undertaken by the bidder as part of the project.
- d. All the Panel's shall be metal clad, totally enclosed, rigid, floor mounted, air - insulated, cubical type suitable for operation on three phase / single phase, 415 or 230 volts, 50 Hz
- e. The panels shall be designed for minimum expected ambient temperature of 45 degrees Celsius, 80 percent humidity and dusty weather.
- f. All indoor panels will have protection of IP54 or better. All outdoor panels will have protection of IP65 or better.
- g. Should conform to Indian Electricity Act and rules (till last amendment).
- h. All the 415 AC or 230 volts' devices / equipment like bus support insulators, circuit breakers, SPDs, VTs etc., mounted inside the switchgear shall be suitable for



continuous operation and satisfactory performance under the following supply conditions

Variation in supply voltage +/- 10 %

Variation in supply frequency +/- 3 Hz

47. PCU/ARRAY SIZE RATIO:

- a. The combined wattage of all inverters should not be less than 80% of rated capacity of DC power of the plant under STC.
- b. Maximum power point tracker shall be integrated in the PCU/inverter to maximize energy drawn from the array.

48. PCU/ INVERTER:

The Power Conditioning Unit shall be String Inverter with power exporting facility to the Grid. The DC to AC ratio of 1.25 is to be maintained at all sites. (For eg. – For DC capacity of 100 kWp, the AC capacity of minimum 80 kW is to be maintained). Preferred Makes – Fronius / ABB / SMA

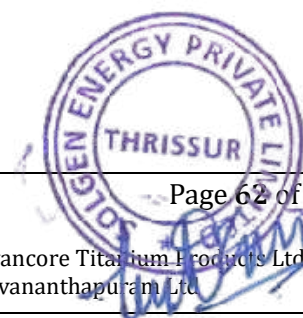
General Specifications:

48.1 All the Inverters should contain the following clear and indelible Marking Label & Warning Label as per IS16221 Part II, clause 5. The equipment shall, as a minimum, be permanently marked with:

- a. The name or trademark of the manufacturer or supplier.
- b. A model number, name or other means to identify the equipment.
- c. A serial number, code or other markings allowing identification of manufacturing location and the manufacturing batch or date within a three-month time period.
- d. Input voltage, type of voltage (A.C. or D.C.), frequency, and maximum continuous current for each input.
- e. Output voltage, type of voltage (A.C. or D.C.), frequency, maximum continuous current, and for A.C. outputs, either the power or power factor for each output.
- f. The Ingress Protection (IP) rating



- 48.2 The inverter output shall be 415 VAC, 50 Hz, 3 phase.
- 48.3 The inverter shall include appropriate self-protective and self-diagnostic feature to protect itself and the PV array from damage in the event of inverter component failure or from parameters beyond the inverter's safe operating range due to internal or external causes.
- 48.4 PCU shall have the dynamic and efficient MPPT algorithm behaviour which finds maximum power point even in low light conditions. The PCU Company should be able to display this feature.
- 48.5 The PCU shall be supplied with in-built advanced grid feed-in feature along with dynamic feed-in control considering self-consumption. The PCU shall also include control functions for optimum feed-in of reactive power and effective power. The amount of reactive power injection and absorption can be controlled depending upon under/over excited systems.
- 48.6 The PCU shall have a provision of external shutdown via remote signal separately with an in-built floating-point contact or similar option using any minimum interface which is to ensure the emergency stop function in the inverter
- 48.7 The PCU shall have a higher degree of ingress protection of IP 65 to handle robust environment conditions from dust and water ingress under complete outdoor installations.
- 48.8 The data logger should possess the feature of extracting the data externally with open protocols like Modbus TCP/RTU. The manufacturer should provide the Modbus register mapping file to utilise this feature
- 48.9 **The inverter shall have an efficient cooling concept with better power derating feature to handle higher temperatures and ensure the best efficiency. The inverter shall be able to provide full rated output power even at ambient temperatures of 50°C. The manufacturer to provide the power derating curves to demonstrate the same.**
- 48.10 The inverter shall be flexible in terms of the installation and should be capable for installation in a horizontal position facilitating easy installation for site specific requirements.



- 48.11 The inverter shall have an integrated feature of emergency stop to halt the inverter from operation considering safety scenarios
- 48.12 The PCU manufacturer should have an authorised service centre in Kerala. The details of the service centre along with the spare list must be submitted along with the bid.
- 48.13 **PCU should be able to respond smoothly to the voltage fluctuations on the low-tension grid via active & reactive power control/ support. The PCU should be able to respond separately to fulfil below mentioned:**
- 48.13.1 Finding out optimisation of the system**
- 48.13.2 Optimal power distribution on each phase**
- 48.13.3 Prevent PCU from unnecessary disconnections**
- 48.14 The PCU Company should have grid connected solar plants running in the country with inverters at least 7 years from the time of bidding to showcase the service reliability and long-term presence. Also, the PCU should have local presence in the county for at least last 5 years. The PCU manufacturer to provide details to authenticate the same.
- 48.15 The Technical Specification of On-Grid Inverters are summarized below:

Specifications of Inverters	
Parameters	Detailed specification
Nominal voltage	230V/415V
Voltage Band	Between 80% and 110% of V nominal
Nominal Frequency	50 Hz
Operating Frequency Range	47.5 to 50.5 Hz
Waveform	Sine wave
Harmonics	AC side total harmonic current distortion < 3%
Ripple	DC Voltage ripple content shall be not more than 1%
Efficiency	Efficiency shall be >98%
Casing protection levels	Degree of protection: Min IP-65
Operating ambient Temp range	-10 to + 60 degree Celsius
Operation	Completely automatic including wakeup, synchronization (phase locking) and shut down
MPPT	MPPT range must be suitable to individual array voltages

Specifications of Inverters	
Parameters	Detailed specification
Protection Class	1
Protections	Over voltage: both input and output Over current: both input and output Over / Under grid frequency Over temperature Short circuit Lightning Surge voltage induced at output due to external source Islanding
Ingress Protection	IP 65
Recommended LED indications	ON Grid ON Under/ Over voltage Overload Over temperature
Recommended LCD Display on front Panel	DC input voltage DC current AC Voltage (all 3 phases) AC current (all 3 phases) Frequency Ambient Temperature Instantaneous power Cumulative output energy Cumulative hours of operation Daily DC energy produced
Communication Interface	RS485/ RS232/Wi-Fi (with or without USB)

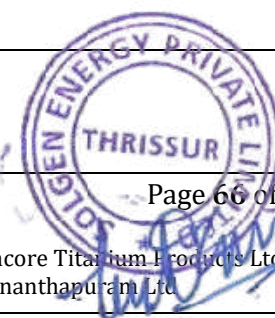
48.16 The Technical Specification for Interconnection are summarized below:

Sl No	Parameters	Requirements	Reference
1	Overall conditions of service	Reference to regulations	Conditions for Supply of Electricity
2	Overall Grid Standards	Reference to regulations	Central Electricity Authority (Grid standards) Regulations 2010

3	Equipment	Applicable industry standards	IEC/EN standards
4	Safety and Supply	Reference to regulations, (General safety requirements	Central Electricity Authority (Measures of safety and electricity supply) Regulations, 2010 and subsequent amendments
5	Meters	Reference to regulations and additional conditions issued by the commission.	Central Electricity Authority (Installation & operation of meters) regulations 2006 and subsequent amendments
6	Harmonic current	Harmonic current injections from a generating station shall not exceed the limits specified in IEEE 519	IEEE 519 relevant CEA (Technical Standards for connectivity of the distributed generation resource) Regulations 2013 and subsequent amendments
7	Synchronization	Photovoltaic system must be equipped with a grid frequency synchronization device, if the system is using synchronizer inherently built in to the inverter, then no separate synchronizer is required	Relevant CEA (Technical Standards for Connectivity of the distributed generation resources) regulations 2013 and subsequent amendments.
8	Voltage	The voltage-operating window should minimize nuisance tripping and should be under operating range of 80% to 110% of the nominal connected voltage. beyond the clearing time of 2 seconds, the Photovoltaic system must isolate itself from the grid	
9	Flicker	Operation of Photovoltaic system should not cause	Relevant CEA regulations 2013 and subsequent if

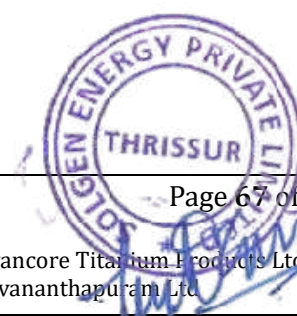
		voltage flicker in excess of the limits stated in IEC 61000 or other equivalent Indian standards if any	any, (Technical standards for connectivity of the distributed generation resource)
10	Frequency	When the distribution system frequency deviates outside the specified limits (50.5 Hz on upper side and 47.5 Hz on lower side) up to 0.2 sec, the Photovoltaic systems shall automatically disconnect from grid and be in island mode.	
11	DC injection	Photovoltaic system shall not inject DC current greater than 0.5% of full rated output at the interconnection point or 1% rated inverter output current into distribution system under any operating conditions.	
12	Power Factor	While the output of the inverter is greater than 50%, a lagging power factor greater than 0.9 shall be maintained.	
13	Islanding and Disconnection	The photovoltaic system in the event of voltage or frequency variations must island/disconnect itself with the time stipulated as per IEC standards	
14	Overload and overheat	The inverter should have the facility to automatically switch off in case of overload or overheat and should restart when normal conditions are restored	

48.17 The Certifications of On-Grid Inverters are summarized below:



Standard	Description
IS 16221-2	Safety of Power Converters for use in Photovoltaic Power Systems Part 2 (Particular Requirements for Inverters)
IEC 61683	Photovoltaic systems - Power conditioners - Procedure for measuring efficiency
IEC 61727	Photovoltaic (PV) systems- Characteristics of the utility interface
IEC/EN 62109-1	Safety of power converters for use in photovoltaic power systems - Part 1: General requirements
IEC/EN 62109-2	Safety of power converters for use in photovoltaic power systems - Part 2: Particular requirements for inverters
IEC/EN 61000-3-3/ 3-11/ 3-5	Electromagnetic compatibility (EMC) - Part 3-11; Limits; Limitation of Voltage Change, Voltage Fluctuations and Flicker in Public Low- Voltage Supply Systems; Rated Current <16A / >16A and <75A / >75A per Phase respectively
IEC/EN 61000-3-2/ -3-12/ -3-4	Electromagnetic compatibility (EMC) - Part 3-12; Limits; Limits for Harmonic Currents produced by equipment connected to the public low voltage systems with Rated Current <16A / >16A and <75A / >75A per Phase respectively
*IEC/EN 61000-6-1 / 6-2	Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity standard for residential and commercial / industrial environments
*IEC/EN 61000-6-3 / 6-4	Electromagnetic compatibility (EMC) - Part 6-4: Generic standards - Emission standard for residential and commercial / industrial environments
IEC 62116 / IS 16169	Utility-interconnected photovoltaic inverters - Test procedure of islanding prevention measures
IEC 60068-2-1	Environmental testing - Part 2-1: Tests - Test A: Cold
IEC 60068-2-2	Environmental testing - Part 2-2: Tests - Test B: Dry heat
IEC 60068-2-14	Environmental testing - Part 2-14: Tests - Test N: Change of temperature
IEC 60068-2-30	Environmental testing - Part 2-30: Tests - Test Db; Damp heat, cyclic (12 h + 12 h cycle)

***Recommended but not mandatory**



49. INTEGRATION OF PV POWER WITH GRID:

The output power from SPV would be fed to the inverters which converts DC produced by SPV array to AC and feeds it into the main electricity grid after synchronization. In case of grid failure, or low or high voltage, solar PV system shall be out of synchronization and shall be disconnected from the grid.

50. REMOTE MONITORING SYSTEM

A dedicated Remote Monitoring System (Hardware and software) for monitoring the plant shall be provided even if the inverter has embedded data logging system. The following weather parameters are to be measured as part of the datalogging system.

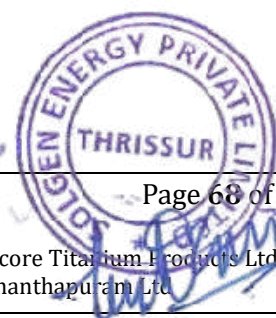
a) Solar Irradiance:

A Pyranometer/ Solar cell-based irradiation sensor (along with calibration certificate) shall be provided, with the sensor mounted in the plane of the array.

b) Temperature: Integrated temp, sensors for measuring the module surface temp., inverter inside enclosure temp, and ambient temp to be provided complete with readouts integrated with the data logging system.

It is recommended that the following important parameters shall be accessible through the Data Logging Facility.

- i. AC Voltage
- ii. AC Output current
- iii. Output Power
- iv. Energy in kWh
- v. DC Input Voltage
- vi. DC Input Current
- vii. Ambient Temperatures
- viii. Invertor Status
- ix. Irradiation
- x. Module temperature



Provision for Internet monitoring and download of historical data shall be incorporated. GSM Modem/Wi Fi modem in case GSM connectivity is used or Wireless Router + modem in case Ethernet connection is being used for remote access must be provided. The data is to be transmitted to ANERT server as well as to the Integrated Command and Control Centre (ICCC) developed by Smart City Thiruvananthapuram Ltd. The successful bidder has to undertake all the works required for such deployment including software and arrange for APIs etc.

51. PROTECTIONS

The system should be provided with all necessary protections like earthing, Lightning, and grid islanding as follows:

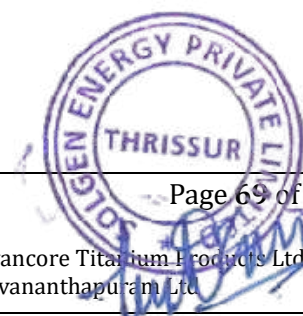
51.1 LIGHTNING PROTECTION

The SPV power plants shall be provided with lightning & overvoltage protection. The main aim in this protection shall be to reduce the over voltage to a tolerable value before it reaches the PV or other sub system components. The source of over voltage can be lightning, atmosphere disturbances etc. The entire space occupying the SPV array shall be suitably protected against Lightning by deploying required number of Lightning Arrestors. Lightning protection should be provided as per IS/IEC 62305 standard. The protection against induced high-voltages shall be provided by the use of metal oxide varistors (MOVs) and suitable earthing such that induced transients find an alternate route to earth.

51.2 SURGE PROTECTION

The system should have installed with Surge Protection Device (SPD) for higher withstand of the continuous PV-DC voltage during earth fault condition. SPD shall have safe disconnection and short circuit interruption arrangements through integrated DC in-built bypass fuse (parallel) which should get tripped driving failure mode of MOV, extinguishing DC arc safely in order to protect the installation against fire hazards. The SPD should be provided in the AC Distribution Box as well.

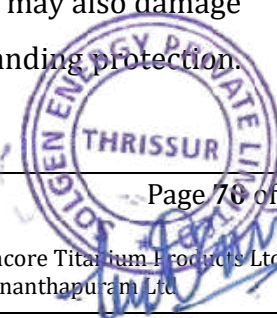
51.3 EARTHING PROTECTION



- i. Each array structure of the PV yard should be grounded/ earthed properly as per IS:3043-1987. In addition, the lighting arrester/masts should also be earthed inside the array field. Earth Resistance shall be tested in presence of the representative of ANERT as and when required after earthing by calibrated earth tester. PCU, ACDB and DCDB should also be earthed properly.
- ii. Earth resistance shall not be more than 5 ohms. It shall be ensured that all the earthing points are bonded together to make them at the same potential.
- iii. Earthing System shall connect all non-current carrying metal receptacles, electrical boxes, appliance frames, chassis and PV module mounting structures in one long run. The earth strips should not be bolted. Earthing GI strips shall be interconnected by proper welding.
- iv. Masonry enclosure with the earth pit of size not less than 400mm X 400mm (width) complete with cemented brick work (1:6) of minimum 500 mm depth duly plastered with cement mortar (inside), shall be provided. Hinged inspection covers of size not less than 300mm X 300mm with locking arrangement shall be provided. Suitable handle shall be provided on the cover by means of welding a rod on top of the cover for future maintenance.
- v. Earthing system must be interconnected through GI strip to arrive equipotential bonding. The size of the GI earth strip must be minimum 25mm X 6mm.
- vi. The complete earthing system shall be mechanically and electrically connected to provide independent return to earth. All three-phase equipment shall have two distinct earth connections. An earth bus shall be provided inside the control facility. For each earth pit, necessary test point shall have to be provided.

51.4 GRID ISLANDING:

- i. In the event of a power failure on the electric grid, it is required that any independent power-producing inverters attached to the grid turn-off in a short period of time. This prevents the DC-to-AC inverters from continuing to feed power into small sections of the grid, known as "islands." Powered islands present a risk to workers who may expect the area to be unpowered, and they may also damage grid-tied equipment. The PV system shall be equipped with islanding protection.



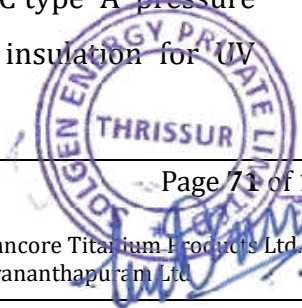
In addition to disconnection from the grid (due to islanding protection) disconnection due to under and over voltage conditions shall also be provided.

- ii. A manual disconnect 4pole isolation switch beside automatic disconnection to grid would have to be provided at utility end to isolate the grid connection by the utility personnel to carry out any maintenance. This switch shall be locked by the utility personnel

52. CABLES

Cables of appropriate size to be used in the system shall have the following characteristics:

- i. Shall meet IEC 60227/IS 694, IEC 60502/IS1554 standards
- ii. Temp. Range: -10°C to $+80^{\circ}\text{C}$.
- iii. Voltage rating 660/1000V
- iv. Excellent resistance to heat, cold, water, oil, abrasion, UV radiation
- v. Flexible
- vi. Sizes of cables between array interconnections, array to junction boxes, junction boxes to Inverter etc. shall be so selected to keep the voltage drop (power loss) of the entire solar system to the minimum. The cables (as per IS) should be insulated with a special grade PVC compound formulated for outdoor use.
- vii. Cable Routing/ Marking: All cable/wires are to be routed in a GI cable tray and suitably tagged and marked with proper manner by good quality ferrule or by other means so that the cable easily identified.
- viii. The Cable should be so selected that it should be compatible up to the life of the solar PV panels i.e. 25years.
- ix. The ratings given are approximate. Bidder to indicate size and length as per system design requirement. All the cables required for the plant provided by the bidder. Any change in cabling sizes if desired by the bidder/approved after citing appropriate reasons. All cable schedules/layout drawings approved prior to installation.
- x. Multi Strand, annealed high conductivity copper conductor PVC type 'A' pressure extruded insulation or XLPE insulation. Overall PVC/XLPE insulation for UV



protection Armored cable for underground laying. All cable trays including covers to be provided. All cables conform to latest edition of IEC/ equivalent BIS Standards as specified below: BoS item / component Standard

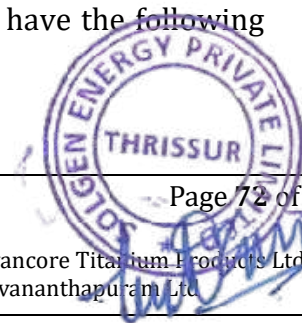
Description Standard Number Cables General Test and Measuring Methods, PVC/XLPE insulated cables for working Voltage up to and including 1100 V, UV resistant for outdoor installation IS /IEC 69947.

- xi. For the DC cabling, XLPE or XLPO insulated and sheathed, UV stabilized single core flexible copper cables shall be used; For the AC cabling, PVC or XLPE insulated and PVC sheathed single or, multi-core flexible Aluminium cables shall be used, Outdoor AC cables shall have a UV -stabilized outer sheath.
- xii. The size of each type of DC cable selected shall be based on minimum voltage drop however; the maximum drop shall be limited to 1%.
- xiii. The size of each type of AC cable selected shall be based on minimum voltage drop however; the maximum drop shall be limited to 2 %.
- xiv. The minimum DC cables size shall be 4.0mm² copper; The minimum AC cable size shall be 4.0mm² copper. In three phase systems, the size of the neutral wire shall be equal to the size of the phase wires.
- xv. The following colour code shall be used for cable wires and shall confirm to IEC 69947
 - DC positive: red (the outer PVC sheath can be black with a red line marking)
 - DC negative: black
 - AC single phase: Phase: Red; Neutral: Black
 - AC three phase: phases: Red, Yellow, Blue; Neutral: Black
 - Earth wires: Green

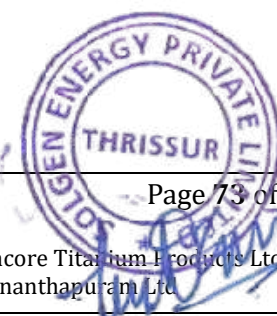
53. CABLING PRACTICE

Cable Cabling is required for wiring from AC output of inverter/PCU to the Grid Interconnection point. It includes the DC cabling from Solar Array to AJB and from AJB to inverter input.

53.1 All cables of appropriate size to be used in the system shall have the following characteristic:



- a. Shall conform to IEC 60227 / IS 694 & IEC 60502 / IS 1554 standards.
 - b. Temperature Range: -10 degree Celsius to +80 degree Celsius
 - c. Voltage rating: 660/1000V
 - d. Excellent resistance to heat, cold, water, oil, abrasion, UV radiation
 - e. Flexible
- 53.2 Sizes of cables between any array interconnections, array to junction boxes, junction boxes to inverter etc. shall be so selected to keep the voltage drop (power loss) of the entire solar system to the minimum (2%).
- 53.3 For the DC cabling, XLPE or XLPO insulated and sheathed, UV stabilized single core flexible copper cables shall be used; multi-core cables shall not be used.
- 53.4 For the AC cabling, PVC or XLPE insulated and PVC sheathed single or, multi-core flexible copper cables shall be used. However, for above 10kWp systems, XLPE insulated Aluminium cable of suitable area of cross section can be used in the AC side subject to a minimum area of cross section of 10 sq.mm. Outdoor AC cables shall have a UV -stabilized outer sheath IS/IEC 69947.
- 53.5 All LT XLPE cables shall conform to IS:7098 part I&II.
- 53.6 The total voltage drop on the cable segments from the solar PV modules to the solar grid inverter shall not exceed 2.0%
- 53.7 The total voltage drop on the cable segments from the solar grid inverter to the building distribution board shall not exceed 2.0%
- 53.8 The DC cables from the SPV module array shall run through a UV-stabilized PVC conduit pipe of adequate diameter with a minimum wall thickness of 1.5mm
- 53.9 Cables and wires used for the interconnection of solar PV modules shall be provided with solar PV connectors (MC4) and couplers
- 53.10 All cables and conduit pipes shall be clamped to the rooftop, walls and ceilings with thermo-plastic clamps at intervals not exceeding 50cm; the minimum DC cables size shall be 4.0mm² copper; the minimum AC cable size shall be 4.0mm² copper. In three phase systems, the size of the neutral wire size shall be equal to the size of the phase wires. Conduits for taking outdoor cables shall be UV treated.



53.11 Cable Marking: All cable/wires are to be marked in proper manner by good quality ferule or by other means so that the cable can be easily identified. The following colour code shall be used for cable wires

- a. DC positive: red (the outer PVC sheath can be black with a red line marking)
- b. DC negative: black
- c. AC single phase: Phase: red; Neutral: black
- d. AC three phase: phases: red, yellow, blue; neutral: black
- e. Earth wires: green

53.12 Cables and conduits that have to pass through walls or ceilings shall be taken through PVC pipe sleeve.

53.13 Cable conductors shall be terminated with tinned copper end ferrules to prevent fraying and breaking of individual wire strands. The termination of the DC and AC cables at the Solar Grid Inverter shall be done as per instructions of the manufacturer, which in most cases will include the use of special connectors.

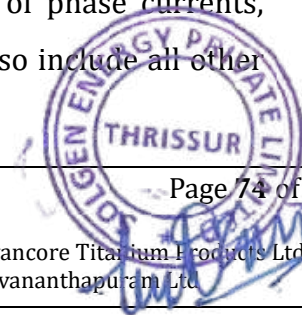
53.14 All cables and connectors used for installation of solar field must be of solar grade which can withstand harsh environment conditions including high temperatures, UV radiation, rain, humidity, dirt, salt, burial and attack by moss and microbes for 25 years and voltages as per latest IEC standards. DC cables used from solar modules to array junction box shall solar grade copper (Cu) with XLPO insulation and rated for 1.1 kV as per relevant standards only.

53.15 Bending radii for cables shall be as per manufactures recommendations and IS: 1255.

53.16 For laying/termination of cables latest BIS/IEC Codes/ standards shall be followed.

54. FACTORY TESTING

- a. PCU shall be tested prior to shipment and factory test certificate for relevant parameters should be provided with the PCU supplied. ANERT or authorised representative of ANERT may be allowed to witness the tests if required.
- b. Factory testing shall not only be limited to measurement of phase currents, efficiencies, harmonic content and power factor, but shall also include all other



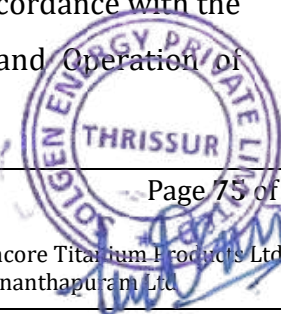
necessary tests/simulation required and requested by the Purchasers Engineers. Tests may be performed at 25, 50, 75 and 100 percent of the rated nominal power.

55 NET METERING AND UTILITY INTERCONNECTION

- a. Net metering equipment (an Import-Export Energy Meter) approved and tested by the electrical utility based on the accuracy class required for the proposed capacity of the system must be provided with the necessary data cables if required.
- b. Net Metering and Utility Interconnection should be accomplished according the Kerala State Electricity Regulatory Commission (Grid Interactive Distributed Solar Energy Systems) Regulations 2014 Clauses (8) & (9) (Notification No. 2096/KSERC/CT/2014 dt. 10th June 2014)

56 INTER CONNECTION OF INVERTER OUTPUT WITH UTILITY GRID

- a. The interconnection of load with inverter output should be done after obtaining permission from Electrical Inspectorate and Electrical Utility.
- b. The plan scheme and drawing related to interconnection details should be submitted to Electrical Inspectorate through a licensed Electrical contractor with the guidance appropriate Engineering Authority.
- c. Licenced contractor has to be engaged for preparation of plan scheme to be submitted to the Kerala State Electricity Licensing Board and necessary fee should be remitted for energisation of Solar Power Plant.
- d. The panel board and distribution board required for AC interconnection should be done as per specification/ instruction given appropriate Engineering Authority.
- e. All the electrical works required for the interconnection of load with inverter output should be done by the successful bidder as a part of the Solar Power Plant installation.
- f. Bidder should visit the actual site and ensure the exact place for providing Solar Modules and Inverter etc. in presence of technical representative from the ANERT.
- g. Net Metering Equipment shall be installed and maintained in accordance with the provisions of The Central Electricity Authority (Installation and Operation of

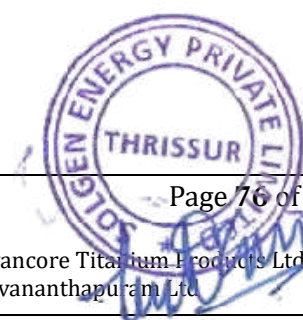


Meters) Regulations, 2006 as amended from time to time. The Contractor shall maintain the Metering System as per metering code and CEA guidelines. The defective meter shall be immediately tested and calibrated.

- h. The accuracy class of the Net Metering Equipment will be selected so that all levels of energy produced or taken by the Solar Power Plant will be measured accurately, and this equipment has applicable accuracy class.
- i. Net Metering Equipment shall be microprocessor-based conforming to the relevant IEC standards with Advanced Metering Infrastructure (AMI) with RS232 cable facility.
- j. Net Metering Equipment shall measure active energy (both import and export) and reactive energy (import) by 3 ph, 4 wire principle suitable for balanced / unbalanced 3 phase load (With KVAR, KWh, KVA measuring registers). Tri-vector based energy meter shall have an accuracy class of energy measurement of at least Class 0.2 for active energy and at least 0.5 Class for reactive energy according to IEC 60687.
- k. Display parameters: LCD test, KWH import, KWH export, MD in KW export, MD in KW import, Date & Time, AC current and voltages and power factor (Cumulative KWH will be indicated continuously by default)

57 WARRANTY

- a. 10 years' warranty should be provided by the supplier for the system and components or part of the system has to be provided as per the special conditions of the contract.
- b. PV modules used in solar power plants/ systems must be warranted for their output peak watt capacity, which should not be less than 90 % at the end of 10 years and 80% at the end of 25 years
- c. The Warranty Card to be supplied with the system must contain the details of the all the components supplied including serial numbers accompanied with the OEM warranty card



58. OPERATION & MAINTENANCE OF THE PLANT

58.1 For the optimal operation of a PV plant, maintenance must be carried out on a regular basis. All the components should be kept clean. It should be ensured that all the components are fastened well at their due place. The O&M Charges for 10-year period is to be quoted by the bidders

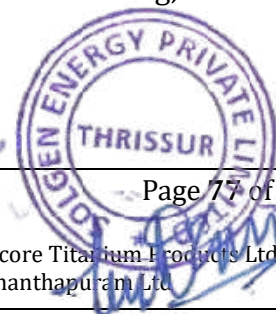
58.2 The service personnel should visit the installations at least once a month for preventive maintenance even if no faults are reported. **Reports of these preventive maintenance visits and generation data should be submitted to the concerned ANERT District Offices on a quarterly basis.**

58.3 Maintenance guidelines for various components viz. solar panels, inverter, wiring etc. are discussed below:

58.3.1 SOLAR PV PANELS

Although the cleaning frequency for the panels will vary from site to site depending on soiling, it is recommended that

- a) The panels are cleaned at least once every thirty days.
- b) Use water and a soft sponge or cloth for cleaning.
- c) Do not use detergent or any abrasive material for panel cleaning.
- d) Iso-propyl alcohol may be used to remove oil or grease stains.
- e) Do not spray water on the panel if the panel glass is cracked or the back side is perforated.
- f) Wipe water from module as soon as possible.
- g) Use proper safety belts while cleaning modules at inclined roofs etc.
- h) The modules should not be cleaned when they are excessively hot. Early morning is particularly good time for module cleaning.
- i) Check if there are any shade problems due to vegetation or new building. If there are, make arrangements for removing the vegetation or moving the panels to a shade-free place.
- j) Ensure that the module terminal connections are not exposed while cleaning; this poses a risk of electric shock.



- k) Never use panels for any unintended use, e. g. drying clothes, chips etc.) Ensure that monkeys or other animals do not damage the panels.

58.3.2 CABLES AND CONNECTION BOXES

- a) Check the connections for corrosion and tightness.
- b) Check the connection box to make sure that the wires are tight, and the water seals are not damaged.
- c) There should be no vermin inside the box.
- d) Check the cable insulating sheath for cracks, breaks or burns. If the insulation is damaged, replace the wire.
- e) If the wire is outside the building, use wire with weather-resistant insulation.
- f) Make sure that the wire is clamped properly and that it should not rub against any sharp edges or corners.
- g) If some wire needs to be changed, make sure it is of proper rating and type.

58.3.3 INVERTER

- a) The inverter should be installed in a clean, dry, and ventilated area.
- b) Remove any excess dust in heat sinks and ventilations. This should only be done with a dry cloth or brush.
- c) Check that vermin have not infested the inverter. Typical signs of this include spider webs on ventilation grills or wasps' nests in heat sinks.
- d) Check functionality, e.g., automatic disconnection upon loss of grid power supply, at least once a month.
- e) Verify the state of DC/AC surge arrestors, cable connections, and circuit breakers.

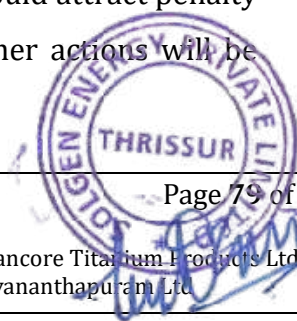
58.4 Inspection and Maintenance Schedule

Component	Activity	Description	Interval
PV Module	Cleaning	- Clean PV modules with plain water or mild dishwashing detergent. - Do not use brushes, any types of solvents, abrasives, or harsh detergents.	Monthly or as per site conditions
PV Array	Inspection	Check the PV modules and rack for any damage.	Annual

Component	Activity	Description	Interval
		Note down location and serial number of damaged modules.	
	Inspection	Determine if any new objects, such as vegetation growth, are causing shading of the array and move them if possible.	Half Yearly
	Vermin Removal	Remove bird nests or vermin from array and rack area.	Half Yearly
Junction Boxes	Inspection	- Inspect electrical boxes for corrosion or intrusion of water or insects. Seal boxes if required. - Check position of switches and breakers. - Check operation of all protection devices.	Annual
Wiring	Inspection	Inspect cabling for signs of cracks, defects, loose connections, overheating, arcing, short or open circuits, and ground faults.	Annual
Inverter	Inspection Service	- Observe instantaneous operational indicators on the faceplate of the inverter to ensure that the amount of power being generated is typical of the conditions. - Inspect Inverter housing or shelter for physical maintenance, if required.	Monthly
Plant	Monitoring	Operation and Performance Monitoring	Monthly
Spare Parts	Management	Manage inventory of spare parts.	As needed

58.5 The faulty system or components should be replaced/ repaired within 7 days of fault reporting. The servicing should be carried out at the site of installation. If any of the components are to be taken out from the site for repair, a standby must be provided to ensure un-interrupted power generation and the systems functions smoothly.

58.6 Any Delay in servicing beyond 7 days of fault reporting would attract penalty at the rate of at the rate fixed by CEO, ANERT and further actions will be initiated against the agency.

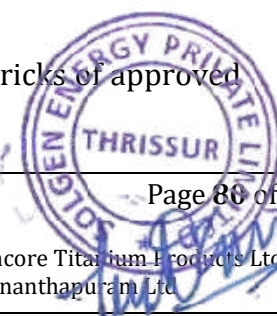


58.7 A designated contact Telephone Number and address should be submitted for reporting faults during the O&M period of 5 years.

59. CIVIL WORKS

While installing solar power plants on rooftops, the physical condition of the rooftop, chances of shading, chances water level rise in the rooftop during raining due improper drainage in the roof-top should be taken in to consideration.

- a. PV array shall be installed in the terrace space free from any obstruction and/or shadow and to minimize effects of shadows due to adjacent PV panel rows.
- b. PV array shall be oriented in the south direction in order to maximize annual energy yield of the plant.
- c. The solar PV array must be installed on the rooftop in such a way that there is sufficient space on the rooftop for maintenance etc.
- d. There should not be any damage what so ever to the rooftop due to setting up of the solar power plant so that on a later day there is leakage of rainwater, etc. from the rooftop.
- e. Some civil works are inevitable for erecting the footings for the module mounting structure as discussed in Module Mounting Structure section. The roof top may be given a suitable grading plaster with suitable leak proof compound so as to render the roof entirely leak proof.
- f. Ample clearance shall be provided in the layout of the inverter and DC/AC distribution boxes for adequate cooling and ease of maintenance.
- g. While cabling the array, care must be taken such that no loose cables lie on the rooftops.
- h. The roof top should look clean and tidy after installation of the array.
- i. Neatness, tidiness and aesthetics must be observed while installing the systems.
- j. RCC Works - All RCC works shall be as per IS 456 and the materials used viz. Cement reinforcement, steel etc. shall be as per relevant IS standards. Reinforcement shall be high strength TMT Fe 415 or Fe 500 conforming to IS: 1786-1985.
- k. Brick Works (If any) - All brick works shall be using 1st class bricks of approved



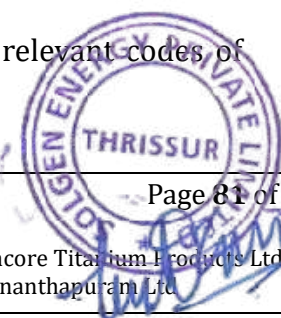
quality as per IS 3102.

- l. Plastering - Plastering in cement mortar 1:5, 1:6 and 1:3 shall be applied to all.
- m. Display of mandatory items- Single Line Diagram and layout diagram of modules and interconnection at installation site shall be provided near the inverter.
- n. For painting on concrete, masonry and plastered surface IS:2395 shall be followed. For distempering IS 427 shall be followed referred. For synthetic enamel painting IS 428 shall be followed. For cement painting IS 5410 shall be followed.
- o. All Civil works required for the installation of the PV Plant and other civil and electrical work in evacuation infrastructure, wherever necessary, shall be within the scope of the bidder

The layout of Inverter accommodation shall be designed to enable adequate heat dissipation and availability. Mount within the existing infrastructure available in consultation with the Site in charge. String Inverters may be installed with Canopy type structure over it to protect it from frequent monsoon and weather changes.

60. TESTING & COMMISSIONING

- a. The contractor shall provide necessary drawings and documents required by statutory authorities and obtain the approval before taking up erection.
- b. Any modification in the equipment or installation that may be demanded by the inspecting authorities shall be carried out by the contractor at no additional cost to the KSEBL
- c. In accordance with the specific installation instruction as per the manufacturers drawings or as directed by the KSEBL, the successful Bidder shall unload, assemble, erect, install test, commission and hand over all electrical equipments included in this contract after O&M of 10 years.
- d. Erection materials including all consumables, tools, testing instruments or any other equipment required for successful commissioning shall be arranged by the successful Bidder in a timely manner.
- e. All equipment and instruments, indoor and outdoor, shall be marked with No. and provided with danger boards before commissioning.
- f. All Power equipments shall be handled and erected as per the relevant codes of practice and manufacturer's drawings and instruction manuals.



- g. The Contractor shall obtain the temporary Electrical connection for construction purposes and the same has to be dismantled off the premises after completion of erection of plant.

61. PERFORMANCE RATIO TEST (PR TEST)

The Plant should run minimum two weeks without any major equipment failure to start the PR test. The EPC Contractor shall submit two copies of O&M manual with soft copy before the start of PR Test. Depending on the requirement, capacity and suitable Pyranometer shall be installed at locations suggested by ANERT or else METEONORM data shall be considered for calculating PR.

- i. The PR test shall be conducted at site by the Contractor in presence of the ANERT officials as per IEC 61724. The PR test procedure shall be submitted by the Contractor for review and approval. Any special equipment, instrumentation tools and tackles required for the successful completion of the performance test shall be arranged by the Contractor at his own cost.
- ii. The procedure for PR demonstration test shall be as follows:

The Weather monitoring station installed in the plant shall be in working condition for minimum 2 weeks and all the parameters shall be available for analysis and verification. The test report for the calibration shall be submitted by the Contractor for approval. After the successful verification of the initial parameters by ANERT, PR test shall be conducted. The Following factors shall be excluded for calculation;

- Generation loss due to grid outage.
- Irradiance below 250 W/m²
- The measured global solar radiation of the period of the outage of the power evacuation system shall be excluded to calculate average global solar radiation for the period of PR test.

PR is to be calculated as per the below formula:

$$PR = \frac{\text{Measured output in kW}}{\text{Installed Plant capacity in kW} * (1000 / \text{Measured radiation intensity in W/m}^2)}$$



The EPC Contractor shall demonstrate minimum PR of 75% (measured at output of the inverter/solar meter level) in the initial PR test within 7 consecutive days. If the contractor fails to prove the desired performance ratio at the time of completion and during any of the consecutive years of defect liability period, he will be given a second chance to demonstrate the PR within another 7 consecutive days. Still if it is not achieved, the same shall be demonstrated within another 7 consecutive days and still if it is not achieved, EPC contractor shall improve the quality of the plant by replacement of module/other components with all suitable modification requirements on balance of systems at his own cost to achieve the performance ratio. After obtaining Energisation Approval from Electrical Inspectorate and demonstration of minimum specified PR, the solar plant shall be commissioned which shall be the date of completion of the project.

62. DATE OF COMMISSIONING

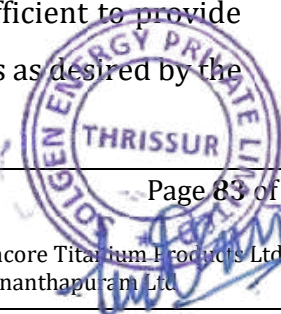
After the Inspection and approval of the Electrical Inspectorate, date of Energisation to the Grid will be considered as the official Date of Commissioning (CoD) of the project. To ensure PR, the bidder will be allowed EPC contractor shall improve the quality of the plant by replacement of any components with all suitable modification requirements on balance of systems at his own cost to achieve the performance ratio.

63. SOLAR PV SYSTEM FOR MEETING THE ANNUAL ENERGY REQUIREMENT

Key Performance Indicators (For installations above 50 kW)

The following KPIs would be monitored by the ANERT/Owner throughout the contract tenure and the contractor shall furnish monthly reports on above, without fail.

- PV Array Energy Yield
- Final System Yield
- PV System Efficiency (DC/AC)
- Performance Ratio (PR): The performance ratio test as per IS/IEC 61724 has to be carried out at site by the agency in presence of authorized officials of ANERT, deriving sample data within a period of 7 consecutive days sufficient to provide operational data representing insolation and ambient conditions as desired by the



agreement authority to prove the Performance ratio of 75%. If a Solar Plant achieves the Minimum Performance Ratio, then the ANERT will issue Commercial Operation Date Certificate.

- Capacity Utilization Factor (CUF)
- Plant uptime
- Reactive Power Consumption
- Auxiliary Energy Consumption
- CO₂ Savings
- Environment, Health & Safety

64. DANGER BOARDS AND SIGNAGES:

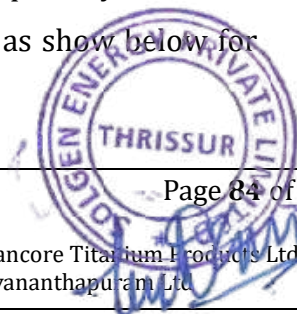
Danger boards should be provided as and where necessary as per IE Act. /IE rules as amended up to date. Three signage shall be provided one each at battery –cum- control room, solar array area and main entry from administrative block. Text of the signage may be finalized in consultation with ANERT/ owner.

65. DRAWINGS & MANUALS:

- i. Two sets of Electrical drawings installation and O&M manuals are to be supplied. Bidders shall provide complete technical data sheets for each equipment giving details of the specifications along with make/makes in their bid along with basic design of the power plant and power evacuation, synchronization along with protection equipment.
- ii. Approved ISI and reputed makes for equipment be used.
- iii. For complete electro-mechanical works, bidders shall supply complete design, details and drawings for approval to ANERT before progressing with the installation work

67. BILL OF MATERIAL

The bidder should provide the bill of material mentioning the quantity of each of the item consisting in the system, along with the offer in the format as show below for each capacity:

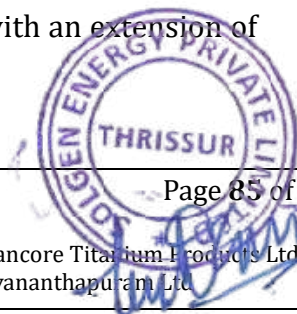


Sl. No.	Item	Make (if any)	Model & Individual Capacity (If any)	Qty (Nos)	Rating / Capacity
1.	PV Module				
2.	PCU/Inverter				
3.	DC Cables				
4.	AC Cables				
5.	AJB/SCB				
6.	Module Mounting Structure (MMS)				
7.	ACDB				
8.	Lightning Arrester				
9.	Earthing System Details and No. of Earth pits				
10.	Data Acquisition System				

68. SITE INSPECTON

It is recommended that the bidders visit all the sites listed here for the physical verification and for correctly estimating the quantity, especially related to structure and cabling, before submitting the bids. **Bidder must include all the AC/DC wiring cost, replacement of instrument transformers, panel boards etc only after visiting the proposed site. The quoted amount will be for all the site-specific works and no additional amount will be allotted for any sort of works.**

The site-specific requirement of ladders for accessing PV modules, pathway facility along with handrails in case of sheet roofs are under the scope of the bidder. The Fabrication of Permanent Ladder should be of GI (min14 SWG), coated with Epoxy steel primer with rung spacing not be more than 10 inches and rung width of min 50 inches. Side Handrails / Grab Bars welded on both sides for safety purpose with an extension of



Min 50 inches above the landing or access level. The pathway can be either of GI or FRP material and shall include handrails for safety without causing shade on the PV modules.

69. CLEANING

The bidder shall provide permanent arrangement for module washing in the SPV Plant. Water lines may be drawn to feed water from the available resources. Contractor has to provide additional facility including pipeline, motor for pumping to the additional overhead tank, if required.

70. DISPLAY BOARD

The vendor has to display a board of size at the project site of size minimum 60 cm x 30 cm including the following details

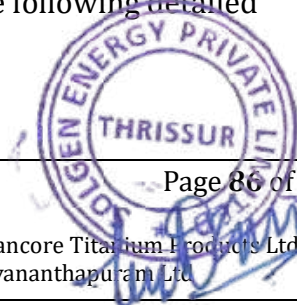
- Plant Name, Capacity, Location, Type of Renewable Energy plant (solar), Date of commissioning etc. The logo of ANERT and details of the scheme as specified in the work order.

71. INSURANCE

- The power plant must be insured at every stage of operation – from Material dispatch, storage, completion of installation and till 5 years after commissioning. The insurance coverage on handing over of the system must include all conditions of **Standard Fire and Special Perils Policy (Material Damage)**.
- The insurance premium for the 10 years of warranty is to be paid by the bidder. Only the system components are to be insured. On handing over of the system, the original insurance policy is to be handed over to the authorised person at the site of installation and a copy to ANERT District Office. The annual premium payment receipt must be handed to the authorised person at the site of installation.

72. ENGINEERING DRAWINGS

The bidder should submit and get the necessary approval of the following detailed Engineering Drawings before execution of the project:



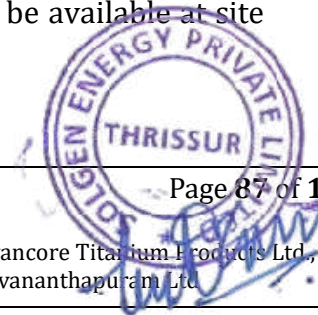
- i. Schematic drawing showing the PV panels, Power conditioning Unit(s)/Inverter, Array Junction Boxes (AJBs)/String Combiner Boxes (SJB), AC and DC Distribution Box, Net meters, MSB etc.
- ii. Layout of solar PV Array
- iii. Single Line Diagram (SLD) with specification of all components.
- iv. Design document for Module Mounting Structure (MMS) including certificate showing wind speed withstanding capacity of the structure (STAAD/Equivalent).
- v. Module Mounting Structure (MMS) drawing along with foundation details for the structure.
- vi. Sizes and specification of cables for PV Module interconnections, PV Array to Array Junction Boxes, Array Junction Boxes to Inverter, Inverter to ACDB/ Grid Connection point etc. shall be furnished.

The Vendor shall submit a PVsyst report for PV power plants from 25kWp and above. All PV plant design should contain the following details which should be approved by the concerned officer before installation.

- i. Design of strings including the number of PV modules
- ii. AC Protection (Circuit Breaker, Switches, Fuses, SPD)
- iii. DC Protection (Switches, Fuses, SPD)
- iv. AJB / SCB details
- v. DC Cable size and length from point to point
- vi. AC Cable size and length from point to point
- vii. Earthing system details and number of pits
- viii. Lightning protection details/specification
- ix. PV Syst / Any other software-based Simulation Report

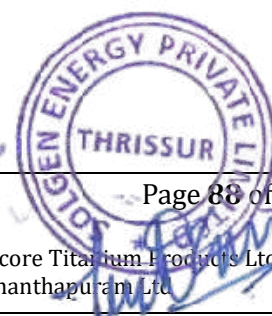
73. SAFETY MEASURES

The bidder shall take entire responsibility for electrical safety of the installation(s) including connectivity with the grid and follow all the safety rules & regulations applicable as per Electricity Act, 2003 and CEA guidelines etc. Adequate firefighting equipment and extinguishing agents of sufficient capacity and quantity must always be available at site



and kept ready for immediate use. The installation of Fire Extinguishers should confirm to BIS standards.

The fire extinguishers shall be provided in the control room housing inverters as well as on the Roof or site where the PV arrays have been installed. One liquefied CO2 fire extinguisher upright type of capacity 8 kg having IS: 2171 -7, IS: 10658 marked per installation of 100kWp shall be supplied by the Successful bidder and kept near the Inverter accommodation and shall also be responsible for periodic renewal during the maintenance period. The fire extinguisher shall be suitable for fighting fire of oils, solvents, gases, paints, varnishes, electrical wiring, live machinery fires and all flammable liquid & gas.





**AGENCY FOR NEW & RENEWABLE ENERGY
RESEARCH AND TECHNOLOGY (ANERT)**

Department of Power, Government of Kerala
Thiruvananthapuram, Kerala – 695 033;
www.ANERT.gov.in , projects@ANERT.in

E-TENDER DOCUMENT

***Request for Selection (RFS) of agency for the
Implementation of 2 MW Solar Power Plant at
Travancore Titanium Products Ltd., Kochuveli,
Thiruvananthapuram under Solar City project funded
by Smart City Thiruvananthapuram Ltd***

Ref. No.: ANERT-TECH/99/2022-T2

VOL – 4: ANNEXURES

Date of Publishing of Bids : - 12/04/2023

Last Date of Submission of Bids : - 26/04/2023



FORMAT 1 - COVERING LETTER

(This letter to be submitted on the official letter head of the tenderer, signed by the authorised signatory.)

Sir,

I/We hereby e-tender to supply, under annexed terms and conditions of contract, the whole of the articles referred to and described in the attached specification and quantity decided by the Agency for New and Renewable Energy Research & Technology (ANERT), at the rates quoted against each item. The articles will be delivered and installed/commissioned operated and maintained for 10 years thereafter within the time and at the place(s) specified in the schedule.

I am/We are remitting herewith the required amount of Rs. towards the cost of e-tender and Earnest Money Deposit by electronic payment vide transaction No dtd.....

Yours faithfully,

Place:

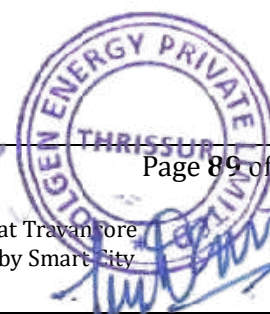
Signature

Date:

Name

Designation

(Office Seal)



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Request for Selection (RFS) of agency for the Implementation of 2 MW Solar Power Plant at Travanfore
Titanium Products Ltd., Kochuveli, Thiruvananthapuram 523 Under Solar City project funded by Smart City
Thiruvananthapuram Ltd

FORMAT 2 - POWER OF ATTORNEY

(To be on non-judicial Kerala stamp paper of appropriate value as per Stamp Act relevant to place of execution)

Power of Attorney to be provided by the Bidding Company in favour of its representative as evidence of authorized signatory's authority.

Know all men by these presents, We (name and address of the registered office of the Bidding Company as applicable) do hereby constitute, appoint and authorize Mr./Ms. (name & residential address) who is presently employed with us and holding the position of as our true and lawful attorney, to do in our name and on our behalf, all such acts, deeds and things necessary in connection with or incidental to submission of our Bid for Implementation of 2 MW Solar Power Plant at Travancore Titanium Products Ltd., Kochuveli, Thiruvananthapuram, Kerala in response to the RFS. No dated issued by ANERT including signing and submission of the Bid and all other documents related to the Bid, including but not limited to undertakings, letters, certificates, acceptances, clarifications, guarantees or any other document which the ANERT may require us to submit. The aforesaid Attorney is further authorized for making representations to the ANERT and providing information / responses to ANERT representing us in all matters before ANERT and generally dealing with ANERT in all matters in connection with this Bid till the completion of the bidding process as per the terms of the above mentioned RFS.

We hereby agree to ratify all acts, deeds and things done by our said attorney pursuant to this Power of Attorney and that all acts, deeds and things done by our aforesaid attorney shall be binding on us and shall always be deemed to have been done by us.

All the terms used herein but not defined shall have the meaning ascribed to such terms under the RFS.

Signed by the within named

..... **(Insert the name of the executant company)**

through the hand of Mr.

Request for Selection (RFS) of agency for the Implementation of 2 MW Solar Power Plant at Travancore Titanium Products Ltd., Kochuveli, Thiruvananthapuram under Solar City project funded by Smart City Thiruvananthapuram Ltd

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duly authorized by the Board (vide Board Resolution No____) to issue such Power of Attorney

Dated this day of

Accepted

.....

Signature of Attorney

(Name, designation and address of the Attorney)

Attested

.....

(Signature of the executant)

(Name, designation and address of the executant)

.....

Signature and stamp of Notary of the place of execution

Common seal of has been affixed in my/our presence pursuant to Board of CEO's Resolution dated.....(Board of CEO's Resolution is also enclosed)

WITNESS

1.

(Signature)

Name.....

Designation

2.

(Signature)

Name.....

Designation

Notes:

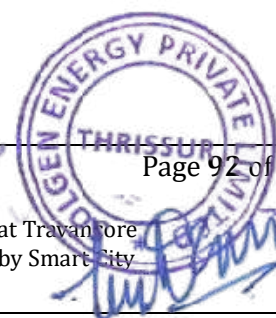
The mode of execution of the power of attorney should be in accordance with the procedure, if any, laid down by the applicable law and the charter documents of the executant(s) and the same should be under common seal of the executant affixed in accordance with the applicable procedure. Further, the person whose signatures are to be provided on the power of attorney shall be duly authorized by the executant(s) in this regard.



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Request for Selection (RFS) of agency for the Implementation of 2 MW Solar Power Plant at Travancore
Titanium Products Ltd., Kochuveli, Thiruvananthapuram under Solar City project funded by Smart City
Thiruvananthapuram Ltd

The person authorized under this Power of Attorney, in the case of the Bidding Company / Lead Member being a public company, or a private company which is a subsidiary of a public company, in terms of the Companies Act, 1956, with a paid up share capital of more than Rupees Five crores, should be the Managing CEO / whole time CEO/manager appointed under section 269 of the Companies Act, 1956. In all other cases the person authorized should be a CEO duly authorized by a board resolution duly passed by the Company. Also, wherever required, the executant(s) should submit for verification the extract of the chartered documents and documents such as a Board resolution / power of attorney, in favour of the person executing this power of attorney for delegation of power hereunder on behalf of the executant(s).



FORMAT 3 – GENERAL PARTICULARS

(This letter to be submitted on the official letter head of the tenderer, signed by the authorised signatory.)

Name of the Agency	
Registered Office	
Nature of Agency (Ltd. Co., Partnership etc.) Attach Copy of partnership Deed/ Certification of Incorporation	
Year of Establishment	
Registration of Number	
Address for Communication	
Telephone number of Contact person(Mobile if any)	
Name of CEOs/ Proprietor/Partners(with address and Telephone No)	
GST Registration Number (Copy to be Attached)	
PAN Number	
TAN Number	
Whether the bidder wishes to form a project company for execution of work	
Whether any Civil Suit / Litigation arisen in the contract executed during the last five years/being executed. If yes, please furnish the name of the Contract, employer nature of work, contract value,	

work order and date and brief details of litigation.	
Details of Total Experience in general since inception(Details of similar systems installed till the date of bid)	
Details of Turnover for last Two years. (Copy Audited Statements has to be submitted for last two financial years)	
Details of offices in Kerala, India and abroad- address and contact details	

Documentary evidence for the bid qualification requirements are submitted along with this document and the details furnished above are true and correct.

Signature
of authorised signatory

Name

Designation

Date:

(office seal)

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Request for Selection (RFS) of agency for the Implementation of 2 MW Solar Power Plant at Travanfore
Titanium Products Ltd., Kochuveli, Thiruvananthapuram under Solar City project funded by Smart City
Thiruvananthapuram Ltd

FORMAT 4 – FINANCIAL CRITERIA

(certified by Authorized Signatory and the Statutory Auditor / Practising Chartered Accountant of the Bidding Company)

Financial Qualification Certificate

(Rupees in Crores)

S/N	Financial parameters	FY 17-18	FY 18-19	FY 19-20	FY 20-21	FY 21-22
1.	Net Worth					
a)	Paid up Capital					
b)	Free Reserves and Surplus*					
c)	Misc expenses to the extent not written off					
	Net Worth (a+b-c)					
2.	Annual Turnover **					

* Free Reserve and Surplus shall be Exclusive of Revaluation Reserve, written back of Depreciation Provision and Amalgamation.

** Annual total Income/ turnover as incorporated in the Profit and Loss Account excluding non-recurring income, i.e., sale of fixed asset etc.

It is certified that all the figures are based on audited accounts read with auditors report and Notes to Accounts etc.

(Signature & Seal of Authorized Signatory

Name of Authorized Signatory:

Designation:

Date:

Place:

Certifying Chartered Accountant:

Name of Firm:

UDIN No:

Date:

Place:

Note:

1. In addition to above certificate from Chartered Accountant, Bidder is required to submit Firm's Annual Audit Report, Balance sheet, Profit & Loss and Income Tax Returns / CA certificate for last Five years i.e., F.Y: 2017-18, 2018-19, 2019-20, 2020-21 & 2021-22.

FORMAT 5 - PERFORMANCE SECURITY GUARANTEE

(To be on non-judicial Kerala stamp paper of appropriate value as per Stamp Act relevant to place of execution)

BG No. :

Amount :

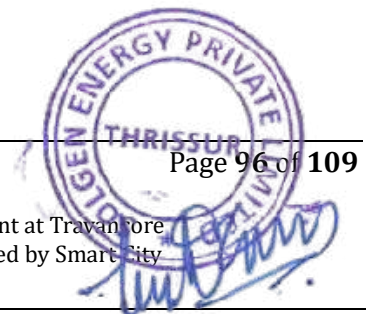
Date :

Valid up to :

In consideration of the Agency for New & Renewable Energy Research and Technology, therein after called "ANERT") have allotted work to M/s..... (hereinafter called the said Contractor) under the terms and conditions of Supply Order No..... issued by ANERT and the agreement dated made between (name of contractor) and ANERT for covering (hereinafter called the said agreement) of Security Deposit for the due fulfilment by the said contractor of the terms and conditions.

Contained in the said agreement, on production of the Bank Guarantee for Rs..... (Rupees..... only) we,Bank having our Head Office at (herein after referred to as "the Bank") at the request of M/s.(name of contractor) do hereby undertake to pay to the ANERT an amount not exceeding Rs..... (Rupees only), against any loss or damage caused to or suffered or would be caused to or suffered by the ANERT by reason of any breach by the said contractor of any of the terms and conditions contained in the said agreement

We,Bank, do hereby undertake to pay the amount due and payable under this Guarantee without any demur, merely on a demand from the ANERT stating that the amount claimed is due by way of loss or damage caused to or would be caused to or suffered by the ANERT by reasons of breach by the said contractor of any of the terms or conditions contained in the said agreement. Any such demand made on the Bank shall be conclusive as regards the amount due and payable by the Bank under this guarantee. However, our liability under this guarantee shall be restricted to an amount not exceeding Rs. (Rupees only).



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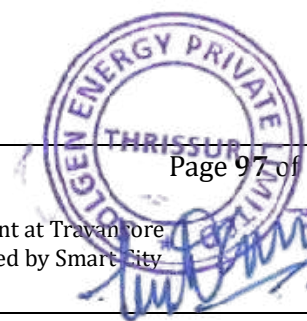
Request for Selection (RFS) of agency for the Implementation of 2 MW Solar Power Plant at Travanfore
Titanium Products Ltd., Kochuveli, Thiruvananthapuram 530 under Solar City project funded by Smart City
Thiruvananthapuram Ltd

This guarantee will not be discharged due to change in the constitution of the bank or the contractor/supplier.

Notwithstanding anything contained hereinbefore:

- 1) Our liability under this Bank Guarantee shall not exceed Rs.....(Rupees only)
- 2) This Bank Guarantee shall be valid upto
- 3) We are liable to pay the guaranteed amount or any part thereof under this Bank Guarantee amount only and only if you serve us a written claim or demand on or before.....

Dated at this day of 2023



FORMAT 6 – COMPONENT WISE SPLIT UP OF COSTS

(On Letterhead of the respective entity for which the below details are provided.)

To be provided for all capacity quoted by the bidder

S/N	Component	Percentage (%)
1	SPV Modules	
2	Module Mounting Structure	
3	Grid Tied Inverter as per specification	
4	Balance of System	
5	Cost for 10 Year Warranty and Preventive Maintenance	
6	Installation and Commissioning Charges	
7	Insurance (From Material dispatch till 10 years warranty period)	
8	Any miscellaneous expenses required for the successful commissioning of the plant	
9	Remote Monitoring and associated costs	
Total		100%

ANNEXURE A – PRE-AGREEMENT

(To be on non-judicial Kerala stamp paper of value Rs. 200)

ARTICLES OF AGREEMENT executed on this the day of
Two thousand andbetween the **Agency for New & Renewable Energy Research and Technology** (hereinafter referred to as **ANERT**) of the one part and Sri
(Name and Address of the tenderer) hereinafter referred to as “the Bounden”) of the other part.

WHEREAS in response to the Notification No.
dated the bounden has submitted to ANERT a e-tender for the ***Request for Selection (RFS) of agency for the Implementation of 2 MW Solar Power Plant at Travancore Titanium Products Ltd., Kochuveli, Thiruvananthapuram under Solar City project funded by Smart City Thiruvananthapuram Ltd*** specified therein subject to the terms and conditions contained in the said e-tender.

AND WHEREAS the bounden has furnished to ANERT a sum of Rs. as Earnest Money Deposit for execution of an agreement undertaking the due fulfilment of the contract in case his e-tender is accepted by ANERT. NOW THESE PRESENTS WITNESS and it is hereby mutually agreed as follows: -

In case the e-tender submitted by the bounden is accepted by ANERT and the contract for is awarded to the bounden, the bounden shall within Fifteen days of acceptance of this e-tender, execute an agreement with ANERT incorporating all the terms and conditions under which ANERT accepts this e-tender.

In case the bounden fails to execute the agreement as aforesaid incorporating the terms and conditions governing the contract, ANERT shall have power and authority to recover

Request for Selection (RFS) of agency for the Implementation of 2 MW Solar Power Plant at Travancore Titanium Products Ltd., Kochuveli, Thiruvananthapuram under Solar City project funded by Smart City Thiruvananthapuram Ltd

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from the bounden any loss or damage caused to ANERT by such breach as may be determined by ANERT by appropriating the moneys inclusive of Earnest Money deposited by the bounden and if the Earnest Money is found to be inadequate the deficit amount may be recovered from the bounden and his properties movable and immovable in the manner hereinafter contained.

All sums found due to ANERT under or by virtue of this agreement shall be recoverable from the bounden and his properties movable and immovable under the provisions of the Revenue Recovery Act for the time being in force as though such sums are arrears of land revenue and in such other manner as ANERT may deem fit.

In witness whereof Sri (Name and Designation) for and on behalf of the Agency for New & Renewable Energy Research and Technology and Sri the bounden have hereunto set their hands the day and year shown against their respective signature.

Signed by Sri Signed by Sri

(Date)

(Date)

in the presence of witnesses

in the presence of witnesses

1.

1.

2.

2.

ANNEXURE B – BIDDERS TECHNICAL INFORMATION

TECHNICAL PARTICULAR DATA

Solar PV Module

Sl. No	Particulars	Required	Offered
1	PV Module Manufacture name & Country of origin	Manufacture name to be specified	
2	PV Module type	Poly/Mono Crystalline, Mono PERC	
3	No. of PV cells per Module		
4	Total number of PV modules		
5	Max. Power, P_{mp} @STC	330 Wp or above	
6	Max. Power tolerance (%)	Not more than 3%	
7	Max. Power voltage (V_{mp}) @STC	To be specified	
8	Max. Power current (I_{mp}) @STC	To be specified	
9	Open circuit voltage, V_{oc} @ STC	To be specified	
10	Short circuit current, I_{sc} @STC	To be specified	
11	Nominal voltage	To be specified	
12	Nominal Wattage	To be specified	
13	Fill Factor	Not less than 0.7	
14	Temp. coefficient of V_{oc} (%/C)		
15	Temp. coefficient of P_{mp} (%/C)		
16	Temperature Co-efficient of I_{sc} (%/°C)		
17	Normal Operating Cell Temperature (NOCT) (°C)		
18	Operating Temperature (°C)		
19	Module efficiency	$\geq 17\%$	
20	No. of By-pass Diodes		
21	Mounting arrangement for Solar Module	Fixed Arrangement	

Sl. No	Particulars	Required	Offered
22	Solar Module frame material	Anodized Aluminium	
23	Module dimensions' cm (L x W x H)	To be specified	
24	PV panel Weight (kg)	To be specified	
25	Output Cables	Polarized, UV protected & Weather Proof DC rated multi-contact connector	
26	Output Terminal	PV Connectors	
27	Junction Box	Weather resistant HDPE (IP65)	
28	Copies of test certificates	IS 14286/IEC 61215,61730 part 1&2, IEC 61701	

INVERTER

Sl. No.	Particulars	Required	Offered
1	Manufacturer		
2	Model name/No.		
3	Number of units		
4	Nominal AC power		
5	Nominal AC voltage		
6	Nominal AC Current		
7	AC grid Frequency range	50Hz $\pm$ 0.5%	
8	AC grid voltage range		
9	Power Factor (+ and -)		

Sl. No.	Particulars	Required	Offered
10	Total Harmonic Distortion	As per IEEE-519 2014	
11	AC over / under voltage over / under frequency protection		
12	Max PV input power		
13	Maximum DC voltage	Less than 1000 V	
14	MPPT voltage range		
15	Maximum DC current		
16	No. of DC input ports		
17	Maximum Efficiency	as per IEC61683	
18	DC voltage ripple		
19	Ambient temperature range		
20	Humidity (non-condensing)	95%, non-condensing	
21	Protective functions - AC over/under voltage, AC over/under frequency, over temperature, AC and DC overcurrent, DC over-voltage, against Islanding		
22	Communication Interface	RS485, MPI Profi-Bus/Telephone Modem/WiFi	
22	User-display standard	LCD panel with membrane keypad	
23	Enclosure environment rating		
24	Safety and EMC		
25	Anti-islanding feature	IEEE1547/UL1741/IEC62116	

ANNEXURE C – DECLARATION BY THE BIDDER

e-Tender Notification No:, dtd for Request for Selection (RFS) of agency for the Implementation of 2 MW Solar Power Plant at Travancore Titanium Products Ltd., Kochuveli, Thiruvananthapuram under Solar City project funded by Smart City Thiruvananthapuram Ltd

To

The CEO
ANERT

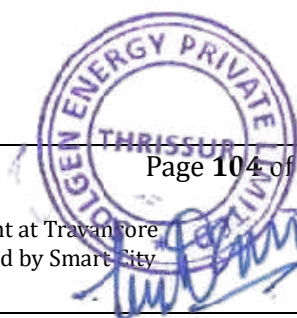
We, the undersigned, declare that:

1. We have examined and have no reservations to the Bidding Document, including Addenda No.: (if any)
2. We offer to supply in conformity with the Bidding Document and in accordance with the delivery schedule
3. Our Bid shall be valid for a period of 6 months from the date fixed as deadline for the submission of tenders in accordance with the Bidding Document, and it shall remain binding upon us and may be accepted at any time before the expiration of that period;
4. If our Bid is accepted, we commit to submit a Security Deposit in the amount of 5 percent of the Contract Price for the due performance of the Contract;
5. We are not participating, as Bidders, in more than one Bid in this bidding process;
6. Our firm, its affiliates or subsidiaries, including any subcontractors or suppliers for any part of the Contract, has not been declared ineligible by the ANERT or Government of Kerala;
7. We understand that this Bid, together with your written acceptance thereof included in your notification of award, shall constitute a binding contract between us, until a formal Contract is prepared and executed.
8. Our firm has obtained the certifications from MNRE or NABL approved Test laboratories that the goods and services are satisfying the technical criteria specified in the bid.

Signature

Name

Date



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Request for Selection (RFS) of agency for the Implementation of 2 MW Solar Power Plant at Travancore Titanium Products Ltd., Kochuveli, Thiruvananthapuram under Solar City project funded by Smart City Thiruvananthapuram Ltd

ANNEXURE D – DECLARATION OF RELATIONSHIP WITH ANERT EMPLOYEE

(to be signed and submitted by the bidder along with the bid)

Tender Notification No.:

Request for Selection (RFS) of agency for the Implementation of 2 MW Solar Power Plant at Travancore Titanium Products Ltd., Kochuveli, Thiruvananthapuram under Solar City project funded by Smart City Thiruvananthapuram Ltd

To

The CEO
ANERT

Name of the ANERT employee with Designation:

Name of the bidder related to the employee:

This is to put on record that Shri/Smt

currently working as in ANERT is related

to, who is the bidder in the bid. We are aware of

the Anti-corruption policy of ANERT and will observe the highest standards during the

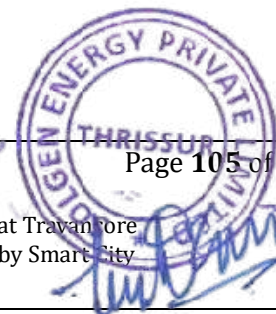
procurement and the execution of contract and shall retain from corrupt, fraudulent,

collusive or coercive practices on competing for the contract.

Signature

Name _____

Date



Page 105 of 109

Request for Selection (RFS) of agency for the Implementation of 2 MW Solar Power Plant at Travancore
Titanium Products Ltd., Kochuveli, Thiruvananthapuram under Solar City project funded by Smart City
Thiruvananthapuram Ltd

ANNEXURE F – CERTIFICATIONS & STANDARDS

QUALITY CERTIFICATION, STANDARDS AND TESTING FOR GRID-CONNECTED SOLAR PV POWER PLANTS

Solar PV Modules/Panels	
IEC 61215	<i>Design Qualification and Type Approval for Crystalline Silicon Terrestrial Photovoltaic (PV) Modules</i>
IS 14286	<i>Design Qualification and Type Approval for Crystalline Silicon Terrestrial Photovoltaic (PV) Modules</i>
IEC 61646	<i>Design Qualification and Type Approval for Thin-Film Terrestrial Photovoltaic (PV) Modules</i>
IS 16077	<i>Design Qualification and Type Approval for Thin-Film Terrestrial Photovoltaic (PV) Modules</i>
IEC 62108	<i>Design Qualification and Type Approval for Concentrator Photovoltaic (CPV) Modules and Assemblies</i>
IEC 61701	<i>Salt Mist Corrosion Testing of Photovoltaic (PV) Modules</i>
IEC 61725	<i>Analytical expression for Daily Solar Profiles</i>
IEC 61853-1	<i>Photovoltaic (PV) Module performance testing and energy rating Part-1: Irradiance and temperature performance measurements, and power rating</i>
IS 16170: Part 1	<i>Photovoltaic (PV) Module performance testing and energy rating Part-1: Irradiance and temperature performance measurements, and energy rating</i>
IEC 62716	<i>Photovoltaic (PV) Modules - Ammonia (NH₃) Corrosion Testing</i>
IEC 60721-2-1	<i>Classification of environmental conditions - Part 2-1 : Environmental conditions appearing in nature - Temperature and humidity</i>
IEC 61730-1	<i>Photovoltaic (PV) Module Safety Qualification - Part 1: Requirements for Construction</i>
IEC 61730-2	<i>Photovoltaic (PV) Module Safety Qualification - Part 2: Requirements for Testing</i>
IEC 60904-2	<i>Photovoltaic devices - Part 2: Requirements for photovoltaic reference devices (STC Performance, 1-V)</i>
IEC 60891	<i>Photovoltaic devices - Procedures for temperature and irradiance corrections to measured I-V characteristics (STC Performance)</i>
IEC TS 62548	<i>Photovoltaic (PV) Arrays - Design requirements</i>
IEC 61829	<i>Crystalline silicon photovoltaic (PV) array- on-site measurement of I-V characteristics</i>

Solar PV String Inverters/INVERTERS	
IEC 62109-1, IEC 62109-2	<i>Safety of power converters for use in photovoltaic power systems- Part 1: General requirements, and Safety of power converters for use in photovoltaic power systems - part 2 : Particular requirements for inverters. Safety compliance (Protection degree IP 65 for outdoor mounting, IP 54 for indoor mounting)</i>
IEC/IS 61683	<i>Photovoltaic systems - Power conditioners: Procedure for measuring Efficiency (10%, 25%, 50%, 75% & 90-100% loading conditions)</i>
IEC 62093	<i>Balance-of-system components for photovoltaic systems – Design qualification natural environments for solar inverters (grid-connected)</i>
IEC 62116	<i>Utility-interconnected photovoltaic inverters- Test procedure of Islanding prevention measures Standard for Inverters, Converters, Controllers and</i>
UL1741	<i>interconnection system Equipment for use with Distributed Energy Resources</i>
IEEE 1547	<i>Standard for interconnecting Distributed Resources with Electric Power Systems</i>
IEEE 1547.1	<i>Standard for Conformance Test procedures for</i>
	<i>Equipment interconnecting Distributed Resources with Electric Power Systems</i>
IEC 60255-27	<i>Measuring relays and protection equipment - Part 27 : Product safety requirements</i>
IEC 60068-2 (1,2,14,27,30 & 64)	<i>Environmental Testing of PV System – Power Conditioners and Inverters IEC 60068 -2-1: Environmental testing - part 2-1: Tests - Test A: Cold IEC 60068 -2-2: Environmental testing - part 2-2: Tests - Test B: Dry heat IEC 60068 -2-14: Environmental testing - part 2-14: Tests - Test N: Change of temperature IEC 60068 -2-27: Environmental testing - part 2-27: Tests - Test Ea and guidance: shock IEC 60068 -2-30: Environmental testing - part 2-30: Tests - Test Db: Damp heat, cyclic (12h+12h cycle) IEC 60068 -2-64: Environmental testing - part 2-64: Tests - Test Fh : Vibration, broadband random and guidance</i>
IEC 61727	<i>Photovoltaic (PV) systems - characteristics of the utility interface (Parallel operation)</i>
CEA Guidelines / Regulations	<i>Technical standards for connectivity of the distributed Generation Resources at Voltage - level of below 33kV</i>
IEC 62103	<i>Electronic equipment for use in power installations</i>
BS EN 50438	<i>Requirements for micro-generating plants to be connected in parallel with public low-voltage distribution networks</i>

IEC 61000 Series	<i>Electromagnetic Interference (EMI), and Electromagnetic Compatibility (EMC) testing of PV inverters</i>
IEC61850	<i>Inverters with Reactive Power Control</i>
IEC 62124	<i>Photovoltaic (PV) Stand -alone systems- Design verification</i>
Fuses	
IS/IEC 60947 (Part 1,2 &3) EN 50521	<i>General safety requirements for connectors, switches, circuit breakers (AC/DC) Low-voltage switchgear and Control-gear, Part-1: General rules Low-voltage switchgear and Control-gear, Part-2: Circuit Breakers Low-voltage switchgear and Control-gear, Part-3: Switches, disconnectors, switch-disconnectors and fuse- combination units EN. 50521: Connectors for photovoltaic systems - Safety requirement</i>
Surge Arrestors	
IEC 60364-5-53	<i>DC surge protection device (SPD), class 2</i>
IEC 60364-5-53	<i>AC surge protection device (SPD), class 2</i>
IEC 60364-5-53	<i>Electrical installations of buildings-Part 5-53: Selection and erection of electrical equipment - Isolation, switching and control</i>
IS 15086-5	<i>Surge Arresters, Part 5: Selection and Application Recommendations</i>
Cables	
IEC 60227/IS 694, IEC 60502/IS 1554 (Part 1 & 2)	<i>General test and measuring method for PVC (Polyvinyl chloride) insulated cables (for working voltage up to and including 1100V, and UV resistant for outdoor installation)</i>
Earthing	
IS 3043-1986	<i>Earthing shall be done in accordance with IS-3043-1986, provided that earthing conductors shall have a minimum size of 6.0 mm² copper, 10 mm² aluminum or 70mm² hot dip galvanized steel</i>
IEC 60364-5-53	<i>The SPDs earthing terminal shall be connected to earth through the above-mentioned dedicated earthing system; The SPDs shall be of type 2 as per IEC 60364-5-53</i>
IS 3043	<i>Code of practice for earthing (ETD 20: Electrical Installation)</i>
IEC 62561 Series	<i>IEC 62561-1 - Lightning protection system components (LPSC)- Part 1: Requirements for connection components IEC 62561-2 - Lightning protection system components (LPSC)- Part 2: Requirements for conductors and earth electrodes IEC 62561-7 - Lightning protection system components (LPSC)- Part 2:</i>

	<i>Requirements for earthing enhancing compounds</i>
<i>Junction Boxes</i>	
<i>IEC 529</i>	<i>Junction boxes and solar panel terminal boxes shall be of the thermo plastic type with IP 65 protection for outdoor use, and IP 54 protection for indoor use</i>
<i>IE 62208, IP 54 as per IEC 529</i>	<i>General requirements for junction boxes, charge controllers</i>
<i>CEA Regulations</i>	<i>Energy Meter Installation and operation of Energy Meters Regulations 2006, and as amended in 2010 & 2014</i>
<i>IS 13779</i>	<i>AC Static watt-hour Meters Class 1 and 2 - specification</i>
<i>IS 14697</i>	<i>AC Static Transformer Operated Watt-hour and Var- hour Meters, Class 0.2 S and 0.5 S - specification</i>
<i>IS 15884</i>	<i>Alternating Current Direct connected static Prepayment Meters for Active Energy (Class 1 and 2) - Specification</i>
<i>IS 15959</i>	<i>Data exchange for electricity meter reading, tariff and load control-companion specification</i>
<i>IS 16444</i>	<i>AC Static direct connected watt-hour Smart Meter Class 1 and 2 specifications (with Import & Export/Net energy measurements)</i>
<i>System Performance Monitoring</i>	
<i>IS/IEC 61724</i>	<i>Guidelines for PV System Performance Monitoring- measurement, Data Exchange, and Analysis</i>
<i>Rooftop PV System/Power Plant inspection</i>	
<i>IEC 62446</i>	<i>Grid connected Solar PV Systems-Minimum requirements for system Documentation, Commissioning Tests, and Inspection</i>
<i>IEC 61557-1</i>	<i>Electrical Safety in low voltage distribution systems up to 1000 V AC. and 1500 V DC - Equipment for testing, measuring or monitoring of protective measures – Part 1: General requirements</i>
<i>IEC 60364-6</i>	<i>Low-voltage electrical installations - part 6: Verification</i>
<i>IEC 61829</i>	<i>Crystalline silicon photovoltaic (PV) array- on-site measurement of I-V characteristics</i>



Government of India

Form GST REG-06

[See Rule 10(1)]

Registration Certificate

Registration Number :29AABCP6384L1ZS

1.	Legal Name	POWER ONE MICRO SYSTEMS PRIVATE LIMITED			
2.	Trade Name, if any	POWER-ONE MICRO SYSTEMS (P) LTD.,			
3.	Constitution of Business	Private Limited Company			
4.	Address of Principal Place of Business	5TH CROSS, GF 3 F 12, KSSIDC BUILDING, PEENYA INDL AREA, BANGALORE, Bengaluru (Bangalore) Urban, Karnataka,			
5.	Date of Liability	01/07/2017			
6.	Period of Validity	From	01/07/2017	To	NA
7.	Type of Registration	Regular			
8.	Particulars of Approving Authority				
Signature					
Name					
Designation					
Jurisdictional Office					
9.	Date of issue of Certificate	20/09/2017			
Note: The registration certificate is required to be prominently displayed at all places of business in the State.					

This is a system generated digitally signed Registration Certificate issued based on the deemed approval of the application for registration

**Annexure A**

GSTIN	29AABCP6384L1ZS
Legal Name	POWER ONE MICRO SYSTEMS PRIVATE LIMITED
Trade Name, if any	POWER-ONE MICRO SYSTEMS (P) LTD.,

Details of Additional Places of Business

Total Number of Additional Places of Business in the State	1
--	---

Sr. No.	Address
1	No C 332, INDUSTRIAL ESTATE, PEENYA INDL ESTATE, BANGALORE, Bengaluru (Bangalore) Urban, Karnataka, 560058



GSTIN	29AABCP6384L1ZS
Legal Name	POWER ONE MICRO SYSTEMS PRIVATE LIMITED
Trade Name, if any	POWER-ONE MICRO SYSTEMS (P) LTD.,

Details of Managing / Whole-time Directors and Key Managerial Persons

1		Name	IPPALAVALLASA BHIMA RAO
		Designation/Status	MANAGING DIRECTOR
		Resident of State	Karnataka
2		Name	RAMANNA RAJESH MAYASANDRA
		Designation/Status	DIRECTOR
		Resident of State	Karnataka

स्थायी लेखा संख्या /PERMANENT ACCOUNT NUMBER
AABCP6384L

नाम /NAME

POWER ONE MICRO SYSTEMS PRIVATE LIMITED

निगमन/बनने की तिथि /DATE OF INCORPORATION/FORMATION

30-03-1998

मुख्य आयकर आयुक्त, कर्नाटक एवं गोवा

Chief Commissioner of Income-tax, Karnataka & Goa

M. R. Raul





प्रारूप ० आई ० आर ०

Form. i. R.

निगमन का प्रमाण-पत्र

CERTIFICATE OF INCORPORATION

ता० का से०

No. 08/23553 of 19 98

हैं एतद्वारा प्रमाणित करता हूँ कि आज

कम्पनी अधिनियम 1956 (1956 का 1) के अधीन निगमित की गई हैं और यह कम्पनी परिसीमित है।

I hereby certify that..... **POWER-ONE MICRO SYSTEMS PRIVATE**

LIMITED

is this day incorporated under the Companies Act, 1956 (No. 1 of 1956) and that the company is limited.

मेरे हस्ताक्षर से आज ता० को दिया गया।

Given under my hand at BANGALORE this..... **THIRTIETH**

day of..... **MARCH** one thousand nine hundred and Ninety **EIGHT**

(B.K. BANSAL).

कम्पनियों का रजिस्ट्रार

कर्नाटक, बंगलूर

Registrar of Companies

KARNATAKA, BANGALORE



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For Income tax related queries
ASK : 1800 180 1961For Rectification and Refund
CPC : 1800 425 2229For e-Filing of Returns
e-Filing : 1800 4250 0025

Know Your TAN

TAN Details

TAN

BLRP01676D

Category of Deductor

Company

Name

POWER-ONE MICRO SYSTEMS PVT LTD

Address

SHED NO F-3,KSSID
BUILDING,VTH CROS S,
INDUSTRIAL ESTATE,
PEENYA I STAGE,
KARNATAKA
BANGALORE-560 058
0

PAN

STATUS

Active

E-Mail ID1

E-Mail ID2

TAN AO Code

Area Code

KAR

AO Type

CT

Range Code

182

AO Number

1

CA V.K. Sudhakar Shetty
B.Sc., F.C.A



V. K. S. SHETTY & CO.,
CHARTERED ACCOUNTANTS

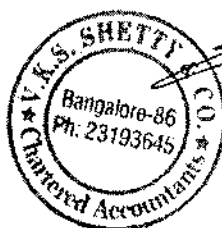
CERTIFICATE

This is to certify that, **M/s Power-One Micro Systems Pvt. Ltd.**, a company having its registered office at GF -3, & F -12, KSSIDC Building, 5th Cross, 1st Stage, Peenya Industrial Estate, Bangalore- 560058, engaged in the business of manufacturing and selling of Electronic Uninterruptible Power Supply (UPS) Systems including Solar UPS, Solar PV Power Systems, Voltage Stabilizers (SCVs), Battery chargers, storage and AC to DC & DC to DC converters had achieved "Total Annual Turnover" for the last Five financial years as mentioned below.

Sl. No	Financial Year	Total Annual Turnover (Rs. In Lakhs)
1.	2017-18	10719.36
2.	2018-19	12597.24
3.	2019-20	12000.32
4.	2020-21	10033.49
5.	2021-22	13494.18

Place: Bangalore
Date: 03.11.2022

For V. K. S. Shetty & Co.,
Chartered Accountants



Sudhakar Shetty V.K
Proprietor
Membership No: 029676
Firm Regn. No: 005302S
ICAI UDIN: 22029676BCAZLW9091



No.55, 1st Floor, 10th Cross, Mahalakshmiapuram, 2nd Stage, West of Chord Road, (Near Rajajinagar Metro Station) Bangalore-560086

Tel: +91-80-23193645 / 46, +91-96631 99003 (Off) 98455 97123 (Per)

GSTIN : 29AEOPS9245M1ZD Email : ca.vksshetty@gmail.com, vksshettyandco@gmail.com / Website : www.vksshettyandco.in

CA V.K. Sudhakar Shetty
B.Sc., F.C.A.



V. K. S. SHETTY & CO.,
CHARTERED ACCOUNTANTS

FORM "B-1"
FORM FOR CERTIFICATE OF NET WORTH FROM CHARTERED
ACCOUNTANT

"It is to certify that as per the audited balance sheet and profit & loss account during the financial year 2021-22, the Net Worth of M/s Power One Micro Systems Pvt. Ltd., GF-3 & F-12, KSSIDC Building, 5th Cross, 1st Stage, Peenya Industrial Estate, Bangalore – 560058, as on 31/03/2022 is Rs.52,97,13,210/- after considering all liabilities. It is further certified that the Net Worth of the company has not eroded by more than 30 % in the last three years ending on 31/03/2022."

Unique Document Identification Number (UDIN) : 22029676BEJTOV8943

Signature of Chartered Accountant :

For V.K.S. SHETTY & Co.,
CHARTERED ACCOUNTANTS

V.K. Sudhakar Shetty

Proprietor

M.No. 029676

Name of Chartered Accountant

: V. K. S. Shetty and Co.
Chartered Accountants
Sudhakar Shetty V. K.
Proprietor

Firm Regn. No

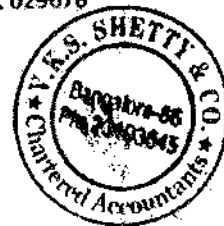
: 005302S

Membership No. of ICAI

: 029676

Date and Seal

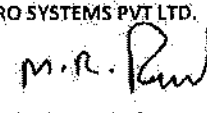
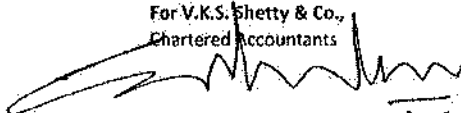
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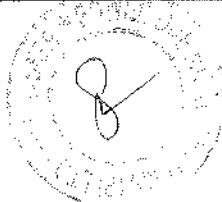


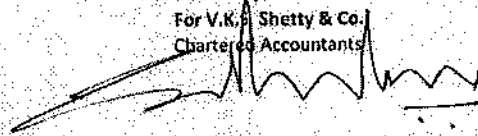
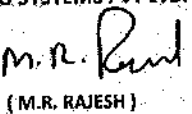
No.55, 1st Floor, 10th Cross, Mahalakshimpuram, 2nd Stage, West of Chord Road, (Near Rajajinagar Metro Station) Bangalore-560086

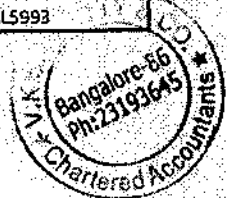
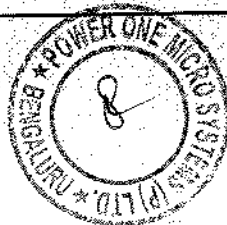
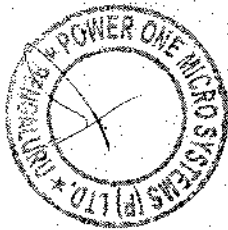
Tel: +91-80-23193645 / 46, +91-96631 99003 (Off) 98455 97123 (Per)

GSTIN : 29AEOPS9245M1ZD Email : ca.vksshetty@gmail.com vksshettyandco@gmail.com / Website : www.vksshettyandco.in

POWER-ONE MICRO SYSTEMS PRIVATE LIMITED. GF-3 & F12 KSSIDC BUILDING, 5TH CROSS, INDUSTRIAL ESTATE, PEENYA STAGE BANGALORE-560058 CIN : U32109KA1998PTC023553 Balance Sheet as at 31st March, 2020			
Particulars	Note	As at 31.03.2020	As at 31.03.2019
I. EQUITY AND LIABILITIES			
(1) Shareholder's Funds			
(a) Share Capital	3	49,92,000	49,92,000
(b) Reserves and Surplus	4	40,88,56,733	34,87,88,917
(c) Money received against share warrants		-	-
(2) Share application money pending allotment		-	-
(3) Non-Current Liabilities			
(a) Long-term borrowings	5	58,45,045	32,15,303
(b) Deferred tax liabilities (Net)		-	-
(4) Current Liabilities			
(a) Short-term borrowings	6	12,98,52,962	13,50,40,037
(b) Trade payables	7	18,55,66,497	24,68,39,864
(c) Other current liabilities	8	1,82,46,384	1,24,96,077
(d) Short-term provisions	9	17,01,35,786	22,82,94,277
Total	Rs.	92,34,95,407	97,96,66,475
II. Assets			
(1) Non-current assets			
(a) Fixed assets	10		
(i) Tangible assets		2,16,21,159	1,83,97,481
(ii) Intangible assets		-	-
(iii) Capital work-in-progress		-	-
(iv) Intangible assets under development		-	-
(b) Non-current investments	11	6,100	6,100
(c) Deferred tax assets (net)	12	15,50,245	17,42,377
(d) Long term loans and advances	13	-	-
(e) Other non-current assets	14	36,03,253	31,50,419
(2) Current assets			
(a) Current investments		-	-
(b) Inventories	15	18,00,11,955	19,70,26,446
(c) Trade receivables	16	47,74,81,394	64,85,21,722
(d) Cash and cash equivalents	17	20,74,90,026	7,64,12,413
(e) Short-term loans and advances	18	2,65,57,519	3,14,52,945
(f) Other current assets	19	51,73,756	29,56,572
Total	Rs.	92,34,95,407	97,96,66,475
The Notes referred to above are an integral part of Balance Sheet. For and on behalf of the board, For POWER-ONE MICRO SYSTEMS PVT LTD.  (I.B. RAO) DIN : 01361057 Director  (M.R. RAJESH) DIN : 01361100 Director Place : Bangalore Date : 09.12.2020 As Per Our Report of Even Date For V.K.S. Shetty & Co., Chartered Accountants  (V.K. Sudhakar Shetty) Proprietor Firm Reg. No. 0053025 Membership No. 029676 ICAI UDIN : 21029676AAAAA15993			



POWER-ONE MICRO SYSTEMS PRIVATE LIMITED. GF-3 & F12 KSSIDC BUILDING, 5TH CROSS, INDUSTRIAL ESTATE, PEENYA I STAGE BANGALORE-560058 CIN : U32109KA1998PTC023553 Statement of Profit and Loss Account for the period ended 31st March, 2020			
Particulars	Note	Year Ending 31.03.2020	Year Ending 31.03.2019
A. Revenue from operations	20	1,20,00,32,326	1,25,97,23,632
B. Other Income	21	84,34,666	1,02,61,924
C. Total Revenue (A+B)	Rs.	1,20,84,66,992	1,26,99,85,556
<u>D. Expenses:</u>			
Cost of materials consumed	22	73,98,49,050	99,23,55,259
Purchase of Stock-in-Trade			
Changes in Inventories of finished goods, work-in-progress and Stock-in-Trade	23	7,46,39,209	(8,35,38,218)
Employee benefit expense	24	20,32,73,239	18,35,61,451
Financial costs	25	1,62,20,767	1,85,33,435
Depreciation and amortization expense	10	56,06,477	56,06,386
Other expenses	26	8,47,23,736	7,50,82,779
Total Expenses	Rs.	1,12,43,12,477	1,19,17,01,092
E. Profit before tax	(C-D)	8,41,54,515	7,82,84,464
F. Tax expense:			
(1) Current tax		2,14,87,320	2,24,72,590
(2) Deferred tax		1,92,132	1,51,631
G. Profit/(Loss) for the period	(E-F)	6,24,75,063	5,56,60,243
H. Earning per equity share:			
(1) Basic		125.15	111.50
(2) Diluted		125.15	111.50
The Notes referred to above are an integral part of Balance Sheet.			
For and on behalf of the board, For POWER-ONE MICRO SYSTEMS PVT LTD.  (I.B. RAO) DIN : 01361057 Director Place : Bangalore Date : 09.12.2020		As Per Our Report of Even Date For V.K. Shetty & Co. Chartered Accountants  (V.K. Sudhakar Shetty.) Proprietor Firm Reg. No. 0053025 Membership No. 029676 ICAI UDIN : 21029676AAAAAL5993	
 (M.R. RAJESH) DIN : 01361100 Director			

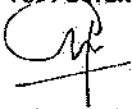


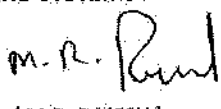
POWER-ONE MICRO SYSTEMS PRIVATE LIMITED. GF-3 & F12 KSSIDC BUILDING, 5TH CROSS, INDUSTRIAL ESTATE, PEENYA I STAGE BANGALORE-560058 CIN : U32109KA1998PTC023553 Balance Sheet as at 31st March ,2021			
Particulars	Note	As at 31.03.2021	As at 31.03.2020
I. EQUITY AND LIABILITIES			
(1) Shareholder's Funds			
(a) Share Capital	4	49,92,000	49,92,000
(b) Reserves and Surplus	5	45,65,77,409	40,88,56,733
(c) Money received against share warrants		-	-
(2) Share application money pending allotment		-	-
(3) Non-Current Liabilities			
(a) Long-term borrowings	6	59,67,246	58,45,046
(b) Deferred tax liabilities (Net)		-	-
(4) Current Liabilities			
(a) Short-term borrowings	7	11,28,73,650	12,98,52,962
(b) Trade payables	8	13,96,06,108	18,55,66,497
(c) Other current liabilities	9	2,73,80,996	1,82,46,384
(d) Short-term provisions	10	12,85,93,286	17,01,35,786
Total	Rs.	87,59,88,694	92,34,95,407
II. Assets			
(1) Non-current assets			
(a) Fixed assets	11		
(i) Tangible assets		2,24,74,722	2,16,21,160
(ii) Intangible assets		-	-
(iii) Capital work-in-progress		-	-
(iv) Intangible assets under development		-	-
(b) Non-current investments	12	6,100	6,100
(c) Deferred tax assets (net)	13	12,24,271	15,50,245
(d) Long term loans and advances	14	-	-
(e) Other non-current assets	15	33,24,253	36,03,253
(2) Current assets			
(a) Current investments		-	-
(b) Inventories	16	15,56,61,229	18,00,11,955
(c) Trade receivables	17	49,29,24,116	47,74,81,394
(d) Cash and cash equivalents	18	18,91,51,282	20,74,90,026
(e) Short-term loans and advances	19	66,86,573	2,65,57,519
(f) Other current assets	20	45,36,149	51,73,756
Total	Rs.	87,59,88,694	92,34,95,408
The Notes referred to above are an integral part of Balance Sheet. For and on behalf of the board, FOR POWER-ONE MICRO SYSTEMS PVT LTD. <i>(Signature)</i> (I.B. HAO) DIN : 01361057 Director Place : Bangalore Date : 07.11.2021 <i>(Signature)</i> (M.R. RAJESH) DIN : 01361100 Director As Per Our Report of Even Date For V. K. S. Shetty & Co., Chartered Accountants <i>(Signature)</i> (V.K. Sudhakar Shetty) Proprietor Firm Reg. No. 0053025 Membership No. 029676 UDIN NO:22029676AAAAAC6291			

POWER-ONE MICRO SYSTEMS PRIVATE LIMITED. GF-3 & F12 KSSIDC BUILDING, 5TH CROSS, INDUSTRIAL ESTATE, PEENYA I STAGE BANGALORE-560058 CIN : U32109KA1998PTC023553 Statement of Profit and Loss Account for the period ended 31st March, 2021			
Particulars	Note	Year Ending 31.03.2021	Year Ending 31.03.2020
A. Revenue from operations	21	1,00,33,48,630	1,20,00,32,326
B. Other Income	22	94,31,691	84,34,666
C. Total Revenue (A+B)	Rs.	1,01,27,80,322	1,20,84,66,992
<u>D. Expenses:</u>			
Cost of materials consumed	23	63,29,18,359	73,98,49,050
Purchase of Stock-in-Trade			
Changes in inventories of finished goods, work-in-progress and Stock-in-Trade	24	68,04,260	7,46,39,209
Employee benefit expense	25	19,75,01,919	20,32,73,239
Financial costs	26	80,86,199	1,62,20,767
Depreciation and amortization expense	11	62,23,057	56,06,477
Other expenses	27	9,40,97,382	8,47,23,736
Total Expenses	Rs.	94,56,31,176	1,12,43,12,477
E. Profit before tax	(C-D)	6,71,49,145	8,41,54,515
F. Tax expense:			
(1) Current tax		1,91,02,495	2,14,87,320
(2) Deferred tax		3,25,974	1,92,132
G. Profit/(Loss) for the period	(E-F)	4,77,20,676	6,24,75,063
H. Earning per equity share:			
(1) Basic		95.59	125.15
(2) Diluted		95.59	125.15

The Notes referred to above are an integral part of Balance Sheet.

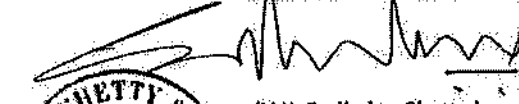
For and on behalf of the board,
For **POWER-ONE MICRO SYSTEMS PVT LTD.**

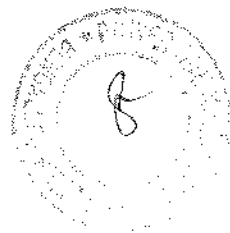
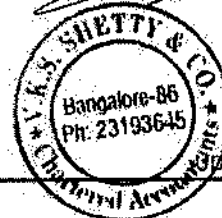

(I.B. RAO)
DIN : 01361057
Director
Place : Bangalore
Date : 07.11.2021

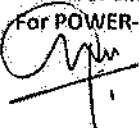
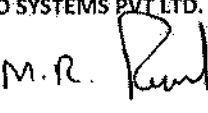
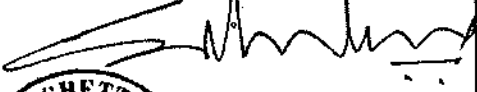

(M.R. RAJESH)
DIN : 01361100
Director

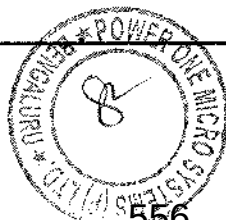
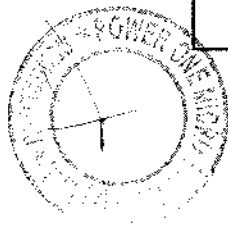


As Per Our Report of Even Date
For **V. K. S. Shetty & Co.,**
Chartered Accountants


(V.K. Sudhakar Shetty)
Proprietor
Firm Reg. No. 0053025
Membership No. 029676
DIN NO:22029676AAAAAC6291



POWER-ONE MICRO SYSTEMS PRIVATE LIMITED. GF-3 & F12 KSSIDC BUILDING, 5TH CROSS, INDUSTRIAL ESTATE, PEENYA I STAGE BANGALORE-560058 CIN : U32109KA1998PTC023553 Balance Sheet as at 31st March 2022 (Rs. In Lakhs)			
Particulars	Note	As at 31.03.2022	As at 31.03.2021
I. EQUITY AND LIABILITIES			
(1) Shareholder's Funds			
(a) Share Capital	4	49.92	49.92
(b) Reserves and Surplus	5	5,247.21	4,565.77
(c) Money received against share warrants		-	-
(2) Share application money pending allotment		-	-
(3) Non-Current Liabilities			
(a) Long-term borrowings	6	44.32	59.67
(b) Deferred tax liabilities (Net)		-	-
(4) Current Liabilities			
(a) Short-term borrowings	7	1.67	1,128.72
(b) Trade payables	8		
(A) total outstanding dues of micro enterprises and small enterprises; and		221.62	164.31
(B) total outstanding dues of creditors other than micro enterprises and small enterprises		1,735.45	1,080.23
(c) Other current liabilities	9	561.05	425.33
(d) Short-term provisions	10	1,008.51	1,285.93
Total	Rs.	8,869.75	8,759.89
II. ASSETS			
(1) Non-current assets			
(a) Property, Plant and Equipment and Intangible assets	11		
(i) Property, Plant and Equipment		387.66	224.75
(ii) Intangible assets		-	-
(b) Non-current investments	12	0.06	0.06
(c) Deferred tax assets (net)	13	11.20	12.24
(d) Long term loans and advances	14	-	-
(e) Other non-current assets	15	64.34	33.24
(2) Current assets			
(a) Current investments		-	-
(b) Inventories	16	2,189.43	1,556.61
(c) Trade receivables	17	5,009.28	4,929.24
(d) Cash and cash equivalents	18	1,028.97	1,891.51
(e) Short-term loans and advances	19	128.07	66.87
(f) Other current assets	20	50.74	45.36
Total	Rs.	8,869.75	8,759.89
The Notes referred to above are an integral part of Balance Sheet. For and on behalf of the board, For POWER-ONE MICRO SYSTEMS PVT LTD.  (I.B. RAO) DIN : 01361057 Director  (M.R. RAJESH) DIN : 01361100 Director Place : Bangalore Date : 30.08.2022			
As Per Our Report of Even Date For V. K. S. Shetty & Co., Chartered Accountants  (V.K. Sudhakar Shetty) Proprietor Firm Reg. No. 005302S Membership No. 029676 DIN: 22029676AXSKRD6758 			

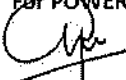


POWER-ONE MICRO SYSTEMS PRIVATE LIMITED.			
GF-3 & F12 KSSIDC BUILDING, 5TH CROSS, INDUSTRIAL ESTATE, PEENYA I STAGE			
BANGALORE-560058			
CIN : U32109KA1998PTC023553			
Statement of Profit and Loss for the period ended 31st March 2022			
(Rs. In Lakhs)			
Particulars	Note	Year Ended 31.03.2022	Year Ended 31.03.2021
A Revenue from operations	21	13,494.18	10,033.49
B Other income	22	50.39	94.32
C Total Income (A+B)	Rs.	13,544.57	10,127.80
D Expenses:			
Cost of materials consumed	23	8,956.45	6,329.18
Purchase of Stock-in-Trade			
Changes in inventories of finished goods, work-in-progress and Stock-In-Trade	24	(15.80)	68.04
Employee benefits expense	25	2,189.79	1,975.02
Financial costs	26	53.93	80.86
Depreciation and amortization expense	11	70.24	62.23
Other expenses	27	1,351.69	940.97
Total Expenses	Rs.	12,606.30	9,456.31
E Profit before tax	(C-D)	938.27	671.49
F Tax expense:			
(1) Current tax		255.79	191.02
(2) Deferred tax		1.04	3.26
G Profit/(Loss) for the period	Rs. (E-F)	681.44	477.21
H Earning per equity share:			
(1) Basic (In Rupees)		136.51	95.59
(2) Diluted (In Rupees)		136.51	95.59

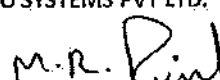
The Notes referred to above are an integral part of Balance Sheet.

For and on behalf of the board,

For POWER-ONE MICRO SYSTEMS PVT LTD.



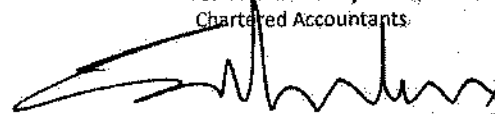
(I.B. RAO)
DIN : 01361057
Director
Place : Bangalore
Date : 30.08.2022



(M.R. RAJESH)
DIN : 01361100
Director

As Per Our Report of Even Date

For V. K. S. Shetty & Co.,
Chartered Accountants

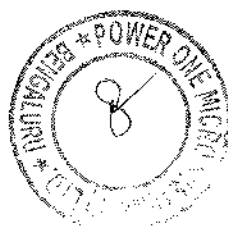


(V.K. Sudhakar Shetty)
Proprietor

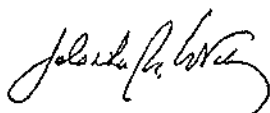
Firm Reg. No. 005302S

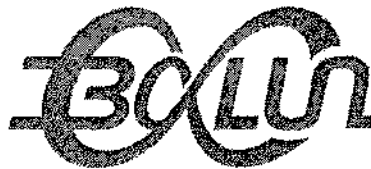
Membership No. 029676

UDIN: 22029676AXSKRD6758



	Ref. Certif. No. US-35033-M1-UL
IEC SYSTEM FOR MUTUAL RECOGNITION OF TEST CERTIFICATES FOR ELECTRICAL EQUIPMENT (IECEE) CB SCHEME	
CB TEST CERTIFICATE	
Product Name and address of the applicant Name and address of the manufacturer Name and address of the factory Note: When more than one factory, please report on page 2 Ratings and principal characteristics Trademark / Brand (if any) Type of Customer's Testing Facility (CTF) Stage used Model / Type Ref. Additional information (if necessary may also be reported on page 2) A sample of the product was tested and found to be in conformity with As shown in the Test Report Ref. No. which forms part of this Certificate	Photovoltaic (PV) Module(s) WAAREE ENERGIES LTD PLOT NO: 231-236 SURAT SPECIAL ECONOMIC ZONE DIAMOND PARK, SACHIN SURAT, Gujarat 394230, India Waaree Energies Limited SY. NO: 38/1, Tumb Village Tumb, Umbergaon Valsad, Gujarat 396150, India WAAREE ENERGIES LIMITED Survey No. 38/1 Village Tumb, Umbergaon, District Valsad 396150, Gujarat, India ☒ Additional information on page 2 Maximum system voltage: 1500V Maximum Over-Current Protection Rating: 20A For more details see Product Electrical Rating in the Test Report The report was revised to include technical modifications. ☒ Additional information on page 2 IEC 61215-1:2016, IEC 61215-2:2016, IEC 61215-2:2016 E483234-4788949700-1 Amendment 1 issued on 2020-02-24
This CB Test Certificate is issued by the National Certification Body	
☒ UL (USA) 483234-4788949700-1, Non-EU/CA/USA ☒ UL (Denmark) 483234-4788949700-1, CE Marked DENMARK ☒ UL (UK) 483234-4788949700-1, CE Marked CHINA ☒ UL (CAN) 483234-4788949700-1, CE Marked CANADA Date: 2020-02-26 Original Issue Date: 2019-12-20 Signature: Jolanta M. Wroblewska For full legal entity name: www.ul.com/cb/members	

			Ref. Certif. No. US-35033-M1-UL								
Model Details: Mono series modules: 72 cells module: WSM-xxx, xxx stands for power range from 350-390, in step of 5 W 60 cells module: WSM-xxx, xxx stands for power range from 295-325, in step of 5 W Poly series modules: 72 cells module: WS-xxx, xxx stands for power range from 320-350, in step of 5 W 60 cells module: WS-xxx, xxx stands for power range from 270-290, in step of 5 W 54 cells module: WS-xxx, xxx stands for power range from 240-260, in step of 5 W 36 cells module: WS-xxx, xxx stands for power range from 160-175, in step of 5 W Factories: WAAREE ENERGIES LIMITED Plot No. 231-236, Surat Special Economic Zone, Diamond Park, Sachin, Surat-394230, Gujarat, India Additional Information: Additionally evaluated to EN 61215-1:2016, EN 61215-1-1:2016 and EN 61215-2:2017 The original report was modified to include the following technical changes/additions: added additional cell, alternate glass and alternate junction box, revised the frame supplier											
Additional information (if necessary)  <table border="0"> <tr> <td>☒</td> <td>UL (US), 333 Plingsten Rd IL 60062, Northbrook, USA</td> </tr> <tr> <td>☒</td> <td>UL (Denko), Borupvang 5A DK-2750 Ballerup, DENMARK</td> </tr> <tr> <td>☒</td> <td>UL (JP), Marunouchi Trust Tower Main Building 6F, 1-8-3 Marunouchi, Chiyoda-ku, Tokyo 100-0005, JAPAN</td> </tr> <tr> <td>☒</td> <td>UL (CA), 7 Underwriters Road, Toronto, M1R 3B4 Ontario, CANADA</td> </tr> </table> For full legal entity names see www.ul.com/incbnames Date: 2020-02-26 Original Issue Date: 2019-12-20  Signature: Jolanta M. Wroblewska				☒	UL (US), 333 Plingsten Rd IL 60062, Northbrook, USA	☒	UL (Denko), Borupvang 5A DK-2750 Ballerup, DENMARK	☒	UL (JP), Marunouchi Trust Tower Main Building 6F, 1-8-3 Marunouchi, Chiyoda-ku, Tokyo 100-0005, JAPAN	☒	UL (CA), 7 Underwriters Road, Toronto, M1R 3B4 Ontario, CANADA
☒	UL (US), 333 Plingsten Rd IL 60062, Northbrook, USA										
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☒	UL (JP), Marunouchi Trust Tower Main Building 6F, 1-8-3 Marunouchi, Chiyoda-ku, Tokyo 100-0005, JAPAN										
☒	UL (CA), 7 Underwriters Road, Toronto, M1R 3B4 Ontario, CANADA										



Shenzhen BALUN Technology Co., Ltd.

Room 104, 204, 205, Building 1, No. 6, Industrial South Road, Songshan Lake District, Dongguan, Guangdong, China

VERIFICATION OF CONFORMITY

Certificate No.: BL-DG2140195D02

Applicant: Power-One Micro systems Pvt Ltd

Address: GF-3, KSSIDC Multi storied building, 5 th cross, 1 st stage, Peenya Industrial estate, Bengaluru-560058, INDIA

Manufacture: Power-One Micro systems Pvt Ltd

Address: GF-3, KSSIDC Multi storied building, 5 th cross, 1 st stage, Peenya Industrial estate, Bengaluru-560058, INDIA

Product: PV Solar Grid Tie Inverter

Brand name:  **POWER-ONE**

Model name: SGTU-703, SGTU-753, SGTU-803,
SGTU-903, SGTU-1003, SGTU-1103

The submitted sample of the above product has been tested according with below Standard(s):

Applied Standards:	Report No.:
IEC 61727:2004	BL-DG2140195-B02
IEC 62116: 2014	BL-DG2140196-B02
IEC 61683	BL-DG2140197-B02
IEC 60068	BL-DG2140198-B02



Tel: +86 755 65850100

Fax: +86 755 61824271

Email: qc@baluntek.com

baluntek.com



Head office & Factory : GF-3 & F-12, KSSIDC Building, 5th Cross, 1st Stage, Peenya Industrial Estate, Bangalore -560 058,
INDIA Ph : +91 - 80- 22027400, 2839 7832, 28398730, 28379844, Toll Free: 18004257832 (service)
E-mail : poweroneups@poweroneups.com, rajeshmr@poweroneups.com, blrmarketing@poweroneups.com

Ref: POM/MRR/ANERT/SPV/2023-24/Q-012

Date: 03/05/2023

ANNEXURE C – DECLARATION BY THE BIDDER

e-Tender Notification No: **ANERT-TECH/99/2022-T2** for **Request for Selection (RFS)** of agency for the **Implementation of 2 MW Solar Power Plant at Travancore Titanium Products Ltd., Kochuveli, Thiruvananthapuram under Solar City project funded by Smart City Thiruvananthapuram Ltd**

To
The CEO
ANERT

We, the undersigned, declare that:

1. We have examined and have no reservations to the Bidding Document, including Addenda No.: 1 (if any)
2. We offer to supply in conformity with the Bidding Document and in accordance with the delivery schedule and this is as per the visit to the sites. We also undertake that we will complete any additional works required for the successful commissioning of the power plants.
3. Our Bid shall be valid for a period of 3 months from the date fixed as deadline for the submission of tenders in accordance with the Bidding Document, and it shall remain binding upon us and may be accepted at any time before the expiration of that period;
4. If our Bid is accepted, we commit to submit a Security Deposit in the amount of 3 percent of the Contract Price for the due performance of the Contract;
5. We are not participating, as Bidders, in more than one Bid in this bidding process;
6. Our firm, its affiliates or subsidiaries, including any subcontractors or suppliers for any part of the Contract, has not been declared ineligible by the ANERT or Government of Kerala;
7. We understand that this Bid, together with your written acceptance thereof included in your notification of award, shall constitute a binding contract between us, until a formal Contract is prepared and executed.
8. We have visited all the sites for which we have quoted and all additional works required for the successful commissioning of the Solar Power Plant will be done by us. In case, we fail to do so, ANERT may initiate the required proceedings against us.

Date: 03/05/2023

Place: Bangalore

Yours faithfully,

For M/s. Power One Micro Systems Pvt. Ltd.


Shantharama Shetty
Sr. Manager Projects
Mob: 9900842336
E-mail: projects@poweroneups.com



www.poweroneups.com

CIN: U32109KA190014C023553

GSTIN : 29AABCP6384L1ZS

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Head office & Factory : GF-3 & F-12, KSSIDC Building, 5th Cross, 1st Stage, Peenya Industrial Estate, Bangalore -560 058,
INDIA Ph : +91 - 80- 22027400, 2839 7832, 28398730, 28379844, Toll Free: 18004257832 (service)
E-mail : poweroneups@poweroneups.com, rajeshmr@poweroneups.com, blrmarketing@poweroneups.com

Ref: POM/MRR/ANERT/SPV/2023-24/Q-012

Date: 03/05/2023

ANNEXURE D – DECLARATION OF RELATIONSHIP WITH ANERT EMPLOYEE

Tender Notification Ref.No.: **ANERT-TECH/99/2022-T2** for **Request for Selection (RFS)** of agency for the **Implementation of 2 MW Solar Power Plant at Travancore Titanium Products Ltd., Kochuveli, Thiruvananthapuram under Solar City project funded by Smart City Thiruvananthapuram Ltd**

To
The CEO
ANERT

Name of the ANERT employee with Designation: NIL
Name of the bidder related to the employee: NIL

This is to put on record that Shri/Smt **NIL** currently working as **NIL** in ANERT is related to **NIL**, who is the bidder in the bid. We are aware of the Anti-corruption policy of ANERT and will observe the highest standards during the procurement and the execution of contract and shall retain from corrupt, fraudulent, collusive or coercive practices on competing for the contract.

Date: **03/05/2023**

Place: **Bangalore**

Yours faithfully,

For M/s. Power One Micro Systems Pvt. Ltd.

Shantharama Shetty
Sr.Manager Projects
Mob: 9900842336
E-mail: projects@poweroneups.com



www.poweroneups.com

CIN: U32109KA190044C023553

GSTIN : 29AABCP6384L1ZS

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ANSWER TO
ALL YOUR
POWER NEEDS



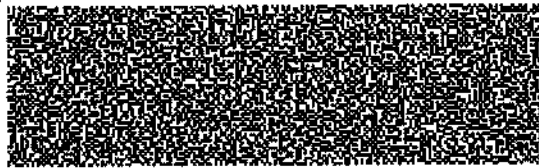
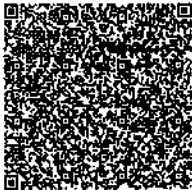


INDIA NON JUDICIAL

Government of Karnataka

e-Stamp

Certificate No. : IN-KA56564496000207V
Certificate Issued Date : 04-May-2023 12:37 PM
Account Reference : NONACC (FI)/ kacrsfi08/ PEENYA3/ KA-RJ
Unique Doc. Reference : SUBIN-KAKACRSFL0894804426516828V
Purchased by : POWER ONE MICRO SYSTEMS PVT LTD
Description of Document : Article 41 Power of Attorney
Description : POWER OF ATTORNEY
Consideration Price (Rs.) : 0
 (Zero)
First Party : POWER ONE MICRO SYSTEMS PVT LTD
Second Party : ANERT
Stamp Duty Paid By : POWER ONE MICRO SYSTEMS PVT LTD
Stamp Duty Amount(Rs.) : 100
 (One Hundred only)



Please write or type below this line

FORMAT 2- POWER OF ATTORNEY

Power of Attorney to be provided by the Bidding Company in favors of its representative as evidence of authorized signatory's authority.

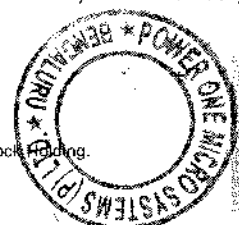
Know all men by these presents, We M/s. Power One Micro Systems Pvt. Ltd. GF-3 F-12 KSSIDC Building 5th Cross 1st Stage Peenya Industrial Estate Bangalore – 560058 do hereby constitute, appoint and authorize Mr. Balasankar, PRA 109, Nandanam, Palottukonam Lane, Cotton Hill P O, Trivandrum – 695014 who is presently employed with us and holding the position of Regional Manager as our true and lawful attorney, to do in our name and on our behalf, all such acts,

Statutory Alert:

1. The authenticity of this Stamp certificate should be verified at 'www.shcilestamp.com' or using e-Stamp Mobile App of Stock Holding. Any discrepancy in the details on this Certificate and as available on the website / Mobile App renders it invalid.
2. The onus of checking the legitimacy is on the users of the certificate

File No. ANERT-TECH/992022-23 (Company Discrepancy) please inform the Competent Authority.

m. R. Ravi

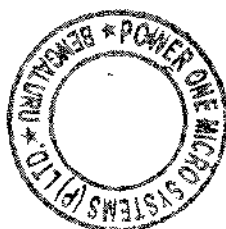


Deeds and things necessary in connection with or incidental to submission of our Bid for Implementation of 2 MW solar power plant at Travancore Titanium Products Ltd., Kochuveli, Thiruvananthapuram, Kerala in response to the Ref. No. **ANERT-TECH/99/2022-T2** dated 12 April 2023 issued by ANERT, including signing and submission of the Bid and all other documents related to the Bid, including but not limited to undertakings, letters, certificates, acceptances, clarifications, guarantees or any other document which the Insert the name of State Implementing Agency may require us to submit. The aforesaid attorney is further authorized for making representations to the Insert the name of State Implementing Agency, and providing information / responses to Insert the name of State Implementing Agency, representing us in all matters before Insert the name of State Implementing Agency and generally dealing with ANERT in all matters in connection with Bid till the completion of the bidding process as per the terms of the above mentioned RFS.

We hereby agree to ratify all acts, deeds and things done by our said attorney pursuant to this Power of Attorney and that all acts, deeds and things done by our aforesaid attorney shall be binding on us and shall always be deemed to have been done by us.

All the terms used herein but not defined shall have the meaning ascribed to such terms under the RFS.

Signed by the within named
M.R. Rajesh



Through the hand of Mr. Balasankar

**Duly authorized by the Board (vide Board Resolution to issue such Power of Attorney
Dated this May 02th day of 2023**

Accepted

Mr. Balashankar
Regional Manager

Attested

.....
(Signature of the executant)

(Name, designation and address of the executant)

.....
Signature and stamp of Notary of the place of execution

Common seal of has been affixed in my/our presence pursuant to

Board of CEO's Resolution dated.....(Board of CEO's Resolution is also enclosed) WITNESS

1.

Name: Vinod Kumar N

Designation: Marketing

2.

Name: Shalini

Designation: Admin



Head office & Factory : GF-3 & F-12, KSSIDCBuilding, 5th Cross, 1st Stage, Peenya Industrial Estate, Bangalore -560 058,
INDIA Ph : +91 - 80- 22027400, 2839 7832, 28398730, 28379844, Toll Free: 18004257832 (service)
E-mail : poweroneups@poweroneups.com, rajeshmr@poweroneups.com, blrmarketing@poweroneups.com

Ref: POM/MRR/ANERT/SPV/2023-24/Q-012

Date: 03/05/2023

COVERING LETTER

To,
The CEO
ANERT

Sub: Request for Selection (RFS) of agency for the Implementation of 2 MW Solar Power Plant at Travancore Titanium Products Ltd., Kochuveli, Thiruvananthapuram under Solar City project funded by Smart City Thiruvananthapuram Ltd.

Ref. No: ANERT-TECH/99/2022-T2 And Tender ID: 2023_ANERT_571678_1

Sir,

We hereby e-tender to supply, under annexed terms and conditions of contract, the whole of the articles referred to and described in the attached specification and quantity decided by the Agency for New and Renewable Energy Research & Technology (ANERT), at the rates quoted against each item. The articles will be delivered and installed/commissioned operated and maintained for 10 years thereafter within the time and at the place(s) specified in the schedule.

We are remitting herewith the required amount of **Rs. NIL** towards the cost of e-tender and Earnest Money Deposit by electronic payment vide transaction No **NIL**.

Date: 03/05/2023

Place: Bangalore

Yours faithfully,

For M/s. Power One Micro Systems Pvt. Ltd.

Shantharama Shetty
Sr.Manager Projects
Mob: 9900842336
E-mail: projects@poweroneups.com



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GSTIN : 29AABCP6384L1ZS



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 E-mail : poweroneups@poweroneups.com, rajeshmr@poweroneups.com, blrmarketing@poweroneups.com

Ref: POM/MRR/ANERT/SPV/2023-24/Q-012
Date: 03/05/2023

BOM 1500kW Solar Power Plant 3Phase Input – 3Phase Output					
Sl. No.	Item	Make (if any)	Model & Individual Capacity (If any)	Qty (Nos)	Rating / Capacity
1.	PV Module	From ALMM list	1000kWp	2778Nos	540Wp
2.	PCU/Inverter	Power-One Microsystems	SGTU-1003N	15Nos	SET
4.	DC Cables	Poly Cab/Ravicab/Equivalent		1 Lot	As per design
5.	AC Cables	Southking/Polycab/Equivalent		1 Lot	As per design
6.	AJB/SCB	Power-One Microsystems	1500kWp	1 Set	1500kWp - 3Ph/3Ph
7.	Module Mounting Structure (MMS)	Power-One Microsystems	1500kWp	1 Set	As per design
8.	ACDB	Power-One Microsystems	1500kWp	1 Set	SET
9.	Lightning Arrester	Gravin/JEF/Smart Solutions/Manav Energy/Indelec/Equivalent		1 Set	SET
10.	Earthing System Details and No. of Earth pits	Gravin/JEF/Smart Solutions/Manav Energy/Indelec/Equivalent		1Set	17mm Dia with 1.2 mtr length Cu. bonded rod with earth compound, 25x3mm GI strips, 300x300 mm earth chamber

BOM 500kW Solar Power Plant 3Phase Input – 3Phase Output					
Sl. No.	Item	Make (if any)	Model & Individual Capacity (If any)	Qty (Nos)	Rating / Capacity
1.	PV Module	From ALMM list	500kWp	2778Nos	540Wp
2.	PCU/Inverter	Power-One Microsystems	SGTU-1003N	5Nos	SET

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GSTIN : 29AABCP6384L1ZS



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 E-mail : poweroneups@poweroneups.com, rajeshmr@poweroneups.com, blrmarketing@poweroneups.com

4.	DC Cables	Poly Cab/Ravicab/Equivalent		1 Lot	As per design
5.	AC Cables	South king /Polycab/ Equivalent		1 Lot	As per design
6.	AJB/SCB	Power-One Microsystems	500kWp	1 Set	500kWp - 3Ph/3Ph
7.	Module Mounting Structure (MMS)	Power-One Microsystems	500kWp	1 Set	As per design
8.	ACDB	Power-One Microsystems	500kWp	1 Set	SET
9.	Lightning Arrester	Gravin/JEF/Smart Solutions/Manav Energy/Indelec/Equivalent		1 Set	SET
10.	Earthing System Details and No. of Earth pits	Gravin/JEF/Smart Solutions/Manav Energy/Indelec/Equivalent		1Set	17mm Dia with 1.2 mtr length Cu. bonded rod with earth compound, 25x3mm GI strips, 300x300 mm earth chamber

Date: 03/05/2023

Place : Bangalore

Yours faithfully,

For M/s. Power One Micro Systems Pvt. Ltd.


Shantharama Shetty

Sr.Manager Projects

Mob: 9900842336

E-mail: projects@poweroneups.com



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 E-mail : poweroneups@poweroneups.com, rajeshmr@poweroneups.com, blrmarketing@poweroneups.com

Ref: POM/MRR/ANERT/SPV/2023-24/Q-012

Date: 03/05/2023

ANNEXURE B – GUARANTEED TECHNICAL PARAMETERS

Solar PV Module			
Sl. No	Particulars	Required	Offered
1.	PV Module Manufacture Name & Country of origin	Manufacture name to be specified)	EMMVEE/WAREE/VIKRAM/RENEWSYS/RAYSON/Goldee/EQUIVALENT
2.	PV Module type	Poly/Mono Crystalline, Mono/Poly PERC	MONO PERC
3.	Product Code		E540HCMW144
4.	No. of PV cells per Module		144
5.	Total number of PV modules		1 Lot As per Capacity
6.	Max.Power, Pmp @STC	330 Wp or above	540Wp
7.	Max.power tolerance (%)	Not more than 3%	Max 3%
8.	Max.power voltage (Vmp)@STC	To be specified	41.5V
9.	Max.power current (Imp) @STC	To be specified	13A
10.	Open circuit voltage, Voc@STC	To be specified	49.5V
11.	Short circuit current, Isc@STC	To be specified	13.6A
12.	Nominal voltage	To be specified	49.5V
13.	Nominal Wattage	To be specified	540Wp
14.	Fill Factor	Not less than 0.7	Yes
15.	Temp. coefficient of Voc (%/C)		-0.34% / °K
16.	Temp. coefficient of Pmp (%/C)		-0.4%/°K
17.	Temperature Co-efficient of Isc (%/°C)		+0.05% / °K
18.	Normal Operating Cell Temperature (NOCT) (°C)		46°C+/-2°C
19.	Operating Temperature (°C)		-40°C TO 60°C
20.	Max Temperature rise of solar cells under severe working conditions over Max. Ambient Temp.	To be specified	
21.	Module is suitable to operate at 50 ⁰ ambient	Yes/No	Yes
22.	Cell efficiency	%	
23.	Module efficiency	>=17% (Document to prove efficiency shall be furnished with the offer)	20.9%
24.	Maximum System Voltage		1500 V DC
25.	No. of By-pass Diodes		
26.	Mounting arrangement for Solar Module	Fixed Arrangement	Fixed Arrangement

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27.	Solar Module frame material	Anodized Aluminium	Anodized Aluminium
28.	Finish		
29.	Types of Sections used		
30.	Module dimensions cms (LxWxH)	To be specified	2278mm*1134mm*35mm(L*W*H)
31.	PV panel Weight (kg)	To be specified	26Kg
32.	Module Life (minimum)	25 years	25 Years
33.	PV array area (sqm)		Aprox 8 sq meter/kWp
34.	Standards/Approvals from International Agencies	IEC 61215/IEC 61730/ IEC 61701	
35.	Guaranteed output confirm	Yes	Yes
36.	Output Cables	Polarized, UV protected & Weather Proof DC rated multi-contact connector	4 Sqmm solar cables, Length 1200mm
37.	Output Terminal	PV Connectors	Mc4 compatible
38.	Junction Box	Weather resistant HDPE (IP65)	IP65
39.	Construction Front, Back	High transmittance glass. Polyester Ethyl Vinyl Acetate (EVA) encapsulate	EVA
40.	Glass	Low iron tempered	3.2mm High transmission, Tempered Glass
43.	Copies of test certificates	IS 14286/IEC 61215, 61730 part 1&2, IEC 61701	Yes

GUARANTEED TECHNICAL PARAMETERS INVERTER (1500KW 3Ph/3Ph)

Sl. No.	Particulars	Required	Offered
1.	Manufacturer		Power one
2.	Model name/No.		SGTU-1003N
3.	Number of units		15
5.	Nominal AC power		1500KW
6.	Nominal AC voltage		380/400
7.	Nominal AC Current		115.9
8.	AC grid Frequency range	50Hz $\pm$ 0.5%	50
9.	AC grid voltage range		280-480
10.	Power Factor (+ and -)		0.98
11.	Total Harmonic Distortion	As per IEEE-519 2014	<3%
12.	AC over / under voltage over / under frequency protection		● DC Reverse- Polarity protection

Head office & Factory : GF-3 & F-12, KSSIDC Building, 5th Cross, 1st Stage, Peenya Industrial Estate, Bangalore -560 058,
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 E-mail : poweroneups@poweroneups.com, rajeshmr@poweroneups.com, blrmarketing@poweroneups.com

			● Output overvoltage protection ● Surge protection ● AC short circuit protection ● Insulation resistance protection ● Islanding protection ● AC output overcurrent protection ● Ground fault monitoring ● Temperature protection
13.	Max PV input power		1500KW
14.	Maximum DC voltage	Less than 1000 V	1000V
15.	MPPT voltage range		200-800
16.	Maximum DC current		40A PER MPPT
17.	No. of DC input ports		4*4
18.	Maximum Efficiency	As per IEC61683	98.9%
19.	DC voltage ripple		< 0.5%
20.	Ambient temperature range		-25°C- + 60°C
21.	Humidity (non - condensing)	95%, non-condensing	0-100%
22.	Degree of protection		IP65
23.	Dimensions approx. (HxWxD)		838*568*323(W*H*D)
24.	Weight		73kgs
25.	Protective functions AC over/under voltage, AC over / under frequency, over temperature, AC and DC overcurrent, DC over- voltage, against Islanding		● DC Reverse- Polarity protection ● Output overvoltage protection ● Surge protection ● AC short circuit protection ● Insulation resistance protection ● Islanding protection ● AC output overcurrent protection ● Ground fault monitoring ● Temperature protection
26.	Communication Interface	RS485. MPI Profi Bus / Telephone Modem/WiFi	RS485/RS232
27.	User-display standard	LCD panel with membrane keypad	LCD
28.	Enclosure environment rating		IEC 60068-2-1:2007, IEC 60068-2-2:2007, IEC 60068-2-14:2009, IEC 60068-2-30:2005.
29.	Safety and EMC		IEC 62109-2:2011

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30.	Anti-islanding feature	IEEE1547/UL1741/IEC62116	IEC 62116:2014
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GUARANTEED TECHNICAL PARAMETERS INVERTER (500KW 3Ph/3Ph)

Sl. No.	Particulars	Required	Offered
1.	Manufacturer		Power one
2.	Model name/No.		SGTU-1003N
3.	Number of units		5
5.	Nominal AC power		500KW
6.	Nominal AC voltage		380/400
7.	Nominal AC Current		115.9
8.	AC grid Frequency range	50Hz $\pm$ 0.5%	50
9.	AC grid voltage range		280-480
10.	Power Factor (+ and -)		0.98
11.	Total Harmonic Distortion	As per IEEE-519 2014	<3%
12.	AC over / under voltage over / under frequency protection		● DC Reverse- Polarity protection ● Output overvoltage protection ● Surge protection ● AC short circuit protection ● Insulation resistance protection ● Islanding protection ● AC output overcurrent protection ● Ground fault monitoring ● Temperature protection
13.	Max PV input power		500KW
14.	Maximum DC voltage	Less than 1000 V	1000V
15.	MPPT voltage range		200-800
16.	Maximum DC current		40A PER MPPT
17.	No. of DC input ports		4*4
18.	Maximum Efficiency	As per IEC61683	98.9%
19.	DC voltage ripple		< 0.5%
20.	Ambient temperature range		-25°C- + 60°C
21.	Humidity (non - condensing)	95%, non-condensing	0-100%
22.	Degree of protection		IP65
23.	Dimensions approx. (HxWxD)		838*568*323(W*H*D)
24.	Weight		73kgs
25.	Protective functions AC over/under voltage, AC over / under frequency, over temperature, AC and DC		● DC Reverse- Polarity protection ● Output overvoltage

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E-mail : poweroneups@poweroneups.com, rajeshmr@poweroneups.com, blrmarketing@poweroneups.com

	overcurrent, DC over- voltage, against Islanding		protection ● Surge protection ● AC short circuit protection ● Insulation resistance protection ● Islanding protection ● AC output over current protection ● Ground fault monitoring ● Temperature protection
26.	Communication Interface	RS 485. MPI Profile Bus / Telephone Modem/WiFi	RS485/RS232
27.	User-display standard	LCD panel with membrane keypad	LCD
28.	Enclosure environment rating		IEC 60068-2-1:2007, IEC 60068-2-2:2007, IEC 60068-2-14:2009, IEC 60068-2-30:2005.
29.	Safety and EMC		IEC 62109-2:2011
30.	Anti-islanding feature	IEEE1547/UL1741/IEC62116	IEC 62116:2014

Date: 05/05/2023

Place : Bangalore

Yours faithfully,

For M/s. Power One Micro Systems Pvt. Ltd.


Shantharama Shetty

Sr. Manager Projects

Mob: 9900842336

E-mail: projects@poweroneups.com





Head office & Factory : GF-3 & F-12, KSSIDC Building, 5th Cross, 1st Stage, Peenya Industrial Estate, Bangalore -560 058,
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E-mail : poweroneups@poweroneups.com, rajeshmr@poweroneups.com, blrmarketing@poweroneups.com

Ref: POM/MRR/ANERT/SPV/2023-24/Q-012

Date: 03/05/2023

FORMAT – 3 - GENERAL PARTICULARS

Name of the Agency	M/s Power One Micro Systems Pvt Ltd
Registered Office	Registered Office & Factory: GF-3 & F-12, KSSIDC Multistoreyed Building, 5 th cross, 1 st stage, Peenya Industrial Estate, Bangalore-560058 Branch Office : PRA 109, Nandanam, Palottukonam Lane, Cotton Hill P O, Trivandrum - 695014
Nature of Agency (Ltd. Co.,Partnership etc.) Attach Copy of partnership Deed / Certification of Incorporation	Manufacturer
Year of Establishment	1992
Registration of Number	08/23553 of 1998
Address for Communication	Registered Office & Factory: GF-3 & F-12, KSSIDC Multistoreyed Building, 5 th cross, 1 st stage, Peenya Industrial Estate, Bangalore-560058 Branch Office : PRA 109, Nandanam, Palottukonam Lane, Cotton Hill P O, Trivandrum - 695014
Telephone number of Contactperson(Mobile if any)	080 – 28398730 / 28379844 9447033724
Name of CEOs/ Proprietor / Partners (with addressand Telephone No)	IB Rao Rajesh M.R
GST Registration Number (Copyto be Attached)	29AABCP6384L1ZS
PAN Number	AABCP6384L
TAN Number	BLRP01676D
Whether the bidder wishes toform a project company for execution of work	Yes
Whether any Civil Suit / Litigationarisen in the contract executed during the last five years/being executed. If yes, please furnish thename of the Contract, employer work order and date and brief details of litigation.	NO NIL
Details of Total Experience in general since inception(Details of similar systems installed till the date of bid)	
Details of Turnover for last Two years. (Copy Audited Statements has to be submitted for last two financial years)	Enclosed
Details of offices in Kerala, India and abroad- address and contact details	Enclosed

Date: 03/05/2023

Place: Bangalore

Yours faithfully,

For M/s. Power One Micro Systems Pvt. Ltd.

Shantharama Shetty

Sr.Manager Projects

Mob: 9900842336

E-mail: projects@poweroneups.com



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Ref: POM/MRR/ANERT/SPV/2023-24/Q-012

Date: 03/05/2023

LIST OF OFFICE/ SERVICE CENTER IN KERALA

COCHIN (KOCHI) : "RR Building" No. 48/651F, 2nd Floor, South Keerthi Nagar Lane, Elamakara.P.O, Kochi-682026, Tele: 0484-2530633, E-mail: cochin@poweroneups.com

TRIVANDRUM : "PRA 109, Nandanam, Palottukonam Lane, Cotton Hill P O Trivandrum - 695 014

Tele: 0471-2728724, Email: trivandrum@poweroneups.com

CALICUT : M.K. Building, Room No. 24/987F, P.O. Manakavu, Kaloore Road Junction, Calicut-673007 Tele: 0495

2333754 Email: calicut@poweroneups.com

Sl. No.	Name	Designation	Location	Mob. No.	E-mail Id
Sales & Marketing Staff					
1	KG Balasankar Menon	Regional Manager	Trivandrum	9447033724 7907241109	balasankar@poweroneups.com
Service Staff					
2	Joymon Devassy	Service Engineer	Cochin	9895148392	cochin@poweroneups.com
3	Sanjeev Kumar	Customer Support Head	Trivandrum	9447763724	trivandrum@poweroneups.com
4	Faris A	Service Engineer	Trivandrum	9745888724 7012743407	mktgtvm@poweroneups.com
5	Jidu Krishnan	Service Engineer	Trivandrum	8943846269	
6	Ajith GK	Service Engineer	Trivandrum	7011291353 9447031345	
7	Mashood RS	Service Engineer	Trivandrum	9496281559	
8	AMAL MOHAN T	Service Engineer	Calicut	9947832047	calicut@poweroneups.com

Date: 03/05/2023

Place : Bangalore

Yours faithfully,

For M/s. Power One Micro Systems Pvt. Ltd.

Shantharama Shetty

Sr. Manager Projects

Mob: 9900842336

E-mail: projects@poweroneups.com



List of Solar Power Plant Works Executed in last 5 Years

S.No	Name of Work	Customer Name	Capacity in kWp	Qty	Total Cumulative Capacity Installed	Order Value	Date of Commencement/ Completion	Completed or Not
1	SITC of 3 kWp Hybrid Solar Power Plants for BSWAN 2.0	Bihar State Electronics Development corporation Limited, Beltron Bhawan, Shastri Nagar, Patna - 800023	3 kWp		532.1596 kWp	383798000.00	10/11/2016 10/06/2017	Completed
2	SITC of 4 kWp Ongrid & Hybrid Solar Power Plants in State of Uttrakhand under UREDA Rate Contract	Uttrakhand Renewable Energy Development Agency, Pateinagar, Dehradun	4 kWp		296.1184 kWp	90560000.00	10/12/2016 30/10/2017	Completed
3	SITC of 5HP (4.8 kWp) Solar Power Water Pumping System for Farmers of Chitradurga District, Karnataka	Minor Irrigation Department (Govt of Karnataka), Chitradurga, Karnataka	4.8 kWp		170.816 kWp	95200000.00	10/01/2015 08/08/2015	Completed
4	SITC of Various capacity of On Grid Solar PV Power Plants all over Kerala State under ANERT rate contract 2015-16	Agency for Non Conventional Energy & Rural Technology (Dept of Power, Govt of Kerala), Law College Road Vilas Bhawan PO, Thiruvanthapuram, Kerala-695033	Various Capacity ranging from 2 kWp to 50 kWp		734 kWp	56700000.00	01/04/2015 30/11/2016	Completed
7	SITC of 2 kWp x 165 Nos Off Grid Solar Power Plants at Atalji Jana Sneh Kendras in Mysore Region of Karnataka State	Karnataka Renewable Energy Development Limited, No.139,Shanthi Gruha, Palace Road, Bangalore-560001	2 kWp		165.708 kWp	169478750.00	2/12/2012 20/03/2013	Completed
8	SITC of 2 kWp x 130 Nos Off Grid Solar Power plants at Atalji Jana Sneh Kendras in Gulbarga Region of Karnataka State	Karnataka Renewable Energy Development Limited, No.139,Shanthi Gruha, Palace Road, Bangalore-560001	2 kWp		130			
9	SITC of 2 kWp x 59 Nos Off Grid Solar Power Plants at Atalji Jana Sneh Kendras in Belgaum Region of Karnataka State	Karnataka Renewable Energy Development Limited, No.139,Shanthi Gruha, Palace Road, Bangalore-560001	2 kWp		59			
3	SITC of various capacity of On Grid Solar PV Power Plants all over Andhra Pradesh State under NREDCAP Rate Contract	New & Renewable Energy Corporation of Andhra Pradesh Ltd, No.5-8-207/2 Piegah Complex, Nampally Hyderabad-500001	25 kWp 15 kWp 10 kWp 6 kWp 5 kWp 3 kWp 2 kWp	2 1 5 2 7 65 30	417 kWp	45345000.00	20/4/2014 10/03/2015	Completed
10	SITC of 1 kWp Off Grid Solar PV Power Plants all over Kerala State under ANERT rate contract	Agency for Non Conventional Energy & Rural Technology (Dept of Power, Govt of Kerala), Law College Road Vikas Bhawan PO, Thiruvanthapuram, Kerala-695033	1 kWp		100.210 kWp	39600000.00	10/05/2013 26/02/2014	Completed
11	SITC of 2 x 100 kWp On Grid Solar Power Plants at BEML, Mysore	BEML, Belavadi Post, Mysore-570018	100 kWp		2.200 kWp	16182000.00	10/11/2016 17/05/2017	Completed
Total Capacity & Value of On grid & Off grid Solar Power Plants Installed					5865 kWp	896863750.00		
Sl No.	Name of Client	Qty	Capacity	Total Capacity of the Project	Project Value	Start Date		
1	RDP-Project-Gramapanchayat, Taluk Panchayath,Zilapanchayath all Districts of Karnataka	Multiple Sites	1.2,3,5&10kWp HYBRID	1900kWp	18 Cro	On Going Multiple Sites		
2	Postal Department	1 Nos	15kWp ON GRID	15kWp	8Lakhs	05-02-2023		
3	SBI Hyderabad	3Nos	25,28&40kWp ON GRID	93kWp	52 Lakhs	25-01-2023		
4	Anert Kerala	6Nos	5,7,5&10kWp-Hybrid	47.5kWp	70 Lakhs	15-01-2023		
5	HAL Bengaluru	1 No.	15kWp-ON GRID	15kWp	10Lakhs	10-12-2022		



Sl No.	Name of Client	Qty	Capacity	Total Capacity of the Project
1	REIL	1	ONGRID	1900kwp
2	Brigade WTC -Chennai	1 Nos	210kwp ON GRID	210kwp
3	Kannada University -Hampe	15 Nos	10kwp-Hybrid	150kwp
4	WII FI - Project Bihar	300 Nos	3kwp-Hybrid	900kwp
5	Vidya vardhaka Engineering college- Mysore	1 No.	175kwp-ON GRID	175kwp
6	KSEB-Kerala	48 Nos	5kwp-ON GRID	240kwp
7	BEML-Mysore	2 Nos.	100kwp-ON GRID	200kwp
8	KRIES-Bangalore	30 Nos	30kwp-Hybrid	900kwp
9	Jharkhand Renewable Energy Dev Agency	200 nos	1 kwp	200 kwp
10	Brigade Southfield-Bangalore	1 No	80kwp ON GRID	80kwp
11	Brigade Senate 1 and 2	2 Nos	33 kwp ON GRID	33kwp
12	Brigade Panorama-Bangalore	1 No	10kwp-Off Grid	10kwp
13	Brigade Xanadu cluster-Chennai	4 Nos	15kwp-ON GRID	60kwp
14	St.Paul Church-Bangalore	1 No	20kwp	20kwp
15	Govt-ITI college-Gangavathi	1 No	50kwp ON GRID	50kwp
16	KUJFDC-Bangalore	1 No	50kwp ON GRID	50kwp
17	SBI-Durgapur,Kaikkali-Kolkata	2 Nos	10kwp-ON GRID	20kwp
18	MP Urja-Collectral offcass	15 Nos	10kwp-Hybrid	150kwp
19	HAL-Bangalore	35 Nos	2kwp-Off Grid	70kwp
20	ITC-Bangalore	3 Nos	15kwp ON GRID	15kwp
21	BEI-Bangalore	17 Nos	48kwp-ON GRID	48kwp
22	IPDS Project Kolkata	300 Nos	5 and 10kwp ON GR	1.5Mwp
23	Vertex-Vijayawada	3 Nos	10kwp-ON GRID	30kwp
24	LERC-Bangalore	1 No	60kwp-ON GRID	60kwp
25	GPO-Bangalore	1 Nos	75kwp-ON GRID	75kwp
26	KRIDL-Bangalore	16 Nos	175kwp-Hybrid	175kwp
27	Post Office Bellary	1 No	15kwp-ON GRID	15kwp
28	Dr. Banuprakash-Mysore	1 No.	10kwp-ON GRID	10kwp
29	Kaveri Gramaena Bank, Mandya Karnataka	15 nos	1 kwp	15 kwp
30	Mandya District Co Operative Central Bank Ltd	48 nos	2 kwp	96 kwp
31	Karnataka Renewable Energy Dev. Ltd	165 nos	2 kwp	330 kwp
32	Karnataka Renewable Energy Dev. Ltd	130 nos	2 kwp	260 kwp
33	Karnataka Renewable Energy Dev. Ltd	59 nos	2 kwp	118 kwp
34	ANERT - Kerala	328 nos	1 kwp	328 kwp
35	ANERT - Kerala	1 no.	2.5 kwp	2.5 kwp
36	Trivandrum Zilla Panchayat	1 no.	5 kwp	5 kwp
37	Trivandrum			
38	MILMA Calicut	1 no.	3 kwp	3 kwp
	M/s Tekmark, Dharwad University	1 no.	100 kwp	100 kwp



39	POM Systems & Services P Ltd, Bangalore	1 no.	5 kwp	5 kwp
40	New & Renewable Energy Dev Cor of AP Ltd. Department of Police	26 nos	1.5 kwp	39 kwp
41	New & Renewable Energy Dev Cor of AP	112 no's	Cumulative	417 kwp
42	Power Grid Cochin	1	50 kwp	50 kwp
43	Superintendent of Police- Wireless, Government of Karnataka	12 nos	2 kwp	24 kwp
44	M/s Tekmark, Dharmad University	1 no.	50 kwp	50 kwp
45	SRR College Vijaywada	1 no.	10 kwp	10 kwp
46	AGSGS	1 no.	25 kwp	25 kwp
47	Bharath Dynamic Limited	1 no.	25 kwp	25 kwp
48	Keonics	02 no's	10 kwp	10 kwp
49	CESCOM	01 no	20 kwp	20 kwp
50	Anert Grid Connected Project	74 no's	Cumulative	700 kwp
51	Minor irrigation Department	170 no's	5 Hp	850 kwp
52	BSWAN	495 no's	3 kwp	1485 kwp
53	JREDA	100 no's	1 kwp	100 kwp
54	JREDA	01 no's	50 kwp	50 kwp
55	Tata Advanced Systems Limited- Patna(CCTV-Police Stations)	627 Nos	3 kwp Hybrid plants	1881kwp
56	RDPR-Project-Gramapanchayat Taluk Panchayath,Zillapanchayath all over Karnataka	482 Nos	2,3,5,10kwp Hybrid plants	1.6MWp
57	Voltas Limited-Tirupathi	1 No.	20 kwp ON GRID	20kwp
58	Brigade group-Mysore	1No.	5kwp-ON GRID	5kwp
59	State Bank of India Bellary	2 nos	3.75 kwp	7.50 kwp
60	Vijay bank, Rural branches, Shimoga District, Karnataka	5 nos	1.5 kwp	7.5kwp
		1 no	2.5kwp	5kwp
		2 nos	4kwp	8kwp
		1 no	2kwp	2kwp



I/17588/2023



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ANERT

Agency for New and Renewable Energy Research and Technology

നവീനവും പുനരുപയോഗയോഗ്യവുമായ ഊർജ്ജ ഗവേഷണങ്ങൾക്കും സാങ്കേതിക വിദ്യകൾക്കുമുള്ള ഏജൻസി
(Department of Power, Government of Kerala)

No. ANERT-TECH/57/2023-PE1(RTS)

20-04-2023

To

**M/s Powerone Micro Systems Pvt.Ltd,
GF-3, KSSIDC Multistoreyed Building,
5th cross, 1st stage, Peenya Industrial Estate,
Bangalore, Karanataka - 560058**

WORK ORDER

Sir,

Sub: ANERT - Design, Supply, Installation and Commissioning of Grid connected SPV Power Plants in University of Kerala, Karyavattam Campus, Thiruvananthapuram under Solar City Project (funded by Smart City Thiruvananthapuram Ltd) - reg

Ref: 1. Tender ID: 2023_ANERT_568710_1 published on Kerala Tenders portal
2. Your Bid No. 1533204 dtd 05/04/2023

Attention is invited to the references cited. Your offer for the Design, Supply, Installation and Commissioning of Grid connected SPV Power Plants in University of Kerala, Karyavattam Campus, Thiruvananthapuram under Solar City Project (funded by Smart City Thiruvananthapuram Ltd) is accepted. You are requested to carry out the work at the sites as detailed below subject to the following terms and conditions.

SN	Name of building	Capacity (kW)	Amount
1	Design, Supply, Installation, Testing and Commissioning of Grid connected Solar Power plant in various buildings within University of Kerala, Karyavattam Campus	750	4,78,08,992/-
Total		750	4,78,08,992/-
Rupees Four Crores Seventy-Eight Lakh Eight Thousand Nine Hundred and Ninety-Two only			

A tripartite agreement has to be executed by you in the prescribed form (enclosed as Annexure - I) on Kerala Stamp paper as per the Kerala Government order - G.O.(P) No.113/2019/TD dtd 24/07/2019 (One rupee for every Rs 1000 or part thereof on the contract amount, subject to a minimum of rupees 200 and a maximum of rupees one lakh) within 7 days of the receipt of this work order for the fulfilment of

Law College Road, Vikas Bhavan P.O., Thiruvananthapuram, Kerala - 695 033 Phone: +91 471 - 2338077, 2334122, 2333124, 2331803 Fax: + 91 471 - 2329853
Web: www.anert.gov.in E-mail: info@anert.in e-Market place: www.buymysun.com

the contract along with a security deposit of **Rs. 14,34,270/- (Rupees Fourteen Lakh Thirty-Four Thousand Two Hundred & Seventy only)** being the 3% of contract value of **Rs. 4,78,08,992/-** on Demand Draft/Bank Guarantee/NEFT transfer in favour of CEO, ANERT. You have to pay all expenses incidental to the execution of the above agreement. Another agreement must be provided before the start of the O&M period upon issue of separate work order and the formats shall be provided during the commissioning of the SPV Power Plant.

1. SCHEDULE OF SUPPLY, INSTALLATION & COMMISSIONING:

- i. The items should be delivered and installed at the Roof top of the buildings listed below as specified by ANERT, under prior intimation and supervision of ANERT. The work awarded agency is free to omit any of the buildings listed below if they are able to accommodate the capacity in other buildings. Further, they are free to select any other additional building within the campus with permission of the UoK authorities and prior approval from ANERT for installation of the above capacity.

SN	Name of building	Capacity (kW)
1	School of Distance Education	100
2	Department of Aquatic Biology & Fisheries	90
3	Department of chemistry	90
4	Institute of management Kerala (IMK)	80
5	CLIF (Central Laboratory for instrumentation and facilitation)	60
6	Department of Optoelectronics	60
7	Department of Demography	50
8	University College of Engineering	50
9	Department of Biotechnology (New Building)	40
10	Department Of Environmental Sciences	35
11	Department of political Science	35
12	University Campus Library	30
13	PG Hostel For Men	15
14	Womens' Hostel PG Block	15
TOTAL		750

- ii. If the successful bidder fails to deliver the materials within the days mentioned below, the order stands cancelled and ANERT will award the work to the next

bidder and penalty as decided by ANERT will be levied.

SN	Material Delivery (Days)	Completion Period (Days)
1	30	60

- iii. The detailed Engineering drawings as mentioned in the tender also be submitted prior to start of works. The rates mentioned above is inclusive of all additional works required for the successful commissioning of the power plant and no request for enhancement of rates will be entertained.
- iv. Supply of the SPV module must be from the ALMM list issued by MNRE from time to time. It is required to use Mono PERC Half cut cells – 500 Wp or above for the works. The Solar PCU and charge controller should meet the General and Technical specifications as mentioned in the tender.
- v. The agency shall submit the timeline for completion along with the agreement and security deposit. This timeline must be followed and no extension of time for completing the installation will be granted. Although, time extension may be granted for things beyond the control of your agency.
- vi. The detailed Bill of Materials along with datasheets & Test certificates of PV Modules (Mono PERC), Grid Tie Inverter etc must be provided well in advance and must be approved by ANERT before material despatch. ANERT reserves the right to reject the materials if the same are not in compliance with the requirements of the tender. In case, the successful bidder delivers the materials without BoM approval, they may have to take back the materials at their own cost and no time extension without penalty will be provided for completion of works.
- vii. The Supply, Installation and Commissioning of the Power Plant must be completed within the timeline mentioned above. This is the time period for handing over the system to ANERT with Grid connectivity.
- viii. In case of no valid reason, extension of time of completion that can be granted at a time shall will be 25% of the original time. The maximum extension that can be granted for a work shall be limited to half the original time of completion.
- ix. When the contract period has to be extended wholly or partly due to default on the part of the bidder, the Agreement Authority may sanction extension of time after imposing fine as mentioned below;

Period	Rate of Fine
First Extension	1% of the PAC subject to a minimum of Rs. 1000/- and maximum of Rs. 50,000/-.
Second Extension	2% of the PAC subject to a minimum of Rs. 2000/- and maximum of Rs. 1,00,000/-

- x. Penalty for delay in supply and installation will be imposed at 0.5 % per week up

to a maximum 10%. In case of delay in supply and installation, CEO, ANERT may cancel the contract and take recourse to other action as deemed appropriate.

2. INSTALLATION

- i. The installation work of the solar power plant must be in compliance with the Technical Requirements and Standards as mentioned in the Tender.
- ii. A display board, made of metal plate (size 60cm x 40cm) should be displayed with contents to be provided by the concerned official at ANERT is to be placed at each of the sites.
- iii. The vendor is to bear the fee for KSEBL feasibility, Registration and all other expenses along with additional costs for site specific cabling works, earthing, mounting structure modifications, Electrical panel modification, access ladders, pathway facility in case required are also under the scope of the vendor. The scope of enhancing load, phase conversion wherever necessary is also under the scope.
- iv. In case the installations require the replacement of CTs (Class 0.2s), PT (Class 0.2) of rating for commissioning of the power plant, it is under the scope of the vendor. The rates for Supply of tested transformers & Replacement at the site of these items are under the vendor scope.
- v. Any other work required for the successful commissioning of the power plant which are not mentioned in this document and are required as per prevailing laws & regulations in the country

3. PAYMENT

A. The terms of payment shall be:

A1. EPC Payment

- i. Upon delivery of major components (PV Modules, Inverter, MMS etc) at the site/warehouse, a maximum of 60 % of the contract value can be released through Running Accounts Bills of min 10% of the contract value. The supplier shall submit the part invoice for the materials (including serial numbers and delivery chalan) for the materials duly certified by the concerned District Office along with a report regarding the supply of materials. Each RAB shall be accompanied with an item wise statement of work completion with qty, rate & the actual expenditure incurred audited by a Chartered Accountant.
- ii. On completion of the installation of power plant and filing application for testing with the electrical utility (incl Energisation order for plant capacity above 30kW), 20% of the contract value shall be released as second part payment. The supplier shall submit the invoice for the materials supplied and all documents

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- related including the Project Completion Report to the completion of the work certified by the district office shall be submitted for the release of the amount. The PCR submitted will be used for conducting the pre-commissioning tests.
- iii. On commissioning of the grid connected system, 10% of the remaining contract value will be released after proving the Performance ratio (AC). All documents related to the completion of the work including commissioning report shall be submitted for the release of the amount.
 - iv. The balance 10% shall be retained as performance security and will be released in parts - 2% after 1 year of operation, 2% after 3 years of operation, 2% after 5 years of operation, 2% after 7 years of operation and the balance upon completion of warranty. For each of these payment release, Performance ratio (AC) shall be proved within a period of 7 consecutive days at the end of each year for release of payment. This period will be considered only from the date of commissioning.
 - v. The security deposit of 3% furnished along with the contract agreement shall be released on successful completion of supply, installation and commissioning.

A2. O&M Payment

- i. A separate work order for the O&M if required will be issued by ANERT. The O&M charges shall be released on annual basis after completion of the O&M period of the previous year. The start of O&M period will be considered from the scheduled date of operation.
- ii. The preventive maintenance reports along with receipt of premium of insurance and generation reports are to be submitted for the release of O&M payments.
- iii. The payment shall be released after the inspection by the authorised personnel of ANERT on annual basis.

B. Income tax, contribution to workers' welfare fund and other statutory deductions shall be made from the payment as per prevailing norms.

4. REMOTE MONITORING SYSTEM

A dedicated Remote Monitoring System (Hardware and software) for monitoring the plant shall be provided even if the inverter has embedded data logging system. The following weather parameters are to be measured as part of the datalogging system.

a) Solar Irradiance: A Pyranometer/ Solar cell-based irradiation sensor (along with calibration certificate) shall be provided, with the sensor mounted in the plane of the array. Readout shall be integrated with data logging system.

b) Temperature: Integrated temp, sensors for measuring the module surface temp., inverter inside enclosure temp, and ambient temp to be provided complete with readouts integrated with the data logging system.

It is recommended that the following important parameters shall be accessible through the Data Logging Facility.

- a. AC Voltage
- b. AC Output current
- c. Output Power
- d. Energy in kWh
- e. DC Input Voltage
- f. DC Input Current
- g. Temperatures (C)
- h. Inverter Status
- i. Irradiation
- j. Module temperature

Provision for Internet monitoring and download of historical data shall be incorporated. GSM Modem/Wi Fi modem in case GSM connectivity is used or Wireless Router + modem in case Ethernet connection is being used for remote access must be provided. The data is to be transmitted to ANERT server as well as to the Integrated Command and Control Centre (ICCC) developed by Smart City Thiruvananthapuram Ltd. The successful bidder has to undertake all the works required for such deployment including software and arrange for APIs etc.

5. WARRANTY

- i. 10 years' warranty should be provided by the supplier for the system and components or part of the system has to be provided.
- ii. PV modules used in solar power plants/ systems must be warranted for their output peak watt capacity, which should not be less than 90 % at the end of 10 years and 80% at the end of 25 years
- iii. The Warranty Card to be supplied must contain all the details of the system supplied. The OEM warranty card of all the equipment must also be submitted along with the warranty certificate issued in your letter head.

6. SERVICE AND MAINTENANCE

- i. The faulty system or components should be replaced/ repaired within 7 days of fault reporting. The servicing should be carried out at the site of installation.
- ii. Any Delay in servicing beyond 7 days of fault reporting would attract penalty at

the rate of at the rate fixed by CEO, ANERT and further actions will be initiated against the agency.

- iii. A designated contact Telephone Number and address should be submitted for reporting faults during the warranty period.
- iv. A detailed O&M order will be issued separately upon completion of the EPC works

7. PERIODIC MAINTENANCE

- i. For the optimal operation of a PV plant, maintenance must be carried out on a quarterly basis. All the components should be kept clean. It should be ensured that all the components are fastened well at their due place.
- ii. The service personnel should visit the installations at least once a quarter for preventive maintenance even if no faults are reported. Reports of these preventive maintenance visits and generation data should be submitted to the concerned ANERT District Office on a quarterly basis.

8. PERFORMANCE RATIO TEST (PR TEST)

The Plant should run minimum two weeks without any major equipment failure to start the PR test. The EPC Contractor shall submit two copies of O&M manual with soft copy before the start of PR Test. Depending on the requirement, capacity and suitable Pyranometer shall be installed at locations suggested by ANERT or else METEONORM data shall be considered for calculating PR.

- i. The PR test shall be conducted at site by the Contractor in presence of the ANERT officials as per IEC 61724. The PR test procedure shall be submitted by the Contractor for review and approval. Any special equipment, instrumentation tools and tackles required for the successful completion of the performance test shall be arranged by the Contractor at his own cost.
- ii. The procedure for PR demonstration test shall be as follows:
The Following factors shall be excluded for calculation;
 - Generation loss due to grid outage.
 - Irradiance below 250 W/m²
 - The measured global solar radiation of the period of the outage of the power evacuation system shall be excluded to calculate average global solar radiation for the period of PR test.

PR is to be calculated as per the below formula:

$$PR = (\text{Measured output in kW}) / (\text{Installed Plant capacity in kW} * (1000 / \text{Measured radiation intensity in W/m}^2))$$

The EPC Contractor shall demonstrate minimum PR of 75% (measured at output

of the inverter/solar meter level) in the initial PR test within 7 consecutive days. If the contractor fails to prove the desired performance ratio at the time of completion and during any of the consecutive years of defect liability period, he will be given a second chance to demonstrate the PR within another 7 consecutive days. Still if it is not achieved, the same shall be demonstrated within another 7 consecutive days and still if it is not achieved, EPC contractor shall improve the quality of the plant by replacement of module/other components with all suitable modification requirements on balance of systems at his own cost to achieve the performance ratio. After obtaining Energisation Approval from Electrical Inspectorate and demonstration of minimum specified PR, the solar plant shall be commissioned which shall be the date of completion of the project.

9. ENGINEERING DRAWINGS

The bidder should submit and get the necessary approval of the following detailed Engineering Drawings before execution of the project:

- i. Schematic drawing showing the PV panels, Power conditioning Unit(s)/Inverter, Array Junction Boxes (AJBs)/String Combiner Boxes (SJB), AC and DC Distribution Box, Net meters, MSB etc.
- ii. Layout of solar PV Array
- iii. Single Line Diagram (SLD) with specification of all components.
- iv. Design document for Module Mounting Structure (MMS) including certificate showing wind speed withstanding capacity of the structure (STAAD/Equivalent).
- v. Module Mounting Structure (MMS) drawing along with foundation details for the structure.
- vi. Sizes and specification of cables for PV Module interconnections, PV Array to Array Junction Boxes, Array Junction Boxes to Inverter, Inverter to ACDB/ Grid Connection point etc. shall be furnished.

The PV plant design should contain the following details which should be approved by the concerned officer before installation.

- i. Design of strings including the number of PV modules in series and number of strings
- ii. AC Protection (Circuit Breaker, Switches, Fuses, SPD)
- iii. DC Protection (Switches, Fuses, SPD)
- iv. AJB / SCB details
- v. DC Cable size and length from point to point
- vi. AC Cable size and length from point to point

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- vii. Earthing system details and number of pits
- viii. Lightning protection details/specification
- ix. PV Syst / Any other software-based Simulation Report

10. CLEANING

The bidder shall provide permanent arrangement for module washing in the SPV Plant. Water lines may be drawn to feed water from the available resources. Contractor has to provide additional facility including pipeline, motor for pumping to the additional overhead tank, if required.

11. INSURANCE

The power plant must be insured at every stage of operation – from Material dispatch, storage, completion of installation and till 10 years after commissioning. The insurance coverage on handing over of the system must include all conditions of **Standard Fire and Special Perils Policy (Material Damage)**. The insurance premium for the 10 years of warranty is to be paid by your agency. On handing over of the system, the original insurance policy is to be handed over to the authorised person at ANERT District Office. The annual premium payment receipt must be handed to the authorised person at the District Office of ANERT.

Not Withstanding the terms and conditions stipulated above, it is to be noted that the conditions in the tender document shall prevail;

Yours faithfully



NARENDRA NATH VELURI I F S
CEO ANERT



राजस्थान इलेक्ट्रॉनिक्स एण्ड इन्स्ट्रुमेन्ट्स लिमिटेड Rajasthan Electronics & Instruments Limited

(An ISO 9001 : 2008 & 14001 : 2004 "Mini Ratna" Public Sector Enterprise)

RATE CONTRACT

Doc. No. REIL-MM-XXX-050002

M/s Power-One Microsystems (P) Ltd,
GF - 3 & 12, KSSIDC Multistoreyed Building,
5th Cross, 1st Stage, Peenya Industrial Estate,
Bangalore - 560 058,
Tel No 080 - 28397832/28398730
Email- rajeshmr@poweroneups.com

: Order No. : REIL/PROC/19119110/ 3876
: Date : 10.09.2019

Dear Sir,

Sub:- Design, Engineering, Supply, Construction, Erection, Testing, Transportation, Unloading, Installation, Commissioning and 25 year O&M of Solar PV based Power Plant with capacities ranging from 250 KW to 2 MW or more (total 3.5 MW) at various locations/sub stations of MSEDCL in the state of Maharashtra.

With reference to your online offer against our tender no. REIL/RE/2019-20/GC/MWP/19079 dated 22.07.2019 & your revised offer dated 06.09.2019, please arrange to execute the following as per terms and conditions given below:-

S/No	Description	Qty in Watt	Unit Rate in Rs	Total Value in Rs
01	Supply Part: Supply of Solar PV Modules, Balance of Systems (BOS) including Grid. Tie Inverter, MMS, Transformers, AJB, Cables, Connectors, LT, HT Panels etc. required for successful commissioning	35,00,000.00 (3.5 MW)	33.00 Per Watt	11,55,00,000.00
2	I&C Part: Erection, Installation & Commissioning of Solar Power Grid connected Systems Project	35,00,000.00 (3.5 MW)	2.35Per Watt	82,25,000.00
3	AMC Part: Operation & maintenance of Solar Power Grid Connected Systems Project for 25 Years	35,00,000.00 (3.5 MW)	13.65 Per Watt	4,77,75,000.00
Total Value				17,15,00,000.00

Terms & Conditions:- As per Annexure - 1

For & On behalf of
RAJASTHAN ELECTRONICS & INSTRUMENTS LTD.,
(DEEPAK GUPTA)
Dy. GENERAL MANAGER (PROC. DIV.)



Acknowledgement Copy

Registered Office : 2, Kanakpura Industrial Area, JAIPUR-302 012 (Raj.) INDIA
Tel. : +91-141-2470363, 2470271, 2470784, (Electronics), 2470176 (Foss Business) 2470908 (RE), 2471083 (MM)
Fax : +91-141-2470139 • E-Mail : reilp@sancharnet.in • Website : www.reilp.com



Annexure : 1

M/s Power One Micro Systems Pvt. Ltd, Bangalore

TERMS & CONDITIONS:-

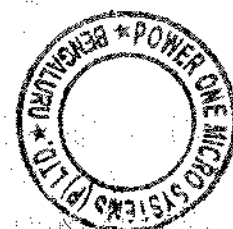
- 1) Terms of Delivery : FOR Site (As instructed by REIL)
- 2) GST : GST extra as applicable.
- 3) Project Completion Period : 90 days from the issue of LOI & allocation of sites.
- 4) Payment terms :

a) During Supply Installation, Testing and Commissioning: (For Part A& Part B of contract price table)

S. No.	% of Payment	Criteria
1.	60% of (Part A+ Part B) as per price bid	1. Within 30 days of supply of the SPV modules, PCU/Inverters, BoS and associated project material required for construction, erection, testing and commissioning at site supported with pre-dispatch inspection report, quantity as per BoQ and receipt of the SI's invoice at REIL office with receipt, acknowledgement, signed and stamped by EESL-authorized representative/EIC at designated site. 2. Release of REIL payment.
2.	30 % of (Part A+ Part B) as per price bid	1. Within 30 days of successful installation, synchronization and commissioning of systems along with requisite documentation, training programs and Issuance of Completion certificate to the SI by respective DISCOM. 2. Release of REIL payment.
3.	10 % of (Part A+ Part B) as per price bid	1. After one year of reliable and trouble free operation and demonstration of the energy generation by the project as per RfP from the date of commissioning of the project(s). 2. Release of REIL payment.

b) Payment during O&M Period

Years	% of O&M value released during the period
2-5	10%
6-10	20%
11-15	40%
16-20	10%
21-25	20%



- 5) **Contract Performance Bank Guarantee (CPG) :** Contractor shall submit PBG of 5% amount of total work order valid for 25 years after placement of LOI with in 15 days from the LOI. Within fifteen (15) days of the receipt of notification of award from REIL, the Contractor shall furnish the CPG in the form of Demand Draft/ Pay Order or Bank Guarantee for 5% of the total contract value. The Bank Guarantee must be valid to cover Delivery Period + Warrantee Period + Three Months Claim Period. However, out of which 2.5% CPG would be released after 10 years based on satisfactorily performance of the Contractor. Any delay in submission of SD/CPG shall be deemed as accruing of financial benefit to the supplier and REIL may take necessary interest penalty recovery action (interest @ SBI's MCLR + 2 %) from the payments due to the supplier for the period of delay. However, this provision does not bind REIL in any way from proceeding against the supplier (including forfeiture of EMD, cancellation of the empanelment/LOA, etc.) for non-compliance towards non-submission of the SD/CPG. In case Contractor provides CPG for shorter duration, it shall be for a minimum period of 3.5 years and REIL reserves right to invoke CPG in case extended CPG/fresh CPG is not furnished at least 90 days prior to expiry of original CPG.

(Extra Copy)



POWER-ONE®
MICRO SYSTEMS (P) LTD.

Unit - III, No -75, 6th Main
3rd Phase
Peenya Indl Area
Bangalore
Phone: 080-28398730
Telefax: 080-28377074
Email: accounts@poweroneups.com
Email: poweroneups@poweroneups.com
Website: www.poweroneups.com

TAX INVOICE

TAX INVOICE NO. : U3 - 737		INVOICE Date. : 28-Sep-2019			
Preparation Date : 28-Sep-2019		Removal Date :			
Preparation Time : 16:30 Hrs		Removal Time :			
Buyer: Rajasthan Electronics & Instruments Limited 2, Kanakpura Industrial Area, Sirsi, Road, JAIPUR - 302012 Telephone No. - 0141-2471083 Contact Person : Mr. Mr Deepak Gupta (DGM: MM) GSTIN: 08AABCR1528G1ZL State Code: 27 PAN: AABCR1528G Place of Supply: Maharashtra Your Order No.: REIL/PROC/19119110/38/6 Your Order Dt.: 10-Sep-2019		Consignee: Maharashtra State Electricity Distribution Company Limited 33/11KV SUBSTATION NIMBONI, SOLAPUR DIST. MAHARASHTRA Pin Code : 413001 GSTIN: State Code: 27 State: Maharashtra Motor Vehicle Reg. : Transporter:			
Sl.	Description	HSN/SAC No.	Qty	Rate P/U Rs. Ps.	Amount Rs. Ps.
1	SUPPLY OF 645.12KWP Solar Power Generating Systems With All Accessories As Per (BOS) (Supply Part 33.00Per Watt & I&C Part 2.35Per Watt Included)	85437092	1 Set's	1,59,63,494.00	1,59,63,494.00
2	Installation and Services Charges - SPGS	998739	1 Oth	68,41,498.00	68,41,498.00
Sub-Total:					2,28,04,992.00
IGST @ 5%					7,98,174.06
IGST @ 18%					12,31,470.04
Round Off					12,31,470.00
Notes:					
Total:					2,48,34,637.00

Amount Chargeable : Rupees Two Crore Forty Eight Lakh Thirty Four Thousand Six Hundred Thirty Seven Only.

HSN/SAC	Taxable Value	Integrated Tax Rate	Integrated Tax Amount	Total Tax Amount
85437092	1,59,63,494.00	5%	7,98,174.06	7,98,174.06
998739	68,41,498.00	18%	12,31,470.04	12,31,470.04
Total	2,28,04,992.00		20,29,645.00	20,29,645.00

Tax Amount (in words) : INR Twenty Lakh Twenty Nine Thousand Six Hundred Forty Five Only

* Certified that the particulars given above are true and correct and the amount indicated represents the price actually charged and there is no additional consideration directly or indirectly from the buyer.

For POWER ONE MICROSYSTEMS PVT LTD

Place : BANGALORE

PAN : AABCP6384L

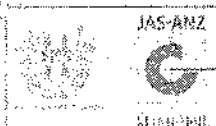
GSTIN: 29AABCP6384L1Z5

CIN : U32109KA1996PTC023553

Note: 1. 22% interest will be charged if the payment is not made within due date.

2. Payment to be made by A/c Payee DD/Cheque only.

SUBJECT TO BANGALORE JURISDICTION



POWER-ONE
MICRO SYSTEMS (P) LTD.

Unit - III, No -75, 6th Main
3rd Phase
Peenya Indl Area
Bangalore
Phone: 080-28398730
Telefax: 080-28377074
Email: accounts@poweroneups.com
Email: poweroneups@poweroneups.com
Website: www.poweroneups.com

TAX INVOICE

TAX INVOICE NO. : U3 - 738		INVOICE Date. : 28-Sep-2019			
Preparation Date : 28-Sep-2019		Removal Date :			
Preparation Time : 16:50 Hrs		Removal Time :			
Buyer: Rajasthan Electronics & Instruments Limited 2, Kanakpura Industrial Area, Sirsi, Road, JAIPUR - 302012 Telephone No. : 0141-2471083 Contact Person : Mr. Mr Deepak Gupta (DGM: MM) GSTIN: 08AABCR1528G1ZL PAN: AABCR1528G Place of Supply : Maharashtra		Consignee: Maharashtra State Electricity Distribution Company Limited PANGARI SUB STATION UNNAMED ROAD, PANGRI Maharashtra - 413404 GSTIN: State Code: 27 State: Maharashtra			
Your Order No.: REIL/PROC/19119110/3876		Motor Vehicle Reg. :			
Your Order Dt.: 10-Sep-2019		Transporter:			
Sl.	Description	HSN/SAC No.	Qty	Rate P/U Rs. Ps.	Amount Rs. Ps.
1	Supply of 350 Kwp Solar Power Generating Systems With All Accessories As Per (BOS) (Supply Part 33.00Per Watt & I&C Part 2.35Per Watt Included)	85437092	1 Set's	86,60,750.00	86,60,750.00
2	Installation and Services Charges - SPGS	998739	1 Oth	37,11,750.00	37,11,750.00
Sub-Total:					1,23,72,500.00
IGST @ 5%					4,33,037.50
IGST @ 18%					6,68,115.00
Round Off					(-)0.50
Notes:					
Total:					1,34,73,652.00
Amount Chargeable : Rupees One Crore Thirty Four Lakh Seventy Three Thousand Six Hundred Fifty Two Only .					
HSN/SAC		Taxable Value	Integrated Tax Rate	Amount	Total Tax Amount
85437092		86,60,750.00	5%	4,33,037.50	4,33,037.50
998739		37,11,750.00	18%	6,68,115.00	6,68,115.00
Total		1,23,72,500.00		11,01,152.50	11,01,152.50
Tax Amount (in words) : INR Eleven Lakh One Thousand One Hundred Fifty Two and Fifty paise Only					
* Certified that the particulars given above are true and correct and the amount indicated represents the price actually charged and there is no additional consideration directly or indirectly from the buyer.					
For POWER ONE MICROSYSTEMS PVT LTD					
Place : BANGALORE		Director/s			
PAN : AABCP6384L		GSTIN : 29AABCP6384L1ZS		CIN : U32109KA1998PTC023553	
Note: 1. 22% interest will be charged if the payment is not made within due date .					
2. Payment to be made by A/c Payee DD/Cheque only.					

SUBJECT TO BANGALORE JURISDICTION





POWER-ONE
MICRO SY STEMS (P) LTD.

Unit - III, No -75, 6th Main
3rd Phase
Peenya Indl Area
Bangalore
Phone: 080-28398730
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Email: accounts@poweroneups.com
Email: poweroneups@poweroneups.com
Website: www.poweroneups.com

(Extra Copy)

TAX INVOICE

TAX INVOICE NO. : U3 - 736	INVOICE Date. : 28-Sep-2019
Preparation Date : 28-Sep-2019	Removal Date :
Preparation Time : 16:22 Hrs	Removal Time :
Buyer: Rajasthan Electronics & Instruments Limited 2, Kanakpura Industrial Area, Sirsi, Road, JAIPUR - 302012 Telephone.No. - 0141-2471083 Contact Person : Mr.Mr Deepak Gupta (DGM: MM) GSTIN: 08AABCR1528G1ZL PAN: AABCR1528G Place of Supply: Maharashtra	Consignee: Maharashtra State Electricity Distribution Company Limited 33/11KV SUBSTATION KARKAMB, SOLAPUR DIST. MAHARASHTRA Pin Code : 413302 GSTIN: State: Maharashtra
Your Order No.: REIL/PROC/19119110/3876	Motor Vehicle Reg. :
Your Order Dt.: 10-Sep-2019	Transporter:

Sl.	Description	HSN/SAC No.	Qty	Rate P/U Rs. Ps.	Amount Rs. Ps.
1	SUPPLY OF 420.46KWP Solar Power Generating Systems With All Accessories As Per (BOS) (Supply Part 33.00Per Watt & I&C Part 2.35Per Watt Included)	85437092	1 Sets	1,04,04,778.00	1,04,04,778.00
2	Installation and Services Charges - SPGS	998739	1 Oth	44,59,190.00	44,59,190.00
	Sub-Total:				1,48,63,968.00
	IGST @ 5%				5,20,238.86
	IGST @ 18%				8,02,654.14
	Notes:				
Total:					1,51,86,861.00

Amount Chargeable		: Rupees One Crore Sixty One Lakh Eighty Six Thousand Eight Hundred Sixty One Only.		
HSN/SAC		Taxable Value	Integrated Tax	Total
85437092		1,04,04,778.00	5%	5,20,238.86
998739		44,59,100.00	18%	8,02,654.14
Total		1,48,63,878.00		13,22,893.00

Tax Amount (in words) : INR Thirteen Lakh Twenty Two Thousand Eight Hundred Ninety Three Only

* Certified that the particulars given above are true and correct and the amount indicated represents the price actually charged and there is no additional consideration directly or indirectly from the buyer.

For POWER ONE MICROSYSTEMS PVT LTD

Place : BANGALORE

PAN : AABCP6384L

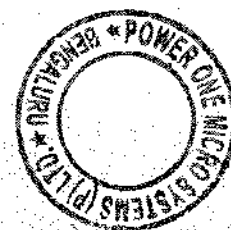
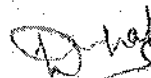
GSTIN: 29AABCP6384L1Z5

CIN : U32109KA1998PTC023553

Note: 1. 22% Interest will be charged if the payment is not made within due date.
2. Payment to be made by A/c Payee DD/Cheque only.

SUBJECT TO BANGALORE JURISDICTION

- 6) O & M : 25 Years
7) Inspection of Material : Inspection of the material will be carried out by EESL/REIL QA TPI
8) Insurance : Insurance of Plant & Machinery will be borne by contractor
9) SLA : SLA will be entered into between REIL & Contractor as per draft given by REIL.
10) LD Clause : LD of 1% per two weeks subject to max of 10 % shall be charged against delay of completion of the project.
11) Other Terms & Conditions : All technical specifications and requirements shall be as per tender no. REIL/RE/2019-20/Grid-Connected / MWP /19079 Dt. 22.07.2019.





POWER-ONE
MICRO SYSTEMS (P) LTD.

Unit - III, No - 75, 6th Main
3rd Phase
Peenya Indl Area
Bangalore
Phone: 080-28398730
Telefax: 080-28377074
Email: accounts@poweroneups.com
Email: poweroneups@poweroneups.com
Website: www.poweroneups.com

TAX INVOICE

TAX INVOICE NO. : U3 - 1785		INVOICE Date. : 31-Jan-2020	
Preparation Date : 31-Jan-2020		Removal Date	
Preparation Time : 19:02 Hrs		Removal Time	
Buyer: Rajasthan Electronics & Instruments Limited 2, Kanaka Industrial Area, Sirsi, Road, JAIPUR - 302012 Telephone.No. - 0141-2471083 Contact Person : Mr.Mr Deepak Gupta (DGM: MM) GSTIN: 08AABCR1528G1ZL PAN: AABCR1528G Place of Supply: Rajasthan		Consignee: Maharashtra State Electricity Distribution Company Limited 33/11KV SUBSTATION, Gat No.143/2, NIMBONI, MANGALVEDHA, SOLAPUR DIST. MAHARASHTRA Pin Code : 413001 GSTIN: State: Maharashtra	
Your Order No.: REIL/PROC/19119110/3876		Motor Vehicle Reg. :	
Your Order Dt.: 10-Sep-2019		Transporter:	

Sl.	Description	HSN/SAC No.	Qty	Rate P/U Rs. Ps.	Amount Rs. Ps.
1	Solar Photovoltaic Modules	85437092	820 KW	22,250.00	1,82,45,000.00
2	Earthing Systems	85437099	1 Set's	4,50,000.00	4,50,000.00
Sub-Total:					1,86,95,000.00
IGST @ 5%					9,12,250.00
IGST @ 18%					81,000.00
Notes:					
Total:					1,96,88,250.00



Amount Chargeable : Rupees One Crore Ninety Six Lakh Eighty Eight Thousand Two Hundred Fifty Only.		Total: 1,96,88,250.00	
HSN/SAC	Taxable Value	Integrated Tax Rate Amount	Total Tax Amount
85437092	1,82,45,000.00	5%	9,12,250.00
85437099	4,50,000.00	18%	81,000.00
Total		1,86,95,000.00	9,93,250.00

Tax Amount (in words) : INR Nine Lakh Ninety Three Thousand Two Hundred Fifty Only

* Certified that the particulars given above are true and correct and the amount indicated represents the price actually charged and there is no additional consideration directly or indirectly from the buyer.

Place : BANGALORE

PAN : AABCP6384L

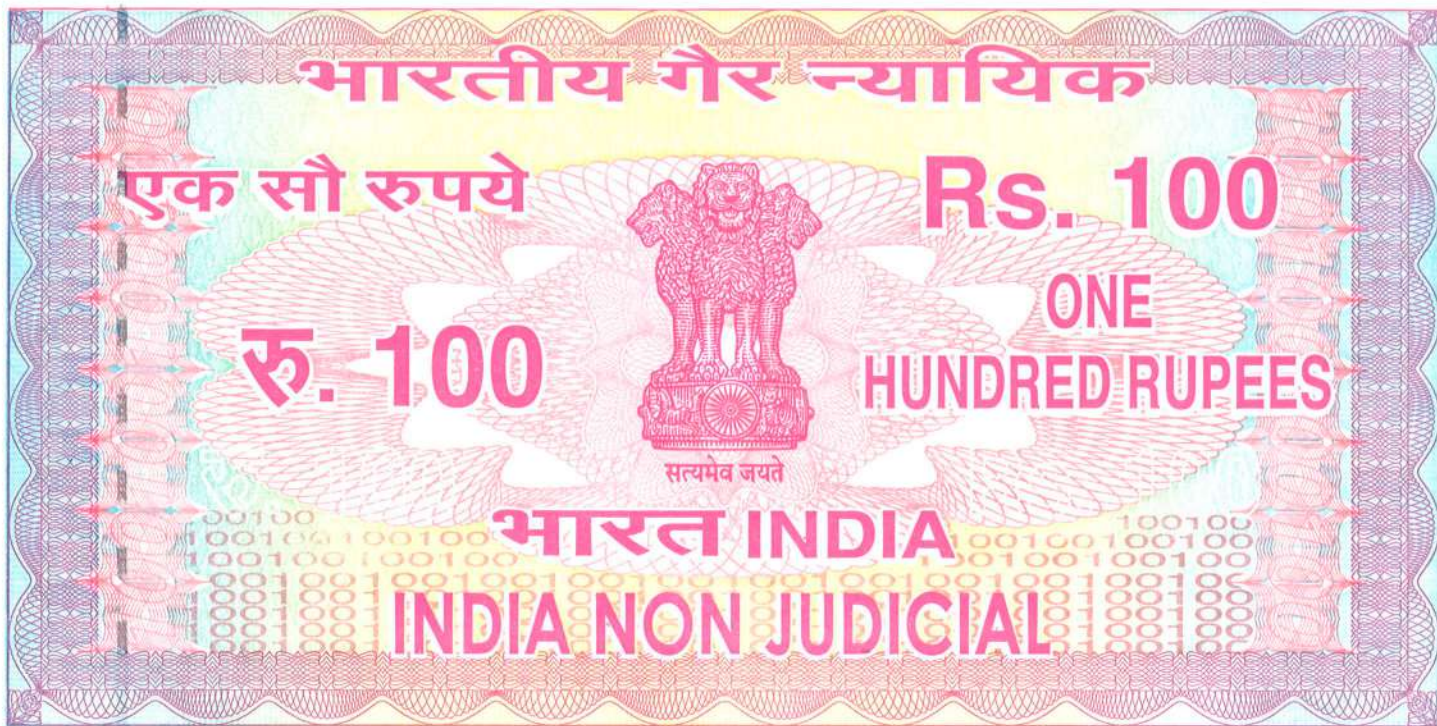
GSTIN: 29AABCP6384L1ZS

CIN : U32109KA1998PTC023553

Note: 1. 22% interest will be charged if the payment is not made within due date.
2. Payment to be made by A/c Payee DD/Cheque only.

SUBJECT TO BANGALORE JURISDICTION

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കേരളം KERALA

DY 726010

ANNEXURE A – Pre - Agreement

ARTICLES OF AGREEMENT executed on this the 03rd Day of MAY Two thousand and Twenty Three between the **Agency for New & Renewable Energy Research and Technology** (hereinafter referred to as ANERT) of the one part and **Sri and M/s Power One Micro Systems Pvt Ltd**, GF-3 & F-12, KSSIDC Building, 5th cross, 1st stage, Peenya Industrial Estate, Bangalore-560058 hereinafter referred to as "the Bounden") of the other part.

WHEREAS in response to the Notification No **ANERT-TECH/99/2022-T2** the bounden has submitted to ANERT a e-tender for the **Request for Selection (RFS)** of agency for the **Implementation of 2 MW Solar Power Plant at Travancore Titanium Products Ltd., Kochuveli, Thiruvananthapuram** under **Solar City project funded by Smart City Thiruvananthapuram Ltd** specified therein subject to the terms and conditions contained in the said e-tender.

AND WHEREAS the bounden has furnished to ANERT Earnest Money Deposit **Nil** for execution of an agreement undertaking the due fulfilment of the contract in case his e-tender is accepted by ANERT. NOW THESE PRESENTS WITNESS and it is hereby mutually agreed as follows: -

In case the e-tender submitted by the bounden is accepted by ANERT and the contract for **Request for Selection (RFS)** of agency for the **Implementation of 2 MW Solar Power Plant at Travancore Titanium Products Ltd., Kochuveli, Thiruvananthapuram** under **Solar City project funded by Smart City Thiruvananthapuram Ltd** is awarded to the bounden, the bounden shall within 15 days of acceptance of this e- tender, execute an agreement with ANERT incorporating all the terms and conditions under which ANERT accepts this e-tender.

no: 323
03-04-2023

594

SASTHAMANGALAM
VENDOR
RAJEEV. R.S



In case the bounden fails to execute the agreement as aforesaid incorporating the terms and conditions governing the contract, ANERT shall have power and authority to recover from the bounden any loss or damage caused to ANERT by such breach as may be determined by ANERT by appropriating the moneys inclusive of Earnest Money deposited by the bounden and if the Earnest Money is found to be inadequate the deficit amount may be recovered from the bounden and his properties movable and immovable in the manner hereinafter contained.

All sums found due to ANERT under or by virtue of this agreement shall be recoverable from the bounden and his properties movable and immovable under the provisions of the Revenue Recovery Act for the time being in force as though such sums are arrears of land revenue and in such other manner as ANERT may deem fit.

In witness whereof Sri..... (Name and Designation) for and on behalf of the Agency for New & Renewable Energy Research & Technology and Sri **Shantharama Shetty (Sr. Project Manager)** M/s. Power One Micro Systems Pvt. Ltd., the bounden have hereunto set their hands the day and year shown against their respective signature.

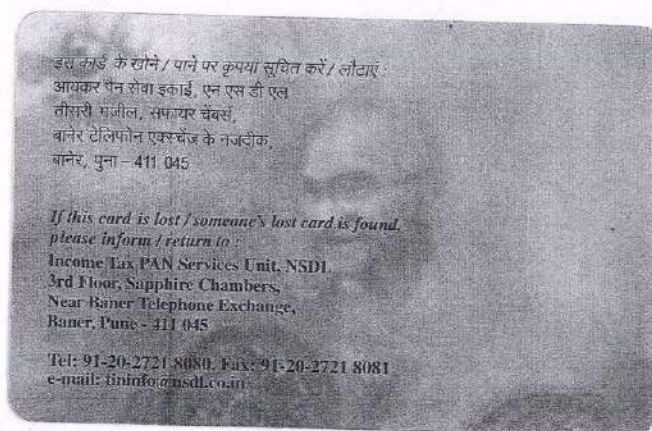
Signed by Sri
(Date)
in the presence of witnesses

Signed by Sri
(Date) 02.05.2023
in the presence of witnesses

For M/s. Power One Micro Systems Pvt. Ltd.,

Shantharama Shetty
Sr Manager Projects
Ph: 9900842336
E-mail: projects@poweroneups.com





True Copy /
27/11/2015
C.C.Chinnor

ASSISTANT LABOUR OFFICER GR-1
ERNAKULAM, COCHIN-30

भारत सरकार-कॉर्पोरेट कार्य मंत्रालय
कम्पनी रजिस्ट्रार कार्यालय, केरल एवं लक्षद्वीप

नाम परिवर्तन के पश्चात नया निगमन प्रमाण-पत्र

कॉर्पोरेट पहचान संख्या : U45209KL2007PLC020471

मैसर्स Infrastructures Kerala Limited

के मामले में, मैं एतद्वारा सत्यापित करता हूँ कि मैसर्स
Infrastructures Kerala Limited

जो मूल रूप में दिनांक नौ मार्च दो हजार सात को कम्पनी अधिनियम, 1956 (1956 का 1) के अंतर्गत मैसर्स
Infrastructures Kerala Limited

के रूप में निगमित की गई थी, ने कम्पनी अधिनियम, 1956 की धारा 21 की शर्तों के अनुसार विधिवत आवश्यक विनिश्चय पारित करके तथा लिखित रूप में यह सूचित करके की उसे भारत का अनुमोदन, कम्पनी अधिनियम, 1956 की धारा 21 के साथ पठित, भारत सरकार, कम्पनी कार्य विभाग, नई दिल्ली की अधिसूचना सं. सा. का. नि 507 (अ) दिनांक 24.6.1985 एस्.आर.एन B22514244 दिनांक 13/10/2011 के द्वारा प्राप्त हो गया है, उक्त कम्पनी का नाम आज परिवर्तित रूप में मैसर्स
INKEL LIMITED

हो गया है और यह प्रमाण-पत्र, कथित अधिनियम की धारा 23(1) के अनुसरण में जारी किया जाता है।

यह प्रमाण-पत्र इरणाकुलम में आज दिनांक तेरह अक्टूबर दो हजार ग्यारह को जारी किया जाता है।

GOVERNMENT OF INDIA - MINISTRY OF CORPORATE AFFAIRS
Registrar of Companies, Kerala and Lakshadweep

Fresh Certificate of Incorporation Consequent upon Change of Name

Corporate Identity Number : U45209KL2007PLC020471

In the matter of M/s Infrastructures Kerala Limited

I hereby certify that Infrastructures Kerala Limited which was originally incorporated on Ninth day of March Two Thousand Seven under the Companies Act, 1956 (No. 1 of 1956) as Infrastructures Kerala Limited having duly passed the necessary resolution in terms of Section 21 of the Companies Act, 1956 and the approval of the Central Government signified in writing having been accorded thereto under Section 21 of the Companies Act, 1956, read with Government of India, Department of Company Affairs, New Delhi, Notification No. G.S.R 507 (E) dated 24/06/1985 vide SRN B22514244 dated 13/10/2011 the name of the said company is this day changed to INKEL LIMITED and this Certificate is issued pursuant to Section 23(1) of the said Act.

Given at Ernakulam this Thirteenth day of October Two Thousand Eleven.



Signature noted
16 APR 2014

Registrar of Companies, Kerala and Lakshadweep

कम्पनी रजिस्ट्रार, केरल एवं लक्षद्वीप

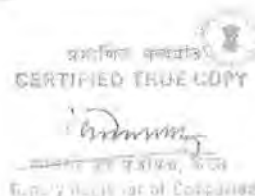
*Note: The corresponding form has been approved by V E JOSEKUTTY, Deputy Registrar of Companies and this certificate has been digitally signed by the Registrar through a system generated digital signature under rule 5(2) of the Companies (Electronic Filing and Authentication of Documents) Rules, 2006.

The digitally signed certificate can be verified at the Ministry website (www.mca.gov.in).

कम्पनी रजिस्ट्रार के कार्यालय अभिलेख में उपलब्ध पत्राचार का पता :

Mailing Address as notified & available in Registrar of Companies office:

INKEL LIMITED
BUILDING NO VI/832 C, FIRST FLOOR, INKEL CENTRE, THRIKKAKARA GRAMA
PANCHAYAT, ERNAKULAM,
COCHIN - 682025
Kerala, INDIA





**Government of India
And
Government of Kerala
Form GST REG-25**

Certificate of Provisional Registration

1.	GSTIN	32AABCI6802J1ZT
2.	PAN	AABCI6802J
3.	Legal Name	INKEL LIMITED
4.	Trade Name	INKEL LIMITED
5.	Registration Details under Existing Law	
	Act	Registration Number
(a)	TIN under Value Added Tax	32072025093
(b)	Service Tax Registration Number	AABCI6802JST001
(c)	Central Sales Tax Registration Number	32072025093C
(d)	Corporate Identity Number / Foreign Company Registration Number	U45209KL2007PLC020471
(e)	Importer / Exporter Code Number	1011015188
Date	28/06/2017	

This is a Certificate of Provisional Registration issued under the provisions of the Act.

INKEL LIMITED

ANNEXURE 1 TO THE INDEPENDENT PRACTITIONER'S REPORT ON THE STATEMENT OF COMPUTATION OF FINANCIAL QUALIFICATION CERTIFICATE AS AT 31ST MARCH 2018 TO 31ST MARCH 2022

FORMAT C- CERTIFICATE OF BIDDER'S FINANCIAL QUALIFICATION .

(Rupees in Lakhs)

S/N	Financial parameters	FY17-18	FY18-19	FY19-20	FY20-21	FY21-22
1.	Net Worth					
a)	Paid up Capital	16,302.70	17,781.43	17,781.43	17,781.43	17,781.43
b)	Free Reserves and Surplus*	3,724.82	4,239.26	2,450.36	2,116.87	2,233.22
c)	Misc expenses to the extent not written off	-	-	-	-	-
	Net Worth (a+b-c)	20,027.52	22,020.69	20,231.79	19,897.30	20,014.65
2.	Annual Turnover**	5,257.10	4,022.15	2,574.12	5,600.95	5,774.85

*Free Reserve and Surplus shall be Exclusive of Revaluation Reserve, written back of Depreciation Provision and Amalgamation.

**Annual total Income/turnover as incorporated in the Profit and Loss Account excluding non-recurring income ,i.e., sale of fixed asset etc.

It is certified that all the figures are based on audited accounts read with auditor's report and Notes to Accounts etc.

Name of Authorized Signatory:
Designation:

Certifying Chartered Accountant:
Name of Firm:



For T. MATHEW & Co.
CHARTERED ACCOUNTANTS
(FRN 009256 S)

THOMAS MATHEW F. C. A.
M. No. 206481

Date: 15.12.2022

UDIN: 22206481BFMOWI3932

Place: Pathanamthitta

Note : Annual Turnover as extracted from the Statement of Profit and Loss Account excludes non-recurring income such as Provision for doubtful debts written back, Share of Profit from LLP, Profit on sale of fixed assets, Dividend Income and Miscellaneous income .

Sir,

I/We hereby e-tender to supply, under annexed terms and conditions of contract, the whole of the articles referred to and described in the attached specification and quantity decided by the Agency for New and Renewable Energy Research & Technology (ANERT), at the rates quoted against each item. The articles will be delivered and installed/commissioned operated and maintained for 10 years thereafter within the time and at the place(s) specified in the schedule.

I am/we are remitting herewith the required amount of Rs.NIL towards the cost of e-tender by electronic payment.

Yours Faithfully,

For **INKEL Limited**

**General Manager
Renewable Energy & Business Development**



Place:Kakkanad

Date:25-04-2023

Generated from eOffice by VINAY P. PE1(BTS) ANERT PE1(BTS) ANERT AGENCY FOR NEW AND RENEWABLE ENERGY RESEARCH & TECHNOLOGY on 03/10/2024 12:54 PM

ANNEXURE C- DECLARATION BY THE BIDDER

E-Tender Notification No: ANERT-TECH/99/2022-T2 Dated 12.04.2023
Request for Selection (RFS) of agency for the Implementation of 2 MW Solar Power Plant at Travancore Titanium Products Ltd., Kochuveli, Thiruvananthapuram under Solar City project funded by Smart City Thiruvananthapuram Ltd

To

The CEO
ANERT

We, the undersigned, declare that:

1. We have examined and have no reservations to the Bidding Document, including Addenda No.: (if any)
2. We offer to supply in conformity with the Bidding Document and in accordance with the delivery schedule
3. Our Bid shall be valid for a period of 6 months from the date fixed as deadline for the submission of tenders in accordance with the Bidding Document, and it shall remain binding upon us and may be accepted at any time before the expiration of that period;
4. If our Bid is accepted, we commit to submit a Security Deposit in the amount of 5 percent of the Contract Price for the due performance of the Contract;
5. We are not participating, as Bidders, in more than one Bid in this bidding process;
6. Our firm, its affiliates or subsidiaries, including any subcontractors or suppliers for any part of the Contract, has not been declared ineligible by the ANERT or Government of Kerala;
7. We understand that this Bid, together with your written acceptance thereof included in your notification of award, shall constitute a binding contract between us, until a formal Contract is prepared and executed.
8. Our firm has obtained the certifications from MNRE or NABL approved Test laboratories that the goods and services are satisfying the technical criteria specified in the bid.

25.04.2023



For **INKEL Limited**



**General Manager
Renewable Energy &
Business Development**

ANNEXURE D – DECLARATION OF RELATIONSHIP WITH ANERT EMPLOYEE

Tender Notification No.: ANERT-TECH/126/2023-PE1(RTS) Dated 12.04.2023

Request for Selection (RFS) of agency for the Implementation of 1 MW Solar Power Plant at HLL Lifecare Ltd, Peroorkada Factory, Thiruvananthapuram under Solar City project funded by Smart City Thiruvananthapuram Ltd

To

The CEO ANERT

Name of the ANERT employee with Designation: Not Applicable

Name of the bidder related to the employee: Not Applicable

This is to put on record that no one currently working in ANERT is related to anyone working in INKEL Limited, who is the bidder in the bid. We are aware of the Anti-corruption policy of ANERT and will observe the highest standards during the procurement and the execution of contract and shall refrain from corrupt, fraudulent, collusive or coercive practices on competing for the contract.

For **INKEL Limited**



Date: 25.04.2023

General Manager
Renewable Energy &
Business Development

Component wise split up of Cost

S/N	Component	Percentage (%)
1	SPV Modules	57
2	Module Mounting Structure	7
3	Grid Tied Inverter as per specification	6
4	Balance of System	12
5	Cost for 10 Year Warranty and Preventive Maintenance	3
6	Installation and Commissioning Charges	10
7	Insurance (From Material dispatch till 10 years warranty period)	1
8	Any miscellaneous expenses required for the successful commissioning of the plant	2
9	Remote Monitoring and associated costs	2
Total		100%



VENDOR GRADING IN RENEWABLE ENERGY SECTOR FOR ANERT



THIS IS TO INFORM THAT

INKEL LIMITED

has been assigned a grade of '1C' indicating 'Strong Performance Strength' and
'Average Financial Strength'

JANUARY 27, 2022

A handwritten signature in blue ink, appearing to read 'Vinay P.', is positioned above a horizontal line.

Authorized signatory

This certificate must be read in conjunction with the Grading letter dated Jan 27, 2022, issued to INKEL Limited

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CONFIDENTIAL

**Ref: Email from INKEL Limited for ANERT Vendor Grading,
Dated: January 13, 2022**

Date: January 27, 2022

Mr. P Rajeev

Chairman (Hon'ble Minister (Industries) Government of Kerala)

INKEL Limited

Door No.7/473ZA-5 & 6,
2nd Floor, Ajiyal Complex,
Kakkanad Cochin - 682030

Dear Sir,

Sub: Grading of your organization under vendor grading in renewable energy sector for ANERT

Please refer to your email dated January 13, 2022, for assigning vendor grading of your organization.

ICRA Analytics (ICRA-A), after due consideration, has assigned **1C** to **INKEL Limited**. The grading indicates that based on performance parameters the entity has got Grade 1 [Strong Performance Strength] and based on financial parameters the entity has got Grade C [Average Financial Strength] of the Manufacturers / System Integrators / EPC contractor in the Renewable Energy sector space. Our grading symbols are annexed.

We thank you for your kind cooperation extended during the grading exercise. Please let us know if you need any clarification. We look forward to further strengthening our existing relationship and assure you of our best services.¹

With kind regards,

Yours sincerely,

for ICRA Analytics Limited

Authorised signatory

e-Copy to ANERT (Manager-in-charge)

¹ICRA-A reserves the right to suspend/withdraw/revise the grading assigned on the basis of new information or in the event of failure on the part of the entity to furnish such information, material or clarifications as may be required by ICRA-A. ICRA-A shall also be entitled to publicize/disseminate such suspension/withdrawal/revision in the assigned grading in any manner considered appropriate by it, without reference to you.



**ICRA
ANALYTICS**
A Group ICRA Company

ICRA ANALYTICS LIMITED
(Formerly known as ICRA Online Limited)

The grading scale is as follows:

Performance capability	Financial Strength					
		Strong	Above average	Average	Below average	Weak
	Strong	1A	1B	1C	1D	1E
	Above average	2A	2B	2C	2D	2E
	Average	3A	3B	3C	3D	3E
	Below average	4A	4B	4C	4D	4E
	Weak	5A	5B	5C	5D	5E

DISCLAIMER: An ICRA Analytics' Manufacturers / System Integrators (SI) / EPC contractor grade reflects ICRA Analytics' opinion on the ability of the company to undertake renewable energy projects. ICRA Analytics or its affiliates or group companies and its respective officers, directors, personnel and employees, shall not be liable for or accept any liability for any loss, damage of any nature, including but not limited to direct, indirect, punitive, special, exemplary, consequential, and also any loss of profit in any way arising from the use of this document or its contents in any manner. This grading does not constitute an audit by ICRA Analytics of the SI / Manufacturer / EPC contractor. The gradings are solely based on the information provided by the company or obtained by ICRA Analytics from sources it considers reliable. ICRA Analytics does not guarantee the completeness or accuracy of the information on which the grading is based and therefore shall not be responsible for any liability incurred by the users of such grading. An ICRA Analytics' Manufacturers / System Integrators / EPC contractor grading is not a recommendation to use the services of the company, or to invest in any project undertaken by the company, or to lend to the company or invest in any financial instrument issued by the company. ICRA Analytics has the right to revise gradings as and when circumstances so warrant. At the same time ICRA Analytics is not under any obligation to review or revise the gradings assigned at any later period of time. The grading(s) provided are based on the data and circumstances that it believes to be in existence at the time of conducting the assignment. ICRA Analytics is not responsible for any errors and especially states that it has no financial liability whatsoever to the subscribers / users / transmitters / distributors of its gradings.

Infinity Benchmark, 17th & 18th Floors,
Plot G1, Block - GP, Sector - V, Salt Lake,
Kolkata - 700 091, WB, INDIA

Boardline : +91-33-40170100
Fax : +91-33-40170101
CIN No. : U72900WB1999PLC109180

Website : www.icraanalytics.com
www.mutualfundindia.com
E-mail : contact@icraanalytics.com

Registered Office : Infinity Benchmark, 17th Floor, Plot G1, Block - GP, Sector - V, Salt Lake, Kolkata - 700 091, WB, INDIA Boardline : +91-33-40170100

File No. ANERT-TECH/99/2022-T2 (Computer No. 531f)

RISK MANAGEMENT • MARKET DATA • CONSULTING • KNOWLEDGE SERVICES • GRADING SERVICES

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GOVT. OF INDIA
KALADHARAN T.G.
Ennakulam Dist. (Kerala)
Reg. No. 6954
Expiry Date: 2022
കേരള KERALA

H 915174

POWER OF ATTORNEY

Know all men by these presents, We, INKEL Limited having registered office at 7/473 ZA-5 & 6, Ajiyal Complex, Post Office Road, Kakkanad, Cochin-682030 do hereby irrevocably constitute, nominate, appoint and authorize Mr. Sam Roofus, son of Mr. M Rufus Manuel and presently residing at House No 14, West Cliff Garden, YMR Junction, Nandhancode, Trivandrum 695 004, who is presently employed with us holding the position of Asst. General Manager Solar, as our true and lawful attorney hereinafter referred to as the "Attorney") to do in our name and on our behalf, all such acts, deeds and things as are necessary or required in connection with or incidental to submission of our bid for the Solar tenders of various departments in Government of Kerala, Tamilnadu, Karnataka including but not limited to signing and submission of all applications, bids and other documents and writings, participate in bidders' and other conferences and providing information / responses to the Authority, representing us in all matters before the Authority, signing and execution of all contracts including the Concession Agreement and undertakings consequent to acceptance



For INKEL Limited

A MOHANLAL
Managing Director

Sworn and signed before me
Attested

NO: 45900 5001
RS.
19/11/2020

LINU JOSE
S R O VENDOR
THIRAKKARA

INKEL LTD

6081

T.G. KALADHARAN
ADVOCATE & NOTARY
TRANS AVENUE, MAVELIPURAM
KAKKANAD P.O. PIN-682030
MOB: +91 9446485490

Notary



of our bid, and generally dealing with the Authority in all matters in connection with or relating to or arising out of our bid for the said Project and/or upon award thereof to us and/or till the entering into of the Concession Agreement with the Authority.

AND we hereby agree to ratify and confirm and do hereby ratify and confirm all acts, deeds and things done or caused to be done by our said Attorney pursuant to and in exercise of the powers conferred by this Power of Attorney and that all acts, deeds and things done by our said Attorney in exercise of the powers hereby conferred shall and shall always be deemed to have been done by us.

IN WITNESS WHEREOF WE, INKEL LIMITED, THE ABOVE NAMED PRINCIPAL HAVE EXECUTED THIS POWER OF ATTORNEY ON THIS 19th DAY OF NOVEMBER 2020.

For INKEL Limited



[Signature] 19/11/2020
A Mohanlal
Managing Director

Witnesses:

1. Anjana M A, Company Secretary, INKEL Limited

[Signature]
19/11/2020

2. Nayana Sreekanth, Law Officer, INKEL Limited

[Signature]
19/11/2020

Accepted

[Signature]
Sam Roofus
Asst. General Manager
INKEL LTD
Ajiyal Complex
Post Office Road
Kakkanad, Kochi

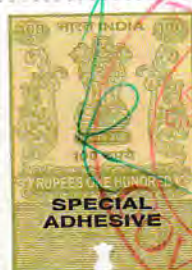
Duly executed and signed before me

Attested

[Signature]
Notary

20/11/2020

T.G. KALADHARAN
ADVOCATE & NOTARY
TRANS AVENUE, MAVELIPURAM
KAKKANAD P.O. PIN-682030
MOB:+91 9446485490



T.G. KALADHARAN, T.G.
Mavelipuram Dist (Kerala)
Reg. No: 6954
Expiry Date:
13-10-2023

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KERALA STATE ELECTRICITY BOARD LIMITED

Office of the Deputy Chief Engineer
Transmission Circle, Kanjikode P.O., Palakkad, Pin - 678 621
Phone: 0491-2568816
FCT No: 9496010198
E-mail: dcetrpkd@gmail.com

No.TCP/DB/40.3/KJKD Solar/22-23/ 793

Date : 13.07.2022

COMPLETION CERTIFICATE

This is to certify that M/s Inkel Limited, Door no:7/473, ZA-5&6, 2nd floor, Ajiyal Complex, Kakkanad, Cochin-682030, has successfully completed the work of Design, Supply, Erection, Testing and Commissioning of 1MWp Grid-Tied Ground mount Solar Power plant, at 33kV substation Agali on 11-11-2021. The Solar power plant is working satisfactorily.

Details of the project are as given below

LOA No	06/2019-20 Dated 23.11.2019
Construction Start date	17.12.2020
Date Commissioning	11.11.2021
Contract Value	Rupees 5,37,20,375/- (Five Crore Thirty Seven Lakhs Twenty Thousand Three Hundred Seventy Five Only)

This certificate is issued as per their request.

Date: 13/07/2022



Deputy Chief Engineer
Transmission Circle
Kanjikode, Palakkad Dist.

(Signature)
 DC (O)

(Signature)
 RRK
 DE-1



KERALA STATE ELECTRICITY BOARD LIMITED

Office of the Deputy Chief Engineer
Transmission Circle, Kanjikode P.O., Palakkad, Pin - 678 621
Phone: 0491-2568816
FCT No: 9496010198
E-mail: dcetrpkd@gmail.com

No.TCP/DB/40.3/KJKD Solar/22-23/794

Date : 13.07.2022

COMPLETION CERTIFICATE

This is to certify that M/s Inkel Limited, Door no:7/473, ZA-5&6, 2nd floor, Ajiyal Complex, Kakkanad, Cochin-682030, has successfully completed the work of Design, Supply, Erection, Testing and Commissioning of 3MWp Grid-Tied Ground mount Solar Power plant, near 220kV KSEB substation Kanjikode, Palakkad on 19-02-2022. The Solar power plant is working satisfactorily.

Details of the project are as given below

LOA No	06/2019-20 Dated 23.11.2019
Construction start date	22.07.2021
Date Commissioning	19.02.2022
Contract Value	Rupees 16,11,61,123/- (Sixteen Crores Eleven Lakhs Sixty One Thousand One Hundred Twenty Three only)

This certificate is issued as per their request.

Date: 13/07/2022



Deputy Chief Engineer
Transmission Circle
Kanjikode, Palakkad Dist.

(Signature)
(Initials)

RRR
AE-1



KERALA STATE ELECTRICITY BOARD LIMITED

(Incorporated under the Companies Act, 1956)

Office of the Chief Engineer (Renewable Energy & Energy Savings)
9th Floor, Vidyuthi Bhavanam, Pattom, Thiruvananthapuram - 695 004, Kerala
Phone: +91 471 2447404, E-mail: ceees@kseb.in
website : www.kseb.in CIN :U40100KL2011SGC027424

By Registered Post with A/D

LETTER OF AWARD

To

M/s **INKEL Ltd**,
2nd Floor, Ajiyal Complex
Kakkanad,
Cochin-682030
Phone: 0484-2978101/103, Fax.No.0484-2978102
Email: info@inkel.in web:www.inkel.in

Work Order No.	06/ 2019-20
Date	23.11.2019
Order type	Appointment of EPC contractor for design as per site conditions, erection, testing & commissioning of Grid Tied Ground Mounted Solar PV Power plants at Brahmapuram, Kanjikode and Agali owned by KSEBL with total installed capacity of 8 MWp (4MWp-Brahmapuram, 3MWp-Kanjikode and 1MWp-Agali) including Operation & Maintenance of the plants for the first 5 years from the date of handing over
Reference file	CE(REES)/Clubbed projects BAK / 19-20 / 1449
e -Tender No	This office Tender No. KSEBL/REES/CLUBBED PROJECTS BAK/17/2018-19 dated 17.01.2019 with Tender ID: 2019_KSEB_261756_2
Value	INR 44,99,99,999/-only
Price	Fixed

Sir,

Sub:- Appointment of EPC contractor for design as per site conditions, erection, testing & Commissioning of Grid Tied Ground Mounted Solar PV Power plants at Brahmapuram Kanjikode and Agali owned by KSEBL with an installed capacity of 8 MWp (4MWp -Brahmapuram, 3MWp-Kanjikode and 1MWp-Agali) including Operation & Maintenance of the plants for the first 5 years from the date of handing over - Award of contract - reg

Ref:- 1) Office order (CMD) No 654/2018 (CE(REES)/ Clubbed Projects Agali,

- Kanjikode, Brahmapuram / 2018-19/ TVM dated: 25.10.2018,
- 2) This office E-Tender No. KSEBL/REES/Clubbed Projects BAK/17/2018-19 dated: 17.01.2019.
 - 3) Your offer for e -Tender No. KSEBL/REES/Clubbed Projects BAK/17/2018- 19 dated: 17.01.2019 vide Tender ID: 2019_KSEB_261756_2
 - 4) Letter No. INKEL/SOLAR/KSEB-8MW/19-20/011 dated: 17.08.2019 from M/s. Inkel Ltd.
 - 5) Letter No. INKEL/SOLAR/KSEB-8 MW/19-20/002 dated: 23.08.2019 from M/s. Inkel Ltd.
 - 6) This office letter No.CE/(REES)/Clubbed Projects BAK/2019-20/1298 dated 05-11-2019
 - 7) Letter No. INKEL/SOLAR/KSEB-8MW/19-20/003 dated 7-11-2019 from M/s INKEL

The subject work is awarded to you at a contract value of INR 44,99,99,999/- (Rupees Forty four crore ninety nine lakhs ninety nine thousand nine hundred and ninety nine only) inclusive of all taxes and duties. You shall carryout and complete the work as per the time schedule as contained in clause 2.2.4 and 5.3.2 of tender document Volume-1. Two copies of the order are included herewith. The duplicate of this order shall be returned to this office within seven days after affixing your seal and signature on all pages as a token of acceptance.

This contract will be governed by the terms and conditions as contained in tender document Volume-I, II and III and all corrigendum issued in this respect by the tendering authority. This Letter of Award (LoA) & tender documents will form part of the contract agreement. Additional conditions, modifications, if any stated in your offer or elsewhere, which are not agreed to by KSEBL or not in accordance with any of the provisions covered by the bid documents referred shall stand nullified.

1. Glance of the Project:

Appointment of EPC contractor for design as per site conditions, erection, testing & commissioning of Grid Tied Ground Mounted Solar PV Power plants at Brahmapuram, Kanjikode and Agali owned by KSEBL with total installed capacity of 8 MWp (4MWp-Brahmapuram, 3MWp-Kanjikode and 1MWp-Agali) including Operation & Maintenance of the plants for the first 5 years from the date of handing over where Performance Ratio of location shall be 75 - 80% as detailed in the Clause 2.2.3 of Tender document Volume 1 and corrigendum issued in this respect, herein after called "the project".

2. Scope of work:

The scope of work will be governed by clause 2.2.3 of tender document Volume-1 and corrigendum issued in this respect.

Sites	Brahamapuram- 4MWp, Kanjikode- 3MWp, Agali- 1MWp
Total Capacity	8.0MWp
Number of locations	3
Operation and Maintenance	Five years from date of handing over as per Clause 6.9
Performance Ratio(AC)	75-80%

3. Contract amount:

The Total Contract Amount is **INR 44,99,99,999/-** (Rupees forty four crore ninety nine lakh ninety nine thousand nine hundred and ninety nine only) inclusive of all taxes and duties for design, planning, investigation, survey, engineering, manufacture/procurement, manufacturer's quality assurance, shop testing (including type testing where specified/required), transportation, handling, storage, erection including all associated civil/structural works, electrical and general works, piping, cabling, instrumentation, installation, testing and commissioning, training, services, permits and insurance at all stages and all related works for connectivity, statutory inspection and training, cabling, power evacuation including cost of transformers and HT metering including design and implementation of plant, string level monitoring scheme with compatible software and hardware for providing real time SCADA visibility to load despatch centre, Kalamassery and proposed renewable data centre at Vidyuthi Bhavanam TVM and works related with single phase to three phase conversion required in necessary locations of the project sites and handing over the SPV Plants to KSEBL to its full satisfaction after proving the performance ratio (AC) at the time of handing over of the project. The performance ratio (AC) of each location shall range from 75- 80%. Performance ratio (AC) shall be proved deriving samples within a period of 7 consecutive days at the end of each year for release of O&M charges as per the table given 2.2.3 of tender document volume 1 and corrigendum issued in this respect, as per the financial proposal submitted by you and as detailed in the Price Schedule attached as Annexure 1.

Freight and Insurance charges for transportation of material/equipment to destination project site and up to complete installation and commissioning should be arranged by the contractor at their own cost. KSEBL will not entertain or bear any charge for the same.

Contract amount shall be governed as per provisions under Clause 4.1 of Volume 1 of the tender document. This amount shall be firm during the period of contract and shall not be varied or adjusted on whatsoever reason on any account.

4. Taxes & Duties:

The Contract Amount as indicated in Clause 3 of this document is inclusive of all Taxes, Duties, incidental charges and other levies. Taxes & Duties will be governed by the Clauses as detailed in clause 4.1, 5.9.1, 5.9.2, 5.9.3 of Volume 1 of the tender document. All Taxes and duties will be as per the latest orders of KSEBL and prevailing rules of State /Central Government. No separate claim on this behalf will be entertained and future claims on any taxes and duties will not be admitted and also all statutory recoveries will be deducted by K.S.E.B Ltd from the work bill. No future claims on unquoted taxes and duties will be allowed. The GST on freight & insurance

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shall be borne by you and GST on basic rate quoted by you shall be paid by KSEBL.

5. Insurance:

All equipment, machinery, works etc. which are furnished, installed, constructed and and to be handed over to the KSEBL under this contract for the completion of project shall be insured by the Contractor for the period of contract. It shall be the responsibility of the Contractor to maintain adequate insurance coverage at all times. Insurance will be governed by Clause 5.9.4 of Volume 1 of the tender document.

All the Personnel employed and engaged by the Contractor shall have adequate insurance coverage. Any claim due to mishap/accidents or otherwise to personnel and equipment, shall be taken up by the contractor, directly with the Insurance Company.

6. Work Completion Period and Date of Commissioning (CoD):

The work shall be completed within 12 months (maximum) from the date of handing over of site. The period of commencement of work as stipulated vide clause 2.2.4 will be reckoned from 10 days from the date of agreement or the date of handing over the site, even if not in full, but in a manner the work can be commenced and proceeded with in accordance with the programme of works, whichever is earlier and time of Completion will be worked out accordingly. All the works stipulated under the scope of the Contract shall be completed in all respects, supplies made, services provided and final cleaning up done and required testing shall be completed and commissioned before the expiry of the Time of Completion thus worked out, unless the time of completion is postponed and period of completion is extended by a written letter from the agreement Authority

The date of commissioning shall be the date on which the Solar plant is synchronized into KSEBL grid after obtaining clearances from all statutory bodies and after conducting necessary grid interfacing tests ,clearing of snags and with satisfactory measurements by the KSEBL. The Engineer-in-Charge shall issue a certificate including date of commissioning and an authorization certificate/ commissioning report after successful synchronization, commissioning of the plant with the grid after proving the Performance ratio as detailed in clause 2.2.3 of tender document Volume-1 and corrigendum issued in this respect.

7. Extension of Completion Date:

The contractor shall not claim any price escalation, in case the completion period is extended due to any reason, including litigation or force majeure conditions and is governed by Clause 5.3.6 of tender document Volume-1.

8. Liquidated Damage:

Liquidated Damage will be governed by the clause 5.3.9 of tender document Volume 1.

9. Execution of Agreement:

The successful bidder shall execute an agreement for the work as well O&M of individual solar PV plant KSEBL in Kerala Government Stamp paper worth **Rs.1,00,000 /-** (Rupees one lakh only) after furnishing a Bank Guarantee of **Rs.4,50,00,000 /-** (Indian Rupees four crore fifty lakh only) i.e. 10% of the Contract value rounded off to the higher multiple of Rs 1000/-, within 15 days from the date of

Issue of Letter of Award of contract, with the KSEBL . After execution of the agreement the successful bidder shall be known as 'EPC Integrator.

10. Construction Programme:

Within 15 days from the date of award, the contractor shall submit to the KSEBL for approval, a programme showing the general method, arrangements, order and timing for all the activities involved in the work in a systematic manner based on planning technique and tool like PERT /CPM in MS (Projects) and GANTT chart indicating the critical events/paths and milestones. The contractor shall carryout the works in accordance with this programme and as approved by KSEBL, and complete them in all respects to the full satisfaction of KSEBL.

Any change to the approved work plan due to unavoidable circumstances shall be made only with the prior approval of KSEBL.

11. Terms of Payment:

The payment condition is governed by Clause 5.2 of tender document Volume-1

- a. The Contractor has to produce four separate Bank Guarantees towards performance security of the project and O&M performance guarantee of Individual plants, for an amount apportioned suitably, totalling to 10% of the Contract amount at the time of executing Contract Agreement.
- b. No amount shall be released as mobilisation advance
- c. Upon delivery , acceptance and production of Insurance certificates of major components of the plant (PV modules, Inverters, transformers and module mounting structures) required for a particular site, 30% of the total value of materials delivered to the site, shall be released. However the total amount so released for all the sites together shall be limited to 30% of the contract value excluding O&M. Necessary invoices and documentary evidences shall be produced in this regard for release of amount. The no. of modules required for a particular site shall be assessed on the basis of capacity requirement of that site.

The Engineer-In -charge is to be informed about the delivery of material at least one week in advance by the contractor. The Engineer in charge shall ensure the site acceptance / rejection of the received material at site within three days of delivery of material along with submission of the SAT procedure of the delivered material from the vendor by the contractor. The invoices shall be submitted by the contractor as per the accepted price schedule which is to be verified and made ready for release of payment within 15 days of receipt of the invoices subject to the satisfaction of the above conditions.

- d. Balance 70% of the total value of contract (except Operation and Maintenance charges) will be released after satisfactory completion, testing, commissioning of the solar plant at all sites after proving the Performance ratio (AC) as per clause 2.2.3 and handing over the entire project . However part payment could be released on satisfactory completion, testing, commissioning of the solar plant at a particular site, after proving the Performance ratio (AC) and handing over that site as per clause 2.2.3.

The contractor can submit the final invoice as per the accepted price schedule within 10 days on proving the Performance ratio (AC) (as per Clause 2.2.3)

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after completing the project within 12 months. The invoices shall be verified and final payment will be released within 3 months of receipt of the invoices subject to the satisfaction of the above conditions.

- e. The Operation & Maintenance charges of a particular site shall be released at the end of each year after commissioning and demonstration of the specified Performance ratio (AC) as per clause 2.2.3 at the end of each year during the O&M period (5 years). The performance guarantee amount towards O&M of a particular site shall be released at the end of every year of O&M period of a site after demonstrating the specified Performance ratio (AC) (as per Clause 2.2.3) at the end of every year during the O & M period.
- f. The Quoted taxes and duties etc. as Governed by GST will be released subject to an undertaking from the Contractor in Kerala Government Stamp paper that "If any dispute in payment of taxes and duties etc. as Governed by GST from concerned Tax authorities occurs in future, he shall indemnify KSEBL from such liabilities and shall be liable for the additions, loss or cost on account of such discrepancies /dispute".

12. Advance Payment:

No amount shall be released as mobilisation advance

13. Performance security deposit:

The performance security deposit is governed by Clause 5.1.7 of Tender document Volume 1

In order to cover the liabilities under the contract and to ensure sufficient guarantee to cover all possible liabilities pertaining to defects, shortfalls, remedial measures arising out of poor workmanship, materials, loss, excess amount, risk and cost of Contractor in case of alternate arrangements and any type of dues to the KSEBL, an amount as prescribed by KSEBL shall be collected and retained from the Contractor towards Performance Security for the Contract.

The Contractor shall submit four separate Performance security deposits in the form of Bank Guarantees at the time of execution of agreement in the prescribed format (Annexure 5) towards performance security of the project and O&M performance guarantee of individual plants, which shall be an amount, apportioned suitably totalling to 10% of the total Contract amount. The Bank Guarantee submitted by the contractor shall be rounded off to the higher multiple of Rs 1000/ i.e., INR.4,50,00,000 /-(Indian Rupees four crore fifty lakhs only).

The Bank Guarantee towards the performance security of the project shall be initially valid from the date of agreement for a period of 1 year and will be released after the satisfactory handing over of the project. Three separate BGs furnished towards O&M performance guarantee of the respective sites shall initially be valid for two years and be kept renewed from time to time till the end of defect liability period. The performance Guarantee of each plant will be released at the end of every year of O&M, after demonstration of desired performance ratio (AC) as per clause 2.2.3 during the O&M period. The performance ratio (AC measurements) (as per Clause 2.2.3) will be calculated based on data from pyranometer / Meteoronorm data. Failure of the successful bidder to submit the required Performance Guarantee shall constitute sufficient grounds for termination of Contract & forfeiting the EMD. However while considering renewal of BG towards performance security of O&M for the succeeding

Par, proportionate reduction in the BG amount corresponding to the elapsed O&M period shall be made.

No interest will be paid by KSEBL at any stage of contract on the Performance Security.

The performance ratio (AC)(as per Clause 2.2.3 of tender document volume 1) can be checked at any time in between if deemed necessary by the Engineer in charge (as per clause 2.2.3 of tender document Volume 1 and Addendums issued in this respect). If any unusual degradation is noticed in the PR, the contractor shall attend and rectify the same within 24 hours on intimation. If not the performance security deposit will be forfeited.

14. Payment Authority and Engineer-in-Charge:

Engineer-in-Charge – Engineer authorized by the Chief Engineer (Renewable Energy & Energy Savings). The Engineer-in-Charge may delegate powers to subordinate officers in respect of execution of work such as Site supervision of Electrical works and arrangements for interconnection facility, Technical support and civil supervision.

The work shall be treated completed only when the Engineer-in-charge issues certificate of completion where the actual date of completion of work will be mentioned. In case of termination or foreclosure, the Engineer-in-charge will issue the certificate of completion to that effect. If the contractor fails to complete any part of the work as required for satisfactory completion before taking over and / or the date of completion specified, and fails to remove the surplus materials, the KSEBL will complete the works and remove the surplus materials etc. and the amount incurred for the same will be realized from the contractor from any amount due to him from this work or any other work with KSEBL or his assets in appropriate proceedings. The contractor will not have any claim over the surplus materials so removed by the KSEBL.

The contractor shall submit bills in Triplicate to the **Engineer-in-Charge** with all supporting documents as indicated in the relevant Clauses of Volume 1 of the bid document.

15. Manufacturing Schedule:

The Bidder is to choose high efficiency 350Wp or higher mono crystalline PERC silicon modules manufactured in **India of reputed make** from the list of PV modules to be approved from this office.. The bidder shall specify all basic design details, including details of the PV modules and the support structures, grid tie inverter transformer, cables (AC&DC) Plant protection scheme, Integration and power evacuation details with existing power system, with appropriate diagram and drawings. The drawings along with detailed structure design and material selected as per the IS 2062/IS 4759. All guaranteed technical particulars, details of each items, make, model number and specification conforming to relevant standards, entire drawings, detailed test reports, list of O & M spares for major materials, detailed Bill of materials and Priced Bill of Quantities in respect of materials/equipment and works for the entire Project shall be submitted within 15 days of receipt of this LoA.

All materials and equipment required for successful completion and commissioning of the project must be included. The design details and other accessories should adhere to and match with the technical specification provided in

the volume III of the tender document and as per the Guaranteed Technical Particulars offered by you.

The Contractor shall submit all the appropriate diagram and drawings to the agreement authority for approval. Also specifications of major items such as PV modules, inverters etc. shall be submitted to the Agreement authority for approval. Approvals for Layout of Power Plant Installation shall be issued by the Agreement Authority on submission of all the drawings within 15 days of issuance of LoA. Modifications if any, suggested by the agreement authority shall be incorporated in the design brief/revised drawings and shall be resubmitted within seven working days of intimation.

16. Drawings and documents

The design documents to be submitted by the contractor will include but not limited to:

1. String Sizing & Array design
2. String Layout
3. Array Layout
4. DC Protection
5. Inverter Sizing
6. AC Protection.
7. DC Cable size calculation
8. DC cable specification
9. DC cable schedule, voltage drop and power loss calculation.
10. String monitoring unit specification.
11. DC earthing & pit calculation
12. HT transformer & Isolation Transformer Switch Gear
13. Lightning protection details/specification.
14. All technical specification of AC components
15. Cable schedules.
16. PV syst Simulation Report with proposed modules and Grid Tie Inverter.

Contractor shall furnish the following drawings under this contract and has to obtain approvals.

- a. Shadow analysis
- b. General arrangement and dimensional layout
- c. Schematic drawing showing the SPV panels, Power conditioning Unit(s)/ Inverter, Junction Boxes, AC and DC Distribution Boards, meters etc.
- d. Layout of solar PV Array and Single line diagram with specification of all components..
- e. Design document for Mounting structure
- f. Mounting structure drawing
- g. Structural drawing along with foundation details for the structure.
- h. Civil drawings of control room building.
- i. Cable Layout (indicating details of cable route for power & communication cables).
- j. Utility drawings (showing water piping, fire lines etc.)
- k. Itemized bill of material for complete SPV plant covering all the components and associated accessories.
- l. Sizes and specification of cables between array interconnections, array to junction boxes, junction boxes to Inverter etc. shall be furnished

● The drawings along with detailed structure design and material selected and their standards shall be submitted to agreement authority for approval before starting the execution work. The work will be carried out as per the approved design.

The contractor shall furnish drawings, design, data, documents/information in soft/hard copies for the respective works including all calculations and approvals shall be taken from the Engineer-in -Charge before commencement of the project. The contractor shall furnish following documents/information.

- a. General description of equipment offered specifying the important features, make, technical parameters, material of construction, etc. to enable the owner to have proper understanding of the equipment offered and its operation
- b. Technical literature, catalogue and publications.
- c. Layout of complete power plant installation showing location of all major sub-systems
- d. Single line diagram
- e. Typical general arrangement and foundation details.
- f. Technical particulars as listed in this specification.
- g. Earthing layout design and calculations
- h. Lightning protection design
- i. CSS drawing
- j. Module installation guidelines from module manufacturer,
- k. Detailed calculation of Auxilliary consumption
- l. Type tests certificates of all major equipment like transformers, switchgears, Grid tie Inverter, solar modules etc.

The contractor shall provide necessary drawings and documents required by statutory authorities and obtain the approval before taking up erection.

17. Quality Assurance:

The Contractor shall establish a Quality Assurance system for the Work to demonstrate the compliance of such part with the requirement of the contract and specifications. The Quality Assurance system shall be subject to the approval of the Engineer-In-Charge. The system shall be in accordance with the specifications stated in the Contract or with BIS specifications unless otherwise specified anywhere in this Contract. The Engineer-in-Charge shall be entitled to inspect the system and the reports shall be periodically sent to him by the Contractor. Compliance with the Quality Assurance system shall not relieve the Contractor from any of his obligations or responsibilities under the Contract.

The cost of all Quality Assurance operation shall be included in the quoted amount under the price schedule and no extra claim will be entertained. The details of sampling, testing, procedures etc. for different works are given in the Technical Specifications of the Contract. If these details are not stated in the technical document, BIS specification shall be followed. The Contractor shall provide samples and test without any extra cost and co-operate in the testing of materials if so desired by the Engineer-In-Charge.

18. Review and Progress report:

This report shall be submitted (e mailed) to the agreement Authority as well as Engineer In charge on a monthly basis within Ten Calendar days from cut-off date as agreed upon, covering over all scenario of the work as per clause 7.1 of tender document volume I.

19. Technical parameters for getting grid connectivity:

As per technical specification of tender document

20. Testing and Commissioning:

Commissioning test with all required testing shall be conducted by the contractor in presence of KSEBL officers delegated by the Engineer-In-Charge.

The contractor shall also prepare and handover the as-built drawing, Operational manuals and Maintenance manuals of the plant to KSEBL.

On completion of all works stipulated in the scope of work and after testing and commissioning of the Project, and if there are no obligations to arise out of the Contract, KSEBL shall issue a completion certificate as described under Clause 5.3.3 of Tender document Volume 1.

21. Operation and Maintenance (O&M):

Operation and Maintenance is governed by clause 6.9 of tender document Volume 1. Operation and maintenance of the solar plant up to the point of supply for a period of 5 years of Defects Liability period is the responsibility of the Contractor. Operation and Maintenance during this period shall include supply of spares of panels, inverters and all equipment in the solar plant including transportation of these items from the original manufacturer, consumables, general comprehensive insurance covering fire, earthquake. The solar plant should be maintained in shadow free environment. The tree branches if any causing hindrance to the shadow free operation of solar plant shall be cut and removed under the supervision of KSEB officials.

Copies of the insurance policies are to be given to KSEBL as and when taken. The contractor shall ensure efficient operation of the SPV plant and the associated facilities to achieve the maximum power generation from the plant. For this purpose the contractor shall engage the services of adequate number of Engineers and Technicians trained under "Suryamitra" Skill Development Programme of MNRE. The contractor shall also attend to all failures, rectifications, breakdowns, 5 year comprehensive Operation and Maintenance checks.

Adequate training shall be given to personnel identified by KSEBL, for Daily Monitoring Information like solar energy generated, net meter readings etc. Monthly System (MIS) reports with generation and down time analysis data has to be sent to KSEBL corporate office as well as Engineer in Charge by E-mail during the defect liability period.

The contractor shall not misuse the land and assign responsibility for the safety of machinery within the premises.

22. Annual Maintenance Contract (AMC):

The Annual Maintenance Contract shall begin after the Operation and Maintenance period. If desired the EPC Contractor may be asked to execute the AMC for 5 years on agreement between KSEBL and the contractor at mutually agreed price.

23. Performance & Warrantee:

The mechanical structures, electrical works and overall workmanship of the grid solar power plant must ensure longevity. PV modules used in grid power plant shall be warranted for output wattage, which should not be less than 90% at the end of 10 years and 80% at the end of 25 years. Manufactures warranty certificate shall be produced in this regard.

EPC contractor shall ensure the performance ratio of each location as detailed in the Clause 2.2.3 of Tender document Volume 1

24. Generation Assessment

The performance ratio (AC) of each location shall range from 75- 80% as per Clause 2.2.3 of Tender document Volume 1 . The performance ratio test as per IEC 61724 has to be carried out at site by the EPC contractor in presence of authorized officials from KSEBL, deriving samples within a period of 7 consecutive days sufficient to provide operational data representative of insolation and ambient conditions as desired by the agreement authority to prove the Performance ratio achieved in the range of 75-80% as per obligations under the EPC contract. This is mandatory for handing over the plant to the KSEBL. It is also agreed that if the specified performance ratio is not achieved, the same shall be demonstrated within a period of another 7 consecutive days and still if it is not achieved, EPC contractor shall enhance the module capacity of solar plant or improve the quality of the plant by replacement of module or any other components with all suitable modification requirements on balance of systems at his own cost to achieve the performance ratio.

Operation and maintenance charges shall be released at the end of each year based on the Performance ratio (AC) as mentioned above, as per the table given below.

Sl.No	Particulars	Performance ratio(AC) in %
1	At the time of completion and commissioning	75-80
2	At the end of 1 st year	74-79
3	At the end of 2 nd year	73-78
4	At the end of 3 rd year	72-77
5	At the end of 4 th year	71-76
6	At the end of 5 th year	70-75

25. Handing over:

Date of Handing Over is the date on which the first performance ratio will be proved to the satisfaction of KSEBL along with the successful clearing of snag list of all the projects.

26. Termination of Contract:

Termination of Contract will be guided strictly in accordance with Clause 5.3.11 of the Tender document volume 1.

27. Force Majeure:

Force Majeure shall be governed by Clause 5.3.8 of the Tender document volume 1.

28. Defects Liability Period:

The Defect Liability Period shall be governed by Clause 5.3.4 of the Tender document volume-1

29. Law and Jurisdiction:

This contract has to be performed complying with the laws of India and Kerala and any dispute arising out of this contract will be subject to the exclusive jurisdiction of Civil Courts at Thiruvananthapuram.

30. Contract Documents.

The Contract documents among other things consist of this agreement on stamp paper.

Bid document consisting of

Volume I - Conditions of Bid and Contract

Volume II - Pre Qualification Bid

Volume III - Technical Specifications

Schedule of Technical particulars and prices

Corrections and amendments to the specifications and conditions of contract included in the above volume

Annexure, if any, to the above volume containing the change in specifications and conditions of contract arrived at after mutual negotiations before awarding the work.

Drawings as listed in the conditions of contract

Schedule of prices as finally accepted.

Approved Construction Programme

31. Assignment & Subletting

As per the Article VIII of Tender documents Volume 1, the contractor shall not assign or make over the contract or the benefit or the burdens thereof, or any part thereof, to any other person or persons or body corporate. The contractor shall not

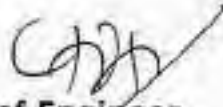
underlet or sublet to any person or persons or body corporate, the execution of the contract or any part thereof without the consent, in writing, of the KSEBL.

32. Acknowledgment by the Contractor:

This Letter of Award is issued subject to the documents referred above and terms and conditions contained therein. You will also be deemed to be fully aware of **KSEBL's General conditions of contract** which is applicable to this contract also and Ignorance of these conditions will not exempt you from your liability to abide by the same.

If there is any contradiction/ conflict between the tender documents and LoA, conditions in the LoA will prevail.

The documents specified in Sl. Nos 10 and 15 of the LOA shall be submitted within 15 days from the date of issue of this LoA


Chief Engineer

(Renewable Energy & Energy Savings)

23/4)

- Acc:-**
1. Price schedule -annexure-1
 2. Form of contract agreement -annexure -4
 3. Performance Bank Guarantee -annexure 5
 4. Copy of LoA in duplicate

Copy to:-

1. The Secretary K.S.E.B Ltd, Thiruvananthapuram.
2. The LA and DEO K.S.E.B Ltd, Thiruvananthapuram.
3. The Financial Advisor, KSEBL.
4. The Deputy Chief Engineer, BDPP, Cochin
5. TA to The Chairman & Managing Director, KSEBL, Thiruvananthapuram
6. TA to Director (Distribution & IT)/ Director (Tr & Sys. Operation)/ Director (Corp. Plg, Gen-Ele, SCM & Safety)/ Director(Generation Civil &HRM)
7. PA to The Director (Finance)
8. Sr.CA to Chief Vigilance Officer
9. The Main Income Tax Officer, Thiruvananthapuram, Kerala.
- 10.The Accountant General, Thiruvananthapuram, Kerala
- 11.The Executive Engineer, BDPP, Cochin
- 12.TheExecutiveEngineer,TransmissionDivision,Kanjikode

Government of Kerala
Department of Electrical Inspectorate
Office of the Chief Electrical Inspector
Housing Board Buildings, Shanthi Nagar
Thiruvananthapuram 695 001
Phone: 0471 2331104, 0471 2331159
Email : cei@cei.kerala.gov.in
Web site: www.cei.kerala.gov.in



An ISO 15700 : 2005 Certified Department

Proceedings of the
Chief Electrical Inspector to Government of Kerala
Thiruvananthapuram

Present: V.C. Anil Kumar

Subject:- Installation of 1MW Grid connected Solar Plant, two numbers of 630kVA transformer and connected electrics at the premises of Agali Substation, Agali, Palakkad District - Issue of sanction for energisation - regarding

- Read -**
1. Scheme Approval No.B3-19260/20/CEI dated 30/01/2021
 2. Completion report submitted by the Essjay Electro Links Pvt. Ltd., Kallinga Parambil, Nochima, NAD.P.O., Aluva - 683 563 vide letter No. Nil dated 06.01.2021 received on 16.08.2021
 3. Inspection conducted on 16.08.2021.
 4. Non conformity report vide letter No. B3-19260/20/CEI dated 16/09/2021
 5. Compliance report submitted by Essjay Electro Links Pvt. Ltd., Kallinga Parambil, Nochima, NAD P.O., Aluva - 683 563 vide letter No. Nil dated 28.09.2021 received on 1.10.2021

Order No: B3 -19260/2020/CEI dated 05.10.2021

Sanction for energisation is hereby accorded under Section 54 of Indian Electricity Act, 2003 and Regulation 43 and 52 of Central Electricity Authority (Measures Relating to Safety and Electric Supply) Regulations, 2010 for the installation of 1MW Grid connected Solar Plant, two numbers of 630kVA transformer and connected electrics at the premises of Agali Substation, Agali, Palakkad District with details of which given as annexure and subject to following conditions

1. All pre-commission test results shall be recorded
2. All maintenance work shall be recorded in Maintenance Register. Maintenance work shall be done as specified in relevant B.I.S and as suggested by manufacturer.
3. Any addition or alteration to the existing installation shall be carried out only after getting prior permission from this department.

Sd/-
Chief Electrical Inspector

Load details - As per Annexure

To

The Executive Engineer, Transmission Division
Thiruvananthapuram(P.O), Vennakkara, Palakkad-678004

Copy to:-

1. The Electrical Inspector, Palakkad.
2. M/s Essjay Electro Links Pvt. Ltd., Kallinga Parambil, Nochima, NAD P.O., Aluva - 683 563
3. Office Copy.
4. Spare

Forwarded/By Order

Electrical Inspector



Annexure to Order No: B3 - 19260/2020/CEI dated 05.10.2021

Equipment Details		Quantity in Nos.
Transformer-1		1
Make : Hammond Power Solutions		
Rating : 630kVA, 11kV/400V		
Sl. No. : 22049		
Transformer-2		1
Make : Hammond Power Solutions		
Rating : 630kVA, 11kV/400V		
Sl. No. : 22050		
HT VCB Panel		
VCB Incoming	800A	1
HTSFU Outgoing	630A	2
LT Panel-1		
ACB Incoming	1000A	1
MCCB Outgoing	200A	6
LT Panel-2		
ACB Incoming	1000A	1
MCCB Outgoing	200A	6
Inverter -1		
Isolator Incoming	200A	1
Isolator Outgoing	63A	6
Inverter -2		
Isolator Incoming	200A	1
Isolator Outgoing	63A	6
Inverter -3		
Isolator Incoming	200A	1
Isolator Outgoing	63A	6
Inverter -4		
Isolator Incoming	200A	1
Isolator Outgoing	63A	6
Inverter -5		
Isolator Incoming	200A	1
Isolator Outgoing	63A	6
Inverter -6		
Isolator Incoming	200A	1
Isolator Outgoing	63A	6
Inverter -7		
Isolator Incoming	200A	1
Isolator Outgoing	63A	6
Inverter -8		
Isolator Incoming	200A	1
Isolator Outgoing	63A	6
Inverter -9		
Isolator Incoming	200A	1
Isolator Outgoing	63A	6
Inverter -10		
Isolator Incoming	200A	1
Isolator Outgoing	63A	6
Solar Inverter	100kW	10
Earth Electrode		6



PROJECT HANDING OVER CERTIFICATE

This is to certify that M/s. INKEL Limited has completed the construction, commissioned and handed over the following system to KSEBL:

Work Order No &	06/2019-20 dated 23.11.2019 of the Chief Engineer (REES)
System Capacity	1 MWp
Type of system	Grid Connected Ground Mount
Location of Installation	Near 33kV Substation, Agali, Palakkad
Details of Electrical Inspectorate Sanction	No. B3 - 19260/2020/CEI dated 05.10.2021
Details of Equipment	As per Sanction Order above
Date of Commissioning	11.11.2021
Date of Performance Ratio (P.R) measurement	22.12.2021
Value of P.R measured	82.07 %
SCADA system details	Link: http://117.251.18.55:8080 Username: KSEB Password: operator

Taken Over by For KSEBL  Signature: Name: Assistant Engineer 110KV SUBSTATION KSEBL MANNARKKAD Designation: PH: 9496010241 PIN: 678582 Date: 11.11.2021	Handed Over by For INKEL Limited  Signature: Name: Sam Roofus Designation: Joint General Manager Date: 11.11.2021
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Counter Signed

Assistant Executive Engineer
 Transmission Subdivision
 Kerala State Electricity Board Limited
 Mannarkkad

PROJECT HANDING OVER CERTIFICATE

This is to certify that M/s. INKEL Limited has completed the construction, commissioned and handed over the following system to KSEBL:

Work Order No &	06/2019-20 dated 23.11.2019 of the Chief Engineer (REES)
System Capacity	3 MWp
Type of system	Grid Connected Ground Mount
Location of Installation	Near 220kV Substation, Kanjikode, Palakkad
Details of Electrical Inspectorate Sanction	No. B3-00617/21/CEI Dated 18-02-2022
Details of Equipment	Attached as Annex - 1
Date of Commissioning	19.02.2022
Date of Performance Ratio (P.R) measurement	28.02.2021 04.03.2022
Value of P.R measured	82.10%.

Taken Over by For KSEBL Signature:  Name: Jayadevan Nair Designation: Assistant Executive Engineer 220 KV Sub Station Sub Division KSEB Ltd. Kanjikode, Palakkad Date: 4.3.22	Handed Over by For INKEL Limited Signature:  Name: Nevil Jose Designation: Senior Manager Date: 04.03.2022 Nevil Jose Sr. Manager-Solar INKEL Limited 
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പട്ടികവർഗ്ഗ വികസന വകുപ്പ് ഡയറക്ടറുടെ നടപടി ക്രമം
വികാസ് ഭവൻ, തിരുവനന്തപുരം
(നിലവിൽ; ഡോ. പി. പുഗഴേന്തി ഐ.എഫ്.എസ്)

- വിഷയം:-** പട്ടികവർഗ്ഗവികസനം - പട്ടികവർഗ്ഗവികസന വകുപ്പിനു കീഴിലുള്ള 4 മോഡൽ റസിഡൻഷ്യൽ സ്കൂളുകളിലേക്ക് സോളാർ പവർ പ്ലാന്റ് സ്ഥാപിക്കുന്നതിനായി M/s. INKEL LMTD, എറണാകുളം നൽകിയ എസ്റ്റിമേറ്റ് അംഗീകരിച്ച് വർക്ക് ഓർഡർ നൽകി കൊണ്ടുള്ള ഉത്തരവ്.
- സൂചന:-** M/s. INKEL LTD, അസിസ്റ്റന്റ് ജനറൽ മാനേജരുടെ 27/08/2018, 7/09/2018 എന്നീ തീയതികളിലെ INKEL /SOLAR/TCP/CAPEX /2708 2018/16, -ാം നം.കത്തുകൾ.

ഉത്തരവ് നമ്പർ ഡി3.14185/2018 തീയതി : 26 .09.18

പട്ടികവർഗ്ഗവികസന വകുപ്പിന്റെ കീഴിൽ പ്രവർത്തിക്കുന്ന 4 മോഡൽ റസിഡൻഷ്യൽ സ്കൂളുകളിലേക്ക് സോളാർ പവർ പ്ലാന്റ് സ്ഥാപിക്കുന്നതിനായി പ്രൊപ്പോസലുകൾ ക്ഷണിച്ചതിന്റെ അടിസ്ഥാനത്തിൽ M/s. INKEL LTD 5,58,99,998/- രൂപയുടെയും M/s KEL 5,87,30,964/- രൂപയുടെയും M/s SII K 5,75,79,375/- രൂപയുടെയും പ്രൊപ്പോസലുകൾ സമർപ്പിച്ചിരുന്നു. M/s. INKEL LTD മായി നടത്തിയ നെഗോസിയേഷനെ തുടർന്ന് 5,53,50,000/- രൂപയ്ക്ക് (അഞ്ച് കോടി അൻപത്തി മൂന്ന് ലക്ഷത്തി അൻപതിനായിരം രൂപ മാത്രം) ടി പദ്ധതി നടപ്പിലാക്കാമെന്ന് അറിയിച്ചിട്ടുണ്ട്. പ്രസ്തുത സാഹചര്യത്തിൽ ഇതേടൊപ്പം അനുബന്ധത്തിൽ ചേർത്തിരിക്കുന്ന സ്ഥാപനങ്ങളിൽ സോളാർ പവർ പ്ലാന്റ് സ്ഥാപിക്കുന്നതിനായി M/s. INKEL LTD , എറണാകുളം നൽകിയ 5,53,50,000/- രൂപയുടെ (അഞ്ച് കോടി അൻപത്തി മൂന്ന് ലക്ഷത്തി അൻപതിനായിരം രൂപ മാത്രം) പ്രൊപ്പോസൽ താഴെ പറയുന്ന വ്യവസ്ഥകൾക്ക് വിധേയമായി അംഗീകരിച്ചു കൊണ്ട് ഉത്തരവാകുന്നു.

1. സോളാർ പവർ പ്ലാന്റ് സ്ഥാപിക്കുന്നതിനായി പട്ടികവർഗ്ഗ വികസന വകുപ്പ് ഡയറക്ടറുമായി M/s INKEL LTD അധികാരികൾ എം.ഒ.യു. ഒപ്പു വയ്ക്കേണ്ടതാണ്.
2. കുരാർ പ്രകാരം ഒപ്പുവച്ചതിന് ശേഷം 20% മൊബിലൈസേഷൻ അഡ്വാൻസ് തുക അനുവദിക്കുന്നതാണ്. പൂർത്തിയായ പ്രവർത്തികളുടെ അടിസ്ഥാനത്തിൽ സമർപ്പിക്കുന്ന പാർട്ട് ബില്ലുകളുടെ അടിസ്ഥാനത്തിൽ ബാക്കി തുക അനുവദിക്കുന്നതാണ്. സോളാർ പവർ പ്ലാന്റ് രൂപീകരണമായി കമ്മീഷൻ ചെയ്ത് ആയതിന്റെ പ്രവർത്തനം വിലയിരുത്തിയശേഷം മാത്രം ഫൈനൽ ബിൽ തുക നൽകുന്നതായിരിക്കും.
3. ധാരണാപത്രം ഒപ്പു വക്കുന്ന തീയതി മുതൽ ആറ് മാസത്തിനകം പണി പൂർത്തിയാക്കേണ്ടതാണ്.

4. കമ്മീഷൻ ചെയ്യുന്ന തീയതി മുതൽ 3 വർഷത്തെ വാറണ്ടി നൽകേണ്ടതും വാറണ്ടി കാലയളവിൽ കേടുപാടു സംഭവിക്കുന്ന ഉപകരണങ്ങൾ മാറ്റി പുതിയവ സ്ഥാപിക്കേണ്ടതുമാണ്.
5. വാറണ്ടി കാലാവധി തീരുന്ന മുറയ്ക്ക് എ.എം.സി നൽകേണ്ടതാണ്.
6. സോളാർ പവർ പ്ലാന്റ് സ്ഥാപിക്കുന്ന സ്ഥാപനങ്ങളിൽ 6 മാസങ്ങളിൽ ഒരിക്കലെങ്കിലും ടി സംവിധാനത്തിന്റെ പ്രവർത്തനം M/s **INKEL LTD** അധികൃതർ പരിശോധിക്കേണ്ടതും കൂടാതെ സ്ഥാപനമേധാവി ആവശ്യപ്പെടുന്ന ഏതു സ്ഥലത്തും M/s **INKEL LTD** തങ്ങളുടെ ജീവനക്കാരുടെ സേവനം ലഭ്യമാക്കേണ്ടതുമാണ്.
7. സോളാർ പവർ പ്ലാന്റ് സ്ഥാപിക്കുന്ന മോഡൽ റസിഡൻഷ്യൽ സ്കൂളുകളിലെ 3 ഉദ്യോഗസ്ഥർക്ക് റീതം ടി സംവിധാനം പ്രവർത്തിപ്പിക്കുന്നത് സംബന്ധിച്ച ട്രെയിനിംഗ് നൽകേണ്ടതാണ്.
8. നിശ്ചിത തീയതിക്കകം പദ്ധതി പൂർത്തിയാക്കാത്ത പക്ഷം പ്രതിമാസം പദ്ധതിയുടെ 2% നിരക്കിൽ പിഴ ഈടാക്കുന്നതാണ്.
9. സർക്കാർ ഉത്തരവ് നം. (അച്ചടി) 311/14 ധനകാര്യം തീയതി. 30.07.2014 , സർക്കാർ ഉത്തരവ് നം. (അച്ചടി) 18/17 ധനകാര്യം തീയതി. 09.02.2017, സർക്കാർ ഉത്തരവ് നം. (അച്ചടി) 118/19 ധനകാര്യം തീയതി. 3.08.2018 എന്നീ സർക്കാർ ഉത്തരവുകളിലേയും മറ്റു ബന്ധപ്പെട്ട സർക്കാർ ഉത്തരവുകളിലേയും മാർഗ്ഗ നിർദ്ദേശങ്ങൾ നിർവ്വഹണ ഏജൻസിയായ M/s **INKEL LTD** പാലിക്കേണ്ടതാണ്.
10. ANERT മുഖേന ടി പ്രവൃത്തിയുടെ പൂർത്തീകരണം സാക്ഷ്യപ്പെടുത്തേണ്ടതാണ്.

(ഒപ്പ്/-)
ഡയറക്ടർ

മാനേജിംഗ് ഡയറക്ടർ
M/s **INKEL LTD**
പോസ്റ്റോഫീസ് റോഡ്, കാക്കനാട്
കൊച്ചി
പകർപ്പ്:-
ബന്ധപ്പെട്ട പ്രോജക്ട് ഓഫീസർ/ട്രെയ്നർ ഡവലപ്മെന്റ് ഓഫീസർമാർക്ക്/
സീനിയർ സൂപ്രണ്ടുമാർ /സ്റ്റോക്ക് ഫയൽ/സ്പെയർ.



എസ്.എ 25.09.23

ഉത്തരവിൻ പ്രകാരം

ജി.അനീൽകുമാർ
സീനിയർ സൂപ്രണ്ട്

‘ഭരണഭാഷ - മാതൃഭാഷ’

പട്ടികവർഗ്ഗ വികസന വകുപ്പ് ഡയറക്ടറുടെ കാര്യാലയം

4-ാം നില, വികാസ് ഭവൻ, തിരുവനന്തപുരം പിൻ, 895 033

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നമ്പർ.ഡി3. 20002/16(1)

തീയതി: 11.10.18

സാക്ഷ്യപത്രം

പട്ടികവർഗ്ഗ വികസന വകുപ്പിന്റെ കീഴിൽ പ്രവർത്തിക്കുന്ന 8 മോഡൽ റസിഡൻഷ്യൽ സ്കൂളുകളിൽ സോളാർ പവർ സിസ്റ്റം സ്ഥാപിക്കുന്നതിലേക്കായി ഇൻകെൽ ലിമിറ്റഡ് എന്ന സ്ഥാപനത്തിനെ ഉത്തരവ് നമ്പർ ഡി3.20002/2016 തീയതി 29.11.2017 പ്രകാരം 722 KWP പവർ സിസ്റ്റം തൃപ്തികരമായി സ്ഥാപിച്ചു പ്രവർത്തനക്ഷമമാക്കിത്തന്ന വിവരം ഇതിനാൽ സാക്ഷ്യപ്പെടുത്തുന്നു.



ഒപ്പ്
ഡയറക്ടർ

ഡയറക്ടർ/വേണ്ടി

Handwritten signature

Handwritten signature and date 4/12

പട്ടികവർഗ്ഗ വികസന വകുപ്പ് ഡയറക്ടറുടെ നടപടി ക്രമം
വികാസ് ഭവൻ, തിരുവനന്തപുരം
(നിലവിൽ; ഡോ. പി. പുഗഴേണി. ഐ.എഫ്.എസ്)

വിഷയം:- പട്ടികവർഗ്ഗവികസനം - പട്ടികവർഗ്ഗവികസന വകുപ്പിന്റെ കീഴിൽ പ്രവർത്തിക്കുന്ന 8 എം.ആർ. എസ്.കളിൽ സോളാർ പവർ പ്ലാന്റ് സ്ഥാപിക്കുന്നതിനായി M/s ഇൻകൽ, കൊച്ചി നൽകിയ എസ്റ്റിമേറ്റ് അംഗീകരിച്ച് വർക്ക് ഓർഡർ നൽകി കൊണ്ടുള്ള ഉത്തരവ്.

- സൂചന:-**
- 1. M/s ഇൻകൽ ലിമിറ്റഡ്, സീനിയർ മാനേജരുടെ 07/08/17 ലെ ഔദ്യോഗിക സന്ദേശം.
 - 2. സർക്കാർ ഉത്തരവ് (സാധാ)നം.2852/2017/പജവവവിവ തീയതി 09/11/2017.

ഉത്തരവ് നമ്പർ വി3.20002/2016 തീയതി :29.11.17

പട്ടികവർഗ്ഗവികസന വകുപ്പിന്റെ കീഴിൽ പ്രവർത്തിക്കുന്ന 8 മോഡൽ ഗ്രാമ ഡെവലപ്മെന്റ് സ്കീമുകളിൽ സോളാർ പവർ പ്ലാന്റ് സ്ഥാപിക്കുന്നതിനായി M/s INKEL, M/s KELTRON, M/s KEL എന്നീ സ്ഥാപനങ്ങൾ എസ്റ്റിമേറ്റ് സമർപ്പിക്കുകയും ആയതിൽ ഏറ്റവും കുറഞ്ഞ നിരക്ക് മേഖലപ്പെടുത്തി M/s ഇൻകൽ ലിമിറ്റഡ്, കൊച്ചി 8,44,00,910/- രൂപയുടെ (എട്ട് കോടി നാൽപ്പത്തി നാല് ലക്ഷത്തി തൊള്ളായിരത്തി പത്ത് രൂപ മാത്രം) പ്രൊപ്പോസൽ 28/10/2017 ൽ ചേർന്ന സാമ്പമാനന്തല വർക്കിംഗ് ഡ്രൂപ്പിൻ്റെ സമർപ്പിക്കുകയും സൂചന (2) പ്രകാരം ഭരണാനുമതി ലഭ്യമായിട്ടുണ്ട്. പ്രസ്തുത സാഹചര്യത്തിൽ ഇതോടൊപ്പം അനുബന്ധമായി ചേർത്തിരിക്കുന്ന സ്ഥാപനങ്ങളിൽ സോളാർ പവർ പ്ലാന്റ് സ്ഥാപിക്കുന്നതിനായി M/s INKEL Kochi നൽകിയ 8,44,00,910/- രൂപയുടെ (എട്ട് കോടി നാൽപ്പത്തി നാല് ലക്ഷത്തി തൊള്ളായിരത്തി പത്ത് രൂപ മാത്രം) പ്രൊപ്പോസൽ താഴെ പറയുന്ന വ്യവസ്ഥകൾക്ക് വിധേയമായി അംഗീകരിച്ചു കൊണ്ട് ഉത്തരവാകുന്നു.

- 1. സോളാർ പവർ പ്ലാന്റ് സ്ഥാപിക്കുന്നതിനായി പട്ടികവർഗ്ഗ വികസന വകുപ്പ് ഡയറക്ടറുമായി M/s INKEL, MOU ഒപ്പു വയ്ക്കേണ്ടതാണ്.
- 2. കരാർ പത്രം ഒപ്പുവച്ചതിന് ശേഷം 20% മൊബിലൈസേഷൻ അഡ്വാൻസും കൂടാതെ പൂർത്തിയായ പ്രവർത്തികളുടെ അടിസ്ഥാനത്തിൽ സമർപ്പിക്കുന്ന പാർട്ട് ബില്ലുകളുടെ (പരമാവധി 2 എണ്ണം) അടിസ്ഥാനത്തിൽ തുക അനുവദിക്കുന്നതാണ്.
- 3. എം.ഒ.യു ഒപ്പു വക്കുന്ന തീയതി മുതൽ മൂന്ന് മാസത്തിനുള്ളിൽ പ്രവൃത്തി പൂർത്തിയാക്കേണ്ടതാണ്.

- 4. കമ്മീഷൻ ചെയ്യുന്ന തീയതി മുതൽ 3 വർഷത്തെ വാറണ്ടി നൽകേണ്ടതും വാറണ്ടി കാലാവധിയിൽ കേടുപാടു സംഭവിക്കുന്ന ഉപകരണങ്ങൾ മാറ്റി പുതിയവ സ്ഥാപിക്കേണ്ടതുമാണ്.
- 5. വാറണ്ടി കാലാവധി തീരുന്ന മുമ്പ് ഐ.എം.സി നൽകേണ്ടതാണ്.
- 6. സോളാർ പവർ പ്ലാന്റ് സ്ഥാപിക്കുന്ന സ്ഥാപനങ്ങളിൽ 6 മാസങ്ങളിൽ ഒരിക്കൽ ലെങ്കിമും ടി സംവിധാനത്തിന്റെ പ്രവർത്തനം M/s INKEL അധികൃതർ പരിശോധിക്കേണ്ടതും കൂടാതെ സ്ഥാപനമേധാവി ആവശ്യപ്പെടുന്ന ഏതു സമയത്തും M/s INKEL തങ്ങളുടെ ജീവനക്കാരുടെ സേവനം ലഭ്യമാക്കേണ്ടതുമാണ്.
- 7. സോളാർ പവർ പ്ലാന്റ് സ്ഥാപിക്കുന്ന സ്ഥാപനങ്ങളിലെ 3 ഉദ്യോഗസ്ഥർക്ക് വീതം ടി സംവിധാനം പ്രവർത്തിപ്പിക്കുന്നത് സംബന്ധിച്ച ട്രെയിനിംഗ് നൽകേണ്ടതാണ്.
- 8. നിശ്ചിത തീയതിക്കകം പദ്ധതി പൂർത്തിയാക്കാത്ത പക്ഷം പ്രതിമാസം പദ്ധതിയുടെ 2% നിരക്കിൽ പിഴ ഈടാക്കുന്നതാണ്.

(ഒപ്പ്)-
ഡയറക്ടർ

ഉത്തരവിൻപ്രകാരം

വി. ശശിശ്രീ

ഡെപ്യൂട്ടി ഡയറക്ടർ (വിദ്യാഭ്യാസം)
ഡയറക്ടർക്കു വേണ്ടി

സീനിയർ മാനേജർ
M/s INKEL ലിമിറ്റഡ്,
Door No.07/473 ZA-5&6
Ajiyal Complex
Post Office Road, Kakanad
Cochin-682 030
പകർപ്പ്:-
ബന്ധപ്പെട്ട പ്രോജക്ട് ഓഫീസർ/ഓട്രെഞ്ചൽ ഡവലപ്മെന്റ് ഓഫീസർമാർക്ക്/ സീനിയർ
സ്റ്റാഫ്/സ്റ്റോക്ക് ഫയൽ/സ്പെഷൽ.

അതി 10.17

TO WHOM IT MAY CONCERN

This is to certify that M/s.INKEL Limited has successfully commissioned the Solar Power Plants with a total capacity of **1.08MW** at Various Model Residential Schools under ST Department in Kerala during the year 2017-18. The system supplied and installed by M/S INKEL Limited are working satisfactorily and systems Performance is good. System details attached Annexure-1.

05-12-2019
Trivandrum


Director

DIRECTOR
Scheduled Tribes Development Dep-
Vikas Bhavan, Trivandrum



Annexure - I

A. Solar Power Plant Commissioned (Order No.D3.20002/2016 dated 29/11/2017)

Sl No.	Name of The Site	Solar Power Plant Capacity(kWp)
1	MRS Njaraneeli, Trivandrum	110.88kWp
2	MRS Kulathupuzha, Kollam	103.95kWp
3	MRS Attapady, Palakkad	93.55kWp
4	MRS Nilambur, Malappuram	103.95kWp
5	MRS Kaniyambetta, Wayanad	124.74kWp
6	MRS Nalloornad, Wayanad	66.46kWp
7	MRS Noolpuzha, Wayanad	68.04kWp

B. Solar Power Plant Commissioned (Order No.D3.14185/2018 dated 26/09/2018)

Sl No.	Name of The Site	Solar Power Plant Capacity(kWp)
1	MRS Kattela, Trivandrum	110kWp
2	MRS Ettumanoor, Kottayam	110kWp
3	MRS Chalakkudi, Thrissur	80kWp
4	MRS Pattanam, Kannur	110kWp

05-12-2019
Trivandrum



Director

DIRECTOR
Scheduled Tribes Development
Kerala Sahasra...



05 DEC 2019

VASTRA ENTERPRISES

INKEL BUSINESS PARK-Tower 2, 22/637-G-1, Angamaly South, Kerala - 683573.

Ph: 0484-2983999

E mail: admin@vastraenterprises.com

To,

INKEL LTD.

Ajlyal Complex 2nd Floor,

Door No: 7/4732A-5&6

Kakkand, Cochin - 682030

Sub: Supply of 10kWp Solar Power Plant at Vastra Enterprises

Ref : INKEL/SPVP/2016/2525

With reference to the proposal as well as the technical discussions, we are pleased to convey our willingness to enter into a contract with you for the supply of 10kWp Solar Power Plant for our office at INKEL Tower- 2 , Angamaly based on the following.

Scope: Supply of 10kWp Solar Power Plant

Price : Rs. 9,53,000/- (Nine Lakh Fifty Three Thousand Only)

Payment Terms:- 30% advance payment along with PO & 50% against material readiness and 20% against completion.

Yours Faithfully,


For Vastra Enterprises
(Venugopal Menon)



VASTRA ENTERPRISES

INKEL BUSINESS PARK-Tower 2, 22/637-G-1, Angamaly South, Kerala – 683573.

Ph: 0484-2983999

E mail: admin@vastraenterprises.com

To,

INKEL LTD.

Ajiyal Complex 2nd Floor,

Door No: 7/4732A-5&6

Kakkand, Cochin – 682030

Sub: Installation & Commissioning of 10kWp Solar Power Plant at Vastra Enterprises

Ref : INKEL/SPVP/2016/2525

With reference to the proposal as well as the technical discussions, we are pleased to convey our willingness to enter into a contract with you for solar power plant installation for our office at INKEL Tower- 2 , Angamaly based on the following.

Scope: Installation and commissioning of 10kWp Solar Power Plant

Price : Rs. 17000/- (Seventeen Thousand Only)

Payment Terms:- After the completion of Installation

Yours Faithfully,



For Vastra Enterprises
(Venugopal Menon)



Inkel Business Park, Tower 2, Aruppamkudi South,
Erode District, Kerala - 685577
Ph: 0484-2983899
Email: admin@vastraenterprises.com

4/12/2017

To,
INKEL LIMITED
Ajilal Complex
Kakkanad
Cochin - 682030

SUB:- Completion Letter for Supply, Installation & Commissioning of 10kWp Solar Power ON Grid Power Plant at Vastra Enterprises

This is to certify that INKEL Limited has Successfully Completed the Supply, Installation, and Commissioning of 10kWp Grid Connected Solar Photo Voltaic Plant for Vastra Enterprises.

The Systems are working in good with excellent performance.

 **For Vastra Enterprises**

For Vastra Enterprises,

Proprietor



KERALA STATE ELECTRICITY BOARD LIMITED

Office of the Chief Engineer (Renewable Energy & Energy Savings)
9th Floor, Vidyuthi Bhavanam, Pattom, Thiruvananthapuram - 695 004, Kerala
Phone: +91 471 2447404, 9446008007 Fax: 0471 2558340
E-mail: ceeres@ksebl.in

By Registered post with A/D

LETTER OF AWARD

To

M/s. INKEL Limited
Ajiyal Complex
Post office Road
Kakkanad, Cochin 682030

W.O No.	03 /2018-19
Date	02 .08 .2018
Order type	335 kWp Grid tied rooftop solar PV plant at 5 locations of Building owned by LSGD-District Panchayath Kasargod- II phase
Reference file	CE(REES)/LSGD-Kasargod-RT-II phase/ 2018-19 / <u>778</u> / <u>03.08.2018</u>
e-Tender No	E tender No. KSEBI/REES/LSGD District Panchayath Kasargod II/01/2018- 19 having Tender ID : 2018_KSEB_202397_1
Value	INR 2,23,31,999/- (Rupees Two Crore Twenty Three Lakh Thirty One Thousand Nine Hundred and Ninety Nine only)
Price	Fixed

Sir,

Sub Appointment of Engineering, Procurement and Construction (EPC) Contractor for the design as per site conditions, supply, installation, testing and commissioning of Grid Tied Rooftop Solar PV Power plants on buildings owned by LSGD(District Panchayath Kasargod II Phase) with a total installed capacity of 335 kWp in 5 locations, including Operation & Maintenance of the plant for the first 5 years from the date of handing over - Award of contract reg.

- Ref**
- 1 B.O.(FTD)No.S26/2017-CF(REES)/General/2016-17TVM dated 02.03.17
 - 2 B.O.(CMD)No 842/2017-CE(REES)/General/2016-17TVM dated 30.03.17
 - 3 B.O.(FTD)No.2053/2017-KSEBI/CF(REES)/2017-18 TVM dated 09.08.17
 - 4 E tender No.KSEBI/REES/LSGD District Panchayath Kasargod II/01/2018- 19 having Tender ID : 2018_KSEB_202397_1
 - 5 Letter No INKEL/Solar/CEREES/002/2018-19/18.07.2018 from M/s INKEL Limited
 - 6 Remarks of FA on the price bid as per No.Tender-1/38/2018 dtd 26.07.2018

The subject work is awarded to you at a contract value of INR 2,23,31,999/- (Rupees Two Crore Twenty Three Lakh Thirty One Thousand Nine Hundred and Ninety Nine only) inclusive of all taxes and duties. You shall carryout and complete the work as per the time schedule as contained in clause 2.2.4 and 5.3.2 of tender document Volume 1. Two copies of this order are enclosed herewith.

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The duplicate of this order shall be returned to this office within seven days after affixing your seal and signature on all pages as a token of acceptance.

This contract will be governed by the terms and conditions as contained in tender document volume-I, II and III issued in this respect by the tendering authority. This Letter of Award (LOA), tender documents will form part of the contract agreement. Additional conditions, modifications if any, stated in your offer or elsewhere, which are not agreed to by KSEBL or not in accordance with any of the provisions covered by the bid documents referred shall stand withdrawn or nullified.

1. Scope of work:

The subject work shall be considered as a composite supply. The scope of work will be governed by clause 2.2.3 of tender document Volume-1 in this respect.

Sl. No	Location of the project	Capacity of the proposed plant(kWp)
1	GHSS Chandragiri	20
2	District Allopathy Hospital, Kanhangad	100
3	District Ayurvedic Hospital, Padanakkad	15
4	GHSS Mogral, Puthur	100
5	GHSS Kumbala	100

Appointment of Engineering, Procurement and Construction (EPC) Contractor for the design as per site conditions, supply, installation, testing and commissioning of Grid Tied Rooftop Solar PV Power plants on buildings owned by LSGD(District Panchayath Kasargod II phase) with a total installed capacity of 335 kWp in 5 locations, including Operation & Maintenance of the plant for the first 5 years from the date of handing over where performance ratio of each location shall be 75 - 80% as detailed in the Clause 2.2.3 of Tender document Volume-1 in this respect, herein after called "the project".

2. Contract amount:

The Total Contract Amount is INR 2,23,31,999/ (Rupees Two Crore Twenty Three Lakh thirty One Thousand Nine Hundred and Ninety Nine only) for design, engineering, manufacturing, procurement, supply(including spares), handling storage, civil works, erection, installation, testing & commissioning, training of personnel, along with operation and maintenance charges of the project as all inclusive Price which include taxes, duties, Cess, freight and insurance charges, logistics, etc and all the levies payable by the contractor for successful completion, operation and maintenance of the Grid Tied Rooftop Solar PV Power plants on the Roof of buildings owned by LSGD(District Panchayath Kasargod) with a total installed capacity of 335 kWp in 5 locations including Operation & Maintenance of the plant for the first 5 years from the date of handing over where performance ratio of each location shall be 75 - 80% as detailed in the Clause 2.2.3 of Tender document Volume-1 issued in this respect, as per the financial proposal submitted by you and as detailed in the Price Schedule attached as Annexure 1.

Freight and Insurance charges for transportation of material/equipment to destination project site and up to complete installation and commissioning should be arranged by the contractor at their own cost. KSEBL will not entertain or bear any charge for the same.

Contract amount shall be governed as per provisions under Clause 4.1 of Volume 1 of the tender document. This amount shall be firm during the period of contract and shall not be varied or adjusted on whatsoever reason on any account.

3. Taxes & Duties:

The Contract Amount as indicated in clause 3 of this document is inclusive of all Taxes, Duties, incidental charges and other levies. Taxes & Duties will be governed by the clauses as detailed in clause 4.1, 5.9.1, 5.9.2, 5.9.3 of Volume 1 of the tender document. All Taxes and duties will be as per the latest orders of KSEBL and prevailing rules of State /Central Government. No separate claim on this behalf will be entertained and future claims on any taxes and duties will not be admitted and also all statutory recoveries will be deducted by K.S.E.B Ltd from the work bill. KSEBL will provide C form for transfer of the tax benefit to KSEBL. No future claims on unquoted taxes and duties will be allowed.

4. Insurance:

All equipment, machinery, works etc. which are furnished, installed, constructed and handed over/to be handed over to the KSEBL under this contract for the completion of project shall be insured by the Contractor for the period of contract. It shall be the responsibility of the Contractor to maintain adequate insurance coverage at all times. Insurance will be governed by Clause 5.9.4 of Volume 1 of the tender document.

All the Personnel employed/engaged by the Contractor shall have adequate insurance coverage. Any claim due to mishap/accidents or otherwise to personnel/equipments, shall be taken up by the contractor, directly with the Insurance company. KSEBL/LSGD will not have any liability in this respect whatsoever.

5. Work Completion Period and Date of Commissioning(CoD):

The Contractor shall complete the works in all respect within 6 months from the official date of commencement of work which shall be the date of Agreement or the date of handing over the site, even if not in full, but in a manner the work can be commenced and proceeded with in accordance with the programme of works, whichever is later. All the works stipulated under the scope of the Contract shall be completed in all respects, supplies made, services provided and final cleaning up done and required testing shall be completed and commissioned before the expiry of the time of completion thus worked out, unless the time of completion is postponed and period of completion is extended by a written letter from the Tripartite agreement Authority.

The date of completion/commissioning shall be the date on which the Solar plant is synchronized into KSEBL grid after obtaining clearances from all statutory bodies and after conducting necessary grid interfacing tests and measurements by the KSEBL are found satisfactory. The Engineer-in-Charge shall issue a certificate including date of commissioning and an authorization certificate/commissioning report after successful synchronization, commissioning of the plant with the grid after proving the Performance ratio as detailed in clause 2.2.3 of tender document volume-1 in this respect

6. Extension Of Completion Date:

The contractor shall not claim any price escalation, in case the completion period is extended for any reason, including litigation or force majeure conditions and is governed by clause 5.3.6 of tender document Volume-1.

7 Liquidated Damage:

Liquidated Damage will be governed by the clause 5.3.9 of of tender document Volume 1.

8. Execution of Agreement:

The Contractor shall execute a tripartite agreement in Kerala Government Stamp paper worth INR 22,340/- (Indian Rupee Twenty Two Thousand Three Hundred and Forty only) after furnishing a Bank Guarantee of INR 22,34,000/- (Indian Rupees Twenty Two lakh Thirty Four Thousand only) i.e. 10% of the Contract value rounded off to the higher multiple of Rs 1000/-, within 15 days from the date of issue of Letter of Award of contract, with the KSEBL and LSGD (District Panchayath Kasargod) as First and Second party respectively, as per the terms and conditions set forth in the Bld document. After execution of the tripartite agreement the successful bidder shall be known as 'EPC Integrator. The tripartite agreement has to be executed by the contractor in the prescribed format in Form-B of Contract Tripartite agreement of this document, along with the performance security deposit at the Office of the Chief Engineer (Renewable Energy & Energy Savings), on a date and time to be mutually agreed. The contractor shall provide for signing of the contract, 2 additional copies of contract agreement, 2 copies of Bank Guarantee in lieu of Performance security deposit, appropriate power of Attorney and other requisite documents. All the documents cited in clause No. 30 of this document will form part of the agreement. Power of Attorney shall be in stamp paper attested by a registered Notary Public.

After handing over of the project to LSGD (District Panchayath Kasargod), you shall execute Separate O&M Bilateral Agreements with LSGD (District Panchayath Kasargod) as the first party.

9. Construction Programme:

Within 15 days from the date of award, the contractor shall submit to the KSEBL for approval, a programme showing the general method, arrangements, order and timing for all the activities involved in the work in a systematic manner based on planning technique and tool like PERT /CPM in MS [Projects] and GANTT chart indicating the critical events/paths and milestones.

The contractor shall carryout the works in accordance with this programme and as approved by KSEBL, and complete them in all respects to the full satisfaction of KSEBL.

Any change to the approved work plan due to unavoidable circumstances shall be made only with the prior approval of KSEBL.

10. Terms of Payment:

The payment condition is governed by clause 5.2 of tender document volume 1 in this respect.

a. The Contractor has to produce Bank Guarantee for an amount of 10% of the Contract amount as Performance Security Deposit at the time of executing Contract Agreement.

b. 30% of the contract value excluding O&M, will be released to the contractor as cost of major components of the plant (PV modules, Inverters and module mounting structures) after delivery of this materials at site, inspection and verification by authorized departmental officers, and production of insurance certificates for the materials delivered at site. (Refer clause 5.5.2 of tender document Volume-1). The Engineer-in-charge is to be informed about the delivery of material one week in advance by the contractor.

The Engineer in charge shall ensure the site acceptance/ rejection of the received material at site within three days of delivery of material along with submitting the SAT procedure of the delivered material from the vendor by the contractor.

The invoices shall be submitted by the contractor as per the accepted price schedule which is to be verified and made ready for release of payment within 15 days of receipt of the invoices subject to the satisfaction of the above conditions

c. 100% of the total Contract amount except Operation and Maintenance charges will be released after satisfactory completion, testing, commissioning of the solar plant after proving the Performance ratio (AC) as per clause 2.2.3 of Tender document Volume-1 in this respect. The contractor can submit the final invoice as per the accepted price schedule within 10 days on proving the Performance ratio (AC) (as per Clause 2.2.3 of tender document Volume-1) after completing the project within 06 months.

The invoices shall be verified and final payment may be released within 3 months of receipt of the invoices subject to the satisfaction of the above conditions

d. The Operation & Maintenance charges will be released at the end of each year by LSGD (District Panchayath Kasargod), after commissioning and demonstration of the specified Performance ratio (AC) as per clause 2.2.3 of tender document Volume-1 in this respect, at the end of each year during O&M period (5 years).

e. The performance security amount shall also be released in equal instalments each year (O&M period) from the date of handing over the project after demonstrating the specified Performance ratio (AC) (as per Clause 2.2.3 of Tender document Volume-1 in this respect).

f. The Quoted taxes and duties etc as Governed by GST will be released subject to an undertaking from the Contractor in Kerala Government Stamp paper that "If any dispute in payment of taxes and duties etc as Governed by GST from concerned tax authorities occurs in future, the Contractor shall Indemnify LSGD (District Panchayath Kasargod) from such liabilities and the Contractor shall be liable for the additions, loss or cost on account of such discrepancies/ dispute".

11. Advance Payment:

No amount shall be released as mobilisation advance.

12. Performance security deposit:

The performance security deposit is governed by clause 5.1.7 of Tender document volume 1

The Contractor shall submit Performance security deposit as Bank Guarantee at the time of execution of bipartite agreement in the prescribed format (Annexure 5) for performance security of the Contract and it shall be an amount equal to 10% of the total Contract amount rounded off to the higher multiple of Rs 1000/- i.e. INR 22,34,000/- (Indian Rupees Twenty Two lakh Thirty Four Thousand only) in order to cover the liabilities under the contract and to ensure sufficient guarantee to cover all possible liabilities pertaining to defects, shortfalls, remedial measures arising out of poor workmanship, materials, loss, excess amount, risk and cost of Contractor in case of alternate arrangements and any type of dues to the LSGD (District Panchayath Kasargod), an amount as prescribed by KSEBL shall be collected and retained from the Contractor towards Performance Security for the Contract.

The Bank Guarantee shall be initially valid from the date of agreement for a period of 2 years and be kept renewed from time to time till the end of defect liability period including O&M. The performance security B.G will be released in equal installments each year after demonstration of desired performance ratio (AC) (as per clause 2.2.3 of tender document vol-1 in this respect) during the defect liability period. The performance ratio (AC) (as per Clause 2.2.3 of tender document vol-1 in this respect) will be calculated based on data from Pyranometer/ Meteoronorm/ Pyrheliometer data. Failure of the successful bidder to submit the required Performance Guarantee shall constitute sufficient grounds for termination of Contract & forfeiting the EMD.

No interest will be paid by KSEBL at any stage of contract on the Performance Security.

The performance ratio (AC) (as per Clause 2.2.3 of tender document vol-1 in this respect) can be checked at any time in between if deemed necessary by the Engineer in charge (as per clause 2.2.3 of tender document Volume-1 in this respect) If any unusual degradation is noticed in the PR the contractor shall attend and rectify the same within 24 hours on intimation. If not the performance security deposit will be forfeited.

13. Payment Authority and Engineer-in-Charge:

Engineer in Charge – Engineer authorized by Chief Engineer (Renewable Energy & Energy Savings). The Engineer-in Charge may delegate powers to subordinate officers in respect of execution of work such as Site supervision of Electrical works and arrangements for interconnection facility, Technical support and civil supervision.

The work shall be treated completed only when the Engineer-in-charge issues certificate of completion where the actual date of completion of work will be mentioned. In case of termination or foreclosure the Engineer in charge will issue the certificate of completion to that effect. If the contractor fails to complete any part of the work as required for satisfactory completion before taking over and / or the date of completion specified, and fails to remove the surplus materials, the KSEBL will complete the works and remove the surplus materials etc and the amount incurred for the same will be realized from the contractor from any amount due to him from this work or any other work with KSEBL or his assets in appropriate proceedings. The contractor will not have any claim over the surplus materials so removed by the KSEBL

The contractor shall submit bills in Triplicate to the **Engineer in Charge** with all supporting documents as indicated in the relevant clauses of volume 1 of the bid document

14. Manufacturing Schedule:

Contractor shall specify all basic design details, including details of the PV modules and the support structures, inverters, cables, online monitoring, integration and power evacuation details with existing power system, with appropriate diagram and drawings. The drawings along with detailed structure design and material selected as per the relevant standards. All guaranteed technical particulars, details of each items, make, model number and specification conforming to relevant standards, entire drawings, detailed test reports, list of O & M spares for major materials, detailed Bill of materials and Priced Bill of Quantities in respect of materials/equipments and works for the entire Project shall be submitted within 15 days of receipt of this LoA.

All materials and equipments required for successful completion and commissioning of the project must be included. The design details and other accessories should adhere to and match with the technical specification provided in the volume III of the tender document and as per the Guaranteed Technical Particulars offered by you.

The Contractor shall submit all the appropriate diagram and drawings to the agreement authority for approval. Also specifications of major items such as PV modules, inverters etc shall be submitted to the Agreement authority for approval. Approvals for Layout of Power Plant Installation shall be provided by the Engineer- in- Charge prior to the submission of all the drawings.

Energy meter provided for the installation of the solar PV plant shall be in accordance with the regulations and technical specifications of KSEBL.

For the goods supplied from outside the purchaser's country, the supplier shall be entirely responsible for all taxes, duties, stamp duties, license fees, and other such levies imposed outside the purchaser's country.

The contractor shall provide all MAFs (Manufacturer's Authorization Forms) for all the components specified in the bid within 15 days and before executing the Contract Agreement

15. Drawings and documents

The design documents to be submitted by the contractor will include but not limited to:

- I. DC cable size calculation
- II. DC cable specification
- III. DC cable schedule, voltage drop and power loss calculation
- IV. String monitoring unit specification
- V. DC earthing & pit calculation
- VI. Lightning protection details/specification
- VII. All technical specification of AC components
- VIII. Cable schedules

Contractor shall furnish the following drawings under this contract and has to obtain approvals.

- a. Shadow analysis of the roof
- b. General arrangement and dimensional layout
- c. Schematic drawing showing the SPV panels, Power conditioning Unit(s)/ inverter, Junction Boxes, AC and DC Distribution Boards, meters etc.
- d. Layout of solar PV Array and Single line diagram.
- e. Mounting structure drawing

- f. Structural drawing along with foundation details for the structure.
- g. Location specific Itemized bill of material for complete SPV plant covering all the components and associated accessories.
- h. Sizes and specification of cables between array interconnections, array to junction boxes, junction boxes to inverter etc. shall be furnished
- i. PV Syst simulation report of the combination offered PV modules with the offered inverters shall be furnished to the agreement authority for approval.

The drawings along with detailed structure design and material selected and their standards shall be submitted to agreement authority for approval before starting the execution work. The work will be carried out as per the approved design.

The contractor shall provide necessary drawings and documents required by statutory authorities and obtain the approval before taking up erection.

16 Quality Assurance:

Strict compliance with the approved and proven & established quality assurance systems and procedures during the different stages of the project starting from sizing, selection of make, storage (at site), during erection, testing and commissioning have to be ensured by the contractor.

PV modules should have valid qualification test (as per STC) certificate as per IEC 61215 and IEC 61730 -1&2 and IEC 61701. The power conditioning units / inverters should comply with applicable IEC/ equivalent BIS standard for efficiency measurements and environmental tests, safety standards and characteristics of the utility interface (Parallel operation) as per standard codes IEC 61683 and IEC 60068 2(1,2,14,30) and IEC 62109-1&2 and IEC 61727 respectively. Inverter shall be provided with protection against islanding of Grid as per IEEE 1547/UL1741/62116 to isolate it from the grid in case of no supply, under voltage and over voltage conditions so that in no case there is any chance of accident. The module mounting structure shall be as per latest BIS 2062 and galvanization of mounting structure shall be in compliance of BIS 4759 (amended up to date)/IS2629.

The type test certificates shall be verified by KSEBL while conducting factory inspection tests. The contractor shall furnish detailed quality procedures for the major components for approval prior to the Factory inspection call. The agreement authority will provide the approvals regarding the test to be conducted during the inspection.

The following minimum tests shall be conducted on the required number of samples as is required by the engineer-in-charge, during the Factory inspection:

For PV modules:

1. Visual inspection
2. Dimensional Check
3. Insulation Resistance
4. Leakage Current
5. Electrical Test(with sun simulator)
6. RFID verification
7. Electro luminous tests
8. Robustness of termination

For inverters:

1. Visual inspection
2. Dimensional and Power Wiring Check.
3. Auxiliary functional check.
4. Fan direction of rotation, On-Off control, etc
5. Functionality test of relays
6. Command checks.
7. Protection function checks.
8. AC under voltage, AC over voltage, AC under frequency, AC over frequency
9. Load tests simulation 25%, 50%, 70% and 100%
10. Load test performed at variable MPPT voltage @100% load on the specified voltage range.
11. Over temperature, ground fault simulation

For Isolation transformer:

1. Visual inspection
2. Routine test as per IS-7026/ IEC 60601-1/IEC 61558-1

For Module mounting structures:

1. Visual inspection
2. Dimensional Inspection
3. Functional fitments

The contractor shall submit letters of inspection calls sufficiently in advance specifying the date and venue of inspection to the agreement authority through Engineer-in-Charge. All the major components should undergo factory inspection tests.

The agreement authority shall arrange inspection of material/ equipment and upon satisfactory completion of the inspection and tests, the Material Despatch Clearance Certificate will be issued.

The test and Inspection shall be done in accordance with the relevant standards and the Manufacturer's standard before the delivery to site as well as after the erection and commission at site.

All acceptance and routine tests of equipment as per the specification and relevant standards shall be carried out by the contractor. Agreement authority or authorized officials may undertake the quality checks during the manufacturing stages also. Functional testing and erection of equipments shall be carried out by the contractor in presence of KSEBL officers delegated by the Engineer-in-Charge and the approvals will be given only if the same is satisfactory.

Engineer in Charge shall conduct visual inspection including dimensional checks, verification of serial numbers, RFID reading of PV modules etc for the Site Acceptance of the delivered materials based on the BOM. Any materials or work found to be defective or which

does not meet the requirements of the specification will be rejected and shall be replaced at contractor's cost.

17. Review and Progress report:

The contractor shall submit monthly progress report to Engineer-in-Charge and all concerned personnel in connection with this order, with a copy to this office.

The Engineer-In-Charge will co-ordinate and monitor all activities of the project. These progress report formats may be changed as and when required by KSEBL.

The contractor shall produce an updated Activity Schedule within 14 days of being instructed by the KSEBL.

18. Technical parameters for getting grid connectivity:

- a. Harmonic current injections from a plant shall not exceed the limits specified in IEEE 519 as per CEA technical standard for connectivity of the distributed generation resources

Individual voltage harmonics distortion	< 3 %
Total voltage Distortion THD	< 5%
Total Current harmonic Distortion	< 8%
Output frequency	= 50Hz +/- 0.5Hz
- b. Photovoltaic system should not inject DC power more than 0.5% of full rated output at the interconnection point or 1% of rated inverter output current into distribution system under any operating conditions
- c. Operation of Photovoltaic system shouldn't cause voltage flicker in excess of the limits stated in IEC 61000 or other equivalent Indian standards, if any
- d. While the output of the inverter is greater than 50%, a lagging power factor of greater than 0.9 shall be maintained.
- e. The Photovoltaic system in the event of voltage or frequency variations must island/disconnect itself within IEC standard on stipulated period.
- f. The voltage-operating window should minimize nuisance tripping and should be under operating range of 80% to 110% of the nominal connected voltage beyond a clearing time of 2 seconds, the Photovoltaic system must isolate itself from the grid.
- g. When the Distribution system frequency deviates outside the specified conditions (50.5 Hz on upper side and 47.5 Hz on lower side up to 0.2 sec), the Photovoltaic system shouldn't energize the grid

19. Testing and Commissioning:

Commissioning test with all required testing shall be conducted by the contractor in presence of KSEBL officers delegated by the Engineer-in-Charge/authorized person of LSGD (District Panchayath Kasargod).

The contractor shall also prepare and handover the as-built drawing, Operational manuals and Maintenance manuals of the plant and handed over to KSEBL

On completion of all works stipulated in the scope of work and after testing and commissioning of the Project, and if there are no obligations to arise out of the Contract, KSEBL shall issue a completion certificate as described under Clause 5.3.3 of Tender document Volume 1.

20. Operation and Maintenance (O&M):

Operation and Maintenance is governed by clause 6.9 of tender document volume-1. Operation and maintenance of the solar plant up to the point of supply for a period of 5 years of Defects Liability period is the responsibility of the Contractor.

Operation and Maintenance during this period shall include supply of spares of panels, Inverters and all equipments in the solar plant including transportation of these items from the original manufacturer, consumables, general comprehensive insurance covering fire, earthquake.

The solar plant should be maintained shadow free. The tree branches if any causing hindrance to the shadow free operation of solar plant shall be cut and removed under the supervision of LSGD (District Panchayath Kasargod). Copies of the Insurance Policies are to be given to LSGD (District Panchayath Kasargod) as and when taken.

The contractor shall ensure efficient operation of the SPV plant and the associated facilities to achieve the maximum power generation from the plant. For this purpose the contractor shall engage the services of adequate number of Engineers and Technicians trained under "Suryamitra" Skill Development Programme of MNRE. The contractor shall also attend to all failures, rectifications, breakdowns, 5 year comprehensive Operation and Maintenance checks.

Adequate training should be given to personnel identified by the LSGD (District Panchayath Kasargod) for Daily Monitoring Information like solar energy generated, net meter readings etc. Monthly System (MIS) reports with generation and down time analysis data has to be sent to LSGD (District Panchayath Kasargod) Corporate offices by E-mail during the defect liability period. Any discrepancy/malfunctioning noted shall be immediately attended to and got rectified by the contractor.

The contractor should not misuse the land and assign responsibility for the safety of machinery within the premises.

21. Annual Maintenance Contract (AMC):

The plant shall then be handed over to the LSGD (District Panchayath Kasargod) at the end of 5 years for O&M. After five years from the date of commissioning, the EPC contractor may be asked to execute the AMC for another 5 years on mutual agreement at mutually agreed price.

The EPC contractor shall execute the AMC agreement as per conditions stipulated at that time.

22. Performance & Warranty:

The mechanical structures, electrical works and overall workmanship of the solar power plant must be warranted for a minimum of 10 years. PV modules used in solar power plant must be warranted for output wattage, which should not be less than 90% at the end of 10 years and 80% at the end of 25 years.

EPC contractor shall ensure the performance ratio of each location as detailed in the Clause 2.2.3 of Tender document Volume-1 in this respect.

23. Generation Assessment

The performance ratio (AC) of each location shall range from 75- 80% as per clause 2.2.3 of Tender document Volume-1 in this respect. Performance ratio test as per IEC 61724 will be carried out at site jointly by the EPC contractor in presence of authorized officials from KSEBL and LSGD (District Panchayath Kasargod). This is mandatory for commissioning and handing over the plant. If the contractor fails to prove the desired performance ratio at the time of completion and during any of the consecutive five years of defect liability period he will be

given a second chance to demonstrate the PR in another 7 days. Still If It is not achieved, the same shall be demonstrated in another 7 days and still if it is not achieved, EPC contractor shall enhance the module capacity of solar plant/ improve the quality of the plant by replacement of module/ other components with all suitable modification requirements on balance of systems at his own cost to achieve the performance ratio.

Operation and maintenance charges shall be released at the end of each year based on the Performance ratio (AC) as mentioned above, as per the table given below.

Sl.No	Particulars	Performance ratio(AC) in %
1	At the time of completion and commissioning	75-80
2	At the end of 1 st year	74-79
3	At the end of 2 nd year	73-78
4	At the end of 3 rd year	72-77
5	At the end of 4 th year	71-76
6	At the end of 5 th year	70-75

24. Handing over:

After the date of successful commissioning the Contractor shall hand over the complete system to the LSGD (District Panchayath Kasargod) as specified in the tender within 15 days. Any component found defective/inefficient/worn out shall be rectified/ replaced/ made good at contractor's cost before handing over the system to the LSGD (District Panchayath Kasargod) authorities. In order to ensure longevity & safety of the core equipment and optimum performance of the system the Contractor should use only genuine spares of high quality standards. Contractor has to maintain the rooftop SPV plant till the end of the contract period of five years from the date of handing over.

The contractor shall provide the name list of essential tools and spares required for the future operation and maintenance of the plant.

25. Termination of Contract:

Termination of Contract will be guided strictly in accordance with clause 5.3.11 of the tender document volume 1.

26. Force Majeure:

Force Majeure shall be governed by Clause 5.3.8 of the tender document volume 1.

27. Defects Liability Period:

The Defect Liability Period shall be governed by Clause.5.3.4 of the tender document volume 1.

28. Law and Jurisdiction:

This contract has to be performed complying with the laws of India and Kerala and any dispute arising out of this contract will be subject to the exclusive jurisdiction of Civil Courts at Thiruvananthapuram.

29. Contract Documents.

1. Agreement executed in Kerala Government Stamp Paper
2. Letter of Award (duly signed and seal affixed on all pages)
3. Correspondences between the KSEBL and the selected bidder included in the Agreement.
4. Special Conditions of Contract
5. General Conditions of Contract.
6. Technical specifications.
7. Accepted Schedule of Technical Particulars and construction programme & Manufacturer Authorization form of Components.
8. Accepted Schedule of Prices
9. General Bid conditions
10. Instructions to bidders.
11. Information to bidders.
12. Detailed Structural Drawings including approved drawing issued from time to time.
13. All volumes of bid with Tender No.KSEBL/REES/LSGD District Panchayath Kasargod II/01/2018- 19 having Tender ID . 2018_KSEB_202397_1 along with clarifications and related documents issued by the Tendering Authority.
14. Response (proposal) of M/s. INKET Limited, Ajiyal Complex, Post office Road, Kakkanad, Cochin 682030 including the Bid, Clarification documents and the accepted rate submitted.

30 Acknowledgment by the Contractor:

This Letter of Award is issued subject to the documents referred above and terms and conditions contained therein. You will also be deemed to be fully aware of KSEBL's **General conditions of contract** which is applicable to this contract also and ignorance of these conditions will not exempt you from your liability to abide by the same.

If there is any contradiction/conflict between the tender documents and LoA, conditions in the LoA will prevail.

The documents specified in Cl 10 and 15 shall be submitted within 15 days from the date of issue of this LoA


Chief Engineer

(Renewable Energy & Energy Savings)

Acc:-

1. Annexure 1: Price schedule
2. Annexure 2: Contract Forms
 - A. Performance Security deposit BG
 - B. Form of contract agreement
3. Annexure 3: Copy of LoA

Copy to:-

1. The Secretary K.S.E.B Ltd, Thiruvananthapuram

Annexure 1.1
Total Price Schedule
Appointment of EPC contractor for the design as per site conditions, erection, testing & commissioning of Grid Tied Rooftop Solar PV Power plants, on the Roof of buildings owned by LSGD/District Panchayath Kasargod II) with a total installed capacity of 335 kWp in 5 locations including Operation & Maintenance of the plant for the first 5 years from the date of handing over

S.L. No	Item Description	Quantity	Unit	Basic rate	Freight charges	Insur ance	KGST	CGST	IGST	Any other applicable tax	Total amount without tax	Total amount with tax
1	Total Price for the 335 kWp roof top solar power plant in 5 locations on turnkey basis on the buildings of District Panchayath Kasargod, for the Design as per site condition, Supply of all materials, Construction, Erection, testing and commissioning work of the Solar plant, and also includes Purchase, Testing and installation of meters(Net meter & Solar meter), providing online data from all locations, Application and Registration fee and all related works for connectivity, Statutory Inspection & Testing, Additional work/Cabling, Power Evaluation including cost of transformers and HT metering and works related with Single Phase to Three phase Conversion required in necessary locations .	01	Sct	21099999.00	0	0	527499.97	527499.97	0	0	21099999.00	22154998.94
2	Total price for Operation and Maintenance (O & M) charges of the Solar Photovoltaic Power Plant for a period of 5 year including											

arrangement of cost of replacement of all the defective parts, consumables, tools, tackles, testing equipments & instruments; manpower, all administrative work, maintenance of records and submissions to all concerned authorities for the 335 kWp Grid tied rooftop Solar PV plant in 5 locations of buildings owned by LSIGD including all taxes as per GST, covered under Guarantee period for a period of 5 years from the date of handing over..											
O&M charge for 1 st year	01	Set	30000.00	0	0	0	2700.00	2700.00	0	30000.00	35400.00
O&M charge for 2 nd year	01	Set	30000.00	0	0	0	2700.00	2700.00	0	30000.00	35400.00
O&M charge for 3 rd year	01	Set	30000.00	0	0	0	2700.00	2700.00	0	30000.00	35400.00
O&M charge for 4 th year	01	Set	30000.00	0	0	0	2700.00	2700.00	0	30000.00	35400.00
O&M charge for 5 th year	01	Set	30000.00	0	0	0	2700.00	2700.00	0	30000.00	35400.00
Total O&M for 5 years			150000.00				13500.00	13500.00		150000.00	177000.00
Total of item 1&2										21249999.00	22331998.00
Rounded to											22331999.00

(Rupees Two Crore Twenty Three Lakh Thirty One Thousand Nine Hundred and Ninety Nine only)

Chief Engineer
(Renewable Energy & Energy Savings)



KERALA STATE ELECTRICITY BOARD LIMITED

(Incorporated under the Companies Act, 1956)

Office of the Chief Engineer (Renewable Energy & Energy Savings)
9th Floor, Vidyuthi Bhavanam, Pattom, Thiruvananthapuram – 695 004, Kerala
Phone: +91 471 2447404, Fax: 0471 2558340, E-mail: cerees@kseb.in
website : www.kseb.in. CIN : U40100KL2011SGC027424

No. CE(REES)/LSGD Kasaragod II phase/2018-19/1570

Dt. 9-12-2019

Certificate of Completion

Sub:- Appointment of Engineering, Procurement and Construction (EPC) Contractor for the design as per site conditions, supply, installation, testing and commissioning of Grid Tied Rooftop Solar PV Power plants on buildings owned by LSGD(District Panchayath Kasaragod II phase) with a total installed capacity of 335 kWp in 5 locations, including Operation & Maintenance of the plant for the first 5 years from the date of handing over - Reg

Ref:- 1 E tender No.KSEBL/REES/LSGD District Panchayath Kasaragod II/01/ 2018-19 / having Tender ID : 2018_KSEB_202397_1 and its addendums.
2. Letter of Award No.03/2018-19 dated 02-08-2018
3. Agreement No.05/2018-19 dated 30-08-2018

This is to certify that M/s. INKEL Ltd, Ajiyal Complex, Post office Road, Kakkanad, Cochin, has satisfactorily completed the work of erection, testing & commissioning of Grid Tied Rooftop Solar PV Power plants on buildings owned by LSGD (District Panchayath Kasaragod II phase) with a total installed capacity of 335 kWp in 5 locations on 11-10-2019 as per close 5 of the LOA.


Chief Engineer

(Renewable Energy & Energy Savings)

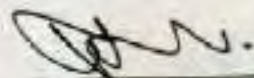
Copy to:

1. Secretary, District Panchayath Kasaragod
2. Sri.Narayana Bhat , Asst.Exe.Engineer, PMU, Kasaragod
3. File

സോളാർ പ്ലാന്റ് കണക്കു രിപ്പോർട്ട്

സെക്ഷൻ : പടന്നാട്
 കൺസ്യൂമർ നമ്പർ : 1168049008563 .(13 അക്കം)
 പേര് : ടീക് മെഡിക്കൽ ഓഫീസ്,
 സ്റ്റാൻ നമ്പർ : 680400002.
 സോളാർ കപ്പാസിറ്റി : 15kw കിലോവാട്ട്
 കണക്ക് ചെയ്ത ദിവസം : 16-08-2019
 സോളാർ മീറ്റർ ഇൻഷുറൻസ് റീഡിംഗ് : 1.66
 നെറ്റ് മീറ്റർ ഇൻഷുറൻസ് റീഡിംഗ് : Import - 2.93, Export - 1.9
 net - 1.03

തീയതി : അസിസ്റ്റന്റ് എഞ്ചിനീയർ പേര് O.V. Rameez

ഒപ്പ് 
 Assistant Engineer
 Electrical Section - KSEB Ltd.
 Padannakkad
 P.O. Padannakkad - 671314

പകർപ്പ് :

ഡെപ്യൂട്ടി ചീഫ് എഞ്ചിനീയർ ഇലക്ട്രിക്കൽ സർക്യൂൾ, തിരുവനന്തപുരം
 എക്സിക്യൂട്ടീവ് എഞ്ചിനീയർ ഇലക്ട്രിക്കൽ ഡിവിഷൻ, തിരുവനന്തപുരം

സോളാർ പ്ലാന്റ് കണക്കു രിപ്പോർട്ട്

സെക്ഷൻ : KUMBALA
കൺസ്യൂമർ നമ്പർ : 1166879018089 (13 അക്കം)
പേര് : THE HEADMASTER GOVT SCHOOL KUMBALA
സ്പിൽ നമ്പർ : 668790001
സോളാർ കപ്പാസിറ്റി : 15 kWp കിലോവാട്ട്
കണക്ക് ചെയ്ത ദിവസം : 21/08/2019.
സോളാർ മീറ്റർ ഇൻഷുൽ റീഡിംഗ് : 1.71 kwh.
നെറ്റ് മീറ്റർ ഇൻഷുൽ റീഡിംഗ് : 3.17-Import, 1.70-Export, 1.47 Net

തീയതി : അസിസ്റ്റന്റ് എഞ്ചിനീയർ പേര് Sudheep S.

ഒപ്പ് 
ASSISTANT ENGINEER
ELECTRICAL SECTION KUMBALA
KSEBLtd.

പകർപ്പ് :
ഡെപ്യൂട്ടി ചീഫ് എഞ്ചിനീയർ, ഇ.പ. സർക്കിൾ, കോന്നൂർ.
എക്സിക്യൂട്ടീവ് എഞ്ചിനീയർ, ഇ.പ. ഡിവിഷൻ, കോന്നൂർ.

സോളാർ പ്ലാന്റ് കണക്കു രിപ്പോർട്ട്

സെക്ഷൻ : udma
കൺസ്യൂമർ നമ്പർ : 1166925026861 (13 അക്കം)
പേര് : THE HEADMASTERS, GHSS, CHANDRA GIRI
സ്റ്റീൻ നമ്പർ : 669200003
സോളാർ കപ്പാസിറ്റി : 20 kwp കിലോവാട്ട്
കണക്ക് ചെയ്ത ദിവസം : 22-08-2019
സോളാർ മീറ്റർ ഇൻഷുൽ റീഡിംഗ് : 1.62 kwh
നെറ്റ് മീറ്റർ ഇൻഷുൽ റീഡിംഗ് : Import - 2.68 kwh Export - 1.54 kwh
Net → 1.14 k

തീയതി: 15/10/19 അസിസ്റ്റന്റ് എഞ്ചിനീയർ പേര് SUTHI-M

ഒപ്പ് [Signature]
15/10/19
Assistant Engineer
ELECTRICAL SECTION
UDMA - 671319

പകർപ്പ്:
ഡെപ്യൂട്ടി ചീഫ് എഞ്ചിനീയർ കുമാരകുമാർ
എക്സിക്യൂട്ടീവ് എഞ്ചിനീയർ കുമാരകുമാർ

സോളാർ പ്ലാന്റ് കണക്കു രിപ്പോർട്ട്

സെക്ഷൻ : Nellikunnu
 കൺസ്യൂമർ നമ്പർ : 1166868013619 (13 അക്കം)
 പേര് : Head Master C.H.S. Megal Pathoor
 സ്റ്റീൻ നമ്പർ : 668600004
 സോളാർ കമ്പാസിറ്റി : 20 kW കിലോവാട്ട്
 കണക്ക് ചെയ്ത ദിവസം : 27/8/2019
 സോളാർ മീറ്റർ ഇനിഷ്യൽ റീഡിംഗ് : 1.69 kWh
 നെറ്റ് മീറ്റർ ഇനിഷ്യൽ റീഡിംഗ് : Import-2.8, Export 1.88, Net 1.26

തീയതി : അസിസ്റ്റന്റ് എഞ്ചിനീയർ പേര് Raveendran M

ഒപ്പ് 
 ASSISTANT ENGINEER
 KSEB LTD.
 ELECTRICAL SECTION
 NELLIKUNNU

പകർപ്പ് :

ഡെപ്യൂട്ടി ചീഫ് എഞ്ചിനീയർ
 എക്സിക്യൂട്ടീവ് എഞ്ചിനീയർ

സോളാർ പ്ലാന്റ് കണക്കുകൾ റിപ്പോർട്ട്

സെക്ഷൻ : Nellikunnu
 കൺസ്യൂമർ നമ്പർ : 116686 601387 (13 അക്കം)
 പേര് : Head Master G.H. Hargob
 സ്കീൻ നമ്പർ : 668600003
 സോളാർ കപ്പാസിറ്റി : 50 KWp കിലോവാട്ട്
 കണക്ക് ചെയ്ത ദിവസം : 23/9/19
 സോളാർ മീറ്റർ ഇൻഷുൽ റീഡിംഗ് : 0.20 KW
 നെറ്റ് മീറ്റർ ഇൻഷുൽ റീഡിംഗ് : Import 1.51, Export 0.18, Net 0.95 KWp

തീയതി : അസിസ്റ്റന്റ് എഞ്ചിനീയർ പേര് Raveendran A

ഒപ്പ്


 ASSISTANT ENGINEER
 KSEB LTD.
 ELECTRICAL SECTION
 NELLIKUNNU

പകർപ്പ് :

ഡെപ്യൂട്ടി ചീഫ് എഞ്ചിനീയർ

എക്സിക്യൂട്ടീവ് എഞ്ചിനീയർ

സോളാർ പ്ലാന്റ് കണക്കു രിപ്പോർട്ട്

സെക്ഷൻ : മറു കാൽ
 കൺസ്യൂമർ നമ്പർ : 1366940003035 (13 അക്കം)
 പേര് : മുഹമ്മദ്, ജിജാ ആമുലനി, കുന്നത്തുപാട്
 സ്റ്റീൻ നമ്പർ : 670100006
 സോളാർ കപ്പാസിറ്റി : 185 കിലോവാട്ട്
 കണക്ക് ചെയ്ത ദിവസം : 11/10/2019
 സോളാർ മീറ്റർ ഇനിഷ്യൽ റീഡിംഗ് : 7.5 Kwh
 നെറ്റ് മീറ്റർ ഇനിഷ്യൽ റീഡിംഗ് : Imp - 391 Kwh, Exp - 89 Kwh

തീയതി : അസിസ്റ്റന്റ് എഞ്ചിനീയർ പേര് A. Jayamol

ഒപ്പ്



Civil Engineer
 Electrical Section /
 Mavungal

പകർപ്പ് :

ഡെപ്യൂട്ടി ചീഫ് എഞ്ചിനീയർ

എക്സിക്യൂട്ടീവ് എഞ്ചിനീയർ

Sl No	Item Description	Quantity	Unit	Basic rate (Rs.)	Freight charges (Rs.)	Insurance (Rs.)	GST (Rs.)	Any other applicable tax (Rs.)	Total amount without tax (Rs.)	Total amount with tax (Rs.)
2	Total price for Operation and Maintenance 10 & 11) charges of the Solar Photovoltaic Power plant for a period of 5 year including arrangement of cost of replacement of all the defective parts, consumables, tools, tackles, testing equipments & instruments, manpower, all administrative work, maintenance of records and submissions to all concerned authorities for the 24 kWp roof top solar power plants in 2 locations (Government LP School Erakkikkal & Government VHS for Girls, Nadakkavil) of Government buildings under Deputy Director Education, Kozhikode owned by Municipal Corporation, Kozhikode including all taxes as per GST, covered under Guarantee period for a period of 5 years from the date of Handing over.									
a	O&M charge for 1 st year	01	Set	7500			1350		7500	8850
b	O&M charge for 2 nd year	01	Set	7500			1350		7500	8850
c	O&M charge for 3 rd year	01	Set	10000			1800		10000	11800
d	O&M charge for 4 th year	01	Set	10000			1800		10000	11800
e	O&M charge for 5 th year	01	Set	10000			1800		10000	11800
	Total O&M for 5 years (2.a+2.b+2.c+2.d+2.e)			45000			8100		45000	53100
	Total of Item 1 & 2			1745000			93100		1745000	1838100
Total amount with tax of Item 1		= Rs. 17,45,000/-								
Total amount with tax of Item 2		= Rs. 93,100/-								
Total amount of Item 1 & Item 2		= Rs. 18,38,100/-								
(Rupees Eighteen Lakh Thirty Eight Thousand and One Hundred only)										

Chief Engineer
(Renewable Energy & Energy Savings)



KERALA STATE ELECTRICITY BOARD LIMITED

(Incorporated under the Companies Act, 1956)

Office of the Chief Engineer (Renewable Energy & Energy Savings)

9th Floor, Vidyuthi Bhavanam, Pattom, Thiruvananthapuram – 695 004, Kerala

Phone: +91 471 2447404, Fax: 0471 2558340, E-mail: ceeres@kseb.in

website : www.kseb.in, CIN :U40100KL2011SGC027424

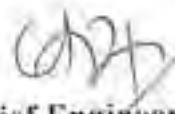
COMPLETION CERTIFICATE

This is to certify that M/s Inkel Ltd, Door no:7/473, ZA-5&6, 2nd floor, Ajjiyal Complex, Kakkanad, Cochin-682030, has successfully completed the work of Erection, Testing & Commissioning of Grid-Tied Roof Top Solar Power plants having total capacity of 24 KWp, in 2 locations owned by Municipal Corporation, Kozhikode, on 20-09-2019 & 335KWp SPV Power plants, in 5 locations, owned by LSGD, District Panchayath, Kasargod on 9-12-2019. The SPV Projects are working satisfactorily till date.

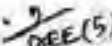
This certificate is issued as per their request for participating in SECI Tender.

Place : Thiruvananthapuram

Date : 05-05-2020


Chief Engineer

(Renewable Energy & Energy Savings)


DRE (5)



GOVERNMENT VOCATIONAL
HIGHER SECONDARY
SCHOOL FOR GIRLS MADHAVU
MADHAVU - 716211

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Page Number 25

Work Completion and satisfactory performance certificate

This is to certify that, M/s INREZ, Limited, registered office at 7th/73 2A-556, Ajjal Complex, Post Office Road, Kuttanad, Cochin 682030 has completed the supply, installation, testing and commissioning of 22 KVA Grid connected power plant in our school premises as per the work order no. 11/2018-19. The work has been completed and connected to Grid on 31.05.2019.

The system is working satisfactorily.


PRINCIPAL
GOVERNMENT VOCATIONAL
HIGHER SECONDARY SCHOOL
FOR GIRLS
MADHAVU

Date: 15.03.2019
Place: Madhavu



663



മലയാളം ഭാഷയിൽ എഴുതിയ
 പത്രക്കുറിപ്പ്
 മലയാളം ഭാഷയിൽ എഴുതിയ - 611.000
 താൽക്കാലികമായി മാറ്റി



മലയാളം ഭാഷയിൽ എഴുതിയ
 പത്രക്കുറിപ്പ്
 മലയാളം ഭാഷയിൽ എഴുതിയ - 611.000
 താൽക്കാലികമായി മാറ്റി

Work Completion and satisfactory performance certificate

This is to certify that, M/s. INKET Limited, registered office at T4471 ZA-586, Ajay Complex, Post Office Road, Kakkad, Cochin 682091 has completed the supply, installation, testing and commissioning of 2 MWp Grid connected power plant in our school premises as per the work order no. 1102018-19. The work has been completed and connected to Grid on 20.09.2019.

The system is working satisfactorily.


 CHANDRASEKHAR V.
 HEADMASTER
 GOVT. JUNIOR COL.
 PERUMALUR

Date: 11.10.2019
 Place: Ernakulam





KERALA STATE ELECTRICITY BOARD LIMITED

(Incorporated under the Companies Act, 1956)

Office of the Chief Engineer (Renewable Energy & Energy Savings)
9th Floor, Vidyuthi Bhavanam, Pattom, Thiruvananthapuram - 695 004, Kerala
Phone: +91 471 2447404, Fax: 0471 2558340, E-mail: cerees@kseb.in
website : www.kseb.in CIN : U40100KL2011SGC027424

By Registered post with A/D

LETTER OF AWARD

To

M/s Inkel Limited
2nd floor, 7/473 2A-5 & 6, Ajiyal Complex
Kakkanad - 682030

W.O No.	12/ 2018 -19/
Date	07.03.2019
Order type	Installation and commissioning of Grid Tied Ground Mounted Solar PV Power plant at Kottiyam under IPDS scheme for Kerala launched by Ministry of Power, Government of India, in the land owned by KSEBL with an installed capacity of 0.60 MWp including Operation & Maintenance of the plant for the first 5 years from the date of commissioning
Reference file	CE(REES)/Projects/AE-2/SPV-Kottiyam/2018-19/ 2188
e -Tender No	KSEBL/REES/Kottiyam/07/2018-19 dated 22.09.2018 with tender ID 2018_KSEB_235016_1
Value	INR32620000/- (Rupees Three Crore Twenty Six lakh Twenty Thousand only)
Price	Fixed

Sir,

Sub Installation, testing and commissioning of Grid Tied Ground Mounted Solar PV Power plant at Kottiyam under IPDS scheme in the land owned by KSEBL with an installed capacity of 0.60 MWp - **Award of contract** - reg.

- Ref 1 B.O.(FTD)No2598/2016(CE(CAPs & Safety)/P2/IPDS/General/2016-17) TVM dated 06.09.2016
- 2 B.O (FTD) No.2036/2017/KSEBL/ CE(REES)/ Engineer-in-charge /solar/2017-18 / Tvpdm dtd 07.8.2017
- 3 B.O. (FTD) No.CE1500/2018 CE(REES)/Projects/AE-2/SPV-KTYM/2018-19/402 Thiruvananthapuram Dated 16.06.2018
- 4 This office E-tender No. KSEBL/REES/Kottiyam/07/2018-19 dated 22.09.2018 having Tender ID: 2018_KSEB_235016_1
- 5 Letter No.CAPs/P2/IPDS/General/2018-19/592 dtd 12.12.2018 of the Chief Engineer (IT,CR & CAPS)

6 **Remarks of FA No. Tender/1/58/2018 dtd 18.12.2018**

- 7 Price bid submitted by M/s Inkel Limited opened on 15.02.2019
- 8 Letter No.Inkel/solar/CEREES-Kottiyam/7/001/2018-19 dated 18.02.2019
- 9 Remarks of FA on the price bid as per Note No. FA/Tender 1/28/2019 dt 28.02.2019

Kerala State Electricity Board Limited is pleased to accept your financial and technical offer and place this Letter of Award (LoA) to your offer for Appointment of EPC contractor for the design as per site conditions, supply, installation, testing & commissioning of Grid Tied Ground Mounted Solar PV Power plant at Kottiyam in the land owned by KSEBL with an installed capacity of 0.60MWp Including Operation & Maintenance of the plant for the first 5 years from the date of commissioning under IPDS for Kerala launched by Ministry of Power, Government of India.

The contract shall be strictly in accordance with provisions contained in the bid documents cited under reference (4) above and its addendums. This LoA, tender documents and its addendums will form part of the contract agreement.

Additional conditions/modifications if any stated in your offer or elsewhere, which are not agreed to by KSEBL or not in accordance with any of the provisions covered by the bid documents referred shall stand withdrawn/nullified.

1. Scope of work:

The subject work shall be considered as a composite supply. The scope of work will be governed by clause 2.2.3 of tender document Volume-1 issued in this respect.

The work includes planning, investigation, survey, design, engineering, manufacture/procurement, manufacturer's quality assurance, shop testing (including type testing where specified/required), transportation, handling & storage, erection including all civil/structural works, electrical and general works, piping, cabling, instrumentation, installation, testing and commissioning, training, services, permits and insurance at all stages on composite supply basis to install the Grid-tied Ground Mounted solar photovoltaic plant at Kottiyam in the land owned by KSEBL with an installed capacity of 0.60 MWp and handing over the SPV Plant to KSEBL to its full satisfaction after proving the performance ratio (AC) within a period of 7 consecutive days after commissioning and at the end of each year upto 5 years after commissioning. Performance ratio (AC) shall be proved within a period of 7 consecutive days at the end of each year for release of O&M charges. The performance ratio (AC) of the solar plant shall range from 75- 80% for first 5 years from the date of commissioning. Operation and maintenance charges shall be released at the end of each year.

The contractor shall be responsible for obtaining consents, clearances, including Electrical Inspectorate sanction, permit and approval from appropriate authorities and KSEBL for grid connection.

The generated output power from the solar panels at low voltage shall be stepped upto 11kV and shall be grid tied to the grid infrastructure nearest to the location as directed by Engineer in Charge of the Project.

Any material or works which have not been specifically mentioned in the specifications/schedule but which are found necessary and essential for the proper fulfilment of the contract during execution will also form part of the work. This shall also deem to be covered by the rates and prices quoted for the work and no additional payment will be made to the contractor for such unspecified but essential work elements.

As the project is under IPDS, the installations shall be satisfactory with the appropriate authorities/Project monitoring agency of IPDS in line with the tender conditions. Sign boards in accordance with the specification for the IPDS projects have to be provided in the project location indicating the name of the project, name of implementation agency and capacity. The sign board should be put up immediately when the plant is commissioned.

All statutory approvals/permissions related to installation of the solar power plant and carrying out its operation & maintenance (O&M) as may be required under applicable law/ rules shall be obtained by the contractor. All fees for such statutory approvals for installation, commissioning and operation and maintenance for first five years from the date of commissioning shall be borne by the Contractor.

2. Name of the Project:

Design, Installation, testing and commissioning of Grid Tied Ground Mounted Solar PV Power plant at Kottiyam under IPDS scheme in the land owned by KSEBL with an installed capacity of 0.60 MWp using IPDS fund and operation and maintenance of the plant for the first 5 years from the date of commissioning of the plant herein after called "the project".

3. Name of the Utility:

Kerala State Electricity Board Ltd, having its Registered Office at Vidyuthi Bhavanam, Pattom, Thiruvananthapuram-695004, Kerala, India. Website: www.kseb.in herein after called "KSEBL"

4. Name of the Contractor:

M/s Inkel Limited, 2nd floor, 7/473 ZA- 5 & 6, Ajiyal Complex, Kakkanad, Kerala-682030 herein after called "Contractor".

5. Contract Amount:

The Total Contract Amount is INR32620000/- (Rupees Three Crore Twenty Six lakh Twenty Thousand only) for design, engineering, manufacturing, procurement, supply(including spares), handling storage, civil works, erection, installation, testing & commissioning, training of personnel, along with operation and maintenance charges of the project as all inclusive Price which include taxes, duties, Cess, freight and insurance charges, logistics etc and all the levies payable by the contractor for successful completion, operation and maintenance of the Grid Tied Ground Mounted Solar PV Power plant for the first 5 years from the date of commissioning where performance ratio of the project shall be 75 - 80% as detailed in the Clause 2.2.3 of Tender document Volume-1 in this respect, as per the financial proposal submitted by you and as detailed in the Price Schedule attached as Annexure 1.

Freight and Insurance charges for transportation of material/equipment to destination project site and up to complete installation and commissioning should be arranged by the contractor at their own cost. KSEBL will not entertain or bear any charge for the same.

Contract amount shall be governed as per provisions under Clause 4.1 of Volume 1 of the tender document. This amount shall be firm during the period of contract and shall not be varied or adjusted on whatsoever reason on any account.

6. Taxes & Duties:

The Contract Amount as indicated in clause 5 of this document is inclusive of all Taxes and duties, incidental charges and other levies. All Taxes and duties will be as per the latest orders of KSEBL and prevailing rules of State/Central Government. No separate claim on this behalf will be entertained and future claims on any taxes and duties will not be admitted and also all statutory recoveries will be deducted by K.S.E.B Ltd from the work bill. No future claims on unquoted taxes and duties will be allowed. The contractor shall submit a clear tax invoice containing all details prescribed as per GST Act and Rules for effecting Payments.

7. Insurance:

All equipment, machinery, works etc. which are furnished, installed, constructed and handed over/to be handed over to the KSEBL under this contract for the completion of project shall be insured by the Contractor for the period of contract i.e. for 5 years. The entire cost on account of this shall be borne by the Contractor. Losses or damage if occurred to such machinery, equipment and work shall be made good at the risk of Contractor. It shall be the responsibility of the Contractor to maintain adequate insurance coverage at all times.

The machinery, equipment and other valuable material of the Contractor at work site shall be insured by the contractor so that any loss or damage due to force majeure situation can be taken up by the Contractor with the insurance companies for getting their claims. The KSEBL will not give any financial assistance on this account.

All the personnel employed/engaged by the contractor shall have adequate insurance coverage. Any claim due to mishap/accidence or otherwise to personnel/equipment, shall be taken up by the contractor, directly with the insurance company. KSEBL will not have any liability in this respect whatsoever. The Contractor, without limiting KSEBL's obligations and responsibilities shall insure:

- (a) the works, together with materials and plant to the full replacement cost and third party liability at site.
- (b) an additional sum of 15% of such replacement cost to cover additional costs and incidental to the rectification of loss or damage including professional fees and cost of demolishing and removing any part of works and of removing debris of whatsoever nature, and
- (c) the Contractor's equipment and other things brought to site, for a sum sufficient to provide for their replacement at the site.

- (d) The insurance against third party liability at site shall be ensured before commencing the execution of work, against any damage or loss or injury which may occur to the equipment being shifted/ installed or to any property or person (including property and employees of the Employer) by or arising out of the execution of works or temporary works in carrying out of the Contract. The insurance coverage shall be revalidated till the certification of project.

The insurances under item (a) and (b) shall be in the joint names of Contractor and KSEBL and shall cover:

- (i) KSEBL and the Contractor against all losses or damage, from whatsoever cause arising from the start of work at the site until the date of issue of the relevant taking over certificate in respect of the works or any section or part thereof as the case may be, and
- ii) The Contractor for his liability :
 1. During the Defects Liability Period for loss or damage arising from a cause occurring prior to the commencement of Defect Liability Period,
 2. for loss or damage caused by the Contractor in the course of any operations carried out by him under the terms of the Contract, and
 3. for loss or damage caused by the Contractor in the course of any operation carried out by him during execution of works to the neighboring habitats, life and property in an area of 200 metres around the boundary of the site.

If the Contractor fails to effect in force the insurances referred in the above clauses, or any other insurance which he may be required to effect under the terms of the contract, then and in any such case, the KSEBL may effect and keep in force any such insurance and pay such premium or premiums as may be necessary for that purpose and from time to time deduct the amount so paid by the KSEBL as aforesaid from any amounts due or which may become due to the Contractor, or recover the same as a debt due from the Contractor.

a. Work commencement, Period of Completion and Date of Commissioning:

The Contractor shall complete the implementation in all respect within **6 months** from the official date of commencement of work which shall be on or before 10 days from the date of executing Agreement.

The site shall be handed over to the contractor by the Engineer-in-Charge within 10 days from the date of execution of Agreement. All the works stipulated under the scope of the Contract shall be completed in all respects, supplies made, services provided and final cleaning up done and required testing shall be completed and commissioned before the expiry of the Time of Completion thus worked out, unless the time of completion is postponed and period of completion is extended by a written letter from the Agreement Authority.

All Commissioning test shall be conducted by the contractor in presence of KSEBL officers delegated by the Engineer-in-Charge and the approvals will be given only if the same is satisfactory.

The date of commissioning shall be the date on which the solar plant is synchronized into KSEBL grid after obtaining clearance from all statutory bodies and after conducting necessary grid interfacing tests and measurements by the KSEBL found satisfactory. The Engineer in Charge should issue a certificate indicating the date of commissioning and an authorization certificate/commissioning report after the successful synchronization and commissioning of the plant with the grid after proving the Performance ratio as detailed in clause 2.2.3 of tender document volume-1 issued in this respect.

On completion of all works stipulated in the scope of work and after testing and commissioning of the Project and if there are no obligations to arise out of the Contract, the Engineer in charge shall furnish a certificate to the Contractor to the effect that all works are completed satisfactorily and no works remains incomplete as per the terms of contract. The issue of this certificate does not relieve the contractor from the obligations during the defect liability period and the execution of Operation and Maintenance for 5 years.

As the projects comes under IPDS, the installations shall be satisfactory with the appropriate authorities/Project monitoring agency of IPDS and necessary rectifications if any proposed against the defects shall be done based on the inspection in line with the tender conditions. The contractor shall also prepare and handover the as-built drawing, Operational manuals and Maintenance manuals of the plant after completion of the project.

9. Price Escalation due to Extension Of Completion Date:

The contractor shall not claim any price escalation, in case the completion period is extended for any reason, including litigation or force majeure conditions.

10. Liquidated Damage:

Any delay in commissioning a Project will adversely affect the total planning which in turn will affect the State and the public exchequer. Hence, for any damage or loss caused to the KSEBL due to the failure from the part of the Contractor in completing the Work in all respects within the stipulated period of completion, the Contractor shall compensate for the same. The Liquidated Damages (not as penalty) is to be realised at the end of the period of completion. The maximum amount of Liquidated Damages shall be limited to 10% of the accepted Contract Amount. The rate of Liquidated Damages shall be 1% of accepted Contract Amount per week of delay subject to a maximum of 10% accepted contract.

Penalty imposed, if any, shall be deducted from the amount of Liquidated Damages. If the delay prolongs in excess of 200 days from the agreed date of completion as per the original agreement, the Work is liable to be terminated and balance works to be completed will be arranged at the risk and cost of the Contractor as per clause 5.3.9 of volume 1 of the tender document.

As per clause 2.2.3 of volume 1 of the tender document and corrigendum, the contractor shall be liable to pay liquidated damages for lower generation as below:

If the plant outage is due to component failure or lack of maintenance and unless it is rectified within 7 days from the date of intimation to the contractor, the contractor is liable for LD. The monetary compensation for the plant outage days shall be computed as 4 units per KWp/Day multiplied by the approved average annual energy purchase cost of that year and will be deducted from the payments to the contractor till the same is rectified. For the year 2017-18, KSERC has approved the average pooled power purchase cost of KSEBL as Rs. 3.26/unit. Average Pooled Cost of Power Purchase will be revised by KSERC for each year.

11. Performance security deposit:

The performance security deposit is governed by clause 5.1.7 of Tender document volume-1.

The Contractor shall submit a Bank Guarantee for an amount equal to 10% of the total contract amount rounded off to the higher multiple of Rs 1000/- ie, **INR 32, 62,000/-** (Rupees Thirty Two Lakh Sixty Two Thousand only) as the Performance security deposit at the time of execution of agreement and shall be in the prescribed format in Annexure 2 - Contract forms A - of this document. Failure of the successful bidder to submit the required Performance Guarantee shall constitute sufficient grounds for termination of Contract & forfeiting the EMD.

In order to cover the liabilities under the contract and to ensure sufficient guarantee to cover all possible liabilities pertaining to defects, shortfalls, remedial measures arising out of poor workmanship, materials, loss, excess amount, risk and cost of Contractor in case of alternate arrangements and any type of dues to the KSEBL, the Performance Security deposit for the Contract shall be collected and retained from the Contractor.

The Bank Guarantee shall be initially valid from the signing of contract and for a period of 2 years and be kept renewed from time to time till the end of defect liability period including O&M. The performance security B.G will be released in equal installments each year after demonstration of desired performance ratio (AC) (as per clause 2.2.3 of tender document vol-1 issued in this respect) during the defect liability period. The performance ratio (AC) will be calculated based on data from pyranometer / Meteororm/Pyreheliometer data.

No interest shall be paid by KSEBL at any stage of contract on this Performance Security Deposit.

The performance ratio (AC) (as per Clause 2.2.3) can be checked at any time in between if deemed necessary by the Engineer in charge. If any unusual degradation is noticed in the PR, the contractor shall attend and rectify the same within 24 hours on intimation. If not the performance security deposit will be forfeited.

12. Agreement:

A contract agreement has to be executed by the contractor within 15 days from the date of issue of this LoA, in the prescribed format in Annexure 2-Contract form B of this document, in Kerala State Government Stamp paper worth INR 32,620/- (Indian Rupees Thirty two thousand Six hundred and twenty only), along with the performance security deposit at the Office of the Chief Engineer (Renewable Energy & Energy Savings), on a date and time to be mutually agreed.

The contractor shall provide the original contract agreement and Bank Guarantee in lieu of Performance security deposit, appropriate power of Attorney in original and other requisite documents for signing of the contract. All the documents cited in clause no.32 of this document will form part of the agreement. Power of Attorney shall be in stamp paper attested by a registered Notary Public.

Failure of the Contractor to comply with the above requirement shall constitute sufficient grounds for cancellation of award of contract and to re-arrange the Work including re-bidding at the risk and cost of the Contractor. If due to the default of the Bidder/Contractor to furnish requisite Performance Security deposit, execute Contract Agreement or to take possession of the site and execute the Work with proper diligence, the Work will be arranged otherwise by Engineer-in-Charge at the risk and cost of the Contractor and if any loss to KSEBL results due to this, the same will be recovered from the Contractor. Recoveries on this or on any other account will be made from the sum that may be due to the Contractor on this or any other subsisting contracts or under the Revenue Recovery Act or otherwise as the KSEBL may decide.

13. Construction Programme:

Within 15 days from the date of award, the contractor shall submit a programme showing the general method, arrangements, order and timing for all the activities involved in the work in a systematic manner based on planning technique and tool like PERT /CPM in MS (Projects) and GANTT chart indicating the critical events/paths and milestones to KSEBL for approval.

The subject work is under IPDS and time bound completion is required to avoid the loss of additional grant provided to KSEBL under IPDS.

The contractor shall carryout the works in accordance with this programme and as approved by KSEBL, and complete them in all respects to the full satisfaction of KSEBL. Any change to the approved work plan due to unavoidable circumstances shall be made only with the prior approval of KSEBL.

14. Terms of Payment:

- a. The contractor shall submit a clear tax invoice containing all details prescribed as per GST ACT and RULES for effecting Payment.
- b. The Contractor has to produce Bank Guarantee for an amount specified in the clause 11 of this LoA as Performance Security Deposit at the time of executing Contract Agreement.
- c. No amount shall be released as mobilisation advance.
- d. 30% of Contract value excluding O&M, will be released to the contractor as cost of major components of the plant (PV Modules, Inverters, Module

Mounting Structures) after delivery of major components at site, after inspection and acceptance tests and verification by authorized departmental officers and production of insurance certificates for the materials delivered at site.

- i) The Engineer-in-charge is to be informed about the delivery of material one week in advance by the contractor.
 - ii) The Engineer in charge shall ensure the site acceptance / rejection of the received material at site within three days of delivery of material along with submitting the SAT procedure of the delivered material from the vendor by the contractor.
 - iii) The invoices shall be submitted by the contractor as per the accepted price schedule which is to be verified and made ready for release of payment within 15 days of receipt of the invoices subject to the satisfaction of the above conditions.
- e. 100% of the total Contract amount except Operation and Maintenance charges will be released after satisfactory completion, testing, commissioning of the solar plant after proving the Performance ratio (AC) as per clause 2.2.3 of Volume 1 of the tender document.
- The contractor can submit the final Invoice as per the accepted price schedule within 10 days on proving the Performance ratio (AC) (as per Clause 2.2.3) after completing the project within 6 months. The invoices shall be verified and final payment may be released within 3 months of receipt of the Invoices subject to the satisfaction of the above conditions.
- f. The Operation & Maintenance charges shall be released at the end of each year after commissioning and demonstration of the specified Performance ratio (AC) as per clause 2.2.3 at the end of each year during O&M period (5 years).
- g. The performance security amount shall also be released in equal instalments each year (O&M period) from the date of commissioning the project after demonstrating the specified Performance ratio (AC) (as per Clause 2.2.3). The proportionate amount for decrease in the production of energy units will be deducted for liquidated damages from the amount to be released and only the remaining will be released after demonstrating the required Performance ratio. i.e. the contractor shall compensate for lower generation as per clause 10 of this LoA.
- h. The Quoted taxes and duties etc as Governed by GST will be released subject to an undertaking from the Contractor in Kerala Government Stamp paper that "If any dispute in payment of taxes and duties etc as Governed by GST from concerned Tax authorities occurs in future, he shall indemnify KSEBL from such liabilities and the contractor shall be liable for the additions, loss or cost on account of such discrepancies /dispute".

15. Advance Payment:

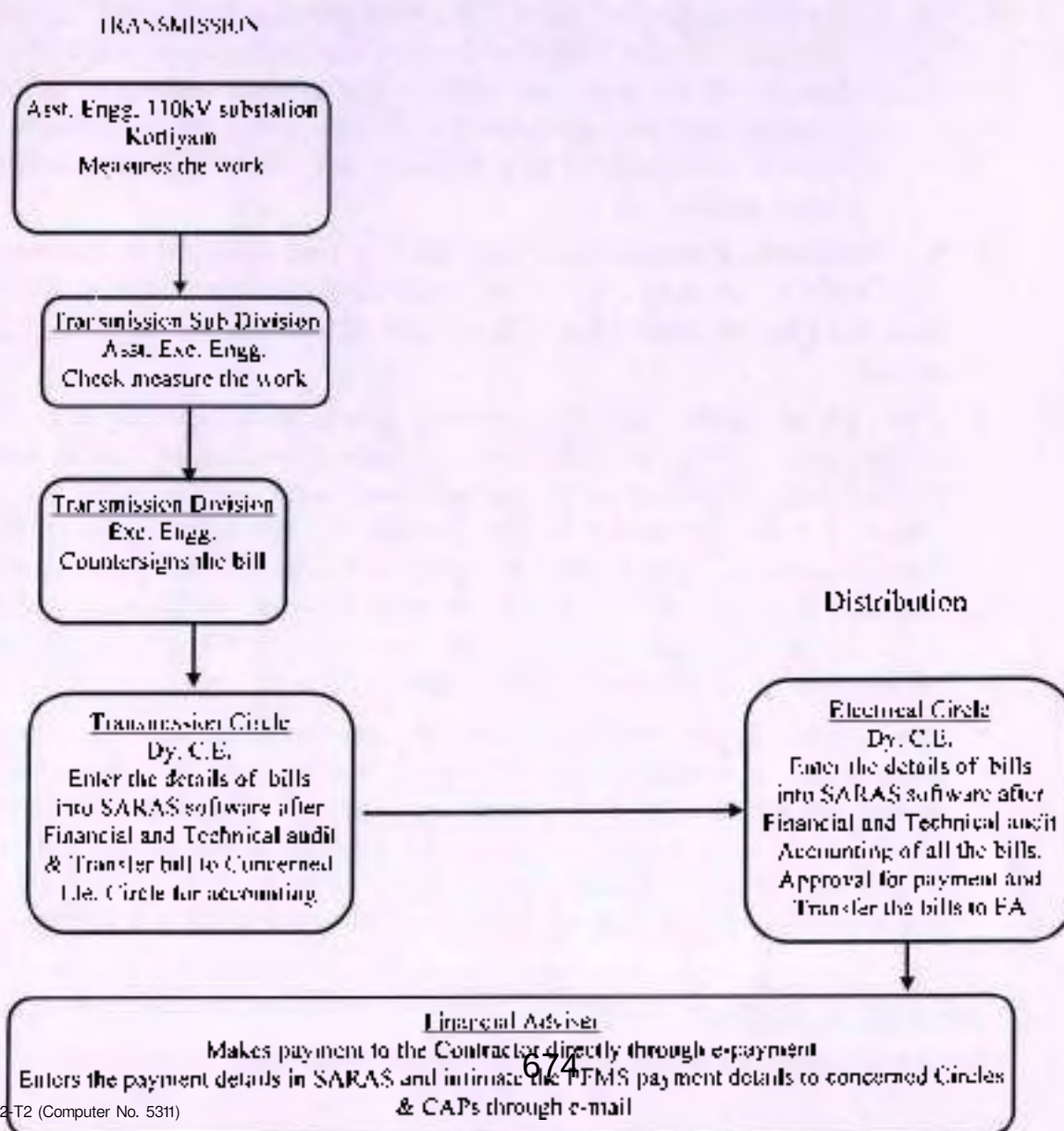
No amount shall be released as mobilization advance.

16. Payment Authority and Engineer-in-Charge:

The detail of Engineer-in-Charge is furnished below for the proper monitoring of the project.

Location of the project	Engineer-In-Charge	Total capacity (MWp)	IPDS Ele.Circle
110 kV Substation Kottiyam	Deputy Chief Engineer Transmission Circle, Kottarakkara	0.60	Kollam

The Engineer-in Charge may delegate powers to subordinate officers in respect of execution of work such as Site supervision of Electrical works and arrangements for interconnection facility, Technical support and civil supervision. The following flow chart indicates the work flow and payment for distribution and transmission works under IPDS.



The contractor shall submit bills in Triplicate to the Engineer in Charge with all supporting documents as specified in the bid document for preliminary audit. Measurement, check measurement and other certifications of the bills shall be done by the respective Engineers, along with necessary Invoices and other mandatory documents, after preliminary audit, shall be forwarded to the Engineer in Charge of each location. The work order and bill details shall be entered in SARAS software, and the bill shall be audited and passed. The duly certified and audited bills for payment of each location are to be forwarded to the respective IPDS Electrical Circle.

The Deputy Chief Engineer of IPDS Electrical Circle shall approve the bill and transfer the bills to FA and will make payment directly to the contractor through e-payment and intimate the payment details to the concerned circles and CAPs. The Engineer-in-Charge shall inform the status and details of payment effected to the agreement authority.

17. Manufacturing Schedule:

Contractor shall specify all basic design details, including details of the PV modules and the support structures, Inverters, cables, Integration and power evacuation details with existing power system, with appropriate diagram and drawings. The drawings along with detailed structure design and material selected as per the relevant standards, all guaranteed technical particulars, details of each items, make, model number and specification conforming to relevant standards, entire drawings, detailed valid test reports, list of O&M spares for major materials, detailed Bill of materials and Priced Bill of Quantities in respect of materials/equipments and works for the entire Project shall be submitted within 15 days of receipt of this LoA.

All materials and equipments required for successful completion and commissioning of the project must be included. The design details and other accessories should adhere to and match with the technical specification provided in the volume III of the tender document and as per the Guaranteed Technical Particulars offered by you.

The Contractor shall submit all the appropriate diagram and drawings to the agreement authority for approval. Also specifications of major items such as PV modules, inverters, module mounting structures etc shall be submitted to the Agreement authority for approval. Approvals for Layout of Power Plant Installation shall be provided by the Engineer- In- Charge in prior to the submission of all the drawings.

For the goods supplied from outside the purchaser's country, the supplier shall be entirely responsible for all taxes, duties, stamp duties, license fees, and other such levies imposed outside the purchaser's country.

The contractor shall provide all MAFs (Manufacturer's Authorization Forms) for all the components specified in the bid within 15 days and before executing the Contract Agreement.

18. Metering

Energy meter provided for the installation of the solar PV plant shall be in accordance with the prevailing regulations and technical specifications of KSEBL.

Solar meter and bi directional Net meter has to be provided by the contractor for the grid connected systems with accuracy class as per the Central Electricity Authority (Installation and Operation of Meters) Regulations, 2006 amended from time to time. Solar meter shall be of accuracy class 0.5s or better and net meter shall be of accuracy class 0.2s.

Meters shall be provided with LCD and ToD facility, having DLMS Compliance and AMR compatibility with optical port and RS 232 port complying with the latest KSERC Regulation suitable for measurement of active kWh, reactive energy kVARh and apparent energy kVAh, kVA MD and kW MD at frequency in the range of 47.5 Hz to 52.5 Hz in balanced as well as unbalanced load conditions.

The meters shall be installed after testing and sealing from the respective TMR divisions.

Solar meter shall be installed at inverter output and a bidirectional meter (net meter) shall be provided at the HT side of the transformer.

19. Drawings and documents

The design documents to be submitted by the contractor will include but not limited to:

- I. DC cable size calculation
- II. DC cable specification
- III. DC cable schedule, voltage drop and power loss calculation
- IV. String monitoring unit specification
- V. DC earthing & pit calculation
- VI. Lightning protection details/specification
- VII. All technical specification of AC components
- VIII. Cable schedules

Contractor shall furnish the following drawings under this contract and has to obtain approvals.

- a. Shadow analysis of the location
- b. General arrangement and dimensional layout
- c. Schematic drawing showing the SPV panels, Power conditioning Unit(s)/ inverter, Junction Boxes, AC and DC Distribution Boards, meters, transformers etc.
- d. Layout of solar PV Array and Single line diagram and Cable Trench layout if any.
- e. Mounting structure drawing
- f. Structural drawing along with foundation details for the structure.
- g. Bill of material for complete SPV plant covering all the components and associated accessories.
- h. Sizes and specification of cables between array interconnections, array to junction boxes, junction boxes to Inverter etc. shall be furnished
- i. PVSyst simulation report of the combination offered PV modules with the offered inverters shall be furnished to the agreement authority for approval.

The drawings along with detailed structure design and material selected and their standards shall be submitted to agreement authority for approval before starting the execution work. The work will be carried out as per the approved design.

The contractor shall provide necessary drawings and documents required by statutory authorities and obtain the approval before taking up erection.

20. Quality Assurance and Inspection/Acceptance tests:

Strict compliance with the approved and proven & established quality assurance systems and procedures during the different stages of the project starting from sizing, selection of make, storage (at site), during erection, testing and commissioning have to be ensured by the contractor.

PV modules should have valid qualification test certificate as per IEC 61215 and IEC 61730 -1&2 and IEC 61701. The inverters should comply with applicable IEC/ equivalent BIS standard for efficiency measurements and environmental tests, safety standards and characteristics of the utility interface (Parallel operation) as per standard codes IEC 61683 and IEC 60068 2(1,2,14,30) and IEC 62109-1&2 and IEC 61727 respectively. Inverter shall be provided with protection against islanding of Grid as per IEEE 1547/UL1741/62116 to isolate it from the grid in case of no supply, under voltage and over voltage conditions so that in no case there is any chance of accident. The module mounting structure shall be as per latest BIS 2062 and galvanisation of mounting structure shall be in compliance of BIS 4759 (amended up to date)/IS2629.

The type test certificates shall be verified by KSEBL while conducting factory inspection tests. The contractor shall furnish detailed quality procedures for the major components for approval prior to the Factory inspection call. The agreement authority will provide the approvals regarding the test to be conducted during the inspection.

The following minimum tests shall be conducted during the Factory inspection:

➤ For PV modules:

1. Visual inspection
2. Dimensional Check
3. Insulation Resistance
4. Leakage Current
5. Electrical Test(with sun simulator)
6. RFID verification
7. Electro luminous tests
8. Robustness of termination

➤ For inverters:

1. Visual inspection
2. Dimensional and Power Wiring Check.
3. Auxillary functional check.
4. Fan direction of rotation, On-Off control, etc
5. Functionality test of relays
6. Command checks
7. Protection function checks.

8. AC under voltage, AC over voltage, AC under frequency, AC over frequency
 9. Load tests simulation 25%, 50%, 70% and 100%
 10. Load test performed at variable MPPT voltage @100% load on the specified voltage range.
 11. Over temperature, ground fault simulation
- For transformer:
 1. Visual inspection
 2. Routine test as per IS-2026
 - For Module mounting structures:
 1. Visual inspection
 2. Dimensional Inspection
 3. Functional fitment

The contractor shall submit letters of inspection calls sufficiently in advance specifying the date and venue of inspection to the agreement authority through Engineer-in-Charge. All the major components should undergo factory inspection tests.

The agreement authority shall arrange inspection of material/ equipment and upon satisfactory completion of the inspection and tests, the Material Despatch Clearance Certificate will be issued.

The test and inspection shall be done in accordance with the relevant standards and the Manufacturer's standard before the delivery to site as well as after the erection and commission at site.

All acceptance and routine tests of equipment as per the specification and relevant standards shall be carried out by the contractor. Agreement authority or authorized officials may undertake the quality checks during the manufacturing stages also.

Functional testing and erection of equipments shall be carried out by the contractor in presence of KSEBL officers delegated by the Engineer-in-Charge and the approvals will be given only if the same is satisfactory.

Engineer-in-Charge shall conduct visual inspection including dimensional checks, verification of serial numbers, RFID reading of PV modules etc for the Site Acceptance of the delivered materials based on the BOM. Any materials or work found to be defective or which does not meet the requirements of the specification will be rejected and shall be replaced at contractor's cost.

21. Review and Progress report:

The contractor shall submit monthly progress report to Engineer-in-Charge and all concerned personnel in connection with this order, with a copy to this office.

Monthly Review Meeting shall be held in the office of the Engineer -in charge, between KSEBL and Contractor to monitor the progress of the works and review the plans for remaining works and to deal with matters that would rise in accordance with the early warning procedure.

The Engineer-In-Charge will co-ordinate and monitor all activities of the project. These progress report formats ~~678~~ **678** be changed as and when required by

The contractor shall produce an updated Activity Schedule within 14 days of being instructed by the KSEBL.

22. Technical parameters for getting grid connectivity:

Harmonic current injections from a plant shall not exceed the limits specified in IEEE 519 as per CEA technical standard for connectivity of the distributed generation resources.

The limits for harmonics on AC side shall as follows:

- a. Total Voltage harmonic Distortion as per IEEE-519 2014
 - b. Individual Voltage harmonics Distortion as per IEEE-519 2014
 - c. Total Current harmonic Distortion as per IEEE-519 2014
 - d. Output frequency = 50Hz +/- 0.5Hz
- a. Photovoltaic system should not inject DC power more than 0.5% of full rated output at the interconnection point or 1% of rated inverter output current into distribution system under any operating conditions
 - b. Operation of Photovoltaic system shouldn't cause voltage flicker in excess of the limits stated in IEC 61000 or other equivalent Indian standards, if any
 - c. While the output of the inverter is greater than 50%, a lagging power factor of greater than 0.9 shall be maintained.
 - d. The Photovoltaic system in the event of voltage or frequency variations must island/disconnect itself within IEC standard on stipulated period.
 - e. The voltage-operating window should minimize nuisance tripping and should be under operating range of 80% to 110% of the nominal connected voltage beyond a clearing time of 2 seconds, the Photovoltaic system must isolate itself from the grid.
 - f. When the Distribution system frequency deviates outside the specified conditions (50.5 Hz on upper side and 47.5 Hz on lower side up to 0.2 sec), the Photovoltaic system shouldn't energize the grid and should shift to island mode.

23. Operation and Maintenance (O&M):

The Contractor shall be responsible for Operation and maintenance of the plant at for the first 5 years from the date of commissioning. The date of commissioning is described under clause no.8 of this LoA. Operation and Maintenance is governed by clause 6.9 of tender document volume-1.

The scope of the contractor shall be, including but not limited to,

- i) Cleaning of module surface on regular basis as and when required.
- ii) Normal and preventive maintenance of the plant
- iii) The contractor is responsible for supply of all spare parts, repairs/ replacement of any defective equipment(s) at his own cost as required from time to time during the O&M period.
- iv) The O&M of the project during this period shall cover the tools and tackles, spare parts, any consumables, and any systems such as modules, inverter,

PCU, remote monitoring etc. required for proper functioning of the SPV system as a whole.

- v) During the comprehensive O&M period, the contractor shall at his cost maintain the spares for minimizing system outage due to time required in getting replacements of defective part(s) of equipment from the manufacturer. The contractor has to use the mandatory spare(s) available at site for replacing defective part(s) of equipment for minimizing system outage temporarily and top up the quantity of spares so that the required quantity of spares shall be made available at site at all the times and same shall be handed over at the end of O&M period.
- vi) The solar plant should be maintained shadow free. The tree branches if any causing hindrance to the shadow free operation of solar plant shall be cut and removed under the supervision of KSEBL official.
- vii) Adequate training should be given to personnel identified by the KSEBL for Daily Monitoring Information like solar energy generated, net meter readings etc.

If the contractor fails to prove the desired Performance ratio (AC) as per clause 2.2.3 of volume 1 during any of the consecutive years the annual O&M period will be extended to that time period till the desired Performance ratio as per clause 2.2.3 is attained

A maintenance record is to be maintained by the operator/Engineer-in-charge to record the regular maintenance work carried out as well as any breakdown maintenance along with the date of maintenance reasons for the breakdowns steps have taken to attend the breakdown duration of the breakdown etc. Contractor shall submit monthly reports to the Engineer in charge, Agreement authority on the energy generation and operating conditions of the solar plant.

24. Annual Maintenance Contract (AMC):

The plant shall then be handed over to KSEBL at the end of 5 years. After five years from the date of commissioning, the EPC contractor may be asked to execute the AMC for another 5 years on mutual agreement at mutually agreed price. The EPC contractor shall execute the AMC agreement as per conditions stipulated at that time.

25. Performance & Warrantee:

The mechanical structures, electrical works and overall workmanship of the solar power plant must be warranted for a minimum of 10 years. PV modules used in solar power plant must be warranted for output wattage, which should not be less than 90% at the end of 10 years and 80% at the end of 25 years.

The PV Power Plant should be designed and simulated with the offered quality components by the bidder (PV Modules, Inverters etc.) so as to obtain the minimum capacity of 0.6 MWp. The electrical degradation of power generated shall not exceed 5% of the minimum rated power over the 5 year period and not more than 10% after ten years.

EPC contractor shall ensure the performance ratio as detailed in the Clause 2.2.3 of Tender document Volume-1 in this respect.

26. Generation Assessment

The performance ratio (AC) shall range from 75- 80% as per clause 2.2.3 of Tender document Volume-1. Performance ratio test as per IEC 61724 will be carried out at site by the EPC contractor in presence of officials from KSEBL. This is mandatory for commissioning and handing over the plant. If the contractor fails to prove the desired performance ratio at the time of completion and during any of the consecutive years of defect liability period he will be given a second chance to demonstrate the PR in another 7 days. Still if it is not achieved, the same shall be demonstrated in another 7 days and still if it is not achieved, EPC contractor shall improve the quality of the plant by replacement of components with all suitable modification requirements on balance of systems at his own cost to achieve the performance ratio.

Operation and maintenance charges shall be released at the end of each year based on the Performance ratio (AC) as mentioned above.

27. Handing over:

The plant shall be handed over to KSEB Ltd in the best working condition at the end of 5 year after commissioning with the following conditions,

- Required Performance ratio shall be achieved and proved.
- After providing basic training to the employer personnel with the concurrence of the site Engineer in Charge
- Handing over of all items and materials with required tools and minimum spares as listed below.

The contractor shall provide the tools specified below with the required number of spare. The list ensuring sufficient number of spares shall be approved by the agreement authority. KSEBL will carry out operation of the plant after taking over of the plant. If required, spares during life period shall be arranged by the contractor after Guaranty Period at the cost of KSEBL.

List of tools & Spares

Tools

Spanner set
Small cable cutters
nose pliers
Wire strippers
Nut drivers
Screw driver
Knife
Electric tester
Clamp meter-ac- dc clamp-on meter/
AC/DC multimeter(AC&DC 1000V)

Spares

PV modules
Junction Boxes
Fuse and fuse holder
MOV's / arrestors
MCBs
DC connectors
DC cables
DC SPD
Nuts and bolts
Diodes
Different Clamps for MMS

Any component found defective/inefficient/worn out shall be rectified/ replaced/ made good at contractor's cost before handing over the system to the KSEBL. In

order to ensure longevity & safety of the core equipment and optimum performance of the system the Contractor should use only genuine spares of high quality standards. Contractor has to maintain the Ground mounted SPV plant till the end of the contract period of five years.

The Contractor shall hand over the complete system and shall transfer all Guarantees and warranties of the different components of the project to KSEBL.

28. Termination of Contract:

Termination of Contract will be guided strictly in accordance with clause 5.3.11 of volume 1 of the tender document.

29. Force Majeure:

Force Majeure shall be governed by Clause.5.3.8 of volume 1 of the tender document.

30. Defects Liability Period:

The Defect Liability Period shall be governed by Clause.5.3.4 of volume 1 of the tender document.

31. Law and Jurisdiction:

Any suit or legal proceedings arising out of this contract shall be governed by the laws of India and Kerala and shall be subject to the exclusive jurisdiction of the Courts at Thiruvananthapuram only.

32. Contract Documents.

1. Agreement executed in Kerala Government Stamp Paper
2. Letter of Award (duly signed and seal affixed on all pages)
3. Correspondences between the KSEBL and the selected bidder included in the Agreement.
4. Special Conditions of Contract.
5. General Conditions of Contract.
6. Technical specifications.
7. Accepted Schedule of Technical Particulars and construction programme & Manufacturer Authorization form of Components.
8. Accepted Schedule of Prices
9. General Bid conditions
10. Instructions to bidders.
11. Information to bidders.
12. Detailed Structural Drawings including approved drawing issued from time to time.
13. Approved List of spares that will be supplied
14. All volumes of bid with Tender No. KSEBL/REES/Kottiyam/07/2018-19 dated 22.09.2018 along with clarifications and related documents Issued by the Tendering Authority.
15. Response (proposal) of M/s Inkel Limited, 2nd Floor, 7/473 ZA-5&6, Ajiyal Complex, Kakkanad, Kerala-682030 including the Bid, Clarification documents and the accepted rate submitted.

33. Acknowledgment by the Contractor:

This Letter of Award is issued subject to the documents referred above and terms and conditions contained therein. You will also be deemed to be fully aware

of KSEBL's **General conditions of contract** which is applicable to this contract also and ignorance of these conditions will not exempt you from your liability to abide by the same.

If there is any contradiction/conflict between the tender documents and LoA, conditions in the LoA will prevail.

The documents specified in Cl. 13 and 17 shall be submitted within 15 days from the date of issue of this LoA.

A copy of the LoA attached is to be returned immediately duly signed and seal affixed on all pages as token of acceptance and for incorporation in the Contract Agreement preferably within 15 days in any case from the date of issue of this Letter of award.



**Chief Engineer
(Renewable Energy & Energy Savings)**

(Signature)

Acc:-

- 1. Annexure 1: Price schedule**
- 2. Annexure 2: Contract Forms**
 - A. Performance Security deposit BG
 - B. Form of contract agreement
- 3. Annexure 3: Copy of LoA**

Copy to:-

1. The Secretary K.S.E.B Ltd, Thiruvananthapuram.
2. The Chief Engineer Distribution (South)/ Transmission (South)/CAPS
3. The Deputy Chief Engineer- Electrical Circle, Kollam
4. The Deputy Chief Engineer- Transmission Circle, Kottarakkara
5. The Executive Engineer- Transmissslon Construction Division , Kottarakkara
6. The LA and DEO K.S.E.B Ltd, Thiruvananthapuram.
7. The Financial Advisor, KSEBL.
8. TA to The Chairman & Managing Director, KSEBL, Thiruvananthapuram/
9. TA to Director (Distribution &IT)/Director (T&SO)/Director(CP,GE, SCM & Safety)/Director(Generation Civil & HRM)
10. PA to The Director (Finance)
11. Sr.CA to Chief Vigilance Officer
12. The Main Income Tax Officer, Thiruvananthapuram, Kerala.
13. The Accountant General, Thiruvananthapuram, Kerala
14. Stock file

Annexure : 1 Price Schedule

Supply, installation, testing and commissioning of Grid Tied Ground Mounted Solar PV Power plant at Kottiyam under IPDS scheme in the land owned by KSEBL with an installed capacity of 0.6 MWp

Item No	Item Description	Quantity	BASIC RATE without tax in Rs.	GST (Rs.)	TOTAL AMOUNT With Taxes (Rs.)
(A)	Total Price for the 0.60MWp Grid Tied Ground Mounted solar PV power plant at Kottiyam in the land owned by KSEBL for the Design as per site condition, Supply of all materials, transportation, Construction, Erection, civil works, testing and commissioning work of the Solar plant, inspection and testing charges, Additional work/Cabling for Power Evacuation and works related to each of the project site	1	30870000.00	1543500.00	32413500.00
684	Total price for Operation and Maintenance (O & M) charges of the 0.60 MWp Grid Tied Ground Mounted solar PV power plant at Kottiyam in the land owned by KSEBL for a period of 5 years including arrangement of cost of replacement of all the defective parts, consumables, tools, tackles, testing equipments & instruments, manpower, all administrative work, maintenance of records and submissions to all concerned authorities including all taxes as per GST, covered under Guarantee period of 5 years from the date of commissioning.				
	O & M Charges for first year	1	35000.00	6300.00	41300.00
	O & M Charges for second year	1	35000.00	6300.00	41300.00
	O & M Charges for third year	1	35000.00	6300.00	41300.00
	O & M Charges for fourth year	1	35000.00	6300.00	41300.00
	O & M Charges for fifth year	1	35000.00	6300.00	41300.00
(B)	Total O&M charges for 5 years		175000.00	31500.00	206500.00
	Total accepted contract amount = (A)+(B)		31045000.00	1575000.00	32620000.00

(Rupees Three Crore Twenty Six Lakh Twenty Thousand only)

CHIEF ENGINEER (REES)

Government of Kerala
Department of Electrical Inspectorate
Office of the Electrical Inspector
Beach Road , Kollam
Kollam , 691001
Phone: 04742743619,
Email: eiklm@ceikerala.gov.in
Website: www.ceikerala.gov.in



Proceedings of the
Electrical Inspector
Kollam
Present: Alex PV

Subject: Installation of 2 Nos of 315 kVA Transformer-HT, 600kWp Solar Panel Installation and 8 Nos of 80kVA Solar Inverter and connected electrics at the premises of The 110kV Substation, Kottiyam, Kollam, 691571 - Sanction for energisation orders issued - regarding.

Reference: 1. Scheme Approval No. B1-24315/19/CEI dated 05.12.2019
2. Completion report submitted by B.Rajeev CA.315, Kalavoor, Alleppey ,Kerala-688522 dated received on 02.01.2020
3. Inspection conducted on 27.12.2019
4. Non conformity report dated 04.01.2020
5. Compliance report submitted by B.Rajeev CA.315, Kalavoor, Alleppey ,Kerala-688522 dated 24.01.2020

Order No: B1-00002/20/EIQ Dated 24-01-2020

Sanction is hereby accorded under section 54 of The Electricity Act, 2003 and Regulation 32 and 43 of the Central Electricity Authority (Measures relating to safety and electric supply) Regulations, 2010 for the energisation of the installations covered under completion report read as (3) above, installed at the premises of ,110kV Substation Kottiyam,kottiyam,Kollam,691571 subject to following conditions and as detailed in the annexure appended

1. Date of energization shall be intimated.
2. Operation and maintenance of electrical installation shall be done only by authorized persons.
3. All the maintenance works shall be recorded in the maintenance register.
4. Addition/alteration in the existing installation shall be carried out only with prior approval from the electrical inspectorate.
5. Copy of the test certificates of relays shall be submitted in this office prior to energisation of the installation

HT Panel (VCB Panels)

VCB-1

Make : ABB
Sl.No. : 1VYN020119006034
Rated Voltage : 12kV
Rated Current : 1250A

VCB-2

Make : ABB
Sl.No. : 1VYN020119006033
Rated Voltage : 12kV
Rated Current : 1250A

VCB-3

Make : ABB
Sl.No. : 1VYN020119006033
Rated Voltage : 12kV
Rated Current : 1250A

Transformer HT

Transformer No: 1

Make : Intrans Electro Components
Pvt.Ltd
Capacity : 315kVA
Y.o.m : 2019
Ratio : 11kV/480V
Sl.No. : T-2854
Type : Oil outdoor type
Vector Group : Dyn 11
% Impedance : 4%

Transformer No: 2

Make : Intrans Electro Components
Pvt.Ltd
Capacity : 315kVA
Y.o.m : 2019
Ratio : 11kV/480V
Sl.No. : T-2855
Type : Oil outdoor type
Vector Group : Dyn 11
% Impedance : 4%

Solar Inverter

Inverter -1

Make : DELTA
Sl.No. : 04C19100261WQ
Capacity : 80kVA
Model : M88H
DC Input : 200-1000V DC
AC Output : 277/480V

Inverter -2

Make : DELTA
Sl.No. : 04C19100272WQ
Capacity : 80kVA
Model : M88H
DC Input : 200-1000V DC
AC Output : 277/480V

Inverter -3

Make : DELTA
Sl.No. : 04C19100274WQ

Capacity : 80kVA
Model : M88H
DC Input : 200-1000V DC
AC Output : 277/480V

Inverter -4

Make : DELTA
Sl.No. : 04C18B03756WP
Capacity : 80kVA
Model : M88H
DC Input : 200-1000V DC
AC Output : 277/480V

Inverter -5

Make : DELTA
Sl.No. : 04C19100280WQ
Capacity : 80kVA
Model : M88H
DC Input : 200-1000V DC
AC Output : 277/480V

Inverter -6

Make : DELTA
Sl.No. : 04C19100256WQ
Capacity : 80kVA
Model : M88H
DC Input : 200-1000V DC
AC Output : 277/480V

Inverter -7

Make : DELTA
Sl.No. : 04C19100273WQ
Capacity : 80kVA
Model : M88H
DC Input : 200-1000V DC
AC Output : 277/480V

Inverter -8

Make : DELTA
Sl.No. : 04C19100213WQ
Capacity : 80kVA
Model : M88H
DC Input : 200-1000V DC
AC Output : 277/480V

Typical PV module

Make : Topsun Energy Ltd.
Model No. : TEL 24M340
Pmmp : 340Wp
Voc : 46.73V
Isc : 9.36A
Total number : 1800 Nos

Total Transformer Capacity: 315kVA Transformer, 2 Nos

Total No: of Earth Electrodes: 19 Nos

sd/-
Electrical Inspector



To:
Station Engineer
110kV Substation, Kottiyam, Kollam
Copy To:

Annexure (Order No: B1-00002/20/EIQ Dated 24.01.2020)			
Items			Quantity(in numbers)
SB	Panel Name : HT panel		
Incomer	VCB	630 Amps	2
Outgoing	VCB	630 Amps	1
Transformer-HT (2kVA)			
SB	Panel Name : Outdoor ACDB 1		
Incomer	MCCB	600 Amps	1
Outgoing	MCB	150 Amps	4
SB	Panel Name : Outdoor ACDB 2		
Incomer	MCCB	600 Amps	1
Outgoing	MCCB	150 Amps	4
Solar Inverter (80kVA)			
SB	Panel Name : Inverter 1 DC switches		
Outgoing	SFU	63 Amps	18
SB	Panel Name : Inverter 2 DC switches		
Outgoing	SFU	32 Amps	18
SB	Panel Name : Inverter 3 DC switches		
Outgoing	SFU	63 Amps	18
SB	Panel Name : Inverter 4 DC switches		
Outgoing	SFU	63 Amps	18
SB	Panel Name : Inverter 5 DC switches		
Outgoing	SFU	63 Amps	18
SB	Panel Name : Inverter 6 DC switches		
Outgoing	SFU	63 Amps	18
SB	Panel Name : Inverter 7 DC switches		
Outgoing	SFU	63 Amps	18
SB	Panel Name : Inverter 8 DC switches		
Outgoing	SFU	63 Amps	18
MSB	Panel Name : HT Panel		688

SB	Panel Name : HT Panel		
SB	Panel Name : HT Panel		
Incomer	VCB	1250 Amps	2
Outgoing	VCB	1250 Amps	1
SB	Panel Name : Outdoor ACDB Panel-1		
Incomer	MCCB	160 Amps	4
Outgoing	MCCB	600 Amps	1
SB	Panel Name : Outdoor ACDB Panel-2		
Incomer	MCCB	160 Amps	4
Outgoing	MCCB	600 Amps	1
SB	Panel Name : HT panel		
Incomer	VCB	630 Amps	2
Outgoing	VCB	630 Amps	1
SB	Panel Name : Outdoor ACDB 1		
Incomer	MCCB	600 Amps	1
Outgoing	MCB	150 Amps	4
SB	Panel Name : Outdoor ACDB 2		
Incomer	MCCB	600 Amps	1
Outgoing	MCCB	150 Amps	4
SB	Panel Name : Inverter 3 DC switches		
Outgoing	SFU	63 Amps	18
SB	Panel Name : Inverter 4 DC switches		
Outgoing	SFU	63 Amps	18
SB	Panel Name : Inverter 1 DC switches		
Outgoing	SFU	63 Amps	18
SB	Panel Name : Inverter 2 DC switches		
Outgoing	SFU	32 Amps	18
SB	Panel Name : Inverter 5 DC switches		
Outgoing	SFU	63 Amps	18
SB	Panel Name : Inverter 6 DC switches		
689			

Outgoing	SFU	63 Amps	18
SB	Panel Name : Inverter 7 DC switches		
Outgoing	SFU	63 Amps	18
SB	Panel Name : Inverter 8 DC switches		
Outgoing	SFU	63 Amps	18
Load Details HT Motor – 0 kW HT Capacitor – 0 MVAr + 0 kVAr Fire Pump Load – 0 kW + 0 kVA + 0 kVAr Lift Load – 0 kW + 0 kVA + 0 kVAr Other Load – 0 kW + 0 kVA + 0 kVAr			
This is a computer generated document. Signature is not required.			

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KERALA STATE ELECTRICITY BOARD LIMITED

(Incorporated under the Indian Companies Act, 1956)

Office of the Chief Engineer (Renewable Energy & Energy Savings)
9th Floor, Vidyuthi Bhavanam, Pattom, Thiruvananthapuram -
695004, Kerala
Phone: +91 471 2447404, 9446008607 Fax: 0471 2558340
E-mail: cerees@ksebl.in

By Registered post with A/D

LETTER OF AWARD

To

M/s INKEL LIMITED
7/473 2A-5 & 6, Ajiyal Complex, Post Office Road
Kakkanad, Cochin-682030

W.O No.	08/2018-19
Date	02.02.2019
Order type	72 kWp Grid tied rooftop solar PV plant at 3 rooftop locations of Building owned by LSGD- Grama Panchayath Muttill, Thavinjal & District Hospital Mananthavady
Reference file	CE (REES)/ESCOT/AEE S/ E Tender/11- 2018- 19
e-Tender No	E TENDER No. KSEBL/REES/LSGD- WAYANAD /11/2018-19/ dated 04.12.2018 and Tender ID: 2018_KSEB_253261_1
Value	INR 50, 80, 000/- (Rupees Fifty Lakh and Eighty Thousand only)
Price	Fixed

Sir,

Sub Appointment of Engineering, Procurement and Construction (EPC) Contractor for the design as per site conditions, supply, installation, testing and commissioning of Grid Tied Rooftop Solar PV Power plants on the roof of buildings owned by LSGD, Wayanad (Grama Panchayath, Muttill, District Hospital Mananthavady & Grama Panchayath, Thavinjal) with a total installed capacity of 72 kWp in 3 locations, including Operation & Maintenance of the plant for the first 5 years from the date of handing over - Award of contract - reg.

- Ref**
- 1 B.O.(FTD)No.526/2017-CE(REES)/General/2016-17TVM dated 02.03.17
 - 2 B.O.(CMD)No.842/2017-CE(REES)/General/2016-17TVM dated 30.03.17
 - 3 B.O.(FTD)No.2053/2017-KSEBL/CE(REES)/2017-18 TVM dated 09.08.17
 - 4 This office TENDER No. KSEBL/REES/LSGD- WAYANAD/11/2018-19/ dated 04.12. and Tender ID: 2018_KSEB_253261_1 and its addendums.
 - 5 Letter No. INKEL/Solar/CEREES-T1-11/001 dated 22.01.2019 of Assistant General Manager, M/s. Inkel Limited
 - 6 Remarks of FA on the price bid dated 29.01.2019

The subject work is awarded to you at a contract value of INR 50, 80,000/- (Rupees Fifty Lakh and Eighty Thousand only) inclusive of all taxes and duties. You shall carryout and complete the work as per the time schedule as contained in clause 2.2.4 and 5.3.2 of tender document Volume 1. Two copies of this order are included herewith. The duplicate of this order shall be returned to this office within seven days after affixing your seal and signature on all pages as a token of acceptance.

This contract will be governed by the terms and conditions as contained in tender document volume-I, II and III and addendums issued in this respect by the tendering authority. This Letter of Award (LOA), tender documents will form part of the contract agreement. Additional conditions/modifications if any stated in your offer or elsewhere, which are not agreed to by KSEBL or not in accordance with any of the provisions covered by the bid documents referred shall stand withdrawn/nullified.

1. Scope of work:

The subject work shall be considered as a composite supply. The scope of work will be governed by clause 2.2.3 of tender document Volume-1 and addendum's issued in this respect.

Sl. No	Location of the project	Capacity of the proposed plant (kWp)
1	Grama Panchayath office, Muttill	43
2	District Hospital, Mananthavady	17
3	Grama Panchayath Office, Thavinjal	12

2. Name of the Project:

Appointment of Engineering, Procurement and Construction (EPC) Contractor for the design as per site conditions, supply, installation, testing and commissioning of Grid Tied Rooftop Solar PV Power plants on buildings owned by LSGD, Wayanad (Grama Panchayath, Muttill, District Hospital Mananthavady & Grama Panchayath, Thavinjal) with a total installed capacity of 72 kWp in 3 locations, including Operation & Maintenance of the plant for the first 5 years from the date of handing over where performance ratio of each location shall be 75 - 80% as detailed in the Clause 2.2.3 of Tender document Volume-1 and addendum's issued in this respect, herein after called "the project".

3. Contract amount:

The Total Contract Amount is INR 50, 80,000/- (Rupees Fifty Lakh and Eighty Thousand only) inclusive of all taxes and duties for design, engineering, manufacturing, procurement, supply (including spares), handling storage, civil works, erection, installation, testing & commissioning, training of personnel, along with operation and maintenance charges of the project as all inclusive Price which include taxes, duties, Cess, freight and insurance charges, logistics, etc and all the levies payable by the contractor for successful completion, operation and maintenance of the Grid Tied Rooftop Solar PV Power plants on the Roof of buildings owned by LSGD, Wayanad (Grama Panchayath, Muttill, District Hospital Mananthavady & Grama Panchayath, Thavinjal) with a total installed capacity of 72 kWp in 3 locations including Operation & Maintenance of the plant for the first 5 years from the date of handing over where performance ratio of each location shall be 75 - 80% as detailed in the Clause 2.2.3 of Tender document Volume-1 and addendum's issued in this respect, as per the financial proposal submitted by you and as

detailed in the Price Schedule attached as Annexure 1.

Freight and Insurance charges for transportation of material/equipment to destination project site and up to complete installation and commissioning should be arranged by the contractor at their own cost. KSEBL will not entertain or bear any charge for the same.

Contract amount shall be governed as per provisions under Clause 4.1 of Volume 1 of the tender document. This amount shall be firm during the period of contract and shall not be varied or adjusted on whatsoever reason on any account.

4. Taxes & Duties:

The Contract Amount as indicated in clause 3 of this document is inclusive of all Taxes, Duties, incidental charges and other levies. Taxes & Duties will be governed by the clauses as detailed in clause 4.1, 5.9.1, 5.9.2, 5.9.3 of Volume 1 of the tender document. All Taxes and duties will be as per the latest orders of KSEBL and prevailing rules of State /Central Government. No separate claim on this behalf will be entertained and future claims on any taxes and duties will not be admitted and also all statutory recoveries will be deducted by K.S.E.B Ltd from the work bill. No future claims on unquoted taxes and duties will be allowed.

5. Insurance:

All equipment, machinery, works etc. which are furnished, installed, constructed and handed over/to be handed over to the KSEBL under this contract for the completion of project shall be Insured by the Contractor for the period of contract. It shall be the responsibility of the Contractor to maintain adequate insurance coverage at all times. Insurance will be governed by Clause 5.9.4 of Volume 1 of the tender document.

All the Personnel employed/engaged by the Contractor shall have adequate insurance coverage. Any claim due to mishap/accidents or otherwise to personnel/equipments, shall be taken up by the contractor, directly with the Insurance Company. KSEBL/ LSGD, Wayanad [Grama Panchayath, Mutil, District Hospital Mananthavady & Grama Panchayath, Thavinjal] will not have any liability in this respect whatsoever.

6. Work Completion Period and Date of Commissioning (CoD):

The Contractor shall complete the works in all respect within 6 months from the official date of commencement of work which shall be the date of Agreement or the date of handing over the site, even if not in full, but in a manner the work can be commenced and proceeded with in accordance with the programme of works, whichever is later. All the works stipulated under the scope of the Contract shall be completed in all respects, supplies made, services provided and final cleaning up done and required testing shall be completed and commissioned before the expiry of the Time of Completion thus worked out, unless the time of completion is postponed and period of completion is extended by a written letter from the Tripartite agreement Authority.

The date of completion/commissioning shall be the date on which the Solar plant is synchronized into KSEBL grid after obtaining clearances from all statutory bodies and after conducting necessary grid interfacing tests and measurements by the KSEBL are found satisfactory. The Engineer-in-Charge should issue a certificate including date of commissioning and an authorization certificate/commissioning report after successful synchronization, commissioning of the plant with the grid after proving the Performance ratio as detailed in clause 2.2.3 of tender document volume-1 and addendums issued in this respect.

7. Extension of Completion Date:

The contractor shall not claim any price escalation, in case the completion period is extended for any reason, including litigation or force majeure conditions and is governed by clause 5.3.6 of tender document Volume-1.

8. Liquidated Damage:

Liquidated Damage will be governed by the clause 5.3.9 of tender document Volume 1.

9. Execution of Agreement:

The Contractor shall execute three tripartite agreements in Kerala Government Stamp paper worth (1). Rs. 2940/- (Rupees Two Thousand Nine Hundred and Forty only) with Grama Panchayath, Muttill after furnishing a Bank Guarantee of Rs 2,94, 000/- (Indian Rupees Two Lakh and Ninety Four Thousand only; (2). Rs. 1310/- (Rupees One Thousand Three Hundred and Ten only) with District Hospital, Mananthavady after furnishing a Bank Guarantee of Rs.131000/- (Indian Rupees Five Lakh and Eight Thousand only) & Rs. 850/- Rupees Eight Hundred and Fifty only) with Grama Panchayath, Thavinjali; after furnishing a Bank Guarantee of Rs. 85, 000/- (Indian Rupees Eighty Five Thousand only) i.e. 10% of the Contract value with each of the three LSGD Wayanad rounded off to the higher multiple of Rs 1000/-, within 15 days from the date of issue of Letter of Award of contract, with the KSEBL and LSGD, Wayanad (Grama Panchayath, Muttill, District Hospital Mananthavady & Grama Panchayath, Thavinjali) as First and Second party respectively, as per the terms and conditions set forth in the Bid document. After execution of the tripartite agreement the successful bidder shall be known as 'EPC Integrator'. The tripartite agreement has to be executed by the contractor in the prescribed format in Form-B of Contract Tripartite agreement of this document, along with the performance security deposit at the Office of the Chief Engineer (Renewable Energy & Energy Savings), on a date and time to be mutually agreed. The contractor shall provide for signing of the contract, 2 additional copies of contract agreement, 2 copies of Bank Guarantee in lieu of Performance security deposit, appropriate power of Attorney and other requisite documents. All the documents cited in clause No. 30 of this document will form part of the agreement. Power of Attorney shall be in stamp paper attested by a registered Notary Public.

After handing over of the project LSGD, Wayanad (Grama Panchayath, Muttill, District Hospital Mananthavady & Grama Panchayath, Thavinjali), you shall execute Separate O&M Bilateral Agreements with the LSGD, Wayanad (Grama Panchayath, Muttill, District Hospital Mananthavady & Grama Panchayath, Thavinjali) as the first party.

10. Construction Programme:

Within 15 days from the date of award, the contractor shall submit to the KSEBL for approval, a programme showing the general method, arrangements, order and timing for all the activities involved in the work in a systematic manner based on planning technique and tool like PERT /CPM in MS (Projects) and GANTT chart indicating the critical events/paths and milestones.

The contractor shall carryout the works in accordance with this programme and as approved by KSEBL, and complete them in all respects to the full satisfaction of KSEBL. Any change to the approved work plan due to unavoidable circumstances shall be made only with the prior approval of KSEBL.

11. Terms of Payment:

The payment condition is governed by clause 5.2 of tender document volume-1 and addendum's issued in this respect.

a. The Contractor has to produce Bank Guarantee for an amount of 10% of the Contract amount as Performance Security Deposit at the time of executing Contract Agreement.

b. 30% of the contract value excluding O&M, will be released to the contractor as cost of major components of the plant (PV modules, Inverters and module mounting structures) after delivery of this materials at site, inspection and verification by authorized departmental officers, and production of insurance certificates for the materials delivered at site.(Refer clause 5.5.2 of tender document Volume-1). The Engineer-in -charge is to be informed about the delivery of material one week in advance by the contractor.

The Engineer in charge shall ensure the site acceptance / rejection of the received material at site within three days of delivery of material along with submitting the SAT procedure of the delivered material from the vendor by the contractor.

The invoices shall be submitted by the contractor as per the accepted price schedule which is to be verified and made ready for release of payment within 15 days of receipt of the invoices subject to the satisfaction of the above conditions.

c. 100% of the total Contract amount except Operation and Maintenance charges will be released after satisfactory completion, testing ,commissioning of the solar plant after proving the Performance ratio (AC) as per clause 2.2.3 of Tender document Volume-1 and addendum's issued in this respect. The contractor can submit the final Invoice as per the accepted price schedule within 10 days on proving the Performance ratio (AC) (as per Clause 2.2.3 of tender document Volume-1 and addendum's issued in this respect) after completing the project within 06 months.

The invoices shall be verified and final payment may be released within 3 months of receipt of the invoices subject to the satisfaction of the above conditions.

d. The Operation & Maintenance charges will be released at the end of each year by LSGD, Wayanad (Grama Panchayath, Muttill, District Hospital Mananthavady & Grama Panchayath, Thavinjal), after commissioning and demonstration of the specified Performance ratio (AC) as per clause 2.2.3 of Tender document Volume-1 and addendum's issued in this respect, at the end of each year during O&M period (5 years).

e. The performance security amount shall also be released in equal installments each year (O&M period) from the date of handing over the project after demonstrating the specified Performance ratio (AC)(as per Clause 2.2.3 of Tender document Volume-1 and addendum's issued in this respect).

f. The Quoted taxes and duties etc as Governed by GST will be released subject to an undertaking from the Contractor in Kerala Government Stamp paper that "If any dispute in payment of taxes and duties etc as Governed by GST from concerned Tax authorities occurs in future, the Contractor shall indemnify LSGD, Wayanad (Grama Panchayath, Muttill, District Hospital Mananthavady & Grama Panchayath, Thavinjal) from such liabilities and the Contractor shall be liable for the additions, loss or cost on account of such discrepancies / dispute".

12. Advance Payment:

No amount shall be released as mobilisation advance.

13. Performance security deposit:

The performance security deposit is governed by clause 5.1.7 of Tender document volume-1.

The Contractor shall submit Performance security deposit as Bank Guarantee at the time of execution of tripartite agreement in the prescribed format (Annexure 5) for performance security of the Contract and it shall be an amount equal to 10% of the total

Contract amount rounded off to the higher multiple of Rs 1000/- i.e. INR 508000/- (Indian Rupees Five Lakh and Eight Thousand only).

In order to cover the liabilities under the contract and to ensure sufficient guarantee to cover all possible liabilities pertaining to defects, shortfalls, remedial measures arising out of poor workmanship, materials, loss, excess amount, risk and cost of Contractor in case of alternate arrangements and any type of dues to the LSGD, Wayanad (Grama Panchayath, Muttill, District Hospital Mananthavady & Grama Panchayath, Thavinjal), an amount as prescribed by KSEBL shall be collected and retained from the Contractor towards Performance Security for the Contract.

The Bank Guarantee shall be initially valid from the date of agreement for a period of 2 years and be kept renewed from time to time till the end of defect liability period including O&M. The performance security B.G will be released in equal installments each year after demonstration of desired performance ratio (AC) (as per clause 2.2.3 of tender document vol-1 and addendum's issued in this respect) during the defect liability period. The performance ratio (AC) (as per Clause 2.2.3 of tender document vol-1 and addendum's issued in this respect) will be calculated based on data from pyranometer / Meteonorm/Pyreheliometer data. Failure of the successful bidder to submit the required Performance EMD Guarantee shall constitute sufficient grounds for termination of Contract & forfeiting the EMD.

No interest will be paid by KSEBL at any stage of contract on the Performance Security.

The performance ratio(AC)(as per Clause 2.2.3 of tender document vol-1 and addendum's issued in this respect) can be checked at any time in between if deemed necessary by the Engineer in charge (as per clause 2.2.3 of tender document Volume-1 and addendum's issued in this respect). If any unusual degradation is noticed in the PR the contractor shall attend and rectify the same within 24 hours on intimation. If not the performance security deposit will be forfeited.

14. Payment Authority and Engineer-in-Charge:

Engineer in Charge - Engineer authorized by Chief Engineer (Renewable Energy & Energy Savings). The Engineer-in Charge may delegate powers to subordinate officers in respect of execution of work such as Site supervision of Electrical works and arrangements for interconnection facility, Technical support and civil supervision.

The work shall be treated completed only when the Engineer-in charge issues certificate of completion where the actual date of completion of work will be mentioned. In case of termination or foreclosure the Engineer- In -charge will issue the certificate of completion to that effect. If the contractor fails to complete any part of the work as required for satisfactory completion before taking over and / or the date of completion specified, and fails to remove the surplus materials, the KSEBL will complete the works and remove the surplus materials etc and the amount incurred for the same will be realized from the contractor from any amount due to him from this work or any other work with KSEBL or his assets in appropriate proceedings. The contractor will not have any claim over the surplus materials so removed by the KSEBL.

The contractor shall submit bills in Triplicate to the Engineer In Charge with all supporting documents as indicated in the relevant clauses of volume 1 of the bid document.

15. Manufacturing Schedule:

Contractor shall specify all basic design details, including details of the PV modules and the

support structures, inverters, cables, online monitoring, integration and power evacuation details with existing power system, with appropriate diagram and drawings. The drawings along with detailed structure design and material selected as per the relevant standards, All guaranteed technical particulars, details of each items, make, model number and specification conforming to relevant standards, entire drawings, detailed test reports, list of O & M spares for major materials, detailed Bill of materials and Priced Bill of Quantities in respect of materials/equipments and works for the entire Project shall be submitted within 15 days of receipt of this LoA.

All materials and equipments required for successful completion and commissioning of the project must be included. The design details and other accessories should adhere to and match with the technical specification provided in the volume III of the tender document and as per the Guaranteed Technical Particulars offered by you.

The Contractor shall submit all the appropriate diagram and drawings to the agreement authority for approval. Also specifications of major items such as PV modules, inverters etc shall be submitted to the Agreement authority for approval. Approvals for Layout of Power Plant Installation shall be provided by the Engineer- in- Charge prior to the submission of all the drawings.

Energy meter provided for the Installation of the solar PV plant shall be in accordance with the regulations and technical specifications of KSEBL.

For the goods supplied from outside the purchaser's country, the supplier shall be entirely responsible for all taxes, duties, stamp duties, license fees, and other such levies imposed outside the purchaser's country.

The contractor shall provide all MAFs (Manufacturer's Authorization Forms) for all the components specified in the bid within 15 days and before executing the Contract Agreement.

16. Drawings and documents

The design documents to be submitted by the contractor will include but not limited to:

- I. DC cable size calculation
- II. DC cable specification
- III. DC cable schedule, voltage drop and power loss calculation
- IV. String monitoring unit specification
- V. DC earthing & pit calculation
- VI. Lightning protection details/specification
- VII. All technical specification of AC components
- VIII. Cable schedules

Contractor shall furnish the following drawings under this contract and has to obtain approvals.

- a. Shadow analysis of the roof
- b. General arrangement and dimensional layout
- c. Schematic drawing showing the SPV panels, Power conditioning Unit(s)/ inverter, Junction Boxes, AC and DC Distribution Boards, meters etc.
- d. Layout of solar PV Array and Single line diagram.
- e. Mounting structure drawing

- f. Structural drawing along with foundation details for the structure.
- g. Location specific Itemized bill of material for complete SPV plant covering all the components and associated accessories.
- h. Sizes and specification of cables between array interconnections, array to junction boxes, junction boxes to inverter etc. shall be furnished
- i. PVSyst simulation report of the combination offered PV modules with the offered inverters shall be furnished to the agreement authority for approval

The drawings along with detailed structure design and material selected and their standards shall be submitted to agreement authority for approval before starting the execution work. The work will be carried out as per the approved design.

The contractor shall provide necessary drawings and documents required by statutory authorities and obtain the approval before taking up erection.

17. Quality Assurance:

Strict compliance with the approved and proven & established quality assurance systems and procedures during the different stages of the project starting from sizing, selection of make, storage (at site), during erection, testing and commissioning have to be ensured by the contractor.

PV modules should have valid qualification test (as per SIC) certificate as per IEC 61215 and IEC 61730 -1&2 and IEC 61701. The power conditioning units / inverters should comply with applicable IEC/ equivalent BIS standard for efficiency measurements and environmental tests, safety standards and characteristics of the utility interface (Parallel operation) as per standard codes IEC 61683 and IEC 60068 2(1,2,14,30) and IEC 62109-1&2 and IEC 61727 respectively. Inverter shall be provided with protection against islanding of Grid as per IEEE 1547/UL1741/62116 to isolate it from the grid in case of no supply, under voltage and over voltage conditions so that in no case there is any chance of accident. The module mounting structure shall be as per latest BIS 2062 and galvanization of mounting structure shall be in compliance of BIS 4759 (amended up to date)/IS2629.

The type test certificates shall be verified by KSEBL while conducting factory inspection tests. The contractor shall furnish detailed quality procedures for the major components for approval prior to the Factory inspection call. The agreement authority will provide the approvals regarding the test to be conducted during the inspection.

The following minimum tests shall be conducted on the required number of samples as is required by the engineer-in-charge, during the Factory inspection:

For PV modules:

1. Visual inspection
2. Dimensional Check
3. Insulation Resistance
4. Leakage Current
5. Electrical Test(with sun simulator)
6. RFID verification
7. Electro luminous tests
8. Robustness of termination

For Inverters:

1. Visual inspection
2. Dimensional and Power Wiring Check.
3. Auxiliary functional check.
4. Fan direction of rotation, On-Off control, etc
5. Functionality test of relays
6. Command checks.
7. Protection function checks.
8. AC under voltage, AC over voltage, AC under frequency, AC over frequency
9. Load tests simulation 25%, 50%, 70% and 100%
10. Load test performed at variable MPPT voltage @100% load on the specified voltage range.
11. Over temperature, ground fault simulation

For Isolation transformer:

1. Visual inspection
2. Routine test as per IS-2026/ IEC 60601-1/IEC 61558-1

For Module mounting structures:

1. Visual inspection
2. Dimensional Inspection
3. Functional fitments

The contractor shall submit letters of inspection calls sufficiently in advance specifying the date and venue of inspection to the agreement authority through Engineer-in-Charge. All the major components should undergo factory inspection tests.

The agreement authority shall arrange inspection of material/ equipment and upon satisfactory completion of the inspection and tests, the Material Despatch Clearance Certificate will be issued.

The test and inspection shall be done in accordance with the relevant standards and the Manufacturer's standard before the delivery to site as well as after the erection and commission at site.

All acceptance and routine tests of equipment as per the specification and relevant standards shall be carried out by the contractor. Agreement authority or authorized officials may undertake the quality checks during the manufacturing stages also.

Functional testing and erection of equipments shall be carried out by the contractor in presence of KSEBL officers delegated by the Engineer-in-Charge and the approvals will be given only if the same is satisfactory.

Engineer-in-Charge shall conduct visual inspection including dimensional checks, verification of serial numbers, RFID reading of PV modules etc for the Site Acceptance of the delivered materials based on the BOM. Any materials or work found to be defective or which does not meet the requirements of the specification will be rejected and shall be replaced at contractor's cost.

18. Review and Progress report:

The contractor shall submit monthly progress report to Engineer-in-Charge and all concerned personnel in connection with this order, with a copy to this office.

The Engineer-in-Charge will co-ordinate and monitor all activities of the project. These progress report formats may be changed as and when required by KSEBL.

The contractor shall produce an updated Activity Schedule within 14 days of being instructed by the KSEBL.

19. Technical parameters for getting grid connectivity:

- a. Harmonic current injections from a plant shall not exceed the limits specified in IEEE 519 2014 as per CEA technical standard for connectivity of the distributed generation resources.

Individual voltage harmonics distortion	< 3 %
Total voltage Distortion THD	< 5%
Total Current harmonic Distortion	<8%
Output frequency	= 50Hz +/- 0.5Hz

- b. Photovoltaic system should not inject DC power more than 0.5% of full rated output at the interconnection point or 1% of rated inverter output current into distribution system under any operating conditions
- c. Operation of Photovoltaic system shouldn't cause voltage flicker in excess of the limits stated in IEC 61000 or other equivalent Indian standards, if any
- d. While the output of the inverter is greater than 50%, a lagging power factor of greater than 0.9 shall be maintained.
- e. The Photovoltaic system in the event of voltage or frequency variations must Island/disconnect itself within IEC standard on stipulated period.
- f. The voltage-operating window should minimize nuisance tripping and should be under operating range of 80% to 110% of the nominal connected voltage beyond a clearing time of 2 seconds, the Photovoltaic system must isolate itself from the grid.
- g. When the Distribution system frequency deviates outside the specified conditions (50.5 Hz on upper side and 47.5 Hz on lower side up to 0.2 sec), the Photovoltaic system shouldn't energize the grid.

20. Testing and Commissioning:

Commissioning test with all required testing shall be conducted by the contractor in presence of KSEBL officers delegated by the Engineer-in-Charge/authorized person of LSGD (District Panchayath Kottayam, Kollam & Altingal Municipality).

The contractor shall also prepare and handover the as-built drawing, Operational manuals and Maintenance manuals of the plant and handed over to KSEBL.

On completion of all works stipulated in the scope of work and after testing and commissioning of the Project, and if there are no obligations to arise out of the Contract, KSEBL shall issue a completion certificate as described under Clause 5.3.3 of Tender document Volume 1.

21. Operation and Maintenance (O&M):

Operation and Maintenance is governed by clause 6.9 of tender document volume-1. Operation and maintenance of the solar plant up to the point of supply for a period of 5 years of Defects Liability period is the responsibility of the Contractor.

Operation and Maintenance during this period shall include supply of spares of panels, inverters and all equipments in the solar plant including transportation of these items from the original manufacturer, consumables, general comprehensive Insurance covering fire, earthquake.

The solar plant should be maintained shadow free. The tree branches if any causing hindrance to the shadow free operation of solar plant shall be cut and removed under the supervision of LSGD, Wayanad (Grama Panchayath, Muttill, District Hospital Mananthavady & Grama Panchayath and Thavinjal). Copies of the Insurance Policies are to be given to LSGD, Wayanad (Grama Panchayath, Muttill, District Hospital Mananthavady & Grama Panchayath, Thavinjal) as and when taken.

The contractor shall ensure efficient operation of the SPV plant and the associated facilities to achieve the maximum power generation from the plant. For this purpose the contractor shall engage the services of adequate number of Engineers and Technicians trained under "Suryamitra" Skill Development Programme of MNRE. The contractor shall also attend to all failures, rectifications, breakdowns, 5 year comprehensive Operation and Maintenance checks.

Adequate training should be given to personnel identified by the LSGD, Wayanad (Grama Panchayath, Muttill, District Hospital Mananthavady & Grama Panchayath, Thavinjal) for Daily Monitoring Information like solar energy generated, net meter readings etc. Monthly System (MIS) reports with generation and down time analysis data has to be sent to LSGD, Wayanad (Grama Panchayath, Muttill, District Hospital Mananthavady & Grama Panchayath, Thavinjal) Corporate offices by E-mail during the defect liability period. Any discrepancy/malfunctioning noted shall be immediately attended to and got rectified by the contractor.

The contractor should not misuse the land and assign responsibility for the safety of machinery within the premises.

22. Annual Maintenance Contract (AMC):

The plant shall then be handed over to the LSGD, Wayanad (Grama Panchayath, Muttill, District Hospital Mananthavady & Grama Panchayath, Thavinjal) at the end of 5 years for O&M. After five years from the date of commissioning, the EPC contractor may be asked to execute the AMC for another 5 years on mutual agreement at mutually agreed price.

The EPC contractor shall execute the AMC agreement as per conditions stipulated at that time.

23. Performance & Warranty:

The mechanical structures, electrical works and overall workmanship of the solar power plant must be warranted for a minimum of 10 years. PV modules used in solar power plant must be warranted for output wattage, which should not be less than 90% at the end of 10 years and 80% at the end of 25 years.

EPC contractor shall ensure the performance ratio of each location as detailed in the Clause 2.2.3 of Tender document Volume-1 and addendum's issued in this respect.

24. Generation Assessment

The performance ratio (AC) of each location shall range from 75- 80% as per clause 2.2.3 of Tender document Volume-1 and addendum's issued in this respect. Performance ratio test as per IEC 61724 will be carried out at site jointly by the EPC contractor in presence of authorized officials from KSEBL and LSGD, Wayanad (Grama Panchayath, Muttill, District Hospital Mananthavady & Grama Panchayath, Thavinjal). This is mandatory for commissioning and handing over the plant. If the contractor fails to prove the desired performance ratio at the time of completion and during any of the consecutive years of defect liability period he will be given a

second chance to demonstrate the PR in another 7 days. Still if it is not achieved, the same shall be demonstrated in another 7 days and still if it is not achieved, EPC contractor shall enhance the module capacity of solar plant/improve the quality of the plant by replacement of module/other components with all suitable modification requirements on balance of systems at his own cost to achieve the performance ratio.

Operation and maintenance charges shall be released at the end of each year based on the Performance ratio (AC) as mentioned above, as per the table given below.

Sl.No	Particulars	Performance ratio(AC) in %
1	At the time of completion and commissioning	75-80
2	At the end of 1 st year	74-79
3	At the end of 2 nd year	73-78
4	At the end of 3 rd year	72-77
5	At the end of 4 th year	71-76
6	At the end of 5 th year	70-75

25. Handing over:

After the date of successful commissioning the Contractor shall hand over the complete system to the LSGD, Wayanad (Grama Panchayath, Muttill, District Hospital Mananthavady & Grama Panchayath, Thavinjal) as specified in the tender within 15 days. Any component found defective/inefficient/worn out shall be rectified/ replaced/ made good at contractor's cost before handing over the system to the LSGD (District Panchayath Kottayam, Kollam & Attingal Municipality) authorities. In order to ensure longevity & safety of the core equipment and optimum performance of the system the Contractor should use only genuine spares of high quality standards. Contractor has to maintain the rooftop SPV plant till the end of the contract period of five years from the date of handing over.

The contractor shall provide the name list of essential tools and spares required for the future operation and maintenance of the plant.

26. Termination of Contract:

Termination of Contract will be guided strictly in accordance with clause 5.3.11 of the tender document volume 1.

27. Force Majeure:

Force Majeure shall be governed by Clause.5.3.8 of the tender document volume 1.

28. Defects Liability Period:

The Defect Liability Period shall be governed by Clause.5.3.4 of the tender document volume 1.

29. Law and Jurisdiction:

This contract has to be performed complying with the laws of India and Kerala and any dispute arising out of this contract will be subject to the exclusive jurisdiction of Civil Courts at Thiruvananthapuram.

30 Contract Documents.

1. Agreement executed in Kerala Government Stamp Paper
2. Letter of Award (duly signed and seal affixed on all pages)
3. Correspondences between the KSEBL and the selected bidder included in the Agreement.
4. Special Conditions of Contract.
5. General Conditions of Contract.
6. Technical specifications.
7. Accepted Schedule of Technical Particulars and construction programme & Manufacturer Authorization form of Components.
8. Accepted Schedule of Prices
9. General Bid conditions
10. Instructions to bidders.
11. Information to bidders.
12. Detailed Structural Drawings including approved drawing issued from time to time.
13. All volumes of bid with **TENDER No. KSEBL/REES/LSGD- WAYANAD/11/2018-19/ dated 04.12.2018 and Tender ID: 2018_KSEB_253261_1** and its Addendums along with clarifications and related documents issued by the Tendering Authority.
14. Response (proposal) of M/s INKEL Limited, Door No. 7/4732A-5 & 6, IInd Floor, Ajiyal Complex, Post Office Road, Kakkanad, Cochin- 682030, including the Bid, Clarification documents and the accepted rate submitted.

31. Acknowledgment by the Contractor:

This Letter of Award is issued subject to the documents referred above and terms and conditions contained therein. You will also be deemed to be fully aware of KSEBL's **General conditions of contract** which is applicable to this contract also and ignorance of these conditions will not exempt you from your liability to abide by the same.

If there is any contradiction/conflict between the tender documents and LoA, conditions in the LoA will prevail.

The documents specified in Cl 10 and 15 shall be submitted within 25 days from the date of issue of this LoA


Chief Engineer

(Renewable Energy & Energy Savings)

Acc:-

1. Annexure 1: Price schedule
2. Annexure 2: Contract Forms
 - A. Performance Security deposit BG
 - B. Form of contract agreement
3. Annexure 3: Copy of LoA


Asst. Engg





Copy to:-

1. **The Secretary K.S.E.B Ltd, Thiruvananthapuram.**
2. **The LA and DEO K.S.E.B Ltd, Thiruvananthapuram.**
3. **The Financial Advisor, KSEBL.**
4. **Deputy Chief Engineer, Electrical Circle-Kozhikode & Vadakara**
5. **TA to The Chairman & Managing Director, KSEBL, Thiruvananthapuram/**
6. **TA to Director (Distribution & IT.)/Director (Tm & Sys. Operation)/
Director(Corp.Plg.Gen(Ele).SCM&Safety)/Director(GenerationCivil&HRM)**
7. **PA to The Director (Finance)**
8. **Sr.CA to Chief Vigilance Officer**
9. **The Main Income Tax Officer, Thiruvananthapuram, Kerala.**
10. **The Accountant General, Thiruvananthapuram, Kerala**
11. **Secretary, District Panchayath Kozhikode**
12. **Stock file**

Annexure: 1 - Total Price Schedule

Appointment of EPC contractor for the design as per site conditions, erection, testing & commissioning of Grid Tied Rooftop Solar PV Power plants, on the Roof of buildings owned by LSGD, Wayanad (Grama Panchayath, Muttill, District Hospital Mananthavady & Grama Panchayath, Thavinjal) with a total installed capacity of 72 kWp in 3 locations including Operation & Maintenance of the plant for the first 5 years from the date of handing over

Sl No	Item Description	Quantity	Unit	Basic rate	Freight charges	Insurance	GST	Any other applicable tax	Total amount without tax	Total amount with tax
1	Total Price for the 72 kWp roof top solar power plant in 3 locations on turnkey basis on the buildings of LSGD, Wayanad (Grama Panchayath, Muttill, District Hospital Mananthavady & Grama Panchayath, Thavinjal), for the Design as per site condition, Supply of all materials, Construction, Erection, testing and commissioning work of the Solar plant, and also includes Purchase, Testing and installation of meters (Net meter & Solar meter), providing online data from all locations, Application and Registration fee and all related works for connectivity, Statutory Inspection & Testing, Additional work/ Cabling for Power Evacuation and works related with Single Phase to Three phase Conversion and installation of power evacuation transformers required in necessary locations.	01	Set	4456000	0	0	222800	0	4456000	4678800

Sl No	Item Description	Quantity	Unit	Basic rate	Freight charges	Insurance	GST	Any other applicable tax	Total amount without tax	Total amount with tax
2	Total price for Operation and Maintenance IO & Mt charges of the Solar Photovoltaic Power Plant for a period of 5 year including arrangement of cost of replacement of all the defective parts, consumables, tools, tackles, testing equipments & instruments, manpower, all administrative work, maintenance of records and submissions to all concerned authorities for the 72 kWp Grid tied rooftop Solar PV plant in 3 locations of buildings owned by LSGD, Wyanad (Grama Panchayath, Muttal, District Hospital Mamanthavady & Grama Panchayath, Thavirijal) including all taxes as per GST, covered under Guarantee period for a period of 5 years from the date of Handing over.									
	O&M charge for 1 st year	01	Set	600000			108000		600000	708000
	O&M charge for 2 nd year	01	Set	600000			108000		600000	708000
	O&M charge for 3 rd year	01	Set	600000			108000		600000	708000
	O&M charge for 4 th year	01	Set	800000			144000		800000	944000
	O&M charge for 5 th year	01	Set	800000			144000		800000	944000
	Total O&M for 5 years			3400000			612000		3400000	4012000
	Total of Item 1 & 2			4796000			284000		4796000	5080000

(Rupees Fifty Lakh and Eighty Thousand only)

[Renewable Energy & Energy Savings]

Chief Engineer



Annexure: 1 (a) - Price Schedule for Muttill Grama Panchayath

Appointment of EPC contractor for the design as per site conditions, erection, testing & commissioning of Grid Tied Rooftop Solar PV Power plants, on the Roof of buildings owned by LSGD - Wayanad - Muttill Grama with a total installed capacity of 43kWp in 1 location including Operation & Maintenance of the plant for the first 5 years from the date of handing over

Sl No	Item Description	Quantity	Unit	Basic rate	Freight charges	Insurance	GST	Any other applicable tax	Total amount without tax	Total amount with tax
1	Total Price for the 43kWp roof top solar power plant in 1 location on turnkey basis on the buildings of LSGD -Wayanad - Grama Panchayath, Muttill for the Design as per site condition, Supply of all materials, Construction, Erection, testing and commissioning work of the Solar plant, and also includes Purchase, Testing and installation of meters (Net meter & Solar meter), providing online data from all locations, Application and Registration fee and all related works for connectivity, Statutory Inspection & Testing, Additional work/ Cabling for Power Evacuation and works related with Single Phase to Three phase Conversion and installation of power evacuation transformers required in necessary locations .	1	Set	7580000			129000		2580000	2709000

Sl No	Item Description	Quantity	Unit	Basic rate	Freight charges	Insurance	GST	Any other applicable tax	Total amount without tax	Total amount with tax
2	Total price for Operation and Maintenance (O & M) charges of the Solar Photovoltaic Power Plant for a period of 5 year including arrangement of cost of replacement of all the defective parts, consumables, tools, tackles, testing equipments & instruments, manpower, all administrative work, maintenance of records and submissions to all concerned authorities for the 43 KWP Grid tied rooftop Solar PV plant in 1 location of buildings owned by LSGD Wavered- Grama Panchayath Mulhal including all taxes at per GST, covered under Guarantee period for a period of 5 years from the date of handing over.									
	O&M charge for 1 st year	01	Set	30000			5400		30000	35400
	O&M charge for 2 nd year	01	Set	30000			5400		30000	35400
	O&M charge for 3 rd year	01	Set	30000			5400		30000	35400
	O&M charge for 4 th year	01	Set	50000			9000		50000	59000
	O&M charge for 5 th year	01	Set	50000			9000		50000	59000
	Total O&M for 5 years			190000			34200		190000	224200
	Total of item 1 & 2			2770000			163200		2770000	2933200

(Rupees Twenty Nine Lakh Thirty Three Thousand and Two Hundred only)

Chief Engineer
(Renewable Energy & Energy Savings)

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Annexure: 1 (b) - Price Schedule for District Hospital, Mananthavady

Appointment of EPC contractor for the design as per site conditions, erection, testing & commissioning of Grid Tied Rooftop Solar PV Power plants, on the Roof of buildings owned by LSGD - Wayanad - District Hospital Mananthavady with a total installed capacity of 17 kWp in 1 location including Operation & Maintenance of the plant for the first 5 years from the date of handing over

Sl No	Item Description	Quantity	Unit	Basic rate	Freight charges	Insurance	GST	Any other applicable tax	Total amount without tax	Total amount with tax
1	Total Price for the 17kWp roof top solar power plant in 1 location on turnkey basis on the buildings of LSGD -Wayanad - District Hospital, Mananthavady for the Design as per site condition, Supply of all materials, Construction, Erection, testing and commissioning work of the Solar plant, and also includes Purchase, Testing and installation of meters (Net meter & Solar meter), providing online data from all locations, Application and Registration fee and all related works for connectivity, Statutory Inspection & Testing, Additional work/ Cabling for Power Evacuation and works related with Single Phase to Three phase Conversion and installation of power evacuation transformers required in necessary locations .	1	Set	1156000			57800		1156000	1213800

Sl No	Item Description	Quantity	Unit	Basic rate	Freight charges	Insurance	GST	Any other applicable tax	Total amount without tax	Total amount with tax
2	Total price for Operation and Maintenance (O & M) charges of the Solar Photovoltaic Power Plant for a period of 5 year including arrangement of cost of replacement of all the defective parts, consumables, tools, tackles, testing equipments & instruments, manpower, all administrative work, maintenance of records and submissions to all concerned authorities for the 17 kWp Grid tied rooftop Solar PV plant in 1 location of buildings owned by LSGD Wavunad District Hospital Mananthavady including all taxes as per GST, covered under Guarantee period for a period of 5 years from the date of handing over.									
	O&M charge for 1 st year	01	Set	15000			2700		15000	17700
	O&M charge for 2 nd year	01	Set	15000			2700		15000	17700
	O&M charge for 3 rd year	01	Set	15000			2700		15000	17700
	O&M charge for 4 th year	01	Set	15000			2700		15000	17700
	O&M charge for 5 th year	01	Set	15000			2700		15000	17700
	Total O&M for 5 years			75000			13500		75000	88500
	Total of Item 1 & 2			1231000			71300		1231000	1302300
(Rupees Thirteen Lakh Two Thousand and Three Hundred only)										

Chief Engineer
(Renewable Energy & Energy Savings)

Annexure: 1 (c) - Price Schedule for Grama Panchayath, Thavinjal

Appointment of EPC contractor for the design as per site conditions, erection, testing & commissioning of Grid Tied Rooftop Solar PV Power plants, on the Roof of buildings owned by LSGD – Wayanad – Grama Panchayath Thavinjal with a total installed capacity of 12kWp in 1 location Including Operation & Maintenance of the plant for the first 5 years from the date of handing over

Sl No	Item Description	Quantity	Unit	Basic rate	Freight charges	Insurance	GST	Any other applicable tax	Total amount without tax	Total amount with tax
1	Total Price for the 12kWp roof top solar power plant in 1 location on turnkey basis on the buildings of LSGD –Wayanad – Grama Panchayath, Thavinjal for the Design as per site condition, Supply of all materials, Construction, Erection, testing and commissioning work of the Solar plant, and also includes Purchase, Testing and installation of meters (Net meter & Solar meter), providing online data from all locations, Application and Registration fee and all related works for connectivity, Statutory Inspection & Testing, Additional work/ Cabling for Power Evacuation and works related with Single Phase to Three phase Conversion and installation of power evacuation transformers required in necessary locations.	1	Set	720000			36000		720000	756000

Sl No	Item Description	Quantity	Unit	Basic rate	Freight charges	Insurance	GST	Any other applicable tax	Total amount without tax	Total amount with tax
2	Total price for Operation and Maintenance (O & M) charges of the Solar Photovoltaic Power Plant for a period of 5 year including arrangement of cost of replacement of all the defective parts, consumables, tools, tackles, testing equipments & instruments, manpower, all administrative work, maintenance of records and submissions to all concerned authorities for the 12 kWp Grid tied rooftop Solar PV plant in 1 location of buildings owned by USGD Wayanad- Grama Panchayath, Thavanimal including all taxes as per GST, covered under Guarantee period for a period of 5 years from the date of handing over.									
	O&M charge for 1 st year	01	Set	15000			2700		15000	17700
	O&M charge for 2 nd year	01	Set	15000			2700		15000	17700
	O&M charge for 3 rd year	01	Set	15000			2700		15000	17700
	O&M charge for 4 th year	01	Set	15000			2700		15000	17700
	O&M charge for 5 th year	01	Set	15000			2700		15000	17700
	Total O&M for 5 years			75000			13500		75000	88500
	Total of item 1 & 2			795000			49500		795000	844500
{Rupees Eight Lakh Forty Four Thousand and Five Hundred only}										

Chief Engineer

(Renewable Energy & Energy Savings)



Government of Kerala
Department of Electrical Inspectorate
Office of the District Electrical Inspector
 Emily Road, Kalpetta, Wayanad, Pin-673 121
 Phone: 04936 295004. Email: eiwayanad@gmail.com



An ISO 15700 : 2005 Certified Department

PROCEEDINGS OF THE ELECTRICAL DEPUTY INSPECTOR IN-CHARGE, WAYANAD (Present: George Philip)

Sub: Installation of 12.54 kWp solar panel at the premises of M/s Thavinjal Grama Panchayath, Thalapuzha (Po), Wayanad Sanction for Energisation - Order issued

Read:

1. Completion report submitted by M/s First Law (CB 7161) on 30-09-2019
2. Inspection dated 10-10-2019.
3. Defect communicated vide letter No: B-902/19/ EIW dated 11-10-2019.
4. Compliance report submitted by M/s First Law (CB 7161) vide letter No: Nil dated 16-10-2019.

ORDER NO: B1-902/ 19/ EIW dt 18-10-2019

Sanction under Section 54 of The Electricity Act 2003 and Regulation 32 of Central Electricity Authority (Measures relating to Safety and Electric Supply) Regulations 2010 is hereby accorded for energisation of the electrical installation covered under the Completion Report read as 2nd above and installed at the premises of M/s Thavinjal Grama Panchayath, Thalapuzha (Po), Wayanad with the following specifications, subject to the conditions mentioned there under.

SPECIFICATIONS

Solar inverter

Make :	Delta	Model :	RPM-M 15 A
SL No :	04718A00750 WC	DC Input Volt :	200-1000 VDC
MPPT :	355-800 VDC	Output :	230/ 400 VAC
Solar inverter :	15 kVA		

Load : 6.28 kW

Earth electrodes : 2 Nos

Switches :

KSEBI side : 63 A

MSB : 136 A

Solar meter : 32 A

Total switches : 231 A

CONDITIONS

1. The whole installation shall be maintained in conformity with Central Electricity Authority (Technical standards for connectivity of the distributed generation resources) Regulation , 2013 and Kerala State Electricity Regulatory Commission (Grid interactive distributed solar energy system) Regulation , 2014.
2. Power allocation for additional loads, if necessary, should be obtained from the KSEB.

3. Any addition or alteration to the existing installation shall be carried out only after getting prior written sanction from this office.
4. The owner should rectify any defects that may be pointed out during subsequent inspection of the installation.
5. Date of energisation should be intimated to this office.
6. The maintenance of all major equipments should be carried out periodically as prescribed by the manufacturer and as per Indian Standard specifications and a register shall be maintained for recording maintenance activity and periodic checking. The register shall be kept up to date and submitted for perusal during periodical inspection.
7. The whole installation shall be operated and maintained in a condition free of any danger and as prescribed under the Regulation 13(4) of Central Electricity Authority (Measures relating to Safety and Electric Supply) Regulations 2010.
8. All the pre-commissioning tests shall be recorded for ready reference.
9. Only authorized persons shall be in charge of the operation and maintenance of the installation.
10. There should not be any violation of Kerala Electricity Supply Code, 2014, The Electricity Act 2003 and Central Electricity Authority (Measures Relating to Safety and Electric Supply) Regulations 2010 and related Bureau of Indian Standards and National Electric Code.
11. This order is subject to any future modifications to the Electricity Act 2003, Central Electricity Authority (Measures Relating to Safety and Electric Supply) Regulations 2010 and connected Bureau of Indian Standards, National Electric Code etc. or any related order from the Honorable courts of law or appropriate Government.
12. Net meter shall be connected and copy of the test certificate shall be forwarded.
13. No Objection Certificate required from Local Authority/Other Departments/Organisation/ Individuals shall be obtained before energisation.

SFI/ Reg No: 65/19-20

To
The Secretary
Thuvinjil Grama Panchayath
Wayanad



ELECTRICAL INSPECTOR IN-CHARGE

Copy to

- 1 M/s First Law
Kannippayur (PO), Kunnamkulam
Thrissur 680 517
- 2 The Assistant Engineer
Electrical Section, KSEBL, Thuvinjil
- 3 O/C
- 4 Stock file



Government of Kerala
Department of Electrical Inspectorate
Office of the District Electrical Inspector
 Emily Road, Kalpetta, Wayanad. Pin-673 121
 Phone: 04936 295004, Email: eiwayanad@gmail.com



PROCEEDINGS OF THE ELECTRICAL DEPUTY INSPECTOR IN-CHARGE, WAYANAD (Present: George Philip)

Sub: Installation of 17.82 kWp solar panel at the premises of M/s District Hospital, Mananthavady, Wayanad Sanction for Energisation - Order issued

Read:

1. Completion report submitted by M/s First Law (CB 7161) on **30-07-2019**
2. Inspection dated 10-10-2019.
3. Defect communicated vide letter No: B-901/19/ EIW dated 11-10-2019.
4. Compliance report submitted by M/s First Law (CB 7161) vide letter No: Nil dated 16-10-2019.

ORDER NO: B1-901/ 19/ EIW dt 18-10-2019

Sanction under Section 54 of The Electricity Act 2003 and Regulation 32 of Central Electricity Authority (Measures relating to Safety and Electric Supply) Regulations 2010 is hereby accorded for energisation of the electrical installation covered under the Completion Report read as 2nd above and installed at the premises of M/s District Hospital, Mananthavady, Wayanad with the following specifications, subject to the conditions mentioned there under.

SPECIFICATIONS

Solar inverter

Make : Delta Model : RPI-m 20 A
 SL No : 04818A02371 WC, DC Input Volt : 200-1000 DC
 MPPT : 470-800 Vdc, Output : 230V-400 AC
 Solar inverter : 20 kVA

Load : 12 kW
 Earth electrodes : 2 Nos

Switches :

KSEB side : 125 A
 LSP : 313 A
 Solar meter : 32 A

Total switches : 470 A

CONDITIONS

1. The whole installation shall be maintained in conformity with Central Electricity Authority (Technical standards for connectivity of the distributed generation resources) Regulation , 2013 and Kerala State Electricity Regulatory Commission (Grid interactive distributed solar energy system) Regulation , 2014.
2. Power allocation for additional loads, if necessary, should be obtained from the KSEB.

3. Any addition or alteration to the existing installation shall be carried out only after getting prior written sanction from this office.
4. The owner should rectify any defects that may be pointed out during subsequent inspection of the installation.
5. Date of energisation should be intimated to this office.
6. The maintenance of all major equipments should be carried out periodically as prescribed by the manufacturer and as per Indian Standard specifications and a register shall be maintained for recording maintenance activity and periodic checking. The register shall be kept up to date and submitted for perusal during periodical inspection.
7. The whole installation shall be operated and maintained in a condition free of any danger and as prescribed under the Regulation 131.4) of Central Electricity Authority (Measures relating to Safety and Electric Supply) Regulations 2010.
8. All the pre-commissioning tests shall be recorded for ready reference.
9. Only authorized persons shall be in charge of the operation and maintenance of the installation.
10. There should not be any violation of Kerala Electricity Supply Code, 2014 , The Electricity Act 2003 and Central Electricity Authority (Measures Relating to Safety and Electric Supply) Regulations 2010 and related Bureau of Indian Standards and National Electric Code.
11. This order is subject to any future modifications to the Electricity Act 2003, Central Electricity Authority (Measures Relating to Safety and Electric Supply) Regulations 2010 and connected Bureau of Indian Standards, National Electric Code etc, or any related order from the Honorable courts of law or appropriate Government.
12. Net meter shall be connected and copy of the test certificate shall be forwarded.
13. No Objection Certificate required from Local Authority/Other Departments/Organisation/Individuals shall be obtained before energisation

SEI: Reg No : 64 19-20

To

The Superintendent
District hospital
Thazhe Angadi, Mananthavady,
Wayanad 670 645



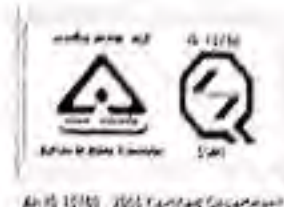
ELECTRICAL INSPECTOR IN-CHARGE

Copy to

- 1 M/s First Law
Kannippayur (PO), Kunnankulam
Thrissur 680 517
- ✓ The Assistant Engineer
Electrical Section, KSEB, Mananthavady
- 3 O C
- 4 Stock file



Government of Kerala
Department of Electrical Inspectorate
Office of the District Electrical Inspector
 Emily Road, Kalpetta, Wayanad, Pin-673 121
 Phone: 04936 295004, Email: eiwayanad@gmail.com



PROCEEDINGS OF THE ELECTRICAL DEPUTY INSPECTOR IN-CHARGE, WAYANAD (Present: George Philip)

- Sub:** Installation of 44.80 kW solar panel at the premises of M/s Muttul Grama Panchayath, Muttul (Po), Wayanad - Sanction for Energisation - Order issued
- Read:**
1. Completion report submitted by M/s First Law (CB 7161) on 30-09-2019
 2. Inspection dated 11-10-2019.
 3. Defect communicated vide letter No: B-903/19/ELW dated 15-10-2019.
 4. Compliance report submitted by M/s First Law (CB 7161) vide letter No: Nil dated 16-10-2019.

ORDER NO: B1-903/19/ELW dt 18-10-2019

Sanction under Section 54 of The Electricity Act 2003 and Regulation 32. of Central Electricity Authority (Measures relating to Safety and Electric Supply) Regulations 2010 is hereby accorded for energisation of the electrical installation covered under the Completion Report read as ^{sup} above and installed at the premises of M/s Muttul Grama Panchayath, Thalapuzha (Po), Wayanad with the following specifications, subject to the conditions mentioned there under.

SPECIFICATIONS

Solar inverter

Make : Delta Model : RPI-M 50 A
 Sl. No : 03618906852 WV. DC Input Volt : 200-1000V DC
 MPPT : 470-800 Vdc. Output : 230/ 400 AC
 Solar inverter : 50 kVA

Load : 13.7 kW
 Earth electrodes : 3 Nos

Switches :

MSB : 125+(63x4) 377 A
 LSP : 125+100(63) 288 A
 Isolator : 100 A

Total switches : 765 A

CONDITIONS

1. The whole installation shall be maintained in conformity with Central Electricity Authority (Technical standards for connectivity of the distributed generation resources) Regulation , 2013 and Kerala State Electricity Regulatory Commission (Grid interactive distributed solar energy system) Regulation , 2014.
2. Power allocation for additional loads, if necessary, should be obtained from the KSEB.
3. Any addition or alteration to the existing installation shall be carried out only after getting prior written sanction from this office.

4. The owner should rectify any defects that may be pointed out during subsequent inspection of the installation.
5. Date of energisation should be intimated to this office.
6. The maintenance of all major equipments should be carried out periodically as prescribed by the manufacturer and as per Indian Standard specifications and a register shall be maintained for recording maintenance activity and periodic checking. The register shall be kept up to date and submitted for perusal during periodical inspection.
7. The whole installation shall be operated and maintained in a condition free of any danger and as prescribed under the Regulation 13(4) of Central Electricity Authority (Measures relating to Safety and Electric Supply) Regulations 2010.
8. All the pre-commissioning tests shall be recorded for ready reference.
9. Only authorized persons shall be in charge of the operation and maintenance of the installation.
10. There should not be any violation of Kerala Electricity Supply Code, 2014 , The Electricity Act 2003 and Central Electricity Authority (Measures Relating to Safety and Electric Supply) Regulations 2010 and related Bureau of Indian Standards and National Electric Code.
11. This order is subject to any future modifications to the Electricity Act 2003, Central Electricity Authority (Measures Relating to Safety and Electric Supply) Regulations 2010 and connected Bureau of Indian Standards, National Electric Code etc, or any related order from the Honorable courts of law or appropriate Government.
12. Net meter shall be connected and copy of the test certificate shall be forwarded.
13. No Objection Certificate required from Local Authority/Other Departments/Organisation/ Individuals shall be obtained before energisation

SFI: Reg No : 62/19-20


DEPUTY ELECTRICAL INSPECTOR IN-CHARGE

To

The Secretary
Muttal Grama Panchayath
Wayanad



Copy to

- 1 M/s First Law
Kannippayur (PO), Kunnarnkulam
Thrissur 680 517
- ✓ 2 The Assistant Engineer
Electrical Section, KSEBL, Muttal
- 3 O/C
- 4 Stock file



KERALA STATE ELECTRICITY BOARD LIMITED

(Incorporated under the Companies Act, 1956)



Office of the Chief Engineer (Renewable Energy & Energy Savings)

9th Floor, Vidyuthi Bhavanam, Pattom, Thiruvananthapuram - 695 004, Kerala

Phone: +91 471 2447404, Fax: 0471 2558340, E-mail: cecees@kseb.in

By Registered post with A/D

LETTER OF AWARD

To

**M/s. INKEL Limited,
Ajiyal Complex, Post Office Road
Kakkanad, Kochi-682030**

W.O No.	03 /2019-20
Date	17.08.2019
Order type	121 kWp Grid tied rooftop Solar PV power plant on the rooftop of identified buildings in 4 sites owned by LSGD, District Panchayath Thiruvananthapuram (Phase 2)
Reference file	CC (REES)/LSCOT/AEC- 7/e-Tender/01- 2019-20/ 64 g dated / 7 -08-2019
e -Tender No	E-Tender No. KSEBL/REES/LSGD-District Panchayath TVM-Phase-2/01/2019-20 dated 10-05-2019 and Tender ID : 2019_KSEB_277008_1
Value	INR 74,00,000/ (Rupees Seventy four lakhs only)
Price	Fixed

Sir,

Sub Appointment of Engineering, Procurement and Construction (EPC) Contractor for the design as per site conditions, supply, installation, testing and commissioning of Grid Tied Rooftop Solar PV Power plants on the roof of selected buildings owned by LSGD District Panchayath Thiruvananthapuram with a total installed capacity of 121 kWp in 4 locations, including Operation & Maintenance of the plants for the first 5 years from the date of handing over - Award of contract – reg.

Ref 1. B.O. (FTD) No 526/2017-CE (REES)/General/2016-17TVM dated 02.03.17
 2. B.O (CMD) No. 842/2017-CE (REES)/General/2016-17TVM dated 30.03.17
 3. B.O (FTD) No. 2053/2017-KSEBL/CE (REES)/2017-18 TVM dated 09.08.17
 4. This office TENDER No. KSEBL/REES/LSGD District Panchayath Thiruvananthapuram Phase 2/01/2019-20 dated 10.05.2019 - Tender ID: 2019_KSEB_277008_1 and its addenda
 5. Lr.No.CC (REES)/LSCOT/AEC 7/RTS/OP TVM Phs II/eTender/01/2019 20/819 Dated: 13.08.19
 6. Lr. No. INKEL/Solar/TVM-PH-II/1/2019-20 dated 13.08.2019 of the Asst Gen Manager-Solar, INKEL Ltd

The subject work is awarded to you at a contract value of INR 74, 00,000/- (Rupees Seventy four lakhs only) inclusive of all taxes and duties. You shall carryout and complete the work

as per the time schedule as contained in clause 2.2.4 and 5.3.2 in Volume-1 of the tender document. Two copies of this order are included herewith. The duplicate of this order shall be returned to this office within seven days, after affixing your seal and signature on all pages as a token of acceptance of the terms and conditions stated in it.

This contract will be governed by the terms and conditions as contained in tender documents Volume-I, II and III and addendums issued in this respect by the tendering authority. This Letter of Award (LOA), tender documents will form part of the contract agreement. Additional conditions/modifications if any stated in your offer or elsewhere, which are not agreed to by KSEBL or not in accordance with any of the provisions covered by the bid documents referred shall stand withdrawn/nullified.

1. Scope of work:

The subject work shall be considered as a composite supply. The scope of work will be governed by clause 2.2.3 in Volume-1 of the tender document and addenda issued in this respect.

Sl. No	Location of the project	Capacity of the proposed plant (kWp)
1	Govt Taluk Hospital, Vithura, Thiruvananthapuram	10
2	Govt Higher Secondary School, Vithura, Thiruvananthapuram	45
3	Govt H.S.S, Mylachal, Thiruvananthapuram	20
4	Govt H.S.S, Punnamoodu, Thiruvananthapuram	46
Total		121 kWp

2. Name of the Project:

Appointment of Engineering, Procurement and Construction (EPC) Contractor for the design as per site conditions, supply, installation, testing and commissioning of Grid Tied Rooftop Solar PV Power plants on buildings owned by **LSGD, District Panchayath Thiruvananthapuram** with a total installation capacity of 121 kWp in 4 locations (Phase-II), including Operation & Maintenance of the plants for the first 5 years from the date of handing over. The Performance ratio of each location shall be 75 - 80% as detailed in the Clause 2.2.3 in Volume-1 of the tender document and the addenda issued in this respect, herein after called "the project".

3. Contract amount:

The Total Contract Amount is **INR 74,00,000/-** (Rupees Seventy four lakhs only) inclusive of all taxes and duties for design, engineering, manufacturing, procurement, supply (including spares), handling, storage, civil works, erection, installation, testing & commissioning, training of personnel, along with operation and maintenance charges of the project as all inclusive Price which include taxes, duties, cess, freight and insurance charges, logistics, etc

and all the levies payable by the contractor for successful completion, operation and maintenance of the Grid Tied Rooftop Solar PV Power plants on the Roof of buildings owned by LS GD, District Panchayath Thiruvananthapuram with a total installed capacity of 171 kWp in 4 locations including Operation & Maintenance of the plant for the first 5 years from the date of handing over. The performance ratio of each location shall be 75 - 80% as detailed in the Clause 2.2.3 of Tender document Volume-1 and the addenda issued in this respect, as per the financial proposal submitted by you and as detailed in the Price Schedule attached as Annexure 1.

Freight and Insurance charges for transportation of material/equipment to destination project site and up to complete installation and commissioning should be arranged by the contractor at their own cost. KSEBL will not entertain or bear any charge for the same.

Contract amount shall be governed as per provisions under Clause 4.1 of Volume 1 of the tender document. This amount shall be firm during the period of contract and shall not be varied or adjusted on whatsoever reason on any account.

4 Taxes & Duties:

The Contract Amount as indicated in clause 3 of this document is inclusive of all Taxes, Duties, incidental charges and other levies. Taxes & Duties will be governed by the clauses as detailed in clause 4.1, 5.9.1, 5.9.2, 5.9.3 of Volume 1 of the tender document. All Taxes and duties will be as per the latest orders of KSEBL and prevailing rules of State /Central Government. No separate claim on this behalf will be entertained and future claims on any taxes and duties will not be admitted and also all statutory recoveries will be deducted by K.S.E.B Ltd from the work bill. No future claims on unquoted taxes and duties will be allowed.

5. Insurance:

All equipment, machinery, works etc. which are furnished, installed, constructed and handed over/to be handed over to the KSEBL under this contract for the completion of project shall be insured by the Contractor for the period of contract. It shall be the responsibility of the Contractor to maintain adequate insurance coverage at all times. Insurance will be governed by Clause 5.9.4 of Volume 1 of the tender document

All the Personnel employed/engaged by the Contractor shall have adequate insurance coverage. Any claim due to mishap/accidents or otherwise to personnel/equipments, shall be taken up by the contractor, directly with the Insurance Company. KSEBL/ LS GD, District Panchayath Thiruvananthapuram will not have any liability in this respect whatsoever.

6. Work Completion Period and Date of Commissioning (CoD):

The Contractor shall complete the works in all respect within 6 months from the official date of commencement of work which shall be the date of Agreement or the date of handing over of the site, even if not in full, but in a manner the work can be commenced and proceeded with in accordance with the programme of works, whichever is later. All the works stipulated under the scope of the Contract shall be completed in all respects, supplies made, services provided and final cleaning up done and required testing shall be

completed and commissioned before the expiry of the Time of Completion unless the time of completion is postponed and period of completion is extended by a written letter from the Tripartite agreement Authority.

The date of completion/commissioning shall be the date on which the Solar plant is synchronized into KSEBL grid after obtaining clearances from all statutory bodies and after conducting necessary grid interfacing tests and measurements by the KSEBL are found satisfactory. The Engineer-in-Charge should issue a certificate including date of commissioning and an authorization certificate/commissioning report after successful synchronization, commissioning of the plant with the grid after proving the Performance ratio as detailed in clause 2.2.3 in Volume-1 of the tender document and addenda issued in this respect.

7. Extension of Completion Date:

The contractor shall not claim any price escalation, in case the completion period is extended for any reason, including litigation or force majeure conditions and is governed by clause 5.3.6 in Volume-1 of tender document.

8. Liquidated Damages:

Liquidated Damages will be governed by the clause 5.3.9 of Volume 1 of the tender document

9. Execution of Agreement:

The Contractor shall execute a tripartite agreement in Kerala Government Stamp paper worth (1). Rs. 7,400/- (Rupees Seven thousand and four hundred only) with The Secretary, District Panchayath Thiruvananthapuram after furnishing a Bank Guarantee of Rs 7,40,000/- (Indian Rupees Seven lakhs and forty thousand only), i.e. 10% of the Contract value rounded off to the higher multiple of Rs 1000/-, within 15 days from the date of issue of Letter of Award of contract, with KSEBL and LSGD, District Panchayath Thiruvananthapuram as First and Second party respectively, as per the terms and conditions set forth in the Bid document. After execution of the tripartite agreement the successful bidder shall be known as 'EPC Integrator'. The tripartite agreement has to be executed by the contractor in the prescribed format in Form B of Contract Tripartite agreement of this document, along with the performance security deposit at the Office of the Chief Engineer (Renewable Energy & Energy Savings), on a date and time to be mutually agreed. The contractor shall provide for signing of the contract, 2 additional copies of contract agreement, 2 copies of Bank Guarantee in lieu of Performance security deposit, appropriate power of Attorney and other requisite documents. All the documents cited in clause No. 30 of this document will form part of the agreement. Power of Attorney shall be in stamp paper attested by a registered Notary Public.

After handing over of the sites in Phase 2 of the LSGD, District Panchayath Thiruvananthapuram project, you shall execute a separate O&M Bilateral Agreement with the LSGD District Panchayath, Thiruvananthapuram as the first party.

10. Construction Programme:

Within 15 days from the date of award, the contractor shall submit to the KSEBL for approval, a programme showing the general method, arrangements, order and timing for all the activities involved in the work in a systematic manner based on planning technique and

tool like PERT /CPM in MS {Projects} and GANTT chart indicating the critical events/paths and milestones.

The contractor shall carryout the works in accordance with this programme and as approved by KSEBL, and complete them in all respects to the full satisfaction of KSEBL. Any change to the approved work plan due to unavoidable circumstances shall be made only with the prior approval of KSEBL.

11. Terms of Payment:

The payment condition is governed by clause 5.2 in Volume-1 of the tender document and addenda issued in this respect.

a. The Contractor has to produce Bank Guarantee for an amount of 10% of the Contract amount as Performance Security Deposit at the time of executing Contract Agreement.

b. 30% of the contract value excluding O&M, will be released to the contractor as cost of major components of the plant (PV modules, Inverters and module mounting structures) after delivery of this materials at site, inspection and verification by authorized departmental officers, and production of insurance certificates for the materials delivered at site. (Refer clause 5.5.2 of tender document Volume-1). The Engineer-in-charge is to be informed about the delivery of material one week in advance by the contractor.

The Engineer in charge shall ensure the site acceptance / rejection of the received material at site within three days of delivery of material along with submitting the SAT procedure of the delivered material from the vendor by the contractor. The invoices shall be submitted by the contractor as per the accepted price schedule which is to be verified and made ready for release of payment within 15 days of receipt of the invoices subject to the satisfaction of the above conditions.

c. 100% of the total Contract amount except Operation and Maintenance charges will be released after satisfactory completion, testing, commissioning of the Solar PV Power plant after proving the Performance ratio (AC) as per clause 2.2.3 of Tender document Volume-1 and addenda issued in this respect. The contractor can submit the final invoice as per the accepted price schedule within 10 days on proving the Performance ratio (AC) (as per Clause 2.2.3 of tender document Volume-1 and addenda issued in this respect) after completing the project within 06 months.

The invoices shall be verified and final payment may be released within 3 months of receipt of the invoices subject to the satisfaction of the above conditions.

d. The Operation & Maintenance charges will be released by LSGD, District Panchayath Thiruvananthapuram, after commissioning and demonstration of the specified Performance ratio (AC) by the Contractor as per clause 2.2.3 in Volume-1 of the tender document and addenda issued in this respect, at the end of each year during O&M period (5 years).

e. The performance security amount shall also be released in equal instalments each year (O&M period) from the date of handing over the project after demonstrating the specified Performance ratio (AC) by the Contractor (as per Clause 2.2.3 in Volume-1 of the tender document and addenda issued in this respect).

f. The Quoted taxes and duties etc as governed by GST will be released subject to an undertaking from the Contractor in Kerala Government Stamp paper that "If any dispute in payment of taxes and duties etc as governed by GST from concerned Tax authorities occurs in future, the Contractor shall indemnify LSGD, District Panchayath Thiruvananthapuram from such liabilities and the Contractor shall be liable for the additions, loss or cost on account of such discrepancies / dispute".

12. Advance Payment:

No amount shall be released as mobilisation advance.

13. Performance security deposit:

The performance security deposit is governed by clause 5.1.7 in Volume-1 of the Tender document.

The Contractor shall submit Performance security deposit as Bank Guarantee at the time of execution of tripartite agreement in the prescribed format (Annexure 5) for performance security of the Contract and it shall be an amount equal to 10% of the total Contract amount rounded off to the higher multiple of Rs 1000/- i.e. INR 7, 40, 000/- (Indian Rupees Seven Lakhs and forty thousand only).

In order to cover the liabilities under the contract and to ensure sufficient guarantee to cover all possible liabilities pertaining to defects, shortfalls, remedial measures arising out of poor workmanship, materials, loss, excess amount, risk and cost of Contractor in case of alternate arrangements and any type of dues to the LSGD, District Panchayath Thiruvananthapuram, an amount as prescribed by KSEBL shall be collected and retained from the Contractor towards Performance Security of the Contract.

The Bank Guarantee shall be initially valid from the date of agreement for a period of 2 years and be kept renewed from time to time till the end of defect liability period including Operation & Maintenance. The performance security Bank Guarantee will be released in equal installments each year after demonstration of desired performance ratio (AC) (as per clause 2.2.3 of tender document vol-1 and the addenda issued in this respect) during the defect liability period. The performance ratio (AC) (as per Clause 2.2.3 of tender document vol-1 and addenda issued in this respect) will be calculated based on data from pyranometer/ Meteororm / Pyrheliometer data. Failure of the successful bidder to submit the required Performance Guarantee shall constitute sufficient grounds for termination of Contract & forfeiting the EMD.

No interest will be paid by KSEBL at any stage of contract on the Performance Security.

The performance ratio (AC) (as per Clause 2.2.3 of Vol-1 of the tender document and the addenda issued in this respect) can be checked at any time in between if deemed necessary by the Engineer in charge (as per clause 2.2.3 of tender document Volume-1 and addenda issued in this respect). If any unusual degradation is noticed in the Performance Ratio, the contractor shall attend and rectify the same within 24 hours on intimation. If not the performance security deposit will be forfeited.

14. Payment Authority and Engineer-in-Charge:

Engineer in Charge -Engineer authorized by Chief Engineer (Renewable Energy &

Energy Savings). The Engineer-in Charge may delegate powers to subordinate officers in respect of execution of work such as Site supervision of Electrical works and arrangements for interconnection facility, technical support and civil supervision.

The work shall be treated completed only when the Engineer-in-charge Issues certificate of completion where the actual date of completion of work will be mentioned. In case of termination or foreclosure the Engineer-in-charge will issue the certificate of completion to that effect. If the contractor fails to complete any part of the work as required for satisfactory completion before taking over and / or the date of completion specified, and fails to remove the surplus materials, the KSEBL will complete the works and remove the surplus materials etc and the amount incurred for the same will be realized from the contractor from any amount due to him from this work or any other work with KSEBL or his assets in appropriate proceedings. The contractor will not have any claim over the surplus materials so removed by the KSEBL.

The contractor shall submit bills in Triplicate to the Engineer-in-Charge with all supporting documents as indicated in the relevant clauses in Volume 1 of the bid document.

15 Manufacturing Schedule:

Contractor shall specify all basic design details, including details of the PV modules and the support structures, inverters, cables, online monitoring, integration and power evacuation details with existing power system, with appropriate diagram and drawings. The drawings along with detailed structure design and material selected as per the relevant standards, All guaranteed technical particulars, details of each items, make, model number and specification conforming to relevant standards, entire drawings, detailed test reports, list of O & M spares for major materials, detailed Bill of materials and Priced Bill of Quantities in respect of materials/equipments and works for the entire Project shall be submitted within 15 days of receipt of this LoA.

All materials and equipments required for successful completion and commissioning of the project must be Included. The design details and other accessories should adhere to and match with the technical specifications provided in the Volume III of the tender document and as per the Guaranteed Technical Particulars offered by you.

The Contractor shall submit all the appropriate diagram and drawings to the agreement authority for approval. Also specifications of major items such as PV modules, inverters etc shall be submitted to the Agreement authority for approval. Approvals for Layout of Power Plant Installation shall be provided by the Engineer-in-Charge prior to the submission of all the drawings.

Energy meter provided for the installation of the solar PV plant shall be in accordance with the regulations and technical specifications of KSEBL.

For the goods supplied from outside the purchaser's country, the supplier shall be entirely responsible for all taxes, duties, stamp duties, license fees, and other such levies imposed outside the purchaser's country.

The contractor shall provide all MA's (Manufacturer's Authorization Forms) for all the

components specified in the bid within 15 days and before executing the Contract Agreement.

16. Drawings and documents

The design documents to be submitted by the contractor will include but not limited to:

- I. DC cable size calculation
- II. DC cable specification
- III. DC cable schedule, voltage drop and power loss calculation
- IV. String monitoring unit specification
- V. DC earthing & pit calculation
- VI. Lightning protection details / specification
- VII. All technical specification of AC components
- VIII. Cable schedules

Contractor shall furnish the following drawings under this contract and has to obtain approvals.

- a. Shadow analysis of the roof
- b. General arrangement and dimensional layout
- c. Schematic drawing showing the SPV panels, Power conditioning Unit(s) / inverter, Junction Boxes, AC and DC Distribution Boards, meters etc.
- d. Layout of solar PV Array and Single line diagram.
- e. Mounting structure drawing
- f. Structural drawing along with foundation details for the structure.
- g. Location specific Itemized bill of material for complete SPV plant covering all the components and associated accessories.
- h. Sizes and specification of cables between array interconnections, array to junction boxes, junction boxes to inverter etc. shall be furnished
- i. PVsyst simulation report of the combination offered PV modules with the offered inverters shall be furnished to the agreement authority for approval.

The drawings along with detailed structure design and material selected and their standards shall be submitted to agreement authority for approval before starting the execution work. The work will be carried out as per the approved design.

The contractor shall provide necessary drawings and documents required by statutory authorities and obtain the approval before taking up erection.

17. Quality Assurance:

Strict compliance with the approved and proven & established quality assurance systems and procedures during the different stages of the project starting from sizing, selection of make, storage (at site), during erection, testing and commissioning have to be ensured by the contractor.

PV modules should have valid qualification test (as per STC) certificate as per IEC 61215 and IEC 61730-1&2 and IEC 61701. The power conditioning units / inverters should comply with applicable IEC/ equivalent BIS standard for efficiency measurements and environmental tests, safety standards and characteristics of the utility interface (Parallel operation) as per standard codes IEC 61683 and IEC 60068 2{1,2,14,30} and IEC 62109-1&2

and IEC 61727 respectively. Inverter shall be provided with protection against islanding of Grid as per IEEE 1547/UL1741/62116 to isolate it from the grid in case of no supply, under voltage and over voltage conditions so that in no case there is any chance of accident. The module mounting structure shall be as per latest BIS 2062 and galvanization of mounting structure shall be in compliance of BIS 4759 (amended up to date)/IS2629.

The type test certificates shall be verified by KSEBL while conducting factory inspection tests. The contractor shall furnish detailed quality procedures for the major components for approval prior to the Factory inspection call. The agreement authority will provide the approvals regarding the test to be conducted during the inspection.

The following minimum tests shall be conducted on the required number of samples as is required by the Engineer-in-charge, during the Factory inspection:

For PV modules:

1. Visual inspection
2. Dimensional Check
3. Insulation Resistance
4. Leakage Current
5. Electrical Test(with sun simulator)
6. RFID verification
7. Electroluminescence tests
8. Robustness of termination

For Inverters:

1. Visual inspection
2. Dimensional and Power Wiring Check.
3. Auxiliary functional check.
4. Fan direction of rotation, On-Off control, etc
5. Functionality test of relays
6. Command checks.
7. Protection function checks.
8. AC under voltage, AC over voltage, AC under frequency, AC over frequency
9. Load tests simulation 25%, 50%, 70% and 100%
10. Load test performed at variable MPPT voltage @100% load on the specified voltage range.
11. Over temperature, ground fault simulation

For Module mounting structures:

1. Visual inspection
2. Dimensional Inspection
3. Functional fitments

The Contractor shall submit letters of inspection calls sufficiently in advance specifying the date and venue of inspection to the agreement authority through the Engineer-in-Charge. All the major components should undergo factory inspection tests. The agreement authority shall arrange inspection of material/ equipment and upon satisfactory completion of the inspection and tests; the Material Despatch Clearance Certificate will be issued.

The test and inspection shall be done in accordance with the relevant standards and the Manufacturer's standard before the delivery to site as well as after the erection and commissioning at site.

All acceptance and routine tests of equipment as per the specification and relevant standards shall be carried out by the contractor. Agreement authority or authorized officials may undertake the quality checks during the manufacturing stages also. Functional testing and erection of equipments shall be carried out by the contractor in presence of KSEBL officers delegated by the Engineer-in-Charge and the approvals will be given only if the same is satisfactory.

Engineer-in-Charge shall conduct visual inspection including dimensional checks, verification of serial numbers, RFID reading of PV modules etc for the Site Acceptance of the delivered materials based on the BOM. Any material or work found to be defective or which does not meet the requirements of the specification will be rejected and shall be replaced at the Contractor's cost.

18. Review and Progress report:

The contractor shall submit monthly progress report to Engineer-in-Charge and all concerned personnel in connection with this order, with a copy to this office.

The Engineer-in-Charge will co-ordinate and monitor all activities of the project. These progress report formats may be changed as and when required by KSEBL.

The contractor shall produce an updated Activity Schedule within 14 days of being instructed by the KSEBL.

19. Technical parameters for getting grid connectivity:

- a. Harmonic current injections from a plant shall not exceed the limits specified in IEEE 519 2014 as per CEA technical standard for connectivity of the distributed generation resources.

Individual voltage harmonics distortion	< 3 %
Total Voltage harmonic Distortion THD	< 5%
Total Current harmonic Distortion	<8%
Output frequency	= 50Hz +/- 0.5Hz

- b. Photovoltaic system should not inject DC power more than 0.5% of full rated output at the interconnection point or 1% of rated inverter output current into distribution system under any operating conditions

- c. Operation of Photovoltaic system shouldn't cause voltage flicker in excess of the limits stated in IEC 61000 or other equivalent Indian standards, if any
- d. While the output of the inverter is greater than 50%, a lagging power factor of greater than 0.9 shall be maintained.
- e. The Photovoltaic system in the event of voltage or frequency variations must island/disconnect itself within IEC standard on stipulated period.
- f. The voltage-operating window should minimize nuisance tripping and should be under operating range of 80% to 110% of the nominal connected voltage beyond a clearing time of 2 seconds, the Photovoltaic system must isolate itself from the grid.
- g. When the Distribution system frequency deviates outside the specified conditions (50.5 Hz on upper side and 47.5 Hz on lower side up to 0.2 sec), the Photovoltaic system shouldn't energize the grid.

20. Testing and Commissioning:

Commissioning test with all required testing shall be conducted by the contractor in presence of KSEBL officers delegated by the Engineer-in-Charge/authorized person of LSGD (District Panchayath, Thiruvananthapuram)

The contractor shall also prepare and handover the as-built drawing, Operational manuals and Maintenance manuals of the plant and handed over to KSEBL.

On completion of all works stipulated in the scope of work and after testing and commissioning of the Project, and if there are no obligations to arise out of the Contract, KSEBL shall issue a completion certificate as described under Clause 5.3.3 of Tender document Volume 1.

21. Operation and Maintenance (O&M):

Operation and Maintenance is governed by clause 6.9 in Volume-1 of the tender document.

Operation and maintenance of the solar plant up to the point of supply for a period of 5 years of Defects Liability period is the responsibility of the Contractor.

Operation and Maintenance during this period shall include supply of spares of panels, inverters and all equipments in the solar plant including transportation of these items from the original manufacturer, consumables, general comprehensive insurance covering fire, earthquake.

The Solar plant should be maintained shadow free. The tree branches if any causing hindrance to the shadow free operation of solar plant shall be cut and removed under the supervision of LSGD, District Panchayath Thiruvananthapuram. Copies of the Insurance Policies are to be given to LSGD, District Panchayath Thiruvananthapuram as and when taken.

The contractor shall ensure efficient operation of the SPV plant and the associated facilities to achieve the maximum power generation from the plant. For this purpose the contractor shall engage the services of adequate number of Engineers and Technicians trained under "Suryamitra" Skill Development Programme of MNRE. The contractor shall

also attend to all failures, rectifications, breakdowns, 5 year comprehensive Operation and Maintenance checks.

Adequate training should be given to personnel identified by the LSGD, District Panchayath Thiruvananthapuram for Daily Monitoring Information like solar energy generated, net meter readings etc. Monthly System (MIS) reports with generation and down time analysis data has to be sent to LSGD, District Panchayath Thiruvananthapuram Corporate offices by E-mail during the defect liability period. Any discrepancy/malfunctioning noted shall be immediately attended to and got rectified by the contractor.

The Contractor should not misuse the land and buildings in the project site and assign responsibility for the safety of machinery within the premises.

22. Annual Maintenance Contract (AMC):

The plant shall then be handed over to the LSGD District Panchayath Thiruvananthapuram at the end of 5 years for O&M. After five years from the date of commissioning, the EPC contractor may be asked to execute the AMC for another 5 years on mutual agreement at mutually agreed price.

The EPC contractor shall execute the AMC agreement as per conditions stipulated at that time.

23. Performance & Warrantee:

The mechanical structures, electrical works and overall workmanship of the Solar Power plant must be warranted for a minimum of 10 years. PV modules used in solar power plant must be warranted for output wattage, which should not be less than 90% at the end of 10 years and 80% at the end of 25 years.

EPC contractor shall ensure the performance ratio of each location as detailed in the Clause 2.2.3 of Tender document Volume-1 and addenda issued in this respect.

24. Generation Assessment

The performance ratio (AC) of each location shall range from 75- 80% as per clause 2.2.3 of Tender document Volume-1 and addendum's issued in this respect. Performance ratio test as per IEC 61724 will be carried out at site jointly by the EPC contractor in presence of authorized officials from KSEBL and LSGD, District Panchayath Thiruvananthapuram. This is mandatory for commissioning and handing over the plant. If the contractor fails to prove the desired performance ratio at the time of completion and during any of the consecutive years of defect liability period he will be given a second chance to demonstrate the PR in another 7 days. Still if it is not achieved, the same shall be demonstrated in another 7 days and still if it is not achieved, EPC contractor shall enhance the module capacity of solar plant/improve the quality of the plant by replacement of module/other components with all suitable modification requirements on balance of systems at his own cost to achieve the stipulated Performance ratio.

Operation and maintenance charges shall be released at the end of each year based on the Performance ratio (AC) as mentioned above, as per the table given below.

Sl.No	Particulars	Performance ratio (AC) in %
1	At the time of completion and commissioning	75-80
2	At the end of 1 st year	74-79
3	At the end of 2 nd year	73-78
4	At the end of 3 rd year	72-77
5	At the end of 4 th year	71-76
6	At the end of 5 th year	70-75

25. Handing over:

After the date of successful commissioning of the Project, the Contractor shall hand over the complete Solar PV Electric Power Generation system to the LSGD, District Panchayath Thiruvananthapuram as specified in the tender within 15 days. Any component found defective/inefficient/worn out shall be rectified/ replaced/ made good at contractor's cost before handing over the system to the LSGD District Panchayath Thiruvananthapuram authorities. In order to ensure longevity & safety of the core equipment and optimum performance of the system the Contractor should use only genuine spares of high quality standards. Contractor has to maintain the rooftop SPV plant till the end of the contract period of five years from the date of handing over.

The contractor shall provide the named list of essential tools and spares required for the future operation and maintenance of the plant.

26. Termination of Contract:

Termination of Contract will be guided strictly in accordance with clause 5.3.11 in Volume 1 of the tender document.

27. Force Majeure:

Force Majeure shall be governed by Clause. 5.3.8 in Volume 1 of the tender document.

28. Defects Liability Period:

The Defect Liability Period shall be governed by Clause 5.3.4 in Volume 1 of the tender document.

29. Law and Jurisdiction:

This contract has to be performed complying with the laws of India and Kerala and any dispute arising out of this contract will be subject to the exclusive jurisdiction of Civil Courts at Thiruvananthapuram.

30. Contract Documents.

1. Agreement executed in Kerala Government Stamp Paper
2. Letter of Award (duly signed and seal affixed on all pages)
3. Correspondences between the KSEBL and the selected bidder included in the Agreement.
4. Special Conditions of Contract.

5. General Conditions of Contract.
6. Technical specifications.
7. Accepted Schedule of Technical Particulars and construction programme & Manufacturer Authorization form of Components.
8. Accepted Schedule of Prices
9. General Bid conditions
10. Instructions to bidders.
11. Information to bidders.
12. Detailed Structural Drawings including approved drawing issued from time to time.
13. All volumes of bid with TENDER No. KSEBL/REES/LSGD-District Panchayath TVM- Phase 2/1/2019-20 dated 10-05-2019 having Tender ID: 2019_KSEB_277008_1 and its addendums along with clarifications and related documents issued by the tendering authority.
14. Response (proposal) of M/s Regional Agro Industrial Development Co-Operative of Kerala Limited, (RAIDCO Kerala Ltd), RAIDCO Tower, SPCA Road, PB No: 407, Kannur- 670 002, Kerala including the bid, clarification documents and the accepted rate submitted.

31. Acknowledgment by the Contractor:

This Letter of Award is issued subject to the documents referred above and terms and conditions contained therein. You will also be deemed to be fully aware of KSEBL's General conditions of contract which is applicable to this contract also and ignorance of these conditions will not exempt you from your liability to abide by the same.

If there is any contradiction/conflict between the tender documents and LoA, conditions in the LoA will prevail.

The documents specified in Clause 10 and 15 shall be submitted within 15 days from the date of issue of this LoA.


 Chief Engineer
 (Renewable Energy & Energy Savings)

Acc:-

1. Annexure 1: Price schedule
2. Annexure 2: Contract Forms
 - A. Performance Security deposit BG
 - B. Form of contract agreement
3. Annexure 3: Copy of LoA

Copy to:-

1. The Secretary K.S.E.B Ltd, Thiruvananthapuram.

2. The LA and DEO K.S.E.B Ltd, Thiruvananthapuram.
3. The Financial Advisor, KSEBL.
4. Deputy Chief Engineer, Electrical Circle, Thiruvananthapuram Urban & Rural
5. TA to The Chairman & Managing Director, KSEBL, Thiruvananthapuram/
6. TA to Director {Distribution & IT.}/Director (Trn & Sys. Operation)/ Director(Corp. Plg, Gen(Ele), SCM & Safety)/Director[Generation Civil & HRM)
7. PA to The Director (Finance)
8. Sr.CA to Chief Vigilance Officer
9. The Main Income Tax Officer, Thiruvananthapuram, Kerala.
10. The Accountant General, Thiruvananthapuram, Kerala
11. The Secretary, District Panchayath Thiruvananthapuram
12. Stock file

Annexure: 1 - Total Price Schedule

Appointment of EPC contractor for the design as per site conditions, erection, testing & commissioning of Grid Tied Rooftop Solar PV Power plants, on the Roof of identified buildings owned by LSGD, District Panchayath Thiruvananthapuram with a total installed capacity of 121 kwp in 4 locations (Phase-2) including Operation & Maintenance of the plant for the first 5 years from the date of handing over

Sl No	Item Description	Quantity	Unit	Basic rate (Rs)	Freight charges (Rs)	Insurance (Rs)	GST (Rs)	Any other applicable tax (Rs)	Total amount without tax (Rs)	Total amount with tax (Rs)
1	Total Price for the design as per site conditions, planning, investigation, survey, engineering, manufacture/procurement, manufacturer's quality assurance, shop testing (including type testing where specified/required), transportation, handling, storage, erection including all civil/structural work, electrical and general works, piping, cabling, instrumentation, installation, testing and commissioning work of the Solar Power plant, training, services, permits and insurance at all stages and also includes Purchase, Testing and installation of meters (Net meter & Solar meter), providing online data from all locations, remittance of Application and Registration fee and all related works for connectivity, Statutory Inspection & Testing, Additional work/Cabling, Power Evacuation including cost of Transformers and HT metering and related works and works related with Single Phase to Three phase Conversion required in necessary locations of Grid-tied, rooftop, Solar Photovoltaic (SPV) Power Plants with a total capacity of 121 kwp on the roof of selected buildings in 4 locations owned by LSGD (District Panchayath Thiruvananthapuram) and executing everything necessary to complete the project successfully in all respects to its full satisfaction and handing over the Solar Photovoltaic Plants to LSGD (District Panchayath Thiruvananthapuram) after proving the Performance rat o(AC) as detailed in the clause 2.2.3 of Volume 1 of the Tender document	01	Set	67,66,667.00	0	0	3,38,333.00	0	67,66,667.00	71,05,000.00

P. T. O

Sl No	Item Description	Quantity	Unit	Basic rate (Rs)	Freight charges (Rs)	Insurance (Rs)	GST (Rs)	Any other applicable tax (Rs)	Total amount without tax (Rs)	Total amount with tax (Rs)
2	Total price for Operation and Maintenance (O & M) charges of the Solar Photovoltaic Power Plant for a period of 5 year including arrangement of cost of replacement of all the defective parts, consumables, tools, tackles, testing equipments & instruments, manpower, all administrative work, maintenance of records and submissions to all concerned authorities for the 121 kWp Grid tied rooftop Solar PV plant in 4 locations of buildings owned by LSGD, District Panchayath Thiruvananthapuram including all taxes as per GST, covered under Guarantee period for a period of 5 years from the date of Handing over.									
a	O&M charge for 1 st year	01	Set	50,000			9,000		50,000	59,000
b	O&M charge for 2 nd year	01	Set	50,000			9,000		50,000	59,000
c	O&M charge for 3 rd year	01	Set	50,000			9,000		50,000	59,000
d	O&M charge for 4 th year	01	Set	50,000			9,000		50,000	59,000
e	O&M charge for 5 th year	01	Set	50,000			9,000		50,000	59,000
	Total O&M for 5 years (2.a+2.b+2.c+2.d+2.e)			2,50,000			45,000		2,50,000	2,95,000

1. Total amount with tax of Item 1

2. Total amount with tax of Item 2

3. Total of Item 1 & Item 2 (Total contract amount inclusive of all taxes)

= Rs 71,05,000/-

= Rs 2,95,000/-

= Rs 74,00,000/-

(Total amount is Rupees Seventy four lakhs only)

Chief Engineer

(Renewable Energy & Energy Savings)

Government of Kerala
 Department of Electrical Inspectorate
 Office of the Deputy Chief Electrical Inspector
 Forth Floor, Corporation Building Vikas Bhavan PO
 Thiruvananthapuram 695033
 Phone: 04712322934,
 Email:dceitvm@gmail.com Website:
 www.ceikerala.gov.in



An IS 15700 : 2005 Certified Department

Proceedings of the
 Deputy Chief Electrical Inspector
 Thiruvananthapuram
Present: P N Anil Kumar

Subject: Installation of 46.2kW Grid Tied Solar Power Plant at the premises of GOVT.Model H.S.S Punnamoodu, Punnamoodu, Thiruvananthapuram, 695020 - Sanction for energisation orders issued - regarding.

Reference:

1. Scheme Approval No. B5-00676/19/EIT dated 24.01.2020
2. Completion report submitted by Nidhin, kunnamkulam, kunnamkulam, Kerala, 680517 dated received on 29.01.2020
3. Inspection conducted on 12.02.2020
4. Non conformity report dated 20.02.2020
5. Compliance report submitted by Nidhin, kunnamkulam, kunnamkulam, Kerala, 680517 dated 24.02.2020

Order No: B5-00676/19/EIT Dated 28-02-2020

Sanction is hereby accorded under section 54 of The Electricity Act, 2003 and Regulation 32 of the Central Electricity Authority (Measures relating to safety and electric supply) Regulations, 2010 for the energisation of the installations covered under completion report read as (2) above, installed at the premises of ,GOVT.Model H.S.S Punnamoodu, Punnamoodu, Thiruvananthapuram, 695020 subject to following conditions and as detailed in the annexure appended

1. Supply from the Solar Panel should not be extended out of the premises.
2. Any addition or alteration to the existing installation shall be carried out only after getting prior written approval from this office.
3. The owner should rectify any defects that may be pointed out during subsequent inspection of the installation by the Electrical Inspector.
4. Date of energisation should be intimated to this office.
5. The whole installation should be in conformity with CEA (Technical Standards for connectivity of the distributed generation resources) Regulation, 2013 and KSERC (Grid interactive distributed solar energy systems) Regulation, 2014.
6. Only authorised person shall be in charge of the operation and maintenance of the installation.
7. Power allocation for additional loads, if necessary, should be obtained from KSEB/Licensee.
8. As per Central Electricity Authority (Technical standards for Connectivity of the Distributed Generation Resources) Regulation 2013- Section 5, the prescribed standards and codes of practice should be followed.
9. The mechanically operated isolation switch should have specification prescribed in Sub Section 5.ii.(9) of Central Electricity Authority Regulation (Technical standards for Connectivity of the distributed generator resources) 2013.
10. The tests prescribed under 5 (8) (2), the harmonic measurements should be done using calibrated instrument in a standard laboratory having national intimation traceability with a basic standard instruments
11. You may conduct tests mentioned in Section 5 (6) 5.ii.1, 2, 3 & 6 in consultation with the licensee and the parameters shall be within the limits as prescribed by Central Electricity Authority (Technical standards for Connectivity of the Distributed Generation Resources) Regulation 2013 before committing the Solar Supply to Kerala State Electricity Regulatory aid.
12. The tests prescribed by Central Electricity Authority Regulation 2013 should be conducted every year and the results furnished in this department for verification as per Regulation 5.8(2) of Central Electricity Authority Regulation (Technical standards for Connectivity of the distributed generator resources) 2013.
13. The whole installation should be conforming to the stipulation under Kerala State Electricity Regulatory Committee (Grid Technical Distributed Solar Energy System) Regulation 2014 to ensure the safety of associated equipments and operating personnel at the premises as well as the KSEB personnel working on their system after switching off the grid supply. The protection incorporated in the solar in restore, switching off the output when grid supply is absent should be ensured by the owner of solar system and he/she would be safely responsible for any accident in case of failure violation of the same.
14. The maintenance of all major equipments should be carried out periodically as prescribed by the manufacturer and as per Indian Standard Specifications and a register shall be maintained for recording maintenance activity and periodic checking. The register shall be kept upto date and submitted for perusal during periodical inspection.

Solar Inverter: 50kVA

Make: Delta RPI; Sl.No: 03619301545WX

Deputy Chief Electrical Inspector



To:

The Principal
M/s.GOV.T.Model H.S.S Punnamoodu Punnamoodu Pallichal.P.O Thiruvananthapuram

Copy To:

- 1 Nidhin , kunnamkulam , kunnamkulam, Kerala , 680517
- 2 FIRSTLAW , FIRSTLAW Kanipayur Kunnamkulam 680517 ,

Annexure (Order No: B5-00676/19/EIT Dated 28.02.2020)			
Items			Quantity(in numbers)
Solar Inverter (50 kVA)			
SSB	Panel Name : LSP		
Incomer	SFU	100 Amps	1
Outgoing	SFU	100 Amps	1
Outgoing	SFU	63 Amps	1
SB	Panel Name : DC DB		
Incomer	Isolator	40 Amps	2
SB	Panel Name : Local Iso		
Incomer	Isolator	100 Amps	1
Earth Electrodes			5
MSB	Panel Name : MSB		
Incomer	MCB	63 Amps	1
Outgoing	MCB	25 Amps	2
MSB	Panel Name : MSB		
Incomer	MCB	63 Amps	1
Outgoing	MCB	25 Amps	2
Load Details HT Motor – 0 kW HT Capacitor – 0 kVAr Fire Pump Load – 0 kW Lift Load – 0 kW Other Load – 7.12 kW + 0 kVA + 0 kVAr			

Deputy Chief Electrical Inspector



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GOVT. MODEL HIGHER SECONDARY SCHOOL, PUNNAMOODU

Pallichal P.O., Thiruvananthapuram - 695 020

Phone : 2406900, 2400486

Ref. No.

Date 30/10/2020

This is to certify that M/s.INKEL Ltd. has successfully installed and commissioned the 46kWp grid connected Solar Photo Voltaic Power Plant at Ghss punnamoodu(Consumer No.1146756012305) Under KSEB - District panchayath Thiruvananthapuram phase 2 project. The SPV plant connected to KSEB Grid on 12/05/2020 and working satisfactorily.



Anitha V.V.

ANITHA .V.V
Headmistress
Govt. Model H S School
Punnamoodu, TVPM-20

Government of Kerala
 Department of Electrical Inspectorate
 Office of the Deputy Chief Electrical Inspector
 Forth Floor, Corporation Building Vikas Bhavan PO
 Thiruvananthapuram 695033
 Phone: 04712322934,
 Email:dceitvm@gmail.com Website:
 www.ceikerala.gov.in



Proceedings of the
 Deputy Chief Electrical Inspector
 Thiruvananthapuram
Present: P N Anil Kumar

Subject: Installation of 45.2kWp Grid Tied Solar Power Plant at the premises of M/s.GOV.T.V.H.S.S Vithura, School Road, Thiruvananthapuram, 695551 - Sanction for energisation orders issued - regarding.

Reference:

1. Scheme Approval No. B5-00675/19/EIT dated 24.01.2020
2. Completion report submitted by Nidhin, kunnamkulam,kunnamkulam,Kerala,680517 dated received on 29.01.2020
3. Inspection conducted on 11.02.2020
4. Non conformity report dated 20.02.2020
5. Compliance report submitted by Nidhin, Kunnamkulam,kunnamkulam,Kerala,680517 dated 24.02.2020

Order No: B5-00675/19/EIT Dated 28-02-2020

Sanction is hereby accorded under section 54 of The Electricity Act, 2003 and Regulation 32 of the Central Electricity Authority (Measures relating to safety and electric supply) Regulations, 2010 for the energisation of the installations covered under completion report read as (2) above, installed at the premises of ,M/s.GOV.T.V.H.S.S Vithura,School Road,Thiruvananthapuram,695551 subject to following conditions and as detailed in the annexure appended.

1. Supply from the Solar Panel should not be extended out of the premises.
2. Any addition or alteration to the existing installation shall be carried out only after getting prior written approval from this office.
3. The owner should rectify any defects that may be pointed out during subsequent inspection of the installation by the Electrical Inspector.
4. Date of energisation should be intimated to this office.
5. The whole installation should be in conformity with CEA (Technical Standards for connectivity of the distributed generation resources) Regulation, 2013 and KSERC (Grid interactive distributed solar energy systems) Regulation, 2014.
6. Only authorised person shall be in charge of the operation and maintenance of the installation.
7. Power allocation for additional loads, if necessary, should be obtained from KSEB/Licensee.
8. As per Central Electricity Authority (Technical standards for Connectivity of the Distributed Generation Resources) Regulation 2013- Section 5, the prescribed standards and codes of practice should be followed.
9. The mechanically operated isolation switch should have specification prescribed in Sub Section 5.ii.(9) of Central Electricity Authority Regulation (Technical standards for Connectivity of the distributed generator resources) 2013.
10. The tests prescribed under 5 (8) (2), the harmonic measurements should be done using calibrated instrument in a standard laboratory having national intimation traceability with a basic standard instruments
11. You may conduct tests mentioned in Section 5 (6) 5.ii.1, 2, 3 & 6 in consultation with the licensee and the parameters shall be within the limits as prescribed by Central Electricity Authority (Technical standards for Connectivity of the Distributed Generation Resources) Regulation 2013 before committing the Solar Supply to Kerala State Electricity Regulatory aid.
12. The tests prescribed by Central Electricity Authority Regulation 2013 should be conducted every year and the results furnished in this department for verification as per Regulation 5.8(2) of Central Electricity Authority Regulation (Technical standards for Connectivity of the distributed generator resources) 2013.
13. The whole installation should be conforming to the stipulation under Kerala State Electricity Regulatory Committee (Grid Technical Distributed Solar Energy System) Regulation 2014 to ensure the safety of associated equipments and operating personnel at the premises as well as the KSEB personnel working on their system after switching off the grid supply. The protection incorporated in the solar in restore, switching off the output when grid supply is absent should be ensured by the owner of solar system and he/she would be safely responsible for any accident in case of failure violation of the same.
14. The maintenance of all major equipments should be carried out periodically as prescribed by the manufacturer and as per Indian Standard Specifications and a register shall be maintained for recording maintenance activity and periodic checking. The register shall be kept upto date and submitted for perusal during periodical inspection.

Solar Inverter: 50kVA

Make: Delta RPI; Sl.No: RPI503M221000

Deputy Chief Electrical Inspector



To:

The Principal
M/s.GOV.T.V.H.S.S Vithura Vithura High school Road Vithura Thiruvananthapuram

Copy To:

- 1 Nidhin , kunnamkulam , kunnamkulam, Kerala , 680517
- 2 FIRSTLAW , FIRSTLAW Kanippayur Kunnamkulam 680517 ,

Annexure (Order No: B5-00675/19/EIT Dated 28.02.2020)			
Items			Quantity(in numbers)
Solar Inverter (50 kVA)			
SSB Panel Name : LSP			
Incomer	SFU	100 Amps	1
Outgoing	SFU	100 Amps	2
Earth Electrodes			4
SB Panel Name : AC DB			
Incomer	MCB	100 Amps	1
SB Panel Name : SCB			
Incomer	Isolator	40 Amps	1
Incomer	Isolator	32 Amps	1
MSB Panel Name : MSB			
Incomer	MCB	63 Amps	1
Incomer	MCB	16 Amps	3
Load Details HT Motor – 0 kW HT Capacitor – 0 kVAr Fire Pump Load – 0 kW Lift Load – 0 kW Other Load – 0 kW + 0 kVA + 0 kVAr			
			Deputy Chief Electrical Inspector 
This is a computer generated document. Signature is not required.			

Government of Kerala
 Department of Electrical Inspectorate
 Office of the Deputy Chief Electrical Inspector
 Forth Floor, Corporation Building Vikas Bhavan PO
 Thiruvananthapuram 695033
 Phone: 04712322934,
 Email: dceitvm@gmail.com Website:
 www.ceikerala.gov.in



Proceedings of the
 Deputy Chief Electrical Inspector
 Thiruvananthapuram
Present: P N Anil Kumar

Subject: Installation of 20.4kWp Solar system at the premises of M/s.GOV.T.H.S.S Mylachal, Thiruvananthapuram, 695125 - Sanction for energisation orders issued - regarding.

Reference:

1. Scheme Approval No. B5-00674/19/EIT dated 24.01.2020
2. Completion report submitted by Nidhin, kunnamkulam, kunnamkulam, Kerala, 680517 dated received on 29.01.2020
3. Inspection conducted on 13.02.2020
4. Non conformity report dated 20.02.2020
5. Compliance report submitted by Nidhin, kunnamkulam, kunnamkulam, Kerala, 680517 dated 24.02.2020

Order No: B5-00674/19/EIT Dated 29-02-2020

Sanction is hereby accorded under section 54 of The Electricity Act, 2003 and Regulation 32 of the Central Electricity Authority (Measures relating to safety and electric supply) Regulations, 2010 for the energisation of the installations covered under completion report read as (3) above, installed at the premises of ,M/s.GOV.T.H.S.S Mylachal, Mylachal, Thiruvananthapuram, 695125 subject to following conditions and as detailed in the annexure appended

1. Supply from the Solar Panel should not be extended out of the premises.
2. Any addition or alteration to the existing installation shall be carried out only after getting prior written approval from this office.
3. The owner should rectify any defects that may be pointed out during subsequent inspection of the installation by the Electrical Inspector.
4. Date of energisation should be intimated to this office.
5. The whole installation should be in conformity with CEA (Technical Standards for connectivity of the distributed generation resources) Regulation, 2013 and KSERC (Grid interactive distributed solar energy systems) Regulation, 2014.
6. Only authorised person shall be in charge of the operation and maintenance of the installation.
7. Power allocation for additional loads, if necessary, should be obtained from KSEB/Licensee.
8. As per Central Electricity Authority (Technical standards for Connectivity of the Distributed Generation Resources) Regulation 2013- Section 5, the prescribed standards and codes of practice should be followed.
9. The mechanically operated isolation switch should have specification prescribed in Sub Section 5.ii.(9) of Central Electricity Authority Regulation (Technical standards for Connectivity of the distributed generator resources) 2013.
10. The tests prescribed under 5 (8) (2), the harmonic measurements should be done using calibrated instrument in a standard laboratory having national intimation traceability with a basic standard instruments.
11. You may conduct tests mentioned in Section 5 (6) 5.ii.1, 2, 3 & 6 in consultation with the licensee and the parameters shall be within the limits as prescribed by Central Electricity Authority (Technical standards for Connectivity of the Distributed Generation Resources) Regulation 2013 before committing the Solar Supply to Kerala State Electricity Regulatory aid.
12. The tests prescribed by Central Electricity Authority Regulation 2013 should be conducted every year and the results furnished in this department for verification as per Regulation 5.8(2) of Central Electricity Authority Regulation (Technical standards for Connectivity of the distributed generator resources) 2013.
13. The whole installation should be conforming to the stipulation under Kerala State Electricity Regulatory Committee (Grid Technical Distributed Solar Energy System) Regulation 2014 to ensure the safety of associated equipments and operating personnel at the premises as well as the KSEB personnel working on their system after switching off the grid supply. The protection incorporated in the solar in restore, switching off the output when grid supply in an absent should be ensured by the owner of solar system and he/she would be safely responsible for any accident in case of failure violation of the same.

Solar Details

Total no. of PV modules: 60Nos.

Module rating:340Wp.

Module per string: 15Nos.

Total no.of strings:4Nos.

Total Capacity: 20.4kWp.

PV module Make:Topsun Energy Ltd.

Inverter: 20kVA

Make:Delta, Sl No.04819801251.

?

Deputy Chief Electrical Inspector



To:

The Headmistress
M/s.GOV.T.H.S.S Mylachal Keezharoor Thiruvananthapuram

Copy To:

1 Nidhin , kunnamkulam , kunnamkulam, Kerala , 680517

Annexure (Order No: B5-00674/19/EIT Dated 29.02.2020)			
Items			Quantity(in numbers)
Solar Inverter (20 kVA)			
SSB Panel Name : LSP			
Incomer	Isolator	63 Amps	1
Outgoing	Isolator	32 Amps	1
SSB Panel Name : LSP			
Incomer	Isolator	63 Amps	1
Outgoing	Isolator	32 Amps	1
Earth Electrodes			4
SB Panel Name : SCB			
Incomer	Isolator	20 Amps	2
SB Panel Name : LOCAL ISO			
Outgoing	MCB	32 Amps	1
MSB Panel Name : MSB			
Incomer	MCCB	63 Amps	1
Outgoing	MCB	16 Amps	4
SB Panel Name : KSEB MB			
Outgoing	SFU	63 Amps	1
SB Panel Name : LSP			
Outgoing	MCB	32 Amps	3
SB Panel Name : Solar AC DB			
Incomer	Isolator	63 Amps	1
SB Panel Name : SCB			
Incomer	Isolator	32 Amps	2

SSB	Panel Name : LSP		
Incomer	Isolator	63 Amps	1
Outgoing	Isolator	32 Amps	1
SB	Panel Name : SCB		
Incomer	Isolator	20 Amps	2
Load Details HT Motor – 0 kW HT Capacitor – 0 kVAr Fire Pump Load – 0 kW Lift Load – 0 kW Other Load – 10 kW + 0 kVA + 0 kVAr			
			Deputy Chief Electrical Inspector 
This is a computer generated document. Signature is not required.			



KERALA STATE ELECTRICITY BOARD LIMITED

(Incorporated under the Companies Act, 1956)

Office of the Chief Engineer (Renewable Energy & Energy Savings)

9th Floor, Vidyuthi Bhavanam, Pattom, Thiruvananthapuram – 695 004, Kerala

Phone: +91 471 2447404, Fax: 0471 2558340, E-mail: cerees@kseb.in

website : www.kseb.in. CIN :U40100KL2011SGC027424

By Registered post with A/D

LETTER OF AWARD

To

M/s INKEL Limited,
Ajiyal Complex, Post Office Road,
Kakkanad, Kochi - 682030

W.O No.	07/2019-20
Date	01.01.2020
Order type	385 kWp Grid tied rooftop Solar PV power plant on the rooftop of buildings owned by LSGD, District Panchayath Thiruvananthapuram (Phase 1)
Reference file	CE (REES)/AE/(RTS/DP-TVM-PH1)/2019-20/1695 dated 1.1.2020
e-Tender No	E-Tender No. KSEBL/REES/LSGD-District Panchayath TVM-Phase 1/14/2018-19 dated 04-12-2018 and Tender ID : 2018_KSEB_253691_1
Value	INR 2,62,00,000/- (Rupees Two Crores and Sixty Two Lakhs Only)
Price	Fixed

Sir,

Sub: Appointment of Engineering, Procurement and Construction (EPC) Contractor for the design as per site conditions, supply, installation, testing and commissioning of Grid Tied Rooftop Solar PV Power plants on the roof of selected buildings owned by LSGD District Panchayath Thiruvananthapuram with a total installed capacity of 385 kWp in 6 locations (Phase 1), including Operation & Maintenance of the plant for the first 5 years from the date of handing over - Award of contract - reg.

Ref 1. B.O. (FTD) No.526/2017-CE (REES)/General/2016-17TVM dated 02.03.17
2. B.O. (CMD) No. 842/2017-CE (REES)/General/2016-17TVM dated 30.03.17
3. B.O.(FTD)No.2053/2017-KSEBL/CE(REES)/2017-18 TVM dated 09.08.17

Registered Office: Vidyuthi Bhavanam, Pattom, Thiruvananthapuram-695004 Website: www.kseb.in, CIN: U40100KL2011SGC027424

4. This office TENDER No, KSEBL/REES/LSGD-District Panchayath Thiruvananthapuram-Phase I/14/2018-19 dated 04.12.2018 - Tender ID: 2018_KSEB_253691_1 and its addenda.
 5. Ltr. No. INKEL/Solar/TVM-PH-II/2019-20/001 dated 03.12.2019
 6. Proceedings No. CE(REES)/ESCOT/AE9/RTS/DP-TVM/Phase I/2019-20/12 dated 31.12.2019

The subject work is awarded to you at a contract value of INR 2,62,00,000/- (Rupees Two Crores Sixty Two Lakhs only) inclusive of all taxes and duties. You shall carryout and complete the work as per the time schedule as contained in clause 2.2.4 and 5.3.2 in Volume-I of the tender document. Two copies of this order are included herewith. The duplicate of this order shall be returned to this office within seven days, after affixing your seal and signature on all pages as a token of acceptance of the terms and conditions stated in it.

This contract will be governed by the terms and conditions as contained in tender documents Volume-I, II and III and addendums issued in this respect by the tendering authority. This Letter of Award (LOA), tender documents will form part of the contract agreement. Additional conditions/modifications if any stated in your offer or elsewhere, which are not agreed to by KSEBL or not in accordance with any of the provisions covered by the bid documents referred shall stand withdrawn/nullified.

1. Scope of work:

The subject work shall be considered as a composite supply. The scope of work will be governed by clause 2.2.3 in Volume-I of the tender document and addenda issued in this respect.

Sl. No	Location of the project	Capacity of the proposed plant (kWp)
1	District Panchayath Office, Pattom	70
2	General Hospital, Neyyattinkara	100
3	District Hospital, Nedumangad	50
4	Govt Model Hospital, Peroorkada	30
5	Govt Ayurveda Hospital, Varkala	60
6	Govt V.H.S.S., Vellanad	75
Total		385 KWp

2. Name of the Project:

Appointment of Engineering, Procurement and Construction (EPC) Contractor for the design as per site conditions, supply, installation, testing and commissioning of Grid Tied Rooftop Solar PV Power plants on buildings owned by **LSGD, District Panchayath Thiruvananthapuram** with a total installation capacity of 385 kWp in 6 locations (Phase-1), including Operation & Maintenance of the plant for the first 5 years from the date of handing over. The Performance ratio of each location shall be 75 - 80% as detailed in the Clause 2.2.3 in Volume-1 of the tender document and the addenda issued in this respect, herein after called "the project".

3. Contract amount:

The Total Contract Amount is INR 2, 62, 00,000/- (Rupees Two Crores Sixty Two Lakhs only) inclusive of all taxes and duties for design, engineering, manufacturing, procurement, supply (including spares), handling, storage, civil works, erection, installation, testing & commissioning, training of personnel, along with operation and maintenance charges of the project as all inclusive Price which include taxes, duties, cess, freight and insurance charges, logistics, etc and all the levies payable by the contractor for successful completion, operation and maintenance of the Grid Tied Rooftop Solar PV Power plants on the Roof of buildings owned by LSGD, District Panchayath Thiruvananthapuram with a total installed capacity of 385 kWp in 6 locations including Operation & Maintenance of the plant for the first 5 years from the date of handing over. The performance ratio of each location shall be 75 - 80% as detailed in the Clause 2.2.3 of Tender document Volume-1 and the addenda issued in this respect, as per the financial proposal submitted by you and as detailed in the Price Schedule attached as Annexure 1.

Freight and Insurance charges for transportation of material/equipment to destination project site and up to complete installation and commissioning should be arranged by the contractor at their own cost. KSEBL will not entertain or bear any charge for the same.

Contract amount shall be governed as per provisions under Clause 4.1 of Volume 1 of the tender document. This amount shall be firm during the period of contract and shall not be varied or adjusted on whatsoever reason on any account.

4. Taxes & Duties:

The Contract Amount as indicated in clause 3 of this document is inclusive of all Taxes, Duties, incidental charges and other levies. Taxes & Duties will be governed by the clauses as detailed in clause 4.1, 5.9.1, 5.9.2, 5.9.3 of Volume 1 of the tender document. All Taxes and duties will be as per the latest orders of KSEBL and prevailing rules of State /Central Government. No separate claim on this behalf will be entertained and future claims on any taxes and duties will not be admitted and also all statutory recoveries will be deducted by K.S.E.B Ltd from the work bill. No future claims on unquoted taxes and duties will be allowed.

5. Insurance:

All equipment, machinery, works etc, which are furnished, installed, constructed and handed over/to be handed over to the KSEBL under this contract for the completion of project shall be insured by the Contractor for the period of contract. It shall be the responsibility of the Contractor to maintain adequate insurance coverage at all times. Insurance will be governed by Clause 5.9.4 of Volume 1 of the tender document.

All the Personnel employed/engaged by the Contractor shall have adequate insurance coverage. Any claim due to mishap/accidents or otherwise to personnel/equipments, shall be taken up by the contractor, directly with the Insurance Company. KSEBL/ LSGD, District Panchayath Thiruvananthapuram will not have any liability in this respect whatsoever.

6. Work Completion Period and Date of Commissioning (CoD):

The Contractor shall complete the works in all respect within **6 months** from the official date of commencement of work which shall be the date of Agreement or the date of handing over of the site, even if not in full, but in a manner the work can be commenced and proceeded with in accordance with the programme of works, whichever is later. All the works stipulated under the scope of the Contract shall be completed in all respects, supplies made, services provided and final cleaning up done and required testing shall be completed and commissioned before the expiry of the Time of Completion unless the time of completion is postponed and period of completion is extended by a written letter from the Tripartite agreement Authority.

The date of completion/commissioning shall be the date on which the Solar plant is synchronized into KSEBL grid after obtaining clearances from all statutory bodies and after conducting necessary grid interfacing tests and measurements by the KSEBL are found satisfactory. The Engineer-in-Charge should issue a certificate including date of commissioning and an authorization certificate/commissioning report after successful synchronization, commissioning of the plant with the grid after proving the Performance ratio as detailed in clause 2.2.3 in Volume-1 of the tender document and addenda issued in this respect.

7. Extension of Completion Date:

The contractor shall not claim any price escalation, in case the completion period is extended for any reason, including litigation or force majeure conditions and is governed by clause 5.3.6 in Volume-1 of tender document.

8. Liquidated Damage:

Liquidated Damage will be governed by the clause 5.3.9 of tender document Volume 1.

9. Execution of Agreement:

The Contractor shall execute a tripartite agreement in Kerala Government Stamp paper worth (1). Rs. 26,200/- (Rupees Twenty Six Thousand and Two Hundred only) after furnishing a Bank Guarantee of Rs 26,20,000/- (Indian Rupees Twenty Six lakhs and Twenty Thousand only) i.e. 10% of the Contract value rounded off to the higher multiple of Rs 1000/-, within 15 days from

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the date of issue of Letter of Award of contract, with KSEBL and LSGD, District Panchayath Thiruvananthapuram as First and Second party respectively, as per the terms and conditions set forth in the Bid document. After execution of the tripartite agreement the successful bidder shall be known as 'EPC Integrator'. The tripartite agreement has to be executed by the contractor in the prescribed format in Form-B of Contract Tripartite agreement of this document, along with the performance security deposit at the Office of the Chief Engineer (Renewable Energy & Energy Savings), on a date and time to be mutually agreed. The contractor shall provide for signing of the contract, 2 additional copies of contract agreement, 2 copies of Bank Guarantee in lieu of Performance security deposit, appropriate power of Attorney and other requisite documents. All the documents cited in clause No. 30 of this document will form part of the agreement. Power of Attorney shall be in stamp paper attested by a registered Notary Public.

After handing over of the sites in phase I of the LSGD, District Panchayath Thiruvananthapuram project, you shall execute a separate O&M Bilateral Agreement with the LSGD District Panchayath, Thiruvananthapuram as the first party.

10. Construction Programme:

Within 15 days from the date of award, the contractor shall submit to the KSEBL for approval, a programme showing the general method, arrangements, order and timing for all the activities involved in the work in a systematic manner based on planning technique and tool like PERT /CPM in MS (Projects) and GANTT chart indicating the critical events/paths and milestones.

The contractor shall carryout the works in accordance with this programme and as approved by KSEBL, and complete them in all respects to the full satisfaction of KSEBL.

Any change to the approved work plan due to unavoidable circumstances shall be made only with the prior approval of KSEBL.

11. Terms of Payment:

The payment condition is governed by clause 5.2 in Volume-1 of the tender document and addenda issued in this respect.

a. The Contractor has to produce Bank Guarantee for an amount of 10% of the Contract amount as Performance Security Deposit at the time of executing Contract Agreement.

b. 30% of the contract value excluding O&M, will be released to the contractor as cost of major components of the plant (PV modules, Inverters and module mounting structures) after delivery of this materials at site, inspection and verification by authorized departmental officers, and production of insurance certificates for the materials delivered at site.(Refer clause 5.5.2 of tender document Volume-1). The Engineer-in -charge is to be informed about the delivery of material one week in advance by the contractor.

The Engineer in charge shall ensure the site acceptance / rejection of the received material at site within three days of delivery of material along with submitting the SAT procedure of the delivered material from the vendor by the contractor. The invoices shall be submitted by the

contractor as per the accepted price schedule which is to be verified and made ready for release of payment within 15 days of receipt of the invoices subject to the satisfaction of the above conditions.

c. 100% of the total Contract amount except Operation and Maintenance charges will be released after satisfactory completion, testing, commissioning of the Solar PV Power plant after proving the Performance ratio (AC) as per clause 2.2.3 of tender document Volume-1 and addenda issued in this respect. The contractor can submit the final invoice as per the accepted price schedule within 10 days on proving the Performance ratio (AC) (as per Clause 2.2.3 of tender document Volume-1 and addenda issued in this respect) after completing the project within 06 months.

The invoices shall be verified and final payment may be released within 3 months of receipt of the invoices subject to the satisfaction of the above conditions.

d. The Operation & Maintenance charges will be released by LSGD, District Panchayath Thiruvananthapuram, after commissioning and demonstration of the specified Performance ratio (AC) by the Contractor as per clause 2.2.3 in Volume-1 of the tender document and addenda issued in this respect, at the end of each year during O&M period (5 years).

e. The performance security amount shall also be released in equal instalments each year (O&M period) from the date of handing over the project after demonstrating the specified Performance ratio (AC) by the Contractor (as per Clause 2.2.3 in Volume-1 of the tender document and addenda issued in this respect).

f. The Quoted taxes and duties etc as governed by GST will be released subject to an undertaking from the Contractor in Kerala Government Stamp paper that "If any dispute in payment of taxes and duties etc as governed by GST from concerned Tax authorities occurs in future, the Contractor shall indemnify LSGD, District Panchayath Thiruvananthapuram from such liabilities and the Contractor shall be liable for the additions, loss or cost on account of such discrepancies / dispute".

12. Advance Payment:

No amount shall be released as mobilisation advance.

13. Performance security deposit:

The performance security deposit is governed by clause 5.1.7 in Volume-1 of the Tender document.

The Contractor shall submit Performance security deposit as Bank Guarantee at the time of execution of tripartite agreement in the prescribed format (Annexure 2) for performance security of the Contract and it shall be an amount equal to 10% of the total Contract amount rounded off to the higher multiple of Rs 1000/- i.e. INR 26,20,000/-(Indian Rupees Twenty Six Lakhs and Twenty Thousand only).

In order to cover the liabilities under the contract and to ensure sufficient guarantee to cover all possible liabilities pertaining to defects, shortfalls, remedial measures arising out of poor workmanship, materials, loss, excess amount, risk and cost of Contractor in case of alternate arrangements and any type of dues to the LSGD, District Panchayath Thiruvananthapuram, an amount as prescribed by KSEBL shall be collected and retained from the Contractor towards Performance Security of the Contract.

The Bank Guarantee shall be initially valid from the date of agreement for a period of 2 years and be kept renewed from time to time till the end of defect liability period including Operation & Maintenance. The performance security Bank Guarantee will be released in equal installments each year after demonstration of desired performance ratio (AC) (as per clause 2.2.3 of tender document vol-1 and the addenda issued in this respect) during the defect liability period. The performance ratio (AC) (as per Clause 2.2.3 of tender document vol-1 and addenda issued in this respect) will be calculated based on data from Pyranometer/ Meteoronorm / Pyrheliometer data. Failure of the successful bidder to submit the required Performance Guarantee shall constitute sufficient grounds for termination of Contract & forfeiting the EMD.

No interest will be paid by KSEBL at any stage of contract on the Performance Security.

The performance ratio (AC) (as per Clause 2.2.3 of Vol-1 of the tender document and the addenda issued in this respect) can be checked at any time in between if deemed necessary by the Engineer in charge (as per clause 2.2.3 of tender document Volume-1 and addenda issued in this respect). If any unusual degradation is noticed in the Performance Ratio, the contractor shall attend and rectify the same within 24 hours on intimation. If not the performance security deposit will be forfeited.

14. Payment Authority and Engineer-in-Charge:

Engineer in Charge –Engineer authorized by Chief Engineer (Renewable Energy & Energy Savings). The Engineer-in Charge may delegate powers to subordinate officers in respect of execution of work such as Site supervision of Electrical works and arrangements for interconnection facility, Technical support and civil supervision.

The work shall be treated completed only when the Engineer-in- charge issues certificate of completion where the actual date of completion of work will be mentioned. In case of termination or foreclosure the Engineer-in -charge will issue the certificate of completion to that effect. If the contractor fails to complete any part of the work as required for satisfactory completion before taking over and / or the date of completion specified, and fails to remove the surplus materials, the KSEBL will complete the works and remove the surplus materials etc and the amount incurred for the same will be realized from the contractor from any amount due to him from this work or any other work with KSEBL or his assets in appropriate proceedings. The contractor will not have any claim over the surplus materials so removed by the KSEBL.

The contractor shall submit bills in Triplicate to the **Engineer-in-Charge** with all supporting documents as indicated in the relevant clauses in Volume 1 of the bid document.

15. Manufacturing Schedule:

Contractor shall specify all basic design details, including details of the PV modules and the support structures, inverters, cables, online monitoring, integration and power evacuation details with existing power system, with appropriate diagram and drawings. The drawings along with detailed structure design and material selected as per the relevant standards. All guaranteed technical particulars, details of each items, make, model number and specification conforming to relevant standards, entire drawings, detailed test reports, list of O & M spares for major materials, detailed Bill of materials and Priced Bill of Quantities in respect of materials/equipments and works for the entire Project shall be submitted within 15 days of receipt of this LoA.

All materials and equipments required for successful completion and commissioning of the project must be included. The design details and other accessories should adhere to and match with the technical specifications provided in the Volume III of the tender document and as per the Guaranteed Technical Particulars offered by you.

The Contractor shall submit all the appropriate diagram and drawings to the agreement authority for approval. Also specifications of major items such as PV modules, inverters etc shall be submitted to the Agreement authority for approval. Approvals for Layout of Power Plant Installation shall be provided by the Engineer-in-Charge prior to the submission of all the drawings.

Energy meter provided for the installation of the solar PV plant shall be in accordance with the regulations and technical specifications of KSEBL.

For the goods supplied from outside the purchaser's country, the supplier shall be entirely responsible for all taxes, duties, stamp duties, license fees, and other such levies imposed outside the purchaser's country.

16. Drawings and documents

The design documents to be submitted by the contractor will include but not limited to:

- I. DC cable size calculation
- II. DC cable specification
- III. DC cable schedule, voltage drop and power loss calculation
- IV. String monitoring unit specification
- V. DC earthing & pit calculation
- VI. Lightning protection details / specification
- VII. All technical specification of AC components
- VIII. Cable schedules

Contractor shall furnish the following drawings under this contract and has to obtain approvals.

- a. Shadow analysis of the roof
- b. General arrangement and dimensional layout
- c. Schematic drawing showing the SPV panels, Power conditioning Unit(s) / inverter, Junction Boxes, AC and DC Distribution Boards, meters etc.
- d. Layout of solar PV Array and Single line diagram,

- e. Mounting structure drawing
- f. Structural drawing along with foundation details for the structure.
- g. Location specific Itemized bill of material for complete SPV plant covering all the components and associated accessories.
- h. Sizes and specification of cables between array interconnections, array to junction boxes, junction boxes to Inverter etc. shall be furnished
- i. PVSyst simulation report of the combination offered PV modules with the offered inverters shall be furnished to the agreement authority for approval.

The drawings along with detailed structure design and material selected and their standards shall be submitted to agreement authority for approval before starting the execution work. The work will be carried out as per the approved design.

The contractor shall provide necessary drawings and documents required by statutory authorities and obtain the approval before taking up erection.

17. Quality Assurance:

Strict compliance with the approved and proven & established quality assurance systems and procedures during the different stages of the project starting from sizing, selection of make, storage (at site), during erection, testing and commissioning have to be ensured by the contractor.

PV modules should have valid qualification test (as per STC) certificate as per IEC 61215 and IEC 61730 -1&2 and IEC 61701. The power conditioning units / inverters should comply with applicable IEC/ equivalent BIS standard for efficiency measurements and environmental tests, safety standards and characteristics of the utility interface (Parallel operation) as per standard codes IEC 61683 and IEC 60068 2(1,2,14,30) and IEC 62109-1&2 and IEC 61727 respectively. Inverter shall be provided with protection against islanding of Grid as per IEEE 1547/UL1741/62116 to isolate it from the grid in case of no supply, under voltage and over voltage conditions so that in no case there is any chance of accident. The module mounting structure shall be as per latest BIS 2062 and galvanization of mounting structure shall be in compliance of BIS 4759 (amended up to date)/IS2629.

The type test certificates shall be verified by KSEBL while conducting factory inspection tests. The contractor shall furnish detailed quality procedures for the major components for approval prior to the Factory inspection call. The agreement authority will provide the approvals regarding the test to be conducted during the inspection.

The following minimum tests shall be conducted on the required number of samples as is required by the Engineer-in-charge, during the Factory inspection:

For PV modules:

1. Visual inspection
2. Dimensional Check
3. Insulation Resistance
4. Leakage Current
5. Electrical Test(with sun simulator)

6. RFID verification
7. Electroluminescence tests
8. Robustness of termination

For Inverters:

1. Visual inspection
2. Dimensional and Power Wiring Check.
3. Auxiliary functional check.
4. Fan direction of rotation, On-Off control, etc
5. Functionality test of relays
6. Command checks.
7. Protection function checks.
8. AC under voltage, AC over voltage, AC under frequency, AC over frequency
9. Load tests simulation 25%, 50%, 70% and 100%
10. Load test performed at variable MPPT voltage @100% load on the specified voltage range.
11. Over temperature, ground fault simulation

For isolation transformer:

1. Visual inspection
2. Routine test as per IS-2026/ IEC 60601-1/IEC 61558-1

For Module mounting structures:

1. Visual inspection
2. Dimensional Inspection
3. Functional fittings

The Contractor shall submit letters of inspection calls sufficiently in advance specifying the date and venue of inspection to the agreement authority through the Engineer-in-Charge. All the major components should undergo factory inspection tests.

The agreement authority shall arrange inspection of material/ equipment and upon satisfactory completion of the inspection and tests; the Material Despatch Clearance Certificate will be issued.

The test and inspection shall be done in accordance with the relevant standards and the Manufacturer's standard before the delivery to site as well as after the erection and commissioning at site.

All acceptance and routine tests of equipment as per the specification and relevant standards shall be carried out by the contractor. Agreement authority or authorized officials may undertake the quality checks during the manufacturing stages also.

Functional testing and erection of equipments shall be carried out by the contractor in presence of KSEBL officers delegated by the Engineer-in-Charge and the approvals will be given only if the same is satisfactory.

Engineer-in-Charge shall conduct visual inspection including dimensional checks, verification of serial numbers, RFID reading of PV modules etc for the Site Acceptance of the delivered materials based on the BOM. Any material or work found to be defective or which does not meet the requirements of the specification will be rejected and shall be replaced at the Contractor's cost.

18. Review and Progress report:

The contractor shall submit monthly progress report to Engineer-in-Charge and all concerned personnel in connection with this order, with a copy to this office.

The Engineer-in-Charge will co-ordinate and monitor all activities of the project. These progress report formats may be changed as and when required by KSEBL.

The contractor shall produce an updated Activity Schedule within 14 days of being instructed by the KSEBL.

19. Technical parameters for getting grid connectivity:

- a. Harmonic current injections from a plant shall not exceed the limits specified in IEEE 519 2014 as per CEA technical standard for connectivity of the distributed generation resources.

Individual voltage harmonics distortion	< 3 %
Total Voltage harmonic Distortion THD	< 5%
Total Current harmonic Distortion	< 8%
Output frequency	= 50Hz +/- 0.5Hz
- b. Photovoltaic system should not inject DC power more than 0.5% of full rated output at the interconnection point or 1% of rated inverter output current into distribution system under any operating conditions
- c. Operation of Photovoltaic system shouldn't cause voltage flicker in excess of the limits stated in IEC 61000 or other equivalent Indian standards, if any
- d. While the output of the inverter is greater than 50%, a lagging power factor of greater than 0.9 shall be maintained.
- e. The Photovoltaic system in the event of voltage or frequency variations must island/disconnect itself within IEC standard on stipulated period.
- f. The voltage-operating window should minimize nuisance tripping and should be under operating range of 80% to 110% of the nominal connected voltage beyond a clearing time of 2 seconds, the Photovoltaic system must isolate itself from the grid.
- g. When the Distribution system frequency deviates outside the specified conditions (50.5 Hz on upper side and 47.5 Hz on lower side up to 0.2 sec), the Photovoltaic system shouldn't energize the grid.

20. Testing and Commissioning:

Commissioning test with all required testing shall be conducted by the contractor in presence of KSEBL officers delegated by the Engineer-in-Charge/authorized person of LSGD (District Panchayath, Thiruvananthapuram).

The contractor shall also prepare and handover the as-built drawing, Operational manuals and Maintenance manuals of the plant to KSEBL.

On completion of all works stipulated in the scope of work and after testing and commissioning of the Project, and if there are no obligations to arise out of the Contract, KSEBL shall issue a completion certificate as described under Clause 5.3.3 of Tender document Volume I.

21. Operation and Maintenance (O&M):

Operation and Maintenance is governed by clause 6.9 in Volume-I of the tender document. Operation and maintenance of the solar plant up to the point of supply for a period of 5 years of Defects Liability period is the responsibility of the Contractor.

Operation and Maintenance during this period shall include supply of spares of panels, inverters and all equipments in the solar plant including transportation of these items from the original manufacturer, consumables, general comprehensive insurance covering fire, earthquake.

The solar plant should be maintained shadow free. The tree branches if any causing hindrance to the shadow free operation of solar plant shall be cut and removed under the supervision of LSGD, District Panchayath Thiruvananthapuram. Copies of the Insurance Policies are to be given to LSGD, District Panchayath Thiruvananthapuram as and when taken.

The contractor shall ensure efficient operation of the SPV plant and the associated facilities to achieve the maximum power generation from the plant. For this purpose the contractor shall engage the services of adequate number of Engineers and Technicians. The contractor shall also attend to all failures, rectifications, breakdowns, 5 year comprehensive Operation and Maintenance checks.

Adequate training should be given to personnel identified by the LSGD, District Panchayath Thiruvananthapuram for Daily Monitoring Information like solar energy generated, net meter readings etc. Monthly System (MIS) reports with generation and down time analysis data has to be sent to LSGD, District Panchayath Thiruvananthapuram Corporate offices by E-mail during the defect liability period. Any discrepancy/malfunctioning noted shall be immediately attended to and got rectified by the contractor.

The Contractor should not misuse the land and buildings in the project site and assign responsibility for the safety of machinery within the premises.

22. Annual Maintenance Contract (AMC):

The plant shall then be handed over to the LSGD District Panchayath Thiruvananthapuram at the end of 5 years for O&M. After five years from the date of commissioning, the EPC contractor

may be asked to execute the AMC for another 5 years on mutual agreement at mutually agreed price.

The EPC contractor shall execute the AMC agreement as per conditions stipulated at that time.

23. Performance & Warrantee:

The mechanical structures, electrical works and overall workmanship of the Solar Power plant must be warranted for a minimum of 10 years. PV modules used in solar power plant must be warranted for output wattage, which should not be less than 90% at the end of 10 years and 80% at the end of 25 years.

EPC contractor shall ensure the performance ratio of each location as detailed in the Clause 2.2.3 of Tender document Volume-1 and addenda issued in this respect.

24. Generation Assessment

The performance ratio (AC) of each location shall range from 75- 80% as per clause 2.2.3 of Tender document Volume-1 and addenda issued in this respect. Performance ratio test as per IEC 61724 will be carried out at site jointly by the EPC contractor in presence of authorized officials from KSEBL and LSGD, District Panchayath Thiruvananthapuram. This is mandatory for commissioning and handing over the plant. If the contractor fails to prove the desired performance ratio at the time of completion and during any of the consecutive years of defect liability period he will be given a second chance to demonstrate the PR in another 7 days. Still if it is not achieved, the same shall be demonstrated in another 7 days and still if it is not achieved, EPC contractor shall enhance the module capacity of solar plant/improve the quality of the plant by replacement of module/other components with all suitable modification requirements on balance of systems at his own cost to achieve the stipulated Performance ratio.

Operation and maintenance charges shall be released at the end of each year based on the Performance ratio (AC) as mentioned above, as per the table given below.

Sl.No	Particulars	Performance ratio (AC) in %
1	At the time of completion and commissioning	75-80
2	At the end of 1 st year	74-79
3	At the end of 2 nd year	73-78
4	At the end of 3 rd year	72-77
5	At the end of 4 th year	71-76
6	At the end of 5 th year	70-75

25. Handing over:

After the date of successful commissioning of the Project, the Contractor shall hand over the complete Solar PV Electric Power Generation system to the LSGD, District Panchayath

Thiruvananthapuram as specified in the tender within 15 days. Any component found defective/inefficient/worn out shall be rectified/ replaced/ made good at contractor's cost before handing over the system to the LSGD District Panchayath Thiruvananthapuram authorities. In order to ensure longevity & safety of the core equipment and optimum performance of the system the Contractor should use only genuine spares of high quality standards. Contractor has to maintain the rooftop SPV plant till the end of the contract period of five years from the date of handing over.

The contractor shall provide the named list of essential tools and spares required for the future operation and maintenance of the plant.

26. Termination of Contract:

Termination of Contract will be guided strictly in accordance with clause 5.3.1 | in Volume 1 of the tender document.

27. Force Majeure:

Force Majeure shall be governed by Clause. 5.3.8 in Volume 1 of the tender document.

28. Defects Liability Period:

The Defect Liability Period shall be governed by Clause.5.3.4 in Volume 1 of the tender document.

29. Law and Jurisdiction:

This contract has to be performed complying with the laws of India and Kerala and any dispute arising out of this contract will be subject to the exclusive jurisdiction of Civil Courts at Thiruvananthapuram.

30. Contract Documents

1. Agreement executed in Kerala Government Stamp Paper
2. Letter of Award (duly signed and seal affixed on all pages)
3. Correspondences between the KSEBL and the selected bidder included in the Agreement.
4. Special Conditions of Contract.
5. General Conditions of Contract.
6. Technical specifications.
7. Accepted Schedule of Technical Particulars and construction programme & Manufacturer Authorization form of Components.
8. Accepted Schedule of Prices
9. General Bid conditions
10. Instructions to bidders.
11. Information to bidders.
12. Detailed Structural Drawings including approved drawing issued from time to time.

13. All volumes of bid with *TENDER* No. KSEBL/REES/LSGD-District Panchayath TVM-Phase 1/14/2018-19 dated 04-12-2018 having Tender ID: 2018_KSEB_253691_1 and its addendums along with clarifications and related documents issued by the Tendering Authority.
14. Response (proposal) of M/s INKEL Ltd, Door no.7/473ZA, 2nd Floor, Ajiyal Complex, Kakkanad, Cochin Kerala including the Bid, Clarification documents and the accepted rate submitted.

31. Acknowledgment by the Contractor:

This Letter of Award is issued subject to the documents referred above and terms and conditions contained therein. You will also be deemed to be fully aware of KSEBL's **General conditions of contract** which is applicable to this contract also and ignorance of these conditions will not exempt you from your liability to abide by the same.

If there is any contradiction/conflict between the tender documents and LoA, conditions in the LoA will prevail.

The documents specified in Clause 10 and 15 shall be submitted within 15 days from the date of issue of this LoA


Chief Engineer
(Renewable Energy & Energy Savings)

Acc:-

1. Annexure 1: Price schedule
2. Annexure 2: Contract Forms
 - A. Performance Security deposit BG
 - B. Form of contract agreement
3. Annexure 3: Copy of LoA



Copy to:-

1. The Secretary K.S.E.B Ltd, Thiruvananthapuram,
2. The LA and DEO K.S.E.B Ltd, Thiruvananthapuram.
3. The Financial Advisor, KSEBL,
4. Deputy Chief Engineer, Electrical Circle, Thiruvananthapuram Urban & Rural
5. TA to The Chairman & Managing Director, KSEBL, Thiruvananthapuram/
6. TA to Director (Distribution, IT & HRM)/ Director (Transmission & System Operation, Safety, Corporate Planning and REES/ Director (Generation -Electrical & SCM/ Director (Generation-Civil)
7. PA to The Director (Finance)
8. Sr.CA to Chief Vigilance Officer
9. The Main Income Tax Officer, Thiruvananthapuram, Kerala.
10. The Accountant General, Thiruvananthapuram, Kerala
11. Secretary, District Panchayath Thiruvananthapuram
12. Stock file

Annexure: 1 - Total Price Schedule

Appointment of EPC contractor for the design as per site conditions, erection, testing & commissioning of Grid Tied Rooftop Solar PV Power plants, on the Roof of buildings owned by LSGD, District Panchayath Thiruvananthapuram with a total installed capacity of 385 kWp in 6 locations (Phase-I) including Operation & Maintenance of the plant for the first 5 years from the date of handing over

Sl No	Item Description	Quantity	Unit	Basic rate (Rs)	Freight charges (Rs)	Insurance (Rs)	GST (Rs)	Any other applicable tax (Rs)	Total amount without tax (Rs)	Total amount with tax (Rs)
1	Total Price for the design, planning, investigation, survey, engineering, manufacture/procurement, manufacturer's quality assurance, shop testing (including type testing where specified/required), transportation, handling, storage, erection including all civil/structural works, electrical and general works, piping, cabling, instrumentation, installation, testing and commissioning, training, services, permits and insurance at all stages, and all related works for connectivity, Statutory Inspection & Testing, Additional work/Cabling, Power Evacuation including cost of Transformers and HT metering and works related with Single Phase to Three phase Conversion required in necessary locations of Grid-tied 385 kWp (in total from 6 locations) Solar Photovoltaic (SPV) Power Plants on the rooftop of buildings under LSGD (District Panchayath Thiruvananthapuram) and executing everything necessary to complete the project successfully in all respects and handing over the SPV Plants to LSGD (District Panchayath Thiruvananthapuram) to its full satisfaction after proving the performance ratio (AC) as detailed in the clause 2.2.3 of Tender document Volume I.	01	Set	2,38,28,571.43	0	0	11,91,428.57	0	2,38,28,571.43	2,50,20,000

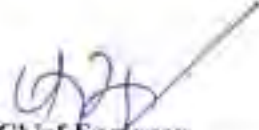
Sl No	Item Description	Quantity	Unit	Basic rate (Rs)	Freight charges (Rs)	Insurance (Rs)	GST (Rs)	Any other applicable tax (Rs)	Total amount without tax (Rs)	Total amount with tax (Rs)
2	Total price for Operation and Maintenance (O & M) charges of the Solar Photovoltaic Power Plant for a period of 5 year including arrangement of cost of replacement of all the defective parts, consumables, tools, tackles, testing equipments & instruments, manpower, all administrative work, maintenance of records and submissions to all concerned authorities for the Grid-tied 385 kWp (in total from 6 locations) Solar Photovoltaic (SPV) Power Plants on the rooftop of buildings under LSGD (District Panchayath Thiruvananthapuram)									
a	O&M charge for 1 st year	01	Set	2,00,000			36,000		2,00,000	2,36,000
b	O&M charge for 2 nd year	01	Set	2,00,000			36,000		2,00,000	2,36,000
c	O&M charge for 3 rd year	01	Set	2,00,000			36,000		2,00,000	2,36,000
d	O&M charge for 4 th year	01	Set	2,00,000			36,000		2,00,000	2,36,000
e	O&M charge for 5 th year	01	Set	2,00,000			36,000		2,00,000	2,36,000
	Total O&M for 5 years (2.a+2.b+2.c+2.d+2.e)			10,00,000			1,80,000		10,00,000	11,80,000

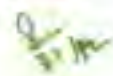
Total amount with tax of Item 1
Total amount with tax of Item 2
Total amount of Item 1 & Item 2

= Rs 2,50,20,000/-
= Rs 11,80,000/-
= Rs 2,62,00,000/-

Total amount is Rupees : Two Crores and Sixty Two Lakhs Only




Chief Engineer
(Renewable Energy & Energy Savings)



Government of Kerala
Department of Electrical Inspectorate
Office of the Deputy Chief Electrical Inspector
Corporation Building, Palayam, Thiruvananthapuram-33
Phone : 0471 2034159 email ID : deetym@gmail.com



**Proceedings of the
Electrical Inspector, Thiruvananthapuram**

(Present:- P K Ushakumari)

- Subject:-** Installation of 30kWp Grid tied solar system at the premises of M/s Govt Model Hospital Peroorkada, Thiruvananthapuram - Sanction for energisation - orders issued - reg -
- Read:-**
1. Completion report No. FIRSTLAW/CO/005-2/20-21 received on 04/11/2020 of M/s Firstlaw, B'Class Electrical Contractor, Kanippayur(P.O) Kunnankulam, Thrissur
 2. Inspection conducted on 01/12/2020
 3. Nonconformities reported under letter number B5-7550/20/EIT dated 03/12/2020
 4. Compliance report furnished under cover of letter No FIRSTLAW/DR/005-2/19-20 received on 26/03/2021 of M/s Firstlaw, B'Class Electrical Contractor, Kanippayur(P.O) Kunnankulam, Thrissur

Order No. B5-7550/20/EIT dated 16/09/2021

Sanction under Section 54 of The Electricity Act, 2003 and Regulation 32 & 43 of the CEA, (Measures relating to Safety and Electric Supply) Regulations, 2010 is hereby accorded for energisation of the electrical installation covered under the Completion Report read as 1st above and installed at the premises of M/s.Govt Model Hospital, Peroorkada, Thiruvananthapuram with the following specifications subject to the conditions mentioned here under

Specifications:-

Inverter

30kVA
Make Delta
Sr No. 01Y19C077623WH

Solar PV Module (91Nos)

Make Tpsun
Rating 330Wp
String 5Nos(19*3.17*2)

Earth Electrodes 5Nos

MV Switch Gears

A.DC DB	40A - 1No	32A - 1No	
B.AC DB	63A - 1No		
C. AC PANEL	200A - 1No	125A - 1No	63A - 1No

Conditions:-

1. Any addition or alteration to the existing installation shall be carried out only after getting prior written approval from this office
2. The owner should rectify any defects that may be pointed out during subsequent inspection of the installation by the undersigned
3. All the pre-commissioning tests shall be recorded for ready reference

- 4 Electricity duty for the units produced from the solar energy system should be remitted to the government when demanded
- 5 The whole installation should be in conformity with CEA (Technical Standards for connectivity of the distributed generation resources) Regulation, 2013 and KSERC (Grid interactive distributed solar energy systems) Regulation, 2014
- 6 Consent from Licensee shall be obtained in case of grid tied system

**Electrical Inspector****To****M/s. Superintendent**

Govt Model Hospital, Peroorkada, Thiruvananthapuram

Copy to:

- 1 M/s Firstlaw, 'B' Class Electrical Contractor, Kanippayur (P O), Kunnankulam, Thrissur [Lic No - CB7161]
- 2 The Assistant Engineer, KSEB, Electrical Section - Peroorkada
- 3 Stock File/Computer Data
- 4 Office Copy

IIR Case No.3641 New Case*e.solutions-7.7*



Government of Kerala
Department of Electrical Inspectorate
Office of the Deputy Chief Electrical Inspector
4th Floor, Corporation Buildings,
Vikas Bhavan P.O., Thiruvananthapuram 695 033.
Phone: 0471 2322934, Email : dceitym@gmail.com



**Proceedings of the
Electrical Inspector(In Charge), Thiruvananthapuram**

(Present:- P K Ushakumari)

Subject:- Installation of 1 No. 60.06 kWp on Grid Solar Power Plant with 2 Nos. 30kVA Solar inverters and connected electrics in the existing non-HT installation at the premise of M/s. Government Ayurveda Hospital Varkala Thiruvananthapuram - Sanction for energisation - orders issued - reg.-

Read:-

1. Scheme approval no. B5-7549/20/EIT dated 12/02/2021
2. Completion report No. Nil FIRSTLAW/CC/005-4/20-21 received on 27/08/2021 of M/s. First Law B-Class Electrical Contractor, CB-7161, Kanippayur P.O, Kunnamkulam, Thrissur.
3. Inspection conducted on 17/09/2021
4. Inspection defect report of even number dated 17/09/2021
5. Compliance report furnished under cover of letter No. FIRSTLAW/CO/005-5/20-21 dated 18/09/2021 of M/s. First Law, B-Class Electrical Contractor, Kanippayur P.O. Kunnamkulam, Thrissur.

Order No. B5-7549/20/EIT dated 18/09/2021

Sanction under Section 54 of The Electricity Act, 2003, Regulation 32 of the CEA (Measures relating to Safety and Electric Supply) Regulations-2010, Central Electricity Authority (Technical Standards for connectivity of the Distributed Generation Resources) Regulations-2013 and Kerala State Electricity Regulatory Commission (Renewable Energy and Net Metering) Regulations 2020 is hereby accorded for energisation of the electrical installation covered under the Completion Report read as 2nd above and installed at the premises of M/s Government Ayurveda Hospital, Varkala, Thiruvananthapuram with the following specifications subject to the conditions mentioned here under.

1. Supply from the Solar Panel should not be extended out of the premises.
2. Any addition or alteration to the existing installation shall be carried out only after getting prior written approval from this office.
3. The owner should rectify any defects that may be pointed out during subsequent inspection of the installation by the Electrical Inspector.
4. Electricity duty for the units produced from the solar energy system should be remitted to the government.
5. Only authorised person shall be in charge of the operation and maintenance of the installation
6. Power allocation for additional loads, if necessary, should be obtained from KSEB/Licensee
7. Consent from licensee shall be obtained for this Solar installation.
8. The whole installation should be in conformity with CEA (Technical Standards for connectivity of the distributed generation resources) Regulation, 2013 and Kerala State Electricity Regulatory Commission (Renewable Energy and Net Metering) Regulations 2020 to ensure the safety of associated equipment and operating personnel at the premises as well as the KSEB personnel working on their system after switching off the grid supply. The protection incorporated in the solar in restore, switching off the output when grid supply in a absent should be ensured by the owner of solar system and he/she would be safely responsible for any accident in case of failure violation of the same.

Load Details: Appended



Electrical Inspector(In Charge)

To,

M/S Government Ayurveda Hospital, Varkala

Copy to:

1. M/s. First Law, B-Class Electrical Contractor, Kanippayur P.O, Kunnankulam, Thrissur (CB-5045)
2. The Assistant Engineer, KSEBL, Electrical Section, Varkala, Thiruvananthapuram
3. Stock File/Computer Data
4. Office Copy

Annexure to Order No: B5-7549/20/EIT dated 18/09/2021

	Quantity (in numbers)
Solar Panel 60.06kWp PV modules 330Wp Make : Topsun Open Circuit Voltage : 40.30V Short Circuit Current : 8.39 A	182 Nos.
30kVA Inverter Inverter Details:- Make: DELTA, SI Nos: O1Y19CO7757WH and O1Y19CO7765WH	2Nos.
Load Sharing Panel-1 125 A SFU(Incomer)x 1No,100A SFU(Outgoing)x1No, 63A 4P MCB(Outgoing)x1No.	
Load Sharing Panel-2 200 A SFU(Incomer)x 1No,160A SFU(Outgoing)x1No, 63A 4P MCB(Outgoing)x1No.	
Earth Pits	3 Nos.

✓
Electrical Inspector(In Charge)



ELU-100
794.473

സോളാർ പ്ലാന്റ് കണക്കുകൾ റിപ്പോർട്ട്



സെക്ഷൻ : Nedumangad
 കൺസ്യൂമർ നമ്പർ : LCN 12/8390 (13 അംഗം)
 പേര് : District Hospital Nedumangad
 സ്ഥിതി നമ്പർ : _____
 സോളാർ ക്യാപസിറ്റി : 50 kw കിഴക്കൻ
 കണക്ക് ചെയ്ത തീയതി : 07/10/2021
 സോളാർ മീറ്റർ ഇൻഷുൽ റീഡിംഗ് : 4.2 kwh
 നെറ്റ് മീറ്റർ ഇൻഷുൽ റീഡിംഗ് : 100.00 kwh

തീയതി : 07/10/2021 അസിസ്റ്റന്റ് എഞ്ചിനീയർ പേര് Pradeep Kumar G

ഒപ്പ് _____
 ASSISTANT ENGINEER
 ELEC.

Government of Kerala
 Department of Electrical Inspectorate
 Office of the Deputy Chief Electrical Inspector
 Forth Floor, Corporation Building Vikas Bhavan PO
 Thiruvananthapuram 695033
 Phone: 04712322934,
 Email:dceitvm@gmail.com Website:
 www.ceikerala.gov.in



Proceedings of the
 Electrical Inspector
 Thiruvananthapuram
Present:P.K.USHAKUMARI

Subject: Installation of at the premises of M/s. Govt. Model HSS,Vellanad, Thiruvananthapuram, 695543 - Sanction for energisation orders issued - regarding.

Reference:

1. Scheme Approval No. B5-06206/20/EIT dated 02.12.2020
2. Completion report submitted by Nidhin, kunnamkulam,kunnamkulam,Kerala,680517 dated received on 18.12.2020
3. Inspection conducted on 04.01.2021
4. Non conformity report dated 06.01.2021
5. Compliance report submitted by Nidhin, kunnamkulam,kunnamkulam,Kerala,680517 dated 07.01.2021

Order No: B5-06206/20/EIT Dated 05-02-2021

Sanction is hereby accorded under section 54 of The Electricity Act, 2003 and Regulation 32 of the Central Electricity Authority (Measures relating to safety and electric supply) Regulations, 2010 for the energisation of the installations covered under completion report read as (3) above, installed at the premises of ,M/s. Govt. Model HSS,Vellanad,Velland,Thiruvananthapuram,695543 subject to following conditions and as detailed in the annexure appended

1. Date of energization shall be intimated.
2. Operation and maintenance of electrical installation shall be done only by authorized persons.
3. All the maintenance works shall be recorded in the maintenance register.
4. Addition/alteration in the existing installation shall be carried out only with prior approval from the electrical inspectorate.

Electrical Inspector



To: M/S. GOVT.MODEL H.S.S VELLANAD
 PEYAD VELLANAD ROAD , VELLANAD P.O , THIRUVANATHAPURAM DISTRICT PIN:695543,.

Copy To:

- 1 Nidhin , kunnamkulam , kunnamkulam, Kerala , 680517
- 2 FIRSTLAW , FIRSTLAW Kanippayur Kunnamkulam 680517 ,

Annexure (Order No: B5-06206/20/EIT Dated 08.02.2021)			
Items			Quantity(in numbers)
Solar Inverter (88 kVA)			
SSB	Panel Name : LSP		
Incomer	Isolator	200 Amps	1
Outgoing	SFU	160 Amps	2
VDB	Panel Name : MSB		
Incomer	MCCB	160 Amps	1
Outgoing	MCCB	100 Amps	4
Earth Electrodes			3
SB	Panel Name : KSEB meter board		
Incomer	SFU	200 Amps	1
SB	Panel Name : solar ac panel		
Incomer	MCCB	160 Amps	1
UPS (2 kVA)			1
VDB	Panel Name : VDB-1		
Incomer	Isolator	63 Amps	1
Outgoing	MCB	40 Amps	6
Outgoing	MCB	32 Amps	2
VDB	Panel Name : VDB-2		
Incomer	Isolator	63 Amps	1
Incomer	MCB	32 Amps	2
Outgoing	MCB	40 Amps	6
VDB	Panel Name : VDB-3		
Incomer	Isolator	63 Amps	1

Outgoing	MCB	40 Amps	6
Outgoing	MCB	32 Amps	2
MSB Panel Name : LSP			
UPS (1.6 kVA)			1
Load Details HT Motor – 0 kW HT Capacitor – 0 kVAr Fire Pump Load – 0 kW Lift Load – 0 kW Other Load – 44 kW + 0 kVA + 0 kVAr			
			Electrical Inspector 
This is a computer generated document. Signature is not required.			

അനുബന്ധം-14

സോളാർ പ്ലാന്റ് കണക്ഷൻ റിപ്പോർട്ട്

സെക്ഷൻ : Velionad Section

കൺസ്യൂമർ നമ്പർ : MHSS.190.001.24 (13 അക്കം)

പേര് : H.M.GOVIND VELIONAD

സ്മിൻ നമ്പർ : 45510.0015

സോളാർ കമ്പാസിറ്റി : 75

കണക്ട് ചെയ്ത ദിവസം : 15/07/2021

സോളാർ മീറ്റർ ഇൻഷുൽ റീഡിംഗ് : 0

നെറ്റ് മീറ്റർ ഇൻഷുൽ റീഡിംഗ് : 0

23/7/2021
തീയതി:

അസിസ്റ്റന്റ് എഞ്ചിനീയർ പേര് H.M.GOVIND

ഒപ്പ്

 ASSISTANT ENGINEER
 ELECTRICAL SECTION
 VELIONAD



KERALA STATE ELECTRICITY BOARD LIMITED

(Incorporated under the Companies Act, 1956)

Office of the Chief Engineer (Renewable Energy & Energy Savings)
9th Floor, Vidyuthi Bhavanam, Pattom, Thiruvananthapuram - 695 004, Kerala
Phone: +91 471 2447404, Fax: 0471 2558340, E-mail: cerees@kseb.in
website : www.kseb.in. CIN :U40100KL2011SGC027424

By Registered post with A/D

LETTER OF AWARD

To

**M/s. INKEL LIMITED
AJIYAL COMPLEX, POST OFFICE ROAD,
KAKKANAD, COCHIN, KERALA , 682021**

W.O No.	03 /2020-21
Date	20 .10.2020
Order type	70 kWp Grid tied rooftop Solar PV power plants on the rooftop of 7 buildings owned by LSGD-Kasaragod including Operation & Maintenance of the plant for the first 5 years from the date of handing over
Reference file	CE (REES)/LSGD-Kasaragod Phase III /70kWp/2020-21
e-Tender No	Tender No : KSEB/ REES/LSGD-Kasaragod phase III/70kWp/14/2019-20 dated 08-06-2020 having Tender ID : 2020_KSEB_362941_1
Value	INR Rs. 40,67,899/-(Rupees Forty Lakhs Sixty Seven Thousand Eight hundred and Ninety Nine Only)
Price	Fixed

Sir,

Sub: Appointment of EPC contractor for the design as per site conditions, erection, testing & commissioning of Grid Tied Rooftop Solar Photo Voltaic (SPV) Power plants, on the Roof of buildings owned by LSGD-Kasaragod (Phase-III) Viz Kasaragod District Panchayath, with a total installed capacity of 70 kWp in total 7 locations including Operation & Maintenance of the plant for the first 5 years from the date of handing over - Award of contract – reg.

- Ref : 1. This office Tender No: KSEB/ REES/LSGD-Kasaragod phase III/70kWp/14/2019-20 dated 08-06-2020 having Tender ID : 2020_KSEB_362941_1.
2. Letter No. INKEL/SOLAR/KSEBL-70 KW DPKP3/2020-21/135 Dated 13.10.2020

Registered Office, Vidyuthi Bhavanam, Pattom, Thiruvananthapuram-695004 Website:www.kseb.in, CIN: U40100KL2011SGC027424

The subject work is awarded to you at a contract value of INR Rs. 4067899/- (Rupees Forty Lakhs Sixty Seven Thousand Eight hundred and Ninety Nine Only) inclusive of all taxes and duties. You shall carryout and complete the work as per the time schedule as contained in clause 2.2.4 and 5.3.2 in Volume-I of the tender document. Two copies of this order are included herewith. The duplicate copy of this order shall be returned to this office within seven days, after affixing your seal and signature on all pages as a token of acceptance of the order.

This contract will be governed by the terms and conditions as contained in tender documents Volume-I, II and III and addenda issued in this respect by the tendering authority. This Letter of Award (LOA), tender documents will form part of the contract agreement. Additional conditions/modifications if any stated in your offer or elsewhere, which are not agreed to by KSEBL or not in accordance with any of the provisions covered by the bid documents referred shall stand withdrawn/nullified.

1. Scope of work:

The subject work shall be considered as a composite supply. The scope of work will be governed by clause 2.2.3 in Volume-I of the tender document and addenda issued in this respect.

Sl. No	Name of location	Owners name	Proposed Capacity in kWp
1	GHSS Kadambar	District Panchayath Kasaragod	10
2	GHSS Edaneer	District Panchayath Kasaragod	10
3	GHSS Cherkala	District Panchayath Kasaragod	10
4	GHSS Kulathoor	District Panchayath Kasaragod	10
5	GHSS Irayanni	District Panchayath Kasaragod	10
6	GHSS Perdala	District Panchayath Kasaragod	10
7	V.P.P.M.K.P.S.GVHSS Thrikkarippur	District Panchayath Kasaragod	10
	Total		70 kWp

2. Name of the Project:

Appointment of EPC Contractor for the design as per site conditions, erection, testing & commissioning of Grid Tied Rooftop Solar Photo Voltaic (SPV) Power plants, on the Roof of buildings of District Panchayath Kasaragod with a total installed capacity of 70 kWp in total 7 locations including Operation & Maintenance of the plant for the first 5 years from the date of handing over. The Performance ratio of each location shall be 75 - 80% as detailed in the Clause

2.2.3 in Volume-1 of the tender document and the addenda issued in this respect, herein after called "the project".

3. Contract amount:

The Total Contract Amount is INR Rs. 40,67,899/- (Rupees Forty Lakhs Sixty Seven Thousand Eight hundred and Ninety Nine Only) inclusive of all taxes and duties for design, engineering, manufacturing, procurement, supply (including spares), handling, storage, civil works, erection, installation, testing & commissioning, training of personnel, along with operation and maintenance charges of the project as all inclusive Price which include taxes, duties, cess, freight and insurance charges, logistics, etc and all the levies payable by the contractor for successful completion, operation and maintenance of the Grid Tied Rooftop Solar PV Power plants on the Roof of buildings owned by District Panchayath Kasaragod with a total installed capacity of 70 kWp in total 7 locations including Operation & Maintenance of the plant for the first 5 years from the date of handing over. The performance ratio of each location shall be 75 - 80% as detailed in the Clause 2.2.3 of Tender document Volume-1 and the addenda issued in this respect, as per the financial proposal submitted by you and as detailed in the Price Schedule attached as Annexure 1.

Freight and Insurance charges for transportation of material/equipment to the destination project sites and up to complete installation and commissioning should be arranged by the contractor at their own cost. KSEBL will not entertain or bear any charge for the same.

Contract amount shall be governed as per provisions under Clause 4.1 of Volume 1 of the tender document. This amount shall be firm during the period of contract and shall not be varied or adjusted on whatsoever reason on any account.

4. Taxes & Duties:

The Contract Amount as indicated in clause 3 of this document is inclusive of all Taxes, Duties, incidental charges and other levies. Taxes & Duties will be governed by the clauses as detailed in clause 4.1, 5.9.1, 5.9.2, 5.9.3 of Volume 1 of the tender document. All Taxes and duties will be as per the latest orders of KSEBL and prevailing rules of State /Central Government. No separate claim on this behalf will be entertained and future claims on any taxes and duties will not be admitted and also all statutory recoveries will be deducted by K.S.E.B Ltd from the work bill. No future claims on unquoted taxes and duties will be allowed.

5. Insurance:

All equipment, machinery, works etc. which are furnished, installed, constructed and handed over/ to be handed over to the KSEBL under this contract for the completion of project shall be insured by the Contractor for the period of contract. It shall be the responsibility of the Contractor to maintain adequate insurance coverage at all times. Insurance will be governed by Clause 5.9.4 of Volume 1 of the tender document.

All the Personnel employed/engaged by the Contractor shall have adequate insurance coverage. Any claim due to mishap/accidents or otherwise to personnel/equipments, shall be taken

up by the contractor, directly with the Insurance Company. KSEBL will not have any liability in this respect whatsoever.

6. Work Completion Period and Date of Commissioning (CoD):

The Contractor shall complete the works in all respect within **6 months** from the official date of commencement of work which shall be the date of Agreement or the date of handing over of the site, even if not in full, but in a manner the work can be commenced and proceeded with in accordance with the programme of works, whichever is later. All the works stipulated under the scope of the Contract shall be completed in all respects, supplies made, services provided and final cleaning up done and required testing shall be completed and commissioned before the expiry of the Time of Completion unless the time of completion is postponed and period of completion is extended by a written letter from the Tripartite agreement Authority.

The date of completion/commissioning shall be the date on which the Solar plant is synchronized into KSEBL grid after obtaining clearances from all statutory bodies and after conducting necessary grid interfacing tests and measurements by the KSEBL are found satisfactory. The Engineer-in-Charge should issue a certificate including date of commissioning and an authorization certificate/commissioning report after successful synchronization, commissioning of the plant with the grid after proving the Performance ratio as detailed in clause 2.2.3 in Volume-I of the tender document and addenda issued in this respect.

7. Extension of Completion Date:

The contractor shall not claim any price escalation, in case the completion period is extended for any reason, including litigation or force majeure conditions and is governed by clause 5.3.6 in Volume-I of tender document.

8. Liquidated Damage:

Liquidated Damage will be governed by the clause 5.3.9 of tender document Volume I.

9. Execution of Agreement:

The Contractor shall execute a tripartite agreement in Kerala Government Stamp paper worth Rs. 4,070/- (Rupees Four Thousand and Seventy only) after furnishing a Bank Guarantee of Rs 4,07,000/- (Indian Rupees Four Lakhs and Seven Thousand only) i.e. 10% of the Contract value rounded off to the higher multiple of Rs 1000/-, within 15 days from the date of issue of Letter of Award of contract, with KSEBL and District Panchayath Kasaragod as First and Second party respectively, as per the terms and conditions set forth in the Bid document. After execution of the tripartite agreement the successful bidder shall be known as 'EPC Integrator'. The tripartite agreement has to be executed by the contractor in the prescribed format in Form-B of Contract Tripartite agreement of this document, along with the performance security deposit at the Office of the Chief Engineer (Renewable Energy & Energy Savings), on a date and time to be mutually agreed. The contractor shall provide for signing of the contract, 2 additional copies of contract agreement, 2 copies of Bank Guarantee in lieu of Performance security deposit, appropriate power of Attorney and other requisite documents. All the documents cited in clause No. 30 of this

document will form part of the agreement. Power of Attorney shall be in stamp paper attested by a registered Notary Public.

10. Construction Programme:

Within 15 days from the date of award, the contractor shall submit to the KSEBL for approval, a programme showing the general method, arrangements, order and timing for all the activities involved in the work in a systematic manner based on planning technique and tool like PERT /CPM in MS (Projects) and GANTT chart indicating the critical events/paths and milestones.

The contractor shall carryout the works in accordance with this programme and as approved by KSEBL, and complete them in all respects to the full satisfaction of KSEBL.

Any change to the approved work plan due to unavoidable circumstances shall be made only with the prior approval of KSEBL.

11. Terms of Payment:

The payment condition is governed by clause 5.2 in Volume-1 of the tender document and addenda issued in this respect.

a. The Contractor has to produce Bank Guarantee for an amount of 10% of the Contract amount as Performance Security Deposit at the time of executing Contract Agreement.

b. 30% of the contract value excluding O&M, will be released to the contractor as cost of major components of the plant (PV modules, Inverters and module mounting structures) after delivery of this materials at site, inspection and verification by authorized departmental officers, and production of insurance certificates for the materials delivered at site. The Engineer-in -charge is to be informed about the delivery of material one week in advance by the contractor.

The Engineer in charge shall ensure the site acceptance / rejection of the received material at site within three days of delivery of material along with submitting the SAT procedure of the delivered material from the vendor by the contractor. The invoices shall be submitted by the contractor as per the accepted price schedule which is to be verified and made ready for release of payment within 15 days of receipt of the invoices subject to the satisfaction of the above conditions.

c. 100% of the total Contract amount except Operation and Maintenance charges will be released after satisfactory completion, testing, commissioning of the Solar PV Power plant after proving the Performance ratio (AC) as per clause 2.2.3 of Tender document Volume-1 and addenda issued in this respect. The contractor can submit the final invoice as per the accepted price schedule within 10 days on proving the Performance ratio (AC) (as per Clause 2.2.3 of tender document Volume-1 and addenda issued in this respect) after completing the project within 06 months.

The invoices shall be verified and final payment may be released within 3 months of receipt of the invoices subject to the satisfaction of the above conditions.

d. The Operation & Maintenance charges will be released by KSEBL, after commissioning and demonstration of the specified Performance ratio (AC) by the Contractor as per clause 2.2.3 in Volume-1 of the tender document and addenda issued in this respect, at the end of each year during O&M period (5 years).

e. The performance security amount shall also be released in equal installments each year (O&M period) from the date of handing over the project after demonstrating the specified Performance ratio (AC) by the Contractor (as per Clause 2.2.3 in Volume-1 of the tender document and addenda issued in this respect).

f. The Quoted taxes and duties etc as governed by GST will be released subject to an undertaking from the Contractor in Kerala Government Stamp paper that "If any dispute in payment of taxes and duties etc as governed by GST from concerned Tax authorities occurs in future, the Contractor shall indemnify KSEBL from such liabilities and the Contractor shall be liable for the additions, loss or cost on account of such discrepancies / dispute".

12. Advance Payment:

No amount shall be released as mobilisation advance.

13. Performance security deposit:

The performance security deposit is governed by clause 5.1.7 in Volume-1 of the Tender document.

The Contractor shall submit Performance security deposit as Bank Guarantee at the time of execution of tripartite agreement in the prescribed format (Annexure 2) for performance security of the Contract and it shall be an amount equal to 10% of the total Contract amount rounded off to the higher multiple of Rs 1000/- i.e. Rs 40,7000/- (Indian Rupees Four Lakhs and Seven Thousand only). In order to cover the liabilities under the contract and to ensure sufficient guarantee to cover all possible liabilities pertaining to defects, shortfalls, remedial measures arising out of poor workmanship, materials, loss, excess amount, risk and cost of Contractor in case of alternate arrangements and any type of dues to KSEBL, an amount as prescribed by KSEBL shall be collected and retained from the Contractor towards Performance Security of the Contract.

The Bank Guarantee shall be initially valid from the date of agreement for a period of 2 years and be kept renewed from time to time till the end of defect liability period including Operation & Maintenance. The performance security Bank Guarantee will be released in equal installments each year after demonstration of desired performance ratio (AC) (as per clause 2.2.3 of tender document vol-1 and the addenda issued in this respect) during the defect liability period. The performance ratio (AC) (as per Clause 2.2.3 of tender document vol-1 and addenda issued in this respect) will be calculated based on data from pyranometer/ Meteonorm / Pyrheliometer data. Failure of the successful bidder to submit the required Performance Guarantee shall constitute sufficient grounds for termination of Contract & forfeiting the EMD.

No interest will be paid by KSEBL at any stage of contract on the Performance Security.

The performance ratio (AC) (as per Clause 2.2.3 of Vol-I of the tender document and the addenda issued in this respect) can be checked at any time in between if deemed necessary by the Engineer in charge. If any unusual degradation is noticed in the Performance Ratio, the contractor shall attend and rectify the same within 24 hours on intimation. If not the performance security deposit will be forfeited.

14. Payment Authority and Engineer-in-Charge:

Engineer in Charge –Engineer authorized by Chief Engineer (Renewable Energy & Energy Savings). The Engineer-in-Charge may delegate powers to the subordinate officers in respect of execution of work such as Site supervision of Electrical works and arrangements for interconnection facility, Technical support and civil supervision.

The work shall be treated completed only when the Engineer-in- charge issues certificate of completion where the actual date of completion of work will be mentioned. In case of termination or foreclosure the Engineer-in-charge will issue the certificate of completion to that effect. If the contractor fails to complete any part of the work as required for satisfactory completion before taking over and / or the date of completion specified, and fails to remove the surplus materials, the KSEBL will complete the works and remove the surplus materials etc and the amount incurred for the same will be realized from the contractor from any amount due to him from this work or any other work with KSEBL or his assets in appropriate proceedings. The contractor will not have any claim over the surplus materials so removed by the KSEBL.

The contractor shall submit bills in Triplicate to the **Engineer-in-Charge** with all supporting documents as indicated in the relevant clauses in Volume I of the bid document.

15. Manufacturing Schedule:

Contractor shall specify all basic design details, including details of the PV modules and the support structures, inverters, cables, online monitoring, integration and power evacuation details with existing power system, with appropriate diagram and drawings. The drawings along with detailed structure design and material selected as per the relevant standards, all guaranteed technical particulars, details of each items, make, model number and specification conforming to relevant standards, entire drawings, detailed test reports, list of O & M spares for major materials, detailed Bill of materials and Priced Bill of Quantities in respect of materials/equipments and works for the entire Project shall be submitted within 15 days of receipt of this LoA.

All materials and equipments required for successful completion and commissioning of the project must be included. The design details and other accessories should adhere to and match with the technical specifications provided in the Volume III of the tender document and as per the Guaranteed Technical Particulars offered by you.

The Contractor shall submit all the appropriate diagram and drawings to the agreement authority for approval. Also specifications of major items such as PV modules, inverters etc shall be submitted to the Agreement authority for approval. Approvals for Layout of Power Plant Installation shall be provided by the Engineer-in-Charge prior to the submission of all the drawings.

Energy meter provided for the installation of the solar PV plant shall be in accordance with the regulations and technical specifications of KSEBL.

The contractor shall provide all MAFs (Manufacturer's Authorization Forms) for all the components specified in the bid within 15 days and before executing the Contract Agreement.

16. Drawings and documents

The design documents to be submitted by the contractor will include but not limited to:

- I. DC cable size calculation
- II. DC cable specification
- III. DC cable schedule, voltage drop and power loss calculation
- IV. String monitoring unit specification
- V. DC earthing & pit calculation
- VI. Lightning protection details / specification
- VII. All technical specification of AC components
- VIII. Cable schedules

Contractor shall furnish the following drawings under this contract and has to obtain approvals.

- a. Shadow analysis of the roof
- b. General arrangement and dimensional layout
- c. Schematic drawing showing the SPV panels, Power conditioning Unit(s) / inverter, Junction Boxes, AC and DC Distribution Boards, meters etc.
- d. Layout of solar PV Array and Single line diagram.
- e. Mounting structure drawing
- f. Structural drawing along with foundation details for the structure.
- g. Location specific Itemized bill of material for complete SPV plant covering all the components and associated accessories.
- h. Sizes and specification of cables between array interconnections, array to junction boxes, junction boxes to Inverter etc. shall be furnished
- i. PV Syst simulation report of the combination offered PV modules with the offered inverters shall be furnished to the agreement authority for approval.

The drawings along with detailed structure design and material selected and their standards shall be submitted to agreement authority for approval before starting the execution of the work. The work will be carried out as per the approved design.

The contractor shall provide necessary drawings and documents required by statutory authorities and obtain the approval before taking up erection.

17. Quality Assurance:

Strict compliance with the approved and proven & established quality assurance systems and procedures during the different stages of the project starting from sizing, selection of make, storage (at site), during erection, testing and commissioning have to be ensured by the contractor.

PV modules should have valid qualification test (as per STC) certificate as per IEC 61215 and IEC 61730 -1&2 and IEC 61701. The inverters should comply with applicable IEC/ equivalent BIS standard for efficiency measurements and environmental tests, safety standards and characteristics of the utility interface (Parallel operation) as per standard codes IEC 61683 and IEC 60068 2(1,2,14,30) and IEC 62109-1&2 and IEC 61727 respectively. Inverter shall be provided

with protection against islanding of Grid as per IEEE 1547/UL1741/62116 to isolate it from the grid in case of no supply, under voltage and over voltage conditions so that in no case there is any chance of accident. The module mounting structure shall be as per latest BIS and galvanization of mounting structure shall be in compliance of BIS 4759 (amended up to date).

The type test certificates shall be verified by KSEBL while conducting factory inspection tests. The contractor shall furnish detailed quality procedures for the major components for approval prior to the Factory inspection call. The agreement authority will provide the approvals regarding the test to be conducted during the inspection.

The following minimum tests shall be conducted on the required number of samples as is required by the Engineer-in-charge, during the Factory inspection:

For PV modules:

1. Visual inspection
2. Dimensional Check
3. Insulation Resistance
4. Leakage Current
5. Electrical Test(with sun simulator)
6. RFID verification
7. Electroluminescence tests
8. Robustness of termination

For Inverters:

1. Visual inspection
2. Dimensional and Power Wiring Check.
3. Auxiliary functional check.
4. Fan direction of rotation, On-Off control, etc
5. Functionality test of relays
6. Command checks.
7. Protection function checks.
8. AC under voltage, AC over voltage, AC under frequency, AC over frequency
9. Load tests simulation 25%, 50%, 70% and 100%
10. Load test performed at variable MPPT voltage @100% load on the specified voltage range.
11. Over temperature, ground fault simulation

For Module mounting structures:

1. Visual inspection
2. Dimensional Inspection
3. Functional fitments

The Contractor shall submit letters of inspection calls sufficiently in advance specifying the date and venue of inspection to the agreement authority through the Engineer-in-Charge. All the major components should undergo factory inspection tests.

The agreement authority shall arrange inspection of material/ equipment and upon satisfactory completion of the inspection and tests; the Material Dispatch Clearance Certificate will be issued.

The test and Inspection shall be done in accordance with the relevant standards and the Manufacturer's standard before the delivery to site as well as after the erection and commissioning at site.

All acceptance and routine tests of equipment as per the specification and relevant standards shall be carried out by the contractor. Agreement authority or authorized officials may undertake the quality checks during the manufacturing stages also.

Functional testing and erection of equipments shall be carried out by the contractor in presence of KSEBL officers delegated by the Engineer-in-Charge and the approvals will be given only if the same is satisfactory.

Engineer-in-Charge shall conduct visual inspection including dimensional checks, verification of serial numbers, RFID reading of PV modules etc for the Site Acceptance of the delivered materials based on the BOM. Any material or work found to be defective or which does not meet the requirements of the specification will be rejected and shall be replaced at the Contractor's cost.

18. Review and Progress report:

The contractor shall submit monthly progress report to Engineer-in-Charge and all concerned personnel in connection with this order, with a copy to this office. The Engineer-in-Charge will co-ordinate and monitor all activities of the project. These progress report formats may be changed as and when required by KSEBL.

The contractor shall produce an updated Activity Schedule within 14 days of being instructed by the KSEBL.

19. Technical parameters for getting grid connectivity:

- a. Harmonic current injections from a plant shall not exceed the limits specified in IEEE 519 2014 as per CEA technical standard for connectivity of the distributed generation resources.

Individual voltage harmonics distortion	< 3 %
Total Voltage harmonic Distortion THD	< 5%
Total Current harmonic Distortion	<8%
Output frequency	= 50Hz +/- 0.5Hz

- b. Photovoltaic system should not inject DC power more than 0.5% of full rated output at the interconnection point or 1% of rated inverter output current into distribution system under any operating conditions
- c. Operation of Photovoltaic system shouldn't cause voltage flicker in excess of the limits stated in IEC 61000 or other equivalent Indian standards, if any
- d. While the output of the inverter is greater than 50%, a lagging power factor of greater than 0.9 shall be maintained.
- e. The Photovoltaic system in the event of voltage or frequency variations must island/disconnect itself within IEC standard on stipulated period.
- f. The voltage-operating window should minimize nuisance tripping and should be under operating range of 80% to 110% of the nominal connected voltage beyond a clearing time of 2 seconds, the Photovoltaic system must isolate itself from the grid.
- g. When the Distribution system frequency deviates outside the specified conditions (50.5 Hz on upper side and 47.5 Hz on lower side up to 0.2 sec), the Photovoltaic system shouldn't energize the grid.

20. Testing and Commissioning:

Commissioning test with all required testing shall be conducted by the contractor in presence of KSEBL officers delegated by the Engineer-in-Charge.

The contractor shall also prepare and handover the as-built drawing, Operational manuals and Maintenance manuals of the plant and hand over to KSEBL.

On completion of all works stipulated in the scope of work and after testing and commissioning of the Project, and if there are no obligations to arise out of the Contract, KSEBL shall issue a completion certificate as described under Clause 5.3.3 of Tender document Volume 1.

21. Operation and Maintenance (O&M):

Operation and Maintenance is governed by clause 6.9 in Volume-1 of the tender document.

Operation and maintenance of the solar plant up to the point of supply for a period of 5 years of Defects Liability period is the responsibility of the Contractor.

Operation and Maintenance during this period shall include supply of spares of panels, inverters and all equipments in the solar plant including transportation of these items from the original manufacturer, consumables, general comprehensive insurance covering fire, earthquake.

The solar plant should be maintained shadow free. The tree branches if any causing hindrance to the shadow free operation of solar plant shall be cut and removed with the concurrence of Collectorate authorities. Copies of the Insurance Policies are to be given to KSEBL as and when taken.

The contractor shall ensure efficient operation of the SPV plant and the associated facilities to achieve the maximum power generation from the plant. For this purpose the contractor shall engage the services of adequate number of Engineers and Technicians. The contractor shall also attend to all failures, rectifications, breakdowns, 5 year comprehensive Operation and Maintenance checks.

Adequate training should be given to personnel identified by KSEBL for Daily Monitoring Information like solar energy generated, net meter readings etc. Monthly System (MIS) reports with

generation and down time analysis data has to be sent to KSEBL, REES by E-mail during the defect liability period. Any discrepancy/malfunctioning noted shall be immediately attended to and got rectified by the contractor.

The Contractor should not misuse the land and buildings in the project site and assign responsibility for the safety of machinery within the premises.

22. Annual Maintenance Contract (AMC):

The plant shall then be handed over to KSEBL after commissioning. After five years from the date of commissioning, the EPC contractor may be asked to execute the AMC for another 5 years on mutual agreement at mutually agreed price.

The EPC contractor shall execute the AMC agreement as per conditions stipulated at that time.

23. Performance & Warrantee:

The mechanical structures, electrical works and overall workmanship of the Solar Power plant must be warranted for a minimum of 10 years. PV modules used in solar power plant must be warranted for output wattage, which should not be less than 90% at the end of 10 years and 80% at the end of 25 years.

EPC contractor shall ensure the performance ratio of each location as detailed in the Clause 2.2.3 of Tender document Volume-1 and addenda issued in this respect.

24. Generation Assessment

The performance ratio (AC) of each location shall range from 75- 80% as per clause 2.2.3 of Tender document Volume-1 and addendum's issued in this respect. Performance ratio test as per IEC 61724 will be carried out at site jointly by the EPC contractor in presence of authorized officials of KSEBL. This is mandatory for commissioning and handing over the plant. If the contractor fails to prove the desired performance ratio at the time of completion and during any of the consecutive years of defect liability period he will be given a second chance to demonstrate the PR in another 7 days. Still if it is not achieved, the same shall be demonstrated in another 7 days and still if it is not achieved, EPC contractor shall enhance the module capacity of solar plant/ improve the quality of the plant by replacement of module/ other components with all suitable modification requirements on balance of systems at his own cost to achieve the stipulated Performance ratio.

Operation and maintenance charges shall be released at the end of each year based on the Performance ratio (AC) as mentioned above, as per the table given below.

Sl.No	Particulars	Performance ratio (AC) in %
1	At the time of completion and commissioning	75-80
2	At the end of 1 st year	74-79
3	At the end of 2 nd year	73-78
4	At the end of 3 rd year	72-77
5	At the end of 4 th year	71-76
6	At the end of 5 th year	70-75

25. Handing over:

After the date of successful commissioning of the Project, the Contractor shall hand over the complete Solar PV Electric Power Generation system to LSGD Kasaragod as specified in the tender within 15 days. Any component found defective/inefficient/worn out shall be rectified/ replaced/ made good at contractor's cost before handing over the system to LSGD Kasaragod. In order to ensure longevity & safety of the core equipment and optimum performance of the system the Contractor should use only genuine spares of high quality standards. Contractor has to maintain the rooftop SPV plant till the end of the contract period of five years from the date of handing over.

The contractor shall provide the named list of essential tools and spares required for the future operation and maintenance of the plant.

After handing over of the 7 sites, The contractor shall execute a separate O&M Bilateral Agreement with LSGD Kasaragod as the first party.

26. Termination of Contract:

Termination of Contract will be guided strictly in accordance with clause 5.3.11 in Volume-1 of the tender document.

27. Force Majeure:

Force Majeure shall be governed by Clause. 5.3.8 in Volume I of the tender document.

28. Defects Liability Period:

The Defect Liability Period shall be governed by Clause.5.3.4 in Volume I of the tender document.

29. Law and Jurisdiction:

This contract has to be performed complying with the laws of India and Kerala and any dispute arising out of this contract will be subject to the exclusive jurisdiction of Civil Courts at Thiruvananthapuram.

30. Contract Documents

1. Agreement executed in Kerala Government Stamp Paper
2. Letter of Award (duly signed and seal affixed on all pages)
3. Correspondences between the KSEBL and the selected bidder included in the Agreement.
4. Special Conditions of Contract.
5. General Conditions of Contract.
6. Technical specifications.
7. Accepted Schedule of Technical Particulars and construction programme & Manufacturer Authorization form of Components.
8. Accepted Schedule of Prices
9. General Bid conditions

10. Instructions to bidders.
11. Information to bidders.
12. Detailed Structural Drawings including approved drawing issued from time to time.
13. All volumes of bid with Tender No :KSEB/ REES/ LSGD- Kasaragod phase III/70kVp/14/2019-20 dated 08-06-2020 having Tender ID :2020_KSEB_362941_1 and its addendums along with clarifications and related documents issued by the Tendering Authority.
14. Response (proposal) of M/s Inket Limited, Building No.vi/832c, First floor, Inket centre, Thrikkakara grama panchayat, Ernakulam ,Cochin, Kerala- 682021, including the Bid, Clarification documents and the accepted rate submitted.

31. Acknowledgment by the Contractor:

This Letter of Award is issued subject to the documents referred above and terms and conditions contained therein. You will also be deemed to be fully aware of KSEBL's **General conditions of contract** which is applicable to this contract also and ignorance of these conditions will not exempt you from your liability to abide by the same.

If there is any contradiction/conflict between the tender documents and LoA, conditions in the LoA will prevail.

The documents specified in Clause 10 and 15 shall be submitted within 15 days from the date of issue of this LoA


Chief Engineer
(Renewable Energy & Energy Savings)


Acc:-

1. Annexure 1: Price schedule
2. Annexure 2: Contract Forms
3. A. Performance Security deposit BG
B. Form of contract tripartite agreement
4. Annexure 3: Copy of LoA

Copy to:-

1. The Secretary LSGD Kasaragod.
2. The Secretary K.S.E.B Ltd, Thiruvananthapuram.
3. The LA and DEO K.S.E.B Ltd, Thiruvananthapuram.
4. The Financial Advisor, KSEBL.
5. TA to The Chairman & Managing Director, KSEBL, Thiruvananthapuram.
6. TA to Director (Distribution, IT & HRM)/ Director (Transmission & System Operation, Safety, Corporate Planning and REES/ Director (Generation –Electrical & SCM)/ Director (Generation-Civil)
7. PA to The Director (Finance)
8. Sr.CA to Chief Vigilance Officer
9. The Main Income Tax Officer, Thiruvananthapuram, Kerala.
10. The Accountant General, Thiruvananthapuram, Kerala.
11. Stock file

Annexure: I - Total Price Schedule

Appointment of EPC contractor for the design as per site conditions, erection, testing & commissioning of Grid Tied Rooftop Solar PV Power plants, on the Roof top of buildings owned by LSGD Kasaragod, with a total installed capacity of 70 kWp in 7 locations including Operation & Maintenance of the plant for the first 5 years from the date of handing over.

Sl No	Item Description	Quantity	Unit	Basic rate (Rs)	Freight charges (Rs)	Insurance (Rs)	GST (Rs)	Any other applicable tax (Rs)	Total amount without tax (Rs)	Total amount with tax (Rs)
1	Total price for the design, planning, investigation, survey, engineering, manufacture/procurement, manufacturer's quality assurance, shop testing (including type testing where specified/required), transportation, handling storage, erection including all civil-structural works, electrical and general works, piping, cabling, instrumentation, installation, testing and commissioning, training, services, permits and insurance at all stages, and all related works for connectivity, Statutory Inspection & Testing, Additional work/Cabling for Power Evacuation and works related with Single Phase to Three Phase Conversion and installation of Power evacuation transformers if required, in necessary locations and executing everything necessary to complete the project successfully in all respects to its full satisfaction for the Grid-tied 70 kWp (in total from 7 locations) solar photovoltaic system on the rooftop of buildings owned by LSGD Kasaragod and handing over the SPV Plants to KSEBI, after proving the performance ratio(AC) as detailed in clause 2.2.3 of volume 1 of the tender document.	01	Set	35,99,999.00	0	0	320399.91	0	35,99,999.00	39,20,398.91

Sl No	Item Description	Quantity	Unit	Basic rate (Rs)	Freight charges (Rs)	Insurance (Rs)	GST (Rs)	Any other applicable tax (Rs)	Total amount without tax (Rs)	Total amount with tax (Rs)
2	Total price for Operation and Maintenance (O & M) charges of the Solar Photovoltaic Power Plant for a period of 5 year including arrangement of cost of replacement of all the defective parts, consumables, tools, tackles, testing equipments & instruments, manpower, all administrative work, maintenance of records and submissions to all concerned authorities for the 70 kWp in 7 locations of buildings owned by LSGD Kasaragod including all taxes as per GST, covered under Guarantee period for a period of 5 years from the date of handing over.									
a	O&M charge for 1 st year	01	Set	25000.00			4500.00		25000.00	29500.00
b	O&M charge for 2 nd year	01	Set	25000.00			4500.00		25000.00	29500.00
c	O&M charge for 3 rd year	01	Set	25000.00			4500.00		25000.00	29500.00
d	O&M charge for 4 th year	01	Set	25000.00			4500.00		25000.00	29500.00
e	O&M charge for 5 th year	01	Set	25000.00			4500.00		25000.00	29500.00
	Total O&M for 5 years (2.a+2.b+2.c+2.d+2.e)									147500.00

Total amount with tax of Item 1

Total amount with tax of Item 2

Total amount of Item 1 & Item 2

Total amount rounded:

Total amount is Rupees: **Forty Lakhs Sixty Seven Thousand Eight Hundred and Ninety Nine Only.**

= Rs. 39,20,398.91

= Rs. 1,47,500.00

= Rs. 40,67,898.91

= **Rs. 40,67,899.00**

 Chief Engineer

(Renewable Energy & Energy Savings)

പെരിന്തൽമണ്ണ ബ്ലോക്ക് പഞ്ചായത്ത് കാര്യാലയം

പെരിന്തൽമണ്ണ ബ്ലോക്ക് പഞ്ചായത്ത് ജില്ല 679 322 ഫോൺ 04933 227402, 04933 230 572
ഇമെയിൽ: perinthalampanchayat@gmail.com, perinthalampanchayat@gmail.com, perinthalampanchayat@gmail.com

നം.862/18

02.03.2019

സ്വീകർത്താവ്

അസിസ്റ്റന്റ് മാനേജർ -സോളാർ
INKEI Ltd.,
എറണാകുളം.

വിഷയം.- 20kw ഓൺ ഗ്രിഡ് സോളാർ പാനൽ സ്ഥാപിക്കുന്നത് സംബന്ധിച്ച്

സൂചന.- പെരിന്തൽമണ്ണ ബ്ലോക്ക് പഞ്ചായത്ത് 2018-19 വർഷിക പദ്ധതി പ്രോജക്ട് നം.179/19

മേലാറ്റൂർ സി.എച്ച്.സി.യിൽ സൂചന പ്രകാരമുള്ള 20kw സോളാർ പാനൽ സ്ഥാപിക്കുന്നതിന് അനുമതിയിൽ നിന്നും 03.09.2018 തീയതിയിലെ സ്പെസിഫിക്കേഷൻ പ്രകാരമുള്ള 15 ലക്ഷം രൂപ അടങ്കൽ നിശ്ചയിച്ച് സാങ്കേതിക അനുമതി ലഭിച്ചിട്ടുണ്ട്. 16.02.2019 തീയതിയിൽ ചേർന്ന ബ്ലോക്ക് പഞ്ചായത്ത് ഭരണ സമിതി 6 (6) നം. തീരുമാനമായി ഈ പ്രവർത്തി INKEI ന് ഏൽപ്പിക്കാൻ തീരുമാനിക്കുകയും 01.03.19 ന് ചേർന്ന മെമ്പർമാരുടെ ജില്ലാ ആസ്സലിസ സമിതി യോഗം അംഗീകരിക്കുകയും ചെയ്തിട്ടുണ്ട്. ആയതിനാൽ INKEI നൽകിയ 149000/- (പതിനാല് ലക്ഷത്തി തൊണ്ണൂറായിരത്തി ഒന്നു നൂറ്) രൂപയ്ക്കുള്ള പ്രോഫോർമ ഇൻവോയ്സ് പ്രകാരം ഈ പ്രവർത്തി ഏറ്റെടുത്ത് നടത്തുന്നതിനാവശ്യമായ കരാർ പത്രം അടിയന്തിരമായി ഒപ്പുവെച്ച് പ്രവർത്തി ആരംഭിക്കണമെന്നും, പ്രവർത്തി പൂർത്തീകരിക്കുന്ന മുറയ്ക്ക് അനുമതിയിൽ നിന്നും പൂർത്തീകരണ സാക്ഷ്യപത്രം ഹാജരാക്കണമെന്നും അഭ്യർത്ഥിക്കുന്നു.

സെക്രട്ടറി
ബ്ലോക്ക് പഞ്ചായത്ത്
പെരിന്തൽമണ്ണ



Agency for Non-conventional Energy and Rural Technology (ANERT)

PV Power Plant Site:
(with PV array capacity)

**20kWp Solar Power Plant at Melatur CHC,
Perinthalmanna Block**

III. PV Power Plant Monitoring Sheet

Sl. No	Parameters under Measurement	Data	Data	Remarks
	Date: 16.01.2020			
	Time: 11.30AM			
1	Inverter	Fronius Eco 25kW		Sl. No 28164500
	PV Voltage (V)	750		
	PV Current (A)	20.5		
	PV Power (kW)	15.2		
	Load Connected (kW)	5.6		
	Voltage in R phase(V)	252		
	Y phase(V)	240		
	B Phase(V)	235		
	Frequency (Hz)	50		
	Battery Voltage(V)	N A		
	Battery Current (A)	N A		
	Inverter Energy Meter (kWh)	TOTAL=932Kwh E. Total=13.8KW		
2	Energy Meter (kWh)	EXPORT=626Kwh import=957Kwh	Net=330Kwh	
3	Remote Monitoring (kWh)	109 (Data Logger Configured on 16.01.2020)		
4	System Commissioning status	Commissioned		
	If commissioned, date of commissioning	11/12/2019		

Signature:

Sureshkumar A.V.
DISTRICT ENGINEER
ANERT, PALAKKAD

2/c Malayappan



KERALA STATE ELECTRICITY BOARD LIMITED

(Incorporated under the Indian Companies Act, 1956)

Regd. Office: Vidyuthi Bhavanam, Patton, Thiruvananthapuram - 695004

ELECTRICAL SECTION, VIYYUR - 680010

TELEPHONE: (OFF.) 0487 2334421, 9496009750

E-Mail: acesviyyur@gmail.com



CERTIFICATE OF CONNECTIVITY

Certified that a Grid interactive Solar plant of 10kWp

Capacity has been tested and connected to the KSEBL'S Low Tension /
High Tension grid on 13-12-2018

Consumer No: 1156808017750....

Name: Karthik Ramani, Kalyan Sunbields Owners Associate

Address: C/o Villa No: 19, Kalyan Sunbields,
Nairthalakavu Temple Kuttuv Thirissur

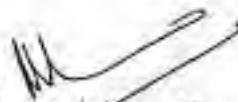
Electrical Section: Viyyur

Electrical Division: TER West

This Certificate is issued for presenting before ANERT (Agency for
Non-conventional Energy and Rural Technology)for clearing subsidies,
if any

Station: Viyyur

Date: 11-1-2019


Asst. Engineer/ Asst. Exe. Engineer
ASSISTANT ENGINEER
ELECTRICAL SECTION
KSEB, VIYYUR



CONSERVE ENERGY ... ENERGY SAVED IS ENERGY GENERATED



Conditions:-

1. Any addition or alteration to the existing installation shall be carried out only after getting prior written approval from this office.
2. The owner should rectify any defects that may be pointed out during subsequent inspection of the installation by the undersigned.
3. All the pre-commissioning tests shall be recorded for ready reference.
4. Electricity duty for the units produced from the solar energy system should be remitted to the government when demanded.
5. The whole installation should be in conformity with CEA (Technical Standards for connectivity of the distributed generation resources) Regulation, 2013 and KSERC (Grid interactive distributed solar energy systems) Regulation, 2014.
6. Consent from Licensee shall be obtained in case of grid tied system.

To

M/s.Cochin Community Welfare Socity,
(IRENE HOMES),Puthencruz, Ernakulam Pin:-682308

Copy to:

1. M/s.Essjay Electrolinks Pvt. Ltd; Manappattu Centre, HMT Junction, Kalamassery, Kochi -683 104 [Lic. No.- CA279]
2. The Assistant Engineer, KSEB, Electrical Section:- Puthencruz (through:- The Deputy Chief Engineer, KSEB, Electrical Circle:- Ernakulam)
3. Stock File/Computer Data
4. Office Copy

IR Case No.14345 New Case

e.solutions-7,7



43305/2021/TAPAL ANERT

File No.ANERT-TECH/43/2020-PE2(RTS)



അനേർട്ട്
ANERT



Agency for New and Renewable Energy Research and Technology

നവീകരണ പുനരുദ്ധരണസംഗ്രഹാലയം ഉൾക്കൊള്ളുന്ന ഗവണ്മെന്റ് സെക്രട്ടറിയറ്റ് സാങ്കേതിക വിദ്യകൾക്കുള്ള - ഏജൻസി
(Department of Power, Government of Kerala)

No. ANERT-TECH/43/2020-PE2(RTS)

22/01/2021

To

M/s INKEL Limited
7/4732A-5&6, Ajiyal Complex
Post office Road, Kakkanad
Cochin - 682030

WORK ORDER

Sir,

Sub: ANERT- Work Order for the Design, Supply, Installation, Testing Commissioning along with Operation and Maintenance of 100 kW Grid connected SPV Power Plant at Kerala Government Secretariat, Thiruvananthapuram (funded by Smart City Thiruvananthapuram Ltd)- reg

- Ref: 1. Tender ID: 2020_ANERT_400694_1
2. Your Bid No. 998856 dtd 13/01/2021

Attention is invited to the references cited. Your offer for the Design, Supply, Installation, Testing Commissioning along with Operation and Maintenance of 100 kW Grid connected SPV Power Plant at Kerala Government Secretariat, Thiruvananthapuram (funded by Smart City Thiruvananthapuram Ltd) is accepted. You are requested to carry out the work as detailed below subject to the following terms and conditions.

#	Site of Instalaltion	Capacity (kW)	Total
1	Government Secretariat (Annex Complex - 1)	50	19,60,145.55
2	Government Secretariat (Annex Complex - 2)	50	19,60,145.55
TOTAL			39,20,291/-
<i>Rupees Thirty-Nine Lakhs Twenty Thousand Two Hundred and Ninety-One only</i>			

An agreement has to be executed by you in the prescribed form (enclosed as Annexure - I) on Kerala Stamp paper worth Rs. 200/- within 7 days of the receipt of this work order for the fulfilment of the contract along with a security deposit of Rs.

Law College Road, Vikas Bhavan P.O., Thiruvananthapuram, Kerala - 695 033 Phone: +91 471 - 2338077,
2334122, 2333124, 2331803 Fax: +91 471 - 2329853
Web: www.anert.gov.in E-mail: info@anert.in © Market place: www.bnymysun.com

1,96,015 /-(Rupees One Lakh Ninety-Six Thousand and Fifteen only) being the 5% of contract value of **Rs. 39,20,291 /-** on Demand Draft/Bank Guarantee in favour of Director, ANERT. You have to pay all expenses incidental to the execution of the above agreement. Another agreement must be provided before the start of the O&M period and the formats shall be provided during the commissioning of the SPV Power Plant.

1. SCHEDULE OF SUPPLY, INSTALLATION & COMMISSIONING:

- i. The Items should be delivered and installed at the Roof top of the Annex Complexes of Kerala Government Secretariat as specified by ANERT, under prior intimation and supervision of ANERT.
- ii. The Design and Engineering for the Solar Power Plants considering all the site aspects at the Annex complex along with shade analysis reports should be provided within 14 days of the issue of this work order. The detailed Engineering drawings as mentioned in the tender also be submitted prior to start of works.
- iii. Supply of the main components such as SPV module, PCU and charge controller should be from the approved component list published in ANERT Website.
- iv. The agency shall submit the timeline for completion along with the agreement and security deposit. This timeline must be followed and no extension of time for completing the installation will be granted. Although, time extension may be granted for things beyond the control of your agency.
- v. The detailed Bill of Materials along with datasheets & Test certificates of PV Modules (Mono PERC), Grid Tie Inverter etc must be provided well in advance and must be approved by ANERT before material despatch.
- vi. The Supply, Installation and Commissioning of the Power Plant must be completed within **45 days from the date of issue of work order.**
- vii. The Testing and Commissioning of the Power Plant must be completed within **60 days from the date of issue of work order.** This is the time period for handing over the system to ANERT with Grid connectivity and no time extension in this regard without valid reasons will be entertained.
- viii. The additional works/requirements at the site as mentioned in the Tender and the corrigendum issued thereafter need to be completed.
- ix. Penalty for delay in supply and installation will be imposed at 0.5 % per week up to a maximum 10 %. In case of delay in supply and installation, Director, ANERT may cancel the contract and take recourse to other action as deemed appropriate.

2. INSTALLATION

- i. The installation work of the solar power plant must be in compliance with the Technical Requirements and Standards as mentioned in the Tender.

- ii. A display board (size 30cm x 20cm) should be displayed with contents to be provided by the concerned official at ANERT is to be placed at the site.

3. OPERATION AND MAINTENANCE

- i. For the optimal operation of a PV plant, maintenance must be carried out on a regular basis. All the components should be kept clean. It should be ensured that all the components are fastened well at their due place.
- ii. The service personnel should visit the installations at least once a month for preventive maintenance even if no faults are reported. Reports of these preventive maintenance visits and generation data should be submitted to the concerned ANERT District Office on a quarterly basis.
- iii. Maintenance guidelines for various components viz. solar panels, inverter, wiring etc. are provided in annexure - III. The O&M part is not limited to the guidelines but includes all the activities required for the smooth functioning of the Power plant for a period of 5 years. Provision for cleaning the panel must be made along with installation.

4. PAYMENT

A. No advance payment will be given. Payment will be released on receipt of invoices and successful installation and commissioning of power plant along certified by the authorised personnel of ANERT along with the Project completion report in format attached as annexure - IV

B. The terms of payment shall be:

B1 EPC Payment

- i. 2.5 % of the invoice amount shall be charged by ANERT as non-refundable license fee and the remaining amount shall be treated as contract value for further payment.
- ii. Upon delivery of major components at the respective site, 30 % of the contract value will be released as first part payment, if requested. The supplier shall submit the invoice for the materials supplied duly certified by the concerned District Office along with a report regarding the supply of materials.
- iii. On completion of the installation of power plant and filing application for connectivity, 30% of the contract value shall be released as part payment. The supplier shall submit the invoice for the materials supplied and all documents related to the completion of the work certified by the District office shall be submitted for the release of the amount.
- iv. On commissioning of the grid connected system, 30% of the remaining contract value will be released. All documents related to the completion of the work including commissioning report shall be submitted for the release of the amount.

- v. The remaining 10% shall be retained as performance security and will be released as given below. This period will be considered only from the date of commissioning. This can be released against a bank guarantee of equivalent amount valid for 5 years.
 - a. 50% of performance security shall be paid after one year on request along with the preventive maintenance reports.
 - b. The remaining 50% shall be paid after the five-year warranty period on request along with the preventive maintenance reports for the 5 years.
- vi. The security deposit of 5% furnished along with the contract agreement shall be released on successful completion of supply, installation and commissioning.

B2. O&M Payment

- i. The O&M charges for the 5 years shall be released on submission of DD/Bank Guarantee for the equivalent amount taken in the name of Director, ANERT revocable through SBI, Pattom Branch. In case of BG, the same is to be submitted for each of the years and the same will be released after the period is expired. Hence, the BGs submitted must be valid for periods ranging from 1 to 5 years.
- ii. The amount shall be released on annual basis after completion of the O&M period of the previous year. The start of O&M period will be considered from the scheduled date of operation.
- iii. The preventive maintenance reports along with receipt of premium of insurance and generation reports are to be submitted for the release of O&M payments.
- iv. The payment shall be released after the inspection by the authorised personnel of ANERT on annual basis.
- C. Income tax, contribution to workers' welfare fund and other statutory deductions shall be made from the payment as per prevailing norms.

5. WARRANTY

- i. 5 years' warranty should be provided by the supplier for the system and components or part of the system has to be provided
- ii. PV modules used in solar power plants/ systems must be warranted for their output peak watt capacity, which should not be less than 90 % at the end of 10 years and 80% at the end of 25 years
- iii. The Warranty Card to be supplied must contain all the details of the system supplied. The OEM warranty card of all the equipment must also be submitted along with the warranty certificate issued in your letter head.

6. OPERATION MANUAL

- i. An Operation, Instruction and Maintenance Manual, in English and Malayalam should be provided with the system.

- a. The following minimum details must be provided in the manual:
- b. About solar power plant – its components and expected performance.
- c. About PV module
- d. About electronics
- e. About charging and significance of indicators
- f. DO's and DON'T's
- g. Clear instructions on regular maintenance and troubleshooting of solar power plant
- h. Name and address of the contract person in case of non-functionality of the solar power plant.

7. SERVICE AND MAINTENANCE

- i. The faulty system or components should be replaced/ repaired within 7 days of fault reporting. The servicing should be carried out at the site of installation.
- ii. Any Delay in servicing beyond 7 days of fault reporting would attract penalty at the rate of at the rate fixed by Director, ANERT and further actions will be initiated against the agency.
- iii. A designated contact Telephone Number and address should be submitted for reporting faults during the warranty period.

8. INSURANCE

The power plant must be insured at every stage of operation – from Material dispatch, storage, completion of installation and till 5 years after commissioning. The insurance coverage on handing over of the system must include all conditions of **Standard Fire and Special Perils Policy (Material Damage)**. The insurance premium for the 5 years of warranty is to be paid by your agency. On handing over of the system, the original insurance policy is to be handed over to the authorised person at ANERT District Office. The annual premium payment receipt must be handed to the authorised person at the District Office of ANERT.

Not Withstanding the terms and conditions stipulated above, it is to be noted that the conditions in the tender document shall prevail;

Yours faithfully

General Manager

Government of Kerala
 Department of Electrical Inspectorate
 Office of the Deputy Chief Electrical Inspector
 Forth Floor, Corporation Building Vikas Bhavan PO
 Thiruvananthapuram 695033
 Phone: 04712322934,
 Email:dceitvm@gmail.com Website:
 www.ceikerala.gov.in



An IS 15700 : 2005 Certified Department

Proceedings of the
 Deputy Chief Electrical Inspector
 Thiruvananthapuram
Present: Jayakrishnan K A

Subject: Installation of 50 kWp Solar at the premises of Kerala Government Secretariat Annexe II, Statue, Thiruvananthapuram, 695001 - Sanction for energisation orders issued - regarding.

Reference:

1. Scheme Approval No. B5-00728/21/EIT dated 10.02.2021
2. Completion report submitted by DHERSAANS & CO, KARIMKUTTIKARA PO, VAMANAPURAM, TRIVANDRUM, Kerala, 695606 dated received on 15.02.2021
3. Inspection conducted on 24.02.2021
4. Non conformity report dated 01.03.2021
5. Compliance report submitted by DHERSAANS & CO, KARIMKUTTIKARA PO, VAMANAPURAM, TRIVANDRUM, Kerala, 695606 dated 13.03.2021

Order No: B5-00728/21/EIT Dated 23-03-2021

Sanction is hereby accorded under section 54 of The Electricity Act, 2003 and Regulation 32 and 43 of the Central Electricity Authority (Measures relating to safety and electric supply) Regulations, 2010 for the energisation of the installations covered under completion report read as (3) above, installed at the premises of ,Kerala Government Secretariat Annexe II, Palayam, Thiruvananthapuram, 695001 subject to following conditions and as detailed in the annexure appended

1. Supply from the Solar Panel should not be extended out of the premises.
2. Any addition or alteration to the existing installation shall be carried out only after getting prior written approval from this office.
3. The owner should rectify any defects that may be pointed out during subsequent inspection of the installation by the Electrical Inspector.
4. Date of energisation should be intimated to this office.
5. The whole installation should be in conformity with CEA (Technical Standards for connectivity of the distributed generation resources) Regulation, 2013 and KSERC (Grid interactive distributed solar energy systems) Regulation, 2014.
6. Only authorised person shall be in charge of the operation and maintenance of the installation.
7. Power allocation for additional loads, if necessary, should be obtained from KSEB/Licensee.
8. As per Central Electricity Authority (Technical standards for Connectivity of the Distributed Generation Resources) Regulation 2013-Section 5, the prescribed standards and codes of practice should be followed.
9. The mechanically operated isolation switch should have specification prescribed in Sub Section 5.ii.(9) of Central Electricity Authority Regulation (Technical standards for Connectivity of the distributed generator resources) 2013.
10. The tests prescribed under 5 (8) (2), the harmonic measurements should be done using calibrated instrument in a standard laboratory having national intimation traceability with a basic standard instruments.
11. You may conduct tests mentioned in Section 5 (6) 5.ii.1, 2, 3 & 6 in consultation with the licensee and the parameters shall be within the limits as prescribed by Central Electricity Authority (Technical standards for Connectivity of the Distributed Generation Resources) Regulation 2013 before committing the Solar Supply to Kerala State Electricity Regulatory aid.
12. The tests prescribed by Central Electricity Authority Regulation 2013 should be conducted every year and the results furnished in this department for verification as per Regulation 5.8(2) of Central Electricity Authority Regulation (Technical standards for Connectivity of the distributed generator resources) 2013.
13. The whole installation should be conforming to the stipulation under Kerala State Electricity Regulatory Committee (Grid Technical Distributed Solar Energy System) Regulation 2014 to ensure the safety of associated equipments and operating personnel at the premises as well as the KSEB personnel working on their system after switching off the grid supply. The protection incorporated in the solar in restore, switching off the output when grid supply in an absent should be ensured by the owner of solar system and he/she would be safely responsible for any accident in case of failure violation of the same.

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Deputy Chief Electrical Inspector



To:

Kerala Government Secretariat Annexe II
Punnen Road, Vanross Palayam Thiruvananthapuram

Copy To:

- 1 DHERSAANS & CO , KARIMKUTTIKARA PO, VAMANAPURAM , TRIVANDRUM, Kerala , 695606
- 2 jamini s , DHERSAANS & CO VAMANAPURAM ,

Annexure (Order No: B5-00728/21/EIT Dated 23.03.2021)	
Items	Quantity(in numbers)
SB Panel Name : ACDB	
Incomer MCCB 100 Amps	1
Solar Inverter (50 kVA)	
SB Panel Name : DCDB	
Incomer Isolator 40 Amps	3
Earth Electrodes	4
SB Panel Name : AC side	
Incomer MCCB 100 Amps	1
Load Details HT Motor – 0 kW HT Capacitor – 0 kVAr Fire Pump Load – 0 kW Lift Load – 0 kW Other Load – 0 kW + 0 kVA + 0 kVAr	
Deputy Chief Electrical Inspector 	
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 Department of Electrical Inspectorate
 Office of the Deputy Chief Electrical Inspector
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 Phone: 04712322934,
 Email:dceitvm@gmail.com Website:
 www.ceikerala.gov.in



Proceedings of the
 Deputy Chief Electrical Inspector
 Thiruvananthapuram
Present: Jayakrishnan K A

Subject: Installation of 50KWp Solar at the premises of Kerala Government Secretariat Annexe-I, Statue, Thiruvananthapuram, 695001 - Sanction for energisation orders issued - regarding.

Reference:

1. Scheme Approval No. B5-00727/21/EIT dated 10.02.2021
2. Completion report submitted by DHERSAANS & CO, KARIMKUTTIKARA PO, VAMANAPURAM, TRIVANDRUM, Kerala, 695606 dated received on 15.02.2021
3. Inspection conducted on 24.02.2021
4. Non conformity report dated 01.03.2021
5. Compliance report submitted by DHERSAANS & CO, KARIMKUTTIKARA PO, VAMANAPURAM, TRIVANDRUM, Kerala, 695606 dated 13.03.2021

Order No: B5-00727/21/EIT Dated 23-03-2021

Sanction is hereby accorded under section 54 of The Electricity Act, 2003 and Regulation 32 and 43 of the Central Electricity Authority (Measures relating to safety and electric supply) Regulations, 2010 for the energisation of the installations covered under completion report read as (3) above, installed at the premises of ,50KWp Solar at Kerala Government Secretariat Annexe-I, Palayam, Thiruvananthapuram, 695001 subject to following conditions and as detailed in the annexure appended

1. Supply from the Solar Panel should not be extended out of the premises.
2. Any addition or alteration to the existing installation shall be carried out only after getting prior written approval from this office.
3. The owner should rectify any defects that may be pointed out during subsequent inspection of the installation by the Electrical Inspector.
4. Date of energisation should be intimated to this office.
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13. The whole installation should be conforming to the stipulation under Kerala State Electricity Regulatory Committee (Grid Technical Distributed Solar Energy System) Regulation 2014 to ensure the safety of associated equipments and operating personnel at the premises as well as the KSEB personnel working on their system after switching off the grid supply. The protection incorporated in the solar in restore, switching off the output when grid supply in an absent should be ensured by the owner of solar system and he/she would be safely responsible for any accident in case of failure violation of the same.

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Deputy Chief Electrical Inspector



To: Kerala Government Secretariat Annexe-I
Punnen Road, Statue, Palayam Thiruvananthapuram

Copy To:

- 1 DHERSAANS & CO , KARIMKUTTIKARA PO, VAMANAPURAM , TRIVANDRUM, Kerala , 695606
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Annexure (Order No: B5-00727/21/EIT Dated 23.03.2021)	
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SB Panel Name : ACDB	
Incomer MCCB 100 Amps	1
SB Panel Name : DCDB	
Incomer Isolator 40 Amps	3
Earth Electrodes	4
SB Panel Name : AC side	
Incomer MCCB 100 Amps	1
Load Details HT Motor – 0 kW HT Capacitor – 0 kVAr Fire Pump Load – 0 kW Lift Load – 0 kW Other Load – 0 kW + 0 kVA + 0 kVAr	
Deputy Chief Electrical Inspector 	
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An IS 15700 : 2005 Certified Department

Proceedings of the
 Deputy Chief Electrical Inspector
 Thiruvananthapuram
Present: Jayakrishnan K A

Subject: Installation of 50KWp Solar at the premises of Kerala Government Secretariat Annexe-I, Statue, Thiruvananthapuram, 695001 - Sanction for energisation orders issued - regarding.

Reference:

1. Scheme Approval No. B5-00727/21/EIT dated 10.02.2021
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Sanction is hereby accorded under section 54 of The Electricity Act, 2003 and Regulation 32 and 43 of the Central Electricity Authority (Measures relating to safety and electric supply) Regulations, 2010 for the energisation of the installations covered under completion report read as (3) above, installed at the premises of ,50KWp Solar at Kerala Government Secretariat Annexe-I, Palayam, Thiruvananthapuram, 695001 subject to following conditions and as detailed in the annexure appended

1. Supply from the Solar Panel should not be extended out of the premises.
2. Any addition or alteration to the existing installation shall be carried out only after getting prior written approval from this office.
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Deputy Chief Electrical Inspector



To: Kerala Government Secretariat Annexe-I
Punnen Road, Statue, Palayam Thiruvananthapuram

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Incomer MCCB 100 Amps	1
SB Panel Name : DCDB	
Incomer Isolator 40 Amps	3
Earth Electrodes	4
SB Panel Name : AC side	
Incomer MCCB 100 Amps	1
Load Details HT Motor – 0 kW HT Capacitor – 0 kVAr Fire Pump Load – 0 kW Lift Load – 0 kW Other Load – 0 kW + 0 kVA + 0 kVAr	
Deputy Chief Electrical Inspector 	
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Proceedings of the
 Deputy Chief Electrical Inspector
 Thiruvananthapuram
Present: Jayakrishnan K A

Subject: Installation of 50 kWp Solar at the premises of Kerala Government Secretariat Annexe II, Statue, Thiruvananthapuram, 695001 - Sanction for energisation orders issued - regarding.

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Deputy Chief Electrical Inspector



To:

Kerala Government Secretariat Annexe II
Punnen Road, Vanross Palayam Thiruvananthapuram

Copy To:

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Load Details HT Motor – 0 kW HT Capacitor – 0 kVAr Fire Pump Load – 0 kW Lift Load – 0 kW Other Load – 0 kW + 0 kVA + 0 kVAr	
Deputy Chief Electrical Inspector 	
This is a computer generated document. Signature is not required.	



Agency for New and Renewable Energy Research and Technology

(Department of Power, Government of Kerala)



No. ANERT-TECH/43/2020-PE2(RTS)

To

M/s INKEL Limited
7/4732A-5&6, Ajiyal Complex
Post office Road, Kakkanad
Cochin - 682030

WORK ORDER

Sir,

Sub: ANERT- Work Order for the Operation and Maintenance of 100 kW Grid connected SPV Power Plant at Kerala Government Secretariat, Thiruvananthapuram - reg

- Ref: 1. Tender ID: 2020_ANERT_400694_1
 2. Your Bid No, 998856 dtd 13/01/2021
 3. ANERT Work Order No of even number dtd 22/01/2021

Attention is invited to the references cited. With reference to the tender under reference, your agency has completed the Design, Supply, Installation, Testing and Commissioning of 100 kW Grid connected SPV Power Plant at Kerala Government Secretariat, Thiruvananthapuram (funded by Smart City Thiruvananthapuram Ltd). Further, your agency is awarded the Operation and Maintenance of the Power Plant for a period of 5 years. You are requested to carry out the work as detailed below subject to the following terms and conditions.

O & M Charges for the 100 kW SPV Power Plant at Govt. Secretariat, Thiruvananthapuram Annex Complex - 1 & 2		
#	ITEM	Total
1	O&M Charges for the First Year	35,400
2	O&M Charges for the Second Year	35,400
3	O&M Charges for the Third Year	35,400
4	O&M Charges for the Fourth Year	35,400
5	O&M Charges for the Fifth Year	35,400

Total	1,77,000/-
Rupees One Lakh Seventy-Seven Thousand only	

An agreement has to be executed by you in the prescribed form (enclosed as Annexure - I) on Kerala Stamp paper worth Rs. 200/- within 7 days of the receipt of this work order for the fulfilment of the contract. You have to pay all expenses incidental to the execution of the above agreement.

I. SCOPE OF WORKS

- A. Scheduled/ Preventive maintenance works for the Power Plants
- B. The contractor shall ensure trouble free operation of the Solar PV Power Plants by undertaking scheduled maintenance of the plant as per the recommendations of the respective OEMs/vendors of component items. The components of the solar PV plant shall be checked for loose connection/heating and the same shall be rectified. Troubleshooting and repair of the solar PV plant shall be done by the contractor. The contractor shall submit a detailed PM schedule of the plant within 15 days of placement of PO. The schedule shall be approved by ANERT.
- C. During the inspection/maintenance schedule, the equipment in the solar PV plant will be thoroughly checked for proper operation, cleaned and serviced.
- D. Scope of regular maintenance work:
 - i. Periodicity of maintenance: Every month Maintenance work to be carried out (Details of activities to be done is attached as annexure – II)
 - ii. The vendor will depute his Service team at least once a month testing/checking of the solar system.
 - iii. Checking and tightening all wiring connections in PV arrays and electrical cables in PCU, earthing and lightning protection system
 - iv. Checking of proper functioning of PCU and recording all parameters, including any Fault/incipient fault.
 - v. Troubleshoot faults, if any, and rectify the same- if the fault cannot be rectified, the maintenance team will inform Institute and contractor. Contractor will arrange for rectification of the fault with the help of OEM/expert. Spares for regular/breakdown maintenance will be in contractor's scope
- E. In case of any faults/ other problems not directly connected to the solar PV plant, the same shall be reported to concerned electrical engineer/Junior Engineer/supervisor.
- F. The contractor shall check the solar PV plant for any damage and ingress of water.

- G. Following reports shall be submitted by the contractor in hard copy during the periodic visits:
- i. Healthiness/problems of solar PV plant (as per solar PV plant OEM(s)' guidelines)
 - ii. Operation checked status (of all components of the solar PV plant, changeover system etc.)
 - iii. Report attended and action taken (in details) for malfunctioning solar PV Plant
 - iv. Any other relevant point
- H. The starting date for annual maintenance service shall be the date on which the plant shall be handed over to Institute to their full satisfaction.
- I. Any other points specifically not mentioned in the supply, installation and commissioning and annual maintenance services, but required for successful operation shall be in the scope of the contractor.
- J. Any spares/serviceable parts/replacement parts required to put the defective plant back into service shall have to be supplied by the contractor without any cost to Institute.

2. OPERATION AND MAINTENANCE

The Maintenance guidelines for various components viz. solar panels, inverter, wiring etc. are discussed below:

2.1 SOLAR PV PANELS

Although the cleaning frequency for the panels will vary from site to site depending on soiling, it is recommended that

- a. The panels are cleaned at least once every thirty days.
- b. Use water and a soft sponge or cloth for cleaning.
- c. Do not use detergent or any abrasive material for panel cleaning.
- d. Iso-propyl alcohol may be used to remove oil or grease stains.
- e. Do not spray water on the panel if the panel glass is cracked or the back side is perforated.
- f. Wipe water from module as soon as possible.
- g. Use proper safety belts while cleaning modules at inclined roofs etc.
- h. The modules should not be cleaned when they are excessively hot. Early morning is particularly good time for module cleaning.
- i. Check if there are any shade problems due to vegetation or new building. If there

- are, make arrangements for removing the vegetation or moving the panels to a shade-free place.
- j. Ensure that the module terminal connections are not exposed while cleaning; this poses a risk of electric shock.
- k. Never use panels for any unintended use, e. g. drying clothes, chips etc. | Ensure that monkeys or other animals do not damage the panels.

2.2 CABLES AND CONNECTION BOXES

- a. Check the connections for corrosion and tightness.
- b. Check the connection box to make sure that the wires are tight, and the water seals are not damaged.
- c. There should be no vermin inside the box.
- d. Check the cable insulating sheath for cracks, breaks or burns. If the insulation is damaged, replace the wire.
- e. If the wire is outside the building, use wire with weather-resistant insulation.
- f. Make sure that the wire is clamped properly and that it should not rub against any sharp edges or corners.
- g. If some wire needs to be changed, make sure it is of proper rating and type.

2.3 INVERTER

- a. The inverter should be installed in a clean, dry, and ventilated area.
- b. Remove any excess dust in heat sinks and ventilations. This should only be done with a dry cloth or brush.
- c. Check that vermin have not infested the inverter. Typical signs of this include spider webs on ventilation grills or wasps' nests in heat sinks.
- d. Check functionality, e.g. automatic disconnection upon loss of grid power supply, at least once a month.
- e. Verify the state of DC/AC surge arrestors, cable connections, and circuit breakers.

2.4 Inspection and Maintenance Schedule

Component	Activity	Description	Interval
PV Module	Cleaning	- Clean PV modules with plain water or mild dishwashing detergent. - Do not use brushes, any types of solvents, abrasives, or harsh detergents	Monthly or as per site conditions

PV Array	Inspection	• Check the PV modules and rack for any damage. • Note down location and serial number of damaged modules.	Annual
	Inspection	• Determine if any new objects, such as vegetation growth, are causing shading of the array and move them if possible.	Half Yearly
	Vermin Removal	• Remove bird nests or vermin from array and rack area.	Half Yearly
Function Boxes	Inspection	• Inspect electrical boxes for corrosion or intrusion of water or insects. Seal boxes if required. • Check position of switches and breakers. • Check operation of all protection devices.	Annual
Wiring	Inspection	• Inspect cabling for signs of cracks, defects, loose connections, overheating, arcing, short or open circuits, and ground faults.	Annual
Inverter	Inspection Service	• Observe instantaneous operational indicators on the faceplate of the inverter to ensure that the amount of power being generated is typical of the conditions. • Inspect Inverter housing or shelter for physical maintenance, if required.	Monthly
Plant	Monitoring	• Operation and Performance Monitoring	Monthly
Spare Parts	Management	• Manage inventory of spare parts.	As needed

2.5 The faulty system or components should be replaced/ repaired within 7 days of fault reporting. The servicing should be carried out at the site of installation. If any of the components are to be taken out from the site for repair, a standby must be provided to ensure un-interrupted power generation and the systems functions smoothly.

2.6 Any Delay in servicing beyond 7 days of fault reporting would attract penalty at the rate of at the rate fixed by Director, ANERT and further actions will be initiated against the agency.

2.7 A designated contact Telephone Number and address should be submitted for reporting faults during the O&M period of 5 years.

2.8 For the optimal operation of a PV plant, maintenance must be carried out on a period of

5 years.

3. PAYMENT

A. The terms of payment shall be:

O&M Payment

- i. The amount shall be released on annual basis after completion of the O&M period of the previous year. The start of O&M period will be considered from the scheduled date of operation.
- ii. The preventive maintenance reports along with receipt of premium of insurance and generation reports are to be submitted for the release of O&M payments.
- iii. The payment shall be released after the inspection by the authorised personnel of ANERT on annual basis.
- iv. The O&M charges for the 5 years can be released on submission of Bank Guarantee for the equivalent amount taken in the name of Director, ANERT revocable through SBI, Patton Branch. In case of BG, the same is to be submitted for each of the years and the same will be released after the period is expired. Hence, the BGs submitted must be valid for periods ranging from 1 to 5 years.

W. Income tax, contribution to workers' welfare fund and other statutory deductions shall be made from the payment as per prevailing norms.

Not Withstanding the terms and conditions stipulated above, it is to be noted that the conditions in the tender document shall prevail.

Yours faithfully


Chief Technical Manager



KERALA STATE ELECTRICITY BOARD LIMITED

(Incorporated under the Companies Act, 1956) CIN :U40100KL2011SGC027424

Reg Office: Vydyuthi Bhavanam, Pattom, Thiruvananthapuram-695004, Kerala.

Office of the State Nodal Officer (SOURA)

2nd Floor, Vydyuthi Bhavanam, Pattom, Thiruvananthapuram-695004, Kerala.

Phone: +91 471 2514478, E-Mail ID :sourakseb@gmail.com

Website : www.kseb.in ; www.sourakseb.in

By Registered post with A/D

LETTER OF AWARD

To

**M/s INKEL LIMITED,
AJIYAL COMPLEX, POST OFFICE ROAD,
KAKKANAD , COCHIN .**

LoA No.	03/2019-20
Date	01.01.2020
Order type	EPC contract
Reference file	Tender No. 1/Soura-200 MWp /2019-20 dated 5.9.2019
e -Tender ID No	KSEBL/EPC/19-20/ET /47
Value	INR 20,62,35,675/-
Price	Fixed

Sir,

Sub Design, supply, installation, testing and commissioning of 5 MWp Grid Tied Rooftop PV Power plants in PART B & C at the identified locations in the State of Kerala including O and M of the plants for 2 years - **Award of contract – reg.**

- Ref**
- 1 **E- Tender No.1/Soura – 200 MWp/ 2019-20 dated 5.9.2019**
 - 2 **Corrigendum V to the tender**
 - 3 **Your offer submitted online**
 - 4 **This office letter no. Soura/ Tender/1/Soura – 200 MWp/2019-20/59 dated 21.11.2019, Soura/ Tender/1/Soura – 200 MWp/2019-20 dated 29.11.2019, E Mail dated 5.12.2019**
 - 5 **Your E-Mail dated 26.11.2019, 2.12.2019 and undertaking vide Email dated 2.12.2019**
 - 6 **B O (DB) No. 01/2020(Soura/Tender No.1/Soura-200 MWp/2019-20) dated 01.01.2020**

Kerala State Electricity Board Limited is pleased to accept your offer and place this Letter of Award (LoA) as EPC contractor for the design, supply, installation, testing and commissioning of 6.5 MWp Grid Tied Rooftop PV Power plants at the identified locations in the State of Kerala including O and M of the plants for 2 years from the date of commissioning.

The contract shall be strictly in accordance with provisions contained in the bid documents, corrigendum cited under reference (1&2) above. This Letter of Award and tender documents will form part of the contract agreement.

Additional conditions/modifications if any, stated in your offer or elsewhere, which are not agreed to by KSEBL or not in accordance with any of the provisions covered by the bid documents referred shall stand withdrawn/nullified.

1. Scope of work:

The scope of work will be governed by clause 2.2.2.1 of tender document Volume-1.

The work includes design as per site conditions, engineering, manufacture/procurement, manufacturer's quality assurance, factory testing, transportation, handling, storage, erection of 6.5 MWp Roof Top Solar Plants at the identified locations in the State of Kerala including all civil/structural works, electrical and general works, piping, cabling, installation, metering, provision for data acquisition with communication facility to Centralized Monitoring System of KSEB Ltd. as specified in Volume-III of the tender document, remittance of grid connectivity fees(Application Fee and Registration Fee), testing, commissioning, training, services, permits/sanction/clearance if any, insurance at all stages of this contract and handing over the grid tied solar PV Plants to State Nodal Officer to its full satisfaction after proving the performance ratio(AC) and mandatory O&M of the plant for a period of 2 years. The defect liability period shall be 5 years from Commercial Operation Date(CoD) for the equipment.

2. Name of the Project:

Soura Project, Phase - I scheme - Design, supply, installation, testing and commissioning of Grid Tied Rooftop PV Power plants on the Roof top of buildings at the identified locations in the State of Kerala including O and M of the plants for 2 years from the date of commissioning and defect liability period for 5 years herein after called "the project".

3. Name of the Agreement Authority:

'Agreement Authority' means State Nodal Officer, Soura Project, Vidyuthi Bhavanam, KSEB Ltd. or any other officer authorized to execute the agreement on behalf of KSEBL with the Contractor for executing the work, herein after called "State Nodal Officer, Soura Project".

4. Name of the Contractor:

M/s INKEL LIMITED, AJIYAL COMPLEX, POST OFFICE ROAD, KAKKANAD, COCHIN
herein after called "Contractor".

5. Contract Plant Capacity:

PART	Awarded Capacity (MWp)
B	2.5
C	2.5
Total	5.0

6. Contract Amount:

The Total Contract Amount is **INR 20,62,35,675/-** (Rupees Twenty Crores Sixty Two Lakhs Thirty Five Thousand Six Hundred and Seventy Five only) as per the scope of work, as all inclusive price for the work, as in Annexure-I.

This amount shall be firm during the period of contract.

7. Taxes & Duties:

The Contract Amount as indicated in clause 6 of this document is inclusive of all Taxes and duties, Freight & Insurance charges, incidental charges and other levies.

8. EPC Agreement:

The EPC Agreement shall be executed within 20 days from the date of issue of this Letter of Award in accordance with the terms and conditions in clause 5.1.1 and format as per Annexure 13 A of the tender document. This agreement shall be the prior document for the work.

The terms and conditions as stated in the EPC Agreement, Letter of Award and Tender document shall be applicable for the contract. For the purpose of interpretation, the priority of the document shall be in accordance with the following sequence.

1. This EPC Agreement;
2. The EPC Order;
3. Letter of Award;
4. Correspondence between the State Nodal Officer and the Contractor
5. Tender Documents

9. EPC Orders.

Separate EPC orders will be issued listing locations ready for taking over by the contractor and such EPC orders shall form part of the EPC contract. The EPC orders will be issued during the period from January 2020 to March 2020.

10. Performance Security Deposit:

The Contractor shall submit Performance security deposit, at the time of execution of agreement in the prescribed format (Annexure 14 of tender document) for an amount of **Rs. 2,06,24,000/- (Rupees Two Crores Six Lakhs Twenty Four Thousand Only)** as Bank Guarantee, which is an amount equal to 10% of the total contract value rounded off to the higher multiple of Rs 1000/-. The terms and conditions shall be as per clause 5.1.8.1 of the tender document.

11. Insurance:

The Contractor shall maintain at its own costs, throughout the duration of this contract (5 years) and any extensions thereof, all mandatory insurance coverage for adequate amount including but not restricted to, theft, damages, comprehensive general liability insurance covering the Solar Plant and accidental losses, bodily harm,

injury, death of all individuals employed/assigned by the Contractor to perform the services required under this EPC Agreement and the occupants of the premises as per clause 5.13.3 of the tender documents and clause 17 of the EPC agreement.

12. Submission of details of equipment , GTP , Drawing and Approval:

The contractor shall furnish Basic design details along with appropriate diagram and drawings as per the tender specifications, Plant protection schemes, integration and power evacuation details with existing power system., material submittal of the PV modules and the support structures, inverters, transformers, cables, (AC & DC), Junction boxes, AC and DC Distribution boards and other materials for the project. He shall provide material sample and obtain material approvals from the State Nodal Officer before offering the materials for inspection and commencement of work. (Cl 6.2, Volume I of tender document.)

13. General Quality requirements of Solar PV Plant shall be as per Volume 3, Cl 1.5 of the tender document.

14. Inspection and acceptance of materials:

The materials shall be offered for inspection, prior to despatch of the same to the locations, as per clause 5.5, Volume I and relevant clauses in Volume III of the tender document.

15. Taking over the location by the contractor and commencement of Work:

Taking over the location and commencement of work shall be as per the conditions prescribed in EPC Agreement and as per the locations listed in the EPC Orders issued from time to time. The EPC Contractor shall open their local offices with sufficient number of staff in each region/regions where the work is awarded within one month of signing the agreement and the details are to be provided to SNO.

On receipt of EPC order, the contractor shall furnish a detailed material procurement and work execution plan in accordance with project completion period, within 7 days from date of receipt of EPC order.

16. Site inspection and Acceptance Test.

All materials and workmanship shall be subject to inspection, examination and testing by the authorized representative of SNO at any and all times during construction at any and all places where such construction is carried out.

17. Work review meetings:

The Contractor shall present the Programme and status at various review meetings as required.

18. Monthly Progress Reports:

This report shall be submitted (e mailed) to the agreement Authority as well as representative of SNO on a monthly basis within Ten Calendar days, covering over all scenario of the work. Report shall include but not be limited, to the following:

- a) Brief introduction of the work.
- b) Activities executed/achievements during the month

- c) Schedule/s Actual percentage progress manufacturing/delivery, sub- contracting, construction and overall work.
- d) Quantum wise status of procurement against schedule shall also be indicated.
- e) Areas of concern/problem/hold ups, impact and action plans.
- f) Resources deployment status.

19. Period of Completion:

The period of completion of plant will be reckoned from the construction start date and time of completion will be worked out accordingly. The plant shall be completed in all respects, tested, commissioned and put in commercial operation in co-ordination with the authorities of the State Nodal Officer within 6 months from the construction start date specified in the EPC Agreement, as mentioned in Clause 2.2.2.3, Vol I of tender document. Construction Start Date means the date on which the construction of a Solar Plant should commence on satisfaction of the Conditions Precedent in accordance with Article 4.3.3 of the EPC Agreement.

20. Payment:

In case of plant capacity greater than or equal to 10 kWp, 50% of the contract value excluding O&M (on prorata basis), will be released to the contractor as cost of major components of the plant [PV modules, inverter, transformers (if required) and module mounting structures] after delivery of this material at site, inspection and verification by authorized departmental officers. No part payment in case of plant capacity below 10 kWp.

100% of the total Contract amount / balance 50% (as the case may be) excluding Operation and Maintenance charges after considering any liquidated damages if any, on pro-rata basis shall be released after CoD of the solar plant/plants. The contractor can submit the final invoice as per the accepted price schedule within 10 days on proving the Performance ratio (AC) (as per tender clause 2.2.2) after completing the plant. The invoices shall be verified and final payment will be released within 2 months of receipt of the invoices subject to the satisfaction of the above conditions.

The terms and conditions of payment is mentioned in Tender clause 5.2.1 / EPC Agreement Clause 13.

21. Warranties:

Manufacturer's warranty certificate as shown below shall be furnished by the contractor inside the packing of each material.

I. Solar PV modules

a) Material Warranty:

- i. The manufacturer should warrant the Solar Module(s) to be free from the defects and/or failures specified below for a period not less than five(05) years from the date of sale.
- ii. Defects and/or failures due to manufacturing
- iii. Defects and/or failures due to quality of materials

iv. Non Conformity to specifications due to faulty manufacturing and/or inspection processes. If the solar Module(s) fails to conform to this warranty, the manufacturer will repair or replace the solar module(s), at the Owners sole option.

b) Performance Warranty:

PV modules used in grid power plants must be warranted for output wattage, which should not be less than 90% at the end of 10 years and 80% at the end of 25 years.

II. **Other equipment:** The module mounting structure, electrical works including power conditioners/inverters / maximum power point tracker units/distribution boards/digital meters/ switchgear etc. and overall workmanship of the SPV power plants/ systems must be warranted against any manufacturing/ design/ installation defects for a minimum period of 5 years. The EPC contractor shall furnish manufacturer's warranty certificate in this regard.

22. Handing over of the plant to KSEBL:

Handing over shall be done as per Clause 10 of the EPC agreement. At the end of the O&M Period, if there are no obligations arising out of the EPC Agreement, then the authorised representative of KSEB LTD. will furnish a certificate to the Contractor to the effect that all the Works upto the end of O&M period of 2 years are completed satisfactorily and no work upto that period remains incomplete as per the terms of the EPC Agreement. Dues and liabilities, if any, outstanding against the Contractor shall also be included in this certificate. The Contractor shall hand over the Solar Plant to KSEB Ltd. on the day of issuance of this Certificate.

23. Acknowledgment by the Contractor:

A copy of the Letter of Award is to be returned within 10 days, duly signed and seal affixed on all pages as token of acceptance and for incorporation in the Contract Agreement.

Yours faithfully,

Sd/-

**STATE NODAL OFFICER
SOURA PROJECT**

Acc:-

1. Annexure : Price schedule

Copy to:-

1. The Secretary K.S.E.B Ltd, Thiruvananthapuram.
2. The Chief Engineer, Distribution (South/ Central/ North/ North Malabar)
3. The Financial Advisor, KSEBL.
4. The Deputy Chief Engineer, All Electrical Circles.
5. TA to The Chairman & Managing Director, KSEBL, Thiruvananthapuram
6. TA to The Director (Distribution , IT & HRM)/ Director (T, SO & S)/Director(GE& SCM)/ Director(Generation Civil)
7. PA to The Director (Finance)
8. Sr.CA to Chief Vigilance Officer
9. Library
10. Stock File

Annexure - I Price Schedule

Name of Work:- Design, supply, installation, testing and commissioning of Grid Tied Rooftop PV Power plants including O & M of the plants for 2 years

PART	Locations (KSEB Electrical Circles)	Quantity (kWp)	BASIC RATE per kWp plant without O & M Charge	Freight Charges	Insurance	GST (18%)	O & M charges for first year without tax	GST for O & M charges for first year	O & M charges for second year without tax	GST for O & M charges for second year	Plant cost per kWp (Rs.)	Total amount (Rs.)
B [11- 100 kWp]	Kozhikkode, Kalpetta, Kannur, Kasargode, Manjeri.	2500	35,158.44	1000.00	850.00	3,293.75	648.07	152.65	932.88	167.92	42,403.72	50,60,09,300.00
C [> 100 kWp]	Kozhikkode, Kasargode	2500	33,139.59	1000.00	850.00	3,114.07	801.81	144.93	841.99	158.76	40,690.55	10,02,26,375.00
	Total contract amount (B+C)	5000										20,62,35,675.00

(Rupees Twenty Crores Sixty Two Lakhs Thirty Five Thousand Six Hundred and Seventy Five only.)

Sd/-
STATE NODAL OFFICER, SOURA PROJECT



KERALA STATE ELECTRICITY BOARD Ltd.

Office of the Assistant Engineer,
Electrical Section, Chengamanadu - 691557
Phone: 0474 2402538 , 9446009137
email: aechengamanadu@gmail.com

DB 08/AE/CHMD/20-21/18

Dated 16/10/20

TO,

M/s. INKEL LIMITED
Kakkanad

This to certify that M/S INKEL Ltd. has successfully installed and commissioned the 15 KWp Solar Photovoltaic Power Plant at Chakkavarakkal Service Co-operative Bank (1145906001378) Under KSEB Sura project. The SPV plant connected to KSEB Grid on 16/10/2020 and working satisfactorily.

Yours faithfully



AE Chengamanadu
ASSISTANT ENGINEER
ELECTRIC SECTION
KSEB LTD.
CHENGAMANAD
KOTTARAKKAVA



KERALA STATE ELECTRICITY BOARD LIMITED

(Incorporated under the Indian Companies Act, 1956) CIN:U40100KL2011SGC027424
 Reg. Office: Vidyuthi Bhavanam, Pattom, Thiruvananthapuram- 695004 Website: www.kseb.in
 Office of The Assistant Engineer, Electrical Section, Mallappally 689 585
 Phone: (O) +914692682245 (CUG) +919446009465 Email: ksebmppy@gmail.com

No. ES MLPY/GEN/20-21/53

15-10-2020

TO,

M/s. INKEL LIMITED
 Kakkanad

This to certify that M/s INKEL Ltd. has successfully installed and commissioned the 15kwp Solar Photo Voltaic Power Plant at Sophia International Academy Mallappally (1146239018945) Under KSEB Soura project. The SPV plant connected to KSEB Grid on 15/10/2020 and working satisfactorily.


 Assistant Engineer
 Electrical section Mallappally



Registered Office: Vidyuthi Bhavanam, Pattom, Thiruvananthapuram- 695004, Website: www.kseb.in

Government of Kerala
 Department of Electrical Inspectorate
 Office of the Electrical Inspector
 Ravi Chambers, Opp. Benziger Hospital Kollam
 Kollam 691001
 Phone: 04742743619,
 Email:eiklm@ceikerala.gov.in Website:
 www.ceikerala.gov.in



An IS 15700 : 2005 Certified Department

Proceedings of the
 Deputy Electrical Inspector
 Kollam
Present:Deepthi S

Subject: Installation of 50kWp Solar power plant at the premises of M/s.Sree Buddha Central School, Karunagapalli, Kollam, 690523 - Sanction for energisation orders issued - regarding.

Reference:

1. Scheme Approval No. B1-01417/21/EIQ dated 26.04.2021
2. Completion report submitted by Jamini S. , M/s. Dhersaans & Co, CB No: 6368, Karimkuttikara PO, Vamanapuram,Trivandrum,Kerala,695606 dated received on 23.06.2021
3. Inspection conducted on 29.06.2021
4. Non conformity report dated 01.07.2021
5. Compliance report submitted by Jamini S. , M/s. Dhersaans & Co, CB No: 6368, Karimkuttikara PO, Vamanapuram,Trivandrum,Kerala,695606 dated 19.07.2021.
6. Countersigned compliance report submitted on 30.07.2021

Order No: B1-01417/21/EIQ Dated 04-08-2021

Sanction is hereby accorded under section 54 of The Electricity Act, 2003 and Regulation 32 of the Central Electricity Authority (Measures relating to safety and electric supply) Regulations, 2010 for the energisation of the installations covered under completion report read as (2) above, installed at the premises of M/s. Sree Buddha Central School,Karunagapalli,Kollam,690523 subject to following conditions and as detailed in the annexure appended

1. Date of energization shall be intimated.
2. Operation and maintenance of electrical installation shall be done only by authorized persons.
3. All the maintenance works shall be recorded in the maintenance register.
4. Addition/alteration in the existing installation shall be carried out only with prior approval from the electrical inspectorate.

Solar Inverter

Make : Jiangsu GoodWe Power Supply Technology Co. Ltd.

Sl.No. : 9050KMTN203W0197

Capacity : 55kVA/50kW

Model : GW50KN-MT

DC Input(max) : 1100 V DC

Typical PV module

Make : Topsun Energy Ltd.

Model No. : TEL24P335

Rated Power : 335Wp

Voc : 45.9V

Isc : 9.43A

Total number : 150Nos

Deputy Electrical Inspector



To:

The Secretary
Sree Buddha Central School, Edakulangara P.O Karunagapally. Kollam

Copy To:

- 1 DHERSAANS & CO , KARIMKUTTIKARA PO, VAMANAPURAM , TRIVANDRUM, Kerala , 695606
- 2 jamini s , DHERSAANS & CO VAMANAPURAM ,
- 3 The Assistant Engineer , Office of the Assistant Engineer, KSEBI Electrical Section, Karunagapally (North) ,

Annexure (Order No: B1-01417/21/EIQ Dated 04.08.2021)		
Items		Quantity(in numbers)
SB Panel Name : DCDB		
Incomer	Isolator 40 Amps	2
Incomer	Isolator 25 Amps	2
SB Panel Name : ACDB		
Incomer	MCCB 100 Amps	1
SB Panel Name : SYNCHRONIZATION PANEL		
Incomer	SFU 125 Amps	1
Outgoing	SFU 125 Amps	1
Outgoing	SFU 100 Amps	1
Solar Inverter (50 kVA)		
Earth Electrodes		3
Load Details HT Motor – 0 kW HT Capacitor – 0 kVAr Fire Pump Load – 0 kW Lift Load – 0 kW Other Load – 0 kW + 0 kVA + 0 kVAr		
		Deputy Electrical Inspector 
This is a computer generated document. Signature is not required.		

Government of Kerala
 Department of Electrical Inspectorate
 Office of the Electrical Inspector
 Canalview Residency, Near Kochukadapalam Alappuzha
 Alappuzha 688012
 Phone: 04772252229,
 Email: eialp@ceikerala.gov.in Website:
 www.ceikerala.gov.in



Proceedings of the
 Electrical Inspector
 Alappuzha
Present: Rani Joseph

Subject: Installation of 50kWp ongrid Solar Plant at the premises of IMS Dhyambhavan, Punnapra, Alappuzha, 688007 - Sanction for energisation orders issued - regarding.

Reference:

1. Scheme Approval No. B1-03141/21/EIA dated 08.09.2021
2. Completion report submitted by ELECTROTECHNO LEGAL SERVICES PVT LTD, Cochin University Road, Ernakulam, Kerala, 682022 dated received on 13.09.2021
3. Inspection conducted on 17.09.2021

Order No: B1-03141/21/EIA Dated 22-09-2021

Sanction is hereby accorded under section 54 of The Electricity Act, 2003 and Regulation 32 of the Central Electricity Authority (Measures relating to safety and electric supply) Regulations, 2010 for the energisation of the installations covered under completion report read as (2) above, installed at the premises of ,IMS Dhyambhavan, Punnapra, Alappuzha, 688007 subject to following conditions and as detailed in the annexure appended

1. Date of energization shall be intimated.
2. Operation and maintenance of electrical installation shall be done only by authorized persons.
3. All the maintenance works shall be recorded in the maintenance register.
4. Addition/alteration in the existing installation shall be carried out only with prior approval from the electrical inspectorate.
5. Solar panel frames shall be earthed.

Solar Inverter: 50kW, Make: Good WE, Sl no: 9050KMTN213W0022

Solar Panels: 150nos. 335 W

Electrical Inspector



To:

Fr. Superior
 IMS Dhyambhavan, Punnapra, Paravoor, Alappuzha

Copy To:

1 ELECTROTECHNO LEGAL SERVICES PVT LTD 833 Cochin University Road , Ernakulam, Kerala , 682022

2 Electrotechno Legal Services Pvt Ltd , 24/91, Manakkat Building, Cochin University Road, Kalamassery,
Ernakulam - 682 022 ,

Annexure (Order No: B1-03141/21/EIA Dated 22.09.2021)	
Items	Quantity(in numbers)
SB Panel Name : AC DB	
Incomer MCCB 125 Amps	1
Inverter (50)	1
SB Panel Name : Lockable Isolation	
Incomer Isolator 100 Amps	1
Earth Electrodes	2
Load Details HT Motor – 0 kW HT Capacitor – 0 kVAr Fire Pump Load – 0 kW Lift Load – 0 kW Other Load – 0 kW + 0 kVA + 0 kVAr	
Electrical Inspector 	
This is a computer generated document. Signature is not required.	

Government of Kerala
 Department of Electrical Inspectorate
 Office of the Electrical Inspector
 Canalview Residency, Near Kochukadapalam Alappuzha
 Alappuzha 688012
 Phone: 04772252229,
 Email: eialp@ceikerala.gov.in Website:
 www.ceikerala.gov.in



Proceedings of the
 Electrical Inspector
 Alappuzha
Present: Rani Joseph

Subject: Installation of 60kWp ongrid Solar Plant at the premises of Carmel Polytechnic College,, Punnapra, Alappuzha, 688004 - Sanction for energisation orders issued - regarding.

Reference:

1. Scheme Approval No. B1-03142/21/EIA dated 12.07.2021
2. Completion report submitted by ELECTROTECHNO LEGAL SERVICES PVT LTD, Cochin University Road, Ernakulam, Kerala, 682022 dated received on 05.09.2021
3. Inspection conducted on 17.09.2021

Order No: B1-03142/21/EIA Dated 22-09-2021

Sanction is hereby accorded under section 54 of The Electricity Act, 2003 and Regulation 32 of the Central Electricity Authority (Measures relating to safety and electric supply) Regulations, 2010 for the energisation of the installations covered under completion report read as (2) above, installed at the premises of ,Carmel Polytechnic College,,Punnapra,Alappuzha,688004 subject to following conditions and as detailed in the annexure appended

1. Date of energization shall be intimated.
2. Operation and maintenance of electrical installation shall be done only by authorized persons.
3. All the maintenance works shall be recorded in the maintenance register.
4. Addition/alteration in the existing installation shall be carried out only with prior approval from the electrical inspectorate.
5. The Solar panel frames shall be earthed.

Solar Inverter: 60kW, Make: Good WE, Sl no: 9060AMTN213W0037

Solar panels: 180nos, 330 w

Electrical Inspector



To:

The Chairman,
 Carmel Polytechnic College, Punnapra, Alappuzha

Copy To:

- 1 ELECTROTECHNO LEGAL SERVICES PVT LTD , Cochin University Road , Ernakulam, Kerala , 682022
- 2 Electrotechno Legal Services Pvt Ltd , 24/91, Manakkat Building, Cochin University Road, Kalamassery, Ernakulam - 682 022 ,

Annexure (Order No: B1-03142/21/EIA Dated 22.09.2021)		
Items	Quantity(in numbers)	
SB Panel Name : AC DB		
Incomer MCCB 125 Amps	1	
Inverter (60 kVA)	1	
SB Panel Name : Lockable Isolator		
Incomer Isolator 125 Amps	1	
Earth Electrodes	2	
Load Details HT Motor – 0 kW HT Capacitor – 0 kVAr Fire Pump Load – 0 kW Lift Load – 0 kW Other Load – 0 kW + 0 kVA + 0 kVAr		
Electrical Inspector 		
This is a computer generated document. Signature is not required.		

Government of Kerala
Department of Electrical Inspectorate
Office of the Deputy Chief Electrical Inspector
3rd Floor, Revenue Tower, Park Avenue,
Near Boat Jetty, Ernakulam-682011
Phone -0484-2976309 Email:-dycelektrn@kerala.gov.in



Proceedings of the Deputy Chief Electrical Inspector, Ernakulam

(Present:- Sunny Mathew)

Subject:- Installation of 20 KWp On Grid Solar Power Plant and connected electrics at the premises of Secretary, SNDP Branch, Okkal - Sanction for energisation - orders issued - reg:-

- Read:-**
1. Completion report No. Nil received on 03/04/2021 of M/s.Dharsaans & co, KK Kara p.O, Vamanapuram, Trivandrum
 2. Inspection conducted on 05/07/2021
 3. Nonconformities reported under letter number B3-7940/21/EIE dated 07/07/2021
 4. Compliance report furnished under cover of letter No.Nil received on 18/09/2021 of M/s.Dharsaans & co. KK Kara p.O, Vamanapuram, Trivandrum
 5. EPC Order No. PH1/INKE 4/22 dated 03/03/2021.

Order No. B3-7940/21/EIE dated 01/10/2021

Sanction under Section 54 of The Electricity Act, 2003 and Regulation 32 of the CEA (Measures relating to Safety and Electric Supply) Regulations, 2010 is hereby accorded for energisation of the electrical installation covered under the Completion Report read as 2nd above and installed at the premises of Secretary, SNDP Branch, Okkal with the following specifications subject to the conditions mentioned here under.

Specifications:-

Inverter

20kVA

Make-Goodwe, Model-GW20KN-DT, 20kW, Vmax PV-1000Vdc, MPPT Voltage Range-200-950Vdc, AC Voltage-400V

PV Modules : - Make - topsun energy Ltd.,

P Max - 335 Watts.

No. of PV Modules/String - 15

No. of String - 4

Total Modules - 60 Nos.

Earth Electrodes

2Nos.

MV Switch Gears

ACDB

63A - 1No.

DCDB

32A - 2Nos

Solar Isolation DB

63A - 2Nos

40A - 1No.

Conditions:-

1. Any addition or alteration to the existing installation shall be carried out only after getting prior written approval from this office.
2. The owner should rectify any defects that may be pointed out during subsequent inspection of the installation by the undersigned.

- 50529 rgn/HT

3. All the pre-commissioning tests shall be recorded for ready reference.
4. Electricity duty for the units produced from the solar energy system should be remitted to the government when demanded.
5. The whole installation should be in conformity with CEA (Technical Standards for connectivity of the distributed generation resources) Regulation, 2013 and KSERC (Grid interactive distributed solar energy systems) Regulation, 2014.
6. Consent from Licensee shall be obtained in case of grid tied system.

To

M/s.Secretary,

SNDP Branch, Okkal


Deputy Chief Electrical Inspector

Copy to:

1. M/s.Dharsaans & co, KK Kara p.O, Vamanapuram, Trivandrum [Lic. No:- CB6368]
2. The Assistant Engineer, KSEB, Electrical Section:- Okkal (through:- The Deputy Chief Engineer, KSEB, Electrical Circle:- Perumbavoor)
3. Stock File/Computer Data
4. Office Copy

IR Case No.50520 New Case

e.solutions-7.7



Government of Kerala
Department of Electrical Inspectorate
Office of the Electrical Inspector

Ravi Chambers, Opp. Benziger Hospital, Beach Road, Kollam - 691 001,
email: eiklm738@gmail.com
Phone:- 0474-2743619



**Proceedings of the
Deputy Electrical Inspector-in Charge, Kollam**

(Present:- Deepthi S)

Subject:- Installation of 12kWp grid tied solar inverter and connected electrics at the premises of M/s. Manjappara Mosque, Manjappara, Aycor - Sanction for energisation - orders issued - reg:-

- Read:-**
1. Completion report No. Nil received on 31-03-21 of Smt.Jamini.S, Dhersaans&Co, Kanimkuttikara P.O, Vamanapuram-695606
 2. Inspection conducted on 03-05-21
 3. Nonconformities reported under letter number B-1855/21/EIQ dated 07-05-21
 4. Compliance report furnished under cover of letter No.Nil received on 29-07-21 of Smt.Jamini.S, Dhersaans&Co, Kanimkuttikara P.O, Vamanapuram-695606

Order No. B-1855/21/EIO dated 06-08-21

Sanction under Section 54 of The Electricity Act, 2003 and Regulation 32 of the CEA (Measures relating to Safety and Electric Supply) Regulations, 2010 is hereby accorded for energisation of the electrical installation covered under the Completion Report read as 1st above and installed at the premises of M/s. Manjappara Mosque, Manjappara, Aycor with the following specifications subject to the conditions mentioned here under.

Specifications:-

Inverter

15kVA
Make: Goodwe
Model: GW15KT-DT
Vmax: 1000V
SL No: 5015KDOTS20AW0023

Solar Panels

Make: Topsun Energy Ltd
Model: TEL 24MP335
Rating: 335kWp
No of panels: 38

Earth Electrodes

2Nos

MV Switch Gears

ACDB	32A - 1No
COS	32A - 1No
Isolator	32A - 1No
KSEB MB	40A - 1No

Conditions:-

- 1 Any addition or alteration to the existing installation shall be carried out only after getting prior written approval from this office.
- 2 The owner should rectify any defects that may be pointed out during subsequent inspection of the installation by the undersigned.
- 3 All the pre-commissioning tests shall be recorded for ready reference.
- 4 Electricity duty for the units produced from the solar energy system should be remitted to the government when demanded.
- 5 The whole installation should be in conformity with CEA (Technical Standards for connectivity of the distributed generation resources) Regulation, 2013 and KSEERC (Grid interactive distributed solar energy systems) Regulation, 2014.
- 6 Consent from Licensee shall be obtained in case of grid tied system.

sd/-

To**Deputy Electrical Inspector-in Charge****The President,**

Manjappara Mosque, Manjappara, Ayoor Pin:-691533

Copy to:

- 1 Smt.Jamini.S, Dheraans&Co, Karimkuttikara P.O, Vamanapuram-695606 [Lic. No.:- CB6368]
- 2 The Assistant Engineer, KSEB, Electrical Section:- Ayoor
- 3 Stock File/Computer Data
- 4 Office Copy

IIR Case No.1093

New Case

e.solutions-7.7



Forwarded by Order

Deputy Electrical Inspector



തമ്പട്: സി-432/18

ഫോൺ: 0484-2711048

ചോറ്റാനിക്കര ഗ്രാമ പഞ്ചായത്ത് ഓഫീസ്
ചോറ്റാനിക്കര പി . ഐ പിൻ 682312 എറണാകുളം ജില്ല

തീയതി : 26/10/18

പ്രേഷിതൻ

സെക്രട്ടറി

സ്വീകർത്താവ്

അസിസിറ്റന്റ് ജനറൽ മാനോജർ
ഇൻകെൽ ലിമിറ്റഡ്, കാക്കനാട്.

സർ,

വിഷയം : സോളാർ പാനൽ സ്ഥാപിക്കൽ വർക്ക് ഓർഡർ സംബന്ധിച്ച്

സൂചന : (1) പഞ്ചായത്ത് കമ്മിറ്റിയുടെ 15/10/18 തീയതിയിലെ 5-ാം

നമ്പർ തീരുമാനം

(2) താങ്കളുടെ 16/10/18 തീയതിയിലെ കത്ത്

ചോറ്റാനിക്കര പഞ്ചായത്തിലെ ഓഫീസ് കെട്ടിടത്തിനുമുകളിൽ സോളാർ പാനൽ സ്ഥാപിക്കൽ (പ്രോജക്ട് നം. 90/19) പദ്ധതിക്ക് സൂചന (1) പ്രകാരം ഇൻകെൽ ലിമിറ്റഡ് എന്ന താങ്കളുടെ സ്ഥാപനത്തെ നിർവഹണ ഏജൻസിയായി തിരഞ്ഞെടുത്തിട്ടുണ്ട്. ആയതിനാൽ ഈ കത്ത് ലഭിച്ച് 7 ദിവസത്തിനകം പഞ്ചായത്തുമായി 200/- രൂപ മുദ്രപത്രത്തിൽ കരാർവെച്ച് പ്രവർത്തി ആരംഭിക്കേണ്ടതും 3 മാസത്തിനകം പ്രവർത്തി പൂർത്തീകരിക്കേണ്ടതുമാണ്. പ്രോഫോർമ ഇൻവോയ്സ് സമർപ്പിക്കുന്ന മുറയ്ക്ക് തുക അനുവദിക്കുന്നതാണ്.

വിശ്വസ്തതയോടെ,




26/10/18
മനോജ്
ചോറ്റാനിക്കര ഗ്രാമപഞ്ചായത്ത്



11-482718

നമ്പർ 1081.271/191

കേരള സർക്കാർ - കമ്മ്യൂണിറ്റി ഹെൽത്ത് സെക്ഷൻ

കേരള സർക്കാർ - കമ്മ്യൂണിറ്റി ഹെൽത്ത് സെക്ഷൻ

സംഗ്രഹം

കേരള സർക്കാർ കമ്മ്യൂണിറ്റി ഹെൽത്ത് സെക്ഷൻ ഹിസ്റ്ററി, കോൺട്രി ഫോറം 20 കിടന്ന വാർഷിക ഹെൽത്ത് റിപ്പോർട്ട് 2019-2020 ജനങ്ങൾക്ക് സുഗമമായി കിട്ടിയിട്ട് പ്രവർത്തനമാക്കിയപ്പോൾ ഇതിൽ പങ്കെടുത്തവർക്ക്

കേരള സർക്കാർ
സെക്ഷൻ



31/05/19
കമ്മ്യൂണിറ്റി ഹെൽത്ത് സെക്ഷൻ
കേരള സർക്കാർ

843



ബ്ലോക്ക് പഞ്ചായത്ത് ഓഫീസ് ,
വെട്ടിക്കവല, കൊല്ലം പിൻ - 691 538
ഐ.സി.എം സീനാ ജോയി ഫോൺ : 0474-2402550
ഡെപ്യൂട്ടി, വെട്ടിക്കവല ബ്ലോക്ക് (പുരസ്കൃത അധികാരി) ഇ-മെയിൽ : bdavettikavala@kerala.gov.in

നം സി 1402/19 മെമ്പർഷിപ്പ് വിത്ത് ഓഫീസ് തീയതി : 18.01.2020

അസിസ്റ്റന്റ് മാനേജർ
ഇൻകെൽ ലിമിറ്റഡ്
കാക്കനാട് , എർണാകുളം

സർ,
വിഷയം : വെട്ടിക്കവല ബ്ലോക്ക് പഞ്ചായത്ത്- കുളക്കട സി.എച്ച്.സി.യിൽ 19
കെ.വി.എ സോളാർ പാനൽ ഓൺ ഗ്രിഡ് സ്ഥാപിക്കുന്നത് -
വർക്ക് ഓർഡർ സംബന്ധിച്ച്

സൂചന : 14.01.2020 ലെ III/2 നമ്പർ കമ്മിറ്റി തീരുമാനം

2019-20 സാമ്പത്തിക വർഷം കുളക്കട സി.എച്ച്.സി യിൽ സോളാർ പാനൽ ഓൺ ഗ്രിഡ് സ്ഥാപിക്കുന്നതിനായി തയ്യാറാക്കിയ പദ്ധതിയിൽ 21.01.2019 ലെ താങ്കളുടെ പ്രസ്താവൽ ബ്ലോക്ക് പഞ്ചായത്ത് കമ്മിറ്റി അംഗീകരിച്ചിട്ടുണ്ട്.
ഈ സാഹചര്യത്തിൽ ഈ കത്ത് ലഭിച്ച് ഒരാഴ്ചയ്ക്കുള്ളിൽ 1500 രൂപാ മുദ്രപത്രത്തിൽ കരാറിൽ ഒപ്പുവെക്കുന്നതിനും പണികൾ ആരംഭിക്കുന്നതിനുള്ള നടപടികൾ സ്വീകരിക്കാൻ താൽപര്യപ്പെടുന്നു.

വിശ്വസ്തതയോടെ

ഡെപ്യൂട്ടി
വെട്ടിക്കവല ബ്ലോക്ക് പഞ്ചായത്ത്

ഭരണഭാഷാ മാതൃഭാഷ

തിരുനാവായഗ്രാമപഞ്ചായത്ത്കാര്യാലയം

പോസ്റ്റ് തിരുനാവായ 676 301 മലപ്പുറം ഫോൺ: 0494 2602042

e-mail: tirunavaya@gmail.com

എ3- 121

തീയതി 11/10/2019

പ്രക്ഷിതൻ

സെക്രട്ടറി

തിരുനാവായ ഗ്രാമപഞ്ചായത്ത്

ന്യായകർത്താവ്

അസിസ്റ്റന്റ് മേയർ മാന്യേജർ

ഇൻകെൽ ലിമിറ്റഡ്

കാക്കനാട്, എറണാകുളം

വർക്ക് ഓർഡർ

തിരുനാവായഗ്രാമപഞ്ചായത്തിലെ 2019/20 വർഷ പദ്ധതിയിൽ പ.നം-164/19-20 പഞ്ചായത്ത് ഓഫീസ് സോളാർ പവർ സ്ഥാപിക്കൽ (750000- പിളാൻ) എന്നപദ്ധതിയിൽ സോളാർ പവർപ്ലാന്റ് സ്ഥാപിക്കുന്നത് 12/12/2019 ലെ സ. ഉ (സാ.ധാ) 2834/2019 തസ്തിക ഉത്തരവുപ്രകാരം ഇൻകെൽ പദ്ധതിയെപ്പറ്റിയുള്ളതുമായി പഞ്ചായത്തു മേയർ കമ്മിറ്റി യുടെ 31/12/2019 ലെ 1(11)നമ്പർ തീരുമാനപ്രകാരം അംഗീകരിച്ചിട്ടുണ്ട്. വർക്ക് ഓർഡർ കിട്ടി ഏഴു ദിവസത്തിനകം 200 രൂപ മൂല്യപത്രത്തിൽ എഗ്രിമെന്റ് വെർഷെണ്ടും അനർട്ടിന്റെ എസ്റ്റിമേറ്റു പ്രകാരം പറഞ്ഞിരിക്കുന്ന സാമഗ്രികൾ ലഭിപ്പിച്ച് സോളാർ പിളാൻ പ്രവൃത്തി പൂർത്തീകരിച്ച് നൽകേണ്ടതാണ്.



കോഴിക്കോട് വിദ്യാഭ്യാസ ഉപഡയറക്ടറുടെ നടപടിക്രമങ്ങൾ (ഹാജർ: ഇ.കെ. സുരേഷ്കുമാർ)

വിഷയം:- പൊതുവിദ്യാഭ്യാസം - കോഴിക്കോട് നഗരസഭാ വിദ്യാഭ്യാസ പദ്ധതി - "സ്കൂളുകൾക്ക് സോളാർ പാനൽ" പദ്ധതി - ഇൻകെൽ ലിമിറ്റഡ് - വിതരണ ഉത്തരവ് സംബന്ധിച്ച്.

സൂചന:-

1. പദ്ധതി നം. 11/20
2. കോഴിക്കോട് നഗരസഭാ വിദ്യാഭ്യാസ കായിക സ്ഥിരം സമിതിയുടെ 13/02/2020 ലെ 2-ാം നമ്പർ തീരുമാനം.
3. കോഴിക്കോട് നഗരസഭാ പ്രൊക്യൂർമെന്റ് കമ്മിറ്റിയുടെ 29/02/2020 ലെ 19-ാം നമ്പർ തീരുമാനം.
4. കോഴിക്കോട് കോർപ്പറേഷൻ കൗൺസിലിന്റെ 05/03/2020 ലെ 3-ാം തീരുമാനം

ഉത്തരവ് നമ്പർ : ഡി2/24173/19 തീയതി, 10/03/2019

കോഴിക്കോട് നഗരസഭയുടെ 2019-20 വർഷത്തെ വിദ്യാഭ്യാസ പദ്ധതിയായ "സ്കൂളുകൾക്ക് സോളാർ പാനൽ" എന്ന സൂചന (1) പ്രകാരമുള്ള പദ്ധതിയിൽ സ്കൂളുകളിൽ സോളാർ പാനലുകൾ സ്ഥാപിക്കുന്നതിന് അംഗീകൃത അഗ്രഡിറ്റഡ് എജൻസിയായ ഇൻകെൽ ലിമിറ്റഡ് എന്ന സ്ഥാപനത്തെ തെരഞ്ഞെടുക്കുകയും ആയത് സൂചന (2, 3, 4) പ്രകാരം കോഴിക്കോട് നഗരസഭ അംഗീകരിക്കുകയും ചെയ്തിട്ടുണ്ട്.

മേൽ സാഹചര്യത്തിൽ ഇതോടൊപ്പം ഉള്ളടക്കം ചെയ്യുന്ന ലിസ്റ്റിൽ പറയുന്ന ഗുണഭോക്തൃ സ്കൂളുകളിൽ കോഴിക്കോട് നഗരസഭ അംഗീകരിച്ച പ്രൊപ്പോസലിൽ പറയുന്ന പ്രകാരം സ്കൂളുകളിൽ സോളാർ പാനലുകൾ സ്ഥാപിച്ച് പ്രവർത്തനക്ഷമമാക്കി കണക്ടിവിറ്റി സർട്ടിഫിക്കറ്റ്, കാംപ്ലിഷൻ സർട്ടിഫിക്കറ്റ്, തുടർന്ന് സ്ഥാപനത്തിന്റെ ബില്ലും (2 പകർപ്പുകൾ) ഈ ഓഫീസിൽ ഹാജരാക്കാൻ ഇൻകെൽ ലിമിറ്റഡ് എന്ന സ്ഥാപനത്തിനോട് ഇതിനാൽ ഉത്തരവാകുന്നു.

Supply installation testing and commissioning of total 60 KWP Grid connected Power Plants at 8 Govt. School - Rs. 4560000/- (Fortyfive lakhs and sixty thousand only) (Inclusive all taxes)

വിതരണ ഉത്തരവ് ഇൻകെൽ ലിമിറ്റഡ് ഈ സ്ഥാപനത്തിൽ വന്ന് കൈപ്പറ്റേണ്ടതും, 200/- രൂപയുടെ മുദ്രപത്രത്തിൽ ഈ ഓഫീസിൽനിന്നും നിർദ്ദേശിക്കുന്ന വിധത്തിൽ എഗ്രിമെന്റ് വേക്കേണ്ടതും, എഗ്രിമെന്റിൽ പറഞ്ഞ പ്രകാരം പ്രവർത്തിക്കേണ്ടതും ആകുന്നു.

സോളാർ പാനലുകൾ സ്ഥാപിക്കൽ വിതരണ ഉടമ്പടി പ്രകാരം പൂർത്തീകരിക്കേണ്ടതാണ്. അല്ലാത്തപക്ഷം സംഭവിക്കുന്ന എല്ലാ കഷ്ടനഷ്ടങ്ങൾക്കും "ഇൻകെൽ ലിമിറ്റഡ്" മാത്രമായിരിക്കും ഉത്തരവാകിയെന്നും അറിയിച്ചുകൊണ്ട് ഇതിനാൽ ഉത്തരവാകുന്നു.

സ്വീകർത്താവ്:-

ഇൻകെൽ ലിമിറ്റഡ്

പകർപ്പ്:-

1. സെക്രട്ടറി, കോഴിക്കോട് നഗരസഭ
2. ശ്രീ. രാധാകൃഷ്ണൻ മാസ്റ്റർ, വിദ്യാഭ്യാസ കായിക സ്ഥിരം സമിതി ചെയർമാൻ
3. കരുതൽ ഫയൽ

MP5 12/03/2019



വിദ്യാഭ്യാസ ഉപ ഡയറക്ടർ,
കോഴിക്കോട്.
DEPUTY DIRECTOR OF EDUCATION
KOZHIKODE



KERALA STATE ELECTRICITY BOARD LIMITED

(Incorporated under the Indian Companies Act, 1956)

Regd. Office: Vidyuthi Bhavanam, Pattom, Thiruvananthapuram - 695004

Office of the Assistant Engineer, Electrical Section Nadakkavu

Gandhi Road, P.O. Beach, Kozhikode, Kerala - 32, Telephone No : 0495-2765682

E-mail: kseb.nadakkavu@gmail.com

Website: www.kseb.in

DB/ES-NDK/2020-21/193

Dated- 09-02-2021

CERTIFICATE OF CONNECTIVITY

Certified that a Grid Tied Rooftop Solar PV Plant of **10 kWp** capacity has been tested and connected to the KSEBL's Low Tension Grid on 25-01-2021

Consumer No. **1166012011234**

Consumer Name: **Headmistress**

Address: **Govt. U P School Vellayil West**

Electrical Section: **Nadakkave**

Station: **Nadakkavu**

Asst. Engineer

Date: 09-02-2021



Yours faithfully,

A handwritten signature in black ink, appearing to be 'S. S. S.' or similar.

Assistant Engineer
Electrical Section Nadakkavu.



KERALA STATE ELECTRICITY BOARD LIMITED

(Incorporated under Indian Companies act 1956)

Reg. Office: Vydhyuthi Bhavanam, Pattom, Thiruvananthapuram, 695004-Kerala

Website: www.kseb.in, CIN: U40100KL2011SGC027424

Office Of The Assistant Engineer,

Electrical Section Central Kozhikode

Gandhiroad, Beach .P.O. Pin-673 032

Email. ksebcentralkkd@gmail.com, Ph. 04952765661

CERTIFICATE OF CONNECTIVITY

It is Certified that On grid solar Roof top Solar PV Plant of 10 kWp capacity has been tested and connected to the KSEBL's Low Tension Grid on 11/09/2020.

Consumer No. 1166028008665

Consumer Name: Headmaster

Address: The Govt. Training School

Electrical Section: Central Kozhikode

Station: Kozhikode

Date: 23/09/2020

sd/-

Assistant Engineer.

ES/WHL/DBT/20-21/142

CERTIFICATE OF CONNECTIVITY

Certified that a Grid Tied Rooftop Solar PV Plant of **5 kWp** capacity has been tested and connected to the KSEBL's Low Tension Grid on **11.09-2020**

Consumer No. **1166045013023**

Consumer Name: **Headmaster**

Address: **EDAKKAD GOVERNMENT
SCHOOL ,PUTHIYANGADI,KOZHIKODE**

UPPER PRIMARY

Electrical Section: **WestHill**


Assistant Engineer
Electrical Section
KSEB Ltd., West Hill
Kozhikode - 673 005

Date: **29.09-2020**

ES/WH/DBT/20-21/143

CERTIFICATE OF CONNECTIVITY

Certified that a Grid Tied Rooftop Solar PV Plant of **5 kWp** capacity has been tested and connected to the KSEBL's Low Tension Grid on **29.09.2020**

Consumer No. **1166044010418**

Consumer Name: **Head Master**

Address: **Govt. L P School Puthiyangadi**

Electrical Section: **WestHill**

Assistant Engineer
Electrical Section
KSEB Ltd. West Hill
Kozhikode - 673 005

Date: **29.09.2020**

CERTIFICATE OF CONNECTIVITY

Certified that a Grid Tied Rooftop Solar PV Plant of **5kWp** capacity has been tested and connected to the KSEBL's Low Tension Grid on **07.05.2021**

Consumer No. **1166361012281**

Consumer Name: **Headmistress**

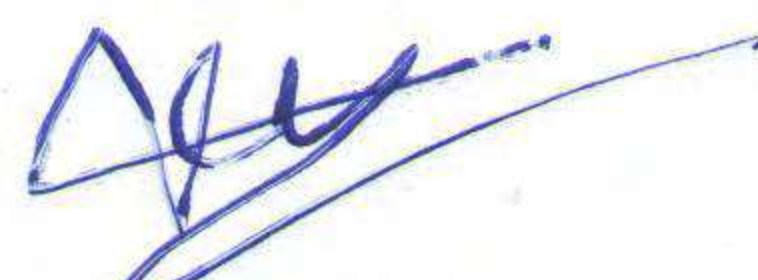
Address: **Govt. L P School Kacherikunnu**

Electrical Section: **Mankavu**

Station: **Mankavu**

Date: **07.05.2021**




Asst. Engineer
Assistant Engineer
Electrical Section
K.S.E.Board Ltd.
Mankave , Calicut-673007

ES/WHL/DB17/20-21/141

CERTIFICATE OF CONNECTIVITY

Certified that a Grid Tied Rooftop Solar PV Plant of **10 kWp** capacity has been tested and connected to the KSEBL's Low Tension Grid on **29-09-2020**

Consumer No. **1166043024919**

Consumer Name: **Principal**

Address: **Govt. HSS EastHill**

Electrical Section: **WestHill**


Assistant Engineer
Electrical Section
KSEB Ltd., West Hill
Kozhikode - 673 005

Date: **29-09-2020**

KERALA STATE ELECTRICITY BOARD LIMITED



കേരളത്തിന്റെ ഊർജ്ജം

Office of the Assistant Engineer
Electrical Section AREEKKADU
Nallalam.P.O, Kozhikode – 27

Ph. 04952421900, 9496012305
E-mail: aekseblesakd@gmail.com

(Reg.Office: Vydyuthi Bhavanam, Pattom, Thiruvananthapuram-695004
CIN – U40100KL20115GC027424 Web site: www.kseb.in)

No. DB/20-21/ Solar /2020-21/ 95

Dtd. 29/09/2020

To,

The Head Master,
GHSS, Nallalam.P.O, Kozhikode

Sir,

Sub : Solar Connectivity Certificate of GHSS, Nallalam – issuing of -reg.

CERTIFICATE OF CONNECTIVITY

Certified that a Grid Tied Rooftop Solar PV Plant of 10 KWp capacity has been tested and connected to the KSEBL's Low Tension Grid on 26/09/2020

Consumer No. 1167893005508

Consumer Name: The Head Master

Address: Govt. Higher Secondary School Nallalam

Electrical Section: Areekkad .

Yours faithfully,



ASSISTANT ENGINEER

Registered Office: Vydyuthi Bhavanam, Pattom, Thiruvananthapuram 695 004, Website: www.kseb.in

CERTIFICATE OF CONNECTIVITY

Certified that a Grid Tied Rooftop Solar PV Plant of 5 kWp capacity has been tested and connected to the KSEBL's Low Tension Grid on 19/10/2020

Consumer No. **1166362006598**

Consumer Name: **Head Master**

Address: **Govt. Achuthan Girls L P S Chalappuram**

Electrical Section: **Mankavu**

Station: **Mankavu**

Date: **19/10/2020**



Asst. Engineer
Assistant Engineer
Electrical Section
K.S.E. Board Ltd.
Mankave, Calicut-673607



GOVT. OF INDIA
KERALA

H 915174

POWER OF ATTORNEY

Know all men by these presents, We, INKEL Limited having registered office at 7/473 ZA-5 & 6, Ajiyal Complex, Post Office Road, Kakkanad, Cochin-682030 do hereby irrevocably constitute, nominate, appoint and authorize Mr. Sam Roofus, son of Mr. M Rufus Manuel and presently residing at House No 14, West Cliff Garden, YMR Junction, Nandhancode, Trivandrum 695 004, who is presently employed with us holding the position of Asst. General Manager Solar, as our true and lawful attorney hereinafter referred to as the "Attorney") to do in our name and on our behalf, all such acts, deeds and things as are necessary or required in connection with or incidental to submission of our bid for the Solar tenders of various departments in Government of Kerala, Tamilnadu, Karnataka including but not limited to signing and submission of all applications, bids and other documents and writings, participate in bidders' and other conferences and providing information / responses to the Authority, representing us in all matters before the Authority, signing and execution of all contracts including the Concession Agreement and undertakings consequent to acceptance



For INKEL Limited

A MOHANLAL
Managing Director

Sworn and signed before me
Attested

NO: 45900 5001
RS.

19/11/2020

LINU JOSE
S R O VENDOR
THIRAKKARA

INKEL LTD

8551

T.G. KALADHARAN
ADVOCATE & NOTARY
TRANS AVENUE, MAVELIPURAM
KAKKANAD P.O. PIN-682030
MOB: +91 9446485490

Notary



of our bid, and generally dealing with the Authority in all matters in connection with or relating to or arising out of our bid for the said Project and/or upon award thereof to us and/or till the entering into of the Concession Agreement with the Authority.

AND we hereby agree to ratify and confirm and do hereby ratify and confirm all acts, deeds and things done or caused to be done by our said Attorney pursuant to and in exercise of the powers conferred by this Power of Attorney and that all acts, deeds and things done by our said Attorney in exercise of the powers hereby conferred shall and shall always be deemed to have been done by us.

IN WITNESS WHEREOF WE, INKEL LIMITED, THE ABOVE NAMED PRINCIPAL HAVE EXECUTED THIS POWER OF ATTORNEY ON THIS 19th DAY OF NOVEMBER 2020.

For INKEL Limited



[Signature] 19/11/2020
A Mohanlal
Managing Director

Witnesses:

1. Anjana M A, Company Secretary, INKEL Limited

[Signature]
19/11/2020

2. Nayana Sreekanth, Law Officer, INKEL Limited

[Signature]
19/11/2020

Accepted

[Signature]
Sam Roofus
Asst. General Manager
INKEL LTD
Ajiyal Complex
Post Office Road
Kakkanad, Kochi

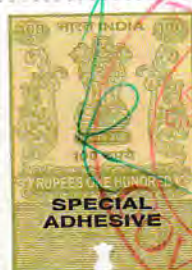
Duly executed and signed before me

Attested

[Signature]
Notary

20/11/2020

T.G. KALADHARAN
ADVOCATE & NOTARY
TRANS AVENUE, MAVELIPURAM
KAKKANAD P.O. PIN-682030
MOB: +91 9446485490



T.G. KALADHARAN, T.G.
Mavelipuram Dist (Kerala)
Reg. No: 6954
Expiry Date:
13-10-2023

856



T MATHEW & CO

Chartered Accountants

INKEL LIMITED

INDEPENDENT PRACTITIONER'S REPORT ON THE STATEMENT OF COMPUTATION OF FINANCIAL QUALIFICATION CERTIFICATE AS AT 31ST MARCH 2018 TO 31ST MARCH 2022

To
The Board of Directors
Inkel Limited
Kochi

Independent Practitioner's Certificate on "The Statement of Computation of Financial Qualification Certificate" as at 31st March 2018, 31st March 2019, 31st March 2020, 31st March 2021 and 31st March 2022.

1. This Certificate is issued in accordance with the terms of our engagement letter dated 13.12.2022 with Inkel Limited.
2. The accompanying Statement of Computation of Financial Qualification Certificate (hereinafter referred to as 'Statement') (Annexure 1) contains the account balances used in the computation of Financial Qualification Certificate traced from the Audited Financial Statements.

Management Responsibility on "The Statement of Computation of Financial Qualification Certificate" as at 31st March 2018 to 31st March 2022.

1. The preparation of the Statement is the responsibility of the management of Inkel Limited, including the preparation and maintenance of all accounting and other relevant supporting records and documents. This responsibility includes the design, implementation and maintenance of internal control relevant to the preparation and presentation of the Statement.



2nd Floor, Mangalam Plaza building, Near Trinity Movie Max, TK Road, Aban Junction,
Pathanamthitta, Kerala, India - 689645

Phone: +91 7025264206, +91 8078850688, 857: ca.thomasmathew@hotmail.com,
tmathew1967@gmail.com

Independent Practitioner's Responsibility on "The Statement of Computation of Financial Qualification Certificate" as at 31 March 2018 to 31st March 2022

1. Pursuant to the terms of engagement as above, it is our responsibility to provide a reasonable assurance that the amounts in the Statement that form part of the Net Worth computation have been accurately extracted from the audited financial statements and the computation of net worth is arithmetically correct; the computation of net worth and working capital is in accordance with the method of computation set out as per Section 2(57) of the Companies Act, 2013.
2. The examination of the Statement has been conducted in accordance with the Guidance Note on Reports or Certificates for Special Purposes issued by the Institute of Chartered Accountants of India. The Guidance Note requires that we comply with the ethical requirements of the Code of Ethics issued by the Institute of Chartered Accountants of India.
3. The relevant applicable requirements of the Standard on Quality Control (SQC) 1, Quality Control for Firms that Perform Audits and Reviews of Historical Financial Information, and Other Assurance and Related Services Engagements, to the extent applicable to this assignment have been complied with.

Opinion

4. Based on the verification of the Statement, we are of the opinion that the amounts in the Statement of Computation of Net Worth have been accurately extracted from the Audited Financial Statements of Inkel Limited.

Restriction on Use

5. This certificate is addressed and provided to the Board of Directors of the company solely for the purpose to comply with the Tender requirement of ANERT and should not be used by any other person or for any other purpose. Accordingly, we do not accept or assume any liability or any duty of care or for any other purpose or to any other party to whom it is shown or into whose hands it may come without our prior consent in writing.



INKEL LIMITED

ANNEXURE 1 TO THE INDEPENDENT PRACTITIONER'S REPORT ON THE STATEMENT OF COMPUTATION OF FINANCIAL QUALIFICATION CERTIFICATE AS AT 31ST MARCH 2018 TO 31ST MARCH 2022

FORMAT C- CERTIFICATE OF BIDDER'S FINANCIAL QUALIFICATION .

(Rupees in Lakhs)

S/N	Financial parameters	FY17-18	FY18-19	FY19-20	FY20-21	FY21-22
1.	Net Worth					
a)	Paid up Capital	16,302.70	17,781.43	17,781.43	17,781.43	17,781.43
b)	Free Reserves and Surplus*	3,724.82	4,239.26	2,450.36	2,116.87	2,233.22
c)	Misc expenses to the extent not written off	-	-	-	-	-
	Net Worth (a+b-c)	20,027.52	22,020.69	20,231.79	19,897.30	20,014.65
2.	Annual Turnover**	5,257.10	4,022.15	2,574.12	5,600.95	5,774.85

*Free Reserve and Surplus shall be Exclusive of Revaluation Reserve, written back of Depreciation Provision and Amalgamation.

**Annual total Income/turnover as incorporated in the Profit and Loss Account excluding non-recurring income ,i.e., sale of fixed asset etc.

It is certified that all the figures are based on audited accounts read with auditor's report and Notes to Accounts etc.

Name of Authorized Signatory:
Designation:

Certifying Chartered Accountant:
Name of Firm:



For T. MATHEW & Co.
CHARTERED ACCOUNTANTS
(FRN 009256 S)

THOMAS MATHEW F. C. A.
M. No. 206481

Date: 15.12.2022

UDIN: 22206481BFMOWI3932

Place: Pathanamthitta

Note : Annual Turnover as extracted from the Statement of Profit and Loss Account excludes non-recurring income such as Provision for doubtful debts written back, Share of Profit from LLP, Profit on sale of fixed assets, Dividend Income and Miscellaneous income .

INKEL LIMITED
BALANCE SHEET AS AT 31st MARCH 2016

Particulars	Note No.	As at 31.03.2016 (In Rupees)	As at 31.03.2015 (In Rupees)
I. EQUITY AND LIABILITIES			
(1) Shareholders' Funds			
(a) Share Capital	2.1	1,63,02,70,000	1,63,02,70,000
(b) Reserves and Surplus	2.2	26,56,63,151	21,80,03,462
(2) Non - Current Liabilities			
(a) Long-term Borrowings	2.3	3,00,00,000	-
(b) Deferred Tax Liabilities (Net)	2.4	5,38,26,040	2,75,57,651
(c) Other Long -Term Liabilities	2.5	63,53,240	55,46,240
(d) Long - Term Provisions	2.6	22,54,189	10,40,450
(3) Current Liabilities			
(a) Trade Payables	2.7		
i. Total outstanding dues of micro enterprise and small enterprise		3,13,999	-
ii. Total outstanding dues other than micro enterprise and small enterprise		96,50,437	91,29,133
(b) Other Current Liabilities	2.8	5,92,06,945	5,10,64,117
(c) Short Term Provisions	2.9	12,36,23,473	6,05,89,529
TOTAL		2,18,11,61,474	2,00,32,00,582
II. ASSETS			
(1) Non - Current Assets			
(a) Fixed Assets			
(i) Tangible Assets	2.10	68,32,48,990	46,59,42,649
(ii) Intangible Assets	2.10	3,59,618	93,281
(iii) Capital Work - in - Progress	2.11	67,308	8,31,01,054
(b) Non - Current Investments	2.12	50,91,88,935	30,65,81,528
(c) Long - Term Loans and Advances	2.13	15,69,26,769	12,71,19,394
(d) Other non-current assets	2.14	2,05,73,000	9,27,52,268
(2) Current Assets			
(a) Inventories	2.15	-	-
(b) Trade Receivables	2.16	24,24,51,332	11,12,52,071
(c) Cash and Cash Equivalents	2.17	18,46,44,159	40,77,94,372
(d) Short - Term Loans and Advances	2.18	36,96,36,282	40,02,67,809
(e) Other Current Assets	2.19	1,40,65,081	82,96,156
TOTAL		2,18,11,61,474	2,00,32,00,582

Significant Accounting Policies and Notes to Accounts

1 & 2

For and on behalf of the Board of Directors

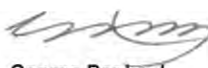
As per our Report of even date attached


T. Balakrishnan, Managing Director
DIN: 00052922


M.M. Abdul Basheer, Director
DIN: 00120916

For Varma & Varma
Chartered Accountants
Firm No.004532S


K. Padmadasan,
Company Secretary


George Raphael,
Chief Financial Officer


Vijay Narayan Govind
(Partner)
Membership No. 203094

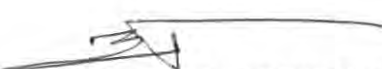
Place : **KOCHI - 19**
Date : **22.06.2016**

INKEL LIMITED
STATEMENT OF PROFIT AND LOSS FOR THE YEAR ENDED 31st MARCH 2016

Particulars	Note No.	For the year ended 31.03.2016 (In Rupees)	For the year ended 31.03.2015 (In Rupees)
I. Revenue			
Revenue from Operations	2.20	29,88,59,302	33,49,64,754
Other Income	2.21	9,98,07,133	11,92,26,216
II. Total Revenue		39,86,66,435	45,41,90,970
III. Expenses:			
Cost of land acquired/building/amenities constructed and disposed (on Long Term Finance Lease Agreements)	2.22	11,66,24,551	20,50,67,875
Employee Benefit Expense	2.23	2,75,43,191	2,08,26,019
Finance Costs	2.24	-	4,61,648
Depreciation and Amortisation	2.10	1,71,55,609	1,80,06,925
Other Expenses	2.25	4,40,93,895	5,14,61,748
IV. Total Expenses		20,54,17,246	29,58,24,215
V. Profit Before Tax (II - IV)		19,32,49,189	15,83,66,755
VI. Tax Expense:			
(1) Current Tax		4,08,34,925	3,46,38,270
(2) Deferred tax		2,62,68,390	2,08,97,928
VII. Profit for the year (V - VI)		12,61,45,874	10,28,30,557
VIII. Earning per Equity Share:	2.26		
(1) Basic		0.77	0.63
(2) Diluted		0.77	0.63
Significant Accounting Policies and Notes to Accounts		1 & 2	

For and on behalf of the Board of Directors

As per our Report of even date attached

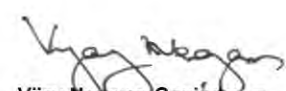

T. Balakrishnan, Managing Director
DIN: 00052922


M.M. Abdul Basheer, Director
DIN: 00120916

For Varma & Varma
Chartered Accountants
Firm No.004532S


K. Padmadasan,
Company Secretary


George Raphael,
Chief Financial Officer


Vijay Narayan Govind
(Partner)
Membership No. 203094

Place : **KOCHI-19**

Date : **22.06.2016**

INKEL LIMITED
BALANCE SHEET AS AT 31st MARCH 2017

Particulars	Note No.	As at 31.03.2017 (In Rupees)	As at 31.03.2016 (In Rupees)
I. EQUITY AND LIABILITIES			
(1) Shareholders' Funds			
(a) Share Capital	2.1	1,63,02,70,000	1,63,02,70,000
(b) Reserves and Surplus	2.2	33,85,53,468	26,56,63,151
(2) Non - Current Liabilities			
(a) Long-term Borrowings	2.3	11,21,63,000	3,00,00,000
(b) Deferred Tax Liabilities (Net)	2.4	6,00,92,346	5,38,26,040
(c) Other Long -Term Liabilities	2.5	64,28,622	63,53,240
(d) Long - Term Provisions	2.6	34,51,389	22,54,189
(3) Current Liabilities			
(a) Short Term Borrowings	2.7	1,03,50,000	-
(b) Trade Payables	2.8		
i. Total outstanding dues of micro enterprises and small enterprises; and		-	3,13,999
ii. Total outstanding dues other than micro enterprises and small enterprises		3,88,81,323	96,50,437
(c) Other Current Liabilities	2.9	4,76,84,895	5,92,06,945
(d) Short Term Provisions	2.10	2,49,76,844	12,36,23,473
TOTAL		2,27,28,51,887	2,18,11,61,474
II. ASSETS			
(1) Non - Current Assets			
(a) Fixed Assets			
(i) Tangible Assets (Property, Plant and Equipment)	2.11	66,45,07,268	68,32,48,990
(ii) Intangible Assets	2.11	2,26,548	3,59,618
(iii) Capital Work - in - Progress	2.12	75,000	67,308
(b) Non - Current Investments	2.13	59,18,63,033	50,91,88,935
(c) Long - Term Loans and Advances	2.14	9,78,36,781	15,69,26,769
(d) Other non-current assets	2.15	2,57,50,342	2,05,73,000
(2) Current Assets			
(a) Inventories	2.16	-	-
(b) Trade Receivables	2.17	16,45,08,873	24,24,51,332
(c) Cash and Cash Equivalents	2.18	34,12,84,792	18,46,44,159
(d) Short - Term Loans and Advances	2.19	38,04,86,278	36,99,98,067
(e) Other Current Assets	2.20	63,12,972	1,37,03,296
TOTAL		2,27,28,51,887	2,18,11,61,474

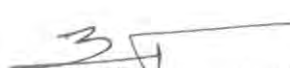
Significant Accounting Policies and Notes to Accounts

1 & 2

The Accompanying Notes are an integral part of the financial statements.

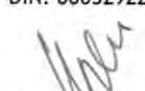
For and on behalf of the Board of Directors

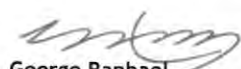
As per our Report of even date attached

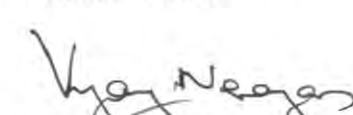

T. Balakrishnan, Managing Director
DIN: 00052922


M.M. Abdul Basheer, Director
DIN: 00120916

For Varma & Varma
Chartered Accountants
Firm No.004532S


K. Padmasadan,
Company Secretary


George Raphael,
Chief Financial Officer


Vijay Narayan Govind
(Partner)
Membership No. 203094

Place : Cochin
Date : 23.06.2017

INKEL LIMITED			
STATEMENT OF PROFIT AND LOSS FOR THE YEAR ENDED 31st MARCH 2017			
Particulars	Note No.	For the year ended 31.03.2017 (In Rupees)	For the year ended 31.03.2016 (In Rupees)
I. Revenue			
Revenue from Operations	2.21	27,59,05,886	29,91,37,999
Other Income	2.22	8,98,65,255	9,95,28,436
II. Total Revenue		36,57,71,141	39,86,66,435
III. Expense:			
Cost of land acquired/building/amenities constructed and disposed (on Long Term Finance Lease Agreements)	2.23	5,92,04,063	11,66,24,551
Purchase of Stock in Trade	2.24	6,06,88,285	-
Employee BenefitS Expense	2.25	4,26,58,328	2,75,43,191
Finance Costs	2.26	1,17,55,687	-
Depreciation and Amortisation Expense	2.11	2,56,11,055	1,71,55,609
Other Expense	2.27	6,45,66,848	4,40,93,895
IV. Total Expense		26,44,84,266	20,54,17,246
V. Profit Before Tax (II - IV)		10,12,86,875	19,32,49,189
VI. Tax Expense:			
(1) Current Tax		3,49,54,710	4,08,34,925
Less: MAT Credit Entitlement		1,28,24,458	-
Net Current tax		2,21,30,252	4,08,34,925
(2) Deferred tax		62,66,306	2,62,68,390
VII. Profit for the year (V - VI)		7,28,90,317	12,61,45,874
VIII. Earning per Equity Share:	2.28		
(1) Basic (face value of Rs 10/- (Rs 10/-) each)		0.45	0.77
(2) Diluted (face value of Rs 10/- (Rs 10/-) each)		0.45	0.77
Significant Accounting Policies and Notes to Accounts		1 & 2	

For and on behalf of the Board of Directors

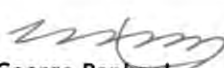
As per our Report of even date attached

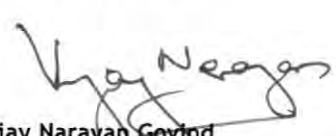

T. Balakrishnan, Managing Director
 DIN: 00052922


M.M. Abdul Basheer, Director
 DIN: 00120916

For Varma & Varma
 Chartered Accountants
 Firm No.004532S


K. Padmadasan,
 Company Secretary


George Raphael,
 Chief Financial Officer


Vijay Narayan Govind
 (Partner)
 Membership No. 203094

 Place : Cochin
 Date : 23.06.2017

INKEL LIMITED

BALANCE SHEET AS AT 31st MARCH 2018

Particulars	Note No.	As at 31.03.2018 (In Rupees)	As at 31.03.2017 (In Rupees)
I. EQUITY AND LIABILITIES			
(1) Shareholders' Funds			
(a) Share Capital	2.1	1,63,02,70,000	1,63,02,70,000
(b) Reserves and Surplus	2.2	37,24,81,724	33,85,53,468
(2) Share Application Money Pending Allotment	2.3	23,72,325	-
(3) Non - Current Liabilities			
(a) Long - Term Borrowings	2.4	9,38,43,000	11,21,63,000
(b) Deferred Tax Liabilities (Net)	2.5	3,48,14,032	6,00,92,346
(c) Other Long Term Liabilities	2.6	96,51,182	64,28,622
(d) Long - Term Provisions	2.7	57,42,296	34,51,389
(4) Current Liabilities			
(a) Short Term Borrowings	2.8	-	1,03,50,000
(b) Trade Payables :-	2.9	-	-
i. Total outstanding dues of micro enterprises and small enterprises; and		-	-
ii. Total outstanding dues other than micro enterprises and small enterprises		11,63,75,327	3,88,81,323
(c) Other Current Liabilities	2.10	26,30,95,383	4,76,84,895
(d) Short - Term Provisions	2.11	4,96,49,189	2,49,76,844
TOTAL		2,57,82,94,458	2,27,28,51,887
II. ASSETS			
(1) Non - Current Assets			
(a) Fixed Assets			
(i) Tangible Assets (Property, Plant and Equipment)	2.12	62,03,53,557	66,45,07,268
(ii) Intangible Assets	2.12	1,77,267	2,26,548
(iii) Capital Work - in - Progress	2.13	-	75,000
(iv) Intangible assets under development	2.14	6,59,375	-
(b) Non - Current Investments	2.15	85,05,75,103	59,18,63,033
(c) Long - Term Loans and Advances	2.16	12,64,16,357	9,78,36,781
(d) Other Non - Current Assets	2.17	1,33,53,705	2,57,50,342
(2) Current Assets			
(a) Inventories	2.18	-	-
(b) Trade Receivables	2.19	19,47,86,146	16,95,41,643
(c) Cash and Cash Equivalents	2.20	37,71,80,485	34,12,84,792
(d) Short - Term Loans and Advances	2.21	39,20,54,626	37,54,53,508
(e) Other Current Assets	2.22	27,37,837	63,12,972
TOTAL		2,57,82,94,458	2,27,28,51,887

Significant Accounting Policies and Notes to Accounts

1 & 2

The Accompanying Notes are an integral part of the financial statements.

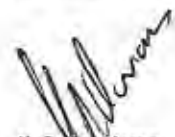
For and on behalf of the Board of Directors

As per our separate report of even date attached

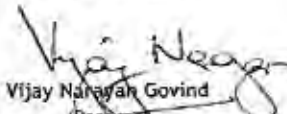

 Dr. Mohamed Sagheer
 Managing Director
 DIN: 02802910


 M.M. Abdul Basheer
 Director
 DIN: C0120916

 For Varma & Varma
 Chartered Accountants
 Firm No.0045325


 K. Padmadasan
 Company Secretary


 George Raphael
 Chief Financial Officer


 Vijay Narayan Govind
 (Partner)
 Membership No. 203094

Place :Kochi

Date : 19-06-2018

INKEL LIMITED
STATEMENT OF PROFIT AND LOSS FOR THE YEAR ENDED 31st MARCH 2018

Particulars	Note No.	For the year ended 31.03.2018 (In Rupees)	For the year ended 31.03.2017 (In Rupees)
Revenue			
I. Revenue from Operations	2.23	46,24,18,795	27,59,05,886
II. Other Income	2.24	6,54,72,861	8,98,65,255
III. Total Revenue (I+II)		52,78,91,656	36,57,71,141
IV. Expenses			
i) Cost of land acquired/building/amenities constructed and disposed (on Long Term Finance Lease Agreements)	2.25	3,64,31,906	5,92,04,063
ii) Purchases of Stock in Trade	2.26	17,66,49,295	6,06,88,285
iii) Employee Benefits Expense	2.27	5,46,23,790	4,26,58,328
iv) Finance Costs	2.28	1,07,09,785	1,17,55,687
v) Depreciation and Amortisation Expense	2.12	2,25,85,318	2,56,11,055
vi) Other Expenses	2.29	11,15,04,236	6,45,66,848
Total Expenses		41,25,04,330	26,44,84,266
V. Profit Before Tax (III - IV)		11,53,87,326	10,12,86,875
VI. Tax Expense			
(1) Current Tax		4,78,72,744	3,49,54,710
Less: MAT Credit Entitlement		-	1,28,24,458
Net Current tax		4,78,72,744	2,21,30,252
(2) Deferred tax		(2,52,78,314)	62,66,306
VII. Profit for the year (V - VI)		9,27,92,896	7,28,90,317
VIII. Earnings per Equity Share:	2.30		
Face value of share ₹ 10/- (₹ 10/-)			
(1) Basic		0.57	0.45
(2) Diluted		0.57	0.45

Significant Accounting Policies and Notes to Accounts

1 & 2

The Accompanying Notes are an integral part of the financial statements.

For and on behalf of the Board of Directors

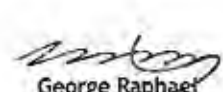
As per our separate report of even date attached

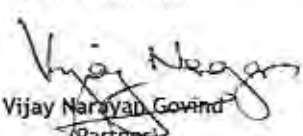

Dr. Mohammed Sagheer
 Managing Director
 DIN: 02802910


M.M. Abdul Basheer
 Director
 DIN: 00120916

For Varma & Varma
 Chartered Accountants
 Firm No.0045325


K. Padmanabhan
 Company Secretary


George Raphael
 Chief Financial Officer


Vijay Narayan Govind
 (Partner)
 Membership No. 203094

Place :Kochi

Date : 19-06-2018

INKEL LIMITED
BALANCE SHEET AS AT 31st MARCH 2019

Particulars	Note No.	As at 31.03.2019 (In Rupees)	As at 31.03.2018 (In Rupees)
I. EQUITY AND LIABILITIES			
(1) Shareholders' Funds			
(a) Share Capital	2.1	1,77,81,43,340	1,63,02,70,000
(b) Reserves and Surplus	2.2	42,39,26,145	37,24,81,724
(2) Share Application Money Pending Allotment	2.3	-	23,72,325
(3) Non - Current Liabilities			
(a) Long - Term Borrowings	2.4	11,46,24,000	9,38,43,000
(b) Deferred Tax Liabilities (Net)	2.5	2,99,45,955	3,48,14,032
(c) Other Long Term Liabilities	2.6	48,57,742	96,51,182
(d) Long - Term Provisions	2.7	1,23,00,099	57,42,296
(4) Current Liabilities			
(a) Short Term Borrowings	2.8	70,25,000	-
(b) Trade Payables :-	2.9	-	-
i. Total outstanding dues of micro enterprises and small enterprises; and			
ii. Total outstanding dues of creditors other than micro enterprises and small enterprises		6,25,58,045	11,63,75,327
(c) Other Current Liabilities	2.10	37,48,68,785	26,30,95,383
(d) Short - Term Provisions	2.11	3,02,91,061	4,96,49,189
TOTAL		2,83,85,40,172	2,57,82,94,458
II. ASSETS			
(1) Non - Current Assets			
(a) Property, Plant and Equipment			
(i) Tangible Assets	2.12	59,58,73,870	62,03,53,557
(ii) Intangible Assets	2.12	1,24,723	1,77,267
(iii) Intangible assets under development	2.13	-	6,59,375
(b) Non - Current Investments	2.14	84,14,64,999	85,05,75,103
(c) Long - Term Loans and Advances	2.15	9,73,94,426	12,64,16,357
(d) Other Non - Current Assets	2.16	23,92,87,274	1,33,53,705
(2) Current Assets			
(a) Inventories	2.17	24,77,654	-
(b) Trade Receivables	2.18	16,72,22,084	16,72,56,295
(c) Cash and Cash Equivalents	2.19	50,38,37,179	37,71,80,485
(d) Short - Term Loans and Advances	2.20	29,38,54,263	37,95,18,626
(e) Other Current Assets	2.21	9,70,03,700	4,28,03,688
TOTAL		2,83,85,40,172	2,57,82,94,458

Significant Accounting Policies and Notes to Accounts

1 & 2

The Accompanying Notes are an integral part of the financial statements.

For and on behalf of the Board of Directors

As per our separate report of even date attached

Dr. K. A. Retheesh
Managing Director
DIN: 01345383

M. M. Abdul Basheer
Director
DIN: 00120916

For VARMA & VARMA
Chartered Accountants
(FRN: 0045325)

Anjana M. A
Company Secretary

George Raphael V. P
Chief Financial Officer

Vijay Narayan Govind
Partner
Membership No. 203094

Place : Kochi
Date : 15.11.2019

Place : Kochi
Date : 28-11-2019

INKEL LIMITED

STATEMENT OF PROFIT AND LOSS FOR THE YEAR ENDED 31st MARCH 2019

Particulars	Note No.	For the year ended 31.03.2019 (In Rupees)	For the year ended 31.03.2018 (In Rupees)
Revenue			
I. Revenue from Operations	2.22	32,05,59,913	46,24,18,795
II. Other Income	2.23	9,18,47,273	6,54,72,243
III. Total Revenue (I+II)		41,24,07,186	52,78,91,038
IV. Expenses			
i) Cost of land acquired/building/amenities constructed and disposed (on Long Term Finance Lease Agreements)	2.24	78,97,745	3,64,31,906
ii) Purchases of Stock-in-Trade	2.25	9,05,93,492	17,66,49,295
iii) Changes in inventories of Stock-in-Trade	2.26	(24,77,654)	-
iv) Employee Benefits Expense	2.27	9,52,82,059	6,14,60,506
v) Finance Costs	2.28	2,57,08,940	1,09,94,300
vi) Depreciation and Amortisation Expense	2.12	1,94,37,305	2,25,85,318
vii) Other Expenses	2.29	10,25,88,468	10,43,82,387
Total Expenses		33,90,30,355	41,25,03,712
V. Profit Before Tax (III - IV)		7,33,76,831	11,53,87,326
VI. Tax Expense			
(1) Current Tax		2,75,73,921	4,78,72,744
(2) Deferred tax		(48,68,077)	(2,52,78,314)
(3) Taxes relating to prior years		43,75,048	-
VII. Profit for the year (V - VI)		4,62,95,939	9,27,92,896
VIII. Earnings per Equity Share:	2.30		
Face value of share ₹ 10/- (₹ 10/-)			
(1) Basic		0.27	0.57
(2) Diluted		0.26	0.57

Significant Accounting Policies and Notes to Accounts

1 & 2

The Accompanying Notes are an integral part of the financial statements.

For and on behalf of the Board of Directors

As per our separate report of even date attached


 Dr. K.A. Rethesh
 Managing Director
 DIN:01345383


 M.M. Abdul Basheer
 Director
 DIN:00120916

 For VARMA & VARMA
 Chartered Accountants
 (FRN: 004532S)


 Anjana M.A.
 Company Secretary


 George Raphael V.P.
 Chief Financial Officer


 Vijay Narayan Govind
 Partner
 Membership No. 203094

 Place : Kochi
 Date : 15.11.2019

 Place : Kochi
 Date : 28-11-2019



INKEL LIMITED
BALANCE SHEET AS AT 31st MARCH 2020

Particulars	Note No.	As at 31.03.2020 (In Rupees)	As at 31.03.2019 (In Rupees)
I. EQUITY AND LIABILITIES			
(1) Shareholders' Funds			
(a) Share Capital	2.1	1,77,81,43,340	1,77,81,43,340
(b) Reserves and Surplus	2.2	24,50,36,381	42,39,26,145
(2) Non - Current Liabilities			
(a) Long - Term Borrowings	2.3	15,93,37,000	12,46,24,000
(b) Deferred Tax Liabilities (Net)	2.4	2,38,48,829	2,99,45,955
(c) Other Long Term Liabilities	2.5	1,02,57,090	48,57,742
(d) Long - Term Provisions	2.6	1,13,39,185	1,23,00,099
(3) Current Liabilities			
(a) Short Term Borrowings	2.7	97,35,000	70,25,000
(b) Trade Payables :-	2.8		
i. Total outstanding dues of micro enterprises and small enterprises; and		-	-
ii. Total outstanding dues of creditors other than micro enterprises and small enterprises		4,84,29,129	6,25,58,045
(c) Other Current Liabilities	2.9	34,78,28,022	36,48,68,785
(d) Short - Term Provisions	2.10	35,48,197	3,02,91,061
TOTAL		2,63,75,02,173	2,83,85,40,172
II. ASSETS			
(1) Non - Current Assets			
(a) Property, Plant and Equipment			
(i) Tangible Assets	2.11	57,60,16,664	59,58,73,870
(ii) Intangible Assets	2.11	11,19,327	1,24,723
(b) Non - Current Investments	2.12	69,22,57,799	84,14,64,999
(c) Long - Term Loans and Advances	2.13	2,84,33,671	9,73,94,426
(d) Other Non - Current Assets	2.14	30,64,78,277	23,92,87,274
(2) Current Assets			
(a) Inventories	2.15	41,26,863	24,77,654
(b) Trade Receivables	2.16	22,34,33,415	16,72,22,084
(c) Cash and Cash Equivalents	2.17	19,10,62,641	50,38,37,179
(d) Short - Term Loans and Advances	2.18	50,15,44,822	29,38,54,263
(e) Other Current Assets	2.19	11,30,28,694	9,70,03,700
TOTAL		2,63,75,02,173	2,83,85,40,172

Significant Accounting Policies and Notes to Accounts 1 & 2

The Accompanying Notes are an integral part of the financial statements.

For and on behalf of the Board of Directors

Jacob Kooror Ninan
Director
DIN: 01213357

Vidya Sangeeth
Director
DIN: 08525336

Anjana M.A
Company Secretary

Prasanna Kumar V
Chief Financial Officer

Place : Kochi
Date : 04-12-2020

As per our separate report of even date attached

For Sridhar & Co
Chartered Accountants
FRN : 0039788

CA. S. Unnikrishnan
Partner
Membership No.218366



INKEL LIMITED

STATEMENT OF PROFIT AND LOSS FOR THE YEAR ENDED 31st MARCH 2020

Particulars	Note No.	For the year ended 31.03.2020 (In Rupees)	For the year ended 31.03.2019 (In Rupees)
Revenue			
I. Revenue from Operations	2.20	19,09,28,787	32,05,59,913
II. Other Income	2.21	10,64,77,907	9,18,47,273
III. Total Revenue (I+II)		29,74,06,694	41,24,07,186
IV. Expenses			
i) Cost of land acquired/building/amenities constructed and disposed (on Long Term Finance Lease Agreements)	2.22	1,63,04,914	78,97,745
ii) Purchases of Stock-in-Trade	2.23	3,51,94,733	9,05,93,492
iii) Changes in inventories of Stock-in-Trade	2.24	(16,49,209)	(24,77,654)
iv) Employee Benefits Expense	2.25	10,26,14,536	9,52,82,059
v) Finance Costs	2.26	2,01,77,422	2,57,08,940
vi) Depreciation and Amortisation Expense	2.11	1,72,75,901	1,94,37,305
vii) Other Expenses	2.27	10,89,45,063	10,25,88,468
viii) Provisions	2.28	13,81,50,205	
Total Expenses		43,70,13,565	33,90,30,355
V. Profit Before Tax (III - IV)		(13,96,06,871)	7,33,76,831
VI. Tax Expense			
(1) Current Tax		25,07,100	2,75,73,921
(2) Deferred tax		(60,97,126)	(48,68,077)
(3) Taxes relating to prior years		-	43,75,048
VII. Profit for the year (V - VI)		(13,60,16,845)	4,62,95,939
VIII. Earnings per Equity Share:	2.29		
Face value of share ₹ 10/- (₹ 10/-)			
(1) Basic		(0.78)	0.27
(2) Diluted		(0.78)	0.26

Significant Accounting Policies and Notes to Accounts 1 & 2

The Accompanying Notes are an integral part of the financial statements.

For and on behalf of the Board of Directors

Jacob Koyoor Ninan
Director
DIN: 01213357

Vidya Sangeeth
Director
DIN: 08525336

Anjana M.A
Company Secretary

Prasanna Kumar V
Chief Financial Officer

Place : Kochi
Date : 04-12-2020

As per our separate report of even date attached

For Sridhar & Co
Chartered Accountants
FRN : 003978S

CA. S. Unnikrishnan
Partner
Membership No.218366



INKEL LIMITED**CIN:U45209KL2007PLC020471****Door No. 7/473 ZA - 5 & 62nd Floor, Ajiyal ComplexKakkanad, Kochi - 30****BALANCE SHEET AS AT 31st MARCH 2021**

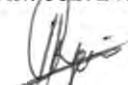
Particulars	Note No.	As at 31.03.2021 (In Rupees)	As at 31.03.2020 (In Rupees)
I. EQUITY AND LIABILITIES			
(1) Shareholders' Funds			
(a) Share Capital	2.1	1,77,81,43,340	1,77,81,43,340
(b) Reserves and Surplus	2.2	21,16,84,902	24,50,36,381
(2) Non - Current Liabilities			
(a) Long - Term Borrowings	2.3	4,03,89,000	15,93,37,000
(b) Deferred Tax Liabilities (Net)	2.4	1,62,00,005	2,38,48,829
(c) Other Long Term Liabilities	2.5	1,62,12,695	1,02,57,090
(d) Long - Term Provisions	2.6	1,13,17,438	1,13,39,185
(3) Current Liabilities			
(a) Short Term Borrowings	2.7	25,45,91,000	97,35,000
(b) Trade Payables :-	2.8		
i. Total outstanding dues of micro enterprises and small enterprises; and		-	-
ii. Total outstanding dues of creditors other than		25,52,71,300	4,84,29,129
(c) Other Current Liabilities	2.9	29,41,48,811	34,78,28,022
(d) Short - Term Provisions	2.10	9,90,429	35,48,197
TOTAL		2,87,89,48,920	2,63,75,02,173
II. ASSETS			
(1) Non - Current Assets			
(a) Property, Plant and Equipment			
(i) Tangible Assets	2.11	54,98,25,006	57,60,16,664
(ii) Intangible Assets	2.11	7,42,964	11,19,327
(b) Non - Current Investments	2.12	68,82,20,346	69,22,57,799
(c) Long - Term Loans and Advances	2.13	2,33,51,382	2,84,33,671
(d) Other Non - Current Assets	2.14	34,39,66,145	30,64,78,277
(2) Current Assets			
(a) Inventories	2.15	2,15,46,216	41,26,863
(b) Trade Receivables	2.16	48,82,11,109	22,34,33,415
(c) Cash and Cash Equivalents	2.17	15,99,82,101	19,10,62,641
(d) Short - Term Loans and Advances	2.18	52,91,30,879	50,15,44,822
(e) Other Current Assets	2.19	7,39,72,772	11,30,28,694
TOTAL		2,87,89,48,920	2,63,75,02,173

Significant Accounting Policies and Notes to Accounts 1 & 2

The Accompanying Notes are an integral part of the financial statements.

For and on behalf of the Board of Directors


Dr. K. Ellangovan IAS
Director
DIN: 05272476


Anjana M.A.
Company Secretary

Place: Kochi
Date : 06-12-2021


Jacob Kovoor Ninan
Director
DIN: 01213357


Prasanna Kumar V
Chief Financial Officer

As per our separate report of even date attached

For Sridhar & Co
Chartered Accountants
FRN : 003978S


CA. S. Unnikrishnan
Partner
Membership No.218366



21218366AAAAGN9504

INKEL LIMITED
CIN:U45209KL2007PLC020471
Door No. 7/473 ZA - 5 & 62nd Floor, Ajiyal ComplexKakkanad, Kochi - 30
STATEMENT OF PROFIT AND LOSS FOR THE YEAR ENDED 31st MARCH 2021

Particulars	Note No.	For the year ended 31.03.2021 (In Rupees)	For the year ended 31.03.2020 (In Rupees)
Revenue			
I. Revenue from Operations	2.20	52,76,24,960	19,09,28,787
II. Other Income	2.21	8,66,42,736	10,64,77,907
III. Total Revenue (I+II)		61,42,67,696	29,74,06,694
IV. Expenses			
i) Cost of land acquired/building/amenities constructed and disposed (on Long Term Finance Lease Agreements)	2.22	87,08,309	1,63,04,914
ii) Purchases of Stock-in-Trade	2.23	21,93,55,025	3,51,94,733
iii) Changes in inventories of Stock-in-Trade	2.24	37,76,998	(16,49,209)
iv) Employee Benefits Expense	2.25	8,77,22,724	10,26,14,536
v) Finance Costs	2.26	1,40,20,582	2,01,77,422
vi) Depreciation and Amortisation Expense	2.11	1,85,48,331	1,72,75,901
vii) Other Expenses	2.27	28,12,00,945	10,89,45,063
viii) Provisions	2.28	2,03,66,744	13,81,50,205
Total Expenses		65,36,99,658	43,70,13,565
V. Profit Before Tax (III - IV)		(3,94,31,962)	(13,96,06,871)
VI. Tax Expense			
(1) Current Tax		-	25,07,100
(2) Deferred tax		(76,48,824)	(60,97,126)
(3) Taxes relating to prior years		15,68,341	-
VII. Profit for the year (V - VI)		(3,33,51,479)	(13,60,16,845)
VIII. Earnings per Equity Share:	2.29		
Face value of share ₹ 10/- (₹ 10/-)			
(1) Basic		(0.19)	(0.78)
(2) Diluted		(0.19)	(0.78)

Significant Accounting Policies and Notes to Accounts 1 & 2

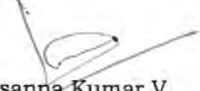
The Accompanying Notes are an integral part of the financial statements.

For and on behalf of the Board of Directors


Dr. K. Ellangovan IAS
 Director
 DIN: 05272476


Jacob Kovoor Ninan
 Director
 DIN: 01213957


Anjana M.A.
 Company Secretary


Prasanna Kumar V
 Chief Financial Officer

As per our separate report of even date attached

For Sridhar & Co
 Chartered Accountants
 FRN : 003978S


CA. S. Unnikrishnan
 Partner
 Membership No.218366



Place: Kochi
 Date : 06-12-2021

UDIN: 21218366AAAAGN9504

INKEL LIMITED**CIN:U45209KL2007PLC020471****Door No. 7/473 ZA - 5 & 6 - 2nd Floor, Ajiyal Complex, Kakkanad, Kochi - 30****BALANCE SHEET AS AT 31st MARCH 2022**

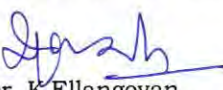
Particulars	Note No.	As at 31.03.2022 (₹ In Lakh)	As at 31.03.2021 (₹ In Lakh)
I. EQUITY AND LIABILITIES			
(1) Shareholders' Funds			
(a) Share Capital	2.1	17,781.43	17,781.43
(b) Reserves and Surplus	2.2	2,233.22	2,116.87
(2) Non - Current Liabilities			
(a) Long - Term Borrowings	2.3	-	403.89
(b) Deferred Tax Liabilities (Net)	2.4	86.09	162.00
(c) Other Long Term Liabilities	2.5	34.08	162.13
(d) Long - Term Provisions	2.6	153.04	113.17
(3) Current Liabilities			
(a) Short Term Borrowings	2.7	2,551.99	2,545.91
(b) Trade Payables :-	2.8		
i. Total outstanding dues of micro enterprises and small enterprises; and		-	-
ii. Total outstanding dues of creditors other than micro enterprises and small enterprises		3,583.27	2,552.57
(c) Other Current Liabilities	2.9	3,196.98	2,941.63
(d) Short - Term Provisions	2.10	102.93	9.90
TOTAL		29,723.03	28,789.50
II. ASSETS			
(1) Non - Current Assets			
(a) Property, Plant and Equipment and intangible Assets			
(i) Property, Plant and Equipment	2.11	5,242.26	5,498.26
(ii) Intangible Assets	2.11	5.31	7.43
(ii) Capital Work in Progress	2.12	1.77	-
(b) Non - Current Investments	2.13	6,865.71	6,882.20
(c) Long - Term Loans and Advances	2.14	427.48	205.98
(d) Other Non - Current Assets	2.15	4,938.57	4,429.40
(2) Current Assets			
(a) Inventories	2.16	1.17	215.46
(b) Trade Receivables	2.17	5,634.51	4,882.11
(c) Cash and Cash Equivalents	2.18	770.85	637.62
(d) Short - Term Loans and Advances	2.19	5,217.95	5,291.31
(e) Other Current Assets	2.20	617.45	739.73
TOTAL		29,723.03	28,789.50

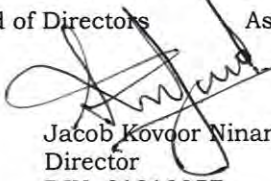
Significant Accounting Policies and Notes to Accounts 1 & 2

The Accompanying Notes are an integral part of the financial statements.

For and on behalf of the Board of Directors

As per our separate report of even date attached


Dr. K Ellangovan
Managing Director
DIN: 05272476


Jacob Kovoor Ninan
Director
DIN: 01213357

For Sridhar & Co
Chartered Accountants
FRN : 003978S


Meera C
Company Secretary


Prasanna Kumar V
Chief Financial Officer


CA. S. Unnikrishnan
Partner
Membership No.218366
UDIN:22218366AMUTHT3328



Place: Kochi
Date : 29.06.2022

INKEL LIMITED

CIN:U45209KL2007PLC020471

Door No. 7/473 ZA - 5 & 6 - 2nd Floor, Ajiyal Complex, Kakkanad, Kochi - 30

STATEMENT OF PROFIT AND LOSS FOR THE YEAR ENDED 31st MARCH 2022

Particulars	Note No.	For the year ended 31.03.2022 (₹ In Lakh)	For the year ended 31.03.2021 (₹ In Lakh)
Income			
I. Revenue from Operations	2.21	5,531.28	5,276.25
II. Other Income	2.22	408.84	866.43
III. Total Income (I+II)		5,940.12	6,142.68
IV. Expenses			
i) Cost of land acquired/building/amenities constructed and disposed (on Long Term Finance Lease Agreements)	2.23	122.64	87.08
ii) Purchases of Stock-in-Trade	2.24	2,805.89	2,193.55
iii) Changes in inventories of Stock-in-Trade	2.25	2.33	37.77
iv) Employee Benefits Expense	2.26	755.47	877.22
v) Finance Costs	2.27	152.96	140.21
vi) Depreciation and Amortisation Expense	2.11	140.60	185.48
vii) Other Expenses	2.28	1,679.52	2,811.99
viii) Provisions	2.29	158.50	203.67
Total Expenses		5,817.91	6,536.97
V. Profit Before Tax (III - IV)		122.21	(394.29)
VI. Tax Expense			
(1) Current Tax		100.42	-
(2) Deferred tax		(75.91)	(76.49)
(3) Taxes relating to prior years		(18.64)	15.68
VII. Profit for the year (V - VI)		116.34	(333.49)
VIII. Earnings per Equity Share:	2.30		
Face value of share ₹ 10/- (₹ 10/-)			
(1) Basic		0.07	(0.19)
(2) Diluted		0.07	(0.19)

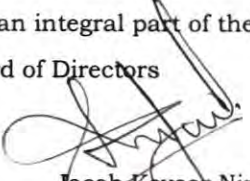
Significant Accounting Policies and Notes to Accounts 1 & 2

The Accompanying Notes are an integral part of the financial statements.

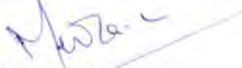
For and on behalf of the Board of Directors

As per our separate report of even date attached


Dr. K. Ellangovan
Managing Director
DIN: 05272476


Jacob Kevoor Ninan
Director
DIN: 01213357

For Sridhar & Co
Chartered Accountants
FRN : 003978S


Meera C
Company Secretary


Prasanna Kumar V
Chief Financial Officer


CA. S. Unnikrishnan
Partner
Membership No.218366
UDIN:22218366AMUTH3328



Place: Kochi
Date : 29.06.2022

INKEL LIMITED**CIN:U45209KL2007PLC020471****Door No. 7/473 ZA - 5 & 6 - 2nd Floor, Ajiyal Complex, Kakkanad, Kochi - 30****CASH FLOW STATEMENT FOR THE YEAR ENDED 31st MARCH 2022**

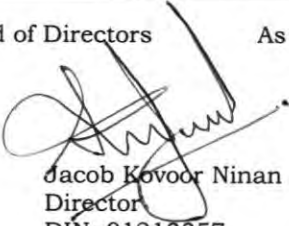
		₹ In Lakh	
	Particulars	For the Year ended 31.03.2022	For the Year ended 31.03.2021
A	CASH FLOW FROM OPERATING ACTIVITIES		
	Profit Before Tax	122.21	(394.29)
	Adjustments for :		
	Depreciation and Amortisation expense	140.60	185.48
	Provision for Doubtful Debts	-	3.67
	Provision for Doubtful Advances	157.50	200.00
	Provision for diminution in value of investment	1.00	-
	Loss/(Profit) on sale of Assets(Net)	2.34	0.01
	Interest Income	(149.75)	(200.47)
	Dividend received INKEL EKK Ltd	-	-
	Finance costs	152.96	140.21
	Share of (Profit)/Loss from Seguro-INKEL Consortium LLP	15.49	40.37
	Conversion of fixed assets to current assets	122.64	87.08
	Operating profit before Working Capital Changes	564.99	62.06
	Changes in Working Capital		
	Adjustments for Increase/Decrease in Operating Assets		
	Trade Receivables	(752.40)	(2,651.44)
	Short term loans and advances	138.00	(152.77)
	Other Non-Current Assets	(509.17)	(1,364.61)
	Inventories	214.29	(174.19)
	Long term Loans and Advances	-	31.06
	Other Current Assets	140.93	359.41
		(768.35)	(3,952.55)
	Adjustments for Increase/ Decrease in Operating Liabilities		
	Trade Payables	1,030.70	2,068.42
	Other Current Liabilities	184.28	(728.46)
	Short term Provisions	(7.40)	(0.51)
	Long term Provisions	39.87	(0.22)
	Other Long Term Liabilities	(1.09)	6.99
		1,246.36	1,346.23
	Cash generated from Operations	1,042.99	(2,544.26)
	Taxes Paid	(203.13)	4.60
	Net Cash Generated from Operating activities - (A)	839.86	(2,539.66)
B	CASH FLOW FROM INVESTING ACTIVITIES		
	Purchase of Fixed Assets including Capital WIP/Capital Advances	(9.80)	(7.75)
	Loans and Advances (given)/repaid	(222.14)	(323.09)
	Interest received on loans/deposits	131.10	231.61
	Proceeds from sale of Fixed assets	0.61	2.07
	Dividend received INKEL EKK	-	-
	Net Cash Used in Investing activities - (B)	(100.00)	(97.15)

C CASH FLOW FROM FINANCING ACTIVITIES		
Proceeds from /(Repayment of) Short term borrowings	6.08	2,448.56
Proceeds/(Repayment) from Long term borrowings	(387.14)	(993.27)
Finance costs paid	(224.93)	(91.74)
Dividend paid	(0.67)	0.28
Dividend Distribution tax paid	-	-
Net Cash Generated from/ (Used in) Financing Activities - (C)	(606.66)	1,363.83
Net increase in Cash and Cash equivalents (A+B+C)	133.20	(1,272.98)
Cash and Cash equivalents at the beginning of the year	637.65	1,910.63
Cash And Cash Equivalents at the end of the year	770.85	637.65

For and on behalf of the Board of Directors

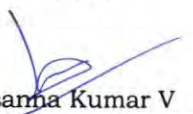
As per our separate report of even date attached


 Dr. K. Ellangovan
 Managing Director
 DIN: 05272476


 Jacob K. V. Ninan
 Director
 DIN: 01213357

For Sridhar & Co
 Chartered Accountants
 FRN : 003978S

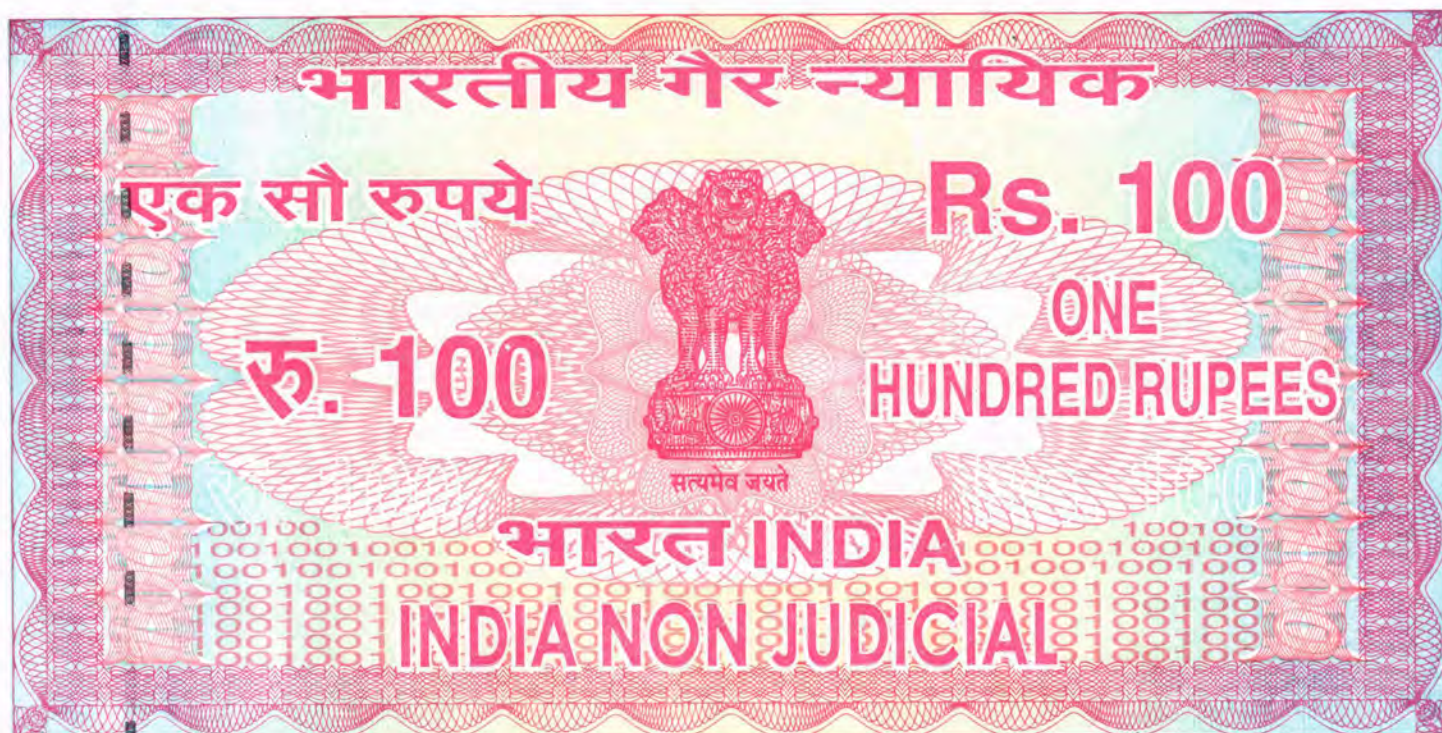

 Meera C
 Company Secretary


 Prasanna Kumar V
 Chief Financial Officer


 CA. S. Unnikrishnan
 Partner
 Membership No.218366
 UDIN:22218366AMUTH3328



Place: Kochi
 Date : 29.06.2022



കേരളം KERALA

DV 728390

ANNEXURE A- PRE-AGREEMENT

ARTICLES OF AGREEMENT executed on this the 25th day of April Two thousand and Twenty Three between the Agency for New & Renewable Energy Research and Technology (hereinafter referred to as ANERT) of the one part and General Manager-Renewable Energy & Business Development, INKEL Limited Door No. 14/812 & 813, 1st Floor, Ajiyal Complex, Kakkanad, Cochin, Ernakulam, Kerala – 682030 hereinafter referred to as “the Bounden”) of the other part.

WHEREAS in response to the Notification No.ANERT-TECH/99/2022-T2 dated 12.04.2023 the bounden has submitted to ANERT a e-tender for the Request for Selection (RFS) of agency for the Implementation of 2 MW Solar Power Plant at Travancore Titanium Products Ltd., Kochuveli, Thiruvananthapuram under Solar City project funded by Smart City Thiruvananthapuram Ltd specified therein subject to the terms and conditions contained in the said e-tender.

AND WHEREAS the bounden has furnished to ANERT a sum of Rs.NIL as Earnest Money Deposit for execution of an agreement undertaking the due fulfilment of the contract in case his e-tender is accepted by ANERT. NOW THESE PRESENTS WITNESS and it is hereby mutually agreed as follows:



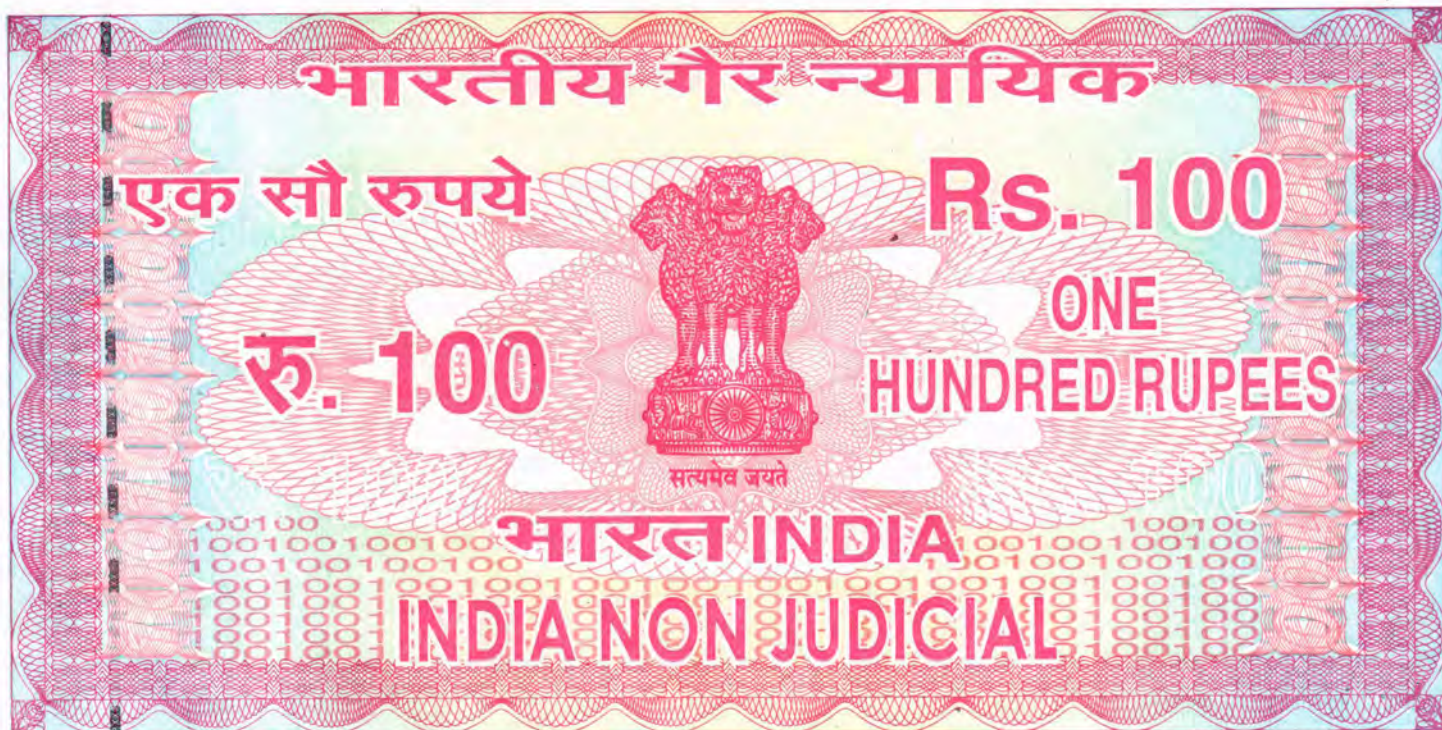
Sam Roofus
General Manager

Renewable Energy & Business Development
INKEL Limited, Ernakulam



INKEL Limited

Door No. 76/22A-5 & 6
2nd Floor, Ajiyal Complex
Kakkanad, Cochin - 682030
Tel: 0484 2978101, 2978103



കേരളം KERALA

DV 728393

In case the e-tender submitted by the bounden is accepted by ANERT and the contract for Request for Selection (RFS) of agency for the Implementation of 2 MW Solar Power Plant at Travancore Titanium Products Ltd., Kochuveli, Thiruvananthapuram under Solar City project funded by Smart City Thiruvananthapuram Ltd is awarded to the bounden, the bounden shall within Fifteen days of acceptance of this e-tender, execute an agreement with ANERT incorporating all the terms and conditions under which ANERT accepts this e-tender.

In case the bounden fails to execute the agreement as aforesaid incorporating the terms and conditions governing the contract, ANERT shall have power and authority to recover from the bounden any loss or damage caused to ANERT by such breach as may be determined by ANERT by appropriating the moneys inclusive of Earnest Money deposited by the bounden and if the Earnest Money is found to be inadequate the deficit amount may be recovered from the bounden and his properties movable and immovable in the manner hereinafter contained.


Sam Roofus
 General Manager
 Renewable Energy & Business Development
 INKEL Limited, Ernakulam



INKEL Limited
 Door No. 7/4737A-5 & 6
 2nd Floor, Ajiyal Complex
 Kakkanad, Kochi 682030
 Tel: 0484 2978101, 2978103



All sums found due to ANERT under or by virtue of this agreement shall be recoverable from the bounden and his properties movable and immovable under the provisions of the Revenue Recovery Act for the time being in force as though such sums are arrears of land revenue and in such other manner as ANERT may deem fit.

In witness whereof Sri
(Name and Designation) for and on behalf of the Agency for New & Renewable Energy Research and Technology and General Manager-Renewable Energy & Business Development, INKEL Limited the bounden have hereunto set their hands the day and year shown against their respective signature.

Signed by Sri

25.04.2023

in the presence of witnesses

1.

2.

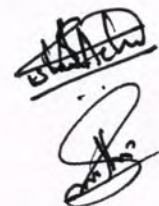
Signed by Sri



in the presence of witnesses

1. AISWARYA . B . S

2. SMRITHI . S




COVERING LETTER

Sir,

I/We hereby e-tender to supply, under annexed terms and conditions of contract, the whole of the articles referred to and described in the attached specification and quantity decided by the Agency for New and Renewable Energy Research & Technology (ANERT), at the rates quoted against each item. The articles will be delivered and installed/commissioned operated and maintained for 10 years thereafter within the time and at the place(s) specified in the schedule.

I am/we are remitting herewith the required amount of Rs.NIL towards the cost of e-tender by electronic payment.

Yours Faithfully,

For **INKEL Limited**

General Manager
Renewable Energy & Business Development



Place:Kakkanad

Date:25-04-2023

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ANNEXURE C- DECLARATION BY THE BIDDER

E-Tender Notification No: ANERT-TECH/99/2022-T2 Dated 12.04.2023
Request for Selection (RFS) of agency for the Implementation of 2 MW Solar Power Plant at Travancore Titanium Products Ltd., Kochuveli, Thiruvananthapuram under Solar City project funded by Smart City Thiruvananthapuram Ltd

To

The CEO
ANERT

We, the undersigned, declare that:

1. We have examined and have no reservations to the Bidding Document, including Addenda No.: (if any)
2. We offer to supply in conformity with the Bidding Document and in accordance with the delivery schedule
3. Our Bid shall be valid for a period of 6 months from the date fixed as deadline for the submission of tenders in accordance with the Bidding Document, and it shall remain binding upon us and may be accepted at any time before the expiration of that period;
4. If our Bid is accepted, we commit to submit a Security Deposit in the amount of 5 percent of the Contract Price for the due performance of the Contract;
5. We are not participating, as Bidders, in more than one Bid in this bidding process;
6. Our firm, its affiliates or subsidiaries, including any subcontractors or suppliers for any part of the Contract, has not been declared ineligible by the ANERT or Government of Kerala;
7. We understand that this Bid, together with your written acceptance thereof included in your notification of award, shall constitute a binding contract between us, until a formal Contract is prepared and executed.
8. Our firm has obtained the certifications from MNRE or NABL approved Test laboratories that the goods and services are satisfying the technical criteria specified in the bid.

25.04.2023



For **INKEL Limited**



**General Manager
Renewable Energy &
Business Development**

**ANNEXURE D - DECLARATION OF RELATIONSHIP WITH ANERT
EMPLOYEE**

Tender Notification No.: ANERT-TECH/126/2023-PE1(RTS) Dated 12.04.2023

Request for Selection (RFS) of agency for the Implementation of 1 MW Solar Power Plant at HLL Lifecare Ltd, Peroorkada Factory, Thiruvananthapuram under Solar City project funded by Smart City Thiruvananthapuram Ltd

To

The CEO
ANERT

Name of the ANERT employee with Designation: Not Applicable

Name of the bidder related to the employee: Not Applicable

This is to put on record that no one currently working in ANERT is related to anyone working in INKEL Limited, who is the bidder in the bid. We are aware of the Anti-corruption policy of ANERT and will observe the highest standards during the procurement and the execution of contract and shall retain from corrupt, fraudulent, collusive or coercive practices on competing for the contract.

For **INKEL Limited**



Date: 25.04.2023

General Manager
Renewable Energy &
Business Development

Bill of Material

Sl. No	Item	Make (if any)	Model & Individual Capacity(If any)	Qty (Nos)	Rating / Capacity
1.	PV MODULE	VIKRAM SOLAR	SOMERA VSMH.72.525.0 5	1 No	525Wp
			SOMERA VSMH.72.530.0 5	1 No	530Wp
			SOMERA VSMH.72.535.0 5	1 No	535Wp
			SOMERA VSMH.72.540.0 5	1 No	540Wp
			SOMERA VSMH.72.545.0 5	1 No	545Wp
			SOMERA VSMH.72.550.0 5	1 No	550Wp
			SOMERA VSMH.66.635.0 5	1 No	635Wp
			SOMERA VSMH.66.640.0 5	1 No	640Wp
			SOMERA VSMH.66.645.0 5	1 No	645Wp
			SOMERA VSMH.66.650.0 5	1 No	650Wp
			SOMERA VSMH.66.655.0 5	1 No	655Wp
			SOMERA VSMH.66.660.0 5	1 No	660Wp

			SOMERA VSMH.66.665.0 5	1 No	665Wp
			SOMERA VSMH.66.670.0 5	1 No	670Wp
		CREDENCE SOLAR	CSHN550-144	1 No	550Wp
			CSQU650-132	1 No	650Wp
			CS-QU535-110	1 No	535Wp
			CS-QU540-110	1 No	540Wp
			CS-QU545-110	1 No	545Wp
			CS-QU550-110	1 No	550Wp
			CS-QU555-110	1 No	555Wp
			CS-QUX650-132	1 No	650Wp
			CS-QUX655-132	1 No	655Wp
			CS-QUX660-132	1 No	660Wp
			CS-QUX665-132	1 No	665Wp
			CS-QUX670-132	1 No	670Wp
		GOLDI SOLAR	GS10M144-WF	1 No	530Wp
				1 No	535Wp
				1 No	540Wp
				1 No	545Wp
				1 No	550Wp
				1 No	555Wp
		RENEWSYS	DESERV SGALACTIC 144	1 No	525Wp

				1 No	530Wp
				1 No	535Wp
				1 No	540Wp
				1 No	545Wp
				1 No	550Wp
			DESERV SGALACTIC 156	1 No	565Wp
				1 No	570Wp
				1 No	575Wp
				1 No	580Wp
				1 No	585Wp
				1 No	590Wp
		ADANI SOLAR	ASM-M10-144-520	1 No	520Wp
			ASM-M10-144-525	1 No	525Wp
			ASM-M10-144-530	1 No	530Wp
			ASM-M10-144-535	1 No	535Wp
			ASM-M10-144-540	1 No	540Wp
			ASM-M10-144-545	1 No	545Wp
		RAYZON	RS530WC	1 No	530Wp
			RS535WC	1 No	535Wp
			RS540WC	1 No	540Wp
			RS545WC	1 No	545Wp

		GROWATT	MID 15KTL3-X	1 No	15kWp
			MID 25KTL3-X	1 No	25kWp
			MID 33KTL3-X2	1 No	33kWp
			MID 40KTL3-X2	1 No	40kWp
			MID 50KTL3-X2	1 No	50kWp
			MAX 80KTL3 LV	1 No	80kWp
		HITACHI	SI 12K	1No	12kWp
			SI 20K	1No	20kWp
			SI 30K	1 No	30kWp
			Si 50K	1 No	50kWp
			Si 70K(HV)/	1 No	70kWp
		GOOD WE	GW5K-DT	1 No	5 kWp
			GW10KN-DT	1 No	10 kWp
			GW12KN-DT	1 No	12 kWp
			GW15KT-DT	1 No	15 kWp
			GW20KT-DT	1 No	20 kWp
			GW25K-MT	1 No	25 kWp
			GW30K-MT	1 No	30kWp
			GW36K-MT	1 No	36 kWp
			GW50K-MT	1 No	50kWp
			GW50KN-MT	1 No	50kWp
			GW80K -MT	1 No	80 kWp
			GW100K-HT	1 No	100kWp
		FRONIUS	FRONIUS SYMO 20.0.3.M	1 No	20kWp
			FRONIUS ECO 25.0.3-S	1 No	25kWp

			TAURO 50-3 D	1 No	50kWp
			TAURO ECO 100-3 D	1 No	100kWp
		SOLAR EDGE	SE25K	1 No	25kWp
			SE33.3K	1 No	33kWp
			SE40K	1 No	40kWp
			SE 50K	1 No	50kWp
			SE 55K	1 No	55kWp
			SE 82.80K	1 No	82.80kWp
		SUNGROW	SG5.0RS	1 No	5kWp
			SG10KTL-M	1 No	10kWp
			SG15KTL-M	1 No	20kWp
			SG20KTL-M	1 No	20kWp
			SG33CX	1 No	33kWp
			SG50CX	1 No	50kWp
			SG110CX	1 No	110kWp
		FIMER	PVS-15-TL	1 No	15kWp
			PVS-20-TL	1 No	20kWp
			TRIO-27.6-TL-OUTD	1 No	27.6kWp
			PVS-30-TL	1 No	30kWp
			PVS-33-TL	1 No	33kWp
			PVS-50-TL	1 No	50kWp
			PVS-60-TL	1 No	60kWp
			PVS-100-TL	1 No	100kWp
3.	DC Cables	Polycab/Havells/KEI, IS & IEC Std Complied		1 Set	1000kW

4.	AC Cables	Polycab/Havells/KEI/ Equilent/ IS & IEC Std Complied		1 Set	1000kW
5.	AJB/SCB	Geesys/Hensel/Equiva lent As per Relevant Std (IS/IEC)		1 Set	
6.	Module Mounting Structure (MMS)	Hot dipped galvanised steel support structure or Equivalent) to withstand a wind velocity of 150Km/Hr., Tilt 09 to 12 degrees adjustable, elevated 60cm from ground.		1 Set	1000kW
7.	ACDB	Geesys/Hensel/Equiva lent As per Relevant Std (IS/IEC)		1 Set	
8.	Lightning Arrester	Excel/OBO/Reputed make (ISI Marked)		1 Set	
9.	Earthing System Details and No. of Earth pits	Reputed make (ISI Marked) & 3 Nos		As per site condition	
10	Data Acquisition System	ESenz/Delremo/ Reputed make			



Guaranteed Technical Particular Data Sheet-2			
Power conditioning unit			
Sl.	Particulars	Required	Offered
1	Manufacturer		Hitachi
2	Model name/No.		SI 5K
3	No of Units		
4	Nominal AC power		5 KVA
5	Nominal AC voltage		240V
6	Nominal AC Current		22.8A
7	AC grid Frequency range	50Hz $\pm$ 0.5%	45HZ-55HZ
8	AC grid voltage range		180V-276V
9	Power Factor (+ and -)		0.8 Lag and Lead
10	Total Harmonic Distortion	as per IEEE-519 2014	Less than 3%
11	AC over / under voltage over / under frequency protection		Provided
12	Max PV input power		5500W
13	Maximum DC voltage	1000V	600V
14	MPPT voltage range		250V to 520V
15	Maximum DC current		14A
16	No. of DC input ports		1/1
17	Maximum Efficiency	as per IEC61683	98.30%
18	DC voltage ripple		Less than 0.5%
19	Ambient temperature range		-25C to 60C
20	Humidity (non condensing)	95%, non condensing	100% Condensing
21	Degree of protection		IP 65
22	Dimensions(HxWxD)		405x315x135mm
23	Weight		11.5Kg
24	Protective functions AC over/under voltage, AC over/under frequency, over-temperature, AC and DC over-current, DC over-voltage, against Islanding		Provided
25	Communication Interface	RS232/RS485/MPI ProfiBus/ Telephone Modem/WiFi	RS 485, WLAN
26	User-display standard	LCD panel with membrane keypad	LCD + LED Display
27	Enclosure Environment Rating		IP 65
28	Safety and EMC		IEC 62109-1, IEC 62109-2, EN 61000-6-1, EN 61000-6-3, EN 61000-3-11, EN 61000-3-12
29	Anti Islanding Feature	IEEE1547/UL1741/IEC62116	IEC 62116



Guaranteed Technical Particular Data Sheet-2			
Power conditioning unit			
Sl.	Particulars	Required	Offered
1	Manufacturer		Hitachi
2	Model name/No.		Si 11K
3	No of Units		
4	Nominal AC power		11 KVA
5	Nominal AC voltage		415V
6	Nominal AC Current		15.9A
7	AC grid Frequency range	50Hz $\pm$ 0.5%	45HZ-55HZ
8	AC grid voltage range		310V-480V
9	Power Factor (+ and -)		0.8 Lag and Lead
10	Total Harmonic Distortion	as per IEEE-519 2014	Less than 3%
11	AC over / under voltage over / under frequency protection		Provided
12	Max PV input power		12000W
13	Maximum DC voltage	1000V	1000V
14	MPPT voltage range		160V to 900V
15	Maximum DC current		15.9A per MPPT
16	No. of DC input ports		2
17	Maximum Efficiency	as per IEC61683	98.30%
18	DC voltage ripple		Less than 0.5%
19	Ambient temperature range		-25C to 60C
20	Humidity (non condensing)	95%, non condensing	100% Condensing
21	Degree of protection		IP 65
22	Dimensions(HxWxD)		457x452x202mm
23	Weight		22Kg
24	Protective functions AC over/under voltage, AC over/under frequency, over-temperature, AC and DC over-current, DC over-voltage, against Islanding		Provided
25	Communication Interface	RS232/RS485/MPI ProfiBus/ Telephone Modem/WiFi	RS.485,WLAN
26	User-display standard	LCD panel with membrane keypad	LCD Display
27	Enclosure Environment Rating		IP 65
28	Safety and EMC		IEC 62109-1, IEC 62109-2, EN 61000-6-1, EN 61000-6-3, EN 61000-3-11, EN 61000-3-12
29	Anti Islanding Feature	IEEE1547/UL1741/IEC62116	IEC 62116



Guaranteed Technical Particular Data Sheet-2			
Power conditioning unit			
Sl.	Particulars	Required	Offered
1	Manufacturer		Hitachi
2	Model name/No.		Si 12K
3	No of Units		
4	Nominal AC power		12 KVA
5	Nominal AC voltage		415V
6	Nominal AC Current		19.1A
7	AC grid Frequency range	50Hz $\pm$ 0.5%	45HZ-55HZ
8	AC grid voltage range		310V-480V
9	Power Factor (+ and -)		0.8 Lag and Lead
10	Total Harmonic Distortion	as per IEEE-519 2014	Less than3%
11	AC over / under voltage over / under frequency protection		Provided
12	Max PV input power		14400W
13	Maximum DC voltage	1000V	1000V
14	MPPT voltage range		160V to 900V
15	Maximum DC current		24A per MPPT
16	No. of DC input ports		2
17	Maximum Efficiency	as per IEC61683	98.30%
18	DC voltage ripple		Less than0.5%
19	Ambient temperature range		-25C to60C
20	Humidity (non condensing)	95%, non condensing	100% Condensing
21	Degree of protection		IP 65
22	Dimensions(HxWxD)		457x452x202mm
23	Weight		22Kg
24	Protective functions AC over/under voltage, AC over/under frequency, over-temperature, AC and DC over-current, DC over-voltage, against Islanding		Provided
25	Communication Interface	RS232/RS485MPI ProfiBus/ Telephone Modem/WiFi	RS 485,WLAN
26	User-display standard	LCD panel with membrane keypad	LCD Display
27	Enclosure Environment Rating		IP 65
28	Safety and EMC		IEC 62109-1,IEC 62109-2,EN 61000-6-1,EN 61000-6-3, EN 61000-3-11,EN 61000-3-12
29	Anti Islanding Feature	IEEE1547/UL1741/IEC62116	IEC 62116



Guaranteed Technical Particular Data Sheet-2 Power conditioning unit			
Sl.	Particulars	Required	Offered
1	Manufacturer		Hitachi
2	Model name/No.		Si 20K
3	No of Units		
4	Nominal AC power		20 KVA
5	Nominal AC voltage		415V
6	Nominal AC Current		32A
7	AC grid Frequency range	50Hz $\pm$ 0.5%	45HZ-55HZ
8	AC grid voltage range		310V-480V
9	Power Factor (+ and -)		0.8 Lag and Lead
10	Total Harmonic Distortion	as per IEEE-519 2014	Less than 3%
11	AC over / under voltage over / under frequency protection		Provided
12	Max PV input power		26000W
13	Maximum DC voltage	1000V	1100V
14	MPPT voltage range		230V to 960V
15	Maximum DC current		24A per MPPT
16	No. of DC input ports		6
17	Maximum Efficiency	as per IEC61683	98.20%
18	DC voltage ripple		Less than 0.5%
19	Ambient temperature range		-25C to 60C
20	Humidity (non condensing)	95% non condensing	100% Condensing
21	Degree of protection		IP 65
22	Dimensions(HxWxD)		666x512x254mm
23	Weight		37Kg
24	Protective functions AC over/under voltage, AC over/under frequency, over-temperature, AC and DC over-current, DC over-voltage, against Islanding		Provided
25	Communication Interface	RS232/RS485/MPI ProfiBus/ Telephone Modem/WiFi	RS 485.WLAN
26	User-display standard	LCD panel with membrane keypad	LCD Display
27	Enclosure Environment Rating		IP 65
28	Safety and EMC		IEC 62109-1, IEC 62109-2, EN 61000-6-1, EN 61000-6-3, EN 61000-3-11, EN 61000-3-12
29	Anti Islanding Feature	IEEE1547/UL1741/IEC62116	IEC 62116



Guaranteed Technical Particular Data Sheet-2			
Power conditioning unit			
Sl.	Particulars	Required	Offered
1	Manufacturer		Hitachi
2	Model name/No.		Si 30K
3	No of Units		
4	Nominal AC power		30 KVA
5	Nominal AC voltage		415V
6	Nominal AC Current		48A
7	AC grid Frequency range	50Hz $\pm$ 0.5%	45HZ-55HZ
8	AC grid voltage range		310V-480V
9	Power Factor (+ and -)		0.8 Lag and Lead
10	Total Harmonic Distortion	as per IEEE-519 2014	Less than3%
11	AC over / under voltage over / under frequency protection		Provided
12	Max PV input power		39000W
13	Maximum DC voltage	1000V	1100V
14	MPPT voltage range		230V to 960V
15	Maximum DC current		30A per MPPT
16	No. of DC input ports		6
17	Maximum Efficiency	as per IEC61683	98.40%
18	DC voltage ripple		Less than0.5%
19	Ambient temperature range		-25°C to60°C
20	Humidity (non condensing)	95%, non condensing	100% Condensing
21	Degree of protection		IP 65
22	Dimensions(HxWxD)		666x512x254mm
23	Weight		37Kg
24	Protective functions AC over/under voltage, AC over/under frequency, over-temperature, AC and DC over-current, DC over-voltage, against Islanding		Provided
25	Communication Interface	RS232/RS485MPI ProfiBus/ Telephone Modem/WiFi	RS 485,WLAN
26	User-display standard	LCD panel with membrane keypad	LCD Display
27	Enclosure Environment Rating		IP 65
28	Safety and EMC		IEC 62109-1,IEC 62109-2,EN 61000-6-1,EN 61000-6-3, EN 61000-3-11,EN 61000-3-12
29	Anti Islanding Feature	IEEE1547/UL1741/IEC62116	IEC 62116



Guaranteed Technical Particular Data Sheet-2 Power conditioning unit			
Sl.	Particulars	Required	Offered
1	Manufacturer		Hitachi
2	Model name/No.		Si 33K
3	No of Units		
4	Nominal AC power		33 KVA
5	Nominal AC voltage		415V
6	Nominal AC Current		53A
7	AC grid Frequency range	50Hz $\pm$ 0.5%	45Hz-55Hz
8	AC grid voltage range		310V-480V
9	Power Factor (+ and -)		0.8 Lag and Lead
10	Total Harmonic Distortion	as per IEEE-519 2014	Less than 3%
11	AC over / under voltage over / under frequency protection		Provided
12	Max PV input power		42900W
13	Maximum DC voltage	1000V	1100V
14	MPPT voltage range		230V to 960V
15	Maximum DC current		30A per MPPT
16	No. of DC input ports		6
17	Maximum Efficiency	as per IEC61683	98.60%
18	DC voltage ripple		Less than 0.5%
19	Ambient temperature range		-25C to 60C
20	Humidity (non condensing)	95%, non condensing	100% Condensing
21	Degree of protection		IP 65
22	Dimensions(HxWxD)		666x512x254mm
23	Weight		37Kg
24	Protective functions AC over/under voltage, AC over/under frequency, over-temperature, AC and DC over-current, DC over-voltage, against Islanding		Provided
25	Communication Interface	RS232/RS485/MPI ProfiBus/ Telephone Modem/WiFi	RS 485, WLAN
26	User-display standard	LCD panel with membrane keypad	LCD Display
27	Enclosure Environment Rating		IP 65
28	Safety and EMC		IEC 62109-1, IEC 62109-2, EN 61000-6-1, EN 61000-6-3, EN 61000-3-11, EN 61000-3-12
29	Anti Islanding Feature	IEEE1547/UL1741/IEC62116	IEC 62116



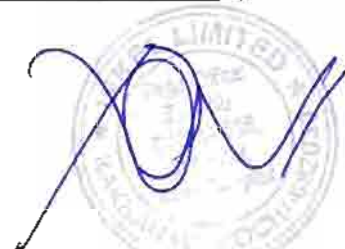
Guaranteed Technical Particular Data Sheet-2			
Power conditioning unit			
Sl.	Particulars	Required	Offered
1	Manufacturer		Hitachi
2	Model name/No.		Si 50K
3	No of Units		
4	Nominal AC power		50 KVA
5	Nominal AC voltage		415V
6	Nominal AC Current		80A
7	AC grid Frequency range	50Hz $\pm$ 0.5%	45Hz-55Hz
8	AC grid voltage range		310V-480V
9	Power Factor (+ and -)		0.8 Lag and Lead
10	Total Harmonic Distortion	as per IEEE-519 2014	Less than 3%
11	AC over / under voltage over / under frequency protection		Provided
12	Max PV input power		55000W
13	Maximum DC voltage	1000V	1000V
14	MPPT voltage range		250V to 960V
15	Maximum DC current		40A per MPPT
16	No. of DC input ports		10 Pairs
17	Maximum Efficiency	as per IEC61683	98.50%
18	DC voltage ripple		Less than 0.5%
19	Ambient temperature range		-25°C to 60°C
20	Humidity (non condensing)	95%, non condensing	100% Condensing
21	Degree of protection		IP 65
22	Dimensions(HxWxD)		713x737x297mm
23	Weight		70Kg
24	Protective functions AC over/under voltage, AC over/under frequency, over-temperature, AC and DC over-current, DC over-voltage, against Islanding		Provided
25	Communication Interface	RS232/RS485/MP1 ProfiBus/ Telephone Modem/WiFi	RS 485, WLAN
26	User-display standard	LCD panel with membrane keypad	LED Display
27	Enclosure Environment Rating		IP 65
28	Safety and EMC		IEC 62109-1, IEC 62109-2, EN 61000-6-1, EN 61000-6-3, EN 61000-3-11, EN 61000-3-12
29	Anti Islanding Feature	IEEE1547/UL1741/IEC62116	IEC 62116



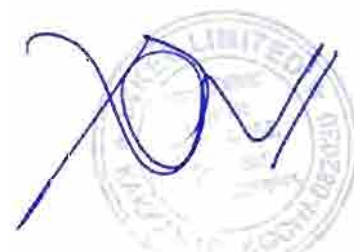
Guaranteed Technical Particular Data Sheet-2			
Power conditioning unit			
Sl.	Particulars	Required	Offered
1	Manufacturer		Hitachi
2	Model name/No.		Si 70K(HV)
3	No of Units		
4	Nominal AC power		70000W
5	Nominal AC voltage		480VAC
6	Nominal AC Current		90A
7	AC grid Frequency range	50Hz $\pm$ 0.5%	50/60Hz
8	AC grid voltage range		422V-528V
9	Power Factor (+ and -)		0.8 Lag and Lead
10	Total Harmonic Distortion	as per IEEE-519 2014	Less than3%
11	AC over / under voltage over / under frequency protection		Provided
12	Max PV input power		77000W
13	Maximum DC voltage	1000V	1000V
14	MPPT voltage range		250V to 960V
15	Maximum DC current		40A per MPPT
16	No. of DC input ports		12 Pairs
17	Maximum Efficiency	as per IEC61683	98.60%
18	DC voltage ripple		Less than0.5%
19	Ambient temperature range		-25C to60C
20	Humidity (non condensing)	95%, non condensing	100% Condensing
21	Degree of protection		IP 65
22	Dimensions(HxWxD)		713x737x297mm
23	Weight		70Kg
24	Protective functions AC over/under voltage, AC over/under frequency, over-temperature, AC and DC over-current, DC over-voltage, against Islanding		Provided
25	Communication Interface	RS232/RS485MPI ProfiBus/ Telephone Modem/WiFi	RS 485,WLAN
26	User-display standard	LCD panel with membrane keypad	LCD Display
27	Enclosure Environment Rating		IP 65
28	Safety and EMC		EN 61000-6-2, EN 61000-6-4, EN 61000-3-11, EN 61000-3-12, IEC62109-1/2, IEC 62116, IEC 61727, IEC-61683, IEC60068(1.2.14,30)
29	Anti Islanding Feature	IEEE1547/UL1741/IEC62116	IEC 62116



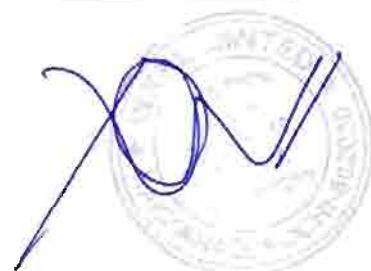
Guaranteed Technical Particular Data Sheet Power Conditioning Unit			
Sl.	Particulars	Required	Offered
1	Manufacturer		FRONIUS
2	Model name/No.		FRONIUS SYMO 20.0-3-M
3	No of units		
4	Nominal AC power		20000W
5	Nominal AC voltage		400V
6	Nominal AC Current		28.9A
7	AC grid Frequency range	50Hz $\pm$ 0.5%	45HZ-55HZ
8	AC grid voltage range		380V-480V
9	Power Factor (+ and -)		0.995Lag and Lead
10	Total Harmonic Distortion	as per IEEE-519 2014	Less than 3%
11	AC over / under voltage over / under frequency protection		Provided
12	Max PV input power		20kW
13	Maximum DC voltage	1000V	1000V
14	MPPT voltage range		200V to 800V
15	Maximum DC current		33 A
16	No. of DC input ports		3+3
17	Maximum Efficiency	> 97% As per IEC61683	98.10%
18	DC voltage ripple		Less than 0.5%
19	Ambient temperature range		-25C to 60C
20	Humidity (non condensing)	95%, non-condensing	100% Condensing
21	Degree of protection		IP 65
22	Dimensions(HxWxD)		725x510x225mm
23	Weight		43.4Kg
24	Protective functions AC over/under voltage, AC over/under frequency, over-temperature, AC and DC over-current, DC over-voltage, against islanding		Provided
25	Communication Interface	RS232/RS485/MPI/Profibus/Tel ephone Modem/WiFi	RS 485, WLAN
26	User-display standard	LCD panel with membrane keypad	LCD Display
27	Enclosure Environment Rating		IP 65
28	Safety and EMC		IEC 62109-1/-2, IEC 62116, IEC 61727
29	Anti Islanding Feature	IEEE1547/UL1741/IEC62116	IEC 62116



Guaranteed Technical Particular Data Sheet Power Conditioning Unit			
Sl.	Particulars	Required	Offered
1	Manufacturer		FRONIUS ECO
2	Model name/No.		FRONIUS ECO 25.0-3-S
3	No of units		
4	Nominal AC power		25000W
5	Nominal AC voltage		400V
6	Nominal AC Current		37.9A
7	AC grid Frequency range	50Hz $\pm$ 0.5%	45HZ-55HZ
8	AC grid voltage range		380V-480V
9	Power Factor (+ and -)		0.995Lag and Lead
10	Total Harmonic Distortion	as per IEEE-519 2014	Less than3%
11	AC over / under voltage over / under frequency protection		Provided
12	Max PV input power		25kW
13	Maximum DC voltage	1000V	1000V
14	MPPT voltage range		580V to 850V
15	Maximum DC current		44.2 A
16	No. of DC input ports		6
17	Maximum Efficiency	> 97% As per IEC61683	98.20%
18	DC voltage ripple		Less than0.5%
19	Ambient temperature range		-25C to60C
20	Humidity (non condensing)	95% non-condensing	100% Condensing
21	Degree of protection		IP 65
22	Dimensions(HxWxD)		725x510x225mm
23	Weight		35.7 Kg
24	Protective functions AC over/under voltage, AC over/under frequency, over-temperature, AC and DC over-current, DC over-voltage, against Islanding		Provided
25	Communication Interface	RS232/RS485MPIProfibus/Tel ephone Modem/WiFi	RS 485,WLAN
26	User-display standard	LCD panel with membrane keypad	LCD Display
27	Enclosure Environment Rating		IP 65
28	Safety and EMC		IEC 62109-1/-2, IEC 62116, IEC 61727
29	Anti Islanding Feature	IEEE1547/UL1741/IEC62116	IEC 62116



Guaranteed Technical Particular Data Sheet Power Conditioning Unit			
Sl.	Particulars	Required	Offered
1	Manufacturer		FRONIUS ECO
2	Model name/No.		FRONIUS ECO 27.0-3-S
3	No of units		
4	Nominal AC power		27000W
5	Nominal AC voltage		400V
6	Nominal AC Current		40.9A
7	AC grid Frequency range	50Hz $\pm$ 0.5%	45HZ-55HZ
8	AC grid voltage range		380V-480V
9	Power Factor (+ and -)		0.995Lag and Lead
10	Total Harmonic Distortion	as per IEEE-519 2014	Less than3%
11	AC over / under voltage over / under frequency protection		Provided
12	Max PV input power		25kW
13	Maximum DC voltage	1000V	1000V
14	MPPT voltage range		580V to 850V
15	Maximum DC current		47.7 A
16	No. of DC input ports		6
17	Maximum Efficiency	> 97% As per IEC61683	98.20%
18	DC voltage ripple		Less than0.5%
19	Ambient temperature range		-25C to60C
20	Humidity (non condensing)	95%, non-condensing	100% Condensing
21	Degree of protection		IP 65
22	Dimensions(HxWxD)		725x510x225mm
23	Weight		35.7 Kg
24	Protective functions AC over/under voltage, AC over/under frequency, over-temperature, AC and DC over-current, DC over-voltage, against Islanding		Provided
25	Communication Interface	RS232/RS485MPIProfibus/Tel ephone Modem/WiFi	RS 485,WLAN
26	User-display standard	LCD panel with membrane keypad	LCD Display
27	Enclosure Environment Rating		IP 65
28	Safety and EMC		IEC 62109-1/-2, IEC 62116, IEC 61727
29	Anti Islanding Feature	IEEE1547/UL1741/IEC62116	IEC 62116



Guaranteed Technical Particular Data Sheet Power Conditioning Unit			
Sl.	Particulars	Required	Offered
1	Manufacturer		FRONIUS
2	Model name/No.		TAURO 50-3 D
3	No of units		
4	Nominal AC power		50000W
5	Nominal AC voltage		400V
6	Nominal AC Current		76A
7	AC grid Frequency range	50Hz $\pm$ 0.5%	45HZ-55HZ
8	AC grid voltage range		380V-480V
9	Power Factor (+ and -)		0.995Lag and Lead
10	Total Harmonic Distortion	as per IEEE-519 2014	Less than3%
11	AC over / under voltage over / under frequency protection		Provided
12	Max PV input power		50kW
13	Maximum DC voltage	1000V	1000V
14	MPPT voltage range		200 to 1000V
15	Maximum DC current		134 A
16	No. of DC input ports		4/3/7
17	Maximum Efficiency	> 97% As per IEC61683	98.60%
18	DC voltage ripple		Less than0.5%
19	Ambient temperature range		-25C to60C
20	Humidity (non condensing)	95%, non-condensing	100% Condensing
21	Degree of protection		IP 65
22	Dimensions(HxWxD)		755x1109x346mm
23	Weight		74 Kg
24	Protective functions AC over/under voltage, AC over/under frequency, over-temperature, AC and DC over-current, DC over-voltage, against Islanding		Provided
25	Communication Interface	RS232/RS485MPIProfibus/Tel ephone Modem/WiFi	RS 485,WLAN
26	User-display standard	LCD panel with membrane keypad	LCD Display
27	Enclosure Environment Rating		IP 65
28	Safety and EMC		IEC 62109-1/-2, IEC 62116, IEC 61727
29	Anti Islanding Feature	IEEE1547/UL1741/IEC62116	IEC 62116



Guaranteed Technical Particular Data Sheet Power Conditioning Unit			
Sl.	Particulars	Required	Offered
1	Manufacturer		FRONIUS
2	Model name/No.		TAURO ECO 100-3 D
3	No of units		
4	Nominal AC power		100000W
5	Nominal AC voltage		400V
6	Nominal AC Current		152 A
7	AC grid Frequency range	50Hz $\pm$ 0.5%	45HZ-55HZ
8	AC grid voltage range		380V-480V
9	Power Factor (+ and -)		0.995Lag and Lead
10	Total Harmonic Distortion	as per IEEE-519 2014	Less than3%
11	AC over / under voltage over / under frequency protection		Provided
12	Max PV input power		100kW
13	Maximum DC voltage	1000V	1000V
14	MPPT voltage range		580 to 1000V
15	Maximum DC current		175 A
16	No. of DC input ports		7/7
17	Maximum Efficiency	> 97% As per IEC61683	98.60%
18	DC voltage ripple		Less than0.5%
19	Ambient temperature range		-25C to60C
20	Humidity (non condensing)	95%, non-condensing	100% Condensing
21	Degree of protection		IP 65
22	Dimensions(HxWxD)		755x1109x346mm
23	Weight		103 Kg
24	Protective functions AC over/under voltage, AC over/under frequency, over-temperature, AC and DC over-current, DC over-voltage, against Islanding		Provided
25	Communication Interface	RS232/RS485MPIProfiBus/Tel ephone Modem/WiFi	RS 485,WLAN
26	User-display standard	LCD panel with membrane keypad	LCD Display
27	Enclosure Environment Rating		IP 65
28	Safety and EMC		IEC 62109-1/-2, IEC 62116, IEC 61727
29	Anti Islanding Feature	IEEE1547/UL1741/IEC62116	IEC 62116



Guaranteed Technical Particular Data Sheet Power Conditioning Unit			
Sl.	Particulars	Required	Offered
1	Manufacturer		SOLAR EDGE
2	Model name/No.		SE25K
3	No of units		
4	Nominal AC power		20000W
5	Nominal AC voltage		400V
6	Nominal AC Current		36.25A
7	AC grid Frequency range	50Hz $\pm$ 0.5%	45HZ-55HZ
8	AC grid voltage range		320V-478V
9	Power Factor (+ and -)		0.995Lag and Lead
10	Total Harmonic Distortion	as per IEEE-519 2014	Less than3%
11	AC over / under voltage over / under frequency protection		Provided
12	Max PV input power		25kW
13	Maximum DC voltage	1000V	1000V
14	MPPT voltage range		680V to 1000V
15	Maximum DC current		36.25A
16	No. of DC input ports		4MC 4 Pairs
17	Maximum Efficiency	> 97% As per IEC61683	98.20%
18	DC voltage ripple		Less than0.5%
19	Ambient temperature range		-40C to60C
20	Humidity (non condensing)	95%, non-condensing	100% Condensing
21	Degree of protection		IP 65
22	Dimensions(HxWxD)		558x328x273mm
23	Weight		32 Kg
24	Protective functions AC over/under voltage, AC over/under frequency, over-temperature, AC and DC over-current, DC over-voltage, against Islanding		Provided
25	Communication Interface	RS232/RS485MPIProfibus/Tel ephone Modem/WiFi	RS 485,WLAN
26	User-display standard	LCD panel with membrane keypad	LED Display
27	Enclosure Environment Rating		IP 65
28	Safety and EMC		IEC 62109-1, IEC-62109-2 IEC61000-6,IEC61000-6-3,IEC61000-3-11 ,IEC61000-3-12
29	Anti Islanding Feature	IEEE1547/UL1741/IEC62116	IEC 62116

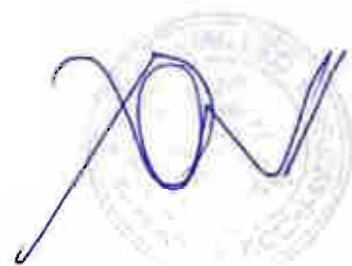


Guaranteed Technical Particular Data Sheet Power Conditioning Unit			
Sl.	Particulars	Required	Offered
1	Manufacturer		SOLAR EDGE
2	Model name/No.		SE33.3K
3	No of units		
4	Nominal AC power		33300W
5	Nominal AC voltage		400V
6	Nominal AC Current		48.25A per phase
7	AC grid Frequency range	50Hz $\pm$ 0.5%	45HZ-55HZ
8	AC grid voltage range		320V-478V
9	Power Factor (+ and -)		0.995Lag and Lead
10	Total Harmonic Distortion	as per IEEE-519 2014	Less than3%
11	AC over / under voltage over / under frequency protection		Provided
12	Max PV input power		33.3kW
13	Maximum DC voltage	1000V	1000V
14	MPPT voltage range		680V to 1000V
15	Maximum DC current		48.25A
16	No. of DC input ports		4MC 4 Pairs
17	Maximum Efficiency	> 97% As per IEC61683	98.20%
18	DC voltage ripple		Less than0.5%
19	Ambient temperature range		-40C to60C
20	Humidity (non condensing)	95%, non-condensing	100% Condensing
21	Degree of protection		IP 65
22	Dimensions(HxWxD)		558x328x273mm
23	Weight		32 Kg
24	Protective functions AC over/under voltage, AC over/under frequency, over-temperature, AC and DC over-current, DC over-voltage, against Islanding		Provided
25	Communication Interface	RS232/RS485MPIProfiBus/Tel ephone Modem/WiFi	RS 485,WLAN
26	User-display standard	LCD panel with membrane keypad	LED Display
27	Enclosure Environment Rating		IP 65
28	Safety and EMC		IEC 62109-1, IEC-62109-2 IEC61000-6,IEC61000-6- 3,IEC61000-3-11 ,IEC61000-3-12
29	Anti Islanding Feature	IEEE1547/UL1741/IEC62116	IEC 62116

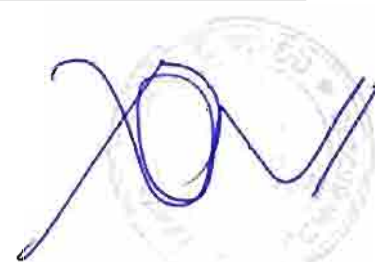
Guaranteed Technical Particular Data Sheet Power Conditioning Unit			
Sl.	Particulars	Required	Offered
1	Manufacturer		SOLAR EDGE
2	Model name/No.		SE40K
3	No of units		
4	Nominal AC power		40000W
5	Nominal AC voltage		400V
6	Nominal AC Current		48.25A per phase
7	AC grid Frequency range	50Hz $\pm$ 0.5%	45HZ-55HZ
8	AC grid voltage range		320V-478V
9	Power Factor (+ and -)		0.995Lag and Lead
10	Total Harmonic Distortion	as per IEEE-519 2014	Less than3%
11	AC over / under voltage over / under frequency protection		Provided
12	Max PV input power		40 kW
13	Maximum DC voltage	1000V	1000V
14	MPPT voltage range		680V to 1000V
15	Maximum DC current		48.25A
16	No. of DC input ports		4MC 4 Pairs
17	Maximum Efficiency	> 97% As per IEC61683	98.20%
18	DC voltage ripple		Less than0.5%
19	Ambient temperature range		_40C to60C
20	Humidity (non condensing)	95%, non-condensing	100% Condensing
21	Degree of protection		IP 65
22	Dimensions(HxWxD)		558x328x273mm
23	Weight		32 Kg
24	Protective functions AC over/under voltage, AC over/under frequency, over-temperature, AC and DC over-current, DC over-voltage, against Islanding		Provided
25	Communication Interface	RS232/RS485MPIProfiBus/Tel ephone Modem/WiFi	RS 485,WLAN
26	User-display standard	LCD panel with membrane keypad	LED Display
27	Enclosure Environment Rating		IP 65
28	Saftey and EMC		IEC 62109-1, IEC-62109-2 IEC61000-6,IEC61000-6-3,IEC61000-3-11 ,IEC61000-3-12
29	Anti Islanding Feature	IEEE1547/UL1741/IEC62116	IEC 62116



Guaranteed Technical Particular Data Sheet Power Conditioning Unit			
Sl.	Particulars	Required	Offered
1	Manufacturer		SOLAR EDGE
2	Model name/No.		SE 50K
3	No of units		
4	Nominal AC power		50000W
5	Nominal AC voltage		400V
6	Nominal AC Current		76A per phase
7	AC grid Frequency range	50Hz $\pm$ 0.5%	45HZ-55HZ
8	AC grid voltage range		320V-460V
9	Power Factor (+ and -)		0.995Lag and Lead
10	Total Harmonic Distortion	as per IEEE-519 2014	Less than3%
11	AC over / under voltage over / under frequency protection		Provided
12	Max PV input power		50kW
13	Maximum DC voltage	1000V	1000V
14	MPPT voltage range		750V to 1000V
15	Maximum DC current		2*37 A
16	No. of DC input ports		2 MC4 Pairs per unit
17	Maximum Efficiency	> 97% As per IEC61683	98 30%
18	DC voltage ripple		Less than0.5%
19	Ambient temperature range		-40C to60C
20	Humidity (non condensing)	95%, non-condensing	100% Condensing
21	Degree of protection		IP 65
22	Dimensions(HxWxD)		940*315*260mm
23	Weight		48 Kg
24	Protective functions AC over/under voltage, AC over/under frequency, over-temperature, AC and DC over-current, DC over-voltage, against Islanding		Provided
25	Communication Interface	RS232/RS485MPIProfiBus/Tel ephone Modem/WiFi	RS 485,WLAN
26	User-display standard	LCD panel with membrane keypad	LED Display
27	Enclosure Environment Rating		IP 65
28	Safety and EMC		IEC 62109-1, IEC-62109-2 IEC61000-6,IEC61000-6- 3,IEC61000-3-11 ,IEC61000-3-12
29	Anti Islanding Feature	IEEE1547/UL1741/IEC62116	IEC 62116



Guaranteed Technical Particular Data Sheet Power Conditioning Unit			
Sl.	Particulars	Required	Offered
1	Manufacturer		SOLAR EDGE
2	Model name/No.		SE 55K
3	No of units		
4	Nominal AC power		55000W
5	Nominal AC voltage		400V
6	Nominal AC Current		80A per phase
7	AC grid Frequency range	50Hz $\pm$ 0.5%	45HZ-55HZ
8	AC grid voltage range		320V-460V
9	Power Factor (+ and -)		0.995Lag and Lead
10	Total Harmonic Distortion	as per IEEE-519 2014	Less than3%
11	AC over / under voltage over / under frequency protection		Provided
12	Max PV input power		55.5kW
13	Maximum DC voltage	1000V	1000V
14	MPPT voltage range		750V to 1000V
15	Maximum DC current		2*40 A
16	No. of DC input ports		3 MC4 pairs per units
17	Maximum Efficiency	> 97% As per IEC61683	98.30%
18	DC voltage ripple		Less than0.5%
19	Ambient temperature range		-40C to60C
20	Humidity (non condensing)	95%, non-condensing	100% Condensing
21	Degree of protection		IP 65
22	Dimensions(HxWxD)		940*315*260mm
23	Weight		48 Kg
24	Protective functions AC over/under voltage, AC over/under frequency, over-temperature, AC and DC over-current, DC over-voltage, against Islanding		Provided
25	Communication Interface	RS232/RS485MPIProfiBus/Tel ephone Modem/WiFi	RS 485,WLAN
26	User-display standard	LCD panel with membrane keypad	LED Display
27	Enclosure Environment Rating		IP 65
28	Safety and EMC		IEC 62109-1, IEC-62109-2 IEC61000-6,IEC61000-6- 3,IEC61000-3-11 ,IEC61000-3-12
29	Anti Islanding Feature	IEEE1547/UL1741/IEC62116	IEC 62116



Guaranteed Technical Particular Data Sheet Power Conditioning Unit			
Sl.	Particulars	Required	Offered
1	Manufacturer		SOLAR EDGE
2	Model name/No.		SE 82.80K
3	No of units		
4	Nominal AC power		82800W
5	Nominal AC voltage		400V
6	Nominal AC Current		120 per phase
7	AC grid Frequency range	50Hz $\pm$ 0.5%	45HZ-55HZ
8	AC grid voltage range		320V-460V
9	Power Factor (+ and -)		0.995Lag and Lead
10	Total Harmonic Distortion	as per IEEE-519 2014	Less than3%
11	AC over / under voltage over / under frequency protection		Provided
12	Max PV input power		82.8kW
13	Maximum DC voltage	1000V	1000V
14	MPPT voltage range		750V to 1000V
15	Maximum DC current		3*40 A
16	No. of DC input ports		3MC4 pairs per unit
17	Maximum Efficiency	> 97% As per IEC61683	98.30%
18	DC voltage ripple		Less than0.5%
19	Ambient temperature range		-40C to60C
20	Humidity (non condensing)	95%, non-condensing	100% Condensing
21	Degree of protection		IP 65
22	Dimensions(HxWxD)		940*315*260mm
23	Weight		48 Kg
24	Protective functions AC over/under voltage, AC over/under frequency, over-temperature, AC and DC over-current, DC over-voltage, against Islanding		Provided
25	Communication Interface	RS232/RS485MPIProfibus/Tel ephone Modem/WiFi	RS 485,WLAN
26	User-display standard	LCD panel with membrane keypad	LED Display
27	Enclosure Environment Rating		IP 65
28	Safety and EMC		IEC 62109-1, IEC-62109-2 IEC61000-6,IEC61000-6- 3,IEC61000-3-11 ,IEC61000-3-12
29	Anti Islanding Feature	IEEE1547/UL1741/IEC62116	IEC 62116

Guaranteed Technical Particular Data Sheet -2 Power Conditioning Unit			
Sl.	Particulars	Required	Offered
1	Manufacturer		Goodwe
2	Model name/No.		GW5K-DT
3	No of Units		
4	Nominal AC power		5KW
5	Nominal AC voltage		400 VAC
6	Nominal AC Current		6.4
7	AC grid Frequency range	50Hz $\pm$ 0.5%	50-60Hz
8	AC grid voltage range		184VAC-264VAC
9	Power Factor (+ and -)		+/- 0.8
10	Total Harmonic Distortion	as per IEEE-519 2014	<2 %
11	AC over / under voltage over / under frequency protection		Complied
12	Max PV input power		7500W
13	Maximum DC voltage		620 V
14	MPPT voltage range	Standard range as per project requirement	180-850V
15	Maximum DC current		12.5/12.5
16	No. of DC input ports		1/1
17	Maximum Efficiency	97% as per IEC61683	98.3 %
18	DC voltage ripple		Less than 0.5
19	Ambient temperature range		-25 to 60deg C
20	Humidity (non condensing)	95%, non condensing	100%
21	Degree of protection		IP65
22	Dimensions(HxWxD)		354 x 433 x 147 mm
23	Weight		15
24	Protective functions AC over/under voltage, AC over/under frequency, over-temperature, AC and DC over-current, DC over-voltage, against Islanding		Provided
25	Communication Interface	RS232/RS485/MPI/Profibus/ Telephone Modem/WiFi	RS 485
26	User-display standard	LCD panel with membrane keypad	LCD panel with membrane keypad
27	Enclosure Environment Rating		IP 65
28	Safety and EMC		EN 62109-1/2, EN 61000-6-2/EN 61000-6-3, EN 61000-3-11, EN 61000-3-13
29	Anti Islanding Feature	IEEE1547/UL1741/IEC62116	IEC 62116

Guaranteed Technical Particular Data Sheet -2 Power Conditioning Unit			
Sl.	Particulars	Required	Offered
1	Manufacturer		Goodwe
2	Model name/No.		GW10KN-DT
3	No of Units		
4	Nominal AC power		10KW
5	Nominal AC voltage		400 VAC
6	Nominal AC Current		
7	AC grid Frequency range	50Hz $\pm$ 0.5%	50-60Hz
8	AC grid voltage range		184VAC-264VAC
9	Power Factor (+ and -)		$\pm$ 0.8
10	Total Harmonic Distortion	as per IEEE-519 2014	<2 %
11	AC over / under voltage over / under frequency protection		Complied
12	Max PV input power		Yes
13	Maximum DC voltage		12000 W
14	MPPT voltage range	Standard range as per project requirement	1000V
15	Maximum DC current		200-850V
16	No. of DC input ports		22/11 A
17	Maximum Efficiency	97% as per IEC61683	98.3 %
18	DC voltage ripple		Less than 0.5
19	Ambient temperature range		-25 to 60deg C
20	Humidity (non condensing)	95%, non condensing	100%
21	Degree of protection		IP65
22	Dimensions(HxWxD)		516 x 415 x 192 mm
23	Weight		24
24	Protective functions AC over/under voltage, AC over/under frequency, over-temperature, AC and DC over-current, DC over-voltage, against Islanding		Provided
25	Communication Interface	RS232/RS485/MPI ProfiBus/ Telephone Modem/WiFi	RS 485
26	User-display standard	LCD panel with membrane keypad	LCD panel with membrane keypad
27	Enclosure Environment Rating		IP 65
28	Safety and EMC		EN 62109-1/2, EN 61000-6-2/EN 61000-6-3, EN 61000-3-11, EN 61000-3-13
29	Anti Islanding Feature	IEEE1547/UL1741/IEC62116	IEC 62116



Guaranteed Technical Particular Data Sheet -2 Power Conditioning Unit			
Sl.	Particulars	Required	Offered
1	Manufacturer		Goodwe
2	Model name/No.		GW12KN-DT
3	No of Units		1 No
4	Nominal AC power		12KW
5	Nominal AC voltage		400 VAC
6	Nominal AC Current		21.5A
7	AC grid Frequency range	50Hz $\pm$ 0.5%	50-60Hz
8	AC grid voltage range		184V-264V
9	Power Factor (+ and -)		+/- 0.8
10	Total Harmonic Distortion	as per IEEE-519 2014	<2 %
11	AC over / under voltage over / under frequency protection		Complied
12	Max PV input power		16800 W
13	Maximum DC voltage		1000V
14	MPPT voltage range	Standard range as per project requirement	200-850V
15	Maximum DC current		22/11 A
16	No. of DC input ports		2
17	Maximum Efficiency	97% as per IEC61683	98.3 %
18	DC voltage ripple		Less than 0.5%
19	Ambient temperature range		-25 to 60deg C
20	Humidity (non condensing)	95%, non condensing	100%
21	Degree of protection		IP65
22	Dimensions(HxWxD)		516 x 455 x 192 mm
23	Weight		26 kg
24	Protective functions AC over/under voltage, AC over/under frequency, over-temperature, AC and DC over-current, DC over-voltage, against Islanding		Provided
25	Communication Interface	RS232/RS485MPI ProfiBus/ Telephone Modem/WiFi	RS 485
26	User-display standard	LCD panel with membrane keypad	LCD panel with membrane keypad
27	Enclosure Environment Rating		IP 65
28	Safety and EMC		EN 62109-1/2, EN 61000-6-2, EN 61000-6-3, EN 61000-3-11, EN 61000-3-13
29	Anti Islanding Feature	IEEE1547/UL1741/IEC62116	IEC 62116



Guaranteed Technical Particular Data Sheet -2 Power Conditioning Unit			
Sl.	Particulars	Required	Offered
1	Manufacturer		Goodwe
2	Model name/No.		GW15KT-DT
3	No of Units		1 No
4	Nominal AC power		15KW
5	Nominal AC voltage		400 VAC
6	Nominal AC Current		24 A
7	AC grid Frequency range	50Hz $\pm$ 0.5%	50-60Hz
8	AC grid voltage range		310VAC-480VAC
9	Power Factor (+ and -)		+/- 0.8
10	Total Harmonic Distortion	as per IEEE-519 2014	<3 %
11	AC over / under voltage over / under frequency protection		Complied
12	Max PV input power		22500 W
13	Maximum DC voltage		1000V
14	MPPT voltage range	Standard range as per project requirement	180-850V
15	Maximum DC current		12.5/25 A
16	No. of DC input ports		1/2 Nos
17	Maximum Efficiency	97% as per IEC61683	98.3 %
18	DC voltage ripple		Less than 0.5
19	Ambient temperature range		-30 to 60 °C
20	Humidity (non condensing)	95%, non condensing	100%
21	Degree of protection		IP65
22	Dimensions(HxWxD)		433 x 354 x 155 mm
23	Weight		18 kg
24	Protective functions AC over/under voltage, AC over/under frequency, over-temperature, AC and DC over-current, DC over-voltage, against Islanding		Provided
25	Communication Interface	RS232/RS485MPI ProfiBus/ Telephone Modem/WiFi	RS 485
26	User-display standard	LCD panel with membrane keypad	LCD panel with membrane keypad
27	Enclosure Environment Rating		IP 65
28	Safety and EMC		EN 62109-1/2, EN 61000-6-2, EN 61000-6-3, EN 61000-3-11, EN 61000-3-13
29	Anti Islanding Feature	IEEE1547/UL1741/IEC62116	IEC 62116



Guaranteed Technical Particular Data Sheet -2 Power Conditioning Unit			
Sl.	Particulars	Required	Offered
1	Manufacturer		Goodwe
2	Model name/No.		GW20KT-DT
3	No of Units		1
4	Nominal AC power		20 KVA
5	Nominal AC voltage		400 VAC
6	Nominal AC Current		31.9A
7	AC grid Frequency range	50Hz $\pm$ 0.5%	50-60Hz
8	AC grid voltage range		184VAC-264VAC
9	Power Factor (+ and -)		+/- 0.8
10	Total Harmonic Distortion	as per IEEE-519 2014	<3 %
11	AC over / under voltage over / under frequency protection		Complied
12	Max PV input power		30000 W
13	Maximum DC voltage		1100V
14	MPPT voltage range	Standard range as per project requirement	200-950V
15	Maximum DC current		25/25 A
16	No. of DC input ports		2/2 nos
17	Maximum Efficiency	97% as per IEC61683	98.4%
18	DC voltage ripple		Less than 0.5
19	Ambient temperature range		-30 to 60 °C
20	Humidity (non condensing)	95%, non condensing	100%
21	Degree of protection		IP65
22	Dimensions(HxWxD)		511 x 415 x 175 mm
23	Weight		25 kg
24	Protective functions AC over/under voltage, AC over/under frequency, over-temperature, AC and DC over-current, DC over-voltage, against Islanding		Provided
25	Communication Interface	RS232/RS485MPI ProfiBus/ Telephone Modem/WiFi	RS 485
26	User-display standard	LCD panel with membrane keypad	LCD panel with membrane keypad
27	Enclosure Environment Rating		IP 65
28	Safety and EMC		EN 62109-1/2, EN 61000-6-2, EN 61000-6-3, EN 61000-3-11, EN 61000-3-13
29	Anti Islanding Feature	IEEE1547/UL1741/IEC62116	IEC 62116



Guaranteed Technical Particular Data Sheet -2 Power Conditioning Unit			
Sl.	Particulars	Required	Offered
1	Manufacturer		Goodwe
2	Model name/No.		GW25KT-DT
3	No of Units		2
4	Nominal AC power		25 KVA
5	Nominal AC voltage		400 VAC
6	Nominal AC Current		40.8A
7	AC grid Frequency range	50Hz $\pm$ 0.5%	50-60Hz
8	AC grid voltage range		184VAC-264VAC
9	Power Factor (+ and -)		+/- 0.8
10	Total Harmonic Distortion	as per IEEE-519 2014	<3 %
11	AC over / under voltage over / under frequency protection		Complied
12	Max PV input power		25000 W
13	Maximum DC voltage		1100V
14	MPPT voltage range	Standard range as per project requirement	200-950V
15	Maximum DC current		37.5/25 A
16	No. of DC input ports		3/2 nos
17	Maximum Efficiency	97% as per IEC61683	98.4%
18	DC voltage ripple		Less than 0.5
19	Ambient temperature range		-30 to 60 °C
20	Humidity (non condensing)	95%, non condensing	100%
21	Degree of protection		IP65
22	Dimensions(HxWxD)		415 x 511 x 175 mm
23	Weight		25 kg
24	Protective functions AC over/under voltage, AC over/under frequency, over-temperature, AC and DC over-current, DC over-voltage, against Islanding		Provided
25	Communication Interface	RS232/RS485MPI ProfiBus/ Telephone Modem/WiFi	RS 485
26	User-display standard	LCD panel with membrane keypad	LCD panel with membrane keypad
27	Enclosure Environment Rating		IP 65
28	Safety and EMC		EN 62109-1/2, EN 61000-6-2, EN 61000-6-3, EN 61000-3-11, EN 61000-3-13
29	Anti Islanding Feature	IEEE1547/UL1741/IEC62116	IEC 62116



Inverter			
Sl.	Particulars	Required	Offered
1	Manufacturer		Good we
2	Model name/No.		GW 60KS-MT
3	Number of Units		
4	Nominal AC power		60kW
5	Nominal AC voltage		400 VAC
6	Nominal AC Current		96A
7	AC grid Frequency range	50Hz $\pm$ 0.5%	50Hz $\pm$ 5 Hz
8	AC grid voltage range		360V to 440V
9	Power Factor (+ and -)		0.8 ind / 0.8 cap
10	Total Harmonic Distortion	as per IEEE-519 2014	Less than 3%
11	AC over / under voltage over / under frequency protection		Provided
12	Max PV input power		60KW
13	Maximum DC voltage	Less than 1000V	1100V
14	MPPT voltage range		200 to 960V
15	Maximum DC current		30A
16	No. of DC input ports		6
17	Maximum Efficiency	as per IEC61683	98.60%
18	DC voltage ripple		Less than 0.5%
19	Ambient temperature range		-25°C to 60°C
20	Humidity (non condensing)	95%, non condensing	100% Condensing
21	Degree of protection		IP 66
22	Dimensions(HxWxD)		520 x 660 x 220 mm
23	Weight		55Kg
24	Protective functions AC over/under voltage, AC over/under frequency, over-temperature, AC and DC over-current, DC over-voltage, against Islanding		Provided
25	Communication Interface	RS485MPI ProfiBus/ Telephone Modem/WiFi	RS 485 / Wifi
26	User-display standard	LCD panel with membrane keypad	LED indication and wireless communication /APP
27	Enclosure Environment Rating		IP 65
28	Safety and EMC		IEC 62109-1, IEC 62109-2, EN 61000-6-1, EN 61000-6-3, EN 61000-3-11, EN 61000-3-12
29	Anti Islanding Feature	IEEE1547/UL1741/IEC62116	IEC 62116



Inverter			
Sl.	Particulars	Required	Offered
1	Manufacturer		Good we
2	Model name/No.		GW 50KS-MT
3	Number of Units		
4	Nominal AC power		50kW
5	Nominal AC voltage		400 VAC
6	Nominal AC Current		96A
7	AC grid Frequency range	50Hz $\pm$ 0.5%	50Hz $\pm$ 5 Hz
8	AC grid voltage range		360V to 440V
9	Power Factor (+ and -)		0.8 ind / 0.8 cap
10	Total Harmonic Distortion	as per IEEE-519 2014	Less than 3%
11	AC over / under voltage over / under frequency protection		Provided
12	Max PV input power		50KW
13	Maximum DC voltage	Less than 1000V	1100V
14	MPPT voltage range		200 to 960V
15	Maximum DC current		30A
16	No. of DC input ports		5
17	Maximum Efficiency	as per IEC61683	98.60%
18	DC voltage ripple		Less than 0.5%
19	Ambient temperature range		-25°C to 60°C
20	Humidity (non condensing)	95%, non condensing	100% Condensing
21	Degree of protection		IP 66
22	Dimensions(HxWxD)		520 x 660 x 220 mm
23	Weight		55Kg
24	Protective functions AC over/under voltage, AC over/under frequency, over-temperature, AC and DC over-current, DC over-voltage, against Islanding		Provided
25	Communication Interface	RS485MPI ProfiBus/ Telephone Modem/WiFi	RS 485 / Wifi
26	User-display standard	LCD panel with membrane keypad	LED indication and wireless communication /APP
27	Enclosure Environment Rating		IP 65
28	Safety and EMC		IEC 62109-1, IEC 62109-2, EN 61000-6-1, EN 61000-6-3, EN 61000-3-11, EN 61000-3-12
29	Anti Islanding Feature	IEEE1547/UL1741/IEC62116	IEC 62116



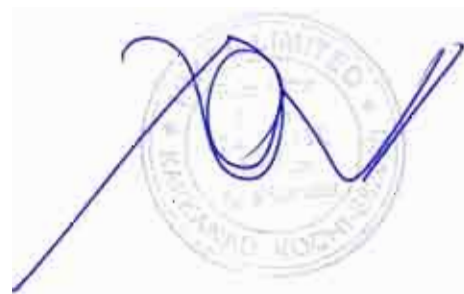
Guaranteed Technical Particular Data Sheet -2 Power Conditioning Unit			
Sl.	Particulars	Required	Offered
1	Manufacturer		Goodwe
2	Model name/No.		GW30K-MT
3	No of Units		
4	Nominal AC power		30KVA
5	Nominal AC voltage		400 VAC
6	Nominal AC Current		48A
7	AC grid Frequency range	50Hz $\pm$ 0.5%	50-60Hz
8	AC grid voltage range		184VAC-264VAC
9	Power Factor (+ and -)		+/- 0.8
10	Total Harmonic Distortion	as per IEEE-519 2014	<3 %
11	AC over / under voltage over / under frequency protection		Complied
12	Max PV input power		39000 W
13	Maximum DC voltage		1100V
14	MPPT voltage range	Standard range as per project requirement	200-950V
15	Maximum DC current		25/25/25 A
16	No. of DC input ports		2/2/2 Nos
17	Maximum Efficiency	97% as per IEC61683	98.8 %
18	DC voltage ripple		
19	Ambient temperature range		-25 to 60deg C
20	Humidity (non condensing)	95%, non condensing	100%
21	Degree of protection		IP65
22	Dimensions(HxWxD)		480 x 590 x 230 mm
23	Weight		40 kg
24	Protective functions AC over/under voltage, AC over/under frequency, over-temperature, AC and DC over-current, DC over-voltage, against Islanding		Provided
25	Communication Interface	RS232/RS485/MPI Profibus/ Telephone Modem/WiFi	RS 485
26	User-display standard	LCD panel with membrane keypad	LCD panel with membrane keypad
27	Enclosure Environment Rating		IP 65
28	Safety and EMC		EN 62109-1/2, EN 61000-6-2/EN 61000-6-3, EN 61000-3-11, EN 61000-3-13
29	Anti Islanding Feature	IEEE1547/UL1741/IEC62116	IEC 62116



Guaranteed Technical Particular Data SheetPower Conditioning Unit			
Sl.	Particulars	Required	Offered
1	Manufacturer		GOODWE
2	Model name/No.		GW36K-MT
3	No of Units		
4	Nominal AC power		36 KW
5	Nominal AC voltage		400 V
6	Nominal AC Current		53.3 A
7	AC grid Frequency range	50Hz $\pm$ 0.5%	50HZ-60HZ
8	AC grid voltage range		340V to 440V
9	Power Factor (+ and -)		0.8Lag-0.8 Lead
10	Total Harmonic Distortion	as per IEEE-519 2014	Less than3%
11	AC over / under voltage over / under frequency protection		Provided
12	Max PV input power		36 KWp
13	Maximum DC voltage	1000V	1100 V
14	MPPT voltage range	Standard range as per project requirement	200V To 950V
15	Maximum DC current		30/MPPT
16	No. of DC input ports		3
17	Maximum Efficiency	97% as per IEC61683	98.80%
18	DC voltage ripple		Less than0.5%
19	Ambient temperature range		_30C to 60°C
20	Humidity (non condensing)	95%, non condensing	0-100%
21	Degree of protection		IP 65
22	Dimensions(WxHxD)		480mm X 590mm X 200mm
23	Weight		40 Kg
24	Protective functions AC over/under voltage, AC over/under frequency, over-temperature, AC and DC over-current, DC over-voltage, against Islanding		Provided
25	Communication Interface	RS232/RS485,MPI ProfiBus/ Telephone Modem/WiFi	RS485, WiFi or 4G or PLC(Optional), Modbus-RTU (SunSpec Compliant)
26	User-display standard	LCD panel with membrane keypad	LCD Display
27	Enclosure Environment Rating		IP 66
28	Safety and EMC		IEC 62116, IEC 61727, IEC 61683, IEC 60068 (1,2,14,30),
29	Anti Islanding Feature	IEEE1547/UL1741/IEC62116	Yes



Guaranteed Technical Particular Data Sheet -2 Power Conditioning Unit			
Sl.	Particulars	Required	Offered
1	Manufacturer		Goodwe
2	Model name/No		GW50K-MT
3	No of Units		
4	Nominal AC power		50KVA
5	Nominal AC voltage		400 VAC
6	Nominal AC Current		80A
7	AC grid Frequency range	50Hz $\pm$ 0.5%	50-60Hz
8	AC grid voltage range		184VAC-264VAC
9	Power Factor (+ and -)		+/- 0.8
10	Total Harmonic Distortion	as per IEEE-519 2014	<3 %
11	AC over / under voltage over / under frequency protection		Complied
12	Max PV input power		65000 W
13	Maximum DC voltage		1000V
14	MPPT voltage range	Standard range as per project requirement	200-850V
15	Maximum DC current		30/30/20/20 A
16	No. of DC input ports		3/3/2/2 Nos
17	Maximum Efficiency	97% as per IEC61683	98.7 %
18	DC voltage ripple		
19	Ambient temperature range		-25 to 60deg C
20	Humidity (non condensing)	95%, non condensing	100%
21	Degree of protection		IP65
22	Dimensions(LxWxD)		586 x 788 x 264 mm
23	Weight		59 kg
24	Protective functions AC over/under voltage, AC over/under frequency, over-temperature, AC and DC over-current, DC over-voltage, against Islanding		Provided
25	Communication Interface	RS232/RS485/MPI Profibus/ Telephone Modem/WiFi	RS 485
26	User-display standard	LCD panel with membrane keypad	LCD panel with membrane keypad
27	Enclosure Environment Rating		IP 65
28	Safety and EMC		EN 62109-1/2, IEC 61000-6-2/EN 61000-6-3, EN 61000-3-11, EN 61000-3-13
29	Anti Islanding Feature	IEEE 547/UL1741/IEC62116	IEC 62116



Guaranteed Technical Particular Data Sheet -2 Power Conditioning Unit			
Sl.	Particulars	Required	Offered
1	Manufacturer		Goodwe
2	Model name/No.		GW50KN-MT
3	No of Units		
4	Nominal AC power		50KVA
5	Nominal AC voltage		400 VAC
6	Nominal AC Current		80A
7	AC grid Frequency range	50Hz $\pm$ 0.5%	50-60Hz
8	AC grid voltage range		184VAC-264VAC
9	Power Factor (+ and -)		+/- 0.8
10	Total Harmonic Distortion	as per IEEE-519 2014	<3 %
11	AC over / under voltage over / under frequency protection		Complied
12	Max PV input power		65000 W
13	Maximum DC voltage		1000V
14	MPPT voltage range	Standard range as per project requirement	200-850V
15	Maximum DC current		30/30/20/20 A
16	No. of DC input ports		3/3/2/2 Nos
17	Maximum Efficiency	97% as per IEC61683	98.7 %
18	DC voltage ripple		
19	Ambient temperature range		-25 to 60deg C
20	Humidity (non condensing)	95% non condensing	100%
21	Degree of protection		IP65
22	Dimensions(HxWxD)		586 x 788 x 264 mm
23	Weight		59 kg
24	Protective functions AC over/under voltage, AC over/under frequency, over-temperature, AC and DC over-current, DC over-voltage, against Islanding		Provided
25	Communication Interface	RS232/RS485/MPI ProfiBus/ Telephone Modem/WiFi	RS 485
26	User-display standard	LCD panel with membrane keypad	LCD panel with membrane keypad
27	Enclosure Environment Rating		IP 65
28	Safety and EMC		EN 62109-1/2, EN 61000-6-2, EN 61000-6-3, EN 61000-3-11, EN 61000-3-13
29	Anti Islanding Feature	IEEE 1547/L1741/IEC62116	IEC 62116



Guaranteed Technical Particular Data SheetPower Conditioning Unit			
Sl.	Particulars	Required	Offered
1	Manufacturer		GOODWE
2	Model name/No.		GW80K-MT
3	No of Units		
4	Nominal AC power		80 KW
5	Nominal AC voltage		400 V
6	Nominal AC Current		133 A
7	AC grid Frequency range	50Hz $\pm$ 0.5%	50HZ-60HZ
8	AC grid voltage range		340V to 440V
9	Power Factor (+ and -)		0.8Lag-0.8 Lead
10	Total Harmonic Distortion	as per IEEE-519 2014	Less than3%
11	AC over / under voltage over / under frequency protection		Provided
12	Max PV input power		80 KWp
13	Maximum DC voltage	1000V	1100 V
14	MPPT voltage range	Standard range as per project requirement	200V To 1000V
15	Maximum DC current		55/MPPT
16	No. of DC input ports		4
17	Maximum Efficiency	97% as per IEC61683	98.80%
18	DC voltage ripple		Less than0.5%
19	Ambient temperature range		_30C to 60°C
20	Humidity (non condensing)	95%, non condensing	0-100%
21	Degree of protection		IP 65
22	Dimensions(WxHxD)		586mm X 788mm X 267mm
23	Weight		70 Kg
24	Protective functions AC over/under voltage, AC over/under frequency, over-temperature, AC and DC over-current, DC over-voltage, against Islanding		Provided
25	Communication Interface	RS232/RS485,MPI ProfiBus/ Telephone Modem/WiFi	RS485, WiFi or 4G or PLC(Optional), Modbus-RTU (SunSpec Compliant)
26	User-display standard	LCD panel with membrane keypad	LED isplay
27	Enclosure Environment Rating		IP 66
28	Saftey and EMC		IEC 62116, IEC 61727, IEC 61683, IEC 60068 (1,2,14,30), IEC 62109-1/2, IEC 61000 IP65.
29	Anti Islanding Feature	IEEE1547/UL1741/IEC62116	Yes



Guaranteed Technical Particular Data Sheet -2 Power Conditioning Unit			
Sl.	Particulars	Required	Offered
1	Manufacturer		Goodwe
2	Model name/No.		GW100K-HT
3	No of Units		1
4	Nominal AC power		100 KVA
5	Nominal AC voltage		400 VAC
6	Nominal AC Current		167A
7	AC grid Frequency range	50Hz $\pm$ 0.5%	50-60Hz
8	AC grid voltage range		184VAC-264VAC
9	Power Factor (+ and -)		+/- 0.8
10	Total Harmonic Distortion	as per IEEE-519 2014	<3 %
11	AC over / under voltage over / under frequency protection		Complied
12	Max PV input power		150 kW
13	Maximum DC voltage		1100V
14	MPPT voltage range	Standard range as per project requirement	180-1000V
15	Maximum DC current		10X30 A
16	No. of DC input ports		2 nos
17	Maximum Efficiency	97% as per IEC61683	98.6%
18	DC voltage ripple		Less than 0.5
19	Ambient temperature range		-30 to 60 °C
20	Humidity (non condensing)	95%, non condensing	100%
21	Degree of protection		IP66
22	Dimensions(HxWxD)		676 x 1005 x 340 mm
23	Weight		93.5 kg
24	Protective functions AC over/under voltage, AC over/under frequency, over-temperature, AC and DC over-current, DC over-voltage, against Islanding		Provided
25	Communication Interface	RS232/RS485MPI ProfiBus/ Telephone Modem/WiFi	RS 485
26	User-display standard	LCD panel with membrane keypad	LED(Standard), LCD(Optional) ,Bluetooth+APP
27	Enclosure Environment Rating		IP 66
28	Safety and EMC		EN 62109-1/2, EN 61000-6-2 EN 61000-6-3, EN 61000-3-11, EN 61000-3-13
29	Anti Islanding Feature	IEEE1547/UL1741/IEC62116	IEC 62116



Guaranteed Technical Particular Data Sheet -2 Power Conditioning Unit			
SL	Particulars	Required	Offered
1	Manufacturer		SUNGROW
2	Model name/No		SG5.0RS
3	No of Units		
4	Nominal AC power		5kVA
5	Nominal AC voltage		240V
6	Nominal AC Current		22.8 A
7	AC grid Frequency range	50Hz $\pm$ 0.5%	45HZ-55HZ
8	AC grid voltage range		154-276V
9	Power Factor (+ and -)		0.8Lag-0.8 Lead
10	Total Harmonic Distortion	as per IEEE-519 2014	Less than3%
11	AC over / under voltage over / under frequency protection		Provided
12	Max PV input power		7.5 KWp
13	Maximum DC voltage	1000V	600V
14	MPPT voltage range	Standard range as per project requirement	40V To 560V
15	Maximum DC current		32A
16	No. of DC input ports		2
17	Maximum Efficiency	97% as per IEC61683	98.60%
18	DC voltage ripple		Less than0.5%
19	Ambient temperature range		-25C to60C
20	Humidity (non condensing)	95%, non condensing	100% Non-Condensing
21	Degree of protection		IP 65
22	Dimensions(HxWxD)		410x270x150mm
23	Weight		10 Kg
24	Protective functions AC over/under voltage, AC over/under frequency, over-temperature, AC and DC over-current, DC over-voltage, against Islanding		Provided
25	Communication Interface	RS232/RS485/MPI ProfiBus/ Telephone Modem/WiFi	RS 485
26	User-display standard	LCD panel with membrane keypad	LCD panel with membrane keypad
27	Enclosure Environment Rating		IP 65
28	Safety and EMC		EN 62109-1/2,EN 61000-6-2,EN 61000-6-3,EN 61000-3-11,EN 61000-3-13
29	Anti Islanding Feature	IEEE1547/UL1741/IEC62116	IEC 62116



Guaranteed Technical Particular Data Sheet -2 Power Conditioning Unit			
Sl.	Particulars	Required	Offered
1	Manufacturer		SUNGROW
2	Model name/No		SG10KTL-M
3	No of Units		
4	Nominal AC power		11000VA
5	Nominal AC voltage		400V
6	Nominal AC Current		16.5 A
7	AC grid Frequency range	50Hz $\pm$ 0.5%	45HZ-55HZ
8	AC grid voltage range		270-480V
9	Power Factor (+ and -)		0.8Lag-0.8 Lead
10	Total Harmonic Distortion	as per IEEE-519 2014	Less than3%
11	AC over / under voltage over / under frequency protection		Provided
12	Max PV input power		10KWp
13	Maximum DC voltage	1000V	600V
14	MPPT voltage range	Standard range as per project requirement	200V To 1000V
15	Maximum DC current		22A
16	No. of DC input ports		2
17	Maximum Efficiency	97% as per IEC61683	98.60%
18	DC voltage ripple		Less than0.5%
19	Ambient temperature range		-25 $^{\circ}$ to60 $^{\circ}$ C
20	Humidity (non condensing)	95% non condensing	100% Non-Condensing
21	Degree of protection		IP 65
22	Dimensions(HxWxD)		370x485x160mm
23	Weight		20 Kg
24	Protective functions AC over/under voltage, AC over/under frequency, over-temperature, AC and DC over-current, DC over-voltage, against Islanding		Provided
25	Communication Interface	RS232/RS485/Modbus/ Telephone Modem/WiFi	RS 485
26	User-display standard	LCD panel with membrane keypad	LCD panel with membrane keypad
27	Enclosure Environment Rating		IP 65
28	Safety and EMC		EN 62109-1/2,EN 61000-6-2EN 61000-6-3,EN 61000-3-11,EN 61000-3-13
29	Anti Islanding Feature	IEEE1547/UL1741/IEC62116	IEC 62116



Guaranteed Technical Particular Data Sheet -2 Power Conditioning Unit			
Sl.	Particulars	Required	Offered
1	Manufacturer		SUNGROW
2	Model name/No.		SG20KTL-M
3	No of Units		
4	Nominal AC power		20 kVA
5	Nominal AC voltage		400V 3Phase
6	Nominal AC Current		31.9 A
7	AC grid Frequency range	50Hz $\pm$ 0.5%	45HZ-55HZ
8	AC grid voltage range		270V to 480V
9	Power Factor (+ and -)		0.8Lag-0.8 Lead
10	Total Harmonic Distortion	as per IEEE-519 2014	Less than3%
11	AC over / under voltage over / under frequency protection		Provided
12	Max PV input power		20.2 KWp
13	Maximum DC voltage	1000V	1000V
14	MPPT voltage range	Standard range as per project requirement	200V To 1000V
15	Maximum DC current		44A
16	No. of DC input ports		2
17	Maximum Efficiency	97% as per IEC61683	98.60%
18	DC voltage ripple		Less than0.5%
19	Ambient temperature range		-25C to60C
20	Humidity (non condensing)	95%, non condensing	100% Non-Condensing
21	Degree of protection		IP 65
22	Dimensions(HxWxD)		6370x485x210mm
23	Weight		24 Kg
24	Protective functions AC over/under voltage, AC over/under frequency, over-temperature, AC and DC over-current, DC over-voltage, against Islanding		Provided
25	Communication Interface	RS232/RS485MPI ProfiBus/ Telephone Modem/WiFi	RS 485
26	User-display standard	LCD panel with membrane keypad	LCD panel with membrane keypad
27	Enclosure Environment Rating		IP 65
28	Safety and EMC		EN 62109-1/2,EN 61000-6-2EN 61000-6-3,EN 61000-3-11,EN 61000-3-13
29	Anti Islanding Feature	IEEE1547/UL1741/IEC62116	IEC 62116



Guaranteed Technical Particular Data Sheet -2 Power Conditioning Unit			
Sl.	Particulars	Required	Offered
1	Manufacturer		SUNGROW
2	Model name/No.		SG33CX
3	No of Units		
4	Nominal AC power		33 kVA
5	Nominal AC voltage		400V 3Phase
6	Nominal AC Current		55.2 A
7	AC grid Frequency range	50Hz $\pm$ 0.5%	45HZ-55HZ
8	AC grid voltage range		312V to 528V
9	Power Factor (+ and -)		0.8Lag-0.8 Lead
10	Total Harmonic Distortion	as per IEEE-519 2014	Less than3%
11	AC over / under voltage over / under frequency protection		Provided
12	Max PV input power		33.4 KWp
13	Maximum DC voltage	1000V	1100V
14	MPPT voltage range	Standard range as per project requirement	200V To 1000V
15	Maximum DC current		78A
16	No. of DC input ports		3
17	Maximum Efficiency	97% as per IEC61683	98.60%
18	DC voltage ripple		Less than0.5%
19	Ambient temperature range		-30°C to60°C
20	Humidity (non condensing)	95%, non condensing	100% Non-Condensing
21	Degree of protection		IP 66
22	Dimensions(HxWxD)		702x595x310mm
23	Weight		50 Kg
24	Protective functions AC over/under voltage, AC over/under frequency, over-temperature, AC and DC over-current, DC over-voltage, against Islanding		Provided
25	Communication Interface	RS232/RS485MPI ProfiBus/ Telephone Modem/WiFi	RS 485
26	User-display standard	LCD panel with membrane keypad	LED Display
27	Enclosure Environment Rating		IP 65
28	Safety and EMC		EN 62109-1/2,EN 61000-6-2EN 61000-6-3,EN 61000-3-11,EN 61000-3-13
29	Anti Islanding Feature	IEEE1547/UL1741/IEC62116	IEC 62116



Guaranteed Technical Particular Data Sheet -2 Power Conditioning Unit			
Sl.	Particulars	Required	Offered
1	Manufacturer		SUNGROW
2	Model name/No.		SG50CX
3	No of Units		
4	Nominal AC power		55 kVA
5	Nominal AC voltage		400V 3Phase
6	Nominal AC Current		55.2 A
7	AC grid Frequency range	50Hz $\pm$ 0.5%	45HZ-55HZ
8	AC grid voltage range		312V to 528V
9	Power Factor (+ and -)		0.8Lag-0.8 Lead
10	Total Harmonic Distortion	as per IEEE-519 2014	Less than3%
11	AC over / under voltage over / under frequency protection		Provided
12	Max PV input power		50 KWp
13	Maximum DC voltage	1000V	1100V
14	MPPT voltage range	Standard range as per project requirement	200V To 1000V
15	Maximum DC current		130A
16	No. of DC input ports		5
17	Maximum Efficiency	97% as per IEC61683	98.60%
18	DC voltage ripple		Less than0.5%
19	Ambient temperature range		-25C to60C
20	Humidity (non condensing)	95%, non condensing	100% Non-Condensing
21	Degree of protection		IP 65
22	Dimensions(HxWxD)		782x645x310mm
23	Weight		62 Kg
24	Protective functions AC over/under voltage, AC over/under frequency, over-temperature, AC and DC over-current, DC over-voltage, against Islanding		Provided
25	Communication Interface	RS232/RS485MPI ProfiBus/ Telephone Modem/WiFi	RS 485
26	User-display standard	LCD panel with membrane keypad	LCD panel with membrane keypad
27	Enclosure Environment Rating		IP 65
28	Safety and EMC		EN 62109-1/2,EN 61000-6-2EN 61000-6-3,EN 61000-3-11,EN 61000-3-13
29	Anti Islanding Feature	IEEE1547/UL1741/IEC62116	IEC 62116



Guaranteed Technical Particular Data Sheet -2 Power Conditioning Unit			
Sl.	Particulars	Required	Offered
1	Manufacturer		SUNGROW
2	Model name/No.		SG110CX
3	No of Units		
4	Nominal AC power		110 kVA
5	Nominal AC voltage		400V
6	Nominal AC Current		158.8A
7	AC grid Frequency range	50Hz $\pm$ 0.5%	45HZ-55HZ
8	AC grid voltage range		320V to 460V
9	Power Factor (+ and -)		0.8Lag-0.8 Lead
10	Total Harmonic Distortion	as per IEEE-519 2014	Less than3%
11	AC over / under voltage over / under frequency protection		Provided
12	Max PV input power		110KWp
13	Maximum DC voltage	1000V	1100V
14	MPPT voltage range	Standard range as per project requirement	200V To 1000V
15	Maximum DC current		26A*9
16	No. of DC input ports		1
17	Maximum Efficiency	97% as per IEC61683	98.70%
18	DC voltage ripple		Less than0.5%
19	Ambient temperature range		-30°C to60°C
20	Humidity (non condensing)	95%, non condensing	100% Non-Condensing
21	Degree of protection		IP 66
22	Dimensions(HxWxD)		660*1051*362.5mm
23	Weight		89Kg
24	Protective functions AC over/under voltage, AC over/under frequency, over-temperature, AC and DC over-current, DC over-voltage, against Islanding		Provided
25	Communication Interface	RS232/RS485MPI ProfiBus/ Telephone Modem/WiFi	RS 485
26	User-display standard	LCD panel with membrane keypad	LED Display
27	Enclosure Environment Rating		IP 66
28	Saftey and EMC		EN 62109-1/2,EN 61000-6-2EN 61000-6-3,EN 61000-3-11,EN 61000-3-13
29	Anti Islanding Feature	IEEE1547/UL1741/IEC62116	IEC 62116



Guaranteed Technical Particular Data Sheet -2 Power Conditioning Unit			
Sl.	Particulars	Required	Offered
1	Manufacturer		GROWATT
2	Model name/No.		MOD 5000TL3-X
3	No of Units		1 No
4	Nominal AC power		5000W
5	Nominal AC voltage		220V/380V, 230V/400V
6	Nominal AC Current		8.3 A
7	AC grid Frequency range	50Hz $\pm$ 0.5%	50/60Hz
8	AC grid voltage range		340-440V
9	Power Factor (+ and -)		0.8leading-0.8lagging
10	Total Harmonic Distortion	as per IEEE-519 2014	<3 %
11	AC over / under voltage over / under frequency protection		Complied
12	Max PV input power		7500 W
13	Maximum DC voltage		1100V
14	MPPT voltage range	Standard range as per project requirement	140V-1000V
15	Maximum DC current		13A / MPPT
16	No. of DC input ports		2
17	Maximum Efficiency	97% as per IEC61683	98.3 %
18	DC voltage ripple		Less than 0.5
19	Ambient temperature range		-25 to 60 °C
20	Humidity (non condensing)	95%, non condensing	0-100%
21	Degree of protection		IP65
22	Dimensions(HxWxD)		387 x 425 x 147 mm
23	Weight		12.5 kg
24	Protective functions AC over/under voltage, AC over/under frequency, over-temperature, AC and DC over-current, DC over-voltage, against Islanding		Provided
25	Communication Interface	RS232/RS485MPI ProfiBus/ Telephone Modem/WiFi	RS 485
26	User-display standard	LCD panel with membrane keypad	LED
27	Enclosure Environment Rating		IP 65
28	Safety and EMC		EN 62109-1/2, EN 61000-6-2 EN 61000-6-3, EN 61000-3-11, EN 61000-3-13
29	Anti Islanding Feature	IEEE1547/UL1741/IEC62116	IEC 62116



Guaranteed Technical Particular Data Sheet -2 Power Conditioning Unit			
Sl.	Particulars	Required	Offered
1	Manufacturer		GROWWATT
2	Model name/No.		MOD 5000TL3-XH
3	No of Units		1 No
4	Nominal AC power		5KW
5	Nominal AC voltage		230/ 400 VAC
6	Nominal AC Current		8.3A
7	AC grid Frequency range	50Hz $\pm$ 0.5%	50-60Hz
8	AC grid voltage range		340VAC-440VAC
9	Power Factor (+ and -)		+/- 0.8
10	Total Harmonic Distortion	as per IEEE-519 2014	<3 %
11	AC over / under voltage over / under frequency protection		Complied
12	Max PV input power		5000 W
13	Maximum DC voltage		1100V
14	MPPT voltage range	Standard range as per project requirement	140-1000V
15	Maximum DC current		16A per MPPT
16	No. of DC input ports		2
17	Maximum Efficiency	97% as per IEC61683	98.8 %
18	DC voltage ripple		Less than 0.5
19	Ambient temperature range		-25 to 60 °C
20	Humidity (non condensing)	95%, non condensing	100%
21	Degree of protection		IP65
22	Dimensions(HxWxD)		387*425*147 mm
23	Weight		12.5kg
24	Protective functions AC over/under voltage, AC over/under frequency, over-temperature, AC and DC over-current, DC over-voltage, against Islanding		Provided
25	Communication Interface	RS232/RS485MPI ProfiBus/ Telephone Modem/WiFi	RS 485
26	User-display standard	LCD panel with membrane keypad	LCD panel with membrane keypad
27	Enclosure Environment Rating		IP 65
28	Safety and EMC		EN 62109-1/2, EN 61000-6-2, EN 61000-6-3, EN 61000-3-11, EN 61000-3-13
29	Anti Islanding Feature	IEEE1547/UL1741/IEC62116	IEC 62116



Guaranteed Technical Particular Data Sheet -2 Power Conditioning Unit			
Sl.	Particulars	Required	Offered
1	Manufacturer		GROWWATT
2	Model name/No.		MOD 10KTL3-XH
3	No of Units		1 No
4	Nominal AC power		10KW
5	Nominal AC voltage		230/ 400 VAC
6	Nominal AC Current		16.7A
7	AC grid Frequency range	50Hz $\pm$ 0.5%	50-60Hz
8	AC grid voltage range		340VAC-440VAC
9	Power Factor (+ and -)		+/- 0.8
10	Total Harmonic Distortion	as per IEEE-519 2014	<3 %
11	AC over / under voltage over / under frequency protection		Complied
12	Max PV input power		10000 W
13	Maximum DC voltage		1100V
14	MPPT voltage range	Standard range as per project requirement	140-1000V
15	Maximum DC current		16A per MPPT
16	No. of DC input ports		2
17	Maximum Efficiency	97% as per IEC61683	98.8 %
18	DC voltage ripple		Less than 0.5
19	Ambient temperature range		-25 to 60 °C
20	Humidity (non condensing)	95%, non condensing	100%
21	Degree of protection		IP65
22	Dimensions(HxWxD)		387*425*178 mm
23	Weight		14kg
24	Protective functions AC over/under voltage, AC over/under frequency, over-temperature, AC and DC over-current, DC over-voltage, against Islanding		Provided
25	Communication Interface	RS232/RS485MPI ProfiBus/ Telephone Modem/WiFi	RS 485
26	User-display standard	LCD panel with membrane keypad	LCD panel with membrane keypad
27	Enclosure Environment Rating		IP 65
28	Safety and EMC		EN 62109-1/2, EN 61000-6-2 EN 61000-6-3, EN 61000-3-11, EN 61000-3-13
29	Anti Islanding Feature	IEEE1547/UL1741/IEC62116	IEC 62116



Guaranteed Technical Particular Data Sheet -2 Power Conditioning Unit			
Sl.	Particulars	Required	Offered
1	Manufacturer		GROWATT
2	Model name/No.		MID 15KTL3-X
3	No of Units		1 No
4	Nominal AC power		15KW
5	Nominal AC voltage		230/ 400 VAC
6	Nominal AC Current		24.2A
7	AC grid Frequency range	50Hz $\pm$ 0.5%	50-60Hz
8	AC grid voltage range		340VAC-440VAC
9	Power Factor (+ and -)		+/- 0.8
10	Total Harmonic Distortion	as per IEEE-519 2014	<3 %
11	AC over / under voltage over / under frequency protection		Complied
12	Max PV input power		22500 W
13	Maximum DC voltage		1100V
14	MPPT voltage range	Standard range as per project requirement	200-100V
15	Maximum DC current		27 per MPPT
16	No. of DC input ports		4
17	Maximum Efficiency	97% as per IEC61683	98.75%
18	DC voltage ripple		Less than 0.5
19	Ambient temperature range		-25 to 60 °C
20	Humidity (non condensing)	95%, non condensing	100%
21	Degree of protection		IP66
22	Dimensions(HxWxD)		525 x 395 x 222 mm
23	Weight		23 kg
24	Protective functions AC over/under voltage, AC over/under frequency, over-temperature, AC and DC over-current, DC over-voltage, against Islanding		Provided
25	Communication Interface	RS232/RS485MPI ProfiBus/ Telephone Modem/WiFi	RS 485
26	User-display standard	LCD panel with membrane keypad	OLED+LED/WIFI+APP
27	Enclosure Environment Rating		IP 65
28	Safety and EMC		EN50549-1, C10/C11, UTE C 15-712, IEC61727, IEC 60068, IEC 61683
29	Anti Islanding Feature	IEEE1547/UL1741/IEC62116	IEC 62116



Guaranteed Technical Particular Data Sheet -2 Power Conditioning Unit			
Sl.	Particulars	Required	Offered
1	Manufacturer		GROWATT
2	Model name/No.		MID 25KTL3-X
3	No of Units		1 No
4	Nominal AC power		25KW
5	Nominal AC voltage		230/ 400 VAC
6	Nominal AC Current		40.2A
7	AC grid Frequency range	50Hz $\pm$ 0.5%	50-60Hz
8	AC grid voltage range		340VAC-440VAC
9	Power Factor (+ and -)		+/- 0.8
10	Total Harmonic Distortion	as per IEEE-519 2014	<3 %
11	AC over / under voltage over / under frequency protection		Complied
12	Max PV input power		37500 W
13	Maximum DC voltage		1100V
14	MPPT voltage range	Standard range as per project requirement	200-100V
15	Maximum DC current		27 per MPPT
16	No. of DC input ports		6
17	Maximum Efficiency	97% as per IEC61683	98.75%
18	DC voltage ripple		Less than 0.5
19	Ambient temperature range		-25 to 60 °C
20	Humidity (non condensing)	95%, non condensing	100%
21	Degree of protection		IP66
22	Dimensions(HxWxD)		525 x 395 x 222 mm
23	Weight		23 kg
24	Protective functions AC over/under voltage, AC over/under frequency, over-temperature, AC and DC over-current, DC over-voltage, against Islanding		Provided
25	Communication Interface	RS232/RS485MPI ProfiBus/ Telephone Modem/WiFi	RS 485
26	User-display standard	LCD panel with membrane keypad	OLED+LED/WIFI+APP
27	Enclosure Environment Rating		IP 65
28	Safety and EMC		EN50549-1, C10/C11, UTE C 15-712, IEC61727, IEC 60068, IEC 61683
29	Anti Islanding Feature	IEEE1547/UL1741/IEC62116	IEC 62116



Guaranteed Technical Particular Data Sheet -2 Power Conditioning Unit			
Sl.	Particulars	Required	Offered
1	Manufacturer		GROWATT
2	Model name/No.		MID 33KTL3-X2
3	No of Units		1 No
4	Nominal AC power		33KW
5	Nominal AC voltage		230/ 400 VAC
6	Nominal AC Current		55.5A
7	AC grid Frequency range	50Hz $\pm$ 0.5%	50-60Hz
8	AC grid voltage range		340VAC-440VAC
9	Power Factor (+ and -)		+/- 0.8
10	Total Harmonic Distortion	as per IEEE-519 2014	<3 %
11	AC over / under voltage over / under frequency protection		Complied
12	Max PV input power		49500 W
13	Maximum DC voltage		1100V
14	MPPT voltage range	Standard range as per project requirement	200-100V
15	Maximum DC current		32A per MPPT
16	No. of DC input ports		6
17	Maximum Efficiency	97% as per IEC61683	98.8 %
18	DC voltage ripple		Less than 0.5
19	Ambient temperature range		-25 to 60 °C
20	Humidity (non condensing)	95%, non condensing	100%
21	Degree of protection		IP66
22	Dimensions(HxWxD)		580 x 435 x 230 mm
23	Weight		31 kg
24	Protective functions AC over/under voltage, AC over/under frequency, over-temperature, AC and DC over-current, DC over-voltage, against Islanding		Provided
25	Communication Interface	RS232/RS485MPI ProfiBus/ Telephone Modem/WiFi	RS 485
26	User-display standard	LCD panel with membrane keypad	OLED+LED/WIFI+APP
27	Enclosure Environment Rating		IP 65
28	Safety and EMC		EN50549-1, C10/C11, UTE C 15-712, IEC61727, IEC 60068, IEC 61683,
29	Anti Islanding Feature	IEEE1547/UL1741/IEC62116	IEC 62116



Guaranteed Technical Particular Data Sheet -2 Power Conditioning Unit			
Sl.	Particulars	Required	Offered
1	Manufacturer		GROWATT
2	Model name/No.		MID 40KTL3-X2
3	No of Units		1 No
4	Nominal AC power		40KW
5	Nominal AC voltage		230/ 400 VAC
6	Nominal AC Current		67.3A
7	AC grid Frequency range	50Hz $\pm$ 0.5%	50-60Hz
8	AC grid voltage range		340VAC-440VAC
9	Power Factor (+ and -)		+/- 0.8
10	Total Harmonic Distortion	as per IEEE-519 2014	<3 %
11	AC over / under voltage over / under frequency protection		Complied
12	Max PV input power		60000 W
13	Maximum DC voltage		1100V
14	MPPT voltage range	Standard range as per project requirement	200-100V
15	Maximum DC current		32A per MPPT
16	No. of DC input ports		8
17	Maximum Efficiency	97% as per IEC61683	98.8 %
18	DC voltage ripple		Less than 0.5
19	Ambient temperature range		-25 to 60 °C
20	Humidity (non condensing)	95%, non condensing	100%
21	Degree of protection		IP66
22	Dimensions(HxWxD)		580 x 435 x 230 mm
23	Weight		37 kg
24	Protective functions AC over/under voltage, AC over/under frequency, over-temperature, AC and DC over-current, DC over-voltage, against Islanding		Provided
25	Communication Interface	RS232/RS485MPI ProfiBus/ Telephone Modem/WiFi	RS 485
26	User-display standard	LCD panel with membrane keypad	OLED+LED/WIFI+APP
27	Enclosure Environment Rating		IP 65
28	Safety and EMC		EN50549-1, C10/C11, UTE C 15-712, IEC61727, IEC 60068, IEC 61683,
29	Anti Islanding Feature	IEEE1547/UL1741/IEC62116	IEC 62116



Guaranteed Technical Particular Data Sheet -2 Power Conditioning Unit			
Sl.	Particulars	Required	Offered
1	Manufacturer		GROWATT
2	Model name/No.		MID 50KTL3-X2
3	No of Units		1 No
4	Nominal AC power		50KW
5	Nominal AC voltage		230/ 400 VAC
6	Nominal AC Current		84.1A
7	AC grid Frequency range	50Hz $\pm$ 0.5%	50-60Hz
8	AC grid voltage range		340VAC-440VAC
9	Power Factor (+ and -)		+/- 0.8
10	Total Harmonic Distortion	as per IEEE-519 2014	<3 %
11	AC over / under voltage over / under frequency protection		Complied
12	Max PV input power		75000 W
13	Maximum DC voltage		1100V
14	MPPT voltage range	Standard range as per project requirement	200-100V
15	Maximum DC current		32A per MPPT
16	No. of DC input ports		8
17	Maximum Efficiency	97% as per IEC61683	98.8 %
18	DC voltage ripple		Less than 0.5
19	Ambient temperature range		-25 to 60 °C
20	Humidity (non condensing)	95%, non condensing	100%
21	Degree of protection		IP66
22	Dimensions(HxWxD)		580 x 435 x 230 mm
23	Weight		37 kg
24	Protective functions AC over/under voltage, AC over/under frequency, over-temperature, AC and DC over-current, DC over-voltage, against Islanding		Provided
25	Communication Interface	RS232/RS485MPI ProfiBus/ Telephone Modem/WiFi	RS 485
26	User-display standard	LCD panel with membrane keypad	OLED+LED/WIFI+APP
27	Enclosure Environment Rating		IP 65
28	Safety and EMC		EN50549-1, C10/C11, UTE C 15-712, IEC61727, IEC 60068, IEC 61683,
29	Anti Islanding Feature	IEEE1547/UL1741/IEC62116	IEC 62116



Guaranteed Technical Particular Data Sheet -2 Power Conditioning Unit			
Sl.	Particulars	Required	Offered
1	Manufacturer		GROWATT
2	Model name/No.		MAX 80KTL3 LV
3	No of Units		1 No
4	Nominal AC power		80KW
5	Nominal AC voltage		230/ 400 VAC
6	Nominal AC Current		128.8A
7	AC grid Frequency range	50Hz $\pm$ 0.5%	50-60Hz
8	AC grid voltage range		340VAC-440VAC
9	Power Factor (+ and -)		+/- 0.8
10	Total Harmonic Distortion	as per IEEE-519 2014	<3 %
11	AC over / under voltage over / under frequency protection		Complied
12	Max PV input power		120000 W
13	Maximum DC voltage		1100V
14	MPPT voltage range	Standard range as per project requirement	200-100V
15	Maximum DC current		26 per MPPT
16	No. of DC input ports		14
17	Maximum Efficiency	97% as per IEC61683	99%
18	DC voltage ripple		Less than 0.5
19	Ambient temperature range		-25 to 60 °C
20	Humidity (non condensing)	95%, non condensing	100%
21	Degree of protection		IP66
22	Dimensions(HxWxD)		860 x 600 x 300 mm
23	Weight		86 kg
24	Protective functions AC over/under voltage, AC over/under frequency, over-temperature, AC and DC over-current, DC over-voltage, against Islanding		Provided
25	Communication Interface	RS232/RS485MPI ProfiBus/ Telephone Modem/WiFi	RS 485
26	User-display standard	LCD panel with membrane keypad	LED/WIFI+APP
27	Enclosure Environment Rating		IP 65
28	Safety and EMC		EN50438, EN50549-1, C10/C11, UTE C 15-712, IEC61727, IEC 60068, IEC 61683
29	Anti Islanding Feature	IEEE1547/UL1741/IEC62116	IEC 62116



Guaranteed Technical Particular Data Sheet			
Inverter			
Sl.	Particulars	Required	Offered
1	Manufacturer		Fimer
2	Model name/No.		TRIO-15-TL
3	No of Units		
4	Nominal AC power		15 KVA
5	Nominal AC voltage		400V
6	Nominal AC Current		23 A
7	AC grid Frequency range	50Hz $\pm$ 0.5%	47HZ-53HZ
8	AC grid voltage range		320V-480V
9	Power Factor (+ and -)		0.9 Lag and Lead
10	Total Harmonic Distortion	as per IEEE-519 2014	Less than3%
11	AC over / under voltage over / under frequency protection		Provided
12	Max PV input power		15300 W
13	Maximum DC voltage		1100V
14	MPPT voltage range		460V to 850V
15	Maximum DC current		30 A
16	No. of DC input ports		2
17	Maximum Efficiency	>97% as per IEC61683	98.20%
18	DC voltage ripple		Less than0.5%
19	Ambient temperature range		-25°C to60°C
20	Humidity (non condensing)	95%, non condensing	100% Condensing
21	Degree of protection		IP 65
22	Dimensions(HxWxD)		568.2x473.6x207 mm
23	Weight		29.6 Kg
24	Protective functions AC over/under voltage, AC over/under frequency, over-temperature, AC and DC over-current, DC over-voltage, against Islanding		Provided
25	Communication Interface	Monitoring Software should support secure MQTT protocol to transmit the data	RS 485,WLAN
26	User-display standard	LCD panel with membrane keypad	LCD panel with membrane keypad
27	Enclosure Environment Rating		IP 65
28	Safety and EMC		IEC 62109-1,IEC 62109-2,EN 61000-6-1,EN 61000-6-3,EN 61000-3-11,EN 61000-3-12
29	Anti Islanding Feature	IEEE1547/UL1741/IEC62116	IEC 62116



Guaranteed Technical Particular Data Sheet Power Conditioning Unit			
Sl.	Particulars	Required	Offered
1	Manufacturer		FIMER
2	Model name/No.		PVS-20-TL
3	No of units		
4	Nominal AC power		20 KVA
5	Nominal AC voltage		400V
6	Nominal AC Current		33.4A
7	AC grid Frequency range	50Hz $\pm$ 0.5%	45Hz-55Hz
8	AC grid voltage range		320V-480V
9	Power Factor (+ and -)		0.995Lag and Lead
10	Total Harmonic Distortion	as per IEEE-519 2014	Less than 3%
11	AC over / under voltage over / under frequency protection		Provided
12	Max PV input power		20500 W
13	Maximum DC voltage	1000V	620 V
14	MPPT voltage range		200V to 1000V
15	Maximum DC current		2*26A + 2*22A
16	No. of DC input ports		2 IN each MPPT
17	Maximum Efficiency	> 97% As per IEC61683	98.30%
18	DC voltage ripple		Less than 0.5%
19	Ambient temperature range		-25C to 60C
20	Humidity (non condensing)	95% non-condensing	100% Condensing
21	Degree of protection		IP 65
22	Dimensions(HxWxD)		675*591.8*227.5mm
23	Weight		50Kg
24	Protective functions AC over/under voltage, AC over/under frequency, over-temperature, AC and DC over-current, DC over-voltage, against islanding		Provided
25	Communication Interface	RS232/RS485MPiProfibus/Tel ephone Modem/WiFi	RS 485,WLAN
26	User display standard	LCD panel with membrane keypad	LED Display
27	Enclosure Environment Rating		IP 65
28	Safety and EMC		IEC 62109-1,IEC 62109-2,IEC 61000-6-1,IEC 61000-6-3, IEC 61000-3-11,IEC 61000-3-12
29	Anti Islanding Feature	IEEE1547/UL1741/IEC62116	IEC 62116



Guaranteed Technical Particular Data Sheet Power conditioning unit			
Sl.	Particulars	Required	Offered
1	Manufacturer		FIMER
2	Model name/No.		TRIO-27.6-TL-OUTD
3	No of Units		
4	Nominal AC power		27.6 KW
5	Nominal AC voltage		400V
6	Nominal AC Current		45 A
7	AC grid Frequency range	50Hz $\pm$ 0.5%	47HZ-53HZ
8	AC grid voltage range		320V-480V
9	Power Factor (+ and -)		0.9 Lag and Lead
10	Total Harmonic Distortion	as per IEEE-519 2014	Less than 3%
11	AC over / under voltage over / under frequency protection		Provided
12	Max PV input power		28600 Wp
13	Maximum DC voltage	1000V	1000V
14	MPPT voltage range		500V to 800V
15	Maximum DC current		64 A
16	No. of DC input ports		5 IN S2X and S2P Version
17	Maximum Efficiency	97% as per IEC61683	98.20%
18	DC voltage ripple		Less than 0.5%
19	Ambient temperature range		-25°C to 60°C
20	Humidity (non condensing)	95%, non condensing	100% Condensing
21	Degree of protection		IP 65
22	Dimensions(HxWxD)		1061x702x292 mm
23	Weight		75 Kg
24	Protective functions AC over/under voltage, AC over/under frequency, over temperature, AC and DC over-current, DC over-voltage, against Islanding		Provided
25	Communication Interface	RS232/RS485MPI ProfiBus/ Telephone Modem/WiFi	RS 485,WLAN
26	User-display standard	LCD panel with membrane keypad	LED Display
27	Enclosure Environment Rating		IP 65
28	Safety and EMC		IEC 62109-1,IEC 62109-2,EN 61000-6-1,EN 61000-6-3,EN 61000-3-11,EN 61000-3-12
29	Anti Islanding Feature	IEEE1547/UL1741/IEC62116	IEC 62116



Guaranteed Technical Particular Data Sheet Power Conditioning Unit			
Sl.	Particulars	Required	Offered
1	Manufacturer		FIMER
2	Model name/No.		PVS-30-TL
3	No of units		
4	Nominal AC power		30 KVA
5	Nominal AC voltage		400V
6	Nominal AC Current		50.1
7	AC grid Frequency range	50Hz $\pm$ 0.5%	45Hz-55Hz
8	AC grid voltage range		320V-480V
9	Power Factor (+ and -)		0.995Lag and Lead
10	Total Harmonic Distortion	as per IEEE-519:2014	Less than3%
11	AC over / under voltage over / under frequency protection		Provided
12	Max PV input power		30600 W
13	Maximum DC voltage	1000V	620V
14	MPPT voltage range		200V to 1000V
15	Maximum DC current		2*26A+ 2*22A
16	No. of DC input ports		2 IN each MPPT
17	Maximum Efficiency	> 97% As per IEC61683	98.30%
18	DC voltage ripple		Less than0.5%
19	Ambient temperature range		-25C to60C
20	Humidity (non-condensing)	95%, non-condensing	100% Condensing
21	Degree of protection		IP 65
22	Dimensions(LxWxD)		675*591.8*227.5mm
23	Weight		50Kg
24	Protective functions AC over/under voltage, AC over/under frequency, over-temperature, AC and DC over-current, DC over-voltage, against Islanding		Provided
25	Communication Interface	RS232/RS485MPITProfibus/Tel ephone Modem/WiFi	RS 485,WLAN
26	User display standard	LCD panel with membrane keypad	LED Display
27	Enclosure Environment Rating		IP 65
28	Safety and EMC		IEC 62109-1,IEC 62109-2,IEC 61000-6-1,IEC 61000-6-3, IEC 61000-3-11,IEC 61000-3-12
29	Anti Islanding Feature	IEEE1547/UL1741/IEC62116	IEC 62116

Guaranteed Technical Particular Data Sheet Power Conditioning Unit			
Sl.	Particulars	Required	Offered
1	Manufacturer		FIMER
2	Model name/No.		PVS-33-TL
3	No of units		
4	Nominal AC power		33 KVA
5	Nominal AC voltage		400V
6	Nominal AC Current		55.1 A
7	AC grid Frequency range	50Hz $\pm$ 0.5%	45HZ-55HZ
8	AC grid voltage range		320V-480V
9	Power Factor (+ and -)		0.995Lag and Lead
10	Total Harmonic Distortion	as per IEEE-519 2014	Less than 3%
11	AC over / under voltage over / under frequency protection		Provided
12	Max PV input power		33700 W
13	Maximum DC voltage	1000V	620V
14	MPPT voltage range		200V to 1000V
15	Maximum DC current		2*26A+ 2*22A
16	No. of DC input ports		2 IN each MPPT
17	Maximum Efficiency	> 97% As per IEC61683	98.30%
18	DC voltage ripple		Less than 0.5%
19	Ambient temperature range		-25C to 60C
20	Humidity (non condensing)	95% non-condensing	100% Condensing
21	Degree of protection		IP 65
22	Dimensions(HxWxD)		675*591.8*227.5mm
23	Weight		50Kg
24	Protective functions AC over/under voltage, AC over/under frequency, over-temperature, AC and DC over-current, DC over-voltage, against Islanding		Provided
25	Communication Interface	RS232/RS485/MPI/Profibus/Tel ephone Modem/WiFi	RS 485, WLAN
26	User-display standard	LCD panel with membrane keypad	LED Display
27	Enclosure Environment Rating		IP 65
28	Safety and EMC		IEC 62109-1, IEC 62109-2, IEC 61000-6-1, IEC 61000-6-3, IEC 61000-3-11, IEC 61000-3-12
29	Anti Islanding Feature	IEEE1547/UL1741/IEC62116	IEC 62116



Guaranteed Technical Particular Data Sheet Power Conditioning Unit			
Sl.	Particulars	Required	Offered
1	Manufacturer		FIMER
2	Model name/No.		PVS-50-TL
3	No of units		
4	Nominal AC power		50 KVA
5	Nominal AC voltage		400V
6	Nominal AC Current		50.1
7	AC grid Frequency range	50Hz $\pm$ 0.5%	45HZ-55HZ
8	AC grid voltage range		320V-480V
9	Power Factor (+ and -)		0.995Lag and Lead
10	Total Harmonic Distortion	as per IEEE-519 2014	Less than 3%
11	AC over / under voltage over / under frequency protection		Provided
12	Max PV input power		50000W
13	Maximum DC voltage	1000V	610V
14	MPPT voltage range		400V to 800V
15	Maximum DC current		36A
16	No. of DC input ports		5
17	Maximum Efficiency	> 97% As per IEC61683	98.60%
18	DC voltage ripple		Less than 0.5%
19	Ambient temperature range		-25C to 60C
20	Humidity (non condensing)	95%, non-condensing	100% Condensing
21	Degree of protection		IP 65
22	Dimensions(HxWxD)		750*1100*257mm
23	Weight		70Kg
24	Protective functions AC over/under voltage, AC over/under frequency, over-temperature, AC and DC over-current, DC over-voltage, against Islanding		Provided
25	Communication Interface	RS232/RS485/MPI/Profibus/Tel ephone Modem/WiFi	RS 485, WLAN
26	User-display standard	LCD panel with membrane keypad	LED Display
27	Enclosure Environment Rating		IP 65
28	Safety and EMC		IEC 62109-1, IEC 62109-2, IEC 61000-6-1, IEC 61000-6-3, IEC 61000-3-11, IEC 61000-3-12
29	Anti Islanding Feature	IEEE1547/UL1741/IEC62116	IEC 62116



Guaranteed Technical Particular Data Sheet Power Conditioning Unit			
Sl.	Particulars	Required	Offered
1	Manufacturer		FIMER
2	Model name/No.		PV5-60-TL
3	No of units		
4	Nominal AC power		60 KVA
5	Nominal AC voltage		400V
6	Nominal AC Current		50 A
7	AC grid Frequency range	50Hz $\pm$ 0.5%	45HZ-55HZ
8	AC grid voltage range		320V-480V
9	Power Factor (+ and -)		0.99Lag and Lead
10	Total Harmonic Distortion	as per IEEE-519-2014	Less than 3%
11	AC over / under voltage over / under frequency protection		Provided
12	Max PV input power		66000W
13	Maximum DC voltage	1000V	610V
14	MPPT voltage range		400V to 800V
15	Maximum DC current		36A
16	No. of DC input ports		5
17	Maximum Efficiency	> 97% As per IEC61683	98.60%
18	DC voltage ripple		Less than 0.5%
19	Ambient temperature range		-25C to 60C
20	Humidity (non condensing)	95% non-condensing	100% Condensing
21	Degree of protection		IP 65
22	Dimensions(HxWxD)		750*1100*257mm
23	Weight		70Kg
24	Protective functions AC over/under voltage, AC over/under frequency, over-temperature, AC and DC over-current, DC over-voltage, against islanding		Provided
25	Communication Interface	RS232/RS485/Modbus/Telephone Modem/Wifi	RS 485,WLAN
26	User-display standard	LCD panel with membrane keypad	LED Display
27	Enclosure Environment Rating		IP 65
28	Safety and EMC		IEC 62109-1,IEC 62109-2,IEC 61000-6-1,IEC 61000-6-3, IEC 61000-3-11,IEC 61000-3-12
29	Anti islanding Feature	IEEE1547/UL1741/IEC62116	IEC 62116



Guaranteed Technical Particular Data Sheet-2			
Power conditioning unit			
Sl	Particulars	Required	Offered
1	Manufacturer		FIMUR
2	Model name/No.		PVS-100-TL
3	No of Units		
4	Nominal AC power		100000W
5	Nominal AC voltage		400V
6	Nominal AC Current		145A
7	AC grid Frequency range	50Hz $\pm$ 0.5%	45Hz-55Hz
8	AC grid voltage range		320V-480V
9	Power Factor (+ and -)		0.995Lag and Lead
10	Total Harmonic Distortion	as per IEEE-519 2014	Less than 3%
11	AC over / under voltage over / under frequency protection		Provided
12	LVRT/HVRT setting option	Yes	Yes
13	Max PV input power		102000W
14	Maximum DC voltage	1000V	1000V
15	MPPT voltage range	450 to 825 V	480V to 850V
16	Maximum DC current		50A per MPPT
17	No. of DC input ports		24 Pairs
18	Maximum Efficiency	97% as per IEC61683	98.40%
19	DC voltage ripple		Less than 0.5%
20	Ambient temperature range		-25°C to 60°C
21	Humidity (non condensing)	95%, non condensing	100% Condensing
22	Degree of protection		IP 65
23	Dimensions(HxWxD)		869x1086x419mm
24	Weight		70Kg
25	Protective functions AC over/under voltage, AC over/under frequency, over-temperature, AC and DC over-current, DC over-voltage, against Islanding		Provided
26	Communication Interface	RS232, RS485, MPI, Profibus, Telephone, Modem, WiFi	RS 485, WLAN
27	User-display standard	LCD panel with membrane keypad	LED Display
28	Enclosure Environment Rating		IP 65
29	Safety and EMC		IEC 62109-1, IEC 62109-2, IEC 61000-6-1, IEC 61000-6-3, IEC 61000-3-11, IEC 61000-3-12
30	Anti Islanding Feature	IEEE 1547, UL1741, IEC 62116	IEC 62116



PV Module			
SL NO	Particulars	Required	Offered
1	PV Module Manufacture name & Country of origin	Indian make solar module (manufacture name to be specified). Should be included in the updated ALMM list published by MNRE for PV modules	Credance Solar Panels Pvt Ltd
2	PV Module type	Mono PERC PV modules having half cut cell of indigenously manufactured solar modules of 540 Wp or higher and the cells shall be with multi bus bar technology	550Wp Half Cut Mono PERC Module
3	Product Code	To be specified	CS-HN550-144
4	No. of PV cells per Module	144	144
5	Total number of PV modules	As per the requirement	As per the requirement
6	Max.Power, Pmp@STC	≥540Wp	≥550Wp
7	Max.power tolerance (%)	Not more than 3%	Not more than 3%
8	Max.power voltage (Vmp)@STC	To be specified	42.6V
9	Max.power current (Imp) @STC	To be specified	12.95A
10	Open circuit voltage,@STC	To be specified	49.35V
11	Short circuit current@STC	To be specified	13.9A
12	Nominal voltage	To be specified	38.41V
13	Nominal Wattage	To be specified	400W
14	Fill Factor	Not less than 0.7	Not less than 0.7
15	Temp.coefficient of Voc(%/C)		-0.230%
16	Temp.coefficient of Pmp (%/C)		-0.278%
17	Temperature Co-efficient of Isc (%/°C)		0.05%
18	Normal Operating Cell Temperature (NOCT) (°C)		44±2
19	Operating Temperature (°C)		44±2
20	Max Temperature rise of solar cells under severe working conditions over Max. Ambient Temp.	To be specified	85°C
21	Module is suitable to operate at 50 ambient	Yes/No	Yes
22	Cell efficiency	%	>20
23	Module efficiency	≥20%	21.50%
24	Maximum System Voltage	1500V	1500V DC
25	No. of By-pass Diodes		3Nos Schottky
26	Mounting arrangement for Solar Module	Fixed Arrangement	Fixed Arrangement
27	Solar Module frame material	Anodized Aluminum	Anodized Aluminum
28	Finish		Smooth Finish
29	Types of Sections used		
30	Module dimensions cms (LxWxH)	To be specified	2261 X 1134 X 35mm
31	PV panel Weight (kg)	To be specified	28.5 Kg
32	Module Life (minimum)	25 Years	25 Years
33	PV array area(sqm)		2.56 Sqm
34	Standards/Approvals from International Agencies	IEC 61215/IEC 61730/ IEC 61701	IEC 61215/IEC 61730/ IEC 61701
35	Guaranteed output confirm	Yes	Yes
36	Output Cables	Polarized, UV protected &Weather Proof DC rated multi-contact connector	Polarized, UV protected &Weather Proof DC rated multi-contact connector
37	Output Terminal	PV Connectors	PV Connectors
38	Junction Box	Weather resistant HDPE (IP65)	Weather resistant HDPE (IP65)
39	Construction Front and Back	High transmittance glass. Polyester Ethyl Vinyl Acetate(EVA) encapsulate	High transmittance glass. Polyester Ethyl Vinyl Acetate(EVA) encapsulate
40	Glass	Low iron tempered	Low iron tempered
43	Copies of test certificates	IEC 61215,61730 part 1&2, IEC 61701	IEC 61215,61730 part 1&2, IEC 61701



PV Module			
SL NO	Particulars	Required	Offered
1	PV Module Manufacture name &Country of origin	Indian make solar module (manufacture name to be specified). Should be included in the updated ALMM list published by MNRE for PV modules	Credance Solar Panels Pvt Ltd
2	PV Module type	Mono PERC PV modules having half cut cell of indigenously manufactured solar modules of 540 Wp or higher and the cells shall be with multi bus bar technology	650 Wp Half Cut Mono PERC Module
3	Product Code	To be specified	CS-QU650-132
4	No. of PV cells per Module	144	132
5	Total number of PV modules	As per the requirement	As per the requirement
6	Max.Power, Pmp@STC	≥540Wp	≥650Wp
7	Max.power tolerance (%)	Not more than 3%	Not more than 3%
8	Max.power voltage (Vmp)@STC	To be specified	38.05V
9	Max.power current (Imp) @STC	To be specified	17.10A
10	Open circuit voltage,@STC	To be specified	45.2V
11	Short circuit current@STC	To be specified	18.15A
12	Nominal voltage	To be specified	34.31V
13	Nominal Wattage	To be specified	471W
14	Fill Factor	Not less than 0.7	Not less than 0.7
15	Temp.coefficient of Voc(%/°C)		-0.212%
16	Temp.coefficient of Pmp (%/°C)		-0.273%
17	Temperature Co-efficient of Isc (%/°C)		0.036%
18	Normal Operating Cell Temperature (NOCT) (°C)		44±2
19	Operating Temperature (°C)		44±2
20	Max Temperature rise of solar cells under severe working conditions over Max. Ambient Temp.	To be specified	85°C
21	Module is suitable to operate at 50 ambient	Yes/No	Yes
22	Cell efficiency	%	>19.6
23	Module efficiency	≥20%	21.60%
24	Maximum System Voltage	1500V	1500V DC
25	No. of By-pass Diodes		3Nos Schottky
26	Mounting arrangement for Solar Module	Fixed Arrangement	Fixed Arrangement
27	Solar Module frame material	Anodized Aluminum	Anodized Aluminum
28	Finish		Smooth Finish
29	Types of Sections used		
30	Module dimensions cms (LxWxH)	To be specified	2384 X 1303 X 35mm
31	PV panel Weight (kg)	To be specified	33.8 Kg
32	Module Life (minimum)	25 Years	25 Years
33	PV array area(sq.m)		3.10 Sqm
34	Standards/Approvals from International Agencies	IEC 61215/IEC 61730/ IEC 61701	IEC 61215/IEC 61730/ IEC 61701
35	Guaranteed output confirm	Yes	Yes
36	Output Cables	Polarized, UV protected &Weather Proof DC rated multi-contact connector	Polarized, UV protected &Weather Proof DC rated multi-contact connector
37	Output Terminal	PV Connectors	PV Connectors
38	Junction Box	Weather resistant HDPE (IP65)	Weather resistant HDPE (IP65)
39	Construction Front and Back	High transmittance glass. Polyester Ethyl Vinyl Acetate(EVA) encapsulate	High transmittance glass. Polyester Ethyl Vinyl Acetate(EVA) encapsulate
40	Glass	Low iron tempered	Low iron tempered
43	Copies of test certificates	IEC 61215,61730 part 1&2, IEC 61701	IEC 61215,61730 part 1&2, IEC 61701



PV Module			
SL NO	Particulars	Required	Offered
1	PV Module Manufacture name &Country of origin	manufacture name to be specified	Credance Solar Panels Pvt Ltd
2	PV Module type	Mono PERC	Half Cut Mono PERC Crystalline
3	Product Code		CS-QU535-110
4	No. of PV cells per Module		110
5	Total number of PV modules		
6	Max.Power, Pmp@STC	380 Wp or Above	535 Wp
7	Max.power tolerance (%)	Not more than 3%	Not more than 3%
8	Max.power voltage (Vmp)@STC	To be specified	31.50 V
9	Max.power current (Imp) @STC	To be specified	17 A
10	Open circuit voltage,@STC	To be specified	37.62 V
11	Short circuit current@STC	To be specified	18.10 A
12	Nominal voltage	To be specified	28.40V
13	Nominal Wattage	To be specified	535
14	Fill Factor	Not less than 0.70	>0.70
15	Temp.coefficient of Voc(%/C)		-0.36
16	Temp.coefficient of Pmp (%/C)		-0.38
17	Temperature Co-efficient of Isc (%/°C)		0.07
18	Normal Operating Cell Temperature (NOCT) (°C)		44°C±2
19	Operating Temperature (°C)		-40°C TO 85°C
20	Max.Temperature rise of solar cells under severe working conditions over Max. Ambient Temp.	To be specified	85°C
21	Module is suitable to operate at 50 ambient	Yes/No	Yes
22	Cell efficiency	%	>19
23	Module efficiency	≥19%	20.50%
24	Maximum System Voltage		1500V
25	No. of By-pass Diodes		3Nos Schottky
26	Mounting arrangement for Solar Module	Fixed Arrangement	Fixed Arrangement
27	Solar Module frame material	Anodized Aluminum	Anodized Aluminum
28	Finish		Smooth Finish
29	Types of Sections used		
30	Module dimensions cms (LxWxH)	To be specified	2384x1303x35 mm
31	PV panel Weight (kg)	To be specified	32.90 kg
32	Module Life (minimum)	25 years	25Years
33	PV array area(sqm)		1.985 sqm
34	Standards/Approvals from International Agencies	IEC 61215/IEC 61730/ IEC 61701	IEC 61215/IEC 61730/ IEC 61701
35	Guaranteed output confirm	Yes	Yes
36	Output Cables	Polarized, UV protected &Weather Proof DC rated multi-contact connector	Polarized, UV protected &Weather Proof DC rated multi-contact connector
37	Output Terminal	PV Connectors	PV Connectors
38	Junction Box	Weather resistant HDPE (IP65)	Weather resistant HDPE (IP65)
39	Construction Front and Back	High transmittance glass,Polyester Ethyl Vinyl Acetate(EVA) encapsulate	High transmittance glass,Polyester Ethyl Vinyl Acetate(EVA) encapsulate
40	Glass	Low iron tempered	3.2mm Thick Low Iron Tempered
43	Copies of test certificates	IEC 61215,61730 part 1&2, IEC 61701	IEC 61215,61730 part 1&2, IEC 61701

PV Module			
SL NO	Particulars	Required	Offered
1	PV Module Manufacture name & Country of origin	manufacture name to be specified	Credance Solar Panels Pvt Ltd
2	PV Module type	Mono PERC	Half Cut Mono PERC Crystalline
3	Product Code		CS-QU540-110
4	No. of PV cells per Module		110
5	Total number of PV modules		
6	Max.Power, Pmp@STC	380 Wp or Above	540Wp
7	Max.power tolerance (%)	Not more than 3%	Not more than 3%
8	Max.power voltage (Vmp)@STC	To be specified	31.60 V
9	Max.power current (Imp) @STC	To be specified	17.10 A
10	Open circuit voltage,@STC	To be specified	37.65 V
11	Short circuit current@STC	To be specified	18.15 A
12	Nominal voltage	To be specified	28.49V
13	Nominal Wattage	To be specified	540
14	Fill Factor	Not less than 0.70	>0.70
15	Temp.coefficient of Voc (%/C)		-0.36
16	Temp.coefficient of Pmp (%/C)		-0.38
17	Temperature Co-efficient of Isc (%/°C)		0.07
18	Normal Operating Cell Temperature (NOCT) (°C)		44°C±2
19	Operating Temperature (°C)		-40°C TO 85°C
20	Max Temperature rise of solar cells under severe working conditions over Max. Ambient Temp.	To be specified	85°C
21	Module is suitable to operate at 50 ambient	Yes/No	Yes
22	Cell efficiency	%	>19
23	Module efficiency	≥19%	20.70%
24	Maximum System Voltage		1500V
25	No. of By-pass Diodes		3Nos Schottky
26	Mounting arrangement for Solar Module	Fixed Arrangement	Fixed Arrangement
27	Solar Module frame material	Anodized Aluminium	Anodized Aluminium
28	Finish		Smooth Finish
29	Types of Sections used		
30	Module dimensions cms (LxWxH)	To be specified	2384x1303x35 mm.
31	PV panel Weight (kg)	To be specified	32.90 kg
32	Module Life (minimum)	25 years	25Years
33	PV array area(sqm)		1.985 sqm
34	Standards/Approvals from International Agencies	IEC 61215/IEC 61730/ IEC 61701	IEC 61215/IEC 61730/ IEC 61701
35	Guaranteed output confirm	Yes	Yes
36	Output Cables	Polarized, UV protected & Weather Proof DC rated multi-contact connector	Polarized, UV protected & Weather Proof DC rated multi-contact connector
37	Output Terminal	PV Connectors	PV Connectors
38	Junction Box	Weather resistant HDPE (IP65)	Weather resistant HDPE (IP65)
39	Construction Front and Back	High transmittance glass, Polyester Ethyl Vinyl Acetate(EVA) encapsulate	High transmittance glass, Polyester Ethyl Vinyl Acetate(EVA) encapsulate
40	Glass	Low iron tempered	3.2mm Thick Low Iron Tempered
43	Copies of test certificates	IEC 61215,61730 part 1&2, IEC 61701	IEC 61215,61730 part 1&2, IEC 61701

PV Module			
SL NO	Particulars	Required	Offered
1	PV Module Manufacture name & Country of origin	manufacture name to be specified	Credance Solar Panels Pvt Ltd
2	PV Module type	Mono PERC	Half Cut Mono PERC Crystalline
3	Product Code		CS-QU545-110
4	No. of PV cells per Module		110
5	Total number of PV modules		
6	Max.Power, Pmp@STC	380 Wp or Above	545Wp
7	Max.power tolerance (%)	Not more than 3%	Not more than 3%
8	Max.power voltage (Vmp)@STC	To be specified	31.70 V
9	Max.power current (Imp) @STC	To be specified	17.20 A
10	Open circuit voltage,@STC	To be specified	37.75 V
11	Short circuit current@STC	To be specified	18.30 A
12	Nominal voltage	To be specified	28.58V
13	Nominal Wattage	To be specified	545
14	Fill Factor	Not less than 0.70	>0.70
15	Temp.coefficient of Voc(%/C)		-0.36
16	Temp.coefficient of Pmp (%/C)		-0.38
17	Temperature Co-efficient of Isc (%/°C)		0.07
18	Normal Operating Cell Temperature (NOCT) (°C)		44°C±2
19	Operating Temperature (°C)		-40°C TO 85°C
20	Max Temperature rise of solar cells under severe working conditions over Max. Ambient Temp.	To be specified	85°C
21	Module is suitable to operate at 50 ambient	Yes/No	Yes
22	Cell efficiency	%	>19
23	Module efficiency	≥19%	20.90%
24	Maximum System Voltage		1500V
25	No. of By-pass Diodes		3Nos Schottky
26	Mounting arrangement for Solar Module	Fixed Arrangement	Fixed Arrangement
27	Solar Module frame material	Anodized Aluminum	Anodized Aluminum
28	Finish		Smooth Finish
29	Types of Sections used		
30	Module dimensions cms (LxWxH)	To be specified	2384x1303x35 mm
31	PV panel Weight (kg)	To be specified	32.90 kg
32	Module Life (minimum)	25 years	25Years
33	PV array area(sq.m)		1.985 sqm
34	Standards/Approvals from International Agencies	IEC 61215/IEC 61730/ IEC 61701	IEC 61215/IEC 61730/ IEC 61701
35	Guaranteed output confirm	Yes	Yes
36	Output Cables	Polarized, UV protected & Weather Proof DC rated multi-contact connector	Polarized, UV protected & Weather Proof DC rated multi-contact connector
37	Output Terminal	PV Connectors	PV Connectors
38	Junction Box	Weather resistant HDPE (IP65)	Weather resistant HDPE (IP65)
39	Construction Front and Back	High transmittance glass, Polyester Ethyl Vinyl Acetate(EVA) encapsulate	High transmittance glass, Polyester Ethyl Vinyl Acetate(EVA) encapsulate
40	Glass	Low iron tempered	3.2mm Thick Low Iron Tempered
43	Copies of test certificates	IEC 61215,61730 part 1&2, IEC 61701	IEC 61215,61730 part 1&2, IEC 61701

PV Module			
SL NO	Particulars	Required	Offered
1	PV Module Manufacture name & Country of origin	manufacture name to be specified	Credance Solar Panels Pvt Ltd
2	PV Module type	Mono PERC	Half Cut Mono PERC Crystalline
3	Product Code		CS-QU550-110
4	No. of PV cells per Module		
5	Total number of PV modules		
6	Max.Power, Pmp@STC	380 Wp or Above	550 Wp
7	Max.power tolerance (%)	Not more than 3%	Not more than 3%
8	Max.power voltage (Vmp)@STC	To be specified	31.80 V
9	Max.power current (Imp) @STC	To be specified	17.35 A
10	Open circuit voltage,@STC	To be specified	37.80 V
11	Short circuit current@STC	To be specified	18.40 A
12	Nominal voltage	To be specified	28.67V
13	Nominal Wattage	To be specified	550
14	Fill Factor	Not less than 0.70	>0.70
15	Temp.coefficient of Voc(%/C)		-0.36
16	Temp.coefficient of Pmp (%/C)		-0.38
17	Temperature Co-efficient of Isc (%/°C)		0.07
18	Normal Operating Cell Temperature (NOCT) (°C)		44°C±2
19	Operating Temperature (°C)		-40°C TO 85°C
20	Max Temperature rise of solar cells under severe working conditions over Max. Ambient Temp.	To be specified	85°C
21	Module is suitable to operate at 50 ambient	Yes/No	Yes
22	Cell efficiency	%	>19
23	Module efficiency	≥19%	21.05%
24	Maximum System Voltage		1500V
25	No. of By-pass Diodes		3Nos Schottky
26	Mounting arrangement for Solar Module	Fixed Arrangement	Fixed Arrangement
27	Solar Module frame material	Anodized Aluminum	Anodized Aluminum
28	Finish		Smooth Finish
29	Types of Sections used		
30	Module dimensions cms (LxWxH)	To be specified	2384x1303x35 mm
31	PV panel Weight (kg)	To be specified	32.90 kg
32	Module Life (minimum)	25 years	25Years
33	PV array area(sq.m)		1.985 sqm
34	Standards/Approvals from International Agencies	IEC 61215/IEC 61730/ IEC 61701	IEC 61215/IEC 61730/ IEC 61701
35	Guaranteed output confirm	Yes	Yes
36	Output Cables	Polarized, UV protected & Weather Proof DC rated multi-contact connector	Polarized, UV protected & Weather Proof DC rated multi-contact connector
37	Output Terminal	PV Connectors	PV Connectors
38	Junction Box	Weather resistant HDPE (IP65)	Weather resistant HDPE (IP65)
39	Construction Front and Back	High transmittance glass, Polyester Ethyl Vinyl Acetate(EVA) encapsulate	High transmittance glass, Polyester Ethyl Vinyl Acetate(EVA) encapsulate
40	Glass	Low iron tempered	3.2mm Thick Low Iron Tempered
43	Copies of test certificates	IEC 61215,61730 part 1&2, IEC 61701	IEC 61215,61730 part 1&2, IEC 61701

PV Module			
SL NO	Particulars	Required	Offered
1	PV Module Manufacture name & Country of origin	manufacture name to be specified	Credance Solar Panels Pvt Ltd
2	PV Module type	Mono PERC	Half Cut Mono PERC Crystalline
3	Product Code		CS-QU555-110
4	No. of PV cells per Module		110
5	Total number of PV modules		
6	Max.Power, Pmp@STC	380 Wp or Above	555Wp
7	Max.power tolerance (%)	Not more than 3%	Not more than 3%
8	Max.power voltage (Vmp)@STC	To be specified	31.90 V
9	Max.power current (Imp) @STC	To be specified	17.40 A
10	Open circuit voltage,@STC	To be specified	37.85 V
11	Short circuit current@STC	To be specified	18.55 A
12	Nominal voltage	To be specified	28.76V
13	Nominal Wattage	To be specified	555
14	Fill Factor	Not less than 0.70	>0.70
15	Temp.coefficient of Voc(%/C)		-0.36
16	Temp.coefficient of Pmp (%/C)		-0.38
17	Temperature Co-efficient of Isc (%/°C)		0.07
18	Normal Operating Cell Temperature (NOCT) (°C)		44°C±2
19	Operating Temperature (°C)		-40°C TO 85°C
20	Max Temperature rise of solar cells under severe working conditions over Max. Ambient Temp.	To be specified	85°C
21	Module is suitable to operate at 50 ambient	Yes/No	Yes
22	Cell efficiency	%	>19
23	Module efficiency	≥19%	21.25%
24	Maximum System Voltage		1500V
25	No. of By-pass Diodes		3Nos Schottky
26	Mounting arrangement for Solar Module	Fixed Arrangement	Fixed Arrangement
27	Solar Module frame material	Anodized Aluminum	Anodized Aluminum
28	Finish		Smooth Finish
29	Types of Sections used		
30	Module dimensions cms (LxWxH)	To be specified	2384x1303x35 mm
31	PV panel Weight (kg)	To be specified	32.90 kg
32	Module Life (minimum)	25 years	25Years
33	PV array area(sqm)		1.985 sqm
34	Standards/Approvals from International Agencies	IEC 61215/IEC 61730/ IEC 61701	IEC 61215/IEC 61730/ IEC 61701
35	Guaranteed output confirm	Yes	Yes
36	Output Cables	Polarized, UV protected & Weather Proof DC rated multi-contact connector	Polarized, UV protected & Weather Proof DC rated multi-contact connector
37	Output Terminal	PV Connectors	PV Connectors
38	Junction Box	Weather resistant HDPE (IP65)	Weather resistant HDPE (IP65)
39	Construction Front and Back	High transmittance glass, Polyester Ethyl Vinyl Acetate(EVA) encapsulate	High transmittance glass, Polyester Ethyl Vinyl Acetate(EVA) encapsulate
40	Glass	Low iron tempered	3.2mm Thick Low Iron Tempered
43	Copies of test certificates	IEC 61215,61730 part 1&2, IEC 61701	IEC 61215,61730 part 1&2, IEC 61701

PV Module			
SL NO	Particulars	Required	Offered
1	PV Module Manufacture name &Country of origin	manufacture name to be specified	Credance Solar Panels Pvt Ltd
2	PV Module type	Mono PERC	Half Cut Mono PERC Crystalline
3	Product Code		CS-QU650-132
4	No. of PV cells per Module		
5	Total number of PV modules		
6	Max.Power, Pmp@STC	380 Wp or Above	650 Wp
7	Max.power tolerance (%)	Not more than 3%	Not more than 3%
8	Max.power voltage (Vmp)@STC	To be specified	38.05 V
9	Max.power current (Imp) @STC	To be specified	17.10 A
10	Open circuit voltage,@STC	To be specified	45.20 V
11	Short circuit current@STC	To be specified	18.15 A
12	Nominal voltage	To be specified	41.11V
13	Nominal Wattage	To be specified	471
14	Fill Factor	Not less than 0.70	>0.70
15	Temp.coefficient of Voc(%/C)		-0.36
16	Temp.coefficient of Pmp (%/C)		-0.38
17	Temperature Co-efficient of Isc (%/°C)		0.07
18	Normal Operating Cell Temperature (NOCT) (°C)		44C±2
19	Operating Temperature (°C)		-40°C TO 85°C
20	Max Temperature rise of solar cells under severe working conditions over Max. Ambient Temp.	To be specified	85°C
21	Module is suitable to operate at 50 ambient	Yes/No	Yes
22	Cell efficiency	%	>19
23	Module efficiency	≥19%	21.00%
24	Maximum System Voltage		1500V
25	No. of By-pass Diodes		3Nos Schottky
26	Mounting arrangement for Solar Module	Fixed Arrangement	Fixed Arrangement
27	Solar Module frame material	Anodized Aluminum	Anodized Aluminum
28	Finish		Smooth Finish
29	Types of Sections used		
30	Module dimensions cms (LxWxH)	To be specified	2384x1303x35 mm
31	PV panel Weight (kg)	To be specified	32.90 kg
32	Module Life (minimum)	25 years	25Years
33	PV array area(sqm)		1.985 sqm
34	Standards/Approvals from International Agencies	IEC 61215/IEC 61730/ IEC 61701	IEC 61215/IEC 61730/ IEC 61701
35	Guaranteed output confirm	Yes	Yes
36	Output Cables	Polarized, UV protected &Weather Proof DC rated multi-contact connector	Polarized, UV protected &Weather Proof DC rated multi-contact connector
37	Output Terminal	PV Connectors	PV Connectors
38	Junction Box	Weather resistant HDPE (IP65)	Weather resistant HDPE (IP65)
39	Construction Front and Back	High transmittance glass,Polyester Ethyl Vinyl Acetate(EVA) encapsulate	High transmittance glass,Polyester Ethyl Vinyl Acetate(EVA) encapsulate
40	Glass	Low Iron tempered	3.2mm Thick Low Iron Tempered
43	Copies of test certificates	IEC 61215,61730 part 1&2, IEC 61701	IEC 61215,61730 part 1&2, IEC 61701

PV Module			
SL NO	Particulars	Required	Offered
1	PV Module Manufacture name &Country of origin	manufacture name to be specified	Credance Solar Panels Pvt Ltd
2	PV Module type	Mono PERC	Half Cut Mono PERC Crystalline
3	Product Code		CS-QU655-132
4	No. of PV cells per Module		
5	Total number of PV modules		
6	Max.Power, Pmp@STC	380 Wp or Above	655 Wp
7	Max.power tolerance (%)	Not more than 3%	Not more than 3%
8	Max.power voltage (Vmp)@STC	To be specified	38.10 V
9	Max.power current (Imp) @STC	To be specified	17.20 A
10	Open circuit voltage,@STC	To be specified	45.25 V
11	Short circuit current@STC	To be specified	18.30 A
12	Nominal voltage	To be specified	41.15V
13	Nominal Wattage	To be specified	475
14	Fill Factor	Not less than 0.70	>0.70
15	Temp.coefficient of Voc(%/C)		-0.36
16	Temp.coefficient of Pmp (%/C)		-0.38
17	Temperature Co-efficient of Isc (%/°C)		0.07
18	Normal Operating Cell Temperature (NOCT) (°C)		44C±2
19	Operating Temperature (°C)		-40°C TO 85°C
20	Max Temperature rise of solar cells under severe working conditions over Max. Ambient Temp.	To be specified	85°C
21	Module is suitable to operate at 50 ambient	Yes/No	Yes
22	Cell efficiency	%	>19
23	Module efficiency	≥19%	21.10%
24	Maximum System Voltage		1500V
25	No. of By-pass Diodes		3Nos Schottky
26	Mounting arrangement for Solar Module	Fixed Arrangement	Fixed Arrangement
27	Solar Module frame material	Anodized Aluminum	Anodized Aluminum
28	Finish		Smooth Finish
29	Types of Sections used		
30	Module dimensions cms (LxWxH)	To be specified	2384x1303x35 mm
31	PV panel Weight (kg)	To be specified	32.90 kg
32	Module Life (minimum)	25 years	25Years
33	PV array area(sqm)		1.985 sqm
34	Standards/Approvals from International Agencies	IEC 61215/IEC 61730/ IEC 61701	IEC 61215/IEC 61730/ IEC 61701
35	Guaranteed output confirm	Yes	Yes
36	Output Cables	Polarized, UV protected &Weather Proof DC rated multi-contact connector	Polarized, UV protected &Weather Proof DC rated multi-contact connector
37	Output Terminal	PV Connectors	PV Connectors
38	Junction Box	Weather resistant HDPE (IP65)	Weather resistant HDPE (IP65)
39	Construction Front and Back	High transmittance glass,Polyester Ethyl Vinyl Acetate(EVA) encapsulate	High transmittance glass,Polyester Ethyl Vinyl Acetate(EVA) encapsulate
40	Glass	Low iron tempered	3.2mm Thick Low Iron Tempered
43	Copies of test certificates	IEC 61215,61730 part 1&2, IEC 61701	IEC 61215,61730 part 1&2, IEC 61701

PV Module			
SL NO	Particulars	Required	Offered
1	PV Module Manufacture name &Country of origin	manufacture name to be specified	Credance Solar Panels Pvt Ltd
2	PV Module type	Mono PERC	Half Cut Mono PERC Crystalline
3	Product Code		CS-QU660-132
4	No. of PV cells per Module		
5	Total number of PV modules		
6	Max.Power, Pmp@STC	380 Wp or Above	660 Wp
7	Max.power tolerance (%)	Not more than 3%	Not more than 3%
8	Max.power voltage (Vmp)@STC	To be specified	38.15 V
9	Max.power current (Imp) @STC	To be specified	17.35 A
10	Open circuit voltage,@STC	To be specified	45.30 V
11	Short circuit current@STC	To be specified	18.40 A
12	Nominal voltage	To be specified	41.24V
13	Nominal Wattage	To be specified	480
14	Fill Factor	Not less than 0.70	>0.70
15	Temp.coefficient of Voc(%/C)		-0.36
16	Temp.coefficient of Pmp (%/C)		-0.38
17	Temperature Co-efficient of Isc (%/°C)		0.07
18	Normal Operating Cell Temperature (NOCT) (°C)		44°C±2
19	Operating Temperature (°C)		-40°C TO 85°C
20	Max Temperature rise of solar cells under severe working conditions over Max. Ambient Temp.	To be specified	85°C
21	Module is suitable to operate at 50 ambient	Yes/No	Yes
22	Cell efficiency	%	>19
23	Module efficiency	≥19%	21.30%
24	Maximum System Voltage		1500V
25	No. of By-pass Diodes		3Nos Schottky
26	Mounring arrangement for Solar Module	Fixed Arrangement	Fixed Arrangement
27	Solar Module frame material	Anodized Aluminum	Anodized Aluminum
28	Finish		Smooth Finish
29	Types of Sections used		
30	Module dimensions cms (LxWxH)	To be specified	2384x1303x35 mm
31	PV panel Weight (kg)	To be specified	32.90 kg
32	Module Life (minimum)	25 years	25Years
33	PV array area(sqm)		1.985 sqm
34	Standards/Approvals from International Agencies	IEC 61215/IEC 61730/ IEC 61701	IEC 61215/IEC 61730/ IEC 61701
35	Guaranteed output confirm	Yes	Yes
36	Output Cables	Polarized, UV protected &Weather Proof DC rated multi-contact connector	Polarized, UV protected &Weather Proof DC rated multi-contact connector
37	Output Terminal	PV Connectors	PV Connectors
38	Junction Box	Weather resistant HDPE (IP65)	Weather resistant HDPE (IP65)
39	Construction Front and Back	High transmittance glass,Polyester Ethyl Vinyl Acetate(EVA) encapsulate	High transmittance glass,Polyester Ethyl Vinyl Acetate(EVA) encapsulate
40	Glass	Low iron tempered	3.2mm Thick Low Iron Tempered
43	Copies of test certificates	IEC 61215,61730 part 1&2, IEC 61701	IEC 61215,61730 part 1&2, IEC 61701

PV Module			
SL NO	Particulars	Required	Offered
1	PV Module Manufacture name &Country of origin	manufacture name to be specified	Credance Solar Panels Pvt Ltd
2	PV Module type	Mono PERC	Half Cut Mono PERC Crystalline
3	Product Code		CS-QU665-132
4	No. of PV cells per Module		
5	Total number of PV modules		
6	Max.Power, Pmp@STC	380 Wp or Above	665 Wp
7	Max.power tolerance (%)	Not more than 3%	Not more than 3%
8	Max.power voltage (Vmp)@STC	To be specified	38.20 V
9	Max.power current (Imp) @STC	To be specified	17.45 A
10	Open circuit voltage,@STC	To be specified	45.35 V
11	Short circuit current@STC	To be specified	18.55 A
12	Nominal voltage	To be specified	41.24V
13	Nominal Wattage	To be specified	483
14	Fill Factor	Not less than 0.70	>0.70
15	Temp.coefficient of Voc(%/C)		-0.36
16	Temp.coefficient of Pmp (%/C)		-0.38
17	Temperature Co-efficient of Isc (%/°C)		0.07
18	Normal Operating Cell Temperature (NOCT) (°C)		44°C±2
19	Operating Temperature (°C)		-40°C TO 85°C
20	Max Temperature rise of solar cells under severe working conditions over Max. Ambient Temp.	To be specified	85°C
21	Module is suitable to operate at 50 ambient	Yes/No	Yes
22	Cell efficiency	%	>19
23	Module efficiency	≥19%	21.50%
24	Maximum System Voltage		1500V
25	No. of By-pass Diodes		3Nos Schottky
26	Mounting arrangement for Solar Module	Fixed Arrangement	Fixed Arrangement
27	Solar Module frame material	Anodized Aluminum	Anodized Aluminum
28	Finish		Smooth Finish
29	Types of Sections used		
30	Module dimensions cms (LxWxH)	To be specified	2384x1303x35 mm
31	PV panel Weight (kg)	To be specified	32.90 kg
32	Module Life (minimum)	25 years	25Years
33	PV array area(sq.m)		1.985 sqm
34	Standards/Approvals from International Agencies	IEC 61215/IEC 61730/ IEC 61701	IEC 61215/IEC 61730/ IEC 61701
35	Guaranteed output confirm	Yes	Yes
36	Output Cables	Polarized, UV protected &Weather Proof DC rated multi-contact connector	Polarized, UV protected &Weather Proof DC rated multi-contact connector
37	Output Terminal	PV Connectors	PV Connectors
38	Junction Box	Weather resistant HDPE (IP65)	Weather resistant HDPE (IP65)
39	Construction Front and Back	High transmittance glass,Polyester Ethyl Vinyl Acetate(EVA) encapsulate	High transmittance glass,Polyester Ethyl Vinyl Acetate(EVA) encapsulate
40	Glass	low iron tempered	3.2mm Thick Low Iron Tempered
43	Copies of test certificates	IEC 61215,61730 part 1&2, IEC 61701	IEC 61215,61730 part 1&2, IEC 61701

PV Module			
SL NO	Particulars	Required	Offered
1	PV Module Manufacture name & Country of origin	manufacture name to be specified	Credance Solar Panels Pvt Ltd
2	PV Module type	Mono PERC	Half Cut Mono PERC Crystalline
3	Product Code		CS-QU670-132
4	No. of PV cells per Module		
5	Total number of PV modules		
6	Max.Power, Pmp@STC	380 Wp or Above	670 Wp
7	Max.power tolerance (%)	Not more than 3%	Not more than 3%
8	Max.power voltage (Vmp)@STC	To be specified	38.25 V
9	Max.power current (Imp) @STC	To be specified	17.55 A
10	Open circuit voltage,@STC	To be specified	45.40 V
11	Short circuit current@STC	To be specified	18.65 A
12	Nominal voltage	To be specified	41.29V
13	Nominal Wattage	To be specified	486
14	Fill Factor	Not less than 0.70	>0.70
15	Temp.coefficient of Voc(%/C)		-0.36
16	Temp.coefficient of Pmp (%/C)		-0.38
17	Temperature Co-efficient of Isc (%/°C)		0.07
18	Normal Operating Cell Temperature (NOCT) (°C)		44°C±2
19	Operating Temperature (°C)		-40°C TO 85°C
20	Max Temperature rise of solar cells under severe working conditions over Max. Ambient Temp.	To be specified	85°C
21	Module is suitable to operate at 50° ambient	Yes/No	Yes
22	Cell efficiency	%	>19
23	Module efficiency	≥19%	21.60%
24	Maximum System Voltage		1500V
25	No. of By-pass Diodes		3Nos Schottky
26	Mounting arrangement for Solar Module	Fixed Arrangement	Fixed Arrangement
27	Solar Module frame material	Anodized Aluminum	Anodized Aluminum
28	Finish		Smooth Finish
29	Types of Sections used		
30	Module dimensions cms (LxWxH)	To be specified	2384x1303x35 mm
31	PV panel Weight (kg)	To be specified	32.90 kg
32	Module Life (minimum)	25 years	25Years
33	PV array area(sqmt)		1.985 sqmt
34	Standards/Approvals from International Agencies	IEC 61215/IEC 61730/ IEC 61701	IEC 61215/IEC 61730/ IEC 61701
35	Guaranteed output confirm	Yes	Yes
36	Output Cables	Polarized, UV protected & Weather Proof DC rated multi-contact connector	Polarized, UV protected & Weather Proof DC rated multi-contact connector
37	Output Terminal	PV Connectors	PV Connectors
38	Junction Box	Weather resistant HDPE (IP65)	Weather resistant HDPE (IP65)
39	Construction Front and Back	High transmittance glass, Polyester Ethyl Vinyl Acetate(EVA) encapsulate	High transmittance glass, Polyester Ethyl Vinyl Acetate(EVA) encapsulate
40	Glass	Low iron tempered	3.2mm Thick Low Iron Tempered
43	Copies of test certificates	IEC 61215,61730 part 1&2, IEC 61701	IEC 61215,61730 part 1&2, IEC 61701

PV Module			
SL NO	Particulars	Required	Offered
1	PV Module Manufacture name & Country of origin	manufacture name to be specified	Goldi Solar
2	PV Module type	Mono PERC	Mono Crystalline PERC
3	Product Code		GS10-M144-WF
4	No. of PV cells per Module		144 cells
5	Total number of PV modules		
6	Max.Power, Pmp@STC	380 Wp or Above	530Wp
7	Max.power tolerance (%)	Not more than 3%	0-2%
8	Max.power voltage (Vmp)@STC	To be specified	43.56V
9	Max.power current (Imp) @STC	To be specified	12.17A
10	Open circuit voltage,@STC	To be specified	49.32V
11	Short circuit current@STC	To be specified	13.39A
12	Nominal voltage	To be specified	43.56V
13	Nominal Wattage	To be specified	530Wp
14	Fill Factor	Not less than 0.70	>0.70
15	Temp.coefficient of Voc(%/C)		-0.28
16	Temp.coefficient of Pmp (%/C)		-0.35
17	Temperature Co-efficient of Isc (%/°C)		0.048
18	Normal Operating Cell Temperature (NOCT) (°C)		45C±2
19	Operating Temperature (°C)		-40°C TO 85°C
20	Max Temperature rise of solar cells under severe working conditions over Max. Ambient Temp.	To be specified	85°C
21	Module is suitable to operate at 50 ambient	Yes/No	Yes
22	Cell efficiency	%	>19
23	Module efficiency	≥19%	20.53%
24	Maximum System Voltage		1000V
25	No. of By-pass Diodes		3Nos Schottky
26	Mounting arrangement for Solar Module	Fixed Arrangement	Fixed Arrangement
27	Solar Module frame material	Anodized Aluminum	Silver Anodized Aluminum Alloy
28	Finish		Smooth Finish
29	Types of Sections used		
30	Module dimensions cms (LxWxH)	To be specified	2278x1133x35 mm
31	PV panel Weight (kg)	To be specified	~ 28kg
32	Module Life (minimum)	25 years	25Years
33	PV array area(sqm)		2.58 sqm
34	Standards/Approvals from International Agencies	IEC 61215/IEC 61730/ IEC 61701	IEC 61215/IEC 61730/ IEC 61701/ IEC 62716/ IEC 62804/ ICE 60068/ IEC 62759
35	Guaranteed output confirm	Yes	Yes
36	Output Cables	Polarized, UV protected & Weather Proof DC rated multi-contact connector	Polarized, UV protected & Weather Proof DC rated multi-contact connector
37	Output Terminal	PV Connectors	MC4 Connectors
38	Junction Box	Weather resistant HDPE (IP65)	Split JB (IP68)
39	Construction Front and Back	High transmittance glass, Polyester Ethyl Vinyl Acetate(EVA) encapsulate	Ultra-clear PID free Ethyl Vinyl Acetate(EVA) encapsulate
40	Glass	Low Iron tempered	3.2mm High transmission, AR coated tempered glass
43	Copies of test certificates	IEC 61215,61730 part 1&2, IEC 61701	IEC 61215,61730 part 1&2, IEC 61701

PV Module			
SL NO	Particulars	Required	Offered
1	PV Module Manufacture name &Country of origin	manufacture name to be specified	Goldi Solar
2	PV Module type	Mono PERC	Mono Crystalline PERC
3	Product Code		GS10-M144-WF
4	No. of PV cells per Module		144 cells
5	Total number of PV modules		
6	Max.Power, Pmp@STC	380 Wp or Above	535Wp
7	Max.power tolerance (%)	Not more than 3%	0-2%
8	Max.power voltage (Vmp)@STC	To be specified	43.64V
9	Max.power current (Imp) @STC	To be specified	12.26A
10	Open circuit voltage,@STC	To be specified	49.39V
11	Short circuit current@STC	To be specified	13.41A
12	Nominal voltage	To be specified	43.64V
13	Nominal Wattage	To be specified	535Wp
14	Fill Factor	Not less than 0.70	>0.70
15	Temp.coefficient of Voc(%/C)		-0.28
16	Temp.coefficient of Pmp (%/C)		-0.35
17	Temperature Co-efficient of Isc (%/°C)		0.048
18	Normal Operating Cell Temperature (NOCT) (°C)		45C±2
19	Operating Temperature (°C)		-40°C TO 85°C
20	Max Temperature rise of solar cells under severe working conditions over Max. Ambient Temp.	To be specified	85°C
21	Module is suitable to operate at 50 ambient	Yes/No	Yes
22	Cell efficiency	%	>19
23	Module efficiency	≥19%	20.73%
24	Maximum System Voltage		1000V
25	No. of By-pass Diodes		3Nos Schottky
26	Mounting arrangement for Solar Module	Fixed Arrangement	Fixed Arrangement
27	Solar Module frame material	Anodized Aluminum	Silver Anodized Aluminum Alloy
28	Finish		Smooth Finish
29	Types of Sections used		
30	Module dimensions cms {LxWxH}	To be specified	2278x1133x35 mm
31	PV panel Weight (kg)	To be specified	~28kg
32	Module Life (minimum)	25 years	25Years
33	PV array area(sqm)		2.58 sqm
34	Standards/Approvals from International Agencies	IEC 61215/IEC 61730/ IEC 61701	IEC 61215/IEC 61730/ IEC 61701/ IEC 62716/ IEC 62804/ ICE 60068/ IEC 62750
35	Guaranteed output confirm	Yes	Yes
36	Output Cables	Polarized, UV protected &Weather Proof DC rated multi-contact connector	Polarized, UV protected &Weather Proof DC rated multi-contact connector
37	Output Terminal	PV Connectors	MC4 Connectors
38	Junction Box	Weather resistant HDPE (IP65)	Split JB (IP68)
39	Construction Front and Back	High transmittance glass,Polyester Ethyl Vinyl Acetate(EVA) encapsulate	Ultra-clear PID free Ethyl Vinyl Acetate(EVA) encapsulate
40	Glass	Low iron tempered	3.2mm High transmission, AR coated tempered glass
43	Copies of test certificates	IEC 61215,61730 part 1&2, IEC 61701	IEC 61215,61730 part 1&2, IEC 61701

PV Module			
SL NO	Particulars	Required	Offered
1	PV Module Manufacture name &Country of origin	manufacture name to be specified	Goldi Solar
2	PV Module type	Mono PERC	Mono Crystalline PERC
3	Product Code		GS10-M144-WF
4	No. of PV cells per Module		144 cells
5	Total number of PV modules		
6	Max.Power, Pmp@STC	380 Wp or Above	540Wp
7	Max.power tolerance (%)	Not more than 3%	0-2%
8	Max.power voltage (Vmp)@STC	To be specified	43.88V
9	Max.power current (Imp) @STC	To be specified	12.31A
10	Open circuit voltage.@STC	To be specified	49.46V
11	Short circuit current@STC	To be specified	13.45A
12	Nominal voltage	To be specified	43.88V
13	Nominal Wattage	To be specified	540Wp
14	Fill Factor	Not less than 0.70	>0.70
15	Temp.coefficient of Voc(%/C)		-0.28
16	Temp.coefficient of Pmp (%/C)		-0.35
17	Temperature Co-efficient of Isc (%/°C)		0.048
18	Normal Operating Cell Temperature (NOCT) (°C)		45C±2
19	Operating Temperature (°C)		-40°C TO 85°C
20	Max Temperature rise of solar cells under severe working conditions over Max. Ambient Temp.	To be specified	85°C
21	Module is suitable to operate at 50 ambient	Yes/No	Yes
22	Cell efficiency	%	>19
23	Module efficiency	≥19%	20.92%
24	Maximum System Voltage		1000V
25	No. of By-pass Diodes		3Nos Schottky
26	Mounting arrangement for Solar Module	Fixed Arrangement	Fixed Arrangement
27	Solar Module frame material	Anodized Aluminum	Silver Anodized Aluminum Alloy
28	Finish		Smooth Finish
29	Types of Sections used		
30	Module dimensions cms (LxWxH)	To be specified	2278x1133x35 mm
31	PV panel Weight (kg)	To be specified	~28kg
32	Module Life (minimum)	25 years	25Years
33	PV array area(sqm)		2.58 sqm
34	Standards/Approvals from International Agencies	IEC 61215/IEC 61730/ IEC 61701	IEC 61215/IEC 61730/ IEC 61701/ IEC 62716/ IEC 62804/ IEC 60068/ IEC 62759
35	Guaranteed output confirm	Yes	Yes
36	Output Cables	Polarized, UV protected &Weather Proof DC rated multi-contact connector	Polarized, UV protected &Weather Proof DC rated multi-contact connector
37	Output Terminal	PV Connectors	MC4 Connectors
38	Junction Box	Weather resistant HDPE (IP65)	Split JB (IP68)
39	Construction Front and Back	High transmittance glass,Polyester Ethyl Vinyl Acetate(EVA) encapsulate	Ultra-clear PID free Ethyl Vinyl Acetate(EVA) encapsulate
40	Glass	Low iron tempered	3.2mm High transmittance, AR coated tempered glass
43	Copies of test certificates	IEC 61215,61730 part 1&2, IEC 61701	IEC 61215,61730 part 1&2, IEC 61701

PV Module			
Sl. NO	Particulars	Required	Offered
1	PV Module Manufacture name & Country of origin	manufacture name to be specified	Goldi Solar
2	PV Module type	Mono PERC	Mono Crystalline PERC
3	Product Code		GS10-M144-WF
4	No. of PV cells per Module		144 cells
5	Total number of PV modules		
6	Max.Power, Pmp@STC	380 Wp or Above	545Wp
7	Max.power tolerance (%)	Not more than 3%	0-2%
8	Max.power voltage (Vmp)@STC	To be specified	43.92V
9	Max.power current (Imp) @STC	To be specified	12.41A
10	Open circuit voltage,@STC	To be specified	49.54V
11	Short circuit current@STC	To be specified	13.50A
12	Nominal voltage	To be specified	43.92V
13	Nominal Wattage	To be specified	545Wp
14	Fill Factor	Not less than 0.70	>0.70
15	Temp.coefficient of Voc(%/°C)		-0.28
16	Temp.coefficient of Pmp (%/°C)		-0.35
17	Temperature Co-efficient of Isc (%/°C)		0.048
18	Normal Operating Cell Temperature (NOCT) (°C)		45C±2
19	Operating Temperature (°C)		-40°C TO 85°C
20	Max Temperature rise of solar cells under severe working conditions over Max. Ambient Temp.	To be specified	85°C
21	Module is suitable to operate at 50 ambient	Yes/No	Yes
22	Cell efficiency	%	>19
23	Module efficiency	≥19%	21.12%
24	Maximum System Voltage		1000V
25	No. of By-pass Diodes		3Nos Schottky
26	Mounting arrangement for Solar Module	Fixed Arrangement	Fixed Arrangement
27	Solar Module frame material	Anodized Aluminum	Silver Anodized Aluminum Alloy
28	Finish		Smooth Finish
29	Types of Sections used		
30	Module dimensions cms (LxWxH)	To be specified	2278x1133x35 mm
31	PV panel Weight (kg)	To be specified	~28kg
32	Module Life (minimum)	25 years	25Years
33	PV array area(sq.m)		2.58 sqm
34	Standards/Approvals from International Agencies	IEC 61215/IEC 61730/ IEC 61701	IEC 61215/IEC 61730/ IEC 61701/ IEC 62716/ IEC 62804/ IEC 60068/ IEC 62759
35	Guaranteed output confirm	Yes	Yes
36	Output Cables	Polarized, UV protected & Weather Proof DC rated multi-contact connector	Polarized, UV protected & Weather Proof DC rated multi-contact connector
37	Output Terminal	PV Connectors	MC4 Connectors
38	Junction Box	Weather resistant HDPE (IP65)	Split JB (IP68)
39	Construction Front and Back	High transmittance glass, Polyester Ethyl Vinyl Acetate(EVA) encapsulate	Ultra-clear PID free Ethyl Vinyl Acetate(EVA) encapsulate
40	Glass	Low iron tempered	3.2mm High transmission, low iron coated tempered glass
43	Copies of test certificates	IEC 61215, 61730 part 1&2, IEC 61701	IEC 61215, 61730 part 1&2, IEC 61701

PV Module			
SL NO	Particulars	Required	Offered
1	PV Module Manufacture name & Country of origin	manufacture name to be specified	Goldi Solar
2	PV Module type	Mono PERC	Mono Crystalline PERC
3	Product Code		GS10-M144-WF
4	No. of PV cells per Module		144 cells
5	Total number of PV modules		
6	Max.Power, Pmp@STC	380 Wp or Above	550Wp
7	Max.power tolerance (%)	Not more than 3%	0-2%
8	Max.power voltage (Vmp)@STC	To be specified	44.01V
9	Max.power current (Imp) @STC	To be specified	12.50A
10	Open circuit voltage,@STC	To be specified	49.61V
11	Short circuit current@STC	To be specified	13.57A
12	Nominal voltage	To be specified	44.01V
13	Nominal Wattage	To be specified	550Wp
14	Fill Factor	Not less than 0.70	>0.70
15	Temp.coefficient of Voc (%/C)		-0.28
16	Temp.coefficient of Pmp (%/C)		-0.35
17	Temperature Co-efficient of Isc (%/°C)		0.048
18	Normal Operating Cell Temperature (NOCT) (°C)		45C±2
19	Operating Temperature (°C)		-40°C TO 85°C
20	Max Temperature rise of solar cells under severe working conditions over Max. Ambient Temp.	To be specified	85°C
21	Module is suitable to operate at 50 ambient	Yes/No	Yes
22	Cell efficiency	%	>19
23	Module efficiency	≥19%	21.31%
24	Maximum System Voltage		1000V
25	No. of By-pass Diodes		3Nos Schottky
26	Mounting arrangement for Solar Module	Fixed Arrangement	Fixed Arrangement
27	Solar Module frame material	Anodized Aluminum	Silver Anodized Aluminum Alloy
28	Finish		Smooth Finish
29	Types of Sections used		
30	Module dimensions cms (LxWxH)	To be specified	2278x1133x35 mm
31	PV panel Weight (kg)	To be specified	~28kg
32	Module Life (minimum)	25 years	25Years
33	PV array area(sqm)		2.58 sqm
34	Standards/Approvals from International Agencies	IEC 61215/IEC 61730/ IEC 61701	IEC 61215/IEC 61730/ IEC 61701/ IEC 62716/ IEC 62804/ IEC 60068/ IEC 62759
35	Guaranteed output confirm	Yes	Yes
36	Output Cables	Polarized, UV protected & Weather Proof DC rated multi-contact connector	Polarized, UV protected & Weather Proof DC rated multi-contact connector
37	Output Terminal	PV Connectors	MC4 Connectors
38	Junction Box	Weather resistant HDPE (IP65)	Split JB (IP68)
39	Construction Front and Back	High transmittance glass, Polyester Ethyl Vinyl Acetate(EVA) encapsulate	Ultra-clear PID free Ethyl Vinyl Acetate(EVA) encapsulate
40	Glass	Low iron tempered	3.2mm High transmission, AR coated tempered glass
43	Copies of test certificates	IEC 61215,61730 part 1&2, IEC 61701	IEC 61215,61730 part 1&2, IEC 61701

PV Module			
SL NO	Particulars	Required	Offered
1	PV Module Manufacture name &Country of origin	manufacture name to be specified	Goldi Solar
2	PV Module type	Mono PERC	Mono Crystalline PERC
3	Product Code		GS10-M144-WF
4	No. of PV cells per Module		144 cells
5	Total number of PV modules		
6	Max.Power, Pmp@STC	380 Wp or Above	555Wp
7	Max.power tolerance (%)	Not more than 3%	0-2%
8	Max.power voltage (Vmp)@STC	To be specified	44.24V
9	Max.power current (Imp) @STC	To be specified	12.55A
10	Open circuit voltage.@STC	To be specified	49.82V
11	Short circuit current@STC	To be specified	13.62A
12	Nominal voltage	To be specified	44.24V
13	Nominal Wattage	To be specified	555Wp
14	Fill Factor	Not less than 0.70	>0.70
15	Temp.coefficient of Voc(%/C)		-0.28
16	Temp.coefficient of Pmp (%/C)		-0.35
17	Temperature Co-efficient of Isc (%/°C)		0.048
18	Normal Operating Cell Temperature (NOCT) (°C)		45C±2
19	Operating Temperature (°C)		-40°C TO 85°C
20	Max Temperature rise of solar cells under severe working conditions over Max. Ambient Temp.	To be specified	85°C
21	Module is suitable to operate at 50° ambient	Yes/No	Yes
22	Cell efficiency	%	>19
23	Module efficiency	≥19%	21.50%
24	Maximum System Voltage		1000V
25	No. of By-pass Diodes		3Nos Schottky
26	Mounting arrangement for Solar Module	Fixed Arrangement	Fixed Arrangement
27	Solar Module frame material	Anodized Aluminum	Silver Anodized Aluminum Alloy
28	Finish		Smooth Finish
29	Types of Sections used		
30	Module dimensions cms (LxWxH)	To be specified	2278x1133x35 mm
31	PV panel Weight (kg)	To be specified	~28kg
32	Module Life (minimum)	25 years	25Years
33	PV array area(sqm)		2.58 sqm
34	Standards/Approvals from International Agencies	IEC 61215/IEC 61730/ IEC 61701	IEC 61215/IEC 61730/ IEC 61701/ IEC 62716/ IEC 62804/ IEC 60068/ IEC 62759
35	Guaranteed output confirm	Yes	Yes
36	Output Cables	Polarized, UV protected &Weather Proof DC rated multi-contact connector	Polarized, UV protected &Weather Proof DC rated multi-contact connector
37	Output Terminal	PV Connectors	MC4 Connectors
38	Junction Box	Weather resistant HDPE (IP65)	Split JB (IP68)
39	Construction Front and Back	High transmittance glass.Polyester Ethyl Vinyl Acetate(EVA) encapsulate	Ultra-clear PID free Ethyl Vinyl Acetate(EVA) encapsulate
40	Glass	Low iron tempered	3.2mm High transmission, AR coated tempered glass
43	Copies of test certificates	IEC 61215,61730 part 1&2, IEC 61701	IEC 61215,61730 part 1&2, IEC 61701

PV Module			
SL NO	Particulars	Required	Offered
1	PV Module Manufacture name & Country of origin	manufacture name to be specified	Goldi Solar
2	PV Module type	Mono PERC	Mono Crystalline PERC
3	Product Code		GS10-M144-WF
4	No. of PV cells per Module		144 cells
5	Total number of PV modules		
6	Max.Power, Pmp@STC	380 Wp or Above	560Wp
7	Max.power tolerance (%)	Not more than 3%	0-2%
8	Max.power voltage (Vmp)@STC	To be specified	44.35V
9	Max.power current (Imp) @STC	To be specified	12.63A
10	Open circuit voltage.@STC	To be specified	49.97V
11	Short circuit current@STC	To be specified	13.65A
12	Nominal voltage	To be specified	44.35V
13	Nominal Wattage	To be specified	560Wp
14	Fill Factor	Not less than 0.70	>0.70
15	Temp.coefficient of Voc(%/C)		-0.28
16	Temp.coefficient of Pmp (%/C)		-0.35
17	Temperature Co-efficient of Isc (%/°C)		0.048
18	Normal Operating Cell Temperature (NOCT) (°C)		45C±2
19	Operating Temperature (°C)		-40°C TO 85°C
20	Max Temperature rise of solar cells under severe working conditions over Max. Ambient Temp.	To be specified	85°C
21	Module is suitable to operate at 50 ambient	Yes/No	Yes
22	Cell efficiency	%	>19
23	Module efficiency	≥19%	21.70%
24	Maximum System Voltage		1000V
25	No. of By-pass Diodes		3Nos Schottky
26	Mounting arrangement for Solar Module	Fixed Arrangement	Fixed Arrangement
27	Solar Module frame material	Anodized Aluminum	Silver Anodized Aluminum Alloy
28	Finish		Smooth Finish
29	Types of Sections used		
30	Module dimensions cms (LxWxH)	To be specified	2278x1133x35 mm
31	PV panel Weight (kg)	To be specified	~28kg
32	Module Life (minimum)	25 years	25Years
33	PV array area(sq.m)		2.58 sqm
34	Standards/Approvals from International Agencies	IEC 61215/IEC 61730/ IEC 61701	IEC 61215/IEC 61730/ IEC 61701/ IEC 62716/ IEC 62804/ IEC 60068/ IEC 62759
35	Guaranteed output confirm	Yes	Yes
36	Output Cables	Polarized, UV protected & Weather Proof DC rated multi-contact connector	Polarized, UV protected & Weather Proof DC rated multi-contact connector
37	Output Terminal	PV Connectors	MC4 Connectors
38	Junction Box	Weather resistant HDPE (IP65)	Split JB (IP68)
39	Construction Front and Back	High transmittance glass.Polyester Ethyl Vinyl Acetate(EVA) encapsulate	Ultra-clear PID free Ethyl Vinyl Acetate(EVA) encapsulate
40	Glass	Low iron tempered	3.2mm High transmission AR coated tempered glass
43	Copies of test certificates	IEC 61215,61730 part 1&2, IEC 61701	IEC 61215,61730 part 1&2, IEC 61701

PV Module			
SL NO	Particulars	Required	Offered
1	PV Module Manufacture name &Country of origin	manufacture name to be specified	Rayzon Solar
2	PV Module type	Mono PERC	Mono Crystalline PERC
3	Product Code		RS530WC
4	No. of PV cells per Module		144 Cells
5	Total number of PV modules		
6	Max.Power, Pmp@STC	385 Wp or Above	530 Wp
7	Max.power tolerance (%)	Not more than 3%	Not more than 3%
8	Max.power voltage (Vmp)@STC	To be specified	41.47V
9	Max.power current (Imp) @STC	To be specified	12.79A
10	Open circuit voltage,@STC	To be specified	48.96V
11	Short circuit current@STC	To be specified	13.45A
12	Nominal voltage	To be specified	39.11 V
13	Nominal Wattage	To be specified	400.63 W
14	Fill Factor	Not less than 0.70	>0.70
15	Temp.coefficient of Voc(%/C)		-0.29
16	Temp.coefficient of Pmp (%/C)		-0.39
17	Temperature Co-efficient of Isc (%/°C)		0.021
18	Normal Operating Cell Temperature (NOCT) (°C)		45C±2
19	Operating Temperature (°C)		-40°C TO 85°C
20	Max Temperature rise of solar cells under severe working conditions over Max. Ambient Temp.	To be specified	85°C
21	Module is suitable to operate at 50 ambient	Yes/No	Yes
22	Cell efficiency	%	>19
23	Module efficiency	≥19%	20.55%
24	Maximum System Voltage		1000V
25	No. of By-pass Diodes		3Nos Schottky
26	Mounting arrangement for Solar Module	Fixed Arrangement	Fixed Arrangement
27	Solar Module frame material	Anodized Aluminum	Anodized Aluminum
28	Finish		Smooth Finish
29	Types of Sections used		
30	Module dimensions cms (LxWxH)	To be specified	2278x1133x40 mm
31	PV panel Weight (kg)	To be specified	28.6 kg
32	Module Life (minimum)	25 years	25Years
33	PV array area(sqm)		1.985 sqm
34	Standards/Approvals from International Agencies	IEC 61215/IEC 61730/ IEC 61701	IEC 61215/IEC 61730/ IEC 61701
35	Guaranteed output confirm	Yes	Yes
36	Output Cables	Polarized, UV protected &Weather Proof DC rated multi-contact connector	Polarized, UV protected &Weather Proof DC rated multi-contact connector
37	Output Terminal	PV Connectors	PV Connectors
38	Junction Box	Weather resistant HDPE (IP65)	Weather resistant HDPE (IP65)
39	Construction Front and Back	High transmittance glass,Polyester Ethyl Vinyl Acetate(EVA) encapsulate	High transmittance glass,Polyester Ethyl Vinyl Acetate(EVA) encapsulate
40	Glass	Low iron tempered	3.2mm Thick Low Iron Tempered
43	Copies of test certificates	IEC 61215,61730 part 1&2, IEC 61701	IEC 61215,61730 part 1&2, IEC 61701

PV Module			
SL NO	Particulars	Required	Offered
1	PV Module Manufacture name &Country of origin	manufacture name to be specified	Rayzon Solar
2	PV Module type	Mono PERC	Mono Crystalline PERC
3	Product Code		RS535WC
4	No. of PV cells per Module		144 Cells
5	Total number of PV modules		
6	Max.Power, Pmp@STC	385 Wp or Above	535 Wp
7	Max.power tolerance (%)	Not more than 3%	Not more than 3%
8	Max.power voltage (Vmp)@STC	To be specified	41.73V
9	Max.power current (Imp) @STC	To be specified	12.83A
10	Open circuit voltage,@STC	To be specified	49.15V
11	Short circuit current@STC	To be specified	13.49A
12	Nominal voltage	To be specified	39.29 V
13	Nominal Wattage	To be specified	404.41 W
14	Fill Factor	Not less than 0.70	>0.70
15	Temp.coefficient of Voc(%/C)		-0.29
16	Temp.coefficient of Pmp (%/C)		-0.39
17	Temperature Co-efficient of Isc (%/°C)		0.021
18	Normal Operating Cell Temperature (NOCT) (°C)		45C±2
19	Operating Temperature (°C)		-40°C TO 85°C
20	Max Temperature rise of solar cells under severe working conditions over Max. Ambient Temp.	To be specified	85°C
21	Module is suitable to operate at 50 ambient	Yes/No	Yes
22	Cell efficiency	%	>19
23	Module efficiency	≥19%	20.74%
24	Maximum System Voltage		1000V
25	No. of By-pass Diodes		3Nos Schottky
26	Mounting arrangement for Solar Module	Fixed Arrangement	Fixed Arrangement
27	Solar Module frame material	Anodized Aluminum	Anodized Aluminum
28	Finish		Smooth Finish
29	Types of Sections used		
30	Module dimensions cms (LxWxH)	To be specified	2278x1133x40 mm
31	PV panel Weight (kg)	To be specified	28.6 kg
32	Module Life (minimum)	25 years	25Years
33	PV array area(sqm)		1.985 sqm
34	Standards/Approvals from International Agencies	IEC 61215/IEC 61730/ IEC 61701	IEC 61215/IEC 61730/ IEC 61701
35	Guaranteed output confirm	Yes	Yes
36	Output Cables	Polarized, UV protected &Weather Proof DC rated multi-contact connector	Polarized, UV protected &Weather Proof DC rated multi-contact connector
37	Output Terminal	PV Connectors	PV Connectors
38	Junction Box	Weather resistant HDPE (IP65)	Weather resistant HDPE (IP65)
39	Construction Front and Back	High transmittance glass,Polyester Ethyl Vinyl Acetate(EVA) encapsulate	High transmittance glass,Polyester Ethyl Vinyl Acetate(EVA) encapsulate
40	Glass	Low iron tempered	3.2mm Thick Low Iron Tempered
43	Copies of test certificates	IEC 61215,61730 part 1&2. IEC 61701	IEC 61215,61730 part 1&2,IEC 61701

PV Module			
SL NO	Particulars	Required	Offered
1	PV Module Manufacture name & Country of origin	manufacture name to be specified	Rayzon Solar
2	PV Module type	Mono PERC	Mono Crystalline PERC
3	Product Code		RS540WC
4	No. of PV cells per Module		72 Cells
5	Total number of PV modules		
6	Max.Power, Pmp@STC	385 Wp or Above	540 Wp
7	Max.power tolerance (%)	Not more than 3%	Not more than 3%
8	Max.power voltage (Vmp)@STC	To be specified	42.06 V
9	Max.power current (Imp) @STC	To be specified	12.85A
10	Open circuit voltage,@STC	To be specified	49.34V
11	Short circuit current@STC	To be specified	13.52A
12	Nominal voltage	To be specified	39.49 V
13	Nominal Wattage	To be specified	408 W
14	Fill Factor	Not less than 0.70	>0.70
15	Temp.coefficient of Voc(%/C)		-0.29
16	Temp.coefficient of Pmp (%/C)		-0.39
17	Temperature Co-efficient of Isc (%/°C)		0.021
18	Normal Operating Cell Temperature (NOCT) (°C)		45°C±2
19	Operating Temperature (°C)		-40°C TO 85°C
20	Max Temperature rise of solar cells under severe working conditions over Max. Ambient Temp.	To be specified	85°C
21	Module is suitable to operate at 50 ambient	Yes/No	Yes
22	Cell efficiency	%	>19
23	Module efficiency	≥19%	20.94%
24	Maximum System Voltage		1000V
25	No. of By-pass Diodes		3Nos Schottky
26	Mounting arrangement for Solar Module	Fixed Arrangement	Fixed Arrangement
27	Solar Module frame material	Anodized Aluminum	Anodized Aluminum
28	Finish		Smooth Finish
29	Types of Sections used		
30	Module dimensions cms (LxWxH)	To be specified	2278x1133x40 mm
31	PV panel Weight (kg)	To be specified	28.6 kg
32	Module Life (minimum)	25 years	25Years
33	PV array area(sq.m)		1.985 sqm
34	Standards/Approvals from International Agencies	IEC 61215/IEC 61730/ IEC 61701	IEC 61215/IEC 61730/ IEC 61701
35	Guaranteed output confirm	Yes	Yes
36	Output Cables	Polarized, UV protected & Weather Proof DC rated multi-contact connector	Polarized, UV protected & Weather Proof DC rated multi-contact connector
37	Output Terminal	PV Connectors	PV Connectors
38	Junction Box	Weather resistant HDPE (IP65)	Weather resistant HDPE (IP65)
39	Construction Front and Back	High transmittance glass, Polyester Ethyl Vinyl Acetate(EVA) encapsulate	High transmittance glass, Polyester Ethyl Vinyl Acetate(EVA) encapsulate
40	Glass	Low iron tempered	3.2mm Thick Low Iron Tempered
43	Copies of test certificates	IEC 61215, 61730 part 1&2, IEC 61701	IEC 61215, 61730 part 1&2, IEC 61701

PV Module			
SL NO	Particulars	Required	Offered
1	PV Module Manufacture name &Country of origin	manufacture name to be specified	Rayzon Solar
2	PV Module type	Mono PERC	Mono Crystalline PERC
3	Product Code		RS545WC
4	No. of PV cells per Module		144 Cells
5	Total number of PV modules		
6	Max.Power, Pmp@STC	385 Wp or Above	545 Wp
7	Max.power tolerance (%)	Not more than 3%	Not more than 3%
8	Max.power voltage (Vmp)@STC	To be specified	42.28 V
9	Max.power current (Imp) @STC	To be specified	12.90A
10	Open circuit voltage,@STC	To be specified	49.45V
11	Short circuit current@STC	To be specified	13.56A
12	Nominal voltage	To be specified	39.00 V
13	Nominal Wattage	To be specified	411.97 W
14	Fill Factor	Not less than 0.70	>0.70
15	Temp.coefficient of Voc(%/C)		-0.29
16	Temp.coefficient of Pmp (%/C)		-0.39
17	Temperature Co-efficient of Isc (%/°C)		0.021
18	Normal Operating Cell Temperature (NOCT) (°C)		45C±2
19	Operating Temperature (°C)		-40°C TO 85°C
20	Max Temperature rise of solar cells under severe working conditions over Max. Ambient Temp.	To be specified	85°C
21	Module is suitable to operate at 50 ambient	Yes/No	Yes
22	Cell efficiency	%	>19
23	Module efficiency	≥19%	21.13%
24	Maximum System Voltage		1000V
25	No. of By-pass Diodes		3Nos Schottky
26	Mounting arrangement for Solar Module	Fixed Arrangement	Fixed Arrangement
27	Solar Module frame material	Anodized Aluminum	Anodized Aluminum
28	Finish		Smooth Finish
29	Types of Sections used		
30	Module dimensions cms (LxWxH)	To be specified	2278x1133x40 mm
31	PV panel Weight (kg)	To be specified	28.6 kg
32	Module Life (minimum)	25 years	25Years
33	PV array area(sq.m)		1.985 sq.m
34	Standards/Approvals from International Agencies	IEC 61215/IEC 61730/ IEC 61701	IEC 61215/IEC 61730/ IEC 61701
35	Guaranteed output confirm	Yes	Yes
36	Output Cables	Polarized, UV protected &Weather Proof DC rated multi-contact connector	Polarized, UV protected &Weather Proof DC rated multi-contact connector
37	Output Terminal	PV Connectors	PV Connectors
38	Junction Box	Weather resistant HDPE (IP65)	Weather resistant HDPE (IP65)
39	Construction Front and Back	High transmittance glass,Polyester Ethyl Vinyl Acetate(EVA) encapsulate	High transmittance glass,Polyester Ethyl Vinyl Acetate(EVA) encapsulate
40	Glass	Low Iron tempered	3.2mm Thick Low Iron Tempered
43	Copies of test certificates	IEC 61215,61730 part 1&2, IEC 61701	IEC 61215,61730 part 1&2, IEC 61701

GUARANTEED TECHNICAL PARTICULAR			
DATA SHEETS			
SL NO	Particulars	Required	Offered
1	PV Module Manufacture name &Country	Indian make,(manufacture name to be specified)	Vikrimsolar
2	PV Module type	Poly/Multi Crystalline	Monofacial
3	Product Code		SOMERA VSM. 144.525
4	No. of PV cells per Module		144 Cells
5	Total number of PV modules		
6	Max.Power, Pmp@STC	≥330Wp	525 Wp
7	Max.power tolerance (%)	Not more than 3%	Not more than 3%
8	Max.power voltage (Vmp)@STC	To be specified	41.4V
9	Max.power current (Imp) @STC	To be specified	12.69A
10	Open circuit voltage,@STC	To be specified	49.2V
11	Short circuit current@STC	To be specified	13.4A
12	Nominal voltage	To be specified	38.2V
13	Nominal Wattage	To be specified	391.4
14	Fill Factor	Not less than 0.7	>0.7
15	Temp.coefficient of Voc(%/C)		-0.27
16	Temp.coefficient of Pmp (%/C)		-0.35
17	Temperature Co-efficient of Isc (%/°C)		0.05
18	Normal Operating Cell Temperature (NOCT) (°C)		45°C±2
19	Operating Temperature (°C)		-40°C TO 85°C
20	Max Temperature rise of solar cells under severe working conditions over Max. Ambient Temp.	To be specified	90°C
21	Module is suitable to operate at 50 ambient	Yes/No	Yes
22	Cell efficiency	>15%	
23	Module efficiency	≥17%	20.36%
24	Maximum System Voltage	600/1000V	1500V
25	No. of By-pass Diodes		3NOS
26	Mounting arrangement for Solar Module	Fixed Arrangement	Fixed Arrangement
27	Solar Module frame material	Anodized Aluminum	Anodized Aluminum
28	Finish		Smooth Finish
29	Types of Sections used		
30	Module dimensions cms (LxWxH)	To be specified	2274x1134x35
31	PV panel Weight (kg)	To be specified	28.2kg
32	Module Life (minimum)	25 years	25Years
33	PV array area(sq.m)		
34	Standards/Approvals from International Agencies	IEC 61215/IEC 61730/ IEC 61701	IEC 61215/IEC 61730/ IEC 61701
35	Guaranteed output confirm	Yes	Yes
36	Output Cables	Polarized, UV protected &Weather Proof DC rated multi-contact connector	Polarized, UV protected &Weather Proof DC rated multi-contact connector
37	Output Terminal	PV Connectors	PV Connectors
38	Junction Box	Weather resistant HDPE (IP65)	Weather resistant HDPE (IP68)
39	Construction Front and Back	High transmittance glass,Polyester Ethyl Vinyl Acetate(EVA) encapsulate	High transmittance glass,Polyester Ethyl Vinyl Acetate(EVA) encapsulate
40	Glass	Low iron tempered	Low iron tempered
41	Total Plant's foot print area(sq.m)		
42	Control facility area (sq.m)		2
43	Copies of test certificates	IEC 61215,61730 part 1&2, IEC 61701	Enclosed

GUARANTEED TECHNICAL PARTICULAR			
DATA SHEETS			
SL NO	Particulars	Required	Offered
1	PV Module Manufacture name & Country	Indian make, (manufacture name to be specified)	Vikrimsolar
2	PV Module type	Poly/Multi Crystalline	Monofacial
3	Product Code		SOMERA VSM.144 530
4	No. of PV cells per Module		144 Cells
5	Total number of PV modules		
6	Max.Power, Pmp@STC	≥ 330Wp	530 Wp
7	Max.power tolerance (%)	Not more than 3%	Not more than 3%
8	Max.power voltage (Vmp)@STC	To be specified	41.5V
9	Max.power current (Imp) @STC	To be specified	12.78A
10	Open circuit voltage,@STC	To be specified	49.3V
11	Short circuit current@STC	To be specified	13.48A
12	Nominal voltage	To be specified	38.3V
13	Nominal Wattage	To be specified	393
14	Fill Factor	Not less than 0.7	>0.7
15	Temp.coefficient of Voc(%/C)		-0.27
16	Temp.coefficient of Pmp (%/C)		-0.35
17	Temperature Co-efficient of Isc (%/°C)		0.05
18	Normal Operating Cell Temperature (NOCT) (°C)		45°C±2
19	Operating Temperature (°C)		-40°C TO 85°C
20	Max Temperature rise of solar cells under severe working conditions over Max. Ambient Temp.	To be specified	90°C
21	Module is suitable to operate at 50 ambient	Yes/No	Yes
22	Cell efficiency	>15%	
23	Module efficiency	≥17%	20.55%
24	Maximum System Voltage	600/1000V	1500V
25	No. of By-pass Diodes		3N05
26	Mounting arrangement for Solar Module	Fixed Arrangement	Fixed Arrangement
27	Solar Module frame material	Anodized Aluminum	Anodized Aluminum
28	Finish		Smooth Finish
29	Types of Sections used		
30	Module dimensions cms (LxWxH)	To be specified	2274x1134x35
31	PV panel Weight (kg)	To be specified	28.2kg
32	Module Life (minimum)	25 years	25Years
33	PV array area(sqm)		
34	Standards/Approvals from International Agencies	IEC 61215/IEC 61730/ IEC 61701	IEC 61215/IEC 61730/ IEC 61701
35	Guaranteed output confirm	Yes	Yes
36	Output Cables	Polarized, UV protected & Weather Proof DC rated multi-contact connector	Polarized, UV protected & Weather Proof DC rated multi-contact connector
37	Output Terminal	PV Connectors	PV Connectors
38	Junction Box	Weather resistant HDPE (IP65)	Weather resistant HDPE (IP68)
39	Construction Front and Back	High transmittance glass, Polyester Ethyl Vinyl Acetate(EVA) encapsulate	High transmittance glass, Polyester Ethyl Vinyl Acetate(EVA) encapsulate
40	Glass	Low iron tempered	Low iron tempered
41	Total Plant's foot print area(sqm)		
42	Control facility area (sqm)		2
43	Copies of test certificates	IEC 61215, 61730 part 1&2, IEC 61701	Enclosed

GUARANTEED TECHNICAL PARTICULAR			
DATA SHEETS			
Sl NO	Particulars	Required	Offered
1	PV Module Manufacture name &Country	Indian make,(manufacture name to be specified)	Vikrānsolar
2	PV Module type	Poly/Multi Crystalline	Monofacial
3	Product Code		SOMERA VSM.144.535
4	No. of PV cells per Module		144 Cells
5	Total number of PV modules		
6	Max.Power, Pmp@STC	≥330Wp	535 Wp
7	Max.power tolerance (%)	Not more than 3%	Not more than 3%
8	Max.power voltage (Vmp)@STC	To be specified	41.6V
9	Max.power current (Imp) @STC	To be specified	12.87A
10	Open circuit voltage,@STC	To be specified	49.4V
11	Short circuit current@STC	To be specified	13.56A
12	Nominal voltage	To be specified	38.4V
13	Nominal Wattage	To be specified	397
14	Fill Factor	Not less than 0.7	>0.7
15	Temp.coefficient of Voc(%/C)		-0.27
16	Temp.coefficient of Pmp (%/C)		-0.35
17	Temperature Co-efficient of Isc (%/°C)		0.05
18	Normal Operating Cell Temperature (NOCT) (°C)		45C±2
19	Operating Temperature (°C)		-40°C TO 85°C
20	Max Temperature rise of solar cells under severe working conditions over Max. Ambient Temp.	To be specified	90°C
21	Module is suitable to operate at 50 ambient	Yes/No	Yes
22	Cell efficiency	>15%	
23	Module efficiency	≥17%	20.75%
24	Maximum System Voltage	600/1000V	1500V
25	No. of By-pass Diodes		3NOS
26	Mounting arrangement for Solar Module	Fixed Arrangement	Fixed Arrangement
27	Solar Module frame material	Anodized Aluminum	Anodized Aluminum
28	Finish		Smooth Finish
29	Types of Sections used		
30	Module dimensions cms (LxWxH)	To be specified	2274x1134x35
31	PV panel Weight (kg)	To be specified	28.2kg
32	Module Life (minimum)	25 years	25Years
33	PV array area(sqm)		
34	Standards/Approvals from International Agencies	IEC 61215/IEC 61730/ IEC 61701	IEC 61215/IEC 61730/ IEC 61701
35	Guaranteed output confirm	Yes	Yes
36	Output Cables	Polarized, UV protected &Weather Proof DC rated multi-contact connector	Polarized, UV protected &Weather Proof DC rated multi-contact connector
37	Output Terminal	PV Connectors	PV Connectors
38	Junction Box	Weather resistant HDPE (IP65)	Weather resistant HDPE (IP68)
39	Construction Front and Back	High transmittance glass,Polyester Ethyl Vinyl Acetate(EVA) encapsulate	High transmittance glass,Polyester Ethyl Vinyl Acetate(EVA) encapsulate
40	Glass	Low iron tempered	Low iron tempered
41	Total Plant's foot print area(sqm)		
42	Control facility area (sqm)		2
43	Copies of test certificates	IEC 61215,61730 part 1&2, IEC 61701	Enclosed

GUARANTEED TECHNICAL PARTICULAR			
DATA SHEETS			
Sl NO	Particulars	Required	Offered
1	PV Module Manufacture name & Country	Indian make, (manufacture name to be specified)	Vikrimsolar
2	PV Module type	Poly/Multi Crystalline	Monofacial
3	Product Code		SOMERA VSM.144.540
4	No. of PV cells per Module		144 Cells
5	Total number of PV modules		
6	Max.Power, Pmp@STC	≥330Wp	540 Wp
7	Max.power tolerance (%)	Not more than 3%	Not more than 3%
8	Max.power voltage (Vmp)@STC	To be specified	41.7V
9	Max.power current (Imp) @STC	To be specified	12.95A
10	Open circuit voltage,@STC	To be specified	49.5 V
11	Short circuit current@STC	To be specified	13.64 A
12	Nominal voltage	To be specified	38.5V
13	Nominal Wattage	To be specified	399
14	Fill Factor	Not less than 0.7	>0.7
15	Temp.coefficient of Voc(%/C)		-0.27
16	Temp.coefficient of Pmp (%/C)		-0.35
17	Temperature Co-efficient of Isc (%/°C)		0.05
18	Normal Operating Cell Temperature (NOCT) (°C)		45°C±2
19	Operating Temperature (°C)		-40°C TO 85°C
20	Max Temperature rise of solar cells under severe working conditions over Max. Ambient Temp.	To be specified	90°C
21	Module is suitable to operate at 50 ambient	Yes/No	Yes
22	Cell efficiency	>15%	
23	Module efficiency	≥17%	20.94%
24	Maximum System Voltage	600/1000V	1500V
25	No. of By-pass Diodes		3NOS
26	Mounting arrangement for Solar Module	Fixed Arrangement	Fixed Arrangement
27	Solar Module frame material	Anodized Aluminum	Anodized Aluminum
28	Finish		Smooth Finish
29	Types of Sections used		
30	Module dimensions cms (LxWxH)	To be specified	2274x1134x35
31	PV panel Weight (kg)	To be specified	28.2kg
32	Module Life (minimum)	25 years	25Years
33	PV array area(sq.m)		
34	Standards/Approvals from International Agencies	IEC 61215/IEC 61730/ IEC 61701	IEC 61215/IEC 61730/ IEC 61701
35	Guaranteed output confirm	Yes	Yes
36	Output Cables	Polarized, UV protected & Weather Proof DC rated multi-contact connector	Polarized, UV protected & Weather Proof DC rated multi-contact connector
37	Output Terminal	PV Connectors	PV Connectors
38	Junction Box	Weather resistant HDPE (IP65)	Weather resistant HDPE (IP68)
39	Construction Front and Back	High transmittance glass, Polyester Ethyl Vinyl Acetate(EVA) encapsulate	High transmittance glass, Polyester Ethyl Vinyl Acetate(EVA) encapsulate
40	Glass	Low iron tempered	Low iron tempered
41	Total Plant's foot print area(sq.m)		
42	Control facility area (sq.m)		2
43	Copies of test certificates	IEC 61215, IEC 61730 part 1&2, IEC 61701	Enclosed

GUARANTEED TECHNICAL PARTICULAR			
DATA SHEETS			
SL NO	Particulars	Required	Offered
1	PV Module Manufacture name &Country	Indian make,(manufacture name to be specified)	Vikramsolar
2	PV Module type	Poly/Multi Crystalline	Monofacial
3	Product Code		SOMERA VSM.144.545
4	No. of PV cells per Module		144 Cells
5	Total number of PV modules		
6	Max.Power, Pmp@STC	≥330Wp	545 Wp
7	Max.power tolerance (%)	Not more than 3%	Not more than 3%
8	Max.power voltage (Vmp)@STC	To be specified	41.8V
9	Max.power current (Imp) @STC	To be specified	13.04A
10	Open circuit voltage,@STC	To be specified	49.6 V
11	Short circuit current@STC	To be specified	13.73 A
12	Nominal voltage	To be specified	38.6 V
13	Nominal Wattage	To be specified	402
14	Fill Factor	Not less than 0.7	>0.7
15	Temp.coefficient of Voc(%/C)		-0.27
16	Temp.coefficient of Pmp (%/C)		-0.35
17	Temperature Co-efficient of Isc (%/°C)		0.05
18	Normal Operating Cell Temperature (NOCT) (°C)		45C±2
19	Operating Temperature (°C)		-40°C TO 85°C
20	Max Temperature rise of solar cells under severe working conditions over Max. Ambient Temp.	To be specified	90°C
21	Module is suitable to operate at 50 ambient	Yes/No	Yes
22	Cell efficiency	>15%	
23	Module efficiency	≥17%	21.13%
24	Maximum System Voltage	600/1000V	1500V
25	No. of By-pass Diodes		3NOS
26	Mounting arrangement for Solar Module	Fixed Arrangement	Fixed Arrangement
27	Solar Module frame material	Anodized Aluminum	Anodized Aluminum
28	Finish		Smooth Finish
29	Types of Sections used		
30	Module dimensions cms (LxWxH)	To be specified	2274x1134x35
31	PV panel Weight (kg)	To be specified	28.2kg
32	Module Life (minimum)	25 years	25Years
33	PV array area(sqm)		
34	Standards/Approvals from International Agencies	IEC 61215/IEC 61730/ IEC 61701	IEC 61215/IEC 61730/ IEC 61701
35	Guaranteed output confirm	Yes	Yes
36	Output Cables	Polarized, UV protected &Weather Proof DC rated multi-contact connector	Polarized, UV protected &Weather Proof DC rated multi-contact connector
37	Output Terminal	PV Connectors	PV Connectors
38	Junction Box	Weather resistant HDPE (IP65)	Weather resistant HDPE (IP68)
39	Construction Front and Back	High transmittance glass,Polyester Ethyl Vinyl Acetate(EVA) encapsulate	High transmittance glass,Polyester Ethyl Vinyl Acetate(EVA) encapsulate
40	Glass	Low Iron tempered	Low iron tempered
41	Total Plant's foot print area(sqm)		
42	Control facility area (sqm)		2
43	Copies of test certificates	IEC 61215,61730 part 1&2, IEC 61701	Enclosed

GUARANTEED TECHNICAL PARTICULAR			
DATA SHEETS			
Sl NO	Particulars	Required	Offered
1	PV Module Manufacture name &Country	Indian make,(manufacture name to be specified)	Vikramsolar
2	PV Module type	Poly/Multi Crystalline	Monofacial
3	Product Code		SOMERA VSM 144.550
4	No. of PV cells per Module		144 Cells
5	Total number of PV modules		
6	Max.Power, Pmp@STC	≥330Wp	550 Wp
7	Max.power tolerance (%)	Not more than 3%	Not more than 3%
8	Max.power voltage (Vmp)@STC	To be specified	41.9V
9	Max.power current (Imp) @STC	To be specified	13.13A
10	Open circuit voltage,@STC	To be specified	49.7 V
11	Short circuit current@STC	To be specified	13.82 A
12	Nominal voltage	To be specified	38.7 V
13	Nominal Wattage	To be specified	407
14	Fill Factor	Not less than 0.7	>0.7
15	Temp.coefficient of Voc (%/C)		-0.27
16	Temp.coefficient of Pmp (%/C)		-0.35
17	Temperature Co-efficient of Isc (%/°C)		0.05
18	Normal Operating Cell Temperature (NOCT) (°C)		45C±2
19	Operating Temperature (°C)		-40°C TO 85°C
20	Max Temperature rise of solar cells under severe working conditions over Max. Ambient Temp.	To be specified	90°C
21	Module is suitable to operate at 50 ambient	Yes/No	Yes
22	Cell efficiency	>15%	
23	Module efficiency	≥17%	21.33%
24	Maximum System Voltage	600/1000V	1500V
25	No. of By-pass Diodes		3NOS
26	Mounting arrangement for Solar Module	Fixed Arrangement	Fixed Arrangement
27	Solar Module frame material	Anodized Aluminum	Anodized Aluminum
28	Finish		Smooth Finish
29	Types of Sections used		
30	Module dimensions mm (LxWxH)	To be specified	2274x1134x35
31	PV panel Weight (kg)	To be specified	28.2kg
32	Module Life (minimum)	25 years	25Years
33	PV array area(sq.m)		
34	Standards/Approvals from International Agencies	IEC 61215/IEC 61730/ IEC 61701	IEC 61215/IEC 61730/ IEC 61701
35	Guaranteed output confirm	Yes	Yes
36	Output Cables	Polarized, UV protected &Weather Proof DC rated multi-contact connector	Polarized, UV protected &Weather Proof DC rated multi-contact connector
37	Output Terminal	PV Connectors	PV Connectors
38	Junction Box	Weather resistant HDPE (IP65)	Weather resistant HDPE (IP68)
39	Construction Front and Back	High transmittance glass,Polyester Ethyl Vinyl Acetate(EVA) encapsulate	High transmittance glass,Polyester Ethyl Vinyl Acetate(EVA) encapsulate
40	Glass	Low iron tempered	Low iron tempered
41	Total Plant's foot print area(sq.m)		
42	Control facility area (sq.m)		2
43	Copies of test certificates	IEC 61215,61730 part 1&2, IEC 61701	Enclosed

GUARANTEED TECHNICAL PARTICULAR			
DATA SHEETS			
Sl NO	Particulars	Required	Offered
1	PV Module Manufacture name &Country	Indian make,(manufacture name to be specified)	Vikramsolar
2	PV Module type	Poly/Multi Crystalline	Monofacial
3	Product Code		SOMERA VSM.144.670
4	No. of PV cells per Module		144 Cells
5	Total number of PV modules		
6	Max.Power, Pmp@STC	≥330Wp	550 Wp
7	Max.power tolerance (%)	Not more than 3%	Not more than 3%
8	Max.power voltage (Vmp)@STC	To be specified	40.9V
9	Max.power current (Imp) @STC	To be specified	16.39A
10	Open circuit voltage,@STC	To be specified	48 V
11	Short circuit current@STC	To be specified	17.55 A
12	Nominal voltage	To be specified	37.3 V
13	Nominal Wattage	To be specified	501.2
14	Fill Factor	Not less than 0.7	>0.7
15	Temp.coefficient of Voc(%/°C)		-0.27
16	Temp.coefficient of Pmp (%/°C)		-0.35
17	Temperature Co-efficient of Isc (%/°C)		0.05
18	Normal Operating Cell Temperature (NOCT) (°C)		45°C±2
19	Operating Temperature (°C)		-40°C TO 85°C
20	Max Temperature rise of solar cells under severe working conditions over Max. Ambient Temp.	To be specified	90°C
21	Module is suitable to operate at 50 ambient	Yes/No	Yes
22	Cell efficiency	>15%	
23	Module efficiency	≥17%	21.57%
24	Maximum System Voltage	600/1000V	1500V
25	No. of By-pass Diodes		3NOS
26	Mounting arrangement for Solar Module	Fixed Arrangement	Fixed Arrangement
27	Solar Module frame material	Anodized Aluminum	Anodized Aluminum
28	Finish		Smooth Finish
29	Types of Sections used		
30	Module dimensions cms (LxWxH)	To be specified	2384x1303x35
31	PV panel Weight (kg)	To be specified	33.6kg
32	Module Life (minimum)	25 years	25Years
33	PV array area(sq.m)		
34	Standards/Approvals from International Agencies	IEC 61215/IEC 61730/ IEC 61701	IEC 61215/IEC 61730/ IEC 61701
35	Guaranteed output confirm	Yes	Yes
36	Output Cables	Polarized, UV protected &Weather Proof DC rated multi-contact connector	Polarized, UV protected &Weather Proof DC rated multi-contact connector
37	Output Terminal	PV Connectors	PV Connectors
38	Junction Box	Weather resistant HDPE (IP65)	Weather resistant HDPE (IP68)
39	Construction Front and Back	High transmittance glass,Polyester Ethyl Vinyl Acetate(EVA) encapsulate	High transmittance glass,Polyester Ethyl Vinyl Acetate(EVA) encapsulate
40	Glass	Low iron tempered	Low iron tempered
41	Total Plant's foot print area(sq.m)		
42	Control facility area (sq.m)		2
43	Copies of test certificates	IEC 61215,61730 part 3&2, IEC 61701	Enclosed

GUARANTEED TECHNICAL PARTICULAR			
DATA SHEETS			
SL NO	Particulars	Required	Offered
1	PV Module Manufacture name & Country	Indian make, (manufacture name to be specified)	Renewsys, India
2	PV Module type	Mono PERC	Monofacial
3	Product Code		DESERV SGALACTIC 144
4	No. of PV cells per Module		144 Cells
5	Total number of PV modules		
6	Max. Power, P _{mp} @STC	≥385Wp	525Wp
7	Max. power tolerance (%)	Not more than 3%	±3%
8	Max. power voltage (V _{mp})@STC	To be specified	41.34 V
9	Max. power current (I _{mp})@STC	To be specified	12.72A
10	Open circuit voltage, @STC	To be specified	49.21V
11	Short circuit current@STC	To be specified	13.46A
12	Nominal voltage	To be specified	37.81V
13	Nominal Wattage	To be specified	390.72W
14	Fill Factor	Above 0.70	Above 0.70
15	Temp. coefficient of Voc (%/°C)		-0.279
16	Temp. coefficient of P _{mp} (%/°C)		-0.36
17	Temperature Co-efficient of I _{sc} (%/°C)		0.044
18	Normal Operating Cell Temperature (NOCT) (°C)		45°C±2
19	Operating Temperature (°C)		-40°C TO 85°C
20	Max Temperature rise of solar cells under severe working conditions over Max. Ambient Temp.	To be specified	90°C
21	Module is suitable to operate at 50° ambient	Yes/No	Yes
22	Cell efficiency	%	>19
23	Module efficiency	≥19%	20.22%
24	Maximum System Voltage	600/1000V	1500V
25	No. of By-pass Diodes		3NOS
26	Mounting arrangement for Solar Module	Fixed Arrangement	Fixed Arrangement
27	Solar Module frame material	Anodized Aluminum	Anodized Aluminum
28	Finish		Smooth Finish
29	Types of Sections used		
30	Module dimensions cms (LxWxH)	To be specified	2284x1137(±2)x35
31	PV panel Weight (kg)	To be specified	28.7kg
32	Module Life (minimum)	25 years	25Years
33	PV array area (sqm)		
34	Standards/ Approvals from International Agencies	IEC 61215/ IEC 61730/ IEC 61701	IEC 61215/ IEC 61730/ IEC 61701
35	Guaranteed output confirm	Yes	Yes
36	Output Cables	Polarized, UV protected & Weather Proof DC rated multi-contact connector	Polarized, UV protected & Weather Proof DC rated multi-contact connector
37	Output Terminal	PV Connectors	PV Connectors
38	Junction Box	Weather resistant HDPE (IP65)	Weather resistant HDPE (IP65)
39	Construction Front and Back	High transmittance glass, Polyester Ethyl Vinyl Acetate (EVA) encapsulate	High transmittance glass, Polyester Ethyl Vinyl Acetate (EVA) encapsulate
40	Glass	Low iron tempered	3.2mm Thick Low Iron Tempered
41	Total Plant's foot print area (sqm)		
42	Control facility area (sqm)		2
43	Copies of test certificates	IEC 61215, 61730 part 1&2, IEC 61701	Enclosed

GUARANTEED TECHNICAL PARTICULAR			
DATA SHEETS			
SL NO	Particulars	Required	Offered
1	PV Module Manufacture name & Country	Indian make, (manufacture name to be specified)	Renewsys.India
2	PV Module type	Mono PERC	Monofacial
3	Product Code		DESERV SGALACTIC 144
4	No. of PV cells per Module		144 Cells
5	Total number of PV modules		
6	Max.Power, Pmp@STC	≥385Wp	335Wp
7	Max.power tolerance (%)	Not more than 3%	±3%
8	Max.power voltage (Vmp)@STC	To be specified	41.65 V
9	Max.power current (Imp) @STC	To be specified	12.85A
10	Open circuit voltage,@STC	To be specified	49.61V
11	Short circuit current@STC	To be specified	13.61A
12	Nominal voltage	To be specified	38.12V
13	Nominal Wattage	To be specified	398.16W
14	Fill Factor	Above 0.70	Above 0.70
15	Temp.coefficient of Voc(%/°C)		-0.279
16	Temp.coefficient of Pmp (%/°C)		-0.36
17	Temperature Co-efficient of Isc (%/°C)		0.044
18	Normal Operating Cell Temperature (NOCT) (°C)		45°C±2
19	Operating Temperature (°C)		-40°C TO 85°C
20	Max Temperature rise of solar cells under severe working conditions over Max. Ambient Temp.	To be specified	90°C
21	Module is suitable to operate at 50 ambient	Yes/No	Yes
22	Cell efficiency	%	>19
23	Module efficiency	≥19%	20.60%
24	Maximum System Voltage	600/1000V	1500V
25	No. of By-pass Diodes		3NOS
26	Mounting arrangement for Solar Module	Fixed Arrangement	Fixed Arrangement
27	Solar Module frame material	Anodized Aluminum	Anodized Aluminum
28	Finish		Smooth Finish
29	Types of Sections used		
30	Module dimensions cms (LxWxH)	To be specified	2284x1137(±2)x35
31	PV panel Weight (kg)	To be specified	28.7kg
32	Module Life (minimum)	25 years	25Years
33	PV array area(sq.m)		
34	Standards/ Approvals from International Agencies	IEC 61215/IEC 61730/ IEC 61701	IEC 61215/IEC 61730/ IEC 61701
35	Guaranteed output confirm	Yes	Yes
36	Output Cables	Polarized, UV protected & Weather Proof DC rated multi-contact connector	Polarized, UV protected & Weather Proof DC rated multi-contact connector
37	Output Terminal	PV Connectors	PV Connectors
38	Junction Box	Weather resistant HDPE (IP65)	Weather resistant HDPE (IP65)
39	Construction Front and Back	High transmittance glass, Polyester Ethyl Vinyl Acetate(EVA) encapsulate	High transmittance glass, Polyester Ethyl Vinyl Acetate(EVA) encapsulate
40	Glass	Low iron tempered	3.2mm Thick Low Iron Tempered
41	Total Plant's foot print area(sq.m)		
42	Control facility area (sq.m)		2
43	Copies of test certificates	IEC 61215,61730 part 1&2, IEC 61701	Enclosed

GUARANTEED TECHNICAL PARTICULAR			
DATA SHEETS			
SL NO	Particulars	Required	Offered
1	PV Module Manufacture name &Country	Indian make,(manufacture name to be specified)	Renewsys,India
2	PV Module type	Mono PERC	Monofacial
3	Product Code		DESERV SGALACTIC 144
4	No. of PV cells per Module		144 Cells
5	Total number of PV modules		
6	Max.Power, Pmp@STC	≥385Wp	530Wp
7	Max power tolerance (%)	Not more than 3%	±3%
8	Max.power voltage (Vmp)@STC	To be specified	41.49 V
9	Max.power current (Imp) @STC	To be specified	12.79A
10	Open circuit voltage,@STC	To be specified	49.40V
11	Short circuit current@STC	To be specified	13.53A
12	Nominal voltage	To be specified	37.95V
13	Nominal Wattage	To be specified	394.44W
14	Fill Factor	Above 0.70	Above 0.70
15	Temp.coefficient of Voc(%/°C)		-0.279
16	Temp.coefficient of Pmp (%/°C)		-0.36
17	Temperature Co-efficient of Isc (%/°C)		0.044
18	Normal Operating Cell Temperature (NOCT) (°C)		45C±2
19	Operating Temperature (°C)		-40°C TO 85°C
20	Max Temperature rise of solar cells under severe working conditions over Max. Ambient Temp.	To be specified	WTC
21	Module is suitable to operate at 50 ambient	Yes/No	Yes
22	Cell efficiency	%	>19
23	Module efficiency	≥19%	20.41%
24	Maximum System Voltage	600/1000V	1500V
25	No. of By-pass Diodes		3NOS
26	Mounting arrangement for Solar Module	Fixed Arrangement	Fixed Arrangement
27	Solar Module frame material	Anodized Aluminum	Anodized Aluminum
28	Finish		Smooth Finish
29	Types of Sections used		
30	Module dimensions cms (LxWxH)	To be specified	2284x1137(±2)x35
31	PV panel Weight (kg)	To be specified	28.7kg
32	Module Life (minimum)	25 years	25Years
33	PV array area(sq.m)		
34	Standards/ Approvals from International Agencies	IEC 61215/IEC 61730/ IEC 61701	IEC 61215/IEC 61730/ IEC 61701
35	Guaranteed output confirm	Yes	Yes
36	Output Cables	Polarized, UV protected &Weather Proof DC rated multi-contact connector	Polarized, UV protected &Weather Proof DC rated multi-contact connector
37	Output Terminal	PV Connectors	PV Connectors
38	Junction Box	Weather resistant HDPE (IP65)	Weather resistant HDPE (IP65)
39	Construction Front and Back	High transmittance glass,Polyester Ethyl Vinyl Acetate(EVA) encapsulate	High transmittance glass,Polyester Ethyl Vinyl Acetate(EVA) encapsulate
40	Glass	Low iron tempered	3.2mm Thick Low Iron Tempered
41	Total Plant's foot print area(sq.m)		
42	Control facility area (sq.m)		2
43	Copies of test certificates	IEC 61215,61730 part 1&2, IEC 61701	Enclosed

GUARANTEED TECHNICAL PARTICULAR			
DATA SHEETS			
SL NO	Particulars	Required	Offered
1	PV Module Manufacture name &Country	Indian make,(manufacture name to be specified)	Renewsys,India
2	PV Module type	Mono PERC	Monofacial
3	Product Code		DESERV SGALACTIC 144
4	No. of PV cells per Module		144 Cells
5	Total number of PV modules		
6	Max.Power, Pmp@STC	≥385Wp	540Wp
7	Max.power tolerance (%)	Not more than 3%	±3%
8	Max.power voltage (Vmp)@STC	To be specified	41.84 V
9	Max.power current (Imp) @STC	To be specified	12.92A
10	Open circuit voltage,@STC	To be specified	49.82V
11	Short circuit current@STC	To be specified	13.68A
12	Nominal voltage	To be specified	38.27V
13	Nominal Wattage	To be specified	401.88W
14	Fill Factor	Above 0.70	Above 0.70
15	Temp.coefficient of Voc(%/C)		-0.279
16	Temp.coefficient of Pmp (%/C)		-0.36
17	Temperature Co-efficient of Isc (%/°C)		0.044
18	Normal Operating Cell Temperature (NOCT) (°C)		45°C±2
19	Operating Temperature (°C)		-40°C TO 85°C
20	Max Temperature rise of solar cells under severe working conditions over Max. Ambient Temp.	To be specified	90°C
21	Module is suitable to operate at 50° ambient	Yes/No	Yes
22	Cell efficiency	%	>19
23	Module efficiency	≥19%	20.79%
24	Maximum System Voltage	600/1000V	1500V
25	No. of By-pass Diodes		3NOS
26	Mounting arrangement for Solar Module	Fixed Arrangement	Fixed Arrangement
27	Solar Module frame material	Anodized Aluminum	Anodized Aluminum
28	Finish		Smooth Finish
29	Types of Sections used		
30	Module dimensions cms (LxWxH)	To be specified	2284x1137(±2)x35
31	PV panel Weight (kg)	To be specified	28.7kg
32	Module Life (minimum)	25 years	25Years
33	PV array area(sqm)		
34	Standards/ Approvals from International Agencies	IEC 61215/IEC 61730/ IEC 61701	IEC 61215/IEC 61730/ IEC 61701
35	Guaranteed output confirm	Yes	Yes
36	Output Cables	Polarized, UV protected &Weather Proof DC rated multi-contact connector	Polarized, UV protected &Weather Proof DC rated multi-contact connector
37	Output Terminal	PV Connectors	PV Connectors
38	Junction Box	Weather resistant HDPE (IP65)	Weather resistant HDPE (IP65)
39	Construction Front and Back	High transmittance glass,Polyester Ethyl Vinyl Acetate(EVA) encapsulate	High transmittance glass,Polyester Ethyl Vinyl Acetate(EVA) encapsulate
40	Glass	Low iron tempered	3.2mm Thick Low Iron Tempered
41	Total Plant's foot print area(sqm)		
42	Control facility area (sqm)		2
43	Copies of test certificates	IEC 61215,61730 part 1&2, IEC 61701	Enclosed



GUARANTEED TECHNICAL PARTICULAR			
DATA SHEETS			
SL NO	Particulars	Required	Offered
1	PV Module Manufacture name & Country	Indian make, (manufacture name to be specified)	Renewsys, India
2	PV Module type	Mono PERC	Monofacial
3	Product Code		DESERV SGALACTIC 144
4	No. of PV cells per Module		144 Cells
5	Total number of PV modules		
6	Max. Power, P _{mp} @STC	≥385Wp	545Wp
7	Max. power tolerance (%)	Not more than 3%	±3%
8	Max. power voltage (V _{mp})@STC	To be specified	41.98 V
9	Max. power current (I _{mp}) @STC	To be specified	12.99A
10	Open circuit voltage, @STC	To be specified	49.97V
11	Short circuit current@STC	To be specified	13.74A
12	Nominal voltage	To be specified	38.39V
13	Nominal Wattage	To be specified	405.61W
14	Fill Factor	Above 0.70	Above 0.70
15	Temp. coefficient of Voc (%/°C)		-0.279
16	Temp. coefficient of P _{mp} (%/°C)		-0.36
17	Temperature Co-efficient of I _{sc} (%/°C)		0.044
18	Normal Operating Cell Temperature (NOCT) (°C)		45°C±2
19	Operating Temperature (°C)		-40°C TO 85°C
20	Max Temperature rise of solar cells under severe working conditions over Max. Ambient Temp.	To be specified	90°C
21	Module is suitable to operate at 50° ambient	Yes/No	Yes
22	Cell efficiency	%	>19
23	Module efficiency	≥19%	20.99%
24	Maximum System Voltage	600/1000V	1500V
25	No. of By-pass Diodes		3NOS
26	Mounting arrangement for Solar Module	Fixed Arrangement	Fixed Arrangement
27	Solar Module frame material	Anodized Aluminum	Anodized Aluminum
28	Finish		Smooth Finish
29	Types of Sections used		
30	Module dimensions cms (LxWxH)	To be specified	2284x1137(±2)x35
31	PV panel Weight (kg)	To be specified	28.7kg
32	Module Life (minimum)	25 years	25Years
33	PV array area (sqm)		
34	Standards/ Approvals from International Agencies	IEC 61215/IEC 61730/ IEC 61701	IEC 61215/IEC 61730/ IEC 61701
35	Guaranteed output confirm	Yes	Yes
36	Output Cables	Polarized, UV protected & Weather Proof DC rated multi-contact connector	Polarized, UV protected & Weather Proof DC rated multi-contact connector
37	Output Terminal	PV Connectors	PV Connectors
38	Junction Box	Weather resistant HDPE (IP65)	Weather resistant HDPE (IP65)
39	Construction Front and Back	High transmittance glass, Polyester Ethyl Vinyl Acetate (EVA) encapsulate	High transmittance glass, Polyester Ethyl Vinyl Acetate (EVA) encapsulate
40	Glass	Low iron tempered	3.2mm Thick Low Iron Tempered
41	Total Plant's foot print area (sqm)		
42	Control facility area (sqm)		2
43	Copies of test certificates	IEC 61215, 61730 part 1&2, IEC 61701	Enclosed

GUARANTEED TECHNICAL PARTICULAR			
DATA SHEETS			
Sl. NO	Particulars	Required	Offered
1	PV Module Manufacture name & Country	Indian make, (manufacture name to be specified)	Renewsys, India
2	PV Module type	Mono PERC	Monofacial
3	Product Code		DESERV SGALACTIC 144
4	No. of PV cells per Module		144 Cells
5	Total number of PV modules		
6	Max. Power, P _{mp} @STC	≥385Wp	550Wp
7	Max. power tolerance (%)	Not more than 3%	5W(Positive)
8	Max. power voltage (V _{mp})@STC	To be specified	42.15 V
9	Max. power current (I _{mp})@STC	To be specified	13.06A
10	Open circuit voltage, @STC	To be specified	50.12
11	Short circuit current@STC	To be specified	13.81
12	Nominal voltage	To be specified	38.55V
13	Nominal Wattage	To be specified	409.32Wp
14	Fill Factor	Above 0.70	Above 0.70
15	Temp. coefficient of Voc (%/°C)		-0.279
16	Temp. coefficient of P _{mp} (%/°C)		-0.36
17	Temperature Co-efficient of I _{sc} (%/°C)		0.044
18	Normal Operating Cell Temperature (NOCT) (°C)		45°C±2
19	Operating Temperature (°C)		-40°C TO 85°C
20	Max Temperature rise of solar cells under severe working conditions over Max. Ambient Temp.	To be specified	90°C
21	Module is suitable to operate at 50° ambient	Yes/No	Yes
22	Cell efficiency	%	>19
23	Module efficiency	≥19%	21.18%
24	Maximum System Voltage	600/1000V	1500V
25	No. of By-pass Diodes		3NOS
26	Mounting arrangement for Solar Module	Fixed Arrangement	Fixed Arrangement
27	Solar Module frame material	Anodized Aluminum	Anodized Aluminum
28	Finish		Smooth Finish
29	Types of Sections used		
30	Module dimensions cms (LxWxH)	To be specified	2284x1137(±2)x35
31	PV panel Weight (kg)	To be specified	28.7kg
32	Module Life (minimum)	25 years	25Years
33	PV array area(sqm)		
34	Standards/ Approvals from International Agencies	IEC 61215/ IEC 61730/ IEC 61701	IEC 61215/ IEC 61730/ IEC 61701
35	Guaranteed output confirm	Yes	Yes
36	Output Cables	Polarized, UV protected & Weather Proof DC rated multi-contact connector	Polarized, UV protected & Weather Proof DC rated multi-contact connector
37	Output Terminal	PV Connectors	PV Connectors
38	Junction Box	Weather resistant HDPE (IP65)	Weather resistant HDPE (IP65)
39	Construction Front and Back	High transmittance glass, Polyester Ethyl Vinyl Acetate(EVA) encapsulate	High transmittance glass, Polyester Ethyl Vinyl Acetate(EVA) encapsulate
40	Glass	Low iron tempered	3.2mm Thick Low Iron Tempered
41	Total Plant's foot print area(sqm)		
42	Control facility area (sqm)		2
43	Copies of test certificates	IEC 61215, 61730 part 1&2, IEC 61701	Enclosed



GUARANTEED TECHNICAL PARTICULAR			
DATA SHEETS			
SL NO	Particulars	Required	Offered
1	PV Module Manufacture name & Country	Indian make, (manufacture name to be specified)	Renewsys, India
2	PV Module type	Mono PERC	Bifacial
3	Product Code		DESERV EXTREME 144
4	No. of PV cells per Module		144 Cells
5	Total number of PV modules		
6	Max. Power, Pmp@STC	≥385Wp	550Wp
7	Max. power tolerance (%)	Not more than 3%	3W(Positive)
8	Max. power voltage (Vmp)@STC	To be specified	42.15 V
9	Max. power current (Imp) @STC	To be specified	13.09A
10	Open circuit voltage, @STC	To be specified	50.12
11	Short circuit current@STC	To be specified	13.81
12	Nominal voltage	To be specified	38.55V
13	Nominal Wattage	To be specified	409.32Wp
14	Fill Factor	Above 0.70	Above 0.70
15	Temp. coefficient of Voc (%/°C)		-0.279
16	Temp. coefficient of Pmp (%/°C)		-0.36
17	Temperature Co-efficient of Isc (%/°C)		0.044
18	Normal Operating Cell Temperature (NOCT) (°C)		45°C±2
19	Operating Temperature (°C)		-40°C TO 85°C
20	Max Temperature rise of solar cells under severe working conditions over Max. Ambient Temp.	To be specified	90°C
21	Module is suitable to operate at 50° ambient	Yes/No	Yes
22	Cell efficiency	%	>19
23	Module efficiency	≥19%	21.02%
24	Maximum System Voltage	600/1000V	1500V
25	No. of By-pass Diodes		3NOS
26	Mounting arrangement for Solar Module	Fixed Arrangement	Fixed Arrangement
27	Solar Module frame material	Anodized Aluminum	Anodized Aluminum
28	Finish		Smooth Finish
29	Types of Sections used		
30	Module dimensions cms (LxWxH)	To be specified	2284x1137(±2)x35
31	PV panel Weight (kg)	To be specified	28.7kg
32	Module Life (minimum)	25 years	25Years
33	PV array area (sqm)		
34	Standards/ Approvals from International Agencies	IEC 61215/IEC 61730/ IEC 61701	IEC 61215/IEC 61730/ IEC 61701
35	Guaranteed output confirm	Yes	Yes
36	Output Cables	Polarized, UV protected & Weather Proof DC rated multi-contact connector	Polarized, UV protected & Weather Proof DC rated multi-contact connector
37	Output Terminal	PV Connectors	PV Connectors
38	Junction Box	Weather resistant HDPE (IP65)	Weather resistant HDPE (IP65)
39	Construction Front and Back	High transmittance glass, Polyester Ethyl Vinyl Acetate(EVA) encapsulate	High transmittance glass, Polyester Ethyl Vinyl Acetate(EVA) encapsulate
40	Glass	Low iron tempered	3.2mm Thick Low Iron Tempered
41	Total Plant's foot print area (sqm)		
42	Control facility area (sqm)		2
43	Copies of test certificates	IEC 61215, 61730 part 1&2, IEC 61701	Enclosed

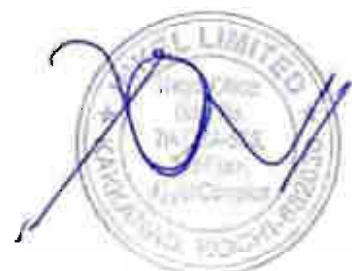
GUARANTEED TECHNICAL PARTICULAR DATA SHEETS			
SL NO	Particulars	Required	Offered
1	PV Module Manufacture name &Country	Indian make,(manufacture name to be specified)	Renewsys,India
2	PV Module type	Mono PERC	Monofacial
3	Product Code		DESERV SGALACTIC 156
4	No. of PV cells per Module		156 Cells
5	Total number of PV modules		
6	Max.Power, Pmp@STC	≥385Wp	565Wp
7	Max.power tolerance (%)	Not more than 3%	±3%
8	Max.power voltage (Vmp)@STC	To be specified	44.69V
9	Max.power current (Imp) @STC	To be specified	12.65A
10	Open circuit voltage,@STC	To be specified	53.14V
11	Short circuit current@STC	To be specified	13.39A
12	Nominal voltage	To be specified	40.87V
13	Nominal Wattage	To be specified	420.49Wp
14	Fill Factor	Above 0.70	Above 0.70
15	Temp.coefficient of Voc(%/°C)		-0.279
16	Temp.coefficient of Pmp (%/°C)		-0.36
17	Temperature Co-efficient of Isc (%/°C)		0.044
18	Normal Operating Cell Temperature (NOCT) (°C)		45°C±2
19	Operating Temperature (°C)		-40°C TO 85°C
20	Max Temperature rise of solar cells under severe working conditions over Max. Ambient Temp.	To be specified	90°C
21	Module is suitable to operate at 50 ambient	Yes/No	Yes
22	Cell efficiency	%	>19
23	Module efficiency	≥19%	20.13%
24	Maximum System Voltage	600/1000V	1500V
25	No. of By-pass Diodes		3NOS
26	Mounting arrangement for Solar Module	Fixed Arrangement	Fixed Arrangement
27	Solar Module frame material	Anodized Aluminum	Anodized Aluminum
28	Finish		Smooth Finish
29	Types of Sections used		
30	Module dimensions cms (LxWxH)	To be specified	2469x1137(±2)x35
31	PV panel Weight (kg)	To be specified	31.7kg
32	Module Life (minimum)	25 years	25Years
33	PV array area(sq.m)		
34	Standards/ Approvals from International Agencies	IEC 61215/IEC 61730/ IEC 61701	IEC 61215/IEC 61730/ IEC 61701
35	Guaranteed output confirm	Yes	Yes
36	Output Cables	Polarized, UV protected &Weather Proof DC rated multi-contact connector	Polarized, UV protected &Weather Proof DC rated multi-contact connector
37	Output Terminal	PV Connectors	PV Connectors
38	Junction Box	Weather resistant HDPE (IP65)	Weather resistant HDPE (IP65)
39	Construction Front and Back	High transmittance glass,Polyester Ethyl Vinyl Acetate(EVA) encapsulate	High transmittance glass,Polyester Ethyl Vinyl Acetate(EVA) encapsulate
40	Glass	Low iron tempered	3.2mm Thick Low Iron Tempered
41	Total Plant's foot print area(sq.m)		
42	Control facility area (sq.m)		2
43	Copies of test certificates	IEC 61215,61730 part 1&2, IEC 61701	Enclosed

GUARANTEED TECHNICAL PARTICULAR			
DATA SHEETS			
SL NO	Particulars	Required	Offered
1	PV Module Manufacture name & Country	Indian make, (manufacture name to be specified)	Renewsys, India
2	PV Module type	Mono PERC	Monofacial
3	Product Code		DESERV SGALACTIC 156
4	No. of PV cells per Module		156 Cells
5	Total number of PV modules		
6	Max. Power, Pmp@STC	≥385Wp	575Wp
7	Max. power tolerance (%)	Not more than 3%	±3%
8	Max. power voltage (Vmp)@STC	To be specified	44.98V
9	Max. power current (Imp) @STC	To be specified	12.79A
10	Open circuit voltage, @STC	To be specified	53.52V
11	Short circuit current@STC	To be specified	13.53A
12	Nominal voltage	To be specified	41.14V
13	Nominal Wattage	To be specified	427.93Wp
14	Fill Factor	Above 0.70	Above 0.70
15	Temp. coefficient of Voc (%/°C)		-0.279
16	Temp. coefficient of Pmp (%/°C)		-0.36
17	Temperature Co-efficient of Isc (%/°C)		0.044
18	Normal Operating Cell Temperature (NOCT) (°C)		45°C±2
19	Operating Temperature (°C)		-40°C TO 85°C
20	Max Temperature rise of solar cells under severe working conditions over Max. Ambient Temp.	To be specified	90°C
21	Module is suitable to operate at 50 ambient	Yes/ No	Yes
22	Cell efficiency	%	>19
23	Module efficiency	≥19%	20.48%
24	Maximum System Voltage	600/1000V	1500V
25	No. of By-pass Diodes		3NOS
26	Mounting arrangement for Solar Module	Fixed Arrangement	Fixed Arrangement
27	Solar Module frame material	Anodized Aluminum	Anodized Aluminum
28	Finish		Smooth Finish
29	Types of Sections used		
30	Module dimensions cms (LxWxH)	To be specified	2469x1137(±2)x35
31	PV panel Weight (kg)	To be specified	31.7kg
32	Module Life (minimum)	25 years	25 Years
33	PV array area (sqm)		
34	Standards/ Approvals from International Agencies	IEC 61215/IEC 61730/ IEC 61701	IEC 61215/IEC 61730/ IEC 61701
35	Guaranteed output confirm	Yes	Yes
36	Output Cables	Polarized, UV protected & Weather Proof DC rated multi-contact connector	Polarized, UV protected & Weather Proof DC rated multi-contact connector
37	Output Terminal	PV Connectors	PV Connectors
38	Junction Box	Weather resistant HDPE (IP65)	Weather resistant HDPE (IP65)
39	Construction Front and Back	High transmittance glass, Polyester Ethyl Vinyl Acetate (EVA) encapsulate	High transmittance glass, Polyester Ethyl Vinyl Acetate (EVA) encapsulate
40	Glass	Low iron tempered	3.2mm Thick Low Iron Tempered
41	Total Plant's foot print area (sqm)		
42	Control facility area (sqm)		2
43	Copies of test certificates	IEC 61215, 61730 part 1&2, IEC 61701	Enclosed

GUARANTEED TECHNICAL PARTICULAR			
DATA SHEETS			
Sl. NO	Particulars	Required	Offered
1	PV Module Manufacture name & Country	Indian make, (manufacture name to be specified)	Renewsys, India
2	PV Module type	Mono PERC	Monofacial
3	Product Code		DESERV SGALACTIC 156
4	No. of PV cells per Module		156 Cells
5	Total number of PV modules		
6	Max. Power, P _{mp} @STC	≥385Wp	580Wp
7	Max. power tolerance (%)	Not more than 3%	±3%
8	Max. power voltage (V _{mp})@STC	To be specified	45.16V
9	Max. power current (I _{mp})@STC	To be specified	12.85A
10	Open circuit voltage, @STC	To be specified	53.74V
11	Short circuit current@STC	To be specified	13.61A
12	Nominal voltage	To be specified	41.30V
13	Nominal Wattage	To be specified	431.65Wp
14	Fill Factor	Above 0.70	Above 0.70
15	Temp. coefficient of Voc (%/°C)		-0.279
16	Temp. coefficient of P _{mp} (%/°C)		-0.36
17	Temperature Co-efficient of I _{sc} (%/°C)		0.044
18	Normal Operating Cell Temperature (NOCT) (°C)		45°C±2
19	Operating Temperature (°C)		-40°C TO 85°C
20	Max Temperature rise of solar cells under severe working conditions over Max. Ambient Temp.	To be specified	90°C
21	Module is suitable to operate at 50° ambient	Yes/No	Yes
22	Cell efficiency	%	>19
23	Module efficiency	≥19%	20.66%
24	Maximum System Voltage	600/1000V	1500V
25	No. of By-pass Diodes		3NOS
26	Mounting arrangement for Solar Module	Fixed Arrangement	Fixed Arrangement
27	Solar Module frame material	Anodized Aluminum	Anodized Aluminum
28	Finish		Smooth Finish
29	Types of Sections used		
30	Module dimensions cms (LxWxH)	To be specified	2469x1137(±2)x35
31	PV panel Weight (kg)	To be specified	31.7kg
32	Module Life (minimum)	25 years	25 Years
33	PV array area (sqm)		
34	Standards/ Approvals from International Agencies	IEC 61215/IEC 61730/ IEC 61701	IEC 61215/IEC 61730/ IEC 61701
35	Guaranteed output confirm	Yes	Yes
36	Output Cables	Polarized, UV protected & Weather Proof DC rated multi-contact connector	Polarized, UV protected & Weather Proof DC rated multi-contact connector
37	Output Terminal	PV Connectors	PV Connectors
38	Junction Box	Weather resistant HDPE (IP65)	Weather resistant HDPE (IP65)
39	Construction Front and Back	High transmittance glass, Polyester Ethyl Vinyl Acetate (EVA) encapsulate	High transmittance glass, Polyester Ethyl Vinyl Acetate (EVA) encapsulate
40	Glass	Low iron tempered	3.2mm Thick Low Iron Tempered
41	Total Plant's foot print area (sqm)		
42	Control facility area (sqm)		2
43	Copies of test certificates	IEC 61215/61730 part 1 & 2, IEC 61701	Enclosed



GUARANTEED TECHNICAL PARTICULAR			
DATA SHEETS			
Sl. NO	Particulars	Required	Offered
1	PV Module Manufacture name & Country	Indian make, (manufacture name to be specified)	Renewsys, India
2	PV Module type	Mono PERC	Monofacial
3	Product Code		DESERV SGALACTIC 156
4	No. of PV cells per Module		156 Cells
5	Total number of PV modules		
6	Max. Power, P _{mp} @STC	≥385Wp	585Wp
7	Max. power tolerance (%)	Not more than 3%	±3%
8	Max. power voltage (V _{mp})@STC	To be specified	45.32V
9	Max. power current (I _{mp})@STC	To be specified	12.92A
10	Open circuit voltage, @STC	To be specified	53.97V
11	Short circuit current@STC	To be specified	13.68A
12	Nominal voltage	To be specified	41.45V
13	Nominal Wattage	To be specified	435.38Wp
14	Fill Factor	Above 0.70	Above 0.70
15	Temp. coefficient of Voc (%/°C)		-0.279
16	Temp. coefficient of P _{mp} (%/°C)		-0.36
17	Temperature Co-efficient of I _{sc} (%/°C)		0.044
18	Normal Operating Cell Temperature (NOCT) (°C)		45°C±2
19	Operating Temperature (°C)		-40°C TO 85°C
20	Max Temperature rise of solar cells under severe working conditions over Max. Ambient Temp.	To be specified	90°C
21	Module is suitable to operate at 50° ambient	Yes/No	Yes
22	Cell efficiency	%	>19
23	Module efficiency	≥19%	20.84%
24	Maximum System Voltage	600/1000V	1500V
25	No. of By-pass Diodes		3NOS
26	Mounting arrangement for Solar Module	Fixed Arrangement	Fixed Arrangement
27	Solar Module frame material	Anodized Aluminum	Anodized Aluminum
28	Finish		Smooth Finish
29	Types of Sections used		
30	Module dimensions cms (LxWxH)	To be specified	2469x1137(±2)x35
31	PV panel Weight (kg)	To be specified	31.7kg
32	Module Life (minimum)	25 years	25Years
33	PV array area (sqm)		
34	Standards/ Approvals from International Agencies	IEC 61215/IEC 61730/ IEC 61701	IEC 61215/IEC 61730/ IEC 61701
35	Guaranteed output confirm	Yes	Yes
36	Output Cables	Polarized, UV protected & Weather Proof DC rated multi-contact connector	Polarized, UV protected & Weather Proof DC rated multi-contact connector
37	Output Terminal	PV Connectors	PV Connectors
38	Junction Box	Weather resistant HDPE (IP65)	Weather resistant HDPE (IP65)
39	Construction Front and Back	High transmittance glass, Polyester Ethyl Vinyl Acetate(EVA) encapsulate	High transmittance glass, Polyester Ethyl Vinyl Acetate(EVA) encapsulate
40	Glass	Low iron tempered	3.2mm Thick Low Iron Tempered
41	Total Plant's foot print area (sqm)		
42	Control facility area (sqm)		2
43	Copies of test certificates	IEC 61215, 61730 part 1&2, IEC 61701	Enclosed



GUARANTEED TECHNICAL PARTICULAR			
DATA SHEETS			
SL NO	Particulars	Required	Offered
1	PV Module Manufacture name &Country	Indian make,(manufacture name to be specified)	Renewsys,India
2	PV Module type	Mono PERC	Monofacial
3	Product Code		DESERV SGALACTIC 156
4	No. of PV cells per Module		156 Cells
5	Total number of PV modules		
6	Max.Power. Pmp@STC	≥385Wp	590Wp
7	Max.power tolerance (%)	Not more than 3%	5W(Positive)
8	Max.power voltage (Vmp)@STC	To be specified	45.48 V
9	Max.power current (Imp) @STC	To be specified	12.98A
10	Open circuit voltage,@STC	To be specified	54.15
11	Short circuit current@STC	To be specified	13.73
12	Nominal voltage	To be specified	41.59V
13	Nominal Wattage	To be specified	439.10Wp
14	Fill Factor	Above 0.70	Above 0.70
15	Temp.coefficient of Voc(%/°C)		-0.279
16	Temp.coefficient of Pmp (%/°C)		-0.36
17	Temperature Co-efficient of Isc (%/°C)		0.044
18	Normal Operating Cell Temperature (NOCT) (°C)		45°C±2
19	Operating Temperature (°C)		-40°C TO 85°C
20	Max Temperature rise of solar cells under severe working conditions over Max. Ambient Temp.	To be specified	90°C
21	Module is suitable to operate at 50° ambient	Yes/No	Yes
22	Cell efficiency	%	>19
23	Module efficiency	≥19%	21.02%
24	Maximum System Voltage	600/1000V	1500V
25	No. of By-pass Diodes		3NOS
26	Mounting arrangement for Solar Module	Fixed Arrangement	Fixed Arrangement
27	Solar Module frame material	Anodized Aluminum	Anodized Aluminum
28	Finish		Smooth Finish
29	Types of Sections used		
30	Module dimensions cms (LxWxH)	To be specified	2469x1137(±2)x35
31	PV panel Weight (kg)	To be specified	31.7kg
32	Module Life (minimum)	25 years	25Years
33	PV array area(sq.m)		
34	Standards/ Approvals from International Agencies	IEC 61215/IEC 61730/ IEC 61701	IEC 61215/IEC 61730/ IEC 61701
35	Guaranteed output confirm	Yes	Yes
36	Output Cables	Polarized, UV protected &Weather Proof DC rated multi-contact connector	Polarized, UV protected &Weather Proof DC rated multi-contact connector
37	Output Terminal	PV Connectors	PV Connectors
38	Junction Box	Weather resistant HDPE (IP65)	Weather resistant HDPE (IP65)
39	Construction Front and Back	High transmittance glass,Polyester Ethyl Vinyl Acetate(EVA) encapsulate	High transmittance glass,Polyester Ethyl Vinyl Acetate(EVA) encapsulate
40	Glass	Low iron tempered	3.2mm Thick Low Iron Tempered
41	Total Plant's foot print area(sq.m)		
42	Control facility area (sq.m)		2
43	Copies of test certificates	IEC 61215,61730 part 1&2, IEC 61701	Enclosed



PV Module			
SL NO	Particulars	Required	Offered
1	PV Module Manufacture name & Country of origin	manufacture name to be specified	Adani Solar
2	PV Module type	Mono PERC	Monofacial
3	Product Code		M10-144 HC
4	No. of PV cells per Module		
5	Total number of PV modules		
6	Max.Power, Pmp@STC	380 Wp or Above	525 Wp
7	Max.power tolerance (%)	Not more than 3%	Not more than 3%
8	Max.power voltage (Vmp)@STC	To be specified	41.34 V
9	Max.power current (Imp) @STC	To be specified	13.48 A
10	Open circuit voltage,@STC	To be specified	48.78 V
11	Short circuit current@STC	To be specified	12.72 A
12	Nominal voltage	To be specified	38.54 V
13	Nominal Wattage	To be specified	393
14	Fill Factor	Not less than 0.70	>0.70
15	Temp.coefficient of Voc(%/C)		-0.28
16	Temp.coefficient of Pmp (%/C)		-0.38
17	Temperature Co-efficient of Isc (%/°C)		0.048
18	Normal Operating Cell Temperature (NOCT) (°C)		45°C±2
19	Operating Temperature (°C)		-40°C TO 85°C
20	Max Temperature rise of solar cells under severe working conditions over Max. Ambient Temp.	To be specified	85°C
21	Module is suitable to operate at 50 ambient	Yes/No	Yes
22	Cell efficiency	%	>19
23	Module efficiency	≥19%	20.44%
24	Maximum System Voltage		1500V
25	No. of By-pass Diodes		3Nos Schottky
26	Mounting arrangement for Solar Module	Fixed Arrangement	Fixed Arrangement
27	Solar Module frame material	Anodized Aluminum	Anodized Aluminum
28	Finish		Smooth Finish
29	Types of Sections used		
30	Module dimensions cms (LxWxH)	To be specified	2266x1133x35 mm
31	PV panel Weight (kg)	To be specified	28 kg
32	Module Life (minimum)	25 years	25Years
33	PV array area(sqm)		1 985 sqm
34	Standards/Approvals from International Agencies	IEC 61215/IEC 61730/ IEC 61701	IEC 61215/IEC 61730/ IEC 61701
35	Guaranteed output confirm	Yes	Yes
36	Output Cables	Polarized, UV protected & Weather Proof DC rated multi-contact connector	Polarized, UV protected & Weather Proof DC rated multi-contact connector
37	Output Terminal	PV Connectors	PV Connectors
38	Junction Box	Weather resistant HDPE (IP65)	Weather resistant HDPE (IP65)
39	Construction Front and Back	High transmittance glass, Polyester Ethyl Vinyl Acetate(EVA) encapsulate	High transmittance glass, Polyester Ethyl Vinyl Acetate(EVA) encapsulate
40	Glass	Low iron tempered	3.2mm Thick Low Iron Tempered
43	Copies of test certificates	IEC 61215,61730 part 1&2, IEC 61701	IEC 61215,61730 part 1&2, IEC 61701

PV Module			
SL NO	Particulars	Required	Offered
1	PV Module Manufacture name &Country of origin	manufacture name to be specified	Adani Solar
2	PV Module type	Mono PERC	Monofacial
3	Product Code		M10-144 HC
4	No. of PV cells per Module		
5	Total number of PV modules		
6	Max.Power, Pmp@STC	380 Wp or Above	530Wp
7	Max.power tolerance (%)	Not more than 3%	Not more than 3%
8	Max.power voltage (Vmp)@STC	To be specified	41.49 V
9	Max.power current (Imp) @STC	To be specified	12.79A
10	Open circuit voltage,@STC	To be specified	48.95 V
11	Short circuit current@STC	To be specified	13.55 A
12	Nominal voltage	To be specified	38.68 V
13	Nominal Wattage	To be specified	397
14	Fill Factor	Not less than 0.70	>0.70
15	Temp.coefficient of Voc(%/C)		-0.28
16	Temp.coefficient of Pmp (%/C)		-0.38
17	Temperature Co-efficient of Isc (%/°C)		0.048
18	Normal Operating Cell Temperature [NOCT] (°C)		45°C±2
19	Operating Temperature (°C)		-40°C TO 85°C
20	Max Temperature rise of solar cells under severe working conditions over Max. Ambient Temp.	To be specified	85°C
21	Module is suitable to operate at 50 ambient	Yes/No	Yes
22	Cell efficiency	%	>19
23	Module efficiency	≥19%	20.64%
24	Maximum System Voltage		1500V
25	No. of By-pass Diodes		3Nos Schottky
26	Mounting arrangement for Solar Module	Fixed Arrangement	Fixed Arrangement
27	Solar Module frame material	Anodized Aluminum	Anodized Aluminum
28	Finish		Smooth Finish
29	Types of Sections used		
30	Module dimensions cms (LxWxH)	To be specified	2266x1133x35 mm
31	PV panel Weight (kg)	To be specified	28 kg
32	Module Life (minimum)	25 years	25Years
33	PV array area(sqm)		1.985 sqm
34	Standards/Approvals from International Agencies	IEC 61215/IEC 61730/ IEC 61701	IEC 61215/IEC 61730/ IEC 61701
35	Guaranteed output confirm	Yes	Yes
36	Output Cables	Polarized, UV protected &Weather Proof DC rated multi-contact connector	Polarized, UV protected &Weather Proof DC rated multi-contact connector
37	Output Terminal	PV Connectors	PV Connectors
38	Junction Box	Weather resistant HDPE (IP65)	Weather resistant HDPE (IP65)
39	Construction Front and Back	High transmittance glass,Polyester Ethyl Vinyl Acetate(EVA) encapsulate	High transmittance glass,Polyester Ethyl Vinyl Acetate(EVA) encapsulate
40	Glass	Low iron tempered	3.2mm Thick Low Iron Tempered
43	Copies of test certificates	IEC 61215,61730 part 1&2, IEC 61701	IEC 61215,61730 part 1&2, IEC 61701

PV Module			
SL NO	Particulars	Required	Offered
1	PV Module Manufacture name &Country of origin	manufacture name to be specified	Adani Solar
2	PV Module type	Mono PERC	Monofacial
3	Product Code		M10-144 HC
4	No. of PV cells per Module		
5	Total number of PV modules		
6	Max.Power, Pmp@STC	380 Wp or Above	535 Wp
7	Max.power tolerance (%)	Not more than 3%	Not more than 3%
8	Max.power voltage (Vmp)@STC	To be specified	41.64 V
9	Max.power current (Imp) @STC	To be specified	12.86 A
10	Open circuit voltage,@STC	To be specified	49.12 V
11	Short circuit current@STC	To be specified	13.63 A
12	Nominal voltage	To be specified	38.82 V
13	Nominal Wattage	To be specified	401
14	Fill Factor	Not less than 0.70	>0.70
15	Temp.coefficient of Voc(%/C)		-0.28
16	Temp.coefficient of Pmp (%/C)		-0.38
17	Temperature Co-efficient of Isc (%/°C)		0.048
18	Normal Operating Cell Temperature (NOCT) (°C)		45°C±2
19	Operating Temperature (°C)		-40°C TO 85°C
20	Max Temperature rise of solar cells under severe working conditions over Max. Ambient Temp.	To be specified	85°C
21	Module is suitable to operate at 50 ambient	Yes/No	Yes
22	Cell efficiency	%	>19
23	Module efficiency	≥19%	20.83%
24	Maximum System Voltage		1500V
25	No. of By-pass Diodes		3Nos Schottky
26	Mounting arrangement for Solar Module	Fixed Arrangement	Fixed Arrangement
27	Solar Module frame material	Anodized Aluminum	Anodized Aluminum
28	Finish		Smooth Finish
29	Types of Sections used		
30	Module dimensions cms (LxWxH)	To be specified	2266x1133x35 mm
31	PV panel Weight (kg)	To be specified	28 kg
32	Module Life (minimum)	25 years	25Years
33	PV array area(sqm)		1.985 sqm
34	Standards/Approvals from International Agencies	IEC 61215/IEC 61730/ IEC 61701	IEC 61215/IEC 61730/ IEC 61701
35	Guaranteed output confirm	Yes	Yes
36	Output Cables	Polarized, UV protected &Weather Proof DC rated multi-contact connector	Polarized, UV protected &Weather Proof DC rated multi-contact connector
37	Output Terminal	PV Connectors	PV Connectors
38	Junction Box	Weather resistant HDPE (IP65)	Weather resistant HDPE (IP65)
39	Construction Front and Back	High transmittance glass,Polyester Ethyl Vinyl Acetate(EVA) encapsulate	High transmittance glass,Polyester Ethyl Vinyl Acetate(EVA) encapsulate
40	Glass	Low iron tempered	3.2mm Thick Low Iron Tempered
43	Copies of test certificates	IEC 61215,61730 part 1&2, IEC 61701	IEC 61215,61730 part 1&2, IEC 61701

PV Module			
SL NO	Particulars	Required	Offered
1	PV Module Manufacture name &Country of origin	manufacture name to be specified	Adani Solar
2	PV Module type	Mono PERC	Monofacial
3	Product Code		M10-144 HC
4	No. of PV cells per Module		
5	Total number of PV modules		
6	Max.Power, Pmp@STC	380 Wp or Above	540 Wp
7	Max.power tolerance (%)	Not more than 3%	Not more than 3%
8	Max.power voltage (Vmp)@STC	To be specified	41.80 V
9	Max.power current (Imp) @STC	To be specified	12.93 A
10	Open circuit voltage,@STC	To be specified	49.32 V
11	Short circuit current@STC	To be specified	13.71A
12	Nominal voltage	To be specified	38.98V
13	Nominal Wattage	To be specified	440
14	Fill Factor	Not less than 0.70	>0.70
15	Temp.coefficient of Voc(%/C)		-0.28
16	Temp.coefficient of Pmp (%/C)		-0.38
17	Temperature Co-efficient of Isc (%/°C)		0.048
18	Normal Operating Cell Temperature (NOCT) (°C)		45°C±2
19	Operating Temperature (°C)		-40°C TO 85°C
20	Max Temperature rise of solar cells under severe working conditions over Max. Ambient Temp.	To be specified	85°C
21	Module is suitable to operate at 50 ambient	Yes/No	Yes
22	Cell efficiency	%	>19
23	Module efficiency	≥19%	21.03%
24	Maximum System Voltage		1500V
25	No. of By-pass Diodes		3Nos Schottky
26	Mounting arrangement for Solar Module	Fixed Arrangement	Fixed Arrangement
27	Solar Module frame material	Anodized Aluminum	Anodized Aluminum
28	Finish		Smooth Finish
29	Types of Sections used		
30	Module dimensions cms (LxWxH)	To be specified	2266x1133x35 mm
31	PV panel Weight (kg)	To be specified	28 kg
32	Module Life (minimum)	25 years	25Years
33	PV array area(sqm)		1.985 sqm
34	Standards/Approvals from International Agencies	IEC 61215/IEC 61730/ IEC 61701	IEC 61215/IEC 61730/ IEC 61701
35	Guaranteed output confirm	Yes	Yes
36	Output Cables	Polarized, UV protected &Weather Proof DC rated multi-contact connector	Polarized, UV protected &Weather Proof DC rated multi-contact connector
37	Output Terminal	PV Connectors	PV Connectors
38	Junction Box	Weather resistant HDPE (IP65)	Weather resistant HDPE (IP65)
39	Construction Front and Back	High transmittance glass,Polyester Ethyl Vinyl Acetate(EVA) encapsulate	High transmittance glass,Polyester Ethyl Vinyl Acetate(EVA) encapsulate
40	Glass	Low iron tempered	3.2mm Thick Low Iron Tempered
43	Copies of test certificates	IEC 61215,61730 part 1&2, IEC 61701	IEC 61215,61730 part 1&2, IEC 61701

PV Module			
SL NO	Particulars	Required	Offered
1	PV Module Manufacture name & Country of origin	manufacture name to be specified	Adani Solar
2	PV Module type	Mono PERC	Monofacial
3	Product Code		M10-144 HC
4	No. of PV cells per Module		
5	Total number of PV modules		
6	Max.Power, Pmp@STC	380 Wp or Above	545 Wp
7	Max.power tolerance (%)	Not more than 3%	Not more than 3%
8	Max.power voltage (Vmp)@STC	To be specified	41.94 V
9	Max.power current (Imp) @STC	To be specified	13.01 A
10	Open circuit voltage,@STC	To be specified	49.48 V
11	Short circuit current@STC	To be specified	13.79 A
12	Nominal voltage	To be specified	39.10V
13	Nominal Wattage	To be specified	408
14	Fill Factor	Not less than 0.70	>0.70
15	Temp.coefficient of Voc(%/C)		-0.28
16	Temp.coefficient of Pmp (%/C)		-0.38
17	Temperature Co-efficient of Isc (%/°C)		0.048
18	Normal Operating Cell Temperature (NOCT) (°C)		45°C±2
19	Operating Temperature (°C)		-40°C TO 85°C
20	Max Temperature rise of solar cells under severe working conditions over Max. Ambient Temp.	To be specified	85°C
21	Module is suitable to operate at 50 ambient	Yes/No	Yes
22	Cell efficiency	%	>19
23	Module efficiency	≥19%	21.22%
24	Maximum System Voltage		1500V
25	No. of By-pass Diodes		3Nos Schottky
26	Mounting arrangement for Solar Module	Fixed Arrangement	Fixed Arrangement
27	Solar Module frame material	Anodized Aluminum	Anodized Aluminum
28	Finish		Smooth Finish
29	Types of Sections used		
30	Module dimensions cms (LxWxH)	To be specified	2266x1133x35 mm
31	PV panel Weight (kg)	To be specified	28 kg
32	Module Life (minimum)	25 years	25Years
33	PV array area(sqm)		1.985 sqm
34	Standards/Approvals from International Agencies	IEC 61215/IEC 61730/ IEC 61701	IEC 61215/IEC 61730/ IEC 61701
35	Guaranteed output confirm	Yes	Yes
36	Output Cables	Polarized, UV protected & Weather Proof DC rated multi-contact connector	Polarized, UV protected & Weather Proof DC rated multi-contact connector
37	Output Terminal	PV Connectors	PV Connectors
38	Junction Box	Weather resistant HDPE (IP65)	Weather resistant HDPE (IP65)
39	Construction Front and Back	High transmittance glass, Polyester Ethyl Vinyl Acetate(EVA) encapsulate	High transmittance glass, Polyester Ethyl Vinyl Acetate(EVA) encapsulate
40	Glass	Low iron tempered	3.2mm Thick Low Iron Tempered
43	Copies of test certificates	IEC 61215,61730 part 1&2, IEC 61701	IEC 61215,61730 part 1&2, IEC 61701

PV Module			
SL NO	Particulars	Required	Offered
1	PV Module Manufacture name &Country of origin	manufacture name to be specified	Adani Solar
2	PV Module type	Mono PERC	Bifacial PERC Half-cut
3	Product Code		M10-144 HC
4	No. of PV cells per Module		144
5	Total number of PV modules		
6	Max.Power, Pmp@STC	380 Wp or Above	525Wp
7	Max.power tolerance (%)	Not more than 3%	Not more than 3%
8	Max.power voltage (Vmp)@STC	To be specified	41.34 V
9	Max.power current (Imp) @STC	To be specified	12.72 A
10	Open circuit voltage,@STC	To be specified	48.78 V
11	Short circuit current@STC	To be specified	13.48 A
12	Nominal voltage	To be specified	41.35V
13	Nominal Wattage	To be specified	525
14	Fill Factor	Not less than 0.70	>0.70
15	Temp.coefficient of Voc(%/C)		-0.30
16	Temp.coefficient of Pmp (%/C)		-0.39
17	Temperature Co-efficient of Isc (%/°C)		0.050
18	Normal Operating Cell Temperature (NOCT) (°C)		45°C±2
19	Operating Temperature (°C)		-40°C TO 85°C
20	Max Temperature rise of solar cells under severe working conditions over Max. Ambient Temp.	To be specified	85°C
21	Module is suitable to operate at 50 ambient	Yes/No	Yes
22	Cell efficiency	%	>19
23	Module efficiency	≥19%	20.25%
24	Maximum System Voltage		1500V
25	No. of By-pass Diodes		3Nos Schottky
26	Mounting arrangement for Solar Module	Fixed Arrangement	Fixed Arrangement
27	Solar Module frame material	Anodized Aluminum	Anodized Aluminum
28	Finish		Smooth Finish
29	Types of Sections used		
30	Module dimensions cms (LxWxH)	To be specified	2266x1133x35 mm
31	PV panel Weight (kg)	To be specified	28 kg
32	Module Life (minimum)	25 years	25 Years
33	PV array area(sqm)		1.985 sqm
34	Standards/Approvals from International Agencies	IEC 61215/IEC 61730/ IEC 61701	IEC 61215/IEC 61730/ IEC 61701
35	Guaranteed output confirm	Yes	Yes
36	Output Cables	Polarized, UV protected &Weather Proof DC rated multi-contact connector	Polarized, UV protected &Weather Proof DC rated multi-contact connector
37	Output Terminal	PV Connectors	PV Connectors
38	Junction Box	Weather resistant HDPE (IP65)	Weather resistant HDPE (IP65)
39	Construction Front and Back	High transmittance glass,Polyester Ethyl Vinyl Acetate(EVA) encapsulate	High transmittance glass,Polyester Ethyl Vinyl Acetate(EVA) encapsulate
40	Glass	Low iron tempered	3.2mm Thick Low Iron Tempered
43	Copies of test certificates	IEC 61215,61730 part 1&2, IEC 61701	IEC 61215,61730 part 1&2, IEC 61701

PV Module			
SL NO	Particulars	Required	Offered
1	PV Module Manufacture name &Country of origin	manufacture name to be specified	Adani Solar
2	PV Module type	Mono PERC	Bifacial-PERC Half-cut
3	Product Code		M10-144 HC
4	No. of PV cells per Module		144
5	Total number of PV modules		
6	Max.Power, Pmp@STC	380 Wp or Above	530Wp
7	Max.power tolerance (%)	Not more than 3%	Not more than 3%
8	Max.power voltage (Vmp)@STC	To be specified	41.49 V
9	Max.power current (Imp) @STC	To be specified	12.79A
10	Open circuit voltage,@STC	To be specified	48.95 V
11	Short circuit current@STC	To be specified	13.55 A
12	Nominal voltage	To be specified	41.49V
13	Nominal Wattage	To be specified	530
14	Fill Factor	Not less than 0.70	>0.70
15	Temp.coefficient of Voc(%/C)		-0.30
16	Temp.coefficient of Pmp (%/C)		-0.39
17	Temperature Co-efficient of Isc (%/°C)		0.050
18	Normal Operating Cell Temperature (NOCT) (°C)		45°C±2
19	Operating Temperature (°C)		-40°C TO 85°C
20	Max Temperature rise of solar cells under severe working conditions over Max. Ambient Temp.	To be specified	85°C
21	Module is suitable to operate at 50 ambient	Yes/No	Yes
22	Cell efficiency	%	>19
23	Module efficiency	≥19%	20.64%
24	Maximum System Voltage		1500V
25	No. of By-pass Diodes		3Nos Schottky
26	Mounting arrangement for Solar Module	Fixed Arrangement	Fixed Arrangement
27	Solar Module frame material	Anodized Aluminum	Anodized Aluminum
28	Finish		Smooth Finish
29	Types of Sections used		
30	Module dimensions cms (LxWxH)	To be specified	2266x1133x35 mm
31	PV panel Weight (kg)	To be specified	28 kg
32	Module Life (minimum)	25 years	25 Years
33	PV array area(sq.m)		1.985 sqm
34	Standards/Approvals from International Agencies	IEC 61215/IEC 61730/ IEC 61701	IEC 61215/IEC 61730/ IEC 61701
35	Guaranteed output confirm	Yes	Yes
36	Output Cables	Polarized, UV protected &Weather Proof DC rated multi-contact connector	Polarized, UV protected &Weather Proof DC rated multi-contact connector
37	Output Terminal	PV Connectors	PV Connectors
38	Junction Box	Weather resistant HDPE (IP65)	Weather resistant HDPE (IP65)
39	Construction Front and Back	High transmittance glass,Polyester Ethyl Vinyl Acetate(EVA) encapsulate	High transmittance glass,Polyester Ethyl Vinyl Acetate(EVA) encapsulate
40	Glass	Low Iron tempered	3.2mm Thick Low Iron Tempered
43	Copies of test certificates	IEC 61215,61730 part 1&2, IEC 61701	IEC 61215,61730 part 1&2, IEC 61701

PV Module			
SL NO	Particulars	Required	Offered
1	PV Module Manufacture name &Country of origin	manufacture name to be specified	Adani Solar
2	PV Module type	Mono PERC	Bifacial-PERC Half-cut
3	Product Code		M10-144 HC
4	No. of PV cells per Module		144
5	Total number of PV modules		
6	Max.Power, Pmp@STC	380 Wp or Above	535Wp
7	Max.power tolerance (%)	Not more than 3%	Not more than 3%
8	Max.power voltage (Vmp)@STC	To be specified	41.64 V
9	Max.power current (Imp) @STC	To be specified	12.86A
10	Open circuit voltage,@STC	To be specified	49.12V
11	Short circuit current@STC	To be specified	13. 63A
12	Nominal voltage	To be specified	41.64 V
13	Nominal Wattage	To be specified	535
14	Fill Factor	Not less than 0.70	>0.70
15	Temp.coefficient of Voc(%/C)		-0.30
16	Temp.coefficient of Pmp (%/C)		-0.39
17	Temperature Co-efficient of Isc (%/°C)		0.050
18	Normal Operating Cell Temperature (NOCT) (°C)		45°C±2
19	Operating Temperature (°C)		-40°C TO 85°C
20	Max Temperature rise of solar cells under severe working conditions over Max. Ambient Temp.	To be specified	85°C
21	Module is suitable to operate at 50 ambient	Yes/No	Yes
22	Cell efficiency	%	>19
23	Module efficiency	≥19%	20.83%
24	Maximum System Voltage		1500V
25	No. of By-pass Diodes		3Nos Schottky
26	Mounting arrangement for Solar Module	Fixed Arrangement	Fixed Arrangement
27	Solar Module frame material	Anodized Aluminum	Anodized Aluminum
28	Finish		Smooth Finish
29	Types of Sections used		
30	Module dimensions cms (LxWxH)	To be specified	2266x1133x35 mm
31	PV panel Weight (kg)	To be specified	28 kg
32	Module Life (minimum)	25 years	25 Years
33	PV array area(sqm)		1.985 sqm
34	Standards/Approvals from international Agencies	IEC 61215/IEC 61730/ IEC 61701	IEC 61215/IEC 61730/ IEC 61701
35	Guaranteed output confirm	Yes	Yes
36	Output Cables	Polarized, UV protected &Weather Proof DC rated multi-contact connector	Polarized, UV protected &Weather Proof DC rated multi-contact connector
37	Output Terminal	PV Connectors	PV Connectors
38	Junction Box	Weather resistant HDPE (IP65)	Weather resistant HDPE (IP65)
39	Construction Front and Back	High transmittance glass,Polyester Ethyl Vinyl Acetate(EVA) encapsulate	High transmittance glass,Polyester Ethyl Vinyl Acetate(EVA) encapsulate
40	Glass	Low iron tempered	3.2mm Thick Low Iron Tempered
43	Copies of test certificates	IEC 61215,61730 part 1&2, IEC 61701	IEC 61215,61730 part 1&2, IEC 61701

PV Module			
SL NO	Particulars	Required	Offered
1	PV Module Manufacture name &Country of origin	manufacture name to be specified	Adani Solar
2	PV Module type	Mono PERC	Bifacial-PERC Half-cut
3	Product Code		M10-144 HC
4	No. of PV cells per Module		144
5	Total number of PV modules		
6	Max.Power, Pmp@STC	380 Wp or Above	540Wp
7	Max.power tolerance (%)	Not more than 3%	Not more than 3%
8	Max.power voltage (Vmp)@STC	To be specified	41.80 V
9	Max.power current (Imp) @STC	To be specified	12.93A
10	Open circuit voltage,@STC	To be specified	49.32V
11	Short circuit current@STC	To be specified	13.71A
12	Nominal voltage	To be specified	41.80 V
13	Nominal Wattage	To be specified	540
14	Fill Factor	Not less than 0.70	>0.70
15	Temp.coefficient of Voc(%/C)		-0.30
16	Temp.coefficient of Pmp (%/C)		-0.39
17	Temperature Co-efficient of Isc (%/°C)		0.050
18	Normal Operating Cell Temperature (NOCT) (°C)		45°C±2
19	Operating Temperature (°C)		-40°C TO 85°C
20	Max Temperature rise of solar cells under severe working conditions over Max. Ambient Temp.	To be specified	85°C
21	Module is suitable to operate at 50° ambient	Yes/No	Yes
22	Cell efficiency	%	>19
23	Module efficiency	≥19%	21.03%
24	Maximum System Voltage		1500V
25	No. of By-pass Diodes		3Nos Schottky
26	Mounting arrangement for Solar Module	Fixed Arrangement	Fixed Arrangement
27	Solar Module frame material	Anodized Aluminum	Anodized Aluminum
28	Finish		Smooth Finish
29	Types of Sections used		
30	Module dimensions cms (LxWxH)	To be specified	2266x1133x35 mm
31	PV panel Weight (kg)	To be specified	28 kg
32	Module Life (minimum)	25 years	25 Years
33	PV array area(sqm)		1.985 sqm
34	Standards/Approvals from International Agencies	IEC 61215/IEC 61730/ IEC 61701	IEC 61215/IEC 61730/ IEC 61701
35	Guaranteed output confirm	Yes	Yes
36	Output Cables	Polarized, UV protected &Weather Proof DC rated multi-contact connector	Polarized, UV protected &Weather Proof DC rated multi-contact connector
37	Output Terminal	PV Connectors	PV Connectors
38	Junction Box	Weather resistant HDPE (IP65)	Weather resistant HDPE (IP65)
39	Construction Front and Back	High transmittance glass,Polyester Ethyl Vinyl Acetate(EVA) encapsulate	High transmittance glass,Polyester Ethyl Vinyl Acetate(EVA) encapsulate
40	Glass	Low iron tempered	3.2mm Thick Low Iron Tempered
43	Copies of test certificates	IEC 61215,61730 part 1&2, IEC 61701	IEC 61215,61730 part 1&2, IEC 61701

PV Module			
SL NO	Particulars	Required	Offered
1	PV Module Manufacture name &Country of origin	manufacture name to be specified	Adani Solar
2	PV Module type	Mono PERC	Bifacial-PERC Half-cut
3	Product Code		M10-144 HC
4	No. of PV cells per Module		
5	Total number of PV modules		
6	Max.Power, Pmp@STC	380 Wp or Above	545 Wp
7	Max.power tolerance (%)	Not more than 3%	Not more than 3%
8	Max.power voltage (Vmp)@STC	To be specified	41.94 V
9	Max.power current (Imp) @STC	To be specified	13.01 A
10	Open circuit voltage,@STC	To be specified	49.48 V
11	Short circuit current@STC	To be specified	13.79 A
12	Nominal voltage	To be specified	41.94 V
13	Nominal Wattage	To be specified	545
14	Fill Factor	Not less than 0.70	>0.70
15	Temp.coefficient of Voc(%/C)		-0.30
16	Temp.coefficient of Pmp (%/C)		-0.39
17	Temperature Co-efficient of Isc (%/°C)		0.050
18	Normal Operating Cell Temperature (NOCT) (°C)		45°C±2
19	Operating Temperature (°C)		-40°C TO 85°C
20	Max Temperature rise of solar cells under severe working conditions over Max. Ambient Temp.	To be specified	85°C
21	Module is suitable to operate at 50° ambient	Yes/No	Yes
22	Cell efficiency	%	>19
23	Module efficiency	≥19%	21.22%
24	Maximum System Voltage		1500V
25	No. of By-pass Diodes		3Nos Schottky
26	Mounting arrangement for Solar Module	Fixed Arrangement	Fixed Arrangement
27	Solar Module frame material	Anodized Aluminum	Anodized Aluminum
28	Finish		Smooth Finish
29	Types of Sections used		
30	Module dimensions cms (LxWxH)	To be specified	2266x1133x35 mm
31	PV panel Weight (kg)	To be specified	28 kg
32	Module Life (minimum)	25 years	25 Years
33	PV array area(sqm)		1.985 sqm
34	Standards/Approvals from International Agencies	IEC 61215/IEC 61730/ IEC 61701	IEC 61215/IEC 61730/ IEC 61701
35	Guaranteed output confirm	Yes	Yes
36	Output Cables	Polarized, UV protected &Weather Proof DC rated multi-contact connector	Polarized, UV protected &Weather Proof DC rated multi-contact connector
37	Output Terminal	PV Connectors	PV Connectors
38	Junction Box	Weather resistant HDPE (IP65)	Weather resistant HDPE (IP65)
39	Construction Front and Back	High transmittance glass.Polyester Ethyl Vinyl Acetate(EVA) encapsulate	High transmittance glass,Polyester Ethyl Vinyl Acetate(EVA) encapsulate
40	Glass	Low iron tempered	3.2mm Thick Low Iron Tempered
43	Copies of test certificates	IEC 61215,61730 part 1&2, IEC 61701	IEC 61215,61730 part 1&2, IEC 61701

Hitachi, with more than 100 years of legacy worldwide and with over 3 GW installation base of PV Central Solar Inverters in India, brings to you the PV STRING INVERTER with latest, efficient & flexible design to maximize the energy yield for large commercial & utility solar projects. With highly efficient conversion technology, this HIVERTER Si Series PV String Solar Inverter is available from 4.4 kW to 70 kW range with 3 Phase output and 1.1 kW to 6 kW range with 1 Phase output.

- Best suitable for heavy industries and large commercial establishments in India
 - Wide range of 1.1 kW to 70 kW Inverters offers more flexibility as per project design
 - Real time precise MPPT algorithm to ensure highest efficiency up to 98.6%
- Intelligent grid management features first of its kind IV curve diagnostics feature
 - A robust IP65 enclosure allowing hassle free outdoor installations
 - Low maintenance cost
 - Safety assured through its anti islanding, RCMU, ground fault monitoring

String Inverter Technology

Intelligent Power Management

- LVRT / ZVRT protections
- Self-power reducer in case of over frequency
- Fully adjustable reactive power & power factor for different grids
- Real time MPPT algorithm

Built-In Protection Functions

- Over current, Over load
- O/ V & U/V protection
- Anti-islanding, Current leakage
- Over temperature protection
- Over frequency, Under-frequency
- SPD Type III, Type II (Optional for 20-33 kW models)

Humanized Functions

- Audible & visible alarming function
- Remote system connection or disconnection
- Remote firmware upgrade
- Remote monitoring
- Separate section for power & termination

Highlights

- Wide DC input range from 250 V to 950 V
 - Highest AC output range +/- 25%
 - Up to 3 Independent MPPT to ensure optimalenergy harvest
 - MPPT accuracy is up to 99.9 %, max euroefficiency 98.4 %
 - Wide ambient temp range -25°C to 60°C
 - IP 65 protection for Indoor & outdoor application
- Low sensitivity to the grid disturbance to avoid unnecessary breakdo
 - User friendly interface like RS 232 / RS 485 / Wi-Fi
 - Easy to read LCD display with all operational status & necessary data
 - Reactive power controller
 - Type II SPD String current monitoring

Advantages

More Reliability

- Usage of only higher voltage level capacitor
- Support four uni-polar output relays (effective heat dissipation, longer life)

Higher Efficiency

- “T” type 3 level topology provides higher efficiency

More Convenience

- All information is available on a 4” large screen
- Availability of four separate buttons give easy operation
- Equipped with compact ACDB & DCDB (optional*)

Safer

- Equipped with leakage current detection components
- Use professional solar AC connectors as output

Better Monitoring

- RS485 / Wi Fi / GPRS / Ethernet
- Local data is recorded in SD card for 25 years
- IV curve scanning technology, catch MPPT easily and quickly

Better Appearance

- Die-casting housings
- Go through anti-corrosion and anti-rust protection processes

Hitachi Hi-Rel Power Electronics Private Limited

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Gandhinagar Facility: B-14/1 & 171, GIDC Electronics Zone, Sector-25, Gandhinagar-382044, Gujarat, India. Tel: +91-79-6170 0500, +91-79-2328 7180/81, Fax: +91-79-23287182
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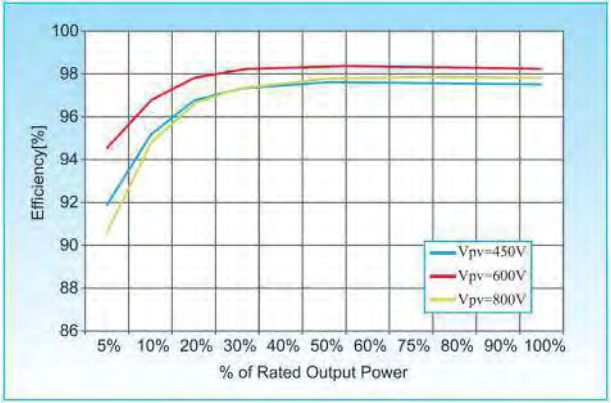


Grid Tied Solar String Inverters
Highly Efficient Conversion Technology
4.4 kW to 70 kW (3Ph.)
1.1 kW to 6 kW (1Ph.)

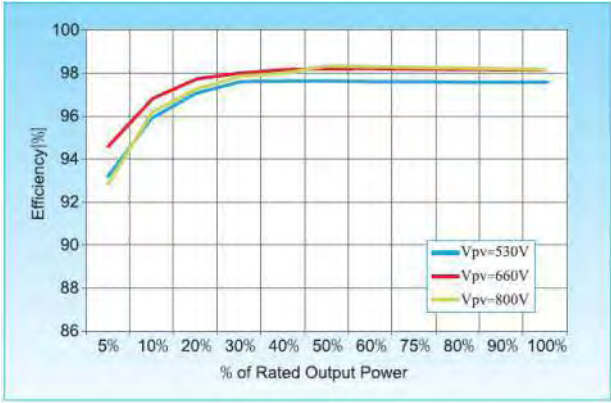
Generating
3 GW+
Renewable Power
in Indian Solar Sector
through
Central Inverters



Efficiency Curve



(HIVERTER Si - 20 kW to 33 kW Models)



(HIVERTER Si - 50 kW to 70 kW Models)

High-yield

- Max 98.6% efficiency
- Real time precise MPPT algorithm for max harvest
- Wide input voltage operation range from 250 V to 950 V

All in one, Flexible and economical system solutions

- DC switch
- Built-in PV combiner
- Power management unit
- Optimum selection for big PV plants, commercial buildings.
- Inbuilt type II DC surge protection device#
- Inbuilt type II AC surge protection device#

Low maintenance cost

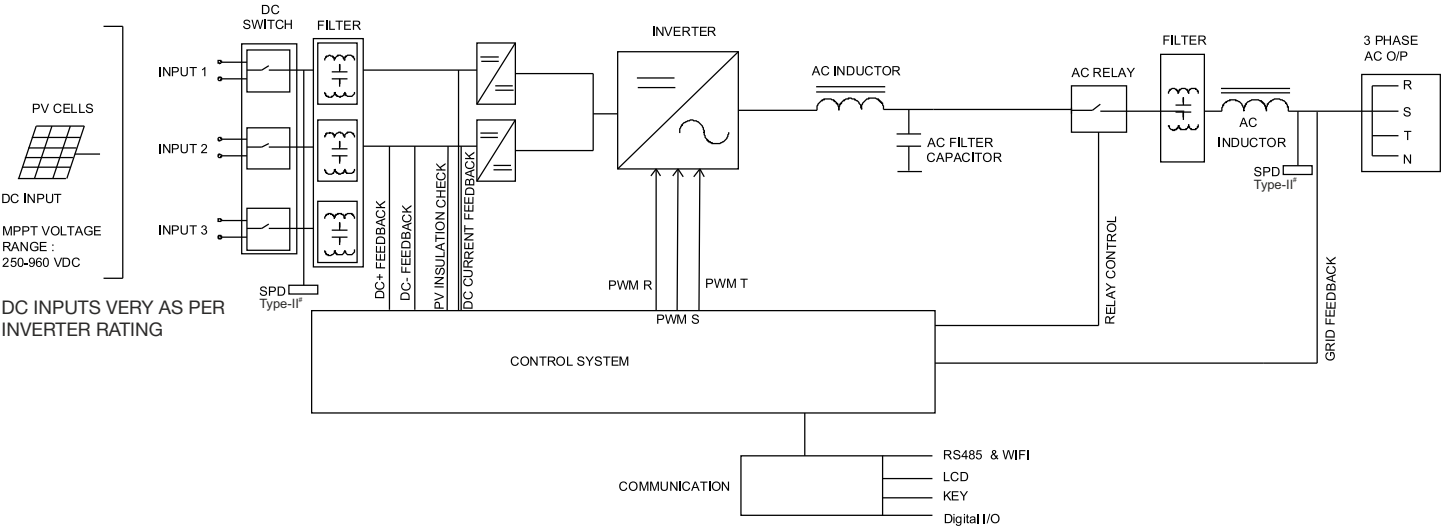
- Rust-free aluminum covers
- Flexible monitoring solution
- Multi-function relay can be configured to show various inverter information

Intelligent grid management

- ZVRT support
- Reactive power adjustable
- Self-power reducer when over frequency
- Remote active / reactive power limit control

(*Optional for 20-33 kW Models)

Single Line Diagram



Globally Renowned Component Partners

MOSIGBT
FAIRCHILD
infineon

IC
ON Semiconductor
TEXAS INSTRUMENTS

Fuse
Littelfuse
COOPER Wheelock

Current Transducer
LEM

Capacitor
NIPPON CHEMI-CON
nichicon
Rubycon

Diode
Microsemi
IXYS

Relay
Panasonic
FUJITSU

MCU
RENESAS

Technical Specifications - Solar String Inverter - 1.1 kW to 3.3 kW (1Ph.)

HIVERTER-Si Series Single Phase, Single MPPT	Si 1.1K-H3	Si 1.6K-H3	Si 2.2K-H3	Si 2.7K-H3	Si 3K-H3	Si 3.3K-H3
Input (DC)						
Recommended PV Input Power	1500W	2200W	3000W	3700W	4100W	4500W
Max. Input Voltage	500V			550V		
Aux. Open Voltage	60V					
Start-up Input Voltage	70V					
Rated Input Voltage	360V					
MPPT Voltage Range	50-500V			50-550V		
Full Load DC Voltage Range	110-450V	150-450V	200-450V	250-500V	275-500V	300-500V
Max. Input Current MPPT	12A					
Max. DC Input Short Circuit Current per MPPT	15A					
Number of MPPT/ String per MPPT	1 / 1					
Input Terminal Type	MC4 / H4					
Output (AC)						
Rated Power	1100W	1600W	2200W	2700W	3000W	3300W
Max. AC Power	1100VA	1600VA	2200VA	2700VA	3000VA	3300VA
Rated Output Current	4.8A	7A	9.6A	11.8A	13A	14.3A
Max. Output Current	5.3A	7.7A	10.6A	13A	14.5A	16A
Nominal Grid Voltage	L/N/PE, 220VAC, 230VAC, 240VAC					
Grid Voltage Range	180VAC-276VAC (According to local standard)					
Nominal Frequency	50 / 60Hz					
Grid Frequency Range	45~55Hz/54~66Hz (According to local standard)					
THDi	<3%					
Power Factor	1default (adjustable ±0.8)					
Efficiency						
Max. Efficiency up to	97.43%	97.51%	97.47%	97.38%	97.34%	97.20%
European Weighted Efficiency up to	96.9%			97.2%		
MPPT Adaptation Efficiency	>99.9%					
Protection						
Anti-islanding Protection	Yes					
DC Reverse Polarity Protection	Yes					
Over Temp Protection	Yes					
Leakage Current Protection	Yes					
Over Voltage Protection	Yes					
Over Current Protection	Yes					
Earth Fault Protection	Yes					
SPD	MOV: Type III standard					
Communication						
Standard Communication Mode	RS485, WiFi / GPRS / Ethernet (optional), USB					
Operation Data Storage	25 years					
General Data						
Topology	Transformer-less					
Ambient Temperature Range	-30℃ ~ +60℃					
Allowable Relative Humidity Range	0~100%					
Noise	<25dB					
DC Switch	Optional					
Cooling	Natural convection					
Max. Operating Altitude	2000m					
Dimension	303 x 260.5 x 118mm			321 x 260.5 x 131.5mm		
Support Bracket	Wall-mounted					
Weight	5.5kg			6.3kg		
Display	LCD+LED					
Degree of Protection	IP65					
Standard						
EMC	EN 61000-6-1, EN 61000-6-2, EN 61000-6-3, EN 61000-6-4					
Safety Standards	IEC 62116, IEC 61727, IEC 61683, IEC 60068(1,2,14,30), IEC 62109-1/2					
Grid Standards	AS 4777, VDE V 0124-100, VDE V 0126-1-1, VDE-AR-N 4105, EN 50438, G83/2, C10/11, RD 1699					

Technical Specifications - Solar String Inverter - 3 kW to 6 kW (1Ph.)

HIVERTER-Si Series Single Phase, Dual MPPT	Si 3K-H2	Si 3.6K-H2	Si 4K-H2	Si 4.6K-H2	Si 5K-H2	Si 6K-H2
Input (DC)						
Recommended PV Input Power	3500W	4000W	4400W	5000W	5500W	6600W
Max DC Power for Single MPPT	2000W	2400W	2600W	3000W	3000W	3500W
Number of Independent MPPT	2					
Number of DC Inputs	1 / 1					
Max. Input Voltage	600V					
Start-up Input Voltage	120V					
Rated Input Voltage	360V					
MPPT Voltage Range	90-580V					
Full Load DC Voltage Range	160V-520V	180V-520V	200V-520V	230V-520V	250V-520V	300V-520V
Max. Input Current per MPPT	11A / 11A					
Maxnimun DC Input Short Circuit Current per MPPT	14A					
Output						
Rated Power	3000W	3680W	4000W	4600W	5000W	6000W
Max. AC Power	3000VA	3680VA	4000VA	4600VA	5000VA	6000VA
Max. Output Current	13.7A	16.8A	18.2A	21A	22.8A	27.3A
Nominal Grid Voltage	L/N/PE, 220VAC, 230VAC, 240VAC					
Grid Voltage Range	180VAC-276VAC (According to local standard)					
Nominal Frequency	50 / 60Hz					
Grid Frequency Range	45~55Hz/54~66Hz (According to local standard)					
Active Power Adjustable Range	0 ~ 100%					
THDI	<3%					
Power Factor	1default (adjustable ±0.8)					
Power Limit Export	Zero export or adjustable power limit export					
Performance						
Max. Efficiency up to	97.7%			97.6%		
European Weighted Efficiency up to				97.5%		
Self-consumption at Night				<1W		
Feed-in Start Power				50W		
MPPT Efficiency				>99.9%		
Protection						
DC Reverse Polarity Protection				Yes		
DC Switch				Optional		
Protection Class/Overvoltage Category				I / III		
Input/Output MOV (II)				Yes		
Safety Protection				Anti islanding, RCMU, Ground fault monitoring		
SPD				MOV: Type III standard		
Communication						
Power Management Unit				According to certification and request		
Standard Communication Mode				RS485, Wifi / Ethernet / GPRS (optional), SD card (optional)		
Operation Data Storage				25 years		
General Data						
Ambient Temperature Range				-25℃ ~ +60℃		
Topology				Transformer-less		
Degree of Protection				IP65		
Allowable Relative Humidity Range				0~100%		
Max. Operating Altitude				2000m		
Noise				<25dB		
Weight				11.5kg		
Cooling				Natural convection		
Dimension				405 x 315 x 135mm		
Display				LCD display		
Standard						
EMC				EN 61000-6-2, EN 61000-6-3, EN 61000-3-2, EN 61000-3-3, EN 61000-3-11, EN 61000-3-12		
Safety Standards				IEC62109-1/2, IEC62116, IEC61727, IEC-61683, IEC60068(1,2,14,30)		
Grid Standards				A S/NZS 4777, VDE V 0124-100, V 0126-1-1, VDE-AR-N 4105, CEI 0-21, EN50438/EN50549, G83/G59/G98/G99, NB/T32004; ABNT NBR 16149/16150		

Technical Specifications - Solar String Inverter - 4.4 kW to 12 kW (3Ph.)

HIVERTER-Si Series Three Phase	Si 4.4K	Si 5.5K	Si 6.6K	Si 8.8K	Si 11K	Si 12K
Input (DC)						
Recommended PV Input Power	4800W	6000W	7200W	9600W	12000W	14400W
Number of Independent MPPT	2					
Number of DC Inputs	1 for each MPPT					
Max. Input Voltage	1000V					
Start-up Input Voltage	180V					
Reated Input Voltage	600V					
MPPT Voltage Range	160V - 900V					
Full Load DC Voltage Range	190V-850V	240V-850V	290V-850V	380V-850V	480V-850V	575V-850V
Max. Input Current per MPPT	11A / 11A					
Max. DC Input Short Circuit Current per MPPT	14A					
Output (AC)						
Rated Power	4000W	5000W	6000W	8000W	10000W	12000W
Max. AC Power	4400VA	5500VA	6600VA	8800VA	11000VA	13200VA
Max. Output Current	6.4A	8.0A	9.6A	12.8A	15.9A	19.1A
Nominal Grid Voltage	3/N/PE, 220/380VAC, 230/400VAC, 240/415VAC					
Grid Voltage Range	310VAC-480VAC (According to local standard)					
Nominal Frequency	50 / 60Hz					
Grid Frequency Range	45Hz-55Hz/54Hz-66Hz (According to local standard)					
Active Power Adjustable Range	0 ~ 100%					
THDi	<3%					
Power Factor	1 default (adjustable ±0. 8)					
Power Limit Export	Zero export or adjustable power limit export					
Performance						
Max Efficiency up to	98%			98.3%		
European Weighted Efficiency up to	97.50%			98%		
Self-Consumption at Night	<1W					
MPPT Efficiency	>99.9%					
Protection						
DC Reverse Polarity Protection	Yes					
DC Switch	Yes					
Safety Protection	Anti-islanding, RCMU, Ground fault monitoring					
ARPC	Anti-reverse power controller (optional)					
Communication						
Power Management Unit	According to certification and request					
Standard Communication Mode	RS485, Wifi / Ethernet / GPRS (optional), SD card					
Operation Data Storage	25 years					
General Data						
Ambient Temperature Range	-25°C ~ +60°C					
Topology	Transformer-less					
Degree of Protection	IP65					
Allowable Relative Humidity Range	0~100%					
Max. Operating Altitude	2000m					
Noise	<29dB					
Weight	21kg			22kg		
Cooling	Natural					
Dimension	457 x 452 x 202mm					
Display	LCD display					
Standard						
EMC	EN 61000-6-1, EN 61000-6-2, EN 61000-6-3, EN 61000-6-4, EN 61000-3-2, EN 61000-3-3, EN 61000-3-12, EN 61000-3-11					
Safety Standards	IEC62109-1/2, IEC62116, IEC61727, IEC-61683, IEC60068(1,2,14,30), IEC60255					
Grid Standards	AS/NZS 4777, VDE V 0124-100, V 0126-1-1, VDE-AR-N 4105, CEI 0-21, EN50438/EN50549, G83/G59, Rd1699, UTE C15-712-1, EN50530, NB/T32004					

Technical Specifications - Solar String Inverter - 20 kW to 33 kW (3Ph.)

HIVERTER-Si Series Three Phase		Si 20K	Si 25K	Si 30K	Si 33K
Input (DC)	Recommended PV Input Power	26000W	32500W	39000W	42900W
	No. of Independent MPPT	2			
	No. of DC Inputs	2 for each MPPT	3 for each MPPT		
	Max. Input Voltage	1100V			
	Start-up Input Voltage	250V			
	Rated Input voltage	620V			
	MPPT Voltage Range	230V-960V			
	Full Load DC Voltage Range	430V-850V	460V-850V	520V-850V	580V-850V
	Max. Input MPPT Current	24A/24A	28A/28A	30A/30A	30A/30A
	Max. DC Input Short Circuit Current per MPPT	30A	35A	37.5A	37.5A
Output (AC)	Rated Power	20000W	25000W	30000W	33000W
	Max. AC Power	22000VA	27500VA	33000VA	36300VA
	Max. Output Current	32A	40A	48A	53A
	Nominal Grid Voltage	3/N/PE, 220/380VAC, 230/400 VAC, 240/415VAC			
	Grid Voltage Range	310VAC-480VAC (According to local standard)			
	Nominal Frequency	50/60Hz			
	Grid Frequency Range	45Hz-55Hz/54Hz-66Hz (According to local standard)			
	Active Power Adjustable Range	0~100%			
	THDi	<3%			
	Power Factor	1 default (adjustable ±0.8)			
Performance	Max Efficiency up to	98.2%	98.4%	98.4%	98.6%
	European Weighted Efficiency up to	98.0%	98.2%	98.2%	98.2%
	Self-consumption at Night	<1 W			
	MPPT Efficiency	>99.9%			
Protection	DC Reverse Polarity Protection	Yes			
	DC Switch	Yes			
	Protection Class/Overvoltage Category	I/III			
	Safety Protection	Anti-islanding, RCMU, Ground fault monitoring			
	ARPC	Anti-reverse power controller (optional)			
Communication	Power Management Unit	According to certification and request			
	Standard Communication Mode	RS485, WiFi / Ethernet / GPRS (optional), SD card			
	Operation Data Storage	25 years			
General Data	Ambient Temperature Range	-25°C ~ +60°C			
	Topology	Transformer-less			
	Degree of Protection	IP65			
	Allowable Relative Humidity Range	0-100%			
	Max. Operating Altitude	2000m			
	Noise	< 30 dB	< 45 dB		
	Weight	37kg			
	Cooling	Natural	Fan		
	Dimensions	666 x 512 x 254mm			
	Display	LCD display			
Standard	EMC	EN 61000-6-2, EN 61000-6-3, EN 61000-3-12, EN 61000-3-11			
	Safety Standards	IEC62109-1/2, IEC62116, IEC61727, IEC-61683, IEC60068(1,2,14,30), IEC60255			
	Grid Standards	A S/NZS 4417, VDE V 0124-100, V 0126-1-1 VDE-AR-N 4105, CEI 0-21/CEI 0-16, EN50438/EN50549, G59, P.O. 12.3, RD1699, UTE C15-712-1, EN50530, NB/T32004			

Technical Specifications - Solar String Inverter - 50 kW to 70 kW (3Ph.)

HIVERTER-Si Series Three Phase		Si 50K	Si 60K	Si 70K(HV)
Input (DC)	Recommended PV Input Power	55000W	66000W	77000W
	Max. DC Power for Single MPPT	22000W/16000W/16000W	22000W/22000W/22000W	26000W/26000W/26000W
	No. of Independent MPPT	3		
	No. of DC Inputs	4/3/3	4/4/4	
	Max. Input Voltage	1000V		
	Start-up Input Voltage	350V		
	Rated Input Voltage	600V	600V	700V
	MPPT Voltage Range	250V-960V		
	Full Load DC Voltage Range	530V-800V	530V-800V	660V-800V
	Max. Input MPPT Current	40A/30A/30A	40A/40A/40A	40A/40A/40A
	Max. Input Current per String	12A		
	Max. DC Input Short Circuit Current per MPPT	48A/36A/36A	48A	48A
Output (AC)	Rated Power	50000W	60000W	70000W
	Max. AC Power	55000VA	60000VA	70000VA
	Max. Output Current	80A	90A	90A
	Nominal Grid Voltage	3/N/PE, 220/380VAC, 230/400VAC, 240/415VAC		3/N/PE or 3/PE, 277/480VAC
	Grid Voltage Range	310VAC-480VAC (According to local standard)		422VAC-528VAC (According to local standard)
	Nominal Frequency	50 / 60Hz		
	Grid Frequency Range	40Hz-55Hz/54Hz-66Hz (According to local standard)		
	Active Power Adjustable Range	0 ~100%		
	THDi	<3%		
	Power Factor	1 default (adjustable ± 0.8)		
Performance	Max Efficiency up to	98.5%	98.6%	98.6%
	European Weighted Efficiency up to	98.3%	98.4%	98.4%
	Self Consumption at Night	<1W		
	MPPT Efficiency	>99.9%		
Protection	DC Reverse Polarity Protection	Yes		
	DC Switch	Yes		
	Protection Class/Overvoltage Category	I/III		
	Input/Output SPD (II)	PV: Type II standard, AC: Type II		
	Safety Protection	Anti-islanding, RCMU, ground fault monitoring		
	ARPC	Anti-reverse power controller (optional)		
	Power Management Unit	According to certification and request		
Communication	Standard Communication Mode	RS485, Wifi / Ethernet / GPRS (optional), SD card, Multi-function relay		
	Operation Data Storage	25 years		
	Ambient Temperature Range	-25°C ~ +60°C		
General Data	Topology	Transformer-less		
	Degree of Protection	IP65		
	Allowable Relative Humidity Range	0~100%		
	Max. Operating Altitude	4000m		
	Noise	≤ 60 dB		
	Weight	68kg	70kg	
	Cooling	Fan		
	Dimensions	713 x 737 x 297 mm		
	Display	LCD display		
	Standard	EMC	EN 61000-6-2, EN 61000-6-4, EN 61000-3-11, EN 61000-3-12	
Safety Standards		IEC62109-1/2, IEC62116, IEC61727, IEC-61683, IEC60068(1,2,14,30)		
Grid Standards		AS/NZS 4777, VDE V 0124-100, V 0126-1-1, VDE-AR-N 4105, BDEW, CEI 0-21/CEI 0-16, UNE 206 007-1, EN50438/EN50549, G59, EN50530, NB/T32004		

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Certificate of Conformity

Certificate No.: 1988AP1010N008001
Equipment: Solar Grid-tied Inverter

Brand Name:

HITACHI

Test Model No.: Hiverter Si-20K, Hiverter Si-25K,
Hiverter Si-30K, Hiverter Si-33K

Applicant: Hitachi Hi-Rel Power Electronics Pvt. Ltd.
SM 3 & 4, Sanand – II GIDC, Industrial Estate, Boll Village,
Sanand – 382 110, Gujarat, India.

Report No.: LD191010N008

The submitted sample of the above equipment has been tested for CE marking according to following European Directive and standards:

- Low Voltage Directive 2014/35/EU.

The referred test report(s) show that the product complies with standard(s) recognized as giving presumption of compliance with the essential requirements in the specified European Directive.

This verification does not imply assessment of the production of the product. The CE marking may be affixed if all relevant and effective European Directives with CE are applicable.

Applied rules and standards

IEC/EN 62109-1:2010

Safety of power converters for use in photovoltaic power systems – Part 1: General requirements

IEC/EN 62109-2:2011

Safety of power converters for use in photovoltaic power systems –
Part 2: Particular requirements for inverters

Name: James Huang
Technical Manager/ New Energy Team
Date: 2019-11-08

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ATTESTATION of conformity with European Directives

Attestation Number: 1988AB1010N008001
 Product: Solar Grid-tied Inverter
 Brand Name: **HITACHI**
 Model: Hiverter Si-33K, Hiverter Si-20K
 Additional Model: Hiverter Si-25K, Hiverter Si-30K
 Applicant: Hitachi Hi-Rel Power Electronics Pvt. Ltd.
 Address: SM 3 & 4, Sanand – II GIDC, Industrial Estate, Boll Village, Sanand – 382 110, Gujarat, India.
 Technical Characteristics: DC input: 230-960V
 AC output: 400V 45-65Hz

The submitted sample of the above equipment has been tested for **CE** marking according to following European Directive and following standards:

- Electromagnetic Compatibility Directive 2014/30/EU

Standards	Report Number	Report date
EN 61000-6-3:2007 + A1:2011 EN 61000-3-11:2001 EN 61000-3-12:2011 EN 61000-6-2:2005	CE191010N008	Nov. 05, 2019

The referred test report(s) show that the product complies with standard(s) recognized as giving presumption of compliance with the essential requirements in the specified European Directive.

This verification does not imply assessment of the production of the product. The **CE** marking may be affixed if all relevant and effective European Directives with **CE** are applicable.



Assistant Manager
EMC Department

Name: Glyn He
Date: Nov. 05, 2019

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Bureau Veritas Shenzhen Co., Ltd.
Dongguan Branch

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Email: customerservice.dg@cn.bureauveritas.com

Certificate of Conformity

Certificate Number: CN-PV-190053

On the basis of the tests undertaken, the samples of the below product have been found to comply with the requirements of the referenced specifications /standards at the time the tests were carried out. It does not imply that Intertek has performed any surveillance or control of the manufacture. The manufacturer shall ensure that the manufacturing process assures compliance of the production units with the examined products mentioned in this certificate.

Applicant Name & Address:	Hitachi Hi-Rel Power Electronics Pvt. Ltd. SM 3 & 4, Sanand – II GIDC, Industrial Estate, Boll Village, Sanand – 382 110, Gujarat, India.
Product Description:	Solar Grid Tied Inverter
Ratings & Principle Characteristics:	See Annex to Certificate of Conformity
Models/Type References:	Hiverter Si-20K, Hiverter Si-25K, Hiverter Si-30K, Hiverter Si-33K
Brand Name:	HITACHI
Specification/Standard:	IEC 60068-2-1:2007, Environmental testing – Part 2-1: Tests- Test A: Cold IEC 60068-2-2:2007, Environmental testing – Part 2-2: Tests- Test B: Dry heat IEC 60068-2-14:2009, Environmental testing – Part 2-14: Tests- Test N: Change of temperature IEC 60068-2-30:2005, Environmental testing – Part 2-30: Tests- Test Db: Damp heat, cyclic (12h +12h cycle)
Certificate Issuing Office Name & Address:	Intertek Testing Services Ltd. Shanghai 2/F (West Side), No. 707, Zhangyang Road, Free Trade Experimental Area, Shanghai, P. R. China
Test Report Number:	191012016GZU-004

Additional information in Appendix.



Signature

Name: Grady Ye

Position: Certifier

Date: 15 November 2019

This Certificate is for the exclusive use of Intertek's client and is provided pursuant to the agreement between Intertek and its Client. Intertek's responsibility and liability are limited to the terms and conditions of the agreement. Intertek assumes no liability to any party, other than to the Client in accordance with the agreement, for any loss, expense or damage occasioned by the use of this Certificate. Only the Client is authorized to permit copying or distribution of this Certificate. Any use of the Intertek name or one of its marks for the sale or advertisement of the tested material, product or service must first be approved in writing by Intertek.

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APPENDIX: Certificate of Conformity

This is an Appendix to Certificate of Conformity Number: CN-PV-190053.

Ratings &
Principle
Characteristics:

Model	Hiverter Si-20K	Hiverter Si-25K	Hiverter Si-30K	Hiverter Si-33K
Max. DC input Voltage	1100Vdc			
Operating MPPT voltage range	230Vdc – 960Vdc			
Max. Input current	24A/24A	28A/28A	30A/30A	30A/30A
PV Isc	30A*2	35A*2	37.5A*2	37.5A*2
Nominal AC output voltage	3/N/PE 230Vac/400Vac			
Nominal AC output Frequency	50Hz			
Nominal AC output Power	20000W	25000W	30000W	33000W
Max. Output Power	22000VA	27500VA	33000VA	36300VA
Power factor	0.8 Leading – 0.8 Lagging			
Safety level	Class I			
Ingress Protection	IP 65			
Operation Ambient Temperature	-25°C - 60°C			
Software version	V1.40			

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Attestation of Conformity

Attestation No.: 1988AP1010N008003

Equipment: Solar Grid-tied Inverter

Brand Name:

HITACHI

Test Model No.: Hiverter Si-20K, Hiverter Si-25K,
Hiverter Si-30K, Hiverter Si-33K

Applicant: Hitachi Hi-Rel Power Electronics Pvt. Ltd.

SM 3 & 4, Sanand – II GIDC, Industrial Estate, Boll Village,
Sanand – 382 110, Gujarat, India.

Report No.: PV191010N008, PV191010N008-1, PV191010N008-2

Use in accordance with regulations:

The inverters are tested for efficiency, functional safety and grid protection. For detailed information, please watch the corresponding test reports.

Applied rules and standards

IEC 61727:2004	Characteristics of the utility interface
IEC 62116:2014	Islanding prevention measures for utility-interconnected photovoltaic inverters
IEC 61683:1999	Photovoltaic systems – Power conditioners – Procedure for measuring efficiency

Name: James Huang
Technical Manager/ New Energy Team
Date: 2019-11-22

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Hitachi, with more than 100 years of legacy worldwide and with over 3 GW installation base of PV Central Solar Inverters in India, brings to you the PV STRING INVERTER with latest, efficient & flexible design to maximize the energy yield for large commercial & utility solar projects. With highly efficient conversion technology, this HIVERTER Si Series PV String Solar Inverter is available from 4.4 kW to 70 kW range with 3 Phase output and 1.1 kW to 7.5 kW range with 1 Phase output.

- Best suitable for heavy industries and large commercial establishments in India
- Wide range of 1.1 kW to 70 kW Inverters offers more flexibility as per project design
- Real time precise MPPT algorithm to ensure highest efficiency up to 98.6%
- Intelligent grid management features first of its kind IV curve diagnostics feature
- A robust IP65 enclosure allowing hassle free outdoor installations
- Low maintenance cost
- Safety assured through its anti islanding, RCMU, ground fault monitoring

String Inverter Technology

Intelligent Power Management

- LVRT / ZVRT protections
- Self-power reducer in case of over frequency
- Fully adjustable reactive power & power factor for different grids
- Real time MPPT algorithm

Built-In Protection Functions

- Over current, Over load
- O/ V & U/V protection
- Anti-islanding, Current leakage
- Over temperature protection
- Over frequency, Under-frequency
- SPD Type III, Type II (Optional for 20-33 kW models)

Humanized Functions

- Audible & visible alarming function
- Remote system connection or disconnection
- Remote firmware upgrade
- Remote monitoring
- Separate section for power & termination

Highlights

- Wide DC input range from 250 V to 950 V
- Highest AC output range +/- 25%
- Up to 3 Independent MPPT to ensure optimalenergy harvest
- MPPT accuracy is up to 99.9 %, max euroefficiency 98.4 %
- Wide ambient temp range -25°C to 60°C
- IP 65 protection for Indoor & outdoor application
- Low sensitivity to the grid disturbance to avoid unnecessary breakdo
- User friendly interface like RS 232 / RS 485 / Wi-Fi
- Easy to read LCD display with all operational status & necessary data
- Reactive power controller
- Type II SPD String current monitoring

Advantages

More Reliability

- Usage of only higher voltage level capacitor
- Support four uni-polar output relays (effective heat dissipation, longer life)

Higher Efficiency

- “T” type 3 level topology provides higher efficiency

More Convenience

- All information is available on a 4” large screen
- Availability of four separate buttons give easy operation
- Equipped with compact ACDB & DCDB (optional*)

(*Optional for 20-33 kW Models)

Hitachi Hi-Rel Power Electronics Pvt. Ltd.

Registered Office (Ahmedabad): B-52, Corporate House, Near Judges Bunglow, Bodakdev, Ahmedabad-380054, Gujarat, India. Tel: +91-79-6604 6200, Fax: +91-79-6604 6201

Sanand Mfg. Works: Survey # 3 & 4, Sanand GIDC II, Industrial Estate, Nr. Bol Village, Chharodi, Sanand-382110, Gujarat, India. Tel: +91-2717-678777, Fax: +91-2717-678700

Gandhinagar Mfg. Works: B-14/1 & 171, GIDC Electronics Zone, Sector-25, Gandhinagar-382044, Gujarat, India. Tel: +91-79-6170 0500, +91-79-2328 7180/81, Fax: +91-79-23287182

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Ver.1.0/2019/ACS I Spotlight

HITACHI

Inspire the Next

Grid Tied Solar String Inverters

Highly Efficient Conversion Technology

4.4 kW to 70 kW (3Ph.)
1.1 kW to 7.5 kW (1Ph.)

Generating

3 GW+

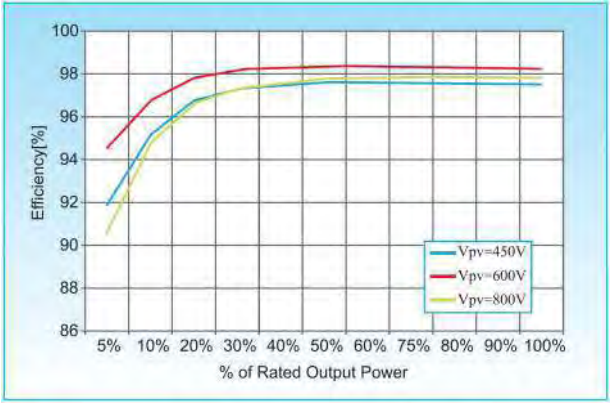
Renewable Power
in Indian Solar Sector
through
Central Inverters



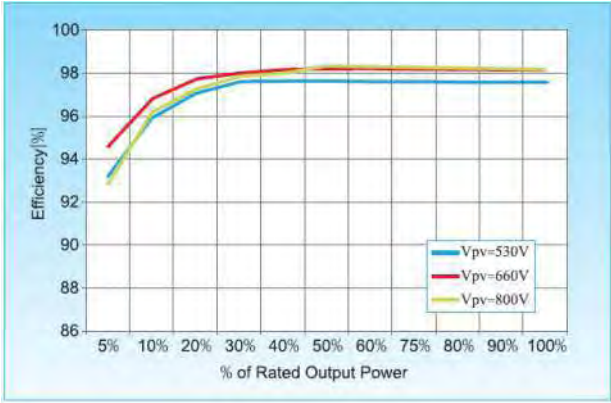
1006

Hitachi Hi-Rel Power Electronics Pvt. Ltd.

Efficiency Curve



(HIVERTER Si - 20 kW to 33 kW Models)



(HIVERTER Si - 50 kW to 70 kW Models)

High-yield

- Max 98.6% efficiency
- Real time precise MPPT algorithm for max harvest
- Wide input voltage operation range from 250 V to 950 V

All in one, Flexible and economical system solutions

- DC switch
- Built-in PV combiner
- Power management unit
- Optimum selection for big PV plants, commercial buildings.
- Inbuilt type II DC surge protection device[#]
- Inbuilt type II AC surge protection device[#]

Low maintenance cost

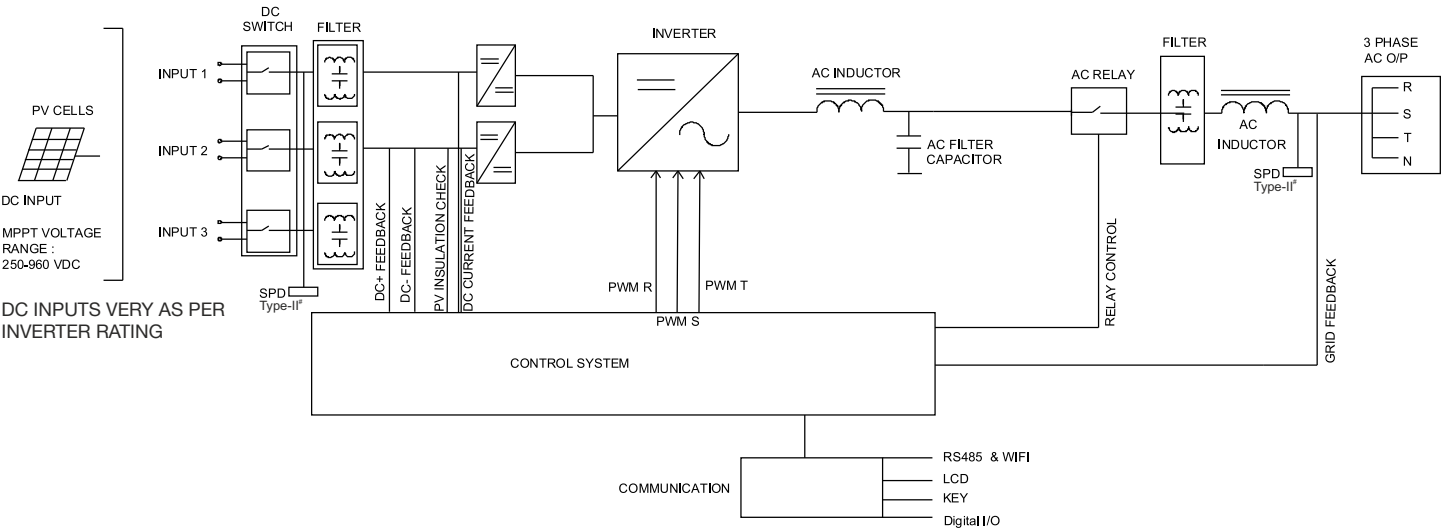
- Rust-free aluminum covers
- Flexible monitoring solution
- Multi-function relay can be configured to show various inverter information

Intelligent grid management

- ZVRT support
- Reactive power adjustable
- Self-power reducer when over frequency
- Remote active / reactive power limit control

^(#)Optional for 20-33 kW Models

Single Line Diagram



Globally Renowned Component Partners

MOSIGBT
FAIRCHILD
infineon

IC
ON Semiconductor
TEXAS INSTRUMENTS

Fuse
Littelfuse
COOPER Wheelock

Current Transducer
LEM

Capacitor
NIPPON CHEMI-CON
nichicon
Rubycon

Diode
Microsemi
IXYS

Relay
Panasonic
FUJITSU

MCU
RENESAS

Technical Specifications - Solar String Inverter - 1.1 kW to 3.3 kW (1Ph.)

HIVERTER-Si Series Single Phase, Single MPPT	Si 1.1K-H3	Si 1.6K-H3	Si 2.2K-H3	Si 2.7K-H3	Si 3K-H3	Si 3.3K-H3
Input (DC)						
Recommended PV Input Power	1500W	2200W	3000W	3700W	4100W	4500W
Max. Input Voltage	500V			550V		
Aux. Open Voltage				60V		
Start-up Input Voltage				70V		
Rated Input Voltage				360V		
MPPT Voltage Range	50-500V			50-550V		
Full Load DC Voltage Range	110-450V	150-450V	200-450V	250-500V	275-500V	300-500V
Max. Input Current MPPT				12A		
Max. DC Input Short Circuit Current per MPPT				15A		
Number of MPPT/ String per MPPT				1 / 1		
Input Terminal Type				MC4 / H4		
Output (AC)						
Rated Power	1100W	1600W	2200W	2700W	3000W	3300W
Max. AC Power	1100VA	1600VA	2200VA	2700VA	3000VA	3300VA
Rated Output Current	4.8A	7A	9.6A	11.8A	13A	14.3A
Max. Output Current	5.3A	7.7A	10.6A	13A	14.5A	16A
Nominal Grid Voltage	L/N/PE, 220VAC, 230VAC, 240VAC					
Grid Voltage Range	180VAC-276VAC (According to local standard)					
Nominal Frequency	50 / 60Hz					
Grid Frequency Range	45~55Hz/54~66Hz (According to local standard)					
THDi	<3%					
Power Factor	1default (adjustable ±0.8)					
Efficiency						
Max. Efficiency up to	97.5%			97.7%		
European Weighted Efficiency up to	96.9%			97.2%		
MPPT Adaptation Efficiency	>99.9%					
Protection						
Anti-islanding Protection	Yes					
DC Reverse Polarity Protection	Yes					
Over Temp Protection	Yes					
Leakage Current Protection	Yes					
Over Voltage Protection	Yes					
Over Current Protection	Yes					
Earth Fault Protection	Yes					
SPD	MOV: Type III standard					
Communication						
Standard Communication Mode	RS485, WiFi / GPRS / Ethernet (optional), USB					
Operation Data Storage	25 years					
General Data						
Topology	Transformer-less					
Ambient Temperature Range	-30℃ ~ +60℃					
Allowable Relative Humidity Range	0~100%					
Noise	<25dB					
DC Switch	Optional					
Cooling	Natural convection					
Max. Operating Altitude	2000m					
Dimension	303 x 260.5 x 118mm			321 x 260.5 x 131.5mm		
Support Bracket	Wall-mounted					
Weight	5.5kg			6.3kg		
Display	LCD+LED					
Degree of Protection	IP65					
Standard						
EMC	EN 61000-6-1, EN 61000-6-2, EN 61000-6-3, EN 61000-6-4					
Safety Standards	IEC 62116, IEC 61727, IEC 61683, IEC 60068(1,2,14,30), IEC 62109-1/2					
Grid Standards	AS 4777, VDE V 0124-100, VDE V 0126-1-1, VDE-AR-N 4105, EN 50438, G83/2, C10/11, RD 1699					

Technical Specifications - Solar String Inverter - 3 kW to 7.5 kW (1Ph.)

HIVERTER-Si Series Single Phase, Dual MPPT	Si 3K-H2	Si 3.6K-H2	Si 4K-H2	Si 4.6K-H2	Si 5K-H2	Si 6K-H2	Si 7.5K-H2
Input (DC)							
Recommended PV Input Power	3500W	4000W	4400W	5000W	5500W	6600W	8300W
Max DC Power for Single MPPT	2000W	2400W	2600W	3000W	3000W	3500W	2*2750W/ 2750W
Number of Independent MPPT	2						
Number of DC Inputs	1 / 1						2 / 1
Max. Input Voltage	600V						
Start-up Input Voltage	120V						
Rated Input Voltage	360V						
MPPT Voltage Range	90-580V						
Full Load DC Voltage Range	160V-520V	180V-520V	200V-520V	230V-520V	250V-520V	300V-520V	250V-520V
Max. Input Current per MPPT	11A / 11A						22A / 11A
Maximun DC Input Short Circuit Current per MPPT	14A						28 / 14A
Output							
Rated Power	3000W	3680W	4000W	4600W	5000W	6000W	7500W
Max. AC Power	3000VA	3680VA	4000VA	4600VA	5000VA	6000VA	7500VA
Max. Output Current	13.7A	16.8A	18.2A	21A	22.8A	27.3A	32.6A
Nominal Grid Voltage	L/N/PE, 220VAC, 230VAC, 240VAC						
Grid Voltage Range	180VAC-276VAC (According to local standard)						
Nominal Frequency	50 / 60Hz						
Grid Frequency Range	45~55Hz/54~66Hz (According to local standard)						
Active Power Adjustable Range	0 ~ 100%						
THDI	<3%						
Power Factor	1default (adjustable ±0.8)						
Power Limit Export	Zero export or adjustable power limit export						
Performance							
Max. Efficiency up to	98.0%						98.2%
European Weighted Efficiency up to	97.5%						97.6%
Self-consumption at Night	<1W						
Feed-in Start Power	50W						
MPPT Efficiency	>99.9%						
Protection							
DC Reverse Polarity Protection	Yes						
DC Switch	Optional						
Protection Class/Overvoltage Category	I / III						
Input/Output MOV (II)	Yes						
Safety Protection	Anti islanding, RCMU, Ground fault monitoring						
SPD	MOV: Type III standard / Type II optional						
Communication							
Power Management Unit	According to certification and request						
Standard Communication Mode	RS485, Wifi / Ethernet / GPRS (optional), SD card (optional)						
Operation Data Storage	25 years						
General Data							
Ambient Temperature Range	-25℃ ~ +60℃						-30℃ ~ +60℃
Topology	Transformer-less						
Degree of Protection	IP65						
Allowable Relative Humidity Range	0~100%						
Max. Operating Altitude	2000m						
Noise	<25dB						
Weight	11.5kg						18kg
Cooling	Natural convection						
Dimension	405 x 315 x 135mm						467 x 352 x 157mm
Display	LCD display						
Standard							
EMC	EN 61000-6-2, EN 61000-6-3, EN 61000-3-2, EN 61000-3-3, EN 61000-3-11, EN 61000-3-12						
Safety Standards	IEC62109-1/2, IEC62116, IEC61727, IEC-61683, IEC60068(1,2,14,30)						
Grid Standards	A S/NZS 4777, VDE V 0124-100, V 0126-1-1, VDE-AR-N 4105, CEI 0-21, EN50438/EN50549, G83/G59/G98/G99, NB/T32004; ABNT NBR 16149/16150 (for SOFAR3KTLM- G2, SOFAR5KTLM- G2& 7.5KTLM)						

Technical Specifications - Solar String Inverter - 4.4 kW to 12 kW (3Ph.)

HIVERTER-Si Series Three Phase	Si 4.4K	Si 5.5K	Si 6.6K	Si 8.8K	Si 11K	Si 12K
Input (DC)						
Recommended PV Input Power	4800W	6000W	7200W	9600W	12000W	14400W
Max DC Power for Single MPPT	4500W	5700W	6250W	6200W	6200W	6850W
Number of Independent MPPT	2					
Number of DC Inputs	1 for each MPPT					
Max. Input Voltage	1000V					
Start-up Input Voltage	180V					
Reated Input Voltage	600V					
MPPT Voltage Range	160V - 900V					
Full Load DC Voltage Range	190V-850V	240V-850V	290V-850V	380V-850V	480V-850V	575V-850V
Max. Input Current per MPPT	11A / 11A					
Max. DC Input Short Circuit Current per MPPT	14A					
Output (AC)						
Rated Power	4400W	5500W	6600W	8800W	11000W	12000W
Max. AC Power	4400VA	5500VA	6600VA	8800VA	11000VA	13200VA
Max. Output Current	6.4A	8.0A	9.6A	12.8A	15.9A	19.1A
Nominal Grid Voltage	3/N/PE, 220/380VAC, 230/400VAC, 240/415VAC					
Grid Voltage Range	310VAC-480VAC (According to local standard)					
Nominal Frequency	50 / 60Hz					
Grid Frequency Range	45Hz-55Hz/54Hz-66Hz (According to local standard)					
Active Power Adjustable Range	0 ~ 100%					
THDi	<3%					
Power Factor	1 default (adjustable ±0. 8)					
Power Limit Export	Zero export or adjustable power limit export					
Performance						
Max Efficiency up to	98%			98.3%		
European Weighted Efficiency up to	97.50%			98%		
Self-Consumption at Night	<1W					
MPPT Efficiency	>99.9%					
Protection						
DC Reverse Polarity Protection	Yes					
DC Switch	Yes					
Safety Protection	Anti-islanding, RCMU, Ground fault monitoring					
ARPC	Anti-reverse power controller (optional)					
Communication						
Power Management Unit	According to certification and request					
Standard Communication Mode	RS485, Wifi / Ethernet / GPRS (optional), SD card					
Operation Data Storage	25 years					
General Data						
Ambient Temperature Range	-25°C ~ +60°C					
Topology	Transformer-less					
Degree of Protection	IP65					
Allowable Relative Humidity Range	0~100%					
Max. Operating Altitude	2000m					
Noise	<29dB					
Weight	21kg			22kg		
Cooling	Natural					
Dimension	457 x 452 x 202mm					
Display	LCD display					
Standard						
EMC	EN 61000-6-1, EN 61000-6-2, EN 61000-6-3, EN 61000-6-4, EN 61000-3-2, EN 61000-3-3, EN 61000-3-12, EN 61000-3-11					
Safety Standards	IEC62109-1/2, IEC62116, IEC61727, IEC-61683, IEC60068(1,2,14,30), IEC60255					
Grid Standards	AS/NZS 4777, VDE V 0124-100, V 0126-1-1, VDE-AR-N 4105, CEI 0-21, EN50438/EN50549, G83/G59, Rd1699, UTE C15-712-1, EN50530, NB/T32004					

Technical Specifications - Solar String Inverter - 20 kW to 33 kW (3Ph.)

HIVERTER-Si Series Three Phase		Si 20K	Si 25K	Si 30K	Si 33K
Input (DC)	Recommended PV Input Power	26000W	32500W	39000W	42900W
	Max. DC Power for Single MPPT	13000W	16000W	18000W	20000W
	No. of Independent MPPT	2			
	No. of DC Inputs	2 for each MPPT	3 for each MPPT		
	Max. Input Voltage	1100V			
	Start-up Input Voltage	250V			
	Rated Input voltage	620V			
	MPPT Voltage Range	230V-960V			
	Full Load DC Voltage Range	480V-850V	460V-850V	520V-850V	580V-850V
	Max. Input MPPT Current	24A/24A	28A/28A	30A/30A	30A/30A
	Max. DC Input Short Circuit Current per MPPT	30A	35A	37.5A	37.5A
Output (AC)	Rated Power	20000W	25000W	30000W	33000W
	Max. AC Power	22000VA	27500VA	33000VA	36300VA
	Max. Output Current	32A	40A	48A	53A
	Nominal Grid Voltage	3/N/PE, 220/380VAC, 230/400 VAC, 240/415VAC			
	Grid Voltage Range	310VAC-480VAC (According to local standard)			
	Nominal Frequency	50/60Hz			
	Grid Frequency Range	45Hz-55Hz/54Hz-66Hz (According to local standard)			
	Active Power Adjustable Range	0~100%			
	THDi	<3%			
	Power Factor	1 default (adjustable ±0.8)			
Performance	Max Efficiency up to	98.2%	98.4%	98.4%	98.6%
	European Weighted Efficiency up to	98.0%	98.2%	98.2%	98.2%
	Self-consumption at Night	<1 W			
	MPPT Efficiency	>99.9%			
Protection	DC Reverse Polarity Protection	Yes			
	DC Switch	Yes			
	Protection Class/Overvoltage Category	I/III			
	Safety Protection	Anti-islanding, RCMU, Ground fault monitoring			
	ARPC	Anti-reverse power controller (optional)			
Communication	Power Management Unit	According to certification and request			
	Standard Communication Mode	RS485, WiFi / Ethernet / GPRS (optional), SD card			
	Operation Data Storage	25 years			
General Data	Ambient Temperature Range	-25°C ~ +60°C			
	Topology	Transformer-less			
	Degree of Protection	IP65			
	Allowable Relative Humidity Range	0-100%			
	Max. Operating Altitude	2000m			
	Noise	< 30 dB	< 45 dB		
	Weight	37kg			
	Cooling	Natural	Fan		
	Dimensions	666 x 512 x 254mm			
	Display	LCD display			
Standard	EMC	EN 61000-6-2, EN 61000-6-3, EN 61000-3-12, EN 61000-3-11			
	Safety Standards	IEC62109-1/2, IEC62116, IEC61727, IEC-61683, IEC60068(1,2,14,30), IEC60255			
	Grid Standards	A S/NZS 4417, VDE V 0124-100, V 0126-1-1 VDE-AR-N 4105, CEI 0-21/CEI 0-16, EN50438/EN50549, G59, P.O. 12.3, RD1699, UTE C15-712-1, EN50530, NB/T32004			

Technical Specifications - Solar String Inverter - 50 kW to 70 kW (3Ph.)

HIVERTER-Si Series Three Phase		Si 50K	Si 60K	Si 70K(HV)
Input (DC)	Recommended PV Input Power	55000W	66000W	77000W
	Max. DC Power for Single MPPT	22000W/16000W/16000W	22000W/22000W/22000W	26000W/26000W/26000W
	No. of Independent MPPT	3		
	No. of DC Inputs	4/3/3	4/4/4	
	Max. Input Voltage	1000V		
	Start-up Input Voltage	250V		
	Rated Input Voltage	600V	600V	700V
	MPPT Voltage Range	250V-960V		
	Full Load DC Voltage Range	530V-800V	530V-800V	660V-800V
	Max. Input MPPT Current	40A/30A/30A	40A/40A/40A	40A/40A/40A
	Max. Input Current per String	12A		
	Max. DC Input Short Circuit Current per MPPT	48A/36A/36A	48A	48A
Output (AC)	Rated Power	50000W	60000W	70000W
	Max. AC Power	55000VA	60000VA	70000VA
	Max. Output Current	80A	90A	90A
	Nominal Grid Voltage	3/N/PE, 220/380VAC, 230/400VAC, 240/415VAC		3/N/PE or 3/PE, 277/480VAC
	Grid Voltage Range	310VAC-480VAC (According to local standard)		422VAC-528VAC (According to local standard)
	Nominal Frequency	50 / 60Hz		
	Grid Frequency Range	40Hz-55Hz/54Hz-66Hz (According to local standard)		
	Active Power Adjustable Range	0 ~100%		
	THDi	<3%		
	Power Factor	1 default (adjustable ± 0.8)		
Performance	Max Efficiency up to	98.5%	98.6%	98.6%
	European Weighted Efficiency up to	98.3%	98.4%	98.4%
	Self Consumption at Night	<1W		
	MPPT Efficiency	>99.9%		
Protection	DC Reverse Polarity Protection	Yes		
	DC Switch	Yes		
	Protection Class/Overvoltage Category	I/III		
	Input/Output SPD (II)	PV: Type II standard, AC: Type II		
	Safety Protection	Anti-islanding, RCMU, ground fault monitoring		
	ARPC	Anti-reverse power controller (optional)		
		According to certification and request		
Communication	Power Management Unit	According to certification and request		
	Standard Communication Mode	RS485, Wifi / Ethernet / GPRS (optional), SD card, Multi-function relay		
	Operation Data Storage	25 years		
General Data	Ambient Temperature Range	-25°C ~ +60°C		
	Topology	Transformer-less		
	Degree of Protection	IP65		
	Allowable Relative Humidity Range	0~100%		
	Max. Operating Altitude	4000m		
	Noise	≤ 60 dB		
	Weight	68kg	70kg	
	Cooling	Fan		
	Dimensions	713 x 737 x 297 mm		
	Display	LCD display		
Standard	EMC	EN 61000-6-2, EN 61000-6-4, EN 61000-3-11, EN 61000-3-12		
	Safety Standards	IEC62109-1/2, IEC62116, IEC61727, IEC-61683, IEC60068(1,2,14,30)		
	Grid Standards	AS/NZS 4777, VDE V 0124-100, V 0126-1-1, VDE-AR-N 4105, BDEW, CEI 0-21/CEI 0-16, UNE 206 007-1, EN50438/EN50549, G59, EN50530, NB/T32004		



Attestation of Conformity

Attestation No.: 1888AP1220N074001
Equipment: PV Grid inverter
Brand Name: **HITACHI**
Test Model No.: Hiverter Si-50K, Hiverter Si-60K, Hiverter Si-70K
Applicant: Hitachi Hi-Rel Power Electronics Pvt. Ltd.
 SM 3 & 4, Sanand-II GIDC, Industrial Estate, Boll Village, Sanand-382
 110, Gujarat, India.
Report No.: PV181220N074, PV181220N074-1, PV181220N074-2, WT186003741

Use in accordance with regulations:

The inverters are tested for functional safety, grid protection, specified environmental influences and efficiency. For detailed information, please watch the corresponding test reports.

Applied rules and standards

IEC 60068-2-1:2007	Environmental testing – Part 2-1: Tests – Test A: Cold
IEC 60068-2-2:2007	Environmental testing – Part 2-2: Tests – Test B: Dry heat
IEC 60068-2-14:2009	Environmental testing – Part 2-14: Tests – Test N: Change of temperature
IEC 60068-2-30:2005	Environmental testing – Part 2-30: Tests – Test Db and guidance: Damp heat, cyclic (12 + 12-hour cycle)
IEC 61683:1999	Photovoltaic systems – Power conditioners – Procedure for measuring efficiency
IEC 61727:2004	Characteristics of the utility interface
IEC 62116:2014	Islanding prevention measures for utility-interconnected photovoltaic inverters

Name: James Huang
Technical Manager/ New Energy Team
Date: 2019-03-01

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 Information given in this document is related to the tested specimen of the described electrical sample.



Attestation of Conformity

Attestation No.: 1888AP1220N074001
Equipment: PV Grid inverter
Brand Name: **HITACHI**
Test Model No.: Hiverter Si-50K, Hiverter Si-60K, Hiverter Si-70K
Applicant: Hitachi Hi-Rel Power Electronics Pvt. Ltd.
 SM 3 & 4, Sanand-II GIDC, Industrial Estate, Boll Village, Sanand-382
 110, Gujarat, India.
Report No.: PV181220N074, PV181220N074-1, PV181220N074-2, WT186003741

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The inverters are tested for functional safety, grid protection, specified environmental influences and efficiency. For detailed information, please watch the corresponding test reports.

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IEC 60068-2-14:2009	Environmental testing – Part 2-14: Tests – Test N: Change of temperature
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Name: James Huang
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Date: 2019-03-01

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 Information given in this document is related to the tested specimen of the described electrical sample.



VERIFICATION OF COMPLIANCE

No.: LVD GZES1901010043PV

Applicant: Hitachi Hi-Rel Power Electronics Pvt. Ltd.
SM 3 & 4, Sanand – II GIDC, Industrial Estate, Boll Village, Sanand – 382 110, Gujarat, India.

Manufacturer: Hitachi Hi-Rel Power Electronics Pvt. Ltd.
SM 3 & 4, Sanand – II GIDC, Industrial Estate, Boll Village, Sanand – 382 110, Gujarat, India.

Product Description: PV inverter

Model No.: Hiverter Si-50K, Hiverter Si-60K, Hiverter Si-70K

Trade Mark: 

Rating: Refer to page 2

Protection against Electric Shock: Class I

Degree of Protection: IP65

Additional Information: N/A

Sufficient samples of the product have been tested and found to be in conformity with

Test Standard: EN 62109-1: 2010,
EN 62109-2: 2011

as shown in the

Test Report Number(s): GZES190101004301, GZES190101004302

This Verification of Compliance has been granted to the applicant based on the results of tests, performed by Laboratory of SGS-CSTC Standards Technical Services Co., Ltd. on sample of the above-mentioned product in accordance with the provisions of the relevant harmonized standards under the Low Voltage Directive 2014/35/EU. The CE marking as shown below can be affixed, under the responsibility of the manufacturer, after completion of an EC Declaration of Conformity and compliance with all relevant EC Directives. The affixing of the CE marking presumes in addition that the conditions in annexes III and IV of the Directive are fulfilled.



David Guo
Senior Technical Manager
SGS-CSTC



2019-01-14

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No.:

LVD GZES1901010043PV

Other information added:

Rating:

Model Number	Hiverter Si-50K	Hiverter Si-60K	Hiverter Si-70K
Full load MPP DC voltage range	530-800Vd.c.		660-800Vd.c.
Max. input voltage	250-1000Vd.c.		
Max. input current	40Ad.c./30Ad.c./ 30Ad.c.	40Ad.c./40Ad.c./ 40Ad.c.	
Rated grid voltage	3P/N/PE 230/400Vac		3P/PE 480Vac
Rated grid frequency	50Hz		
Rated output power	50KW	60KW	70KW
Rated output current	80Aa.c Max.	90Aa.c Max.	
Power factor	0.8 leading to 0.8 lagging		

David Guo
 Senior Technical Manager
 SGS-CSTC



2019-01-14

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Shenzhen BALUN Technology Co., Ltd.

Block B, FL 1, Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen, Guangdong Province, P. R. China 518055.

VERIFICATION OF CONFORMITY

Certificate No.: BL-SZ1910091-402

Applicant: Hitachi Hi-Rel Power Electronics Pvt. Ltd.

Address: SM 3 & 4, Sanand – II GIDC, Industrial Estate, Boll Village, Sanand – 382 110, Gujarat, India.

Manufacture: Hitachi Hi-Rel Power Electronics Pvt. Ltd.

Address: SM 3 & 4, Sanand – II GIDC, Industrial Estate, Boll Village, Sanand – 382 110, Gujarat, India.

Product: PV Inverter

Brand name: **HITACHI**

Model name: Hiverter Si-50K, Hiverter Si-60K, Hiverter Si-70K

The submitted sample of the above product has been tested according with following standards. Standard(s) used for showing compliance with the essential requirements in the specified directive(s):

Applied Standards:	Report No.:
EN 61000-6-2: 2005 EN 61000-6-4: 2007/A1:2011 EN 61000-3-11: 2000 EN 61000-3-12: 2011	BL-SZ1910091-402



Hao Qi / Technology Director

Date of Issue: Jan. 09, 2019

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Shenzhen BALUN Technology Co., Ltd.

Block B, FL 1, Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen, Guangdong Province, P. R. China 518055.

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Manufacture: Hitachi Hi-Rel Power Electronics Pvt. Ltd.

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Product: PV Inverter

Brand name: **HITACHI**

Model name: Hiverter Si-50K, Hiverter Si-60K, Hiverter Si-70K

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Applied Standards:	Report No.:
EN 61000-6-2: 2005 EN 61000-6-4: 2007/A1:2011 EN 61000-3-11: 2000 EN 61000-3-12: 2011	BL-SZ1910091-402



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VERIFICATION OF COMPLIANCE

No.: LVD GZES1901010043PV

Applicant: Hitachi Hi-Rel Power Electronics Pvt. Ltd.
SM 3 & 4, Sanand – II GIDC, Industrial Estate, Boll Village, Sanand – 382 110, Gujarat, India.

Manufacturer: Hitachi Hi-Rel Power Electronics Pvt. Ltd.
SM 3 & 4, Sanand – II GIDC, Industrial Estate, Boll Village, Sanand – 382 110, Gujarat, India.

Product Description: PV inverter

Model No.: Hiverter Si-50K, Hiverter Si-60K, Hiverter Si-70K

Trade Mark: 

Rating: Refer to page 2

Protection against Electric Shock: Class I

Degree of Protection: IP65

Additional Information: N/A

Sufficient samples of the product have been tested and found to be in conformity with

Test Standard: EN 62109-1: 2010,
EN 62109-2: 2011

as shown in the

Test Report Number(s): GZES190101004301, GZES190101004302

This Verification of Compliance has been granted to the applicant based on the results of tests, performed by Laboratory of SGS-CSTC Standards Technical Services Co., Ltd. on sample of the above-mentioned product in accordance with the provisions of the relevant harmonized standards under the Low Voltage Directive 2014/35/EU. The CE marking as shown below can be affixed, under the responsibility of the manufacturer, after completion of an EC Declaration of Conformity and compliance with all relevant EC Directives. The affixing of the CE marking presumes in addition that the conditions in annexes III and IV of the Directive are fulfilled.



David Guo
Senior Technical Manager
SGS-CSTC



2019-01-14

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No.:

LVD GZES1901010043PV

Other information added:

Rating:

Model Number	Hiverter Si-50K	Hiverter Si-60K	Hiverter Si-70K
Full load MPP DC voltage range	530-800Vd.c.		660-800Vd.c.
Max. input voltage	250-1000Vd.c.		
Max. input current	40Ad.c./30Ad.c./ 30Ad.c.	40Ad.c./40Ad.c./ 40Ad.c.	
Rated grid voltage	3P/N/PE 230/400Vac		3P/PE 480Vac
Rated grid frequency	50Hz		
Rated output power	50KW	60KW	70KW
Rated output current	80Aa.c Max.	90Aa.c Max.	
Power factor	0.8 leading to 0.8 lagging		

David Guo
 Senior Technical Manager
 SGS-CSTC



2019-01-14

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Shenzhen BALUN Technology Co., Ltd.

Block B, FL 1, Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen, Guangdong Province, P. R. China 518055.

VERIFICATION OF CONFORMITY

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Manufacture: Hitachi Hi-Rel Power Electronics Pvt. Ltd.

Address: SM 3 & 4, Sanand – II GIDC, Industrial Estate, Boll Village, Sanand – 382 110, Gujarat, India.

Product: PV Inverter

Brand name: **HITACHI**

Model name: Hiverter Si-50K, Hiverter Si-60K, Hiverter Si-70K

The submitted sample of the above product has been tested according with following standards. Standard(s) used for showing compliance with the essential requirements in the specified directive(s):

Applied Standards:	Report No.:
EN 61000-6-2: 2005 EN 61000-6-4: 2007/A1:2011 EN 61000-3-11: 2000 EN 61000-3-12: 2011	BL-SZ1910091-402



Hao Qi / Technology Director

Date of Issue: Jan. 09, 2019

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SMT Series

Three-MPPT, Three-Phase

25kW

30kW

36kW

The brand new GoodWe SMT series inverter is ideal for medium and large-scale commercial rooftop installations, providing a maximum efficiency of 98.8 percent and up to three MPPT routes for a particular environment. With its weight of just 40 kg and compact design, the SMT series is easier to handle and install than similar inverters in the market. Featuring a maximum DC input voltage of 1100V, wider MPPT range, and a start-up voltage of 180V, the SMT series guarantees an earlier generation of power and a longer working time in order to maximize long-term returns and profitability for the system owner.

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Technical Data		GW25K-MT	GW30K-MT	GW36K-MT
PV String Input Data	Max. DC Input Power (W)	32500	39000	42900
	Max. DC Input Voltage (V)	1100	1100	1100
	MPPT Voltage Range (V)	200~950	200~950	200~950
	Start-up Voltage (V)	180	180	180
	MPPT Range for Full Load (V)	470-860	470-860	510-860
	Nominal DC Input Voltage (V)	600	600	600
	Max. Input Current (A)	25/25/25	25/25/25	25/25/25
	Max. Short Current (A)	31.3/31.3/31.3	31.3/31.3/31.3	31.3/31.3/31.3
	No. of MPP Trackers	3	3	3
	No. of Input Strings per Tracker	2/2/2	2/2/2	2/2/2
AC Output Data	Nominal Output Power (W)	25000	30000	36000
	Max. Output Apparent Power (VA)	27500	33000* ¹	36000
	Max. Output Power (W)	27500	33000* ¹	36000
	Nominal Output Voltage (V)	380/400, 3L/N/PE or 3L/PE	380/400, 3L/N/PE or 3L/PE	380/400, 3L/N/PE or 3L/PE
	Nominal Output Frequency (Hz)	50/60	50/60	50/60
	Max. Output Current (A)	40	48	53.3
	Output Power Factor	~1 (Adjustable from 0.8 leading to 0.8 lagging)		
	Output THDi (@Nominal Output)	<3%	<3%	<3%
Efficiency	Max. Efficiency	98.7%	98.8%	98.8%
	Euro Efficiency	98.4%	98.5%	98.5%
Protection	Anti-islanding Protection	Integrated	Integrated	Integrated
	Input Reverse Polarity Protection	Integrated	Integrated	Integrated
	Array String Fault Monitoring	Integrated	Integrated	Integrated
	Insulation Resistor Detection	Integrated	Integrated	Integrated
	PV Module Anti-PID	Optional	Optional	Optional
	DC SPD	Optional (Type II)	Optional (Type II)	Optional (Type II)
	AC SPD	Optional (Type II)	Optional (Type II)	Optional (Type II)
	Residual Current Monitoring Unit	Integrated	Integrated	Integrated
	Output Over Current Protection	Integrated	Integrated	Integrated
	Output Short Protection	Integrated	Integrated	Integrated
	Output Over Voltage Protection	Integrated	Integrated	Integrated
General Data	Operating Temperature Range (°C)	-30~60	-30~60	-30~60
	Relative Humidity	0~100%	0~100%	0~100%
	Operating Altitude (m)	≤4000	≤4000	≤4000
	Cooling	Smart Cooling	Smart Cooling	Smart Cooling
	Noise (dB)	45	45	45
	User Interface	LCD & LED or LED + WiFi APP	LCD & LED or LED + WiFi APP	LCD & LED or LED + WiFi APP
	Communication	RS485 or WiFi or GPRS or PLC	RS485 or WiFi or GPRS or PLC	RS485 or WiFi or GPRS or PLC
	Weight (kg)	40	40	40
	Size (Width*Height*Depth mm)	480*590*230	480*590*230	480*590*230
	Protection Degree	IP65	IP65	IP65
	Night Self Consumption (W)	<1	<1	<1
	Topology	Transformerless	Transformerless	Transformerless
Certifications & Standards	Grid Regulation	AS4777.2/VDE0126-1-1/VDE-AR-N 4105		
	Safety Regulation	IEC62109-1&2		
	EMC Regulation	EN 61000-6-1/EN 61000-6-2/EN 61000-6-3,/EN 61000-6-4		

*¹: 30000 under AS4777.2.

SDT G2 Series

Dual-MPPT, Three-Phase



Technical Data	GW4K-DT	GW5K-DT	GW6K-DT	GW8K-DT	GW10KT-DT	GW12KT-DT	GW15KT-DT
PV String Input Data							
Max. DC Input Power (W)	6000	7500	9000	12000	15000	18000	22500
Max. DC Input Voltage (V)	1000	1000	1000	1000	1000	1000	1000
MPPT Operating Voltage Range (V)	180~850	180~850	180~850	180~850	180~850	180~850	180~850
Start-up Voltage (V)	160	160	160	160	160	160	160
Nominal DC Input Voltage (V)	620	620	620	620	620	620	620
Max. Input Current per MPPT (A)	12.5 / 12.5	12.5 / 12.5	12.5 / 12.5	12.5 / 12.5	12.5 / 12.5	25 / 12.5	25 / 12.5
Max. Short Circuit Current per MPPT (A)	15.6 / 15.6	15.6 / 15.6	15.6 / 15.6	15.6 / 15.6	15.6 / 15.6	31.2 / 15.6	31.2 / 15.6
Number of MPPT	2	2	2	2	2	2	2
Number of strings per MPPT	1 / 1	1 / 1	1 / 1	1 / 1	1 / 1	2 / 1	2 / 1
AC Output Data							
Nominal Output Power (W)	4000	5000	6000	8000	10000	12000	15000
Nominal Output Apparent Power (VA)	4000	5000	6000	8000	10000	12000	15000
Max. Output Apparent Power (VA)	4400* ¹	5500* ¹	6600* ¹	8800* ¹	11000* ¹	14000* ¹	16500* ¹
Nominal Output Voltage (V)	400, 3L / N / PE						
Nominal AC Grid Frequency (Hz)	50 / 60	50 / 60	50 / 60	50 / 60	50 / 60	50 / 60	50 / 60
Max. Output Current (A)	6.4	8	9.6	12.8	16	20.3	24
Nominal Output Current (A)	5.8	7.2	8.7	11.6	14.5	17.3	21.7
Output Power Factor	~1 (Adjustable from 0.8 leading to 0.8 lagging)						
Max. Total Harmonic Distortion	<3%	<3%	<3%	<3%	<3%	<3%	<3%
Efficiency							
Max. Efficiency	98.2%	98.2%	98.2%	98.2%	98.3%	98.3%	98.3%
European Efficiency	>97.6%	>97.6%	>97.6%	>97.6%	>97.7%	>97.7%	>97.7%
Protection							
Anti-Islanding Protection	Integrated	Integrated	Integrated	Integrated	Integrated	Integrated	Integrated
DC Reverse Polarity Protection	Integrated	Integrated	Integrated	Integrated	Integrated	Integrated	Integrated
DC Insulation Resistor Detection	Integrated	Integrated	Integrated	Integrated	Integrated	Integrated	Integrated
DC Surge Protection	Type III						
AC Surge Protection	Type III						
Residual Current Monitoring Unit	Integrated	Integrated	Integrated	Integrated	Integrated	Integrated	Integrated
AC Over Current Protection	Integrated	Integrated	Integrated	Integrated	Integrated	Integrated	Integrated
AC Short Protection	Integrated	Integrated	Integrated	Integrated	Integrated	Integrated	Integrated
AC Over Voltage Protection	Integrated	Integrated	Integrated	Integrated	Integrated	Integrated	Integrated
DC Arc Fault Circuit Interrupter	Optional	Optional	Optional	Optional	Optional	Optional	Optional
General Data							
Operating Temperature Range (°C)	-30~60	-30~60	-30~60	-30~60	-30~60	-30~60	-30~60
Relative Humidity	0~100%	0~100%	0~100%	0~100%	0~100%	0~100%	0~100%
Operating Altitude (m)	≤4000	≤4000	≤4000	≤4000	≤4000	≤4000	≤4000
Cooling Method	Natural Convection			Smart Fan Cooling			
Display	LED, LCD / Wi-Fi+APP						
Communication	WiFi / LAN / RS485						
Weight (Kg)	15	15	15	16	16	18	18
Dimension (W×H×Dmm)	354×433×147	354×433×147	354×433×147	354×433×155	354×433×155	354×433×155	354×433×155
Ingress Protection Rating	IP65	IP65	IP65	IP65	IP65	IP65	IP65
Night Power Consumption (W)	<1	<1	<1	<1	<1	<1	<1
DC Connector	MC4 (2.5~4mm ²)						
Topology	Transformerless						

*¹: For Belgium Max. Output Apparent Power (VA): GW4K-DT is 4000; GW5K-DT is 5000; GW6K-DT is 6000; GW8K-DT is 8000; GW10KT-DT is 10000; GW12KT-DT is 12000; GW15KT-DT is 15000.

*: Please visit GoodWe website for the latest certificates.

C E R T I F I C A T E

of Conformity



Registration No.: AK 50495661 0001

Report No.: CN21GD2X 001

Holder: **JIANGSU GOODWE POWER SUPPLY
TECHNOLOGY CO., LTD.**
No.90 Zijin Rd.,
New District, Suzhou
215011 Jiangsu
P.R. China

Product: PV-inverter
(Grid-connected PV Inverter)

Identification: Type Designation : GW3300-XS
Serial Number : Engineering Sample
Firmware Version : V1.00.08
Remark : Refer to test report CN21GD2X 001
for details.

Tested acc. to: IEC 61727:2004
IEC 62116:2014

The certificate of conformity refers to the above mentioned product. This is to certify that the specimen is in conformity with the assessment requirement mentioned above. This certificate does not imply assessment of the production of the product and does not permit the use of a TÜV Rheinland mark of conformity.



Date 18.02.2021

Weichun LI

TÜV Rheinland LGA Products GmbH - Tillystraße 2 - 90431 Nürnberg

TÜV Rheinland (China) Ltd.
Member of TÜV Rheinland Group



JIANGSU GOODWE POWER SUPPLY
TECHNOLOGY CO., LTD.
Mr. Jiang Tao

Date : 18.02.2021
Our ref. : DJW 01
Your ref. : Jing Xie

No.90 Zijin Rd.,
New District, Suzhou
215011 Jiangsu
P.R. China

Ref : AK Certificate of Conformity

Type of Equipment : Grid-connected PV Inverter
Model Designation : See Certificate
Certificate No. : AK 50495661 0001
Report No. : CN21GD2X 001

Dear Mr. Jiang Tao,

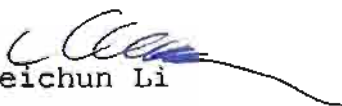
We herewith confirm that a sample of the above mentioned technical equipment has been tested and was found to be in accordance with the relevant requirements.

Enclosed please find your Certificate of Conformity.

We appreciate your kind support and would like to offer our assistance and continuous services in the future.

With kind regards,

Certification Body


Weichun Li

CC: JIANGSU GOODWE POWER SUPPLY

Enclosure

证书的详细资料请登陆www.certipedia.com查询, 或拨打我司客服热线800 999 3668 / 400 883 1300咨询

TÜV Rheinland (China) Ltd.
莱茵检测认证服务(中国)有限公司

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ATTESTATION OF CONFORMITY

Issued to: GoodWe Technologies Co., Ltd.
No.90 ZiJin Rd., New District, Suzhou, 215011, China

For the product: Gird-Tied PV Inverter

Trade name: **GOODWE** or  **GOODWE**

Type/Model: GW700-XS-11; GW1000-XS-11; GW1500-XS-11; GW2000-XS-11; GW2500-XS-11;
GW3000-XS-11; GW3300-XS-11; GW700-XS; GW1000-XS; GW1500-XS;
GW2000-XS; GW2500-XS; GW3000-XS; GW3300-XS; GW2500N-XS; GW3000N-XS

Ratings: See Annex

Manufactured by: GoodWe Technologies Co., Ltd.
No.90 ZiJin Rd., New District, Suzhou, 215011, China

Requirements: IEC 61727:2004
IEC 62116:2014
IEC 60068-2-1:2007
IEC 60068-2-2:2007
IEC 60068-2-14:2009
IEC 60068-2-30:2005
IEC 60068-2-64:2019

This Attestation is granted on account of an examination by DEKRA, the results of which are laid down in a confidential file no. 6140348.51(A-C)

The examination has been carried out on one single specimen or several specimens of the product, submitted by the manufacturer. The Attestation does not include an assessment of the manufacturer's production. Conformity of his production with the specimen tested by DEKRA is not the responsibility of DEKRA.

Arnhem, 24 October 2022

Number: 6140348.02AOC

DEKRA Testing and Certification (Shanghai) Ltd.

Kreny Lin
Certification Manager

© Integral publication of this attestation and adjoining reports is allowed

Page 1 of 3

DEKRA Testing and Certification (Shanghai) Ltd.
3F #250 Jiangchangsan Road Shibe Hi-Tech Park, 200436 Jing'an District, Shanghai, China
T +86 21 6056 7666 F +86 21 6056 7555 www.dekra-product-safety.com

1024

Annex

Document no. : 6140348.02AOC

Ratings of the test product:

GW700-XS-11:

PV input: U_{DCmax} : 500 Vdc, U_{MPP} : 40-450 Vdc, $I_{DC,max}$: 15 Adc, I_{sc} PV: 18.75 Adc

Output: $U_{AC,r}$: 230 Vac, 50 Hz, $P_{AC,r}$: 700 W, $I_{AC,max}$: 3.5 Aac, S_r : 700 VA, S_{max} : 800 VA

GW1000-XS-11:

PV input: U_{DCmax} : 500 Vdc, U_{MPP} : 40-450 Vdc, $I_{DC,max}$: 15 Adc, I_{sc} PV: 18.75 Adc

Output: $U_{AC,r}$: 230 Vac, 50 Hz, $P_{AC,r}$: 1000 W, $I_{AC,max}$: 4.8 Aac, S_r : 1000 VA, S_{max} : 1100 VA

GW1500-XS-11:

PV input: U_{DCmax} : 500 Vdc, U_{MPP} : 50-450 Vdc, $I_{DC,max}$: 15 Adc, I_{sc} PV: 18.75 Adc

Output: $U_{AC,r}$: 230 Vac, 50 Hz, $P_{AC,r}$: 1500 W, $I_{AC,max}$: 7.2 Aac, S_r : 1500 VA, S_{max} : 1650 VA

GW2000-XS-11:

PV input: U_{DCmax} : 500 Vdc, U_{MPP} : 40-450 Vdc, $I_{DC,max}$: 15 Adc, I_{sc} PV: 18.75 Adc

Output: $U_{AC,r}$: 230 Vac, 50 Hz, $P_{AC,r}$: 2000 W, $I_{AC,max}$: 9.6 Aac, S_r : 2000 VA, S_{max} : 2200 VA

GW2500-XS-11:

PV input: U_{DCmax} : 600 Vdc, U_{MPP} : 50-550 Vdc, $I_{DC,max}$: 15 Adc, I_{sc} PV: 18.75 Adc

Output: $U_{AC,r}$: 220 / 230 Vac, 50 Hz, $P_{AC,r}$: 2500 W, $I_{AC,max}$: 12 Aac, S_r : 2500 VA, S_{max} : 2750 VA

GW3000-XS-11:

PV input: U_{DCmax} : 600 Vdc, U_{MPP} : 50-550 Vdc, $I_{DC,max}$: 15 Adc, I_{sc} PV: 18.75 Adc

Output: $U_{AC,r}$: 220 / 230 Vac, 50 Hz, $P_{AC,r}$: 3000 W, $I_{AC,max}$: 14.3 Aac, S_r : 3000 VA, S_{max} : 3300 VA

GW3300-XS-11:

PV input: U_{DCmax} : 600 Vdc, U_{MPP} : 50-550 Vdc, $I_{DC,max}$: 15 Adc, I_{sc} PV: 18.75 Adc

Output: $U_{AC,r}$: 230 Vac, 50 Hz, $P_{AC,r}$: 3300 W, $I_{AC,max}$: 14.3 Aac, S_r : 3300 VA, S_{max} : 3300 VA

GW700-XS:

PV input: U_{DCmax} : 500 Vdc, U_{MPP} : 40-450 Vdc, $I_{DC,max}$: 12.5 Adc, I_{sc} PV: 15.6 Adc

Output: $U_{AC,r}$: 230 Vac, 50 Hz, $P_{AC,r}$: 700 W, $I_{AC,max}$: 3.5 Aac, S_r : 700 VA, S_{max} : 800 VA

GW1000-XS:

PV input: U_{DCmax} : 500 Vdc, U_{MPP} : 40-450 Vdc, $I_{DC,max}$: 12.5 Adc, I_{sc} PV: 15.6 Adc

Output: $U_{AC,r}$: 230 Vac, 50 Hz, $P_{AC,r}$: 1000 W, $I_{AC,max}$: 4.8 Aac, S_r : 1000 VA, S_{max} : 1100 VA

GW1500-XS:

PV input: U_{DCmax} : 500 Vdc, U_{MPP} : 50-450 Vdc, $I_{DC,max}$: 12.5 Adc, I_{sc} PV: 15.6 Adc

Output: $U_{AC,r}$: 230 Vac, 50 Hz, $P_{AC,r}$: 1500 W, $I_{AC,max}$: 7.2 Aac, S_r : 1500 VA, S_{max} : 1650 VA

GW2000-XS:

PV input: U_{DCmax} : 500 Vdc, U_{MPP} : 50-450 Vdc, $I_{DC,max}$: 12.5 Adc, I_{sc} PV: 15.6 Adc

Output: $U_{AC,r}$: 230 Vac, 50 Hz, $P_{AC,r}$: 2000 W, $I_{AC,max}$: 9.6 Aac, S_r : 2000 VA, S_{max} : 2200 VA

GW2500-XS:

Annex

Document no. : 6140348.02AOC

PV input: U_{DCmax} : 500 Vdc, U_{MPP} : 50-450 Vdc, $I_{DC,max}$: 12.5 Adc, Isc PV: 15.6 Adc

Output: $U_{AC,r}$: 230 Vac, 50 Hz, $P_{AC,r}$: 2500 W, $I_{AC,max}$: 12 Aac, S_r : 2500 VA, S_{max} : 2750 VA

GW3000-XS:

PV input: U_{DCmax} : 500 Vdc, U_{MPP} : 50-450 Vdc, $I_{DC,max}$: 12.5 Adc, Isc PV: 15.6 Adc

Output: $U_{AC,r}$: 230 Vac, 50 Hz, $P_{AC,r}$: 3000 W, $I_{AC,max}$: 14.3 Aac, S_r : 3000 VA, S_{max} : 3300 VA

GW3300-XS:

PV input: U_{DCmax} : 500 Vdc, U_{MPP} : 50-450 Vdc, $I_{DC,max}$: 12.5 Adc, Isc PV: 15.6 Adc

Output: $U_{AC,r}$: 220 / 230 Vac, 50 Hz, $P_{AC,r}$: 3300 W, $I_{AC,max}$: 14.3 Aac, S_r : 3300 VA, S_{max} : 3300 VA

GW2500N-XS:

PV input: U_{DCmax} : 600 Vdc, U_{MPP} : 50-550 Vdc, $I_{DC,max}$: 13 Adc, Isc PV: 16.3 Adc

Output: $U_{AC,r}$: 220 / 230 Vac, 50 Hz, $P_{AC,r}$: 2500 W, $I_{AC,max}$: 12 Aac, S_r : 2500 VA, S_{max} : 2750 VA

GW3000N-XS:

PV input: U_{DCmax} : 600 Vdc, U_{MPP} : 50-550 Vdc, $I_{DC,max}$: 13 Adc, Isc PV: 16.3 Adc

Output: $U_{AC,r}$: 220 / 230 Vac, 50 Hz, $P_{AC,r}$: 3000 W, $I_{AC,max}$: 14.3 Aac, S_r : 3000 VA, S_{max} : 3300 VA



BV LCIE
CHINA
Number

N° 1966AS027EM30693

ATTESTATION of conformity with European Directives

Product: PV inverter (Grid-tied photovoltaic inverter)
Reference GW700-XS, GW1000-XS, GW1500-XS, GW2000-XS, GW2500-XS,
 GW3000-XS
Issued to JIANGSU GOODWE POWER SUPPLY TECHNOLOGY CO., LTD
Address NO.189 Kun Lun Shan Road Suzhou New District, Jiangsu, China
Manufacturer JIANGSU GOODWE POWER SUPPLY TECHNOLOGY CO., LTD
Technical characteristics See Next Page

The submitted sample of the above equipment has been tested for **CE** marking according to following European Directive and following standards:

Low Voltage Directive 2014/35/EU

Standards	Report number	Report date
EN 62109-1: 2010	ZEM-19JA0748FCSHP-1	18/02/2019
EN 62109-2: 2011	ZEM-19JA0748FCSHP -2	18/02/2019

The referred test report(s) show that the product complies with standard(s) recognized as giving presumption of compliance with the essential requirements in the specified European Directive

This verification does not imply assessment of the production of the product
 The **CE** marking may be affixed if all relevant and effective European Directives with **CE** are applicable

Shanghai (P.R. China),), Feb 18th, 2019.



Harvey Wang
Product Line Manager



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 Information given in this document, are related to the tested specimen of the described electrical sample.

LCIE CHINA
必维欧亚电气技术咨询服务(上海)有限公司

Version 3/2016.02.19

Building 4, No. 518, Xin Zhuan Road,
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LCIE

BV LCIE
CHINA
Number

N°1966AS027.EM30693

Model / Type	GW700-XS	GW1000-XS	GW1500-XS	GW2000-XS
MPP DC voltage range:	50-450 Vdc			
Max, Input current.....	12,5A			
Nominal output voltage	230V			
Max, Output current.....	3,5A	4,8A	7,2A	9,6A
Nominal Output Power	700W	1000W	1500W	2000W

Model / Type	GW2500-XS	GW3000-XS
MPP DC voltage range:	50-450 Vdc	
Max, Input current.....	12,5A	
Nominal Output Voltage	230V	
Max, Output current.....	12A	14,3A
Nominal Output Power.....	2500W	3000W

Shanghai (P.R. China),), Feb 18th, 2019.



Harvey Wang
Product Line Manager



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Information given in this document, are related to the tested specimen of the described electrical sample.

LCIE CHINA
必维欧亚电气技术咨询服务(上海)有
限公司

Version 3/2016.02.19

Building 4, No. 518, Xin Zhuan Road,
CaoHejing Songjiang High-Tech Park,
Shanghai P.R.C (201612)

Tel: +86 21 6195 7000
Fax: +86 21 6195 7001
Email: contact@cn.bureauveritas.com



Certificate of compliance

Applicant: JIANGSU GOODWE POWER SUPPLY TECHNOLOGY CO., LTD
No.90 ZiJin Rd., New District, Suzhou,
215011,
China

Product: Photovoltaic (PV) inverter

Model: GW700-XS
GW1000-XS
GW1500-XS
GW2000-XS
GW2500-XS
GW3000-XS

Use in accordance with regulations:

Automatic disconnection device with single-phase mains surveillance in accordance with Engineering Recommendation G98/1 for photovoltaic systems with a single-phase parallel coupling via an inverter in the public mains supply. The automatic disconnection device is an integral part of the aforementioned inverter. This serves as a replacement for the disconnection device with isolating function that can access the distribution network provider at any time.

Applied rules and standards:

Engineering Recommendation G98/1-4:2019

Requirements for the connection of Fully Type Tested Micro-generators (up to and including 16 A per phase) in parallel with public Low Voltage Distribution Networks

DIN V VDE V 0126-1-1:2006-02 (4.1 Functional safety)

Automatic disconnection device between a generator and the public low-voltage grid

At the time of issue of this certificate the safety concept of an aforementioned representative product corresponds to the valid safety specifications for the specified use in accordance with regulations.

Report number: ZEM-19JY2488FTSHP

Certificate number: U19-0596

Date of issue:

2019-11-11



Certification body Bureau Veritas Consumer Products Services Germany GmbH accredited according to DIN EN ISO/IEC 17065
A partial representation of the certificate requires the written approval of Bureau Veritas Consumer Products Services Germany GmbH



Annex to the G98/1 certificate of compliance No. U19-0596

Appendix C Type Test Verification Report

Extract from test report according to the Engineering Recommendation G98/1

Nr. ZEM-19JY248PTSHF

Type Approval and declaration of compliance with the requirements of Engineering Recommendation G98/1.

PGM Technology	Photovoltaic inverter		
Manufacturer	JIANGSU GOODWE POWER SUPPLY TECHNOLOGY CO., LTD		
Address	No.90 ZUJin Rd., New District, Suzhou, 215011, China		
Tel	+44(0)333 358 3184		
Email	service@goodwe.co.uk	Website	https://www.goodwe.com

Rated values	GW700-XS	GW1000-XS	GW1500-XS	GW2000-XS
Maximum rated capacity	700W	1000W	1500W	2000W
Rated voltage	220/230V	220/230V	220/230V	220/230V

Rated values	GW2500-XS	GW3000-XS	
Maximum rated capacity	2500W	3000W	
Rated voltage	220/230V	220/230V	

Firmware version	V1.00.08
-------------------------	----------

Measurement period:	2019-08-01 to 2019-09-30
----------------------------	--------------------------

Description of the structure of the power generation unit:

The power generation unit is equipped with a PV and line-side EMC filter. The power generation unit has no galvanic isolation between DC input and AC output. Output switch-off is performed with single-fault tolerance based on two series-connected relays in line and neutral. This enables a safe disconnection of the power generation unit from the network in case of error.

The above stated Generating Units are tested according the requirements in the Engineering Recommendation G98/1. Any modification that affects the stated tests must be named by the manufacturer/supplier of the product to ensure that the product meets all requirements of the Engineering Recommendation G98/1.



Appendix C Type Test Verification Report	
Extract from test report according to the Engineering Recommendation G98/1	
Nr. ZEM-19JY24S8FTSHP	
Operating Range:	
Connection:	Always connected
Limit:	Always connected
Test 1	Voltage = 65% of nominal (195,3 V) Frequency = 47,5 Hz Power Factor = 1 Period of test 90 minutes
Connection:	Always connected
Limit:	Always connected
Test 2	Voltage = 110% of nominal (253 V) Frequency = 51,5 Hz Power Factor = 1 Period of test 90 minutes
Connection:	Always connected
Limit:	Always connected
Test 3	Voltage = 110% of nominal (253 V) Frequency = 52,0 Hz Power Factor = 1 Period of test 15 minutes
Connection:	Always connected
Limit:	Always connected

Protection. Voltage tests.						
Phase 1						
Function	Setting		Trip test		No trip test	
	Voltage [V]	Time delay [s]	Voltage [V]	Time delay [s]	Voltage / time	Confirm no trip
U/V	154	2,0	183,6	2,751	156V / 1s	No trip
					160V / 2,45s	No trip
O/V stage 1	262,2	1,0	262,7	1,281	258,7V / 0,0s	No trip
O/V stage 2	273,7	0,5	273,3	0,778	269,7V / 0,95s	No trip
					277,7V / 0,45s	No trip
Note: For voltage tests the Voltage required to trip is the setting $\pm 3,45V$. The time delay can be measured at a larger deviation than the minimum required to operate the protection. The No trip tests need to be carried out at the setting $\pm 4V$ and for the relevant times as shown in the table above to ensure that the protection will not trip in error.						



Annex to the G98/1 certificate of compliance No. U19-0596

Appendix C Type Test Verification Report

Extract from test report according to the Engineering Recommendation G98/1

Nr. ZEM-19JY246BPT5HP

Protection, Frequency limits.

Function	Setting		Trip test		No trip test	
	Frequency [Hz]	Time delay [s]	Frequency [Hz]	Time delay [s]	Frequency / time	Confirm no trip
U/F stage 1	47.5	20	47.46	20.41	47.7Hz / 30s	No trip
U/F stage 2	47	0.5	47.01	0.781	47.2Hz / 19.5s	No trip
					46.8Hz / 0.45s	No trip
O/F stage 2	52	0.5	52.02	0.781	51.8Hz / 120s	No trip
					52.2Hz / 0.45s	No trip

Note. For Frequency Trip tests the Frequency required to trip is the setting ± 0.1 Hz. In order to measure the time delay a larger deviation than the minimum required to operate the protection can be used. The "No-trip tests" need to be carried out at the setting ± 0.2 Hz and for the relevant times as shown in the table above to ensure that the protection will not trip in error.

Protection, Loss of Mains.

Inverters tested according to BS EN 62116.

Balancing load on islanded network	33% of -5% Q Test 22	66% of -5% Q Test 12	100% of -5% P Test 6	33% of +5% Q Test 31	66% of +5% Q Test 21	100% of +5% P Test 10
Trip time, Ph1 fuse removed [s]	0.104	0.112	0.108	0.080	0.104	0.100

Note. Trip time limit is 0.5s. For technologies which have a substantial shut down time this can be added to the 0.5s in establishing that the trip occurred in less than 0.5s maximum. Shut down time could therefore be up to 1.0s for these technologies.



Annex to the G98/1 certificate of compliance No. U19-0596

Appendix C Type Test Verification Report

Extract from test report according to the Engineering Recommendation G98/1

Nr. ZEM-19/Y2468FTSHP

Protection: Re-connection timer.

Test should prove that the reconnection sequence starts in no less than 20 seconds for restoration of voltage and frequency to within the stage 1 settings of table 2.

Over Voltage				
Time delay setting		Measured delay		
20s		45.81s		
Under Voltage				
Time delay setting		Measured delay		
20s		45.81s		
Over Frequency				
Time delay setting		Measured delay		
20s		45.81s		
Under Frequency				
Time delay setting		Measured delay		
20s		45.71s		
	Checks on no reconnection when voltage or frequency is brought to just outside stage 1 limits of table 1.			
	At 266,2V	At 180,0V	At 47,4Hz	At 52,1Hz
Confirmation that the Generating Unit does not re-connect.	No reconnection	No reconnection	No reconnection	No reconnection

Protection: Frequency change, Stability test.				
	Start Frequency [Hz]	Change	Test Duration	Confirm no trip
Positive Vector Shift	49.5	+50 degrees		No trip
Negative Vector Shift	50.5	-50 degrees		No trip
Positive Frequency drift	49.0 to 51.0	+0.55Hz/sec	2.1s	No trip
Negative Frequency drift	51.0 to 49.0	-0.55Hz/sec	2.1s	No trip

**Appendix C Type Test Verification Report**

Extract from test report according to the Engineering Recommendation G98/1

Nr. ZEM-19/JY2488FT5HT

Limited Frequency Sensitive Mode – Over Frequency

1-min mean value [Hz]:	a) 50,00	b) 50,45	c) 50,70	d) 51,15	e) 50,70	f) 50,45	g) 50,00
1. Measurement a) to g): Active power output > 80% P_n							
Frequency [Hz]:	50,00	50,45	50,70	51,15	50,70	50,45	50,00
P _{exported} [kW]:	N/A	2940	2400	1860	2400	2940	N/A
P _{imported} [kW]:	3047,9	3003,1	2463,3	1897,3	2453,3	2995,7	3045,9
2. Measurement a) to g): Active power output 40% and 60% after freezing > 80% P_n							
Frequency [Hz]:	50,00	50,45	50,70	51,15	50,70	50,45	50,00
P _{exported} [kW]:	N/A	1430	1200	930	1200	1430	N/A
P _{imported} [kW]:	1509,4	1454,5	1197,1	916,4	1198,9	1455,2	1470,8

Output Power with falling Frequency

5-min mean value (each)	a) 50 ± 0,01 Hz	b) - 0,4 to - 0,5 Hz	c) - 2,4 to - 2,5 Hz
Frequency [Hz]:	49,99	49,55	47,55
Active power [W]:	2972,5	2969,9	2969,6
ΔP/P _{max} [%]:			0,04



Appendix C Type Test Verification Report

Extract from test report according to the Engineering Recommendation G99/1

Nr. ZEM-19JY2489FT5HP

Power Quality: Harmonics

GW3000-XS

Phase 1

SSSO rating per phase (rpp)						
	At 45-55% of rated output 1.5kW		100% of rated output 3kW			
Harmonic	Measured Value (MV) in [A]	Measured Value (MV) in [%]	Measured Value (MV) in [A]	Measured Value (MV) in [%]	Limit in BS EN61000-3-2 in Amps	higher limit for odd harmonics 21 and above
2nd	0,039	0,610	0,081	0,642	1,080	
3rd	0,108	1,681	0,261	2,056	2,300	
4th	0,020	0,306	0,043	0,339	0,430	
5th	0,032	0,486	0,083	0,657	1,140	
6th	0,002	0,037	0,005	0,040	0,300	
7th	0,014	0,218	0,019	0,153	0,770	
8th	0,004	0,063	0,003	0,027	0,230	
9th	0,013	0,208	0,008	0,062	0,400	
10th	0,005	0,073	0,004	0,031	0,184	
11th	0,011	0,173	0,012	0,095	0,330	
12th	0,005	0,080	0,006	0,044	0,163	
13th	0,012	0,181	0,011	0,083	0,210	
14th	0,004	0,068	0,005	0,037	0,131	
15th	0,009	0,136	0,005	0,041	0,190	
16th	0,007	0,103	0,009	0,042	0,115	
17th	0,008	0,129	0,011	0,088	0,132	
18th	0,005	0,087	0,005	0,039	0,102	
19th	0,008	0,118	0,010	0,079	0,118	
20th	0,005	0,071	0,006	0,044	0,092	
21th	0,006	0,096	0,005	0,040	0,107	0,160
22th	0,005	0,071	0,004	0,034	0,064	
23th	0,005	0,096	0,006	0,048	0,098	0,147
24th	0,004	0,061	0,003	0,027	0,077	
26th	0,005	0,070	0,006	0,047	0,090	0,135
26th	0,004	0,067	0,003	0,026	0,071	
27th	0,004	0,061	0,005	0,043	0,083	0,124
28th	0,003	0,052	0,004	0,034	0,066	
29th	0,004	0,060	0,005	0,038	0,078	0,117
30th	0,004	0,067	0,004	0,030	0,061	
31th	0,003	0,047	0,005	0,040	0,073	0,106
32th	0,003	0,042	0,003	0,026	0,058	
33th	0,003	0,040	0,005	0,036	0,068	0,102
34th	0,002	0,036	0,003	0,021	0,054	
35th	0,002	0,035	0,004	0,033	0,064	0,096
36th	0,003	0,039	0,002	0,018	0,051	
37th	0,002	0,035	0,004	0,029	0,061	0,091
38th	0,003	0,041	0,003	0,021	0,048	
39th	0,001	0,019	0,005	0,043	0,058	0,087
40th	0,002	0,034	0,003	0,022	0,046	

Note the higher limits for odd harmonics 21 and above are only allowable under certain conditions, if these higher limits are utilized please state the exemption used as detailed in part 6.2.3.4 of BS EN 61000-3-2 in the box below.



Annex to the G98/1 certificate of compliance No. U19-0596

Appendix C Type Test Verification Report

Extract from test report according to the Engineering Recommendation G98/1

Nr. ZEM-15JY2405FTSHF

Power Quality, Power factor.

Output power	218,2V	230V	253V	Measured at three voltage levels and at full output. Voltage to be maintained within $\pm 1.5\%$ of the stated level during the test.
20%	0.9517	0.9956	0.9589	
50%	0.9676	0.9966	0.9997	
75%	0.9892	0.9995	0.9986	
100%	0.9964	1.0000	0.9995	
Limit	>0.95	>0.95	>0.95	

Power Quality, Voltage fluctuation and Flicker.

	Starting			Stopping			Running	
	dmax	dc	d(f)	dmax	dc	d(f)	Pst	PB 2 hours
Measured values at test impedance	0.75%	0.61%	0.00%	0.61%	0.54%	0.00%	0.12	0.10
Limits set under BS EN 61000-3-11	4%	3.3%	3.3% 500ms	4%	3.3%	3.3% 500ms	1.0	0.65
Test impedance	R	0.4	Ω	R	0.4	Ω		
	Z	0.47	Ω					

Power Quality, DC injection.

Test level power [%]	20	50	75	100
Recorded value [mA]	13.7	18.4	24.7	0.51
Recorded value [%]	0.10	0.13	0.17	0.12
Limit [%]	0.25	0.25	0.25	0.25
Note: DC-injection is tested at each phase of the inverter and a limit of 0.25% per phase was used as pass criteria.				



Annex to the G98/1 certificate of compliance No. U19-0596

Appendix C Type Test Verification Report

Extract from test report according to the Engineering Recommendation G98/1

Nr. ZEM-19JY2488FTSRP

Fault level Contribution.

For a directly coupled SSEG			For a inverter SSEG		
Parameter	Symbol	Value	Time after fault	Volts [V]	Amps [A]
Peak Short Circuit current	I_k	N/A	20ms	105.35V	1.37A
Initial Value of aperiodic current	I_a	N/A	100ms	N/A	N/A
Initial symmetrical short-circuit current*	I_k	N/A	250ms	N/A	N/A
Decaying (aperiodic) component of short circuit current*	I_{dc}	N/A	500ms	N/A	N/A
Reactance/Resistance Ratio of source*	X/R	N/A	Time to Trip [s]	0.00s	

For rotating machines and linear piston machines the test should produce a 0s - 2s plot of the short circuit current as seen at the Generating Unit terminals.

* Values for these parameters should be provided where the short circuit duration is sufficiently long to enable interpolation of the plot.

Self Monitoring – Solid state switching.	N/A
It has been verified that in the event of the solid state switching device failing to disconnect the Generating Unit, the voltage on the output side of the switching device is reduced to a value below 50 volts within 0.5 seconds.	
Note. Unit do not provide solid state switching relays. In case the semiconductor bridge is switched off, then the voltage on the output drops to 0. In this case the relays on the output will also open (Functional safety of the internal automatic disconnection device according to VDE 0126-1-1).	

Logic Interface (Input port) Required by paragraph 11.1.3	N
Confirm that an input port is provided and can be used to shut down the module.	Yes



Certificate of compliance

Applicant: JIANGSU GOODWE POWER SUPPLY TECHNOLOGY CO., LTD
NO.189 Kun Lun Shan Road
Suzhou New District, Jiangsu
China

Product: Photovoltaic (PV) inverter

Model: GW700-XS, GW1000-XS, GW1500-XS,
GW2000-XS, GW2500-XS, GW3000-XS

Use in accordance with regulations:

Automatic disconnection device with single-phase mains surveillance in accordance with IEC 61727:2004 and IEC 62116:2014 for photovoltaic systems with a single-phase parallel coupling via an inverter in the public mains supply. The automatic disconnection device is an integral part of the aforementioned inverters.

Applied rules and standards :

IEC 61727:2004

Photovoltaic (PV) systems – Characteristics of the utility interface

IEC 62116:2014

Test procedure of islanding prevention measures for utility interconnected photovoltaic inverters

At the time of issue of this certificate the safety concept of an aforementioned representative product corresponds to the valid safety specifications for the specified use in accordance with regulations

Report number: ZEM-19JA0749FCSHP-1
ZEM-19JA0749FCSHP-2

Certificate number: U19-0174

Date of issue: 2019-03-14



Certification body of Bureau Veritas Consumer Products Services Germany GmbH
Accredited according to DIN EN ISO/IEC 17065



**BUREAU
VERITAS**

Certificate of compliance

Applicant: JIANGSU GOODWE POWER SUPPLY TECHNOLOGY CO., LTD
No.90 Zi Jin Road
SND, Suzhou
China

Product: Photovoltaic inverter

Model: GW1000-XS
GW2000-XS
GW3000-XS

Use in accordance with regulations:

The inverters are tested according to specified environmental influences and efficiency. For detailed information, please watch the corresponding test reports.

Applied rules and standards:

IEC 60068-2-1:2007 Environmental testing – Part 2-1: Tests – Test A: Cold
IEC 60068-2-2:2007 Environmental testing – Part 2-2: Tests – Test B: Dry heat
IEC 60068-2-14:2009 Environmental testing – Part 2-14: Tests – Test N: Change of temperature
IEC 60068-2-30:2005 Environmental testing – Part 2-30: Tests – Test Db: Damp heat, cyclic (12h + 12 h cycle)
IEC 60068-2-64:2008 Environmental testing – Part 2-64: Tests – Test Fh: Vibration, broadband random and guidance
IEC 61683:1999 Photovoltaic systems – Power conditioners – Procedure for measuring efficiency
EN 50530:2010 Overall efficiency of grid connected photovoltaic inverters

At the time of issue of this certificate the safety concept of an aforementioned representative product corresponds to the valid safety specifications for the specified use in accordance with regulations.

Report number: ZEM-19JA0736FCSHP-1-R1
ZEM-19JA0736FCSHP-2-R1
ZEM-19JA0736FCSHP-3-R1

Certificate number: U19-0561

Date of issue: 2019-10-10



Certification body Bureau Veritas Consumer Products Services Germany GmbH accredited according to DIN EN ISO/IEC 17065
A partial representation of the certificate requires the written approval of Bureau Veritas Consumer Products Services Germany GmbH



Product Service

Compliance Document

No. D 15 03 83373 010

Holder of Certificate: JIANGSU GOODWE POWER SUPPLY
TECHNOLOGY CO., LTD.

No. 189 Kun Lun Shan Road
Suzhou New District
215163 Suzhou, Jiangsu
PEOPLE'S REPUBLIC OF CHINA

Product: Converter
Grid-Tied PV Inverter

This Compliance document confirms the compliance with the listed standards on a voluntary basis. It refers only to the sample submitted for testing and certification and does not certify the quality or safety of the serial products. See also notes overleaf.

Test report no.: 704091503803-00



Date, 2015-03-25

Zhang
(Zhengdong Ma)

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TÜV SÜD Product Service GmbH Zertifizierungsstelle Rüdigerstraße 66 80339 München Germany

TUV



Product Service

Compliance Document

No. D 15 03 83373 010

Model(s): GW10K-DT, GW12K-DT, GW15K-DT,
GW17K-DT, GW20K-DT, GW25K-DT.

Parameters:	V _{max} PV:	1000 V _{dc}
	MPPT voltage range:	260 ... 850 V _{dc}
	Rated DC voltage:	640 V _{dc}
	Max. DC current:	22/11 A _{dc} (GW10K-DT, GW12K-DT) 22/22 A _{dc} (GW15K-DT, GW17K-DT, GW20K-DT) 27/27 A _{dc} (GW25K-DT)
	I _{sc} PV:	21/20 A _{dc} (GW10K-DT, GW12K-DT) 27/27 A _{dc} (GW15K-DT, GW17K-DT, GW20K-DT) 32/32 A _{dc} (GW25K-DT)
	Rated grid voltage:	3/N/PE ~ 400/230 V
	Rated grid frequency:	50 Hz
	Max. output current:	17 A _{ac} (GW10K-DT) 19 A _{ac} (GW12K-DT) 25 A _{ac} (GW15K-DT, GW17K-DT) 30 A _{ac} (GW20K-DT) 37 A _{ac} (GW25K-DT)
	Rated AC power:	10 kW (GW10K-DT) 12 kW (GW12K-DT) 15 kW (GW15K-DT) 17 kW (GW17K-DT) 20 kW (GW20K-DT) 25 kW (GW25K-DT)
	Power factor range:	1@nominal power(adj: 0.9cap .. 0.9ind)
	Operation temperature range:	-25 ... +60°C
	Protective class:	I
	Ingress protection:	IP65
	Overvoltage category:	III(Mains), II(PV)

Tested according to: EN 50438:2013

Technical Compliance Statement



Ref. No.: ACWE-RC140143 (ACWE-G1204007R4)

For the following equipment

Applicant : Jiangsu Goodwe Power Supply Technology Co.,Ltd.
Manufacturer : Jiangsu Goodwe Power Supply Technology Co.,Ltd.
Product : PV Inverter
Model Number : (1) GW17K-DT (2) GW10K-DT (3) GW12K-DT
(4) GW15K-DT (5) GW06K-DT (6) GW20K-DT
(7) GW25K-DT (8) GW09K-DT
Brand : GOODWE

We, **AUDIX Technology (Wujiang) Co., Ltd. EMC Dept.** hereby certify that the above products has been tested by us with the listed standards and found in compliance with the council EMC directive 2004/108/EC. It is possible to use CE marking to demonstrate the compliance with this EMC Directive. The test data & results are issued on the EMC test report No. **ACWE-E1204009D**.

Emission: EN 61000-6-3:2007+A1:2011+AC: 2012;
EN 61000-6-4:2007+A1:2011

EN 61000-3-11:2000 ,EN 61000-3-12:2011

Immunity: EN 61000-6-1:2007; EN 61000-6-2:2005

(IEC 61000-4-2:2008, IEC 61000-4-3:2006+A2:2010,

IEC 61000-4-4:2012, IEC 61000-4-5:2014,

IEC 61000-4-6:2013, IEC 61000-4-8:2009, IEC 61000-4-11:2004)

Oct.22, 2014

Ken Lu/ Assistant General Manager

AUDIX Technology (Wujiang) Co., Ltd. EMC Dept.

The statement is based on a single evaluation of one sample of the above-mentioned products. It does not imply an assessment of the whole production and does not permit the use of the test lab logo.

SDT G2 Series

Dual-MPPT, Three-Phase



Technical Data	GW4K-DT	GW5K-DT	GW6K-DT	GW8K-DT	GW10KT-DT	GW12KT-DT	GW15KT-DT
PV String Input Data							
Max. DC Input Power (W)	6000	7500	9000	12000	15000	18000	22500
Max. DC Input Voltage (V)	1000	1000	1000	1000	1000	1000	1000
MPPT Operating Voltage Range (V)	180~850	180~850	180~850	180~850	180~850	180~850	180~850
Start-up Voltage (V)	160	160	160	160	160	160	160
Nominal DC Input Voltage (V)	620	620	620	620	620	620	620
Max. Input Current per MPPT (A)	12.5 / 12.5	12.5 / 12.5	12.5 / 12.5	12.5 / 12.5	12.5 / 12.5	25 / 12.5	25 / 12.5
Max. Short Circuit Current per MPPT (A)	15.6 / 15.6	15.6 / 15.6	15.6 / 15.6	15.6 / 15.6	15.6 / 15.6	31.2 / 15.6	31.2 / 15.6
Number of MPPT	2	2	2	2	2	2	2
Number of strings per MPPT	1 / 1	1 / 1	1 / 1	1 / 1	1 / 1	2 / 1	2 / 1
AC Output Data							
Nominal Output Power (W)	4000	5000	6000	8000	10000	12000	15000
Nominal Output Apparent Power (VA)	4000	5000	6000	8000	10000	12000	15000
Max. Output Apparent Power (VA)	4400* ¹	5500* ¹	6600* ¹	8800* ¹	11000* ¹	14000* ¹	16500* ¹
Nominal Output Voltage (V)	400, 3L / N / PE						
Nominal AC Grid Frequency (Hz)	50 / 60	50 / 60	50 / 60	50 / 60	50 / 60	50 / 60	50 / 60
Max. Output Current (A)	6.4	8	9.6	12.8	16	20.3	24
Nominal Output Current (A)	5.8	7.2	8.7	11.6	14.5	17.3	21.7
Output Power Factor	~1 (Adjustable from 0.8 leading to 0.8 lagging)						
Max. Total Harmonic Distortion	<3%	<3%	<3%	<3%	<3%	<3%	<3%
Efficiency							
Max. Efficiency	98.2%	98.2%	98.2%	98.2%	98.3%	98.3%	98.3%
European Efficiency	>97.6%	>97.6%	>97.6%	>97.6%	>97.7%	>97.7%	>97.7%
Protection							
Anti-Islanding Protection	Integrated	Integrated	Integrated	Integrated	Integrated	Integrated	Integrated
DC Reverse Polarity Protection	Integrated	Integrated	Integrated	Integrated	Integrated	Integrated	Integrated
DC Insulation Resistor Detection	Integrated	Integrated	Integrated	Integrated	Integrated	Integrated	Integrated
DC Surge Protection	Type III						
AC Surge Protection	Type III						
Residual Current Monitoring Unit	Integrated	Integrated	Integrated	Integrated	Integrated	Integrated	Integrated
AC Over Current Protection	Integrated	Integrated	Integrated	Integrated	Integrated	Integrated	Integrated
AC Short Protection	Integrated	Integrated	Integrated	Integrated	Integrated	Integrated	Integrated
AC Over Voltage Protection	Integrated	Integrated	Integrated	Integrated	Integrated	Integrated	Integrated
DC Arc Fault Circuit Interrupter	Optional	Optional	Optional	Optional	Optional	Optional	Optional
General Data							
Operating Temperature Range (°C)	-30~60	-30~60	-30~60	-30~60	-30~60	-30~60	-30~60
Relative Humidity	0~100%	0~100%	0~100%	0~100%	0~100%	0~100%	0~100%
Operating Altitude (m)	≤4000	≤4000	≤4000	≤4000	≤4000	≤4000	≤4000
Cooling Method	Natural Convection			Smart Fan Cooling			
Display	LED, LCD / Wi-Fi+APP						
Communication	WiFi / LAN / RS485						
Weight (Kg)	15	15	15	16	16	18	18
Dimension (W×H×Dmm)	354×433×147	354×433×147	354×433×147	354×433×155	354×433×155	354×433×155	354×433×155
Ingress Protection Rating	IP65	IP65	IP65	IP65	IP65	IP65	IP65
Night Power Consumption (W)	<1	<1	<1	<1	<1	<1	<1
DC Connector	MC4 (2.5~4mm ²)						
Topology	Transformerless						

*1: For Belgium Max. Output Apparent Power (VA): GW4K-DT is 4000; GW5K-DT is 5000; GW6K-DT is 6000; GW8K-DT is 8000; GW10KT-DT is 10000; GW12KT-DT is 12000; GW15KT-DT is 15000.

*: Please visit GoodWe website for the latest certificates.



Product Service

Compliance Document

No. D 17 03 83373 018

Holder of Certificate: JIANGSU GOODWE POWER SUPPLY TECHNOLOGY CO., LTD.

No. 189 Kun Lun Shan Road
Suzhou New District
215163 Suzhou, Jiangsu
PEOPLE'S REPUBLIC OF CHINA

Product: Converter
Grid-Tied PV Inverter

Model(s): GW4000-DT, GW5000-DT, GW6000-DT,
GW8000-DT, GW9000-DT, GW10KN-DT

Parameters:	Inverter topology:	Non-isolated
	Operating temperature range:	-25°C +60°C
	AC Overvoltage-category:	III
	DC Overvoltage-category:	II
	Protective class	I
	Ingress protection:	IP65
	Remark: Electrical ratings in attachment	

Tested according to:

- IEC 61727:2004
- IEC 62116:2014
- IEC 61683:1999
- EN 50530:2010/A1:2013
- IEC 60068-2-1:2007
- IEC 60068-2-2:2007
- IEC 60068-2-14:2009
- IEC 60068-2-30:2005

This Compliance document confirms the compliance with the listed standards on a voluntary basis. It refers only to the sample submitted for testing and certification and does not certify the quality or safety of the serial products. See also notes overleaf.

Test report no.: 704091705305-00

Date, 2017-03-28

(Zhengdong Ma)

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Compliance Document

No. D 17 03 83373 018



Product Service

Model Parameter	GW4000- DT	GW5000- DT	GW6000- DT	GW8000- DT	GW9000- DT	GW10KN- DT
Max. PV-generator power (W)	5200	6500	7800	9600	10800	12000
Vmax PV (Vd.c.)	1000					
Isc PV (Ad.c.)	16/16					
Rated DC voltage (Vd.c.)	640					
MPPT voltage range (Vd.c.)	200...800	200...800	200...800	200...850	200...850	200...850
Max. DC current (Ad.c.)	11/11					
Rated grid voltage (Va.c.)	3/N/PE~, 400					
Rated current (Aa.c.)	7	8,5	10	12,1	13,6	15,2
AC-grid frequency (Hz)	50					
Rated apparent power (kVA)	4	5	6	8	9	10
Power factor range	Default >0,99, 0,8cap...0,8ind(adj.)					

Technical Compliance Statement



Ref. No.: ACWE-RC140143 (ACWE-G1204007R4)

For the following equipment

Applicant : Jiangsu Goodwe Power Supply Technology Co.,Ltd.

Manufacturer : Jiangsu Goodwe Power Supply Technology Co.,Ltd.

Product : PV Inverter

Model Number : (1) GW17K-DT (2) GW10K-DT (3) GW12K-DT
(4) GW15K-DT (5) GW06K-DT (6) GW20K-DT
(7) GW25K-DT (8) GW09K-DT

Brand : GOODWE

We, **AUDIX Technology (Wujiang) Co., Ltd. EMC Dept.** hereby certify that the above products has been tested by us with the listed standards and found in compliance with the council EMC directive 2004/108/EC. It is possible to use CE marking to demonstrate the compliance with this EMC Directive. The test data & results are issued on the EMC test report No. **ACWE-E1204009D**.

**Emission: EN 61000-6-3:2007+A1:2011+AC: 2012;
EN 61000-6-4:2007+A1:2011**

EN 61000-3-11:2000 ,EN 61000-3-12:2011

Immunity: EN 61000-6-1:2007; EN 61000-6-2:2005

(IEC 61000-4-2:2008, IEC 61000-4-3:2006+A2:2010,

IEC 61000-4-4:2012, IEC 61000-4-5:2014,

IEC 61000-4-6:2013, IEC 61000-4-8:2009, IEC 61000-4-11:2004)

Oct.22, 2014

Ken Lu/ Assistant General Manager

AUDIX Technology (Wujiang) Co., Ltd. EMC Dept.

The statement is based on a single evaluation of one sample of the above-mentioned products. It does not imply an assessment of the whole production and does not permit the use of the test lab logo.



Product Service

Compliance Document

No. D 15 03 83373 010

Holder of Certificate: **JIANGSU GOODWE POWER SUPPLY TECHNOLOGY CO., LTD.**

No. 189 Kun Lun Shan Road
Suzhou New District
215163 Suzhou, Jiangsu
PEOPLE'S REPUBLIC OF CHINA

Product: **Converter
Grid-Tied PV Inverter**

This Compliance document confirms the compliance with the listed standards on a voluntary basis. It refers only to the sample submitted for testing and certification and does not certify the quality or safety of the serial products. See also notes overleaf.

Test report no.: 704091503803-00



Date, 2015-03-25

Zhang
(Zhengdong Ma)

Page 1 of 2

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TÜV SÜD Product Service GmbH Zertifizierungsstelle Rüdigerstraße 66 80339 München Germany

TÜV



Product Service

Compliance Document

No. D 15 03 83373 010

Model(s): GW10K-DT, GW12K-DT, GW15K-DT,
GW17K-DT, GW20K-DT, GW25K-DT.

Parameters:	V _{max} PV:	1000 V _{dc}
	MPPT voltage range:	260 ... 850 V _{dc}
	Rated DC voltage:	640 V _{dc}
	Max. DC current:	22/11 A _{dc} (GW10K-DT, GW12K-DT) 22/22 A _{dc} (GW15K-DT, GW17K-DT, GW20K-DT) 27/27 A _{dc} (GW25K-DT)
	I _{sc} PV:	21/20 A _{dc} (GW10K-DT, GW12K-DT) 27/27 A _{dc} (GW15K-DT, GW17K-DT, GW20K-DT) 32/32 A _{dc} (GW25K-DT)
	Rated grid voltage:	3/N/PE ~ 400/230 V
	Rated grid frequency:	50 Hz
	Max. output current:	17 A _{ac} (GW10K-DT) 19 A _{ac} (GW12K-DT) 25 A _{ac} (GW15K-DT, GW17K-DT) 30 A _{ac} (GW20K-DT) 37 A _{ac} (GW25K-DT)
	Rated AC power:	10 kW (GW10K-DT) 12 kW (GW12K-DT) 15 kW (GW15K-DT) 17 kW (GW17K-DT) 20 kW (GW20K-DT) 25 kW (GW25K-DT)
	Power factor range:	1@nominal power(adj: 0.9cap .. 0.9ind)
	Operation temperature range:	-25 ... +60°C
	Protective class:	I
	Ingress protection:	IP65
	Overvoltage category:	III(Mains), II(PV)

Tested according to: EN 50438:2013



Product Service

Compliance Document

No. D 17 03 83373 018

Holder of Certificate: JIANGSU GOODWE POWER SUPPLY TECHNOLOGY CO., LTD.

No. 189 Kun Lun Shan Road
Suzhou New District
215163 Suzhou, Jiangsu
PEOPLE'S REPUBLIC OF CHINA

Product: Converter
Grid-Tied PV Inverter

Model(s): GW4000-DT, GW5000-DT, GW6000-DT,
GW8000-DT, GW9000-DT, GW10KN-DT

Parameters:

Inverter topology:	Non-isolated
Operating temperature range:	-25°C +60°C
AC Overvoltage-category:	III
DC Overvoltage-category:	II
Protective class	I
Ingress protection:	IP65
Remark:	Electrical ratings in attachment

Tested according to:

IEC 61727:2004
IEC 62116:2014
IEC 61683:1999
EN 50530:2010/A1:2013
IEC 60068-2-1:2007
IEC 60068-2-2:2007
IEC 60068-2-14:2009
IEC 60068-2-30:2005

This Compliance document confirms the compliance with the listed standards on a voluntary basis. It refers only to the sample submitted for testing and certification and does not certify the quality or safety of the serial products. See also notes overleaf.

Test report no.: 704091705305-00

Date, 2017-03-28

(Zhengdong Ma)



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TÜV SÜD Product Service GmbH · Zertifizierstelle · Ridlerstraße 65 · 80339 München · Germany

TUV®

Compliance Document

No. D 17 03 83373 018



Product Service

Model Parameter	GW4000- DT	GW5000- DT	GW6000- DT	GW8000- DT	GW9000- DT	GW10KN- DT
Max. PV-generator power (W)	5200	6500	7800	9600	10800	12000
Vmax PV (Vd.c.)	1000					
Isc PV (Ad.c.)	16/16					
Rated DC voltage (Vd.c.)	640					
MPPT voltage range (Vd.c.)	200...800	200...800	200...800	200...850	200...850	200...850
Max. DC current (Ad.c.)	11/11					
Rated grid voltage (Va.c.)	3/N/PE~, 400					
Rated current (Aa.c.)	7	8,5	10	12,1	13,6	15,2
AC-grid frequency (Hz)	50					
Rated apparent power (kVA)	4	5	6	8	9	10
Power factor range	Default >0,99, 0,8cap...0,8ind(adj.)					

SDT G2 Series

Dual-MPPT, Three-Phase



Technical Data	GW4K-DT	GW5K-DT	GW6K-DT	GW8K-DT	GW10KT-DT	GW12KT-DT	GW15KT-DT
PV String Input Data							
Max. DC Input Power (W)	6000	7500	9000	12000	15000	18000	22500
Max. DC Input Voltage (V)	1000	1000	1000	1000	1000	1000	1000
MPPT Range (V)	180~850	180~850	180~850	180~850	180~850	180~850	180~850
Start-up Voltage (V)	160	160	160	160	160	160	160
Min. Feed-in Voltage(V)	210	210	210	210	210	210	210
Nominal DC Input Voltage (V)	620	620	620	620	620	620	620
Max. Input Current (A)	12.5/12.5	12.5/12.5	12.5/12.5	12.5/12.5	12.5/12.5	12.5/25	12.5/25
Max. Short Current (A)	15.6/15.6	15.6/15.6	15.6/15.6	15.6/15.6	15.6/15.6	15.6/31.2	15.6/31.2
No. of MPP Trackers	2	2	2	2	2	2	2
No. of Input Strings Per MPP Tracker	1/1	1/1	1/1	1/1	1/1	1/2	1/2
AC Output Data							
Nominal Output Power (W)	4000	5000	6000	8000	10000	12000	15000
Max. Output Apparent Power (VA)	4400* ¹	5500* ¹	6600* ¹	8800* ¹	11000* ¹	14000* ¹	16500* ¹
Nominal Output Voltage (V)	400, 3L/N/PE						
Nominal Output Frequency (Hz)	50/60	50/60	50/60	50/60	50/60	50/60	50/60
Max. Output Current (A)	6.4	8	9.6	12.8	16	20.3	24
Output Power Factor	~1 (Adjustable from 0.8 leading to 0.8 lagging)						
Output THDi (@Nominal Output)	<3%	<3%	<3%	<3%	<3%	<3%	<3%
Efficiency							
Max. Efficiency	98.2%	98.2%	98.2%	98.2%	98.3%	98.3%	98.3%
European Efficiency	>97.6%	>97.6%	>97.6%	>97.6%	>97.7%	>97.7%	>97.7%
Protection							
Anti-Islanding Protection	Integrated	Integrated	Integrated	Integrated	Integrated	Integrated	Integrated
Input Reverse Polarity Protection	Integrated	Integrated	Integrated	Integrated	Integrated	Integrated	Integrated
Insulation Resistor Detection	Integrated	Integrated	Integrated	Integrated	Integrated	Integrated	Integrated
DC Surge Protection	Integrated (Type III)						
AC Surge Protection	Integrated (Type III)						
Residual Current Monitoring Unit	Integrated	Integrated	Integrated	Integrated	Integrated	Integrated	Integrated
Output Over Current Protection	Integrated	Integrated	Integrated	Integrated	Integrated	Integrated	Integrated
Output Short Protection	Integrated	Integrated	Integrated	Integrated	Integrated	Integrated	Integrated
Output Over Voltage Protection	Integrated	Integrated	Integrated	Integrated	Integrated	Integrated	Integrated
General Data							
Operating Temperature Range (°C)	-30~60	-30~60	-30~60	-30~60	-30~60	-30~60	-30~60
Relative Humidity	0~100%	0~100%	0~100%	0~100%	0~100%	0~100%	0~100%
Operating Altitude (m)	≤4000	≤4000	≤4000	≤4000	≤4000	≤4000	≤4000
Cooling	Natural Cooling	Natural Cooling	Natural Cooling	Fan Cooling	Fan Cooling	Fan Cooling	Fan Cooling
User Interface	LCD&LED						
Communication	WiFi or LAN or RS485						
Weight (kg)	15	15	15	16	16	18	18
Size (Width*Height*Depth mm)	354*433*147	354*433*147	354*433*147	354*433*155	354*433*155	354*433*155	354*433*155
Protection Degree	IP65	IP65	IP65	IP65	IP65	IP65	IP65
Night Self Consumption (W)	<1	<1	<1	<1	<1	<1	<1
Topology	Transformerless						

*1: For Belgium Max. Output Apparent Power (VA): GW4K-DT is 4000; GW5K-DT is 5000; GW6K-DT is 6000; GW8K-DT is 8000; GW10KT-DT is 10000; GW12KT-DT is 12000; GW15KT-DT is 15000.

*: Please visit GoodWe website for the latest certificates.



Certificate of Conformity

Certificate No.: 2088AP0409N065001
Product: SOLAR (PV) Grid INVERTER
Brand Name:  **GOODWE**
Test Model No.: GW12KT-DT, GW15KT-DT
Applicant: Jiangsu GoodWe Power Supply Technology Co.,Ltd.
 No.90 Zijin Rd., New District, Suzhou, 215011, China
Report No.: PV200409N065, PV200409N065-1, PV200409N065-2, PV200409N065-3,
 WT203102059

Use in accordance with regulations:

The inverters are tested for functional safety, grid protection, specified environmental influences and efficiency. For detailed information, please watch the corresponding test reports.

Applied rules and standards

IEC 60068-2-1:2007	Environmental testing – Part 2-1: Tests – Test A: Cold
IEC 60068-2-2:2007	Environmental testing – Part 2-2: Tests – Test B: Dry heat
IEC 60068-2-14:2009	Environmental testing – Part 2-14: Tests – Test N: Change of temperature
IEC 60068-2-30:2005	Environmental testing – Part 2-30: Tests – Test Db and guidance: Damp heat, cyclic (12 + 12-hour cycle)
IEC 60068-2-64:2008	Environmental testing – Part 2-64: Tests – Test Fh: Vibration, broadband random and guidance
IEC 61683:1999	Photovoltaic systems – Power conditioners – Procedure for measuring efficiency
IEC 61727:2004	Photovoltaic (PV) systems – Characteristics of the utility interface
IEC 62116:2014	Utility-interconnected photovoltaic inverters – Test procedure of islanding prevention measures
EN 50530:2010	Overall efficiency of grid connected photovoltaic inverters
+ A1:2013	



Name: James Huang
Technical Manager/ New Energy Team
Date: 2020-07-10

This document shall not be reproduced, except in full, without the written approval of
 Bureau Veritas Shenzhen Co., Ltd. Dongguan Branch.
 Information given in this document is related to the tested specimen of the described electrical sample.



Certificate of Suitability

Certificate No.: **SAA192403**

Certificate Holder: Jiangsu Goodwe Power Supply Technology Co., Ltd.
No. 189, Kun Lun Shan Road,
Suzhou New District, 215163 Suzhou,
Jiangsu
P.R. China

Class Description: Non-Prescribed
Product Description: PV Inverter (Grid-tied photovoltaic inverter)
Trade Name: GOODWE
Model No.: GW6K-DT
Markings: Input: MPPT Voltage range: 180-850Vdc, Max 1000Vdc,
Max 12.5A/12.5A, Isc: 15.6/15.6A
Output: 3/N/PE, 400V~ 50/60Hz, 3x8.7A 6000W
-30°C to +60°C, IP65, Class I
Standard: IEC 62109-1 Ed 1.0
IEC 62109-2 Ed 1.0
AS/NZS 4777.2:2015
Conditions: Nil

Certification Mark: RCM and SAA192403

Date First Registered: 4 September 2019

Date of Expiry: 4 September 2024

For and on Behalf of
SAA Approvals Pty Ltd

SAA Approvals Pty Ltd as accredited by JAS-ANZ under ISO/IEC 17065 and declared a RECS under *Old Electrical Safety Act 2002 and Electrical Safety Regulations 2013* certifies in accordance with the SAA Approvals Electrical Product Safety Certification Scheme that the product nominated in this certificate complies with standard/s listed.

When using the RCM the requirements of all relevant parts of AS/NZS 4417 applicable to the article must be fulfilled.

For SAA Contact Details and to verify this Certificate go to:

www.saaapprovals.com.au



www.jas-anz.org/register



Issued: 04-09-19 192403/1



Certificate of Suitability

Addendum

Certificate No.: SAA192403

Date of Issue: 4 September 2019

Class Description: Non-Prescribed

Product Description: PV Inverter (Grid-tied photovoltaic inverter)

General Modification:

Hardware (Firmware) version: 290-10098-00

Software version: V1.00.00.01

Additional Models	Trade Name	Rating
GW4K-DT	GOODWE	Input: MPPT Voltage range: 180-850Vdc, Max 1000Vdc, Max 12.5A/12.5A, Isc: 15.6/15.6A Output: 3/N/PE, 400V~ 50/60Hz, 3x5.8A 4000W
GW4KL-DT	GOODWE	Input: MPPT Voltage range: 180-550Vdc, Max 600Vdc, Max 12.5A/12.5A, Isc: 15.6/15.6A Output: 3/N/PE, 400V~ 50/60Hz, 3x5.8A 4000W
GW5K-DT	GOODWE	Input: MPPT Voltage range: 180-850Vdc, Max 1000Vdc, Max 12.5A/12.5A, Isc: 15.6/15.6A Output: 3/N/PE, 400V~ 50/60Hz, 3x7.3A 5000W
GW5KL-DT	GOODWE	Input: MPPT Voltage range: 180-550Vdc, Max 600Vdc, Max 12.5A/12.5A, Isc: 15.6/15.6A Output: 3/N/PE, 400V~ 50/60Hz, 3x7.3A 5000W
GW6KL-DT	GOODWE	Input: MPPT Voltage range: 180-550Vdc, Max 600Vdc, Max 12.5A/12.5A, Isc: 15.6/15.6A Output: 3/N/PE, 400V~ 50/60Hz, 3x8.7A 6000W

For and on Behalf of
SAA Approvals Pty Ltd

SAA Approvals Pty Ltd is accredited by JAS-ANZ under ISO/IEC 17065 and declared a RECS under *Old Electrical Safety Act 2002 and Electrical Safety Regulations 2013* certifies in accordance with the SAA Approvals Electrical Product Safety Certification Scheme that the product nominated in this certificate complies with standard/s listed.

When using the RCM the requirements of all relevant parts of AS/NZS 4417 applicable to the article must be fulfilled.

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Issued: 04-09-19 192403/2



Certificate of Suitability

Addendum

Certificate No.: SAA192403

Date of Issue: 30 June 2020

Regulatory Definition: NP: Non-Prescribed
Product Description: PV Inverter (Grid-tied photovoltaic inverter)

General Modification:

Hardware version for models GW8K-DT, GW10K-DT, GW12K-DT, GW15K-DT:
 290-10113-00.

Additional Models	Trade Name	Rating/Marking
GW8K-DT	GOODWE	Input: MPPT Voltage range: 180-850Vdc, Max 1000Vdc, Max 12.5A/12.5A, Isc: 15.6/15.6A Output: 3/N/PE, 400V~ 50/60Hz, 3x11.6A 8000VA -30°C to +60°C, IP65, Class I
GW10KT-DT	GOODWE	Input: MPPT Voltage range: 180-850Vdc, Max 1000Vdc, Max 12.5A/12.5A, Isc: 15.6/15.6A Output: 3/N/PE, 400V~ 50/60Hz, 3x14.5A 10000VA -30°C to +60°C, IP65, Class I
GW12KT-DT	GOODWE	Input: MPPT Voltage range: 180-850Vdc, Max 1000Vdc, Max 12.5A/12.5A, Isc: 15.6/15.6A Output: 3/N/PE, 400V~ 50/60Hz, 3x20.3A 12000W 14000VA -30°C to +60°C, IP65, Class I
GW15KT-DT	GOODWE	Input: MPPT Voltage range: 180-850Vdc, Max 1000Vdc, Max 12.5A/12.5A, Isc: 15.6/15.6A Output: 3/N/PE, 400V~ 50/60Hz, 3x24A 15000W 16500VA -30°C to +60°C, IP65, Class I

RANILL

For and on Behalf of
 SAA Approvals Pty Ltd

SAA Approvals Pty Ltd as accredited by JAS-ANZ under ISO/IEC 17065 and declared a RECS under *Old Electrical Safety Act 2002 and Electrical Safety Regulations 2013* certifies in accordance with the SAA Approvals Electrical Product Safety Certification Scheme that the product nominated in this certificate complies with standard/s listed.

When using the RCM the requirements of all relevant parts of AS/NZS 4417 applicable to the article must be fulfilled.

For SAA Contact Details and to verify this Certificate go to:

www.saaapprovals.com.au



Issued: 30-06-20 192403/4

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SDT G2 Series Datasheet



Technical Data	GW17KT-DT	GW20KT-DT	GW25KT-DT
PV String Input Data			
Max. DC Input Power (W)	25500	30000	37500
Max. DC Input Voltage (V)	1100	1100	1100
MPPT Range (V)	200~950	200~950	200~950
Starting Voltage (V)	180	180	180
Min. Feed-in Voltage (V)	210	210	210
Nominal DC Input Voltage (V)	620	620	600
Max. Input Current (A)	25/25	25/25	37.5/25
Max. Short Current (A)	31.2/31.2	31.2/31.2	46.8/31.2
No. of MPP Trackers	2	2	2
No. of Input Strings per Tracker	2/2	2/2	3/2
AC Output Data			
Nominal Output Power (W)	17000	20000	25000
Max. Output Apparent Power (VA)	19000*1	22000*1	27500*1
Nominal Output Voltage (V)	400, 3L/N/PE		
Nominal Output Frequency (Hz)	50/60	50/60	50/60
Max. Output Current (A)	28.8	31.9	40.8
Output Power Factor	~1 (Adjustable from 0.8 leading to 0.8 lagging)		
Output THDi (@Nominal Output)	<3%	<3%	<3%
Efficiency			
Max. Efficiency	98.4%	98.4%	98.4%
European Efficiency	>97.7%	>97.7%	>97.7%
Protection			
Anti-Islanding Protection	Integrated	Integrated	Integrated
Input Reverse Polarity Protection	Integrated	Integrated	Integrated
Insulation Resistor Detection	Integrated	Integrated	Integrated
DC Surge Protection	Type III (Type II optional)		
AC Surge Protection	Type III		
Residual Current Monitoring Unit	Integrated	Integrated	Integrated
Output Over Current Protection	Integrated	Integrated	Integrated
Output Short Protection	Integrated	Integrated	Integrated
Output Over Voltage Protection	Integrated	Integrated	Integrated
General Data			
Operating Temperature Range (°C)	-30~60	-30~60	-30~60
Relative Humidity	0~100%	0~100%	0~100%
Operating Altitude (m)	≤4000	≤4000	≤4000
Cooling	Fan Cooling	Fan Cooling	Fan Cooling
User Interface	LCD & LED		
Communication	WiFi or LAN or RS485(Optional)		
Weight (kg)	25	25	25
Size (Width*Height*Depth mm)	415*511*175	415*511*175	415*511*175
Protection Degree	IP65	IP65	IP65
Night Self Consumption (W)	<1	<1	<1
Topology	Transformerless		

*1: For Belgium Max. Output Apparent Power (VA): GW17KT-DT is 17000; GW20KT-DT is 20000; GW25KT-DT is 25000.

*: Please visit GoodWe website for the latest certificates.

Zertifikat

Certificate



Zertifikat Nr. *Certificate No.*
R 50471900

Blatt *Sheet*
0001

Ihr Zeichen <i>Client Reference</i>	Unser Zeichen <i>Our Reference</i>	Ausstellungsdatum	<i>Date of Issue</i>
X.J	01-DJW-50381214 001	23.06.2020	(day/mo/yr)

Genehmigungsinhaber *License Holder*

JIANGSU GOODWE POWER SUPPLY
TECHNOLOGY CO., LTD.
No.90 Zijin Rd.,
New District, Suzhou
215011 Jiangsu
P.R. China

Fertigungsstätte *Manufacturing Plant*

JIANGSU GOODWE POWER SUPPLY
TECHNOLOGY CO., LTD.
No.90 Zijin Rd.,
New District, Suzhou
215011 Jiangsu
P.R. China

Prüfzeichen *Test Mark*

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ID 111122551

Geprüft nach *Tested acc. to*

IEC 62109-1:2010
IEC 62109-2:2011
EN 62109-1:2010
EN 62109-2:2011

Zertifiziertes Produkt (Geräteidentifikation)
Certified Product (Product Identification)

Lizenzentgelte - Einheit
License Fee - Unit

PV-Wechselrichter (Grid-connected PV Inverter)

Type designation	: GW8KAU-DT GW10KAU-DT GW12KAU-DT	10
V _{max} PV [Vd.c.]	: 1100	
ISC PV [Ad.c.]	: 31.2/31.2	
MPP Voltage Range[Vd.c.]	: 200-950	
Max. Input Current[Ad.c.]	: 25/25	
Overvoltage Category (OVC)	: II for PV	
Rated Output Voltage[Va.c.]	: 3L/N/PE, 400	
Rated Output Frequency[Hz]	: 50/60	
Rated Output Power[kW]	: 8 10 12	
Max. Output Current[Aa.c.]	: 12.8 16 19.2	
Power Factor	: [-0.80, +0.80]	
Overvoltage Category (OVC)	: III for AC mains	

continued on page 0002

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ANLAGE (Appendix): 1

Dem Zertifikat liegt unsere Prüf- und Zertifizierungsordnung zugrunde und es bestätigt die Konformität des Produktes mit den oben genannten Standards und Prüfgrundlagen. Zusätzliche Anforderungen in Ländern, in denen das Produkt in Verkehr gebracht werden soll, müssen zusätzlich betrachtet werden. Die Herstellung des zertifizierten Produktes wird überwacht.
This certificate is based on our Testing and Certification Regulation and states the conformity of the product with the standards and testing requirements as indicated above. Any additional requirements in countries where the product is going to be marketed have to be considered additionally. The manufacturing of the certified product is subject to surveillance.

TÜV Rheinland LGA Products GmbH, Tillystraße 2, 90431 Nürnberg

Tel.: +49 221 806-1371 e-mail: cert-validity@de.tuv.com
Fax: +49 221 806-3935 http://www.tuv.com/safety

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Weichun Li

Zertifikat**Certificate**

Zertifikat Nr. *Certificate No.*
R 50471900

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0002

Ihr Zeichen <i>Client Reference</i>	Unser Zeichen <i>Our Reference</i>	Ausstellungsdatum <i>Date of Issue</i>
X.J	01-DJW-50381214 001	23.06.2020 (day/mo/yr)

Genehmigungsinhaber *License Holder*

JIANGSU GOODWE POWER SUPPLY
TECHNOLOGY CO., LTD.
No.90 Zijin Rd.,
New District, Suzhou
215011 Jiangsu
P.R. China

Fertigungsstätte *Manufacturing Plant*

JIANGSU GOODWE POWER SUPPLY
TECHNOLOGY CO., LTD.
No.90 Zijin Rd.,
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Geprüft nach *Tested acc. to*

IEC 62109-1:2010
IEC 62109-2:2011
EN 62109-1:2010
EN 62109-2:2011

Zertifiziertes Produkt (Geräteidentifikation)
Certified Product (Product Identification)

Lizenzentgelte - Einheit
License Fee - Unit

PV-Wechselrichter (Grid-connected PV Inverter)

Type designation	: GW15KAU-DT GW17KAU-DT GW20KAU-DT	3
Vmax PV [Vd.c.]	: 1100	
ISC PV [Ad.c.]	: 31.2/31.2	
MPP Voltage Range [Vd.c.]	: 200-950	
Max. Input Current [Ad.c.]	: 25/25	
Overvoltage Category (OVC)	: II for PV	
Rated Output Voltage [Va.c.]	: 3L/N/PE, 400	
Rated Output Frequency [Hz]	: 50/60	
Rated Output Power [kW]	: 15 17 20	
Max. Output Current [Aa.c.]	: 24 28.8 31.9	
Power Factor	: [-0.80, +0.80]	
Overvoltage Category (OVC)	: III for AC mains	

continued on page 0003

3

ANLAGE (Appendix): 1

Dem Zertifikat liegt unsere Prüf- und Zertifizierungsordnung zugrunde und es bestätigt die Konformität des Produktes mit den oben genannten Standards und Prüfgrundlagen. Zusätzliche Anforderungen in Ländern, in denen das Produkt in Verkehr gebracht werden soll, müssen zusätzlich betrachtet werden. Die Herstellung des zertifizierten Produktes wird überwacht.
This certificate is based on our Testing and Certification Regulation and states the conformity of the product with the standards and testing requirements as indicated above. Any additional requirements in countries where the product is going to be marketed have to be considered additionally. The manufacturing of the certified product is subject to surveillance.

TÜV Rheinland LGA Products GmbH, Tillystraße 2, 90431 Nürnberg

Tel.: +49 221 806-1371 e-mail: cert-validity@de.tuv.com

Fax: +49 221 806-3935 http://www.tuv.com/safety

File No. ANERT-TECH/99/2022-T2 (Computer No. 5311)



Weichun Li

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Zertifikat

Certificate



Zertifikat Nr. *Certificate No.*
R 50471900

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0003

Ihr Zeichen <i>Client Reference</i>	Unser Zeichen <i>Our Reference</i>	Ausstellungsdatum <i>Date of Issue</i>
X.J	01-DJW-50381214 001	23.06.2020 (day/mo/yr)

Genehmigungsinhaber *License Holder*
JIANGSU GOODWE POWER SUPPLY
TECHNOLOGY CO., LTD.
No.90 Zijin Rd.,
New District, Suzhou
215011 Jiangsu
P.R. China

Fertigungsstätte *Manufacturing Plant*
JIANGSU GOODWE POWER SUPPLY
TECHNOLOGY CO., LTD.
No.90 Zijin Rd.,
New District, Suzhou
215011 Jiangsu
P.R. China

Prüfzeichen *Test Mark*

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ID 1111225551

Geprüft nach *Tested acc. to*

IEC 62109-1:2010
IEC 62109-2:2011
EN 62109-1:2010
EN 62109-2:2011

Zertifiziertes Produkt (Geräteidentifikation)
Certified Product (Product Identification)

Lizenzentgelte - Einheit
License Fee - Unit

PV-Wechselrichter (Grid-connected PV Inverter)

Type designation	: GW17KT-DT GW20KT-DT GW25KT-DT	3
Vmax PV [Vd.c.]	: 1100	
ISC PV [Ad.c.]	: 31.2/31.2 31.2/31.2 46.8/31.2	
MPP Voltage Range[Vd.c.]	: 200-950	
Max. Input Current[Ad.c.]	: 25/25 25/25 37.5/25	
Overvoltage Category (OVC)	: II for PV	

Rated Output Voltage[Va.c.] : 3L/N/PE, 400
Rated Output Frequency[Hz] : 50/60
Rated Output Power[kW] : 17 20 25
Max. Output Current[Aa.c.] : 28.8 31.9 40.8
Power Factor : [-0.80, +0.80]
Overvoltage Category (OVC) : III for AC mains

continued on page 0004

3

ANLAGE (Appendix) : 1

Dem Zertifikat liegt unsere Prüf- und Zertifizierungsordnung zugrunde und es bestätigt die Konformität des Produktes mit den oben genannten Standards und Prüfgrundlagen. Zusätzliche Anforderungen in Ländern, in denen das Produkt in Verkehr gebracht werden soll, müssen zusätzlich betrachtet werden. Die Herstellung des zertifizierten Produktes wird überwacht.
This certificate is based on our Testing and Certification Regulation and states the conformity of the product with the standards and testing requirements as indicated above. Any additional requirements in countries where the product is going to be marketed have to be considered additionally. The manufacturing of the certified product is subject to surveillance.

TÜV Rheinland LGA Products GmbH, Tillystraße 2, 90431 Nürnberg

Tel.: +49 221 806-1371 e-mail: cert-validity@de.tuv.com

Fax: +49 221 806-3935 http://www.tuv.com/safety

File No. ANERT-TECH/99/2022-T2 (Computer No. 5311)



Weichun Li

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Zertifikat

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Zertifikat Nr. *Certificate No.*
R 50471900

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0004

Ihr Zeichen <i>Client Reference</i>	Unser Zeichen <i>Our Reference</i>	Ausstellungsdatum <i>Date of Issue</i>
X..J	01-DJW-50381214 001	23.06.2020 (day/mo/yr)

Genehmigungsinhaber *License Holder*
JIANGSU GOODWE POWER SUPPLY
TECHNOLOGY CO., LTD.
No.90 Zijin Rd.,
New District, Suzhou
215011 Jiangsu
P.R. China

Fertigungsstätte *Manufacturing Plant*
JIANGSU GOODWE POWER SUPPLY
TECHNOLOGY CO., LTD.
No.90 Zijin Rd.,
New District, Suzhou
215011 Jiangsu
P.R. China

Prüfzeichen *Test Mark*

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Geprüft nach *Tested acc. to*

IEC 62109-1:2010
IEC 62109-2:2011
EN 62109-1:2010
EN 62109-2:2011

Zertifiziertes Produkt (Geräteidentifikation)
Certified Product (Product Identification)

Lizenzentgelte - Einheit
License Fee - Unit

PV-Wechselrichter (Grid-connected PV Inverter)

as page 0003 Continuation

Protective Class	: I
Enclosure Protection (IP)	: IP65
Pollution degree (PD)	: PD 3 (outside)
Altitude [m]	: ≤4000
Operating Temperature [°C]	: -30 to 60 (> 45 derating)

Remark:

The installation has to be carried out according to the attached installation instruction.
Any additional requirements in countries where the product is going to be marketed have to be considered additionally.

ANLAGE (Appendix): 1

Dem Zertifikat liegt unsere Prüf- und Zertifizierungsordnung zugrunde und es bestätigt die Konformität des Produktes mit den oben genannten Standards und Prüfgrundlagen. Zusätzliche Anforderungen in Ländern, in denen das Produkt in Verkehr gebracht werden soll, müssen zusätzlich betrachtet werden. Die Herstellung des zertifizierten Produktes wird überwacht.
This certificate is based on our Testing and Certification Regulation and states the conformity of the product with the standards and testing requirements as indicated above. Any additional requirements in countries where the product is going to be marketed have to be considered additionally. The manufacturing of the certified product is subject to surveillance.

TÜV Rheinland LGA Products GmbH, Tillystraße 2, 90431 Nürnberg

Tel.: +49 221 806-1371 e-mail: cert-validity@de.tuv.com
Fax: +49 221 806-3935 http://www.tuv.com/safety

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Weichun Li

TÜV Rheinland (China) Ltd.
Member of TÜV Rheinland Group



JIANGSU GOODWE POWER SUPPLY
TECHNOLOGY CO., LTD.
Mr. Jiang Tao

Date : 23.06.2020
Our ref. : DJW 01
Your ref.: X.J

No.90 Zijin Rd.,
New District, Suzhou
215011 Jiangsu
P.R. China

Ref : R TÜV-Mark Approval

Type of Equipment : Grid-connected PV Inverter
Model Designation : See Certificate
Certificate No. : R 50471900 0001
Report No. : 50381214 001

Dear Mr. Jiang Tao,

The above specified equipment has been tested and found to be in accordance with the relevant requirements.

Please find enclosed your certificate as specified above.

If cancellation of the certificate is submitted by 15 November in a given year, no fee will be charged for the following year.

The certificate is issued with the reservation that the license holder applies all information required in § 6 of the ProdSG related to name and address of the manufacturer or his authorized representative / importer, including their respective contact addresses on the product prior to marketing of the product in the European Economic Area.

With kind regards,

Certification Body


Weichun Li

Enclosure

证书的详细资料请登陆www.certipedia.com查阅,或拨打我司客服热线800 999 3668 / 400 883 1300咨询

TÜV Rheinland (China) Ltd.
莱茵检测认证服务(中国)有限公司

Unit 707, AVIC Bldg., No. 10B,
Central Road, East 3rd Ring
Road, Chaoyang District,
Beijing, 100022, P.R.China

北京市朝阳区东三环中路乙10号
艾维克大厦707室
邮编: 100022

Tel: (8610)6566 6660
Fax: (8610)6566 6667
e-mail: info@bj.chn.tuv.com
Internet: <http://www.chn.tuv.com>

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LV MT/MT Series Datasheet



Technical Data

GW30KLV-MT GW35KLV-MT GW50KLV-MT GW50KN-MT GW60KN-MT GW50KBF-MT

DC Input Data

Max. PV Power (W)	54000	63000	90000	65000	80000	65000
Max. DC Input Voltage (V)	800	800	800	1100	1100	1100
MPPT Range (V)	200~650	200~650	200~650	200~1000	200~1000	200~1000
Starting Voltage (V)	200	200	200	200	200	200
Min. Feed-in Voltage (V)	210	210	210	210	210	210
Nominal DC Input Voltage (V)	370	370	370	620	620	620
Max. Input Current (A)	33/33/22/22	33/33/33/33	44/44/44/44	33/33/22/22	33/33/33/33	30/30/30/30
Max. Short Current (A)	41.5/41.5/27.5/27.5	41.5/41.5/41.5/41.5	55/55/55/55	41.5/41.5/27.5/27.5	41.5/41.5/41.5/41.5	37.5/37.5/37.5/37.5
Current Inrush (A)	-	-	-	100(peak, duration 1us)	100(peak, duration 1us)	100(peak, duration 1us)
Backfeed Current (A)	-	-	-	Not Support	Not Support	Not Support
No. of MPP Trackers	4	4	4	4	4	4
No. of Input Strings per Tracker	3/3/2/2	3/3/3/3	4/4/4/4	3/3/2/2	3/3/3/3	2/2/2/2

AC Output Data

Nominal Output Power (W)	30000	36000	50000	50000	60000	50000
Max. Output Power (W)	28800@208VAC 30000@220VAC 33000@240VAC	34500@208VAC 36000@220VAC 39900@240VAC	47300@208VAC 50000@220VAC 55000@240VAC	55000:57500 @415Vac*1	66000:69000 @415Vac*1	55000:57500 @415Vac*1
Max. Output Apparent Power (VA)	33000	39900	55000	55000:57500 @415Vac*2	66000:69000 @415Vac*2	55000:57500 @415Vac*2
Nominal Output Voltage (V)	150-300	150-300	150-300	400, default 3L+N+PE, 3L+PE optional in settings		
Nominal Output Frequency (Hz)	50/60	50/60	50/60	50/60	50/60	50/60
Max. Output Current (A)	80	96	133	80	96	80
Max. Output Fault Current and duration	-	-	-	180(duration 5us)	180(duration 5us)	180(duration 5us)
Max. Output Overcurrent Protection	-	-	-	180	180	180
Output Power Factor	~1 (Adjustable from 0.8 leading to 0.8 lagging)					
Output THDi (@Nominal Output)	<3%	<3%	<3%	<3%	<3%	<3%

Efficiency

Max. Efficiency	98.7%	98.8%	98.7%	98.7%	98.8%	98.8%
European Efficiency	98.3%	98.5%	98.3%	98.3%	98.5%	98.3%

Protection

PV String Current Monitoring	Integrated	Integrated	Integrated	Integrated	Integrated	Integrated
Anti-Islanding Protection	Integrated	Integrated	Integrated	Integrated	Integrated	Integrated
Input Reverse Polarity Protection	Integrated	Integrated	Integrated	Integrated	Integrated	Integrated
Insulation monitoring	Integrated	Integrated	Integrated	Integrated	Integrated	Integrated
DC fuse	Integrated	Integrated	Integrated	Integrated	Integrated	Integrated
Anti-PID Function for Module	Optional	Optional	Optional	Optional	Optional	Optional
DC SPD Protection	Integrated (Type II)					
AC SPD Protection	Integrated (Type II)					
Residual Current Monitoring Unit	Integrated	Integrated	Integrated	Integrated	Integrated	Integrated
AC Over Current Protection	Integrated	Integrated	Integrated	Integrated	Integrated	Integrated
AC Short Protection	Integrated	Integrated	Integrated	Integrated	Integrated	Integrated
AC Over Voltage Protection	Integrated	Integrated	Integrated	Integrated	Integrated	Integrated

General Data

Ambient Temperature Range (°C)	-30~60	-30~60	-30~60	-30~60	-30~60	-30~60
Relative Humidity	0~100%	0~100%	0~100%	0~100%	0~100%	0~100%
Operating Altitude (m)	≤4000	≤4000	≤4000	≤4000	≤4000	≤4000
Cooling	Fan Cooling	Fan Cooling	Fan Cooling	Fan Cooling	Fan Cooling	Fan Cooling
Display	LCD or WiFi+APP		LED, WiFi+APP		LCD or WiFi+APP	
Communication	RS485 or WiFi		RS485 & WiFi, PLC(Optional)		RS485 or WiFi or PLC	
Weight (kg)	59	64	70	59	64	60
Dimension (Width*Height*Depth mm)	586*788*264	586*788*264	586*788*267	586*788*264	586*788*264	586*788*264
Protection Degree	IP65	IP65	IP65	IP65	IP65	IP65
Night Self Consumption (W)	<1	<1	<1	<1	<1	<1
Topology	Transformerless					

*1: For Belgium Max. Output Power (W): GW50KN-MT is 50000; GW60KN-MT is 60000; GW50KBF-MT is 50000.

*2: For Belgium Max. Output Apparent Power (VA): GW50KN-MT is 50000; GW60KN-MT is 60000; GW50KBF-MT is 50000.

*: Please visit GoodWe website for the latest certificates.



MT Series Datasheet

Technical Data

GW60KBF-MT GW75KBF-MT GW80KBF-MT GW70KHF-MT GW80KHF-MT GW75K-MT GW80K-MT

DC Input Data

Max. PV Power (W)	80000	97500	104000	91000	120000	112500	120000
Max. DC Input Voltage (V)	1100	1100	1100	1100	1100	1100	1100
MPPT Range (V)	200~1000	200~1000	200~1000	200~1000	200~1000	200~1000	200~1000
Starting Voltage (V)	200	200	200	200	200	200	200
Min. Feed-in Voltage (V)	210	210	210	210	210	210	210
Nominal DC Input Voltage (V)	620	750	800	750	800	600	620
Max. Input Current (A)	44/44/44/44	44/44/44/44	39/39/39/39	33/33/33/33	44/44/44/44	44/44/44/44	44/44/44/44
Max. Short Current (A)	55/55/55/55	55/55/55/55	54.8/54.8/54.8/54.8	41.5/41.5/41.5/41.5	55/55/55/55	55/55/55/55	55/55/55/55
Current Inrush (A)	100(peak, duration 1us)	-	-	-	-	-	100(peak, duration 1us)
Backfeed Current (A)	Not Support	-	-	-	-	-	Not Support
No. of MPP Trackers	4	4	4	4	4	4	4
No. of Input Strings per Tracker	3/3/3/3	3/3/3/3	3/3/3/3	3/3/3/3	3/3/3/3	4/4/4/4(Standard) 3/3/3/3(Optional, Support bifacial module)	4/4/4/4(Standard)

AC Output Data

Nominal Output Power (W)	60000	75000	80000	70000	80000	75000	80000
Max. Output Power (W)	66000; 69000 @415Vac*1	82500*1	88000*1	77000*1	88000*1	75000	88000*1
Max. Output Apparent Power (VA)	66000; 69000 @415Vac*2	82500*2	88000*2	77000*2	88000*2	75000	88000*2
Nominal Output Voltage (V)	400, default 3L+N+PE, 3L+PE optional in settings	500, 3L/PE	540, 3L/PE	500, 3L/PE	540, 3L/PE	380/415	400, default 3L+N+PE, 3L+PE optional in settings
Nominal Output Frequency (Hz)	50/60	50/60	50/60	50/60	50/60	50/60	50/60
Max. Output Current (A)	96	95.3	94.1	89	94.1	133	133
Max. Output Fault Current and duration	180(duration 5us)	-	-	-	-	-	235(duration 5us)
Max. Output Overcurrent Protection	180	-	-	-	-	-	235
Output Power Factor	~1 (Adjustable from 0.8 leading to 0.8 lagging)						
Output THDi (@Nominal Output)	<3%	<3%	<3%	<3%	<3%	<3%	<3%

Efficiency

Max. Efficiency	98.8%	99.0%	99.0%	99.0%	99.0%	98.8%	98.8%
European Efficiency	98.3%	98.4%	98.4%	98.4%	98.4%	98.3%	98.3%

Protection

PV String Current Monitoring	Integrated	Integrated	Integrated	Integrated	Integrated	Integrated	Integrated
Anti-Islanding Protection	Integrated	Integrated	Integrated	Integrated	Integrated	Integrated	Integrated
Input Reverse Polarity Protection	Integrated	Integrated	Integrated	Integrated	Integrated	Integrated	Integrated
Insulation monitoring	Integrated	Integrated	Integrated	Integrated	Integrated	Integrated	Integrated
DC fuse	Integrated	Integrated	Integrated	Integrated	Integrated	Integrated	Integrated
Anti-PID Function for Module	Optional	Optional	Optional	Optional	Optional	Optional	Optional
DC SPD Protection	Integrated (Type II)						
AC SPD Protection	Integrated (Type II)						
Residual Current Monitoring Unit	Integrated	Integrated	Integrated	Integrated	Integrated	Integrated	Integrated
AC Over Current Protection	Integrated	Integrated	Integrated	Integrated	Integrated	Integrated	Integrated
AC Short Protection	Integrated	Integrated	Integrated	Integrated	Integrated	Integrated	Integrated
AC Over Voltage Protection	Integrated	Integrated	Integrated	Integrated	Integrated	Integrated	Integrated
Humidity Monitoring	NA	NA	NA	NA	NA	Integrated	Integrated

General Data

Ambient Temperature Range (°C)	-30~60	-30~60	-30~60	-30~60	-30~60	-30~60	-30~60
Relative Humidity	0~100%	0~100%	0~100%	0~100%	0~100%	0~100%	0~100%
Operating Altitude (m)	≤4000	≤4000	≤4000	≤4000	≤4000	≤4000	≤4000
Cooling	Fan Cooling	Fan Cooling	Fan Cooling	Fan Cooling	Fan Cooling	Fan Cooling	Fan Cooling
Display	LED, WIFI+APP			LCD or WIFI+APP		LED, WIFI+APP	LED, WIFI+APP
Communication	RS485 or WIFI or PLC					RS485 & WiFi, PLC(Optional)	RS485 & WiFi, PLC(Optional)
Weight (kg)	65	65	65	60	65	70	70
Dimension (Width*Height*Depth mm)	586*788*267	586*788*267	586*788*267	586*788*264	586*788*264	586*788*267	586*788*267
Protection Degree	IP65	IP65	IP65	IP65	IP65	IP65	IP65
Night Self Consumption (W)	<1	<1	<1	<1	<1	<1	<1
Topology	Transformerless						

*1: For Belgium Max. Output Power (W): GW60KBF-MT is 60000; GW75KBF-MT is 75000; GW80KBF-MT is 80000; GW70KHF-MT is 70000; GW80KHF-MT is 80000; GW80K-MT is 80000.

*2: For Belgium Max. Output Apparent Power (VA): GW60KBF-MT is 60000; GW75KBF-MT is 75000; GW80KBF-MT is 80000; GW70KHF-MT is 70000; GW80KHF-MT is 80000; GW80K-MT is 80000.

*: Please visit GoodWe website for the latest certificates.



Certificate of Conformity

Certificate No.: 1988AP0628N093001

Equipment: Grid-connected PV Inverter

Brand Name:  **GOODWE**
your solar engine

Test Model No.: GW50KN-MT, GW60KN-MT, GW70KHV-MT, GW80KHV-MT, GW80K-MT

Applicant: Jiangsu GoodWe Power Supply Technology Co., Ltd.
No.90 ZiJin Rd., New District, Suzhou, 215011, China

Report No.: ZEM-19MA2560FCSHP-1, ZEM-19MA2560FCSHP-2,
ZEM-19MA2560FCSHP-3, ZEM-19MA2560FCSHP-4,
ZEM-19MA2560FCSHP-5, 50190447 001, 50190444 001,
PV190628N093-4, PV190628N093-5

Use in accordance with regulations:

The inverters are tested for functional safety, grid protection, specified environmental influences and efficiency. For detailed information, please watch the corresponding test reports.

Applied rules and standards

IEC 60068-2-1:2007	Environmental testing – Part 2-1: Tests – Test A: Cold
IEC 60068-2-2:2007	Environmental testing – Part 2-2: Tests – Test B: Dry heat
IEC 60068-2-14:2009	Environmental testing – Part 2-14: Tests – Test N: Change of temperature
IEC 60068-2-30:2005	Environmental testing – Part 2-30: Tests – Test Db and guidance: Damp heat, cyclic (12 + 12-hour cycle)
IEC 60068-2-64:2008	Environmental testing – Part 2-64: Tests – Test Fh: Vibration, broadband random and guidance
IEC 61683:1999	Photovoltaic systems – Power conditioners – Procedure for measuring efficiency
EN 50530:2010	Overall efficiency of grid connected photovoltaic inverters
IEC 61727:2004	Characteristics of the utility interface
IEC 62116:2014	Islanding prevention measures for utility-interconnected photovoltaic inverters



Name: James Huang
Technical Manager/ New Energy Team
Date: 2019-11-26

This document shall not be reproduced, except in full, without the written approval of
Bureau Veritas Shenzhen Co., Ltd. Dongguan Branch.
Information given in this document is related to the tested specimen of the described electrical sample.

Certificate Number: AZ 69022517

Page: 0001

CERTIFICATE OF SUITABILITY

Authorised marking: TUV022517E

This is to certify that TÜV Rheinland Australia Pty Ltd as accredited by JAS-ANZ in accordance with ISO/IEC Guide 65 has examined for compliance with certification standards, the electrical equipment described hereunder and authorises the certificate holder to affix the above mentioned mark to products of the same type; or the Regulatory Compliance Mark (RCM) provided that the requirements of all relevant parts of AS/NZS 4417 applicable to the article are fulfilled

CERTIFICATE HOLDER:

JIANGSU GOODWE POWER SUPPLY
TECHNOLOGY CO., LTD.
NO. 189 Kun Lun Shan Road
Suzhou New District
Jiangsu 215163
P. R. China

DESCRIPTION OF EQUIPMENT**Declared class:**

Non-declared

Product:

Grid-connected PV Inverter

Trade Name / Manufacturer:

GOODWE

Model Number:

GW50K-MT; GW60K-MT.

Ratings:

Ratings refer to CONTINUATION SHEET 1 to 2 for details

Standard:

IEC 62109-1:2010
IEC 62109-2:2011
AS/NZS 4777.2:2015

Issue Date:

26/02/2018

Expiry Date:

26/02/2023

Signed for and on behalf of TÜV Rheinland Australia Pty Ltd


Brian Wong

Acc. No. Z2870404AA
www.jas-anz.org/register

Certificate Number: AZ 69022517

Page: 0002

CERTIFICATE OF SUITABILITY

Authorised marking: TUV022517E

CONTINUATION SHEET 1

DESCRIPTION OF EQUIPMENT

Ratings:

For all models (GW50K-MT, GW60K-MT)

Output voltage: 400Va.c./N/PE., 50Hz, three-phase;

Power factor: >0.99 (adjustable 0.8 inductive to 0.8 capacitive), Class I, IP65, PDIII;

Operating Temp.: -30°C to 60°C (>50°C derating);

Overvoltage Category (OVC): PV input: II; Grid Output: III.

For model GW50K-MT:

Input:

VDC max: 1000Vd.c., VDC MPPT: 200-850Vd.c.;

IDC max: 30/30/20/20Ad.c., for 10 input strings;

IDC max: 30/30/30/30Ad.c., for 12 input strings;

Output:

Rated AC Power: 50000VA @50°C Amb.,

IAC max.: 80*3Aa.c.

Issue Date: 26/02/2018

Expiry Date: 26/02/2023

Signed for and on behalf of TÜV Rheinland Australia Pty Ltd
Brian WongAcc. No. Z2870404AA
www.jas-anz.org/register

Certificate Number: AZ 69022517

Page: 0003

CERTIFICATE OF SUITABILITY

Authorised marking: TUV022517E

CONTINUATION SHEET 2

DESCRIPTION OF EQUIPMENT

Ratings:

For model GW60K-MT:

input:

DC max: 1000Vd.c., VDC MPPT: 200-850Vd.c.;

IDC max: 30/30/30/30 Ad.c., for 12 input strings;

IDC max: 30/30/30/40 Ad.c., for 13 input strings;

Output:

Rated AC Power: 60000VA @50°C Amb.,

IAC max.: 96*3Aa.c.

Issue Date: 26/02/2018

Expiry Date: 26/02/2023

Signed for and on behalf of TÜV Rheinland Australia Pty Ltd
Brian WongAcc. No. Z2870404AA
www.jas-anz.org/register

JIANGSU GOODWE POWER SUPPLY
TECHNOLOGY CO., LTD.
Xie Jing
Technic Support Dept.
NO. 189 Kun Lun Shan Road
Suzhou New District
Jiangsu 215163
P. R. China

Date : 26.02.2018
Our ref. : CSC AU1
Your ref.: 154281100

Ref : AZ JAS-ANZ accredited certificate

Type of Equipment : Grid-connected PV Inverter
Model Designation : See Certificate
Certificate No. : AZ 69022517 0001
Report No. : 50127631 001

Dear Xie Jing,

The above specified technical equipment has been certified and found to be in accordance with the relevant requirements.

Enclosed you will find the Certificate of Suitability in respect to your application received.

The Authorised Marking is specified in the certificate.

Alternatively, the Regulatory Compliance Mark (RCM) may be used providing that the requirements of all relevant parts of AS/NZS 4417 applicable to the article are fulfilled.

Please be advised that should the electrical equipment be modified, you are required to notify us and apply for a modification of the certificate.

We appreciate your kind support and would like to offer our assistance and continuous services in the future. Please contact our office for approval of your new products.

With kind regards,

Certification Body

Brian Wong



Enclosure

Certificate Number: AZ 69022517

Page: 0004



CERTIFICATE OF SUITABILITY

Authorised marking: TUV022517E

CONTINUATION SHEET 3

(Modification 1)

Add alternative model, GW60KN-MT, GW50KN-MT:
Models GW60KN-MT, GW50KN-MT which are similar to previously approved models GW60K-MT, GW50K-MT, except the different of model number and the PV input changed by software.

Ratings:

For models GW60KN-MT, GW50KN-MT:
Output voltage: 400Va.c. ~3L/N/PE or 3L/PE, 50Hz, three-phase,
Power factor: >0.99 (adjustable 0.8 inductive to 0.8 capacitive), Class I, IP65, PDIII,
Operating Temp.: -30°C to 60°C (>50°C derating),
Overvoltage Category (OVC): PV input: II; Grid Output: III.

For model GW50KN-MT:

Input:

VDC max: 1100Vd.c., VDC MPPT: 200-1000Vd.c.,
IDC max: 33/33/22/22Ad.c.;

Output:

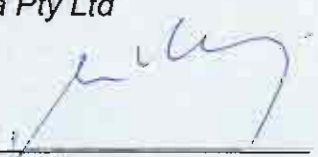
Rated AC Power: 50000VA @50°C amb,
IAC max.: 80Aa.c.
(Further Ratings refer CONTINUATION SHEET 4).

Issue Date: 27/12/2018

Expiry Date: 26/02/2023

Signed for and on behalf of TÜV Rheinland Australia Pty Ltd

Acc. No: Z2870404AA
www.jas-anz.org/register


Billy Chu

TÜV Rheinland Australia Pty Ltd
182 Dougherty Road, Heidelberg West VIC 3081
Phone: +61 (3) 9450 1400
Email: certification@au.tuv.com
Website: www.au.tuv.com

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Certificate Number: AZ 69022517

Page: 0005

CERTIFICATE OF SUITABILITY

Authorised marking: TUV022517E

CONTINUATION SHEET 4

(Modification 1)

Ratings:

For model GW60KN-MT:

Input:

VDC max: 1100Vd.c., VDC MPPT: 200-1000Vd.c.,

IDC max: 33/33/33/33 Ad.c.;

Output:

Rated AC Power: 60000VA @50°C amb,

IAC max.: 96Aa.c.

Issue Date: 27/12/2018

Expiry Date: 26/02/2023

Signed for and on behalf of TÜV Rheinland Australia Pty Ltd
Billy ChuAcc. No. Z2870404AA
www.jas-anz.org/register

Certificate Number: AZ 69022517

Page: 0006

CERTIFICATE OF SUITABILITY

Authorised marking: TUV022517E

CONTINUATION SHEET 5

(Modification 2)

For All Models:

Update CDF.

Add the new additional sources of components for alternative use as below.

Object/part No. ; Manufacturer/ Trademark ; Type/ model ;

Technical data ; Standard ; Mark(s) of conformity:

DC FAN ; NMB ; 3610VL-04W-B76-BR1 ; 12V, 1.15A ;

IEC/EN 60950-1 ; VDE 118626.

DC FAN ; NMB ; 3615RL-04W-B46-ER1 ; 12V, 1.15A ;

UL 60950-1 ; UL E89936.

DC FAN ; NMB ; 09225VA-12Q-BU-03 ; 12V, 0.72A ;

UL 60950-1 ; UL E89936.

Cable gland ; KSS ; PA66 ; 94-V0, M12*1.25 IP68 ; UL 94 ;

UL E70062.

Cable gland ; Hunttec ; RSKP-M12 ; M12*1.25 IP68 ; UL 94 ;

UL E475610.

Insulation ; SUZHOU OMAI OPTICAL MATERIALS CO., LTD. ;

PC G11 ; 94-V2 ; UL 94 ; UL E249605.

Insulation ; ITW ; FORMEX GK-17 ; 94-V0 ; UL 94 ;

UL E121855.

Insulation ; ITW ; FORMEX GK-5BK ; 94-V0 ; UL 94 ;

UL E121855.

(Further CDF info refer to CONTINUATION SHEET 6-7).

Issue Date: 27/02/2019

Expiry Date: 26/02/2023

Signed for and on behalf of TÜV Rheinland Australia Pty Ltd

Acc. No. Z2870404AA
www.jas-anz.org/registerTÜV Rheinland Australia Pty Ltd
182 Dougherty Road, Heidelberg West VIC 3081
Phone: +61 (3) 9450 1400
Email: certification@au.tuv.com
Website: www.au.tuv.com
Billy Chu

1071

Certificate Number: AZ 69022517

Page: 0007

CERTIFICATE OF SUITABILITY

Authorised marking: TUV022517E

CONTINUATION SHEET 6

(Modification 2)

For All Models:

Update CDF.

Add the new additional sources of components for alternative use as below.

Object/part No. ; Manufacturer/ Trademark ; Type/ model ;
 Technical data ; Standard ; Mark(s) of conformity:
 BOTTOM COVER ; SABIC ; EXL9330 ; 94-V0 ; UL 94 ; UL E121562.

PV Input connectors ; Dongguan Vaconn Electronic Technology Co., Ltd ; VP-D4B-PSF, VP-D4B-PHSM, VP-D4B-CHSM, VP-D4B-CSF;
 4 mm², 30A, 1100Vdc, IP68 ; IEC62852: 2014 , EN62852: 2015;
 TUV R 50396796.

PV Input connectors ; QC Solar (Suzhou) Corporation ;
 QC4.3, QC4.10, QC4.10 ; 1000V, 30A, IP68 ; EN 62852: 2015,
 ANSI/UL 6703 ; TUV B170977362004 , UL E340004.

PV Input connectors ; Multi-Contact ; PV-ADSP4, PV-ADBP4,
 PV-KST4, PV-KBT4 ; 45A, 1000Vdc, IP67, 45A, 1250Vdc, IP68;
 IEC 62852:2014 ; TUV R 60127190, TUV R 60127181.

PV Input connectors ; Amphenol ; H4CMB4TMS, H4CFB4TMS ;
 42A, 1000V, IP68 ; IEC 62852: 2014 ; TUV R 50388083.

AC Output Terminal block (L1, L2, L3, N) ; Weidmüller ;
 WFF 70 ; 1100V/167A ; IEC60998-2-1 , IEC60947-7-1 ;
 KEMA 98ATEX1684U.

Issue Date: 27/02/2019

Expiry Date: 26/02/2023

Signed for and on behalf of TÜV Rheinland Australia Pty Ltd


 Billy Chu


Acc. No. Z2870404AA
www.jas-anz.org/register

TUV Rheinland Australia Pty Ltd
 182 Dougherty Road, Heidelberg West VIC 3081
 Phone: +61 (3) 9450 1400
 Email: certification@au.tuv.com
 Website: www.au.tuv.com

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Certificate Number: AZ 69022517

Page: 0008

CERTIFICATE OF SUITABILITY

Authorised marking: TUV022517E

CONTINUATION SHEET 7

(Modification 2)

For All Models:

Update CDF.

Add the new additional sources of components for alternative use as below.

Object/part No. ; Manufacturer/ Trademark ; Type/ model ;

Technical data ; Standard ; Mark(s) of conformity:

DC Switch ; Santon international B.V. ; XBE+3210/2 ;

800V, 25A, 1000V, 16A, 1100V, 10A, IP65, 4 pole ;

EN 60947-3: 2009 / A2: 2015 ; KEMA 71-103409.

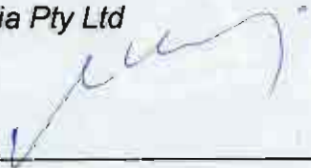
DC Switch ; Beijing People's Electric Plant Co., Ltd. ;

GHX5-32P ; 1100V, 32A, 850V, 40A, IP65, 4 pole ;

EN 60947-3: 2009/A2:2015 ; TUV B 0832660038.

Issue Date: 27/02/2019

Expiry Date: 26/02/2023

Signed for and on behalf of TÜV Rheinland Australia Pty Ltd
Billy ChuAcc. No. Z2870404AA
www.jas-anz.org/registerTUV Rheinland Australia Pty Ltd
182 Dougherty Road, Heidelberg West VIC 3081
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Email: certification@au.tuv.com
Website: www.au.tuv.com

1073

TÜV Rheinland (China) Ltd.
Member of TÜV Rheinland Group



JIANGSU GOODWE POWER SUPPLY
TECHNOLOGY CO., LTD.
Mr. Jiang Tao

Date : 20.11.2020
Our ref. : DJW 01
Your ref.: Jiang Tao

No.90 Zijin Rd.,
New District, Suzhou
215011 Jiangsu
P.R. China

Ref : AK Certificate of Conformity

Type of Equipment : Grid-connected PV Inverter
Model Designation : See Certificate
Certificate No. : AK 50487186 0001
Report No. : CN201MNG 001

Dear Mr. Jiang Tao,

We herewith confirm that a sample of the above mentioned technical equipment has been tested and was found to be in accordance with the relevant requirements.

Enclosed please find your Certificate of Conformity.

We appreciate your kind support and would like to offer our assistance and continuous services in the future.

With kind regards,

Certification Body


Weichun Li

Enclosure

证书的详细信息请登录www.certipedia.com查阅,或拨打我司客服热线800 999 3668 / 400 883 1300咨询

TÜV Rheinland (China) Ltd.
莱茵检测认证服务(中国)有限公司

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e-mail: info@bj.chn.tuv.com
Internet: <http://www.chn.tuv.com>

1074

GOODWE

SMT Series

25-36kW | Three Phase | 3 MPPTs

The GoodWe SMT Series three-phase inverter is ideal for commercial rooftop system solutions. The SMT series achieves maximum efficiency of 98.8% and features unique design highlights, including solid capacitors, fuse-free design, and optional Arc Fault Circuit Interrupter (AFCI) function. These new features ensure a longer lifespan and a higher safety level of operation, allowing for an improved user experience. With a compact design and weight of just 40kg, the SMT series is more convenient to install. With a maximum DC input voltage of 1100V, a wider MPPT range for complex rooftops, and a start-up voltage of 180V, the SMT series guarantees an earlier generation of power and a longer working time to maximize long-term returns and profitability in safe operating conditions.



Smart Control & Monitoring

- String level monitoring
- Dynamic power export limit



Optimal Generation for Higher Return

- 98.8% Max. Efficiency
- Up to 130% DC input oversizing & 110% AC output overloading



Superb Safety & Reliability

- Optional Arc-fault circuit interrupter*
- Optional Type II SPD on both DC and AC*



Friendly & Thoughtful Design

- 40kg compact design
- Power line communication optional*

1075

Technical Data	GW25K-MT	GW29.9K-MT	GW30K-MT	GW36K-MT
Input				
Max. Input Voltage (V)	1100	1100	1100	1100
MPPT Operating Voltage Range (V)	200 ~ 950	200 ~ 950	200 ~ 950	200 ~ 950
Start-up Voltage (V)	180	180	180	180
Nominal Input Voltage (V)	600	600	600	600
Max. Input Current per MPPT (A)	30	30	30	30
Max. Short Circuit Current per MPPT (A)	37.5	37.5	37.5	37.5
Number of MPP Trackers	3	3	3	3
Number of Strings per MPPT	2	2	2	2
Output				
Nominal Output Power (kW)	25.0	29.9	30.0	36.0 ⁺¹
Nominal Output Apparent Power (kVA)	25.0	29.9	30.0	36.0 ⁺¹
Max. AC Active Power (kW)	27.5 ⁺²	29.9	33.0 ⁺²	36.0
Max. AC Apparent Power (kVA)	27.5 ⁺³	29.9	33.0 ⁺³	36.0
Nominal Output Voltage (V)	400 ⁺⁴ , 3L / N / PE or 3L / PE	400, 3L / N / PE or 3L / PE	400 ⁺⁴ , 3L / N / PE or 3L / PE	
Nominal AC Grid Frequency (Hz)	50 / 60	50 / 60	50 / 60	50 / 60
Max. Output Current (A)	40.0	43.3	48.0	53.3
Power Factor	~1 (Adjustable from 0.8 leading to 0.8 lagging)			
Max. Total Harmonic Distortion	<3%	<3%	<3%	<3%
Efficiency				
Max. Efficiency	98.7%	98.8%	98.8%	98.8%
European Efficiency	98.4%	98.5%	98.5%	98.5%
Protection				
PV String Current Monitoring	Integrated	Integrated	Integrated	Integrated
PV Insulation Resistance Detection	Integrated	Integrated	Integrated	Integrated
Residual Current Monitoring	Integrated	Integrated	Integrated	Integrated
PV Reverse Polarity Protection	Integrated	Integrated	Integrated	Integrated
Anti-islanding Protection	Integrated	Integrated	Integrated	Integrated
AC Overcurrent Protection	Integrated	Integrated	Integrated	Integrated
AC Short Circuit Protection	Integrated	Integrated	Integrated	Integrated
AC Overvoltage Protection	Integrated	Integrated	Integrated	Integrated
DC Switch	Integrated	Integrated	Integrated	Integrated
DC Surge Protection	Type III (Type II Optional)			
AC Surge Protection	Type III (Type II Optional)			
AFCI	Optional	Optional	Optional	Optional
Remote Shutdown	Optional	Optional	Optional	Optional
PID Recovery	Optional	Optional	Optional	Optional
General Data				
Operating Temperature Range (°C)	-30 ~ +60	-30 ~ +60	-30 ~ +60	-30 ~ +60
Relative Humidity	0 ~ 100%	0 ~ 100%	0 ~ 100%	0 ~ 100%
Max. Operating Altitude (m)	3000	3000	3000	3000
Cooling Method	Smart Fan Cooling	Smart Fan Cooling	Smart Fan Cooling	Smart Fan Cooling
User Interface	LED, LCD (Optional), WLAN + APP			
Communication	RS485, WiFi or 4G or PLC(Optional) ⁺⁵			
Communication Protocols	Modbus-RTU (SunSpec Compliant)			
Weight (kg)	40.0	40.0	40.0	40.0
Dimension (W × H × D mm)	480 × 590 × 200	480 × 590 × 200	480 × 590 × 200	480 × 590 × 200
Topology	Non-isolated	Non-isolated	Non-isolated	Non-isolated
Self-consumption at Night (W)	<1	<1	<1	<1
Ingress Protection Rating	IP65	IP65	IP65	IP65
DC Connector	MC4 (Max.6mm ²)	MC4 (Max.6mm ²)	MC4 (Max.6mm ²)	MC4 (Max.6mm ²)
AC Connector	OT / DT Terminal (Max.25mm ²)			

*1: 33kW for Italy, 36kW for other country.

*2: For Belgium and Brazil Max. AC Active Power (kW): GW25K-MT is 25; GW30K-MT is 30.

*3: For Belgium and Brazil Max. AC Apparent Power (kVA): GW25K-MT is 25; GW30K-MT is 30.

*4: For Brazil Nominal Output Voltage is 380V, 3L / N / PE or 3L / PE.

*5: For Brazil Communication is RS485, WiFi, USB, PLC (Optional).

*: Optional functions or devices are purchased separately.

*: Please visit GoodWe website for the latest certificates.

GOODWE

MT Series

50-80kW | Three Phase | 4 MPPTs

The second generation of GoodWe MT Series inverter is suited for medium and large scale commercial rooftops and ground-mounted solar PV systems where maximum versatility and profitability are important. With its compact design and power boost function, the Goodwe MT series of the new generation can provide a 150% continuous maximum AC output power overload, offering a faster return on investment. The start-up voltage is 200V, much lower than other products, which makes the inverter start up earlier, therefore generating more power over time.



Up to 150% DC input oversizing



String level monitoring



Up to 115% AC output overloading



Full-load running at 50°C



Up to 99% Max. Efficiency



Power line communication

1077

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ATTESTATION of Conformity

Certificate No.: 2288AP030176001

Equipment: Grid-connected PV Inverter

Brand Name:



Test Model No.: GW50KBF-MT, GW60KBF-MT

Applicant: GoodWe Technologies Co., Ltd.

No.90 ZiJin Rd., New District, Suzhou, 215011,China

Report No.:

**PV2203WDG0176-1, PV2203WDG0176-2,
ZEM-19MA2560FCSH-1-R1, ZEM-19MA2560FCSH-3-R1,
ZEM-19MA2560FCSH-5-R1**

Use in accordance with regulations:

The inverters are tested for functional safety, grid protection, specified environmental influences and efficiency. For detailed information, please watch the corresponding test reports.

Applied rules and standards

IEC 60068-2-1:2007	Environmental testing – Part 2-1: Tests – Test A: Cold
IEC 60068-2-2:2007	Environmental testing – Part 2-2: Tests – Test B: Dry heat
IEC 60068-2-14:2009	Environmental testing – Part 2-14: Tests – Test N: Change of temperature
IEC 60068-2-30:2005	Environmental testing – Part 2-30: Tests –Test Db and guidance: Damp heat, cyclic (12 + 12-hour cycle)
IEC 60068-2-64:2008	Environmental testing – Part 2-64: Tests –Test Fh: Vibration, broadband random and guidance
IEC 61683:1999	Photovoltaic systems – Power conditioners – Procedure for measuring efficiency
EN 50530:2010	Overall efficiency of grid connected photovoltaic inverters
IEC 61727:2004	Characteristics of the utility interface
IEC 62116:2014	Islanding prevention measures for utility-interconnected photovoltaic inverters

Name: Ken Chan
Manager/ New Energy Team
Date: 2022-04-15

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Bureau Veritas Shenzhen Co., Ltd. Dongguan Branch.

Information given in this document is related to the tested specimen of the described electrical sample.



Certificate of Conformity

Certificate No.: 1988AP0628N093001

Equipment: Grid-connected PV Inverter

Brand Name:



Test Model No.: GW50KN-MT, GW60KN-MT, GW70KHV-MT, GW80KHV-MT, GW80K-MT

Applicant: Jiangsu GoodWe Power Supply Technology Co., Ltd.

No.90 ZiJin Rd., New District, Suzhou,215011,China

Report No.:

ZEM-19MA2560FCSHP-1, ZEM-19MA2560FCSHP-2,
ZEM-19MA2560FCSHP-3, ZEM-19MA2560FCSHP-4,
ZEM-19MA2560FCSHP-5, 50190447 001, 50190444 001,
PV190628N093-4, PV190628N093-5

Use in accordance with regulations:

The inverters are tested for functional safety, grid protection, specified environmental influences and efficiency. For detailed information, please watch the corresponding test reports.

Applied rules and standards

IEC 60068-2-1:2007	Environmental testing – Part 2-1: Tests – Test A: Cold
IEC 60068-2-2:2007	Environmental testing – Part 2-2: Tests – Test B: Dry heat
IEC 60068-2-14:2009	Environmental testing – Part 2-14: Tests – Test N: Change of temperature
IEC 60068-2-30:2005	Environmental testing – Part 2-30: Tests –Test Db and guidance: Damp heat, cyclic (12 + 12-hour cycle)
IEC 60068-2-64:2008	Environmental testing – Part 2-64: Tests –Test Fh: Vibration, broadband random and guidance
IEC 61683:1999	Photovoltaic systems – Power conditioners – Procedure for measuring efficiency
EN 50530:2010	Overall efficiency of grid connected photovoltaic inverters
IEC 61727:2004	Characteristics of the utility interface
IEC 62116:2014	Islanding prevention measures for utility-interconnected photovoltaic inverters

Name: James Huang

Technical Manager/ New Energy Team

Date: 2019-11-26

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Bureau Veritas Shenzhen Co., Ltd. Dongguan Branch.

Information given in this document is related to the tested specimen of the described electrical sample.

TÜV Rheinland (China) Ltd.
Member of TÜV Rheinland Group



JIANGSU GOODWE POWER SUPPLY
TECHNOLOGY CO., LTD.
Xie Jing
Technic Support Dept.
NO. 189 Kun Lun Shan Road
Suzhou New District
Jiangsu 215163
P. R. China

Date : 19/10/2018
Our ref. : DJW 01
Your ref.: Jing Xie

Ref : AK Certificate of Conformity

Type of Equipment : Grid-connected PV Inverter
Model Designation : See Certificate
Certificate No. : AK 50420741 0001
Report No. : 50190444 001

Dear Xie Jing,

We herewith confirm that a sample of the above mentioned technical equipment has been tested and was found to be in accordance with the relevant requirements.

Enclosed please find your Certificate of Conformity.

We appreciate your kind support and would like to offer our assistance and continuous services in the future.

With kind regards,

Certification Body



Weichun Li

Enclosure

证书的详细资料请登陆www.certipedia.com查阅,或拨打我司客服热线800 999 3668 / 400 883 1300咨询

TÜV Rheinland (China) Ltd.
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北京市朝阳区东三环中路乙10号
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1081100022

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Fax: (8610)6566 6667
e-mail: info@bj.chn.tuv.com
Internet: <http://www.chn.tuv.com>

C E R T I F I C A T E

of Conformity



Registration No.: AK 50420741 0001

Report No.: 50190444 001

Holder: JIANGSU GOODWE POWER SUPPLY
TECHNOLOGY CO., LTD.
NO. 189 Kun Lun Shan Road
Suzhou New District
Jiangsu 215163
P. R. China

Product: PV-Inverter
(Grid-connected PV Inverter)

Identification:

Type Designation	: GW50K-MT	GW60K-MT	GW50KN-MT
	GW60KN-MT	GW50KBF-MT	GW60KBF-MT
	GW70KHV-MT	GW80KHV-MT	GW75KBF-MT
	GW80KBF-MT		
Serial Number	: Engineering Samples		
Firmware Version	: V1.06.06		
Remark	: Refer to test report 50190444 001 for details.		

Tested acc. to: IEC 61727:2004
IEC 62116:2014

The certificate of conformity refers to the above mentioned product. This is to certify that the specimen is in conformity with the assessment requirement mentioned above. This certificate does not imply assessment of the production of the product and does not permit the use of a TÜV Rheinland mark of conformity.

Certification Body



Date 19.10.2018

Weichun Li
Weichun Li

TÜV Rheinland LGA Products GmbH - Tillystraße 2 - 90431 Nürnberg

TÜV Rheinland (China) Ltd.
Member of TÜV Rheinland Group



JIANGSU GOODWE POWER SUPPLY
TECHNOLOGY CO., LTD.
Xie Jing
Technic Support Dept.
NO. 189 Kun Lun Shan Road
Suzhou New District
Jiangsu 215163
P. R. China

Date : 19/10/2018
Our ref. : DJW 01
Your ref.: Jing Xie

Ref : AK Certificate of Conformity

Type of Equipment : Grid-connected PV Inverter
Model Designation : See Certificate
Certificate No. : AK 50420752 0001
Report No. : 50190447 001

Dear Xie Jing,

We herewith confirm that a sample of the above mentioned technical equipment has been tested and was found to be in accordance with the relevant requirements.

Enclosed please find your Certificate of Conformity.

We appreciate your kind support and would like to offer our assistance and continuous services in the future.

With kind regards,

Certification Body


Weichun Li

Enclosure

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e-mail: info@bj.chn.tuv.com
Internet: <http://www.chn.tuv.com>

C E R T I F I C A T E

of Conformity



Registration No.: AK 50420752 0001

Report No.: 50190447 001

Holder: JIANGSU GOODWE POWER SUPPLY
TECHNOLOGY CO., LTD.
NO. 189 Kun Lun Shan Road
Suzhou New District
Jiangsu 215163
P. R. China

Product: PV-Inverter
(Grid-connected PV Inverter)

Identification: Type Designation : GW70KHV-MT GW80KHV-MT
Serial Number : Engineering Samples
Remark : Refer to test report 50190447 001
for details.

Tested acc. to: EN 50530:2010+A1
IEC 61683:1999
IEC 60068-2-1:2007
IEC 60068-2-2:2007
IEC 60068-2-14:2009
IEC 60068-2-30:2005
IEC 60068-2-64:2008

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Date 19.10.2018

Weichun Li

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TÜV Rheinland (China) Ltd.
Member of TÜV Rheinland Group



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TECHNOLOGY CO., LTD.
Xie Jing
Technic Support Dept.
NO. 189 Kun Lun Shan Road
Suzhou New District
Jiangsu 215163
P. R. China

Date : 19/10/2018
Our ref. : DJW 01
Your ref.: Jing Xie

Ref : AK Certificate of Conformity

Type of Equipment : Grid-connected PV Inverter
Model Designation : See Certificate
Certificate No. : AK 50420752 0001
Report No. : 50190447 001

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e-mail: info@bj.chn.tuv.com
Internet: <http://www.chn.tuv.com>

C E R T I F I C A T E

of Conformity



Registration No.: AK 50420752 0001

Report No.: 50190447 001

Holder: JIANGSU GOODWE POWER SUPPLY
TECHNOLOGY CO., LTD.
NO. 189 Kun Lun Shan Road
Suzhou New District
Jiangsu 215163
P. R. China

Product: PV-Inverter
(Grid-connected PV Inverter)

Identification:

Type Designation	: GW70KHV-MT GW80KHV-MT
Serial Number	: Engineering Samples
Remark	: Refer to test report 50190447 001 for details.

Tested acc. to:

EN 50530:2010+A1
IEC 61683:1999
IEC 60068-2-1:2007
IEC 60068-2-2:2007
IEC 60068-2-14:2009
IEC 60068-2-30:2005
IEC 60068-2-64:2008

The certificate of conformity refers to the above mentioned product. This is to certify that the specimen is in conformity with the assessment requirement mentioned above. This certificate does not imply assessment of the production of the product and does not permit the use of a TÜV Rheinland mark of conformity.



Date 19.10.2018

Weichun Li

TÜV Rheinland LGA Products GmbH - Tillystraße 2 - 90431 Nürnberg

TÜV Rheinland (China) Ltd.
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P. R. China

Date : 19/10/2018
Our ref. : DJW 01
Your ref.: Jing Xie

Ref : AK Certificate of Conformity

Type of Equipment : Grid-connected PV Inverter
Model Designation : See Certificate
Certificate No. : AK 50420741 0001
Report No. : 50190444 001

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Certification Body



Weichun Li

Enclosure

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Beijing, 100022, P.R.China

Tel: (8610)6566 6660
Fax: (8610)6566 6667
e-mail: info@bj.chn.tuv.com
Internet: <http://www.chn.tuv.com>

C E R T I F I C A T E

of Conformity



Registration No.: AK 50420741 0001

Report No.: 50190444 001

Holder: JIANGSU GOODWE POWER SUPPLY
TECHNOLOGY CO., LTD.
NO. 189 Kun Lun Shan Road
Suzhou New District
Jiangsu 215163
P. R. China

Product: PV-Inverter
(Grid-connected PV Inverter)

Identification:

Type Designation	:	GW50K-MT	GW60K-MT	GW50KN-MT
		GW60KN-MT	GW50KBF-MT	GW60KBF-MT
		GW70KHV-MT	GW80KHV-MT	GW75KBF-MT
		GW80KBF-MT		
Serial Number	:	Engineering Samples		
Firmware Version	:	V1.06.06		
Remark	:	Refer to test report 50190444 001 for details.		

Tested acc. to: IEC 61727:2004
IEC 62116:2014

The certificate of conformity refers to the above mentioned product. This is to certify that the specimen is in conformity with the assessment requirement mentioned above. This certificate does not imply assessment of the production of the product and does not permit the use of a TÜV Rheinland mark of conformity.

Certification Body



Date 19.10.2018

Weichun Li
Weichun Li

TÜV Rheinland LGA Products GmbH - Tillystraße 2 - 90431 Nürnberg



Certificate of Conformity

Certificate No.: 1988AP0628N093001

Equipment: Grid-connected PV Inverter

Brand Name:



Test Model No.: GW50KN-MT, GW60KN-MT, GW70KHV-MT, GW80KHV-MT, GW80K-MT

Applicant: Jiangsu GoodWe Power Supply Technology Co., Ltd.

No.90 ZiJin Rd., New District, Suzhou,215011,China

Report No.:

ZEM-19MA2560FCSHP-1, ZEM-19MA2560FCSHP-2,
ZEM-19MA2560FCSHP-3, ZEM-19MA2560FCSHP-4,
ZEM-19MA2560FCSHP-5, 50190447 001, 50190444 001,
PV190628N093-4, PV190628N093-5

Use in accordance with regulations:

The inverters are tested for functional safety, grid protection, specified environmental influences and efficiency. For detailed information, please watch the corresponding test reports.

Applied rules and standards

IEC 60068-2-1:2007	Environmental testing – Part 2-1: Tests – Test A: Cold
IEC 60068-2-2:2007	Environmental testing – Part 2-2: Tests – Test B: Dry heat
IEC 60068-2-14:2009	Environmental testing – Part 2-14: Tests – Test N: Change of temperature
IEC 60068-2-30:2005	Environmental testing – Part 2-30: Tests –Test Db and guidance: Damp heat, cyclic (12 + 12-hour cycle)
IEC 60068-2-64:2008	Environmental testing – Part 2-64: Tests –Test Fh: Vibration, broadband random and guidance
IEC 61683:1999	Photovoltaic systems – Power conditioners – Procedure for measuring efficiency
EN 50530:2010	Overall efficiency of grid connected photovoltaic inverters
IEC 61727:2004	Characteristics of the utility interface
IEC 62116:2014	Islanding prevention measures for utility-interconnected photovoltaic inverters

Name: James Huang

Technical Manager/ New Energy Team

Date: 2019-11-26

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Bureau Veritas Shenzhen Co., Ltd. Dongguan Branch.

Information given in this document is related to the tested specimen of the described electrical sample.

HT Series Datasheet



Technical Data	GW100K-HT	GW110K-HT	GW120K-HT	GW136K-HTH
PV String Input Data				
Max. DC Input Power (kW)	150	165	180	205
Max. DC Input Voltage (V)	1100	1100	1100	1100
MPPT Range (V)	180~1000	180~1000	180~1000	180~1000
Min. Start-up Voltage (V)	200	200	200	200
Nominal DC Input Voltage (V)	600	600	600	750
Max. Input Current (A)	10*30A	12*30A	12*30A	12*30A
Max. Short Current (A)	10*45A	12*45A	12*45A	12*45A
No. of MPP Trackers	10	12	12	12
No. of Input Strings per Tracker	2	2	2	2
AC Output Data				
Nominal Output Power (kW)	100	110	120	136
Max. Output Power (kW)	110	121	132	150
Max. Output Apparent Power (kVA)	110	121	132	150
Nominal Output Voltage (V)	400, 3L/N/PE or 3L/PE	400, 3L/N/PE or 3L/PE	400, 3L/N/PE or 3L/PE	500V, 3L/PE
Nominal Output Frequency (Hz)	50/60	50/60	50/60	50/60
Max. Output Current (A)	167	175.5	191.3	173.2A
Output Power Factor	~1 (Adjustable from 0.8 leading to 0.8 lagging)			
Output THDi (@Nominal Output)	<3%	<3%	<3%	<3%
Efficiency				
Max. Efficiency	98.6%	98.6%	98.6%	99.0%
European Efficiency	98.3%	98.3%	98.3%	98.5%
Protection				
PV String Current Monitoring	Integrated	Integrated	Integrated	Integrated
Internal Humidity Detection	Integrated	Integrated	Integrated	Integrated
Insulation Resistor Detection	Integrated	Integrated	Integrated	Integrated
Residual Current Monitoring	Integrated	Integrated	Integrated	Integrated
Anti-islanding Protection	Integrated	Integrated	Integrated	Integrated
Input Reverse Polarity Protection	Integrated	Integrated	Integrated	Integrated
DC SPD Protection	Type II (Type I optional)			
AC SPD Protection	Type II (Type I optional)			
Output Over Current Protection	Integrated	Integrated	Integrated	Integrated
Output Short Protection	Integrated	Integrated	Integrated	Integrated
Output Over Voltage Protection	Integrated	Integrated	Integrated	Integrated
Arc Fault Protection	Optional	Optional	Optional	Optional
Emergency Power off	Optional	Optional	Optional	Optional
AC Terminal Over-temperature Protection	Optional	Optional	Optional	Optional
PID Recovery	Optional	Optional	Optional	Optional
General Data				
Operating Temperature Range (°C)	-30~60	-30~60	-30~60	-30~60
Relative Humidity	0~100%	0~100%	0~100%	0~100%
Operating Altitude (m)	≤4000	≤4000	≤4000	≤4000
Cooling	Fan Cooling	Fan Cooling	Fan Cooling	Fan Cooling
Display	LED(Standard), LCD(Optional), Bluetooth+APP			
Communication	RS485 or PLC or WiFi	RS485 or PLC or WiFi	RS485 or PLC or WiFi	RS485 or PLC or WiFi
Weight (kg)	93.5	98.5	98.5	98.5
Dimension (Width*Height*Depth mm)	1005*676*340	1005*676*340	1005*676*340	1005*676*340
Protection Degree	IP66	IP66	IP66	IP66
Night Self Consumption (W)	<2	<2	<2	<2
Topology	Transformerless			

*: Please visit GoodWe website for the latest certificates.

C E R T I F I C A T E

of Conformity



Registration No.: AK 50487261 0001

Report No.: CN206GIC 001

Holder: JIANGSU GOODWE POWER SUPPLY
TECHNOLOGY CO., LTD.
No.90 Zijin Rd.,
New District, Suzhou
215011 Jiangsu
P.R. China

Product: PV-Inverter
(Grid-connected PV Inverter)

Identification: Type Designation: GW100K-HT GW110K-HT GW120K-HT GW136K-HT
Serial Number : Engineering Samples
Remark : Refer to test report CN206GIC 001
for details.

Tested acc. to: EN 50530:2010+A1
IEC 61683:1999
IEC 60068-2-1:2007
IEC 60068-2-2:2007
IEC 60068-2-14:2009
IEC 60068-2-30:2005
IEC 60068-2-64:2008

The certificate of conformity refers to the above mentioned product. This is to certify that the specimen is in conformity with the assessment requirement mentioned above. This certificate does not imply assessment of the production of the product and does not permit the use of a TÜV Rheinland mark of conformity.



Date 20.11.2020

Weichun Li

TÜV Rheinland LGA Products GmbH - Tillystraße 2 - 90431 Nürnberg

TÜV Rheinland (China) Ltd.
Member of TÜV Rheinland Group



JIANGSU GOODWE POWER SUPPLY
TECHNOLOGY CO., LTD.
Mr. Jiang Tao

Date : 20.11.2020
Our ref. : DJW 01
Your ref.: Jiang Tao

No.90 Zijin Rd.,
New District, Suzhou
215011 Jiangsu
P.R. China

Ref : AK Certificate of Conformity

Type of Equipment : Grid-connected PV Inverter
Model Designation : See Certificate
Certificate No. : AK 50487261 0001
Report No. : CN206GIC 001

Dear Mr. Jiang Tao,

We herewith confirm that a sample of the above mentioned technical equipment has been tested and was found to be in accordance with the relevant requirements.

Enclosed please find your Certificate of Conformity.

We appreciate your kind support and would like to offer our assistance and continuous services in the future.

With kind regards,

Certification Body



Weichun Li

Enclosure

证书的详细信息请登陆www.certipedia.com查阅,或拨打我司客服热线800 999 3668 / 400 883 1300咨询

TÜV Rheinland (China) Ltd.
莱茵检测认证服务(中国)有限公司

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邮编: 100022

Tel: (8610)6566 6660
Fax: (8610)6566 6667
e-mail: info@bj.chn.tuv.com
Internet: <http://www.chn.tuv.com>

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Product Service

Compliance Document

No. D 083373 0069 Rev. 00

Holder of Certificate: **JIANGSU GOODWE POWER SUPPLY TECHNOLOGY CO., LTD.**

No. 90 Zijin Road
New District
215011 Suzhou
PEOPLE'S REPUBLIC OF CHINA

Product: **Converter**
Grid-Tied PV Inverter

This Compliance document confirms the compliance with the listed standards on a voluntary basis. It refers only to the sample submitted for testing and certification and does not certify the quality or safety of the serial products. For details see: www.tuvsud.com/ps-cert

Test report no.: 704092001906-00

Date, 2021-01-13

(Zhengdong Ma)

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Compliance Document

No. D 083373 0069 Rev. 00

Model(s): GW225K-HT, GW250K-HT

Parameters:

Model	GW225K-HT	GW250K-HT
Max. Input Voltage	1500Vd.c.	1500Vd.c.
Rated Input Voltage	500-1500V	500-1500V
Max. Input Current	12x30A	12x30A
Isc PV	12x50A	12x50A
Rated Output Voltage	3L/PE~ 800Va.c.	3L/PE~ 800Va.c.
Rated Output Frequency	50 Hz	50 Hz
Max. Output Current	a.c. 178,7A	a.c. 180,5A
Rated Output Power	225 kW	250 kW
Max. Apparent Power	247,5 kVA	250 kVA
Safety Class	I	I
Overvoltage Category	III(AC), II(DC)	III(AC), II(DC)
Enclosure	IP66	IP66
Operating ambient temperature range	-30°C ...+60°C	-30°C ...+60°C

Tested according to:

IEC 60068-2-1:2007
IEC 60068-2-2:2007
IEC 60068-2-14:2009
IEC 60068-2-30:2005
IEC 60068-2-64:2008/AMD1:2019
IEC 61683:1999
EN 50530:2010/A1:2013

C E R T I F I C A T E

of Conformity



Registration No.: AK 50487186 0001

Report No.: CN201MNG 001

Holder: JIANGSU GOODWE POWER SUPPLY
TECHNOLOGY CO., LTD.
No.90 Zijin Rd.,
New District, Suzhou
215011 Jiangsu
P.R. China

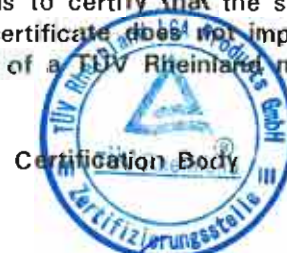
Product: PV-Inverter
(Grid-connected PV Inverter)

Identification:

Type Designation	: GW73KLV-HT	GW100K-HT	GW110K-HT
		GW120K-HT	GW136K-HTH
Serial Number	: Engineering Samples		
Firmware Version	: V1.01.01		
Remark	: Refer to test report CN201MNG 001 for details.		

Tested acc. to: IEC 61727:2004
IEC 62116:2014

The certificate of conformity refers to the above mentioned product. This is to certify that the specimen is in conformity with the assessment requirement mentioned above. This certificate does not imply assessment of the production of the product and does not permit the use of a TÜV Rheinland mark of conformity.



Date 20.11.2020

Weichun Li

TÜV Rheinland LGA Products GmbH - Tillystraße 2 - 90431 Nürnberg

TÜV Rheinland (China) Ltd.
Member of TÜV Rheinland Group



JIANGSU GOODWE POWER SUPPLY
TECHNOLOGY CO., LTD.
Mr. Jiang Tao

Date : 20.11.2020
Our ref. : DJW 01
Your ref.: Jiang Tao

No.90 Zijin Rd.,
New District, Suzhou
215011 Jiangsu
P.R. China

Ref : AK Certificate of Conformity

Type of Equipment : Grid-connected PV Inverter
Model Designation : See Certificate
Certificate No. : AK 50487186 0001
Report No. : CN201MNG 001

Dear Mr. Jiang Tao,

We herewith confirm that a sample of the above mentioned technical equipment has been tested and was found to be in accordance with the relevant requirements.

Enclosed please find your Certificate of Conformity.

We appreciate your kind support and would like to offer our assistance and continuous services in the future.

With kind regards,

Certification Body


Weichun Li

Enclosure

证书的详细资料请登陆www.certipedia.com查阅.或拨打我司客服热线800 999 3668 / 400 883 1300咨询

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Internet: <http://www.chn.tuv.com>

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GOODWE

HT Series | 1100Vdc

73-136kW | Up to 12 MPPTs Three Phase

The HT 1100 Vdc Series 73-136kW is GoodWe's new string inverter for C&I and small utility projects to boost your power and profit. Generate your solar power and make use of it with this centerpiece of the clean energy system. The HT Series seamlessly incorporates its technical strengths designed to achieve higher savings in the installation, enhance productivity with increased energy yields, realize high power density and diversify available monitoring options. It takes safety to the top possible level in accordance with the strictest industry standards and runs efficiently even under the harshest environmental conditions. This unrivalled set of features was conceived to ensure the lowest levelized cost of electricity (LCOE) to offer this ideal choice for commercial and industrial PV systems.



Smart Control & Monitoring

- String Level Monitoring
- Dynamic power export limit



Optimal Generation for Higher Return

- Full load running at 45°C
- Up to 12 MPPTs



Superb Safety & Reliability

- IP66 and C5 protection
- Optional Type I Surge Protection & AFCI¹



Friendly & Thoughtful Design

- Easy and quick configuration via Bluetooth
- Power line communication

Technical Data		GW73KLV-HT	GW75K-HT	GW80K-HT	GW100K-HT	GW110K-HT	GW120K-HT	GW136K-HTH	
Input									
Max. Input Voltage (V)	800	1100	1100	1100	1100	1100	1100	1100	
MPPT Operating Voltage Range (V)	180 ~ 650	180 ~ 1000	180 ~ 1000	180 ~ 1000	180 ~ 1000	180 ~ 1000	180 ~ 1000	180 ~ 1000	
Start-up Voltage (V)	200								
Nominal Input Voltage (V)	370	600	600	600	600	600	600	750	
Max. Input Current per MPPT (A)	30								
Max. Short Circuit Current per MPPT (A)	45								
Number of MPP Trackers	12	10	10	10	12	12	12	12	
Number of Strings per MPPT	2								
Output									
Nominal Output Power (kW)	73	75	80	100 ^{*1}	110	120	120	136	
Nominal Output Apparent Power (kVA)	73	75	80	100 ^{*1}	110	120	120	136	
Max. AC Active Power (kW)	69@208V; 73@220V; 75@240V	75	88	110 ^{*1*3}	121 ^{*3}	132 ^{*3}	132 ^{*3}	150 ^{*3}	
Max. AC Apparent Power (kVA)	75	75	88	110 ^{*1*4}	121 ^{*4}	132 ^{*4}	132 ^{*4}	150 ^{*4}	
Nominal Output Voltage (V)	220V, 3L / N / PE or 3L / PE	380V / 400V, 3L / N / PE or 3L / PE ^{*2}		400V, 3L / N / PE or 3L / PE ^{*2}				500V, 3L / PE	
Nominal AC Grid Frequency (Hz)	50 / 60								
AC Grid Frequency Range (Hz)	45 ~ 55 / 55 ~ 65								
Max. Output Current (A)	192.0	125.3	134.0	167.0	175.5	191.3	191.3	173.2	
Power Factor	~ 1 (Adjustable from 0.8 leading to 0.8 lagging)								
Max. Total Harmonic Distortion	<3%								
Efficiency									
Max. Efficiency	98.4%	98.6%	98.6%	98.6%	98.6%	98.6%	98.6%	99.0%	
European Efficiency	98.1%	98.3%	98.3%	98.3%	98.3%	98.3%	98.3%	98.5%	
Protection									
PV String Current Monitoring				Integrated					
PV Insulation Resistance Detection				Integrated					
Residual Current Monitoring				Integrated					
PV Reverse Polarity Protection				Integrated					
Anti-islanding Protection				Integrated					
AC Overcurrent Protection				Integrated					
AC Short Circuit Protection				Integrated					
AC Overvoltage Protection				Integrated					
DC Switch				Integrated					
DC Surge Protection				Type II (Type I optional)					
AC Surge Protection				Type II (Type I optional)					
AFCI				Optional					
Remote Shutdown				Optional					
PID Recovery				Optional					
General Data									
Operating Temperature Range (°C)				-30 ~ +60					
Relative Humidity				0 ~ 100%					
Max. Operating Altitude (m)				5000 (>4000 derating)					
Cooling Method				Smart Fan Cooling					
User Interface				LED, LCD (Optional), WLAN + APP					
Communication			RS485, WiFi or 4G (Optional)						RS485, WiFi or 4G or PLC (Optional)
Communication Protocols				Modbus-RTU (SunSpec Compliant)					
Weight (kg)	98.5	93.5	93.5	93.5	98.5	98.5	98.5	98.5	
Dimension (W × H × D mm)	1008 × 678 × 343								
Topology	Non-isolated								
Self-consumption at Night (W)	<2								
Ingress Protection Rating	IP66								
DC Connector	MC4 (4 ~ 6mm²)								
AC Connector	OT / DT terminal (Max. 300mm²)								

*1: For Australia is 99.99kW / kVA.

*2: For Brazil, Nominal Output Voltage (V): 380, 3L / N / PE or 3L / PE.

*3: For Belgium, Max. AC Active Power (kW): GW100K-HT is 100, GW110K-HT is 110, GW120K-HT is 120, GW136K-HTH is 136.

*4: For Belgium, Max. AC Apparent Power (kVA): GW100K-HT is 100, GW110K-HT is 110, GW120K-HT is 120, GW136K-HTH is 136.

*: Please visit GoodWe website for the latest certificates.

*: All pictures shown are for reference only. Actual appearance may vary.

/ Perfect Welding / Solar Energy / Perfect Charging



FRONIUS TAURO

Direct variant.



System design flexibility



Max. performance up to 50°C



Direct sunlight



Optimizing costs



Active Double Wall Cooling



Power stage replacement

The three-phase Fronius Tauro in the 50 and 100 kW power classes promises maximum performance for decentral systems even under the harshest conditions.

With its smart hardware design, it offers not just BOS cost optimization but unprecedented flexibility in system design. Simple installation and the fastest service on the market ensure maximum yield.

TECHNICAL DATA FRONIUS TAURO

INPUT DATA	TAURO 50-3-D	TAURO ECO 50-3-D	TAURO ECO 99-3-D	TAURO ECO 100-3-D
Number of MPP trackers	3		1	
Max. input current ($I_{dc\ max}$)	134 A	87.5 A		175 A
Max. input current module field (PV1 / PV2 / PV3)	36 / 36 / 72 A	75 / 75 / - A		75 / 75 / 75 A
Max. short circuit current (PV1 / PV2 / PV3)	72 / 72 / 125	125 / 125 / -		125 / 125 / 125
Max. short circuit current ($I_{sc\ max}$, inverter)	240	178		355
DC input voltage range ($U_{dc\ min} - U_{dc\ max}$)	200 - 1000 V		580 - 1000 V	
Feed-in start voltage ($U_{dc\ start}$)	200 V		650 V	
Usable MPP voltage range ($U_{mpp\ min} - U_{mpp\ max}$)	400 - 870 V		580 - 930 V	
Number of DC connections (PV1 / PV2 / PV3)	4 / 3 / 7	7 / 7 / -		7 / 7 / 8
Max. PV generator power ($P_{dc\ max}$)		75 kW _{peak}		150 kW _{peak}

OUTPUT DATA	TAURO 50-3-D	TAURO ECO 50-3-D	TAURO ECO 99-3-D	TAURO ECO 100-3-D
AC nominal output ($P_{ac\ n}$)		50,000 W	99,990 W	100,000 W
Max. output power		50,000 VA	99,990 VA	100,000 VA
AC output current ($I_{ac\ nom}$)		76 A		152 A
Grid connection ($U_{ac\ n}$)		3~ NPE 400/230 V ; 3~ NPE 380/220 V		
Frequency (frequency range $f_{min} - f_{max}$)		50 Hz / 60 Hz (45 - 65 Hz)		
Power factor ($\cos \phi_{ac\ n}$)		0 - 1 ind. / cap.		

GENERAL DATA	TAURO 50-3-D	TAURO ECO 50-3-D	TAURO ECO 99-3-D	TAURO ECO 100-3-D
Dimensions (height x width x depth)		755 x 1109 x 346 mm (without wall mount)		
Weight	92 kg	74 kg		103 kg
Degree of protection		IP 65		
Protection class		1		
Night-time consumption		< 16 W		
Cooling		Active cooling technology and double wall system		
Installation		Indoor and outdoor ¹		
Ambient temperature range		- 40 bis + 65 °C ²		
Certificates and compliance with standards ³		AS/NZS 4777.2:2020, IEC62109-1/-2, VDE-AR-N 4105:2018, IEC62116, EN50549-1:2019 & EN50549-2:2019, VDE-AR-N 4110:2018, CEI 0-16:2019, CEI 0-21:2019		

¹ Direct under the sun is possible

² Optional AC-disconnect mounted inside the inverter: from -30 to +65 °C

³ These are planned certificates. For the current certificates, please see www.fronius.com/tauro-cert

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TECHNICAL DATA FRONIUS TAURO

AC CONNECTION TECHNOLOGY	TAURO 50-3-D	TAURO ECO 50-3-D	TAURO ECO 99-3-D	TAURO ECO 100-3-D
Cable cross section	35 - 240 mm ²		70 - 240 mm ²	
AC conductor material	Al and Cu			
Connection terminals	Cable lug or V clamps			
Single core option (single core cable)	Cable gland: 5 x M40			
Multi core option (multi core cable)	Cable gland: 1 x multi core connection ø 16 - 61.4 mm + 1 x M32			
AC Daisy Chaining option (single core cable)	Cable gland: 10 x M32			

DC CONNECTION TECHNOLOGY	TAURO 50-3-D	TAURO ECO 50-3-D	TAURO ECO 99-3-D	TAURO ECO 100-3-D
Cable cross section	4 - 6 mm ²			
AC conductor material	Cu			
Connection terminals	DC-direct connection Stäubli Multi Contact MC4			

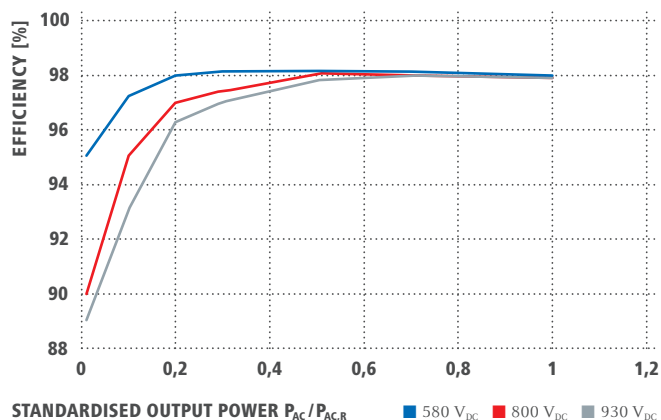
EFFICIENCY	TAURO 50-3-D	TAURO ECO 50-3-D	TAURO ECO 99-3-D	TAURO ECO 100-3-D
Max. efficiency	98.6 %	98.5 %		
European efficiency (ηEU)	98.1 %	98.2 %		
MPP adaptation efficiency	> 99.9 %			

PROTECTION DEVICES	TAURO 50-3-D	TAURO ECO 50-3-D	TAURO ECO 99-3-D	TAURO ECO 100-3-D
DC disconnect	integrated			
Overload behaviour	Operating point shift, power limitation			
Reverse polarity protection	integrated			
RCMU	integrated			
DC insulation measurement	integrated			
DC/AC surge protection	Type 1 + 2 integrated, Type 2 optional			
DC string fusing	integrated, 15 A or 20 A			

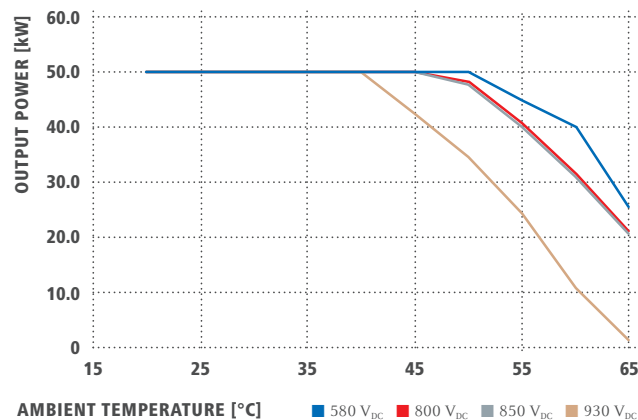
INTERFACES	TAURO 50-3-D	TAURO ECO 50-3-D	TAURO ECO 99-3-D	TAURO ECO 100-3-D
Wi-Fi	Fronius Solar.web, Modbus TCP Sunspec, Fronius Solar API (JSON)			
2x Ethernet LAN RJ45	10/100Mbit; max. 100m Fronius Solar.web, Modbus TCP Sunspec, Fronius Solar API (JSON)			
USB (type A socket)	1A @5V max. ³			
Wired Shutdown (WSD)	Emergency stop			
2x RS485	Modbus RTU SunSpec			
6 digital inputs / 6 digital I/Os	Programmable interface for ripple control receiver, energy management, load control			
Datalogger and Webserver	Integrated			

³ for power supply only

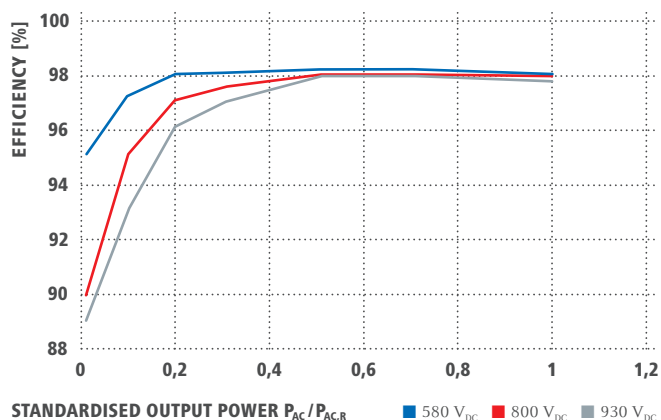
FRONIUS TAURO ECO 50-3-D EFFICIENCY CURVE



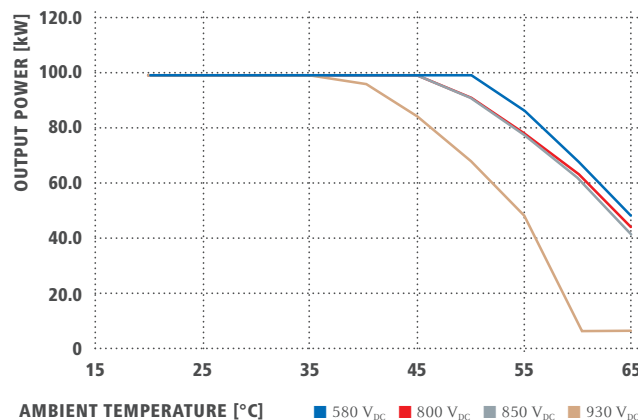
FRONIUS TAURO ECO 50-3-D TEMPERATURE DERATING



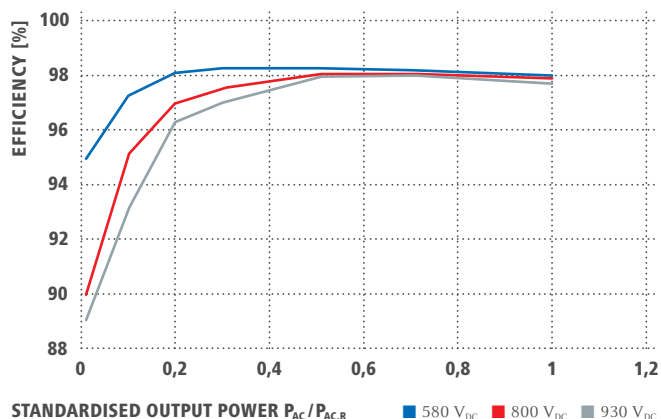
FRONIUS TAURO ECO 99-3-D EFFICIENCY CURVE



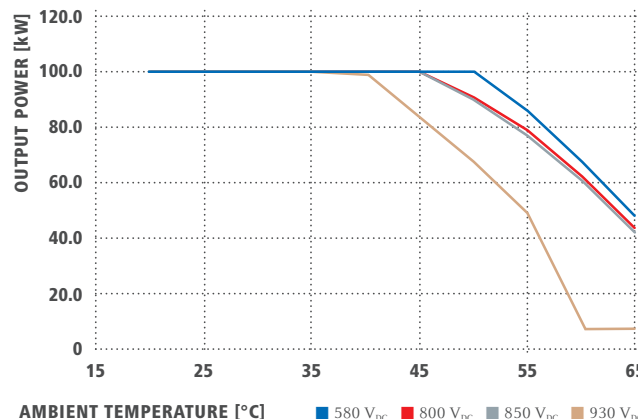
FRONIUS TAURO ECO 99-3-D TEMPERATURE DERATING



FRONIUS TAURO ECO 100-3-D EFFICIENCY CURVE



FRONIUS TAURO ECO 100-3-D TEMPERATURE DERATING



THREE BUSINESS UNITS, ONE GOAL: TO SET THE STANDARD THROUGH TECHNOLOGICAL ADVANCEMENT.

What began in 1945 as a one-man operation now sets technological standards in the fields of welding technology, photovoltaics and battery charging. Today, the company has around 5,440 employees worldwide and 1,264 patents for product development show the innovative spirit within the company. Sustainable development means for us to implement environmentally relevant and social aspects equally with economic factors. Our goal has remained constant throughout: to be the innovation leader.

PERFECT WELDING

Our mission is Perfect Welding; a task we have approached with passion and skill for decades in order that our customers can join materials with the perfect weld seam. With our outstanding technologies and services and together with our customer's applications, not only do we solve their specific welding technology problems, but we also make a substantial contribution to increasing their productivity.

SOLAR ENERGY

Our mission is to achieve 24 hours of sun. Day after day we are hard at work turning this vision of a future in which 100% of the world's energy needs are covered by renewable sources into a reality. We are therefore concentrating on solutions to intelligently, efficiently and economically generate, store, distribute and consume solar energy.

PERFECT CHARGING

As know-how leaders in the world of battery charging, we deliver exceptional solutions to create the maximum benefit for our customers. For the intralogistics sector, we are committed to energy flow optimisation for electric forklift trucks and are constantly striving for the next innovation. Our powerful charging systems for vehicle workshops guarantee safe and reliable processes.

Further information about all Fronius products and our global sales partners and representatives can be found at www.fronius.com

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/ Perfect Welding / Solar Energy / Perfect Charging



FRONIUS PRIMO

/ The communicative inverter for optimised energy management.



/ SnapINverter Technology



/ Integrated data communication



/ SuperFlex Design



/ Dynamic Peak Manager



/ Smart Grid Ready



/ Zero feed-in



/ The Fronius Primo in power categories from 3.0 to 8.2 kW perfectly completes the SnapINverter generation. This single-phase, transformerless device is the ideal inverter for private households. Its innovative SuperFlex Design provides maximum flexibility in system design, while the SnapINverter mounting system makes installation and maintenance easier than ever before. The communication package included as standard, with WLAN, energy management, several interfaces and much more besides, makes the Fronius Primo a communicative inverter for owner-occupiers.

TECHNICAL DATA FRONIUS PRIMO (3.0-1, 3.5-1, 3.6-1, 4.0-1, 4.6-1)

INPUT DATA	PRIMO 3.0-1	PRIMO 3.5-1	PRIMO 3.6-1	PRIMO 4.0-1	PRIMO 4.6-1
Number of MPP trackers	2				
Max. input current ($I_{dc\ max\ 1} / I_{dc\ max\ 2}$)	12.0 A / 12.0 A				
Max. array short circuit current (MPP_1 / MPP_2)	18.0 A / 18.0 A				
DC input voltage range ($U_{dc\ min} - U_{dc\ max}$)	80 - 1,000 V				
Feed-in start voltage ($U_{dc\ start}$)	80 V				
Usable MPP voltage range	80 - 800 V				
Number of DC connections	2 + 2				
Max. PV generator output ($P_{dc\ max}$)	4.5 kW _{peak}	5.3 kW _{peak}	5.5 kW _{peak}	6.0 kW _{peak}	6.9 kW _{peak}

OUTPUT DATA	PRIMO 3.0-1	PRIMO 3.5-1	PRIMO 3.6-1	PRIMO 4.0-1	PRIMO 4.6-1
AC nominal output ($P_{ac,r}$)	3,000 W	3,500 W	3,680 W	4,000 W	4,600 W
Max. output power	3,000 VA	3,500 VA	3,680 VA	4,000 VA	4,600 VA
AC output current ($I_{ac\ nom}$)	13.0 A	15.2 A	16.0 A	17.4 A	20.0 A
Grid connection (voltage range)	1 - NPE 220 V / 230 V (180 V - 270 V)				
Frequency (frequency range)	50 Hz / 60 Hz (45 - 65 Hz)				
Total harmonic distortion	< 5 %				
Power factor ($\cos \varphi_{ac,r}$)	0.85 - 1 ind. / cap.				

TECHNICAL DATA FRONIUS PRIMO (3.0-1, 3.5-1, 3.6-1, 4.0-1, 4.6-1)

GENERAL DATA	PRIMO 3.0-1	PRIMO 3.5-1	PRIMO 3.6-1	PRIMO 4.0-1	PRIMO 4.6-1
Dimensions (height x width x depth)	645 x 431 x 204 mm				
Weight	21.5 kg				
Degree of protection	IP 65				
Protection class	1				
Overvoltage category (DC / AC) ¹⁾	2 / 3				
Night time consumption	< 1 W				
Inverter design	Transformerless				
Cooling	Regulated air cooling				
Installation	Indoor and outdoor installation				
Ambient temperature range	-40 - +55 °C				
Permitted humidity	0 - 100 %				
Max. altitude	4,000 m				
DC connection technology	4x DC+ and 4x DC- screw terminals 2.5 - 16 mm ²				
AC connection technology	3-pole AC screw terminals 2.5 - 16 mm ²				
Certificates and compliance with standards	DIN V VDE 0126-1-1/A1, IEC 62109-1/2, IEC 62116, IEC 61727, AS 4777-2, AS 4777-3, G83/2, G59/3, CEI 0-21, VDE AR N 4105				

EFFICIENCY	PRIMO 3.0-1	PRIMO 3.5-1	PRIMO 3.6-1	PRIMO 4.0-1	PRIMO 4.6-1
Max. efficiency	98.0 %	98.0 %	98.0 %	98.1 %	98.1 %
European efficiency (η_{EU})	96.1 %	96.8 %	96.8 %	97.0 %	97.0 %
MPP adaptation efficiency	> 99.9 %				

PROTECTIVE DEVICES	PRIMO 3.0-1	PRIMO 3.5-1	PRIMO 3.6-1	PRIMO 4.0-1	PRIMO 4.6-1
DC insulation measurement	Yes				
Overload behaviour	Operating point shift. Power limitation				
DC disconnecter	Yes				
Reverse polarity protection	Yes				

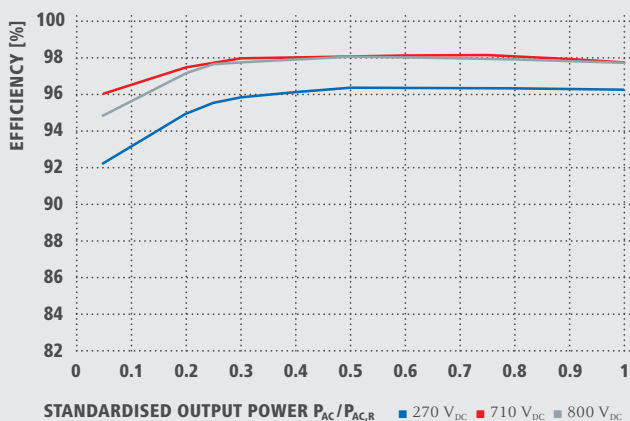
INTERFACES	PRIMO 3.0-1	PRIMO 3.5-1	PRIMO 3.6-1	PRIMO 4.0-1	PRIMO 4.6-1
WLAN / Ethernet LAN	Fronius Solar.web, Modbus TCP SunSpec, Fronius Solar API (JSON)				
6 inputs and 4 digital in/out	Interface to ripple control receiver				
USB (A socket) ²⁾	Datalogging, inverter update via USB flash drive				
2x RS422 (RJ45 socket) ²⁾	Fronius Solar Net				
Signalling output ²⁾	Energy management (potential-free relay output)				
Datalogger and Webserver	Included				
External input ²⁾	S0-Meter Interface / Input for overvoltage protection				
RS485	Modbus RTU SunSpec or meter connection				

¹⁾ According to IEC 62109-1.

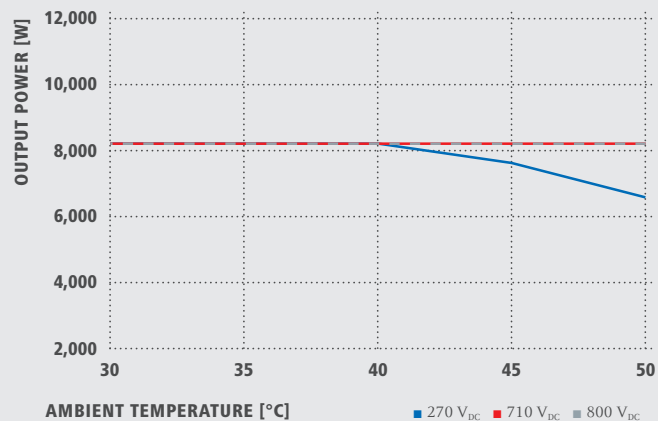
²⁾ Also available in the light version.

Further information regarding the availability of the inverters in your country can be found at www.fronius.com.

FRONIUS PRIMO 8.2-1 EFFICIENCY CURVE



FRONIUS PRIMO 8.2-1 TEMPERATURE DERATING



TECHNICAL DATA FRONIUS PRIMO (5.0-1, 5.0-1 AUS, 6.0-1, 8.2-1)

INPUT DATA	PRIMO 5.0-1	PRIMO 5.0-1 AUS	PRIMO 6.0-1	PRIMO 8.2-1
Number of MPP trackers	2			
Max. input current ($I_{dc\ max\ 1} / I_{dc\ max\ 2}$)	12.0 A / 12.0 A	18.0 A / 18.0 A		
Max. array short circuit current (MPP ₁ /MPP ₂)	18.0 A / 18.0 A	27.0 A / 27.0 A		
DC input voltage range ($U_{dc\ min} - U_{dc\ max}$)	80 - 1,000 V			
Feed-in start voltage ($U_{dc\ start}$)	80 V			
Usable MPP voltage range	80 - 800 V			
Number of DC connections	2 + 2			
Max. PV generator output ($P_{dc\ max}$)	7.5 kW _{peak}	7.5 kW _{peak}	9.0 kW _{peak}	12.3 kW _{peak}

OUTPUT DATA	PRIMO 5.0-1	PRIMO 5.0-1 AUS	PRIMO 6.0-1	PRIMO 8.2-1
AC nominal output ($P_{ac,r}$)	5,000 W	4,600 W	6,000 W	8,200 W
Max. output power	5,000 VA	5,000 VA	6,000 VA	8,200 VA
AC output current ($I_{ac\ nom}$)	21.7 A	21.7 A	26.1 A	35.7 A
Grid connection (voltage range)	1 - NPE 220 V / 230 V (180 V - 270 V)			
Frequency (frequency range)	50 Hz / 60 Hz (45 - 65 Hz)			
Total harmonic distortion	< 5 %			
Power factor ($\cos \varphi_{ac,r}$)	0.85 - 1 ind. / cap.			

GENERAL DATA	PRIMO 5.0-1	PRIMO 5.0-1 AUS	PRIMO 6.0-1	PRIMO 8.2-1
Dimensions (height x width x depth)	645 x 431 x 204 mm			
Weight	21.5 kg			
Degree of protection	IP 65			
Protection class	1			
Overvoltage category (DC / AC) ¹⁾	2 / 3			
Night time consumption	< 1 W			
Inverter design	Transformerless			
Cooling	Regulated air cooling			
Installation	Indoor and outdoor installation			
Ambient temperature range	-40 - +55 °C			
Permitted humidity	0 - 100 %			
Max. altitude	4,000 m			
DC connection technology	4x DC+ and 4x DC- screw terminals 2.5 - 16 mm ²			
AC connection technology	3-pole AC screw terminals 2.5 - 16 mm ²			
Certificates and compliance with standards	DIN V VDE 0126-1-1/A1, IEC 62109-1/2, IEC 62116, IEC 61727, AS 4777-2, AS 4777-3, G83/2, G59/3, CEI 0-21, VDE AR N 4105 ²⁾			

¹⁾ According to IEC 62109-1.

²⁾ Fronius Primo 5.0-1, Fronius Primo 6.0-1 and Fronius Primo 8.2-1 are not fully compliant with VDE AR N 4105. Further information regarding the availability of the inverters in your country can be found at www.fronius.com.

EFFICIENCY	PRIMO 5.0-1	PRIMO 5.0-1 AUS	PRIMO 6.0-1	PRIMO 8.2-1
Max. efficiency	98.1 %	98.1 %	98.1 %	98.1 %
European efficiency (η_{EU})	97.1 %	97.1 %	97.3 %	97.5 %
MPP adaptation efficiency	> 99.9 %			

PROTECTIVE DEVICES	PRIMO 5.0-1	PRIMO 5.0-1 AUS	PRIMO 6.0-1	PRIMO 8.2-1
DC insulation measurement	Yes			
Overload behaviour	Operating point shift, power limitation			
DC disconnecter	Yes			
Reverse polarity protection	Yes			

INTERFACES	PRIMO 5.0-1	PRIMO 5.0-1 AUS	PRIMO 6.0-1	PRIMO 8.2-1
WLAN / Ethernet LAN	Fronius Solar.web, Modbus TCP SunSpec, Fronius Solar API (JSON)			
6 inputs and 4 digital in/out	Interface to ripple control receiver			
USB (A socket) ¹⁾	Datalogging, inverter update via USB flash drive			
2x RS422 (RJ45 socket) ¹⁾	Fronius Solar Net			
Signalling output ¹⁾	Energy management (potential-free relay output)			
Datalogger and Webserver	Included			
External input ¹⁾	S0-Meter Interface / Input for overvoltage protection			
RS485	Modbus RTU SunSpec or meter connection			

¹⁾ Also available in the light version.

Further information and technical data can be found at www.fronius.com.

/ Perfect Welding / Solar Energy / Perfect Charging

WE HAVE THREE DIVISIONS AND ONE PASSION: SHIFTING THE LIMITS OF POSSIBILITY.

/ Whether welding technology, photovoltaics or battery charging technology – our goal is clearly defined: to be the innovation leader. With around 3,700 employees worldwide, we shift the limits of what's possible - our record of over 800 granted patents is testimony to this. While others progress step by step, we innovate in leaps and bounds. Just as we've always done. The responsible use of our resources forms the basis of our corporate policy.

Further information about all Fronius products and our global sales partners and representatives can be found at www.fronius.com

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/ Perfect Welding / Solar Energy / Perfect Charging



SHIFTING THE LIMITS

FRONIUS sYMO

/ Maximum flexibility for the applications of tomorrow.



/ SnapINverter technology



/ Integrated data communication



/ SuperFlex Design



/ Dynamic Peak Manager



/ Smart Grid Ready



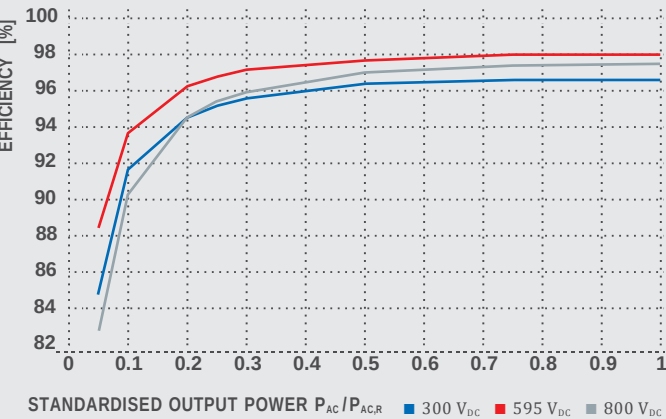
/ Boasting power categories ranging from 3.0 to 20.0 kW, the transformerless Fronius Symo is the three-phase inverter for systems of every size. Owing to the SuperFlex Design, the Fronius Symo is the perfect answer to irregularly shaped or multi-oriented roofs. The standard interface to the internet via WLAN or Ethernet and the ease of integration of third-party components make the Fronius Symo one of the most communicative inverters on the market. Furthermore, the meter interface permits dynamic feed-in management and a clear visualisation of the consumption overview.

TECHNICAL DATA FRONIUS SYMO (3.0-3-S, 3.7-3-S, 4.5-3-S, 3.0-3-M, 3.7-3-M, 4.5-3-M)

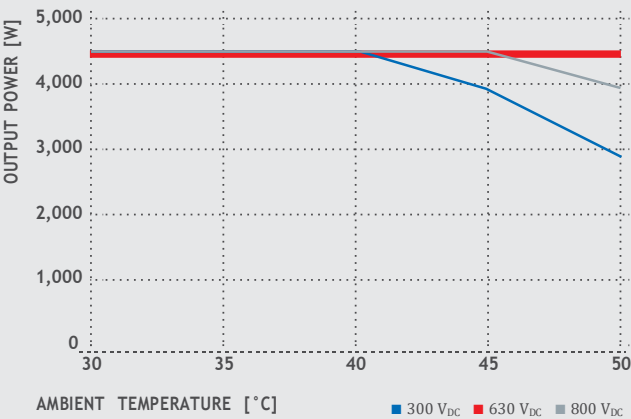
INPUT DATA	SYMO 3.0-3-S	SYMO 3.7-3-S	SYMO 4.5-3-S	SYMO 3.0-3-M	SYMO 3.7-3-M	SYMO 4.5-3-M
Max. input Current (I _{dc max 1} / I _{dc max 2} ¹⁾)	16.0 A / 16.0 A					
Max. array short Circuit Current (MPP ₁ /MPP ₂ ¹⁾)	24.0 A / 24.0 A					
Min. input voltage (U _{dc min})	150 V					
Feed-in start voltage (U _{dc start})	200 V					
Nominal input voltage (U _{dc,r})	595 V					
Max. input voltage (U _{dc max})	1,000 V					
MPP voltage range (U _{mpp min} – U _{mpp max})	200 - 800 V	250 - 800 V	300 - 800 V	150 - 800 V		
Number MPP trackers	1			2		
Number of DC connections	3			2+2		
OUTPUT DATA	SYMO 3.0-3-S	SYMO 3.7-3-S	SYMO 4.5-3-S	SYMO 3.0-3-M	SYMO 3.7-3-M	SYMO 4.5-3-M
AC nominal output (P _{ac,r})	3,000 W	3,700 W	4,500 W	3,000 W	3,700 W	4,500 W
Max. output power	3,000 VA	3,700 VA	4,500 VA	3,000 VA	3,700 VA	4,500 VA
AC output current (I _{ac nom})	4.3 A	5.3 A	6.5 A	4.3 A	5.3 A	6.5 A
Grid connection (voltage range)	3~NPE 400 V / 230 V or 3~NPE 380 V / 220 V (+20 % / -30 %)					
Frequency (Frequency range)	50 Hz / 60 Hz (45 - 65 Hz)					
Total harmonic distortion	< 3 %					
Power factor (cos φ _{ac,r})	0.70 - 1 ind. / cap.			0.85 - 1 ind. / Cap.		
GENERAL DATA	SYMO 3.0-3-S	SYMO 3.7-3-S	SYMO 4.5-3-S	SYMO 3.0-3-M	SYMO 3.7-3-M	SYMO 4.5-3-M
Dimensions (height x width x depth)	645 x 431 x 204 mm					
Weight	16.0 kg			19.9 kg		
Degree of protection	IP 65					
Protection class	1					
Overvoltage Category (DC / AC) ²⁾	2 / 3					
Night time consumption	< 1 W					
Inverter design	Transformerless					
Cooling	Regulated air cooling					
Installation	Indoor and outdoor installation					
Ambient temperature range	-25 - +60 °C					
Permitted humidity	0 - 100 %					
Max. altitude	2,000 m / 3,400 m (unrestricted / restricted voltage range)					
DC connection technology	3x DC+ and 3x DC- screw terminals 2.5 - 16 mm²			4x DC+ and 4x DC- screw terminals 2.5 - 16mm² ³⁾		
AC connection technology	5-pole AC screw terminals 2.5 - 16 mm²			5-pole AC screw terminals 2.5 - 16mm² ³⁾		
Certificates and compliance with standards	ÖVE / ÖNORM E 8001-4-712, DIN V VDE 0126-1-1/A1, VDE AR N 4105, IEC 62109-1/-2, IEC 62116, IEC 61727, AS 3100, AS 4777-2, AS 4777-3, CER 06-190, G83/2, UNE 206007-1, SI 4777 ¹⁾ , CEI 0-21 ¹⁾ , NRS 097					

¹⁾ This applies to Fronius Symo 3.0-3-M, 3.7-3-M and 4.5-3-M.²⁾ According to IEC 62109-1.³⁾ 16 mm² without wire end ferrules. Further information regarding the availability of the terminals in your country can be found at www.fronius.com.

FRONIUS SYMO 4.5-3-S EFFICIENCY CURVE



FRONIUS SYMO 4.5-3-S TEMPERATURE DERATING



TECHNICAL DATA FRONIUS SYMO (3.0-3-S, 3.7-3-S, 4.5-3-S, 3.0-3-M, 3.7-3-M, 4.5-3-M)

EFFICIENCY	SYMO 3.0-3-S	SYMO 3.7-3-S	SYMO 4.5-3-S	SYMO 3.0-3-M	SYMO 3.7-3-M	SYMO 4.5-3-M
Max. efficiency	98.0 %					
European efficiency (η _{EU})	96.2 %	96.7 %	97.0 %	96.5 %	96.9 %	97.2 %
η at 5 % P _{AC,r} ¹⁾	80.3 / 83.6 / 79.1 %	83.4 / 86.4 / 80.6 %	84.8 / 88.5 / 82.8 %	79.8 / 85.1 / 80.8 %	81.6 / 87.8 / 82.8 %	83.4 / 90.3 / 85.0 %
η at 10 % P _{AC,r} ¹⁾	87.8 / 91.0 / 86.2 %	90.1 / 92.5 / 88.7 %	91.7 / 93.7 / 90.3 %	86.5 / 91.6 / 87.7 %	87.9 / 93.6 / 90.5 %	89.2 / 94.1 / 91.2 %
η at 20 % P _{AC,r} ¹⁾	92.6 / 95.0 / 92.6 %	93.7 / 95.7 / 93.6 %	94.6 / 96.3 / 94.5 %	90.8 / 95.3 / 93.0 %	91.9 / 96.0 / 94.1 %	92.8 / 96.5 / 95.1 %
η at 25 % P _{AC,r} ¹⁾	93.4 / 95.6 / 93.8 %	94.5 / 96.4 / 94.7 %	95.2 / 96.8 / 95.4 %	91.9 / 96.0 / 94.2 %	92.9 / 96.6 / 95.2 %	93.5 / 97.0 / 95.8 %
η at 30 % P _{AC,r} ¹⁾	94.0 / 96.3 / 94.5 %	95.0 / 96.7 / 95.4 %	95.6 / 97.2 / 95.9 %	92.8 / 96.5 / 95.1 %	93.5 / 97.0 / 95.8 %	94.2 / 97.3 / 96.3 %
η at 50 % P _{AC,r} ¹⁾	95.2 / 97.3 / 96.3 %	96.9 / 97.6 / 96.7 %	96.4 / 97.7 / 97.0 %	94.3 / 97.5 / 96.5 %	94.6 / 97.7 / 96.8 %	94.9 / 97.8 / 97.2 %
η at 75 % P _{AC,r} ¹⁾	95.6 / 97.7 / 97.0 %	96.2 / 97.8 / 97.3 %	96.6 / 98.0 / 97.4 %	94.9 / 97.8 / 97.2 %	95.0 / 97.9 / 97.4 %	95.1 / 98.0 / 97.5 %
η at 100 % P _{AC,r} ¹⁾	95.6 / 97.9 / 97.3 %	96.2 / 98.0 / 97.5 %	96.6 / 98.0 / 97.5 %	95.0 / 98.0 / 97.4 %	95.1 / 98.0 / 97.5 %	95.0 / 98.0 / 97.6 %
MPP adaptation efficiency	> 99.9 %					

¹⁾ And at U_{mpp min} / U_{dc,r} / U_{mpp max}

PROTECTIVE DEVICES	SYMO 3.0-3-S	SYMO 3.7-3-S	SYMO 4.5-3-S	SYMO 3.0-3-M	SYMO 3.7-3-M	SYMO 4.5-3-M
DC insulation measurement	Yes					
Overload behaviour	Operating point shift, power limitation					
DC disconnect	Yes					
Reverse polarity protection	Yes					

INTERFACES	SYMO 3.0-3-S	SYMO 3.7-3-S	SYMO 4.5-3-S	SYMO 3.0-3-M	SYMO 3.7-3-M	SYMO 4.5-3-M
WLAN / Ethernet LAN	Fronius Solar.web, Modbus TCP SunSpec, Fronius Solar API (JSON)					
6 inputs and 4 digital in/out	Interface to ripple control receiver					
USB (A socket) ²⁾	Datalogging, inverter update via USB flash drive					
2x RS422 (RJ45 socket) ²⁾	Fronius Solar Net					
Signalling output ²⁾	Energy management (potential-free relay output)					
Datalogger and Webserver	Included					
External input ²⁾	S0-Meter Interface / Input for overvoltage protection					
RS485	Modbus RTU SunSpec or meter connection					

²⁾ Also available in the light version.

TECHNICAL DATA FRONIUS SYMO (5.0-3-M, 6.0-3-M, 7.0-3-M, 8.2-3-M)

INPUT DATA	SYMO 5.0-3-M	SYMO 6.0-3-M	SYMO 7.0-3-M	SYMO 8.2-3-M
Max. input current ($I_{dc\ max\ 1} / I_{dc\ max\ 2}$)	16.0 A / 16.0 A			
Max. array short circuit current (MPP ₁ /MPP ₂)	24.0 A / 24.0 A			
Min. input voltage ($U_{dc\ min}$)	150 V			
Feed-in start voltage ($U_{dc\ start}$)	200 V			
Nominal input voltage ($U_{dc,r}$)	595 V			
Max. input voltage ($U_{dc\ max}$)	1,000 V			
MPP voltage range ($U_{mpp\ min} - U_{mpp\ max}$)	163 - 800 V	195 - 800 V	228 - 800 V	267 - 800 V
Number MPP trackers	2			
Number of DC connections	2 + 2			

OUTPUT DATA	SYMO 5.0-3-M	SYMO 6.0-3-M	SYMO 7.0-3-M	SYMO 8.2-3-M
AC nominal output ($P_{ac,r}$)	5,000 W	6,000 W	7,000 W	8,200 W
Max. output power	5,000 VA	6,000 VA	7,000 VA	8,200 VA
AC output current ($I_{ac\ nom}$)	7.2 A	8.7 A	10.1 A	11.8 A
Grid connection (voltage range)	3-NPE 400 V / 230 V or 3~NPE 380 V / 220 V (+20 % / -30 %)			
Frequency (Frequency range)	50 Hz / 60 Hz (45 - 65 Hz)			
Total harmonic distortion	< 3 %			
Power factor ($\cos \varphi_{ac,r}$)	0.85 - 1 ind. / Cap.			

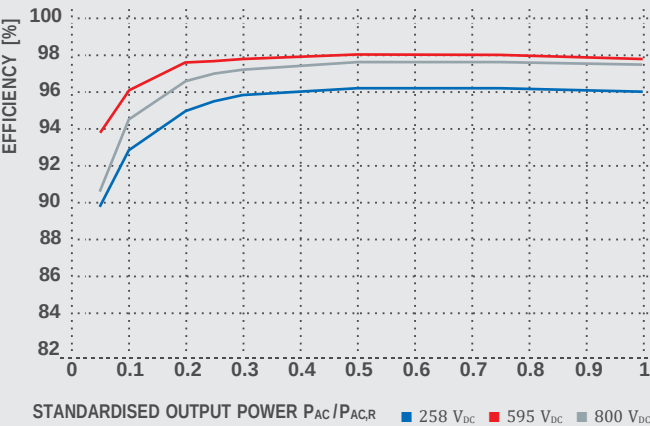
GENERAL DATA	SYMO 5.0-3-M	SYMO 6.0-3-M	SYMO 7.0-3-M	SYMO 8.2-3-M
Dimensions (height x width x depth)	645 x 431 x 204 mm			
Weight	19.9 kg		21.9 kg	
Degree of protection	IP 65			
Protection class	1			
Overvoltage category (DC / AC) ¹⁾	2 / 3			
Night time consumption	< 1 W			
Inverter design	Transformerless			
Cooling	Regulated air cooling			
Installation	Indoor and outdoor installation			
Ambient temperature range	-25 - +60 °C			
Permitted humidity	0 - 100 %			
Max. altitude	2,000 m / 3,400 m (unrestricted / restricted voltage range)			
DC connection technology	4x DC+ and 4x DC- Screw terminals 2.5 - 16mm ^{2 2)}			
AC connection technology	5-pole AC Screw terminals 2.5 - 16mm ^{2 2)}			
Certificates and compliance with standards	ÖVE / ÖNORM E 8001-4-712, DIN V VDE 0126-1-1/A1, VDE AR N 4105, IEC 62109-1/-2, IEC 62116, IEC 61727, AS 3100, AS 4777-2, AS 4777-3, CER 06-190, G83/2, UNE 206007-1, SI 4777, CEI 0-21, NRS 097			

¹⁾ According to IEC 62109-1.

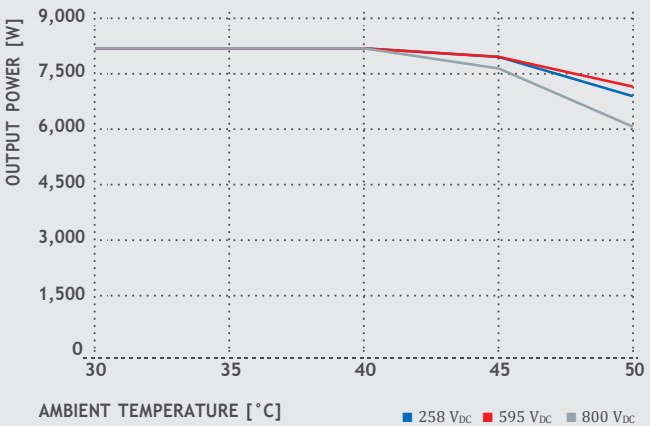
²⁾ 16 mm² without wire end ferrules.

Further information regarding the availability of the inverters in your country can be found at www.fronius.com.

FRONIUS SYMO 8.2-3-M EFFICIENCY CURVE



FRONIUS SYMO 8.2-3-M TEMPERATURE DERATING



TECHNICAL DATA FRONIUS SYMO (5.0-3-M, 6.0-3-M, 7.0-3-M, 8.2-3-M)

EFFICIENCY	SYMO 5.0-3-M	SYMO 6.0-3-M	SYMO 7.0-3-M	SYMO 8.2-3-M
Max. efficiency	98.0 %			
European efficiency (η _{EU})	97.3 %	97.5 %	97.6 %	97.7 %
η at 5 % P _{AC,r} ¹⁾	84.9 / 91.2 / 85.9 %	87.8 / 92.6 / 87.8 %	88.7 / 93.1 / 89.0 %	89.8 / 93.8 / 90.6 %
η at 10 % P _{AC,r} ¹⁾	89.9 / 94.6 / 91.7 %	91.3 / 95.6 / 93.0 %	92.0 / 95.9 / 94.7 %	92.8 / 96.1 / 94.5 %
η at 20 % P _{AC,r} ¹⁾	93.2 / 96.7 / 95.4 %	94.1 / 97.1 / 95.9 %	94.5 / 97.3 / 96.3 %	95.0 / 97.6 / 96.6 %
η at 25 % P _{AC,r} ¹⁾	93.9 / 97.2 / 96.0 %	94.7 / 97.5 / 96.5 %	95.1 / 97.6 / 96.7 %	95.5 / 97.7 / 97.0 %
η at 30 % P _{AC,r} ¹⁾	94.5 / 97.4 / 96.5 %	95.1 / 97.7 / 96.8 %	95.4 / 97.7 / 97.0 %	95.8 / 97.8 / 97.2 %
η at 50 % P _{AC,r} ¹⁾	95.2 / 97.9 / 97.3 %	95.7 / 98.0 / 97.5 %	95.9 / 98.0 / 97.5 %	96.2 / 98.0 / 97.6 %
η at 75 % P _{AC,r} ¹⁾	95.3 / 98.0 / 97.5 %	95.7 / 98.0 / 97.6 %	95.9 / 98.0 / 97.6 %	96.2 / 98.0 / 97.6 %
η at 100 % P _{AC,r} ¹⁾	95.2 / 98.0 / 97.6 %	95.7 / 97.9 / 97.6 %	95.8 / 97.9 / 97.5 %	96.0 / 97.8 / 97.5 %
MPP adaptation efficiency	> 99.9 %			

¹⁾ And at U_{mpp min} / U_{dc,r} / U_{mpp max}

PROTECTIVE DEVICES	SYMO 5.0-3-M	SYMO 6.0-3-M	SYMO 7.0-3-M	SYMO 8.2-3-M
DC insulation measurement	Yes			
Overload behaviour	Operating point shift, power limitation			
DC disconnect	Yes			
Reverse polarity protection	Yes			

INTERFACES	SYMO 5.0-3-M	SYMO 6.0-3-M	SYMO 7.0-3-M	SYMO 8.2-3-M
WLAN / Ethernet LAN	Fronius Solar.web, Modbus TCP SunSpec, Fronius Solar API (JSON)			
6 inputs and 4 digital in/out	Interface to ripple control receiver			
USB (A socket) ²⁾	Datalogging, inverter update via USB flash drive			
2x RS422 (RJ45 socket) ²⁾	Fronius Solar Net			
Signalling output ²⁾	Energy management (potential-free relay output)			
Datalogger and Webserver	Included			
External input ²⁾	S0-Meter Interface / Input for overvoltage protection			
RS485	Modbus RTU SunSpec or meter connection			

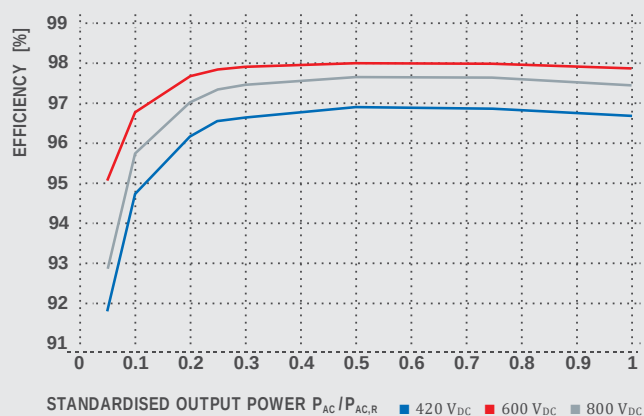
²⁾ Also available in the light version.

TECHNICAL DATA FRONIUS SYMO (10.0-3-M, 12.5-3-M, 15.0-3-M, 17.5-3-M, 20.0-3-M)

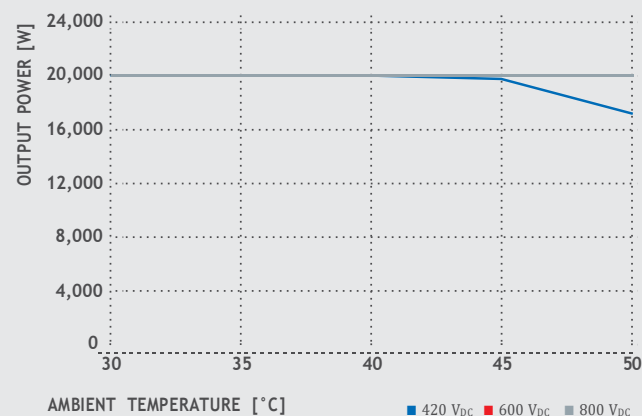
INPUT DATA	SYMO 10.0-3-M	SYMO 12.5-3-M	SYMO 15.0-3-M	SYMO 17.5-3-M	SYMO 20.0-3-M
Max. input current (I _{dc max 1} / I _{dc max 2})	27.0 A / 16.5 A ¹⁾		33.0 A / 27.0 A		
Max. usable input current total (I _{dc max 1} + I _{dc max 2})	43.5 A		51.0 A		
Max. array short circuit current (MPP ₁ /MPP ₂)	40.5 A / 24.8 A		49.5 A / 40.5 A		
Min. input voltage (U _{dc min})	200 V				
Feed-in start voltage (U _{dc start})	200 V				
Nominal input voltage (U _{dc,r})	600 V				
Max. input voltage (U _{dc max})	1,000 V				
MPP voltage range (U _{mpp min} – U _{mpp max})	270 - 800 V	320 - 800 V		370 - 800 V	420 - 800 V
Number MPP trackers	2				
Number of DC connections	3+3				
Max. PV generator output (P _{dc max})	15.0 kW _{peak}	18.8kW _{peak}	22.5 kW _{peak}	26.3 kW _{peak}	30.0 kW _{peak}
OUTPUT DATA	SYMO 10.0-3-M	SYMO 12.5-3-M	SYMO 15.0-3-M	SYMO 17.5-3-M	SYMO 20.0-3-M
AC nominal output (P _{ac,r})	10,000 W	12,500 W	15,000 W	17,500 W	20,000 W
Max. output power	10,000 VA	12,500 VA	15,000 VA	17,500 VA	20,000 VA
AC output current (I _{ac nom})	14.4 A	18.0 A	21.7 A	25.3 A	28.9 A
Grid connection (voltage range)	3-NPE 400 V / 230 V or 3~NPE 380 V / 220 V (+20 % / -30 %)				
Frequency (Frequency range)	50 Hz / 60 Hz (45 - 65 Hz)				
Total harmonic distortion	1.8 %	2.0 %	1.5 %	1.5 %	1.3 %
Power factor (cos φ _{ac,r})	0 - 1 ind. / cap.				
GENERAL DATA	SYMO 10.0-3-M	SYMO 12.5-3-M	SYMO 15.0-3-M	SYMO 17.5-3-M	SYMO 20.0-3-M
Dimensions (height x width x depth)	725 x 510 x 225 mm				
Weight	34.8 kg		43.4 kg		
Degree of protection	IP 66				
Protection class	1				
Overvoltage category (DC / AC) ²⁾	2 / 3				
Night time Consumption	< 1 W				
Inverter design	Transformerless				
Cooling	Regulated air cooling				
Installation	Indoor and outdoor installation				
Ambient temperature range	-40 - +60 °C				
Permitted humidity	0 - 100 %				
Max. altitude	2,000 m / 3,400 m (unrestricted / restricted voltage range)				
DC connection technology	6x DC+ and 6x DC- screw terminals 2.5 - 16 mm ²				
AC connection technology	5-pole AC screw terminals 2.5 - 16 mm ²				
Certificates and compliance with standards	ÖVE / ÖNORM E 8001-4-712, DIN V VDE 0126-1-1/A1, VDE AR N 4105, IEC 62109-1/-2, IEC 62116, IEC 61727, AS 3100, AS 4777-2, AS 4777-3, CER 06-190, G83/2, UNE 206007-1, SI 4777, CEI 0-16, CEI 0-21, NRS 097				

¹⁾ 14.0 A for voltages < 420 V
²⁾ According to IEC 62109-1. DIN rail for optional overvoltage protection (type 2) is included.
Further information regarding the availability of the inverters in your country can be found at www.fronius.com.

FRONIUS SYMO 20.0-3-M EFFICIENCY CURVE



FRONIUS SYMO 20.0-3-M TEMPERATURE DERATING



TECHNICAL DATA FRONIUS SYMO (10.0-3-M, 12.5-3-M, 15.0-3-M, 17.5-3-M, 20.0-3-M)

EFFICIENCY	SYMO 10.0-3-M	SYMO 12.5-3-M	SYMO 15.0-3-M	SYMO 17.5-3-M	SYMO 20.0-3-M
Max. efficiency	98.0 %				98.1 %
European efficiency (η_{EU})	97.4 %	97.6 %	97.8 %	97.8 %	97.9 %
η at 5 % $P_{AC,R}^{1)}$	87.9 / 92.5 / 89.2 %	88.7 / 93.1 / 90.1 %	91.2 / 94.8 / 92.3 %	91.6 / 95.0 / 92.7 %	91.9 / 95.2 / 93.0 %
η at 10 % $P_{AC,R}^{1)}$	91.2 / 94.9 / 92.8 %	92.9 / 96.1 / 94.6 %	93.4 / 96.0 / 94.4 %	94.0 / 96.4 / 95.0 %	94.8 / 96.9 / 95.8 %
η at 20 % $P_{AC,R}^{1)}$	94.6 / 97.1 / 96.1 %	95.4 / 97.3 / 96.6 %	95.9 / 97.4 / 96.7 %	96.1 / 97.6 / 96.9 %	96.3 / 97.8 / 97.1 %
η at 25 % $P_{AC,R}^{1)}$	95.4 / 97.3 / 96.6 %	95.6 / 97.6 / 97.0 %	96.2 / 97.6 / 97.0 %	96.4 / 97.8 / 97.2 %	96.7 / 97.9 / 97.4 %
η at 30 % $P_{AC,R}^{1)}$	95.6 / 97.5 / 96.9 %	95.9 / 97.7 / 97.2 %	96.5 / 97.8 / 97.3 %	96.6 / 97.9 / 97.4 %	96.8 / 98.0 / 97.6 %
η at 50 % $P_{AC,R}^{1)}$	96.3 / 97.9 / 97.4 %	96.4 / 98.0 / 97.5 %	96.9 / 98.1 / 97.7 %	97.0 / 98.1 / 97.7 %	97.0 / 98.1 / 97.8 %
η at 75 % $P_{AC,R}^{1)}$	96.5 / 98.0 / 97.6 %	96.5 / 98.0 / 97.6 %	97.0 / 98.1 / 97.8 %	97.0 / 98.1 / 97.8 %	97.0 / 98.1 / 97.7 %
η at 100 % $P_{AC,R}^{1)}$	96.5 / 98.0 / 97.6 %	96.5 / 97.8 / 97.6 %	97.0 / 98.1 / 97.7 %	96.9 / 98.1 / 97.6 %	96.8 / 98.0 / 97.6 %
MPP adaptation efficiency	> 99.9 %				
PROTECTIVE DEVICES	SYMO 10.0-3-M	SYMO 12.5-3-M	SYMO 15.0-3-M	SYMO 17.5-3-M	SYMO 20.0-3-M
DC insulation measurement	Yes				
Overload behaviour	Operating point shift, power limitation				
DC disconnect	Yes				
Reverse polarity protection	Yes				
INTERFACES	SYMO 10.0-3-M	SYMO 12.5-3-M	SYMO 15.0-3-M	SYMO 17.5-3-M	SYMO 20.0-3-M
WLAN / Ethernet LAN	Fronius Solar.web, Modbus TCP SunSpec, Fronius Solar API (JSON)				
6 inputs and 4 digital inputs/outputs	Interface to ripple control receiver				
USB (A socket) ²⁾	Datalogging, inverter update via USB flash drive				
2x RS422 (RJ45-socket) ²⁾	Fronius Solar Net				
Signalling output ²⁾	Energy management (potential-free relay output)				
Datalogger und Webserver	Included				
External input ²⁾	S0-Meter Interface / Input for overvoltage protection				
RS485	Modbus RTU SunSpec or meter connection				

¹⁾ And at $U_{mpp\ min} / U_{dc,r} / U_{mpp\ max}$ ²⁾ Also available in the light version.

/ Perfect Welding / Solar Energy / Perfect Charging

WE HAVE THREE DIVISIONS AND ONE PASSION: SHIFTING THE LIMITS OF POSSIBILITY.

/ Whether welding technology, photovoltaics or battery charging technology – our goal is clearly defined: to be the innovation leader. With around 3,300 employees worldwide, we shift the limits of what's possible – our record of over 900 granted patents is testimony to this. While others progress step by step, we innovate in leaps and bounds. Just as we've always done. The responsible use of our resources forms the basis of our corporate policy.

Further information about all Fronius products and our global sales partners and representatives can be found at www.fronius.com

v05 May 2015 EN

Wels, April 03rd 2018

ANTI ISLANDING PROTECTION FRONIUS INVERTERS

Fronius International GmbH

hereby certifies, that the inverters

- / **Fronius Symo 3.0-3- S – 20.0-3-M**
- / **Fronius Symo Hybrid 3.0-3-S – 5.0-3-S**
- / **Fronius Galvo 1.5-1 – 3.1-1**
- / **Fronius Primo 3.0-1 – 8.2-1**
- / **Fronius Eco 25.0-3-S – 27.0-3-S**

Fulfil all requirements, which are postulated by the Greek Energy Supply Industry, including the Anti Islanding Protection.

1. The disconnection and connection of the inverter to the point of power injection is done with internal relays which are controlled by a software which will initiate:
 - a. an automatic (re-)connection to the public grid provided that voltage and frequency are within the range of $0,8 \times V_{nom} - 1,15 \times V_{nom}$ and $49,5 \text{ Hz} - 50,5 \text{ Hz}$.
 - b. an immediate ($< 0,5 \text{ s}$) disconnection if the voltage, the frequency or both are not within these limits.
 - c. the software with its adjustments can not be accessed by the end-user.
2. The connection time and the reconnection time after clearance of grid failure is not shorter than 180 s.
3. The injected DC current into the grid is $< 0,5\%$ of nominal current.
4. The total harmonic distortion of the output current (THDI) is lower than 5%.
5. In addition to the passive protection limits (voltage and frequency) an Active Anti Islanding method according to VDE 0126-1-1 is implemented. The pattern detection method injects reactive current pulses and analyses the resulting frequency behavior. The Anti Islanding protection trip time is < 5 seconds.

Με το παρόν βεβαιώνει ότι όλα τα είδη των μετατροπέων

- / **Fronius Symo 3.0-3- S – 20.0-3-M**
- / **Fronius Symo Hybrid 3.0-3-S – 5.0-3-S**
- / **Fronius Galvo 1.5-1 – 3.1-1**
- / **Fronius Primo 3.0-1 – 8.2-1**
- / **Fronius Eco 25.0-3-S – 27.0-3-S**

Εκπληρώνουν όλες τις απαιτήσεις οι οποίες αξιώνονται από την Ελληνική βιομηχανία παραγωγής ενέργειας, συμπεριλαμβανομένης της προστασίας έναντι του φαινομένου της νησιδοποίησης.

1. Ο μετατροπέας συνδέεται στο σημείο εισαγωγής ισχύος και αποσυνδέεται από αυτό με τη βοήθεια εσωτερικών ηλεκτρονόμων που ελέγχονται μέσω λογισμικού το οποίο πραγματοποιεί:
 - a. αυτόματη (επανα-)σύνδεση στο δημόσιο δίκτυο, εφόσον οι τιμές της τάσης και της συχνότητας εμπίπτουν εντός του εύρους τιμών $0,8 \times V_{nom} - 1,15 \times V_{nom}$ και $49,5 \text{ Hz} - 50,5 \text{ Hz}$.
 - b. άμεση ($< 0,5 \text{ s}$) αποσύνδεση, εφόσον η τάση, η συχνότητα ή και τα δύο δεν εμπίπτουν εντός αυτού του εύρους.
 - c. ο τελικός χρήστης δεν έχει πρόσβαση στο λογισμικό ούτε στις ρυθμίσεις του.
2. Ο χρόνος σύνδεσης και ο χρόνος επανασύνδεσης μετά την επαναφορά του δικτύου από σφάλμα είναι τουλάχιστον 180 s.
3. Η έγχυση συνεχούς ρεύματος στο δίκτυο είναι $< 0,5\%$ του ονομαστικού
4. Η συνολική αρμονική παραμόρφωση του ρεύματος εξόδου (THDI) είναι μικρότερη από 5%.
5. Επιπλέον των ορίων προστασίας της τάσης και της συχνότητας, εφαρμόζεται ενεργή μέθοδος προστασίας έναντι του φαινομένου της νησιδοποίησης κατά το πρότυπο VDE 0126-1-1. Η σύμφωνη με το πρότυπο μέθοδος ανίχνευσης, αναλύει την συμπεριφορά της συχνότητας ως αποτέλεσμα της έγχυσης παλμών άεργου ρεύματος. Ο χρόνος λειτουργίας της προστασίας έναντι νησιδοποίησης είναι < 5 δευτερόλεπτα.

**Fronius International GmbH**

Business Unit Solar Energy
Froniusplatz 1
A-4600 Wels

A handwritten signature in blue ink, appearing to read "Martin Heidl".

DI Dr. Martin Heidl
Head of Systems Technology



Our Ref: REGISTRATION/CRS 2021-0161/R-41186376

Date:28-01-2022

Inclusion Id: 53212

Subject :Inclusion of Additional Model(s)

MANUFACTURING UNIT :	Fronius International GmbH FRONIUSSTRAÙE 1, 4643 PETTENBACH UPPER AUSTRIA,Austria-04643 Einwagner.Hans@fronius.com 00436646100943	
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Dear Sir,

1. This has reference to your request for inclusion of models of "Utility-Interconnected Photovoltaic Inverters" as per IS 16221 (Part 2):2015/IEC 62109-2 :2011 & IS 16169 :2014/IEC 62116 :2008 in Licence No. R-41186376 already granted to you which is valid upto 06-04-2023.
2. It is intimated that the additional Models as per details given below have been agreed to be included in your scope of Licence. **R-41186376 w.e.f. 28-01-2022:**

Product Category	Utility-Interconnected Photovoltaic Inverters
Product Name	Utility-Interconnected Photovoltaic Inverters
IS No.	IS 16221 (Part 2):2015/IEC 62109-2 :2011 & IS 16169 :2014/IEC 62116 :2008
Brand (As Declared by Manufacturer):	FRONIUS
Inclusion of Additional Models (w.e.f. 28-01-2022)	Fronius Tauro ECO 100-3-D,Fronius Tauro ECO 100-3-P, Fronius Tauro ECO 50-3-D , Fronius Tauro ECO 50-3-P
Factory Address	FRONIUSSTRAÙE 1, 4643 PETTENBACH UPPER AUSTRIA,Austria-04643

3. Other terms and conditions of the licence shall remain same.
4. This letter is being issued with the approval of competent authority.

Kindly acknowledge receipt of this letter.

Thanking you,

Yours faithfully,
(Sundeep Kumar)
Sc. D
Telfax : +91-11-23230856
E-mail: registration@bis.gov.in

Note: This is a system generated letter. Hence signature is not required.
To verify authentication of letter, kindly scan the QR code on this letter.

For details information on BIS, consult the e-BIS Portal (www.manakonline.in).
Please use BIS CARE APP for verification of ISI-marked goods and hallmarked gold jewellery.



भारतीय मानक ब्यूरो
(अभियांत्रिकी, वाणिज्यिक एवं सार्वजनिक विभाग, भारत सरकार)
BUREAU OF INDIAN STANDARDS
(Ministry of Consumer Affairs, Food & Public Distribution,
Govt. of India)

मानक भवन, 9 बहादुर शाह जफर मार्ग, नई दिल्ली - 110002
Manak Bhavan, 9 Bahadur Shah Zafar Marg, New Delhi - 110002
दूरभाष/Phone: +91-11-23230856/2323010131/23233375/23239402
ई-मेल/E-mail: registration@bis.gov.in
वेबसाइट/Website: <https://bis.gov.in/>, <https://www.crsbis.in/BIS/>

Our Ref: Registration/CRS 2021-0161/R-41186376

Date:07-04-2021

Subject : Licence Document

MANUFACTURING UNIT :	Fronius International GmbH FRONIUSSTRAßE 1, 4643 PETTENBACH UPPER AUSTRIA, Austria-04643 Einwagner.Hans@fronius.com 00436646100943	
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Dear Sir,

1. With reference to your Application, we are pleased to inform you that it has been decided to grant you licence as per details given below :

Product Category :	Utility-Interconnected Photovoltaic Inverters
Product Name :	Utility-Interconnected Photovoltaic Inverters
IS NO :	IS 16221 (PART 2):2015/IEC 62109-2 :2011 & IS 16169 :2014/IEC 62116 :2008
Brand (As Declared by Manufacturer) :	FRONIUS
Model :	[Brand -> FRONIUS, Models -> Fronius Eco 25.0-3-S, Fronius Eco 27.0-3-S (Lead model), Fronius Primo 3.0-1, Fronius P primo 3.5-1, Fronius Primo 4.0-1, Fronius Primo 4.6-1, Fronius Primo 5.0-1, (Lead model) , Fronius Primo 6.0-1, Fronius Primo 8.2-1 (Lead model), Fronius Symo 10.0-3-M, Fronius Symo 12.5-3-M (Lead model), Fronius Symo 15.0-3-M, Fronius Symo 17.5-3-M, Fronius Symo 20.0-3-M (Lead model), Fronius Symo 3.0-3-M, Fronius Symo 3.7-3-M, Fronius Symo 4.5-3-M, Fronius Symo 5.0-3-M, Fronius Symo 6.0-3-M (Lead model), Fronius Symo 7.0-3-M, Fronius Symo 8.2-3-M (Lead model)]
Factory Address :	FRONIUSSTRAßE 1, 4643 PETTENBACH UPPER AUSTRIA, Austria-04643

2. The Licence is being granted for your unit located at the address and for the brand and models mentioned at serial no 1 above.

3. The number assigned to this Licence is **R-41186376** which has been made operative from **07-04-2021** and is valid upto **06-04-2023** . The Licence Number should invariably be referred to in your future correspondence.

4. The rights and privileges under the licence shall not be exercised by any other factory / organization at any other location. This licence is not transferable. In the event of shifting of the manufacturing machinery from the registered premises to some other place use of the Licence Number shall be stopped and BIS shall be informed.

5. The licensee shall comply with the provisions of the Act, rules and regulations framed thereunder and as amended from time to time.

6. The licensee shall follow the guidelines for the use of Standard Mark and labeling requirements as per Annex-I.

7. The licensee shall not use the licence in any manner which contravenes the provisions of Act, rules and regulations framed thereunder and as amended from time to time.

8. Upon expiry of validity, stoppage or suspension or cancellation of licence, you shall discontinue forthwith the self declaration of conformity to the relevant Indian Standard(s) and withdraw all promotional and advertising matter which contains any reference thereto.

9. As per your declaration, **VISHWANATH VENKATESH KAMATH, Managing Director, Fronius India Private Limited (Address- BG-71/2/B, PIMPRI INDUSTRIAL AREA, TELCO ROAD, MIDC BHOSARI, PUNE, Pune, Maharashtra, 411026, NA)** is your authorized Indian representative. Any intended change in the name of the Indian representative ought to be brought to our notice immediately along with requisite fees and document.

10. For renewal of licence, the licensee shall have to apply to BIS three months in advance before expiration of the licence and application form for renewal is available on BIS website

11. The licence is not transferable. Kindly acknowledge receipt of this letter.

Thanking you,

Yours faithfully,
(Mohit Prabhat)
Sc. C
Telfax : +91-11-23230856
E-mail: registration@bis.gov.in

1116

Note: This is a system generated letter. Hence signature is not required.
To verify authentication of letter, kindly scan the QR code on this letter.

Annex - 1

The guidelines for use of Standard Mark for Scheme-C are per 3(1) of BIS (Conformity Assessment) Regulations, 2017 are given below:

- i) The monogram of the 'Standard Mark' consists of the pictorial representation, drawn in the exact style as indicated in the figure in the figure in Annexure I. Its photographic reduction and enlargement is permitted.
- ii) The 'Standard Mark' can be displayed in single colour or multi-colour as per the details given below. The colour scheme for the Standard Mark to be used in multi colour shall be use as indicated below.
- iii) The licensee shall display the 'Standard Mark' on the article and/or the packaging, as the case may be, in a manner so as to be easily visible. It shall be legible, indelible and non-removable. Further, the durability of marking shall be as per the provisions of the relevant Indian Standard, wherever applicable. The display of IS number, Registration number and words shall not be less than Arial font size 6.
- iv) Any device with an integrated display screen may present the Standard Mark electronically (e-labelling) in lieu of a physical presentation on the product.

For details information on BIS, consult the e-BIS Portal (www.manakonline.in).
Please use BIS CARE APP for verification of ISI-marked goods and hallmarked gold jewellery.

/ Perfect Welding / Solar Energy / Perfect Charging



FRONIUS ECO

The compact project inverter for maximum yields



SnapInverter
Technology



Integrated data
communication



Dynamic Peak
Manager



Smart Grid
Ready



Zero feed-in



The three-phase Fronius Eco in power categories 25.0 and 27.0 kW perfectly meets all the requirements of large-scale installations. Thanks to its light weight and SnapInverter mounting system, this transformerless device can be installed quickly and easily either indoors or outdoors.

This inverter range is setting new standards with its IP 66 protection class. Furthermore, thanks to its integrated double fuse holders and optional overvoltage protection, string collection boxes are no longer necessary.

TECHNICAL DATA FRONIUS ECO

INPUT DATA	FRONIUS ECO 25.0-3-S	FRONIUS ECO 27.0-3-S
Number of MPP trackers	1	
Max. input current ($I_{dc \max}$)	44.2 A	47.7 A
Max. array short circuit current	71.6 A	
DC input voltage range ($U_{dc \min} - U_{dc \max}$)	580 - 1,000 V	
Feed-in start voltage ($U_{dc \text{ start}}$)	650 V	
Usable MPP voltage range	580 - 850 V*	
Number of DC connections	6	
Max. PV generator output ($P_{dc \max}$)	37.8 kW _{peak}	

* based on 230 V grid voltage

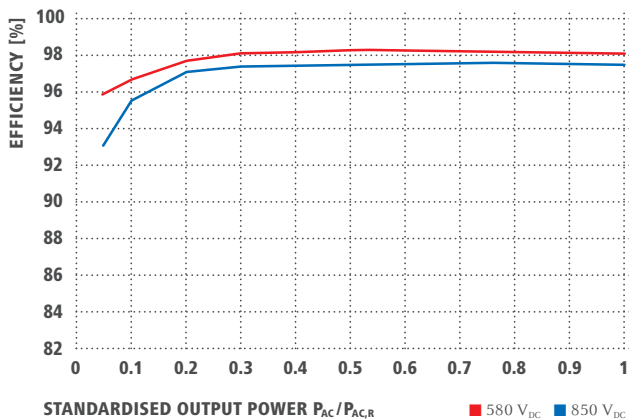
OUTPUT DATA	FRONIUS ECO 25.0-3-S	FRONIUS ECO 27.0-3-S
AC nominal output ($P_{ac,n}$)	25,000 W	27,000 W
Max. output power	25,000 VA	27,000 VA
AC output current ($I_{ac,nom}$)	37.9 A / 36.2 A	40.9 A / 39.1 A
Grid connection (voltage range)	3~NPE 380 V / 220 V or 3~NPE 400 V / 230 V (+20 % / - 30 %)	
Frequency (frequency range)	50 Hz / 60 Hz (45 - 65 Hz)	
Total harmonic distortion	< 2.0 %	
Power factor ($\cos \phi_{ac,r}$)	0 - 1 ind. / cap.	

GENERAL DATA	FRONIUS ECO 25.0-3-S	FRONIUS ECO 27.0-3-S
Dimensions (height x width x depth)	725 x 510 x 225 mm	
Weight	35.7 kg	
Degree of protection	IP 66	
Protection class	1	
Overvoltage category (DC / AC) ¹⁾	2 / 3	
Night-time consumption	< 1 W	
Inverter concept	Transformerless	
Cooling	Regulated air cooling	
Installation (DIN rail)	Indoor and outdoor installation (106 x 90 x 66 mm)	
Ambient temperature range	-25 - +60 °C	
Permitted humidity	0 to 100 %	
Max. altitude	2,000 m	
DC connection technology	6x DC+ and 6x DC- screw terminals 2.5 - 16 mm ²	
AC connection technology	5-pole AC screw terminals 2.5 - 16 mm ²	
Certificates and compliance with standards	ÖVE / ÖNORM E 8001-4-712, DIN V VDE 0126-1-1/A1, VDE AR N 4105, IEC 62109-1/-2, IEC 62116, IEC 61727, AS 3100, AS 4806, AS 4777-3, CER 06-190, G59/3, UNE 206007-1, SI 4777, CEI 0-16, CEI 0-21	

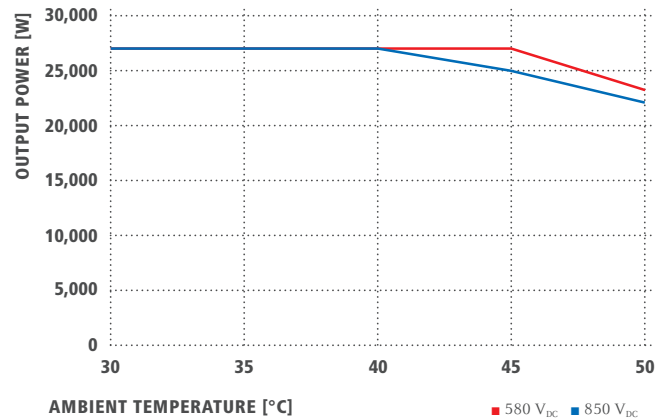
¹⁾ According to IEC 62109-1, DIN rail for optional type 1 + 2 or type 2 surge protection device available.

Further information regarding the availability of the inverters in your country can be found at www.fronius.com.

FRONIUS ECO 27.0.3-S EFFICIENCY CURVE



FRONIUS ECO 27.0.3-S TEMPERATURE DERATING



TECHNICAL DATA FRONIUS ECO

EFFICIENCY	FRONIUS ECO 25.0-3-S	FRONIUS ECO 27.0-3-S
Max. efficiency	98.2 %	98.3 %
European efficiency (η_{EU})	98.0 %	98.0 %
MPP adaptation efficiency	> 99.9 %	

PROTECTION DEVICES	FRONIUS ECO 25.0-3-S	FRONIUS ECO 27.0-3-S
DC insulation measurement		Yes
Overload behavior	Operating point shift, power limitation	
DC disconnect		Yes
Integrated string fuse holders ¹⁾		Yes
Reverse polarity protection		Yes
RCMU		Yes

INTERFACES	FRONIUS ECO 25.0-3-S	FRONIUS ECO 27.0-3-S
WLAN / Ethernet LAN	Fronius Solar.web, Modbus TCP SunSpec, Fronius Solar API (JSON)	
6 inputs and 4 digital inputs/outputs	Interface to ripple control receiver	
USB (A socket) ²⁾	Datalogging, inverter update via USB flash drive	
2x RS422 (RJ45 socket) ²⁾	Fronius Solar Net	
Signalling output ²⁾	Energy management (floating relay output)	
Datalogger and Webserver	Included	
External input ²⁾	50 meter connection / Evaluation of overvoltage protection	
RS485	Modbus RTU SunSpec or meter connection	

¹⁾ Optionally fitted with 6 fuses 15 A / 1,000 V on the plus side. ²⁾ Also available in the light version.

Further information and technical data can be found at www.fronius.com.

/ Perfect Welding / Solar Energy / Perfect Charging

THREE BUSINESS UNITS, ONE GOAL: TO SET THE STANDARD THROUGH TECHNOLOGICAL ADVANCEMENT.

What began in 1945 as a one-man operation now sets technological standards in the fields of welding technology, photovoltaics and battery charging. Today, the company has around 4,760 employees worldwide and 1,253 patents for product development show the innovative spirit within the company. Sustainable development means for us to implement environmentally relevant and social aspects equally with economic factors. Our goal has remained constant throughout: to be the innovation leader.

Further information about all Fronius products and our global sales partners and representatives can be found at www.fronius.com

Fronius India Private Limited
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90-92 Lambeck Drive
Tullamarine VIC 3043
Australia
pv-sales-australia@fronius.com
www.fronius.com.au

Fronius UK Limited
Maidstone Road, Kingston
Milton Keynes, MK10 0BD
United Kingdom
pv-sales-uk@fronius.com
www.fronius.co.uk

Fronius International GmbH
Froniusplatz 1
4600 Wels
Austria
pv-sales@fronius.com
www.fronius.com

Three Phase Inverter

SE25K / SE33.3K / SE40K

INVERTERS



Specifically designed to work with power optimizers

- / Fixed voltage inverter for superior efficiency (98.3%) and longer strings
- / Quick and easy inverter commissioning directly from a smartphone using the SolarEdge SetApp
- / Small, lightest in its class, and easy to install
- / Optional RS485 and type 2 DC and AC Surge Protection, to better withstand surges caused by lightning or other events
- / Built-in module-level monitoring with Ethernet, wireless or cellular communication (optional) for full system visibility
- / IP65 Outdoor and indoor installation
- / Optional integrated DC Safety Unit - eliminates the need for external DC isolators
- / Future-ready for SolarEdge energy storage solution

/ Three Phase Inverter

SE25K / SE33.3K / SE40K

Applicable to inverters with part number		SEXK-RWXXIXXXX		
	SE25K	SE33.3K	SE40K	
OUTPUT				
Rated AC Active Power Output	25000	33300	40000	W
Maximum AC Apparent Output Power	25000	33300	40000	VA
AC Output Voltage - Line to Line / Line to Neutral (Nominal)	380 / 220 ; 400 / 230		480 / 277	Vac
AC Output Voltage - Line to Line / Line to Neutral	304 - 437 / 176 - 253 ; 320 - 478 / 184 - 264.5		422.5 - 529 / 244 - 305	Vac
AC Frequency	50/60 ± 5%			Hz
Maximum Continuous Output Current (per Phase)	36.25	48.25		Aac
AC Output Line Connections	3W + PE, 4W + PE			
Supported Grids	WYE: TN-C, TN-S, TN-C-S, TT, IT; Delta: IT			
Utility Monitoring, Islanding Protection, Configurable Power Factor, Country Configurable Thresholds	Yes			
Total Harmonic Distortion	≤ 3			%
Power Factor Range	+/-0.2 to 1			
Maximum Residual Current Injection ⁽¹⁾	100			mA
INPUT				
Maximum DC Power (Module STC)	43750	58275	70000	W
Transformer-less, Ungrounded	Yes			
Maximum Input Voltage DC+ to DC-	1000			Vdc
Operating Voltage Range	680 - 1000			Vdc
Maximum Input Current	36.25	48.25		Adc
Reverse-Polarity Protection	Yes			
Ground-Fault Isolation Detection	167kΩ Sensitivity ⁽²⁾			
Maximum Inverter Efficiency	98.3	98.1		%
European Weighted Efficiency	98			%
Nighttime Power Consumption	< 4			W
ADDITIONAL FEATURES				
Supported Communication Interfaces ⁽³⁾	2 x RS485, Wi-Fi (optional), Cellular (optional)			
Smart Energy Management	Export Limitation			
Inverter Commissioning	With the SetApp mobile application using built-in Wi-Fi access point for local connection			
Arc Fault Protection	Built-in, User Configurable (According to UL1699B)			
Rapid Shutdown	Optional ⁽⁴⁾ (Automatic upon AC Grid Disconnect)			
RS485 Surge Protection	Optional			
DC Surge Protection	Type II, field replaceable, optional			
AC Surge Protection	Type II, field replaceable, optional			
DC SAFETY UNIT (OPTIONAL)				
DC Disconnect	Integrated in the DC safety unit			
DC Fuses (Single Pole)	Optional, 25A			
STANDARD COMPLIANCE				
Safety	IEC-62109-1, IEC-62109-2			
Grid Connection Standards ⁽⁵⁾	VDE-AR-N-4105, VDE-AR-N-4110, AS-4777, EN 50549-1, EN 50549-2, CEI-021, VDE 0126-1-1, CEI-016			
Emissions	IEC61000-6-2, IEC61000-6-3 Class A, IEC61000-3-11, IEC61000-3-12			
RoHS	Yes			
INSTALLATION SPECIFICATIONS				
AC Output Gland Diameter / Line cross section / PE cross section	Cable diameter 19 - 28 mm / 4 - 16 mm² / 4 - 16 mm²			
DC Input ⁽⁶⁾	4 MC4 pairs			
DC Input with Safety Unit	4 Strings: Gland: Cable outer diameter 5 - 10 mm / Wire cross section 2.5 - 16mm²			
Dimensions (H x W x D)	558 x 328 x 273			mm
Dimensions with Safety Unit (H x W x D)	839 x 328 x 300			mm
Weight	32			kg
Weight with Safety Unit	36.5			kg
Operating Temperature Range	-40 to +60 ⁽⁷⁾			°C
Cooling	Fan (user replaceable)			
Noise	< 62			dBA
Protection Rating	IP65 - outdoor and indoor			
Mounting	Brackets provided			

(1) If an external RCD is required, its trip value must be ≥ 100mA

(2) Where permitted by local regulations

(3) Refer to Datasheets -> Communications category on Downloads page for specifications of optional communication options: <https://www.solaredge.com/products/communication>

(4) Inverters with rapid shutdown part number: SExxK-xxRxxxxx

(5) For all standards refer to Certifications category in Downloads page: <https://www.solaredge.com/downloads/#/>

(6) Only MC4 connectors manufactured by Stäubli are approved for use

(7) For power de-rating information refer to: <https://www.solaredge.com/sites/default/files/se-temperature-derating-note.pdf>

Three Phase Inverter with Synergy Technology

For Delta Grids (Belgium, Norway, Taiwan & Philippines)

SE50K / SE55K / SE82.8K

INVERTERS



Specifically designed to work with power optimizers

- / Easy two-person installation – each unit mounted separately, equipped with cables for simple connection between units
- / Balance of System and labor reduction compared to using multiple smaller string inverters
- / Independent operation of each unit enables higher uptime and easy serviceability
- / No wasted ground area: wall/rail mounted or horizontally mounted under the modules (10° inclination)
- / Built-in module-level monitoring with Ethernet or cellular GSM
- / Fixed voltage inverter for superior efficiency (98.3%) and longer strings
- / Integrated Connection Unit with optional integrated DC Safety Switch – eliminates the need for external DC isolators
- / Advanced safety features - integrated are fault protection and optional rapid shutdown
- / Built-in RS485 Surge Protection, to better withstand lightning events

Three Phase Inverter with Synergy Technology for Delta Grids (Belgium, Norway, Taiwan & Philippines)

SE50K / SE55K / SE82.8K

SE50K ⁽¹⁾		SE55K		SE82.8K	
OUTPUT					
Rated AC Power Output	29000	32000		48000	VA
Maximum AC Power Output	29000	32000		48000	VA
AC Output Voltage — Line to Line / Line to PE	220 / 127 ; 230 / 133				Vac
AC Output Voltage — Line to Line Range	184 - 264.5				Vac
AC Frequency	50/60 ± 5				Hz
Maximum Continuous Output Current (per Phase) @Vac,nom	76	80		120	A
Grids Supported — Three Phase	3 Lines / PE (Delta; corner grounding not supported)				
Maximum Residual Current Injection	250 per unit ⁽²⁾				mA
Utility Monitoring, Islanding Protection, Configurable Power Factor, Country Configurable Thresholds	Yes				
INPUT					
Maximum DC Power (Module STC), Inverter / Unit	39150 / 19575	43200 / 21600		64800 / 21600	W
Transformer-less, Ungrounded	Yes				
Maximum Input Voltage	600				Vdc
Operating Voltage Range	370 - 600				Vdc
Maximum Input Current	74	80		120	Adc
Reverse-Polarity Protection	Yes				
Ground-Fault Isolation Detection	350kΩ Sensitivity per Unit ⁽³⁾				
Maximum Inverter Efficiency	98.3				%
European Weighted Efficiency	98				%
Nighttime Power Consumption	< 12				W
ADDITIONAL FEATURES					
Supported Communication Interfaces ⁽⁴⁾	RS485, Ethernet, GSM plug-in (optional)				
RS485 Surge Protection	Built-in				
Rapid Shutdown	Optional ⁽⁵⁾ (Automatic upon AC Grid Disconnect)				
CONNECTION UNIT					
DC Disconnect (optional)	1000V / 2 x 40A		1000V / 3 x 40A		
STANDARD COMPLIANCE					
Safety	IEC-62109, AS3100				
Grid Connection Standards ⁽⁶⁾	VDE-AR-N-4105, G59/3, AS-4777,EN 50438 , CEI-021,VDE 0126-1-1, CEI-016, BDEW				
Emissions	IEC61000-6-2, IEC61000-6-3 , IEC61000-3-11, IEC61000-3-12				
RoHS	Yes				
INSTALLATION SPECIFICATIONS					
Number of Units	2		3		
AC Output Cable	Cable gland — diameter 22-32; PE gland diameter 10-16		Cable gland — diameter 20-38; PE gland diameter 10-16		mm
DC Input ⁽⁷⁾	6 strings, 4-10mm² DC wire, gland outer diameter 5-10mm / 2 MC4 pairs per unit		9 strings, 4-10mm² DC wire, gland outer diameter 5-10mm / 3 MC4 pairs per unit		
AC Output Wire	Aluminum or Copper; L, N: Up to 70, PE: Up to 35		Aluminum or Copper; L, N: Up to 95, PE: Up to 50		mm²
Dimensions (H x W x D)	Primary Unit: 940 x 315 x 260; Secondary Unit: 540 x 315 x 260				mm
Weight	Primary Unit: 48; Secondary Unit: 45				kg
Operating Temperature Range	-40 to +60 ⁽⁸⁾				°C
Cooling	Fan (user replaceable)				
Noise	< 60				dBA
Protection Rating	IP65 — Outdoor and Indoor				
Mounting	Bracket provided				

⁽¹⁾ Available in the UK, Hungary and Israel

⁽²⁾ If an external RCD is required, its trip value must be ≥ 300mA per unit (≥ 600mA for SE55K; ≥ 900mA for SE82.8K)

⁽³⁾ Where permitted by local regulations

⁽⁴⁾ Refer to Datasheets -> Communications category on Downloads page for specifications of optional communication options: <http://www.solaredge.com/groups/support/downloads>

⁽⁵⁾ Inverter with rapid shutdown part number: SExxK-RWRP04NU4; Available for SE55K and SE82.8K.

⁽⁶⁾ For all standards refer to Certifications category on Downloads page: <http://www.solaredge.com/groups/support/downloads>

⁽⁷⁾ The DC input type, MC4 or glands, and DC switch depends on the part number ordered. Inverter with glands and DC switch P/N: SExxK-xx0P0BNG4, inverter with glands and without DC switch P/N: SExxKxx0P0BNA4, inverter with MC4 and with DC switch P/N: SExxK-xx0P0BNU4, inverter with MC4 and without DC switch P/N: SExxK-xx0P0BNU4

⁽⁸⁾ For power de-rating information refer to: <https://www.solaredge.com/sites/default/files/se-temperature-derating-note.pdf>



Certificate of compliance

Applicant: SolarEdge Technologies Ltd.
1 HaMada Street
Herzliya 4673335
Israel

Product: Photovoltaic inverter

Model: SE40K
SE33.3K
SE30K
SE27.6K
SE25K
SE20K

Use in accordance with regulations:

The inverters are tested according to electrical safety, grid protection, specified environmental influences and efficiency. For detailed information, please watch the corresponding test reports.

Applied rules and standards:

IEC 61727:2004 Characteristics of the utility interface
IEC 62116:2008/2014 Islanding prevention measures for utility-interconnected photovoltaic inverters.
IEC 62109-1:2010 Safety of power converters for use in photovoltaic power systems
IEC 62109-2:2011 Safety of power converters for use in photovoltaic power systems
IEC 60068-2-1:2007 Environmental testing – Part 2-1: Tests – Test A: Cold
IEC 60068-2-2:2007 Environmental testing – Part 2-2: Tests – Test B: Dry heat
IEC 60068-2-14:2009 Environmental testing – Part 2-14: Tests – Test N: Change of temperature
IEC 60068-2-30:2005 Environmental testing – Part 2-30: Tests – Test Db: Damp heat, cyclic (12h + 12 h cycle)
IEC 60068-2-78:2012 Environmental testing – Part 2-78: Tests – Test Cab: Damp heat, steady state
IEC 61683:1999 Photovoltaic systems – Power conditioners – Procedure for measuring efficiency

At the time of issue of this certificate, the safety concept of an aforementioned representative product corresponds to the valid safety specifications for the specified use in accordance with regulations.

Report number: 19TH0534-IEC61683_0
19TH0534-IEC62109-1_7
19TH0534-IEC62109-2_6
19TH0534-IEC60068_0
19TH0534-IEC61727_1

Certification scheme: NSOP-0032-DEU-ZE-V01

Certificate number: U21-0759

Date of issue: 2021-09-01

Certification body



Thomas Lammel

Certification body Bureau Veritas Consumer Products Services Germany GmbH accredited according to DIN EN ISO/IEC 17065

A partial representation of the certificate requires the written permission of Bureau Veritas Consumer Products Services Germany GmbH

1124



Certificate of compliance

Applicant: SolarEdge Technologies Ltd.
1 HaMada Street
Herzliya 4673335
Israel

Product: Photovoltaic (PV) inverter

Model: SE50K; SE55K; SE66.6K; SE82.8K; SE90K; SE100K
SE66.6K*; SE80K*; SE100K*; SE120K*
SE55K-IN**; SE82.8K-IN**

Note: * 480 V mains voltage models
** Models for India

Use in accordance with regulations:

The inverters are tested according the IEC 61683:1999, EN 61683:2000, DIN EN 61683:2000 procedure for measuring efficiency.

Applied rules and standards:

IEC 61683:1999, EN 61683:2000, DIN EN 61683:2000

Photovoltaic systems – Power conditioners – Procedure for measuring efficiency

At the time of issue of this certificate the safety concept of an aforementioned representative product corresponds to the valid safety specifications for the specified use in accordance with regulations.

Report number: 20TH0532-IEC61683_0
Certificate number: U21-0594

Certification program: NSOP-0032-DEU-ZE-V01
Date of issue: 2021-06-28



Certification body of Bureau Veritas Consumer Products Services Germany GmbH accredited according to DIN EN ISO/IEC 17065
A partial representation of the certificate requires the written approval of Bureau Veritas Consumer Products Services Germany GmbH

Measuring of efficiency

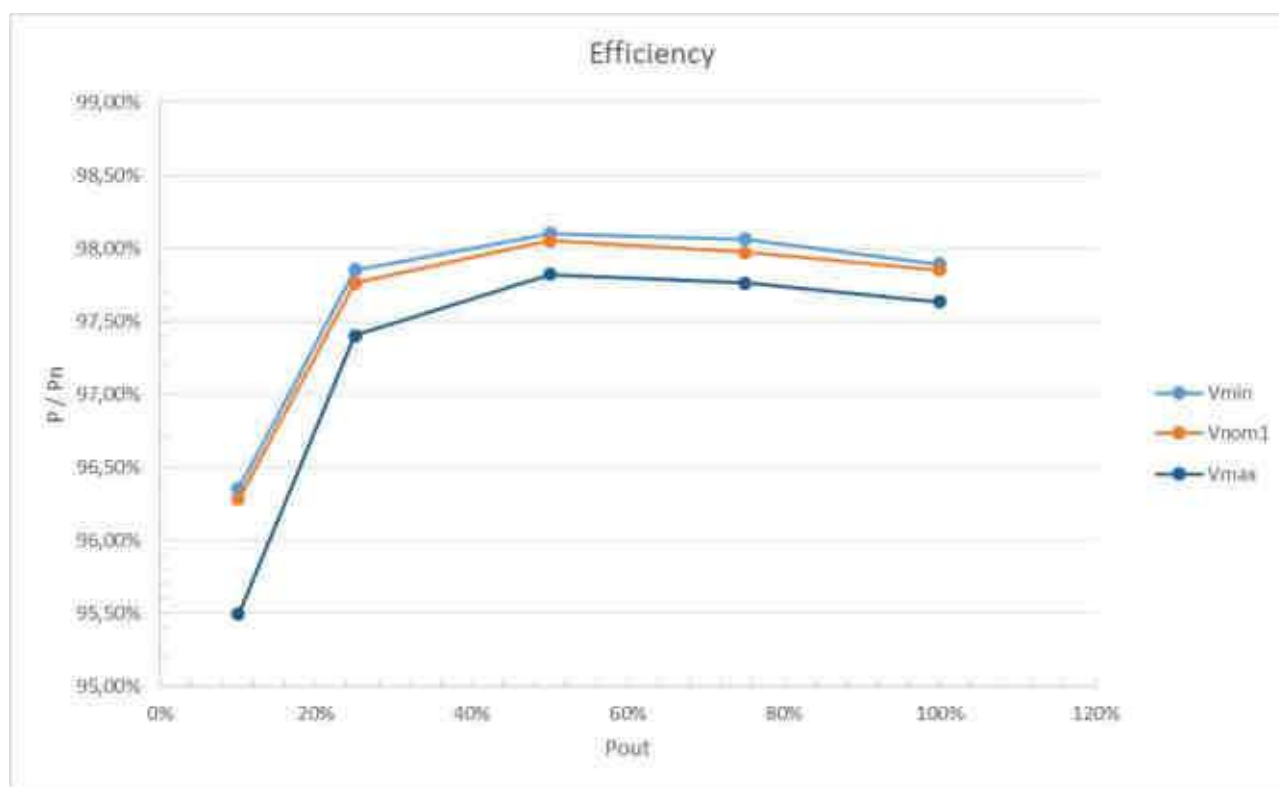
Extract from test report according the IEC 61683

Nr. 20TH0532-IEC61683_0

Efficiency measurement conditions test results

SE25K

Input voltage [Vdc]		Power in [W] (nom. 25000W)				
		10%	25%	50%	75%	100%
		2500	6250	12500	18750	25000
		η in [%]				
V_{min}	700	96,35	97,85	98,10	98,06	97,89
$V_{nominal}$	750	96,28	97,76	98,05	97,97	97,85
V_{max} (90%)	900	95,49	97,40	97,82	97,76	97,63



Note: The efficiency tests inside the referenced report were not tested on the full unit with a combiner box. The efficiency tests are only related to the inverter model and the losses of the combiner box and the connections between are not taken under consideration.

Measuring of efficiency

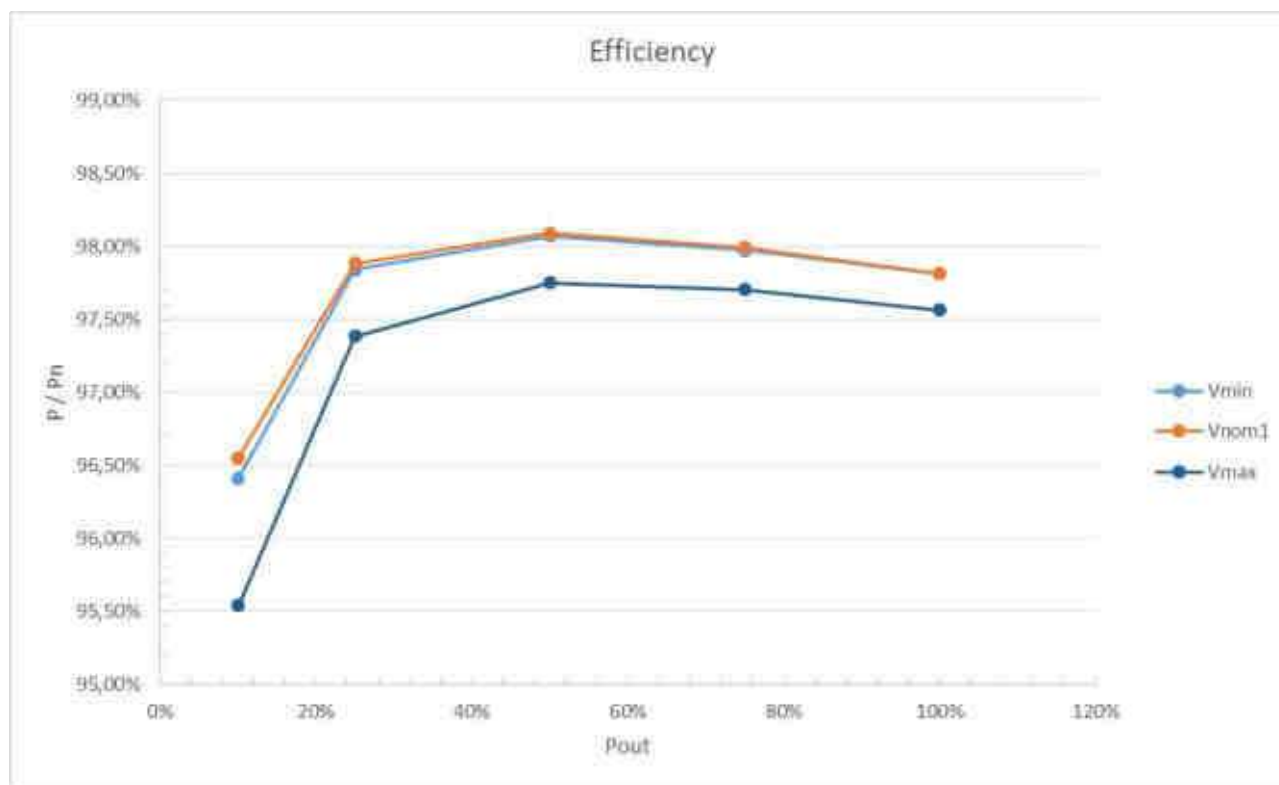
Extract from test report according the IEC 61683

Nr. 20TH0532-IEC61683_0

Efficiency measurement conditions test results

SE27.6K

Input voltage [Vdc]		Power in [W] (nom. 27600W)				
		10%	25%	50%	75%	100%
		2500	6250	12500	20700	25000
		η in [%]				
V_{min}	700	96,41	97,84	98,07	97,97	97,81
$V_{nominal}$	750	96,55	97,88	98,09	97,99	97,81
V_{max} (90%)	900	95,54	97,38	97,75	97,70	97,56



Note: The efficiency tests inside the referenced report were not tested on the full unit with a combiner box. The efficiency tests are only related to the inverter model and the losses of the combiner box and the connections between are not taken under consideration.

Measuring of efficiency

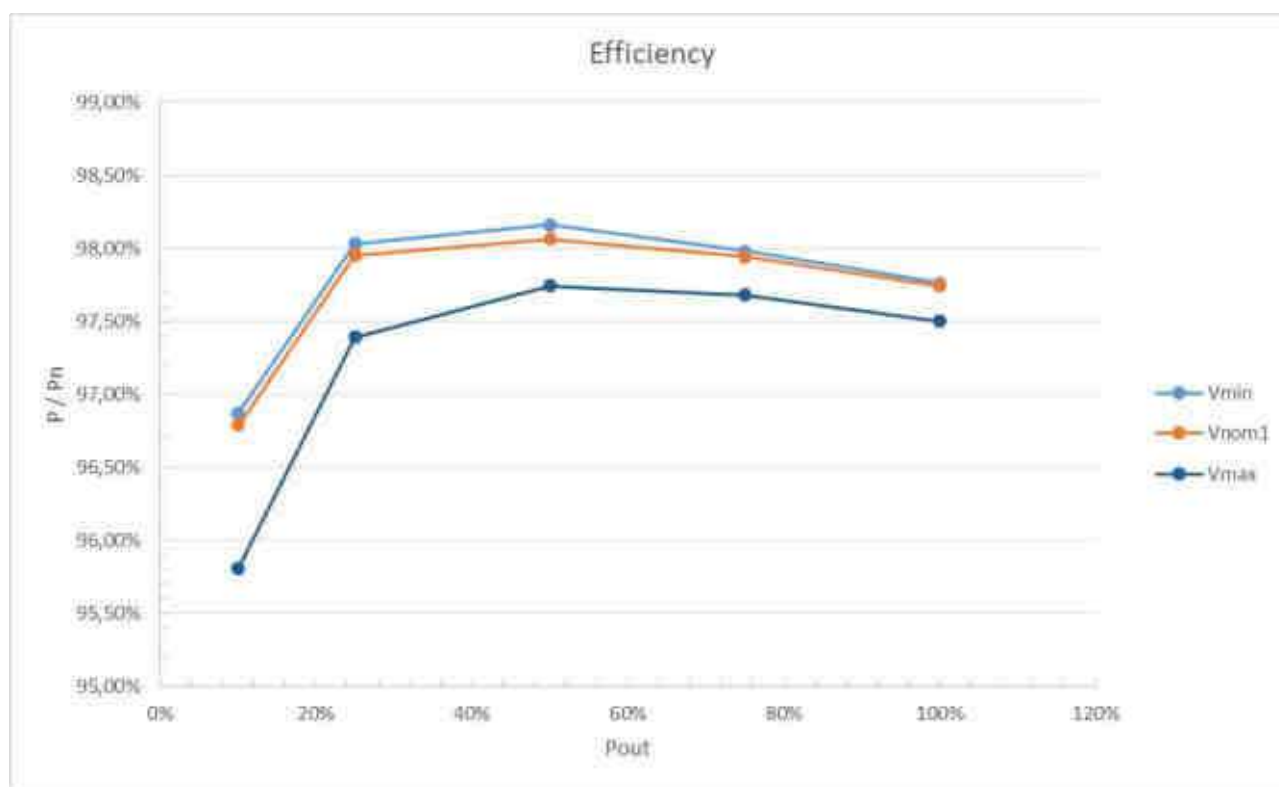
Extract from test report according the IEC 61683

Nr. 20TH0532-IEC61683_0

Efficiency measurement conditions test results

SE30K

Input voltage [Vdc]		Power in [W] (nom. 30000W)				
		10%	25%	50%	75%	100%
		3000	7500	15000	22500	30000
		η in [%]				
V_{min}	700	96,87	98,03	98,16	97,98	97,76
$V_{nominal}$	750	96,79	97,95	98,06	97,94	97,74
V_{max} (90%)	900	95,81	97,39	97,74	97,68	97,50



Note: The efficiency tests inside the referenced report were not tested on the full unit with a combiner box. The efficiency tests are only related to the inverter model and the losses of the combiner box and the connections between are not taken under consideration.

Measuring of efficiency

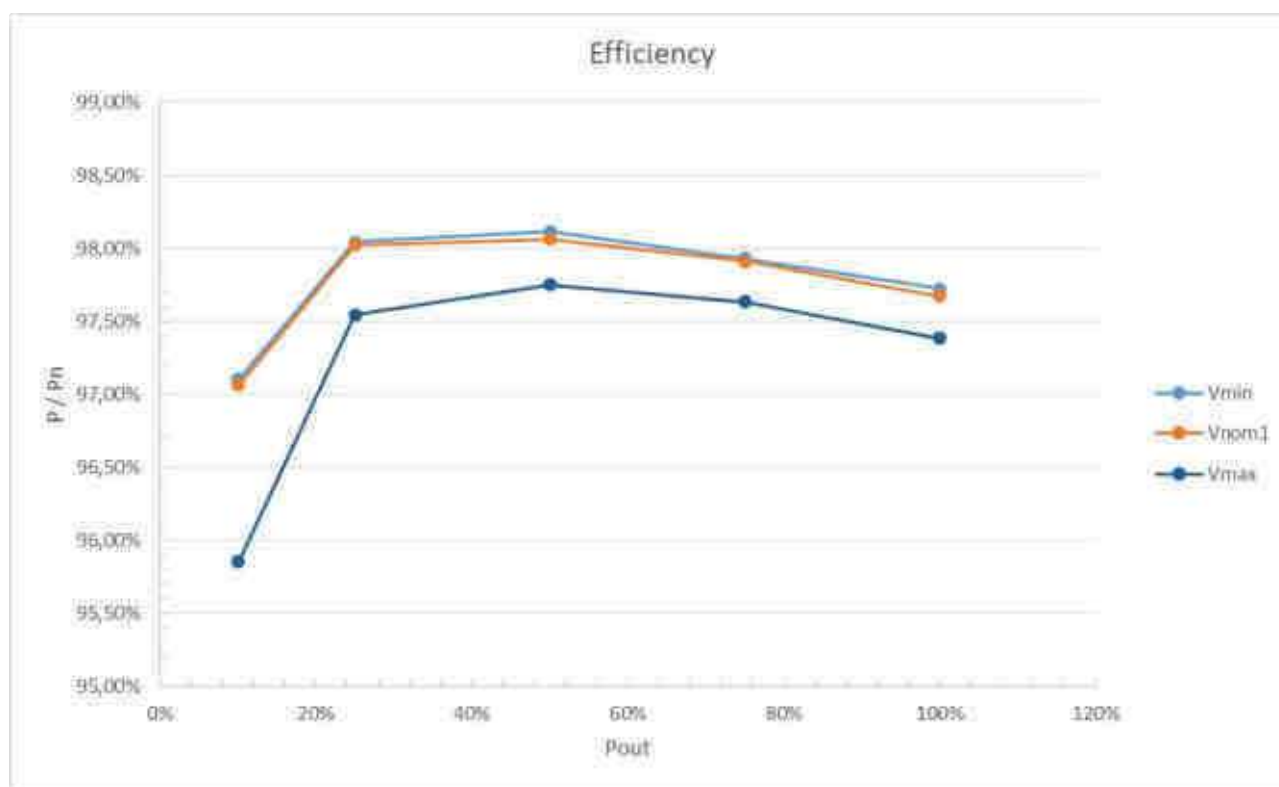
Extract from test report according the IEC 61683

Nr. 20TH0532-IEC61683_0

Efficiency measurement conditions test results

SE33.3K

Input voltage [Vdc]		Power in [W] (nom. 33300W)				
		10%	25%	50%	75%	100%
		3330	8325	16650	24975	33300
		η in [%]				
V_{min}	700	97,10	98,04	98,11	97,93	97,72
$V_{nominal}$	750	97,06	98,02	98,06	97,91	97,67
V_{max} (90%)	900	95,85	97,54	97,75	97,63	97,38



Note: The efficiency tests inside the referenced report were not tested on the full unit with a combiner box. The efficiency tests are only related to the inverter model and the losses of the combiner box and the connections between are not taken under consideration.

Measuring of efficiency

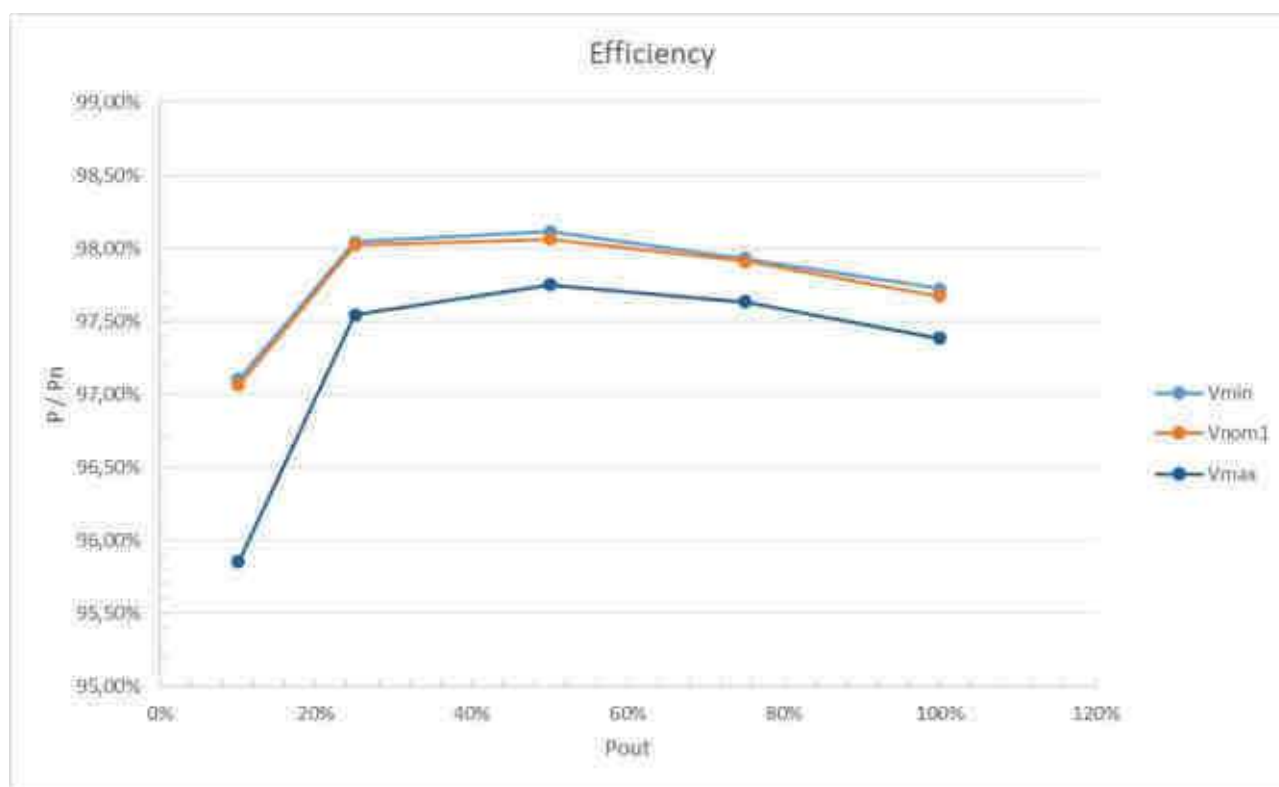
Extract from test report according the IEC 61683

Nr. 20TH0532-IEC61683_0

Efficiency measurement conditions test results

SE30K 277V

Input voltage [Vdc]		Power in [W] (nom. 30000W)				
		10%	25%	50%	75%	100%
		3000	7500	15000	22500	30000
		η in [%]				
V_{min}	790	96,57	98,36	98,51	98,39	98,25
$V_{nominal}$	850	96,52	97,97	98,26	98,23	98,11
V_{max} (90%)	950	95,53	97,59	98,08	98,09	97,99



Note: The efficiency tests inside the referenced report were not tested on the full unit with a combiner box. The efficiency tests are only related to the inverter model and the losses of the combiner box and the connections between are not taken under consideration.

Measuring of efficiency

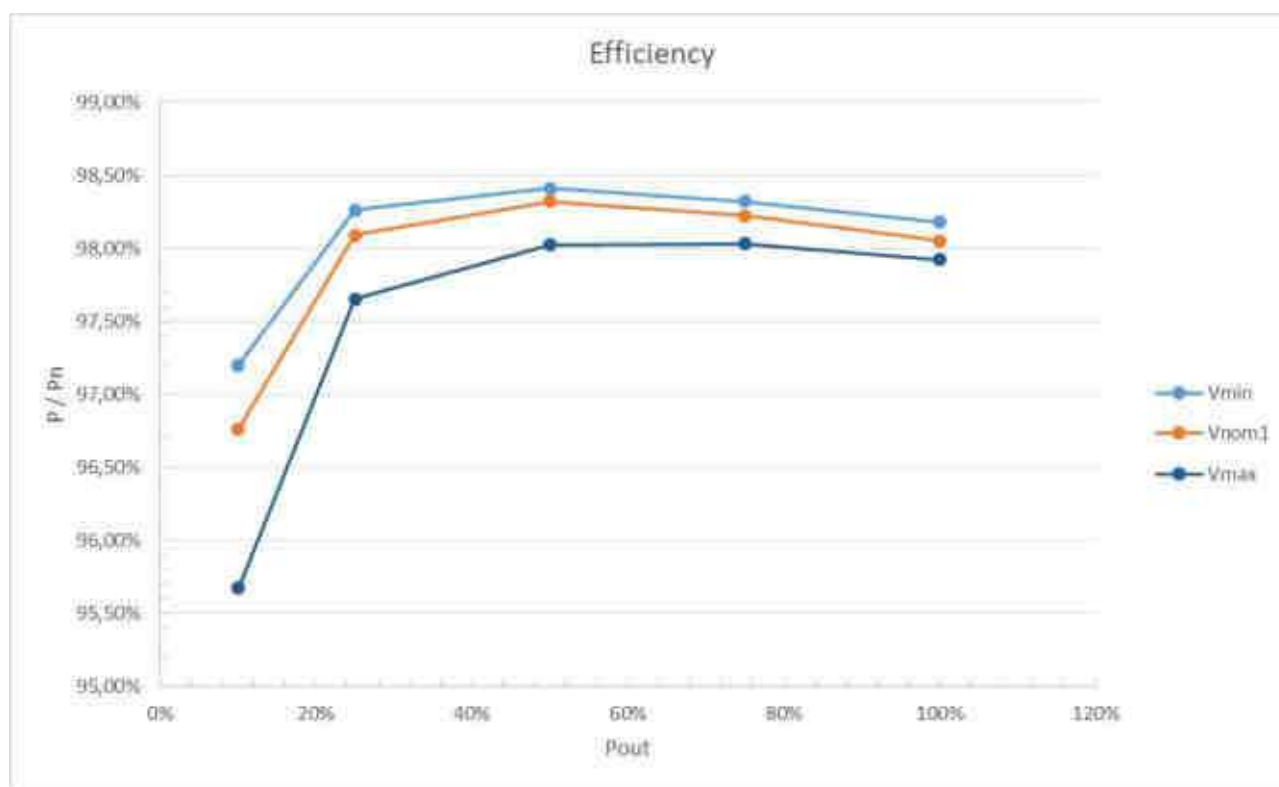
Extract from test report according the IEC 61683

Nr. 20TH0532-IEC61683_0

Efficiency measurement conditions test results

SE33.3K 277V

Input voltage [Vdc]		Power in [W] (nom. 33300W)				
		10%	25%	50%	75%	100%
		3330	8325	16650	24975	33300
		η in [%]				
V_{min}	790	97,20	98,26	98,41	98,32	98,18
$V_{nominal}$	850	96,76	98,09	98,32	98,22	98,05
V_{max} (90%)	950	95,67	97,65	98,02	98,03	97,92



Note: The efficiency tests inside the referenced report were not tested on the full unit with a combiner box. The efficiency tests are only related to the inverter model and the losses of the combiner box and the connections between are not taken under consideration.

Measuring of efficiency

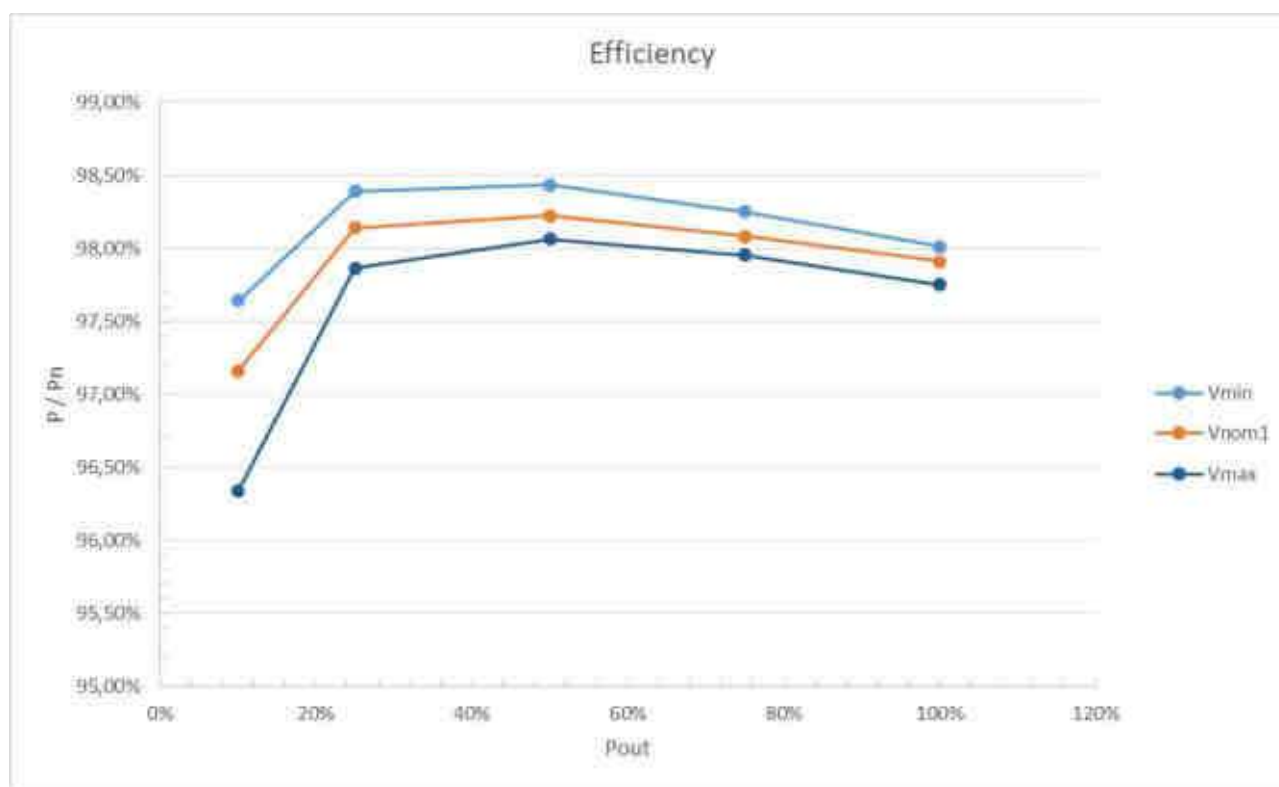
Extract from test report according the IEC 61683

Nr. 20TH0532-IEC61683_0

Efficiency measurement conditions test results

SE40K 277V

Input voltage [Vdc]		Power in [W] (nom. 40000W)				
		10%	25%	50%	75%	100%
		4000	10000	20000	30000	40000
		η in [%]				
V_{min}	790	97,64	98,39	98,43	98,25	98,01
$V_{nominal}$	850	97,16	98,14	98,22	98,08	97,91
V_{max} (90%)	950	96,34	97,86	98,06	97,95	97,75



Note: The efficiency tests inside the referenced report were not tested on the full unit with a combiner box. The efficiency tests are only related to the inverter model and the losses of the combiner box and the connections between are not taken under consideration.



Certificate of compliance

Applicant: SolarEdge Technologies Ltd.
1 HaMada Street
Herzeliya 4673335
Israel

Product: Photovoltaic inverter

Model: SE55K (2 x SE27.6K)
SE66.6K (2 x SE33.3K)
SE82.8K (3 x SE27.6K)
SE100K (3 x SE 33.3K)

Use in accordance with regulations:

The inverters are tested according to electrical safety, specified environmental influences and efficiency. For detailed information, please see the corresponding test reports.

Applied rules and standards:

IEC 61727:1995	Photovoltaic (PV) systems – Characteristics of the utility interface
IEC 62116:2014	Utility-interconnected photovoltaic inverters – Test procedure of islanding prevention measures
IEC 62109-1:2010	Safety of power converters for use in photovoltaic power systems
IEC 62109-2:2011	Safety of power converters for use in photovoltaic power systems
IEC 60068-2-1:2007	Environmental testing – Part 2-1: Tests – Test A: Cold
IEC 60068-2-2:2007	Environmental testing – Part 2-2: Tests – Test B: Dry heat
IEC 60068-2-14:2009	Environmental testing – Part 2-14: Tests – Test N: Change of temperature
IEC 60068-2-30:2005	Environmental testing – Part 2-30: Tests – Test Db: Damp heat, cyclic (12h + 12 h cycle)
IEC 60068-2-78:2012	Environmental testing – Part 2-78: Tests – Test Cab: Damp heat, steady state
IEC 61683:1999	Photovoltaic systems – Power conditioners – Procedure for measuring efficiency

At the time of issue of this certificate the safety concept of an aforementioned representative product corresponds to the valid safety specifications for the specified use in accordance with regulations.

Report number: 14TH0209-IEC61727_0
14TH0209-IEC62109-1_4
14TH0209-IEC62109-2_1
14TH0209-IEC60068-ENV-TR_0
14TH0209-IEC61683_0

Certificate number: U18-0259

Date of issue: 2018-05-07

Certification body



Holger Schaffer

Certification body of Bureau Veritas Consumer Products Services Germany GmbH
Accredited according to DIN EN ISO/IEC 17065

1133



Certificate of compliance

Applicant: SolarEdge Technologies Ltd.
1 HaMada Street
Herzliya 4673335
Israel

Product: Photovoltaic (PV) Inverter

Model: SE66.6K
SE90K
SE100K
SE120K
SE55K-IN
SE82.8K-IN

The certificate refers to the stated model(s) which passed the tests according to the applicable standard(s):

IEC 60068-2-1:2007 Environmental testing – Part 2-1: Tests – Test A: Cold
IEC 60068-2-2:2007 Environmental testing – Part 2-2: Tests – Test B: Dry heat
IEC 60068-2-14:2009 Environmental testing – Part 2-14: Tests – Test N: Change of temperature
IEC 60068-2-30:2005 Environmental testing – Part 2-30: Tests – Test Db: Damp heat, cyclic (12h + 12 h cycle)
(Test conditions were defined according to customer specification)

Report number: 20TH0532-IEC60068-2-
1 2 14 30 0

Certification Program: NSOP-0032-DEU-ZE-V01

Certificate number: U21-0776

Date of issue: 2021-09-07

Certification body



Thomas Lammel



Deutsche
Akkreditierungsstelle
D-ZE-12024-01-00

Certification body Bureau Veritas Consumer Products Services Germany GmbH accredited according to DIN EN ISO/IEC 17065

A partial representation of the certificate requires the written approval of Bureau Veritas Consumer Products Services Germany GmbH

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Annex to Certificate of compliance No.: U21-0776

Ratings:	SE66.6K	SE90K	SE100K
Input DC voltage range [V]	680 - 1000	680 - 1000	680 - 1000
Input DC current [A]	2 x 48,25	3 x 43,5	3 x 48,25
Output AC voltage [V].....	220 / 380 230 / 400	220 / 380 230 / 400	220 / 380 230 / 400
Output AC current [A]	96,5	130,5	145
Initial short-current AC current Ik[A]:	102	141	153
Output power [VA]	66600	90000	100000

Ratings:	SE120K	SE55K-IN*	SE82.8K-IN*
Input DC voltage range [V]	680 - 1000	680 - 1000	680 - 1000
Input DC current [A]	3 x 48,5	2 x 40	3 x 40
Output AC voltage [V].....	277 / 480	220 / 380 230 / 400	220 / 380 230 / 400
Output AC current [A]	145	80	120
Initial short-current AC current Ik[A]:	153	85	128
Output power [VA]	120000	55000	82800

Supplementary information	SE120K consists of three SE40K inverters SE100K consists of three SE33.3K inverters SE90K consists of three SE30K inverters SE82.8K-IN consists of three SE27.6K inverters SE66.6K consists of two SE33.3K inverters SE55K-IN consists of two SE27.6K inverters
---------------------------------	--



Certificate

Manufacturer / applicant: SolarEdge Technologies Ltd.
 1 HaMada Street
 Herzliya 4673335
 Israel

Product type: Grid-tied photovoltaic inverter

Model: SE40K; SE33.3K; SE30K; SE27.6K; SE25K; SE20.1K

The certificate refers to the stated model(s) which passed the tests according to the applicable standard(s):

IEC 60068-2-1:2007 Environmental testing – Part 2-1: Tests – Test A: Cold
 IEC 60068-2-2:2007 Environmental testing – Part 2-2: Tests – Test B: Dry heat
 IEC 60068-2-14:2009 Environmental testing – Part 2-14: Tests – Test N: Change of temperature
 IEC 60068-2-30:2005 Environmental testing – Part 2-30: Tests – Test Db: Damp heat, cyclic (12h + 12 h cycle)
 IEC 60068-2-78:2012 Environmental testing – Part 2-78: Tests – Test Cab: Damp heat, steady state

Report number: 19TH0534-IEC60068_0 **Certification program:** NSOP-0033-DEU-ZE-V01

Certificate number: U20-0868 **Date of issue:** 2020-11-03



Certification body

Thomas Lammel



A partial representation of the certificate requires the written permission of Bureau Veritas Consumer Products Services Germany GmbH

Certification body of Bureau Veritas Consumer Products Services Germany GmbH
 Accredited according to DIN EN ISO / IEC 17065



Our Ref: REGISTRATION/CRS 2021-1821/R-41191833

Date:04-02-2022

Inclusion Id: 53569

Subject :Inclusion of Additional Model(s)

MANUFACTURING UNIT :	Jabil Circuit (Guangzhou) Ltd. 128, JUN CHENG ROAD, GUNAGZHOU ECONOMIC AND TECHNOLOGICAL DEVELOPMENT DISTRICT, GUANGDONG PROVINCE, PEOPLE'S REPUBLIC OF CHINA GUANGDONG PROVINCE,China-510530 Emily_chen@jabil.com +86-20 28055789	
----------------------	--	---

Dear Sir,

1. This has reference to your request for inclusion of models of **"Utility-Interconnected Photovoltaic Inverters" as per IS 16221 (Part 2):2015/IEC 62109-2 :2011 & IS 16169 :2014/IEC 62116 :2008 in Licence No. R-41191833** already granted to you which is valid upto 26-05-2023.

2. It is intimated that the additional Models as per details given below have been agreed to be included in your scope of Licence. **R-41191833 w.e.f. 04-02-2022:**

Product Category	Utility-Interconnected Photovoltaic Inverters
Product Name	Utility-Interconnected Photovoltaic Inverters
IS No.	IS 16221 (Part 2):2015/IEC 62109-2 :2011 & IS 16169 :2014/IEC 62116 :2008
Brand (As Declared by Manufacturer):	Solaredge (Logo)
Inclusion of Additional Models (w.e.f. 04-02-2022)	SE100K, SE33.3K, SE55K-IN, SE66.6K, SE82.8K-IN, SE90K
Factory Address	128, JUN CHENG ROAD, GUNAGZHOU ECONOMIC AND TECHNOLOGICAL DEVELOPMENT DISTRICT, GUANGDONG PROVINCE, PEOPLE'S REPUBLIC OF CHINA GUANGDONG PROVINCE,China-510530

3. Other terms and conditions of the licence shall remain same.

4. This letter is being issued with the approval of competent authority.

Kindly acknowledge receipt of this letter.

Thanking you,

Yours faithfully,
(Sundeep Kumar)
Sc. D
Telfax : +91-11-23230856
E-mail: registration@bis.gov.in

Note: This is a system generated letter. Hence signature is not required.
To verify authentication of letter, kindly scan the QR code on this letter.

For details information on BIS, consult the e-BIS Portal (www.manakonline.in).
Please use BIS CARE APP for verification of ISI-marked goods and hallmarked gold jewellery.

SG15KTL-M/SG20KTL-M

Multi-MPPT String Inverter for 1000 V_{dc} System



High Yield

- Max. efficiency 98.6 %, European efficiency 98.3 %
- 1.1 overload capacity, 10% more yield under high irradiance
- Adapt to complex power grid, extend the grid-connected generation time
- Patented PID recovery function optional



Easy O&M

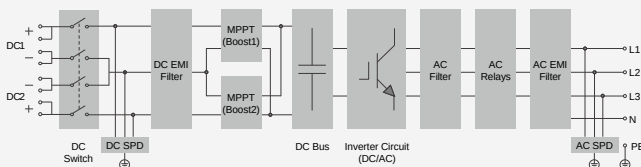
- 24kg, easy O&M
- Plug and play design, easy installation
- String current monitoring function for fast trouble shooting
- Fast commissioning, easy local and on-line monitoring



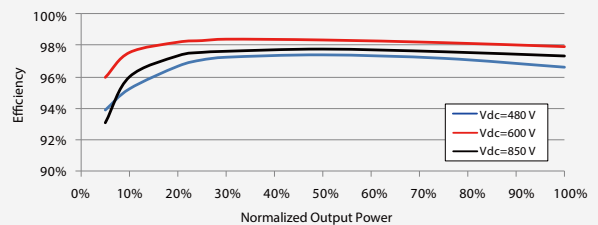
Safe and Reliable

- High power quality, no interference for electrical equipment
- Low radiation, compliance with household equipment standards
- High anti-corrosion with aluminum alloy die casting
- Built-in surge arresters and residual current protection

Circuit Diagram



Efficiency Curve



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 Subject to change without notice. Version 1.2

Input (DC)**SG15KTL-M****SG20KTL-M**

Max. PV input voltage	1100 V	
Min. PV input voltage / Start-up input voltage	200 V / 250 V	
Nominal PV input voltage	600 V	
MPP voltage range	200 V – 1000 V	
MPP voltage range for nominal power	380 V – 850 V	480 V – 850 V
No. of independent MPP inputs	2	
Max. number of PV strings per MPPT	2	
Max. PV input current	44 A (22 A / 22 A)	
Max. current for input connector	15 A	
Max. DC short-circuit current	60 A (30 A / 30 A)	

Output (AC)

AC output power	16500 VA @ 35 °C / 15000 kVA @ 45 °C	22000 VA @ 35 °C / 20000 kVA @ 45 °C
Max. AC output current	24.0 A	31.9 A
Nominal AC voltage	3 / N / PE, 230 / 400 V	
AC voltage range	270 V – 480 V	
Nominal grid frequency / Grid frequency range	50 Hz / 45 – 55 Hz, 60 Hz / 55 – 65 Hz	
THD	< 3 % (at nominal power)	
DC current injection	< 0.5 % I _n	
Power factor at nominal power / Adjustable power factor	> 0.99 / 0.8 leading – 0.8 lagging	
Feed-in phases / Connection phases	3 / 3	

Efficiency

Max. efficiency / Euro. efficiency	98.6 % / 98.3 %
------------------------------------	-----------------

Protection

DC reverse connection protection	Yes
AC short-circuit protection	Yes
Leakage current protection	Yes
Grid monitoring	Yes
DC switch / AC switch	Yes* / No
PV string current monitoring	Yes
PID recovery function	Optional
Overvoltage protection	DC Type II / AC Type II

General Data

Dimensions (W*H*D)	370*485*210 mm
Weight	24 kg
Isolation method	Transformerless
Degree of protection	IP65
Night power consumption	< 1 W
Operating ambient temperature range	-25 to 60 °C (> 45 °C derating)
Allowable relative humidity range (non-condensing)	0 – 100 %
Cooling method	Smart forced air cooling
Max. operating altitude	4000 m (> 3000 m derating)
Display / Communication	LED, Bluetooth + APP / RS485 (Optional: WiFi / Ethernet)
DC connection type	MC4 (Max. 6 mm ²)
AC connection type	Plug and play connector (Max. 16 mm ²)
Compliance	EN 62109-1, EN 62109-2, EN 61000-3-11, EN 61000-3-12, IEC 61727, IEC 62116, VDE0126-1-1/4105, AS 4777.2, IEC 60068, IEC 61683, EN 50530, CEI 0-21,NB/T32004-2013, UNE 206007-1, G59/3, UTE C15-712-1
Grid support	Active & reactive power control and power ramp rate control
Type designation	SG15KTL-M-10 SG20KTL-M-10

*:Devices for Australia are not equipped with DC switches





C E R T I F I C A T E
of Conformity
EC Council Directive 2014/30/EU
Electromagnetic Compatibility

Registration No.: AE 50415431 0001

Report No.: 50138642 001

Holder: Sungrow Power Supply Co., Ltd.
No.1699 Xiyou Rd., New & High
Technology Industrial
Development Zone,
Hefei 230088
P. R. China

Product: PV-Inverter
(Grid-connected PV Inverter)

Identification: SG15KTL-M SG17KTL-M SG20KTL-M
Serial No.: n.a.
Remark: Refer to test report 50138642 001 for details.

Tested acc. to: EN 61000-6-1:2007
EN 61000-6-2:2005
EN 61000-6-3:2007+A1
EN 61000-6-4:2007+A1
IEC 61000-6-1:2005
IEC 61000-6-2:2005
IEC 61000-6-3:2006+A1
IEC 61000-6-4:2006+A1

This certificate of conformity is based on an evaluation of a sample of the above mentioned product. Technical Report and documentation are at the Licence Holder's disposal. This is to certify that the tested sample is in conformity with all provisions of Annex I of Council Directive 2014/30/EU. This certificate does not imply assessment of the production of the product and does not permit the use of a TÜV Rheinland mark of conformity. The holder of the certificate is authorized to use this certificate in connection with the EC declaration of conformity according to the same Directive.



Date 13.08.2018

Weichun Li

TÜV Rheinland LGA Products GmbH - Tillystraße 2 - 90431 Nürnberg

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CE The CE marking may only be used if all relevant and effective EC Directives are complied with. CE

TÜV Rheinland (China) Ltd.
Member of TÜV Rheinland Group



Sungrow Power Supply Co., Ltd.
Shandong Cao

Date : 13.08.2018
Our ref. : LHX 01
Your ref.: C.S.D.

No.1699 Xiyou Rd., New & High
Technology Industrial
Development Zone,
Hefei 230088
P. R. China

Ref : AE Certificate of Conformity EMC

Type of Equipment : Grid-connected PV Inverter
Model Designation : See Certificate
Certificate No. : AE 50415431 0001
Report No. : 50138642 001

Dear Shandong Cao,

We herewith confirm that a sample of the above mentioned technical equipment has been tested and was found to be in accordance with the relevant requirements.

Enclosed please find your Certificate of Conformity.

We appreciate your kind support and would like to offer our assistance and continuous services in the future.

With kind regards,

Certification Body


Weichun Li

CC: Sungrow Power Supply Co., Ltd.

Enclosure

证书的详细资料请登陆www.certipedia.com查阅,或拨打我司客服热线800 999 3668 / 400 883 1300咨询

TÜV Rheinland (China) Ltd.
莱茵检测认证服务(中国)有限公司

Unit 707, AVIC Bldg., No. 10B,
Central Road, East 3rd Ring
Road, Chaoyang District,
Beijing, 100022, P.R.China

北京市朝阳区东三环中路乙10号
艾维克大厦707室
邮编: 100022

Tel: (8610)8566 6660
Fax: (8610)8566 6667
e-mail: info@bj.chn.tuv.com
Internet: <http://www.chn.tuv.com>

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C E R T I F I C A T E

of Conformity



Registration No.: AK 50415674 0001

Report No.: 50169193 001

Holder: Sungrow Power Supply Co., Ltd.
No. 1699 Xiyou Rd., New & High
Technology Industrial
Development Zone,
Hefei 230088
P. R. China

Product: PV-Inverter
(Grid-connected PV Inverter)

Identification:

Type Name	:	SG20KTL-M	SG17KTL-M	SG15KTL-M
Serial No.	:	Engineering Samples		
Firmware Ver.	:	DSP_MOONSTONE_V11_A, LCD_MOONSTONE_V01_A_M		
Remark(s)	:	Refer to report 50169193 001 for details.		

Tested acc. to:

- IEC 61683:1999
- IEC 60068-2-1:2007
- IEC 60068-2-2:2007
- IEC 60068-2-14:2009
- IEC 60068-2-27:2008
- IEC 60068-2-30:2005
- IEC 60068-2-64:2008

The certificate of conformity refers to the above mentioned product. This is to certify that the specimen is in conformity with the assessment requirement mentioned above. This certificate does not imply assessment of the production of the product and does not permit the use of a TÜV Rheinland mark of conformity.

Certification Body



Date 13.08.2018

Weichun Li

TÜV Rheinland LGA Products GmbH - Tillystraße 2 - 90431 Nürnberg

C E R T I F I C A T E

of Conformity



Registration No.: AK 50415485 0001

Report No.: 50169192 001

Holder: Sungrow Power Supply Co., Ltd.
No.1699 Xiyou Rd., New & High
Technology Industrial
Development Zone,
Hefei 230088
P. R. China

Product: PV-Inverter
(Grid-connected PV Inverter)

Identification:

Type Name	:	SG20KTL-M	SG17KTL-M	SG15KTL-M	SG12KTL-M
		SG10KTL-M	SG8KTL-M	SG6KTL-MT	SG5KTL-MT
Serial No.	:	Engineering Samples			
Firmware Ver.:	:	DSP_MOONSTONE_V11_A LCD_MOONSTONE_V01_A_M			
Remark(s)	:	Refer to report 50169192 001 for details.			

Tested acc. to:

IEC 61727:2004
IEC 62116:2014
IEC 61000-3-11:2000
IEC 61000-3-12:2011

The certificate of conformity refers to the above mentioned product. This is to certify that the specimen is in conformity with the assessment requirement mentioned above. This certificate does not imply assessment of the production of the product and does not permit the use of a TÜV Rheinland mark of conformity.



Date 10.08.2018

Weichun Li

TÜV Rheinland LGA Products GmbH - Tillystraße 2 - 90431 Nürnberg

SG15KTL-M/SG20KTL-M

Multi-MPPT String Inverter for 1000 V_{dc} System



High Yield

- Max. efficiency 98.6 %, European efficiency 98.3 %
- 1.1 overload capacity, 10% more yield under high irradiance
- Adapt to complex power grid, extend the grid-connected generation time
- Patented PID recovery function optional



Easy O&M

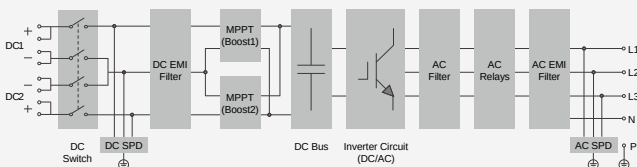
- 24kg, easy O&M
- Plug and play design, easy installation
- String current monitoring function for fast trouble shooting
- Fast commissioning, easy local and on-line monitoring



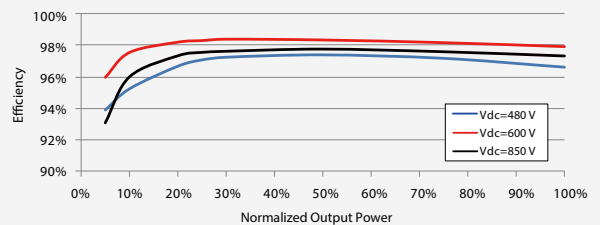
Safe and Reliable

- High power quality, no interference for electrical equipment
- Low radiation, compliance with household equipment standards
- High anti-corrosion with aluminum alloy die casting
- Built-in surge arresters and residual current protection

Circuit Diagram



Efficiency Curve



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 Subject to change without notice. Version 1.2

Input (DC)**SG15KTL-M****SG20KTL-M**

Max. PV input voltage	1100 V	
Min. PV input voltage / Start-up input voltage	200 V / 250 V	
Nominal PV input voltage	600 V	
MPP voltage range	200 V – 1000 V	
MPP voltage range for nominal power	380 V – 850 V	480 V – 850 V
No. of independent MPP inputs	2	
Max. number of PV strings per MPPT	2	
Max. PV input current	44 A (22 A / 22 A)	
Max. current for input connector	15 A	
Max. DC short-circuit current	60 A (30 A / 30 A)	

Output (AC)

AC output power	16500 VA @ 35 °C / 15000 kVA @ 45 °C	22000 VA @ 35 °C / 20000 kVA @ 45 °C
Max. AC output current	24.0 A	31.9 A
Nominal AC voltage	3 / N / PE, 230 / 400 V	
AC voltage range	270 V – 480 V	
Nominal grid frequency / Grid frequency range	50 Hz / 45 – 55 Hz, 60 Hz / 55 – 65 Hz	
THD	< 3 % (at nominal power)	
DC current injection	< 0.5 % I _n	
Power factor at nominal power / Adjustable power factor	> 0.99 / 0.8 leading – 0.8 lagging	
Feed-in phases / Connection phases	3 / 3	

Efficiency

Max. efficiency / Euro. efficiency	98.6 % / 98.3 %
------------------------------------	-----------------

Protection

DC reverse connection protection	Yes
AC short-circuit protection	Yes
Leakage current protection	Yes
Grid monitoring	Yes
DC switch / AC switch	Yes* / No
PV string current monitoring	Yes
PID recovery function	Optional
Overvoltage protection	DC Type II / AC Type II

General Data

Dimensions (W*H*D)	370*485*210 mm
Weight	24 kg
Isolation method	Transformerless
Degree of protection	IP65
Night power consumption	< 1 W
Operating ambient temperature range	-25 to 60 °C (> 45 °C derating)
Allowable relative humidity range (non-condensing)	0 – 100 %
Cooling method	Smart forced air cooling
Max. operating altitude	4000 m (> 3000 m derating)
Display / Communication	LED, Bluetooth + APP / RS485 (Optional: WiFi / Ethernet)
DC connection type	MC4 (Max. 6 mm ²)
AC connection type	Plug and play connector (Max. 16 mm ²)
Compliance	EN 62109-1, EN 62109-2, EN 61000-3-11, EN 61000-3-12, IEC 61727, IEC 62116, VDE0126-1-1/4105, AS 4777.2, IEC 60068, IEC 61683, EN 50530, CEI 0-21,NB/T32004-2013, UNE 206007-1, G59/3, UTE C15-712-1
Grid support	Active & reactive power control and power ramp rate control
Type designation	SG15KTL-M-10 SG20KTL-M-10

*:Devices for Australia are not equipped with DC switches



SG33CX/SG40CX/SG50CX **New**

SUNGROW
Clean power for all

Multi-MPPT String Inverter for 1000 Vdc System



HIGH YIELD

- Up to 5 MPPTs with max. efficiency 98.7%
- Compatible with bifacial module
- Built-in PID recovery function

SMART O&M

- Touch free commissioning and remote firmware upgrade
- Smart IV Curve diagnosis *
- Fuse free design with smart string current monitoring

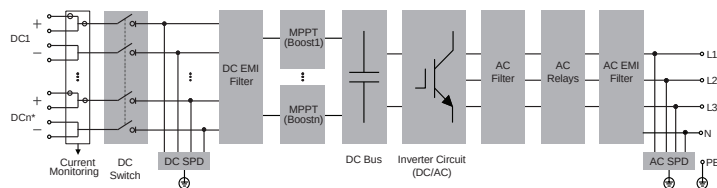
SAVED INVESTMENT

- Compatible with Al and Cu AC cables
- DC 2 in 1 connection enabled
- Cable free communication with optional WLAN

PROVEN SAFETY

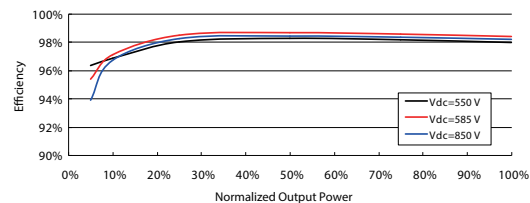
- IP66 and C5 anti-corrosion
- Type II SPD for both DC and AC, DC Type I+II Opt.
- Satisfied global safety and grid code

CIRCUIT DIAGRAM



*: n=3(SG33CX)/4(SG40CX)/5(SG50CX)

EFFICIENCY CURVE (SG50CX)



Type designation	SG33CX	SG40CX	SG50CX
Input (DC)			
Max. PV input voltage		1100 V **	
Min. PV input voltage / Start-up input voltage		200 V / 250 V	
Nominal PV input voltage		585 V	
MPP voltage range		200 – 1000 V	
No. of independent MPP inputs	3	4	5
No. of PV strings per MPPT		2	
Max. PV input current	3 * 26 A	4 * 26 A	5 * 26 A
Max. DC short-circuit current	3 * 40 A	4 * 40 A	5 * 40 A
Output (AC)			
AC output power	33 kVA @45 °C, 400Vac / 36.3 kVA @ 40 °C,400Vac 33 KVA @ 50 °C, 415Vac / 36.3 KVA @ 45 °C, 415Vac	40 kVA @ 45 °C, 400Vac / 44 kVA @ 40 °C,400Vac 40 KVA @ 50 °C, 415Vac / 44 KVA @ 45 °C, 415Vac	50 kVA @45 °C, 400Vac / 55kVA @ 40 °C,400Vac 50KVA @ 50 °C, 415Vac / 55kVA @ 45 °C,415Vac
Max. AC output current	55.2 A	66.9 A	83.6 A
Nominal AC voltage		3 / N / PE, 230 / 400 V	
AC voltage range		312 – 528 V	
Nominal grid frequency / Grid frequency range		50 Hz / 45 – 55 Hz, 60 Hz / 55 – 65 Hz	
Harmonic (THD)		< 3 % (at nominal power)	
DC current injection		< 0.5 % In	
Power factor at nominal power / Adjustable power factor		> 0.99 / 0.8 leading – 0.8 lagging	
Feed-in phases / AC connection		3 / 3-PE	
Efficiency			
Max. efficiency / European efficiency	98.6 % / 98.3 %	98.6% / 98.3%	98.7% / 98.4%
Protection and Function			
DC reverse polarity protection		Yes	
AC short circuit protection		Yes	
Leakage current protection		Yes	
Grid monitoring		Yes	
Ground fault monitoring		Yes	
DC switch		Yes	
AC switch		No	
PV string monitoring		Yes	
Q at night function		Yes	
PID recovery function		Yes	
Arc fault circuit interrupter (AFCI)		Optional	
Surge protection		DC Type II (optional: Type I + II) / AC Type II	
General Data			
Dimensions (W*H*D)	702*595*310mm	782*645*310mm	782*645*310mm
Weight	50 kg	58 kg	62 kg
Topology		Transformerless	
Degree of protection		IP66	
Night power consumption		≤2 W	
Operating ambient temperature range		-30 to 60 °C (> 45 °C derating)	
Allowable relative humidity range		0 – 100 %	
Cooling method		Smart forced air cooling	
Max. operating altitude		4000 m (> 3000 m derating)	
Display		LED, Bluetooth+APP	
Communication		RS485 / Optional: WLAN, Ethernet	
DC connection type		MC4 (Max. 6 mm²)	
AC connection type		OT or DT terminal (Max.70 mm²)	
Compliance	IEC 62109, IEC 61727, IEC 62116, IEC 60068, IEC 61683, VDE-AR-N 4105:2018, VDE-AR-N 4110:2018, IEC 61000-6-3, EN 50549-1/2, AS/NZS 4777.2:2015, CEI 0-21 2019, CEIO-16 2019, VDE 0126-1-1/A1 VFR 2019, UTE C15-712-1:2013, DEWA, UNE 206007-1/RD 1699, UNE 217001, Israel certificate, G99		
Grid Support	Q at night function, LVRT, HVRT,active & reactive power control and power ramp rate control		

* Only compatible with Sungrow logger, EyeM4 and iSolarCloud

** If the maximum DC voltage in the system can exceed 1000V, the MC4 connectors included in the scope of delivery must not be used. In this case MC4 Evo2 connectors must be used.



C E R T I F I C A T E

of Conformity



Registration No.: AK 50434878 0001

Report No.: 50238433 001

Holder: Sungrow Power Supply Co., Ltd.
No.1699 Xiyou Rd., New & High
Technology Industrial
Development Zone,
Hefei 230088
P. R. China

Product: PV-Inverter
(Grid Connected PV Inverter)

Identification:

Type Designation	: SG33CX SG40CX SG50CX
Serial Number	: Engineering Sample
Firmware Version	: LCD_AGATE-S_V11_V01_A MDSP_AGATE-S_V11_V01_A
Remark	: Refer to test report 50238433 001 for details.

Tested acc. to:

IEC 61727:2004
IEC 62116:2014
IEC 61000-3-11:2000
IEC 61000-3-12:2011

The certificate of conformity refers to the above mentioned product. This is to certify that the specimen is in conformity with the assessment requirement mentioned above. This certificate does not imply assessment of the production of the product and does not permit the use of a TÜV Rheinland mark of conformity.

Date 06.05.2019



TÜV Rheinland LGA Products GmbH - Tillystraße 2 - 90431 Nürnberg

TÜV Rheinland (China) Ltd.
Member of TÜV Rheinland Group



TÜVRheinland®
Precisely Right.

Sungrow Power Supply Co., Ltd.
Daniel Du
-
No.1699 Xiyou Rd., New & High
Technology Industrial
Development Zone,
Hefei 230088
P. R. China

Date : 06.05.2019
Our ref. : DJW 01
Your ref.: Daniel Du

Ref : AK Certificate of Conformity

Type of Equipment : Grid Connected PV Inverter
Model Designation : See Certificate
Certificate No. : AK 50434878 0001
Report No. : 50238433 001

Dear Daniel Du,

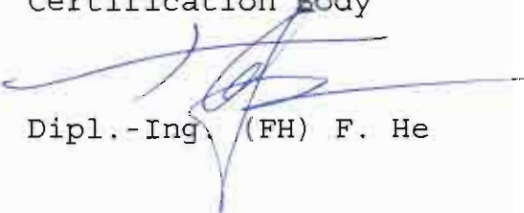
We herewith confirm that a sample of the above mentioned technical equipment has been tested and was found to be in accordance with the relevant requirements.

Enclosed please find your Certificate of Conformity.

We appreciate your kind support and would like to offer our assistance and continuous services in the future.

With kind regards,

Certification Body


Dipl.-Ing. (FH) F. He

Enclosure

证书的详细信息请登录www.certipedia.com查阅,或拨打我司客服热线800 999 3668 / 400 883 1300咨询

TÜV Rheinland (China) Ltd.
莱茵检测认证服务(中国)有限公司

Unit 707, AVIC Bldg., No. 10B,
Central Road, East 3rd Ring
Road, Chaoyang District,
Beijing, 100022, P.R.China

北京市朝阳区东三环中路乙10号
艾维克大厦707室
邮编: 100022

Tel: (8610)6566 6660
Fax: (8610)6566 6667
e-mail: info@bj.chn.tuv.com
Internet: <http://www.chn.tuv.com>

1149

C E R T I F I C A T E

of Conformity



Registration No.: AK 50434877 0001

Report No.: 50241839 001

Holder: Sungrow Power Supply Co., Ltd.
No.1699 Xiyou Rd., New & High
Technology Industrial
Development Zone,
Hefei 230088
P. R. China

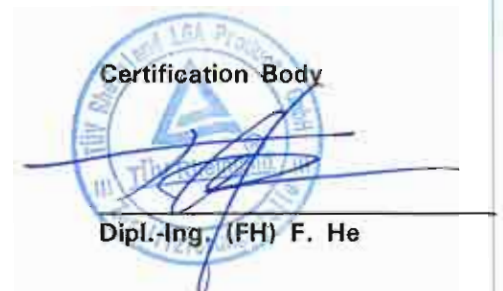
Product: PV-Inverter
(Grid Connected PV Inverter)

Identification: Type Designation : SG33CX SG40CX SG50CX
Serial Number : Engineering Sample
Remark : Refer to test report 50241839 001
for details.

Tested acc. to: IEC 61683:1999
IEC 60068-2-1:2007
IEC 60068-2-2:2007
IEC 60068-2-14:2009
IEC 60068-2-30:2005
IEC 60068-2-64:2008
IEC 60068-2-27:2008

The certificate of conformity refers to the above mentioned product. This is to certify that the specimen is in conformity with the assessment requirement mentioned above. This certificate does not imply assessment of the production of the product and does not permit the use of a TÜV Rheinland mark of conformity.

Date 06.05.2019



TÜV Rheinland LGA Products GmbH - Tillystraße 2 - 90431 Nürnberg

C E R T I F I C A T E

of Conformity



Registration No.: AK 50435267 0001

Report No.: 50241858 001

Holder: Sungrow Power Supply Co., Ltd.
No.1699 Xiyou Rd., New & High
Technology Industrial
Development Zone,
Hefei 230088
P. R. China

Product: PV-Inverter
(Grid Connected PV Inverter)

Identification:

Type Designation	: SG33CX SG40CX SG50CX
Serial Number	: Engineering Sample
Firmware Version	: LCD_AGATE-S_V11_V01_A MDSP_AGATE-S_V11_V01_A
Remark	: Refer to test report 50241858 001 for details.

Tested acc. to: EN 50530:2010+A1

The certificate of conformity refers to the above mentioned product. This is to certify that the specimen is in conformity with the assessment requirement mentioned above. This certificate does not imply assessment of the production of the product and does not permit the use of a TÜV Rheinland mark of conformity.

Date 26.04.2019

Certification Body



Dipl.-Ing. (FH) F. He

TÜV Rheinland LGA Products GmbH - Tillystraße 2 - 90431 Nürnberg

TÜV Rheinland (China) Ltd.
Member of TÜV Rheinland Group



Sungrow Power Supply Co., Ltd.
Daniel Du
-
No.1699 Xiyou Rd., New & High
Technology Industrial
Development Zone,
Hefei 230088
P. R. China

Date : 06.05.2019
Our ref. : DJW 01
Your ref.: Daniel Du

Ref : AK Certificate of Conformity

Type of Equipment : Grid Connected PV Inverter
Model Designation : See Certificate
Certificate No. : AK 50435267 0001
Report No. : 50241858 001

Dear Daniel Du,

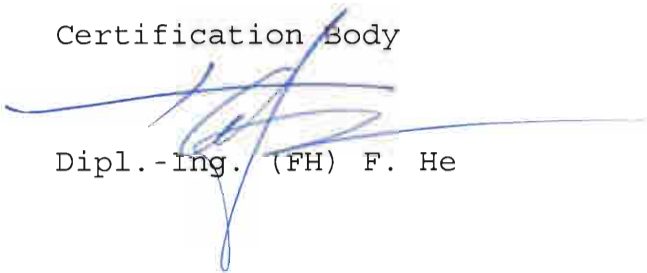
We herewith confirm that a sample of the above mentioned technical equipment has been tested and was found to be in accordance with the relevant requirements.

Enclosed please find your Certificate of Conformity.

We appreciate your kind support and would like to offer our assistance and continuous services in the future.

With kind regards,

Certification Body


Dipl.-Ing. (FH) F. He

Enclosure

证书的详细信息请登录 www.certipedia.com 查询, 或拨打我们客服热线 800 999 3668 / 400 883 1300 咨询

TÜV Rheinland (China) Ltd.
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Unit 707, AVIC Bldg., No. 10B,
Central Road, East 3rd Ring
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北京市朝阳区东三环中路10号
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Tel: (8610)6566 6660
Fax: (8610)6566 6667
e-mail: info@bj.chn.tuv.com
Internet: <http://www.chn.tuv.com>

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Zertifikat**Certificate**

Zertifikat Nr. *Certificate No.*
R 50431160

Blatt *Sheet*
0001

Ihr Zeichen *Client Reference*

Daniel Du

Unser Zeichen *Our Reference*

01-LiBru-50220375 001

Ausstellungsdatum

04.04.2019

Date of Issue

(day/mo/yr)

Genehmigungsinhaber *License Holder*

Sungrow Power Supply Co., Ltd.
No.1699 Xiyou Rd., New & High
Technology Industrial
Development Zone,
Hefei 230088
P. R. China

Fertigungsstätte *Manufacturing Plant*

Sungrow Power Supply Co., Ltd.
No.1699 Xiyou Rd., New & High
Technology Industrial
Development Zone,
Hefei 230088
P. R. China

Prüfzeichen *Test Mark*



Bauart geprüft
Sicherheit
Regelmäßige
Produktions-
überwachung

www.tuv.com
ID 1419066995

Geprüft nach *Tested acc. to*

IEC 62109-1:2010
IEC 62109-2:2011
EN 62109-1:2010
EN 62109-2:2011

Zertifiziertes Produkt (Geräteidentifikation)

Certified Product (Product Identification)

Lizenzentgelte - Einheit

License Fee - Unit

PV-Wechselrichter (Grid-connected PV Inverter)

Type Designation	:	SG30CX	SG33CX	SG40CX	SG50CX	11
Vmax PV[Vd.c.]	:	1100				
Isc PV[Ad.c.]	:	120	120	160	200	
MPP Voltage Range[Vd.c.]	:	200 - 1000				
Max.Input Current[Ad.c.]	:	78	78	104	130	
MPP Voltage Range for	:					
Rated Power[Vd.c.]	:	550 - 850				
Overvoltage Category(OVC)	:	II for PV				
Rated Output Voltage[Va.c.]	:	3/N/PE, AC 230/400V				
Rated Output Frequency[Hz]	:	50/60				
Rated Output Power[kW]	:	29.9	33	40	50	
Max. Output Current[Aa.c.]	:	43.16	55.2	66.9	83.6	
Power Factor	:	0.80 leading, 0.80 lagging				
Overvoltage Category(OVC)	:	III for AC Mains				

continued on page 0002



11

ANLAGE (Appendix): 1.0

Dem Zertifikat liegt unsere Prüf- und Zertifizierungsordnung zugrunde und es bestätigt die Konformität des Produktes mit den oben genannten Standards und Prüfgrundlagen. Zusätzliche Anforderungen in Ländern, in denen das Produkt in Verkehr gebracht werden soll, müssen zusätzlich betrachtet werden. Die Herstellung des zertifizierten Produktes wird überwacht.

This certificate is based on our Testing and Certification Regulation and states the conformity of the product with the standards and testing requirements as indicated above. Any additional requirements in countries where the product is going to be marketed have to be considered additionally. The manufacturing of the certified product is subject to surveillance.

TÜV Rheinland LGA Products GmbH, Tillystraße 2, 90431 Nürnberg

Tel.: +49 221 806-1371 e-mail: cert-validity@de.tuv.com

Fax: +49 221 806-3935 http://www.tuv.com/safety

File No. ANERT-TECH/99/2022-T2 (Computer No. 5311)

1153

Zertifizierungsstelle

Mai Miao
Mai Miao

Zertifikat**Certificate**

Zertifikat Nr. *Certificate No.*
R 50431160

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0002

Ihr Zeichen <i>Client Reference</i>	Unser Zeichen <i>Our Reference</i>	Ausstellungsdatum <i>Date of Issue</i>
Daniel Du	01-LiBru-50220375 001	04.04.2019 (day/mo/yr)

Genehmigungsinhaber *License Holder*
Sungrow Power Supply Co., Ltd.
No.1699 Xiyou Rd., New & High
Technology Industrial
Development Zone,
Hefei 230088
P. R. China

Fertigungsstätte *Manufacturing Plant*
Sungrow Power Supply Co., Ltd.
No.1699 Xiyou Rd., New & High
Technology Industrial
Development Zone,
Hefei 230088
P. R. China

Prüfzeichen *Test Mark*

Bauart geprüft
Sicherheit
Regelmäßige
Produktions-
überwachung

www.tuv.com
ID 1413066995

Geprüft nach *Tested acc. to*

IEC 62109-1:2010
IEC 62109-2:2011
EN 62109-1:2010
EN 62109-2:2011

Zertifiziertes Produkt (Geräteidentifikation)
Certified Product (Product Identification)

Lizenzentgelte - Einheit
License Fee - Unit

PV-Wechselrichter (Grid-connected PV Inverter)

as page 0001 continuation

Protective Class : Class I
Ingress Protection (IP) : IP66
Pollution Degree (PD) : PD3
Operating Temperature [°C] : -30 to 60 (>45 derating)
Altitude [m] : 4000
Type of Inverter : Non-isolated

Remark(s):

The installation has to be carried out according to the attached installation instruction.
Any additional requirements in countries where the product is going to be marketed have to be considered additionally.



ANLAGE (Appendix): 1.0

Dem Zertifikat liegt unsere Prüf- und Zertifizierungsordnung zugrunde und es bestätigt die Konformität des Produktes mit den oben genannten Standards und Prüfgrundlagen. Zusätzliche Anforderungen in Ländern, in denen das Produkt in Verkehr gebracht werden soll, müssen zusätzlich betrachtet werden. Die Herstellung des zertifizierten Produktes wird überwacht.
This certificate is based on our Testing and Certification Regulation and states the conformity of the product with the standards and testing requirements as indicated above. Any additional requirements in countries where the product is going to be marketed have to be considered additionally. The manufacturing of the certified product is subject to surveillance.

TÜV Rheinland LGA Products GmbH, Tillystraße 2, 90431 Nürnberg

Tel.: +49 221 806-1371 e-mail: cert-validity@de.tuv.com

Fax: +49 221 806-3935 http://www.tuv.com/safety

File No. ANERT-TECH/99/2022-T2 (Computer No. 5311)

1154

Zertifizierungsstelle

Mai Miao

Mai Miao

SG110CX New

Multi-MPPT String Inverter for 1000 Vdc System



High Yield

- 9 MPPTs with max. efficiency 98.7%
- Compatible with bifacial module
- Built-in PID recovery function



Smart O&M

- Touch free commissioning and remote firmware upgrade
- Online IV curve scan and diagnosis
- Fuse free design with smart string current monitoring



Low Cost

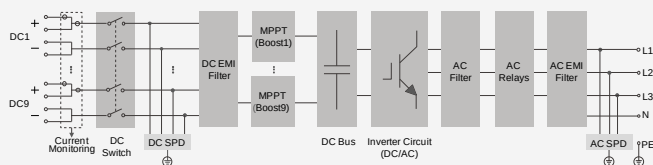
- Compatible with Al and Cu AC cables
- DC 2 in 1 connection enabled
- Q at night function



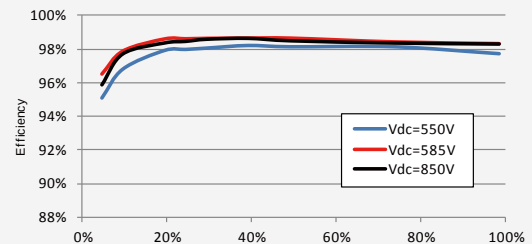
Proven Safety

- IP66 and C5 protection
- Type II SPD for both DC and AC
- Compliant with global safety and grid code

Circuit Diagram



Efficiency Curve



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 Subject to change without notice. Version 1.1

Input (DC)**SG110CX**

Max. PV input voltage	1100 V
Min. PV input voltage / Startup input voltage	200 V / 250 V
Nominal PV input voltage	585 V
MPP voltage range	200 – 1000 V
MPP voltage range for nominal power	550V – 850 V
No. of independent MPP inputs	9
Max. number of PV strings per MPPT	2
Max. PV input current	26 A * 9
Max. current for input connector	30 A
Max. DC short-circuit current	40 A * 9

Output (AC)

AC output power	110 kVA @ 45 °C / 100 kVA @ 50 °C
Max. AC output current	158.8 A
Nominal AC voltage	3 / N / PE, 400 V
AC voltage range	320 – 460 V
Nominal grid frequency / Grid frequency range	50 Hz / 45 – 55 Hz, 60 Hz / 55 – 65 Hz
THD	< 3 % (at nominal power)
DC current injection	< 0.5 % In
Power factor at nominal power / Adjustable power factor	> 0.99 / 0.8 leading – 0.8 lagging
Feed-in phases / connection phases	3 / 3

Efficiency

Max. efficiency / Euro. efficiency	98.7 % / 98.5 %
------------------------------------	-----------------

Protection

DC reverse connection protection	Yes
AC short circuit protection	Yes
Leakage current protection	Yes
Grid monitoring	Yes
Ground fault monitoring	Yes
DC switch / AC switch	Yes / No
PV String current monitoring	Yes
Q at night function	Yes
PID recovery function	Optional
Overvoltage protection	DC Type II / AC Type II

General Data

Dimensions (W*H*D)	1051*660*362.5 mm
Weight	85 kg
Isolation method	Transformerless
Ingress protection rating	IP66
Night power consumption	< 2W
Operating ambient temperature range	-30 to 60 °C (> 50 °C derating)
Allowable relative humidity range (non-condensing)	0 – 100 %
Cooling method	Smart forced air cooling
Max. operating altitude	4000 m (> 3000 m derating)
Display	LED, Bluetooth+APP
Communication	RS485 / Optional: Wi-Fi, Ethernet
DC connection type	MC4 (Max. 6 mm ²)
AC connection type	OT terminal (Max. 240 mm ²)
Compliance	IEC 62109, IEC 61727, IEC 62116, IEC 60068, IEC 61683, VDE-AR-N 4110:2018, VDE-AR-N 4120:2018, IEC 61000-6-3, EN 50438, AS/NZS 4777.2:2015, CEI 0-21, VDE 0126-1-1/A1 VFR 2014, UTE C15-712-1:2013, DEWA
Grid Support	Q at night function, LVRT, HVRT, active & reactive power control and power ramp rate control





Product Service

Compliance Document

No. D 073342 0262 Rev. 00

Holder of Certificate: **Sungrow Power Supply Co., Ltd.**
No. 1699 Xiyou Road, New & High
Technology Industrial Development Zone,
230088 Hefei, Anhui
PEOPLE'S REPUBLIC OF CHINA

Product: **Converter**
Grid-Connected Inverter

This Compliance document confirms the compliance with the listed standards on a voluntary basis. It refers only to the sample submitted for testing and certification and does not certify the quality or safety of the serial products. See also notes overleaf.

Test report no.: 704091802547-00

Date, 2019-03-26


(Zhengdong Ma)



Product Services

Compliance Document

No. D 073342 0262 Rev. 00

Model(s): SG110CX

Parameters:

Max. input voltage:	d.c. 1100 V
Min. MPP voltage:	d.c. 200 V
Max. MPP voltage:	d.c. 1000 V
Max. input current:	d.c. 9×26 A
Isc PV:	d.c. 9×40 A
Nominal grid voltage:	a.c. 3/N/PE ~, 400/230V
Nominal grid frequency:	50 Hz
Max. continuous output current:	a.c. 158.8 A
Rated output power:	100 kW
Max. apparent power:	110 kVA
Power factor range:	0.8Leading...0.8Lagging
Ambient temperature range:	-30°C...+60°C
Protective class:	I
Ingress protection:	IP66
Overvoltage category:	II(PV), III(Mains)

Tested
according to:

IEC 61683:1999
EN 50530:2010/A1:2013
IEC 60068-2-1:2007
IEC 60068-2-2:2007
IEC 60068-2-14:2009
IEC 60068-2-30:2005
IEC 60068-2-27:2008
IEC 60068-2-64:2008



Product Service

CERTIFICATE

No. B 073342 0264 Rev. 00

Holder of Certificate: **Sungrow Power Supply Co., Ltd.**
No. 1699 Xiyou Road, New & High
Technology Industrial Development Zone,
230088 Hefei, Anhui
PEOPLE'S REPUBLIC OF CHINA

Certification Mark:

Product: **Converter**
PV Grid-connected Inverter

The product was tested on a voluntary basis and complies with the essential requirements. The certification mark shown above can be affixed on the product. It is not permitted to alter the certification mark in any way. In addition the certification holder must not transfer the certificate to third parties. See also notes overleaf.

Test report no.: 704091802546-00

Valid until: 2024-03-19

Date, 2019-03-21


(Zhengdong Ma)



Product Service

CERTIFICATE

No. B 073342 0264 Rev. 00

Model(s): SG150TX, SG136TX, SG132TX,
SG110CX, SG100CX.

Parameters:

Vmax PV:	d.c. 1100 V
Min. MPP voltage:	d.c. 200 V
Max. MPP voltage:	d.c. 1000 V
Max. input current:	d.c. 12×26 A (SG150TX, SG136TX, SG132TX) d.c. 9×26 A (SG110CX, SG100CX).
Isc PV:	d.c. 12×40 A (SG150TX, SG136TX, SG132TX) d.c. 9×40 A (SG110CX, SG100CX).
Nominal grid voltage:	a.c. 3/PE ~ 540V (SG150TX, SG136TX), a.c. 3/PE ~ 480V (SG132TX), a.c. 3/N/PE ~ 400/230V (SG110CX, SG100CX)
Nominal grid frequency:	50/60Hz
Max. continuous output current:	a.c. 160.4 A (SG150TX, SG136TX), a.c. 158.8 A (SG132TX, SG110CX, SG100CX)
Rated output power:	136 kW (SG150TX, SG136TX), 120 kW (SG132TX), 100 kW (SG110CX, SG100CX)
Max. apparent power:	150 kVA (SG150TX, SG136TX), 132 kVA (SG132TX), 110 kVA (SG110CX, SG100CX)
Power factor range:	0.8Leading...0.8Lagging
Ambient temperature range:	-30°C...+60°C
Protective class:	I
Ingress protection:	IP66
Overvoltage category:	II(PV), III(Mains)

Tested according to: IEC 62109-1(ed.1)
EN 62109-1:2010
IEC 62109-2(ed.1)
EN 62109-2:2011

Production Facility(ies): 073342



Product Service

CERTIFICATE

No. B 073342 0264 Rev. 00

Holder of Certificate: **Sungrow Power Supply Co., Ltd.**
No. 1699 Xiyou Road, New & High
Technology Industrial Development Zone,
230088 Hefei, Anhui
PEOPLE'S REPUBLIC OF CHINA

Certification Mark:

Product: **Converter**
PV Grid-connected Inverter

The product was tested on a voluntary basis and complies with the essential requirements. The certification mark shown above can be affixed on the product. It is not permitted to alter the certification mark in any way. In addition the certification holder must not transfer the certificate to third parties. See also notes overleaf.

Test report no.: 704091802546-00

Valid until: 2024-03-19

Date, 2019-03-21


(Zhengdong Ma)



Product Service

CERTIFICATE

No. B 073342 0264 Rev. 00

Model(s): SG150TX, SG136TX, SG132TX,
SG110CX, SG100CX.

Parameters:

Vmax PV:	d.c. 1100 V
Min. MPP voltage:	d.c. 200 V
Max. MPP voltage:	d.c. 1000 V
Max. input current:	d.c. 12×26 A (SG150TX, SG136TX, SG132TX) d.c. 9×26 A (SG110CX, SG100CX).
Isc PV:	d.c. 12×40 A (SG150TX, SG136TX, SG132TX) d.c. 9×40 A (SG110CX, SG100CX).
Nominal grid voltage:	a.c. 3/PE ~ 540V (SG150TX, SG136TX), a.c. 3/PE ~ 480V (SG132TX), a.c. 3/N/PE ~ 400/230V (SG110CX, SG100CX)
Nominal grid frequency:	50/60Hz
Max. continuous output current:	a.c. 160.4 A (SG150TX, SG136TX), a.c. 158.8 A (SG132TX, SG110CX, SG100CX)
Rated output power:	136 kW (SG150TX, SG136TX), 120 kW (SG132TX), 100 kW (SG110CX, SG100CX)
Max. apparent power:	150 kVA (SG150TX, SG136TX), 132 kVA (SG132TX), 110 kVA (SG110CX, SG100CX)
Power factor range:	0.8Leading...0.8Lagging
Ambient temperature range:	-30°C...+60°C
Protective class:	I
Ingress protection:	IP66
Overvoltage category:	II(PV), III(Mains)

Tested according to: IEC 62109-1(ed.1)
EN 62109-1:2010
IEC 62109-2(ed.1)
EN 62109-2:2011

Production Facility(ies): 073342



Product Service

Compliance Document

No. D 073342 0263 Rev. 00

Holder of Certificate: **Sungrow Power Supply Co., Ltd.**

No. 1699 Xiyou Road, New & High
Technology Industrial Development Zone,
230088 Hefei, Anhui
PEOPLE'S REPUBLIC OF CHINA

Product: **Converter**
Grid-Connected Inverter

Model(s): **SG110CX**

Parameters:

Max. input voltage:	d.c. 1100 V
Min. MPP voltage:	d.c. 200 V
Max. MPP voltage:	d.c. 1000 V
Max. input current:	d.c. 9×26 A
isc PV:	d.c. 9×40 A
Nominal grid voltage:	a.c. 3/N/PE ~, 400/230V
Nominal grid frequency:	50 Hz
Max. continuous output current:	a.c. 158.8 A
Rated output power:	100 kW
Max. apparent power:	110 kVA
Power factor range:	0.8Leading...0.8Lagging
Ambient temperature range:	-30°C...+60°C
Protective class:	I
Ingress protection:	IP66
Overvoltage category:	II(PV), III(Mains)

Tested according to: IEC 61727:2004
IEC 62116:2014
IEC 61000-3-11:2000
IEC 61000-3-12:2011

This Compliance document confirms the compliance with the listed standards on a voluntary basis. It refers only to the sample submitted for testing and certification and does not certify the quality or safety of the serial products. See also notes overleaf.

Test report no.: 704091802548-00

Date, 2019-03-26 (Zhengdong Ma)

MID 15~25KTL3-X

- Max. efficiency 98.75%
- Dual MPP trackers
- Touch key and OLED display
- Type II SPD on AC and DC side
- AFCI function optional



GROWATT

www.ginverter.com

P O W E R
- I N G
T O M O -
R R O W O

Datasheet	MID 15KTL3-X	MID 17KTL3-X	MID 20KTL3-X	MID 22KTL3-X	MID 25KTL3-X
Input data (DC)					
Max. recommended PV power (for module STC)	22500W	25500W	30000W	33000W	37500W
Max. DC voltage	1100V				
Start Voltage	250V				
Normal Voltage	200V-1000V				
MPPT voltage range	580V				
No. of MPP trackers/strings per MPP tracker	2/2	2/2	2/2	2/2	2/3
Max.input current per MPP tracker	27A	27A	27A	27A	27A/40.5A
Max. short-circuit current per MPP tracker	33.8A	33.8A	33.8A	33.8A	33.8A/50.7A
Output data (AC)					
Rated AC output power	15000W	17000W	20000W	22000W	25000W
Max. AC apparent power	16600VA	18800VA	22000VA	24400VA	27700VA
Nominal AC voltage(range*)	230V/400V; 340-440V				
AC grid frequency;(range*)	50/60 Hz; 45~55Hz/55-65 Hz				
Max. output current	24.2A	27.4A	31.9A	35.5A	40.2A
Adjustable power factor	0.8 leading - 0.8 lagging				
THDi	<3%				
AC grid connection type	3W + N + PE				
Efficiency					
Max.efficiency	98.75%				
European efficiency	98.6%				
MPPT efficiency	99.9%				
Protection devices					
DC reverse polarity protection	Yes				
DC Switch	Yes				
AC/DC surge protection	Type II / Type II				
Insulation resistance monitoring	Yes				
AC short-circuit protection	Yes				
Ground fault monitoring	Yes				
Grid monitoring	Yes				
Anti-islanding protection	Yes				
Residual-current monitoring unit	Yes				
String monitoring	Yes				
AFCI protection	Optional				
General data					
Dimensions (W / H / D)	525/395/222mm				
Weight	23kg				
Operating temperature range	-25 °C ... +60 °C				
Self-Consumption (night)	< 1W				
Topology	Transformerless				
Cooling	Smart air cooling				
Protection degree	IP65				
Relative Humidity	0~100%				
Altitude	4000m				
DC connection	H4/MC4(Optional)				
AC connection	Cable gland+OT terminal				
Display	OLED+LED/WIFI+APP				
Interfaces: RS485 / USB / WIFI/ GPRS / RF/ LAN	Yes/Yes /Optional/Optional/Optional/Optional				
Warranty: 5 years / 10 years	Yes/Optional				
CE, VDE0126, Greece, EN50549-1, C10/C11, UTE C 15-712, IEC62116, IEC61727, IEC 60068, IEC 61683, CEI0-21, N4105, G98/G99, G100, KSC8565					

* The AC voltage range and frequency range may vary depending on specific country grid standard.
All specifications are subject to change without notice.

MID 30~50KTL3-X2

- Maximum string input current 16A
- Type II SPD on DC and AC side
- I/V curve scanning
- Intelligent string monitoring
- AFCI function optional



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1166

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Datasheet	MID 30KTL3-X2-1	MID 33KTL3-X2	MID 36KTL3-X2	MID 40KTL3-X2	MID 50KTL3-X2
Input data (DC)					
Max. recommended PV power (for module STC)	45000W	49500W	54000W	60000W	75000W
Max. DC voltage	1100V				
Start Voltage	200V				
Normal Voltage	600V				
MPPT voltage range	200-1000V				
No. of MPP trackers	3	3	3	4	4
No. of PV strings per MPP tracker	2				
Max.input current per MPP tracker	32A				
Max. short-circuit current per MPP tracker	40A				
Output data (AC)					
AC nominal power	30000W	33000W	36000W	40000W	50000W
Max. AC apparent power	30000VA	36600VA	40000VA	44400VA	55500VA
Nominal AC voltage (range*)	220V/380V, 230V/400V (340-440V)				
AC grid frequency (range*)	50/60 Hz (45-55Hz/55-65 Hz)				
Max. output current	45.5A	55.5A	60.6A	67.3A	84.1A
Adjustable power factor	0.8leading...0.8lagging				
THDi	< 3%				
AC grid connection type	3W+N+PE				
Efficiency					
Max.efficiency	98.8%				
European efficiency	98.5%				
MPPT efficiency	99.9%				
Protection devices					
DC reverse polarity protection	Yes				
DC Switch	Yes				
AC/DC surge protection	Type II / Type II				
Insulation resistance monitoring	Yes				
AC short-circuit protection	Yes				
Ground fault monitoring	Yes				
Grid monitoring	Yes				
Anti-islanding protection	Yes				
Residual-current monitoring unit	Yes				
String monitoring	Yes				
AFCl protection	Optional				
General data					
Dimensions (W / H / D)	580/435/230mm				
Weight	31kg	31kg	31kg	37kg	37kg
Operating temperature range	- 25°C ... +60°C				
Nighttime power consumption	< 1W				
Topology	Transformerless				
Cooling	Smart air cooling				
Protection degree	IP66				
Relative humidity	0-100%				
Altitude	4000m				
DC connection	H4/MC4(Optional)				
AC connection	Cable gland+OT terminal				
Display	OLED+LED/WIFI+APP				
Interfaces: RS485 / USB / WIFI/ GPRS / RF/ LAN	Yes/Yes/Optional/Optional/Optional/Optional				
Warranty: 5 years / 10 years	Yes/Optional				
CE, VDE0126, Greece, EN50549-1, C10/C11, UTE C 15-712, IEC62116, IEC61727, IEC 60068, IEC 61683, CEIO-21, N4105, TOR Erzeuger, G98/G99, G100, UNE217001, UNE206007, PO12.2					

* The AC voltage range and frequency range may vary depending on specific country grid standard.
All specifications are subject to change without notice.

MID 25~40KTL3-X

- The maximum efficiency is up to 98.8%
- Touch key and OLED display
- String monitoring
- AC&DC type II SPD
- AFCI optional



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Datasheet	MID 25KTL3-X1	MID 30KTL3-X	MID 33KTL3-X	MID 36KTL3-X	MID 40KTL3-X
Input data (DC)					
Max. recommended PV power (for module STC)	37500W	45000W	49500W	54000W	60000W
Max. DC voltage	1100V				
Start Voltage	250V				
Normal Voltage	600V				
MPPT voltage range	200-1000V				
No. of MPP trackers	3	3	3	4	4
No. of PV strings per MPP tracker	2				
Max.input current per MPP tracker	26A				
Max. short-circuit current per MPP tracker	32A				
Output data (AC)					
AC nominal power	25000W	30000W	33000W	36000W	40000W
Max. AC apparent power	27700VA	33300VA	36600VA	39600VA	44000VA
Nominal AC voltage(range*)	220V/380V, 230V/400V (340-440V)				
AC grid frequency(range*)	50/60 Hz (45-55Hz/55-65 Hz)				
Max. output current	40A	50.5A	55.5A	60.0A	66.6A
Adjustable power factor	0.8leading...0.8lagging				
THDi	<3%				
AC grid connection type	3W+N+PE				
Efficiency					
Max.efficiency	98.8%				
European efficiency	98.5%				
MPPT efficiency	99.9%				
Protection devices					
DC reverse polarity protection	Yes				
DC Switch	Yes				
AC/DC surge protection	Type II / Type II				
Insulation resistance monitoring	Yes				
AC short-circuit protection	Yes				
Ground fault monitoring	Yes				
Grid monitoring	Yes				
Anti-islanding protection	Yes				
Residual-current monitoring unit	Yes				
String monitoring	Yes				
AFCI protection	Optional				
General data					
Dimensions (W / H / D)	580/435/230mm				
Weight	29.5kg	29.5kg	29.5kg	30.5kg	30.5kg
Operating temperature range	- 25°C ... +60°C				
Nighttime power consumption	< 1W				
Topology	Transformerless				
Cooling	Smart air cooling				
Protection degree	IP66				
Relative humidity	0-100%				
Altitude	4000m				
DC connection	H4/MC4(Optional)				
AC connection	Cable gland+OT terminal				
Display	OLED+LED/WIFI+APP				
Interfaces: RS485 / USB / WIFI/ GPRS / RF/ LAN	Yes/Yes/Optional/Optional/Optional/Optional				
Warranty: 5 years / 10 years	Yes/Optional				
CE, VDE0126, Greece, EN50549, C10/C11, UTE C 15-712, IEC62116,IEC61727, IEC 60068, IEC 61683, CEI0-21, CEI0-16, N4105, TOR Erzeuger, G98/G99, G100, AS/NZS 3100, AS4777, UNE217001, UNE206007, PO12.2, KSC8565					

* The AC voltage range and frequency range may vary depending on specific country grid standard.
All specifications are subject to change without notice.

MAX 50~80KTL3 LV

- 6 / 7 MPPTs, fusefree design
- High efficiency up to 99%
- One-click diagnosis
- String monitoring
- AC&DC type II SPD
- AFCI optional



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Datasheet	MAX 50KTL3 LV	MAX 60KTL3 LV	MAX 70KTL3 LV	MAX 80KTL3 LV
Input data (DC)				
Max. recommended PV power (for module STC)	75000W	90000W	105000W	120000W
Max.DC voltage	1100V			
Start voltage	250V			
Nominal voltage	585V	585V	600V	600V
MPPT voltage range	200V-1000V			
No. of MPP trackers	6	6	7	7
No. of PV strings per MPP tracker	2			
Max. input current per MPP tracker	26A			
Max. short-circuit current per MPP tracker	32A			
Output data (AC)				
AC nominal power	50000W	60000W	70000W	80000W
Max. AC apparent power	55500VA	66600VA	77700VA	88800VA
Nominal AC voltage(range*)	220V/380V, 230V/400V (340-440V)			
AC grid frequency(range*)	50/60 Hz (45-55Hz/55-65 Hz)			
Max. output current	80.5A	96.6A	112.7A	128.8A
Adjustable power factor	0.8leading ...0.8lagging			
THDi	<3%			
AC grid connection type	3W+N+PE			
Efficiency				
Max.efficiency	98.8%	98.8%	99%	99%
European efficiency	98.4%	98.4%	98.5%	98.5%
MPPT efficiency	99.9%			
Protection devices				
DC reverse polarity protection	Yes			
DC switch	Yes			
DC surge protection	Type II / Type II			
Insulation resistance monitoring	Yes			
AC short-circuit protection	Yes			
Ground fault monitoring	Yes			
Grid monitoring	Yes			
Anti-islanding protection	Yes			
Residual-current monitoring unit	Yes			
String monitoring	Yes			
AFCI protection	Optional			
General data				
Dimensions (W / H / D)	860/600/300mm			
Weight	82kg	82kg	86kg	86kg
Operating temperature range	-25°C ... +60°C			
Self-consumption	< 1W			
Topology	Transformerless			
Cooling	Smart air cooling			
Protection degree	IP65			
Relative humidity	0-100%			
Altitude	4000m			
DC connection	H4/MC4(Optional)			
AC connection	Cable gland+OT terminal			
Display	LED/WIFI+APP			
Interfaces: RS485 / USB /WIFI/ RF/GPRS	Yes/Yes /Optional/Optional/Optional			
Warranty: 5 years / 10 years	Yes /Optional			
CE , VDE0126, Greece, EN50438, EN50549-1, C10/C11, UTE C 15-712, IEC62116, IEC61727, IEC 60068, IEC 61683, CEI0-21, CEI 0-16, N4105, DRRG, G98/G99, G100, NRS 097-2-1, MEA , PEA , KSC8565				

* The AC voltage range and frequency range may vary depending on specific country grid standard.
All specifications are subject to change without notice.

Certificate of Conformity

Certificate Number: 180903061GZU-001

On the basis of the tests undertaken, the sample<s> of the below product have been found to comply with the requirements of the referenced specification<s>/standard<s> at the time the tests were carried out. This certificate is part of the full test report<s> and should be read in conjunction with it ;

Applicant Name & Address:	Shenzhen Growatt New Energy Technology Co.,Ltd 1st East & 3rd Floor of Building A, Building B, Jiayu Industrial Park, #28, GuangHui Road, LongTeng Community, Shiyan Street, Baoan District, Shenzhen, P.R.China
Product Description:	PV Grid inverter
Ratings & Principle Characteristics:	See Annex to Test Certificate of Conformity
Models:	MAX 50KTL3 LV, MAX 60KTL3 LV, MAX 70KTL3 LV, MAX 80KTL3 LV, MAX 60KTL3 MV, MAX 70KTL3 MV, MAX 80KTL3 MV
Relevant Standards	IEC 61727 2nd ed:2004, Photovoltaic (PV) systems – Characteristics of the Utility interface IEC 62116 2nd ed.:2014, Test procedure of islanding prevention measures for Utility-interconnected photovoltaic inverter
Certificate Issuing Office:	Intertek Legal Entity: Intertek Testing Services Shenzhen Ltd. Guangzhou Branch
Date of Tests:	03 Sep., 2018 – 25 Sep., 2018
Test Report Number(s):	180108041GZU-001, & Revision 1: 26 Sep., 2018 180108041GZU-002, & Revision 1: 26 Sep., 2018

Additional information in Appendix.

Signature

Name: Grady Ye
Position: Manager
Date: 27 Sep 2018



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APPENDIX: Certificate of Conformity

This is an Annex to Certificate of Conformity with Certificate/Report Number(s): 180903061GZU-001;

Ratings and principal characteristics

Maximum d.c. input voltage: 1100 Vdc
Input voltage range: 200-1000 Vdc
MPPT voltage range (full Load): 500-850 V (for MAX 50KTL3 LV); 520-850 V (for MAX 60KTL3 LV, MAX 60KTL3 MV); 600-850 V (for MAX 70KTL3 LV, MAX 70KTL3 MV); 685-850 V (for MAX 80KTL3 LV, MAX 80KTL3 MV);
Max. input current: 6×25A
PV Isc: 6×32A
Nominal output voltage: 3W/N/PE 230V/400Vac (for MAX 50KTL3 LV, MAX 60KTL3 LV, MAX 70KTL3 LV, MAX 80KTL3 LV); 3W/N/ PE or 3W/PE 277/480Vac (for MAX 60KTL3 MV, MAX 70KTL3 MV, MAX 80KTL3 MV);
Max. output current: 3×80.5 A (for MAX 50KTL3 LV); 3×96.6A (for MAX 60KTL3 LV); 3×112.7 A (for MAX 70KTL3 LV); 3×128.8A (for MAX 80KTL3 LV); 3×80.2 A (for MAX 60KTL3 MV); 3×93.6 A (for MAX 70KTL3 MV); 3×107.0A (for MAX 80KTL3 MV)
Nominal frequency: 50/60 Hz
Max. output power: 55500VA (for MAX 50KTL3 LV); 66600VA (for MAX 60KTL3 LV, MAX 60KTL3 MV); 77700VA (for MAX 70KTL3 LV, MAX 70KTL3 MV); 88800VA (for MAX 80KTL3 LV, MAX 80KTL3 MV);
Ingress protection: IP65
Operating temperature range: -25~+60°C
Software Version: TI1.0

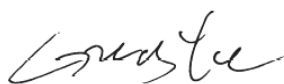
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Certificate of Conformity

Certificate Number: 180108053GZU-001

On the basis of the tests undertaken, the sample<s> of the below product have been found to comply with the requirements of the referenced specification<s>/standard<s> at the time the tests were carried out. This certificate is part of the full test report<s> and should be read in conjunction with it

Applicant Name & Address:	SHENZHEN GROWATT NEW ENERGY TECHNOLOGY CO., LTD 1st East & 3rd Floor of Building A, Building B, Jiayu Industrial Park, #28, GuangHui Road, LongTeng Community, Shiyan Street, Baoan District, Shenzhen, P.R.China
Product Description:	PV Grid inverter
Ratings & Principle Characteristics:	See Annex to Certificate of Conformity
Models:	MAX 50KTL3 LV, MAX 60KTL3 LV, MAX 70KTL3 LV, MAX 80KTL3 LV MAX 60KTL3 MV, MAX 70KTL3 MV, MAX 80KTL3 MV
Relevant Standards	IEC 60068-2-1:2007, Environmental testing – Part 2-1: Tests- Test A: Cold IEC 60068-2-2:2007, Environmental testing – Part 2-2: Tests- Test B: Dry heat IEC 60068-2-14:2009, Environmental testing – Part 2-14: Tests- Test N: Change of temperature IEC 60068-2-30:2005, Environmental testing – Part 2-30: Tests- Test Db: Damp heat, cyclic(12h +12h cycle) IEC 61683: 1999, Photovoltaic systems – Power conditioners – Procedure for measuring efficiency
Certificate Issuing Office:	Same as Intertek Legal Entity
Date of Tests:	07 May 2018 – 25 May 2018
Test Report Number(s):	180108053GZU-001
Additional information in Appendix.	



Signature

Name: Grady Ye
Position: Manager
Issuing Office: Intertek Legal Entity: Intertek
Testing Services Shenzhen Ltd.
Guangzhou Branch
Date: 28 May 2018



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APPENDIX: Certificate of Conformity

This is an Annex to Certificate of Conformity with certificate/Report Number(s): 180108053GZU-001. The issuing office is Intertek Legal Entity as above.

Ratings and principal characteristics

Maximum d.c. input voltage: 1100 Vdc

Input voltage range: 200-1000 Vdc

MPPT voltage range (full Load): 500-850 V (for MAX 50KTL3 LV); 520-850 V (for MAX 60KTL3 LV, MAX 60KTL3 MV); 600-850 V (for MAX 70KTL3 LV, MAX 70KTL3 MV); 685-850 V (for MAX 80KTL3 LV, MAX 80KTL3 MV);

Max. input current: 6×25A

Nominal output voltage: 3/N/PE230V/400Vac (for MAX 50KTL3 LV, MAX 60KTL3 LV, MAX 70KTL3 LV, MAX 80KTL3 LV); 3/PE 480Vac (for MAX 60KTL3 MV, MAX 70KTL3 MV, MAX 80KTL3 MV);

Max. output current: 3×81 A (for MAX 50KTL3 LV); 3×97A (for MAX 60KTL3 LV); 3×113 A (for MAX 70KTL3 LV); 3×129A (for MAX 80KTL3 LV); 3×81 A (for MAX 60KTL3 MV); 3×94 A (for MAX 70KTL3 MV); 3×107A (for MAX 80KTL3 MV)

Nominal frequency: 50 Hz

Max. output power: 55500VA (for MAX 50KTL3 LV); 66600VA (for MAX 60KTL3 LV, MAX 60KTL3 MV); 77700VA (for MAX 70KTL3 LV, MAX 70KTL3 MV); 88800VA (for MAX 80KTL3 LV, MAX 80KTL3 MV);

Ingress protection: IP65

Operating temperature range: -25~+60°C

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GFT-OP-11a (28-April-2017)

Certificate of Conformity

Certificate Number: CN-PV-200098

On the basis of the tests undertaken, the samples of the below product have been found to comply with the requirements of the referenced specifications /standards at the time the tests were carried out. It does not imply that Intertek has performed any surveillance or control of the manufacture. The manufacturer shall ensure that the manufacturing process assures compliance of the production units with the examined products mentioned in this certificate.

Applicant:	Shenzhen Growatt New Energy Technology CO., Ltd 1st East & 3rd Floor of Building A, Building B, Jiayu Industrial Park, #28, GuangHui Road, LongTeng Community, Shiyan Street, Baoan District, Shenzhen, P.R.China
Product:	PV Grid inverter
Ratings & Principle Characteristics:	See Appendix to Certificate of Conformity
Models:	MID 17KTL3-X1, MID 20KTL3-X1, MID 22KTL3-X1, MID 25KTL3-X1, MID 30KTL3-X, MID 33KTL3-X, MID 36KTL3-X, MID 40KTL3-X
Brand Name:	Growatt
Tested according to:	IEC 61727:2004 Photovoltaic (PV) systems – Characteristics of the utility interface IEC 62116:2014 Test procedure of islanding prevention measures for utility-interconnected photovoltaic inverters
Certificate Issuing Office Name & Address:	Intertek Testing Services Ltd. Shanghai 2/F (West Side), No. 707, Zhangyang Road, Free Trade Experimental Area, Shanghai, P. R. China
Test Reports No:	200426150GZU-001, 200426150GZU-002

Additional information in Appendix.



Signature

Certification Manager: Grady Ye

Date: 31 July 2020

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APPENDIX: Certificate of Conformity

This is an Appendix to Certificate of Conformity Number: CN-PV-200098

Ratings & Principle Characteristics:

Model	MID 17KTL3-X1	MID 20KTL3-X1	MID 22KTL3-X1	MID 25KTL3-X1
Max.PV voltage	1100Vdc			
PV voltage range	200V – 1000Vdc			
Max.input current	26A*3			
PV Isc	32A*3			
Nominal output voltage	3W/N/PE, 230/400Vac			
Nominal output Frequency	50/60Hz			
Max.output current	28.5A	33.3A	36.7A	41.9A
Max.output power	17000W	20000W	22000W	25000W
Max.apparent power	18800VA	22000VA	24200VA	27700VA
Power factor range	0.8Leading – 0.8 lagging			
Safety level	Class I			
Ingress Protection	IP 66			
Operation Ambient Temperature	-25°C - +60°C			
Software Version	DM1.0			

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APPENDIX: Certificate of Conformity

This is an Appendix to Certificate of Conformity Number: CN-PV-200098

Ratings & Principle Characteristics:

Model	MID 30KTL3-X	MID 33KTL3-X	MID 36KTL3-X	MID 40KTL3-X
Max.PV voltage	1100Vdc			
PV voltage range	200V – 1000Vdc			
Max.input current	26A*3		26A*4	
PV Isc	32A*3		32A*4	
Nominal output voltage	3W/N/PE 230/400Vac			
Nominal output Frequency	50/60Hz			
Max.output current	50.5A	55.5A	60.0A	66.6A
Max.output power	30000W	33000W	36000W	40000W
Max.apparent power	33300VA	36600VA	39600VA	44000VA
Power factor range	0.8Leading – 0.8 lagging			
Safety level	Class I			
Ingress Protection	IP 66			
Operation Ambient Temperature	-25°C - +60°C			
Software version	DM1.0			

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Certificate of Conformity

Certificate Number: CN-PV-210059

On the basis of the tests undertaken, the samples of the below product have been found to comply with the requirements of the referenced specifications /standards at the time the tests were carried out. It does not imply that Intertek has performed any surveillance or control of the manufacture. The manufacturer shall ensure that the manufacturing process assures compliance of the production units with the examined products mentioned in this certificate.

Applicant:	Shenzhen Growatt New Energy Co., Ltd. 2F and 3F, Building 4, Jiayu Company Industrial Park, Xibianling, Shangyu Village, Shiyan Street, Bao'an District, Shenzhen, China
Product:	PV Grid inverter
Ratings & Principle Characteristics:	See Appendix to Certificate of Conformity
Models:	MID 25KTL3-X1, MID 30KTL3-X, MID 33KTL3-X, MID 36KTL3-X, MID 40KTL3-X
Brand Name:	GROWATT
Tested according to:	IEC 60068-2-1:2007, IEC 60068-2-2:2007, IEC60068-2-14:2009, IEC60068-2-30:2005, IEC61683:1999
Certificate Issuing Office Name & Address:	Intertek Testing Services Ltd. Shanghai West Area, 2 nd Floor, No. 707, Zhangyang Road China (Shanghai) Pilot Free Trade Zone, Shanghai, P. R. China
Test Reports No:	200426159GZU-001

Additional information in Appendix.



Signature

Certification Manager: Grady Ye

Date: 19 April 2021

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APPENDIX: Certificate of Conformity

This is an Appendix to Certificate of Conformity Number: CN-PV-210059

Model	MID 25KTL3-X1	MID 30KTL3-X	MID 33KTL3-X	MID 36KTL3-X	MID 40KTL3-X
Max.PV voltage	1100Vdc				
PV voltage range	200V – 1000Vdc				
Max.input current	26A*3			26A*4	
PV Isc	32A*3			32A*4	
Nominal output voltage	3W/N/PE 230/400Vac				
Nominal output Frequency	50/60Hz				
Max.output current	41.9A	50.5A	55.5A	60.0A	66.6A
Max.output power	25000W	30000W	33000W	36000W	40000W
Max.apparent power	27700VA	33300VA	36600VA	39600VA	44000VA
Power factor range	0.8Leading – 0.8 lagging				
Safety level	Class I				
Ingress Protection	IP 66				
Operation Ambient Temperature	-25℃ - +60℃				
Software version	DM1.0				

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Certificate of Conformity

Certificate Number: CN-PV-210038

On the basis of the tests undertaken, the samples of the below product have been found to comply with the requirements of the referenced specifications /standards at the time the tests were carried out. It does not imply that Intertek has performed any surveillance or control of the manufacture. The manufacturer shall ensure that the manufacturing process assures compliance of the production units with the examined products mentioned in this certificate.

Applicant:	Shenzhen Growatt New Energy Co., Ltd. 2F and 3F, Building 4, Jiayu Company Industrial Park, Xibianling, Shangyu Village, Shiyan Street, Bao'an District, Shenzhen, Guangdong, China
Product:	PV Grid inverter
Ratings & Principle Characteristics:	See Appendix to Certificate of Conformity
Models:	MID 10KTL3-X, MID 12KTL3-X, MID 15KTL3-X, MID 17KTL3-X, MID 20KTL3-X, MID 22KTL3-X, MID 25KTL3-X
Brand Name:	Growatt
Tested according to:	IEC 61727:2004 Photovoltaic (PV) systems – Characteristics of the utility interface IEC 62116:2014 Test procedure of islanding prevention measures for utility-interconnected photovoltaic inverters
Certificate Issuing Office Name & Address:	Intertek Testing Services Ltd. Shanghai West Area, 2nd Floor, No. 707, Zhangyang Road China (Shanghai) Pilot Free Trade Zone, Shanghai, P. R. China
Test Reports No:	190416203GZU-001 Revision 1: 02 Mar 2021 190416203GZU-002 Revision 1: 02 Mar 2021

Additional information in Appendix.



Signature

Certification Manager: Grady Ye

Date: 04 March 2021

This Certificate is for the exclusive use of Intertek's client and is provided pursuant to the agreement between Intertek and its Client. Intertek's responsibility and liability are limited to the terms and conditions of the agreement. Intertek assumes no liability to any party, other than to the Client in accordance with the agreement, for any loss, expense or damage occasioned by the use of this Certificate. Only the Client is authorized to permit copying or distribution of this Certificate. Any use of the Intertek name or one of its marks for the sale or advertisement of the tested material, product or service must first be approved in writing by Intertek.

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APPENDIX: Certificate of Conformity

This is an Appendix to Certificate of Conformity Number: CN-PV-210038

Ratings & Principle Characteristics:

Maximum d.c. input voltage: 1100 Vdc
 Input voltage range: 160-1000Vdc
 MPPT voltage range (full Load): 280-850 V (for MID 10KTL3-X, MID 12KTL3-X); 420-850 V (for MID 10KTL3-X, MID 12KTL3-X, MID 15KTL3-X); 480-850 V (for MID 17KTL3-X, MID 20KTL3-X); 520-850 V (for MID 22KTL3-X, MID 25KTL3-X);
 Max. input current: 2×27A (for the models except MID 25KTL3-X), 27/40.5A (for MID 25KTL3-X)
 PV Isc: 2×33.8A (for the models except MID 25KTL3-X), 33.8/50.7A (for MID 25KTL3-X)
 Nominal output voltage: 3W/N/PE 230V/400Vac
 Max. output current: 16.1A (for MID 10KTL3-X); 19.3A (for MID 12KTL3-X); 24.2A (for MID 15KTL3-X); 27.4A (for MID 17KTL3-X); 31.9 A (for MID 20KTL3-X); 35.5A (for MID 22KTL3-X); 40.2 A (for MID 25KTL3-X)
 Nominal frequency: 50/60 Hz
 Max. output power: 10000W (for MID 10KTL3-X); 12000W (for MID 12KTL3-X); 15000W (for MID 15KTL3-X); 17000W (for MID 17KTL3-X); 20000W (for MID 20KTL3-X); 22000W (for MID 22KTL3-X); 25000W (for MID 25KTL3-X)
 Max. apparent power: 11100VA (for MID 10KTL3-X); 13300VA (for MID 12KTL3-X); 16600VA (for MID 15KTL3-X); 18800VA (for MID 17KTL3-X); 22000VA (for MID 20KTL3-X); 24400VA (for MID 22KTL3-X); 27700VA (for MID 25KTL3-X)
 Power factor range: 0.8leading ~ 0.8lagging
 Safety level: Class I
 Ingress protection: IP65
 Operating temperature range: -25 ~ +60°C
 Software Version: TJ1.0

This Certificate is for the exclusive use of Intertek's client and is provided pursuant to the agreement between Intertek and its Client. Intertek's responsibility and liability are limited to the terms and conditions of the agreement. Intertek assumes no liability to any party, other than to the Client in accordance with the agreement, for any loss, expense or damage occasioned by the use of this Certificate. Only the Client is authorized to permit copying or distribution of this Certificate. Any use of the Intertek name or one of its marks for the sale or advertisement of the tested material, product or service must first be approved in writing by Intertek.

Certificate of Conformity

Certificate Number: CN-PV-210037

On the basis of the tests undertaken, the samples of the below product have been found to comply with the requirements of the referenced specifications /standards at the time the tests were carried out. It does not imply that Intertek has performed any surveillance or control of the manufacture. The manufacturer shall ensure that the manufacturing process assures compliance of the production units with the examined products mentioned in this certificate.

Applicant:	Shenzhen Growatt New Energy Co., Ltd. 2F and 3F, Building 4, Jiayu Company Industrial Park, Xibianling, Shangyu Village, Shiyan Street, Bao'an District, Shenzhen, Guangdong, China
Product:	PV Grid inverter
Ratings & Principle Characteristics:	See Appendix to Certificate of Conformity
Models:	MID 20KTL3-X, MID 25KTL3-X
Brand Name:	Growatt
Tested according to:	IEC 60068-2-1:2007, Environmental testing – Part 2-1: Tests- Test A: Cold IEC 60068-2-2:2007, Environmental testing – Part 2-2: Tests- Test B: Dry heat IEC 60068-2-14:2009, Environmental testing – Part 2-14: Tests- Test N: Change of temperature IEC 60068-2-30:2005, Environmental testing – Part 2-30: Tests- Test Db: Damp heat, cyclic (12h +12h cycle) IEC 61683: 1999, Photovoltaic systems – Power conditioners – Procedure for measuring efficiency
Certificate Issuing Office Name & Address:	Intertek Testing Services Ltd. Shanghai West Area, 2nd Floor, No. 707, Zhangyang Road China (Shanghai) Pilot Free Trade Zone, Shanghai, P. R. China
Test Reports No:	190826049GZU-001 Revision 1: 02 Mar 2021

Additional information in Appendix.



Signature

Certification Manager: Grady Ye

Date: 04 March 2021

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APPENDIX: Certificate of Conformity

This is an Appendix to Certificate of Conformity Number: CN-PV-210037

Ratings & Principle Characteristics:

Model	MID 20KTL3-X	MID 25KTL3-X
Max.PV voltage	1100Vdc	
PV voltage range	160V – 1000Vdc	
Max.input current	27A*2	27/40.5A
PV Isc	33.8A*2	33.8/50.7A
Nominal output voltage	3W/N/PE, 230/400Vac	
Nominal output Frequency	50/60Hz	
Max.output current	31.9A	40.2A
Max.output power	20.0KW	25.0KW
Max.apparent power	22.0KVA	27.7KVA
Power factor range	0.8Leading – 0.8 lagging	
Safety level	Class I	
Ingress Protection	IP 65	
Operation Ambient Temperature	-25°C - +60°C	
Software version	TJ1.0	

This Certificate is for the exclusive use of Intertek's client and is provided pursuant to the agreement between Intertek and its Client. Intertek's responsibility and liability are limited to the terms and conditions of the agreement. Intertek assumes no liability to any party, other than to the Client in accordance with the agreement, for any loss, expense or damage occasioned by the use of this Certificate. Only the Client is authorized to permit copying or distribution of this Certificate. Any use of the Intertek name or one of its marks for the sale or advertisement of the tested material, product or service must first be approved in writing by Intertek.

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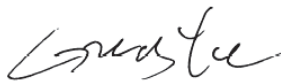
Certificate of Conformity

Certificate Number: 180108053GZU-001

On the basis of the tests undertaken, the sample<s> of the below product have been found to comply with the requirements of the referenced specification<s>/standard<s> at the time the tests were carried out. This certificate is part of the full test report<s> and should be read in conjunction with it

Applicant Name & Address:	SHENZHEN GROWATT NEW ENERGY TECHNOLOGY CO., LTD 1st East & 3rd Floor of Building A, Building B, Jiayu Industrial Park, #28, GuangHui Road, LongTeng Community, Shiyan Street, Baoan District, Shenzhen, P.R.China
Product Description:	PV Grid inverter
Ratings & Principle Characteristics:	See Annex to Certificate of Conformity
Models:	MAX 50KTL3 LV, MAX 60KTL3 LV, MAX 70KTL3 LV, MAX 80KTL3 LV MAX 60KTL3 MV, MAX 70KTL3 MV, MAX 80KTL3 MV
Relevant Standards	IEC 60068-2-1:2007, Environmental testing – Part 2-1: Tests- Test A: Cold IEC 60068-2-2:2007, Environmental testing – Part 2-2: Tests- Test B: Dry heat IEC 60068-2-14:2009, Environmental testing – Part 2-14: Tests- Test N: Change of temperature IEC 60068-2-30:2005, Environmental testing – Part 2-30: Tests- Test Db: Damp heat, cyclic(12h +12h cycle) IEC 61683: 1999, Photovoltaic systems – Power conditioners – Procedure for measuring efficiency
Certificate Issuing Office:	Same as Intertek Legal Entity
Date of Tests:	07 May 2018 – 25 May 2018
Test Report Number(s):	180108053GZU-001

Additional information in Appendix.



Signature

Name: Grady Ye
Position: Manager
Issuing Office: Intertek Legal Entity: Intertek
Testing Services Shenzhen Ltd.
Guangzhou Branch
Date: 28 May 2018



This Certificate is for the exclusive use of Intertek's client and is provided pursuant to the agreement between Intertek and its Client. Intertek's responsibility and liability are limited to the terms and conditions of the agreement. Intertek assumes no liability to any party, other than to the Client in accordance with the agreement, for any loss, expense or damage occasioned by the use of this Certificate. Only the Client is authorized to permit copying or distribution of this Certificate. Any use of the Intertek name or one of its marks for the sale or advertisement of the tested material, product or service must first be approved in writing by Intertek. The observations and test/inspection results referenced in this Certificate are relevant only to the sample tested/inspected. This Certificate by itself does not imply that the material, product, or service is or has ever been under an Intertek certification program.

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Page 1 of 2

GFT-OP-11a (28-April-2017)

APPENDIX: Certificate of Conformity

This is an Annex to Certificate of Conformity with certificate/Report Number(s): 180108053GZU-001. The issuing office is Intertek Legal Entity as above.

Ratings and principal characteristics

Maximum d.c. input voltage: 1100 Vdc

Input voltage range: 200-1000 Vdc

MPPT voltage range (full Load): 500-850 V (for MAX 50KTL3 LV); 520-850 V (for MAX 60KTL3 LV, MAX 60KTL3 MV); 600-850 V (for MAX 70KTL3 LV, MAX 70KTL3 MV); 685-850 V (for MAX 80KTL3 LV, MAX 80KTL3 MV);

Max. input current: 6×25A

Nominal output voltage: 3/N/PE230V/400Vac (for MAX 50KTL3 LV, MAX 60KTL3 LV, MAX 70KTL3 LV, MAX 80KTL3 LV); 3/PE 480Vac (for MAX 60KTL3 MV, MAX 70KTL3 MV, MAX 80KTL3 MV);

Max. output current: 3×81 A (for MAX 50KTL3 LV); 3×97A (for MAX 60KTL3 LV); 3×113 A (for MAX 70KTL3 LV); 3×129A (for MAX 80KTL3 LV); 3×81 A (for MAX 60KTL3 MV); 3×94 A (for MAX 70KTL3 MV); 3×107A (for MAX 80KTL3 MV)

Nominal frequency: 50 Hz

Max. output power: 55500VA (for MAX 50KTL3 LV); 66600VA (for MAX 60KTL3 LV, MAX 60KTL3 MV); 77700VA (for MAX 70KTL3 LV, MAX 70KTL3 MV); 88800VA (for MAX 80KTL3 LV, MAX 80KTL3 MV);

Ingress protection: IP65

Operating temperature range: -25~+60°C

This Certificate is for the exclusive use of Intertek's client and is provided pursuant to the agreement between Intertek and its Client. Intertek's responsibility and liability are limited to the terms and conditions of the agreement. Intertek assumes no liability to any party, other than to the Client in accordance with the agreement, for any loss, expense or damage occasioned by the use of this Certificate. Only the Client is authorized to permit copying or distribution of this Certificate. Any use of the Intertek name or one of its marks for the sale or advertisement of the tested material, product or service must first be approved in writing by Intertek. The observations and test/inspection results referenced in this Certificate are relevant only to the sample tested/inspected. This Certificate by itself does not imply that the material, product, or service is or has ever been under an Intertek certification program.

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Page 2 of 2

GFT-OP-11a (28-April-2017)

Certificate of Conformity

Certificate Number: CN-PV-200146

On the basis of the tests undertaken, the samples of the below product have been found to comply with the requirements of the referenced specifications/standards at the time the tests were carried out. It does not imply that Intertek has performed any surveillance or control of the manufacture. The manufacturer shall ensure that the manufacturing process assures compliance of the production units with the examined products mentioned in this certificate.

Applicant:	Shenzhen Growatt New Energy Co., Ltd 2F and 3F, Building 4, Jiayu Company Industrial Park, Xibianling, Shangyu Village, Shiyan Street, Bao'an District, Shenzhen, China
Product:	PV Grid inverter
Ratings & Principle Characteristics:	See appendix of Certificate of Conformity
Model:	MOD 3000TL3-X, MOD 4000TL3-X, MOD 5000TL3-X, MOD 6000TL3-X, MOD 8000TL3-X, MOD 9000TL3-X, MOD 10KTL3-X, MOD 12KTL3-X, MOD 15KTL3-X
Brand Name:	Growatt
Tested according to:	IEC 60068-2-1:2007, Environmental testing – Part 2-1: Tests- Test A: Cold IEC 60068-2-2:2007, Environmental testing – Part 2-2: Tests- Test B: Dry heat IEC 60068-2-14:2009, Environmental testing – Part 2-14: Tests- Test N: Change of temperature IEC 60068-2-30:2005, Environmental testing – Part 2-30: Tests- Test Db: Damp heat, cyclic (12h +12h cycle) IEC 61683: 1999, Photovoltaic systems – Power conditioners – Procedure for measuring efficiency
Certificate Issuing Office Name & Address:	Intertek Testing Services Ltd. Shanghai West Area, 2nd Floor, No. 707, Zhangyang Road China (Shanghai) Pilot Free Trade Zone, Shanghai, P. R. China
Test Report No.:	200427179GZU-001

Additional information in Appendix.



Signature

Certification Manager: Grady Ye
Date: 10 Nov 2020

This Certificate is for the exclusive use of Intertek's client and is provided pursuant to the agreement between Intertek and its Client. Intertek's responsibility and liability are limited to the terms and conditions of the agreement. Intertek assumes no liability to any party, other than to the Client in accordance with the agreement, for any loss, expense or damage occasioned by the use of this Certificate. Only the Client is authorized to permit copying or distribution of this Certificate. Any use of the Intertek name or one of its marks for the sale or advertisement of the tested material, product or service must first be approved in writing by Intertek.

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APPENDIX: Certificate of Conformity

This is an Appendix to Certificate of Conformity Number: CN-PV-200146

Ratings & Principle Characteristics:

Model	MOD 3000TL3-X	MOD 4000TL3-X	MOD 5000TL3-X	MOD 6000TL3-X
Max. PV voltage	1100Vdc			
PV voltage range	140 – 1000Vdc			
PV Isc	2*16A			
Max. input current	2*13A			
Max. output power	3000W	4000W	5000W	6000W
Max. apparent power	3300VA	4400VA	5500VA	6600VA
Nominal output voltage	3W/N/PE 230/400Vac			
Max. output current	5.0A	6.7A	8.3A	10.0A
Nominal output frequency	50Hz			
Power factor range	0.8Leading ~ 0.8Lagging			
Safety level	Class I			
Ingress protection	IP66			
Operation ambient temperature	-25°C - +60°C			
Software version	DL 1.0			

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APPENDIX: Certificate of Conformity

This is an Appendix to Certificate of Conformity Number: CN-PV-200146

Ratings & Principle Characteristics:

Model	MOD 8000TL3-X	MOD 9000TL3-X	MOD 10KTL3-X	MOD 12KTL3-X	MOD 15KTL3-X
Max. PV voltage	1100Vdc				
PV voltage range	140 – 1000Vdc				
PV Isc	2*16A			16/32A	
Max. input current	2*13A			13/26A	
Max. output power	8000W	9000W	10000W	12000W	15000W
Max. apparent power	8800VA	9900VA	11000VA	13200VA	16500VA
Nominal output voltage	3W/N/PE 230/400Vac				
Max. output current	13.3A	15.0A	16.7A	20.0A	25.0A
Nominal output frequency	50Hz				
Power factor range	0.8Leading ~ 0.8Lagging				
Safety level	Class I				
Ingress protection	IP66				
Operation ambient temperature	-25°C - +60°C				
Software version	DL 1.0				

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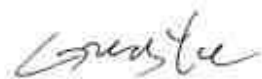
Certificate of Conformity

Certificate Number: CN-PV-210194

On the basis of the tests undertaken, the samples of the below product have been found to comply with the requirements of the referenced specifications /standards at the time the tests were carried out. It does not imply that Intertek has performed any surveillance or control of the manufacture. The manufacturer shall ensure that the manufacturing process assures compliance of the production units with the examined products mentioned in this certificate.

Applicant:	Shenzhen Growatt New Energy CO., Ltd 4-13/F, Building A, Sino-German(Europe) Industrial Park, Hangcheng Ave, Bao'an District, Shenzhen, China.
Product:	PV Grid inverter & Hybrid Inverter
Ratings & Principle Characteristics:	See Appendix to Certificate of Conformity
Models:	MOD 3000TL3-X, MOD 4000TL3-X, MOD 5000TL3-X, MOD 6000TL3-X, MOD 7000TL3-X, MOD 8000TL3-X, MOD 9000TL3-X, MOD 10KTL3-X, MOD 11KTL3-X, MOD 12KTL3-X, MOD 13KTL3-X, MOD 15KTL3-X, MOD 3000TL3-XH, MOD 4000TL3-XH, MOD 5000TL3-XH, MOD 6000TL3-XH, MOD 7000TL3-XH, MOD 8000TL3-XH, MOD 9000TL3-XH, MOD 10KTL3-XH
Brand Name:	Growatt
Tested according to:	IEC 61727:2004 Photovoltaic (PV) systems – Characteristics of the utility interface IEC 62116:2014 Test procedure of islanding prevention measures for utility-interconnected photovoltaic inverters
Certificate Issuing Office Name & Address:	Intertek Testing Services Ltd. Shanghai West Area, 2nd Floor, No. 707, Zhangyang Road China (Shanghai) Pilot Free Trade Zone, Shanghai, P. R. China
Test Reports No:	200427174GZU-001, Revision 1 31 Aug 2021; 200427174GZU-002, Revision 1 31 Aug 2021

Additional information in Appendix.



Signature

Certification Manager: Grady Ye

Date: 06 Sep2021

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1190

APPENDIX: Certificate of Conformity

This is an Appendix to Certificate of Conformity Number: CN-PV-210194

Ratings & Principle Characteristics:

Model	MOD 3000TL3-X	MOD 4000TL3-X	MOD 5000TL3-X	MOD 6000TL3-X
Max. PV voltage	1100Vdc			
PV voltage range	140 – 1000Vdc			
PV Isc	2*16A			
Max. input current	2*13A			
Max. output power	3000W	4000W	5000W	6000W
Max. apparent power	3300VA	4400VA	5500VA	6600VA
Nominal output voltage	3W/N/PE 230/400Vac			
Max. output current	5.0A	6.7A	8.3A	10.0A
Nominal output frequency	50/60 Hz			
Power factor range	0.8Leading ~ 0.8Lagging			
Safety level	Class I			
Ingress protection	IP66			
Operation ambient temperature	-25°C - +60°C			
Software version	DL 1.0			

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APPENDIX: Certificate of Conformity

This is an Appendix to Certificate of Conformity Number: CN-PV-210194

Ratings & Principle Characteristics:

Model	MOD 7000TL3-X	MOD 8000TL3-X	MOD 9000TL3-X	MOD 10KTL3-X
Max. PV voltage	1100Vdc			
PV voltage range	140 – 1000Vdc			
PV Isc	2*16A			
Max. input current	2*13A			
Max. output power	7000W	8000W	9000W	10000W
Max. apparent power	7700VA	8800VA	9900VA	11000VA
Nominal output voltage	3W/N/PE 230/400Vac			
Max. output current	11.7A	13.3A	15.0A	16.7A
Nominal output frequency	50/60 Hz			
Power factor range	0.8Leading ~ 0.8Lagging			
Safety level	Class I			
Ingress protection	IP66			
Operation ambient temperature	-25°C - +60°C			
Software version	DL 1.0			

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APPENDIX: Certificate of Conformity

This is an Appendix to Certificate of Conformity Number: CN-PV-210194

Ratings & Principle Characteristics:

Model	MOD 11KTL3-X	MOD 12KTL3-X	MOD 13KTL3-X	MOD 15KTL3-X
Max. PV voltage	1100Vdc			
PV voltage range	140 – 1000Vdc			
PV Isc	2*16A	16/32A		
Max. input current	2*13A	13/26A		
Max. output power	11000W	12000W	13000W	15000W
Max. apparent power	12100VA	13200VA	14300VA	16500VA
Nominal output voltage	3W/N/PE 230/400Vac			
Max. output current	18.3A	20.0A	21.7A	25.0A
Nominal output frequency	50/60 Hz			
Power factor range	0.8Leading ~ 0.8Lagging			
Safety level	Class I			
Ingress protection	IP66			
Operation ambient temperature	-25°C - +60°C			
Software version	DL 1.0			

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1193

APPENDIX: Certificate of Conformity

This is an Appendix to Certificate of Conformity Number: CN-PV-210194

Ratings & Principle Characteristics:

Model	MOD 3000TL3-XH	MOD 4000TL3-XH	MOD 5000TL3-XH	MOD 6000TL3-XH
Max. PV voltage	1100Vdc			
PV voltage range	140 – 1000Vdc			
PV Isc	20A*2			
Max. input current	16A*2			
Max. output power	3000W	4000W	5000W	6000W
Max. apparent power	3300VA	4400VA	5500VA	6600VA
Nominal output voltage	3W/N/PE 230/400Vac			
Max. output current	5.0A	6.7A	8.3A	10.0A
Nominal output frequency	50/60 Hz			
Power factor range	0.8Leading ~ 0.8Lagging			
Safety level	Class I			
Ingress protection	IP66			
Operation ambient temperature	-25°C - +60°C			
Software version	DN 1.0			

This Certificate is for the exclusive use of Intertek's client and is provided pursuant to the agreement between Intertek and its Client. Intertek's responsibility and liability are limited to the terms and conditions of the agreement. Intertek assumes no liability to any party, other than to the Client in accordance with the agreement, for any loss, expense or damage occasioned by the use of this Certificate. Only the Client is authorized to permit copying or distribution of this Certificate. Any use of the Intertek name or one of its marks for the sale or advertisement of the tested material, product or service must first be approved in writing by Intertek.

1194

APPENDIX: Certificate of Conformity

This is an Appendix to Certificate of Conformity Number: CN-PV-210194

Ratings & Principle Characteristics:

Model	MOD 7000TL3-XH	MOD 8000TL3-XH	MOD 9000TL3-XH	MOD 10KTL3-XH
Max. PV voltage	1100Vdc			
PV voltage range	140 – 1000Vdc			
PV Isc	20A*2			
Max. input current	16A*2			
Max. output power	7000W	8000W	9000W	10000W
Max. apparent power	7700VA	8800VA	9900VA	11000VA
Nominal output voltage	3W/N/PE 230/400Vac			
Max. output current	11.7A	13.3A	15.0A	16.7A
Nominal output frequency	50/60 Hz			
Power factor range	0.8Leading ~ 0.8Lagging			
Safety level	Class I			
Ingress protection	IP66			
Operation ambient temperature	-25°C - +60°C			
Software version	DN 1.0			

This Certificate is for the exclusive use of Intertek's client and is provided pursuant to the agreement between Intertek and its Client. Intertek's responsibility and liability are limited to the terms and conditions of the agreement. Intertek assumes no liability to any party, other than to the Client in accordance with the agreement, for any loss, expense or damage occasioned by the use of this Certificate. Only the Client is authorized to permit copying or distribution of this Certificate. Any use of the Intertek name or one of its marks for the sale or advertisement of the tested material, product or service must first be approved in writing by Intertek.



Solar inverter

PVS-10/12.5/15-TL

The PVS-10/12.5/15-TL is the new FIMER three-phase solution, ideal for the optimization of installation and operational costs in commercial and industrial PV plants.

From 10 to 15 kW

1196

String inverter PVS-10/12.5/15-TL

This new PVS string inverter family, with power ratings of up to 33 kW, has been designed with the objective to maximize the ROI in commercial and industrial applications such as rooftop plants, carports and trackers.

Ease of installation and maintenance

The compact design of the product allows savings on installation costs. The installation is quick and easy, without the need to open the front cover. Moreover, being fuse-free, this inverter guarantees further savings on maintenance costs and time, reducing on site interventions to a minimum.

Maximum flexibility and integration

The input voltage range and all DC-side specs as a whole allow for the greatest plant design flexibility within both new and existing installations. This new inverter family guarantees maximum integration with the latest PV technologies, including bifacial modules.

Advanced communication

Fast commissioning thanks to the Solar Inverters installer app which enable a quick multi-inverter installation, saving up to 70% commissioning time. The single string current monitoring allows to keep the status of the PV generator under control and to detect potential faults in real time. The built-in FIMER Export Limitation solution allows to comply with any power export constraints established by utilities, without any additional devices to be installed.

Integrated PID recovery function

Inverters equipped with PID (Potential Induced Degradation) recovery function are able to restore the optimal conditions of the PV module in

order to prevent performance losses which could be caused by the PID during standard operation. Such functionality allows to maintain the highest level of performance and to maximize the working life of the plant, hence, optimizing the return on investment.

Integrated Arc Fault Circuit Interrupter

The Integrated Arc Fault Circuit Interrupter allows to recognize and immediately interrupt the electric arcs which may occur on the PV system. Thanks to such functionality the inverter is able to offer a reliable fire prevention mechanism wherever required for roof mounted installations.

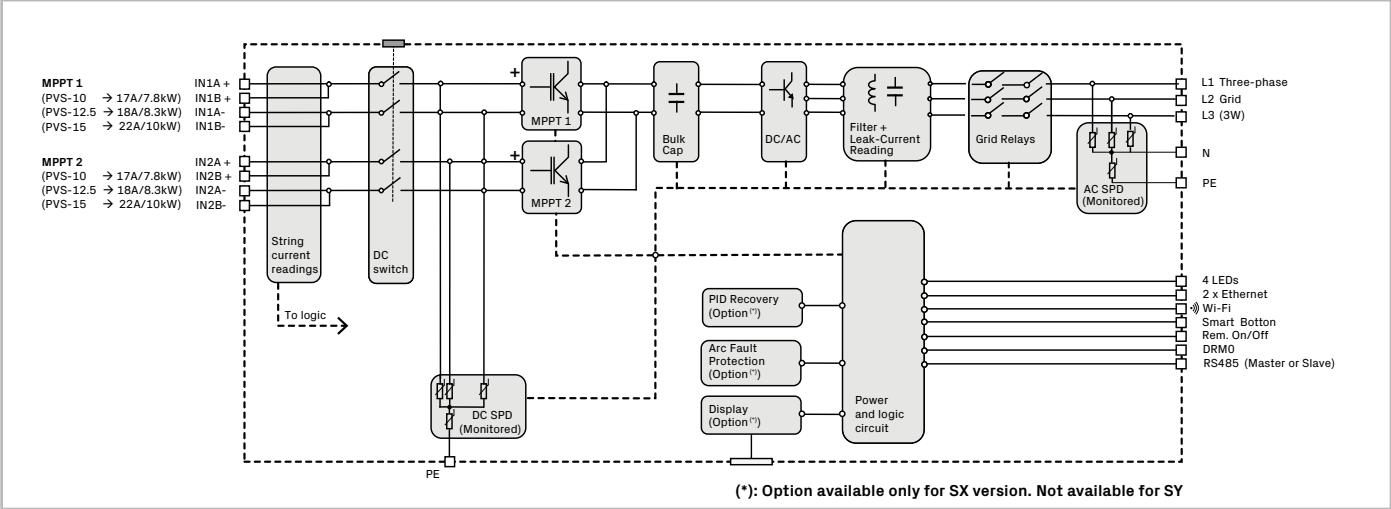
RSD compatibility

PVS-10/33 is tested for operation in PV systems equipped with Rapid Shutdown systems (RSD) and/or with I-V optimizers installed at module level (contact FIMER for a complete list of compatible systems).

Highlights

- Communication active during the night
- High DC/AC power oversizing capability
- Compact inverter suitable for vertical and horizontal installation
- Fuse-free design
- Installation on new and existing plants
- Maximum string voltage 1100 Vdc
- PID recovery function (optional)
- Commissioning through the Solar Inverters installer app
- Integrated Export Limitation function
- Single string current monitoring
- Arc fault circuit interrupter (optional)
- Energy communities ready

Block diagram PVS-10/12.5/15-TL



Technical data and types			
Type code	PVS-10-TL	PVS-12.5-TL	PVS-15-TL
Input side			
Absolute maximum DC input voltage ($V_{\text{max,abs}}$)	1100 V		
Start-up DC input voltage (V_{start})	250...500V (default 360V)		
Operating DC input voltage range ($V_{\text{dcmin}}...V_{\text{dcmax}}$)	200-1000 V		
Rated DC input voltage (V_{dcr})	620V		
Rated DC input power (P_{dcr})	10200 W	12760 W	15300 W
Number of independent MPPT	2		
Maximum photovoltaic power recommended ($P_{\text{PV, max}}$)	14500 Wp	18125 Wp	21750 Wp
Maximum DC input power for each MPPT ($P_{\text{MPPT, Tmax}}$)	7800W	8300W	10000W
MPPT input DC voltage range ($V_{\text{MPPTmin}} ... V_{\text{MPPTmax}}$) a P_{acr}	460-850V		
Maximum DC input current (I_{dcmax}) for each MPPT	2x17A	2x18A	2x22A
Maximum input short circuit current for each MPPT	30 A		
Number of DC input pairs for each MPPT	2		
DC connection type	PV quick fit connector		
Input protection			
Revers polarity protection	Yes, from limited current source		
Input over voltage protection for each MPPT	SPD Type II / Type I+II (optional)		
Isolation control	According to local standard		
Output side			
AC grid connection type	Three-phase (3W+PE or 3W+N+PE)		
Earthing system	TN-S, TN-C, TN-CS, TT	TN-S, TN-C, TN-CS, TT	TN-S, TN-C, TN-CS, TT
Rated AC power ($P_{\text{acr}} @\cos\varphi=1$)	10000 W	12500 W	15000 W
Maximum AC output power ($P_{\text{acmax}} @\cos\varphi=1$)	10000 W	12500 W	15000 W
Maximum apparent power (S_{max})	10000 VA	12500 VA	15000 VA
Maximum reactive power (Q_{max})	6000 VAR	7500 VAR	9000 VAR
Nominal power factor and adjustable range	> 0.995; 0.8...1 inductive/capacitive		
Rated AC output voltage (V_{acr})	380V, 400V ¹⁾		
Maximum AC output current ($I_{\text{ac,max}}$)	16 A	20 A	23 A
Rated output frequency (f_i)	50 Hz / 60 Hz		
Output frequency range ($f_{\text{min}}...f_{\text{max}}$)	47...53 Hz / 57...63 Hz ²⁾		
Total current harmonic distortion	<3%		
Maximum AC cable	16 mm² copper		
AC connection type	AC quick fit connector		
Output protection			
Anti-islanding protection	According to local standard		
Maximum external AC overcurrent protection	25 A	32 A	32 A
Output overvoltage protection	SPD Type II		
Operating performance			
Maximum efficiency (η_{max})	98,4%	98,5%	98,5%
Weighted efficiency (EURO)	98,1%	98,2%	98,2%
Communication			
Embedded communication interfaces	Double Ethernet port, WLAN, RS485 port		
Communication protocol	Modbus TCP Sunspec, Modbus RTU Sunspec		
User interface	LEDs, Web User Interface, Installer APP, Display (optional)		
Cloud services	Aurora Vision® Plant Management Platform, Rest API		
Advanced features	Embedded export limitation control (in combination with external meter), 24h self-consumption monitoring		

Technical data and types

Type code	PVS-10-TL	PVS-12.5-TL	PVS-15-TL
Environmental			
Ambient temperature range	-25...+60°C (-13...140 °F) with derating above 45 °C (113 °F)		
Relative humidity	4%... 100% with condensation		
Maximum operating altitude	4000 m (13123 ft) with derating above 2000 m (6561 ft)		
Physical			
Inverter type	Grid connected, double stage, transformerless		
Environmental protection rating	IP65		
Environmental classification	4K26 (IEC 60721-3-4)		
Cooling	Natural cooling		
Dimension (H x W x D)	568,2 x 473,6 x 207		
Weight	29,6 Kg		
Mounting system	Mounting bracket		
Safety			
Marking	CE, RCM		
Safety and EMC standards	IEC/EN 62109-1, IEC/EN 62109-2, EN 61000-6-1, EN 61000-6-2, EN 61000-3-11, EN 61000-3-12 EN 62311, EN 301 489-1, EN 301 489-17, EN 300 328		
Certificates and compliance (check your sales channel for availability)	IEC 61683, EN 50530, IEC 62116, IEC 61727, AS/NZS 4777.2, VDE-AR-N 4105, VDE-AR-N 4110, VDE V 0124-100, DIN VDE V 0126-1-1, VFR 2019, UTE C15-712-1, CEI 0-21, CEI 0-16, PEA, MEA, EN 50438, EN 50549-1/-2, DRRG (DUBAI), CLC/TS 50549-1/-2, G98, G99, Synergrid C10/11, RD 413, RD 1565, RD244, P.O. 12.3, NTS 631, UNE 206006 IN (ITC-BT-40), PPDS-priloha, Denmark Type A/B, IRR-DCC-MV, ABNT NBR 16149, ABNT NBR 16150, NRS 097-2-1, SII, ISO/IEC Guide 67, Netherlands Type A, EIFS Type A, Ireland		
Available product versions			
Inverter equipped with SPD Type 2 on the DC and AC side	PVS-10-TL-SX	PVS-12.5-TL-SX	PVS-15-TL-SX
Inverter equipped with SPD Type 1+2 on the DC side and Type 2 on the AC side	PVS-10-TL-SY	PVS-12.5-TL-SY	PVS-15-TL-SY
Available ordering options			
PID recovery	Only for SX version	Only for SX version	Only for SX version
AFCI (Arc Fault Circuit Interrupter)	Only for SX version	Only for SX version	Only for SX version
Display	Only for SX version	Only for SX version	Only for SX version

1) The output voltage range may vary depending on specific country grid standards
2) The output frequency range may vary depending on specific country grid standards

Remarks:

- Designed and manufactured in Italy
- Features not specifically listed in the present data sheet are not included in the product



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C E R T I F I C A T E

of Conformity



Registration No.: AK 60155924 0001

Report No.: 28120692 010

Holder: **FIMER S.p.A.**
VIA TORTONA 25
20144 MILAN MI
Italia

Product: Electrical Equipment
Solar grid tied inverter

Identification: PVS-10-TL-SX PVS-10-TL-SY
PVS-12.5-TL-SX PVS-12.5-TL-SY
PVS-15-TL-SX PVS-15-TL-SY

Tested acc. to: EN 61727:1995
IEC 61727:2004

The certificate of conformity refers to the above mentioned product. This is to certify that the specimen is in conformity with the assessment requirement mentioned above. This certificate does not imply assessment of the production of the product and does not permit the use of a TÜV Rheinland mark of conformity.

Date 07.04.2021



TÜV Rheinland LGA Products GmbH 1200 **Tillystraße 2 - 90431 Nürnberg**

C E R T I F I C A T E

of Conformity



Registration No.: AK 60155915 0001

Report No.: 28120692 002

Holder: **FIMER S.p.A.**
VIA TORTONA 25
20144 MILAN MI
Italia

Product: Electrical Equipment
Solar grid tied inverter

Identification: PVS-10-TL-SX PVS-10-TL-SY
PVS-12.5-TL-SX PVS-12.5-TL-SY
PVS-15-TL-SX PVS-15-TL-SY

Tested acc. to: EN 62109-1:2010
IEC 62109-1:2010

The certificate of conformity refers to the above mentioned product. This is to certify that the specimen is in conformity with the assessment requirement mentioned above. This certificate does not imply assessment of the production of the product and does not permit the use of a TÜV Rheinland mark of conformity.

Date 06.04.2021



TÜV Rheinland LGA Products GmbH ¹²⁰¹ Tillystraße 2 - 90431 Nürnberg

C E R T I F I C A T E

of Conformity



Registration No.: AK 60155917 0001

Report No.: 28120692 003

Holder: **FIMER S.p.A.**
VIA TORTONA 25
20144 MILAN MI
Italia

Product: Electrical Equipment
Solar grid tied inverter

Identification: PVS-10-TL-SX PVS-10-TL-SY
PVS-12.5-TL-SX PVS-12.5-TL-SY
PVS-15-TL-SX PVS-15-TL-SY

Tested acc. to: EN 62109-2:2011
IEC 62109-2:2011

The certificate of conformity refers to the above mentioned product. This is to certify that the specimen is in conformity with the assessment requirement mentioned above. This certificate does not imply assessment of the production of the product and does not permit the use of a TÜV Rheinland mark of conformity.

Date 06.04.2021

Certification Body



TÜV Rheinland LGA Products GmbH 1202 **Tillystraße 2 - 90431 Nürnberg**

C E R T I F I C A T E

of Conformity



Registration No.: AK 60155922 0001

Report No.: 28120692 008

Holder: FIMER S.p.A.
VIA TORTONA 25
20144 MILAN MI
Italia

Product: Electrical Equipment
Solar grid tied inverter

Identification:

PVS-10-TL-SX	PVS-10-TL-SY
PVS-12.5-TL-SX	PVS-12.5-TL-SY
PVS-15-TL-SX	PVS-15-TL-SY

Tested acc. to: EN 62116:2014
IEC 62116:2014

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Date 07.04.2021

Certification Body



TÜV Rheinland LGA Products GmbH, Tillystraße 2 - 90431 Nürnberg

1203

C E R T I F I C A T E

of Conformity



Registration No.: AK 60155921 0001

Report No.: 28120692 008

Holder: **FIMER S.p.A.**
VIA TORTONA 25
20144 MILAN MI
Italia

Product: Electrical Equipment
Solar grid tied inverter

Identification: PVS-10-TL-SX PVS-10-TL-SY
PVS-12.5-TL-SX PVS-12.5-TL-SY
PVS-15-TL-SX PVS-15-TL-SY

Tested acc. to: IEC 61683:1999

The certificate of conformity refers to the above mentioned product. This is to certify that the specimen is in conformity with the assessment requirement mentioned above. This certificate does not imply assessment of the production of the product and does not permit the use of a TÜV Rheinland mark of conformity.

Date 07.04.2021



TÜV Rheinland LGA Products GmbH - Tillystraße 2 - 90431 Nürnberg

1204



Solar inverter

TRIO-20.0/27.6-TL-OUTD

The TRIO 20.0/27.6 commercial inverter offers more flexibility and control to installers who have installations with varying configurations and orientations.

From 20.0 to 27.6 kW

1205

String inverter - TRIO-20.0/27.6-TL-OUTD

The dual input section featuring two independent Maximum Power Point Tracking (MPPT), allows optimal energy harvesting from two sub-arrays oriented in different directions.

The TRIO features a high speed and precise MPPT algorithm for real power tracking and improved energy harvesting.

High efficiency at all output levels

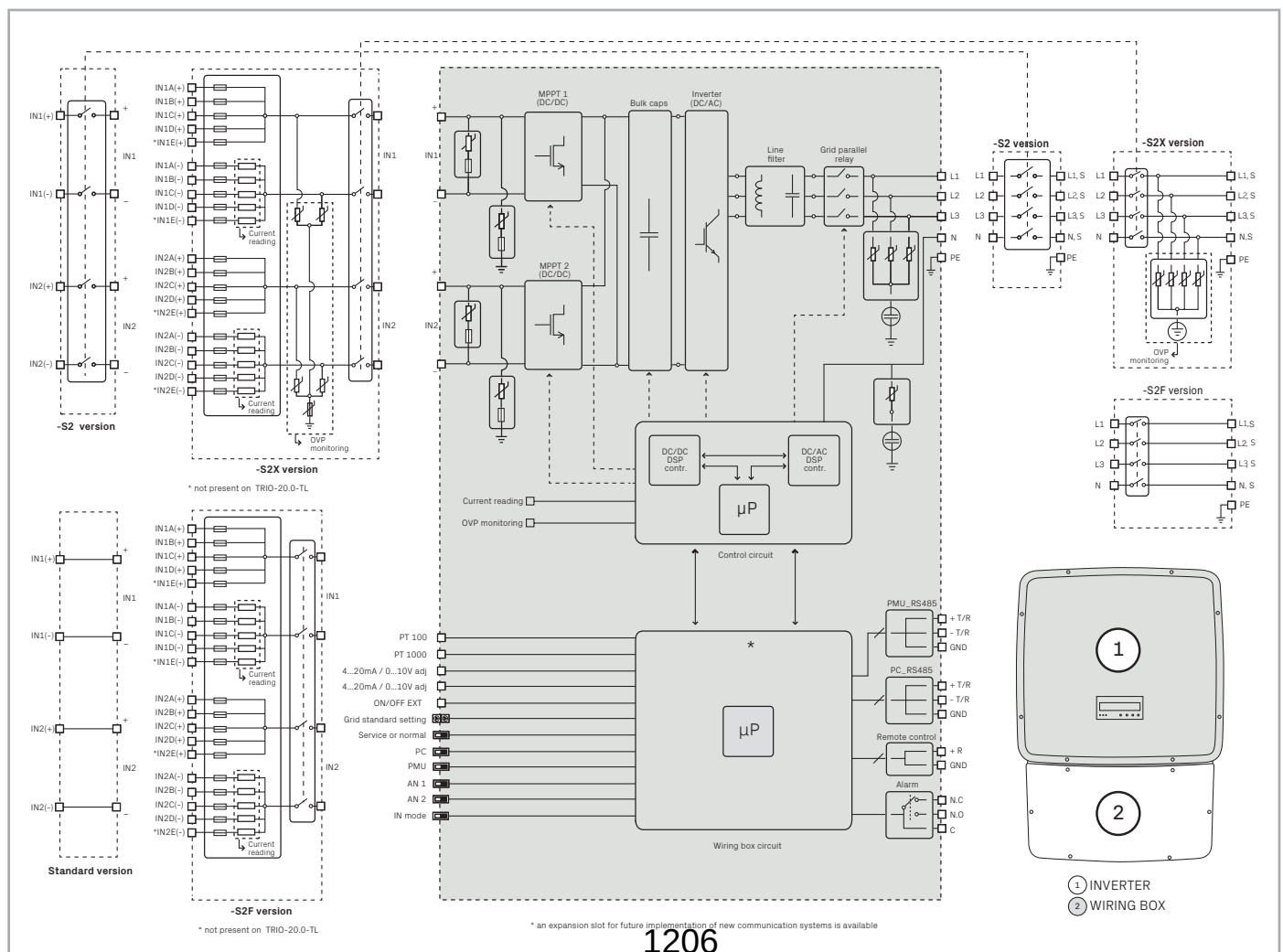
Flat efficiency curves ensure high efficiency at all output levels guaranteeing consistent and stable performance across the entire input voltage and output power range.

This device has an efficiency rating of up to 98.2%.

The very wide input voltage range makes the inverter suitable for installations with reduced string length.

Highlights

- True three-phase bridge topology for DC/AC output converter
- Transformerless topology
- Each inverter is set on specific grid codes which can be selected upon commissioning
- Detachable wiring box to allow an easy installation
- Wide input voltage range
- Integrated string combiner with different configurations which include DC and AC disconnect switch in compliance with international standards (-S2, -S1J, -S2J, -S2F and -S2X versions)
- Natural convection cooling for maximum reliability
- Outdoor enclosure for operation use under any environmental conditions
- Capability to connect external sensors for monitoring environmental conditions
- Availability of auxiliary DC output voltage (24 V, 300 mA)
- VSN300 Wifi Logger Card enables wireless access to Aurora Vision with DC input channel monitoring
- Lifetime free of charge access to Aurora Vision

TRIO-20.0/27.6-TL-OUTD string inverter block diagram

Technical data and types		
Type code	TRIO-20.0-TL-OUTD	TRIO-27.6-TL-OUTD
Input side		
Absolute maximum DC input voltage (V _{max,abs})	1000 V	
Start-up DC input voltage (V _{start})	430 V (adj. 250...500 V)	
Operating DC input voltage range (V _{dmin} ...V _{dmax})	0.7 x V _{start} ...950 V (min 200 V)	
Rated DC input voltage (V _{dcr})	620 V	
Rated DC input power (P _{dcr})	20750 W	28600 W
Number of independent MPPT	2	
Maximum DC input power for each MPPT (P _{MPPTmax})	12000 W	16000 W
DC input voltage range with parallel configuration of MPPT at P _{acr}	440...800 V	500...800 V
DC power limitation with parallel configuration of MPPT	Linear derating from max to null [800 V≤V _{MPPT} ≤950 V]	
DC power limitation for each MPPT with independent configuration of MPPT at P _{acr} , max unbalance example	12000 W [480 V≤V _{MPPT} ≤800 V] the other channel: P _{dcr} =12000 W [350 V≤V _{MPPT} ≤800 V]	16000 W [500 V≤V _{MPPT} ≤800 V] the other channel: P _{dcr} =16000 W [400 V≤V _{MPPT} ≤800 V]
Maximum DC input current (I _{dcm}) / for each MPPT (I _{MPPTmax})	50.0 A / 25.0 A	64.0 A / 32.0 A
Maximum input short circuit current for each MPPT	30.0 A	40.0 A
Number of DC input pairs for each MPPT	1 (4 in -S2X, -S2F, -S1J, -S2J versions)	1 (5 in -S2X and -S2F versions, 4 in -S1J and -S2J)
DC connection type	PV quick fit connector ¹⁾ / Screw terminal block on Standard and -S2 versions	
Input protection		
Reverse polarity protection	Yes, from limited current source	
Input over voltage protection for each MPPT - varistor	Yes, 4	
Input over voltage protection for each MPPT - plug In modular surge arrester (-S2X, -S1J and -S2J versions)	-S2X: Type 2; -S1J, -S1J: Type 1+2	
Photovoltaic array isolation control	According to local standard	
DC switch rating for each MPPT (version with DC switch)	40 A / 1000 V	
Fuse rating (versions with fuses)	15 A / 1000 V	
Output side		
AC grid connection type	Three-phase 3W+PE or 4W+PE	
Rated AC power (P _{acr} @cosφ=1)	20000 W	27600 W
Maximum AC output power (P _{acmax} @cosφ=1)	22000 W ²⁾	30000 W ³⁾
Maximum apparent power (S _{max})	22200 VA ⁴⁾	30670 VA ⁴⁾
Rated AC grid voltage (V _{ac,r})	400 V	
AC voltage range	320...480 V ⁵⁾	
Maximum AC output current (I _{ac,max})	33.0 A	45.0 A
Contributory fault current	35.0 A	46.0 A
Rated output frequency (f _r)	50 Hz / 60 Hz	
Output frequency range (f _{min} ...f _{max})	47...53 Hz / 57...63 Hz ⁶⁾	
Nominal power factor and adjustable range	> 0.995, adj. ± 0.9 with P _{acr} =20.0 kW, ± 0.8 with max 22.2 kVA	> 0.995, adj. ± 0.9 with P _{acr} =27.6 kW, ± 0.8 with max 30 kVA
Total current harmonic distortion	< 3%	
AC connection type	Screw terminal block, cable gland PG36	
Output protection		
Anti-islanding protection	According to local standard	
Maximum external AC overcurrent protection	50.0 A	63.0 A
Output overvoltage protection - varistor	4	
Output overvoltage protection - plug in modular surge arrester (-S2X version)	4 (Type 2)	
Operating performance		
Maximum efficiency (η _{max})	98.2%	
Weighted efficiency (EURO/CEC)	98.0% / 98.0%	
Feed in power threshold	40 W	
Night consumption	< 0.6 W	
Communication		
Wired local monitoring	PVI-USB-RS232_485 (opt.)	
Remote monitoring	VSN300 Wifi Logger Card (opt.), VSN700 Data Logger (opt.)	
Wireless local monitoring	VSN300 Wifi Logger Card (opt.)	
User interface	Graphic display	

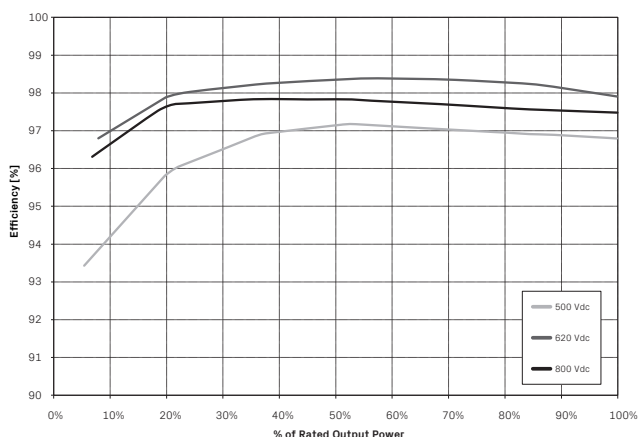
Technical data and types

Type code	TRIO-20.0-TL-OUTD	TRIO-27.6-TL-OUTD
Environmental		
Ambient temperature range	-25...+60°C / -13...140°F with derating above 45°C/113°F	
Relative humidity	0...100% condensing	
Sound pressure level, typical	50 dBA @ 1 m	
Maximum operating altitude without derating	2000 m / 6560 ft	
Physical		
Environmental protection rating	IP65	
Cooling	Natural	
Dimension (H x W x D)	1061 mm x 702 mm x 292 mm / 41.7" x 27.6" x 11.5"	
Weight	< 70.0 kg / 154.3 lbs (Standard version)	< 75.0 kg / 165.4 lbs (Standard version)
Mounting system	Wall bracket	
Safety		
Isolation level	Transformerless	
Marking	CE (50 Hz only), RCM	
Safety and EMC standard	EN 50178, IEC/EN 62109-1, IEC/EN 62109-2, AS/NZS 3100, AS/NZS 60950.1, EN 61000-6-2, EN 61000-6-3, EN 61000-3-11, EN 61000-3-12	
Grid standard (check your sales channel for availability)	CEI 0-21, CEI 0-16, DIN V VDE V 0126-1-1, VDE-AR-N 4105, G59/3, C10/11, EN 50438 (not for all national appendices), RD 1699, RD 413, RD 661, P.O. 12.3, AS 4777, BDEW, NRS-097-2-1, MEA, IEC 61727, IEC 62116, Ordinul 30/2013, VFR 2014	
Available products variants		
Standard	TRIO-20.0-TL-OUTD-400	TRIO-27.6-TL-OUTD-400
With DC+AC switch	TRIO-20.0-TL-OUTD-S2-400	TRIO-27.6-TL-OUTD-S2-400
With DC+AC switch and fuse	TRIO-20.0-TL-OUTD-S2F-400	TRIO-27.6-TL-OUTD-S2F-400
With DC+AC switch, fuse and surge arrester	TRIO-20.0-TL-OUTD-S2X-400	TRIO-27.6-TL-OUTD-S2X-400
With DC+AC switch, fuse and 1 DC surge arrester Type 1 + 2	TRIO-20.0-TL-OUTD-S1J-400	TRIO-27.6-TL-OUTD-S1J-400
With DC+AC switch, fuse and 2 DC surge arrester Type 1 + 2	TRIO-20.0-TL-OUTD-S2J-400	TRIO-27.6-TL-OUTD-S2J-400

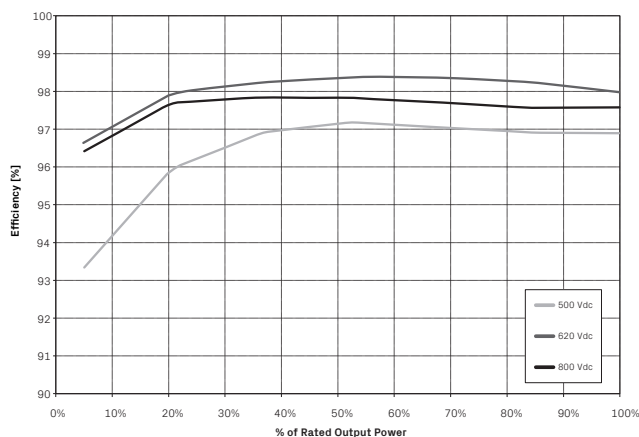
- 1) Please refer to the document "String inverters – Product manual appendix" available at www.fimer.com for information on the quick-fit connector brand and model used in the inverter
- 2) Limited to 20000 W according to country specific regulations
- 3) Limited to 27600 W according to country specific regulations

- 4) Due to country specific regulations this value can be limited to 22000VA/30000VA
- 5) The AC voltage range may vary depending on specific country grid standard
- 6) The Frequency range may vary depending on specific country grid standard
- Remark. Features not specifically listed in the present data sheet are not included in the product**

Efficiency curves of TRIO-20.0-TL-OUTD



Efficiency curves of TRIO-27.6-TL-OUTD



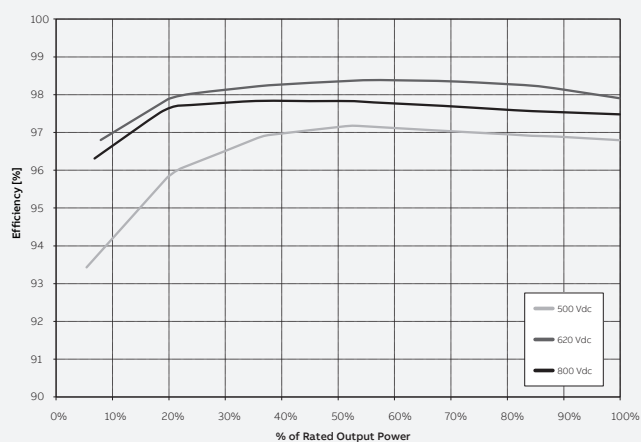
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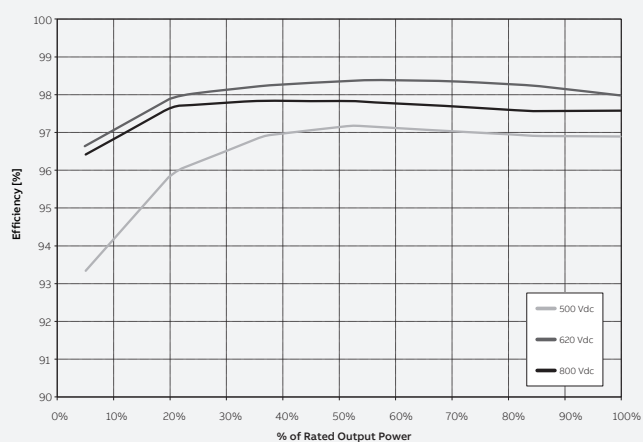
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Efficiency curves of TRIO-20.0-TL-OUTD


Efficiency curves of TRIO-27.6-TL-OUTD


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www.abb.com/solarinverters
www.abb.com

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1209





**Bureau Veritas
Consumer Products Services
Germany GmbH**

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Certification body of BV CPS GmbH
Accredited according to EN 45011 -
ISO / IEC Guide 65

Certificate of compliance

Applicant: **Power-One Italy S.p.A.**
Via San Giorgio 642
52028 Terranuova Bracciolini, Arezzo
Italy

Product: **Grid-tied photovoltaic (PV) inverter**

Model: **TRIO-20.0-TL-OUTD-400**
TRIO-20.0-TL-OUTD-S2-400
TRIO-20.0-TL-OUTD-S2F-400
TRIO-20.0-TL-OUTD-S2X-400
TRIO-20.0-TL-OUTD-S1J-400
TRIO-20.0-TL-OUTD-S2J-400
TRIO-27.6-TL-OUTD-400
TRIO-27.6-TL-OUTD-S2-400
TRIO-27.6-TL-OUTD-S2F-400
TRIO-27.6-TL-OUTD-S2X-400
TRIO-27.6-TL-OUTD-S1J-400
TRIO-27.6-TL-OUTD-S2J-400

Use in accordance with regulations:

The inverter are tested according the IEC 61683:1999, EN 61683:2000, DIN EN 61683:2000 procedure for measuring efficiency.

Applied rules and standards:

IEC 61683:1999, EN 61683:2000, DIN EN 61683:2000

Photovoltaic systems – Power conditioners – Procedure for measuring efficiency

At the time of issue of this certificate the safety concept of an aforementioned representative product corresponds to the valid safety specifications for the specified use in accordance with regulations.

Report number: **14TH0151-IEC61683**

Certificate number: **U14-0286**

Date of issue: **2014-05-12**

Certification body

Dieter Zitzmann



1210

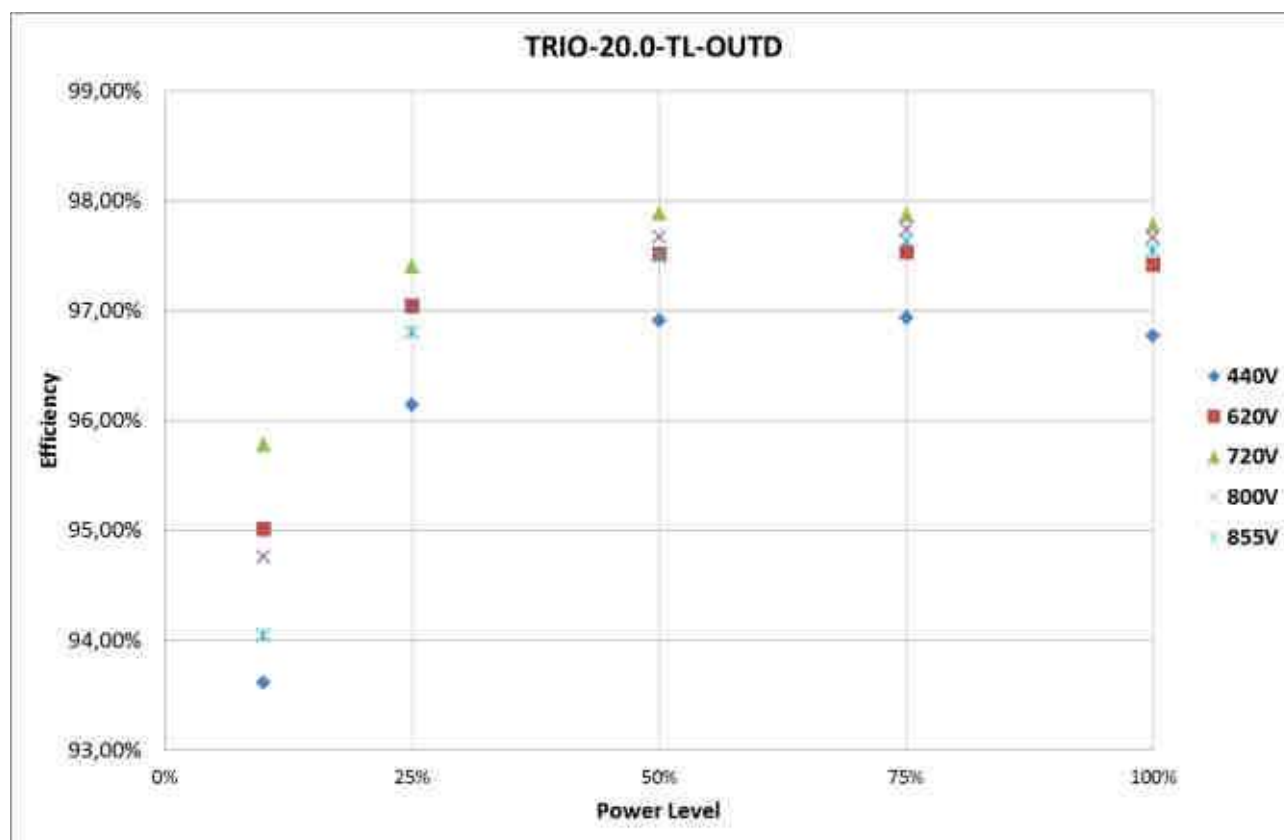
Measuring of efficiency

Extract from test report according the IEC 61683

Nr. 14TH0151

4. Efficiency measurement conditions test results

TRIO-20.0-TL-OUTD		Temperature 25°C				
Input voltage (Vdc)		Power Level				
		10%	25%	50%	75%	100%
		2000W	5000W	10000W	15000W	20000W
		η in [%]				
Vmin	440	93,61%	96,14%	96,91%	96,93%	96,77%
Vnominal	620	95,01%	97,04%	97,52%	97,53%	97,42%
Vmax (90% MPPT)	720	95,78%	97,40%	97,89%	97,87%	97,78%
Vmax (MPPT)	800	94,76%	97,06%	97,67%	97,74%	97,66%
Vmax (90%)	855	94,04%	96,80%	97,49%	97,63%	97,55%



Internal power consumption via auxiliary input in standby : 34,25 W (Input: 779V, 0,044A; Ouput: 0V, 0mA)

Internal power consumption via auxiliary input at maximum output power : 678W

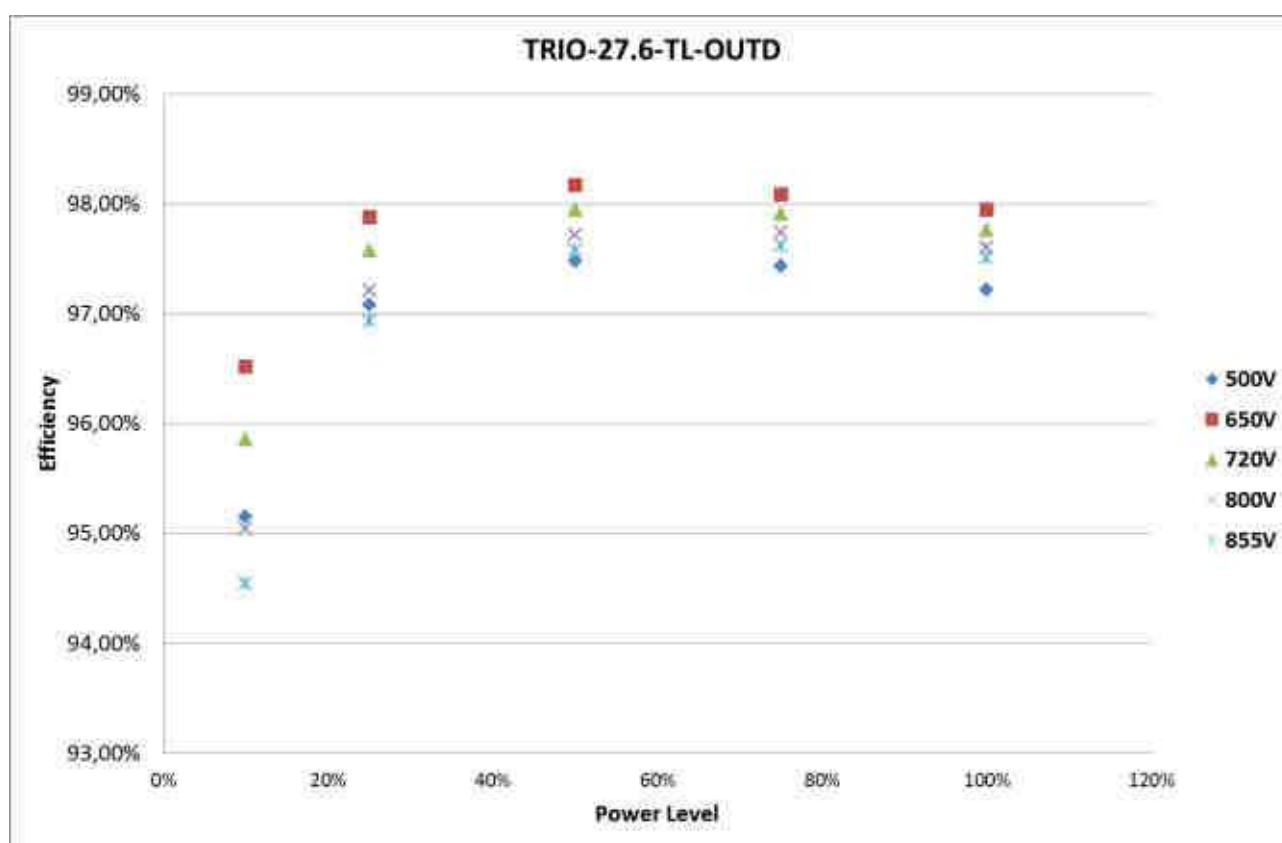
Measuring of efficiency

Extract from test report according the IEC 61683

Nr. 14TH0151

4. Efficiency measurement conditions test results

TRIO-27.6-TL-OUTD		Temperature 25°C				
Input voltage (Vdc)		Power Level				
		10%	25%	50%	75%	100%
		2760W	6900W	13800W	20700W	27600W
		η in [%]				
Vmin	500	95,15%	97,08%	97,48%	97,43%	97,22%
Vnominal	650	96,52%	97,88%	98,17%	98,09%	97,95%
Vmax (90% MPPT)	720	95,86%	97,58%	97,95%	97,91%	97,76%
Vmax (MPPT)	800	95,04%	97,21%	97,72%	97,74%	97,60%
Vmax (90%)	855	94,54%	96,93%	97,58%	97,62%	97,51%



Internal power consumption via auxiliary input in standby : 38,31W (Input: 815V, 0,047A; Ouput: 0V, 0mA)

Internal power consumption via auxiliary input at maximum output power : 790W

C E R T I F I C A T E

of Conformity



Registration No.: AK 60103114 0001

Report No.: 28107790 001

Holder: Power - One Italy S.p.A.
Via San Giorgio 642
52028 Terranuova Bracciolini AR
Italia

Product: Electrical Equipment
Grid tied inverter

Identification: Trademark: ABB
Models: TRIO-20.0(27.6)-TL-OUTD-400
TRIO-20.0(27.6)-TL-OUTD-S2-400
TRIO-20.0(27.6)-TL-OUTD-S2X-400
TRIO-20.0(27.6)-TL-OUTD-S2F-400
TRIO-20.0(27.6)-TL-OUTD-S1J-400
TRIO-20.0(27.6)-TL-OUTD-S2J-400
TRIO-20.0(27.6)-TL-OUTD-400-W

Tested acc. to: IEC 62109-1:2010
EN 62109-1:2010

The certificate of conformity refers to the above mentioned product. This is to certify that the specimen is in conformity with the assessment requirement mentioned above. This certificate does not imply assessment of the production of the product and does not permit the use of a TÜV Rheinland mark of conformity.

Date 16.07.2015

Certification Body

A blue ink signature of Marco Piva.
Marco Piva

A circular blue stamp of TÜV Rheinland LGA Products GmbH. The outer ring contains the text "TÜV Rheinland LGA Products GmbH" and "Zertifizierungsstelle". The inner circle contains the TÜV Rheinland logo and the text "TÜVRheinland".

TÜV Rheinland LGA Products GmbH 1213 Tillystraße 2 - 90431 Nürnberg

C E R T I F I C A T E

of Conformity



Registration No.: AK 60103137 0001

Report No.: 28107790 002

Holder: Power - One Italy S.p.A.
Via San Giorgio 642
52028 Terranuova Bracciolini AR
Italia

Product: Electrical Equipment
Grid tied inverter

Identification: Trademark: ABB
Models: TRIO-20.0(27.6)-TL-OUTD-400
TRIO-20.0(27.6)-TL-OUTD-S2-400
TRIO-20.0(27.6)-TL-OUTD-S2X-400
TRIO-20.0(27.6)-TL-OUTD-S2F-400
TRIO-20.0(27.6)-TL-OUTD-S1J-400
TRIO-20.0(27.6)-TL-OUTD-S2J-400
TRIO-20.0(27.6)-TL-OUTD-400-W

Tested acc. to: IEC 62109-2:2011
EN 62109-2:2011

The certificate of conformity refers to the above mentioned product. This is to certify that the specimen is in conformity with the assessment requirement mentioned above. This certificate does not imply assessment of the production of the product and does not permit the use of a TÜV Rheinland mark of conformity.

Date 17.07.2015

Certification Body

Marco Piva



TÜV Rheinland LGA Products GmbH 1214 Tillystraße 2 - 90431 Nürnberg

C E R T I F I C A T E

of Conformity



Registration No.: AK 60076861 0001

Report No.: 28105150 001

Holder: Power - One Italy S.p.a.
Via San Giorgio 642
52028 Terranuova Bracciolini AR
Italia

Product: Electrical Equipment
Photovoltaic grid tied inverter

Identification: Trademark: POWER-ONE
Models: TRIO-20.0 (27.6) -TL-OUTD-400
TRIO-20.0 (27.6) -TL-OUTD-S2-400
TRIO-20.0 (27.6) -TL-OUTD-S2X-400
TRIO-20.0 (27.6) -TL-OUTD-S2F-400
TRIO-20.0 (27.6) -TL-OUTD-S1J-400
TRIO-20.0 (27.6) -TL-OUTD-S2J-400
Sw. rel. : Booster (DSP) :A.0.3.7; Inverter (DSP) :B.0.C.4
Supervisor (uP) : C.0.9.F

Tested acc. to: IEC 62109-1:2010
IEC 62116:2008
IEC 61727:2004

The certificate of conformity refers to the above mentioned product. This is to certify that the specimen is in conformity with the assessment requirement mentioned above. This certificate does not imply assessment of the production of the product and does not permit the use of a TÜV Rheinland mark of conformity.

Date 21.05.2012



TÜV Rheinland LGA Products GmbH 12115 **Tillystraße 2 - 90431 Nürnberg**

C E R T I F I C A T E

of Conformity



Registration No.: AK 60103153 0001

Report No.: 28108052 001

Holder: Power - One Italy S.p.A.
Via San Giorgio 642
52028 Terranuova Bracciolini AR
Italia

Product: Electrical Equipment
Grid tied inverter

Identification: Trademark: ABB
Models: TRIO-20.0(27.6)-TL-OUTD-XX-400
TRIO-20.0(27.6)-TL-OUTD-400-W
Where XX can be: blank, "S2", "S2X", "S2F"
"S1J", "S2J"

Compliant to class 4K4H as defined in
IEC 60721-3-4:1995 + A1:1996

Tested acc. to: IEC 60068-2-1:2007
IEC 60068-2-2:2007
IEC 60068-2-14:2009
IEC 60068-2-30:2005
EN 60068-2-78:2001

The certificate of conformity refers to the above mentioned product. This is to certify that the specimen is in conformity with the assessment requirement mentioned above. This certificate does not imply assessment of the production of the product and does not permit the use of a TÜV Rheinland mark of conformity.

Certification Body

Date 17.07.2015



TÜV Rheinland LGA Products GmbH Tillystraße 2 - 90431 Nürnberg
1216

C E R T I F I C A T E

of Conformity



Registration No.: AK 60101812 0001

Report No.: 28106975 002

Holder: Power - One Italy S.p.A.
Via San Giorgio 642
52028 Terranuova Bracciolini AR
Italia

Product: Electrical Equipment
Grid tied inverter

Identification: Trademark: ABB
Models: TRIO-27.6(20.0)-TL-OUTD-400
TRIO-27.6(20.0)-TL-OUTD-S2-400
TRIO-27.6(20.0)-TL-OUTD-S2X-400
TRIO-27.6(20.0)-TL-OUTD-S2F-400
TRIO-27.6(20.0)-TL-OUTD-S1J-400
TRIO-27.6(20.0)-TL-OUTD-S2J-400
TRIO-27.6(20.0)-TL-OUTD-400-W

Tested acc. to: IEC 62116:2014
EN 62116:2014
EN 62116:2011
IEC 62116:2008

The certificate of conformity refers to the above mentioned product. This is to certify that the specimen is in conformity with the assessment requirement mentioned above. This certificate does not imply assessment of the production of the product and does not permit the use of a TÜV Rheinland mark of conformity.

Certification Body

Date 20.05.2015



TÜV Rheinland LGA Products GmbH - Tillystraße 2 - 90431 Nürnberg
1217

C E R T I F I C A T E

of Conformity



Registration No.: AK 60116178 0001

Report No.: 28110219 001

Holder: Power - One Italy S.p.A.
Via San Giorgio 642
52028 Terranuova Bracciolini AR
Italia

Product: Electrical Equipment
Grid tied inverter

Identification: Models: TRIO-20.0 (27.6) -TL-OUTD-400
TRIO-20.0 (27.6) -TL-OUTD-S2-400
TRIO-20.0 (27.6) -TL-OUTD-S2X-400
TRIO-20.0 (27.6) -TL-OUTD-S2F-400
TRIO-20.0 (27.6) -TL-OUTD-S1J-400
TRIO-20.0 (27.6) -TL-OUTD-S2J-400
TRIO-20.0 (27.6) -TL-OUTD-400-W

Tested acc. to: EN 61000-6-1:2007
EN 61000-6-2:2005
EN 61000-6-3:2007+A1
EN 61000-6-4:2007+A1
EN 61000-3-12:2011
EN 61000-3-11:2000

The certificate of conformity refers to the above mentioned product. This is to certify that the specimen is in conformity with the assessment requirement mentioned above. This certificate does not imply assessment of the production of the product and does not permit the use of a TÜV Rheinland mark of conformity.

Date 15.06.2017

Certification Body

A handwritten signature in blue ink, appearing to read "Marco Piva".
Marco Piva
A circular blue stamp with the text "TÜV Rheinland LGA Products GmbH" around the top and "Zertifizierungsstelle" around the bottom. In the center is the TÜV Rheinland logo.

TÜV Rheinland LGA Products GmbH, Tillystraße 2 - 90431 Nürnberg
1218

C E R T I F I C A T E

of Conformity



Registration No.: AK 60111761 0001

Report No.: 28109455 001

Holder: Power - One Italy S.p.A.
Via San Giorgio 642
52028 Terranuova Bracciolini AR
Italia

Product: Electrical Equipment
Grid tied inverter

Identification: Trademark: ABB
Models: TRIO-20.0(27.6)-TL-OUTD-XX-400
TRIO-20.0(27.6)-TL-OUTD-400-W
Where XX can be: blank, "S2", "S2X", "S2F"
"S1J", "S2J"

Tested acc. to: IEC 61727:2004
EN 61727:1995

The certificate of conformity refers to the above mentioned product. This is to certify that the specimen is in conformity with the assessment requirement mentioned above. This certificate does not imply assessment of the production of the product and does not permit the use of a TÜV Rheinland mark of conformity.

Date 20.06.2016

Certification Body



TÜV Rheinland LGA Products GmbH 1219 Tillystraße 2 - 90431 Nürnberg



Solar inverter

PVS-50/60-TL

The PVS-50/60-TL is FIMER's cloud connected three-phase string solution enabling cost efficient large decentralized photovoltaic systems for both commercial and utility applications.

From 50 to 60 kW

1220

String inverter - PVS-50/60-TL

The PVS string inverter family, with 3 independent MPPT and power ratings of up to 60 kW, has been designed with the objective to maximize the ROI in large systems with all the advantages of a decentralized configuration for both rooftop and ground-mounted installations.

Compact design

Thanks to technological choices aimed at optimizing installation times and costs, the product design features the power module and wiring box enclosed in a single compact chassis thus saving installation resources and costs.

The inverter comes in multiple versions also allowing the possibility to connect to third-party DC string combiners.

Ease of installation

The horizontal and vertical mounting possibility creates flexibility for both rooftop and ground mounted installations.

Moreover the cover is equipped with hinges and locks that are fast to open and reduce the risk of damaging the chassis and interior components when commissioning and performing maintenance actions.

Advanced cloud connected features

Standard wireless access from any mobile device makes the configuration of inverter and plant easier and faster. Improved user experience thanks to a built-in User Interface (UI) enables access to advanced inverter configuration settings.

The Installer for Solar Inverters mobile app and configuration wizard enable a quick multi-inverter installation, saving up to 70% commissioning time.

Fast system integration

Industry standard Modbus (RTU/TCP)/SUNSPEC protocol enables fast system integration. Two ethernet ports enable fast and future-proof communication for PV plants.

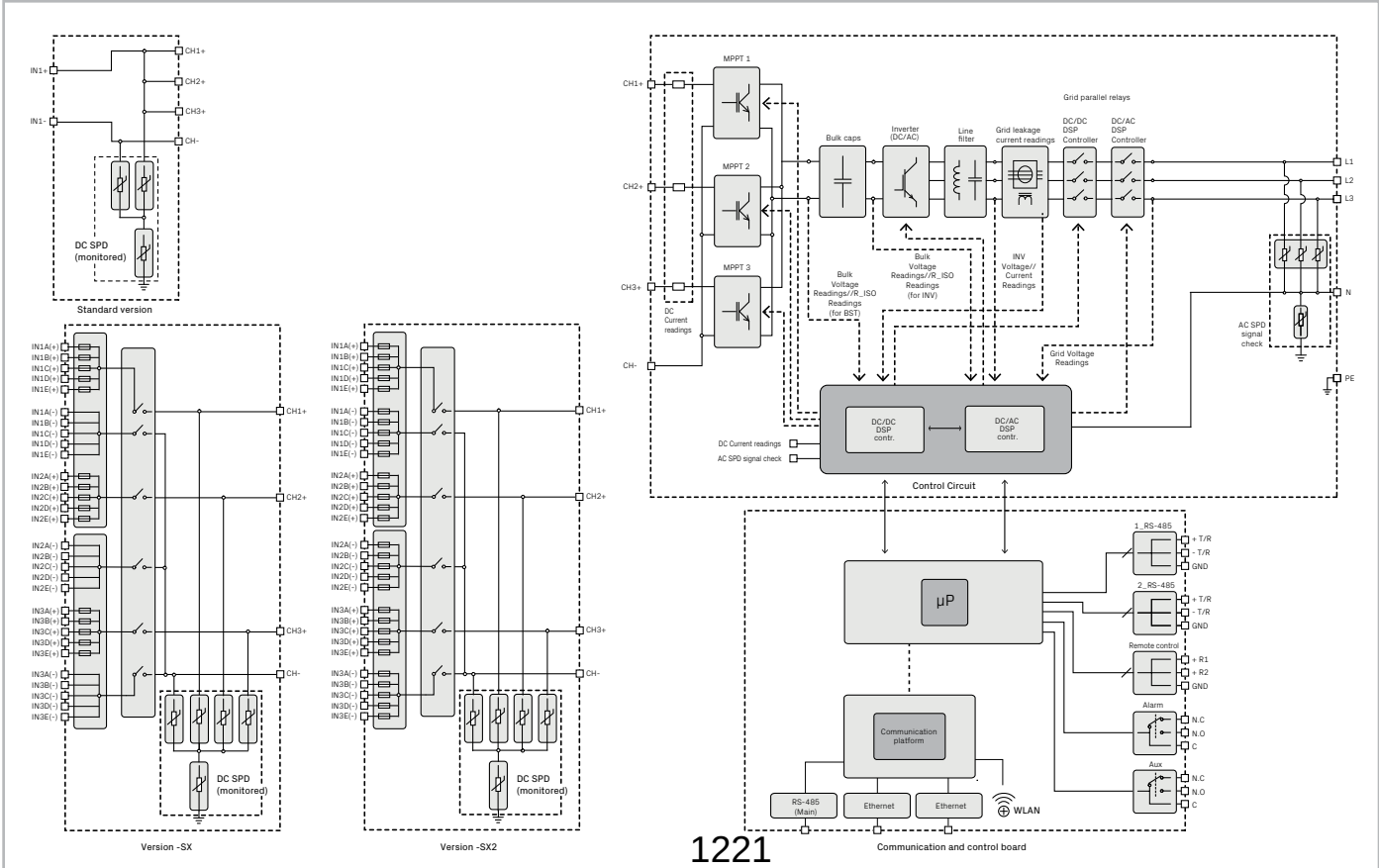
Plant portfolio integration

Monitoring your assets is made easy, as every inverter is capable to connect to Aurora Vision cloud platform to secure your assets and profitability in long term.

Highlights

- Up to 3 independent MPPT
- Two power ratings: 50 kW at 400 V_{ac} and 60 kW at 480 V_{ac}
- Horizontal and vertical installation
- Easy access to wiring box thanks to hinges and cam latches positioned on cover
- Power module and wiring box in a single compact chassis
- Wi-Fi interface for commissioning and configuration
- Reactive power management capability
- Remote monitoring and firmware upgrade via Aurora Vision cloud platform (logger free)
- Provides 10% extra power in case of limited ambient temperature
- Improved operating altitude. Can work up to 4000 mt.
- Built-in dynamic export limitation control algorithm

PVS-50/60-TL string inverter block diagram



Technical data and types		
Type code	PVS-50-TL	PVS-60-TL
Input side		
Absolute maximum DC input voltage ($V_{max,abs}$)	1000 V	
Start-up DC input voltage (V_{start})	420...700 V (Default 420 V)	420...700 V (Default 500 V)
Operating DC input voltage range ($V_{dcmin}...V_{dcmax}$)	0,7x V_{start} ...950 V (min 300 V)	0,7x V_{start} ...950 V (min 360 V)
Rated DC input voltage (V_{dcr})	610 Vdc	720 Vdc
Rated DC input power (P_{dcr})	52000 W	61800 W
Number of independent MPPT	3 (version SX and SX2) / 1 (standard version)	
Maximum DC input power for each MPPT ($P_{MPPTmax}$)	19300W@30°C / 17500W@45°C	23100W@30°C / 21000W@45°C
MPPT input DC voltage range ($V_{MPPTmin}$... $V_{MPPTmax}$) at P_{acr}	480-800 Vdc	570-800 Vdc
Maximum DC input current ($I_{dcm\max}$) for each MPPT	36 A	
Maximum input short circuit current for each MPPT	55 A (165 A in case of parallel MPPT)	
Number of DC input pairs for each MPPT	5 (SX and SX2 versions), 1 (standard version)	
DC connection type	Screw terminal block (Standard version) or PV quick fit connector ¹⁾ (SX and SX2 version)	
Input protection		
Reverse polarity protection	Yes, from limited current source	
Input over voltage protection for each MPPT	Type 2 / Type 1 + 2 (option)	
Photovoltaic array isolation control	According to local standard	
DC switch rating for each MPPT	75 A / 1000 V for each MPPT (SX and SX2 version)	
Fuse rating (version with fuses) / max fuse rating	15 A, 20 A, 25 A ²⁾	
Output side		
AC grid connection type	Three-phase (3W+PE or 3W+N+PE), grounded WYE system only	
Rated AC power (P_{acr} @cosf=1)	50000 W	60000 W
Maximum AC output power (P_{acmax} @cosf=1)	55000 W up to 30°C ³⁾	66000 W up to 30°C ³⁾
Maximum apparent power (S_{max})	55000 VA up to 30°C ³⁾	66000 VA up to 30°C ³⁾
Rated AC grid voltage ($V_{ac,r}$)	400 V	480 V
AC voltage range	320...480 V ³⁾	384...571 V ⁴⁾
Maximum AC output current ($I_{ac,max}$)	80 A	
Contributory fault current	92 A	
Rated output frequency (f_r)	50 Hz / 60 Hz	
Output frequency range ($f_{min}...f_{max}$)	47...53 Hz / 57...63 Hz ⁵⁾	
Nominal power factor and adjustable range	> 0.995; 0...1 inductive/capacitive with maximum Sn	
Total current harmonic distortion	<3%	
Maximum AC cable	95mm2 copper or stranded aluminum	
AC connection type	Screw terminal block, cable gland (admitted cable diameter 25...44mm)	
Output protection		
Anti-islanding protection	According to local standard	
Maximum external AC overcurrent protection	100 A	
Output overvoltage protection	Type 2	
Operating performance		
Maximum efficiency (η_{max})	98.4%	98.6%
Euro efficiency	98.2%	98.4%
Communication		
Embedded communication interfaces	3x RS-485, 2X Ethernet (RJ45), WLAN (IEEE802.11 b/g/n @ 2.4 GHz)	
Communication protocol	Modbus RTU / TCP (Sunspec compliant); Aurora Protocol	
Remote monitoring services	Standard level access to Aurora Vision monitoring portal	
Advanced features	Integrated Web User Interface; Embedded logging and direct transferring of data to Cloud	

Technical data and types

Type code	PVS-50-TL	PVS-60-TL
Environmental		
Ambient temperature range	-25...+60°C (-13...140 °F) with derating above 45 °C (113 °F) with derating above 45 °C (113 °F)	
Relative humidity	4%... 100% condensing	
Sound pressure level, typical	75 dB(A) @1 m	
Maximum operating altitude	4000 m (13123 ft) with derating above 2000 m / 6561 ft	
Physical		
Environmental protection rating	IP65	
Cooling	Forced air	
Dimension (H x W x D)	750 mm x 1100 mm x 257 mm / 29.5" x 43.3" x 10.12"	
Weight	70 kg / 154 lbs (SX version)	
Mounting system	Single mounting bracket	
Safety		
Marking	CE	
Safety and EMC standard	IEC/EN 62109-1, IEC/EN 62109-2, EN 61000-6-2, EN 61000-6-3, EN 61000-3-11, EN 61000-3-12 EN 62311, EN 301 489-1, EN 301 489-17, EN 300 328	
Grid standard (check your sales channel for availability)	CEI 0-21, CEI 0-16, DIN V VDE V 0126-1-1, VDE-AR-N 4105, G59/3, DRRG/DEWA, EN 50438, RD 1565, RD 413, UTE C15-7-712-1 P.O. 12.3, AS/NZS 4777.3, BDEW, NRS-097-2-1, MEA, PEA, IEC 61727, ISO/IEC Guide 67 (System 5) IEC 61683, VFR-2014, IEC 62116, Synergrid C10/11, IRR-DCC-MV, CLC-TS-50549-1/-2, G99, EN 50549-1/-2	
Available product versions		
Input connections with terminal blocks + surge arrester Type 2 in both DC and AC sides	PVS-50-TL	PVS-60-TL
15 quick Input connections + fuses (single pole) + DC switch + surge arresters Type 2 in both DC and AC sides	PVS-50-TL-SX	PVS-60-TL-SX
15 quick Input connections + fuses (both poles) + DC switch + surge arresters Type 2 in both DC and AC sides	PVS-50-TL-SX2	PVS-60-TL-SX2
Available options		
SPD Type 1 + 2 on the DC side	Only for SX2 version	Only for SX2 version
Display	For all versions	For all versions
Additional plug-in		
PVS-50/60-GROUNDING KIT	Available	Available

- 1) Please refer to the document “String inverters – Product manual appendix” available at www.fimer.com for information on the quick-fit connector brand and model used in the inverter.
- 2) 25 A fuses can be used with a limited number of inputs, only up to 3 per channel. The inverter equipped with the desired fuse size can be ordered through dedicated part.
- 3) Due to country specific regulation this value can be automatically limited to the rated value (50kW for PVS-50-TL, 60kW for PVS-60-TL). This limitation

- can also be set manually through the integrated Web User Interface.
- 4) The AC voltage range may vary depending on specific country grid standards.
- 5) The Frequency range may vary depending on specific country grid standards.

Remarks:

- Designed and manufactured in Italy
- Features not specifically listed in the present data sheet are not included in the product



For more information
please contact
your local FIMER
representative or visit:

fimer.com

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C E R T I F I C A T E

of Conformity



Registration No.: AK 60148018 0001

Report No.: 28111830 033

Holder: Power - One Italy S.p.A.
Via San Giorgio 642
52028 Terranuova Bracciolini AR
Italia

Product: Electrical Equipment
Solar grid tied inverter

Identification: PVS-50-TL(-S) (-SX) (-SX2)
PVS-60-TL(-S) (-SX) (-SX2)

Comply with: E DIN VDE V 0124-100 VDE V 0124-100:2019-09

Tested acc. to: VDE-AR-N 4105/11.18

The certificate of conformity refers to the above mentioned product. This is to certify that the specimen is in conformity with the assessment requirement mentioned above. This certificate does not imply assessment of the production of the product and does not permit the use of a TÜV Rheinland mark of conformity.

Date 18.03.2020



TÜV Rheinland LGA Products GmbH - Tillystraße 2 - 90431 Nürnberg

1224

C E R T I F I C A T E

of Conformity



Registration No.: AK 60132736 0001

Report No.: 28111530 007

Holder: Power - One Italy S.p.A.
Via San Giorgio 642
52028 Terranuova Bracciolini AR
Italia

Product: Electrical Equipment
Solar grid tied inverter

Identification: Trademark: ABB
Models: PVS-50-TL(-S) (-SX) (-SX2)
PVS-60-TL(-S) (-SX) (-SX2)

Tested acc. to: EN 62116:2014
IEC 62116:2014

The certificate of conformity refers to the above mentioned product. This is to certify that the specimen is in conformity with the assessment requirement mentioned above. This certificate does not imply assessment of the production of the product and does not permit the use of a TÜV Rheinland mark of conformity.

Date 14.09.2018

Certification Body



TÜV Rheinland LGA Products GmbH Tillystraße 2 - 90431 Nürnberg
1225

C E R T I F I C A T E

of Conformity



Registration No.: AK 60132736 0001

Report No.: 28111530 007

Holder: Power - One Italy S.p.A.
Via San Giorgio 642
52028 Terranuova Bracciolini AR
Italia

Product: Electrical Equipment
Solar grid tied inverter

Identification: Trademark: ABB
Models: PVS-50-TL(-S) (-SX) (-SX2)
PVS-60-TL(-S) (-SX) (-SX2)

Tested acc. to: EN 62116:2014
IEC 62116:2014

The certificate of conformity refers to the above mentioned product. This is to certify that the specimen is in conformity with the assessment requirement mentioned above. This certificate does not imply assessment of the production of the product and does not permit the use of a TÜV Rheinland mark of conformity.

Date 14.09.2018



TÜV Rheinland LGA Products GmbH, Tillystraße 2 - 90431 Nürnberg
1226

C E R T I F I C A T E

of Conformity



Registration No.: AK 60146346 0001

Report No.: 28111830 029

Holder: Power - One Italy S.p.A.
Via San Giorgio 642
52028 Terranuova Bracciolini AR
Italia

Product: Electrical Equipment
Solar grid tied inverter

Identification: Trademark: ABB
Models: PVS-50-TL(-S) (-SX) (-SX2)
PVS-60-TL(-S) (-SX) (-SX2)

Tested acc. to: NRS 097-2-1:2017

The certificate of conformity refers to the above mentioned product. This is to certify that the specimen is in conformity with the assessment requirement mentioned above. This certificate does not imply assessment of the production of the product and does not permit the use of a TÜV Rheinland mark of conformity.

Date 22.01.2020

Certification Body


Marco Piva



TÜV Rheinland LGA Products GmbH - Tillystraße 2 - 90431 Nürnberg
1227

Certificate



Registration No.: AK 60147533 0001

Page 1/1

Report No.: 28111830 031

License Holder:

Power-One Italy S.p.A.
Via S. Giorgio, 642
52028 Terranuova Bracciolini (AR)
Italy

Product:

Solar Grid Tied Inverter

Trademark:

ABB

Model:

PVS-50-TL(-S)(-SX)(-SX2)
PVS-60-TL(-S)(-SX)(-SX2)

Manufacturing Plant(s) *:

Power-One Italy S.p.A.
Via S. Giorgio, 642
52028 Terranuova Bracciolini (AR)
Italy

Basis:

☒ **DIN V VDE V 0126-1-1: 2006 +A1:2012**

"Automatic disconnection device between a generator and the public low-voltage grid"

☒ **Factory Inspection**

To document the consistent quality of the product factory inspection are performed periodically.

Remarks:

Tested Acc. To: System 5 of ISO/IEC Guide 67:2004

This Certificate is valid up to 04.03.2025 conditioned to the positive result of yearly based inspection at Manufacturer's facility.

04.03.2020



TÜV Rheinland LGA Products GmbH, Tillystrasse 2, D-90431 Nurnberg
Contact: + 49 221 806 2477 email: service@de.tuv.com

1228

CERTIFICATE of Conformity



Registration No.: AK 50420285 0001

Report No.: 50190020 001

Holder: Power-One Italy S.P.A.
Via San Giorgio 642
Terranuova Bracciolini (AR) 52028
Italy

Product: PV-Inverter
Grid-connected PV Inverter

Identification: Type Designation: PVS-60-TL ; PVS-60-TL-S ; PVS-60-TL-SX ;
PVS-60-TL-SX2 ; PVS-60-TL-SX-CN ;
PVS-50-TL ; PVS-50-TL-S
PVS-50-TL-SX ; PVS-50-TL-SX2
Serial Number : 1809000001
Remark : Refer to test report 50190020 001 for
for details.

Tested acc. to: DIN V VDE V 0126-1-1:2006+A1
DIN VDE V 0126-1-1/08.13

The certificate of conformity refers to the above mentioned product. This is to certify that the specimen is in conformity with the assessment requirement mentioned above. This certificate does not imply assessment of the production of the product and does not permit the use of a TÜV Rheinland mark of conformity.

Date 15.10.2018

Certification Body
 Zertifizierungsstelle
 Weichun Li

TÜV Rheinland LGA Products GmbH - Tillystraße 2 - 90431 Nürnberg

C E R T I F I C A T E

of Conformity



Registration No.: AK 50419904 0001

Report No.: 50178540 001

Holder: Power-One Italy S.P.A.
Via San Giorgio 642
Terranuova Bracciolini (AR) 52028
Italy

Product: PV-Inverter
Grid-connected PV Inverter

Identification: Type Designation: PVS-60-TL ; PVS-60-TL-S ; PVS-60-TL-SX ;
PVS-60-TL-SX2 ; PVS-60-TL-SX-CN ;
PVS-50-TL ; PVS-50-TL-S
PVS-50-TL-SX ; PVS-50-TL-SX2
Serial Number : 1809000001
Remark : Refer to test report 50178540 001 for
for details.

Tested acc. to: IEC 61727:2004

The certificate of conformity refers to the above mentioned product. This is to certify that the specimen is in conformity with the assessment requirement mentioned above. This certificate does not imply assessment of the production of the product and does not permit the use of a TÜV Rheinland mark of conformity.

Date 10.10.2018

A circular blue stamp with the text "Certification Body" at the top, "TÜV Rheinland" in the center, and "Zertifizierungsstelle" at the bottom. A signature is written across the stamp.
Weichun Li

TÜV Rheinland LGA Products GmbH - Tillystraße 2 - 90431 Nürnberg

C E R T I F I C A T E

of Conformity



Registration No.: AK 50419442 0001

Report No.: 50178539 001

Holder: Power-One Italy S.P.A.
Via San Giorgio 642
Terranuova Bracciolini (AR) 52028
Italy

Product: PV-Inverter
Grid-connected PV Inverter

Identification: Type Designation: PVS-60-TL ; PVS-60-TL-S ; PVS-60-TL-SX ;
PVS-60-TL-SX2 ; PVS-60-TL-SX-CN ;
PVS-50-TL ; PVS-50-TL-S
PVS-50-TL-SX ; PVS-50-TL-SX2
Serial Number : 1809000001
Remark : Refer to test report 50178539 001 for
for details.

Tested acc. to: G59/3-4/07.18

The certificate of conformity refers to the above mentioned product. This is to certify that the specimen is in conformity with the assessment requirement mentioned above. This certificate does not imply assessment of the production of the product and does not permit the use of a TÜV Rheinland mark of conformity.



Date 29.09.2018

Weichun Li

TÜV Rheinland LGA Products GmbH - Tillystraße 2 - 90431 Nürnberg



Solar inverter

PVS-100/120-TL

The PVS-100/120-TL is FIMER's cloud connected three-phase string solution for cost efficient decentralized photovoltaic systems for both ground mounted and large commercial applications.

From 100 to 120 kW

1232

String inverter - PVS-100/120-TL

This platform, for extreme high power string inverters with power ratings up to 120 kW, maximizes the ROI for decentralized ground mounted and large rooftop applications. With up to six MPPT, energy harvesting is optimized even in shading situations.

Extreme power with high integration level

The extreme high power module up to 120 kW saves installation resources as less units are required.

Due to its compact size further savings are generated in logistics and in maintenance. Thanks to the integrated DC/AC disconnection, 24 string connections, fuses and surge protection no additional boxes are required.

Ease of installation

The horizontal and vertical mounting possibility creates flexibility for both ground mounted and rooftop installations. Covers are equipped with hinges and locks that are fast to open and reduce the risk of damaging the chassis and interior components when commissioning and performing maintenance actions.

Standard wireless access from any mobile device makes the configuration of inverter and plant easier and faster. Improved user experience thanks to a built in User Interface (UI) enables access to advanced inverter configuration settings.

The installer mobile APP, available for Android/iOS devices, further simplifies multi-inverter installations.

The design supports both copper and aluminum cabling even up to 185 mm² cross section to minimize the energy losses.

Fast system integration

Industry standard Modbus/SUNSPEC protocol enables fast system integration. Two ethernet ports enable fast and future proof communication for PV plants.

Plant portfolio integration

Monitoring your assets is made easy as every inverter is capable to connect to Aurora Vision cloud platform to secure your assets and profitability in long term.

Design flexibility and shade tolerance

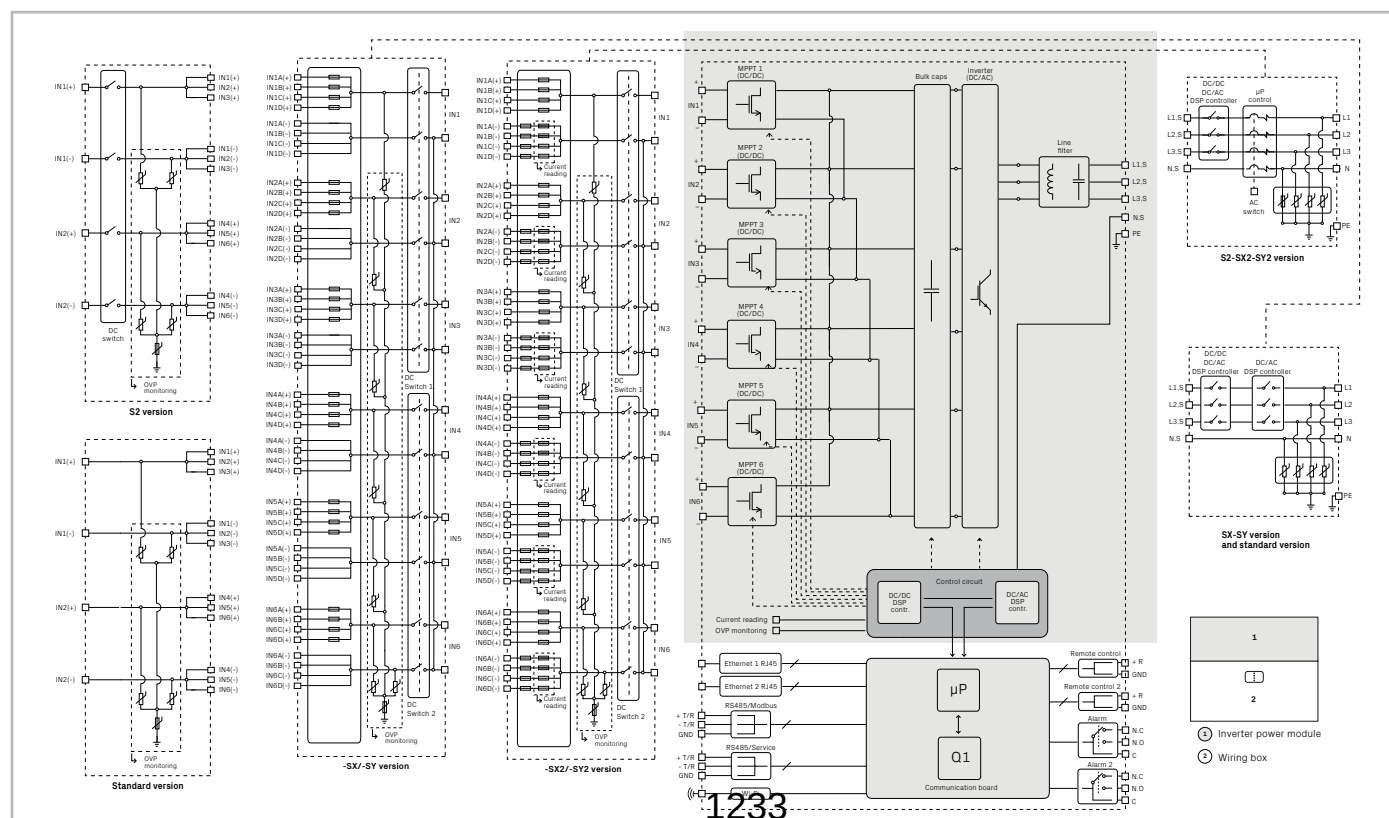
Available in different versions, thanks to the double stage conversion topology and the modular design, PVS-100/120 guarantees maximum flexibility for the system design on rooftops or hilly ground. The separate and configurable wiring compartment, available with six MPPT as well as with two parallelable MPPT, allows the inverter to satisfy any plant condition and any customer need.

With this technological choice energy harvesting is optimized even in shading situations.

Highlights

- Up to 6 independent MPPT
- Transformerless inverter
- 120 kW for 480 Vac and 100 kW for 400 Vac
- Wi-Fi as standard for configuration
- Two ethernet ports for plant level communication
- Large set of specific grid codes available which can be selected directly in the field
- Double stage topology for a wide input range
- Both vertical and horizontal installation
- Separate wiring compartment for fast swap and replacement
- IP66 Environmental protection
- Maximum efficiency up to 98.9%

PVS-100/120-TL string inverter block diagram



String inverter - PVS-100/120-TL

Technical data and types				
Type code		PVS-100-TL		
Wiring Box version	SX, SX2	SY, SY2	Standard	S2
Input side				
Absolute maximum DC input voltage ($V_{max,abs}$)	1000 V			
Start-up DC input voltage (V_{start})	420 V (400...500 V)			
Operating DC input voltage range ($V_{dcmin}...V_{dcmax}$)	360...1000 V			
Rated DC input voltage (V_{dcr})	620 V			
Rated DC input power (P_{dcr})	102000 W			
Number of independent MPPT	6		2 (Parallelable)	
MPPT input DC voltage range at ($V_{MPPTmin}...V_{MPPTmax}$) at P_{acr}	480...850 V (symmetrical load)			
Maximum DC input power for each MPPT ($P_{MPPT,max}$)	21000 W [585 V≤VMPPT≤850 V]		63000 W [585 V≤VMPPT≤850 V]	
Maximum DC input current for each MPPT (I_{dcmax})	36 A		108 A	
Maximum input short circuit current (I_{scmax}) for each MPPT ¹⁾	50 A		150 A	
Number of DC input pairs for each MPPT	4		1	
DC connection type	PV quick fit connector ²⁾		4 x M40 cable glands (Ø 19...28mm) with M10 Cable lugs	
Input protection				
Reverse polarity protection	Yes, from limited current source			
Input over voltage protection for each MPPT-surge arrester with monitoring	Type II	Type I+II	Type II	
Photovoltaic array isolation control	Yes, acc. to IEC 62109-2			
Residual Current Monitoring Unit (leakage current protection)	Yes, acc. to IEC 62109-2			
DC switch rating for each MPPT	50 A-1000 V		Not present	150 A-1000V
Fuse rating (versions with fuses)	20 A / 1000 V ³⁾		No fuses inside	
Input current monitoring	Single string level (24ch.): SX2, SY2 / MPPT level: Standard, S2, SX, SY			
Output side				
AC Grid connection type	Three phase 3W+PE or 4W+PE			
Rated AC power (P_{acr} @cosφ=1)	100000 W			
Maximum AC output power (P_{acmax} @cosφ=1)	100000 W			
Maximum apparent power (S_{max})	100000 VA			
Rated Apparent Power (S_r)	100000 VA			
Rated AC grid voltage ($V_{ac,r}$)	400 V			
AC voltage range	320...480 V ⁴⁾			
Maximum AC output current ($I_{ac,max}$)	145 A			
Rated output current	145 A			
Output inrush current (peak and duration)	10% of I _{max} for 5 msec			
Rated output frequency (f _r)	50 Hz / 60 Hz			
Output frequency range ($f_{min}...f_{max}$)	45...55 Hz / 55...65 Hz ⁵⁾			
Nominal power factor and adjustable range	> 0.995, 0...1 inductive/capacitive with maximum S _{max}			
Total current harmonic distortion	< 3%			
Max DC Current Injection (% of I _n)	< 0.5%*I _n			
Maximum AC cable	185mm ² Aluminum and copper			
AC connection type	Provided bar for lug connections M10, single core cable glands 4xM40 and M25, multi core cable gland M63 as option			
Output protection				
Anti-islanding protection	According to local standard			
Maximum external AC overcurrent protection	225 A			
Output overvoltage protection - replaceable surge protection device	Type 2 with monitoring			
Operating performance				
Maximum efficiency (η_{max})	98.4%			
Weighted efficiency (EURO)	98.2%			
Communication				
Embedded communication interfaces	1x RS485, 2x Ethernet (RJ45), WLAN (IEEE802.11 b/g/n @ 2,4 GHz)			
User interface	4 LEDs, Web User Interface			
Communication protocol	Modbus RTU/TCP (Sunspec compliant)			
Commissioning tool	Web User Interface, Mobile APP/APP for plant level			
Remote monitoring services	Aurora Vision monitoring portal			
Advanced features	Embedded logging, direct telemetry data transferring to Aurora Vision			
Environmental				
Operating ambient temperature range	-25...+60°C / -13...140°F with derating above 40°C / 104°F			
Relative humidity	4%...100% condensing			
Sound pressure level, typical	68dB(A)@ 1m			
Maximum operating altitude without derating	2000 m / 6560 ft			

String inverter - PVS-100/120-TL

Technical data and types				
Type code		PVS-100-TL		
Wiring Box version	SX, SX2	SY, SY2	Standard	S2
Physical				
Environmental protection rating		IP 66 (IP54 for cooling section)		
Cooling		Forced air		
Dimension (H x W x D)		869x1086x419 mm / 34.2" x 42.7" x 16.5"		
Weight		70kg / 154 lbs for power module ; ~55kg / 121 lbs for wiring box Overall max 125 kg / 276 lbs		
Mounting system		Mounting bracket vertical & horizontal support		
Safety				
Isolation level		Transformer-less		
Marking		CE		
Safety and EMC standard		IEC/EN 62109-1, IEC/EN 62109-2, EN 61000-6-2, EN 61000-6-4		
Grid standard (check your sales channel for availability)		CEI 0-16, CEI 0-21, IEC 61727, IEC 62116, IEC 60068, IEC 61683, JORDAN IRR-DCC-MV, DRRG/ DEWA, Chile LV/MV, Belg C10-C11, EN50438 Generic +Ireland, EN50549-1/2, CLC-TS50549-1/2, AS/ NZS4777.2, UK G59/3, EREC G99-1, MEA, PEA, ISO-IEC Guide 67 (system 5), NRS 097-2-1, P.O. 12.3, ITC-BT-40, UNE 206006 IN, VDE-AR-N 4105, VDE-AR-N 4110, VDE-AR-N 4120, VDE V 0-126-1-1, VFR 2019, UTE C15-712-1, Taiwan		
Available products variants				
Inverter power module		PVS-100-TL-POWER MODULE		
Input with 24 quick fit connectors pairs + String fuses (both positive and negative pole) + DC disconnect switches + AC disconnect switch + AC and DC overvoltage surge arresters (Type II) + individual string monitoring (24 ch.)		WB -SX2-PVS-100-TL		
Input with 24 quick fit connectors pairs + String fuses (positive pole) + DC disconnect switches + AC and DC overvoltage surge arresters (Type II) + MPPT level input current monitoring (6 ch.)		WB -SX-PVS-100-TL		
Input with 24 quick fit connectors pairs + String fuses (both positive and negative pole) + DC disconnect switches + AC disconnect switch + AC and DC overvoltage surge arresters (Type II for AC and Type I+II for DC) + individual string monitoring (24 ch.)		WB -SY2-PVS-100-TL		
Input with 24 quick fit connectors pairs + String fuses (positive pole) + DC disconnect switches + AC and DC overvoltage surge arresters (Type II for AC and Type I+II for DC) + MPPT level input current monitoring (6 ch.)		WB -SY-PVS-100-TL		
Input with cable gland + DC disconnect switch + AC disconnect switch + AC and DC overvoltage surge arresters (Type II) + MPPT level input current monitoring		WB-S2-PVS-100-TL		
Input with cable gland + AC and DC overvoltage surge arresters (Type II) + MPPT level input current monitoring		WB-PVS-100-TL		
Optional available				
AC Plate, Single Core Cables		Plate with 5 individual AC cable glands: 4 x M40: Ø 19...28mm, 1 x M25: Ø 10...17mm		
AC Plate, Multi Core Cables		Plate with 2 individual AC cable glands: 1 x M63: Ø 37...53mm, 1 x M25: Ø 10...17mm		
PVS-100/120 Pre-Charge Board Kit		Night time operation with restart capability		
PVS-100/120 Grounding Kit ⁶⁾		Allow to connect the negative input pole to ground		

1) Maximum number of opening 5 under overloading
2) Please refer to the document "String inverters – Product manual appendix" available at www.fimer.com for information on the quick-fit connector brand and model used in the inverter
3) Maximum fuse size supported 20A. Additionally two strings input per MPPT supports 30A fuse size for connecting two strings per input
4) The AC voltage range may vary depending on country specific country grid standard
5) The Frequency range may vary depending on specific country grid standards

6) When grounding-kit is installed, Residual Current Monitoring does not fully operate. Inverter must be installed and operate in "restricted areas (access limited to qualified personnel)" according to IEC 62109-2

Remarks:
• **Designed and manufactured in Italy**
• **Features not specifically listed in the present data sheet are not included in the product**

String inverter - PVS-100/120-TL

Technical data and types				
Type code	PVS-120-TL			
Wiring Box version	SX, SX2	SY, SY2	Standard	S2
Input side				
Absolute maximum DC input voltage (V _{max.abs})	1000 V			
Start-up DC input voltage (V _{start})	420 V (400...500 V)			
Operating DC input voltage range (V _{dccmin} ...V _{dccmax})	360...1000 V			
Rated DC input voltage (V _{dcr})	720 V			
Rated DC input power (P _{dcr})	123000 W			
Number of independent MPPT	6		2 (Parallelable)	
MPPT input DC voltage range at (V _{MPPTmin} ...V _{MPPTmax}) at P _{acr}	570...850 V (symmetrical load)			
Maximum DC input power for each MPPT (P _{MPPT,max})	25000 W [695 V≤VMPPT≤850 V]		75000 W [695 V≤VMPPT≤850 V]	
Maximum DC input current for each MPPT (I _{dccmax})	36 A		108 A	
Maximum input short circuit current (I _{scmax}) for each MPPT ¹⁾	50 A		150 A	
Number of DC input pairs for each MPPT	4		1	
DC connection type	PV quick fit connector ²⁾		4 x M40 cable glands (Ø 19...28mm) with M10 Cable lugs	
Input protection				
Reverse polarity protection	Yes, from limited current source			
Input over voltage protection for each MPPT-surge arrester with monitoring	Type II	Type I+II	Type II	
Photovoltaic array isolation control	Yes, acc. to IEC 62109-2			
Residual Current Monitoring Unit (leakage current protection)	Yes, acc. to IEC 62109-2			
DC switch rating for each MPPT	50 A-1000 V		Not present	150 A
Fuse rating (versions with fuses)	20 A / 1000 V ³⁾		No fuses inside	
Input current monitoring	Single string level (24ch.): SX2, SY2 / MPPT level: Standard, S2, SX, SY			
Output side				
AC Grid connection type	Three phase 3W+PE or 4W+PE			
Rated AC power (P _{acr} @cosφ=1)	120000 W			
Maximum AC output power (P _{acmax} @cosφ=1)	120000 W			
Maximum apparent power (S _{max})	120000 VA			
Rated Apparent Power (Sr)	120000 VA			
Rated AC grid voltage (V _{acr,t})	480 V			
AC voltage range	384...576 ⁴⁾			
Maximum AC output current (I _{ac,max})	145 A			
Rated output current	145 A			
Output inrush current (peak and duration)	10% of I _{max} for 5 msec			
Rated output frequency (f _r)	50 Hz / 60 Hz			
Output frequency range (f _{min} ...f _{max})	45...55 Hz / 55...65 Hz ⁵⁾			
Nominal power factor and adjustable range	> 0.995, 0...1 inductive/capacitive with maximum S _{max}			
Total current harmonic distortion	< 3%			
Max DC Current Injection (% of I _n)	< 0.5%*I _n			
Maximum AC cable	185mm² Aluminum and copper			
AC connection type	Provided bar for lug connections M10, single core cable glands 4xM40 and M25, multi core cable gland M63 as option			
Output protection				
Anti-islanding protection	According to local standard			
Maximum external AC overcurrent protection	225 A			
Output overvoltage protection - replaceable surge protection device	Type 2 with monitoring			
Operating performance				
Maximum efficiency (η _{max})	98.9%			
Weighted efficiency (EURO)	98.6%			
Communication				
Embedded communication interfaces	1x RS485, 2x Ethernet (RJ45), WLAN (IEEE802.11 b/g/n @ 2.4 GHz)			
User interface	4 LEDs, Web User Interface			
Communication protocol	Modbus RTU/TCP (Sunspec compliant)			
Commissioning tool	Web User Interface, Mobile APP/APP for plant level			
Remote monitoring services	Aurora Vision monitoring portal			
Advanced features	Embedded logging, direct telemetry data transferring to Aurora Vision			
Environmental				
Operating ambient temperature range	-25...+60°C / -13...140°F with derating above 40°C / 104°F			
Relative humidity	4%...100% condensing			
Sound pressure level, typical	68dB(A)@ 1m			
Maximum operating altitude without derating	2000 m / 6560 ft			
Physical				
Environmental protection rating	IP 66 (IP54 for cooling section)			
Cooling	Forced air			
Dimension (H x W x D)	869x1086x419 mm / 34.2" x 42.7" x 16.5"			
Weight	70 kg / 154 lbs for power module ; ~55kg / 121 lbs for wiring box Overall max 125 kg / 276 lbs			
Mounting system	Mounting bracket vertical & horizontal support			

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NER-T-TECH-99-2022-T2-(Computer-No.: 5311)

Technical data and types				
Type code	PVS-120-TL			
Wiring Box version	SX, SX2	SY, SY2	Standard	S2
Safety				
Isolation level	Transformer-less			
Marking	CE			
Safety and EMC standard	IEC/EN 62109-1, IEC/EN 62109-2, EN 61000-6-2, EN 61000-6-4			
Grid standard (check your sales channel for availability)	CEI 0-16, IEC 61727, IEC 62116, IEC 60068, IEC 61683, JORDAN IRR-DCC-MV, DRRG/DEWA, Chile MV, Belg C10-C11, EN50438 Generic +Ireland, EN50549-2, CLC-TS50549-2, UK G59/3, EREC			
	G99-1, PEA, ISO-IEC Guide 67 (system 5), NRS 097-2-1, P.O. 12.3,			
	ITC-BT-40, UNE 206006 IN, VDE-AR-N 4110, VDE-AR-N 4120, VDE V 0-126-1-1,VFR 2019, UTE C15-712-1, Taiwan			
Available products variants				
Inverter power module	PVS-120-TL-POWER MODULE			
Input with 24 quick fit connectors pairs + String fuses (both positive and negative pole) + DC disconnect switches + AC disconnect switch + AC and DC overvoltage surge arresters (Type II) + individual string monitoring (24 ch.)	WB -SX2-PVS-120-TL			
Input with 24 quick fit connectors pairs + String fuses (positive pole) + DC disconnect switches + AC and DC overvoltage surge arresters (Type II) + MPPT level input current monitoring (6 ch.)	WB -SX-PVS-120-TL			
Input with 24 quick fit connectors pairs + String fuses (both positive and negative pole) + DC disconnect switches + AC disconnect switch + AC and DC overvoltage surge arresters (Type II for AC and Type I+II for DC) + individual string monitoring (24 ch.)	WB -SY2-PVS-120-TL			
Input with 24 quick fit connectors pairs + String fuses (positive pole) + DC disconnect switches + AC and DC overvoltage surge arresters (Type II for AC and Type I+II for DC) + MPPT level input current monitoring (6 ch.)	WB -SY-PVS-120-TL			
Input with cable gland + DC disconnect switch + AC disconnect switch + AC and DC overvoltage surge arresters (Type II) + MPPT level input current monitoring	WB-S2-PVS-120-TL			
Input with cable gland + AC and DC overvoltage surge arresters (Type II) + MPPT level input current monitoring	WB-PVS-120-TL			
Optional available				
AC Plate, Single Core Cables	Plate with 5 individual AC cable glands: 4 x M40: Ø 19...28mm, 1 x M25: Ø 10...17mm			
AC Plate, Multi Core Cables	Plate with 2 individual AC cable glands: 1 x M63: Ø 37...53mm, 1 x M25: Ø 10...17mm			
PVS-100/120 Pre-Charge Board Kit	Night time operation with restart capability			
PVS-100/120 Grounding Kit ⁵⁾	Allow to connect the negative input pole to ground			

1) Maximum number of opening 5 under overloading
2) Please refer to the document "String inverters – Product manual appendix" available at www.fimer.com for information on the quick-fit connector brand and model used in the inverter
3) Maximum fuse size supported 20A. Additionally two strings input per MPPT supports 30A fuse size for connecting two strings per input
4) The AC voltage range may vary depending on country specific country grid standard

5) The Frequency range may vary depending on specific country grid standards
6) When grounding-kit is installed, Residual Current Monitoring does not fully operate. Inverter must be installed and operate in "restricted areas (access limited to qualified personnel)" according to IEC 62109-2

Remarks:

- **Designed and manufactured in Italy**
- **Features not specifically listed in the present data sheet are not included in the product**



For more information please contact your local FIMER representative or visit:

fimer.com

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C E R T I F I C A T E

of Conformity



Registration No.: AK 60126777 0001

Report No.: 28111159 014

Holder: Power - One Italy S.p.A.
Via San Giorgio 642
52028 Terranuova Bracciolini AR
Italia

Product: Electrical Equipment
Solar grid tied inverter

Identification: Trademark: ABB
Models: PVS-100-TL
PVS-120-TL

Tested acc. to: EN 61683:2000
IEC 61683:1999
CEI EN 61683:2010

The certificate of conformity refers to the above mentioned product. This is to certify that the specimen is in conformity with the assessment requirement mentioned above. This certificate does not imply assessment of the production of the product and does not permit the use of a TÜV Rheinland mark of conformity.

Date 29.01.2018

Certification Body
A circular blue stamp with the text "TÜV Rheinland LGA Products GmbH" around the perimeter and "TÜV Rheinland" in the center. A signature is written across the stamp.
Marco Piva

TÜV Rheinland LGA Products GmbH - Tillystraße 2 - 90431 Nürnberg
1238

C E R T I F I C A T E

of Conformity



Registration No.: AK 60126782 0001

Report No.: 28111159 018

Holder: Power - One Italy S.p.A.
Via San Giorgio 642
52028 Terranuova Bracciolini AR
Italia

Product: Electrical Equipment
Solar grid tied inverter

Identification: Trademark: ABB
Models: PVS-100-TL
PVS-120-TL

Tested acc. to: IEC 61727:2004
EN 61727:1995

The certificate of conformity refers to the above mentioned product. This is to certify that the specimen is in conformity with the assessment requirement mentioned above. This certificate does not imply assessment of the production of the product and does not permit the use of a TÜV Rheinland mark of conformity.

Date 29.01.2018

Certification Body
A blue ink signature of Marco Piva over a circular stamp.
Marco Piva
Zertifizierungsgesellschaft

TÜV Rheinland LGA Products GmbH - Tillystraße 2 - 90431 Nürnberg
1239

C E R T I F I C A T E

of Conformity



Registration No.: AK 60126766 0001

Report No.: 28111159 002

Holder: Power - One Italy S.p.A.
Via San Giorgio 642
52028 Terranuova Bracciolini AR
Italia

Product: Electrical Equipment
Solar grid tied inverter

Identification: Trademark: ABB
Models: PVS-100-TL
PVS-120-TL

Tested acc. to: EN 62109-2:2011
IEC 62109-2:2011

The certificate of conformity refers to the above mentioned product. This is to certify that the specimen is in conformity with the assessment requirement mentioned above. This certificate does not imply assessment of the production of the product and does not permit the use of a TÜV Rheinland mark of conformity.

Date 29.01.2018

Certification Body
A circular blue stamp of TÜV Rheinland LGA Products GmbH, featuring the company logo and name.
A blue ink signature of Marco Piva.
Marco Piva

TÜV Rheinland LGA Products GmbH - Tillystraße 2 - 90431 Nürnberg
1240

C E R T I F I C A T E

of Conformity



Registration No.: AK 60126781 0001

Report No.: 28111159 017

Holder: Power - One Italy S.p.A.
Via San Giorgio 642
52028 Terranuova Bracciolini AR
Italia

Product: Electrical Equipment
Solar grid tied inverter

Identification: Trademark: ABB
Models: PVS-100-TL
PVS-120-TL

Tested acc. to: IEC 62116:2014
EN 62116:2014

The certificate of conformity refers to the above mentioned product. This is to certify that the specimen is in conformity with the assessment requirement mentioned above. This certificate does not imply assessment of the production of the product and does not permit the use of a TÜV Rheinland mark of conformity.

Date 29.01.2018



TÜV Rheinland LGA Products GmbH - Tillystraße 2 - 90431 Nürnberg
1241

C E R T I F I C A T E

of Conformity



Registration No.: AK 60126779 0001

Report No.: 28111159 015

Holder: Power - One Italy S.p.A.
Via San Giorgio 642
52028 Terranuova Bracciolini AR
Italia

Product: Electrical Equipment
Solar grid tied inverter

Identification: Trademark: ABB
Models: PVS-100-TL
PVS-120-TL

Compliant to class 4K4H as defined in
IEC 60721-3-4:1995 + A1:1996

Tested acc. to: IEC 60068-2-1:2007
IEC 60068-2-2:2007
IEC 60068-2-14:2009
IEC 60068-2-30:2005
EN 60068-2-78:2001

The certificate of conformity refers to the above mentioned product. This is to certify that the specimen is in conformity with the assessment requirement mentioned above. This certificate does not imply assessment of the production of the product and does not permit the use of a TÜV Rheinland mark of conformity.

Date 29.01.2018

Certification Body

A blue ink signature of Marco Piva.
Marco Piva
A circular blue seal of TÜV Rheinland LGA Products GmbH. The seal contains the company logo and the text "TÜV Rheinland LGA Products GmbH" and "Zertifizierungsstelle".

TÜV Rheinland LGA Products GmbH - Tillystraße 2 - 90431 Nürnberg
1242

C E R T I F I C A T E

of Conformity



Registration No.: AK 60126767 0001

Report No.: 28111159 005

Holder: Power - One Italy S.p.A.
Via San Giorgio 642
52028 Terranuova Bracciolini AR
Italia

Product: Electrical Equipment
Solar grid tied inverter

Identification: Trademark: ABB
Models: PVS-100-TL
PVS-120-TL

Tested acc. to: EN 61000-6-1:2007
EN 61000-6-2:2005
EN 61000-6-3:2007+A1
EN 61000-6-4:2007+A1
EN 61000-3-11:2000
EN 61000-3-12:2011

The certificate of conformity refers to the above mentioned product. This is to certify that the specimen is in conformity with the assessment requirement mentioned above. This certificate does not imply assessment of the production of the product and does not permit the use of a TÜV Rheinland mark of conformity.

Date 29.01.2018

Certification Body
A circular blue stamp of TÜV Rheinland LGA Products GmbH, featuring the company logo and name.
A blue ink signature of Marco Piva.
Marco Piva

TÜV Rheinland LGA Products GmbH - Tillystraße 2 - 90431 Nürnberg
1243

somera

HIGH EFFICIENCY MONOFACIAL PV MODULES

525-550W

MAXIMUM EFFICIENCY %

21.33

POSITIVE POWER TOLERANCE WP

0~+4.99

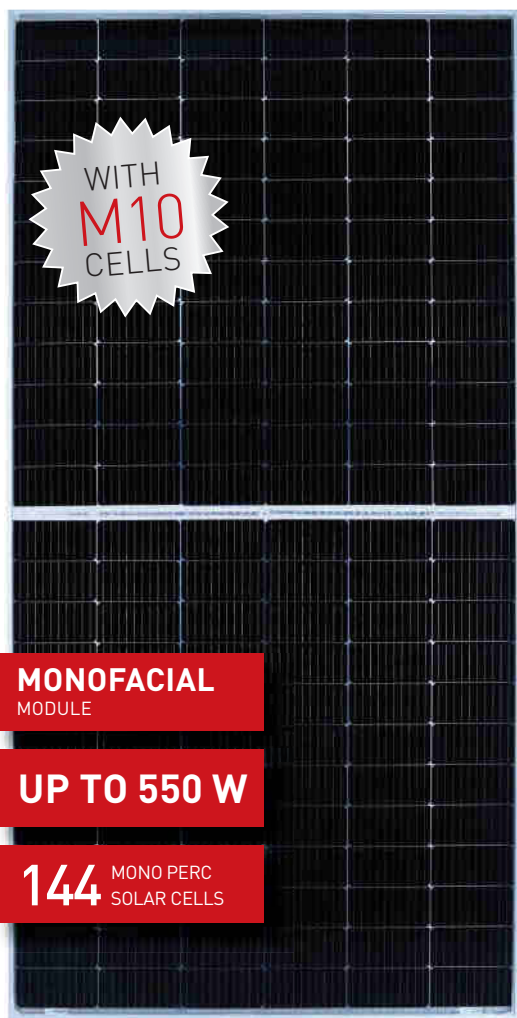
CELLS

M10 144

MODULE TECHNOLOGY

**HALF CUT & MICRO
GAP DESIGN**

WITH IMPROVED SHADE TOLERANCE



CYLINDRICAL TABBING WIRE increases cell absorption by enhancing scattering effects



Implementation of bypass diodes in split JB series-parallel connections enable the module to perform in **PARTIAL SHADOW CONDITIONS** with respect to full-cell module



HIGHER NUMBER OF BUSBARS make the PV modules less prone to loss in efficiency and increases tolerance to micro cracks



FIELD RELIABILITY is improved due to multiple contact points on the cell which lowers the cell stress during module fabrication



LCOE IS CUT BACK by using M10 size solar cell with adding more power output than lower size cell module



LOWER INTERNAL RESISTANCE boosts module power helping to achieve minimal power loss with respect to previous variant modules



APPLICATIONS

- On-grid large scale utility systems
- On-grid rooftop industrial and commercial systems
- Rooftop residential systems

FRAME SUPERSTRATE SUBSTRATE

SILVER

GLASS

BACKSHEET
WHITE

1244


vikram solar

THIS DATASHEET IS APPLICABLE FOR: SOMERA VSMH.72.AAA.05 (AAA=525-550)

Electrical Data^{1,2} All data refers to STC (AM 1.5, 1000 W/m², 25°C)

Peak Power P _{max} (Wp)	525	530	535	540	545	550
Maximum Voltage V _{mpp} (V)	41.4	41.5	41.6	41.7	41.8	41.9
Maximum Current I _{mp} (A)	12.69	12.78	12.87	12.95	13.04	13.13
Open Circuit Voltage V _{oc} (V)	49.2	49.3	49.4	49.5	49.6	49.7
Short Circuit Current I _{sc} (A)	13.4	13.48	13.56	13.64	13.73	13.82
Module Efficiency η[%]	20.36	20.55	20.75	20.94	21.13	21.33

1) STC: 1000 W/m² irradiance, 25°C cell temperature, AM1.5g spectrum according to EN 60904-3. | 2) Power measurement uncertainty is within +/- 2%.

Electrical Parameters at NOCT³

Power (W)	391.4	393	397	399	402	407
V@P _{max} (V)	38.2	38.3	38.4	38.5	38.6	38.7
I@P _{max} (A)	10.25	10.29	10.34	10.37	10.43	10.52
V _{oc} (V)	45.8	45.9	46	46.1	46.2	46.3
I _{sc} (A)	10.83	10.89	10.96	11.03	11.09	11.15

3) NOCT irradiance 800 W/m², ambient temperature 20°C, wind speed 1 m/sec

Temperature Coefficients (Tc) permissible operating conditions

Tc of Open Circuit Voltage (β)	-0.27%/°C
Tc of Short Circuit Current (α)	0.050%/°C
Tc of Power (γ)	-0.35%/°C
Maximum System Voltage	1500V
NOCT	45°C ± 2°C
Temperature Range	-40°C to + 85°C

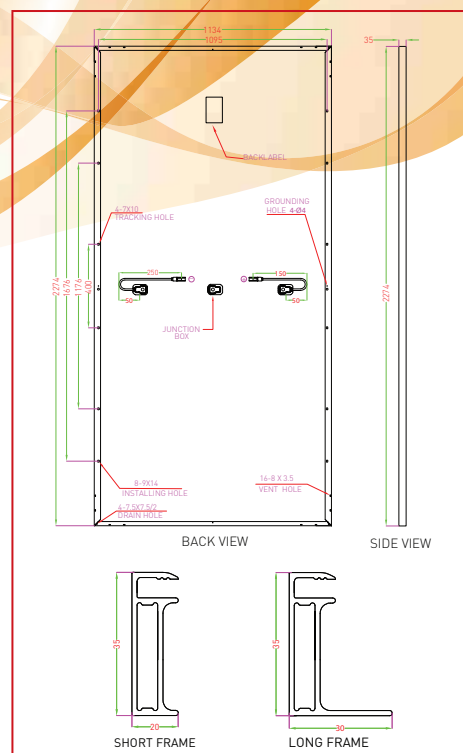
Mechanical Data

Length × Width × Height	2274 × 1134 × 35mm (89.53 × 44.65 × 1.38 inches)
Weight	28.2 Kg (62.17 lbs)
Junction Box	IP68, Split Junction Box with individual bypass diodes
Cable & Connectors [#]	200 mm (+ve terminal) and 300 mm (-ve terminal) length cables, MC4 Compatible/MC4 Connectors
Application Class	Class A (Safety class II)
Superstrate ^{##}	3.2 mm (0.125 inches) high transmission low iron tempered glass, AR coated
Cells	72 Mono PERC (144 half-cells) P-Type solar cells
Back Sheet	Composite film
Frame	Anodized aluminium frame with twin wall profile
Mechanical Load Test	5400 Pa (Snow load), 2400 Pa (Wind load)
Maximum Series Fuse Rating	25A

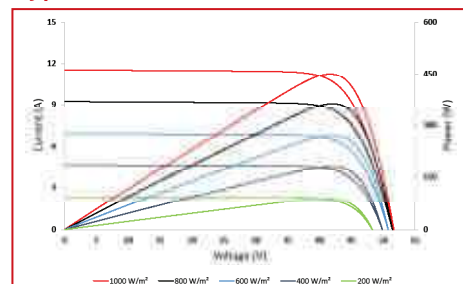
Warranty and Certifications

Product Warranty ^{**}	12 years
Performance Warranty ^{**}	Linear Power Warranty for 27 years with 2% for 1st year degradation and 0.55% from year 2 to year 27
Approvals and Certificates [^]	IEC 61215 : 2016, IEC 61730 : 2016, IEC 61701, IEC 62716, IEC 60068-2-68, IEC 62804, CE, CEC (California), UL 61215, UL 61730, CAN-CSA

Dimensions in mm

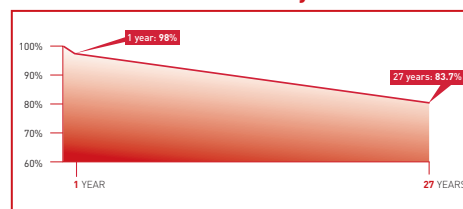


Typical I-V Curves⁴



4) Average relative efficiency reduction of 5% at 200 W/m² according to EN 60904-1.

Performance Warranty



Packaging Information

Quantity /Pallet	31
Pallets/Container (40'HC)	20
Quantity/Container (40'HC)	620

[^] All (*) certifications under progress. | ^{**} Refer to Vikram Solar's warranty document for terms and conditions. | [#] 400mm(15.75 inches), 1000mm(39.37 inches), 1200mm (47.24 inches) cable lengths are also available | ^{**} Anti-glare Glass is also available

CAUTION: READ SAFETY AND INSTALLATION MANUAL BEFORE USING THE PRODUCT.

Specifications included in this datasheet are subject to change without notice. Electrical data without guarantee. Please confirm your exact requirement with the company representative while placing your order.

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1245

somera

HIGH EFFICIENCY MONOFACIAL PV MODULES

635-670W

MAXIMUM EFFICIENCY %

21.57

POSITIVE POWER TOLERANCE WP

0~+4.99

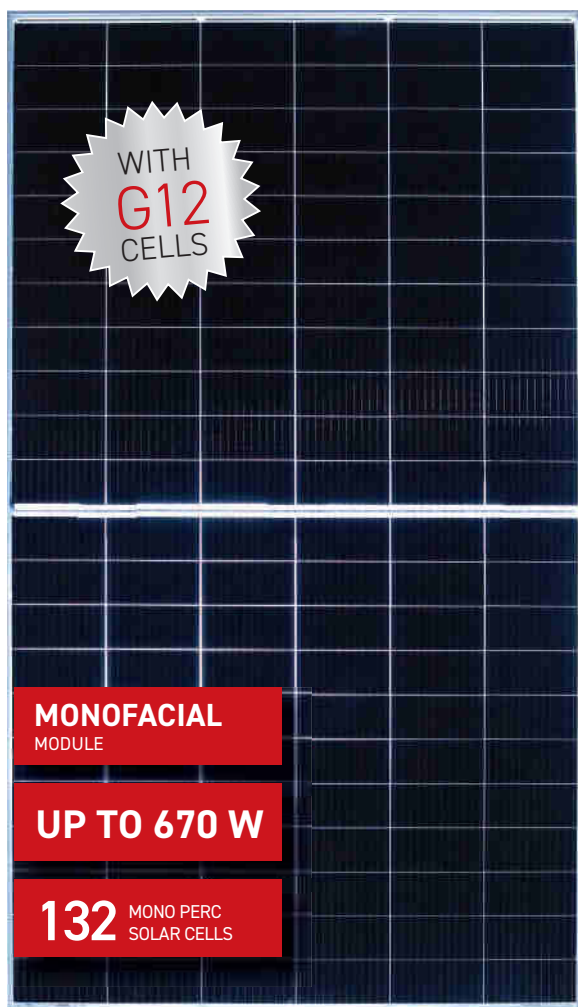
CELLS

G12 132

MODULE TECHNOLOGY

**HALF CUT & MICRO
GAP DESIGN**

WITH IMPROVED SHADE TOLERANCE



CYLINDRICAL TABBING WIRE increases cell absorption by enhancing scattering effects



Implementation of bypass diodes in split JB series-parallel connections enable the module to perform in **PARTIAL SHADOW CONDITIONS** with respect to full-cell module



HIGHER NUMBER OF BUSBAR makes the PV modules less prone to loss in efficiency and increase tolerance to micro cracks



FIELD RELIABILITY is improved due to multiple contact points on the cell which lowers the cell stress during module fabrication



LCOE IS CUT BACK by using M12 size solar cell with adding more power output than lower size cell module



LOWER INTERNAL RESISTANCE boosts module power helping to achieve minimal power loss with respect to previous variant modules



APPLICATIONS

- ♦ On-grid large scale utility systems
- ♦ On-grid rooftop industrial and commercial systems
- ♦ Rooftop residential systems

FRAME

SILVER

SUPERSTRATE

GLASS

SUBSTRATE

**BACKSHEET
WHITE**

1246


vikram solar

THIS DATASHEET IS APPLICABLE FOR: SOMERA VSMH.66.AAA.05 (AAA=635-670)

Electrical Data^{1,2} All data refers to STC (AM 1.5, 1000 W/m², 25°C)

Peak Power P _{max} (Wp)	635	640	645	650	655	660	665	670
Maximum Voltage V _{mpp} (V)	40.2	40.3	40.4	40.5	40.6	40.7	40.8	40.9
Maximum Current I _{mp} (A)	15.8	15.89	15.97	16.05	16.14	16.22	16.3	16.39
Open Circuit Voltage V _{oc} (V)	47.3	47.3	47.4	47.5	47.6	47.7	47.8	48
Short Circuit Current I _{sc} (A)	16.99	17.07	17.15	17.23	17.31	17.4	17.48	17.55
Module Efficiency (%)	20.44	20.60	20.76	20.92	21.09	21.25	21.41	21.57

1) STC:1000 W/m² irradiance, 25°C cell temperature, AM1.5g spectrum according to EN 60904-3. | 2) Power measurement uncertainty is within +/- 2%.**Electrical Parameters at NOCT³**

Power (W)	475.2	479.2	482.7	486.3	490.2	494.1	497.2	501.2
V@P _{max} (V)	36.6	36.7	36.8	36.9	37	37.1	37.1	37.3
I@P _{max} (A)	13	13.07	13.13	13.19	13.26	13.33	13.39	13.45
V _{oc} (V)	44	44	44.1	44.2	44.3	44.4	44.5	44.6
I _{sc} (A)	13.74	13.8	13.87	13.93	13.99	14.07	14.13	14.19

3) NOCT irradiance 800 W/m², ambient temperature 20°C, wind speed 1 m/sec**Temperature Coefficients (Tc)** permissible operating conditions

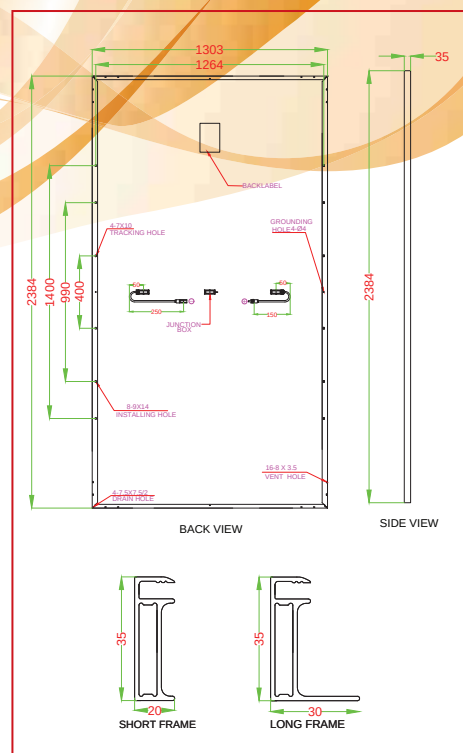
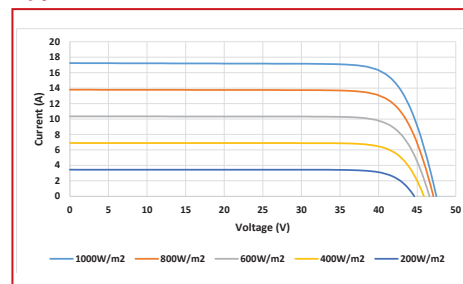
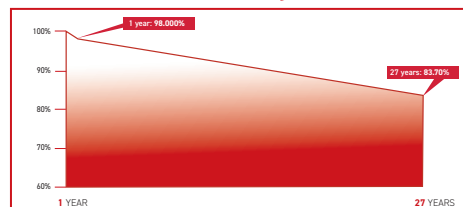
Tc of Open Circuit Voltage ()	-0.27%/°C
Tc of Short Circuit Current ()	0.050%/°C
Tc of Power ()	-0.35%/°C
Maximum System Voltage	1500V
NOCT	45°C ± 2°C
Temperature Range	-40°C to + 85°C

Mechanical Data

Length × Width × Height	2384 × 1303 × 35mm (93.86 × 51.30 × 1.38 inches)
Weight	33.6 Kg (74.08 lbs)
Junction Box	IP68, Split Junction Box with individual bypass diodes
Cable & Connectors [#]	200 mm (+ve terminal) and 300 mm(-ve terminal) length cables, MC4 Compatible/MC4 Connectors
Application Class	Class A (Safety class II)
Superstrate ^{##}	3.2 mm (0.125 inches) high transmission low iron tempered glass, AR coated
Cells	66 Mono PERC (132 half-cells) P-Type solar cells
Back Sheet	Composite film
Frame	Anodized aluminium frame with twin wall profile
Encapsulant	EVA (Ethylene-vinyl acetate)
Mechanical Load Test	5400 Pa (Snow load), 2400 Pa (Wind load)
Maximum Series Fuse Rating	30A

Warranty and Certifications

Product Warranty ^{**}	12 years
Performance Warranty ^{**}	Linear Power Warranty for 27 years with 2% for 1st year degradation and 0.55% from year 2 to year 27
Approvals and Certificates [^]	IEC 61215 : 2016, IEC 61730 : 2016, IEC 61701, IEC 62716, IEC 60068-2-68, IEC 62804, CE, CEC (California), UL 61215, UL 61730, CAN-CSA

Dimensions in mm**Typical I-V Curves⁴**4) Average relative efficiency reduction of 5% at 200 W/m² according to EN 60904-1.**Performance Warranty****Packaging Information**

Quantity /Pallet	31
Pallets/Container (40'HC)	17
Quantity/Container (40'HC)	527

[^] All (*) certifications under progress. | ^{**} Refer to Vikram Solar's warranty document for terms and conditions. | [#] 400mm (15.75 inches), 1000mm (39.37 inches), 1200mm (47.24 inches) cable lengths are also available | ^{##} Anti-glare Glass is also available

CAUTION: READ SAFETY AND INSTALLATION MANUAL BEFORE USING THE PRODUCT.

Specifications included in this datasheet are subject to change without notice. Electrical data without guarantee. Please confirm your exact requirement with the company representative while placing your order. Vikram Solar and all its accompanying logos are trademarks of Vikram Solar Limited registered in India.



Zertifikat**Certificate**

Zertifikat Nr. Certificate No.
PV 60142854

Blatt Sheet
0009

Ihr Zeichen Client Reference

Unser Zeichen Our Reference
0002--21290534 013

Ausstellungsdatum
07.09.2022

Date of Issue
(day/mo/yr)

Genehmigungsinhaber License Holder
Vikram Solar Limited
The Chambers, 8th Floor
1865, Rajdanga Main Road
Kolkata 700107
India

Fertigungsstätte Manufacturing Plant
Refer to latest revision
of the annex list of factories

Prüfzeichen Test Mark



Geprüft nach Tested acc. to
IEC 61215-1:2016
IEC 61215-1-1:2016
IEC 61215-2:2016
IEC 61730-1:2016
IEC 61730-2:2016

Zertifiziertes Produkt (Geräteidentifikation)
Certified Product (Product Identification)

Lizenzentgelte - Einheit
License Fee - Unit

PV Module

Type:
with monocrystalline half cut cells:
SOMERA VSMH.72.AAA.05
(AAA = 385-545 in steps of 1 with 144 cells)

SOMERA VSMHBB.54.AAA.05
(AAA = 395-405 in steps of 1 with 108 cells)

AAA represent output power in Wp

Remarks:
Class II acc. to IEC 61140
Max. System voltage: 1500 VDC (Voc at STC)
Max. positive Design Load (downward): 3600 Pa
Max. negative Design Load (upward): 1600 Pa
with safety factor 1.5
Fire Class C per UL 1703 (per UL 790 modified)

Conditions: see page 4

Validity: 25 September 2024

Dem Zertifikat liegt unsere Prüf- und Zertifizierungsordnung zugrunde.
Das Produkt entspricht den o.g. Anforderungen, die Herstellung wird überwacht.
This certificate is based on our Testing and Certification Regulation. The product
fulfills above mentioned requirements, the production is subject to surveillance.

TÜV Rheinland LGA Products GmbH, Tillystraße 2, 90431 Nürnberg

http://www.tuv.com/safety E-mail: markcheck@tuv.com
Fax: +49 221 806-3935

1248

Zert

Dipl





Our Ref: REGISTRATION/CRS 2021-1382/R-61002070

Date:21-11-2022

Inclusion Id: 62897

Subject :Inclusion of Additional Model(s)

MANUFACTURING UNIT :	Vikram Solar Limited B1000A,B1100C, INDOSPACE INDUSTRIAL PARK PANRUTI PVT LTD, SURVEY NO-2/A, SRIPERUMBUDUR TALUK, PANAIYUR VILLAGE, KANCHIPURAM TAMIL NADU,India-603302 madhab.das@vikramsolar.com 9830800701	
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Dear Sir,

1. This has reference to your request for inclusion of models of "**CRYSTALLINE SILICON TERRESTRIAL PHOTOVOLTAIC (PV) MODULES (Si wafer based)**" as per **IS 14286 : 2010/ IEC 61215 : 2005, IS/IEC 61730 (Part 1) : 2004 & IS/IEC 61730 (Part 2) : 2004** in Licence No. **R-61002070** already granted to you which is valid upto 14-06-2023.
2. It is intimated that the additional Models as per details given below have been agreed to be included in your scope of Licence. **R-61002070 w.e.f. 21-11-2022:**

Product Category	CRYSTALLINE SILICON TERRESTRIAL PHOTOVOLTAIC (PV) MODULES (Si wafer based)
Product Name	Crystalline Silicon Terrestrial Photovoltaic (PV) modules (Si wafer based)
IS No.	IS 14286 : 2010/ IEC 61215 : 2005, IS/IEC 61730 (Part 1) : 2004 & IS/IEC 61730 (Part 2) : 2004
Brand (As Declared by Manufacturer):	VIKRAMSOLAR
Inclusion of Additional Models (w.e.f. 21-11-2022)	SOMERA VSMH.54.395.05,SOMERA VSMH.54.400.05,SOMERA VSMH.54.405.05,SOMERA VSMH.54.410.05,SOMERA VSMH.60.450.05,SOMERA VSMH.60.455.05,SOMERA VSMH.60.460.05,SOMERA VSMH.72.540.05,SOMERA VSMH.72.545.05,SOMERA VSMH.72.550.05,SOMERA VSMHBB.54.395.05,SOMERA VSMHBB.54.400.05,SOMERA VSMHBB.54.405.05,SOMERA VSMHBB.54.410.05,SOMERA VSMHBB.60.450.05,SOMERA VSMHBB.60.455.05,SOMERA VSMHBB.60.460.05,SOMERA VSMHBB.72.540.05,SOMERA VSMHBB.72.545.05,SOMERA VSMHBB.72.550.05
Factory Address	B1000A,B1100C, INDOSPACE INDUSTRIAL PARK PANRUTI PVT LTD, SURVEY NO-2/A, SRIPERUMBUDUR TALUK, PANAIYUR VILLAGE, KANCHIPURAM TAMIL NADU,India-603302

3. Other terms and conditions of the licence shall remain same.
4. This letter is being issued with the approval of competent authority.

Kindly acknowledge receipt of this letter.

Thanking you,

Yours faithfully,
(Sundeep Kumar)
Sc. D
Telfax : +91-11-23230856
E-mail: registration@bis.gov.in

Note: This is a system generated letter. Hence signature is not required.
To verify authentication of letter, kindly scan the QR code on this letter.

For details information on BIS, consult the e-BIS Portal (www.manakonline.in).
Please use BIS CARE APP for verification of ISI-marked goods and hallmarked gold jewellery.

Quasar

Half Cut Mono PERC Module

670Wp

Efficiency up to 21.60%

Credence Solar: As a Solar PV Modules manufacturer our commitment is simple: High-power Solar energy that is reliable and efficient. Our main priorities are Performance and reliability.

We are on a mission: To build a sustainable future, to fight the climate change and to reduce the carbon footprint. We want to shift the future into a better world and we want to show you how you can be a part of this mission. Join us in a journey to change the world.

We've only just begun & soon you'll find us Chasing The Sun..!

To achieve what we have dreamt, our modules are manufactured under one of the top class latest & most advanced state of art manufacturing facility with fully automatic line and having the latest testing facility located in Rajkot, Gujarat, India.

Certifications

Organization Certificates:

- ISO 9001:2015-Quality Management
- ISO 14001:2015-Environmental Management*
- ISO 18001:2007-Occupational Health&Safety*
- ISO 50001:2011-Energy Management*

Product Certificates:

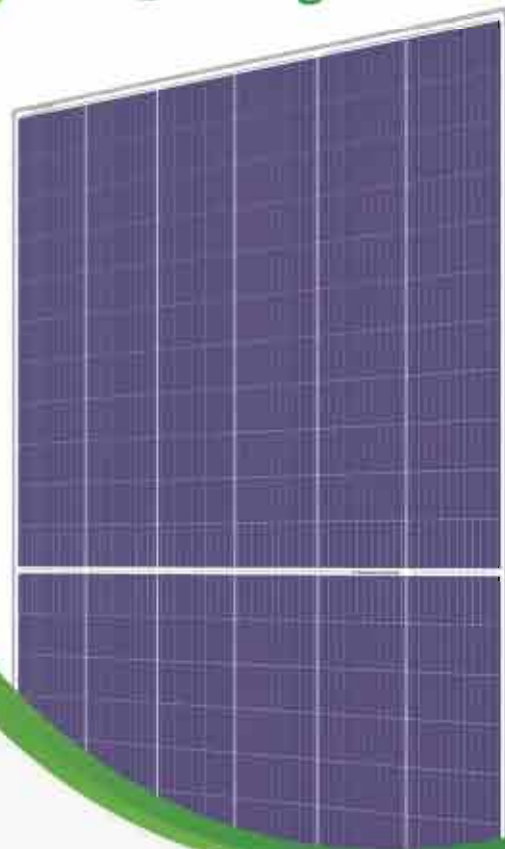
- IEC 61215*
- IEC 61730-1 & 2*
- IEC 62804*
- IEC 61701*

* Under Process



1250

Chasing The Sun...!



Half Cut Cell Design With Multi Bus Bar Technology



1500V DC System Voltage



Higher Efficiency



Lower LCOE & BOS



PID Tested

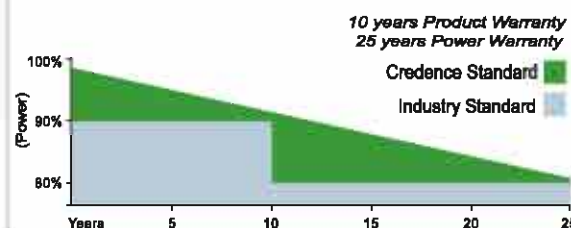


Design Load 5400 Pa



2 Stage 100% EL Inspected

Linear Performance Warranty



Quasar

Half Cut Mono PERC Module

555Wp

Efficiency up to 21.25%

Credence Solar: As a Solar PV Modules manufacturer our commitment is simple: High-power Solar energy that is reliable and efficient. Our main priorities are Performance and reliability.

We are on a mission: To build a sustainable future, to fight the climate change and to reduce the carbon footprint. We want to shift the future into a better world and we want to show you how you can be a part of this mission. Join us in a journey to change the world.

We've only just begun & soon you'll find us Chasing The Sun..!

To achieve what we have dreamt, our modules are manufactured under one of the top class latest & most advanced state of art manufacturing facility with fully automatic line and having the latest testing facility located in Rajkot, Gujarat, India.

Certifications

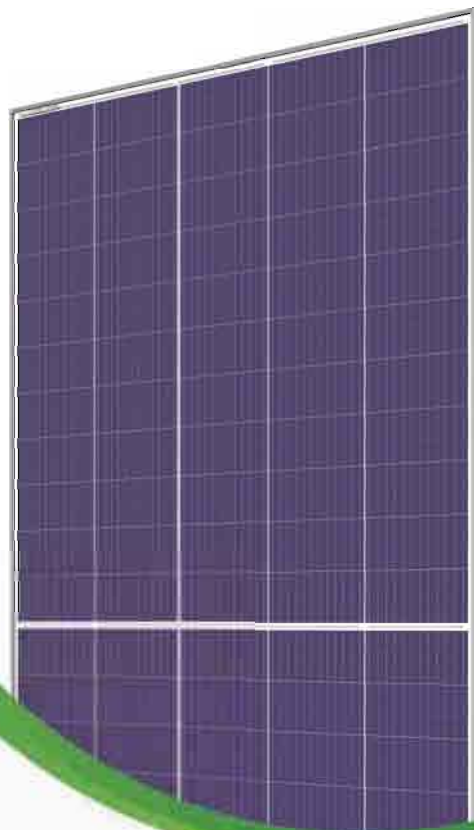
Organization Certificates:

- ISO 9001:2015-Quality Management
- ISO 14001:2015-Environmental Management*
- ISO 18001:2007-Occupational Health&Safety*
- ISO 50001:2011-Energy Management*

Product Certificates:

- IEC 61215*
- IEC 61730-1 & 2*
- IEC 62804*
- IEC 61701*

* Under Process



Half Cut Cell Design With Multi Bus Bar Technology



1500V DC System Voltage



Higher Efficiency



Lower LCOE & BOS



PID Tested



Design Load 5400 Pa

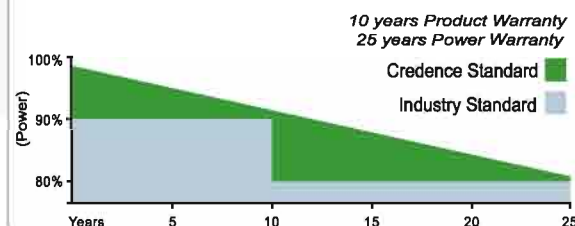


2 Stage 100% EL Inspected



1251

Linear Performance Warranty



ELECTRICAL PARAMETERS (STC*):

Model	Voc (V)	Vmp (V)	Imp (A)	Isc (A)	Pmax (W)	Eff (%)
CS-QU555-110	37.85	31.90	17.45	18.55	555	21.25
CS-QU550-110	37.80	31.80	17.35	18.40	550	21.05
CS-QU545-110	37.75	31.70	17.20	18.30	545	20.90
CS-QU540-110	37.65	31.60	17.10	18.15	540	20.70
CS-QU535-110	37.62	31.50	17.00	18.10	535	20.50

*STC (Standard Test Conditions): Irradiance 1000W/m², Temperature 25°C, Spectrum at AM 1.5G.

ELECTRICAL PARAMETERS (NMOT*):

Model	Voc (V)	Vmp (V)	Imp (A)	Isc (A)	Pmax (W)	Eff (%)
CS-QU555-110	34.42	28.76	14.02	14.90	403	19.30
CS-QU550-110	34.38	28.67	13.94	14.78	400	19.15
CS-QU545-110	34.33	28.58	13.82	14.70	395	18.90
CS-QU540-110	34.24	28.49	13.73	14.58	391	18.75
CS-QU535-110	34.21	28.40	13.65	14.54	388	18.55

*NMOT (Nominal Module Operating Temperature): Irradiance 800W/m², Ambient temperature 20°C, Spectrum at AM 1.5G, Wind speed at 1m/s. (NOCT is similar to NMOT)

Design Specifications:

Cell Type	210mm- 12BB Mono PERC Crystalline
Cell Configuration	110 (11 x 5 x 2) Half Cut Cells
Operating Temperature	-40°C to +85°C
Max. System Voltage	1500V DC
Max. Series Fuse Rating	30A (Recommended)
Application Class	A
Safety Class	C
Junction Box Type	Split JB IP68
Output Cable Length	300mm (1000mm/1200mm upon request)

Dimensional & Packing Details:

Dimensions	2384 x 1096 x 35mm
Weight	29.0 kg
Modules/ Pallet	30 Nos
19Ft Truck	300 Nos
40 Ft HQ Container	600 Nos

Temperature Coefficients:

Power (Pmax)	-0.38%/°C
Voltage (Voc)	-0.36%/°C
Current (Isc)	+0.07%/°C
NMOT/ NOCT	44±2 °C

Other Quasar Products:

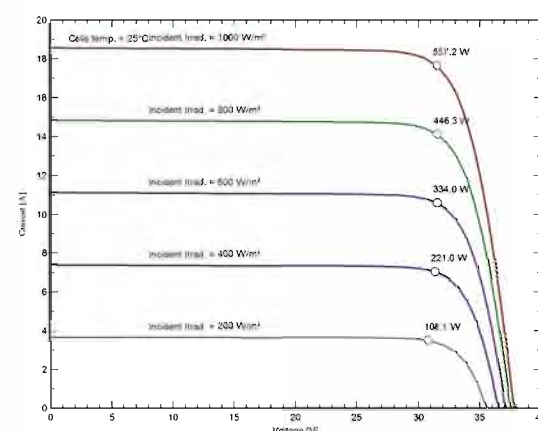
- CS-QUxxx-132 - 650Wp - 670Wp
- CS-QUxxx-120 - 585Wp - 605Wp

Data sheets are available upon request.

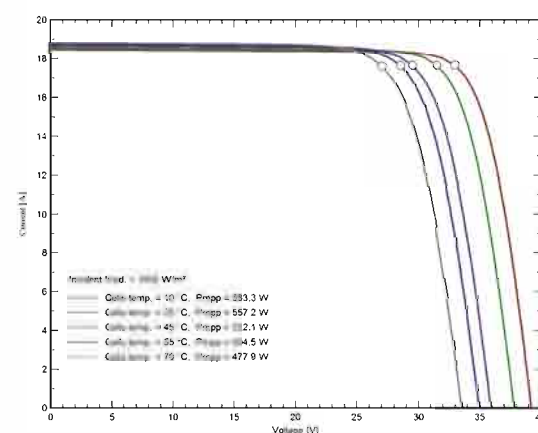
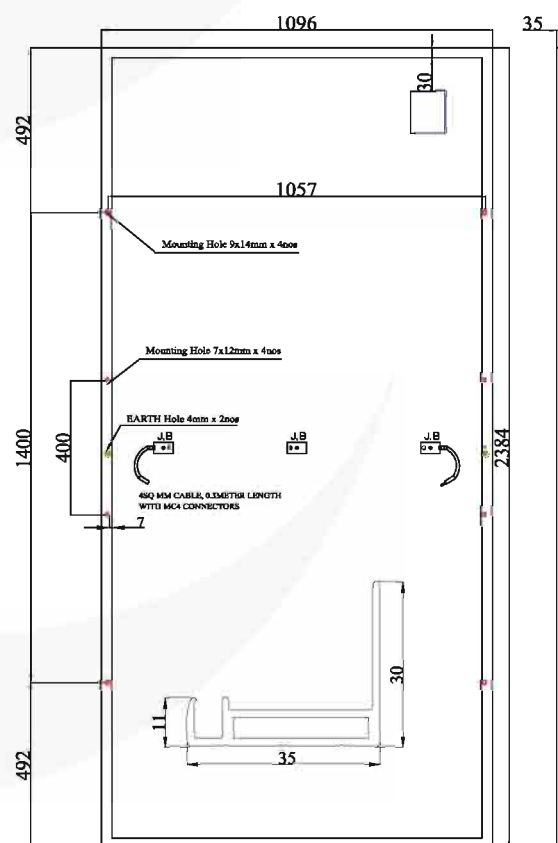
The technical data and specifications are mentioned in the data sheet may changed without prior notice due to continuous improvements and innovations in the product. Please contact marketing for the latest updates and data sheet before finalizing the Order. Please be advised that Solar PV modules should be handled and installed by qualified personnel and please Refer Installation, Operation & Maintenance Manual before handling and start installation for safety & installation.

Reference IV Curve Detail:

PV module: Credence Solar, CS-QU555-110



PV module: Credence Solar, CS-QU555-110

**Rear View & Mounting Detail:**

All Dimensions are in mm; Tolerance: ±2mm

ELECTRICAL PARAMETERS (STC*):

Model	Voc (V)	Vmp (V)	Imp (A)	Isc (A)	Pmax (W)	EFF (%)
CS-QU670-132	45.40	38.25	17.55	18.65	670	21.60
CS-QU665-132	45.35	38.20	17.45	18.55	665	21.50
CS-QU660-132	45.30	38.15	17.35	18.40	660	21.30
CS-QU655-132	45.25	38.10	17.20	18.30	655	21.10
CS-QU650-132	45.20	38.05	17.10	18.15	650	21.00

*STC (Standard Test Conditions): Irradiance 1000W/m², Temperature 25°C, Spectrum at AM 1.5G.

ELECTRICAL PARAMETERS (NMOT*):

Model	Voc (V)	Vmp (V)	Imp (A)	Isc (A)	Pmax (W)	EFF (%)
CS-QU670-132	41.29	34.49	14.10	14.98	486	19.60
CS-QU665-132	41.24	34.44	14.02	14.90	483	19.50
CS-QU660-132	41.20	34.40	13.94	14.78	480	19.30
CS-QU655-132	41.15	34.35	13.82	14.70	475	19.10
CS-QU650-132	41.11	34.31	13.73	14.58	471	19.00

*NMOT (Nominal Module Operating Temperature): Irradiance 800W/m², Ambient temperature 29°C, Spectrum at AM 1.5G, Wind speed at 1m/s. (NOCT is similar to NMOT)

Design Specifications:

Cell Type	210mm- 12BB Mono PERC Crystalline
Cell Configuration	132 (11 x 6 x 2) Half Cut Cells
Operating Temperature	-40°C to +85°C
Max. System Voltage	1500V DC
Max. Series Fuse Rating	30A (Recommended)
Application Class	A
Safety Class	C
Junction Box Type	Split J8 IP68
Output Cable Length	300mm (1000mm/1200mm upon request)

Dimensional & Packing Details:

Dimensions	2384 x 1303 x 35mm
Weight	32.90 kg
Modules/ Pallet	30 Nos
19Ft Truck	240 Nos
40 Ft HQ Container	540 Nos

Temperature Coefficients:

Power (Pmax)	-0.38%/°C
Voltage (Voc)	-0.36%/°C
Current (Isc)	+0.07%/°C
NMOT/ NOCT	44±2°C

Other Quasar Products:

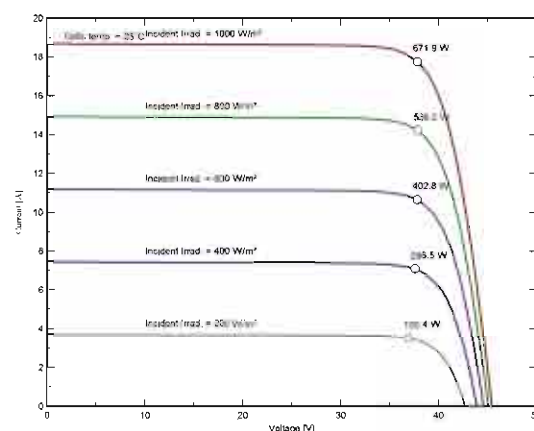
- CS-QUxxx-120 - 585Wp - 605Wp
- CS-QUxxx-110 - 535Wp - 555Wp

Data sheets are available upon request.

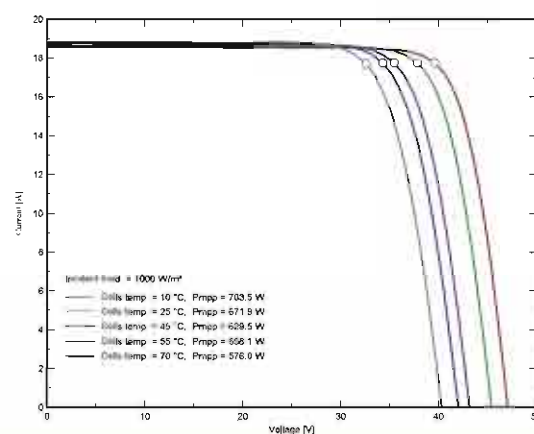
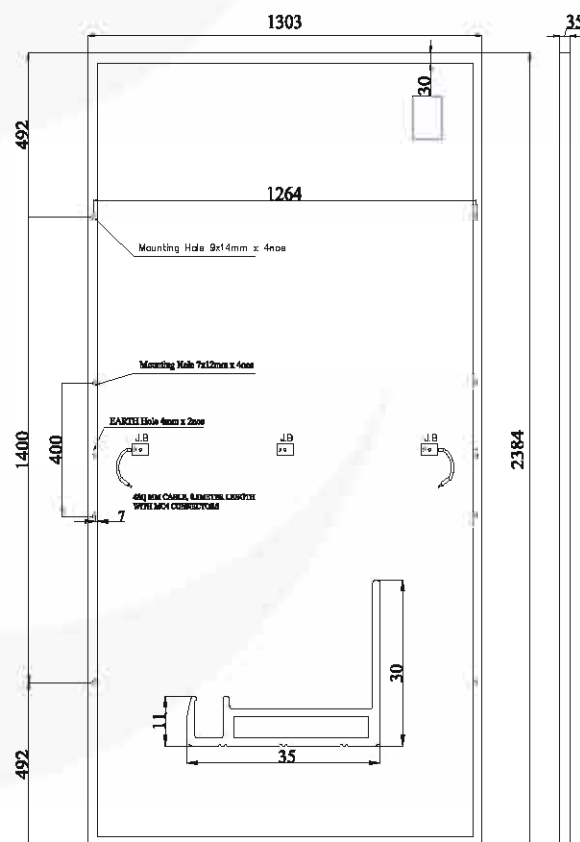
The technical data and specifications are mentioned in the data sheet may changed without prior notice due to continuous improvements and innovations in the product. Please contact marketing for the latest updates and data sheet before finalizing the Order. Please be advised that Solar PV modules should be handled and installed by qualified personnel and please Refer Installation, Operation & Maintenance Manual before handling and start installation for safety & installation.

Reference IV Curve Detail:

PV module: Credence Solar, CS-QU670-132



PV module: Credence Solar, CS-QU670-132

**Rear View & Mounting Detail:**

All Dimensions are in mm; Tolerance: ±2mm



Our Ref: REGISTRATION/CRS 2022-1411/R-72006165

Date:01-09-2022

Inclusion Id: 59359

Subject :Inclusion of Additional Model(s)

MANUFACTURING UNIT :	CREDENCE SOLAR PANELS PRIVATE LIMITED PLOT NO 18 AND 19, SURVAY NO 142/2, NR. RAJKOT- JAMNAGAR HIGHWAY, PADADHARI, RAJKOT, GUJARAT, 360110 GUJARAT,India-360110 info.credencepanels@gmail.com 9537682287	
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Dear Sir,

1. This has reference to your request for inclusion of models of "**CRYSTALLINE SILICON TERRESTRIAL PHOTOVOLTAIC (PV) MODULES (Si wafer based)**" as per **IS 14286 : 2010/ IEC 61215 : 2005, IS/IEC 61730 (Part 1) : 2004 & IS/IEC 61730 (Part 2) : 2004** in Licence No. **R-72006165** already granted to you which is valid upto 10-05-2024.
2. It is intimated that the additional Models as per details given below have been agreed to be included in your scope of Licence. **R-72006165 w.e.f. 01-09-2022:**

Product Category	CRYSTALLINE SILICON TERRESTRIAL PHOTOVOLTAIC (PV) MODULES (Si wafer based)
Product Name	Crystalline Silicon Terrestrial Photovoltaic (PV) modules (Si wafer based)
IS No.	IS 14286 : 2010/ IEC 61215 : 2005, IS/IEC 61730 (Part 1) : 2004 & IS/IEC 61730 (Part 2) : 2004
Brand (As Declared by Manufacturer):	CREDENCE SOLAR PANELS PRIVATE LIMITED
Inclusion of Additional Models (w.e.f. 01-09-2022)	CS-QB315-70 , CS-QB320-70, CS-QB325-70, CS-QB330-70, CS-QB335-70, CS-QB340-70, CS-QB355-80, CS-QB360-80, CS-QB365-80, CS-QB370-80, CS-QB375-80, CS-QB380-80, CS-QB385-80, CS-QB390-80, CS-QB400-90, CS-QB405-90, CS-QB410-90, CS-QB415-90, CS-QB420-90, CS-QB425-90, CS-QB430-90, CS-QB435-90, CS-QB440-90, CS-QB445-100, CS-QB450-100, CS-QB455-100, CS-QB460-100, CS-QB465-100, CS-QB470-100, CS-QB475-100, CS-QB480-100, CS-QB485-100, CS-QB490-100, CS-QB490-110, CS-QB495-110, CS-QB500-110, CS-QB505-110, CS-QB510-110, CS-QB515-110, CS-QB520-110, CS-QB525-110, CS-QB530-110, CS-QB535-110, CS-QB535-120, CS-QB540-110, CS-QB540-120, CS-QB545-120, CS-QB550-120, CS-QB555-120, CS-QB560-120, CS-QB565-120, CS-QB570-120, CS-QB575-120, CS-QB580-120, CS-QB585-120, CS-QB590-120, CS-QB590-132, CS-QB595-132, CS-QB600-132, CS-QB605-132, CS-QB610-132, CS-QB615-132, CS-QB620-132, CS-QB625-132, CS-QB630-132, CS-QB635-132, CS-QB640-132, CS-QB645-132,CS-QB650-132
Factory Address	PLOT NO 18 AND 19, SURVAY NO 142/2, NR. RAJKOT- JAMNAGAR HIGHWAY, PADADHARI, RAJKOT, GUJARAT, 360110 GUJARAT,India-360110

3. Other terms and conditions of the licence shall remain same.
4. This letter is being issued with the approval of competent authority.
- Kindly acknowledge receipt of this letter.

Thanking you,

Yours faithfully,
(Saksham Vasudev)
Scientist-B
Telfax : +91-11-23230856
E-mail: registration@bis.gov.in

Note: This is a system generated letter. Hence signature is not required.
To verify authentication of letter, kindly scan the QR code on this letter.

For details information on BIS, consult the e-BIS Portal (www.manakonline.in).
Please use BIS CARE APP for verification of ISI-marked goods and hallmarked gold jewellery.


HI PHYSIX LABORATORY INDIA PVT. LTD.

B-32/1/2, MIDC, Ranjangaon, Pune, Maharashtra

info@hiphysix.com, infohplindia@gmail.com

Phone : 02138 - 232901, 232902, 232903

CIN : U74120DL2009PTC194754

Mobile 1 : +91 7768005400

Mobile 2 : +91 7768005411

Mobile 3 : +91 7768005422

TEST CERTIFICATE

The product Photovoltaic Modules have been tested by HI Physix Laboratory India Pvt Ltd. and found to comply in accordance with the test procedure indicated in this report.

Report No.: HPLI/Test/2210045002

Issue Date: 08/12/2022

Applicant: Credence Solar Panels Pvt Ltd.

Plot No. 18 & 19, Survey No. 142/2, Near Rajkot- Jamnagar Highway,
Padadhari, Rajkot, Gujarat-360110

Tested Model: CS-QU650-132 (Representative Model)

Series Models: 132 Cut Cells: CS-QU590-132 to CS-QU645-132 (in steps of 5W)

120 Cut Cells: CS-QU535-120 to CS-QU590-120 (in steps of 5W)

110 Cut Cells: CS-QU490-110 to CS-QU540-110 (in steps of 5W)

100 Cut Cells: CS-QU445-100 to CS-QU490-100 (in steps of 5W)

90 Cut Cells: CS-QU400-90 to CS-QU440-90 (in steps of 5W)

80 Cut Cells: CS-QU355-80 to CS-QU390-80 (in steps of 5W)

70 Cut Cells: CS-QU315-70 to CS-QU340-70 (in steps of 5W)

Test Specification: IEC TS 62804-1:2015

Disclaimer: The test results presented in this report related only to the object tested and to the specific test carried out. This report shall not be reproduced, except in full, without the written approval of the issuing test laboratory.

Issued By



Authorized By


HI PHYSIX LABORATORY INDIA PVT. LTD.

B-32/1/2, MIDC, Ranjangaon, Pune, Maharashtra

info@hiphysix.com, infohplindia@gmail.com

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CIN : U74120DL2009PTC194754

Mobile 1 : +91 7768005400

Mobile 2 : +91 7768005411

Mobile 3 : +91 7768005422

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Padadhari, Rajkot, Gujarat-360110

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Series Models: 132 Cut Cells: CS-QB590-132 to CS-QB645-132 (in steps of 5W)

120 Cut Cells: CS-QB535-120 to CS-QB590-120 (in steps of 5W)

110 Cut Cells: CS-QB490-110 to CS-QB540-110 (in steps of 5W)

100 Cut Cells: CS-QB445-100 to CS-QB490-100 (in steps of 5W)

90 Cut Cells: CS-QB400-90 to CS-QB440-90 (in steps of 5W)

80 Cut Cells: CS-QB355-80 to CS-QB390-80 (in steps of 5W)

70 Cut Cells: CS-QB315-70 to CS-QB340-70 (in steps of 5W)

Test Specification: IEC TS 62804-1:2015

Disclaimer: The test results presented in this report related only to the object tested and to the specific test carried out. This report shall not be reproduced, except in full, without the written approval of the issuing test laboratory.

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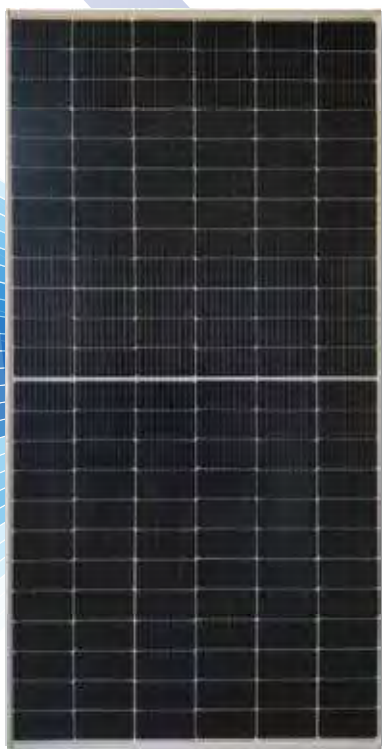


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DESERV® EXTREME 144 525 WP - 550 WP



*Module image for representation purpose only



SAFE

-  IP68 Junction box
-  10 years of product warranty
-  25 Years of power output warranty
-  1500 Vdc



RELIABLE

-  Extreme weather resilience
-  Windspeed - 2400 Pa, Snowload - 5400 Pa
-  Highly reliable anti-reflective coated glass



HIGH PERFORMANCE

-  PID resistant
-  Superlative performance in low light
-  High power density
-  Positive power tolerance

World-class products, Made in India

- **Smart:** High module efficiency with 144X half-cut Mono crystalline Bi-facial PERC Solar Cells
- **Modern:** Processed on state-of-the-art technology production lines
- **Dependable:** Use of highest quality raw material coupled with rigorous in-house testing
- **Versatile:** Suitable for Utility, Rooftop, and other general applications

Certifications:

- IEC 61215: 2016 (520-540 Wp)
- IEC 61730: 2016 (520-540 Wp)
- CAN/CSA: 61730 (520 Wp)
- IEC TS 62804-1
- IEC 61853-1 (525 Wp)
- IEC 61853-2 (535 Wp)
- LeTID
- BIS Number R-71018970 (520 Wp-545 Wp)
- IMS Certified Company - ISO 9001: 2015
- OHSAS 45001: 2018
- EMS - ISO 14001: 2015
- Independently audited by SOLARBUYER



RenewSys is the first integrated manufacturer of Solar PV Modules and its key components - Encapsulants (EVA and POE), Backsheets and Solar PV Cells. We have a global presence with offices in India, Mauritius, Nigeria, South Africa, Singapore, UAE, representatives in Europe, USA, Mexico, and an evolving distributor network.

Registered Office: Unit No. 607, 6th Floor,
Trade Center, Bandra-Kurla Complex, Bandra
East, Mumbai - 400 051, Maharashtra, India.

Factory: Plot No. E-141, Additional Patalganga MIDC
Industrial Area, Village - Karade Khurd, Taluka Panvel,
District Raigad - 410 206, Maharashtra, India.

Factory: Plot No.6, Survey # 114/P, Srinagar Village,
Maheshwaram Mandal, Dist - Rangareddy,
Hyderabad - 501 359, Telangana, India.

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Performance under standard test conditions (1000w/m², AM 1.5, 25 °C)

DESERV Extreme 144 Bi-Facial Gain @Different Albedo (%)												
	Pm (Wp)	Vmp (V)	Imp (A)	Voc (V)	Isc (A)	Efficiency (%)	Pm (Wp)	Vmp (V)	Imp (A)	Voc (V)	Isc (A)	Efficiency (%)
Front @STC	525	41.34	12.72	49.21	13.46	20.22	530	41.49	12.79	49.40	13.53	20.41
5%	551.2	41.34	13.33	49.21	14.07	21.23	556.5	41.49	13.41	49.40	14.15	21.43
10%	577.5	41.34	13.97	49.21	14.71	22.24	583.0	41.49	14.05	49.40	14.79	22.45
20%	630.0	41.34	15.24	49.21	15.98	24.26	636.0	41.49	15.33	49.40	16.07	24.49
Front @STC	535	41.68	12.85	49.61	13.61	20.60	540	41.84	12.92	49.82	13.68	20.79
5%	561.7	41.68	13.48	49.61	14.24	21.63	567.0	41.84	13.55	49.82	14.31	21.83
10%	588.5	41.68	14.12	49.61	14.88	22.66	594.0	41.84	14.20	49.82	14.96	22.87
20%	642.0	41.68	15.40	49.61	16.16	24.72	648.0	41.84	15.49	49.82	16.25	24.95
Front @STC	545	41.98	12.99	49.97	13.74	20.99	550	42.15	13.06	50.12	13.81	21.18
5%	572.2	41.98	13.63	49.97	14.38	22.04	577.5	42.15	13.70	50.12	14.45	22.23
10%	599.5	41.98	14.28	49.97	15.03	23.09	605.0	42.15	14.35	50.12	15.10	23.29
20%	654.0	41.98	15.58	49.97	16.33	25.18	660.0	42.15	15.65	50.12	16.40	25.41

Operating Conditions	
Temperature, °C	-40 to +85
Max. system voltage, Vdc	1500
Hail impact velocity, m/sec	23
Max. surface load capacity, Pa	5400
Max. wind speed capacity, Pa	2400
Series fuse rating, A	30

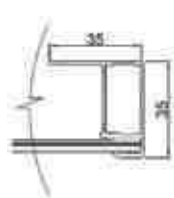
Cell Temperature Coefficient	Bi-Facial
Open circuit voltage	-0.293 % / °C
Short circuit current	+0.038 % / °C
Peak power	-0.37 % / °C

Test uncertainty for $P_{max} \pm 3\%$

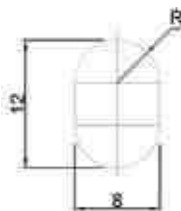
Bi-facial gain subject to mounting structure specifications and albedo % of ground

Physical Parameters	
No. of cells	144
Module dimension (mm)	2284 X 1137 (± 2)
Module thickness (mm)	35
Approximate weight (kg)	28.7

Frame Cross Section



Mounting Hole

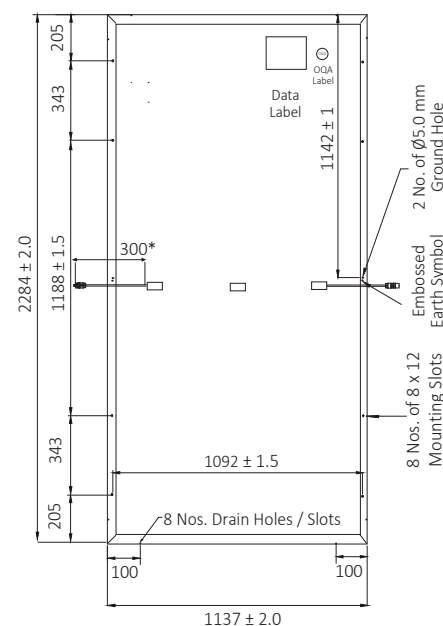


NOCT (Wp) at 45 ± 2 °C @800 W/m²	525	530	535	540	545	550
Pmax (W)	390.72	394.44	398.16	401.88	405.61	409.32
Max. power voltage (Vmp), V	37.81	37.95	38.12	38.27	38.39	38.55
Max. power current (Imp), A	10.35	10.41	10.46	10.52	10.57	10.63
Open circuit voltage (Voc), V	45.76	45.93	46.13	46.32	46.46	46.60
Short circuit current (Isc), A	11.00	11.05	11.12	11.18	11.22	11.28

Bi-faciality factor: $70 \pm 5\%$

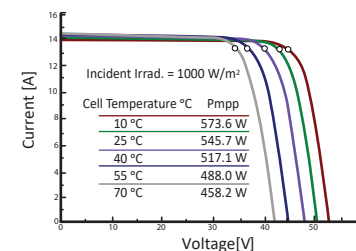
Mechanical Characteristics	
Cable	No. 12 AWG, 4mm ² , (300mm Standard)
PV Connectors	MC4 Compatible
Frame	Anodized Aluminum Alloy
Junction box	IP68 Split junction box with 3 bypass diodes
Glass	3.2mm Thick low iron tempered

Module Dimension Diagram (mm)

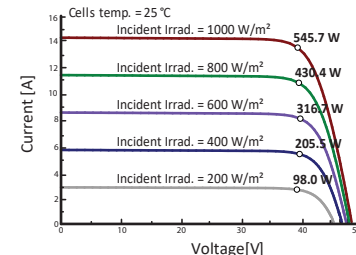


IV Curves

Cell temperature sensitivity chart



Incident irradiance sensitivity chart



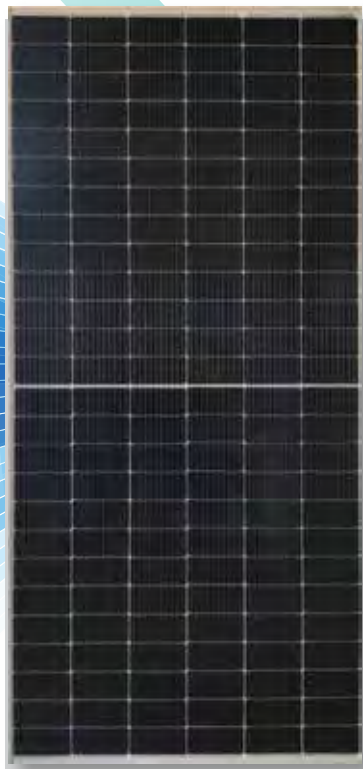
- Please refer to the installation manual for detailed information.

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DESERV[®] SGALACTIC 156 565 WP - 590 WP



*Module image for representation purpose only

DESERV[®]



SAFE

-  IP68 Junction box
-  10 YEARS 10 years of product warranty
-  25 YEARS 25 Years of power output warranty
-  1500 Vdc



RELIABLE

-  Extreme weather resilience
-  Windspeed - 2400 Pa, Snowload - 5400 Pa
-  Highly reliable anti-reflective coated glass



HIGH PERFORMANCE

-  PID resistant
-  Superlative performance in low light
-  High power density
-  Positive power tolerance

World-class products, Made in India

- **Smart:** High module efficiency with 156X half-cut Mono crystalline PERC Solar Cells
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- **Dependable:** Use of highest quality raw material coupled with rigorous in-house testing
- **Versatile:** Suitable for Utility, Rooftop, and other general applications

Certifications:

- IEC 61215: 2016 (565 Wp-590 Wp)
- IEC 61730: 2016 (565 Wp-590 Wp)
- CAN/CSA: 61730 (565 Wp-580 Wp)
- BIS Number R-71018970 (565 Wp-590 Wp)
- IMS Certified Company - ISO 9001: 2015
- OHSAS 45001: 2018
- EMS - ISO 14001: 2015
- Independently audited by SOLARBUYER



RenewSys is the first integrated manufacturer of Solar PV Modules and its key components - Encapsulants (EVA and POE), Backsheets and Solar PV Cells. We have a global presence with offices in India, Mauritius, Nigeria, South Africa, Singapore, UAE, representatives in Europe, USA, Mexico, and an evolving distributor network.

Registered Office: Unit No. 607, 6th Floor, Trade Center, Bandra-Kurla Complex, Bandra East, Mumbai - 400 051, Maharashtra, India.

Factory: Plot No. E-141, Additional Patalganga MIDC Industrial Area, Village - Karade Khurd, Taluka Panvel, District Raigad - 410 206, Maharashtra, India.

Factory: Plot No.6, Survey # 114/P, Srinagar Village, Maheshwaram Mandal, Dist - Rangareddy, Hyderabad - 501 359, Telangana, India.

1259

Performance under standard test conditions (1000w/m², AM 1.5, 25 °C)

DESERV SGalactic 156	565	570	575	580	585	590
Rated power (P _{max}), Wp	565	570	575	580	585	590
Max. power voltage (V _{mp}), V	44.69	44.83	44.98	45.16	45.32	45.48
Max. power current (I _{mp}), A	12.65	12.72	12.79	12.85	12.92	12.98
Open circuit voltage (V _{oc}), V	53.14	53.31	53.52	53.74	53.97	54.15
Short circuit current (I _{sc}), A	13.39	13.46	13.53	13.61	13.68	13.73
Module efficiency (%)	20.13	20.30	20.48	20.66	20.84	21.02

Test uncertainty for P_{max} ± 3%

NOCT (Wp) at 45 ± 2 °C @800 W/m ²	565	570	575	580	585	590
P _{max} (W)	420.49	424.21	427.93	431.65	435.38	439.10
Max. power voltage (V _{mp}), V	40.87	41.00	41.14	41.30	41.45	41.59
Max. power current (I _{mp}), A	10.30	10.35	10.41	10.46	10.52	10.56
Open circuit voltage (V _{oc}), V	49.41	49.57	49.76	49.97	50.18	50.35
Short circuit current (I _{sc}), A	10.94	11.00	11.05	11.12	11.18	11.22

Mechanical Characteristics	
Cable	No. 12 AWG, 4mm ² , (300mm Standard)
PV Connectors	MC4 Compatible
Frame	Anodized Aluminum Alloy
Junction box	IP68 Split junction box with 3 bypass diodes
Glass	3.2mm Thick low iron tempered

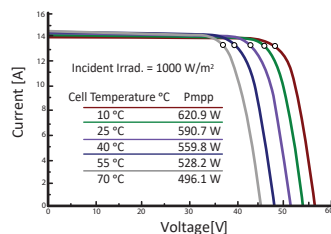
Operating Conditions	
Temperature, °C	-40 to +85
Max. system voltage, V _{dc}	1500
Hail impact velocity, m/sec	23
Max. surface load capacity, Pa	5400
Max. wind speed capacity, Pa	2400
Series fuse rating, A	25

Physical Parameters	
No. of cells	156
Module dimension (mm)	2469 X 1137 (± 2)
Module thickness (mm)	35
Approximate weight (kg)	31.7

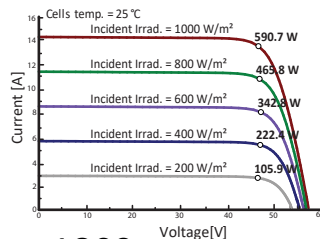
Cell Temperature Coefficient	Mono PERC
Open circuit voltage	-0.279 % / °C
Short circuit current	+0.044 % / °C
Peak power	-0.36 % / °C

IV Curves

Cell temperature sensitivity chart



Incident irradiance sensitivity chart

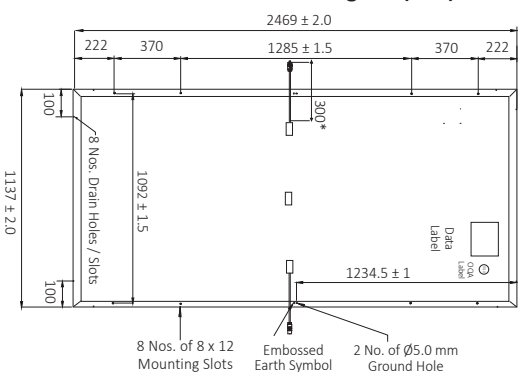


Frame Cross Section



Mounting Hole

Module Dimension Diagram (mm)

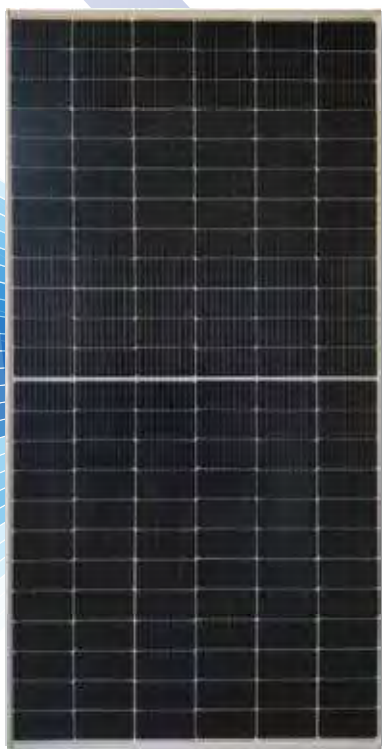


- Please refer to the installation manual for detailed information.

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RenewSys[®]
let there be light

DESERV[®] SGALACTIC 144 525 WP - 550 WP



*Module image for representation purpose only

DESERV[®]



SAFE

-  IP68 Junction box
-  10 YEARS 10 years of product warranty
-  25 YEARS 25 Years of power output warranty
-  1500 Vdc



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- CAN/CSA: 61730 (520 Wp)
- IEC TS 62804-1
- IEC 61853-1 (525 Wp)
- IEC 61853-2 (535 Wp)
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- Independently audited by SOLARBUYER



RenewSys is the first integrated manufacturer of Solar PV Modules and its key components - Encapsulants (EVA and POE), Backsheets and Solar PV Cells. We have a global presence with offices in India, Mauritius, Nigeria, South Africa, Singapore, UAE, representatives in Europe, USA, Mexico, and an evolving distributor network.

Registered Office: Unit No. 607, 6th Floor, Trade Center, Bandra-Kurla Complex, Bandra East, Mumbai - 400 051, Maharashtra, India.

Factory: Plot No. E-141, Additional Patalganga MIDC Industrial Area, Village - Karade Khurd, Taluka Panvel, District Raigad - 410 206, Maharashtra, India.

Factory: Plot No.6, Survey # 114/P, Srinagar Village, Maheshwaram Mandal, Dist - Rangareddy, Hyderabad - 501 359, Telangana, India.

1261

Performance under standard test conditions (1000w/m², AM 1.5, 25 °C)

DESERV SGalactic 144	525	530	535	540	545	550
Rated power (P _{max}), Wp	525	530	535	540	545	550
Max. power voltage (V _{mp}), V	41.34	41.49	41.68	41.84	41.98	42.15
Max. power current (I _{mp}), A	12.72	12.79	12.85	12.92	12.99	13.06
Open circuit voltage (V _{oc}), V	49.21	49.40	49.61	49.82	49.97	50.12
Short circuit current (I _{sc}), A	13.46	13.53	13.61	13.68	13.74	13.81
Module efficiency (%)	20.22	20.41	20.60	20.79	20.99	21.18

Test uncertainty for P_{max} ± 3%

NOCT (Wp) at 45 ± 2 °C @800 W/m ²	525	530	535	540	545	550
P _{max} (W)	390.72	394.44	398.16	401.88	405.61	409.32
Max. power voltage (V _{mp}), V	37.81	37.95	38.12	38.27	38.39	38.55
Max. power current (I _{mp}), A	10.35	10.41	10.46	10.52	10.57	10.63
Open circuit voltage (V _{oc}), V	45.76	45.93	46.13	46.32	46.46	46.60
Short circuit current (I _{sc}), A	11.00	11.05	11.12	11.18	11.22	11.28

Mechanical Characteristics	
Cable	No. 12 AWG, 4mm ² , (300mm Standard)
PV Connectors	MC4 Compatible
Frame	Anodized Aluminum Alloy
Junction box	IP68 Split junction box with 3 bypass diodes
Glass	3.2mm Thick low iron tempered

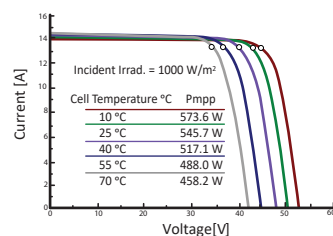
Operating Conditions	
Temperature, °C	-40 to +85
Max. system voltage, V _{dc}	1500
Hail impact velocity, m/sec	23
Max. surface load capacity, Pa	5400
Max. wind speed capacity, Pa	2400
Series fuse rating, A	25

Physical Parameters	
No. of cells	144
Module dimension (mm)	2284 X 1137 (± 2)
Module thickness (mm)	35
Approximate weight (kg)	28.7

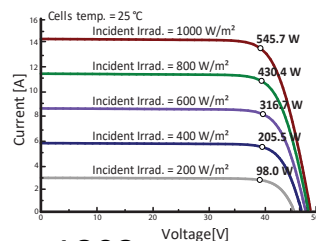
Cell Temperature Coefficient	Mono PERC
Open circuit voltage	-0.279 % / °C
Short circuit current	+0.044 % / °C
Peak power	-0.36 % / °C

IV Curves

Cell temperature sensitivity chart



Incident irradiance sensitivity chart

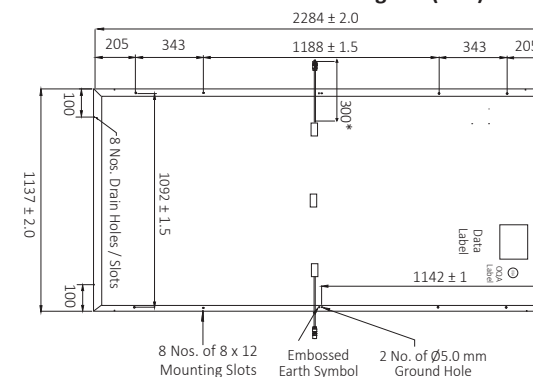


Frame Cross Section



Mounting Hole

Module Dimension Diagram (mm)



- Please refer to the installation manual for detailed information.

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Elan Shine Bifacial PV Modules MBB P-Type PERC Half-cut

ASB-M10-144-AAA. (AAA=520-545) | 144 Cells | 520-545 Wp

Highlights



MBB cell technology - excellent anti-microcracking performance with more balanced interior stress; grid pattern current path, lower cost



Up to $70 \pm 5\%$ bifaciality Factor



Longer Product life and performance -0.45 year over year degradation with 30 years warranty on power



Least Degradation for LID, LeTID



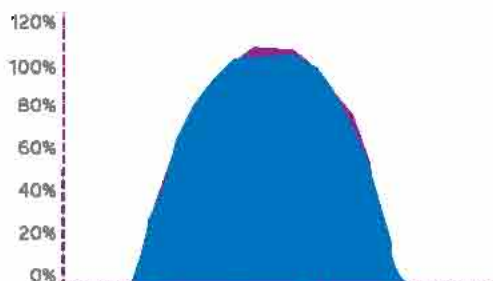
Modules Made with Ga doped wafer, Smart Soldering, 10BB



Excellent PID Resistance

Higher generation due to bifacial technology

■ Adani bifacial module ■ Monofacial module



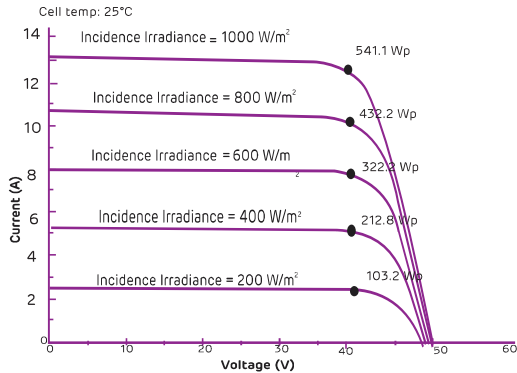
Warranty based on power

■ ADANI Linear warranty ■ STD Linear warranty

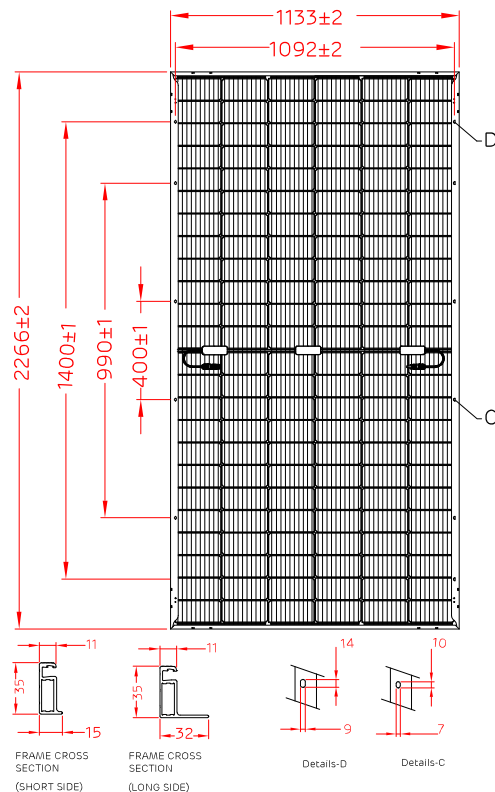


Technical Data

Multi irradiance curve Bifacial M10-144 HC cell Module



Dimensions in mm



Warranty and certifications

Product warranty**

12 years of product warranty

Performance warranty**

Power degradation < 2.0 % in first year
< 0.45 % / year in 2-30 years

Approvals and certificates#: IEC 61215 Ed2, IEC 61730, IEC 61701, UL 61730, MCS, JET, CEC, CEC-Aus, IEC 62716, IEC 62782, IEC 60068-2-68, IEC 61853, BIS



All certifications are under process

Electrical data – All data measured to STC*

Electrical Specification	Only front (STC)					
Peak power, (0 ~+ 4.99 Wp) Pmax(Wp)	520	525	530	535	540	545
Maximum voltage, Vmpp (V)	41.18	41.34	41.49	41.64	41.80	41.94
Maximum current, Impp (A)	12.65	12.72	12.79	12.86	12.93	13.01
Open circuit voltage, Voc (V)	48.60	48.78	48.95	49.12	49.32	49.48
Short circuit current, Isc (A)	13.41	13.48	13.55	13.63	13.71	13.79
Module efficiency (%)	20.25	20.44	20.64	20.83	21.03	21.22

*STC: Irradiance 1000 W/m², cell temperature 25°C, Air Mass AM 1.5 according to EN 60904-3. Average efficiency reduction of 4.5 % at 200 W/m² according to EN 60904-1. Except Pmpp, all other parameters have a tolerance of +/-3 %, measurement uncertainty <3 %

Electrical Characteristics with different rear side power gain (Reference 525 Wp Front)

Electrical Specification	Pmax gain from rear side*			
Bifaciality Gain	10%	15%	20%	25%
Peak power, (0 ~+ 4.99 Wp) Pmax(Wp)	575	600	630	650
Maximum voltage, Vmpp (V)	41.35	41.35	41.36	41.36
Maximum current, Impp (A)	13.89	14.50	15.25	15.75
Open circuit voltage, Voc (V)	48.36	48.36	48.36	48.36
Short circuit current, Isc (A)	15.01	15.66	16.47	17.01
Module efficiency (%)	22.39	23.37	24.54	25.32

*Power gain from rear side depends upon the ground reflectance (Albedo) & Bifaciality factor.

Temperature co-efficients (Tc) and permissible operating conditions

T _c of open circuit voltage (β)	-0.30 % /°C
T _c of short circuit current (α)	0.050 % /°C
T _c of power (γ)	-0.39 % /°C
Maximum system voltage	1500 VDC (IEC & UL)
NOCT	45°C ± 2°C
Temperature range	-40°C to + 85°C

Mechanical data

Length	2266 mm
Width	1133 mm
Height	35 mm
Weight	28.0 kg
Junction box	IP68; Junction box, MC4 compatible
Cable and connectors	300 mm length cable, MC4 & Amphenol compatible connectors
Application class	Class A (Safety class II)
Superstrate	High transmittance ARC glass-3.2mm
Cells	144 Half-cut mono-crystalline P-type PERC bifacial solar cells; Multi bus bar
Encapsulation	High volume resistivity and low MVTR
Substrate	Transparent Backsheet
Frame	Anodized Frame
Design Mechanical Load	3600 Pa-downward; 1600 Pa-upward
Safety factor for Mechanical load	1.5
Maximum series fuse rating	30 A

Packaging Configuration

Container	40'HC
Pallets / Container	19
Pieces / Container	589

Note:

- The specifications included in this datasheet are subject to change without notice.
- The electrical data given here is for reference purpose only.
- Please confirm your exact requirements with the sales representative while placing your order.

** Warranty:

Please read Adani solar warranty documents thoroughly.

*Caution:

Please read safety and installation instructions before using the product.

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ETERNAL SHINE Series

Monofacial PV Modules

MBB P-Type PERC Half-cut

ASM-M10-144-AAA (AAA=520-545) | 144 Cells | 520-545 Wp

Highlights



MBB cell technology with 10BB, Smart Soldering



High module conversion efficiency upto 21.22%



Excellent low light performance



Least Degradation for LID & LeTID with Ga Doped wafer technology

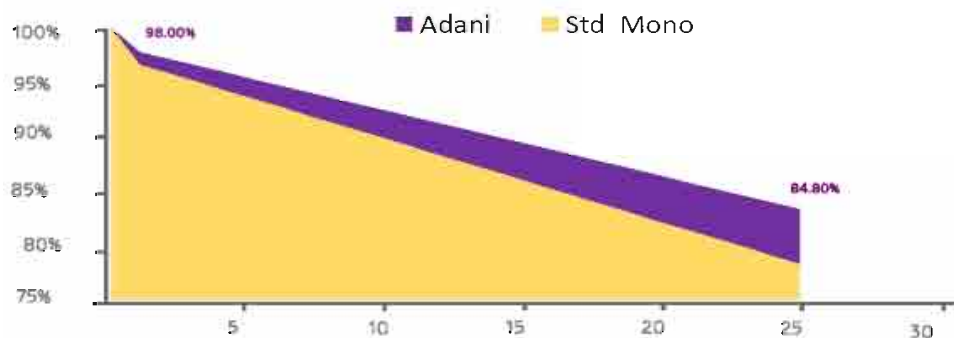


Excellent anti-micro cracking performance with more balanced interior stress: grid pattern current path, lower cost



Excellent PID Resistance

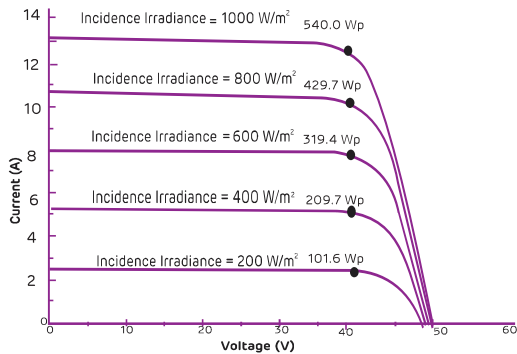
Warranty based on power



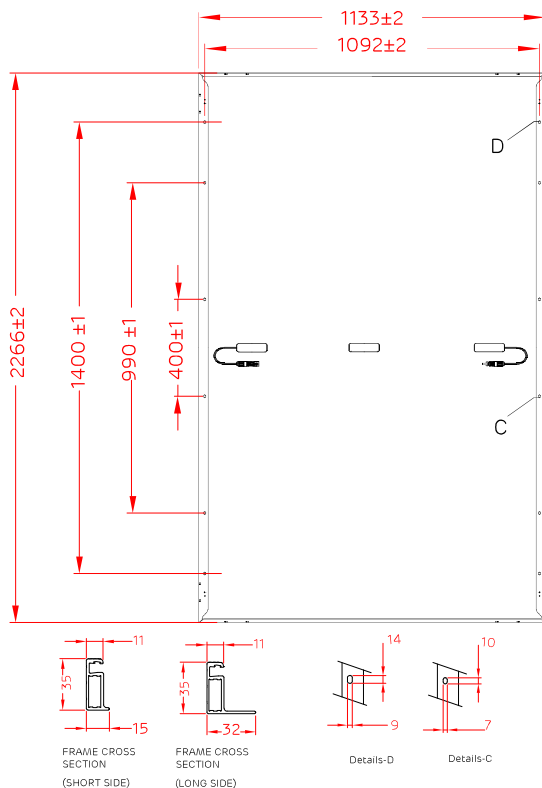
Technical Data

Multi irradiance curve Monofacial M10-144 HC cell Module

Cell temp: 25°C



Dimensions in mm



Warranty and certifications

Product warranty**

12 years of product warranty

Performance warranty**

Power degradation < 2.0 % in first year
< 0.55 % / year in 2-25 years

Approvals and certificates:

IEC 61215, IEC 61730, BIS, IEC 61853

UL 61730, MCS, JET, CEC, CEC-Aus, IEC 62716,
IEC 61701, IEC 62782, IEC 60068-2-68

certifications are under process

Electrical data – All data measured to STC*

Electrical Specification	Only front (STC)					
Peak power, (0 ~+ 4.99 Wp) Pmax(Wp)	520	525	530	535	540	545
Maximum voltage, Vmpp (V)	41.18	41.34	41.49	41.64	41.80	41.94
Maximum current, Imp (A)	12.65	12.72	12.79	12.86	12.93	13.01
Open circuit voltage, Voc (V)	48.60	48.78	48.95	49.12	49.32	49.48
Short circuit current, Isc (A)	13.41	13.48	13.55	13.63	13.71	13.79
Module efficiency (%)	20.25	20.44	20.64	20.83	21.03	21.22

*STC: Irradiance 1000 W/m², cell temperature 25°C, Air Mass AM 1.5 according to EN 60904-3
. Average efficiency reduction of 4.5 % at 200 W/m² according to EN 60904-1. Except Pmpp,
all other parameters have a tolerance of +/-3 %, measurement uncertainty <3 %

Electrical Characteristics at NOCT**

Pmax(Wp)	390	393	397	401	404	408
Maximum voltage, Vmpp (V)	38.39	38.54	38.68	38.82	38.98	39.10
Maximum current, Imp (A)	10.16	10.22	10.27	10.33	10.38	10.46
Open circuit voltage, Voc (V)	45.43	45.76	45.92	46.09	46.28	46.42
Short circuit current, Isc (A)	10.90	10.96	11.02	11.08	11.13	11.22

**NOCT irradiance 800 W/m², ambient temperature 20°C, Air Mass AM 1.5, Wind speed 1 m/sec

Temperature co-efficients (Tc) and permissible operating conditions

Tc of open circuit voltage (β)	-0.28 % /°C
Tc of short circuit current (α)	0.048 % /°C
Tc of power (γ)	-0.37% /°C
Maximum system voltage	1500 VDC (IEC & UL)
NOCT	45°C ± 2°C
Temperature range	-40°C to + 85°C

Mechanical data

Length	2266 mm
Width	1133 mm
Height	35 mm
Weight	28.0 kg
Junction box	IP68; Junction box, MC4 compatible
Cable and connectors	300 / 1500 mm length cable, MC4 & Amphenol compatible connectors
Application class	Class A (Safety class II)
Superstrate	High transmittance ARC glass-3.2mm
Cells	144 Half-cut mono-crystalline P-type PERC bifacial solar cells; Multi bus bar
Encapsulation	High volume resistivity and low MVTR
Substrate	White Backsheet
Frame	Anodized Frame
Design Mechanical Load	3600 Pa-downward; 1600 Pa-upward
Safety factor for Mechanical load	1.5
Maximum series fuse rating	25 A

Packaging Configuration

Container	40'HC
Pallets / Container	20
Pieces / Container	620

Note:

- The specifications included in this datasheet are subject to change without notice.
- The electrical data given here is for reference purpose only.
- Please confirm your exact requirements with the sales representative while placing your order.

** Warranty:

Please read Adani solar warranty documents thoroughly.

*Caution:

Please read safety and installation instructions before using the product.

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Our Ref: Registration/CRS 2021-7347/R-72005460

Date:27-12-2021

Subject : Licence Document

Manufacturing Unit :	Mundra Solar Energy Limited SURVEY NO.180/P, APSEZ, VILLAGE TUNDA, MUNDRA, KACHCHH, GUJARAT GUJARAT,India-370435 vishanth.venkatesh@adani.com 9099991283	
----------------------	--	---

Dear Sir,

1.With reference to your Application, we are pleased to inform you that it has been decided to grant you licence as per details given below :

Product Category:	CRYSTALLINE SILICON TERRESTRIAL PHOTOVOLTAIC (PV) MODULES (Si wafer based)
Product Name:	Crystalline Silicon Terrestrial Photovoltaic (PV) modules (Si wafer based)
IS NO :	IS 14286 : 2010/ IEC 61215 : 2005, IS/IEC 61730 (PART 1) : 2004 & IS/IEC 61730 (PART 2) : 2004
Brand (As Declared by Manufacturer) :	Adani
Model :	[Brand -> Adani, Models -> ASB-M10-144-500, ASB-M10-144-501, ASB-M10-144-502, ASB-M10-144-503, ASB-M10-144-504, ASB-M10-144-505, ASB-M10-144-506, ASB-M10-144-507, ASB-M10-144-508, ASB-M10-144-509, ASB-M10-144-510, ASB-M10-144-511, ASB-M10-144-512, ASB-M10-144-513, ASB-M10-144-514, ASB-M10-144-515, ASB-M10-144-516, ASB-M10-144-517, ASB-M10-144-518, ASB-M10-144-519, ASB-M10-144-520, ASB-M10-144-521, ASB-M10-144-522, ASB-M10-144-523, ASB-M10-144-524, ASB-M10-144-525, ASB-M10-144-526, ASB-M10-144-527, ASB-M10-144-528, ASB-M10-144-529, ASB-M10-144-530, ASB-M10-144-531, ASB-M10-144-532, ASB-M10-144-533, ASB-M10-144-534, ASB-M10-144-535, ASB-M10-144-536, ASB-M10-144-537, ASB-M10-144-538, ASB-M10-144-539, ASB-M10-144-540, ASM-M10-144-500, ASM-M10-144-501, ASM-M10-144-502, ASM-M10-144-503, ASM-M10-144-504, ASM-M10-144-505, ASM-M10-144-506, ASM-M10-144-507, ASM-M10-144-508, ASM-M10-144-509, ASM-M10-144-510, ASM-M10-144-511, ASM-M10-144-512, ASM-M10-144-513, ASM-M10-144-514, ASM-M10-144-515, ASM-M10-144-516, ASM-M10-144-517, ASM-M10-144-518, ASM-M10-144-519, ASM-M10-144-520, ASM-M10-144-521, ASM-M10-144-522, ASM-M10-144-523, ASM-M10-144-524, ASM-M10-144-525, ASM-M10-144-526, ASM-M10-144-527, ASM-M10-144-528, ASM-M10-144-529, ASM-M10-144-530, ASM-M10-144-531, ASM-M10-144-532, ASM-M10-144-533, ASM-M10-144-534, ASM-M10-144-535, ASM-M10-144-536, ASM-M10-144-537, ASM-M10-144-538, ASM-M10-144-539, ASM-M10-144-540]
Factory Address :	SURVEY NO.180/P, APSEZ, VILLAGE TUNDA, MUNDRA, KACHCHH, GUJARAT GUJARAT,India-370435

2. The licence is being granted for your unit located at the address and for the brand and models mentioned at serial no 1 above.
3. The number assigned to this Licence is **R-72005460** which has been made operative from **27-12-2021** and is valid upto **26-12-2023** . The Licence Number should invariably be referred to in your future correspondence.
4. The rights and privileges under the licence shall not be exercised by any other factory / organization at any other location. This licence is not transferable. In the event of shifting of the manufacturing machinery from the registered premises to some other place use of the licence Number shall be stopped and BIS shall be informed.
5. The licensee shall comply with the provisions of the Act, rules and regulations framed thereunder and as amended from time to time.
6. The licensee shall follow the guidelines for the use of Standard Mark and labeling requirements as per Annex-I.
7. The licensee shall not use the licence in any manner which contravenes the provisions of Act, rules and regulations framed thereunder and as amended from time to time.
8. Upon expiry of validity, stoppage or suspension or cancellation of licence, you shall discontinue forthwith the self declaration of conformity to the relevant Indian Standard(s) and withdraw all promotional and advertising matter which contains any reference thereto.
9. For renewal of licence, the licensee shall have to apply to BIS three months in advance before expiration of the licence and application form for renewal is available on BIS website.
10. The licence is not transferable. Kindly acknowledge receipt of this letter.

Thanking you,

Yours faithfully,
(Avik Datta)
Scientist-C
Telfax : +91-11-23230856
E-mail: registration@bis.gov.in

Note: This is a system generated letter. Hence signature is not required.
To verify authentication of letter, kindly scan the QR code on this letter.

Annex - 1

The guidelines for use of Standard Mark for Scheme-C are per 3(1) of BIS (Conformity Assessment) Regulations,2017 are given below:

- i) The monogram of the 'Standard Mark' consists of the pictorial representation, drawn in the exact style as indicated in the figure in the figure in Annexure I. Its photograpic reductin and enlargement is permitted.
- ii)The 'Standard Mark' can be displayed in single colour or multi-colour as per the details given below. The colour scheme for the Standard Mark to be used in multi colour shall be use as indicated below.
- iii) The licensee shall diplay the 'Standard Mark' on the article and/or the packaging, as the case may be, in a manner so as to be easily visible. It shall be legible, indelible and non-remobable. Further, the durability of marking shall be as per the provisions of the relevant Indian Standard, wherever applicable. The diplay of IS number, Registration number and words shall not be less than Arial forn size 6.
- iv) Any device with a integrated display scenen may present the Standard Mark electronically (e-labelling) in lieu of a physical presentation on the product.

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K 255600

ANNEXURE A – PRE-AGREEMENT

WHEREAS in response to the Notification No ANERT-TECH/99/2022-T2 dated 24/04/2023 the bounden has submitted to ANERT a e-tender for the *Request for Selection (RFS) of agency for the Implementation of 2 MW Solar Power Plant at Travancore Titanium Products Ltd., Kochuveli, Thiruvananthapuram under Solar City project funded by Smart City Thiruvananthapuram Ltd* specified therein subject to the terms and conditions contained in the said e-tender.

AND WHEREAS the bounden has furnished to ANERT a sum of Rs Not Applicable as Earnest Money Deposit for execution of an agreement undertaking the due fulfilment of the contract in case his e-tender is accepted by ANERT. NOW THESE PRESENTS WITNESS and it is hereby mutually agreed as follows: -

In case the e-tender submitted by the bounden is accepted by ANERT and the contract for Request for Selection (RFS) of agency for the Implementation of 2 MW Solar Power Plant at Travancore Titanium Products Ltd., Kochuveli, Thiruvananthapuram under Solar City project funded by Smart City Thiruvananthapuram Ltd is awarded to the bounden, the bounden shall within Fifteen days of acceptance of this etender, execute an agreement with ANERT incorporating all the terms and conditions under which ANERT accepts this e-tender.

K. ABDUL SHAHAN M.
ADVOCATE & NOTARY
(Reg No. 1/2014/KLM)
Kollam, Kerala
Mob: 9367902269

269 T.M. KRISHNA KUMAR
STAMP VENDOR
KUNDARA

File No. ANERT-TECH/99/2022-T2 (Computer No. 5311)

In case the bounden fails to execute the agreement as aforesaid incorporating the terms and conditions governing the contract, ANERT shall have power and authority to recover from the bounden any loss or damage caused to ANERT by such breach as may be determined by ANERT by appropriating the moneys inclusive of Earnest Money deposited by the bounden and if the Earnest Money is found to be inadequate the deficit amount may be recovered from the bounden and his properties movable and immovable in the manner hereinafter contained.

All sums found due to ANERT under or by virtue of this agreement shall be recoverable from the bounden and his properties movable and immovable under the provisions of the Revenue Recovery Act for the time being in force as though such sums are arrears of land revenue and in such other manner as ANERT may deem fit.

In witness whereof Sri (Name and Designation) for and on behalf of the Agency for New & Renewable Energy Research and Technology and Sri
 Rahul Malhotra the bounden have hereunto set their hands the day and year shown against their respective signature.

Signed by Sri

(Date)

in the presence of witnesses

1.

2.

Notarial Register
 Volume - 02
 Page - 11
 Serial No - 106



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Signed by Sri Rahul Malhotra

(Date) 04/26/2023

in the presence of witnesses

1.

2.





കേരളം KERALA

DZ 851826

FORMAT 2 - POWER OF ATTORNEY

(To be on non-judicial Kerala stamp paper of appropriate value as per Stamp Act relevant to place of execution)

Power of Attorney to be provided by the Bidding Company in favour of its representative as evidence of authorized signatory's authority.

Know all men by these presents, We Oakridge Energy Private Limited – 5Link Road, Jungpura Extension, Delhi do hereby constitute, appoint and authorize Mr./Ms. Rahul Malhotra – B6/10 Safdarjung Enclave, New Delhi, Delhi - 110029 who is presently employed with us and holding the position of Director as our true and lawful attorney, to do in our name and on our behalf, all such acts, deeds and things necessary in connection with or incidental to submission of our Bid for Implementation of 2 MW Solar Power Plant at Travancore Titanium Products Ltd, Kochuveli, Thiruvananthapuram, Kerala in response to the RFS. No ANERT-TECH/126/2023-PE1 dated 24/04/2023 issued by ANERT including signing and submission of the Bid and all other documents related to the Bid, including but not limited to undertakings, letters, certificates, acceptances, clarifications, guarantees or any other document which the ANERT may require us to submit. The aforesaid Attorney is further authorized for making representations to the ANERT and providing information / responses to ANERT representing us in all matters before ANERT and generally dealing with ANERT in all matters in connection with this Bid till the completion of the bidding process as per the terms of the above mentioned RFS.

NOTARY
K. ABDUL SHAHAN
ADVOCATE & NOTARY
(Reg. No. 1/2014/KLM)
Kollam, Kerala

Rs. 100/-
24/4/23

K. ABDUL SHAHAN
ADVOCATE & NOTARY
(Reg. No. 1/2014/KLM)
Kollam, Kerala
T.M. KRISHNA KUMAR
STAMP VENDOR
KUNDARA

No. 305

We hereby agree to ratify all acts, deeds and things done by our said attorney pursuant to this Power of Attorney and that all acts, deeds and things done by our aforesaid attorney shall be binding on us and shall always be deemed to have been done by us.

All the terms used herein but not defined shall have the meaning ascribed to such terms under the RFS.

Signed by the within named

Oakridge Energy Private Limited (through the hand of Mr. Dilwar Singh duly authorized by the Board (vide Board Resolution No 04) to issue such Power of Attorney

Dated this 24th day of April, 2023 Accepted



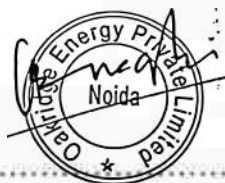
Signature of Attorney

Rahul Malhotra

(Director)

Address: B6/10, Safdarjung Enclave, New Delhi -110029

Attested



(Signature of the executants)

Dilwar Singh

(Director)

Address: B6/10, Safdarjung Enclave, New Delhi-110029

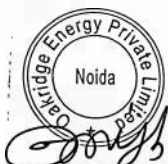
K. ABDUL SHAHAN MOON
ADVOCATE & NOTARY
(Reg. No. 1/2014/KLM)
Kollam, Kerala
Mob: 9387902289

Signature and stamp of Notary of the place of execution



Common seal of has been affixed in my/our presence pursuant to Board of CEO's Resolution dated 13th April, 2023 (Board of CEO's Resolution is also enclosed)

WITNESS



1.

(Signature)

Name... Nimish Singh Chouhan

Designation... Manager



2.

(Signature)

Name... Ranjish Kumar

Designation... Assistant Manager Design

Notes:

The mode of execution of the power of attorney should be in accordance with the procedure, if any, laid down by the applicable law and the charter documents of the executant(s) and the same should be under common seal of the executant affixed in accordance with the applicable procedure. Further, the person whose signatures are to be provided on the power of attorney shall be duly authorized by the executant(s) in this regard.

The person authorized under this Power of Attorney, in the case of the Bidding Company / Lead Member being a public company, or a private company which is a subsidiary of a public company, in terms of the Companies Act, 1956, with a paid up share capital of more than Rupees Five crores, should be the Managing CEO / whole time CEO/manager appointed under section 269 of the Companies Act, 1956. In all other cases the person authorized should be a CEO duly authorized by a board resolution duly passed by the Company. Also, wherever required, the executant(s) should submit for verification the extract of the chartered documents and documents such as a Board resolution / power of attorney, in favour of the person executing this power of attorney for delegation of power hereunder on behalf of the executant(s).



K. ABDUL SHAHAN Moan
ADVOCATE & NOTARY
(Reg No. 1/2014/KLM)
Kollam, Kerala
Mob: 9387902269

1273



FORMAT FOR COVERING LETTER

Sir,

I/We hereby e-tender to supply, under annexed terms and conditions of contract, the whole of the articles refereed to and described in the attached specifications and quantity decide by the Agency for new & Renewable Energy Research and Technology (ANERT) at the quoted against each item. The article will be delivered and installed/Commissioned operated and maintained for 10 years hereafter within the time and at the place(s) specified in the scheduled.

I am/e are remitting herewith the required amount of Rs **NIL** towards the cost of e tender and Earnest Money Deposit by electronics payment vide transaction No **NA** dtd **NA**

Place :- New Delhi

Date :- 26/04/2023

Yours Faithfully



Rahul Malhotra – Director

contact@oakridge.co.in

www.oakridge.co.in

CIN: U40101DL2012PTC240047

Regd. Office: Oakridge Energy Pvt. Ltd., 6, Link Road, Jangpura Extension, New Delhi – 110014

Corporate Office: Oakridge Energy Pvt. Ltd., 85/10, Saketjung Enclave, New Delhi – 110028





 contact@oakridge.co.in

 www.oakridge.co.in

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 **Corporate Office:** Oakridge Energy Pvt. Ltd., 85/10, Saketjung Enclave, New Delhi – 110028



Acknowledgement Receipt of Income Tax Forms

(Other Than Income Tax Return)



e-Filing Acknowledgement Number

943312840310123

RRR Number

770000165556112

Date of e-Filing

31-Jan-2023

Name	:	OAKRIDGE ENERGY PRIVATE LIMITED
PAN/TAN	:	DELO05189C
Address	:	b6/10,new delhi,safdarjung enclave,Delhi,INDIA,110029
Form No.	:	Form 26Q
Form Description	:	Quarterly statement of deduction of tax under sub-section (3) of section 200 of the Income-tax Act, 1961 in respect of payments other than salary for the quarter ended June/September/December/March.(Financial year)
Assessment Year	:	-
Financial Year	:	2022-23
Month	:	-
Quarter	:	Q3
Filing Type	:	Regular
Capacity	:	director
Verified By	:	AVFPS0173A

(This is a computer generated Acknowledgement Receipt and needs no signature)





FORMAT 3 – GENERAL PARTICULARS

Name of the Agency	Oakridge Energy Private Limited
Registered Office	5 Link Road, Jangpura Extension, New Delhi - 110014
Nature of Agency (Ltd. Co., Partnership etc.) Attach Copy of partnership Deed/ Certification of Incorporation.	Solar Installation EPC Company
Year of Establishment	2012
Registration of Number	U40101DL2012PTC240047
Address for Communication	B 6/10, Block B6, Humayunpur, Safdarjung Enclave, New Delhi, Delhi 110029
Telephone number of Contact person (Mobile if any)	+918619533287
Name of CEO's/ Proprietor/Partners (with address and Telephone No)	Veeravalli sundram Sampath – 97179 36888 - B 6/10, Block B6, Humayunpur, Safdarjung Enclave, New Delhi, Delhi 110029

✉ contact@oakridge.co.in

🌐 www.oakridge.co.in

CIN: U40101DL2012PTC240047

📍 **Regd. Office:** Oakridge Energy Pvt. Ltd., 5, Link Road, Jangpura Extension, New Delhi – 110014

📍 **Corporate Office:** Oakridge Energy Pvt. Ltd., B6/10, Safdarjung Enclave, New Delhi – 110029





	Rahul Malhotra – 87250 60202 - B 6/10, Block B6, Humayunpur, Safdarjung Enclave, New Delhi, Delhi 110029 Dilwar Negi - 90151 18111 - B 6/10, Block B6, Humayunpur, Safdarjung Enclave, New Delhi, Delhi 110029
GST Registration Number (Copy to be Attached)	09AABCO7282N2ZR
PAN Number	AABCO7282N
TAN Number	DELO05189C
Whether the bidder wishes to form a project company for execution of work	No
Whether any Civil Suit / Litigation arisen in the contract executed during the last five years/being executed. If yes, please furnish the name of the Contract, employer nature of work, contract value,	No
work order and date and brief details of litigation.	NA
Details of Total Experience in general since inception (Details of similar systems installed till the	11 years

contact@oakridge.co.in

www.oakridge.co.in

CIN: U40101DL2012PTC240047

Regd. Office: Oakridge Energy Pvt. Ltd., 5, Link Road, Jangpura Extension, New Delhi – 110014

Corporate Office: Oakridge Energy Pvt. Ltd., B6/10, Safdarjung Enclave, New Delhi – 110029





date of bid)	
Details of Turnover for last Two years. (Copy Audited Statements has to be submitted for last two financial years)	Turnover of last two years 2021 2022 – 1447.64 Lakhs 2020 -2021 – 1866.02 Lakhs
Details of offices in Kerala, India and abroad- address and contact details	Oakridge Energy PTE Limited – 68, circular road # 025101, singapore

Documentary evidence for the bid qualification requirements are submitted along with this document and the details furnished above are true and correct.

Date: 26/04/2023



Signature of authorized signatory
Name – Rahul Malhotra
Designation - Director
(office seal)

contact@oakridge.co.in

www.oakridge.co.in

CIN: U40101DL2012PTC240047

Regd. Office: Oakridge Energy Pvt. Ltd., 6, Link Road, Jangpura Extension, New Delhi – 110014

Corporate Office: Oakridge Energy Pvt. Ltd., 85/10, Saketjung Enclave, New Delhi – 110028





Government of India

Form GST REG-06

[See Rule 10(1)]

Registration Certificate

Registration Number : 09AABCO7282N2ZR

1.	Legal Name	OAKRIDGE ENERGY PRIVATE LIMITED			
2.	Trade Name, if any	Oakridge Energy Private Limited			
3.	Constitution of Business	Private Limited Company			
4.	Address of Principal Place of Business	A - 108 B, Sector - 58, Noida, Gautam Buddha Nagar, Uttar Pradesh, 201301			
5.	Date of Liability	07/02/2019			
6.	Period of Validity	From	07/02/2019	To	NA
7.	Type of Registration	Regular			
8.	Particulars of Approving Authority	Uttar Pradesh			
Signature Signature Not Verified Digitally signed by DS GOODS AND SERVICES TAX NETWORK(2) Date: 2019.02.12 16:01:15 IST					
Name		BHASKER SINGH			
Designation		Assistant Commissioner			
Jurisdictional Office		Noida Sector-9			
9. Date of issue of Certificate		12/02/2019			
Note: The registration certificate is required to be prominently displayed at all places of business in the State.					

This is a system generated digitally signed Registration Certificate issued based on the approval of application granted on 12/02/2019 by the jurisdictional authority.

**Annexure A**

GSTIN	09AABCO7282N2ZR
Legal Name	OAKRIDGE ENERGY PRIVATE LIMITED
Trade Name, if any	Oakridge Energy Private Limited

Details of Additional Places of Business

Total Number of Additional Places of Business in the State	0
--	---



GSTIN 09AABCO7282N2ZR
 Legal Name OAKRIDGE ENERGY PRIVATE LIMITED
 Trade Name, if any Oakridge Energy Private Limited

Details of Managing / Whole-time Directors and Key Managerial Persons

1		Name	sampath shravan
		Designation/Status	Director
		Resident of State	Delhi
2		Name	Nabanshu Bhattacharjee
		Designation/Status	Director
		Resident of State	Assam
3		Name	Shobhit Kumar
		Designation/Status	Director
		Resident of State	Uttar Pradesh
4		Name	SAMPATH SUNDARAM VEERAVALLI
		Designation/Status	Director
		Resident of State	Delhi



ANNEXURE C – DECLARATION BY THE BIDDER

e-Tender Notification No: **ANERT-TECH/99/2022-T2**, dtd 26/04/202 for Request for Selection (RFS) of agency for the Implementation of 2 MW Solar Power Plant at Travancore Titanium Products Ltd., Kochuveli, Thiruvananthapuram under Solar City project funded by Smart City Thiruvananthapuram Ltd

To

The CEO
ANERT

We, the undersigned, declare that:

1. We have examined and have no reservations to the Bidding Document, including Addenda No.: **NA** (if any)
2. We offer to supply in conformity with the Bidding Document and in accordance with the delivery schedule
3. Our Bid shall be valid for a period of 6 months from the date fixed as deadline for the submission of tenders in accordance with the Bidding Document, and it shall remain binding upon us and may be accepted at any time before the expiration of that period.
4. If our Bid is accepted, we commit to submit a Security Deposit in the amount of 5 percent of the Contract Price for the due performance of the Contract.
5. We are not participating, as Bidders, in more than one Bid in this bidding process.
6. Our firm, its affiliates, or subsidiaries, including any subcontractors or suppliers for any part of the Contract, has not been declared ineligible by the ANERT or Government of Kerala.
7. We understand that this Bid, together with your written acceptance thereof, included in your notification of award, shall constitute a binding contract between us, until a formal Contract is prepared and executed.

✉ contact@oakridge.co.in

🌐 www.oakridge.co.in

CIN: U40101DL2012PTC240047

📍 **Regd. Office:** Oakridge Energy Pvt. Ltd., 6, Link Road, Jangpura Extension, New Delhi – 110014

📍 **Corporate Office:** Oakridge Energy Pvt. Ltd., 85/10, Saketjung Enclave, New Delhi – 110028





8. Our firm has obtained the certifications from MNRE or NABL approved Test. laboratories that the goods and services are satisfying the technical criteria. specified in the bid.

Date- 26/04/2023

Signature
Name-Rahul Malhotra - Director



contact@oakridge.co.in

www.oakridge.co.in

CIN: U40101DL2012PTC240047

Regd. Office: Oakridge Energy Pvt. Ltd., 6, Link Road, Jangpura Extension, New Delhi - 110014

Corporate Office: Oakridge Energy Pvt. Ltd., 85/10, Saketjung Enclave, New Delhi - 110028





ANNEXURE D – DECLARATION OF RELATIONSHIP WITH ANERT EMPLOYEE

Tender Notification No.: ANERT-TECH/99/2022-T2

Request for Selection (RFS) of agency for the Implementation of 2 MW Solar Power Plant at Travancore Titanium Products Ltd., Kochuveli, Thiruvananthapuram under Solar City project funded by Smart City Thiruvananthapuram Ltd

To

The CEO
ANERT

Name of the ANERT employee with Designation: **NIL**

Name of the bidder related to the employee: **NIL**

This is to put on record that Shri/Smt None currently working as **NA** in ANERT is related to **NA**, who is the bidder in the bid. We are aware of the Anti-corruption policy of ANERT and will observe the highest standards during the procurement and the execution of contract and shall retain corrupt, fraudulent, collusive, or coercive practices on competing for the contract.

Date – 26/04/2023



Signature

Name – Rahul Malhotra - Director

contact@oakridge.co.in

www.oakridge.co.in

CINEU40101DL20129TC240047

Regd. Office: Oakridge Energy Pvt. Ltd., 5, Link Road, Jangpura Extension, New Delhi - 110014

Corporate Office: Oakridge Energy Pvt. Ltd., 88/10, Safdarjung Enclave, New Delhi - 110028





प्रारूप 1
पंजीकरण प्रमाणपत्र

कॉर्पोरेट आईडी नम्बर: U40101DL2012PTC240547

2012 - 2013

श्री ए.एन.एस. प्रो.प्रा. प्रा. लि. के पक्ष

Oakridge Energy Private Limited

यह पंजीकरण, कानून में अधिनियम 1956, 1956 या 1956 के अधिनियम द्वारा किया गया है और यह
उपरोक्त कानून के तहत है।

यह निम्नलिखित जानकारी के साथ है कि यह कंपनी का नाम है और यह कंपनी का नाम है और यह

Form 1

Certificate of Incorporation

Corporate Identity Number: U40101DL2012PTC240547

2012 - 2013

hereby certify that Oakridge Energy Private Limited is this day incorporated under
the Companies Act, 1956 (No. 1 of 1956) and that the company is private limited.

Given at Delhi this Ninth day of August Two Thousand Twelve

Registrar of Companies

Registrar of Companies, National Capital Territory of Delhi and Haryana

कानून, 1956 के अधिनियम के तहत है और यह

Note: The corresponding form has been prepared by MCA 21, the Assistant Registrar of Companies and the
company has been digitally signed by the Registrar through a secure digital signature system under rule 5(2) of the
Companies (Electronic Filing and Authentication of Documents) Rules, 2006.
The digitally signed certificate can be verified at the MCA 21 website (www.mca21.gov.in)

कानून, 1956 के अधिनियम के तहत है और यह

Marine Address as per record available in Registrar of Companies office
Oakridge Energy Private Limited
5, JANK ROAD, JANGHURA EXT., NEW DELHI - 110014,
Delhi, India



Board Of Resolution

CERTIFIED TRUE COPY OF THE RESOLUTION PASSED BY THE BOARD OF DIRECTORS OF OAKRIDGE ENERGY PRIVATE LIMITED AT ITS MEETING HELD ON THURSDAY, 13TH APRIL 2023 AT 11:00 A.M, AT B6/10, SAFDARJUNG ENCLAVE, NEW DELHI - 110029

“RESOLVED THAT consent of the Board be and is hereby accorded to authorize Mr. Dilwar Singh, Director of the Company for executing a Power of Attorney in favor of Mr. Rahul Malhotra, Director (“the Attorney”) to submit tenders with any organization or authorities related to Solar Power Project.

RESOLVED FURTHER THAT any work carried out by the Attorney about the purposes mentioned above shall be valid and binding upon the Company.

RESOLVED FURTHER THAT any Director of the Company be and is hereby further authorized to do all such acts, deeds and things as may be necessary to give effect to this resolution.”

**Certified true copy
FOR OAKRIDGE ENERGY PRIVATE LIMITED**



**Dilwar Singh
(Director)
DIN: 10042450**



**AGENCY FOR NEW & RENEWABLE ENERGY
RESEARCH AND TECHNOLOGY (ANERT)**

Department of Power, Government of Kerala
Thiruvananthapuram, Kerala – 695 033;
www.anert.gov.in , projects@anert.in

E-TENDER DOCUMENT

***Request for Selection (RFS) of agency for the
Implementation of 2 MW Solar Power Plant at
Travancore Titanium Products Ltd., Kochuveli,
Thiruvananthapuram under Solar City project
funded by Smart City Thiruvananthapuram Ltd***

Ref. No.: ANERT-TECH/99/2022-T2

Date of Publishing of Bids : - 12/04/2023

Last Date of Submission of Bids : - 26/04/2023



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**AGENCY FOR NEW & RENEWABLE ENERGY
RESEARCH AND TECHNOLOGY (ANERT)**

Department of Power, Government of Kerala
Thiruvananthapuram, Kerala – 695 033;
www.anert.gov.in , projects@anert.in

E-TENDER DOCUMENT

***Request for Selection (RFS) of agency for the
Implementation of 2 MW Solar Power Plant at
Travancore Titanium Products Ltd., Kochuveli,
Thiruvananthapuram under Solar City project
funded by Smart City Thiruvananthapuram Ltd***

Ref. No.: ANERT-TECH/99/2022-T2

VOL – 1: GENERAL CONDITIONS

Date of Publishing of Bids : - 12/04/2023

Last Date of Submission of Bids : - 26/04/2023



E-TENDER NOTICE

Competitive e-tenders in two cover system with Earnest Money Deposit (EMD) and Price Bid are invited from experience and eligible bidders to participate in the ***Request for Selection (RFS) of agency for the Implementation of 2 MW Solar Power Plant at Travancore Titanium Products Ltd., Kochuveli, Thiruvananthapuram under Solar City project funded by Smart City Thiruvananthapuram Ltd.*** The e-tender documents can be downloaded from the e-tendering website of Govt. of Kerala. Tender form will not be available in any other form.

Bid documents which include Eligibility criteria, "Technical Specifications", various conditions of contract, formats, etc. can be downloaded from website www.etenders.kerala.gov.in. Any amendment (s)/corrigendum/clarifications with respect to this Bid shall be uploaded on the above website only. The Bidder should regularly follow up for any Amendment/Corrigendum/Clarification on the above website.

Thiruvananthapuram

CEO

12/04/2023



Page 1 of 109

Request for Selection (RFS) of agency for the Implementation of 2 MW Solar Power Plant at Travancore Titanium Products Ltd., Kochuveli, Thiruvananthapuram under Solar City project funded by Smart City Thiruvananthapuram Ltd

1294

TENDER ABSTRACT

Ref. No.	ANERT-TECH/99/2022-T2
Document Description	Implementation of 2 MWp Grid Connected Solar PV Power Plant at Travancore Titanium Products Ltd., Kochuveli, Thiruvananthapuram
Name of Work	Design, Supply, Engineering, Erection Testing, Commissioning of SPV Power Plant of cumulative capacity of 1 MWp with Grid connectivity along with 10 years of Operation & Maintenance at various
Site	Travancore Titanium Products Ltd., Kochuveli, Thiruvananthapuram
Download of Tender Form	http://www.etenders.kerala.gov.in
Last date of submission of Tender	26/04/2023 @ 03.00 PM
Date and Time of Bid opening (Techno-Commercial)	27/04/2023 @ 03.30 PM
Cost of Tender form	Rs. 11,800/- (Including GST)
EMD	Rs. 2,00,000/-
Warranty period	10-year warranty and complete Operation & Maintenance. Minimum guaranteed PR and CUF of the plant as specified in the Technical Specification to be maintained.
Availability of Tender Forms	Website http://www.etenders.kerala.gov.in
Place of opening of tender	Office of CEO, ANERT Law College Road, Vikas Bhavan. PO, Thiruvananthapuram – 695 033, Kerala
Thiruvananthapuram 12/04/2023	Sd/- CEO

Important Note: Prospective Bidders are requested to remain updated for any notices/amendments/clarifications etc. to the RFS document through the website www.anert.gov.in/www.etenders.kerala.gov.in. No separate notifications will be issued for such notices/amendments/clarification etc. in the print media or individually.

DISCLAIMER

1. Though adequate care has been taken while preparing the NIT document, the Bidders shall satisfy themselves that the document is complete in all respect. Intimation regarding any discrepancy shall be given to this office immediately. If no intimation is received from any Bidder within Ten (10) days from the date of notification of NIT / issuance of e-Tender documents, it shall be considered that the document is complete in all respect and has been received / acknowledged by the Bidder(s).
2. Agency for New and Renewable Energy Research and Technology (ANERT) reserves the right to modify, amend or supplement this document.
3. While this tender document has been prepared in good faith, neither ANERT nor their employees or advisors make any representation or warranty, express or implied, or accept any responsibility or liability, whatsoever, in respect of any statements or omissions herein, or the accuracy, completeness or reliability of information, and shall incur no liability under any law, statute, rules or regulations as to the accuracy, reliability or completeness of this document, even if any loss or damage is caused by any act or omission on their part.



GENERAL TERMS AND CONDITIONS FOR E-PROCUREMENT

This e-Tender is being published as the Request for Selection (RFS) of agency for the Implementation of 2 MW Solar Power Plant at Travancore Titanium Products Ltd., Kochuveli, Thiruvananthapuram under Solar City project funded by Smart City Thiruvananthapuram Ltd. The tender is invited in two cover system from experienced manufacturers / EPC contractors through e-procurement portal of Government of Kerala (www.etenders.kerala.gov.in). Prospective bidders willing to participate in this tender shall necessarily register themselves with above mentioned e-procurement portal.

The tender timeline is available in the critical date section of this tender published in www.etenders.kerala.gov.in

1. ONLINE BIDDER REGISTRATION PROCESS:

- 1.1 Bidders should have a Class III or above Digital Signature Certificate (DSC) to be procured from any Registration Authorities (RA) under the Certifying Agency of India. Details of RAs will be available on www.cca.gov.in. Once, the DSC is obtained, bidders have to register on www.etenders.kerala.gov.in website for participating in this tender. Website registration is a one-time process without any registration fees. However, bidders have to procure DSC at their own cost.
- 1.2 Bidders may contact e-Procurement support desk of Kerala State IT Mission over telephone at 0471- 2577088, 2577188, 2577388 or 0484 – 2336006, 2332262 - through email: helpetender@gmail.com/etendershelp@kerala.gov.in for assistance in this regard

2. ONLINE TENDER PROCESS:

The tender process shall consist of the following stages:

- i. Downloading of tender document: Tender document will be available for free download on www.etenders.kerala.gov.in. However, tender document fees shall be payable at the time of bid submission as stipulated in this tender document.



- ii. Publishing of Corrigendum: All corrigenda shall be published on www.etenders.kerala.gov.in and shall not be available elsewhere.
- iii. Bid submission: Bidders have to submit their bids along with supporting documents to support their eligibility, as required in this tender document on www.etenders.kerala.gov.in. No manual submission of bid is allowed and manual bids shall not be accepted under any circumstances.
- iv. In case bidder encounters any technical issues pertaining to e-Procurement system while acting on the tender, computer screen shot of the error message with date & time stamp on the web-browser along with the query shall be e-mailed by the bidder to the help desk (**helpetender@gmail.com/etendershelp@kerala.gov.in**), for resolution of the problem. At the same time, problem must be intimated to the concerned Tender Inviting Authority via email.
- v. The time taken to ascertain, evaluate and suggest a solution for the problem reported by bidder may vary from case to case. Hence bidders are advised to submit the bid **at least 2 working days before the due date** and time of bid submission to avoid any last-minute issues that may come up.
- vi. Opening of Bid and Bidder short-listing: The single cover bids will be opened, evaluated and shortlisted as per the eligibility. Failure to submit the required documents online will attract disqualification. Price bids of the qualified bidders will open on the day to be intimated to all bidders and the work will be awarded.

3. DOCUMENTS COMPRISING BID:

- 3.1 The 2-cover bid shall contain the scanned copies of the following documents which every bidder has to upload:
 - i. The tender document duly signed and sealed downloaded from the website.
 - ii. Pre-Agreement in the prescribed format (Annexure A) on Govt. of Kerala stamp paper worth Rs. 200/-
 - iii. Copy of Registration Certificate of the bidder firm
 - iv. Copy of PAN card



- v. The bidder must have an experience of successful commissioning of at least 5 MW SPV Power Plants in India.
- vi. Documentary evidence to support the bidders experience in any completed or ongoing SPV contract with a Govt. Department / Govt. undertaking / PSU / Private sector for having a single plant capacity not less than 1 MW. The plant shall be in operation at least 3 months before the date of opening of this bid proposal.
- vii. Documents to prove the annual Turnover of the bidder (audited statement)
- viii. Certifications required for proving technical compliance
- ix. Summary of bidders Technical Information (Annexure B)
- x. Declaration by the Bidder (format as in Annexure C)
- xi. Declaration of relationship with ANERT employee (format as in Annexure D)
- xii. The Price Schedule as per BOQ in Excel format for this tender to be downloaded from e-tender website, duly digitally signed by the tenderer/authorized signatory of the tender.
- xiii. Bill of Material

3.2 The department doesn't take any responsibility for any technical snag or failure that has taken place during document upload.

3.3 The Bidder shall complete the Price bid as per format given for download along with this tender.

Note: The blank price bid should be downloaded and saved on bidder's computer without changing file-name otherwise price bid will not get uploaded. The bidder should fill in the details in the same file and upload the same back to the website.

4. TENDER DOCUMENT FEES AND EARNEST MONEY DEPOSIT (EMD)

4.1 The Bidder shall pay, a tender document fee of Rs. 17,850/- and Earnest Money Deposit or Bid Security or Bid Bond of Rs. 2,00,000/-. The Bid security is required to protect the purchaser against risk of Bidder's conduct, which would warrant the forfeiture of security.



4.2 Online Payment modes: The tender document fees and EMD can be paid in through e-Payment facility provided by the e-Procurement system. Bidders can make payment only via Internet banking facility

State Bank of India Multi Option Payment System (SBI MOPS Gateway): Bidders are required to avail Internet Banking Facility in any of below banks for making tender remittances in eProcurement System.

A) Internet Banking Options (Retail)			
1	Allahabad Bank	32	Kotak Mahindra Bank
2	Axis Bank	33	Lakshmi Vilas Bank
3	Andhra Bank	34	Mehsana Urban Co-op Bank
4	Bandan Bank	35	NKGSB Co-operative Bank
5	Bank of Bahrain and Kuwait	36	Oriental Bank of Commerce
6	Bank of Baroda	37	Punjab and Maharashtra Cooperative Bank
7	Bank of India	38	Punjab National Bank
8	Bank of Maharashtra	39	Punjab and Sind Bank
9	Bassein Catholic Co-operative Bank	40	RBL Bank
10	BNP Paribas	41	Saraswat Cooperative Bank
11	Canara Bank	42	Shamrao Vithal Cooperative Bank
12	Catholic Syrian Bank	43	South Indian Bank
13	Central Bank of India	44	Standard Chartered Bank
14	City Union Bank	45	State Bank of India
15	Corporation Bank	46	Syndicate Bank
16	Cosmos Bank	47	Tamil Nadu Mercantile Bank
17	DCB Bank	48	Tamil Nadu Cooperative Bank
18	Dena Bank	49	The Kalyan Janata Sahakari Bank
19	Deutsche Bank	50	TJSB Bank
20	Dhanalaxmi Bank	51	UCO Bank
21	Federal Bank	52	Union Bank of India
22	HDFC Bank	53	United Bank of India
23	ICICI Bank	54	Vijaya Bank



24	IDBI Bank	55	YES Bank
25	Indian Bank		
26	Indian Overseas Bank		
27	IndusInd Bank		
28	Jammu & Kashmir Bank		
29	Janata Sahakari Bank		
30	Karnataka Bank		
31	Karur Vysya Bank		
B) Internet Banking Options (Corporate)			
1	Bank of Baroda	21	Laxmi Vilas Bank
2	Bank of India	22	Oriental Bank of Commerce
3	Bank of Maharashtra	23	Punjab & Maharashtra Coop Bank
4	BNP Paribas	24	Punjab & Sind Bank
5	Canara Bank	25	Punjab National Bank
6	Catholic Syrian Bank	26	RBL Bank
7	City Union Bank	27	Shamrao Vitthal Co-operative Bank
8	Corporation Bank	28	South Indian Bank
9	Cosmos Bank	29	State Bank of India
10	Deutsche Bank	30	Syndicate Bank
11	Development Credit Bank	31	UCO Bank
12	Dhanalaxmi Bank	32	Union Bank of India
13	Federal Bank	33	UPPCL
14	HDFC Bank	34	Vijaya Bank
15	ICICI Bank	35	Axis Bank
16	Indian Overseas Bank		
17	Janta Sahakari Bank		
18	Jammu & Kashmir Bank		
19	Karur Vysya Bank		
20	Kotak Bank		



During the online bid submission process, bidder shall select **SBI MOPS** option and submit the page, to view the **Terms and Conditions** page. On further submitting the same, the e-Procurement system will re-direct the bidder to MOPS Gateway, where two options namely **SBI** and **Other Banks*** will be shown. Here, Bidder may proceed as per below:

- a) SBI Account Holders shall click **SBI** option to with its Net Banking Facility, where bidder can enter their internet banking credentials and transfer the Tender Fee and EMD amount.
- b) Other Bank Account Holders may click **Other Banks** option to view the bank selection page. Here, bidders can select from any of the 54 Banks to proceed with its Net Banking Facility, for remitting tender payments.

**Transaction Charges for Other Banks vide SBI Letter No. LHO/TVM/AC/2016-17/47 – 1% of transaction value subject to a minimum of Rs. 50/- and maximum of Rs. 150/-*

** Bidders who are using Other Banks option under SBI MOPS Payment Gateway, are advised by SBI to make online payment 72 hours in advance before tender closing time.*

5. SUBMISSION PROCESS:

- 5.1 For submission of bids, all interested bidders have to register online as explained above in this document. After registration, bidders shall submit their Technical bid and Financial bid online on www.etenders.kerala.gov.in along with online payment of tender document fees and EMD.
- 5.2 For page-by-page instructions on bid submission process, please visit www.etenders.kerala.gov.in and click “Bidders Manual Kit” link on the home page.
- 5.3 It is necessary to click on “Freeze bid” link/ icon to complete the process of bid submission otherwise the bid will not get submitted online and the same shall not be available for viewing/ opening during bid opening process.



6. VALIDITY

- 6.1 The tender offer shall be kept valid for acceptance for a period of 3 months from the date of opening of offers. The offers with lower validity period are liable for rejection.
- 6.2 Further, the tenderer may extend the validity of the Bids without altering the substance and prices of their Bid for further periods, if so required

7. DEVIATIONS

- 7.1 The offers of the bidders with Deviations in Commercial terms and Technical Terms of the Tender Document are liable for rejection.

8. BLACK LIST

- 8.1 All the intending tenderers shall agree that in the event of the documents furnished with the offer being found to be bogus or the documents contain false particulars, they shall be blacklisted for future tenders/ association with ANERT and EMD shall be forfeited against any losses incurred by ANERT.

9. BIDDER'S LOCATION

- 9.1 The tenderers are requested to furnish the exact location of their factories/godown with detailed postal address and pin code, telephone and fax nos. etc. in their tenders to arrange inspection by ANERT, if considered necessary.
- 9.2 All communication shall be made to the registered email of the bidder in the e-tendering systems and ANERT shall not be responsible for non-receipt or delay of any such communication.



CONDITIONS OF CONTRACT

10. GENERAL CONDITIONS

- 10.1 The tenders should be submitted online at www.etenders.kerala.gov.in.
- 10.2 The tenders should be as per the prescribed form which should be downloaded from the e-tender website. The cost of tender forms should be paid online, and once paid will not be refunded. Tender forms are not transferable. Tenders that are not in the prescribed form are liable to be rejected.
- 10.3 Intending tenderers should submit their tenders on or before the due date and time mentioned in the tender abstract. Late tender will not be accepted.
- 10.4 The rates quoted should be only in Indian currency. Tenders in any other currency are liable to rejection. The rates quoted should be for the unit specified in the schedule attached.
- 10.5 The tenderer shall submit a copy of PAN card of the authorised signatory along with tender.
- 10.6 Tenders subject to conditions will not be considered. They are liable to be rejected on that sole ground.
- 10.7 The tenders will be opened on the specified day and time in the office of the CEO, ANERT in the presence of such of those tenderer's representatives who may be present with proper authorisation issued by the tenderer.
- 10.8 Every tenderer should send along with his tender an Earnest Money Deposit. This may be paid online at the e-tenders website.
- 10.9 If any tenderer withdraws from his e-tender before the expiry of the period fixed for keeping the rates firm for acceptance, the earnest money if any, deposited by him, will be forfeited.
- 10.10 The final acceptance/rejection of the tenders rests entirely with CEO, ANERT who do not bind themselves to accept the lowest or any tender.
- 10.11 In the case of materials of technical nature, the successful tenderer should be prepared to guarantee satisfactory performance for a period of guarantee under a definite penalty. Communication of acceptance of the e-tender normally constitutes a concluded contract. Nevertheless, the successful tenderer shall also

execute an agreement for the due fulfilment of the contract within the period to be specified in the letter of acceptance. The contractor shall have to pay all stamp duty, Lawyer's charges and other expenses incidental to the execution of the agreement. Failure to execute the agreement within the period specified will entail the penalties set out below:

- 10.11.1 The successful tenderer shall **a) deposit a sum @ 3% of the contract till the completion of Installation works. The deposit shall be in the form of a BG which shall be returned after COD (Commercial Operation Date).** There will be no exemption for MSE's in depositing this security amount. If the successful bidder fails to deposit the security and execute the agreement as stated above, the earnest money deposited by him will be forfeited to ANERT; and contract arranged elsewhere at the defaulter's risk and any loss incurred by ANERT on account of the purchase will be recovered from the defaulter who will however not be entitled to any gain accruing thereby.
- 10.11.2 In cases where a successful tenderer, after having made partial supplies fails to fulfil the contracts in full, all or any of the materials not supplied may at the discretion of the Purchasing Officer be purchased by means of another tender/quotation or by negotiation or from the next higher tenderer who had offered to supply already, and the loss if any caused to ANERT shall thereby together with such sums as may be fixed by ANERT towards damages be recovered from the defaulting tenderer.
- 10.12 Return the Security deposit shall, subject to the conditions specified herein to the contractor within three months after the expiration of the contract. But in the event of any dispute arising between ANERT and the contractor, ANERT shall be entitled to deduct out of the deposits or the balance thereof, until such dispute is determined the amount of such damages, costs, charges and expenses as may be claimed. The same may also be deducted from any other sum, which may be due at any time from ANERT to the contractor. In all cases where there are guarantee for the goods supplied, the security deposit will be released only after the expiry of the guarantee period.



(a) All payments to the contractors will be made by CEO ANERT in due course by NEFT transfer only

(b) All incidental expenses incurred by ANERT for making payments outside the State in which the claim arises shall be borne by the contractor.

10.13 The contractor shall not assign or make over the contract on the benefits or burdens thereof to any other person or body corporate. The contractor shall not underlet or sublet to any person or persons or body corporate the execution of the contract or any part thereof without the consent in writing of the purchasing officer who shall have absolute power to refuse such consent or to rescind such consent (if given) at any time if he is not satisfied with the manner in which the contract is being executed and no allowance or compensation shall be made to the contractor or the subcontractor upon such rescission. Provided always that if such consent be given at any time, the contractor shall not be relieved from any obligation, duty or responsibility under this contract.

10.14 In case the contractor becomes insolvent or goes into liquidation, or makes or proposes to make any assignment for the benefit of his creditors or proposes any composition with his creditors for the settlement of his debts, carries on his business or the contract under inspection or behalf of or his creditors or in case any receiving order(s) for the administration of his estate are made against him or in case the contractor shall commit any act of insolvency or in case in which under any clause or clauses any act of insolvency or in case in which under any clause(s) of this contract the contractor shall have rendered himself liable to damages amounting to the whole of his security deposits, the contract shall, thereupon, after notice given by the Purchasing Officer to the contractor, be determined and ANERT may complete the contract in such time and manner and by such persons as ANERT shall think fit. But such determination of the contract shall be without any prejudice to any right or remedy of ANERT against the contractor or his sureties in respect of any breach of contract committed by the contractor. All expenses and damages caused to ANERT by any breach of contract by the contractor shall be paid by the contractor to ANERT and may be recovered from him under the provisions of the Revenue Recovery Act in force in the State.



- 10.15 Any sum of money due and payable to the contractor (including security deposit returnable to him) under this contract may be appropriated by the CEO or any other person authorised by ANERT and set off against any claim of ANERT for the payment of a sum of money arising out of or under any other contract made by the contractor with ANERT or any other person authorised by ANERT. Any sum of money due and payable to the successful tenderer or contractor from ANERT shall be adjusted against any sum of money due to ANERT from him under any other contracts.
- 10.16 Every notice hereby required or authorised to be given may be either given to the contractor personally or left at his residence or last known place of abode or business, or may be handed over to his agent personally, or may be addressed to the contractor by post at his usual or last known place of abode or business and if so addressed and posted, shall be deemed to have been served on the contractor on the date on which in the ordinary course of post, a letter so addressed and posted would reach his place of abode or business.
- 10.17 The tenderer shall undertake the installation and commissioning of the system according to the standards and specification.
- 10.18 No representation for enhancement of rate once accepted will be considered.
- 10.19 Special conditions, if any, of the tenderers attached with the tenders will not be applicable to the contract unless they are expressly accepted in writing by the purchaser.
- 10.20 The tenderer should send along with this tender an agreement executed and signed in Kerala Stamp Paper of value Rs.200/-. A specimen form of agreement is given as Annexure A to this tender. Tenders without the agreement in stamped paper will be rejected outright.
- 10.21 Conditions in the technical document, technical specifications and special conditions of this tender document would override these general conditions, wherever applicable.
- 10.22 ANERT, by notice sent to the Supplier, may terminate the contract, in whole or in part, at any time for its convenience. The notice of termination shall specify that termination be for ANERT's convenience, the extent to which performance of the

Supplier under the contract is terminated, and the date upon which such termination becomes effective.

- 10.23 The E-tender shall be opened at the time and date announced in the tender notice, and the price bid will be evaluated as intimated vide auto generated email only.
- 10.24 In case any difference or dispute arises in connection with the contract, all legal proceedings relating to the matter shall be instituted in the Court within whose jurisdiction the CEO, ANERT voluntarily resides.
- 10.25 The Courts situated at the place where the headquarters of ANERT is situated viz, Thiruvananthapuram alone will have jurisdiction to entertain civil suits and all other legal pertaining to this contract.

11. SPECIAL CONDITIONS

- 11.1 Each bidder should submit only one (1) bid. Any bidder who submits/participates in more than one bid for the work shall be disqualified.
- 11.2 The tenders will be opened at the date and time advised in the Bidding Document. If the due date for receiving and opening the tender happens to be declared holiday, then the tender will be received and opened on the very next day, for which no prior intimation will be given.
- 11.3 If the bidder has NOT submitted the requisite EMD OR Agreement, OR if the price bid is not submitted along with the tender, such tenders will be summarily rejected.
- 11.4 During the tender evaluation, ANERT may seek more clarifications/details from any or all of the tenderers, if felt necessary.
- 11.5 The price bids of the tenderers, which submitted the required documents only will be opened and the L1 bidder will be awarded the work of supply and installation of items after fulfilling all the requirements.
- 11.6 If found essential, ANERT reserves the right, in the interest of completion of work within the time limit, to award portion/portions of the Work order to next higher bidders, called for negotiation in the increasing order of their price offers, if they agree to supply at the L1 price.



- 11.7 **The rate quoted should be all-inclusive including delivery of materials at the location to be specified, and the cost of materials and labour for the civil works, installation and commissioning, Warranties, Application fees, O&M charges, GST and all other expenses.**
- 11.8 The tender offer shall be kept valid for acceptance for a period of 6 months from the date of opening of bid. The offers with lower validity period are liable for rejection.
- 11.9 The evaluation of the price bid will be based on the grand total of all-inclusive amount quoted excluding GST.





Request for Selection (RFS) of agency for the Implementation of 2 MW Solar Power Plant at Travancore Titanium Products Ltd,
Kochuveli, Thiruvananthapuram under Solar City project funded by Smart City Thiruvananthapuram Ltd

1310



**AGENCY FOR NEW & RENEWABLE ENERGY
RESEARCH AND TECHNOLOGY (ANERT)**

Department of Power, Government of Kerala
Thiruvananthapuram, Kerala – 695 033;
www.anert.gov.in , projects@anert.in

E-TENDER DOCUMENT

***Request for Selection (RFS) of agency for the
Implementation of 2 MW Solar Power Plant at
Travancore Titanium Products Ltd., Kochuveli,
Thiruvananthapuram under Solar City project funded
by Smart City Thiruvananthapuram Ltd***

Ref. No.: ANERT-TECH/99/2022-T2

VOL – 2: SCHEDULE AND SCOPE OF WORKS

Date of Publishing of Bids : - 12/04/2023

Last Date of Submission of Bids : - 26/04/2023



REQUEST FOR SELECTION (RFS)

FOR

12. Implementation of 2 MWp Grid Connected Solar PV System to be installed at multiple locations within the Travancore Titanium Products Ltd., Kochuveli, Thiruvananthapuram

- 12.1 ANERT, therefore, invites bids from eligible bidders to participate in the Request for Selection in the e-tendering platform for Design, Manufacture, Supply, Erection, Testing and Commissioning including Warranty, Operation and Maintenance of Solar PV Power System at proposed location.
- 12.2 For the implementation of above-mentioned work, Bidders should submit their bid proposal online complete in all aspect on or before Last date of Bid Submission.
- 12.3 Bid documents, which include Eligibility Criteria, Technical Specifications, various Conditions of Contract, and Formats etc., can be downloaded from website www.anert.gov.in. It is mandatory to download official copy of E-TENDER Document from Kerala Tenders Portal. Any amendment(s)/corrigendum/clarification(s) with respect to this Bid shall be uploaded on www.etenders.kerala.gov.in. The Bidder should regularly check for any Amendment(s)/Corrigendum/Clarification(s) on the above website only.
- 12.4 The scope of work includes:
- 12.4.1 Design, Engineering, Manufacture, Supply, Storage, Civil work, Erection, Testing & Commissioning of the Grid connected PV Project including Power evacuation, Operation and Maintenance (O & M) of the project for a period of 10 years for after commissioning of project.

13. DEFINITIONS & ABBREVIATIONS

a) In this “Bid / RFS Document” the following words and expression will have the meaning as herein defined where the context so admits:

13.1 **“Affiliate”** shall mean a company that either directly or indirectly



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Request for Selection (RFS) of agency for the Implementation of 2 MW Solar Power Plant at Travancore Titanium Products Ltd., Kochuveli, Thiruvananthapuram under Solar City project funded by Smart City Thiruvananthapuram Ltd

- a. controls or
 - b. is controlled by or
 - c. is under common control with
- 13.2 A Bidding Company and **“control”** means ownership by one company of at least twenty-six percent (26%) of the voting rights of the other company.
- 13.3 **“B.I.S”** shall mean specifications of Bureau of Indian Standards (BIS);
- 13.4 **“Bid”** shall mean the Techno Commercial and Price Bid submitted by the Bidder along with all documents/credentials/attachments annexure etc., in response to this RFS, in accordance with the terms and conditions hereof.
- 13.5 **“Bidder/Bidding Company”** shall mean Bidding Company submitting the Bid. Any reference to the Bidder includes Bidding Company / including its successors, executors and permitted assigns as the context may require;
- 13.6 **“Bid Deadline”** shall mean the last date and time for submission of Bid in response to this RFS as specified in the Tender Abstract;
- 13.7 **“Bid Capacity”** shall mean capacity offered by the bidder in his Bid.
- 13.8 **“CEA”** shall mean Central Electricity Authority.
- 13.9 **“Chartered Accountant”** shall mean a person practicing in India or a firm whereof all the partners practicing in India as a Chartered Accountant(s) within the meaning of the Chartered Accountants Act, 1949;
- 13.10 **“Competent Authority”** shall mean (Designation of Competent Authority) of [Name of the Organization] himself and/or a person or group of persons nominated by MD for the mentioned purpose herein;
- 13.11 **“Commissioning,”** means Successful operation of the Project / Works by the Contractor, for carrying out Performance Test(s) as defined in RFS.
- 13.12 **“Company”** shall mean a body incorporated in India under the Companies Act, 1956 or Companies Act, 2013 including any amendment thereto;
- 13.13 **Commercial Operation Date:** The date of successful conducting field acceptance tests and injection of power at delivery point shall be the "Commercial Operation Date"
- 13.14 **“Capacity Utilization Factor” (CUF)** shall mean the ratio of actual energy generated by SPV project over the year to the equivalent energy output of its



rated capacity over the yearly period.

$$CUF = \frac{\text{actual annual energy generated from the plant in kWh}}{(\text{installed plant capacity in kW} * 365 * 24)}$$

13.15 **"Eligibility Criteria"** shall mean the Eligibility Criteria as set forth in Clause 16 of this RFS;

13.16 **"Financially Evaluated Entity"** shall mean the company which has been evaluated for the satisfaction of the Financial Eligibility Criteria set forth in Clause 16.3 hereof;

13.17 **"IEC"** shall mean specifications of International Electro-Technical Commission;

13.18 **"kWp"** shall mean kilo-Watt Peak;

13.19 **"kWh"** shall mean kilo-Watt-hour;

13.20 **"MNRE"** shall mean Ministry of New and Renewable Energy, Government of India;

13.21 **"O&M"** shall mean Operation & Maintenance of Solar PV system for PPA period.

13.22 **"Owner of the project"** shall mean MILMA Ernakulam Diary, shall mean anyone who has ownership (including lease ownership also) of the land / roof and is the legal owner of all equipments of the project. Owner of the project can enter into a PPA with the consumer (s) of power for supply of solar power for agreed time (years) from the date of Commissioning of project.

13.23 **"Project Cost / Project Price"** shall mean the price offered by the Bidder for the Scope of work as per RFS document for the site.

13.24 **"Project capacity"** means Capacity in kWp offered by the Bidder. The project capacity specified is on "DC" output Side only.

13.25 **"Performance Ratio" (PR) means**

"Performance Ratio" (PR) means the ratio of plant output versus installed plant capacity at any instance with respect to the radiation measured.

$$PR = \frac{\text{Measured output in kW}}{\text{Installed Plant capacity in kW} * (1000 / \text{Measured radiation intensity in W/m}^2)}$$

13.26 **"Parent"** shall mean a company, which holds more than 51% equity either directly or indirectly in the Bidding Company or Project Company or a Member in a Consortium developing the Project

13.27 **"Project Company"** shall mean Company incorporated by the bidder as per



Indian Laws in accordance with Clause no 16.1.

13.28 **"Price Bid"** shall mean BoQ, containing the Bidder's quoted Price as per the Volume- IV of this RFS;

13.29 **"Qualified Bidder"** shall mean the Bidder(s) who, after evaluation of their Techno Commercial Bid stand qualified for opening and evaluation of their Price Bid;

13.30 **"RFS"** shall mean Request for Selection (RFS)/Bid document/Tender document

13.31 **"Statutory Auditor"** shall mean the auditor of a Company appointed under the provisions of the Companies Act, 1956 or under the provisions of any other applicable governing law;

13.32 **"Successful Bidder(s) /Contractor/Project Developers(s)"** shall mean the Bidder(s) selected by Owner pursuant to this RFS for Implementation of Grid Connected Ground mounted Solar PV System as per the terms of the RFS Documents, and to whom an Allocation Letter has been issued;

13.33 **"Site"** shall mean the project location at the address mentioned below.

MILMA Ernakulam Dairy, Thrippunithura PO., Ernakulam-682 301

13.34 **"SNA"** shall mean State Nodal Agency, ANERT.

13.35 **"Tendered Capacity"** shall mean the Total aggregate capacity in MW proposed to be tendered by ANERT to the Successful Bidder through this bidding process as per terms and conditions specified therein;

13.36 **"Ultimate Parent"** shall mean a company, which owns at least more than fifty percent (51%) equity either directly or indirectly in the Parent and Affiliates.

13.37 **"Wp"** shall mean Watt Peak.

13.38 **2MWp** for the purpose of conversion in **kWp** shall be considered as 2000kWp.

b) INTERPRETATIONS

- i. Words comprising the singular shall include the plural & vice versa
- ii. An applicable law shall be construed as reference to such applicable law including its amendments or re-enactments from time to time.
- iii. A time of day shall save as otherwise provided in any agreement or document be construed as a reference to Indian Standard Time.
- iv. Different parts of this contract are to be taken as mutually explanatory and



supplementary to each other and if there is any differentiation between or among the parts of this contract, they shall be interpreted in a harmonious manner to give effect to each part.

- v. The table of contents and any headings or sub headings in the contract has been inserted for case of reference only & shall not affect the interpretation of this agreement.



INTRODUCTION, BID DETAILS AND INSTRUCTIONS TO THE BIDDERS

14. INTRODUCTION

- 14.1 ANERT, on behalf of Smart City Thiruvananthapuram Ltd, hereby invites interested companies to participate in the bidding process for the selection of Successful Bidder(s) for implementation of grid-connected Solar Photovoltaic Project under CAPEX model in Travancore Titanium Products Ltd., Kochuveli, Thiruvananthapuram.
- 14.2 The Bidders are advised to read carefully all instructions and conditions appearing in this document and understand them fully. All information and documents required as per the bid document must be furnished. Failure to provide the information and / or documents as required may render the bid technically unacceptable.
- 14.3 The bidder shall be deemed to have examined the bid document, to have obtained his own information in all matters whatsoever that might affect the carrying out the works in line with the scope of work specified elsewhere in the document at the offered rates and to have satisfied himself to the sufficiency of his bid. The bidder shall be deemed to know the scope, nature and magnitude of the works and requirement of materials, equipment, tools and labour involved, wage structures and as to what all works, he has to complete in accordance with the bid documents irrespective of any defects, omissions or errors that may be found in the bid documents.

15. BID DETAILS

- 15.1 The bidding process under this RFS is for a 2 MWp cumulative capacity of SPV Power Plant at Travancore Titanium Products Ltd., Kochuveli, Thiruvananthapuram. This includes 1.5 MWp installation to be done in Ground and 500 kWp in the Rooftop of various buildings within TTL campus.



BID QUALIFICATION REQUIREMENTS

16. ELIGIBILITY CRITERIA

16.1 General

- i. The Bidder should be either a body incorporated in India under the Companies Act, 1956 or 2013 including any amendment thereto, Sole Proprietorship, Partnership company and engaged in the business of Solar Power.
- ii. A copy of certificate of incorporation shall be furnished along with the bid in support of above.

16.2 Technical Eligibility Criteria:

The Bidder should have installed & commissioned Grid connected Solar PV Power Project having a capacity of single plant not less than 1 MW and cumulative capacity of above 5 MW, which should have been commissioned at least two months prior to Techno-Commercial Bid Opening date. The list of projects commissioned at least 2 months prior to Techno-Commercial Bid Opening date, indicating whether the project is grid connected, along with a copy of the Commissioning certificate and Work order / Contract / Agreement/ from the Client/Owner shall be submitted in support of Clause 16.2.

16.3 Financial eligibility criteria

The Bidder should have an Annual Turnover or Net worth as indicated below.

- i. The Minimum Average Annual turnover of Rupees 8 Crores in any two of the last 5 financial years preceding the Bid Deadline subject to the condition that the Bidder should at least have completed two financial years.

OR

- ii. Net worth equals to or greater than the value calculated at rate of Rs. 10 Crores. The Computation of Net worth shall be based on unconsolidated audited annual accounts of the last financial year immediately preceding the Bid Deadline. Share



premium can be included in the Net-worth calculation in case of listed companies in India only.

The formula of calculation of net-worth shall be as follows:

Net-worth = (Paid up share capital) + {(Free reserves - Share premium) + Share premium of listed companies}} - (Revaluation of reserves)- (Intangible assets) - (Miscellaneous expenditure to the extent not written off and carry forward losses).

For the purposes of meeting financial requirements, only unconsolidated audited annual accounts shall be used. Bidders shall furnish documentary evidence as per the Format - 5, duly certified by Authorized Signatory and the Statutory Auditor / Practising Chattered Accountant of the Bidding Company in support of their financial capability.

16.4 Bid submission by the bidder

16.4.1 The Bidder shall submit the information and/or documents as per the formats specified in Volume-IV.

16.4.2 Strict adherence to the formats wherever specified, is required. Wherever, information has been sought in specified formats, the Bidder shall refrain from referring to brochures /pamphlets. Non-adherence to formats and / or submission of incomplete information may be a ground for declaring the Bid as non-responsive. Each format has to be duly signed and stamped by the authorized signatory of the Bidder.

16.4.3 The Bidder shall furnish documentary evidence in support of meeting Eligibility Criteria as indicated in Clause no. 16.1, 16.2 and 16.3 to the satisfaction of ANERT. They shall also furnish unconsolidated/consolidated audited annual accounts in support of meeting financial requirement, which shall consist of balance sheet, profit and loss account, profit appropriation account, auditors report, etc., as the case may be of Bidding Company or Financially Evaluated Entity for any of the last three(3) financial years immediately preceding the Bid Deadline which are used by the bidder for the purpose of calculation of Annual Turnover or of last Financial Year in case of Net Worth.



16.4.4 In case the annual accounts for the latest financial year are not audited and therefore the bidder cannot make it available, the applicant shall give certificate to this effect from their CEOs. In such a case, the Applicant shall provide the Audited Annual Reports for 3 (Three) years preceding the year or from the date of incorporation if less than 3 years for which the Audited Annual Report is not being provided.

16.5 Amendments to RFS

16.5.1 At any time prior to the deadline for submission of Bids, ANERT may, for any reason, whether at its own initiative or in response to a clarification requested by a prospective Bidder, modify the RFS document by issuing clarification(s) and/or amendment(s).

16.5.2 The clarification(s) / amendment(s) (if any) may be notified on Kerala Tenders website www.etenders.kerala.gov.in at least Two (2) days before the proposed date of submission of the Bid. If any amendment is required to be notified within Two (2) days of the proposed date of submission of the Bid, the Bid Deadline may be extended for a suitable period.

16.5.3 ANERT will not bear any responsibility or liability arising out of non-receipt of the information regarding Amendments in time or otherwise. Bidders must check the website for any such amendment before submitting their Bid.

16.5.4 In case any amendment is notified after submission of the Bid (prior to the opening of Techno-Commercial Bid.

16.5.5 All the notices related to this Bid which are required to be publicized shall be uploaded on website www.etenders.kerala.gov.in

16.6 Bidding process

16.6.1 Bid formats

The Bid shall comprise of the following:

(A) Cover I - Techno-Commercial documents

i. Covering Letter as per the prescribed Format-1



- ii. Copy of PAN and TAN certificates of Bidding company
- iii. Original power of attorney issued by the Bidding Company in favour of the authorized person signing the Bid, in the form attached hereto as Format-2 or standard power of attorney in favour of authorized person signing the Bid. (Power of Attorney must be supplemented by Board Resolution to above effect for the company). However, ANERT may accept general Power of Attorney executed in favour of Authorised signatory of the Bidder, if it shall conclusively establish that the signatory has been authorized by the Board of CEOs to execute all documents on behalf of the Bidding Company.
- iv. General particulars of bidders as per Format-3
- v. Document in support of meeting Eligibility Criteria as per Clause no. 16.1 & 16.2.
- vi. Certificates of incorporation of Bidding company
- viii. Details for meeting Financial Eligibility Criteria as per Clause no. 16.3 along with documentary evidence for the same as per Format -4
- ix. Board resolution for Authorised signatory
- x. Signed and stamped Copy of RFS Documents including amendments & clarifications by Authorised signatory on each page.

(B) Cover II- Price bid

The Bidder shall inter-alia take into account the following while preparing and submitting the Price Bid digitally signed by the authorized signatory. The Bidder shall submit Price Bid in excel BoQ file downloaded from the e-tender website.

16.7 Validity of Bid

- 16.7.1 The bid and the Price Schedule included shall remain valid for a period of 3 months from the date of techno-commercial bid opening, with bidder having no right to withdraw, revoke or cancel his offer or unilaterally vary the offer submitted or any terms thereof. In case of the bidder revoking or cancelling his offer or varying any term & conditions in regard thereof or not accepting letter of allocation, ANERT shall forfeit the Bid Bond furnished by him.



16.7.2 In exceptional circumstances when letter of acceptance is not issued, ANERT may solicit the Bidder's consent to an extension of the period of validity. The request and the responses thereto shall be made in writing. The EMD provided shall also be suitably extended. A Bidder may refuse the request without forfeiting its Bid Bond. A Bidder granting the request will neither be required nor permitted to modify its Bid in any manner.

16.8 Cost of bidding

The bidder shall bear all the costs associated with the preparation and submission of his offer, and ANERT will in no case be responsible or liable for those costs, under any conditions. The Bidder shall not be entitled to claim any costs, charges and expenses of and incidental to or incurred by him through or in connection with his submission of bid even though ANERT may elect to modify / withdraw the invitation of Bid.

16.9 Performance Security / Performance Bank Guarantee (PBG)

- 16.9.1 Within 30 days from the date of issue of Allocation letter, Successful Bidder shall furnish the Performance Security @ 3% of the total contract value.
- 16.9.2 The Performance Security shall be denominated in Indian Rupees and shall be in one of the following forms:
 - a. A demand draft, or a bank guarantee in the format given in Format-4 from any nationalised bank.
 - b. Be confirmed for payment by the branch of the bank giving the bank guarantee at Thiruvananthapuram.
- 16.9.3 The PBG shall be forfeited as follows without prejudice to the Bidder being liable for any further consequential loss or damage incurred to ANERT, if the Successful Bidder is not able to commission the projects to the satisfaction of ANERT.
- 16.9.4 The Performance Security shall be valid for a minimum period of 6 months from the date of issue of LoA

16.10 Right to withdraw the RFS and to reject any bid

- 16.10.1 This RFS may be withdrawn or cancelled by ANERT at any time without assigning any reasons thereof. ANERT further reserves the right, at its



complete discretion, to reject any or all of the Bids without assigning any reasons whatsoever and without incurring any liability on any account.

16.10.2 ANERT reserve the right to interpret the Bid submitted by the Bidder in accordance with the provisions of the RFS and make its own judgment regarding the interpretation of the same. In this regard ANERT shall have no liability towards any Bidder and no Bidder shall have any recourse to ANERT with respect to the selection process. ANERT shall evaluate the Bids using the evaluation process specified in Volume - III, at its sole discretion. ANERT's decision in this regard shall be final and binding on the Bidders.

16.10.3 ANERT reserves its right to vary, modify, revise, amend or change any of the terms and conditions of the Bid before submission. The decision regarding acceptance or rejection of bid by ANERT will be final.

16.11 Zero Deviation

This is a ZERO Deviation Bidding Process. Bidder is to ensure compliance of all provisions of the Bid Document and submit their Bid accordingly. Tenders with any deviation to the bid conditions shall be liable for rejection.

16.12 Examination of Bid document

16.12.1 The Bidder is required to carefully examine the Technical Specification, terms and Conditions of Contract, and other details relating to supplies as given in the Bid Document.

16.12.2 The Bidder shall be deemed to have examined the bid document including the agreement/contract, to have obtained information on all matters whatsoever that might affect to execute the project activity and to have satisfied himself as to the adequacy of his bid. The bidder shall be deemed to have known the scope, nature and magnitude of the supplies and the requirements of material and labour involved etc. and as to all supplies he has to complete in accordance with the Bid document.

16.12.3 Bidder is advised to submit the bid on the basis of conditions stipulated in the Bid Document. Bidder's standard terms and conditions if any will not be considered. The cancellation / alteration / amendment / modification in Bid documents shall not be accepted by ANERT.



16.12.4 Bid not submitted as per the instructions to bidders is liable to be rejected. Bid shall confirm in all respects with requirements and conditions referred in this bid document.



SCOPE OF WORK

17. SCOPE OF WORKS

The scope includes the Supply, Installation, Testing and Commissioning of Rooftop On-Grid SPV power plants. All the necessary approvals from KSEBL/Electrical Inspectorate, feasibility study, necessary civil work, Mounting of Module Structures, PV Module Installation, Inverter Installation, DC/AC Cabling and interconnections, Installation of Lightning Arresters and Earthing System as per the standards, Arranging all the necessary inspections from KSEBL/Electrical Inspectorate/ANERT District Office as part of Pre-Commissioning, if any, Commissioning of the PV Power Plant along with warranty and Operation and Maintenance (O&M) of the project under CAPEX model for 10 years after Commercial Operation Date (COD) are coming under the scope of the bidder.

The total project comprises of 500 kWp Rooftop Solar Power plant and 1500 kWp Ground Mounted Solar Power plant. The successful bidder reserves the right to finalise the capacity being installed at these locations identified within the area available with due approval of ANERT/TTL authorities.

17.1 LOCATION DETAILS

The location of installation of the proposed 2 MWp Solar Power plant is at Travancore Titanium Products Ltd., Kochuveli, Thiruvananthapuram, Kerala.

Site Name	Travancore Titanium Products Ltd., Kochuveli
Area available	Rooftop (Various buildings as listed below) and Ground of area 13000 Sqm.
District	Thiruvananthapuram
State	Kerala
Latitude	8°29'57.73"N
Longitude	76°54'5.13"E
Nearest National Highway	NH-66
Nearest Village/Town	Kochuveli

Nearest Railway Station	Kochuveli (3 km from the site)
Nearest Airport	Trivandrum International Airport (5 km from the site)
Nearest KSEB Substation	Within the Campus

The Proposed 1.5 MW Solar Power Plant is to be installed on the area marked below



The balance 500 kWp is to be installed at the Rooftops of Buildings listed below:

#	Name of Block / Building	Capacity (kW)
1	Canteen	200
2	Locker Room	75
3	CLSS	75
4	Lime Storage Area	50
5	Filter Press	50
6	Time Office	25
7	66 kV Substation	25
TOTAL		500



The bidders are to quote the per kW cost for the successful Supply, Testing, Installation and Commissioning of the Power plants as per the capacity mentioned for Rooftop as well as Ground mounted system. The full work will be awarded to the lowest bidder for the 2000 kWp. The cost of O&M will not form part of the selection of the L1 bidder.

17.2 ADDITIONAL WORKS

- i. The successful bidder is to borne the fee for KSEBL feasibility, Registration and all other expenses. The additional costs for site specific cabling works, earthing, mounting structure modifications, required civil works etc to meet the technical criteria as detailed in this document are under the scope of the bidder.
- ii. The scope of enhancing load, phase conversion, changing of CTs, PT, modification of Panel boards, extension of bus bars, replacement of metering panel boards etc wherever necessary is under the scope of the bidder. The rates for the same are to be considered in the bid for each site.
- iii. In case of installations to be made in sites with HT connection, the replacement of CTs (Class 0.2s), PT (Class 0.2) of rating is under the scope of the vendor. The rates for Supply of tested transformers & Replacement at the site of these items to be quoted along with the bid.
- iv. It is mandatory that the bidders are to visit the sites and quote the rates considering all the requirements as mentioned in this tender document. No requests for revision of rates will be entertained. In case, the successful bidder is not undertaking the specific work, the work will be cancelled and disciplinary proceedings will be initiated against the bidder and all payments due will be withheld. Hence, Bidders are requested to visit the site before quoting and the rate for successful commissioning in all aspects is to be quoted.
- v. **The rate quoted should be all inclusive including delivery of materials, the cost of materials and labour for the civil works, Installation and Commissioning, 10-year Warranty, fee for approval from the KSEBL, Electrical Inspectorate if any, Solar Meter, Remote monitoring Facility, Insurance, GST and all other expenses deemed necessary for the proper**



implementation of the conditions and specification as in-corporated in the tender.

- vi. The Operation and Maintenance of the Power plant for the whole period of warranty will be duty of the vendor. The rates for O&M per year need to be quoted in the BoQ file provided.**
- vii. The Component wise split up of the costs in percentage for each capacity is to be included as part of the technical bid (included as format 6).**
- viii. Any other work required for the successful commissioning of the power plant which are not mentioned in this document and are required as per prevailing laws & regulations in the country**

17.3 SUBMITTALS

On commencement of the Project, the Contractor shall submit the following to ANERT:

- a. Prior to the technical submittals, the contractor shall submit detailed baseline program and methodology indicating the proposed overall schedule for documentation such as calculations, shop/ working drawings, plan/ procedures and records. Submission of samples, process of fabrication / delivery to site storage yard for the approval of the Employer. Also, Contractor shall submit Method statements and Quality Assurance plan for each activity to be done and get approval from ANERT before commencing the work. Contractor shall maintain the necessary Quality and Quantity documentation. All the documents shall be submitted to Employer for their review and records.
- b. Detailed work procedures and schedules shall be submitted by contractor at least one month before start of work and shall get necessary approval from ANERT authorities and various entities. If required meeting shall be called to settle all the open issues. Contractor to ensure that all issues are closed one month prior to start of work.
- c. Complete fabrication drawings, materials list, cutting lists, bolt lists, welding schedules and QC schedules, based on the design drawing furnished to him and in accordance with the approved schedule. It is highlighted that structural steel



members, dimensions thereof indicated in tender drawings are tentative only, and may be modified during final design stage.

- d. Results of any tests, as and when conducted and as required by Employer.
- e. A detailed list of all constructional Plant & Equipment, such as cranes, derricks, winches, welding sets etc. their makes, model, present condition and location, available to the contractor and the ones he will employ on the job to maintain the progress of work in accordance with the contract.
- f. The total number of experienced personnel of each category, like fitters, welders, riggers etc., which he intends to deploy on the project.
- g. The contractor shall submit complete design calculations for any alternative sections proposed by him, for the approval of Employer and records of Owner.

18. PROJECT COST

18.1 The Project cost shall include all the costs related to above Scope of Work. Bidder shall quote for the entire facilities on a “single responsibility” basis such that the total Bid Price covers all the obligations mentioned in the Bidding Documents in respect of Design, Supply, Erection, Testing and Commissioning including Warranty, Operation & Maintenance for a period 10 years under CAPEX model, goods and services including spares required if any during O&M period. The Bidder has to take all permits, approvals and licenses, Insurance etc., provide training and such other items and services required to complete the scope of work mentioned above.

18.2 The Project cost shall remain firm and fixed and shall be binding on the Successful Bidder till completion of work. No escalation will be granted on any reason whatsoever. The bidder shall not be entitled to claim any additional charges, even though it may be necessary to extend the completion period for any reasons whatsoever.

18.3 The cost shall be inclusive of all duties and taxes, insurance etc. The prices quoted by the firm shall be complete in all respect and no price variation /adjustment shall be payable during the 10-year period.

18.4 The Operation & Maintenance of Solar Photovoltaic Power Plant would include wear, tear, overhauling, machine breakdown, insurance, and replacement of



defective modules, invertors / Power Conditioning Unit (PCU), spares, consumables & other parts for a period of 10 years.

- 18.5 The cost shall be specified in sanction letter based on Successful Bidder's quote for the project. The project cost shall be in accordance with all terms, conditions, specifications and other conditions of the Contract as accepted by ANERT and incorporated into the sanction letter.

19. INSURANCE

- 20.1 The Bidder shall be responsible and take an Insurance Policy for transit-cum-storage-cum-erection for all the materials to cover all risks and liabilities for supply of materials on site basis, storage of materials at site, erection, testing and commissioning. The bidder shall also take appropriate insurance during O&M period.
- 20.2 The Bidder shall also take insurance for Third Party Liability covering loss of human life, engineers and workmen and also covering the risks of damage to the third party/material/equipment/properties during execution of the Contract. Before commencement of the work, the Bidder will ensure that all its employees and representatives are covered by suitable insurance against any damage, loss, injury or death arising out of the execution of the work or in carrying out the Contract. Liquidation, Death, Bankruptcy etc., shall be the responsibility of bidder.

20. WARRANTIES AND GUARANTEES

The Bidder shall warrant that the goods supplied under this contract are new, unused, of the most recent or latest technology and incorporate all recent improvements in design and materials. The bidder shall provide system warrantee covering the rectification of any and all defects in the design of equipment, materials and workmanship including spare parts for a period of the 10-years from the date of commissioning. The successful bidder has to transfer all the Guarantees /Warrantees of the different components to the Owner of the project. The responsibility of operation of Warrantee and Guarantee clauses and Claims/ Settlement of issues arising out of said clauses shall be



joint responsibility of the Successful bidder and the owner of the project and ANERT will not be responsible in any way for any claims whatsoever on account of the above.

21. TYPE AND QUALITY OF MATERIALS AND WORKMANSHIP

- 22.1 The Design, Engineering, Manufacture, Supply, Installation, Testing and Performance of the equipment shall be in accordance with latest appropriate IEC/Indian Standards as detailed in the Vol- III (Technical specifications) of the bid document. Where appropriate Indian Standards and Codes are not available, other suitable standards and codes as approved by the MNRE / authorised Government agency shall be used.
- 22.2 The specifications of the components should meet the technical specifications mentioned in Volume III.
- 22.3 Any supplies which have not been specifically mentioned in this Contract but which are necessary for the design, engineering, manufacture, supply & performance or completeness of the project shall be provided by the Bidder without any extra cost and within the time schedule for efficient and smooth operation and maintenance of the SPV plant.

22. OPERATION & MAINTENANCE

- i. The bidder shall be responsible for Operation and Maintenance of the Solar PV system for the 10-year period, during which ANERT will monitor the project for effective performance in line with conditions specified elsewhere in the bid document. During this period, the bidder shall be responsible for supply of all spare parts as required from time to time for scheduled and preventive maintenance, major overhauling of the plant, replacement of defective modules, inverters, PCU's etc and maintaining log sheets for operation detail, deployment of staff for continuous operations and qualified engineer for supervision of O&M work, complaint logging & its attending.
- ii. If any Operation & Maintenance issues are not resolved within 7 days, then complaint may be raised to ANERT, pursuant to which a penalty as decided by CEO, ANERT will be imposed.



- iii. If the outage of the plant is more than 30 days continuously, then the 50% PBG amount shall be encashed by ANERT.
- iv. If the outage is exceedingly more than 60 days then complete PBG amount shall be encashed by Owner. (This will be applicable till 10 years of O&M as per the Scope of the RFS.) Legal proceedings and other as deemed necessary by CEO, ANERT will be initiated against the defaulted contractor.

23. METERING AND GRID CONNECTIVITY

Metering and grid connectivity of the solar PV system under this project would be the responsibility of the Bidder in accordance with the prevailing guidelines of the concerned DISCOM and / or CEA (if available by the time of implementation). The bidder need to connectivity and the entire responsibility lies with bidder only. This particular power plant will be connected to the 11 kV bus at the 66 kV Substation under Captive consumer category.

24. PLANT PERFORMANCE EVALUATION

The successful bidder shall be required to meet minimum guaranteed generation with Performance Ratio (PR) at the time of commissioning and related Capacity Utilization Factor (CUF) as per the GHI levels of the location during the O&M period. PR should be shown minimum of 75% at the time of inspection for initial commissioning acceptance. Minimum CUF shall not be less than 21% for a period of 10 years. The bidder should send the periodic plant output details to ANERT for ensuring the CUF. The PR will be measured at Inverter output level during peak radiation conditions.

25. PROGRESS REPORT

The bidder shall submit the progress report monthly to ANERT in Prescribed Proforma. ANERT will have the right to depute his/their representatives to ascertain the progress of contract at the premises of works of the bidder.



26. SCHEDULE OF SUPPLY

- i. The items should be delivered and installed at the sites of institution for which work order shall be given and specified by ANERT, under prior intimation and supervision of ANERT. The list of sites is listed below:
- ii. If the successful bidder fails to deliver the materials within the days mentioned below, the order stands cancelled and ANERT will award the work to the next bidder and penalty as decided by ANERT will be levied.

#	Capacity of Solar Plant	Material Delivery (Days)	Completion Period (Days)
1	2 MWp	25	45

- iii. For any delay in Installation and Commissioning beyond the period mentioned above, the ANERT will charge penalty of 0.5% of the order value/week or part thereof, subject to the cost not exceeding 10% of the total cost. Order will be cancelled if the delay of service is more than this time period and work will be issued to the second successful bidder
- iv. Bidders are to submit their quotes only after visiting the site and the details of additional works required for the successful commissioning of the power plant is to be mentioned in the technical bid. No additional amount for any works will be provided under any circumstance, even if the site requires additional work other than quoted by the bidder. Hence, special care must be taken while submitting the bids.
- v. Supply of the SPV module must be from the ALMM list issued by MNRE from time to time. The test certificates and reports of the inverters being used for the project must be submitted along with the bid. ANERT reserves the right to reject the bid based on the non-conformity of the inverter being supplied.
- vi. The successful bidder shall submit the detailed BoM and the timeline for completion along with the agreement and security deposit. This timeline must be followed and no extension of time for completing the installation will be granted. Although, time extension may be granted for things beyond the control of the bidder.



- vii. In case of no valid reason, extension of time of completion that can be granted at a time shall will be 25% of the original time. The maximum extension that can be granted for a work shall be limited to half the original time of completion.
- viii. When the contract period has to be extended wholly or partly due to default on the part of the bidder, the Agreement Authority may sanction extension of time after imposing fine as mentioned below;

Period	Rate of Fine
First Extension	1% of the PAC subject to a minimum of Rs. 1000/- and maximum of Rs. 50,000/-.
Second Extension	2% of the PAC subject to a minimum of Rs. 2000/- and maximum of Rs. 1,00,000/-

27. PAYMENT

27.1 No advance payment will be given. All the documents submitted should be certified by the concerned personnel of ANERT.

27.2 The quotes for the Design, Supply, Installation & Commissioning including 10 years of warranty (EPC Part) to be provided by the bidders. The L1 bidder will be selected on the basis of their quotes on the EPC part with 10-year warranty and the O&M quote will not be part of bid evaluation.

27.3 The terms of payment shall be:

27.3.1 EPC Payment

- i. Upon delivery of major components (PV Modules, Inverter etc) at the site/warehouse, a maximum of 60% of the contract value can be released through Running Accounts Bills of min 10% of the contract value. The supplier shall submit the part invoice for the materials (including serial numbers and delivery chalan) for the materials duly certified by the concerned District Office along with a report regarding the supply of materials. Each RAB shall be accompanied with an item wise statement of work completion with qty, rate & the actual expenditure incurred audited by a Chartered Accountant.
- ii. On completion of installation of the power plant, a maximum of 20% of the contract value can be released as Running Account Bills of min 10% of the

contract value. The supplier shall submit the invoice for the materials supplied and all documents related including the Project Completion Report to the completion of the work certified by the district office shall be submitted for the release of the amount. The second part invoice can be raised only after submitting application for energization to the Electrical Inspectorate. Each RAB shall be accompanied with an item wise statement of work completion with qty, rate & the actual expenditure incurred audited by a Chartered Accountant.

- iii. After the Inspection and Approval of the Electrical Inspectorate, 5% of the contract value will be released. All documents related to the completion of the work including commissioning report shall be submitted for the release of the amount.
- iv. The date of Energisation to the Grid by the DISCOM will be considered as the official Date of Commissioning (CoD) of the project and this will be treated as the commissioning of the system. On commissioning of the grid connected system, 5% of the contract value will be released after proving the Performance ratio (AC). The PR report as per standard is to be provided for release of the amount.
- v. The balance 10% shall be retained as performance security and will be released in five equal parts - 2% after 1 year of operation, 2% after 3 years of operation, 2% after 5 years of operation, 2% after 7 years of operation and last 2% after the 10 years of warranty. For releasing these payment, Performance ratio (AC) shall be proved within a period of 7 consecutive days at the end of each year for release of payment. **The plant shall be handed over at the end of 10 years after commissioning after proving the performance ratio (AC).** This period will be considered only from the date of commissioning.
- vi. The security deposit of 3% furnished along with the contract agreement shall be released on successful completion of supply, installation and commissioning.

27.3.2 *Maintenance Payment*



- i. The amount shall be released on annual basis after completion of the period of the previous year. The start of maintenance period will be considered from the scheduled date of operation.
- ii. The preventive maintenance reports along with receipt of premium of insurance and generation reports are to be submitted for the release of payments.
- iii. The payment shall be released after the inspection by the authorised personnel of ANERT on annual basis.

27.4 Income tax, contribution to workers' welfare fund and other statutory deductions shall be made from the payment as per prevailing norms.

28. PROJECT INSPECTION

The project progress will be monitored by ANERT and the projects will be inspected for quality at any time during commissioning or after the completion of the project either by officer(s) from ANERT or any authorized agency/ experts.

29. APPLICABLE LAW

The Contract shall be interpreted in accordance with the laws of the Union of India and in the Jurisdiction of Thiruvananthapuram, Kerala.

30. SETTLEMENT OF DISPUTE

29.1 If any dispute of any kind whatsoever arises between ANERT and Successful bidder in connection with or arising out of the contract including without prejudice to the generality of the foregoing, any question regarding the existence, validity or termination, the parties shall seek to resolve any such dispute or difference by mutual consent. If the same cannot be resolved, the courts in the jurisdiction will be approached and finalised by the appropriate court after legal proceedings.

31. FORCE MAJEURE

30.1 Notwithstanding the provisions of clauses contained in this RFS document, the contractor shall not be liable to forfeit (a) Security deposit for delay and (b)



termination of contract; if he is unable to fulfill his obligation under this contract due to force majeure conditions.

30.2 For purpose of this clause, "Force Majeure" means an event beyond the control of the contractor and not involving the contractor's fault or negligence and not foreseeable, either in its sovereign or contractual capacity. Such events may include but are not restricted to Acts of God, wars or revolutions, fires, floods, epidemics, quarantine restrictions and fright embargoes etc. Whether a "Force majeure" situation exists or not, shall be decided by ANERT and its decision shall be final and binding on the contractor and all other concerned.

30.3 In the event that the contractor is not able to perform his obligations under this contract on account of force majeure, he will be relieved of his obligations during the force majeure period. In the event that such force majeure extends beyond six months, ANERT has the right to terminate the contract in which case, the security deposit shall be refunded to him.

30.4 If a force majeure situation arises, the contractor shall notify ANERT in writing promptly, not later than 14 days from the date such situation arises. The contractor shall notify ANERT not later than 3 days of cessation of force majeure conditions. After examining the cases, ANERT shall decide and grant suitable additional time for the completion of the work, if required.

32. LANGUAGE

All documents, drawings, instructions, design data, calculations, operation, maintenance and safety manuals, reports, labels and any other data shall be in English Language. The contract agreement and all correspondence between ANERT and the bidder shall be in English language.

33. OTHER CONDITIONS

32.1 The Successful bidder shall not transfer, assign or sublet the work under this contract or any substantial part thereof to any other party without the prior consent of ANERT in writing.



32.2 The Successful bidder shall not display the photographs of the work and not take advantage through publicity of the work without written permission of ANERT.

32.3 The Successful bidder shall not make any other use of any of the documents or information of this contract, except for the purposes of performing the contract.

32.4 Successors and Assigns:

In case ANERT or Successful bidder may undergo any merger or amalgamation or a scheme of arrangement or similar re-organization & this contract is assigned to any entity (ies) partly or wholly, the contract shall be binding mutatis mutandis upon the successor entities & shall continue to remain valid with respect to obligation of the successor entities.

32.5 Severability:

It is stated that each paragraph, clause, sub-clause, schedule or annexure of this contract shall be deemed severable & in the event of the unenforceability of any paragraph, clause sub-clause, schedule or the remaining part of the paragraph, clause, sub-clause, schedule annexure & rest of the contract shall continue to be in full force & effect.

32.6 Counterparts

This contract may be executed in one or more counterparts, each of which shall be deemed an original & all of which collectively shall be deemed one of the same instruments.

32.7 Rights and Remedies under the contract only for the parties

This contract is not intended & shall not be construed to confer on any person other than the ANERT & Successful bidder hereto, any rights and / or remedies herein.



BID EVALUATION

34. BID EVALUATION

The evaluation process comprises the following four steps:

Step I - Responsiveness check of Techno Commercial Bid

Step II - Evaluation of Bidder's fulfilment of Eligibility Criteria as per Clause 16

Step III - Evaluation of Price Bid

Step IV - Successful Bidders(s) selection

I. Responsiveness check of Techno Commercial Bid

The Techno Commercial Bid submitted by Bidders shall be scrutinized to establish responsiveness to the requirements laid down in the RFS subject to Clause 16.1 and Clause 16.2. Any of the following may cause the Bid to be considered "non-responsive", at the sole discretion of ANERT:

- a. Bids that are incomplete, i.e. not accompanied by any of the applicable formats inter alia covering letter, power of attorney supported by a board resolution, applicable undertakings, format for disclosure, etc.;
- b. Bid not signed by authorized signatory and /or stamped in the manner indicated in this RFS;
- c. Material inconsistencies in the information /documents submitted by the Bidder, affecting the Eligibility Criteria;
- d. Information not submitted in the formats specified in this RFS;
- e. Bid being conditional in nature;
- f. Bid having Conflict of Interest;
- g. More than one Member of a Bidding Company using the credentials of the same Parent Company /Affiliate;
- h. Bidder delaying in submission of additional information or clarifications sought by ANERT as applicable;
- i. Bidder makes any misrepresentation.



Each Bid shall be checked for compliance with the submission requirements set forth in this RFS before the evaluation of Bidder's fulfilment of Eligibility Criteria is taken up. Clause 16.2 shall be used to check whether each Bidder meets the stipulated requirement.

33.1 Preliminary Examination

33.1.1 ANERT will examine the Bids to determine whether they are complete, whether any computational errors have been made, whether required sureties have been furnished, whether the documents have been properly signed and stamped and whether the Bids are otherwise in order.

33.1.2 Arithmetical errors will be rectified on the following basis. If there is a discrepancy between the unit price and the total Amount that is obtained by multiplying the unit price and quantity, the unit price shall prevail and the total amount shall be corrected. If there is a discrepancy between words and figures, the amount written in words will prevail.

II. Evaluation of Bidder's fulfilment of eligibility criteria

Evaluation of Bidder's Eligibility will be carried out based on the information furnished by the Bidder as per the prescribed Formats and related documentary evidence in support of meeting the Eligibility Criteria as specified in Clause 16.2. Non-availability of information and related documentary evidence for the satisfaction of Eligibility Criteria may cause the Bid to be non-responsive.

III. Evaluation of Price Bid

The Price Bid of only the Qualified Bidders shall be opened in presence of the representatives of such Qualified Bidders, who wish to be present, on a date as may be intimated by ANERT to the Bidders through ANERT. The evaluation of Price Bid shall be carried out based on the information furnished in the BoQ. The Price Bid submitted by the Bidders shall be scrutinized to ensure conformity with the RFS. Any Bid not meeting any of the requirements of this RFS may cause the Bid to be considered "non-responsive" at the sole decision of the ANERT.



IV. Successful Bidder(s) Selection

- i. Bids qualifying in Clause 16.2 shall only be evaluated in this stage.
- ii. The Price Bids of Qualified Bidders shall be ranked from the lowest to the highest. The lowest bidder will be declared as the successful bidder.
- iii. Letter of Acceptance (LOA): The Letter of Acceptance (LOA) shall be issued to Successful Bidder selected as per the provisions of this Clause 33
- iv. The Successful Bidder shall acknowledge the LoA and return duplicate copy with signature & stamp of the authorized signatory of the Successful Bidder to ANERT within Seven (7) days of issue of LoA.
- v. If the Successful Bidder, to whom the Letter of Acceptance has been issued does not fulfil any of the conditions specified in Bid document, ANERT reserves the right to annul/cancel the award of the Letter of Acceptance of the Successful Bidder and forfeit the Bid security.
- vi. ANERT at its own discretion, has the right to reject any or all the Bids without assigning any reason whatsoever, at its sole discretion

35. NOTIFICATION TO SUCCESSFUL BIDDERS

The name of Successful Bidder shall be notified indicating the awarded project price individually through letter of acceptance.

36. REQUIREMENT OF APPROVALS ON MAKES OF THE COMPONENTS:

The modules should be manufactured in India only. Rest of the components can be procured from any source. However, these items should meet the Technical specification and standards mentioned in RFS.

37. OPERATION OF THE SYSTEM DURING WEEKENDS AND GENERAL HOLIDAYS AND CALCULATION OF CUF:

During grid failure, the SPV system stops generating. Any instances of grid failure need to be mentioned in the monthly report and those instances need to be authorised by local DISCOM. Then the period will be excluded in calculation of CUF.



38. COMMERCIAL OPERATION DATE:

38.1 Document Submission for Issue Commissioning/ Completion Certificate:

The following documents will be deemed to form the completion documents:

- a. Project completion report from successful bidder as per ANERT format
- b. Project completion/satisfaction certificate from ANERT.

38.2 Commercial Operation Date

If the results of system acceptance testing indicate that the System is capable of generating electric energy (at full rated kWp) for 3 continuous days using such instruments and meters as have been installed for such purposes, then the power producer shall send a written notice to Employer to that effect, and the date of successful conducting such tests and injection of power at delivery point shall be the "Commercial Operation Date"

39. CORRUPT OR FRAUDULENT PRACTICES

The Successful Bidders/ Contractors should follow the highest standard of ethics during the execution of contract. In pursuance of this policy, ANERT:

39.1 defines, for the purposes of this provision, the terms set forth as follows:

- a. "corrupt practice" means the offering, giving, receiving or soliciting of anything of value to influence the action of a public official in the bid process or in contract execution; and
- b. "fraudulent practice" means a misrepresentation of facts in order to influence a bid process or the execution of a contract to the detriment of ANERT/Govt. scheme, and includes collusive practice among Bidders (prior to or after Bid submission) designed to establish Bid prices at artificial non-competitive levels and to deprive ANERT of the benefits of free and open competition;
- c. will declare a firm ineligible/debarred, either indefinitely or for a specific period of time, a GOVT contract if at any time it is found that the firm has engaged in corrupt or fraudulent practices in competing for, or in executing, a Government/ANERT schemes.





**AGENCY FOR NEW & RENEWABLE ENERGY
RESEARCH AND TECHNOLOGY (ANERT)**

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E-TENDER DOCUMENT

***Request for Selection (RFS) of agency for the
Implementation of 2 MW Solar Power Plant at
Travancore Titanium Products Ltd., Kochuveli,
Thiruvananthapuram under Solar City project funded
by Smart City Thiruvananthapuram Ltd***

Ref. No.: ANERT-TECH/99/2022-T2

VOL – 3: TECHNICAL SPECIFICATIONS

Date of Publishing of Bids : - 12/04/2023

Last Date of Submission of Bids : - 26/04/2023



TECHNICAL SPECIFICATIONS

The proposed projects shall be commissioned as per the technical specifications given below.

40. DEFINITION

A Grid Tied Solar Photo Voltaic (SPV) power plant consists of SPV array, Module Mounting Structure, Power Conditioning Unit (PCU) consisting of Maximum Power Point Tracker (MPPT), Inverter, and Controls & Protections, interconnect cables and switches. PV Array is mounted on a suitable structure. Grid tied SPV system do not have battery backup and should be designed with necessary features to supplement the grid power during day time. Components and parts used in the SPV power plants including the PV modules, metallic structures, cables, junction box, switches, PCUs etc., should conform to the BIS or IEC or international specifications, wherever such specifications are available and applicable.

Solar PV system shall consist of following equipments/components.

- Solar PV modules consisting of required number of **Crystalline** PV modules.
- Grid interactive Power Conditioning Unit with Remote Monitoring System
- Mounting structures
- String Monitoring Units / Junction Boxes.
- Power evacuation system
- Earthing and lightening protections.
- IR/UV protected PVC Cables, pipes and accessories
- RTTU / Metering

The detailed list of certifications and standards to be followed are given in annexure – F



41. SYSTEM COMPONENTS - TECHNICAL COMPLIANCE FOR SYSTEM COMPONENTS

S/N	System Component	Capacity/ rating	Minimum Technical Compliance
1.	Solar panel (MONO PERC Half cut of capacity 600 Wp or above)	As per the required capacity	IS 14286 - Design Qualification and Type Approval for Crystalline Silicon Terrestrial Photovoltaic (PV) Modules IEC/IS 61730: Part I & II;
2.	Grid Tied Inverter (DC to AC ratio of 1.2 to be maintained at all sites)	As per the required capacity	IS 16221: Part 1 & 2 - Safety of Power Converters for use in Photovoltaic Power Systems IS 16169 - Test Procedure of Islanding Prevention Measures for Utility-Interconnected Photovoltaic Inverters
3.	Module Mounting Structure	As per the required capacity	IS 2062 - Hot Rolled Medium and High Tensile structural Steel
4.	Cables	As required	IS 4759 - Hot-dip Zinc Coatings on structural steel and other products IEC 60227 / IS 694 IEC 60502 / IS 1554 (Pt. I & II)
5.	Switches/ Circuit Breakers	As required	IEC 60947 part I, II, III / IS 60947 Part I, II, III
6.	Connectors		EN 50521
7.	Surge Protection Device		IEC 60364-5-53 / IS 15086-5
8.	Junction Boxes/Enclosures for Inverters/ Charge Controllers	As required	IP 54 (for outdoor) or IP 65 / IP 21(for indoor) as per IEC 529
9.	Energy Meter for Recording Solar Electricity Generated & Two-way meter for Distribution Licensee grid connection		As per CEA Regulations; IEC 60687/ IEC 62052-11 / IEC 62053-22 / IS 14697
10.	Lightning Protection	As required	As per IEC 62305 / IEC 62561
11.	Electrical Grounding (Earthing)	As required	As per IS 3043



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Request for Selection (RFS) of agency for the Implementation of 2 MW Solar Power Plant at Travancore Titanium Products Ltd., Kochuveli, Thiruvananthapuram under Solar City project funded by Smart City Thiruvananthapuram Ltd

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42. SOLAR PHOTOVOLTAIC MODULES:

42.1 The PV modules used should be made in India and should be from the ALMM list issued by MNRE from time to time of Mono PERC type having module capacity of 600Wp or above.

42.2 The PV modules used must qualify to the latest edition BIS standards for Crystalline Silicon Solar Cell Modules - IS 14286. In addition, the modules must conform to IEC 61730 Part-2- requirements for construction & Part 2 - requirements for testing, for safety qualification or equivalent IS.

- i. For the PV modules to be used in a highly corrosive atmosphere throughout their lifetime, they must qualify to IEC 61701/IS 61701
- ii. The total solar PV array capacity should not be less than 2 MWp and should comprise of solar crystalline modules of MONO PERC type of minimum 525 Wp and above wattage. Module capacity less than minimum 525 watts shall not be accepted. Inspection of testing of PV array will be conducted by the Tendering Authority including identification of panels ready for dispatch to be confirmed with details provided in RFID tag using RFID reader at site during FAT. The RFID details of each module shall be issued to the employer during FAT.
- iii. Protective devices against surges at the PV module shall be provided. Low voltage drop bypass diodes shall be provided.
- iv. PV modules must be tested and approved by one of the BIS approved test centers.
- v. The module frame shall be made of corrosion resistant materials, preferably having anodized aluminum.
- vi. The bidder shall carefully design & accommodate requisite numbers of the modules to achieve the rated power in his bid. ANERT shall allow only minor changes at the time of execution.
- vii. Other general requirement for the PV modules and subsystems shall be the Following:
 - a. The rated output power of any supplied module shall have tolerance of $\pm 3\%$.
 - b. The peak-power point voltage and the peak-power point current of any supplied module and/or any module string (series connected modules) shall



not vary by more than 2 (two) per cent from the respective arithmetic means for all modules and/or for all module strings, as the case may be.

- c. The module shall be provided with a junction box with either provision of external screw terminal connection or sealed type and with arrangement for provision of by-pass diode. The box shall have hinged, weather proof lid with captive screws and cable gland entry points or may be of sealed type and IP-65 rated.
- d. IV curves at STC should be provided by bidder.

42.3 Modules deployed must use a RF identification tag. The following information must be mentioned in the RFID used on each module (This can be inside or outside the laminate, but must be able to withstand harsh environmental conditions).

- a. Name of the manufacturer of the PV module
- b. Name of the manufacturer of Solar Cells.
- c. Month & year of the manufacture (separate for solar cells and modules)
- d. Country of origin (separately for solar cells and module)
- e. I-V curve for the module Wattage, I_m , V_m and FF for the module
- f. Unique Serial No and Model No of the module
- g. Date and year of obtaining BIS PV module qualification certificate.
- h. Name of the test lab issuing BIS certificate.
- i. Other relevant information on traceability of solar cells and module as per ISO 9001 and ISO 14001

42.4 Warranties:

A. Material Warranty:

- i. Material Warranty is defined as: The manufacturer should warrant the Solar Module(s) to be free from the defects and/or failures specified below for a period not less than five (10) years from the date of sale to the original customer ("Customer")
- ii. Defects and/or failures due to manufacturing
- iii. Defects and/or failures due to quality of materials



- iv. Non conformity to specifications due to faulty manufacturing and/or inspection processes. If the solar Module(s) fails to conform to this warranty, the manufacturer will repair or replace the solar module(s), at the Owners sole option

B. Performance Warranty:

- i. The predicted electrical degradation of power generated not more than 10% after ten years' period and not exceeding 20% of the minimum rated power over the 25-year period and of the full rated original output.

42.5 Use of advance cell technologies

- a. The Contractor shall try to maximize the output within the allocated area. The contractor is allowed to propose use of new and better technology. (Eg. Bifacial Modules)
- b. Additionally, the bidder at bidding stage may propose modern methods for maintenance & cleaning of the plant. Technology employing drone, cleaning methods without water, which will automate the maintenance and reduce the cost of maintenance may be proposed.
- c. Based on the technology employed, the contractor has to design, Electrical System Features, Architecture and Structural requirement and the same shall be implemented with the prior approval of ANERT. The tenderer at tender stage shall submit the details of the technology proposed. The tender submission shall also include the proposed modified structure also. The capacity mentioned in the tender is indicative and extra capacity over and above the indicative capacity mentioned will be permitted, based on the technology proposed and employed.

43. ARRAY STRUCTURE

43.1 For Ground Mounted:

- a. Hot dip galvanized MS as per specifications BIS 2062 or shall be cold formed light gauge structural steel sections with IS 811: 1987/IS 801: 1975 having galvanization thickness as per BIS 4759 -amended upto date; may be used for mounting the modules/ panels/arrays. Each structure should have angle of inclination as per the



site conditions to take maximum insolation. However, to accommodate more capacity the angle inclination may be reduced until the plant meets the specified performance ratio requirements.

- b. The Mounting structure shall be so designed to withstand the speed for the wind zone of the location where a PV system is proposed to be installed (min wind speed of 150 km/ hour). It may be ensured that the design has been certified by a recognized Lab/ Institution in this regard and submit wind loading calculation sheet to ANERT. Suitable fastening arrangement such as grouting and calming should be provided to secure the installation against the specific wind speed. The array design shall be submitted with the STAAD structural design report for the materials used with relevant IS.
- c. Structural material shall be corrosion resistant and electrolytically compatible with the materials used in the module frame, its fasteners, nuts and bolts. Aluminium structures also can be used which can withstand the wind speed of respective wind zone. Necessary protection towards rusting need to be provided either by coating or anodization.
- d. The fasteners used should be made up of stainless steel. The structures shall be designed to allow easy replacement of any module. The array structure shall be so designed that it will occupy minimum space without sacrificing the output from the SPV panels
- e. Regarding civil structures, the bidder needs to take care of the load bearing capacity of the soil at the site of installation. The soil is fine sand and specific care is to be taken while designing the foundation. The foundation design must be submitted to ANERT duly certified by a chartered structural engineer before start of works.
- f. The minimum clearance of the structure from the ground level should be 200 mm for ground mounted installations
- g. The array will be installed on steel racking structures that are anchored in the ground. Racks will be laid out in parallel matrices allowing for individuals to access the area between the racks for cleaning and other maintenance needs. In between the row of solar panels sufficient gap need to be provided to avoid falling of shadow.



of previous row on the next row. Seismic factors for the site will be considered while making the design of the foundation.

43.2 For Ground Mounted:

- a. Photovoltaic arrays must be mounted on a stable, durable structure that can support the array and withstand wind, rain, and other adverse conditions. The modules will be fixed on structures with fixed arrangement.
- b. The module mounting structures shall have adequate strength and appropriate design suitable to the locations, which can withstand the load and high wind velocities. Stationary structures shall support PV modules at a given orientation, absorb and transfer the mechanical loads to the surface properly.
- c. Wherever required, suitable number of PV panel structures shall be provided. Structures shall be of flat-plate design using minimum size of C (75 x 40 x 5mm) or L (55 x 55 x 5mm) or I (60x 40x 4mm) sections or higher dimensions for respective sections.
- d. Each structure with fixed tilt should have a tilt angle as per the site conditions to take maximum insolation which will be approximately equal to the latitude of the location facing true South with a North - South orientation. The tilt angle can vary from 9 degree to 12 degree based on the location's latitude in Kerala
- e. The PV module mounting structure shall have a capacity to withstand a wind velocity of 150 km/hr unless specified for dedicated requirements
- f. Suitable fastening arrangement such as grouting and calming should be provided to secure the installation against the specific wind speed. The PV array structure design shall be appropriate with a factor of safety of min 1.5.
- g. The materials used for structures shall be Hot dip Galvanized Mild Steel conformed to IS 2062:1992 or aluminium of suitable grade minimum alloy 6063 or better.
- h. The minimum thickness of galvanization for hot dip Galvanized Mild Steel should be at least 80 microns as per IS 4759. The galvanisation thickness will be checked during inspection and the vendor is to arrange the equipment needed for the same at the site.



- i. The Bolts, Nuts, fasteners, and clamps used for panel mounting shall be of Stainless-Steel SS 304.
- j. Structures shall be supplied complete with all members to be compatible for allowing easy installation at the site. Additional Structures/Frames for required for the installation of modules if any need to be provided by the bidder.
- k. The structures shall be designed to allow easy replacement of any module, repairing and cleaning of any module. No Welding is allowed on the mounting structure. Adequate spacing shall be provided between two panel frames and rows of panels to facilitate personnel protection, ease of installation, replacement, cleaning of panels and electrical maintenance
- l. Aluminium structures used shall be protected against rusting either by coating or anodization. Aluminium frames should be avoided for installations in coastal areas.
- m. The structure shall be designed to withstand operating environmental conditions for a period of minimum 25 years. And shall be free from corrosion while installation.
- n. Screw fasteners shall use existing mounting holes provided by module manufacturer. No additional holes shall be drilled on module frames
- o. The total load of the structure (when installed with PV modules) on the roof should be less than 60 kg/m².
- p. Minimum distance between the lower level of PV Module and the ground shall be 0.6m from the ground level.
- q. The PV Panel area shall be accessible for cleaning and for any repair work.
- r. Sufficient gap needs to be provided between the rows to avoid falling of shadow of one row on the next row. Seismic factors for the site will be considered while making the design of the foundation.
- s. Adequate spacing shall be provided between any two modules secured on PV panel for improved wind resistance.
- t. Installation of structure for solar PV mounting should not tamper with the water proofing of the roofs.



43.3 The Rooftop Structures maybe classified in three broad categories as follows (drawings at **Annexure-G**). The bidders are required to quote the rates for each separately in the financial bid:

i. Ballast structure

- a. The mounting structure must be Non-invasive ballast type and any sort of penetration of roof to be avoided.
- b. The minimum clearance of the structure from the roof level should be in between 70 - 150 mm to allow ventilation for cooling, also ease of cleaning and maintenance of panels as well as cleaning of terrace.
- c. The structures should be suitably loaded with reinforced concrete blocks of appropriate weight made out of M25 concrete mixture.

ii. Tin shed

- a. The structure design should be as per the slope of the tin shed.
- b. The inclination angle of structure can be done in two ways
 - b.1. Parallel to the tin shed (flat keeping zero-degree tiling angle), if the slope of shed in Proper south direction
 - b.2. With same tilt angle based on the slope of tin shed to get the maximum output.
- c. The minimum clearance of the lowest point from the tin shade should be more then 100mm.
- d. The base of structure should be connected on the Purlin of tin shed with the proper riveting. e. All structure member should be of minimum 2 mm thickness.

iii. RCC Elevated structure: It can be divided into further three categories:

A. Minimum Ground clearance (300MM – 1000 MM)

- a. The structure shall be designed to allow easy replacement of any module and shall be in line with site requirement. The gap between module should be minimum 30MM.
- b. Base Plate – Base plate thickness of the Structure should be 5MM for this segment.
- c. Column – Structure Column should be minimum 2MM in Lip section / 3MM in C Channel section. The minimum section should be 70MM in Web side and 40MM in flange side in Lip section.



- d. Rafter - Structure rafter should be minimum 2MM in Lip section / 3MM in C Channel section. The minimum section should be 70MM in Web side (y-axis) and 40MM in flange side (x-axis).
- e. Purlin - Structure purlin should be minimum 2MM in Lip section. The minimum section should be 60MM in Web side and 40MM in flange side in Lip section.
- f. Front/back bracing - The section for bracing part should be minimum 2MM thickness.
- g. Connection - The structure connection should be bolted completely. Leg to rafter should be connected with minimum 12 diameter bolt. Rafter and purlin should be connected with minimum 10 diameter bolt. Module mounting fasteners should be SS-304 only and remaining fasteners either SS-304 or HDG 8.8 Grade.
- h. For single portrait structure the minimum ground clearance should be 500MM.

B. Medium Ground clearance (1000MM – 2000 MM)

- a. Base Plate - Base plate thickness of the Structure should be Minimum 6MM for this segment.
- b. Column - Structure Column should be minimum 2MM in Lip section / 3MM in C-Channel section. The minimum section should be 80MM in Web side and 50MM in flange side in Lip section.
- c. Rafter - Structure rafter should be minimum 2MM in Lip section / 3MM in C Channel section. The minimum section should be 70MM in Web side and 40MM in flange side in Lip section.
- d. Purlin - Structure purlin should be minimum 2MM in Lip section. The minimum section should be 70MM in Web side and 40MM in flange side in Lip section.
- e. Front/back bracing - The section for bracing part should be minimum 2MM thickness.
- f. Connection - The structure connection should be bolted completely. Leg to rafter should be connected with minimum 12 diameter bolt. Rafter and purlin should be connected with minimum 10 diameter bolt. Module mounting fasteners should be SS-304 only and remaining fasteners either SS-304 or HDG 8.8 Grade.

C. Maximum Ground clearance (2000MM – 3000 MM)



- a. Base Plate – Base plate thickness of the Structure should be minimum 8 MM for this segment.
- b. Column – Structure Column thickness should be minimum 2.6MM in square hollow section (minimum 50x50) or rectangular hollow section (minimum 60x40) or 3MM in C-Channel section.
- c. Rafter - Structure rafter should be minimum 2MM in Lip section / 3MM in Channel section. The minimum section should be 80MM in Web side and 50MM in flange side in Lip section.
- d. Purlin - Structure purlin should be minimum 2MM in Lip section. The minimum section should be 80MM in Web side and 50MM in flange side in Lip section.
- e. Front/back bracing – The section for bracing part should be minimum 3MM thickness.
- f. Connection – The structure connection should be bolted completely. Leg to rafter should be connected with minimum 12 diameter bolt. Rafter and purlin should be connected with minimum 10 diameter bolt. Module mounting fasteners should be SS-304 only and remaining fasteners either SS-304 or HDG 8.8 Grade.

D. Super elevated structure (More than 3000 MM)

i. Base structure

- b. Base Plate – Base plate thickness of the Structure should be 10MM for this segment.
- c. Column – Structure Column minimum thickness should be minimum 2.9MM in square hollow section (minimum 60x60) or rectangular hollow section (minimum 80x40).
- d. Rafter - Structure Rafter minimum thickness should be minimum 2.9MM in square hollow section (minimum 60x60) or rectangular hollow section (minimum 80x40)



- e. Cross bracing – Bracing for the connection of rafter and column should be of minimum thickness of 4mm L-angle with the help of minimum bolt diameter of 10mm.

ii. Upper structure of super elevated structure

- a. Base Plate – Base plate thickness of the Structure should be minimum 5MM for this segment.
- b. Column – Structure Column should be minimum 2MM in Lip section / 3MM in Channel section. The minimum section should be 70MM in Web side and 40MM in flange side in Lip section.
- c. Rafter - Structure rafter should be minimum 2MM in Lip section / 3MM in Channel section. The minimum section should be 70MM in Web side and 40MM in flange side in Lip section.
- d. Purlin - Structure purlin should be minimum 2MM in Lip section. The minimum section should be 60MM in Web side and 40MM in flange side in Lip section.
- e. Front/back bracing – The section for bracing part should be minimum 2MM thickness.
- f. Connection – The structure connection should be bolted completely. Leg to rafter should be connected with minimum 12 diameter bolt. Rafter and purlin should be connected with minimum 10 diameter bolt. Module mounting fasteners should be SS-304 only and remaining fasteners either SS-304 or HDG 8.8 Grade.
- iii. If distance between two legs in X-Direction is more than 3M than sag angle/Bar should be provide for purlin to avoid deflection failure. The sag angle should be minimum 2MM thick, and bar should be minimum 12Dia.
- iv. Degree - The Module alignment and tilt angle shell be calculated to provide the maximum annual energy output. This shall be decided on the location of array installation
- v. Foundation – Foundation should be as per the roof condition; two types of the foundation can be done- either penetrating the roof or without penetrating the roof.
 - a) If penetration on the roof is allowed (based on the client requirement) then minimum 12MM diameter anchor fasteners with minimum length 100MM



be used with proper chipping. The minimum RCC size should be 400x400x300 cubic mm. Material grade of foundation should be minimum M20.

- b) If penetration on roof is not allowed, then foundation can be done with the help of 'J Bolt' (refer IS 5624 for foundation hardware). Proper Neto bond solution should be used to adhere the Foundation block with the RCC roof. Foundation J - bolt length should be minimum 12MM diameter and length should be minimum 300MM.

44. ARRAY JUNCTION BOXES (JBs)

- a. The junction boxes are to be provided in the PV array for termination of connecting cables. The J. Boxes (JBs) shall be made of GRP/FRP/Powder Coated Aluminum /cast aluminum alloy with full dust, water & vermin proof arrangement. All wires/cables must be terminated through cable lugs. The JBs shall be such that input & output termination can be made through suitable cable glands.
- b. Copper bus bars/terminal blocks housed in the junction box with suitable termination threads Conforming to IP65 standard and IEC 62208 Hinged door with EPDM rubber gasket to prevent water entry. Single / double compression cable glands, Provision for earthing the box must be provided.
- c. Each Junction Box shall have High quality Suitable Capacity Metal Oxide Varistors (MOVs) / SPDs, suitable Reverse Blocking Diodes. The Junction Boxes shall have suitable arrangement monitoring and disconnection for each of the groups. Each string combiner box/ junction box will have suitable Reverse Blocking Diodes of maximum DC blocking voltage of 600 / 1000V or as per the system requirement with suitable arrangement for its connecting.
- d. Suitable markings shall be provided on the bus bar for easy identification and the cable ferrules must be fitted at the cable termination points for identification
- e. The junction boxes/ enclosures should be IP 65(for outdoor)/ IP 54 (indoor) and as per IEC 529 specifications. The Junction boxes / string combiner boxes shall conform to IEC 60529 (Degrees of Protection provided by Enclosures (IP Code))



45. DC DISTRIBUTION BOARD:

- a. DC Distribution panel to receive the DC output from the array field. DC generated by the solar modules is transmitted through the appropriate cables from Array Yard to Control facility. DC bus & panel should be provided for the incoming DC supply from array yard. The panel should consist of adequate size.
- b. DC DPBs shall have sheet from enclosure of dust & vermin proof conform to IP 65 protection. The bus bars are made of copper of desired size. Suitable capacity MCBs/MCCB shall be provided for controlling the DC power output to the PCU along with necessary surge arrestors.

46. AC DISTRIBUTION PANEL BOARD:

- a. AC Distribution Panel Board (DPB) shall control the AC power from PCU/ inverter, and should have necessary surge arrestors. Output from the inverter shall be fed to the ACDB through 4 pole MCCB of suitable current rating and multifunction export solar meter.
- b. All switches and the circuit breakers, connectors should conform to IEC 60947, part I, II and III/ IS60947 part I, II and III.
- c. The changeover switches, cabling work should be undertaken by the bidder as part of the project.
- d. All the Panel's shall be metal clad, totally enclosed, rigid, floor mounted, air - insulated, cubical type suitable for operation on three phase / single phase, 415 or 230 volts, 50 Hz
- e. The panels shall be designed for minimum expected ambient temperature of 45 degrees Celsius, 80 percent humidity and dusty weather.
- f. All indoor panels will have protection of IP54 or better. All outdoor panels will have protection of IP65 or better.
- g. Should conform to Indian Electricity Act and rules (till last amendment).
- h. All the 415 AC or 230 volts' devices / equipment like bus support insulators, circuit breakers, SPDs, VTs etc., mounted inside the switchgear shall be suitable for



continuous operation and satisfactory performance under the following supply conditions

Variation in supply voltage +/- 10 %

Variation in supply frequency +/- 3 Hz

47. PCU/ARRAY SIZE RATIO:

- a. The combined wattage of all inverters should not be less than 80% of rated capacity of DC power of the plant under STC.
- b. Maximum power point tracker shall be integrated in the PCU/inverter to maximize energy drawn from the array.

48. PCU/ INVERTER:

The Power Conditioning Unit shall be String Inverter with power exporting facility to the Grid. The DC to AC ratio of 1.25 is to be maintained at all sites. (For eg. – For DC capacity of 100 kWp, the AC capacity of minimum 80 kW is to be maintained). Preferred Makes – Fronius / ABB / SMA

General Specifications:

48.1 All the Inverters should contain the following clear and indelible Marking Label & Warning Label as per IS16221 Part II, clause 5. The equipment shall, as a minimum, be permanently marked with:

- a. The name or trademark of the manufacturer or supplier.
- b. A model number, name or other means to identify the equipment.
- c. A serial number, code or other markings allowing identification of manufacturing location and the manufacturing batch or date within a three-month time period.
- d. Input voltage, type of voltage (A.C. or D.C.), frequency, and maximum continuous current for each input.
- e. Output voltage, type of voltage (A.C. or D.C.), frequency, maximum continuous current, and for A.C. outputs, either the power or power factor for each output.
- f. The Ingress Protection (IP) rating



- 48.2 The inverter output shall be 415 VAC, 50 Hz, 3 phase.
- 48.3 The inverter shall include appropriate self-protective and self-diagnostic feature to protect itself and the PV array from damage in the event of inverter component failure or from parameters beyond the inverter's safe operating range due to internal or external causes.
- 48.4 PCU shall have the dynamic and efficient MPPT algorithm behaviour which finds maximum power point even in low light conditions. The PCU Company should be able to display this feature.
- 48.5 The PCU shall be supplied with in-built advanced grid feed-in feature along with dynamic feed-in control considering self-consumption. The PCU shall also include control functions for optimum feed-in of reactive power and effective power. The amount of reactive power injection and absorption can be controlled depending upon under/over excited systems.
- 48.6 The PCU shall have a provision of external shutdown via remote signal separately with an in-built floating-point contact or similar option using any minimum interface which is to ensure the emergency stop function in the inverter
- 48.7 The PCU shall have a higher degree of ingress protection of IP 65 to handle robust environment conditions from dust and water ingress under complete outdoor installations.
- 48.8 The data logger should possess the feature of extracting the data externally with open protocols like Modbus TCP/RTU. The manufacturer should provide the Modbus register mapping file to utilise this feature
- 48.9 **The inverter shall have an efficient cooling concept with better power derating feature to handle higher temperatures and ensure the best efficiency. The inverter shall be able to provide full rated output power even at ambient temperatures of 50°C. The manufacturer to provide the power derating curves to demonstrate the same.**
- 48.10 The inverter shall be flexible in terms of the installation and should be capable for installation in a horizontal position facilitating easy installation for site specific requirements.



- 48.11 The inverter shall have an integrated feature of emergency stop to halt the inverter from operation considering safety scenarios
- 48.12 The PCU manufacturer should have an authorised service centre in Kerala. The details of the service centre along with the spare list must be submitted along with the bid.
- 48.13 **PCU should be able to respond smoothly to the voltage fluctuations on the low-tension grid via active & reactive power control/ support. The PCU should be able to respond separately to fulfil below mentioned:**
- 48.13.1 Finding out optimisation of the system**
- 48.13.2 Optimal power distribution on each phase**
- 48.13.3 Prevent PCU from unnecessary disconnections**
- 48.14 The PCU Company should have grid connected solar plants running in the country with inverters at least 7 years from the time of bidding to showcase the service reliability and long-term presence. Also, the PCU should have local presence in the county for at least last 5 years. The PCU manufacturer to provide details to authenticate the same.
- 48.15 The Technical Specification of On-Grid Inverters are summarized below:

Specifications of Inverters	
Parameters	Detailed specification
Nominal voltage	230V/415V
Voltage Band	Between 80% and 110% of V nominal
Nominal Frequency	50 Hz
Operating Frequency Range	47.5 to 50.5 Hz
Waveform	Sine wave
Harmonics	AC side total harmonic current distortion < 3%
Ripple	DC Voltage ripple content shall be not more than 1%
Efficiency	Efficiency shall be >98%
Casing protection levels	Degree of protection: Min IP-65
Operating ambient Temp range	-10 to + 60 degree Celsius
Operation	Completely automatic including wakeup, synchronization (phase locking) and shut down
MPPT	MPPT range must be suitable to individual array voltages

Specifications of Inverters	
Parameters	Detailed specification
Protection Class	1
Protections	Over voltage: both input and output Over current: both input and output Over / Under grid frequency Over temperature Short circuit Lightning Surge voltage induced at output due to external source Islanding
Ingress Protection	IP 65
Recommended LED indications	ON Grid ON Under/ Over voltage Overload Over temperature
Recommended LCD Display on front Panel	DC input voltage DC current AC Voltage (all 3 phases) AC current (all 3 phases) Frequency Ambient Temperature Instantaneous power Cumulative output energy Cumulative hours of operation Daily DC energy produced
Communication Interface	RS485/ RS232/Wi-Fi (with or without USB)

48.16 The Technical Specification for Interconnection are summarized below:

Sl No	Parameters	Requirements	Reference
1	Overall conditions of service	Reference to regulations	Conditions for Supply of Electricity
2	Overall Grid Standards	Reference to regulations	Central Electricity Authority (Grid standards) Regulations 2010



3	Equipment	Applicable industry standards	IEC/EN standards
4	Safety and Supply	Reference to regulations, (General safety requirements	Central Electricity Authority (Measures of safety and electricity supply) Regulations, 2010 and subsequent amendments
5	Meters	Reference to regulations and additional conditions issued by the commission.	Central Electricity Authority (Installation & operation of meters) regulations 2006 and subsequent amendments
6	Harmonic current	Harmonic current injections from a generating station shall not exceed the limits specified in IEEE 519	IEEE 519 relevant CEA (Technical Standards for connectivity of the distributed generation resource) Regulations 2013 and subsequent amendments
7	Synchronization	Photovoltaic system must be equipped with a grid frequency synchronization device, if the system is using synchronizer inherently built in to the inverter, then no separate synchronizer is required	Relevant CEA (Technical Standards for Connectivity of the distributed generation resources) regulations 2013 and subsequent amendments.
8	Voltage	The voltage-operating window should minimize nuisance tripping and should be under operating range of 80% to 110% of the nominal connected voltage. beyond the clearing time of 2 seconds, the Photovoltaic system must isolate itself from the grid	
9	Flicker	Operation of Photovoltaic system should not cause	Relevant CEA regulations 2013 and subsequent

		voltage flicker in excess of the limits stated in IEC 61000 or other equivalent Indian standards if any	any, (Technical standards for connectivity of the distributed generation resource)
10	Frequency	When the distribution system frequency deviates outside the specified limits (50.5 Hz on upper side and 47.5 Hz on lower side) up to 0.2 sec, the Photovoltaic systems shall automatically disconnect from grid and be in island mode.	
11	DC injection	Photovoltaic system shall not inject DC current greater than 0.5% of full rated output at the interconnection point or 1% rated inverter output current into distribution system under any operating conditions.	
12	Power Factor	While the output of the inverter is greater than 50%, a lagging power factor greater than 0.9 shall be maintained.	
13	Islanding and Disconnection	The photovoltaic system in the event of voltage or frequency variations must island/disconnect itself with the time stipulated as per IEC standards	
14	Overload and overheat	The inverter should have the facility to automatically switch off in case of overload or overheat and should restart when normal conditions are restored	

48.17 The Certifications of On-Grid Inverters are summarized below:



Standard	Description
IS 16221-2	Safety of Power Converters for use in Photovoltaic Power Systems Part 2 (Particular Requirements for Inverters)
IEC 61683	Photovoltaic systems - Power conditioners - Procedure for measuring efficiency
IEC 61727	Photovoltaic (PV) systems- Characteristics of the utility interface
IEC/EN 62109-1	Safety of power converters for use in photovoltaic power systems - Part 1: General requirements
IEC/EN 62109-2	Safety of power converters for use in photovoltaic power systems - Part 2: Particular requirements for inverters
IEC/EN 61000-3-3/ 3-11/ 3-5	Electromagnetic compatibility (EMC) - Part 3-11; Limits; Limitation of Voltage Change, Voltage Fluctuations and Flicker in Public Low- Voltage Supply Systems; Rated Current <16A / >16A and <75A / >75A per Phase respectively
IEC/EN 61000-3-2/ -3-12/ -3-4	Electromagnetic compatibility (EMC) - Part 3-12; Limits; Limits for Harmonic Currents produced by equipment connected to the public low voltage systems with Rated Current <16A / >16A and <75A / >75A per Phase respectively
*IEC/EN 61000-6-1 / 6-2	Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity standard for residential and commercial / industrial environments
*IEC/EN 61000-6-3 / 6-4	Electromagnetic compatibility (EMC) - Part 6-4: Generic standards - Emission standard for residential and commercial / industrial environments
IEC 62116 / IS 16169	Utility-interconnected photovoltaic inverters - Test procedure of islanding prevention measures
IEC 60068-2-1	Environmental testing - Part 2-1: Tests - Test A: Cold
IEC 60068-2-2	Environmental testing - Part 2-2: Tests - Test B: Dry heat
IEC 60068-2-14	Environmental testing - Part 2-14: Tests - Test N: Change of temperature
IEC 60068-2-30	Environmental testing - Part 2-30: Tests - Test Db:, Damp heat, cyclic (12 h + 12 h cycle)

***Recommended but not mandatory**



49. INTEGRATION OF PV POWER WITH GRID:

The output power from SPV would be fed to the inverters which converts DC produced by SPV array to AC and feeds it into the main electricity grid after synchronization. In case of grid failure, or low or high voltage, solar PV system shall be out of synchronization and shall be disconnected from the grid.

50. REMOTE MONITORING SYSTEM

A dedicated Remote Monitoring System (Hardware and software) for monitoring the plant shall be provided even if the inverter has embedded data logging system. The following weather parameters are to be measured as part of the datalogging system.

a) Solar Irradiance:

A Pyranometer/ Solar cell-based irradiation sensor (along with calibration certificate) shall be provided, with the sensor mounted in the plane of the array.

b) Temperature: Integrated temp, sensors for measuring the module surface temp., inverter inside enclosure temp, and ambient temp to be provided complete with readouts integrated with the data logging system.

It is recommended that the following important parameters shall be accessible through the Data Logging Facility.

- i. AC Voltage
- ii. AC Output current
- iii. Output Power
- iv. Energy in kWh
- v. DC Input Voltage
- vi. DC Input Current
- vii. Ambient Temperatures
- viii. Invertor Status
- ix. Irradiation
- x. Module temperature



Provision for Internet monitoring and download of historical data shall be incorporated. GSM Modem/Wi Fi modem in case GSM connectivity is used or Wireless Router + modem in case Ethernet connection is being used for remote access must be provided. The data is to be transmitted to ANERT server as well as to the Integrated Command and Control Centre (ICCC) developed by Smart City Thiruvananthapuram Ltd. The successful bidder has to undertake all the works required for such deployment including software and arrange for APIs etc.

51. PROTECTIONS

The system should be provided with all necessary protections like earthing, Lightning, and grid islanding as follows:

51.1 LIGHTNING PROTECTION

The SPV power plants shall be provided with lightning & overvoltage protection. The main aim in this protection shall be to reduce the over voltage to a tolerable value before it reaches the PV or other sub system components. The source of over voltage can be lightning, atmosphere disturbances etc. The entire space occupying the SPV array shall be suitably protected against Lightning by deploying required number of Lightning Arrestors. Lightning protection should be provided as per IS/IEC 62305 standard. The protection against induced high-voltages shall be provided by the use of metal oxide varistors (MOVs) and suitable earthing such that induced transients find an alternate route to earth.

51.2 SURGE PROTECTION

The system should have installed with Surge Protection Device (SPD) for higher withstand of the continuous PV-DC voltage during earth fault condition. SPD shall have safe disconnection and short circuit interruption arrangements through integrated DC in-built bypass fuse (parallel) which should get tripped driving failure mode of MOV, extinguishing DC arc safely in order to protect the installation against fire hazards. The SPD should be provided in the AC Distribution Box as well.

51.3 EARTHING PROTECTION



- i. Each array structure of the PV yard should be grounded/ earthed properly as per IS:3043-1987. In addition, the lightning arrester/masts should also be earthed inside the array field. Earth Resistance shall be tested in presence of the representative of ANERT as and when required after earthing by calibrated earth tester. PCU, ACDB and DCDB should also be earthed properly.
- ii. Earth resistance shall not be more than 5 ohms. It shall be ensured that all the earthing points are bonded together to make them at the same potential.
- iii. Earthing System shall connect all non-current carrying metal receptacles, electrical boxes, appliance frames, chassis and PV module mounting structures in one long run. The earth strips should not be bolted. Earthing GI strips shall be interconnected by proper welding.
- iv. Masonry enclosure with the earth pit of size not less than 400mm X 400mm (width) complete with cemented brick work (1:6) of minimum 500 mm depth duly plastered with cement mortar (inside), shall be provided. Hinged inspection covers of size not less than 300mm X 300mm with locking arrangement shall be provided. Suitable handle shall be provided on the cover by means of welding a rod on top of the cover for future maintenance.
- v. Earthing system must be interconnected through GI strip to arrive equipotential bonding. The size of the GI earth strip must be minimum 25mm X 6mm.
- vi. The complete earthing system shall be mechanically and electrically connected to provide independent return to earth. All three-phase equipment shall have two distinct earth connections. An earth bus shall be provided inside the control facility. For each earth pit, necessary test point shall have to be provided.

51.4 GRID ISLANDING:

- i. In the event of a power failure on the electric grid, it is required that any independent power-producing inverters attached to the grid turn off in a short period of time. This prevents the DC-to-AC inverters from continuing to feed power into small sections of the grid, known as "islands." Powered islands present a risk to workers who may expect the area to be unpowered, and they may also damage grid-tied equipment. The PV system shall be equipped with islanding protection.



In addition to disconnection from the grid (due to islanding protection) disconnection due to under and over voltage conditions shall also be provided.

- ii. A manual disconnect 4pole isolation switch beside automatic disconnection to grid would have to be provided at utility end to isolate the grid connection by the utility personnel to carry out any maintenance. This switch shall be locked by the utility personnel

52. CABLES

Cables of appropriate size to be used in the system shall have the following characteristics:

- i. Shall meet IEC 60227/IS 694, IEC 60502/IS1554 standards
- ii. Temp. Range: -10°C to $+80^{\circ}\text{C}$.
- iii. Voltage rating 660/1000V
- iv. Excellent resistance to heat, cold, water, oil, abrasion, UV radiation
- v. Flexible
- vi. Sizes of cables between array interconnections, array to junction boxes, junction boxes to Inverter etc. shall be so selected to keep the voltage drop (power loss) of the entire solar system to the minimum. The cables (as per IS) should be insulated with a special grade PVC compound formulated for outdoor use.
- vii. Cable Routing/ Marking: All cable/wires are to be routed in a GI cable tray and suitably tagged and marked with proper manner by good quality ferrule or by other means so that the cable easily identified.
- viii. The Cable should be so selected that it should be compatible up to the life of the solar PV panels i.e. 25years.
- ix. The ratings given are approximate. Bidder to indicate size and length as per system design requirement. All the cables required for the plant provided by the bidder. Any change in cabling sizes if desired by the bidder/approved after citing appropriate reasons. All cable schedules/layout drawings approved prior to installation.
- x. Multi Strand, annealed high conductivity copper conductor PVC type 'A' pressure extruded insulation or XLPE insulation. Overall PVC/XLPE insulation for 1000V



protection Armored cable for underground laying. All cable trays including covers to be provided. All cables conform to latest edition of IEC/ equivalent BIS Standards as specified below: BoS item / component Standard

Description Standard Number Cables General Test and Measuring Methods, PVC/XLPE insulated cables for working Voltage up to and including 1100 V, UV resistant for outdoor installation IS /IEC 69947.

- xi. For the DC cabling, XLPE or XLPO insulated and sheathed, UV stabilized single core flexible copper cables shall be used; For the AC cabling, PVC or XLPE insulated and PVC sheathed single or, multi-core flexible Aluminium cables shall be used, Outdoor AC cables shall have a UV -stabilized outer sheath.
- xii. The size of each type of DC cable selected shall be based on minimum voltage drop however; the maximum drop shall be limited to 1%.
- xiii. The size of each type of AC cable selected shall be based on minimum voltage drop however; the maximum drop shall be limited to 2 %.
- xiv. The minimum DC cables size shall be 4.0mm² copper; The minimum AC cable size shall be 4.0mm² copper. In three phase systems, the size of the neutral wire shall be equal to the size of the phase wires.
- xv. The following colour code shall be used for cable wires and shall confirm to IEC 69947
 - DC positive: red (the outer PVC sheath can be black with a red line marking)
 - DC negative: black
 - AC single phase: Phase: Red; Neutral: Black
 - AC three phase: phases: Red, Yellow, Blue; Neutral: Black
 - Earth wires: Green

53. CABLING PRACTICE

Cable Cabling is required for wiring from AC output of inverter/PCU to the Grid Interconnection point. It includes the DC cabling from Solar Array to AJB and from AJB to inverter input.

- 53.1 All cables of appropriate size to be used in the system shall have the following characteristic:



- a. Shall conform to IEC 60227 / IS 694 & IEC 60502 / IS 1554 standards.
 - b. Temperature Range: -10 degree Celsius to +80 degree Celsius
 - c. Voltage rating: 660/1000V
 - d. Excellent resistance to heat, cold, water, oil, abrasion, UV radiation
 - e. Flexible
- 53.2 Sizes of cables between any array interconnections, array to junction boxes, junction boxes to inverter etc. shall be so selected to keep the voltage drop (power loss) of the entire solar system to the minimum (2%).
- 53.3 For the DC cabling, XLPE or XLPO insulated and sheathed, UV stabilized single core flexible copper cables shall be used; multi-core cables shall not be used.
- 53.4 For the AC cabling, PVC or XLPE insulated and PVC sheathed single or, multi-core flexible copper cables shall be used. However, for above 10kWp systems, XLPE insulated Aluminium cable of suitable area of cross section can be used in the AC side subject to a minimum area of cross section of 10 sq.mm. Outdoor AC cables shall have a UV -stabilized outer sheath IS/IEC 69947.
- 53.5 All LT XLPE cables shall conform to IS:7098 part I&II.
- 53.6 The total voltage drop on the cable segments from the solar PV modules to the solar grid inverter shall not exceed 2.0%
- 53.7 The total voltage drop on the cable segments from the solar grid inverter to the building distribution board shall not exceed 2.0%
- 53.8 The DC cables from the SPV module array shall run through a UV-stabilized PVC conduit pipe of adequate diameter with a minimum wall thickness of 1.5mm
- 53.9 Cables and wires used for the interconnection of solar PV modules shall be provided with solar PV connectors (MC4) and couplers
- 53.10 All cables and conduit pipes shall be clamped to the rooftop, walls and ceilings with thermo-plastic clamps at intervals not exceeding 50cm; the minimum DC cables size shall be 4.0mm² copper; the minimum AC cable size shall be 4.0mm² copper. In three phase systems, the size of the neutral wire size shall be equal to the size of the phase wires. Conduits for taking outdoor cables shall be UV treated.



- 53.11 Cable Marking: All cable/wires are to be marked in proper manner by good quality ferule or by other means so that the cable can be easily identified. The following colour code shall be used for cable wires
- DC positive: red (the outer PVC sheath can be black with a red line marking)
 - DC negative: black
 - AC single phase: Phase: red; Neutral: black
 - AC three phase: phases: red, yellow, blue; neutral: black
 - Earth wires: green
- 53.12 Cables and conduits that have to pass through walls or ceilings shall be taken through PVC pipe sleeve.
- 53.13 Cable conductors shall be terminated with tinned copper end ferrules to prevent fraying and breaking of individual wire strands. The termination of the DC and AC cables at the Solar Grid Inverter shall be done as per instructions of the manufacturer, which in most cases will include the use of special connectors.
- 53.14 All cables and connectors used for installation of solar field must be of solar grade which can withstand harsh environment conditions including high temperatures, UV radiation, rain, humidity, dirt, salt, burial and attack by moss and microbes for 25 years and voltages as per latest IEC standards. DC cables used from solar modules to array junction box shall solar grade copper (Cu) with XLPO insulation and rated for 1.1 kV as per relevant standards only.
- 53.15 Bending radii for cables shall be as per manufactures recommendations and IS: 1255.
- 53.16 For laying/termination of cables latest BIS/IEC Codes/ standards shall be followed.

54. FACTORY TESTING

- PCU shall be tested prior to shipment and factory test certificate for relevant parameters should be provided with the PCU supplied. ANERT or authorised representative of ANERT may be allowed to witness the tests if required.
- Factory testing shall not only be limited to measurement of phase currents, efficiencies, harmonic content and power factor, but shall also include all other



necessary tests/simulation required and requested by the Purchasers Engineers. Tests may be performed at 25, 50, 75 and 100 percent of the rated nominal power.

55 NET METERING AND UTILITY INTERCONNECTION

- a. Net metering equipment (an Import-Export Energy Meter) approved and tested by the electrical utility based on the accuracy class required for the proposed capacity of the system must be provided with the necessary data cables if required.
- b. Net Metering and Utility Interconnection should be accomplished according the Kerala State Electricity Regulatory Commission (Grid Interactive Distributed Solar Energy Systems) Regulations 2014 Clauses (8) & (9) (Notification No. 2096/KSERC/CT/2014 dt. 10th June 2014)

56 INTER CONNECTION OF INVERTER OUTPUT WITH UTILITY GRID

- a. The interconnection of load with inverter output should be done after obtaining permission from Electrical Inspectorate and Electrical Utility.
- b. The plan scheme and drawing related to interconnection details should be submitted to Electrical Inspectorate through a licensed Electrical contractor with the guidance appropriate Engineering Authority.
- c. Licenced contractor has to be engaged for preparation of plan scheme to be submitted to the Kerala State Electricity Licensing Board and necessary fee should be remitted for energisation of Solar Power Plant.
- d. The panel board and distribution board required for AC interconnection should be done as per specification/ instruction given appropriate Engineering Authority.
- e. All the electrical works required for the interconnection of load with inverter output should be done by the successful bidder as a part of the Solar Power Plant installation.
- f. Bidder should visit the actual site and ensure the exact place for providing Solar Modules and Inverter etc. in presence of technical representative from the ANERT.
- g. Net Metering Equipment shall be installed and maintained in accordance with the provisions of The Central Electricity Authority (Installation and Operation of



Meters) Regulations, 2006 as amended from time to time. The Contractor shall maintain the Metering System as per metering code and CEA guidelines. The defective meter shall be immediately tested and calibrated.

- h. The accuracy class of the Net Metering Equipment will be selected so that all levels of energy produced or taken by the Solar Power Plant will be measured accurately, and this equipment has applicable accuracy class.
- i. Net Metering Equipment shall be microprocessor-based conforming to the relevant IEC standards with Advanced Metering Infrastructure (AMI) with RS232 cable facility.
- j. Net Metering Equipment shall measure active energy (both import and export) and reactive energy (import) by 3 ph, 4 wire principle suitable for balanced / unbalanced 3 phase load (With KVA_r, KWh, KVA measuring registers). Tri-vector based energy meter shall have an accuracy class of energy measurement of at least Class 0.2 for active energy and at least 0.5 Class for reactive energy according to IEC 60687.
- k. Display parameters: LCD test, KWH import, KWH export, MD in KW export, MD in KW import, Date & Time, AC current and voltages and power factor (Cumulative KWH will be indicated continuously by default)

57 WARRANTY

- a. 10 years' warranty should be provided by the supplier for the system and components or part of the system has to be provided as per the special conditions of the contract.
- b. PV modules used in solar power plants/ systems must be warranted for their output peak watt capacity, which should not be less than 90 % at the end of 10 years and 80% at the end of 25 years
- c. The Warranty Card to be supplied with the system must contain the details of the all the components supplied including serial numbers accompanied with the OEM warranty card



58. OPERATION & MAINTENANCE OF THE PLANT

58.1 For the optimal operation of a PV plant, maintenance must be carried out on a regular basis. All the components should be kept clean. It should be ensured that all the components are fastened well at their due place. The O&M Charges for 10-year period is to be quoted by the bidders

58.2 The service personnel should visit the installations at least once a month for preventive maintenance even if no faults are reported. **Reports of these preventive maintenance visits and generation data should be submitted to the concerned ANERT District Offices on a quarterly basis.**

58.3 Maintenance guidelines for various components viz. solar panels, inverter, wiring etc. are discussed below:

58.3.1 SOLAR PV PANELS

Although the cleaning frequency for the panels will vary from site to site depending on soiling, it is recommended that

- a) The panels are cleaned at least once every thirty days.
- b) Use water and a soft sponge or cloth for cleaning.
- c) Do not use detergent or any abrasive material for panel cleaning.
- d) Iso-propyl alcohol may be used to remove oil or grease stains.
- e) Do not spray water on the panel if the panel glass is cracked or the back side is perforated.
- f) Wipe water from module as soon as possible.
- g) Use proper safety belts while cleaning modules at inclined roofs etc.
- h) The modules should not be cleaned when they are excessively hot. Early morning is particularly good time for module cleaning.
- i) Check if there are any shade problems due to vegetation or new building. If there are, make arrangements for removing the vegetation or moving the panels to a shade-free place.
- j) Ensure that the module terminal connections are not exposed while cleaning; this poses a risk of electric shock.



- k) Never use panels for any unintended use, e. g. drying clothes, chips etc.) Ensure that monkeys or other animals do not damage the panels.

58.3.2 CABLES AND CONNECTION BOXES

- a) Check the connections for corrosion and tightness.
- b) Check the connection box to make sure that the wires are tight, and the water seals are not damaged.
- c) There should be no vermin inside the box.
- d) Check the cable insulating sheath for cracks, breaks or burns. If the insulation is damaged, replace the wire.
- e) If the wire is outside the building, use wire with weather-resistant insulation.
- f) Make sure that the wire is clamped properly and that it should not rub against any sharp edges or corners.
- g) If some wire needs to be changed, make sure it is of proper rating and type.

58.3.3 INVERTER

- a) The inverter should be installed in a clean, dry, and ventilated area.
- b) Remove any excess dust in heat sinks and ventilations. This should only be done with a dry cloth or brush.
- c) Check that vermin have not infested the inverter. Typical signs of this include spider webs on ventilation grills or wasps' nests in heat sinks.
- d) Check functionality, e.g., automatic disconnection upon loss of grid power supply, at least once a month.
- e) Verify the state of DC/AC surge arrestors, cable connections, and circuit breakers.

58.4 Inspection and Maintenance Schedule

Component	Activity	Description	Interval
PV Module	Cleaning	• Clean PV modules with plain water or mild dishwashing detergent. • Do not use brushes, any types of solvents, abrasives, or harsh detergents.	Monthly or as per site conditions
PV Array	Inspection	• Check the PV modules and rack for any damage.	Annual

Component	Activity	Description	Interval
		Note down location and serial number of damaged modules.	
	Inspection	Determine if any new objects, such as vegetation growth, are causing shading of the array and move them if possible.	Half Yearly
	Vermin Removal	Remove bird nests or vermin from array and rack area.	Half Yearly
Junction Boxes	Inspection	- Inspect electrical boxes for corrosion or intrusion of water or insects. Seal boxes if required. - Check position of switches and breakers. - Check operation of all protection devices.	Annual
Wiring	Inspection	Inspect cabling for signs of cracks, defects, loose connections, overheating, arcing, short or open circuits, and ground faults.	Annual
Inverter	Inspection Service	- Observe instantaneous operational indicators on the faceplate of the inverter to ensure that the amount of power being generated is typical of the conditions. - Inspect Inverter housing or shelter for physical maintenance, if required.	Monthly
Plant	Monitoring	Operation and Performance Monitoring	Monthly
Spare Parts	Management	Manage inventory of spare parts.	As needed

58.5 The faulty system or components should be replaced/ repaired within 7 days of fault reporting. The servicing should be carried out at the site of installation. If any of the components are to be taken out from the site for repair, a standby must be provided to ensure un-interrupted power generation and the systems functions smoothly.

58.6 Any Delay in servicing beyond 7 days of fault reporting would attract penalty at the rate of at the rate fixed by CEO, ANERT and further actions will be initiated against the agency.



58.7 A designated contact Telephone Number and address should be submitted for reporting faults during the O&M period of 5 years.

59. CIVIL WORKS

While installing solar power plants on rooftops, the physical condition of the rooftop, chances of shading, chances water level rise in the rooftop during raining due improper drainage in the roof-top should be taken in to consideration.

- a. PV array shall be installed in the terrace space free from any obstruction and/or shadow and to minimize effects of shadows due to adjacent PV panel rows.
- b. PV array shall be oriented in the south direction in order to maximize annual energy yield of the plant.
- c. The solar PV array must be installed on the rooftop in such a way that there is sufficient space on the rooftop for maintenance etc.
- d. There should not be any damage what so ever to the rooftop due to setting up of the solar power plant so that on a later day there is leakage of rainwater, etc. from the rooftop.
- e. Some civil works are inevitable for erecting the footings for the module mounting structure as discussed in Module Mounting Structure section. The roof top may be given a suitable grading plaster with suitable leak proof compound so as to render the roof entirely leak proof.
- f. Ample clearance shall be provided in the layout of the inverter and DC/AC distribution boxes for adequate cooling and ease of maintenance.
- g. While cabling the array, care must be taken such that no loose cables lie on the rooftops.
- h. The roof top should look clean and tidy after installation of the array.
- i. Neatness, tidiness and aesthetics must be observed while installing the systems.
- j. RCC Works - All RCC works shall be as per IS 456 and the materials used viz. Cement reinforcement, steel etc. shall be as per relevant IS standards. Reinforcement shall be high strength TMT Fe 415 or Fe 500 conforming to IS: 1786-1985.
- k. Brick Works (If any) - All brick works shall be using 1st class bricks of approved



quality as per IS 3102.

- l. Plastering - Plastering in cement mortar 1:5, 1:6 and 1:3 shall be applied to all.
- m. Display of mandatory items- Single Line Diagram and layout diagram of modules and interconnection at installation site shall be provided near the inverter.
- n. For painting on concrete, masonry and plastered surface IS:2395 shall be followed. For distempering IS 427 shall be followed referred. For synthetic enamel painting IS 428 shall be followed. For cement painting IS 5410 shall be followed.
- o. All Civil works required for the installation of the PV Plant and other civil and electrical work in evacuation infrastructure, wherever necessary, shall be within the scope of the bidder

The layout of Inverter accommodation shall be designed to enable adequate heat dissipation and availability. Mount within the existing infrastructure available in consultation with the Site in charge. String Inverters may be installed with Canopy type structure over it to protect it from frequent monsoon and weather changes.

60. TESTING & COMMISSIONING

- a. The contractor shall provide necessary drawings and documents required by statutory authorities and obtain the approval before taking up erection.
- b. Any modification in the equipment or installation that may be demanded by the inspecting authorities shall be carried out by the contractor at no additional cost to the KSEBL
- c. In accordance with the specific installation instruction as per the manufacturers drawings or as directed by the KSEBL, the successful Bidder shall unload, assemble, erect, install test, commission and hand over all electrical equipments included in this contract after O&M of 10 years.
- d. Erection materials including all consumables, tools, testing instruments or any other equipment required for successful commissioning shall be arranged by the successful Bidder in a timely manner.
- e. All equipment and instruments, indoor and outdoor, shall be marked with No. and provided with danger boards before commissioning.
- f. All Power equipments shall be handled and erected as per the relevant codes of practice and manufacturer's drawings and instruction manuals.



- g. The Contractor shall obtain the temporary Electrical connection for construction purposes and the same has to be dismantled off the premises after completion of erection of plant.

61. PERFORMANCE RATIO TEST (PR TEST)

The Plant should run minimum two weeks without any major equipment failure to start the PR test. The EPC Contractor shall submit two copies of O&M manual with soft copy before the start of PR Test. Depending on the requirement, capacity and suitable Pyranometer shall be installed at locations suggested by ANERT or else METEONORM data shall be considered for calculating PR.

- i. The PR test shall be conducted at site by the Contractor in presence of the ANERT officials as per IEC 61724. The PR test procedure shall be submitted by the Contractor for review and approval. Any special equipment, instrumentation tools and tackles required for the successful completion of the performance test shall be arranged by the Contractor at his own cost.
- ii. The procedure for PR demonstration test shall be as follows:

The Weather monitoring station installed in the plant shall be in working condition for minimum 2 weeks and all the parameters shall be available for analysis and verification. The test report for the calibration shall be submitted by the Contractor for approval. After the successful verification of the initial parameters by ANERT, PR test shall be conducted. The Following factors shall be excluded for calculation;

- Generation loss due to grid outage.
- Irradiance below 250 W/m²
- The measured global solar radiation of the period of the outage of the power evacuation system shall be excluded to calculate average global solar radiation for the period of PR test.

PR is to be calculated as per the below formula:

$$PR = \frac{\text{Measured output in kW}}{\text{Installed Plant capacity in kW} * (1000 / \text{Measured radiation intensity in W/m}^2)}$$



The EPC Contractor shall demonstrate minimum PR of 75% (measured at output of the inverter/solar meter level) in the initial PR test within 7 consecutive days. If the contractor fails to prove the desired performance ratio at the time of completion and during any of the consecutive years of defect liability period, he will be given a second chance to demonstrate the PR within another 7 consecutive days. Still if it is not achieved, the same shall be demonstrated within another 7 consecutive days and still if it is not achieved, EPC contractor shall improve the quality of the plant by replacement of module/other components with all suitable modification requirements on balance of systems at his own cost to achieve the performance ratio. After obtaining Energisation Approval from Electrical Inspectorate and demonstration of minimum specified PR, the solar plant shall be commissioned which shall be the date of completion of the project.

62. DATE OF COMMISSIONING

After the Inspection and approval of the Electrical Inspectorate, date of Energisation to the Grid will be considered as the official Date of Commissioning (CoD) of the project. To ensure PR, the bidder will be allowed EPC contractor shall improve the quality of the plant by replacement of any components with all suitable modification requirements on balance of systems at his own cost to achieve the performance ratio.

63. SOLAR PV SYSTEM FOR MEETING THE ANNUAL ENERGY REQUIREMENT

Key Performance Indicators (For installations above 50 kW)

The following KPIs would be monitored by the ANERT/Owner throughout the contract tenure and the contractor shall furnish monthly reports on above, without fail.

- PV Array Energy Yield
- Final System Yield
- PV System Efficiency (DC/AC)
- Performance Ratio (PR): The performance ratio test as per IS/IEC 61724 has to be carried out at site by the agency in presence of authorized officials of ANERT, deriving sample data within a period of 7 consecutive days sufficient to provide operational data representing insolation and ambient conditions as desired by the



agreement authority to prove the Performance ratio of 75%. If a Solar Plant achieves the Minimum Performance Ratio, then the ANERT will issue Commercial Operation Date Certificate.

- Capacity Utilization Factor (CUF)
- Plant uptime
- Reactive Power Consumption
- Auxiliary Energy Consumption
- CO₂ Savings
- Environment, Health & Safety

64. DANGER BOARDS AND SIGNAGES:

Danger boards should be provided as and where necessary as per IE Act. /IE rules as amended up to date. Three signage shall be provided one each at battery –cum- control room, solar array area and main entry from administrative block. Text of the signage may be finalized in consultation with ANERT/ owner.

65. DRAWINGS & MANUALS:

- i. Two sets of Electrical drawings installation and O&M manuals are to be supplied. Bidders shall provide complete technical data sheets for each equipment giving details of the specifications along with make/makes in their bid along with basic design of the power plant and power evacuation, synchronization along with protection equipment.
- ii. Approved ISI and reputed makes for equipment be used.
- iii. For complete electro-mechanical works, bidders shall supply complete design, details and drawings for approval to ANERT before progressing with the installation work

67. BILL OF MATERIAL

The bidder should provide the bill of material mentioning the quantity of each of the item consisting in the system, along with the offer in the format as show below for each capacity:



Sl. No.	Item	Make (if any)	Model & Individual Capacity (If any)	Qty (Nos)	Rating / Capacity
1.	PV Module				
2.	PCU/Inverter				
3.	DC Cables				
4.	AC Cables				
5.	AJB/SCB				
6.	Module Mounting Structure (MMS)				
7.	ACDB				
8.	Lightning Arrester				
9.	Earthing System Details and No. of Earth pits				
10.	Data Acquisition System				

68. SITE INSPECTON

It is recommended that the bidders visit all the sites listed here for the physical verification and for correctly estimating the quantity, especially related to structure and cabling, before submitting the bids. **Bidder must include all the AC/DC wiring cost, replacement of instrument transformers, panel boards etc only after visiting the proposed site. The quoted amount will be for all the site-specific works and no additional amount will be allotted for any sort of works.**

The site-specific requirement of ladders for accessing PV modules, pathway facility along with handrails in case of sheet roofs are under the scope of the bidder. The Fabrication of Permanent Ladder should be of GI (min14 SWG), coated with Epoxy steel primer with rung spacing not be more than 10 inches and rung width of min 50 inches. Side Handrails / Grab Bars welded on both sides for safety purpose with an extension of



Min 50 inches above the landing or access level. The pathway can be either of GI or FRP material and shall include handrails for safety without causing shade on the PV modules.

69. CLEANING

The bidder shall provide permanent arrangement for module washing in the SPV Plant. Water lines may be drawn to feed water from the available resources. Contractor has to provide additional facility including pipeline, motor for pumping to the additional overhead tank, if required.

70. DISPLAY BOARD

The vendor has to display a board of size at the project site of size minimum 60 cm x 30 cm including the following details

- Plant Name, Capacity, Location, Type of Renewable Energy plant (solar), Date of commissioning etc. The logo of ANERT and details of the scheme as specified in the work order.

71. INSURANCE

- i. The power plant must be insured at every stage of operation – from Material dispatch, storage, completion of installation and till 5 years after commissioning. The insurance coverage on handing over of the system must include all conditions of **Standard Fire and Special Perils Policy (Material Damage)**.
- ii. The insurance premium for the 10 years of warranty is to be paid by the bidder. Only the system components are to be insured. On handing over of the system, the original insurance policy is to be handed over to the authorised person at the site of installation and a copy to ANERT District Office. The annual premium payment receipt must be handed to the authorised person at the site of installation.

72. ENGINEERING DRAWINGS

The bidder should submit and get the necessary approval of the following detailed Engineering Drawings before execution of the project:



- i. Schematic drawing showing the PV panels, Power conditioning Unit(s)/Inverter, Array Junction Boxes (AJBs)/String Combiner Boxes (SJB), AC and DC Distribution Box, Net meters, MSB etc.
- ii. Layout of solar PV Array
- iii. Single Line Diagram (SLD) with specification of all components.
- iv. Design document for Module Mounting Structure (MMS) including certificate showing wind speed withstanding capacity of the structure (STAAD/Equivalent).
- v. Module Mounting Structure (MMS) drawing along with foundation details for the structure.
- vi. Sizes and specification of cables for PV Module interconnections, PV Array to Array Junction Boxes, Array Junction Boxes to Inverter, Inverter to ACDB/ Grid Connection point etc. shall be furnished.

The Vendor shall submit a PVsyst report for PV power plants from 25kWp and above. All PV plant design should contain the following details which should be approved by the concerned officer before installation.

- i. Design of strings including the number of PV modules
- ii. AC Protection (Circuit Breaker, Switches, Fuses, SPD)
- iii. DC Protection (Switches, Fuses, SPD)
- iv. AJB / SCB details
- v. DC Cable size and length from point to point
- vi. AC Cable size and length from point to point
- vii. Earthing system details and number of pits
- viii. Lightning protection details/specification
- ix. PV Syst / Any other software-based Simulation Report

73. SAFETY MEASURES

The bidder shall take entire responsibility for electrical safety of the installation(s) including connectivity with the grid and follow all the safety rules & regulations applicable as per Electricity Act, 2003 and CEA guidelines etc. Adequate firefighting equipment and extinguishing agents of sufficient capacity and quantity must always be available at site.



and kept ready for immediate use. The installation of Fire Extinguishers should confirm to BIS standards.

The fire extinguishers shall be provided in the control room housing inverters as well as on the Roof or site where the PV arrays have been installed. One liquefied CO2 fire extinguisher upright type of capacity 8 kg having IS: 2171 -7, IS: 10658 marked per installation of 100kWp shall be supplied by the Successful bidder and kept near the Inverter accommodation and shall also be responsible for periodic renewal during the maintenance period. The fire extinguisher shall be suitable for fighting fire of oils, solvents, gases, paints, varnishes, electrical wiring, live machinery fires and all flammable liquid & gas.





**AGENCY FOR NEW & RENEWABLE ENERGY
RESEARCH AND TECHNOLOGY (ANERT)**

Department of Power, Government of Kerala

Thiruvananthapuram, Kerala – 695 033;

www.ANERT.gov.in , projects@ANERT.in

E-TENDER DOCUMENT

***Request for Selection (RFS) of agency for the
Implementation of 2 MW Solar Power Plant at
Travancore Titanium Products Ltd., Kochuveli,
Thiruvananthapuram under Solar City project funded
by Smart City Thiruvananthapuram Ltd***

Ref. No.: ANERT-TECH/99/2022-T2

VOL – 4: ANNEXURES

Date of Publishing of Bids : - 12/04/2023

Last Date of Submission of Bids : - 26/04/2023



FORMAT 1 - COVERING LETTER

(This letter to be submitted on the official letter head of the tenderer, signed by the authorised signatory.)

Sir,

I/We hereby e-tender to supply, under annexed terms and conditions of contract, the whole of the articles referred to and described in the attached specification and quantity decided by the Agency for New and Renewable Energy Research & Technology (ANERT), at the rates quoted against each item. The articles will be delivered and installed/commissioned operated and maintained for 10 years thereafter within the time and at the place(s) specified in the schedule.

I am/We are remitting herewith the required amount of Rs. towards the cost of e-tender and Earnest Money Deposit by electronic payment vide transaction No dtd.....

Yours faithfully,

Place:

Signature

Date:

Name

Designation

(Office Seal)



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Request for Selection (RFS) of agency for the Implementation of 2 MW Solar Power Plant at Travancore
Titanium Products Ltd., Kochuveli, Thiruvananthapuram under Solar City project funded by Smart City
Thiruvananthapuram Ltd

FORMAT 2 - POWER OF ATTORNEY

(To be on non-judicial Kerala stamp paper of appropriate value as per Stamp Act relevant to place of execution)

Power of Attorney to be provided by the Bidding Company in favour of its representative as evidence of authorized signatory's authority.

Know all men by these presents, We (name and address of the registered office of the Bidding Company as applicable) do hereby constitute, appoint and authorize Mr./Ms. (name & residential address) who is presently employed with us and holding the position of as our true and lawful attorney, to do in our name and on our behalf, all such acts, deeds and things necessary in connection with or incidental to submission of our Bid for Implementation of 2 MW Solar Power Plant at Travancore Titanium Products Ltd., Kochuveli, Thiruvananthapuram, Kerala in response to the RFS. No dated issued by ANERT including signing and submission of the Bid and all other documents related to the Bid, including but not limited to undertakings, letters, certificates, acceptances, clarifications, guarantees or any other document which the ANERT may require us to submit. The aforesaid Attorney is further authorized for making representations to the ANERT and providing information / responses to ANERT representing us in all matters before ANERT and generally dealing with ANERT in all matters in connection with this Bid till the completion of the bidding process as per the terms of the above mentioned RFS.

We hereby agree to ratify all acts, deeds and things done by our said attorney pursuant to this Power of Attorney and that all acts, deeds and things done by our aforesaid attorney shall be binding on us and shall always be deemed to have been done by us.

All the terms used herein but not defined shall have the meaning ascribed to such terms under the RFS.

Signed by the within named

..... (Insert the name of the executant company)
through the hand of Mr.



duly authorized by the Board (vide Board Resolution No____) to issue such Power of Attorney

Dated this day of

Accepted

.....

Signature of Attorney

(Name, designation and address of the Attorney)

Attested

.....

(Signature of the executant)

(Name, designation and address of the executant)

.....

Signature and stamp of Notary of the place of execution

Common seal of has been affixed in my/our presence pursuant to Board of CEO's Resolution dated.....(Board of CEO's Resolution is also enclosed)

WITNESS

1.

(Signature)

Name.....

Designation

2.

(Signature)

Name.....

Designation

Notes:

The mode of execution of the power of attorney should be in accordance with the procedure, if any, laid down by the applicable law and the charter documents of the executant(s) and the same should be under common seal of the executant affixed in accordance with the applicable procedure. Further, the person whose signatures are to be provided on the power of attorney shall be duly authorized by the executant(s) in this regard.



The person authorized under this Power of Attorney, in the case of the Bidding Company / Lead Member being a public company, or a private company which is a subsidiary of a public company, in terms of the Companies Act, 1956, with a paid up share capital of more than Rupees Five crores, should be the Managing CEO / whole time CEO/manager appointed under section 269 of the Companies Act, 1956. In all other cases the person authorized should be a CEO duly authorized by a board resolution duly passed by the Company. Also, wherever required, the executant(s) should submit for verification the extract of the chartered documents and documents such as a Board resolution / power of attorney, in favour of the person executing this power of attorney for delegation of power hereunder on behalf of the executant(s).



FORMAT 3 – GENERAL PARTICULARS

(This letter to be submitted on the official letter head of the tenderer, signed by the authorised signatory.)

Name of the Agency	
Registered Office	
Nature of Agency (Ltd. Co., Partnership etc.) Attach Copy of partnership Deed/ Certification of Incorporation	
Year of Establishment	
Registration of Number	
Address for Communication	
Telephone number of Contact person(Mobile if any)	
Name of CEOs/ Proprietor/Partners(with address and Telephone No)	
GST Registration Number (Copy to be Attached)	
PAN Number	
TAN Number	
Whether the bidder wishes to form a project company for execution of work	
Whether any Civil Suit / Litigation arisen in the contract executed during the last five years/being executed. If yes, please furnish the name of the Contract, employer nature of work, contract value,	



work order and date and brief details of litigation.	
Details of Total Experience in general since inception(Details of similar systems installed till the date of bid)	
Details of Turnover for last Two years. (Copy Audited Statements has to be submitted for last two financial years)	
Details of offices in Kerala, India and abroad- address and contact details	

Documentary evidence for the bid qualification requirements are submitted along with this document and the details furnished above are true and correct.

Signature
of authorised signatory

Name

Designation

Date:

(office seal)



FORMAT 4 – FINANCIAL CRITERIA

(certified by Authorized Signatory and the Statutory Auditor / Practising Chartered Accountant of the Bidding Company)

Financial Qualification Certificate

(Rupees in Crores)

S/N	Financial parameters	FY 17-18	FY 18-19	FY 19-20	FY 20-21	FY 21-22
1.	Net Worth					
a)	Paid up Capital					
b)	Free Reserves and Surplus*					
c)	Misc expenses to the extent not written off					
	Net Worth (a+b-c)					
2.	Annual Turnover **					

* Free Reserve and Surplus shall be Exclusive of Revaluation Reserve, written back of Depreciation Provision and Amalgamation.

** Annual total Income/ turnover as incorporated in the Profit and Loss Account excluding non-recurring income, i.e., sale of fixed asset etc.

It is certified that all the figures are based on audited accounts read with auditors report and Notes to Accounts etc.

(Signature & Seal of Authorized Signatory

Name of Authorized Signatory:

Designation:

Date:

Place:

Certifying Chartered Accountant:

Name of Firm:

UDIN No:

Date:

Place:

Note:

1. In addition to above certificate from Chartered Accountant, Bidder is required to submit Firm's Annual Audit Report, Balance sheet, Profit & Loss and Income Tax Returns / CA certificate for last Five years i.e., F.Y: 2017-18, 2018-19, 2019-20, 2020-21 & 2021-22.



FORMAT 5 - PERFORMANCE SECURITY GUARANTEE

(To be on non-judicial Kerala stamp paper of appropriate value as per Stamp Act relevant to place of execution)

BG No. :

Amount :

Date :

Valid up to :

In consideration of the Agency for New & Renewable Energy Research and Technology, therein after called "ANERT") have allotted work to M/s..... (hereinafter called the said Contractor) under the terms and conditions of Supply Order No..... issued by ANERT and the agreement dated made between (name of contractor) and ANERT for covering (hereinafter called the said agreement) of Security Deposit for the due fulfilment by the said contractor of the terms and conditions.

Contained in the said agreement, on production of the Bank Guarantee for Rs..... (Rupees..... only) we,Bank having our Head Office at (herein after referred to as "the Bank") at the request of M/s.(name of contractor) do hereby undertake to pay to the ANERT an amount not exceeding Rs..... (Rupees only), against any loss or damage caused to or suffered or would be caused to or suffered by the ANERT by reason of any breach by the said contractor of any of the terms and conditions contained in the said agreement

We,Bank, do hereby undertake to pay the amount due and payable under this Guarantee without any demur, merely on a demand from the ANERT stating that the amount claimed is due by way of loss or damage caused to or would be caused to or suffered by the ANERT by reasons of breach by the said contractor of any of the terms or conditions contained in the said agreement. Any such demand made on the Bank shall be conclusive as regards the amount due and payable by the Bank under this guarantee. However, our liability under this guarantee shall be restricted to an amount not exceeding Rs. (Rupees only).



This guarantee will not be discharged due to change in the constitution of the bank or the contractor/supplier.

Notwithstanding anything contained hereinbefore:

- 1) Our liability under this Bank Guarantee shall not exceed Rs.....(Rupees only)
- 2) This Bank Guarantee shall be valid upto
- 3) We are liable to pay the guaranteed amount or any part thereof under this Bank Guarantee amount only and only if you serve us a written claim or demand on or before.....

Dated at this day of 2023



FORMAT 6 – COMPONENT WISE SPLIT UP OF COSTS

(On Letterhead of the respective entity for which the below details are provided.)

To be provided for all capacity quoted by the bidder

S/N	Component	Percentage (%)
1	SPV Modules	
2	Module Mounting Structure	
3	Grid Tied Inverter as per specification	
4	Balance of System	
5	Cost for 10 Year Warranty and Preventive Maintenance	
6	Installation and Commissioning Charges	
7	Insurance (From Material dispatch till 10 years warranty period)	
8	Any miscellaneous expenses required for the successful commissioning of the plant	
9	Remote Monitoring and associated costs	
Total		100%



ANNEXURE A – PRE-AGREEMENT

(To be on non-judicial Kerala stamp paper of value Rs. 200)

ARTICLES OF AGREEMENT executed on this the day of
Two thousand andbetween the **Agency for New & Renewable Energy Research and Technology** (hereinafter referred to as **ANERT**) of the one part and Sri
(Name and Address of the tenderer) hereinafter referred to as “the Bounden”) of the other part.

WHEREAS in response to the Notification No.
dated the bounden has submitted to ANERT a e-tender for the ***Request for Selection (RFS) of agency for the Implementation of 2 MW Solar Power Plant at Travancore Titanium Products Ltd., Kochuveli, Thiruvananthapuram under Solar City project funded by Smart City Thiruvananthapuram Ltd*** specified therein subject to the terms and conditions contained in the said e-tender.

AND WHEREAS the bounden has furnished to ANERT a sum of Rs. as Earnest Money Deposit for execution of an agreement undertaking the due fulfilment of the contract in case his e-tender is accepted by ANERT. NOW THESE PRESENTS WITNESS and it is hereby mutually agreed as follows: -

In case the e-tender submitted by the bounden is accepted by ANERT and the contract for is awarded to the bounden, the bounden shall within Fifteen days of acceptance of this e-tender, execute an agreement with ANERT incorporating all the terms and conditions under which ANERT accepts this e-tender.

In case the bounden fails to execute the agreement as aforesaid incorporating the terms and conditions governing the contract, ANERT shall have power and authority to return



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Request for Selection (RFS) of agency for the Implementation of 2 MW Solar Power Plant at Travancore
Titanium Products Ltd., Kochuveli, Thiruvananthapuram under Solar City project funded by Smart City
Thiruvananthapuram Ltd

from the bounden any loss or damage caused to ANERT by such breach as may be determined by ANERT by appropriating the moneys inclusive of Earnest Money deposited by the bounden and if the Earnest Money is found to be inadequate the deficit amount may be recovered from the bounden and his properties movable and immovable in the manner hereinafter contained.

All sums found due to ANERT under or by virtue of this agreement shall be recoverable from the bounden and his properties movable and immovable under the provisions of the Revenue Recovery Act for the time being in force as though such sums are arrears of land revenue and in such other manner as ANERT may deem fit.

In witness whereof Sri (Name and Designation) for and on behalf of the Agency for New & Renewable Energy Research and Technology and Sri the bounden have hereunto set their hands the day and year shown against their respective signature.

Signed by Sri Signed by Sri

(Date)

(Date)

in the presence of witnesses

in the presence of witnesses

1.

1.

2.

2.



ANNEXURE B – BIDDERS TECHNICAL INFORMATION

TECHNICAL PARTICULAR DATA

Solar PV Module

Sl. No	Particulars	Required	Offered
1	PV Module Manufacture name & Country of origin	Manufacture name to be specified	
2	PV Module type	Poly/Mono Crystalline, Mono PERC	
3	No. of PV cells per Module		
4	Total number of PV modules		
5	Max. Power, P_{mp} @STC	330 Wp or above	
6	Max. Power tolerance (%)	Not more than 3%	
7	Max. Power voltage (V_{mp}) @STC	To be specified	
8	Max. Power current (I_{mp}) @STC	To be specified	
9	Open circuit voltage, V_{oc} @ STC	To be specified	
10	Short circuit current, I_{sc} @STC	To be specified	
11	Nominal voltage	To be specified	
12	Nominal Wattage	To be specified	
13	Fill Factor	Not less than 0.7	
14	Temp. coefficient of V_{oc} (%/C)		
15	Temp. coefficient of P_{mp} (%/C)		
16	Temperature Co-efficient of I_{sc} (%/°C)		
17	Normal Operating Cell Temperature (NOCT) (°C)		
18	Operating Temperature (°C)		
19	Module efficiency	$\geq 17\%$	
20	No. of By-pass Diodes		
21	Mounting arrangement for Solar Module	Fixed Arrangement	



Sl. No	Particulars	Required	Offered
22	Solar Module frame material	Anodized Aluminium	
23	Module dimensions' cm (L x W x H)	To be specified	
24	PV panel Weight (kg)	To be specified	
25	Output Cables	Polarized, UV protected & Weather Proof DC rated multi-contact connector	
26	Output Terminal	PV Connectors	
27	Junction Box	Weather resistant HDPE (IP65)	
28	Copies of test certificates	IS 14286/IEC 61215,61730 part 1&2, IEC 61701	

INVERTER

Sl. No.	Particulars	Required	Offered
1	Manufacturer		
2	Model name/No.		
3	Number of units		
4	Nominal AC power		
5	Nominal AC voltage		
6	Nominal AC Current		
7	AC grid Frequency range	50Hz $\pm$ 0.5%	
8	AC grid voltage range		
9	Power Factor (+ and -)		

Sl. No.	Particulars	Required	Offered
10	Total Harmonic Distortion	As per IEEE-519 2014	
11	AC over / under voltage over / under frequency protection		
12	Max PV input power		
13	Maximum DC voltage	Less than 1000 V	
14	MPPT voltage range		
15	Maximum DC current		
16	No. of DC input ports		
17	Maximum Efficiency	as per IEC61683	
18	DC voltage ripple		
19	Ambient temperature range		
20	Humidity (non-condensing)	95%, non-condensing	
21	Protective functions - AC over/under voltage, AC over/under frequency, over temperature, AC and DC overcurrent, DC over-voltage, against Islanding		
22	Communication Interface	RS485, MPI Profi-Bus/Telephone Modem/WiFi	
22	User-display standard	LCD panel with membrane keypad	
23	Enclosure environment rating		
24	Safety and EMC		
25	Anti-islanding feature	IEEE1547/UL1741/IEC62116	



ANNEXURE C – DECLARATION BY THE BIDDER

e-Tender Notification No:, dtd for Request for Selection (RFS) of agency for the Implementation of 2 MW Solar Power Plant at Travancore Titanium Products Ltd., Kochuveli, Thiruvananthapuram under Solar City project funded by Smart City Thiruvananthapuram Ltd

To

The CEO
ANERT

We, the undersigned, declare that:

1. We have examined and have no reservations to the Bidding Document, including Addenda No.: (if any)
2. We offer to supply in conformity with the Bidding Document and in accordance with the delivery schedule
3. Our Bid shall be valid for a period of 6 months from the date fixed as deadline for the submission of tenders in accordance with the Bidding Document, and it shall remain binding upon us and may be accepted at any time before the expiration of that period;
4. If our Bid is accepted, we commit to submit a Security Deposit in the amount of 5 percent of the Contract Price for the due performance of the Contract;
5. We are not participating, as Bidders, in more than one Bid in this bidding process;
6. Our firm, its affiliates or subsidiaries, including any subcontractors or suppliers for any part of the Contract, has not been declared ineligible by the ANERT or Government of Kerala;
7. We understand that this Bid, together with your written acceptance thereof included in your notification of award, shall constitute a binding contract between us, until a formal Contract is prepared and executed.
8. Our firm has obtained the certifications from MNRE or NABL approved Test laboratories that the goods and services are satisfying the technical criteria specified in the bid.

Signature

Name

Date



ANNEXURE D – DECLARATION OF RELATIONSHIP WITH ANERT EMPLOYEE

(to be signed and submitted by the bidder along with the bid)

Tender Notification No.:

Request for Selection (RFS) of agency for the Implementation of 2 MW Solar Power Plant at Travancore Titanium Products Ltd., Kochuveli, Thiruvananthapuram under Solar City project funded by Smart City Thiruvananthapuram Ltd

To

The CEO
ANERT

Name of the ANERT employee with Designation:

Name of the bidder related to the employee:

This is to put on record that Shri/Smt
currently working as in ANERT is related
to, who is the bidder in the bid. We are aware of
the Anti-corruption policy of ANERT and will observe the highest standards during the
procurement and the execution of contract and shall refrain from corrupt, fraudulent,
collusive or coercive practices on competing for the contract.

Signature

Name

Date



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Request for Selection (RFS) of agency for the Implementation of 2 MW Solar Power Plant at Travancore
Titanium Products Ltd., Kochuveli, Thiruvananthapuram under Solar City project funded by Smart City
Thiruvananthapuram Ltd

ANNEXURE F – CERTIFICATIONS & STANDARDS

QUALITY CERTIFICATION, STANDARDS AND TESTING FOR GRID-CONNECTED SOLAR PV POWER PLANTS

Solar PV Modules/Panels	
IEC 61215	<i>Design Qualification and Type Approval for Crystalline Silicon Terrestrial Photovoltaic (PV) Modules</i>
IS 14286	<i>Design Qualification and Type Approval for Crystalline Silicon Terrestrial Photovoltaic (PV) Modules</i>
IEC 61646	<i>Design Qualification and Type Approval for Thin-Film Terrestrial Photovoltaic (PV) Modules</i>
IS 16077	<i>Design Qualification and Type Approval for Thin-Film Terrestrial Photovoltaic (PV) Modules</i>
IEC 62108	<i>Design Qualification and Type Approval for Concentrator Photovoltaic (CPV) Modules and Assemblies</i>
IEC 61701	<i>Salt Mist Corrosion Testing of Photovoltaic (PV) Modules</i>
IEC 61725	<i>Analytical expression for Daily Solar Profiles</i>
IEC 61853-1	<i>Photovoltaic (PV) Module performance testing and energy rating Part-1: Irradiance and temperature performance measurements, and power rating</i>
IS 16170: Part 1	<i>Photovoltaic (PV) Module performance testing and energy rating Part-1: Irradiance and temperature performance measurements, and energy rating</i>
IEC 62716	<i>Photovoltaic (PV) Modules - Ammonia (NH₃) Corrosion Testing</i>
IEC 60721-2-1	<i>Classification of environmental conditions - Part 2-1 : Environmental conditions appearing in nature - Temperature and humidity</i>
IEC 61730-1	<i>Photovoltaic (PV) Module Safety Qualification - Part 1: Requirements for Construction</i>
IEC 61730-2	<i>Photovoltaic (PV) Module Safety Qualification - Part 2: Requirements for Testing</i>
IEC 60904-2	<i>Photovoltaic devices - Part 2: Requirements for photovoltaic reference devices (STC Performance, 1-V)</i>
IEC 60891	<i>Photovoltaic devices - Procedures for temperature and irradiance corrections to measured I-V characteristics (STC Performance)</i>
IEC TS 62548	<i>Photovoltaic (PV) Arrays - Design requirements</i>
IEC 61829	<i>Crystalline silicon photovoltaic (PV) array- on-site measurement of characteristics</i>

Solar PV String Inverters/INVERTERS	
IEC 62109-1, IEC 62109-2	<i>Safety of power converters for use in photovoltaic power systems- Part 1: General requirements, and Safety of power converters for use in photovoltaic power systems - part 2 : Particular requirements for inverters. Safety compliance (Protection degree IP 65 for outdoor mounting, IP 54 for indoor mounting)</i>
IEC/IS 61683	<i>Photovoltaic systems - Power conditioners: Procedure for measuring Efficiency (10%, 25%, 50%, 75% & 90-100% loading conditions)</i>
IEC 62093	<i>Balance-of-system components for photovoltaic systems – Design qualification natural environments for solar inverters (grid-connected)</i>
IEC 62116	<i>Utility-interconnected photovoltaic inverters- Test procedure of Islanding prevention measures Standard for Inverters, Converters, Controllers and</i>
UL1741	<i>interconnection system Equipment for use with Distributed Energy Resources</i>
IEEE 1547	<i>Standard for interconnecting Distributed Resources with Electric Power Systems</i>
IEEE 1547.1	<i>Standard for Conformance Test procedures for</i>
	<i>Equipment interconnecting Distributed Resources with Electric Power Systems</i>
IEC 60255-27	<i>Measuring relays and protection equipment - Part 27 : Product safety requirements</i>
IEC 60068-2 (1,2,14,27,30 & 64)	<i>Environmental Testing of PV System – Power Conditioners and Inverters</i>
	<i>IEC 60068 -2-1: Environmental testing - part 2-1: Tests - Test A: Cold</i>
	<i>IEC 60068 -2-2: Environmental testing - part 2-2: Tests - Test B: Dry heat</i>
	<i>IEC 60068 -2-14: Environmental testing - part 2-14: Tests - Test N: Change of temperature</i>
	<i>IEC 60068 -2-27: Environmental testing - part 2-27: Tests - Test Ea and guidance: shock</i>
IEC 61727	<i>Photovoltaic (PV) systems - characteristics of the utility interface (Parallel operation)</i>
	<i>Technical standards for connectivity of the distributed Generation Resources at Voltage - level of below 33kV</i>
CEA Guidelines / Regulations	
IEC 62103	<i>Electronic equipment for use in power installations</i>
BS EN 50438	<i>Requirements for micro-generating plants to be connected in parallel to public low-voltage distribution networks</i>



	<i>Requirements for earthing enhancing compounds</i>
<i>Junction Boxes</i>	
<i>IEC 529</i>	<i>Junction boxes and solar panel terminal boxes shall be of the thermo plastic type with IP 65 protection for outdoor use, and IP 54 protection for indoor use</i>
<i>IE 62208, IP 54 as per IEC 529</i>	<i>General requirements for junction boxes, charge controllers</i>
<i>CEA Regulations</i>	<i>Energy Meter Installation and operation of Energy Meters Regulations 2006, and as amended in 2010 & 2014</i>
<i>IS 13779</i>	<i>AC Static watt-hour Meters Class 1 and 2 - specification</i>
<i>IS 14697</i>	<i>AC Static Transformer Operated Watt-hour and Var- hour Meters, Class 0.2 S and 0.5 S - specification</i>
<i>IS 15884</i>	<i>Alternating Current Direct connected static Prepayment Meters for Active Energy (Class 1 and 2) - Specification</i>
<i>IS 15959</i>	<i>Data exchange for electricity meter reading, tariff and load control-companion specification</i>
<i>IS 16444</i>	<i>AC Static direct connected watt-hour Smart Meter Class 1 and 2 specifications (with Import & Export/Net energy measurements)</i>
<i>System Performance Monitoring</i>	
<i>IS/IEC 61724</i>	<i>Guidelines for PV System Performance Monitoring- measurement, Data Exchange, and Analysis</i>
<i>Rooftop PV System/Power Plant inspection</i>	
<i>IEC 62446</i>	<i>Grid connected Solar PV Systems-Minimum requirements for system Documentation, Commissioning Tests, and Inspection</i>
<i>IEC 61557-1</i>	<i>Electrical Safety in low voltage distribution systems up to 1000 V AC. and 1500 V DC - Equipment for testing, measuring or monitoring of protective measures – Part 1: General requirements</i>
<i>IEC 60364-6</i>	<i>Low-voltage electrical installations - part 6: Verification</i>
<i>IEC 61829</i>	<i>Crystalline silicon photovoltaic (PV) array- on-site measurement of I-V characteristics</i>





FORMAT 4 – FINANCIAL CRITERIA

(Financial Qualification Certificate)

S/N	Financial Parameter	FY 17-18	FY 18-19	FY 19-20	FY 20-21	FY 21-22
1	Net Worth					
a.)	Paid up Capital	0.015	0.015	0.015	0.015	0.015
b.)	Free Reserves and Surplus*	2.72	2.94	3.49	5.48	5.78
c.)	Misc expenses to the extent not written off	0.006	0.006	0.005	0.004	0.003
	Net Worth (a+b-c)	2.73	2.95	3.50	5.49	5.79
2	Annual Turnover **	10.66	11.91	11.61	18.66	14.48

* Free Reserve and Surplus shall be Exclusive of Revaluation Reserve, written back of Depreciation Provision and Amalgamation.

** Annual total Income/ turnover as incorporated in the Profit and Loss Account excluding non-recurring income, i.e., sale of fixed asset etc.

It is certified that all the figures are based on audited accounts read with auditors report and Notes to Accounts etc.



(Signature & Seal of Authorized Signatory)

Name of Authorized Signatory :- Rahul Malhotra

Designation: Director

Date: 24/04/2023

Place:- New Delhi



Certifying Chartered Accountant:

Name of Firm:- **PRIYANKA GUPTA**
UDIN **23546321BGVXJB9448**

Date: **26.04.2023**

Place: **DELHI**

**Note:**

1. In addition to above certificate from Chartered Accountant, Bidder is required to submit Firm's Annual Audit Report, Balance sheet, Profit & Loss and Income Tax Returns / CA certificate for last Five years i.e., F.Y: 2017-18, 2018-19, 2019-20, 2020- 21 & 2021-22.



Oakridge Energy Private Limited Cumulative 5MW Work Experience Details

S. No.	Client Name	Kilowatt
1	Solar Energy Corporation of India	1537KW
2	Jindal Power	1000KW
3	Amazon Warehouse	1000KW
4	Indraprastha Power generation company Ltd	1944KW
	Total	5481KW



✉ contact@oakridge.co.in

🌐 www.oakridge.co.in

CIN: U40101DL2012PTC240047

📍 **Regd. Office:** Oakridge Energy Pvt. Ltd. , 5, Link Road, Jangpura Extension, New Delhi - 110014

📍 **Corporate Office:** Oakridge Energy Pvt. Ltd. , B6/10, Safdarjung Enclave, New Delhi - 110029





सोलर एनर्जी कॉर्पोरेशन ऑफ इंडिया लिमिटेड
(भारत सरकार का उपक्रम)
Solar Energy Corporation of India Ltd.
(A Government of India Enterprise)

स्वच्छ भारत - स्वच्छ ऊर्जा



Rfs No: Date :SECI/Cont./01 /2016/500 /32418

Date:01-08-2019

TO WHOM IT MAY CONCERN

It is hereby certified that M/s Oakridge Energy Private Limited has successfully commissioned 121 rooftop solar projects with a cumulative capacity of 1537 kWp under "Rooftop Solar Scheme" of Solar Energy Corporation of India. All the projects were commissioned within the validity of the scheme, i.e. between November 2016 and 30 June 2018.

The complete list of projects has been enclosed as Annexure- 1.

With regards,

For and Behalf of Solar Energy Corporation of India

for Aile

(R.K Jain)

A.G.M (Solar)

Page - 1 of 7

Regd. Office : 1st Floor, PRIUS Platinum, D-3, District Center, Saket, New Delhi-110017

Phone : (011) 71989200, Email : corporate@seci.gov.in, Website: www.seci.gov.in

CIN : U40106DL2011GOI225263

Annexure 1: List of Projects

Sr No	Name of customer	Address	Capacity (kW)
1	Amar Kumar Singh	Sf- 4/376, Plot No- 376, Sector 4, Vaishali, I.E. Shahibabad, Ghaziabad, Uttar Pradesh - 201010	2.83
2	Kamlesh Sharma	Gf- 4/376, Plot No- 376, Sector 4, Vaishali, I.E. Shahibabad, Ghaziabad, Uttar Pradesh - 201010	5
3	Rekha Trivedi Dewani	A 754 Sector 19, Noida, Uttar Pradesh- 201301, Noida, Uttar Pradesh - 201301	7
4	Arvind Raj Vardhan	G-64/25 Sector, Noida - 201301	8
5	Subhash Chand	E-009, Alpha-1, Greater Noida, Gautam Budh Nagar - 201308	5
6	Rk Vohra	F-22, Sector- 21, Noida-201301	6
7	Jagat Singh	H No. 191, Gama-2, Greater Noida - 201308	5
8	Adarsh Singh	A-24, Sector 52, Noida, Uttar Pradesh - 201307	6
9	Uppalinder Prakash Mathur	D-26, Sector-36, G B Nagar, Noida, Up-201303	5
10	Sanjay Sharma	B-24, Sector 49, Noida - 201301	6
11	Poonam Garg	House No.18, Galli No 2, Bank Colony, Modinagar, Gaziabad, Up - 201204	5
12	Vimal Kumar	A-214, Sector-31, Noida Up-201301	5
13	Hari Krishan Verma	A-024, Alpha-I, Greater Noida, Gautam Budh Nagar, Noida -201308	5
14	Om Prakash Sharma	1389/17 C, Near C I A Chowki, Sector - 17, Gurgaon,	5
15	Hitesh Pal Malhotra	302(P), Sector 21 B, Faridabad, 121001, Haryana	5
16	Birender Singh Yadav	House No 32/22, Gali No 9, Near Sharda International School, Gandhi Nagar, Gurgaon, Haryana	5
17	F A Khan	H. No- 1306/17, Faridabad Haryana	10
18	Om Prakash Yadav	Vill- Chakarpur, Gurgaon, Haryana	5
19	Yogendra Prakash Bakshi	V 28/15 A, Dlf Phase 3 Gurgaon Haryana	3
20	Sewa Samitti School	Ambala Cantt, Haryana - 133001	15
21	Tdi School Sonipat	North / South Wing Tdi, International School, Sector 59, Tdi City Kundli, Sonipat - 131028, Kundli, Sonipat, Haryana - 131028	50
22	Champa Devi Jaipuriya Charitable Trust (Dps School - 1 To 3)	Sector - 47, Dps School, Gurugram - 122018	75
23	Meena Chaturvedi	Plot 4503, Phase 4 Dlf Gurgaon - 122009	6
24	Sheela Devi	M-2/26, Dlf Phase-1, Gurugram, Haryana - 122001	15
25	Champa Devi Jaipuriya Charitable Trust (Dps Sector 40)	House No. 7a, Aurangzeb Road, New Delhi- 110011 (Sector-40, Gurgaon, Haryana - 122002)	25
26	Sd College Socity - 1	West Wing, Jagahdhari Road, Near Civil Hospital, Ambala Cantt, Haryana - 133001	25
27	Sd College Socity - 2	South Wing-E, Jagahdhari Road, Near Civil Hospital, Ambala Cantt, Haryana - 133001	25

Sr No	Name of customer	Address	Capacity (kW)
28	Sd College Socity - 3	North Wing-E, Jagahdhari Road, Near Civil Hospital, Ambala Cantt, Haryana - 133001	25
29	Sd College Socity -4	East Wing-E, Jagahdhari Road, Near Civil Hospital, Ambala Cantt, Haryana - 133001	25
30	S D School - 1	Sd Vidya School, West Wing - E Jagahdhari Road, Near Civil Hospital, Ambala Cantt, Haryana- 133001	25
31	S D School - 2	Sd Vidya School, West Wing - E Jagahdhari Road, Near Civil Hospital, Ambala Cantt, Haryana- 133001	25
32	Vipassana Sadhana Sansthan	Dhamma Pathana, Village Kamaspur, Dist Sonapat, Haryana -131031	25
33	Satvinder Singh	68, Tagor Garden, Naraingarh Road, Ambala City- 134007	10
34	Amar Jeet	H No. 650 - P, Sector-25, Panchkula, Ambala, Haryana - 134109	5
35	Anita Goyal	105, Akash Neem Marg Dlf Phase 2, Gurgaon- 122022	8
36	Ayush Goel	H No. 91, Arjun Marg Dlf Phase -1, Sikanderpur Ghosi (68), Gurgaon, 122002	10
37	Ajay Singh	1566, Sector 9, Bahadurgarh, Jhajjar, Haryana - 124507	5
38	Amrit Singh Bedi	34, Poorvi Marg, Vasant Vihar, New Delhi-110057	10
39	Satish Chander Pasricha	House No. 96, Ground Floor, Kapil Vihar, Pitampura, New Delhi - 110034	5
40	Satish Chander Pasricha	House No 96, 1st Floor, Kapil Vihar, Pitampura, New Delhi - 110034	5
41	Lawrence Road Modern Education Society	H No Besides 248-A, Ground Floor, Blk-D, Ashok Vihar Phase-1, Delhi - 110052	6
42	Handicapped Children's Parents Association	Plot No K-13, Sector-5, Dwarka Institutional Area, New Delhi - 110075	10
43	Bhoopinder Singh Shahpuri	First Floor, J 10/108, Block J, Rajouri Garden	4
44	S.R.Sharda	A 8/9 Vasant Vihar, New Delhi	10
45	Ravinder Singh Sukheja	House No:- H- Block 20 D, Saket, New Delhi	5
46	Sass	Behind Bank Vihar Sharda Niketan Chowk Saraswati Vihar, Pitampura, New Delhi	15
47	Santosh Goel	A-08, Block E, Shyam Vihar Phase -1, Najafgarh, Delhi 110043	5
48	Mr.V. Lakshmi Kumaran	House No B 5/114, S/F Between 111 To 125, Safdarjung Enclave Opp Park, New Delhi	9.75
49	Dhruv Kalra	Khasra No- 1050, Block- A, Opp. A - 14, Asola Homes, Asola, South Delhi, Delhi - 110074	12
50	S.D. Mitroo	C- 95, Panchsheel Enclave, South Delhi, New Delhi - 110017	5
51	Sylvia Paul	M - 558, Second Floor, Guru Harikrishan Nagar Paschim Vihar, New Delhi - 110087	5

Sr No	Name of customer	Address	Capacity (kW)
52	Pankaj Malik	71 Deepali Pitampura, Saraswati Vihar, North West Delhi - 110034	5
53	Geetanjali/Sandeep Biaggana	F.No. 7303, B-10, Vasant Kunj, New Delhi - 110070	5
54	Abhishek Bhatia	Plot No 35, 3rd Floor Blk- A, Pkt 7 Sec 16 Rohini, Landmark Near Main Road, Delhi- 110086	3
55	Raman Bhatia	Plot No 35, 1st Floor Blk- A, Pkt 7 Sec 16 Rohini, Landmark Near Main Road, Delhi- 110086	3
56	Brij Lata Bansal	10a Green Avenue, Behind D3, Church Road, Vasant Kunj, South West Delhi, Delhi-110070	10
57	Navdristi	H.No. F-9 Khasra No 18/4 G/F, Village Mohdpur Majri Rama Vihar Delhi- 110081	6
58	Gurcharan Singh Jolly	62, G/F, Hemkunt Colony, New Delhi- 110048	10
59	Pushpa Devi/ Chandan Bhatia	H.No.23d,Block -G & J Landmark, Pitampura, New Delhi-110034	3
60	Kiran Bhardwaj	2503, D - 2, Vasant Kunj, New Delhi - 110070	3
61	R.P.N.Singh	B-5, Ansal Plaza, Village -Satbari, New Delhi - 110074	25
62	Harmit Trust	B- 37, Greater Kailash-1, New Delhi-110048	14
63	Surekha Gupta	House No. 48, 2nd Floor, Landmark Na Anand Vihar, Pitampura New Delhi 110034.	5
64	Indian Society For Technical Education	Shaheed Jeet Singh Marg, Near Katwaria Sarai Opp. Sanskrit Vidyapeeth New Delhi - 110016	20
65	Rishi Apartments Owners Welfare Association	Rishi Apartment, Alaknanda - 110019	20
66	Gautam Mukhopadhyaya	U-18, F/F S/F Between, T U-Block, Green Park, New Delhi - 110016	5
67	Sneh Lata Surana	House In Kh No 1796, G/F, Rajokari, New Delhi - 110038	20
68	Priya Aggarwal	A-289, Third Floor, Shivalik Colony, New Delhi- 110017.	10
69	Rakesh Paul	F No. 1087, Sect A Pkt, Vasant Kunj, New Delhi - 110070	5
70	Maneesha Tyagi	H No. 27, Ishwar Nagar, New Delhi - 110065	8
71	K.K Venugopal	A-144, Neeti Bagh, New Delhi - 110049	18.7
72	Govt Servants Co Op House Building Society Ltd(Kalyan Kendra)	Kalyan Kendra, 9 Paschimi Marg, Vasant Vihar, New Delhi -110057	20
73	Sunil Vasudeva	House No - 64, Ground Floor, Kalyan Vihar, New Delhi - 110009.	15
74	G Raveendra Nath	C - 81, S/F, Niti Bagh, New Delhi - 110049	5
75	G Tushar Rao	C - 81, G/F, Niti Bagh, New Delhi - 110049	5
76	Nisha Agarwal	C - 81, F/F, Niti Bagh, New Delhi - 110049	5
77	Anita Rana	R-770, New Rajendra Nagar, Delhi - 110060	5
78	Ankush Arora (Rama Softech)	10 Lady Harding Road, New Delhi- 110001	25

Sr No	Name of customer	Address	Capacity (kW)
79	Janak Taneja(Sangam Overseas Pvt Ltd)	9, Kasturba Gandhi Marg, Opp Diwan Chand Reasearch Institute New Delhi - 110001	40
80	Rishi Lal Batra	D-45 A, Ground Floor, East Of Kailash, New Delhi-110065	5
81	Yash Golyan Vardhan	Ho. No. 34, First Floor, Western Avenue, Sarik Farm, Delhi -110062	20
82	Santosh Gupta	House No - 7, 1st Floor, 43 Rajpur Road, Landmark Rajmahal Apartment 43, Civil Lines, New Delhi - 110054	15.5
83	Krishan Lal Anand	E-42, Kh No - 235 Neb Valley Near Nab Sarai, New Delhi - 110068	7
84	Varun Taneja	House No - 17, Road No-13, G/F, Punjabi Bagh Extn, New Delhi - 110026	10
85	Ginni Goel -1	A-11, Shivram Park, Nangloi, New Delhi - 110041	5
86	Ginni Goel -2	A-12, Shivram Park, Nangloi, New Delhi - 110041	5
87	Sanjay Sharma 2	22, Second Floor, Sbi Colony, Paschim Vihar, New Delhi-110063	5
88	Nitin Chaudhry	A-1/306, Paschim Vihar West Delhi, Delhi-110063	4
89	Reeta Thakur	G-44 B, East Of Kailash, New Delhi 110065	5
90	Makarr Educational Welfare Society-South Block (Mount Litera Zee School)	South Block, Mount Litera Zee School, Village Jharkheda, Sirmoli Road 6th Milestone, Alwar 301001, Alwar, Rajasthan- 301001	25
91	Makarr Educational Welfare Society-North Block (Mount Litera Zee School)	North Block, Mount Litera Zee School, Village Jharkheda, Sirmoli Road 6th Milestone, Alwar 301001, Alwar, Rajasthan - 301001	25
92	Makarr Educational Welfare Society-West Block (Mount Litera Zee School)	West Block, Mount Litera Zee School, Village Jharkheda, Sirmoli Road 6th Milestone, Alwar 301001, Alwar, Rajasthan - 301001	25
93	Makarr Educational Welfare Society-Central Block (Mount Litera Zee School)	Central Block, Mount Litera Zee School, Village Jharkheda, Sirmoli Road 6th Milestone, Alwar-301001, Alwar, Rajasthan-301001	25
94	Jasminder Kaur	H No, 3000, Phase-II, Urban Estate, Patiala, Punjab -147002	9
95	Tarsem Lal Verma	H No. 431-B, Street No 4, Guru Nanak Nagar, Patiala, Punjab - 147001	5
96	Madhupuri Apartment Chs Ltd	W/P Left B- Wing, Madhupuri, Chs; Dahanukar, Wadigokhale Road, Kandivali(West), Mumbai 400067	20
97	Nirlep Co Operative Housing Society Ltd Wing - A	A- Wing Plot No - 1178, G D Ambekar Marg, Nr Manohar Decoretor, Parel, Mumbai - 400012	10
98	Nirlep Co Operative Housing Society Ltd Wing - B	B- Wing Plot No - 1178, G D Ambekar Marg, Nr Manohar Decoretor, Parel, Mumbai - 400012	4

Sr No	Name of customer	Address	Capacity (kW)
99	Aditya's A Garden City Phase - Iv Apartments Condominium - 1	Kalyani A, Phase-Iv, Aditya's A Garden City, Warje, Pune, Maharashtra - 411058	25
100	Aditya's A Garden City Phase - Iv Apartments Condominium - 2	Kalyani A, Phase-Iv, Aditya's A Garden City, Warje, Pune, Maharashtra - 411058	25
101	Aditya's A Garden City Phase - Iv Apartments Condominium - 3	Kalyani A, Phase-Iv, Aditya's A Garden City, Warje, Pune, Maharashtra - 411058	25
102	Mediterranea Co-Operative Housing Society	Mediterranea D/E -Wing-E' Casa Rio Kalyan-Shil Road, District-Thane, State-Maharashtra - 421204, Thane, Maharashtra - 421203	15
103	Mediterranea Co-Operative Housing Society	Mediterranea A/B/C, Wing C, Casa Rio, Kalyan-Shil Road, Pin-421204, District-Thane, State-Maharashtra, Thane, Maharashtra - 421204	25
104	Mediterranea Co-Operative Housing Society	Mediterranea Ugt-Wing-E' Casa Rio Kalyan-Shil Road, Pin-421204, District-Thane, State-Maharashtra, Thane, Maharashtra - 421204	15
105	Aqua Co-Operative Housing Society	Aqua Chs, Casa Rio, Lodha Palava City, Kalyan-Shilphata Road,Rnusarghar Gaon, Dombivali, District Thane, State Maharashtra	9
106	Aqua Co-Operative Housing Society	Aqua Chs, Casa Rio, Lodha Palava City, Kalyan-Shilphata Road,Rnusarghar Gaon, Dombivali, District Thane, State Maharashtra	10
107	Aqua Co-Operative Housing Society	Aqua Chs, Casa Rio, Lodha Palava City, Kalyan-Shilphata Road,Rnusarghar Gaon, Dombivali, District Thane, State Maharashtra	15
108	Suhas Sitaram Thakar	Plot No 27 Vijay Nagar G K Road Pune 411007	5
109	Pradeep Krishna-Deshmukh	Plot A-1/32 Sector 6 New Panvel W410206	4
110	V M BHOSALE And Mrs. SHAILAJA	PLOT -2RD NO-13 SECT 12 VASANT NEW PANVEL,PANVEL410206	4
111	Shreeji Enclave	Water Pu Shreeji Enclave Plot-18 Kharghar, Kharghar 410210	11
112	Aditya's A Garden City Phase - Iv Apartments Condominium - 4	Kalyani A, Phase-Iv, Aditya's A Garden City, Warje, Pune, Maharashtra - 411058	25
113	Aditya's A Garden City Phase - Iv Apartments Condominium - 5	Kalyani A, Phase-Iv, Aditya's A Garden City, Warje, Pune, Maharashtra - 411058	25
114	Latitude Co-Op Hsg.Soc.Ltd	Latitude Co-Op Hsg Soc Ltd,Buld-A S.No.173/3/3, Plot-B,Opp.Sukhawani Petrol Pump,Wakad,Pune-411057,Maharashtrarn, Pune, Maharashtra - 411057	25
115	Latitude Co-Op Hsg.Soc.Ltd	Latitude Co-Op Hsg Soc Ltd,Buld-C S.No.173/2/1/1/2/3, Plot-B,Opp.Sukhawani Petrol Pump,Wakad,Pune-	25

Sr No	Name of customer	Address	Capacity (kW)
		411057, Maharashtra, Pune, Maharashtra - 411057	
116	Pratiksha Nagar Palm Acres Co-Op Hsg So. Ltd (1,2,3,4)	0.0, Floor, 7, 18a, Pam Akars Chs Sion Transit Camp Road, Nr Mala, Garden Pratiksha Ngr, Sion(E), Mumbai-400022, Mumbai, Maharashtra - 400022	40
117	Rna Height 1	Rna Heights B-Wing Chs Ltd., Opp. Fantasy Land, Village Majas, Jvnr, Andheri (E), Mumbai 400069, Mumbai, Maharashtra - 400069	15
118	Rna Height 2	Rna Heights B-Wing Chs Ltd., Opp. Fantasy Land, Village Majas, Jvnr, Andheri (E), Mumbai 400069, Mumbai, Maharashtra - 400069	10
119	Milan M. Hindlekar	Sumittha (Hospital) Jn, 2nd Floor, S V Road & Jambhali Galli, Opp Mosksharnplaza Borivall (W), Mumbai, 400092, Mumbai, Maharashtra - 400092	10
120	Omprakash Dindayal Agarwal	S.No.97 4&5 Neel Jyoti room No:1 Kibilli School 411016, Pune, Maharashtra - 411016	10
121	Omprakash Dindayal Agarwal	S No 405 To 410 Sb Road Sharad Hsg Socy S Nagar Pune 411016, Pune, Maharashtra - 411016	6.3
			1537.08



Date: 03rd April 2023.

To Whom It May Concern

This is to certify that M/s. Oakridge Energy Pvt. Ltd. has been allocated work of Supply, Erection & Commissioning of 1000 KWp Rooftop Solar Power Project at OPJSTPP, Tamnar, Raigarh, CG (India) issued by Jindal Power Limited vide PO No. 4100027119 & SO No. 4400015470, dated 17th March 2022 which has been successfully installed and commissioned on 23rd August 2022.

Brief Details of Solar PV Power project commissioned are:

- | | | | |
|---|-----------------------|---|--|
| 1 | Name of work | : | Supply, Erection & Commissioning of 1000 KWp Rooftop Solar Power Project at OPJSTPP, Tamnar, Raigarh, CG (India) |
| 2 | Project Capacity | : | 1000 kWp |
| 3 | Date of Commissioning | : | 23 rd August 2022 |
| 4 | Location | : | Jindal Power Limited, Tamnar, Raigarh, Chhattisgarh. |
| 5 | Project Cost | : | Rs. 4,36,43,908/- (Rupees Four Crore Thirty-Six Lakhs Forty-Three Thousand Nine Hundred Eight Only) (As per the PO dated 17 th March 2022-Purchase and Service order) |

The project is commissioned on 23rd August 2022.

This certificate has been issued with reference to the request letter (Oakridge/Solar/JPL/CC/03042023, dated 03rd April 2023) from Contractor M/s Oakridge Energy Pvt. Ltd- New Delhi for tender purpose only which shall have no financial implication on JPL.

For Jindal Power Limited


A.V.P. (Electrical Power System)

Jindal Power Limited

CIN No. : U04010CT1995PL0008985

Corporate Office: Jindal Centre, 12 Bhikaji Cama Place, New Delhi 110 066

T +91 11 4148 3000 F +91 11 2616 1371 E info@jindalpower.com W www.jindalpower.com

Registered Office: Tamnar - 496 107, District Raigarh, Chhattisgarh



JINDAL POWER LIMITED

P.O.Tamnar District: Raigarh - 496107
Phone : 07767 302000 Fax : 07767 281993

CIN NO : U04010CT1995PLC008985

PURCHASE ORDER

MMC/F/011

Ver. : 0 (17.03.2022)

Vendor : 1103915 OAKRIDGE ENERGY PRIVATE LIMITED OAKRIDGE ENERGY PRIVATE LIMITED JANGPUR EXTN. NEW DELHI 5, LINK ROAD DELHI - 110014 Delhi India Email: shravan.sampath@oakridge.co.in Phone: - Contact Person : Sri Shravan Sampath Phone No. : 9717936888 GST IN : 09AABCO7282N2ZR PAN NUMBER : AABCO7282N	Purchase Order : 4100027119 Purchase Order Date : 17.03.2022 Validity Start Date : 03.03.2022 Validity End Date : 31.08.2022 Buyer Name : Parija Saswati Email : parija.saswati@jindalpower.com PAN No. : AABCJ4683J GST IN : 22AABCJ4683J1ZI
--	--

REFERENCE:

1. OUR REQUIREMENT: Letter of Award no JPL/TAMNAR/M&C/SILAR/LOA/02 for Supply , Erection & commisioning of 1000KWp Rooftop Solar Power Project at OPJSTPP, Tamnar, Raigarh, CG

DEAR SIR,

PLEASE SUPPLY THE FOLLOWING MATERIAL AS PER THE TERMS AND CONDITIONS MENTIONED BELOW.

"Material dispatch clearance should be taken from buyer/user before dispatch"

SNo	Item Code	Description of Material	Qty	UOM	Net Price	Net Amount
10	100000042861	SOLAR PANEL-540WP MONO HALFCUT -JA SOLAR MAKE - JA SOLAR Basic Price : 13,053.68 Tax : NDT-IGST 12% - IP FI Tax (Goods) Delivery Date : 31.08.2022 HSN CODE : TAX CLASS . : IN:Integrated GST-ND 12	1,860	EA	13,053.68	24,279,844.80
						2,913,581.38
20	100000042860	SOLAR ON-GRID STRING INVERTER CAP-100KW CAP-50KW CAP-40KW CAP-60KW Basic Price : 2,406,615.00 Tax : NDT-IGST 12% - IP FI Tax (Goods) Delivery Date : 31.08.2022 HSN CODE : TAX CLASS . : IN:Integrated GST-ND 12	1	LOT	2,406,615.00	2,406,615.00
						288,793.80
30	100000042859	SOLAR MODULE MOUNTING STRUCTURE HOT DIP GALVANIZED ALUMINIUM BOX CHENNAL 4 MTR LENGTH Basic Price : 2,000,000.00 Tax : NDT-IGST 18% - IP FI Tax (Goods)	1	LOT	2,000,000.00	2,000,000.00

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JINDAL POWER LIMITED

P.O.Tamnar District: Raigarh - 496107
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CIN NO : U04010CT1995PLC008985

PURCHASE ORDER

MMC/F/011

Ver. : 0 (17.03.2022)

Order No. : 4100027119

Order Date : 17.03.2022

Delivery Date : 31.08.2022

HSN CODE :

TAX CLASS . :

IN:Integrated GST-ND 18

360,000.00

40	100000042858	SOLAR ACDB -IP65 POLYCARBONATE/CRCA	1	LOT	200,000.00	200,000.00
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METAL BOX HAVING A MCCB

SOLAR DCDB- IP65 POLYCARBONATE BOX

HAVING A DC FUSES

Basic Price : 200,000.00

Tax : NDT-IGST 18% - IP FI Tax (Goods)

Delivery Date : 31.08.2022

HSN CODE :

TAX CLASS . :

IN:Integrated GST-ND 18

36,000.00

50	100000042857	SOLAR EARTHING SET WITH CHEMICAL	1	LOT	156,680.00	156,680.00
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HEAVY DUTY GI ROD OF 20MM DIAMETER

2 MTR LONG HAVING A EARTHING

GI STRIP OF 25 X 3MM

WITH EARTHING CABLE

Basic Price : 156,680.00

Tax : NDT-IGST 18% - IP FI Tax (Goods)

Delivery Date : 31.08.2022

HSN CODE :

TAX CLASS . :

IN:Integrated GST-ND 18

28,202.40

60	100000042856	SOLAR LIGHTNING ARRESTER	1	LOT	112,000.00	112,000.00
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ESE TYPE

DIAMETER 22MM SS MATERIAL

2.5 KG

PRODUCT CODE OLP 50

Basic Price : 112,000.00

Tax : NDT-IGST 18% - IP FI Tax (Goods)

Delivery Date : 31.08.2022

HSN CODE :

TAX CLASS . :

IN:Integrated GST-ND 18

20,160.00

70	100000042855	SOLAR CABLE TRAY	1	LOT	180,500.00	180,500.00
----	--------------	------------------	---	-----	------------	------------

2.5 METER LONG

SIZE - 50 X40 X 1.6 MM , 100 X 40 X1.6 MM

PRE GALVANISED

Basic Price : 180,500.00

Tax : NDT-IGST 18% - IP FI Tax (Goods)

Delivery Date : 31.08.2022

HSN CODE :

TAX CLASS . :

IN:Integrated GST-ND 18

32,490.00

80	100000042854	SOLAR CABLE (AC & DC)	1	LOT	732,675.00	732,675.00
----	--------------	-----------------------	---	-----	------------	------------

AC CABLE - POLYCAB/HAVELLS MAKE, COPPER 4

CORE

DC CABLE- PLOVCAB MAKE, ALUMINIUM 3.5 CORE

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JINDAL POWER LIMITED

P.O.Tamnar District: Raigarh - 496107
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CIN NO : U04010CT1995PLC008985

PURCHASE ORDER

MMC/F/011

Ver. : 0 (17.03.2022)

Order No. : 4100027119

Order Date : 17.03.2022

Basic Price : 732,675.00

Tax : NDT-IGST 18% - IP FI Tax (Goods)

Delivery Date : 31.08.2022

HSN CODE :

TAX CLASS . :

IN:Integrated GST-ND 18

131,881.50

90	100000042853	SOLAR MISCELLANEOUS	1	LOT	473,650.00	473,650.00
		ELECTRICAL SUPPORTING EQUIPMENT				
		PVC CONDUITS -25MM, CABLE LUGS, SOLAR MC4				
		CONNECTOR ETC.				

Basic Price : 473,650.00

Tax : NDT-IGST 18% - IP FI Tax (Goods)

Delivery Date : 31.08.2022

HSN CODE :

TAX CLASS . :

IN:Integrated GST-ND 18

85,257.00

100	100000042852	SOLAR PANEL CLEANING SYSTEM	1	LOT	152,500.00	152,500.00
		0.5 HP PUMP WITH COMPLETE SET				

Basic Price : 152,500.00

Tax : NDT-IGST 18% - IP FI Tax (Goods)

Delivery Date : 31.08.2022

HSN CODE :

TAX CLASS . :

IN:Integrated GST-ND 18

27,450.00

Net Value INR	30,694,464.80
Tax Amount INR	3,923,816.08
Gross Total INR	34,618,280.88

Amount in words : THREE CRORE FORTY-SIX LAKH EIGHTEEN THOUSAND TWO HUNDRED EIGHTY RUPEES AND EIGHTY-EIGHT PAISE ONLY

Payment Instruction:

Please note that you have provided following details for payments to you

Bank A/c : 5427000100113001
Bank : KARNATAKA BANK
Bank IFSC Code : KARB0000542

Please check the Bank details as mentioned above and revert immediately in case of any deviation.

Insurance : Vendor Scope

Support doc.req. along Invoice

Price Basis : FOR - JPL Site Tamnar

Payment Method : EFT

Warranty : 12 Months

Deadline :

The Project Completion Schedule shall be 06 months from the date of issue of this Letter of Award.

Terms of Payment :

Supply of Equipment

[A].5% of the Supply Contract Price of goods shall be paid as an initial advance within 15 days from the date of receipt of following documents:

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JINDAL POWER LIMITED

P.O.Tamnar District: Raigarh - 496107
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CIN NO : U04010CT1995PLC008985

PURCHASE ORDER

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Order Date : 17.03.2022

a) Invoice of 5% of the Total Contract Price of goods.

b) Unconditional acceptances of LOA.

[B].85% of the Supply Contract price along-with 100% taxes and duties shall be released against pro-rata supply through irrevocable without recourse Letter of Credit (LC) against shipment of equipment and following documents at site:

a) Invoices :- 1 set of original + 3 set of copies

b) LR/GR/RR :- 3 copies

c) Packing List :- 3 copies

d) Copy of Transit Insurance Cover Note:-3 copies

e) Test Certificates, wherever applicable:- 3 copies

f) Material dispatch Clearance Certificate (MDCC) issued by Owner prior to dispatch :- 2 copies

[C].10% of the Supply Contract Price of goods shall be paid on successful commissioning and PG test of Goods after receipt of invoice of equivalent amount from the Contractor. This payment shall be released within 30 days after receipt of Invoice.

GST, as applicable, shall be payable extra against documentary evidence.

Bank Charges applicable, if any, shall be in Vendor's Account.

Other Contractual Stipulations :

1) Scope of work:

The scope of the Contractor shall include but not limited to Design, Engineering, Procurement, Supply, Testing, Packing & Forwarding, Transit Insurance, Transportation, Unloading, Storage, Intra-site transportation, Erection, Testing & Commissioning of Solar Photovoltaic (SPV) modules, cables, Inverters, structures, civil work, electrical balance of system and all other work so as required to handover the complete Project to Jindal Power Limited at OPJSTPP, Tamnar, Raigarh, Chattisgarh as per technical specification.

2) TECHNICAL SPECIFICATION:

2.1 The Technical Specification and Scope of Work shall be as per enclosed document in Annexure A and Conditions of Contract as per enclosed document in Annexure-B, and various correspondences referred above.

2.2 In case of any discrepancy between various documents referred above and the clauses indicated in this Letter of Award, the later shall prevail.

2.3 No other deviations on Bid documents Section- I, "Condition of Contract" & Section-II "Technical Specification for 1000 KWp Rooftop Solar PV Project except those specifically mentioned and agreed in this Letter of Award are applicable.

3) Total Contract Price:

3.1 The Total Contract price for the scope mentioned above for the 1000 KWp Rooftop Solar Photovoltaic Power Project shall be Rs 3,83,68,080.00 (Rupees Three Crore Eighty Three Lacs Sixty Eight Thousand Eighty Only). The detailed break up of Supply and Service shall be submitted by the Contractor within 7 days from the EDC.

3.2 The total prices as in Clause No.3.1 above is inclusive of packing and forwarding, freight & transit insurance up to site but exclusive of taxes & duties, Octroi /Entry tax and any other levies, which if levied by Central, State/local authorities shall be paid/reimbursed at actual by JPL in full along with the payment for supplies against the documentary evidence to be furnished by Oakridge Energy Pvt. Ltd. As indicated by you, GST @ 12% shall be applicable on Module and Inverters and 18% GST shall be applicable on Bought Outs and Services.

3.3 The above-mentioned Total Contract price shall remain firm throughout the execution of this Order.

3.4 If there is any delay in completion/commissioning on account of Contractor and there is any statutory increase in duties/taxes/levies or introduction of new tax during the period of delay, in such case, the differential shall be on account of Contractor.

4) WARRANTY / GUARANTEE/DEFECT LIABILITY:

Defect Liability

4.1 The Contractor warrants that the Project or any part thereof shall be free from any defects for a period of 1 (one) year from Date of Handover ("Defect Liability Period"). For purposes clarity, Date of Handover shall be the date when the project is handed over to the Solar Power Plant Owner in a working condition along-with all the necessary documents with respect to design, engineering and warranty of equipment.

4.2 During the Defect Liability Period, the Contractor shall, upon notifying by the Solar Power Owner, at its own cost and within reasonable time as prescribed by the Solar Power Owner, promptly repair, replace or otherwise make good any defects that may cause to the Project.

Project Warranties

4.3 Project components warranty can essentially be construed as guarantees /warranties provided by the project component manufacturers beyond the ones covered under defects liability period, performance warranty period and extended warranties. Best in Class OEM warranty to be provided for all equipment and all such warranty for any of the project components shall be transferred to the Owner at the time of

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E-Mail: info@jindalpower.com, ~~1422~~ www.jindalpower.com



JINDAL POWER LIMITED

P.O.Tamnar District: Raigarh - 496107
Phone : 07767 302000 Fax : 07767 281993

CIN NO : U04010CT1995PLC008985

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handover.

Modules 10 years product warranty and 25 years linear performance warranty

Inverters 5 years product warranty

Balance of System 1 year

Workmanship 1 year

5) Effective Date of Contract (EDC):

Effective date of contract shall be date of release of LOA i.e. 03.03.2022.

6) Delivery Period:

The Project Completion Schedule shall be 06 months from the date of issue of this Letter of Award.

7) Drawing & Document Distribution Schedule:

7.1 Oakridge Energy Pvt. Ltd shall send all the correspondences as per communication protocol with copy to following at the addresses mentioned below:

Site Address;

For Technical

Mr. Ajit Rai, AVP

Jindal Power Limited

Tamnar Raigarh- 496107

Mobile no: 7898905013

E-mail: ajitrai@jindalpower.com

For Commercial

Mr. Saroj Kumar Padhi, VP(M&C)

Email: Saroj.padhi@jindalsteel.com

Mob: 8826664057

7.2 Oakridge Energy Pvt. Ltd shall submit detailed L-1 & L-2 Network indicating Design, Engineering Schedules, Procurement, Manufacturing, Inspection & Dispatch Schedule within 7 (7) days from the effective date of Contract.

7.3 Oakridge Energy Pvt. Ltd shall submit Six (06) sets of various Drawings/Documents, Data Sheet and Design Calculations for comments/approval at JPL, Site Office. The comments/ approval on various drawings/documents will be sent by JPL, Site Office to Oakridge Energy Pvt. Ltd within Fifteen (15) days after receipt of the same from Contractor.

7.4 Oakridge Energy Pvt. Ltd shall send all correspondences and drawings in Autocad/PDF format & documents in MS Office through e-mail as advance copy followed by hard copies through Courier.

7.5 Oakridge Energy Pvt. Ltd shall appoint and furnish the contact details e.g. Office phone Nos. /Direct phone No. /Mobile No. /Fax No. /Residence No. and e-mail id of the Project Manager within one (01) week from the date of this Contract, who will take the single point responsibility/contact person throughout the execution of this Contract.

8) Payment Term

8.1 Supply of Equipment

8.1.1 5% of the Supply Contract Price of goods shall be paid as an initial advance within 15 days from the date of receipt of following documents:

a) Invoice of 5% of the Total Contract Price of goods.

b) Unconditional acceptances of LOA.

8.1.2 85% of the Supply Contract price along-with 100% taxes and duties shall be released against pro-rata supply through irrevocable without recourse Letter of Credit (LC) against shipment of equipment and following documents at site:

a) Invoices :- 1 set of original + 3 set of copies

b) LR/GR/RR :- 3 copies

c) Packing List :- 3 copies

d) Copy of Transit Insurance Cover Note :- 3 copies

e) Test Certificates, wherever applicable :- 3 copies

f) Material dispatch Clearance Certificate (MDCC) issued by Owner prior to dispatch :- 2 copies

8.1.3 10% of the Supply Contract Price of goods shall be paid on successful commissioning and PG test of Goods after receipt of invoice of

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JINDAL POWER LIMITED

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CIN NO : U04010CT1995PLC008985

PURCHASE ORDER

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equivalent amount from the Contractor. This payment shall be released within 30 days after receipt of Invoice.

8.2 Services

8.2.1 5% of the Services Contract Price shall be paid as initial advance as mobilization within 15 days from the date of receipt of following document:

a) Invoice of 5% of the Services Contract Price.

b) Unconditional acceptances of Contract.

8.2.2 85% of the Services Contract Price shall be released against progressive erection on a pro-rata basis against mutually agreed BBU along with 100% taxes & duties within 30 days after receipt of material at site and following documents at site:

a) Invoices :- 1 set of original + 3 set of copies

b) LR/GR/RR :- 3 copies

c) Packing List :- 3 copies

d) Copy of Transit Insurance Cover Note :- 3 copies

e) Test Certificates, wherever applicable :- 3 copies

f) Material dispatch Clearance Certificate (MDCC) issued by Owner prior to dispatch :- 2 copies

8.2.3 10% of the Services Contract Price after successful commissioning and submission of invoice duly certified by EIC and against submission of Performance Bank Guarantee of 10% of the Contract Price.

8.2.4 All the Bank Guarantees shall have a claim period of 3 months

8.2.5 100% of the operation and maintenance contract price as indicated in clause 3.5 above along with taxes and duties shall be released after completion of 1 year O&M period and against submission of invoice duly certified with EIC within 30 days.

9) Liquidated Damages (LD):

9.1 In case Contractor fails to deliver the goods/services for completion of commissioning as per the schedule mentioned in Clause No 6.0 above due to reasons not attributable to JPL, Contractor shall be liable to pay LD @0.5% of the Total Contract price indicated in Clause No 3.1 above for each completed week of delay or part thereof subject to a maximum of 5% of the Total Contract price indicated in Clause no 3.1 above.

9.2 LD for shortfall in Performance Guarantees shall be as indicated in technical specifications for maximum of 10%.

9.3 The combined maximum ceiling of LD on account of delayed delivery/Commissioning and Shortfall in Performance shall be limited to 10% of the Contract Price.

9.4 Contractor shall undertake to pay the LD at the rates stipulated above without requiring JPL to prove actual loss or damage

9.5 LD payable by Contractor shall be deducted by JPL from any outstanding payments due to Contractor.

10) Quality Assurance Plan (QAP)

Contractor shall furnish a complete procedure indicating various components which are to be inspected for stages and final inspection. The procedure shall be furnished and finalized mutually. Contractor shall furnish Quality Assurance Plan (QAP) for JPL's review and approval and inspection / test documents shall be furnished accordingly after approval of QAP.

11) Dispatch Instruction / Dispatch Clearance

For materials / equipment requiring inspection / test witnessing and /or the approval of test certificates, as per Quality Assurance plan (QAP) agreement, the dispatches shall be effected only after the dispatch clearance (MDCC) is given or MDCC waiver (based on necessary test certificates) issued by JPL.

12) Safety

Contractor shall observe strictly the general health, safety and security rules and regulations, as mentioned in the General Condition of Contract (GCC).

13) Inspection and Testing

13.1 The inspection and testing of equipment / materials shall be carried out as per standards prescribed in the specifications / agreed mutually as per QAP. The tests shall be offered with calibrated test grade accuracy instruments as specified by Standards / Good Engineering Practices.

13.2 Contractor shall proceed from one stage to another only after the inspection is completed by JPL / JPL's authorized Third Party Inspection (TPI) and written permission given to proceed further.

13.3 A clear notice of minimum 07 days for domestic and 30 days for imported supply shall be given by Contractor for inspecting the material and equipment or witnessing the tests of indigenous items. On visit of JPL's engineers, if it is found that the materials / equipment are not ready and the inspection of the materials and equipment or witnessing tests thereof is not possible, then such costs of unproductive visits shall be recovered from supplier's bills.

14) In case there are multiple units, all auxiliary/Bought out items shall be sourced / procured from common Vendor/Sub-vendor for all units.

15) For auxiliary/Bought out items, in case there is a requirement to change vendor/sub-vendor after award of work, the Contractor shall necessarily take approval from Owner's Engineering and Commercial Department for the same.

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16) The Contractor shall manufacture, procure and deliver all the materials in an expeditious and Sequential manner to the Site. The Contractor shall take specific approval from Owner prior to dispatch of any perishable items (items with specified shelf life).

17) The Contractor shall submit the detailed Billing Break Up (BBU) within seven (07) days after award of contract for the necessary approval from Engineering and Commercial Departments. While submitting this BBU contractor shall ensure the reasonability of prices which should be a reflection of prevailing market prices. BBU shall cover but not be limited to the actual requirement for the completeness of the scope of work.

18) In case of any contradictions, the clauses mentioned in this Contract shall supersede the respective clauses mentioned in Bidding Document (Section- I, "Condition of Contract", and Section-II "Technical Specification for 1000 KWp Rooftop Photovoltaic Solar Power Project") and all other subsequent correspondence. All other terms & conditions mentioned in Bid document (Section- I, "Condition of Contract", and Section-II "Technical Specification for 1000 KWp Rooftop Photovoltaic Solar Power Project") shall prevail.

Please sign and return the duplicate copy of this Contract as a token of your acceptance to the same. If acceptance is not received from Contractor within one (01) week from the date of release of this Contract, it will be considered that the various terms & conditions indicated in this Contract are acceptable to Contractor.

Annexure A (Scope of Work & Technical Specification)

1 SCOPE OF CONTRACTOR

1.1 The scope of the Contractor will include engineering/designing, procurement and supply, handling, erection, installation, testing & commissioning of Solar Photovoltaic (SPV) modules, cables, Inverters, structures, civil work, electrical balance of system and all other work so as to require to handover the complete Project to the Solar Power Owner.

" Supply and installation of HDG module mounting structure

" Supply and installation of Solar Modules

" Supply and installation of Inverters

" Supply and Installation of cable trays and conduits

" Supply and installation of AC/DC cable

" Supply and installation of LT panels and metering cubicles

" Supply and installation of earthing system with ESE LA

" Supply & Installation of Data logging with remote monitoring

" Supply & Installation of Fire Fighting System

" Supply and installation of Module cleaning sytem with pump

" Supply and installation of online monitoring system

" Testing and commissioning of solar project

"

ITEM ITEM DISCRIPTION UOM Makes

Solar Module Mono Perc 540 Wp Nos Tier -1

String Inverters String Inverter,

415V, 50Hz

Nos Reputed

Remote monitoring solution Online web monitoring solution No Reputed

Module mounting structure Member material of Hot Dip galvanized

iron with coating thickness 80 microns Ballast type foundation

with any direct anchoring

Weight of 200 -250 kg per sqm

Design wind speed to be

170kmph and design code to be

as per IS -801

Set Reputed

LT Panels 415V 3 PH, TPN 430 Amps

Distribution panel , Outdoor

type, with MCB, SPD protection

and MFM meter, IP 65 rated.

No Reputed

AC cables 3Ph N PE, 1.1kV,

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Ver. : 0 (17.03.2022)

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UnAr Cu cable between Inverter
and LT Panel
150 Sqmm 3.5C 3Ph N, 1.1kV,
Al cable between Evacuation
point & LT Panel
Meter Reputed
DC cables 1C, UnAr, UV
resistant, Solar grade, PVC
insulated Copper Cable
LOT Reputed
connectors MC4 Compatible connectors
Pair
Reputed
Cable Conduit 1 - 1.5 inch dia PVC conduits
for DC side un armoured cables,
UV Resistant
Set AKG/Supreme/Prince

Earthing pits Earth rods - 40mm dia,
30 micron thick GI coated
electrode carbon based back
filling compound
& GI clamps (for AC + DC +
LA
Earthing)
For DC
For AC
For LA
Set JMV/ Reputed

Earth Strips 25 X 3 mm GI strip(Minimum)
Meter Reputed
Lightning
arrestor
ESI Type Lightning arrestor
with coverage area required
No
JMV/Reputed

Inverter and
Panel
Mounting
Accessories for wall mounting
of Inverters and LT panel along
with canopy
Lot As per Design
Water Pipe
Line
CPVC Pipe
Lot AKG/Prince/Reputed

1.2 The Contractor shall, inter alia:

a) Provide most optimum design based on best engineering practices.

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JINDAL POWER LIMITED

P.O.Tamnar District: Raigarh - 496107
Phone : 07767 302000 Fax : 07767 281993

CIN NO : U04010CT1995PLC008985

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b) Procure PV panels & other allied equipment keeping in mind the location, performance, size of the available area and all other relevant details.

c) At all times maintain a communication with the Solar Power Plant Owner regarding the progress of the project by providing daily progress report through email

d) Exercise reasonable caution and safety during the execution of work. All Insurances, liabilities would be in the scope of the Contractor before the Date of Handover of the complete project as per the satisfaction of the Solar Power Owner.

e) Maintain all insurance policies, ESI for Manpower at the site etc. that are required for compliances.

f) Keep the site clean always of work.

g) After installation testing and commissioning, handing over the plant to the Solar Power Plant Owner with complete O&M manuals, close out report, learnings, documents pertaining to equipment guarantees & warranties and other relevant documents related to the Project.

h) Be responsible for the labor laws and its compliance with respect to its employees and sub-contractors and shall keep the Solar Power Plant Owner indemnified all times against all such losses or damages that may cause to the Solar Power Plant Owner in that regards.

i) Ensure that no loss or damage would happen to the factory roof or any other part of the factory due to Project work and Contractor shall be responsible for all and any such losses/damages that may cause at factory site till the COD of the project.

j) Take all necessary steps and comply with all applicable Laws, relevant permits, consents and approvals to protect the environment (both on and off the Site) and to limit damage and nuisance to people and property resulting from pollution, noise and other results of his operations.

1.3 The Contractor agrees to co-operate with Solar Power Plant Owner during the term of this Contract and beyond and provide all such assistance, information and support as is reasonably necessary to enable Solar Power Plant Owner to have minimum down time.

1.4 In addition to anything stated hereinbefore, the Contractor shall carry out the following services, leading to complete installation and operationalization of the Solar PV Rooftop Project:

a) Design works, including providing design documents in 1 set of softcopy

LAYOUT Category

Overall Project Layout with coordinates & equipment location Approval

Module Blocks Layout Approval

Module Mounting Structure Foundations Layout Approval

DC & AC plant Earthing layout with calculation (assumption and methodology) Approval

DC & AC cable routing layout with cable tray arrangement Approval

Design of Water Distribution Pipeline & detailed Layout Approval

CIVIL & STRUCTURAL

Module Mounting Structure Approval

Foundations of Module Mounting Structure Approval

Lightning Arrestor Foundation and Design Approval

ELECTRICAL

AC SLD of the solar plant Approval

DC SLD of the solar plant with the Module string configuration Approval

Control Wiring and Monitoring Schematics Review

Lightning Protection layout with calculation (assumption and methodology) Approval

Schematic diagram of the Solar system with the existing Evacuation system Approval

DESIGN CALCULATIONS

Pvsyst report with Near shading, EYA report Approval

Shadow Analysis Approval

AC & DC Cable Sizing Approval

Earthing Design calculation for AC & DC System Approval

Module Mounting Structure & Foundation Design Approval

DC & AC cable voltage drop & power loss calculation (assumption and methodology) Approval

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SPEC SHEETS

Modules, Invertor , AC and DC Cables & ACDB & other relevant equipments Approval

Transformers and associated equipment Approval

OTHER DOCUMENTS

User Manual for all Equipment Review

Installation Manual for all Equipment Review

Project Implementation Schedule Review

Permits and Clearances Required Review

Spare List Review

Plant O&M Manual Review

Field Quality Plan Review

b) Transportation of materials, tools and tackles to site

c) Supply and installation of module mounting structure

d) Supply and Installation of PV modules

e) Construction of cable trenches/ cable runaways

f) Supply and connection of electrical cables

g) Commissioning of system and trial run

h) CEIG and net metering approvals

2 SCOPE OF Contractor SOLAR POWER OWNER

2.1 Pre-Requisite:

The Solar Power Plant Owner shall acknowledge to the Contractor that the followings are the pre-requisites for the Plant on behalf of owner and therefore shall ensure the same:

a) Clear shadow free area for the installation of PV panels

b) Space for the installation and commissioning of electrical panels.

c) An open area for storage of supplied equipments till commissioning.

d) Proper access to roof in terms of having proper ladder to access the roof.

e) Proper roof having good load bearing capacity to withstand solar panels weight. Any existing structure retrofitting repair to be done by Solar Power Plant Owner before start of solar works.

Facilities to be arranged by the Solar Power Owner:

The Solar Power Plant Owner shall be responsible to provide the following facilities at site:

i) Electricity - Construction power shall be arranged by the Solar Power Plant Owner at its own cost at single point.

j) Water - Construction water will be made available by the Solar Power Plant Owner with suitable storage arrangement at single point.

k) Statutory fees required to be paid for setting up solar project.

l) Water for module cleaning

2.2 The Solar Power Owner agrees to co-operate with Contractor during the term of this Contract and provide all such assistance, information and support as is reasonably necessary to enable Contractor to provide the Service to the Solar Power Owner.

3 Performance Guarantee

The bidder is liable to guarantee the Assured Delivered Energy as per table below at the end of 1st Year.

For any shortfall of energy generated below this value, Contractor shall pay penalty to the Owner @ Rs 4.00 per Kwh.

ANNEXURE I

Year wise Estimated Delivered Energy and Assured Delivered Energy

Year from COD Estimated Delivered Energy

(in kWh per annum) Assured Delivered Energy

(in kWh per annum)

Year 1 1400000 1400000

Year 2 1390200 1390200

Year 3 1380468 1380468

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Year 4 1370805 1370805
 Year 5 1361209 1361209
 Year 6 1351681 1351681
 Year 7 1342219 1342219
 Year 8 1332823 1332823
 Year 9 1323494 1323494
 Year 10 1314229 1314229
 Year 11 1305030 1305030
 Year 12 1295894 1295894
 Year 13 1286823 1286823
 Year 14 1277815 1277815
 Year 15 1268871 1268871
 Year 16 1259989 1259989
 Year 17 1251169 1251169
 Year 18 1242410 1242410
 Year 19 1233714 1233714
 Year 20 1225078 1225078
 Year 21 1216502 1216502
 Year 22 1207986 1207986
 Year 23 1199531 1199531
 Year 24 1191134 1191134
 Year 25 1182796 1182796

Deration Factor: The Estimated Delivered Energy for the forthcoming years would be after considering at [0.7] % deration for year 2 from COD and thereafter [0.7] % annual deration.

Vendor Memo (General) :

ENGINEER - IN- CHARGE:

Mr. Ajit Kumar Rai, AVP (Power Control) - Mobile No. 07898905013 or his authorized representative shall be Engineer In charge of the said work. Kindly contact him for further action.

Special Terms in Order :

For materials / equipment requiring inspection / test witnessing and /or the approval of test certificates, as per Quality Assurance plan (QAP) agreement, the dispatches shall be effected only after the dispatch clearance (MDCC) is given or MDCC waiver (based on necessary test certificates) issued by JPL.

In case Contractor fails to deliver the goods/services for completion of commissioning as per the schedule mentioned in Clause No 6.0 above due to reasons not attributable to JPL, Contractor shall be liable to pay LD @0.5% of the Total Contract price.

Terms & Conditions :

GENERAL CONDITIONS OF PURCHASE ORDER

1. Scope # Acknowledgement of Order

The present General Conditions shall be applicable to purchase orders placed by JPL, unless otherwise specified in the order. The vendor shall return to JPL, the acknowledgement of the order, duly signed, within one week from the date of dispatch of the purchase order as a token of acceptance through courier/post/fax/scanned email. JPL reserves the right to cancel the order should the vendor make any alteration to the Acknowledgement. Any action taken to execute the order from JPL, even if there has been no acknowledgement of the order, shall be deemed to constitute acceptance of the present General Conditions.

2. Execution of Orders

The vendor shall be solely responsible for the execution of the order in every respect, in accordance with the normal customs of the trade. He shall draw JPL's attention to any element likely to impede the satisfactory execution of the order, in particular by providing JPL at all times with all relevant information for this purpose.

3. Price

Unless otherwise stated, the unit prices as indicated in Purchase Order are the Ex-Works/ shop / depot prices. Prices mentioned in the order

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shall remain firm and not subject to escalation till the execution of the order even though the completion/execution of the order may take longer time than the delivery period specified and accepted in the purchase order.

4. Price Revisions

Price revisions, if applicable, will be effective only if agreed and confirmed by the buyer in writing and shall not remain effective beyond the specified time limits if the delay is due to the vendor.

5. Packing & Forwarding

Unless otherwise stated explicitly in Purchase Order, P&F expenses will be deemed as Inclusive in the unit price.

6. Packing Conditions

You are requested to reduce packaging waste and minimize utilization of wood items for the packaging without affecting the quality. Any damage to material at the time of delivery at site, due to improper packing shall be the responsibility of vendor. Vendor has to ensure prompt replacement of such damaged items failing which appropriate actions will be taken as deemed fit.

7. Taxes

GST shall be shown separately in the invoice if payable extra. Any increase in the rates of taxes, levies and duties beyond delivery period stipulated in the purchase order shall be to Vendors# account.

Vendor will furnish your GST Registration Number in all your invoices. The registration number indicated in the invoices shall have to be in force on the date of sale of goods.

8. Declaration

We are in the business of Generation, Transmission and Distribution of Electricity, which are non-excisable goods. Therefore we do not have Excise Control Code (ECC) number /Excise Registration No. If you are a SSI, please specify Notification Number and the Concessional duty applicable thereto. If duty is paid under protest then the Notification Number and date should be mentioned.

9. Delivery & invoices

Time is the essence of this order. Material shall be delivered within stipulated date in the order / delivery-schedule.

The invoices shall be made in triplicate (3 copies) and shall accompany the material. The material along with the Original bill/Invoice shall be delivered to the following address;

MANAGER # CENTRAL STORES

Jindal Power Limited,

O.P.Jindal Super Thermal Power Plant(4x250 MW)

P.O. Tamnar,

Dist. Raigarh(C.G.) PIN # 496107

10. Delivery Timings

09.00 to 13.00 hrs & 14.30 to 17.00 Hrs. except Sundays & Public Holidays.

11. Mode of Delivery

a. F.O.R. JPL Central Stores: Vendor will send the materials through any reputed Bank approved transporter as mentioned below and will book the consignment on "Freight prepaid basis" for door delivery.

b. F.O.R. Ex works: Vendor will book the consignment through any reputed Bank approved transporter as mentioned below on "Freight prepaid / Freight to be billed basis" for door delivery.

c. Freight charges are payable by JPL against documentary evidence.

d. Tax at Source (TDS) shall be deducted at source as per statute and applicable government laws. Our preferred transporters: M/s Associated Road Carriers (ARC), M/s Transport Corporation of India Limited, XPS.

12. Insurance

Insurance for the material in transit would be as per the terms agreed and mentioned in the Purchase Order. If this is agreed on #Vendor#s Scope#, vendor shall ensure suitable coverage of the material on warehouse to warehouse basis. If, Insurance is in #JPL Scope#, then vendor shall endorse the Open Marine Policy number, as mentioned in Purchase Order, in all the relevant dispatch documents, viz; Challan/invoice/ LR copy etc. or else the materials will be received at Vendor#s risk.

13. Acceptance of the Supplies

Acceptance of the supplies shall always take place on the JPL site, after due checking, even when the goods are invoiced "ex Works" or "ex Warehouse.

14. Payment

Invoices shall be settled only to the value of the goods accepted, and on condition that all the relevant and other necessary documents have been received at JPL .Provided the invoiced goods have been accepted by JPL after inspection, payment will be made within 30 days from the date of acceptance of the supplies at JPL site, unless otherwise specified in Purchase Order.

15. Liquidated Damages

Delivery period should be guaranteed. In case of delays, the vendor shall be liable to pay the purchaser by way of liquidated damages @

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0.5% of the undelivered value of the order for each week's delay subject to maximum of 5% of the total value of the order. In specific cases this general standard LD clause may be modified and shall be indicated in order /delivery schedule.

16. Risk Purchase

In the event you fail to supply the material on order, JPL will have the right to buy the material from other sources at market rates and the extra cost incurred in such procurement along with Company Overheads will be recovered from your future bills against subsequent supplies/bills.

17. Quality and Inspection

The Materials supplied hereunder shall be of good quality, free from any faults and defects and in conformance with the Purchase Order, and shall at all times be subject to inspection before acceptance by JPL / JPL's Inspection Agency, who will carry out inspection at site. JPL reserve the right to reject part or full consignment received in defective condition. In case JPL representative would like to inspect the item at your site prior to dispatch, the same will be communicated to vendor in advance against intimation of readiness received from vendor's end.

18. Return of Non-Conforming Product

In case of Non-conforming product/ rejection, vendor shall have to arrange for replacement on immediate basis. Vendor shall also arrange to lift the non-conforming/rejected material from our plant within 15 days of the date of Rejection Note, till then the Non-conforming material will remain at Central Stores - JPL at vendor's risk. Further, if vendor fails to lift such materials within 60 days without any intimation to us, it will be presumed that you are not interested to lift the same and in that case JPL reserves the right to shift the non-conforming/ rejected materials to scrap yard at the vendor's risk without any further communication for which no further communication will be entertained.

19. Suitability / Compatibility Certificate

You would be required to furnish at the time of supply, a certificate confirming the suitability with the parent equipment in use, of the material offered by you. In case of any modification in design or manufacture of the spares, which result in not meeting our end use requirement, such spares shall be replaceable by you at no extra cost.

20. Guarantee

Equipment/Material shall be guaranteed for satisfactory performance for a period of 12 months from the date of commissioning or 18 months from the date of receipt whichever

is earlier against faulty design, material and workmanship and shall be replaced free of cost in the event of failure during the guaranteed period, unless otherwise specified and agreed in your offer and our purchase order subsequently.

21. Health & Safety

Vendor will provide complete information regarding the usage, for which the product has been designed, and any restrictions and safeguards which should be observed in all stages of its handling, operation and disposal. This may be in the form of technical specification, leaflet/ brochure, MSDS (Material Safety Data Sheet), instructions for safe Material handling and Storage instructions etc.

22. Compliance to Environment Laws

Please indicate whether your organization is ISO 14001 certified. If not, please certify that the handling, use and disposal of your product consider practices consistent with sound environmental management. We prefer environment friendly products and processes.

23. Grievance Redressal

In case of any grievance the vendor shall bring the same to the notice of the Head -Materials & Contracts. Vendor may also drop his concerns at the drop-box available for this purpose at the reception of Administrative Building, JPL, Tamnar or may send the same through post or electronic mail.

24. Vendor Rating

Vendor is requested to ensure compliance to the terms of the individual orders with regards to timely delivery, provision of all applicable documents / challans / test certificate, quality of the material etc. Vendor performance with respect to these factors will be taken into consideration during rating of vendors for future business.

25. Order Manager

This order will be managed by the Buyer as mentioned in the Purchase Order. All future correspondence related to this order shall be addressed to the above officer.

26. Payment Manager

AGM (F&A) will be the payment manager as per the Purchase Order terms. All future correspondences related to payment shall be addressed to the above officer under copy to the order manager.

27. Indemnity against Patent Rights

The equipment, system, drawings, and other materials supplied by the vendor against this order will become sole property of JPL and JPL management and any individual engaged in this business shall remain indemnified against any claim for infringement or breach of any of the statutes, rules & regulations by the use of or sale of any article or material supplied by the vendor. This indemnity shall include any infringement of patent, trademark, design, copyright or other property rights whether in Country of origin, or elsewhere resulting from vendor's design, manufacture, use, supply or re-supply & would also cover use or sale of any article or material supplied by vendor to JPL

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under this order. This Indemnity shall cover any claim/action taken by a third party either directly against JPL or Any claim/action made against the vendor & where under we are made liable. The Indemnity shall be for loss, damages, and cost including litigation costs incurred by us under this order.

28. Arbitration

Any disputes and differences arising out of or relating to this Purchase Order including interpretation of its terms will be resolved through joint discussion of the designated officials of the concerned parties. However, if the disputes are not resolved by Joint discussions then the matter will be referred for adjudication to the arbitration of a person appointed by the parties in Raigarh (C.G.) in accordance with the Indian Laws. The decision of the arbitrator shall be final and binding on the parties.

29. Jurisdiction

This Purchase Order shall in all respect be subject to the jurisdiction of courts at Raigarh(C.G.). Any dispute relating to this order shall be deemed to have arisen in Raigarh (C.G.) and subject to jurisdiction of Raigarh (C.G.) courts only.

30. Suspension / Termination.

The Buyer shall have the right, even if there is no delay in execution of the order, to suspend or terminate the Purchase Order with prior intimation to the vendor. If, the vendor defaults in his obligations under the Purchase Order, payment shall be limited to such part of the Purchase Order price corresponding to the order executed until such suspension or termination. The vendor may only claim reimbursement of its proven suspension or termination cost, if the Purchase Order was suspended or cancelled for reasons attributable to Buyer.

31. Breach of Contract.

If Vendor breaches any obligation resulting from or in connection with the Purchase Order, the Buyer shall be entitled to claim full compensation of his damages suffered due to such breach including but not limited to damages arising outside the Goods, except where such breach is not due to Vendor's fault. However, Buyer will not hold Vendor liable for loss of production or loss of profit except to the extent damages or losses are due to Vendor's gross negligence or wilful misconduct.

32. Order Validity

The Purchase Order shall stand CLOSED automatically after the expiry of One Year beyond the scheduled completion date, pending in full or partial.

33. Force Majeure

Neither party shall be liable for failure to perform its obligations under the Contract if such failure results from circumstances which were not in the contemplation of the parties at the time of the Contract and which are beyond the reasonable control of the party in breach.

Specific Instructions to Supplier

1 TEST Quality to supplies must be as defined in Our Purchase order

2 Quantity to supplies must be as defined in Our Purchase order

3 if JINDAL POWER LTD weight and Lab report in Final for billing then credit note required for weight and lab report difference along with excise invoice.

4.GST (where applicable):

(A)For the purposes of this Clause the following expressions shall have the meaning given as under:

(i)GST - means any tax imposed on the supply of goods or services or both under applicable GST Law.

(ii)Cess-means any applicable cess, existing as on date or applicable in future on the supply of goods or services or both.

(iii)GST LAW - means IGST Act 2017, GST (Compensation to the States for Loss of Revenue) Act 2017, CGST Act 2017, SGST/ UTGST Act 2017 and all related ancillary legislations.

(B)The rates quoted by the Vendor shall be inclusive of all taxes, duties, levies and Cess except GST and compensation cess. Vendor has to clearly show the amount of GST/compensation cess separately in the Tax Invoices raised by them. Further, it is the responsibility of the Vendor to make all possible efforts to make their Accounting/IT system GST compliant in order to ensure timely availability of Input Tax Credit (ITC) to JINDAL POWER LTD.

(C)In case of variation (increase/decrease) in the rate of GST after the date of agreement, the said revised rate shall be reimbursed or recovered on production of relevant statutory documentary evidence. This provision shall be applicable only during the original period of

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contract. However, during the extended period of contract, if any, this provision shall be applicable as follows:

(i) If input tax credit (ITC) is available, the said revised rate shall be reimbursed or recovered.

(ii) In other cases (i.e. where input tax credit is not available), the said revised rate shall be reimbursed or recovered only if the reasons for extension of the contract is attributable to JINDAL POWER LTD

(D) In cases where GST is leviable on any supplies / facilities provided by JINDAL POWER LTD and used by Vendors and the consideration for which is recovered by JINDAL POWER LTD in the form of reduction in the value of invoice raised by Vendor, then JINDAL POWER LTD shall raise GST invoices on such transactions and the same will be borne by Vendors.

(E) Vendor agrees to do all things not limited to providing GST compliant invoices, debit notes, credit notes or other documentation as per GST law relating to the above supply, payment of taxes, timely filing of valid statutory returns / statements for the tax period on the Goods and Service Tax Portal etc. that may be necessary to match the invoice on GSTN common portal and enable JINDAL POWER LTD to claim input tax credit in relation to any GST payable under this Agreement or in respect of any supply under this Agreement. GST charged on debit notes shall be reimbursed only if such debit notes are issued within the prescribed time limit for availing of credit.

(F) In the event Vendor issues a credit note to the JINDAL POWER LTD, such credit note shall include GST component only in circumstances set out under the GST law and upon mutual agreement between Vendor and JINDAL POWER LTD. This shall be subject to the condition that Vendor shall comply with the procedural requirements relating to issuance of credit notes under the GST law.

(G) In case the Input Tax Credit of GST is denied or demand is recovered from JINDAL POWER LTD on account of any non-compliance by the Vendor, including non-payment of GST charged and recovered, the Vendor shall indemnify JINDAL POWER LTD in respect of all claims of tax, penalty and/or interest, loss, damages, costs, expenses and liability that may arise due to such non-compliance. JINDAL POWER LTD, of its discretion, may also withhold/recover such disputed amount from the pending payments of the Vendor.

The above action can be initiated even when the timelines / thresholds as prescribed by the Government in the GST law, rules, circulars, public announcements, etc. have been breached (e.g. Government portal does not allow filing of GSTR 1 statement if the periodic GST returns, GSTR 3B, are not filed for a prescribed period). In other words recovery from JINDAL POWER LTD by the concerned Revenue / Government authority will not be a criteria to enable JINDAL POWER LTD to withhold / recover such amount. Such amount can be withheld / recovered where it is visible or established that Vendor has breached / non-complied with the timelines under the GST law, rules, circular, public announcements, etc. which will disentitle JINDAL POWER LTD to take ITC or delay the ITC, as the case may be.

(H) Vendor shall maintain high GST compliance rating track record at any given point of time.

(I) Vendor is required to pass on the benefit arising out of GST, including seamless flow of Input Tax Credit, reduction in Tax Rate on inputs as well as final goods by way of reduction of price.

(J) Vendor shall avail the most beneficial notifications, abatements, exemptions etc., if any, as applicable for the supplies under the Goods and Service Tax.

(K) For the purposes of the above-mentioned requirements, the Vendor shall provide documents as may be necessary and shall allow inspection of the same to JINDAL POWER LTD

(L) JINDAL POWER LTD shall charge GST (where applicable) over and above on the liquidated damages and other deductions reduced from the price payable to the Vendor against supply of goods or services or both (To be mentioned if applicable)

5. Excise duty and CST / State sales tax (where applicable):

A. The rates quoted by the Vendor shall be inclusive of all taxes, duties, levies and Cess except GST and compensation cess.

B. The vendor will issue proper Excise and Sales tax invoice under the respective laws which will enable JINDAL POWER LTD to avail ITC / refund (where applicable).

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C.Vendor will ensure submission of duplicate copy (Transporter's copy) of Excise invoice under rules II of the central Excise rules 2002 and or cenvat credit rules 2002

D.In case the Vendor fails to submit the requisites documents, then the amount of duties/taxes / levies as indicated in the quotation /Invoice/purchase order shall be deducted from the bills /Invoice.

6.Income Tax

Applicability of TDS provision u/s 194Q from 1st July 2021

(i)With effect from 1st July 2021, TDS provision u/s 194Q of the Act will be applicable on purchase transaction @ 0.10% on aggregate purchases during the year is over and above INR 50 Lakhs from a supplier. The TDS shall be applicable on payment or booking of invoice expense, whichever is earlier.

(ii)Further, the provision of section 194Q of the Act overrides the TCS provision U/s 206C (1H) of the Act. Therefore, in case provisions of both the sections are applicable, JINDAL POWER LTD shall deduct the TDS U/s 194Q of the Act.

(iii)Furthermore, as per the Provisions of Section 206AB of the Income tax Act, if the supplier has not filed its Income Tax Return (ITR) for preceding 2 previous years and in his/ her/ its case the TDS & TCS is INR 50,000 or more in each of the two previous years then in such case, the said supplier is to be considered as Specified Person and applicable rate of TDS will be 5%.

(iv)As soon as the supplier/ vendor becomes unspecified person from Specified person in compliance with the provisions of section 206AB of the Income Tax Act, it will be the responsibility of the supplier to intimate the fact to JINDAL POWER LTD so that JINDAL POWER LTD can deduct TDS at normal rates instead of higher rates as mentioned in the above clause.

Applicability of TCS provision u/s 206C(1H) up to 30th June 2021

In order to comply with the TCS provision u/s 206C (1H) of the Income tax Act 1961, JINDAL POWER LTD is disclosing its PAN "AAACJ7097D" in the P.O so that TCS will be collected by vendor at the rate of 0.10% prescribed under this section. In case of collection of TCS from JINDAL POWER LTD, Vendors are required to file TCS Return (i.e. Form 27EQ) timely and also duly issue the TCS Certificate (i.e. Form 27D). In case there is any delay and the amount of TCS does not get reflected in form 26AS then the vendor shall reimburse back the amount to JINDAL POWER LTD. "

In case of any changes in law/clarification issued by the Income Tax Authorities on TDS/TCS the same shall be applicable as per the law.

SPECIAL INSTRUCTIONS

A.Quality to supplies must be as defined in Our Purchase order

B.Quantity to supplies must be as defined in Our Purchase order

C.If JINDAL POWER LTD weight and Lab report in Final for billing then credit note required for weight and lab report difference along with Tax / excise invoice.

for JINDAL POWER LIMITED

AUTHORISED SIGNATORY

This is Electronically generated document hence signature is not required.

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JINDAL POWER LIMITED

P.O.Tamnar District: Raigarh - 496107
Phone : 07767 302000 Fax : 07767 281993

CIN NO : U04010CT1995PLC008985

SERVICE ORDER

MMC/F/010

Ver. : 0 (17.03.2022)

Vendor : 1103915 OAKRIDGE ENERGY PRIVATE LIMITED OAKRIDGE ENERGY PRIVATE LIMITED JANGPUR EXTN. NEW DELHI 5, LINK ROAD DELHI - 110014 Delhi India Email: shravan.sampath@oakridge.co.in Phone: - Contact Person : Sri Shravan Sampath Phone No. : 9717936888 GST IN : 09AABCO7282N2ZR PAN NUMBER : AABCO7282N	Service Order : 4400015470 Service Order Date : 17.03.2022 Validity Start Date : 03.03.2022 Validity End Date : 31.08.2022 Buyer Name : Parija Saswati Email : parija.saswati@jindalpower.com PAN No. : AABCJ4683J GST IN : 22AABCJ4683J1ZI
--	--

Dear Sir,

We are Pleased to award the Contract for Erection of 1004.4 KW Rooftop Solar Project at various building at JPL, Tamnar, Raigarh on firm price basis as per below mentioned Terms and Conditions.

References :

- 1.Our Enquiry by email dated 12.01.2022
- 2.Your Initial Technical Offer dated 25.01.2022 and subsequent mails for technical details
- 3.Revised technical offer mail dated 28.01.2022
- 4.Annual guaranteed generation mail dated 31.01.2022
- 5.Your Commercial Offer dated 09.02.2022
- 6.Our mail dated 09.02.2022 for Confirmation of GCC and SCC and terms and conditions and your confirmation by mail dated 10.02.2022
- 7.Your bid submitted against reverse auction on 28.02.2022 and subsequent negotiation with your final offer dated 02.02.2022 and subsequent discussions
8. LOA Ref. JPL/TAMNAR/M&C/SOLAR/LOA/02 Dtd. 03.03.2022

SNo	Item Code	Description of Material	Qty	UOM	Net Price	Net Amount
10		Solar Project 1MW Roof Top PH-02 Basic Price : 7,673,616.36 Tax : GST - Services ND Delivery Date : 31.08.2022	1	AU	7,673,616.36	7,673,616.36
1	300000265	Milestone 1 - Civil foundations Milestone 1 - Civil foundations Gross Price: 1,918,404.09	1	LOT	1,918,404.09	1,918,404.09
		SAC CODE : 998717 TAX CLASS . : 0 (Taxable under GST) IN:Integrated GST-ND 18				345,312.74
2	300000266	Milestone 2 - structure assembly Milestone 2 - structure assembly Gross Price: 1,918,404.09	1	LOT	1,918,404.09	1,918,404.09
		SAC CODE : 998717 TAX CLASS . : 0 (Taxable under GST) IN:Integrated GST-ND 18				345,312.74
3	300000267	Milestone 3-Module installation &cablings	1	LOT	1,918,404.09	1,918,404.09

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Milestone 3 - Module installation <(>&<)> cabling

Gross Price: 1,918,404.09

SAC CODE : 998717

TAX CLASS . : 0 (Taxable under GST)

IN:Integrated GST-ND 18

345,312.74

4	300000268	Milestone 4 - commissioning & PR test	1	LOT	1,918,404.09	1,918,404.09
		Milestone 4 - commissioning <(>&<)> PR test				

Gross Price: 1,918,404.09

SAC CODE : 998717

TAX CLASS . : 0 (Taxable under GST)

IN:Integrated GST-ND 18

345,312.74

Net Value INR	7,673,616.36
Tax Amount INR	1,381,250.96
Gross Total INR	9,054,867.32

Amount in words : NINETY LAKH FIFTY-FOUR THOUSAND EIGHT HUNDRED SIXTY-SEVEN RUPEES AND THIRTY-TWO PAISE ONLY

Payment Instruction:

Please note that you have provided following details for payments to you

Bank A/c : 5427000100113001
Bank : KARNATAKA BANK
Bank IFSC Code : KARB0000542

Please check the Bank details as mentioned above and revert immediately in case of any deviation.

Insurance : Vendor Scope
Support doc.req. along Invoice
Price Basis : FOR - JPL Site Tamnar
Payment Method : EFT
Warranty : 24 Months

Terms of Payment :
Services

[A]. 5% of the Services Contract Price shall be paid as initial advance as mobilization within 15 days from the date of receipt of following document:

- Invoice of 5% of the Services Contract Price.
- Unconditional acceptances of Contract.

[B]. 85% of the Services Contract Price shall be released against progressive erection on a pro-rata basis against mutually agreed BBU along with 100% taxes & duties within 30 days after receipt of material at site and following documents at site:

- Invoices :- 1 set of original + 3 set of copies
- LR/GR/RR :- 3 copies
- Packing List :- 3 copies
- Copy of Transit Insurance Cover Note:-3 copies
- Test Certificates, wherever applicable:- 3 copies
- Material dispatch Clearance Certificate (MDCC) issued by Owner prior to dispatch :- 2 copies

[C]. 10% of the Services Contract Price after successful commissioning and submission of invoice duly certified by EIC and against submission of Performance Bank Guarantee of 10% of the Contract Price.

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[D].All the Bank Guarantees shall have a claim period of 3 months

[E].100% of the operation and maintenance contract price as indicated in clause 3.5 above along with taxes and duties shall be released after completion of 1 year O&M period and against submission of invoice duly certified with EIC within 30 days.

GST, as applicable, shall be payable extra against documentary evidence.

Bank Charges applicable, if any, shall be in Vendor's Account.

Other Contractual Stipulations :

1)Scope of work:

The scope of the Contractor shall include but not limited to Design, Engineering, Procurement, Supply, Testing, Packing & Forwarding, Transit Insurance, Transportation, Unloading, Storage, Intra-site transportation, Erection, Testing & Commissioning of Solar Photovoltaic (SPV) modules, cables, Inverters, structures, civil work, electrical balance of system and all other work so as required to handover the complete Project to Jindal Power Limited at OPJSTPP, Tamnar, Raigarh, Chhattisgarh as per technical specification.

2)TECHNICAL SPECIFICATION:

2.1The Technical Specification and Scope of Work shall be as per enclosed document in Annexure A and Conditions of Contract as per enclosed document in Annexure-B, and various correspondences referred above.

2.2In case of any discrepancy between various documents referred above and the clauses indicated in this Letter of Award, the later shall prevail.

2.3No other deviations on Bid documents Section- I, "Condition of Contract" & Section-II "Technical Specification for 1000 KWp Rooftop Solar PV Project except those specifically mentioned and agreed in this Letter of Award are applicable.

3)Total Contract Price:

3.1The Total Contract price for the scope mentioned above for the 1000 KWp Rooftop Solar Photovoltaic Power Project shall be Rs 3,83,68,080.00 (Rupees Three Crore Eighty Three Lacs Sixty Eight Thousand Eighty Only). The detailed break up of Supply and Service shall be submitted by the Contractor within 7 days from the EDC.

3.2The total prices as in Clause No.3.1 above is inclusive of packing and forwarding, freight & transit insurance up to site but exclusive of taxes & duties, Octroi /Entry tax and any other levies, which if levied by Central, State/local authorities shall be paid/reimbursed at actual by JPL in full along with the payment for supplies against the documentary evidence to be furnished by Oakridge Energy Pvt. Ltd. As indicated by you, GST @ 12% shall be applicable on Module and Inverters and 18% GST shall be applicable on Bought Outs and Services.

3.3The above-mentioned Total Contract price shall remain firm throughout the execution of this Order.

3.4If there is any delay in completion/commissioning on account of Contractor and there is any statutory increase in duties/taxes/levies or introduction of new tax during the period of delay, in such case, the differential shall be on account of Contractor.

4)WARRANTY / GUARANTEE/DEFECT LIABILITY:

Defect Liability

4.1 The Contractor warrants that the Project or any part thereof shall be free from any defects for a period of 1 (one) year from Date of Handover ("Defect Liability Period"). For purposes clarity, Date of Handover shall be the date when the project is handed over to the Solar Power Plant Owner in a working condition along-with all the necessary documents with respect to design, engineering and warranty of equipment.

4.2 During the Defect Liability Period, the Contractor shall, upon notifying by the Solar Power Owner, at its own cost and within reasonable time as prescribed by the Solar Power Owner, promptly repair, replace or otherwise make good any defects that may cause to the Project.

Project Warranties

4.3 Project components warranty can essentially be construed as guarantees /warranties provided by the project component manufacturers beyond the ones covered under defects liability period, performance warranty period and extended warranties. Best in Class OEM warranty to be provided for all equipment and all such warranty for any of the project components shall be transferred to the Owner at the time of handover.

Modules10 years product warranty and 25 years linear performance warranty

Inverters5 years product warranty

Balance of System1 year

Workmanship1 year

5)Effective Date of Contract (EDC):

Effective date of contract shall be date of release of LOA i.e. 03.03.2022.

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6)Delivery Period:

The Project Completion Schedule shall be 06 months from the date of issue of this Letter of Award.

7)Drawing & Document Distribution Schedule:

7.1Oakridge Energy Pvt. Ltd shall send all the correspondences as per communication protocol with copy to following at the addresses mentioned below:

Site Address;

For Technical

Mr. Ajit Rai, AVP

Jindal Power Limited

Tamnar Raigarh- 496107

Mobile no: 7898905013

E-mail: ajitrai@jindalpower.com

For Commercial

Mr. Saroj Kumar Padhi, VP(M&C)

Email: Saroj.padhi@jindalsteel.com

Mob: 8826664057

7.2Oakridge Energy Pvt. Ltd shall submit detailed L-1 & L-2 Network indicating Design, Engineering Schedules, Procurement, Manufacturing, Inspection & Dispatch Schedule within 7 (7) days from the effective date of Contract.

7.3Oakridge Energy Pvt. Ltd shall submit Six (06) sets of various Drawings/Documents, Data Sheet and Design Calculations for comments/approval at JPL, Site Office. The comments/ approval on various drawings/documents will be sent by JPL, Site Office to Oakridge Energy Pvt. Ltd within Fifteen (15) days after receipt of the same from Contractor.

7.4Oakridge Energy Pvt. Ltd shall send all correspondences and drawings in Autocad/PDF format & documents in MS Office through e-mail as advance copy followed by hard copies through Courier.

7.5Oakridge Energy Pvt. Ltd shall appoint and furnish the contact details e.g. Office phone Nos. /Direct phone No. /Mobile No. /Fax No. /Residence No. and e-mail id of the Project Manager within one (01) week from the date of this Contract, who will take the single point responsibility/contact person throughout the execution of this Contract.

8)Payment Term

8.1Supply of Equipment

8.1.15% of the Supply Contract Price of goods shall be paid as an initial advance within 15 days from the date of receipt of following documents:

a)Invoice of 5% of the Total Contract Price of goods.

b)Unconditional acceptances of LOA.

8.1.285% of the Supply Contract price along-with 100% taxes and duties shall be released against pro-rata supply through irrevocable without recourse Letter of Credit (LC) against shipment of equipment and following documents at site:

a)Invoices :- 1 set of original + 3 set of copies

b)LR/GR/RR :- 3 copies

c)Packing List :- 3 copies

d)Copy of Transit Insurance Cover Note:-3 copies

e)Test Certificates, wherever applicable:- 3 copies

f)Material dispatch Clearance Certificate (MDCC) issued by Owner prior to dispatch :- 2 copies

8.1.310% of the Supply Contract Price of goods shall be paid on successful commissioning and PG test of Goods after receipt of invoice of equivalent amount from the Contractor. This payment shall be released within 30 days after receipt of Invoice.

8.2Services

8.2.15% of the Services Contract Price shall be paid as initial advance as mobilization within 15 days from the date of receipt of following document:

a)Invoice of 5% of the Services Contract Price.

b)Unconditional acceptances of Contract.

8.2.285% of the Services Contract Price shall be released against progressive erection on a pro-rata basis against mutually agreed BBU along with 100% taxes & duties within 30 days after receipt of material at site and following documents at site:

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JINDAL POWER LIMITED

P.O.Tamnar District: Raigarh - 496107
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- a)Invoices :- 1 set of original + 3 set of copies
b)LR/GR/RR :- 3 copies
c)Packing List :- 3 copies
d)Copy of Transit Insurance Cover Note:-3 copies
e)Test Certificates, wherever applicable:- 3 copies
f)Material dispatch Clearance Certificate (MDCC) issued by Owner prior to dispatch :- 2 copies
8.2.310% of the Services Contract Price after successful commissioning and submission of invoice duly certified by EIC and against submission of Performance Bank Guarantee of 10% of the Contract Price.
8.2.4All the Bank Guarantees shall have a claim period of 3 months
8.2.5100% of the operation and maintenance contract price as indicated in clause 3.5 above along with taxes and duties shall be released after completion of 1 year O&M period and against submission of invoice duly certified with EIC within 30 days.
9)Liquidated Damages (LD):
9.1In case Contractor fails to deliver the goods/services for completion of commissioning as per the schedule mentioned in Clause No 6.0 above due to reasons not attributable to JPL, Contractor shall be liable to pay LD @0.5% of the Total Contract price indicated in Clause No 3.1 above for each completed week of delay or part thereof subject to a maximum of 5% of the Total Contract price indicated in Clause no 3.1 above.
9.2LD for shortfall in Performance Guarantees shall be as indicated in technical specifications for maximum of 10%.
9.3The combined maximum ceiling of LD on account of delayed delivery/Commissioning and Shortfall in Performance shall be limited to 10% of the Contract Price.
9.4Contractor shall undertake to pay the LD at the rates stipulated above without requiring JPL to prove actual loss or damage
9.5LD payable by Contractor shall be deducted by JPL from any outstanding payments due to Contractor.
10)Quality Assurance Plan (QAP)
Contractor shall furnish a complete procedure indicating various components which are to be inspected for stages and final inspection. The procedure shall be furnished and finalized mutually. Contractor shall furnish Quality Assurance Plan (QAP) for JPL's review and approval and inspection / test documents shall be furnished accordingly after approval of QAP.
11)Dispatch Instruction / Dispatch Clearance
For materials / equipment requiring inspection / test witnessing and /or the approval of test certificates, as per Quality Assurance plan (QAP) agreement, the dispatches shall be effected only after the dispatch clearance (MDCC) is given or MDCC waiver (based on necessary test certificates) issued by JPL.
12)Safety
Contractor shall observe strictly the general health, safety and security rules and regulations, as mentioned in the General Condition of Contract (GCC).
13)Inspection and Testing
13.1The inspection and testing of equipment / materials shall be carried out as per standards prescribed in the specifications / agreed mutually as per QAP. The tests shall be offered with calibrated test grade accuracy instruments as specified by Standards / Good Engineering Practices.
13.2Contractor shall proceed from one stage to another only after the inspection is completed by JPL / JPL's authorized Third Party Inspection (TPI) and written permission given to proceed further.
13.3A clear notice of minimum 07 days for domestic and 30 days for imported supply shall be given by Contractor for inspecting the material and equipment or witnessing the tests of indigenous items. On visit of JPL's engineers, if it is found that the materials / equipment are not ready and the inspection of the materials and equipment or witnessing tests thereof is not possible, then such costs of unproductive visits shall be recovered from supplier's bills.
14)In case there are multiple units, all auxiliary/Bought out items shall be sourced / procured from common Vendor/Sub-vendor for all units.
15)For auxiliary/Bought out items, in case there is a requirement to change vendor/sub-vendor after award of work, the Contractor shall necessarily take approval from Owner's Engineering and Commercial Department for the same.
16)The Contractor shall manufacture, procure and deliver all the materials in an expeditious and Sequential manner to the Site. The Contractor shall take specific approval from Owner prior to dispatch of any perishable items (items with specified shelf life).
17)The Contractor shall submit the detailed Billing Break Up (BBU) within seven (07) days after award of contract for the necessary approval from Engineering and Commercial Departments. While submitting this BBU contractor shall ensure the reasonability of prices which should be a reflection of prevailing market prices. BBU shall cover but not be limited to the actual requirement for the completeness of the scope of work.
18)In case of any contradictions, the clauses mentioned in this Contract shall supersede the respective clauses mentioned in Bidding Document (Section- I, "Condition of Contract", and Section-II "Technical Specification for 1000 KWp Rooftop Photovoltaic Solar Power

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JINDAL POWER LIMITED

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Project") and all other subsequent correspondence. All other terms & conditions mentioned in Bid document (Section- I, "Condition of Contract", and Section-II "Technical Specification for 1000 KWp Rooftop Photovoltaic Solar Power Project") shall prevail.

Please sign and return the duplicate copy of this Contract as a token of your acceptance to the same. If acceptance is not received from Contractor within one (01) week from the date of release of this Contract, it will be considered that the various terms & conditions indicated in this Contract are acceptable to Contractor.

Annexure A (Scope of Work & Technical Specification)

1SCOPE OF CONTRACTOR

1.1The scope of the Contractor will include engineering/designing, procurement and supply, handling, erection, installation, testing & commissioning of Solar Photovoltaic (SPV) modules, cables, Inverters, structures, civil work, electrical balance of system and all other work so as to require to handover the complete Project to the Solar Power Owner.

"Supply and installation of HDG module mounting structure

"Supply and installation of Solar Modules

"Supply and installation of Inverters

"Supply and Installation of cable trays and conduits

"Supply and installation of AC/DC cable

"Supply and installation of LT panels and metering cubicles

"Supply and installation of earthing system with ESE LA

"Supply & Installation of Data logging with remote monitoring

"Supply & Installation of Fire Fighting System

"Supply and installation of Module cleaning sytem with pump

"Supply and installation of online monitoring system

"Testing and commissioning of solar project

"

ITEMITEM DISCRIPTIONUOMMakes

Solar ModuleMono Perc 540 Wp NosTier -1

String InvertersString Inverter,

415V, 50Hz

NosReputed

Remote monitoring solutionOnline web monitoring solutionNoReputed

Module mounting structureMember material of Hot Dip galvanized

iron with coating thickness 80 microns Ballast type foundation

with any direct anchoring

Weight of 200 -250 kg per sqm

Design wind speed to be

170kmph and design code to be

as per IS -801

SetReputed

LT Panels 415V 3 PH, TPN 430 Amps

Distribution panel , Outdoor

type, with MCB, SPD protection

and MFM meter, IP 65 rated.

No Reputed

AC cables3Ph N PE, 1.1kV,

UnAr Cu cable between Inverter

and LT Panel

150 Sqmm 3.5C 3Ph N, 1.1kV,

Al cable between Evacuation

point & LT Panel

MeterReputed

DC cables1C, UnAr, UV

resistant, Solar grade, PVC

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insulated Copper Cable
LOT Reputed
connectorsMC4 Compatible connectors
Pair
Reputed
Cable Conduit 1 - 1.5 inch dia PVC conduits
for DC side un armoured cables,
UV Resistant
Set AKG/Supreme/Prince

Earthing pitsEarth rods - 40mm dia,
30 micron thick GI coated
electrode carbon based back
filling compound
& GI clamps (for AC + DC +
LA
Earthing)
For DC
For AC
For LA
SetJMV/ Reputed

Earth Strips25 X 3 mm GI strip(Minimum)
MeterReputed
Lightning
arrestor
ESI Type Lightning arrestor
with coverage area required
No
JMV/Reputed

Inverter and
Panel
Mounting
Accessories for wall mounting
of Inverters and LT panel along
with canopy
Lot As per Design
Water Pipe
Line
CPVC Pipe
LotAKG/Prince/Reputed

1.2The Contractor shall, inter alia:

- a)Provide most optimum design based on best engineering practices.
- b)Procure PV panels & other allied equipment keeping in mind the location, performance, size of the available area and all other relevant details.
- c)At all times maintain a communication with the Solar Power Plant Owner regarding the progress of the project by providing daily progress report through email
- d)Exercise reasonable caution and safety during the execution of work. All Insurances, liabilities would be in the scope of the Contractor before the Date of Handover of the complete project as per the satisfaction of the Solar Power Owner.
- e)Maintain all insurance policies, ESI for Manpower at the site etc. that are required for compliances.
- f)Keep the site clean always of work.

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g)After installation testing and commissioning, handing over the plant to the Solar Power Plant Owner with complete O&M manuals, close out report, learnings, documents pertaining to equipment guarantees & warranties and other relevant documents related to the Project.

h)Be responsible for the labor laws and its compliance with respect to its employees and sub-contractors and shall keep the Solar Power Plant Owner indemnified all times against all such losses or damages that may cause to the Solar Power Plant Owner in that regards.

i)Ensure that no loss or damage would happen to the factory roof or any other part of the factory due to Project work and Contractor shall be responsible for all and any such losses/damages that may cause at factory site till the COD of the project.

j)Take all necessary steps and comply with all applicable Laws, relevant permits, consents and approvals to protect the environment (both on and off the Site) and to limit damage and nuisance to people and property resulting from pollution, noise and other results of his operations.

1.3The Contractor agrees to co-operate with Solar Power Plant Owner during the term of this Contract and beyond and provide all such assistance, information and support as is reasonably necessary to enable Solar Power Plant Owner to have minimum down time.

1.4In addition to anything stated hereinbefore, the Contractor shall carry out the following services, leading to complete installation and operationalization of the Solar PV Rooftop Project:

a)Design works, including providing design documents in 1 set of softcopy

LAYOUTCategory

Overall Project Layout with coordinates & equipment locationApproval

Module Blocks LayoutApproval

Module Mounting Structure Foundations LayoutApproval

DC & AC plant Earthing layout with calculation (assumption and methodology) Approval

DC & AC cable routing layout with cable tray arrangement Approval

Design of Water Distribution Pipeline & detailed LayoutApproval

CIVIL & STRUCTURAL

Module Mounting StructureApproval

Foundations of Module Mounting StructureApproval

Lightning Arrestor Foundation and DesignApproval

ELECTRICAL

AC SLD of the solar plant Approval

DC SLD of the solar plant with the Module string configuration Approval

Control Wiring and Monitoring SchematicsReview

Lightning Protection layout with calculation (assumption and methodology) Approval

Schematic diagram of the Solar system with the existing Evacuation systemApproval

DESIGN CALCULATIONS

Pvsyst report with Near shading, EYA reportApproval

Shadow Analysis Approval

AC & DC Cable SizingApproval

Earthing Design calculation for AC & DC SystemApproval

Module Mounting Structure & Foundation DesignApproval

DC & AC cable voltage drop & power loss calculation (assumption and methodology) Approval

SPEC SHEETS

Modules, Invertor , AC and DC Cables & ACDB & other relevant equipmentsApproval

Transformers and associated equipmentApproval

OTHER DOCUMENTS

User Manual for all EquipmentReview

Installation Manual for all EquipmentReview

Project Implementation ScheduleReview

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JINDAL POWER LIMITED

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CIN NO : U04010CT1995PLC008985

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Permits and Clearances Required Review

Spare List Review

Plant O&M Manual Review

Field Quality Plan Review

- b) Transportation of materials, tools and tackles to site
- c) Supply and installation of module mounting structure
- d) Supply and Installation of PV modules
- e) Construction of cable trenches/ cable runways
- f) Supply and connection of electrical cables
- g) Commissioning of system and trial run
- h) CEIG and net metering approvals

2 SCOPE OF Contractor SOLAR POWER OWNER

2.1 Pre-Requisite:

The Solar Power Plant Owner shall acknowledge to the Contractor that the followings are the pre-requisites for the Plant on behalf of owner and therefore shall ensure the same:

- a) Clear shadow free area for the installation of PV panels
- b) Space for the installation and commissioning of electrical panels.
- c) An open area for storage of supplied equipments till commissioning.
- d) Proper access to roof in terms of having proper ladder to access the roof.
- e) Proper roof having good load bearing capacity to withstand solar panels weight. Any existing structure retrofitting repair to be done by Solar Power Plant Owner before start of solar works.

Facilities to be arranged by the Solar Power Owner:

The Solar Power Plant Owner shall be responsible to provide the following facilities at site:

- i) Electricity - Construction power shall be arranged by the Solar Power Plant Owner at its own cost at single point.
- j) Water - Construction water will be made available by the Solar Power Plant Owner with suitable storage arrangement at single point.
- k) Statutory fees required to be paid for setting up solar project.
- l) Water for module cleaning

2.2 The Solar Power Owner agrees to co-operate with Contractor during the term of this Contract and provide all such assistance, information and support as is reasonably necessary to enable Contractor to provide the Service to the Solar Power Owner.

3 Performance Guarantee

The bidder is liable to guarantee the Assured Delivered Energy as per table below at the end of 1st Year.

For any shortfall of energy generated below this value, Contractor shall pay penalty to the Owner @ Rs 4.00 per Kwh.

ANNEXURE I

Year wise Estimated Delivered Energy and Assured Delivered Energy

Year from CODE Estimated Delivered Energy
(in kWh per annum) Assured Delivered Energy
(in kWh per annum)

Year 1 14000001400000

Year 2 13902001390200

Year 3 13804681380468

Year 4 13708051370805

Year 5 13612091361209

Year 6 13516811351681

Year 7 13422191342219

Year 8 13328231332823

Year 9 13234941323494

Year 10 13142291314229

Year 11 13050301305030

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Year 1212958941295894
Year 1312868231286823
Year 1412778151277815
Year 1512688711268871
Year 1612599891259989
Year 1712511691251169
Year 1812424101242410
Year 1912337141233714
Year 2012250781225078
Year 2112165021216502
Year 2212079861207986
Year 2311995311199531
Year 2411911341191134
Year 2511827961182796

Deration Factor: The Estimated Delivered Energy for the forthcoming years would be after considering at [0.7] % deration for year 2 from COD and thereafter [0.7] % annual deration.

Vendor Memo (General) :

ENGINEER - IN- CHARGE:

Mr. Ajit Kumar Rai, AVP (Power Control) - Mobile No. 07898905013 or his authorized representative shall be Engineer In charge of the said work. Kindly contact him for further action.

Terms & Conditions :

GENERAL CONDITIONS OF CONTRACT

1. Agreement:

Contractor's acceptance of the work order in writing shall constitute contract between him and JPL. If acceptance/ comments (if any) is not received from contractor, within one week from the date of this order, it will be considered that the various terms and conditions indicated in the order is acceptable to the contractor.

2. Offloading & Subletting of Job: Contractor shall not offload/ sublet the job given to him without prior approval and permission in written from M/s JPL for any contract in full/ partial.

3. Measurement of Work: Work shall be supervised, inspected and measured as directed by Engineer-in-charge and entered in the measurement book for the Scope of Work with signature of both contractor and Engineer-in-charge or their representative as token of acceptance. Payment shall be made as per actual quantity executed. For all labor intensive jobs, it is mandatory to maintain and submit daily report of workmen attendance duly verified by EIC.

4. Submission and Payment of Bill:

a. The invoice/ RA bills for the Scope of Work as defined earlier should be submitted within 2 weeks of completion of job to Engineer-in-charge in triplicate for verification, on monthly basis or as specified complete in all respect and acceptable.

b. The invoice must be supplemented with the work measurement sheet and workmen attendance sheet duly attested by Engineer in-charge.

c. In case, the job is associated with the supply of materials, the invoice must be supplemented with the material challan duly stamped with Gate Entry number, Packing list, Tax invoice, Quality assurance & test certificates.

d. The workmen payment sheet and PF challan, if applicable, must be submitted with invoice after verification and attestation by in-charge (P&A). If applicable and specified explicitly in the work order, PF and Insurance shall be reimbursed at actual on producing documentary evidence.

e. JPL will release the payment after all deductions as per specified conditions and statutory rules within 15 days after receipt of the invoice. HOD (Finance & Accounts), JPL shall be the paying officer.

5. Taxes & Duties:

a. Unless otherwise specified, all taxes, duties, levies, charges etc. that may be applicable to this contract is deemed to have been included in the contract price. GST, as applicable, must be indicated in the bills separately. This will be paid only if supported by documentary proof of payment. The bills shall be prepared & raised along with following information:

i. Tax Credit documents should be original. The document should be serially numbered either with numbering machine, or pre-printed stationery or computer printed with date.

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- ii. The document should contain the name, address and GST Registration Number of the service provider.
- iii. The document should contain our name & address as "Jindal Power Limited, P.O. & Tehsil - Tamnar, Raigarh (C.G.) - 496107".
- iv. The document should contain classification of services, for example "Engineering Consultancy Services", "Erection, Commissioning & Installation services" etc.
- v. The document should contain description of service provided, value of taxable service provided, the amount of GST payable.
- b. As regards Indian Income Tax, Surcharge on Income Tax, Withholding Tax or any Corporate Tax, JPL shall not bear any Tax liabilities whatsoever. The contractor shall be liable and responsible for payment of all such taxes, if attracted under the provisions of law. JPL shall however, deduct applicable taxes at source like TDS under Income Tax Rules and Work Contract Tax under C.G. VAT Act as per law from time to time from bills / payments to be made to the contractor and will issue the TDS Certificate for the same to the contractor.
- c. As regards the payment of Welfare Cess under Building and other Construction worker (RE & CS) Act 1996, all the Building and Construction Contractor whose contract value is more than Rs 10 Lac or more, shall be liable to pay welfare cess @ 1% of the contract value and submit the documentary evidence with P&A department.
- d. In case any contractor fails to meet the above statutory requirement, the same will be deducted from its bills directly.
6. Deductions and Penalties:
 - a. JPL shall be entitled to recover from contractor's bills all cost, damages, expenses which may have to incur or become liable to incur as a result of contractor's negligence or any other action that may originate such cost, charges, expenses etc.
 - b. In case contractor's bill amount is not sufficient to cover such recovery amount the balance shall be deducted from any sum which may become due to contractor at any time thereafter under this or any other contract contractor may have with us. Should this sum also not be sufficient to cover the full amount recoverable, then we reserve our right to recover the same as remedies available under the law.
 - c. If there is any delay in completion of work on the part of the contractor and there is any statutory increase in duties / taxes / levies during the period of delay, in such cases the differential shall be on account of the contractor. In case of failure to execute the work within due date, Security Deposit, if any may be forfeited and JPL reserves the rights to offload the same (complete/ partial) and get it done through other agencies at the cost and risk of the default contractor.
 - d. Any intentional delay, or delay due to improper mobilization of men and material for executing the work by Contractor or any unprofessional attitude of Contractors causing delay, penalty @ 1% of the contract value for each week of delay shall be imposed subject to a maximum of 10% of the contract value.
 - e. In case in delay in completion of work due to reasons attributable to Contractor, he is liable to pay the liquidated damages @ 1% of the Total Order Value, for each completed week of delay or part thereof subjected to a maximum of 10% the Total Order Value.
 - f. In case of non-performance /continuous poor performances, the contract shall be terminated and the work shall be done by any other means at Contractor cost and risk. If the price of contract for the balance work shall be higher, the additional amount shall be recovered from Contractor's security deposit or any dues of this contract or any other contract that the Contractor may have taken in JPL.
 - g. The Contractor shall be solely responsible for any loss or damage to JPL property during the currency of this contract due to negligence, fraud etc. on the part of their personnel and will be liable to make the damages in good condition. In case of any JPL material is lost or damaged during execution of work due to Contractor negligence or wrong workmanship, the cost of the same as per prevailing market rate plus departmental expenses shall be recovered from Contractor bills.
 - h. For any accident due to the negligence of the contractor/ contractor's deployed agencies/workers or subcontractors, following penalties shall be levied.
 - i. For fatal accident - Rs. 5,00,000/-
 - ii. For reportable accident (Permanent disability) - Rs. 1,00,000/-
7. Statutory and Labor Regulations:
 - a. Contractor and his workmen shall abide by all statutory rules and regulations, including but not limited to Contract Labor Act, Workmen's Compensation Act, Minimum Wages Act, Employee Insurance Act, Group Personal Accident Insurance, Provident Fund Act, and any other laws, rules and regulations etc. that may be applicable to this type of work, including any licenses like labor license etc. that may be required to be obtained by the contractors.
 - b. Contractor shall comply & maintain all statutory records, registers and displays as required under various labor laws. Any deviation or fine levied by the Govt. authorities while their inspection will be recovered with penalty from contractor's running bills or security deposit.
 - c. Coverage under Employee Provident Fund & Miscellaneous Provisions Act is mandatory. You must obtain a new PF Code for all your workmen and staff from RPFC, Raipur only.
8. Safety, Health & Environment:
 - a. Contractor and his workmen shall abide by all Safety, Health and Environment rules and regulations of JPL. Any violation of the safety rule shall be viewed seriously and contractor shall be penalized as per JPL rule.
 - b. Contractor workmen shall have to obtain Gate pass before commencement of work, which shall be issued only after getting safety training

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& guidelines from JPL safety officer and ensuring medical fitness from JPL medical officer.

c. Contractor shall have to ensure minimization of pollution at source through environment friendly processes, techniques.

d. Before starting the work, contractor shall submit detailed work program, milestone of different activities, safety & quality plan and any other relevant documents required for the work to the Engineer-in-charge for his approval, after which work shall be started as per the approved program.

e. All safety equipment as per statutory requirements like helmets, safety shoes, safety belts and any other specific safety equipment required for the work will have to be provided by the Contractor to his manpower and will meet the following quality standards for PPEs;

1. Safety Helmet IS : 2925

Colour Code of the Helmets will be as under :-

Contract Supervisor : BLUE

Contract Workers : YELLOW

Fire Staff : RED

Name and Blood group should be displayed on the front side of helmet.

2. Safety Shoes IS : 15298

3. Safety Belt IS : 3521 (Only Double lanyard and full body harness type safety belt shall be provided by the contractor to their workers while working at height in plant premises.)

4. Welding Helmet IS : 1179

5. Face Shield IS : 8521

6. Ear Plug/ Ear Muff IS : 9167

7. Rubber Hand Gloves (Electrical) IS : 4770

8. Rubber / PVC Hand Gloves IS : 4770

9. Rubber/ PVC Coated Fabric Hand Gloves IS : 4501

10. Leather, Cotton and Canvas Hand Gloves IS : 2573

11. Rubber / PVC Coated Fabric Apron/ Clothing IS : 6110

12. Canister Type Gas Mask IS : 8523

13. Cartridge Type Gas Mask IS : 8522

14. Dust Mask IS : 9473

15. Eye - Protector IS : 5983

All personnel employed by you for working inside the factory premises shall abide by all the safety, health, and environmental rules and regulations of JPL. Minimize pollution at source through environment friendly process, techniques and processes. Reduce fugitive emission from loading / unloading and transportation of material (where applicable).

-Your mobile equipment should possess valid and current P.U.C certificate, vehicle Registration paper, Insurance and vehicle fitness certificates before obtaining gate Pass.

- Contractor/agency shall submit the following papers/certificates before obtaining gate pass of vehicles.

" Registration paper of the vehicle.

" P.U.C. certificate

" Valid insurance paper

" Vehicle fitness certificate

Contractor/agency shall also submit renewed/ new certificates on expiry of PUC, insurance and fitness certificates timely.

9. Discipline:

The contractor and his workmen shall have to follow JPL's standard Code of Conduct and the Law of the Land. It shall be Contractor's responsibility to maintain and keep the deployed manpower in specified area only. If the contractor or his workmen is found violating the same or participating in unlawful activities, or influencing JPL staff by any offerings or other inducements, the contract shall stand terminated with immediate effect.

10. Manpower/ Material/Consumable/Tools & Tackles:

a. Contractor has to ensure availability of all the resources required for the job as follows:

o Skilled / Semi-skilled / Un-skilled Manpower

o Site-In-charge / Supervisors

o Drawing and Design

o Material

o Tools & Tackles

o Plants & Machineries

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- o General Purpose Consumables
- o Commissioning Consumables and Spares
- o Maintenance Consumables and Spares
- o Measuring Instruments
- o Scaffolding / Working Platforms Material
- o Material Handling & Transportation Equipments
- b. Lighting at work site will be Contractor's responsibility for which power supply of 220V will be provided by JPL free of cost. Only 24V supply will be permitted for lighting in confined spaces. Contractor has to ensure availability of 220V/24V transformers and bulbs for the purpose.
- c. For the material / spares issued by JPL and used by contractor, record is to be maintained and submitted at the time of billing. The damaged spares replaced are to be kept in Contractor's custody and should be deposited to JPL stores immediately after the completion of work. The stock of the damaged spares / consumed material will be reconciled with the quantity issued. If the Contractor fails to do so, the cost of the same will be deducted from the Contractor's bill. The Contractor must return the unused spares / material issued.

11. Insurance:

The jobs wherein the entire scope of supply and service lies with contractor, he will have to take Insurance policy for Contract value including taxes for Storage cum Erection Policy for the period of contract. The contractor will provide third party insurance at the time of commencement of work or before release of any payment other than mobilization advance, valid for the contract period including extended contract period if any.

12. Manpower Competency:

a. In addition to the site-in-charge, the Contractor has to ensure supervision of work in progress by deploying atleast one technically competent site supervisor. The site-in-charge of the Contractor shall authorize his representative to collect/return materials from/to JPL as per requirement of work.

b. The job is of skilled nature and manpower with suitable requisite skill & experience only shall be permitted to be deployed. Contractor has to ensure that the credentials and certificates of the workmen deployed are submitted to JPL and shall be vetted by them before the start of work.

13. Indemnity:

Contractor shall keep JPL indemnified from all liabilities resulting out of this contract and act of Contractor workman, including but not limited to taxes & duties, damages, penalties, fines, punitive measures, lawyer fees etc. of whatever nature due to non compliance by contractor in his scope of the applicable statutory laws, rules, notifications etc.

14. Force Majeure:

In case force majeure is established and one party informs the other promptly of such occurrences, no increase in price and / or any claim shall be made by the contractor. In case of very prolonged force majeure condition the parties shall mutually discuss and agree to the future course of action.

15. Termination of the contract:

For reasons covered elsewhere in this contract document, if the Contract is to be terminated, Fifteen (15) Days' prior notice shall be given by JPL. In such an eventuality, the Security Deposit and Outstanding payments, if any may also be forfeited at the sole discretion of JPL. However, if the Contractor desires to quit the Contract or JPL decides to short-close the contract, one month's prior notice shall be given by either party.

16. Dispute Settlement:

a. Any dispute or difference arising out of in connection of this contract shall be referred to the sole arbitrator Executive Director, OP Jindal Super Thermal Power Plant, Jindal Power Ltd., Tamnar, Raigarh (CG) and the decision given by the sole arbitrator will be conclusive and final and be binding on both the parties.

b. Arbitration, if arise, shall be resolved in accordance to the Indian Arbitration & Conciliation Act with latest revisions. This agreement being executed at Raigarh & the parties agreed that any dispute or differences arising out of this agreement would be subject to the jurisdiction of only Raigarh court.

STATUTORY AND SAFETY COMPLAINE

The statutory and legal conditions shall be applicable to all labour intensive jobs and the contractor shall have to strictly comply with all the clauses mentioned hereby:

1.Labor Act: Contractor shall abide by all provision of contract labor (R&A) act 1970 and other applicable labor laws and rules made there under from time to time.

2.Labor License: Before commencement of work, Contractor shall submit labor license (if applicable) from competent authority to the JPL's P&A officer through Engineer-In charge.

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3. Gate Pass: Before commencement of work, Contractor has to arrange gate pass for his workmen from JPL's P&A officer as per JPL's standard norms.

4. PF registration: Before commencement of work, Contractor shall submit the Provident Fund Registration No. and ensure to recover provident fund amount from wages of all workmen and deposit to the Provident fund authorities and submit a copy of the same by 20th of every month to the JPL's P&A officer through Engineer-In-charge. In case, contractor fails to produce documentary evidence of PF recovery and deposition, JPL will arrange to deposit the same to the Provident fund authorities and the amount along with overheads @30% will be recovered from the contractors bill.

5. Workmen Insurance: Before commencement of work, Contractor shall obtain Insurance policies under Group Personal Accident Policy & Workmen's Compensation Policy covering employment accidental benefit upto Rs. 4.0 Lacs through each policy (total 8 Lacs) and furnish the copy of it to the JPL's P&A officer through Engineer-In charge. In case of non submission of Insurance Policies before start of work, 5 % (Five percent) of the Monthly Bill values shall be retained by JPL until the Contractor presents the copy of Policy document.

6. Wage Payment: Payment to contractor's workmen shall be disbursed on or before seventh day of the wage period in presence of the JPL's P&A officer & Engineer-In charge or their duly authorized representative who shall certify on the payment sheet/register for fulfillment of provision of law. In case of failure to make payment to the workmen within 07(seven) days after wage period, JPL will arrange for labor payment and the amount along with overheads @30% will be recovered from the contractors bill.

7. Bonus & Retrenchment: Contractor shall have to pay its workmen the bonus as per applicable act. Moreover, retrenchment benefits to workmen under Inter State Migrant act if being retrenched shall be paid by contractor.

8. Records, Register and Display Notices: Contractor must maintain statutory registers and records as applicable under various labour laws. Contractor must displays notices in front of his office in Hindi & English as required under various labour laws.

9. Statutory Reimbursement: Any payment against statutory obligations, if applicable and specified explicitly under JPL's scope, such as PF, ESIC, Insurance etc. shall be reimbursed at actual by JPL on producing documentary evidence by the contractor.

10. Code of Conduct: The contractor shall have to follow JPL's standard Code of Conduct. If the contractor is found violating the same or influencing JPL staff by any offerings or other inducements, the contract shall stand terminated with immediate effect and the contractor may be debarred to work for a period as decided by JPL.

11. Work Permit: Work on any equipment or in any area should be started only after ensuring valid permit. Before starting the work, contractor shall submit detailed work program, milestone of different activities, safety & quality plan and any other relevant documents required for the work to the Engineer-in-charge for his approval, after which work shall be started as per the approved program.

12. Tools & Tackles: Contractor will have to produce fitness test certificate of all lifting tools and tackles being used by him from any outside competent person.

13. Vehicle: All the vehicles (except used by specific person) to be deployed by contractor shall be fit for use in all respect. The Vehicle must be commercially registered with the transport authority and must carry all statutory documents (valid Driving license, Insurance policy, P.U.C. certificate etc.)

14. Labor Health & Hygiene: Contractor shall have to ensure periodical cleaning and disposal of waste from workers residential colonies. Contractor must ensure the hygiene, potable drinking water and regular housekeeping in his workers colony. Non compliance of the same would be viewed seriously by the company and suitable action would be initiated to ensure proper living conditions. During summer this area becomes very hot and prone to the cases of dehydration. Contractor must ensure the provision of ORS drink to all the workers during summer.

for JINDAL POWER LIMITED

AUTHORISED SIGNATORY

This is Electronically generated document hence signature is not required.

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To Whom it May Concern

This is to certify that **M/s. Oakridge Energy Pvt. Ltd.** has been allocated work of **Design, Supply, Installation, Testing, Commissioning, Operation and Maintenance of Grid Connect Rooftops Solar Plant of capacity 1000 kWp at FC Warehouse (Amazon Warehouse) in Devanahalli, Bangalore, Karnataka (India)** issued by **APG Industrial Conglomerate Private Limited** vide Agreement dated 24th November 2020 which has been successfully installed and commissioned on 21st March 2022.

Brief Details of Solar PV Power project commissioned are:

1. Name of work : **Establishment of 1000 kWp Solar Rooftop Project on FC Warehouse in Devanahalli, Bangalore.**
2. Project Capacity : **1000 kWp**
3. Date of Commissioning : **21st March 2022.**
4. Location : **BLR 8, FC Warehouse (Amazon Warehouse), Devanahalli, Bangalore, Karnataka (India).**
5. Project Cost : **Rs. 3,25,37,445/- (Rupees Three Crore Twenty-Five Lakhs)**
Thirty-Seven Thousand Four Hundred Forty-Five Only)
(As per the agreement dated 24th November 2020)

The project is commissioned on 21st March 2022 and the plant is performing satisfactorily as on the date of issuance of this certificate.

Signature and Stamp**Date: 28th April 2022****Place: New Delhi**LAI Investment Manager Private Limited
CIN U65999MH2017FTC301000

VARIATION ORDER - DEVANAHALLI PROJECT					Assetz																
Variation No.	1																				
Variation Reference	1. Agreement dated 24/11/2020 for establishment of 600 kWp Solar Rooftop Project on SC & RC Warehouse located in Devanahalli, Bangalore																				
Project Component	FC warehouse, Devanahalli Bangalore																				
Date	01-Jun-21																				
Revision	1																				
Description	Establishment of 1000 kWp Solar Rooftop Project on FC Warehouse in Devanahalli, Bangalore																				
Value	₹		3,25,37,445																		
To	Oakridge Energy Private Limited																				
	Attention: Shriwan Sampath																				
This variation is being approved based on attached details																					
1. Variation details	Establishment of 1000 kWp Solar Rooftop Project on FC warehouse in Devanahalli, Bangalore (Please refer Annexure 1- Variation order BOQ)																				
2. Scope of Work	FC warehouse, Devanahalli Bangalore 1. Establishment of 1000 kWp Solar Rooftop Project on FC warehouse in Devanahalli, Bangalore																				
3. Specification document	1. Agreement dated 24/11/2020 for establishment of 600 kWp Solar Rooftop Project on SC & RC Warehouse located in Devanahalli, Bangalore 2. Annexure Part A- Variation order BOQ 3. Annexure Part BI-1 - Project Design Brief Report 4. Annexure Part G-I - Program 5. Annexure Part I-A-I - Resource Deployment Schedule																				
4. Drawing reference	Nil																				
5. Cost of Works	<table border="1"> <thead> <tr> <th>Item Description</th> <th>Value of Work</th> <th>Additional costs</th> <th>GST as per BOQ</th> <th>Amount</th> </tr> </thead> <tbody> <tr> <td>Manufacture, supply and Erection of (Please refer Annexure 1- Variation order BOQ)</td> <td>₹ 3,03,00,000</td> <td>₹ 0</td> <td>₹ 20,37,445</td> <td>₹ 3,23,37,445</td> </tr> <tr> <td>TOTAL</td> <td>₹ 3,03,00,000</td> <td>₹ 0</td> <td>₹ 20,37,445</td> <td>₹ 3,23,37,445</td> </tr> </tbody> </table>						Item Description	Value of Work	Additional costs	GST as per BOQ	Amount	Manufacture, supply and Erection of (Please refer Annexure 1- Variation order BOQ)	₹ 3,03,00,000	₹ 0	₹ 20,37,445	₹ 3,23,37,445	TOTAL	₹ 3,03,00,000	₹ 0	₹ 20,37,445	₹ 3,23,37,445
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Manufacture, supply and Erection of (Please refer Annexure 1- Variation order BOQ)	₹ 3,03,00,000	₹ 0	₹ 20,37,445	₹ 3,23,37,445																	
TOTAL	₹ 3,03,00,000	₹ 0	₹ 20,37,445	₹ 3,23,37,445																	
6. Schedule implication	Nil																				
7. Qualifications and experience																					
8. Annexures	1. Annexure Part A- Variation order BOQ 2. Annexure Part BI-1 - Project Design Brief Report 3. Annexure Part I-I - Program 4. Annexure Part I-A-I - Resource Deployment Schedule																				
9. Term and Conditions	This Variation order shall be read in conjunction with the agreement executed on 24/11/2020 for establishment of 600 kWp Solar rooftop project on SC RC warehouse located in Devanahalli project.																				
Oakridge Energy Private Limited																					
Submitted	Shriwan Sampath			Project team																	
	Managing Director	Date	Signature	Approved	Shantanu Parashar																
					Project Director	Date Signature															
APG Industrial Confinement Private Limited																					
Approved	Mr. James Anderson																				
	Authorized Signatory	Date	Signature																		

Scope of Work: Establishment of 100 kW p Solar Rooftop Project at EC warehouse in Deyang Rd, Bangalore.

BID

S.No.	Description	UOM	Est Qty	Rate	Amount	GST Rate	GST Amount	Total
1	Solar Inverter - 100000 VA	Nos	1	3100000	3100000	18%	558000	3658000
2	Solar module - monocrystalline - 440 - 400 Wp	Nos	2247	14000	31458000	18%	5662440	37120440
3	Mounting structure, complete with accessories	Lsq	1	1500000	1500000	18%	270000	1770000
4	DC CABLE - 100 sq. mm, 3000	m	175	100	17500	18%	3150	20650
5	AC CABLE - 2.5 sq. mm, 3000	m	10	800	8000	18%	1440	9440
6	DC CABLE - 4 Sqmm	m	5000	40	200000	18%	36000	236000
7	DC CABLE - 6 Sqmm	m	12000	50	600000	18%	108000	708000
8	ACB - 1000	Nos	2	100000	200000	18%	36000	236000
9	DC Distribution Box - 10 to 15 nos	Nos	7	10000	70000	18%	12600	82600
10	DC Distribution Box - 8 to 10 nos	Nos	5	15000	75000	18%	13500	88500
11	Remote Monitoring System with Accessories	Nos	1	200000	200000	18%	36000	236000
12	Earthing and other Accessories	Lsq	1	80000	80000	18%	14400	94400
Total					38000000		687440	38687440



Annexure Part BI-I
Project Design Brief Report

Project Snapshot

1. Name of the Company	AMAZON INDIA
2. Proposed Project Location	AMAZON WAREHOUSE BANGALURU, KARNATAKA,
3. District Name	UDAYAGIRI, DEVANHALLI TALUK, BAGALURU RURAL
4. State	KARNATAKA
5. Proposed Power Plant capacity	1 MWp (aggregate capacity)
6. Technology	Solar Photovoltaic with zero export system
7. Location of place on Earth	(i) Latitude : 13.209761 (ii) Longitude : 77.666007
8. Altitude	888m
9. Average annual solar isolation	5.6-5.4 kWh/m ² /day
10. Nearest Town	Devanahalli, Bangaluru
11. Nearest airport	Kempegowda International Airport
12. Nearest Railway station	Devanahalli Railway Station
13. Type of Module proposed	Multi/Mono Crystalline
14. Type of Inverter proposed	String



Glossary

Photovoltaic	The physical effect of direct Conversion of light (sunlight) to electrical energy
PV Cell	The smallest photovoltaic (PV) element that generates electricity from light.
PV Module	A collection of interconnected PV cells encapsulated between protective materials such as glass and back sheet (Poly Vinyl Fluoride) or glass and glass and mounted in an aluminium frame. This is a hermetically sealed unit.
String	Multiple PV modules connected in series electrically.
Array	Several strings of modules with the same orientation and tilt angle, located together.
Inverter	An electronic device that converts direct current electricity into alternating current electricity suitable for feeding directly to the electrical grid or to normal AC loads.
Insolation	It is a measure of solar radiation energy received on a given surface area in a given time. It is commonly expressed as average irradiance in watts per square meter (W/m^2) or kilowatt-hours per square meter per day ($kWh/(m^2 \text{ day})$) (or hours/day)
Solar Irradiation	The total electromagnetic radiation emitted by the Sun.
STC	“Standard Test Conditions” - Incident Solar Irradiance of 1000 Watts/ m^2 , at a spectral density of AM1.5 and cell temperature of 25°C.
Mounting Structure	Device used to hold modules in place, at desired angle & direction
Power Evacuation	Power generated from Solar PV Power Plant is transmitted to a point (sub-station) where it is distributed for consumer use.
Sub-station	The place where the generated power from solar is synchronized with utility grid and metered.
Control Room	A room housing control equipment.
Cable	A conductor with one or more strands bound together, used for transmitting electrical energy.
Efficiency	The ratio of the output to the input of any system.
Junction boxes	Inputs of several strings are connected to this box and taken as single output.
Current	A flow of electricity through a conductor measured in Amps.



Voltage	Energy required to move charge from one point to another, expressed in volts It is the difference of electrical potential between two points of an electrical or electronic circuit, expressed in volts. It is the measurement of the potential for an electric field to cause an electric current in an electrical conductor.
Lightning Arrestor	Device used to protect human along with components as per risk assessment from lightning strikes
Earthing	Described as a system of electrical connections to the general mass of earth,
Transformer	A static device, keeping the frequency same by which one voltage is changed to another voltage.
Grid	A system of high/low tension conductor by which electrical power is distributed throughout a region.



Abbreviations

AB	Air Breaker
ACB	Air Circuit Breaker
AC	Alternate current
ACSR	Aluminium Conductors Steel Reinforced
BOS	Balance of the System
CDM	Clean Development Mechanism
CER	Carbon Emission Reduction
CO ₂	Carbon Dioxide
CT	Current Transformer
DAS	Data Acquisition System
DC	Direct Current
DP	Double Pole
DPR	Detailed Project Report
HT	High Tension
LT	Low Tension
LV	Low Voltage
MNRE	Ministry of New and Renewable Energy
kWh	Kilo Watt Hour
NO ₂	Nitrous Oxide
MCB	Main Combiner Box / Miniature Circuit Breaker
MFM	Multi-Function Meters
PLF	Plant Load Factor
PFC	Power Finance Corporation
PPA	Power Purchase Agreement
PV	Photo Voltaic
PT	Power Transformer
SEB	State Electricity Board
SO ₂	Sulphur Dioxide
SP	Single Pole
UNFCCC	United Nations Framework Convention on Climate Change
VCB	Vacuum Circuit Breaker
XLPE	Cross Linked Polyethylene



Introduction

India is both densely populated and has high solar insolation, providing an ideal combination for Solar Power in India. Power is the lifeline of any development of the nation. At present the power requirement is being met by three main sources viz., Thermal, Hydel and Nuclear. While Hydel and Nuclear have their inherent limitations, Thermal Power is often confronted by the challenge associated with the availability of fuel. Currently Thermal Power stations which meet the major part of the power demand use coal as fuel. Conventional fuels such as oil, gas and coal cannot meet the increasing demand forever. In addition to the requirement of huge funds, the implementation of more such projects using conventional means of power generation will also involve issues of growing environmental concern, with depletion of fossil fuels. In order to bring down the dependence of finite fossil fuel for power generation, it is necessary to look into the viability of generating power locally using renewable energy sources.

Fortunately, India lies in sunny regions of the world. Most parts of India receive 4.7 kWh of solar radiation per square meter per day with 300-325 sunny days in a year. India has abundant solar resources, as it receives about 3000 hours of sunshine every year, equivalent to over 5,000 trillion kWh. India can easily utilize the solar energy.

Under the Paris Agreement of UNFCCC, India has made a strong commitment towards mitigating climate change. The three commitments are - reducing greenhouse gas emission intensity of its GDP by 33-35 per cent below 2005 levels by 2030, 40 per cent of India's power capacity would be based on non-fossil fuel sources and create an additional 'carbon sink' of 2.5 to 3 billion tonnes of CO₂ equivalent through additional forest and tree cover by 2030.

Ministry of New and Renewable Energy(MNRE), Government of India (GoI), has been facilitating the implementation of broad spectrum program's including harnessing renewable power/ Energy(make use of one), renewable energy to rural areas for lighting, cooking and motive power, use of renewable energy in urban, industrial and commercial applications and development of alternate fuels and applications. With regards to solar energy, the Government of India has set a target of 100,000 MW of installed solar capacity by 2022, out of which 40000 MW shall be rooftop solar. Accordingly, MNRE has announced multiple schemes to encourage rooftop solar, being implemented through multiple nodal agencies like Solar Energy Corporation of India (SECI), Indraprastha Power Generation Company (IPGCL, Nodal agency for Delhi), Haryana Renewable Development Agency (HAREDA, nodal agency for Haryana) and similar nodal agencies in various states.

Amazon is setting up warehouses in Bangalore which would serve as Sorting Centre, Fulfilment centre and Receiving Centre. The proposal is for setting up solar power plant on the rooftop of the warehouse to meet the internal power demand. As per the regulations of the Karnataka Electricity Regulatory Commission, net-metering has not been permitted, and hence it is important to size the plant to get only the necessary generation as per the day-time requirement of the facility.

Sl No	Projects	Capacity (kW)	Status
1	Amazon 600kW	600	Capacity is under execution- on (RC+SC) rooftop
2	Amazon 1000kW	1000	Capacity to be executed- on FC /BLR-8 rooftop.
Total		1600	



Irradiation Data

Bangaluru irradiation level is in the level of 5.4 to 5.6 kWh / sq m, which is excellent for solar generation, the solar project is within Bangaluru, Karnataka, and hence the radiation data of Bangaluru has been considered. The solar irradiation map of India and the monthly solar irradiation in Bangaluru are provided below -

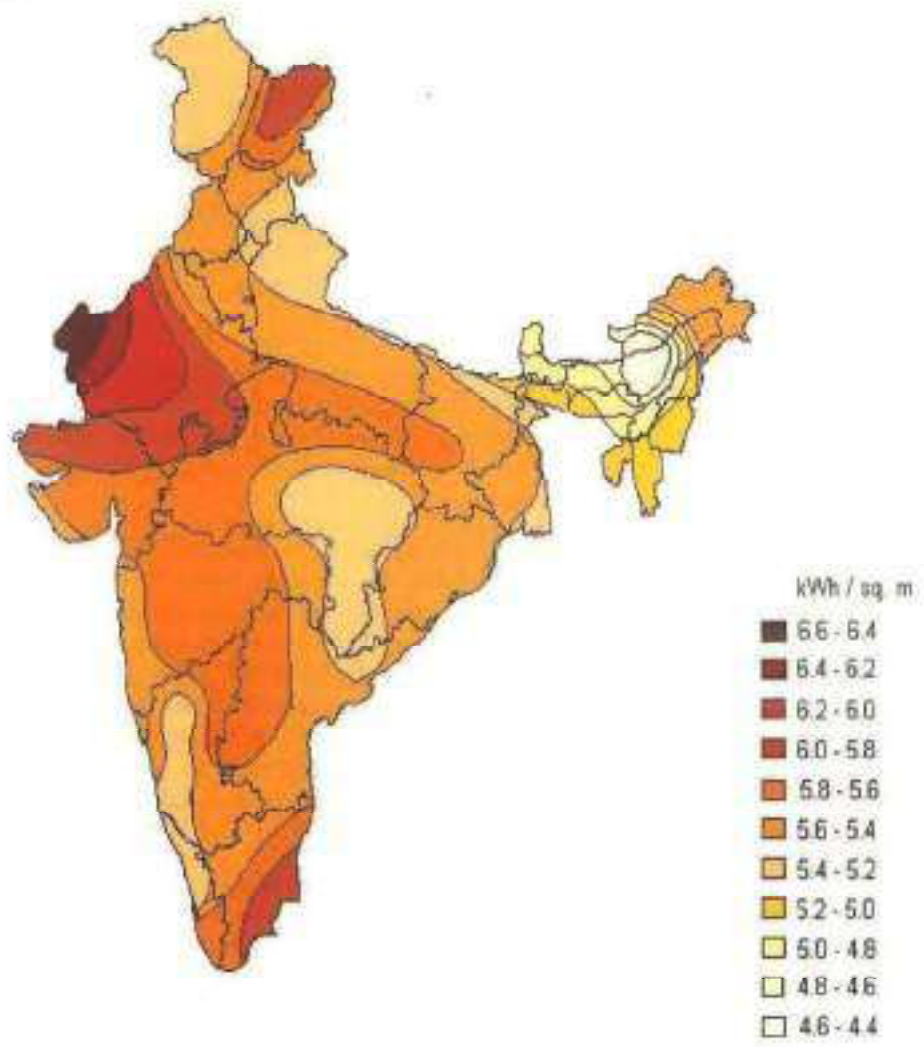


Figure 1- Indian solar irradiation Map

Month	Daily solar radiation-Horizontal (kwh/m ² /d)
January	5.85
February	6.53
March	6.92
April	6.87
May	6.60



June	5.69
July	5.21
August	5.16
September	5.65
October	5.07
November	5.15
December	5.39
Annual	5.32

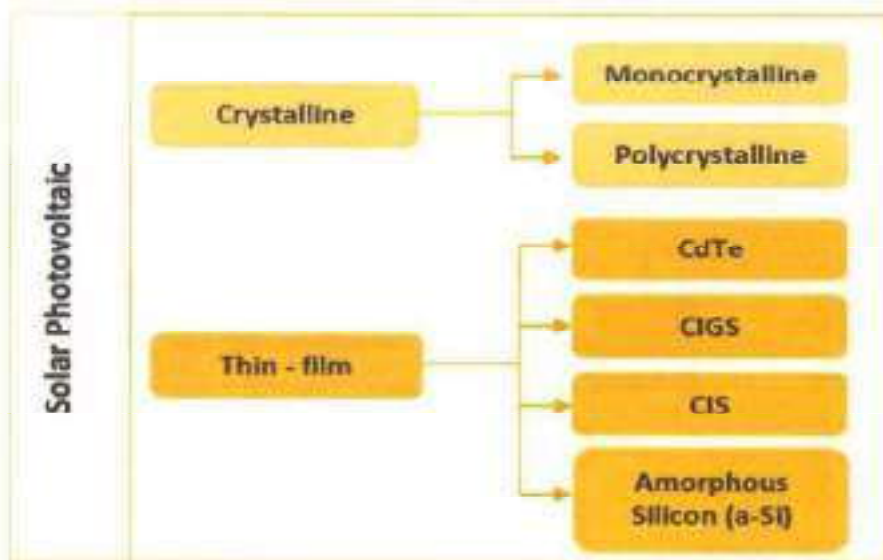
Location and Infrastructure Facilities

The project is in Bangalore, Karnataka, has excellent connectivity by rail, road and air. The project has excellent availability of infrastructure. The Amazon location has two buildings, one with the fulfilment centre (FC), and one with the receiving centre (RC) and sorting centre (SC). Since it is observed that RC and SC has the lower electrical load, it is proposed to set up the first phase plant (600kWp) on the roof of the receiving centre and sorting centre and in second phase plant (1000kWp) on the roof of fulfilment centre.

Selection of PV Technology

Crystalline silicon (c-Si) is the crystalline forms of silicon, either multi-crystalline silicon (multi-Si) consisting of small crystals, or monocrystalline silicon (mono-Si), a continuous crystal. Crystalline silicon is the dominant semiconducting material used in photovoltaic technology to produce solar cells.

Basic features from different solar cell types can be found below.



The advantages & disadvantages of each technology are discussed in the following section.

Crystalline Silicon PV (Preferred by Amazon)



- **Longevity:** Crystalline solar panels are first generation solar technology and have been around a long time, providing evidence of their durability and longevity.
- **Efficiency:** PV panels made from crystalline solar cells are able to convert the highest amount of solar energy into electricity of any type of flat solar panel.
- **Embodied Energy:** While thin-film solar panels offer a lower level of embedded energy per panel, the fact that more panels are needed somewhat negates this aspect, especially given the extra mounting rails sometimes needed.
- **Environmental Friendly:** Crystalline solar panels are not hazardous to the environment. Some thin film solar products use cadmium telluride (CdTe). Cadmium is a heavy metal that accumulates in plant and animal tissues. Cadmium is a 'probable carcinogen' in humans and animals.

Thin Film

- Better performance in weak sunlight environment
- Silicon thin film PV with high absorption coefficient also brings the benefit of module installation against any direction of sunlight.
- Silicon thin film PV with low temperature coefficient has much better capability in hot environment.
- More resistant against Shading.
- Silicon thin film PV outputs power robustly even in shading condition. Oppositely, crystalline silicon PV doesn't work well due to some cells without output.

Keeping in view the fact that in small projects, c-Si panels have a demonstrated record of performance and that the number of manufacturers is large, c-Si panels are being used in the projects.

Power Plant Scheme

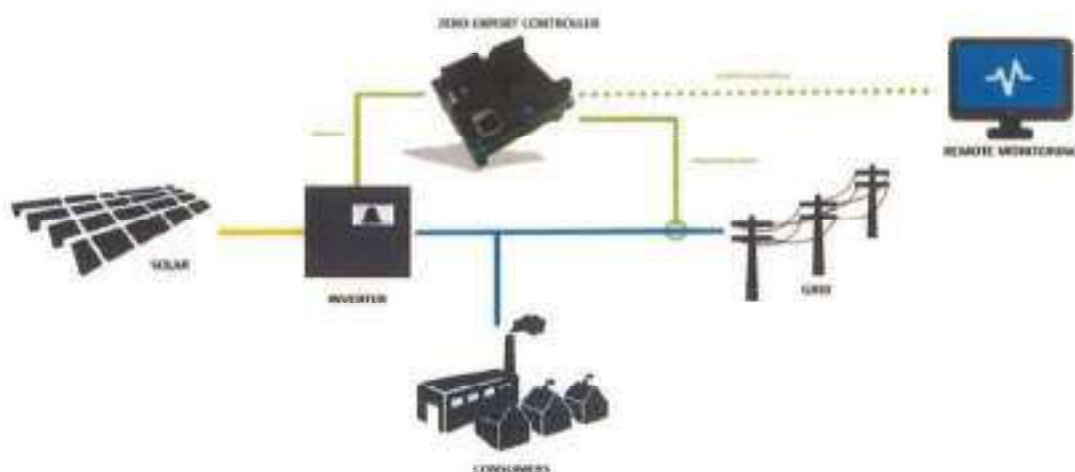


Figure 2 - Schematic diagram of a rooftop solar plant

Basic System Description

Solar Photovoltaic power generator consists of solar modules in series and parallel connections, that convert solar radiations into DC electrical power at the pre-determined range of Voltages whenever



sufficient solar radiation is available. The individual crystalline solar cells are connected together in a module (in series connection), which are hermetically sealed to survive in rugged weather conditions and ensures optimum performance during its long life.

In order to achieve a higher system voltage, modules are installed in a row arrangement, called a string. A higher system voltage has the advantage of lesser installation work, higher efficiency of the entire plant and usage of smaller cross section cables. Calculated no. of strings is connected in parallel by cables in Junction Boxes. Outputs from many such junction boxes are connected in parallel in the Main Combiner Box (MCB). This Main Combiner Box output is fed to the central inverters/Power Control Unit (PCU) to invert solar generated DC power in to conventional 3 phase AC power.

AC power from inverters will be fed to LV panel.

Power Plant Design Philosophy

The Power Plant is sized on the following major criteria:

- Solar Power (average insolation available)
- Power evacuation facility in the vicinity of the proposed site along with Grid availability on 24 Hours a day basis.

The following methodology shall be adopted for design of the rooftop solar project

- Detailed survey of the rooftop
- Preparation of PV layout so that there is no shadow on any panels between 9 am to 3 pm on any day of the year
- Shadow Analysis (using Sketchup)
- Generation Analysis (using PV Syst) to keep the projected generation above the specified
- Solar Project Design in strict compliance with the Technical Specifications spelled out in the bid document.
- Preparation of Bill of Quantity
- Preparation of SLD minimizing the Voltage Drop Calculations.
- Preparation of the design of the module mounting structure designed as per the specifications of the bid document and designed to withstand a wind speed of 150 km / hr.

Sl. No.	Item	Make	Description
1	Solar Module	ReneSola/Trina/ Vikram	335-500Wp Poly/Mono-crystalline modules
2	Module Mounting Structure	GI/Aluminum	Clip Lock Mechanism structure
3	Inverter	Sungrow	String Inverter for 550kW for 1 st phase, 770 kW for 2 nd phase
4	Combiner box	Polycarbonate/Metal sheet	Array Junction Boxes/DC Distribution Box with each Inverter
5	Control Panels	Metal Sheet	LT (Low Tension) Panel



6	Cables	Polycab	PVC/XLPE Copper/Aluminum Cables Accessories for cable interconnection, As per Amazon EHS guidelines
7	Accessories	Standard	installation kit & cable Tray/Conduit
8	Lightning	Conventional	Lightning Protection Units

Power Plant Component Description

As indicated the following are the major components of the Power Plant.

Solar PV Panel

Solar cells produce Direct Current (DC) electricity from light, which can be used to power equipment or to recharge a battery. Cells require protection from the environment and are usually packaged tightly behind a glass sheet. When more power is required than a single cell can deliver, cells are electrically connected together to form photovoltaic modules, or solar panels. A photovoltaic module is a packaged, interconnected assembly of photovoltaic cells, which converts sunlight into electrical power. The cells are hermetically sealed between glass and back cover to protect them from harsh environments.

Crystalline Module

Technical Specifications for Crystalline Modules	
Capacity of PV Modules	440Wp (Mono)
Output power – Pmax (Watts)	440Wp
Voltage at Pmax	41.5V
Current at Pmax	10.62A
Open-circuit voltage	48.8V
Short circuit current	11.56A
Module Efficiency (%)	19.79%
Maximum system voltage (Volts)	1500V
Type of solar PV cell	Mono PERC
Solar cells	72 MON PERC (144 Half-Cell)
Module output	MC 4 terminations

Certification	IEC61215 & EN IEC 61730 Class A, Safety Class II
---------------	--

- 25-year limited warranty on power output & 5-year product warranty

Power warranty	• 25-year performance warranty - 10 years: 90% minimum performance - 25 years: 80% minimum performance
----------------	---

Module Mounting Structure

The module mounting structure is designed for holding suitable number of modules in series. The frames and leg assemblies of the array structures is made of MS hot dip galvanized of suitable sections of Angle, Channel, Tubes or any other sections conforming to IS:2062 for steel structure to meet the design criteria. All nuts & bolts considered for fastening modules with this structure are of very good quality of Stainless Steel. The array structure is designed in such a way that it will occupy minimum space without sacrificing the output from SPV panels at the same time it will withstand severe wind speed up to maximum 100 kmph.

Technical Specification – Module Mounting Structures

Material	GI/Aluminum
Overall dimension	As per design
Wind rating	as per site location
Tilt angle	5 degree along the roof (Flush Mount)
Fixing type	Clip Lock Mechanism on standing seam rooftop

Junction Boxes

In the Junction boxes, individual module strings are bundled and safely routed to the inverter. It is a combination of an exact, well-organized string monitoring system and a safety concept adapted to the PV technology.

The junction boxes will have suitable cable entry points fitted with cable glands of appropriate sizes for both incoming and outgoing cables. They monitor the output of solar PV arrays. If difference between string outputs is too large, the operator is informed through monitoring system. Active disconnection allows string voltages to be measured separately.

These junction boxes are enclosed in an IP 65 rated plastic housing, making it ideal for long-term use in PV systems. In addition, the direct connection between the strings and the spring clamp connectors ensures a durable and safe installation.

Technical Specification – Combiner Boxes

Material	Polycarbonate
Type	Dust, Vermin & Waterproof



Hardware	SS-Rail
Cable Gland	Polycarbonate/Metal sheet
Protection	IP 65

String Inverter

A multi-function power conditioning system combining the functionality of a grid-interactive solar inverter with a highly efficient conversion unit. The inverters achieve their distinguished efficiency factor through the use of IGBTs (Insulated Gate Bipolar Transistors) with Trench Gate Structure, and through the use of iron powder chokes and high-quality transformers with losses less than 1 %.

String / Central inverters operate on MPPT (Maximum Power Point Tracking) mode to ensure maximum output from the solar generators at different ambient conditions. String inverters use higher system voltages to reach very high plant efficiency. Furthermore, installations can be expanded with additions of more modules without problems.

The design of the technical parameters has been optimized with regard to the operating time of the inverter. For example, the IGBTs not only increase the efficiency factor, but their high dielectric strength inhibits the transmission of voltage spikes. The intelligent minimum-performance recognition system protects the AC contactors and a fast-over-current recognition system for all transistors protects the IGBTs.

With a wide range of input voltages from 350 to 1000 V, the inverter allows the largest possible range of module connection possibilities. For larger installations, the proposed inverters can be easily combined to provide higher performance.

Cables

The size of the cables between array interconnections, array to junction boxes, junction boxes to PCU etc shall be so selected to keep the voltage drop and losses to the minimum (Voltage drop calculation will be shared).

The bright annealed 99.97% pure bare copper conductors that offer low conductor resistance, they result in lower heating thereby increase in life and savings in power consumption. These wires are insulated with a special grade PVC compound formulated. The skin coloration offers high insulation resistance and long life.

The connectors/lugs of copper material with high current capacity and easy mode of assembly are proposed.

Technical Specification – Cables	
Type	PV Insulated, sheath & UV resistant
Material	Copper/Aluminum
Voltage	Max: 1100V for DC and AC
Temperature	10 – 70 °C
Colour	Red/ Black /Yellow/Green



Power Evacuation

The Direct Current (DC) from modules will be converted into Alternating Current (AC) by Inverters. The inverter outputs are given to a Low Voltage (LT) panels installed within the project premises.

Monitoring System

Monitoring systems is mainly used to monitor the performance of the Inverters, energy yield, temperature, irradiance level etc. It provides an extremely flexible interface to facilitate PC-based inverter monitoring via analog modem, GSM, Ethernet, or Internet connections.

Protection System

Earthing: The array structure of the PV yard will be grounded properly using adequate number of earthing kits. All metal casing / shielding of the plant shall be thoroughly grounded to ensure safety of the power plant.

Lightning Protection: The SPV Power Plant shall be provided with lightning & over voltage protection. The main aim in this protection shall be to reduce the over voltage to a tolerable value before it reaches the PV or other sub system components. The source of over voltage can be lightning, atmosphere disturbances etc. Metal oxide variators / SPDs shall be provided inside the Array Junction Boxes. In addition, suitable SPDs type-2 also shall be provided in the Inverter to protect the inverter from over voltage.



Bill of Components – 1000kWp project (Phase 2)

Tentative bill of components for a 1000kWp project is provided below

S/N	DESCRIPTION	MAKE	QUANTITY
1	SOLAR INVERTER (110kW)	Sungrow	07 Nos
2	SOLAR MODULE (440Wp)	Renesola/Trina / Vikram	2273 Nos
3	MODULE MOUNTING STRUCTURE	GI/Aluminium	LOT
4	AC CABLE (PVC/XLPE insulated)	POLYCAB	AS PER SITE REQUIREMENT
5	DC CABLE (TYPE-I, 4SQMM&6sqmm COPPER)	POLYCAB	AS PER SITE REQUIREMENT
6	AC SWITCHGEAR Isc-25kA/36kA/50kA	L&T/Schneider	AS PER SITE REQUIREMENT
7	EARTHING Heavy duty GI Bonded 20mm,2m long	GI rod	AS PER SITE REQUIREMENT
8	AC Distribution Box (IP65)	Metal Sheet/Polycarbonate	As per specification mentioned below
9	DC Distribution Box (IP65)	Polycarbonate	As per specification mentioned below
10	LIGHTNING ARRESTER	Conventional Type	AS PER SITE REQUIREMENT
11	CONNECTORS (1000VDC, 15A/30A)	Jainson/Elmex	AS PER SITE REQUIREMENT
12	REMOTE MONITORING SYSTEM 1. Smart data logger with zero export controlling and DG reverse power protection controlling. 2. UPS	1. Intello/Standard 2. Numeric/Microtek/Sukam	AS PER SITE REQUIREMENT



**Annexure Part B2-I
Project Specification**

SL No.	Technical details	Description
i. SPV MODULE		
1	Actual capacity of SPV system (kWp)	1000.12KWp
2	Wattage of each module (Minimum 300Wp and above)	440Wp
3	Number of modules	2273 Nos.
4	Type of modules (Mono /Multi/Thin film)	Mono-crystalline Solar Module
5	Make of Modules and year of manufacturing	Renesola/Trina/Vikram
6	Data sheet of modules	ATTACHED
7	RFID Tag	INSIDE
ii. INVERTER		
8	Make of Inverter	Sungrow
9	Type of Inverter	String
10	Model No. of Inverters	SG110CX
11	Rating of each inverter (Rated AC output)	7x110kW
12	No. of Inverters (Rating wise)	7x110kW and (Single inverter can be overload up to 50%, Please refer the datasheet)
13	wattage of inverters (rated AC output)	7x110kW
14	Data Sheet of Inverter	ATTACHED
15	MPPT is integrated in the PCU/inverter	YES
16	Protection of Enclosure (IP level) /Location of Inverters	IP 65
17	Phase of inverter	THREE-PHASE
iii. STRUCTURE		
18	Type of Roof	Tin-shed (Standing Seam)
19	Type of structure & material of structure	Clip lock mechanism Fluo-PMGlet & GI/Aluminium

Sl. No.	Technical details	Description
iv. DC DISTRIBUTION BOARD		
20	DC Distribution Board material	POLYCARBONATE
21	IP Protection (Level)	IP65
22	Disconnection (MCB/FUSE) Rating & Specification	32A/15A & ATTACHED
v. AC DISTRIBUTION BOARD		
23	Disconnection (MCBs/MCCBs/ACB's) Rating & Specification	4Px200A, 800A as per site requirement
24	IP Protections (All indoor panels will have protection of IP54 or better. All outdoor panels will have protection of IP65 or better)	IP 65
25	Material of ACDB panel	Metal Sheet
vi. LIGHTNING PROTECTION		
26	Technology	Conventional Type
vii. EARTHING CABLE/STRIP		
27	cross sectional area of conductor (≥ 1.6 sq mm) & Make	16sq mm (Al) for AC and DC, 35sqmm (Al) for LA
viii. CABLE AND CONNECTIONS		
28	DC Cable Make & Data Sheet	POLYCAB & ATTACHED
29	Conductor Material, Insulation materials, sheath material of DC cable	COPPER, POLYVINYL CHLORIDE (PVC), UV PROTECTED
30	Size of DC cable & Material, Insulation Material	4 SQMM & 6sqmm Copper, UV protected, PVC
31	AC Cable Make & data sheet	POLYCAB & ATTACHED
32	Conductor Material, Insulation materials, sheath material of AC cable	ALUMINIUM, PVC/XLPE
33	Size of AC cable	3.5C*70SQMM and as per site Requirement
ix. SCADA SYSTEM		
34	Type of Data Acquisition System 1. Smart/Logic power data logger with zero export controlling and DG reverse power protection controlling.	1. Logic power/Intello/standard

Sl. No.	Technical details	Description
x.	MISCELLANEOUS	
35	Danger boards & signage's	YES
36	Fire Extinguishers	YES

Project timelines

Sl. No.	Activity	April-2020	May-2020	June-2021	July-2021
1	Order confirmation				
2	Discom clearances				
3	Design				
4	Delivery of material - FC Roof				
5	Erection on roof				
6	Testing & Commissioning				



Generation Analysis on PVsyst- 1000kW



Version 7.2.2

PVsyst - Simulation report

Grid-Connected System

Project: Amazon India 1MW

Variant: New simulation variant

No 3D scene defined, no shadings

System power: 1004 kWp

Amazon India - India

Author



Page 20 of 32



PVsyst V7.2.2
 V01, Simulation date:
 14/05/21 15:03
 with v7.2.2

Project: Amazon India 1MW

Variant: New simulation variant

Project summary

Geographical Site

Amazon India
 India

Situation

Latitude: 13.21 °N
 Longitude: 77.67 °E
 Altitude: 907 m
 Time zone: UTC+5.5

Project settings

Albedo: 0.20

Meteo data

Amazon India

Meteonorm 8.0 (1990-2015), Sat=100% - Synthetic

System summary

Grid-Connected System

No 1D scene defined, no shadings

PV Field Orientation

Fixed plane

Tilt/Azimuth: 9 / 60 °

Near Shadings

No Shadings

User's needs

Unlimited load (grid)

System information

PV Array

Nb. of modules

2256 units

Power total

1044 kWp

Inverters

Nb. of units

8 units

Power total

800 kWac

Power ratio

1.255

Results summary

Projected Energy

1009 MWh/year

Specific production

1000 kWh/kWp/year - Perf. Ratio PR

70.88 %

Table of contents

Project and results summary	2
General parameters, PV Array Characteristics, System losses	3
Main results	5
Loss diagram	6
Special graphs	7
P50 - P90 evaluation	8





PVsyst V7.2.2
VDS Simulation GUI
14/05/21 15:03
with v7.2.2

Project: Amazon India 1MW

Variant: New simulation variant

General parameters

Grid-Connected System		No 3D scene defined, no shadings	
PV Field Orientation		Sheds configuration	
Orientation		No 3D scene defined	
Fixed plane			
Tilt/Azimuth	0 / 90 °		
Horizon		Near Shadings	
Free horizon		No Shadings	
		Models used	
		Transposition	Perez
		Diffuse	Perez, Meteonorm
		Circumscular	separate
		User's needs	
		Unlimited load (grid)	

PV Array Characteristics

PV module		Inverter	
Manufacturer	Generic	Manufacturer	Generic
Model	JAM78-S16-445-MR	Model	SG110-CX
(Original PVsyst database)		(Original PVsyst database)	
Unit Nom. Power	445 Wp	Unit Nom. Power	100 kWac
Number of PV modules	2256 units	Number of inverters	8 units
Nominal (STC)	1004 kWp	Total power	800 kWac
Modules	141 Strings x 16 in series	Operating voltage	506-1000 V
At operating cond. (38°C)		Prism ratio (DC-AC)	1.25
Pmpp	817 kWp	Total inverter power	
Ump	648 V	Total power	800 kWac
Imp	1416 A	Nbr. of inverters	8 units
Total PV power		Prism ratio	1.25
Nominal (STC)	1004 kWp		
Total	2256 modules		
Module area	4668 m²		

Array losses

Array Soiling Losses		Thermal Loss factor		DC wiring losses				
Loss Fraction	1.5 %	Module temperature according to irradiance:		Global array res.	7.6 mΩ			
		Uc (cond)	15.0 W/m²K	Loss Fraction	1.5 % at STC			
		Uc (wind)	9.0 W/m²K/m/s					
LID - Light Induced Degradation		Module Quality Loss		Module mismatch losses				
Loss Fraction	2.0 %	Loss Fraction	-3.5 %	Loss Fraction	2.0 % at NPP			
Strings Mismatch loss								
Loss Fraction	0.1 %							
IAM loss factor								
Incidence effect (IAM): Fresnel smooth glass, n = 1.526								
0°	35°	50°	60°	70°	75°	80°	85°	90°
1.000	0.998	0.981	0.948	0.862	0.776	0.636	0.433	0.160

System losses

Unavailability of the system	
Time fraction	2.0 %
	7.3 days
	3 periods

14/05/21

PVsyst Evaluation mode

Page 3/8





PVsyst V7.2.2
VCO, Simulation date:
14/05/21 15:00
with V7.2.2

Project: Amazon India 1MW
Variant: New simulation variant

AC wiring losses

inv. output line up to injection point	
inverter voltage	400 V ac 3f
Loss Fraction	1.38 % at STC
Inverter: 69116-CX	
Wire section (6 Inv.)	Copper 6 x 3 x 70 mm ²
Average wire length	72 ft

14/05/21

Physical Evaluation mode

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PVsyst V7.2.2
VCO Simulation date:
14/05/21 15:03
with v7.2.2

Project: Amazon India 1MW

Variant: New simulation variant

Main results

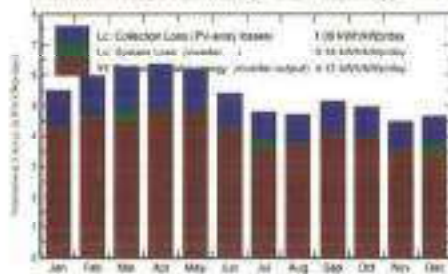
System Production
Produced Energy

1503 MWh/year

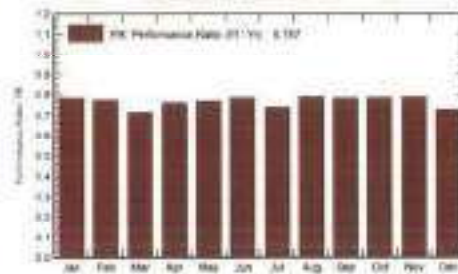
Specific production
Performance Ratio PR

1503 kWh/kWp/year
76.68 %

Normalized productions (per installed kWp)



Performance Ratio PR



Balances and main results:

	GlobHor	DiffHor	T_Amb	GlobInc	GlobEff	EArray	E_Grid	PR
	kWh/m²	kWh/m²	°C	kWh/m²	kWh/m²	MWh	MWh	ratio
January	170.4	46.03	21.52	170.3	151.1	136.9	134.0	0.764
February	167.3	51.05	23.90	167.3	153.4	132.9	130.0	0.774
March	195.6	66.86	26.51	195.1	186.8	152.7	149.4	0.777
April	191.3	72.09	27.21	190.7	183.1	149.0	145.7	0.761
May	192.5	79.03	28.48	192.6	184.5	151.9	148.6	0.769
June	182.0	75.19	34.02	182.0	154.7	136.7	127.9	0.786
July	148.5	41.72	33.63	148.4	142.9	121.1	111.0	0.740
August	145.6	32.41	33.20	145.6	139.2	116.7	115.1	0.761
September	154.0	73.04	35.26	154.1	147.2	124.1	121.4	0.785
October	154.6	89.79	33.42	154.1	147.0	124.4	121.7	0.787
November	134.5	54.79	21.89	134.8	128.1	106.9	100.2	0.792
December	143.7	45.86	21.58	144.0	136.1	116.8	105.2	0.728
Year	1990.4	606.15	25.25	1990.1	1889.3	1568.9	1509.1	0.767

Legends

GlobHor	Global horizontal irradiation	EArray	Effective energy at the output of the array
DiffHor	Horizontal diffuse irradiation	E_Grid	Energy injected into grid
T_Amb	Ambient Temperature	PR	Performance Ratio
GlobInc	Global incident in cell plane		
GlobEff	Effective Global, corr. for IAM and shading		

14/05/21

PVsyst Evaluation mode

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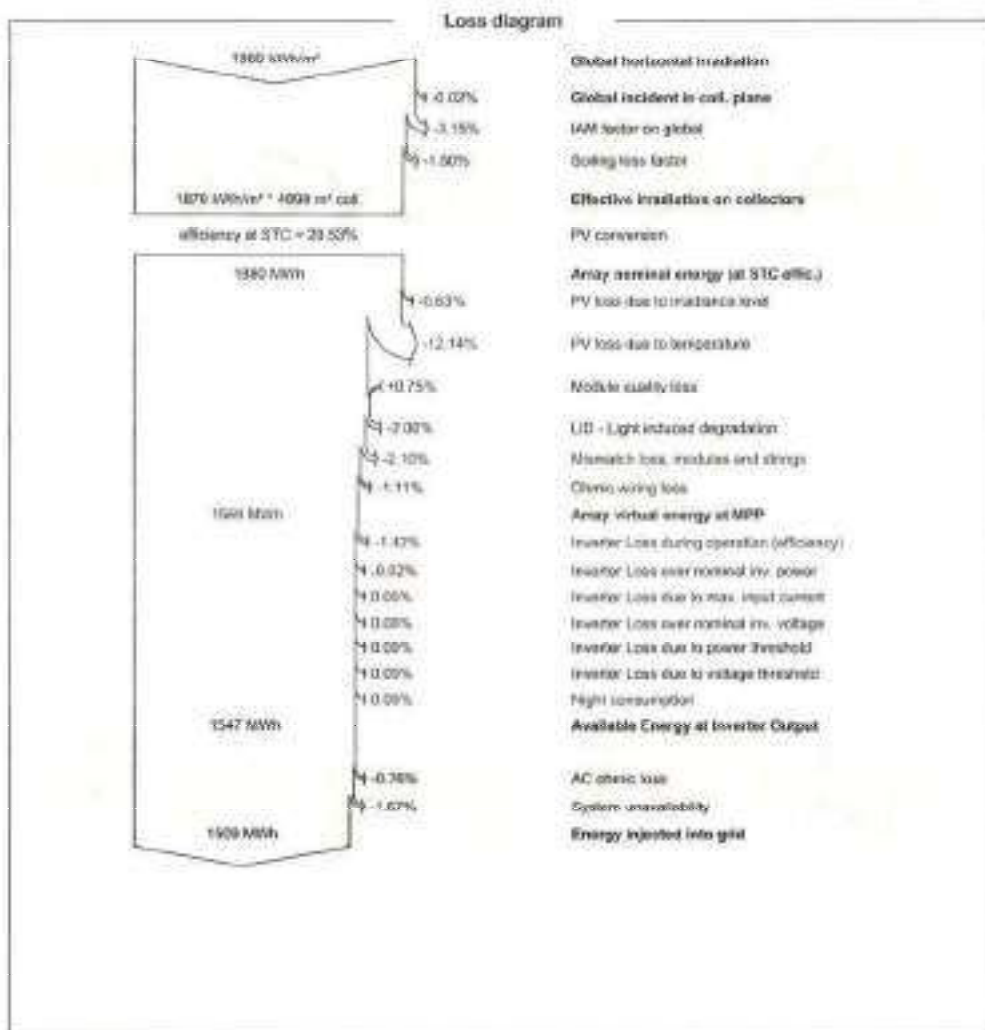


PVsyst V7.2.2

VDO, Simulation date:
14/06/21 15:03
with v7.2.2

Project: Amazon India 1MW

Variant: New simulation variant



140531

PVsyst Evaluation mode

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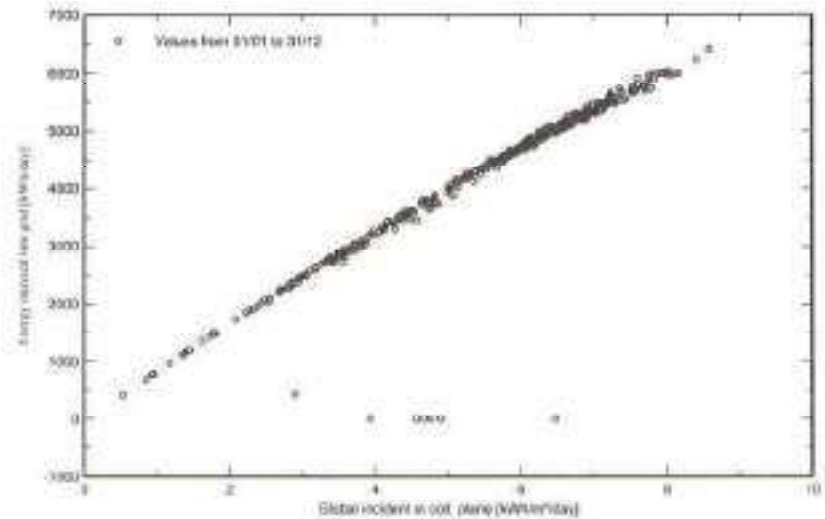
PVsyst V7.2.2
VC0: Simulation done
14/09/21 15:03
with v7.2.2

Project: Amazon India 1MW

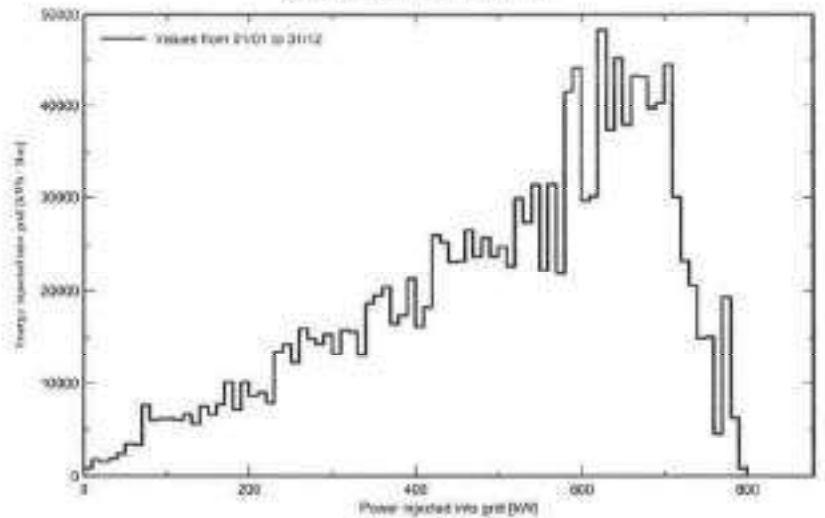
Variant: New simulation variant

Special graphs

Daily input/output diagram



System Output Power Distribution



14/09/21

PVsyst Evaluation mode

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PVsyst V7.2.2
 V01 - Simulation data
 14/05/21 15:00
 with v7.2.2

Project: Amazon India 1MW

Variant: New simulation variant

P50 - P90 evaluation

Meteo data

Meteo data: Meteonorm 8.0 (1996-2015), Set=100%
 Kind: Not defined
 Year-to-year variability (Variance): 0.5 %
 Specified Deviation:

Global variability (meteo + system)

Variability (Quadratic sum): 1.0 %

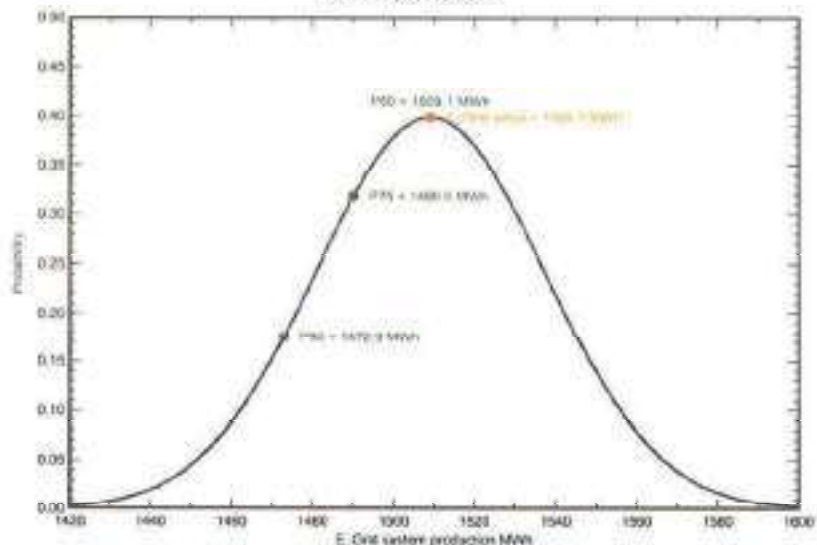
Simulation and parameters uncertainties

PV module modeling/parameters: 1.0 %
 Inverter efficiency uncertainty: 0.5 %
 Sizing and mismatch uncertainties: 1.0 %
 Degradation uncertainty: 1.0 %

Annual production probability

Variability: 26.2 MWh
 P50: 1509.1 MWh
 P90: 1472.0 MWh
 P75: 1480.0 MWh

Probability distribution



14/05/21

PVsyst Evaluation mode

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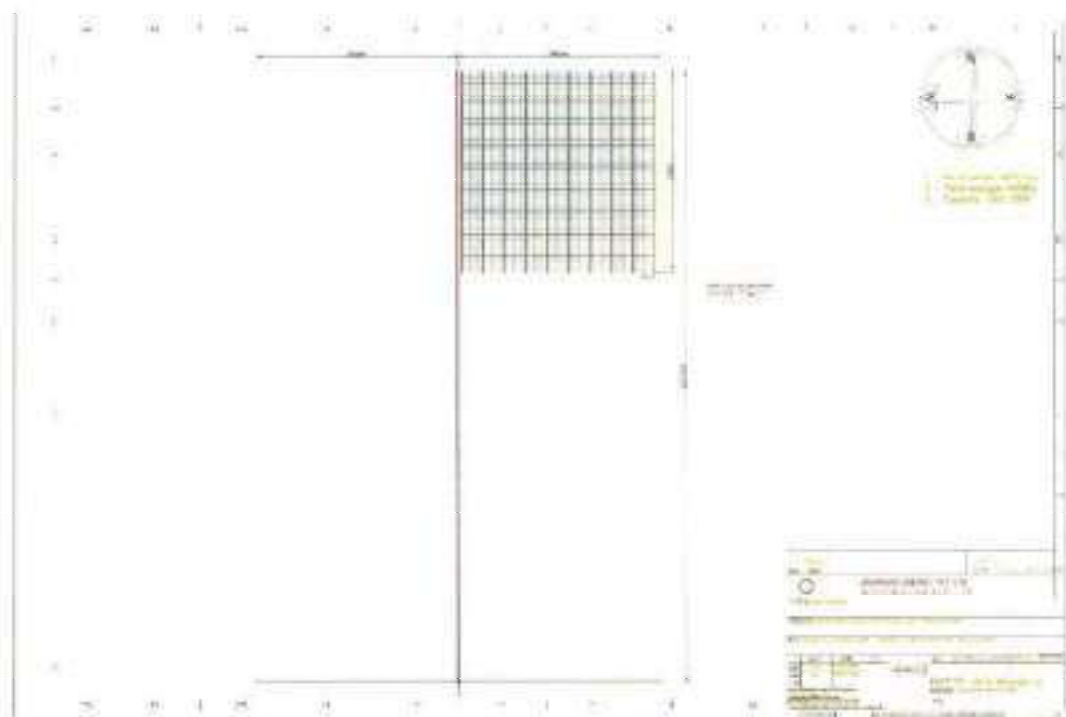


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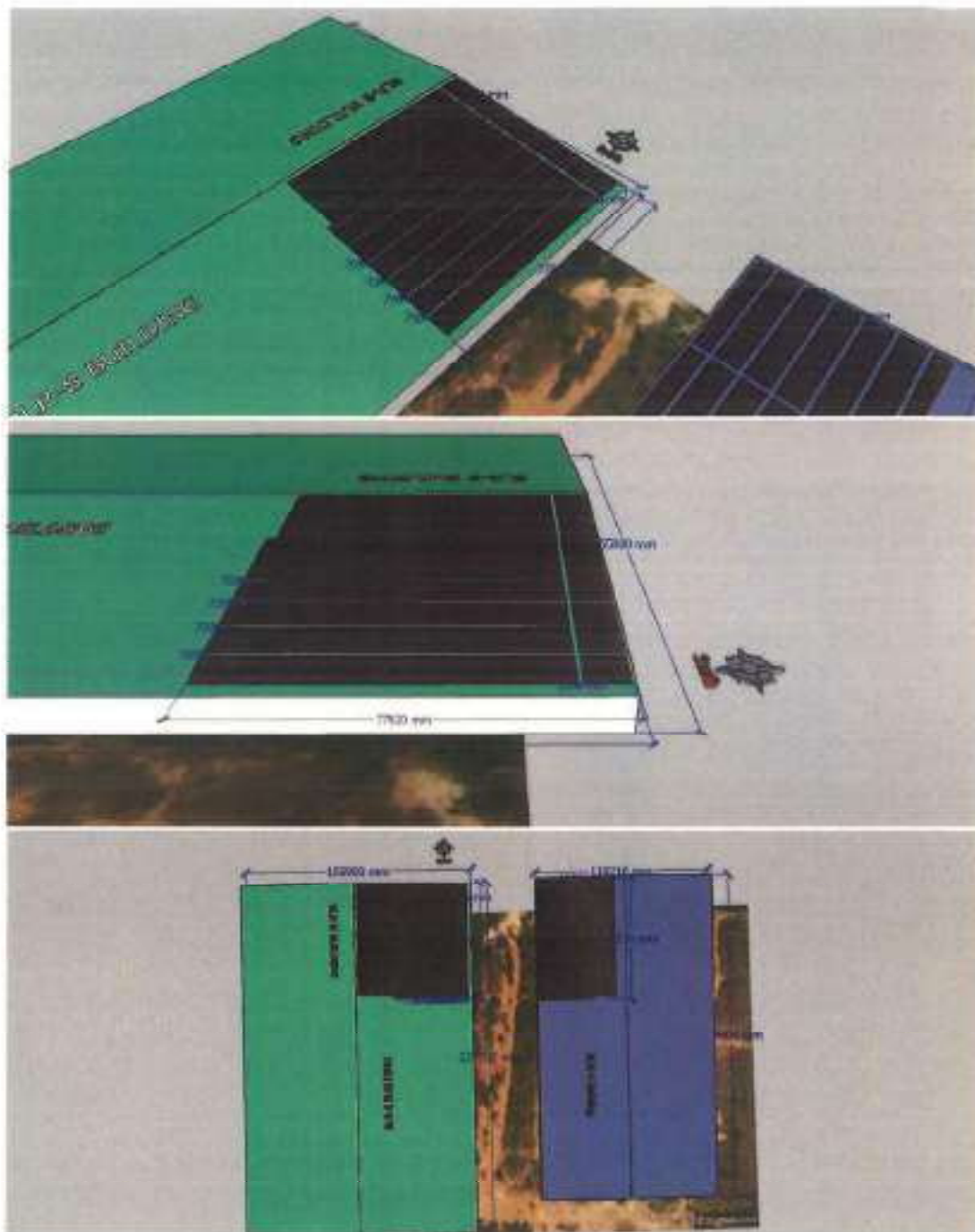
Project Layouts 2nd Phase-1000kW

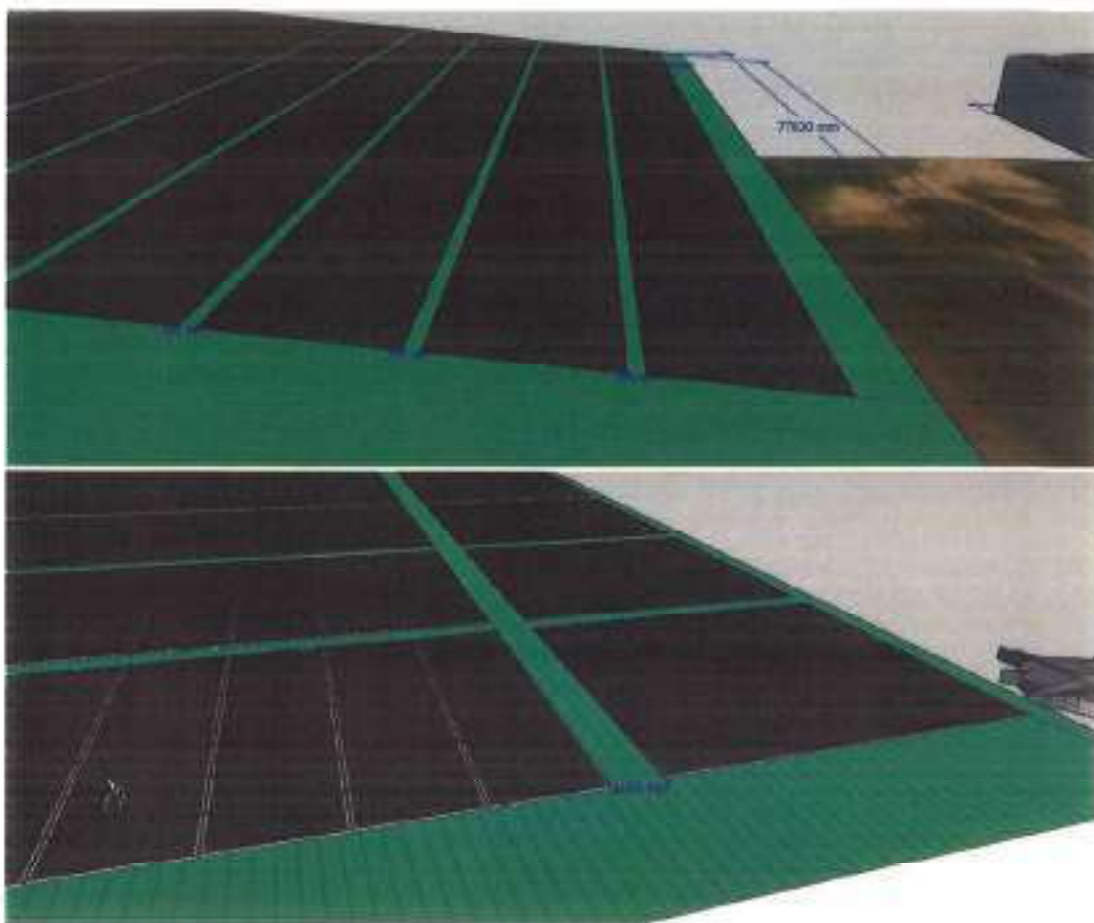
Total No of panel- 2248nos

Capacity: 1000.36kW

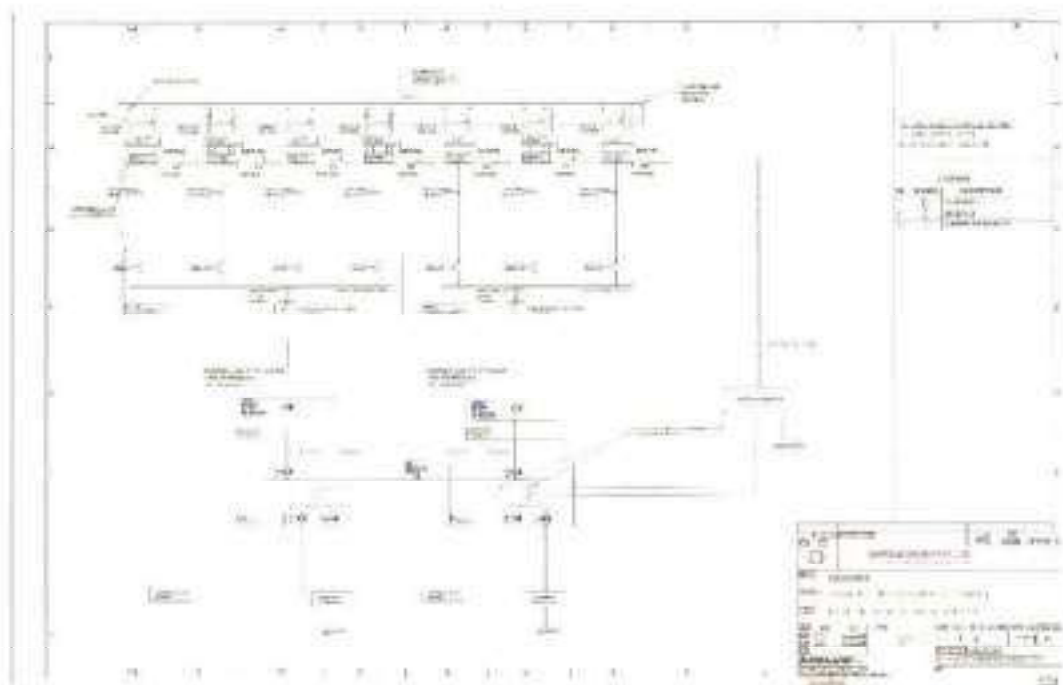








Single Line Diagram 1000.36 kW



Annexure Part I-I

Program

Project Execution Plan

S.no	Activity	Start Date	End Date
1 Procurement - Order Placement			
i.	Panels	Completed	
ii	Inverters	15-Jul-21	20-Jul-21
iii	Structure	10-Jun-21	13-Jun-21
iv	Other items	10-Jun-21	13-Jun-21
v	Installation vendor	10-Jun-21	13-Jun-21
2 Delivery at site			
i.	Panels	1-Jul-21	3-Jul-21
ii	Inverters	7-Aug-21	10-Aug-21
iii	Structure	1-Jul-21	3-Jul-21
iv	Other items	1-Jul-21	10-Aug-21
3 Installation and commissioning			
i.	Site mobilization	28-Jun-21	2-Jul-21
ii	Structure	3-Jul-21	14-Aug-21
iii	Cabling and other items	1-Aug-21	20-Aug-21
iv	Panels	3-Jul-21	14-Aug-21
v	Inverters	10-Aug-21	20-Aug-21
vi	Commissioning	21-Aug-21	30-Aug-21



Annexure Part I-A-1
Resource Deployment Schedule

I. Manpower Histogram

Sr. No.	Duration	Skilled	Semi-Skilled	Unskilled	Total
1	1 st Jul 2021 – 10 th Jul 2021	2	3	5	10
2	11 th Jul 2021 – 15 th Aug 2021	2	5	15	22
3	16 th Aug 2021 – 31 st Aug 2021	2	3	2	7





INDRAPRASTHA POWER GENERATION COMPANY LIMITED

(An undertaking of Govt. of NCT of Delhi)

Regd. Office: Himadri, Rajghat Power House Complex, New Delhi-110 002

Corporate Identity Number (CIN) -U40103DL2001SGC111530

OFFICE OF GENERAL MANAGER (COMMERCIAL, SOLAR, GAS & PROJECTS)

Rajghat Power House Complex, New Delhi - 110 002.

Phone No. 011 2326 7310; e-mail: solaripcgl@gmail.com

Ref. No. GM (T)/ Solar/ RTS MNRE 21.5 MW/ F-6/ 2021-22/ 106

Date: 30.07.2021

COMPLETION CERTIFICATE

This is to certify that M/s Oakridge Rooftops Pvt. Ltd. (A Project Company formed by M/s Oakridge Energy Pvt. Ltd.) having its registered office at Ground Floor, plot No. A108B, Sector 58, Noida, Gautam Buddha Nagar, U.P.- 201301, has been allocated 2000 kWp aggregate capacity vide LOA No. IPGCL/ RfS/ CAPEX-RESCO/ 08/ 2019/ RESCO-B/ 256 dated 06.09.2019 and their amendment vide No. IPGCL/ RfS/ CAPEX-RESCO/ 08-2019/ RESCO-B/ 1687 dated 23.01.2020. M/s Oakridge Rooftops Pvt. Ltd. has successfully commissioned 16 Nos. of RTS projects of aggregate capacity 1944.41 KW on rooftops of Delhi Government buildings rooftops under various IPGCL sanctions.

The details of 16 Nos. of RTS projects commissioned by M/s Oakridge Rooftops Pvt. Ltd. are as under:

S. No.	Name of Beneficiary	Project Cap. (KWp)	Date of Commissioning
1	Govt. Co. Ed. Secondary School C/O Vice Principal/ Govt. Sarvodaya Kanya Vidyalaya (ID 1412084) Rohini Ext. Sector 20, Pooth Kalan, N Delhi-86. CA No. 60006941334	169.51	25.09.2020
2	Principal C/O Vice Principal, Sarvodaya Bal Vidyalaya / Sarvodaya Kanya Vidyalaya (ID 1412026) C Block, Sultanpuri, New Delhi-86. CA No. 60007072881	103.00	02.10.2020
3	Vice Principal, Govt. Sarvodaya Kanya Vidyalaya (ID 1310034) Extension Village Badali, N Delhi -42 CA No. 60020950485	117.92	06.10.2020
4	Principal, Govt. Sr. Sec. School/Govt. Co-Ed Sr. Sec. School (ID 1821206) Site 1, Sector 6, Dwarka, New Delhi - 110 075 CA No. 100018902	106.19	25.09.2020
5	Vice Principal, Govt Co-Ed School/Govt Co-Ed Sr. Secondary School (ID 1821031) Sec-6, (Site 2), Dwarka, Near Papan Kalan, New Delhi - 110075 CA No. 100016990	103.85	28.09.2020

6	Govt. Co. Ed. Sarvodaya Vidyalaya (ID 1821279) Sector 17, Phase-II, Dwarka, New Delhi-110 078 CA No. 151745402	108.68	28.09.2020
7	Principal, Rajkiya Sarvodaya Kanya Vidyalaya (ID 1002022) Kalyanpuri, Near Police Station, Delhi -91 CA No. 100002995	106.56	02.10.2020
8	Principal, Govt. Sarvodaya Bal Vidyalaya No. 1, ID-1514005, Tilak Nagar, New Delhi-110018. CA No. 100007893	103.51	30.09.2020
9	Principal, Govt. CO-ED School (Jai Prakash Narain)/ Rajkiya Sarvodaya Kanya Vidyalaya (ID 1002028) East Vinod Nagar, Delhi-91. CA No. 100022045	146.06	30.09.2020
10	Principal, Govt. Sec. School/ Sarvodaya Kanya Vidyalaya (ID 1720030) Rajokari, New Delhi-110037. CA No. 150155621	126.63	05.10.2020
11	Principal, Rajkiya Sarvodaya Kanya Vidyalaya (ID 1002032) West Vinod Nagar, Delhi-110 092. CA No. 100028793	194.97	06.10.2020
12	Principal, M B Hr Sec school/ Sarvodaya Bal Vidyalaya (ID 2127001) Rouse Avenue, DDU Marg, New Delhi-110002 CA No. 100020288	130.00	02.10.2020
13	The Director, Lady Erwin College College Hall Admin Block, Food Lab & FAS Sikandra Road, New Delhi-110 001. CA No. 2713984407	106.53	05.10.2020
14	Director, Lady Irwin College UG Block, Sikandra Road, New Delhi-110 001. CA No. 8050955889	110.00	05.10.2020
15	Govt. Girls Sr. Sec. School/Govt Co-ed Middle school, School ID- 1310157, Siras Pur, Delhi 110042 CA No. 60007240595	101.00	30.09.2020
16	Krishi Vigyan Kendra, National Horticultural Development, Ujwa, New Delhi-73 CA No. 152306665	110.00	03.01.2021
Total Capacity		1944.41 KW	

For Indraprastha Power Generation Company Limited

M/s Oakridge Rooftops Pvt. Ltd.

Registered office: Ground Floor, Plot No. A108B, Sector 58,

Noida, Gautam Buddha Nagar, U.P. - 201301.

1485

(Signature)
Engineer - in Charge

सुरेश खट्टी / MUKESH KHATIK
होमिंग प्रबन्धक (गैर) और प्रबन्धक/ Sr. Manager (T) Solar
आई.पी.सी.सी.एन./I.P.C.C.L.
(विश्वी वास्तविकता का विकास)
A Govt. of N.C.T. of Delhi Undertaking
राजस्थान गैर सरकारी कार्यालय, आई दिल्ली-110002
Rajsthal Power House Office Complex, New Delhi-110002

 प्रारूप 1 पंजीकरण प्रमाण-पत्र	
कॉर्पोरेट पहचान संख्या : U40300KL2014PTC036294	2013 - 2014
मैं एतद्वारा सत्यापित करता हूँ कि मैसर्स WattSun Energy India Private Limited	
का पंजीकरण, कम्पनी अधिनियम 1956 (1956 का 1) के अंतर्गत आज किया जाता है और यह कम्पनी प्राइवेट लिमिटेड है।	
यह नियमन-पत्र आज दिनांक चार मार्च दो हजार चौदह को इरणाकुलम में जारी किया जाता है।	
Form 1 Certificate of Incorporation	
Corporate Identity Number : U40300KL2014PTC036294	2013 - 2014
I hereby certify that WattSun Energy India Private Limited is this day incorporated under the Companies Act, 1956 (No. 1 of 1956) and that the company is private limited.	
Given at Emakulam this Fourth day of March Two Thousand Fourteen.	
 Registrar of Companies, Kerala and Lakshadweep कम्पनी रजिस्ट्रार, केरल एवं लक्षद्वीप	
*Note: The corresponding form has been approved by V E JOSEKUTTY, Deputy Registrar of Companies and this certificate has been digitally signed by the Registrar through a system generated digital signature under rule 5(2) of the Companies (Electronic Filing and Authentication of Documents) Rules, 2008. The digitally signed certificate can be verified at the Ministry website (www.mca.gov.in).	
कम्पनी रजिस्ट्रार के कार्यालय अभिलेख में उपलब्ध पत्राचार का पता : Mailing Address as per record available in Registrar of Companies office: WattSun Energy India Private Limited TC-36/38(1), Ahiwarya Tower (First Floor), Chackai, Trivandrum - 695024, Kerala, INDIA	



Government of India

Form GST REG-06

[See Rule 10(1)]

Registration Certificate

Registration Number : 32AABCW4979N2ZO

1.	Legal Name	WATTSUN ENERGY INDIA PRIVATE LIMITED		
2.	Trade Name, if any	WATTSUN ENERGY INDIA PVT LTD		
3.	Constitution of Business	Private Limited Company		
4.	Address of Principal Place of Business	TC 36/38-9, Aiswarya Towers, International Airport Road, Chackai, Thiruvananthapuram, Kerala, 695024		
5.	Date of Liability	01/07/2017		
6.	Period of Validity	From	01/07/2017	To NA
7.	Type of Registration	Regular 		
8.	Particulars of Approving Authority			
Signature Signature Not Verified Digitally signed by DS GOODS AND SERVICES TAX NETWORK 1 Date: 2018.07.17 20:27:49 IST				
Name				
Designation				
Jurisdictional Office				
9. Date of issue of Certificate		17/07/2018		
Note: The registration certificate is required to be prominently displayed at all places of business in the State.				

This is a system generated digitally signed Registration Certificate issued based on the deemed approval of application on 01/07/2017 .

**Annexure A**

GSTIN	32AABCW4979N2ZO
Legal Name	WATTSUN ENERGY INDIA PRIVATE LIMITED
Trade Name, if any	WATTSUN ENERGY INDIA PVT LTD

Details of Additional Places of Business

Total Number of Additional Places of Business in the State	0
--	---



GSTIN	32AABCW4979N2ZO
Legal Name	WATTSUN ENERGY INDIA PRIVATE LIMITED
Trade Name, if any	WATTSUN ENERGY INDIA PVT LTD

Details of Managing / Whole-time Directors and Key Managerial Persons

1		Name	TERANCE ALEX
		Designation/Status	MANAGING DIRECTOR
		Resident of State	Kerala



NSDL e-Governance Infrastructure Limited

Office: Main, Seelings Plot No. 341, Sector No. 9/2 D, Model Colony, Near Durgam Chokki, Pune - 411 016
Tel: 91-20-2721 8888 Fax: 91-20-2721 0491, e-mail: nsdl@nsdl.com

e-TDS Intermediary

FileID: 00651 / TANPGNT06101701

TPUC: PSTU

Oct 06, 2017



Ref. No: 50364700072731171/TAN/NEW

TO:
WATTSUN ENERGY (INDIA) PRIVATE LIMITED
TC 36-38-1, AISWARYA TOWER,
FIRST FLOOR, CHACKAL
TRIVANDRUM,
KERALA-695024
TEL. NO: 91-8943345700

Sir/Madam,

Sub: Allotment of Tax Deduction Account Number (TAN)
as per the Income Tax Act, 1961.

Kindly refer to your application (Form 49B) dated Sep 26, 2017 for allotment of Tax Deduction Account Number. In this connection, the following TAN has been issued to you/your organisation:

TVDW00206D

Please quote the same in all TDS challans, TDS certificates, TDS returns, Tax Collection at Source (TCS) returns as well as other documents pertaining to such transaction.

Quoting of TAN on all TDS returns and challans for payment of TDS is necessary to ensure credit of TDS paid by you and faster processing of TDS returns.

The above TAN should also be used as Tax collection at Source Account Number under Section 206CA.

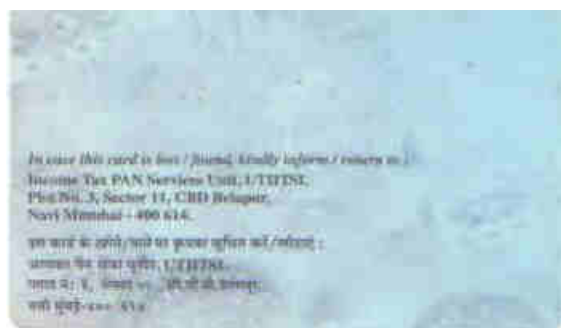
Kindly note that it is mandatory to quote TAN while furnishing TDS returns, including e-TDS returns. e-TDS return will not be accepted if TAN is not quoted.

This supersedes all the TAX Deduction/Collection Account Number, allotted to you earlier.

Income Tax Department

This is a computer-generated letter. Hence, signature is not required.

Caution: Income Tax Department does not send e-mails regarding refunds and does not seek any taxpayer information like user name, password, details of ATM, bank accounts, credit cards, etc. Taxpayers are advised not to part with such information on the basis of emails.



Financial Qualification Certificate

(Rupees In Crores)						
S/N	Financial parameters	FY 18-19	FY 19-20	FY 20-21	FY 21-22	FY 22-23
1.	Net Worth					
a)	Paid up Capital	0.10	0.10	0.10	0.10	0.10
b)	Free Reserves and Surplus*	0.08	0.06	0.09	0.10	Audit not completed
c)	Misc. expenses to the extent not written off	-	-	-	-	-
	Net Worth (a+b-c)	0.18	0.16	0.19	0.20	Audit not completed
2.	Annual Turnover **	4.94	5.72	2.14	6.28	20.16

* Free Reserve and Surplus does not include Revaluation Reserve, written back of Depreciation Provision and Amalgamation.

** Annual total Income/ turnover as incorporated in the Profit and Loss Account does not include non-recurring income, i.e., sale of fixed asset etc.

It is certified that all the figures are based on the audited accounts of Wattsun Energy India (P) Ltd ('the Company') bearing CIN: U40300KL2014PTC036294 read with the Auditor's Report and notes to accounts except for the FY 2022-23. The turnover for the FY 2022-23 is based on the GSTR 1 filed by the company.

For Wattsun Energy India (P) Ltd
Authorized Signatory


Terence Alex
Managing Director

Date: 18/04/2023
Place : Trivandrum

JAKS & Associates
Chartered Accountants
FRN:001360S


Arun Jose F.C.A
(Partner M.No : 233118)
UDIN: 23233118BGUOSP5363



Financial Qualification Certificate

(In Rupees)

Sl. No	Financial Parameters	FY 2017-18	FY 2018-19	FY 2019-20	FY 2020-21	FY 2021-22
1	Net Worth					
a.	Paid up Capital	1,00,000	10,00,000	10,00,000	10,00,000	10,00,000
b.	Free Reserves and Surplus	3,30,472	6,40,575	7,88,446	8,94,508	9,97,136
c.	Misc Expenses to the extent not written off	NIL	NIL	NIL	NIL	NIL
	Net Worth (a+b+c)	4,30,472	16,40,575	17,88,446	18,94,508	19,97,136
2	Annual Turnover	3,71,78,364	5,71,72,429	4,94,39,051	2,14,21,919	6,28,49,293

**Free Reserve and Surplus shall be Exclusive of Revaluation Reserve, written back of Depreciation Provision and Amalgamation.*

***Annual Total Income/Turnover as incorporated in the Profit and Loss Account excluding non-recurring income, i.e., sale of fixed asset etc.*

It is certified that all the figures are based on Audited Accounts read with Auditor's Report and Notes to Accounts.

For WATTSUN ENERGY INDIA PVT. LTD.
 Authorized Signatory

Terance Alex
 (Managing Director)

Place: Trivandrum
 Date: 17/02/2023



For J A K S & ASSOCIATES
 Chartered Accountant
 (FRN No: 001360S)

Jose Zachariah
 Jose Zachariah F.C.A
 (Partner, M.No. 080570)
 (UDIN23080570BGZIDV8524)



INDEPENDENT AUDITORS' REPORT

To
The Members
WattSun Energy India Private Limited
TC: 36/38(1), Alswarya Tower, First Floor, Chackai
TRIVANDRUM - 695 024

Report on the Financial Statements

We have audited the accompanying standalone financial statements of **WattSun Energy India Private Limited** ("the Company"), which comprise the Balance Sheet as at 31st March 2018, the Statement of Profit and Loss and the Cash Flow Statement for the year then ended and a summary of significant accounting policies and other explanatory information.

Management's Responsibility for the Standalone Financial Statements

The Company's Board of Directors is responsible for the matters in sub-section (5) of Section 134 of the Companies Act, 2013 ("the Act") with respect to the preparation of these standalone financial statements that give a true and fair view of the financial position, financial performance and cash flows of the Company in accordance with the accounting principles generally accepted in India, including the Accounting Standards specified under Section 133 of the Act, read with Rule 7 of the Companies (Accounts) Rules, 2014. This responsibility also includes the maintenance of adequate accounting records in accordance with the provisions of the Act for safeguarding of the assets of the Company and for preventing and detecting frauds and other irregularities; selection and application of appropriate accounting policies; making judgments and estimates that are reasonable and prudent; and design, implementation and maintenance of adequate internal financial controls, that were operating effectively for ensuring the accuracy and completeness of the accounting records, relevant to the preparation and presentation of the financial statements that give a true and fair view and are free from material misstatement, whether due to fraud or error.

Auditor's Responsibility

Our responsibility is to express an opinion on these standalone financial statements based on our audit.

We have taken into account the provisions of the Act, the accounting and auditing standards and matters which are required to be included in the audit report under the provisions of the Act and the Rules made thereunder.

We conducted our audit in accordance with the Standards on Auditing specified under sub-section (10) of Section 143 of the Act. Those Standards require that we comply with ethical requirements and plan and perform the audit to obtain reasonable assurance about whether the financial statements are free from material misstatement.



An audit involves performing procedures to obtain audit evidence about the amounts and the disclosures in the financial statements. The procedures selected depend on the auditor's judgment, including the assessment of the risks of material misstatement of the financial statements, whether due to fraud or error. In making those risk assessments, the auditor considers internal financial control relevant to the Company's preparation of the financial statements that give true and fair view in order to design audit procedures that are appropriate in the circumstances. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of the accounting estimates made by Company's Directors, as well as evaluating the overall presentation of the financial statements.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion on the standalone financial statements.

Opinion

In our opinion and to the best of our information and according to the explanations given to us, the aforesaid standalone financial statements give the information required by the Act in the manner so required and give a true and fair view in conformity with the accounting principles generally accepted in India;

- a) in the case of the Balance Sheet, of the state of affairs of the Company as at 31st March, 2018;
- b) in the case of the Statement of Profit and Loss, of the profit for the year ended on that date; and
- c) in the case of the Cash Flow Statement, of the cash flows for the year ended on that date.

Emphasis of Matters

There are no matters in the Notes to the financial statements requiring specific emphasis.

Report on Other Legal and Regulatory Requirements

- 1) As required by the Companies (Auditor's Report) Order, 2018 ("the Order"), issued by the Central Government of India in terms of sub-section (11) of section 143 of the Act, we give in the "Annexure" a statement on the matters specified in paragraphs 3 and 4 of the Order, to the extent applicable.
- 2) As required by sub-section (3) of Section 143 of the Act, we report, to the extent applicable, that:
 - a) We have sought and obtained all the information and the explanations which to the best of our knowledge and belief were necessary for the purposes of our audit.



- b) In our opinion, proper books of account as required by law have been kept by the Company so far as it appears from our examination of those books.
- c) The Balance Sheet and the Statement of Profit and Loss dealt with by this Report are in agreement with the books of account.
- d) In our opinion, the aforesaid standalone financial statements comply with the Accounting Standards specified under Section 133 of the Act, read with Rule 7 of the Companies (Accounts) Rules, 2014.
- e) On the basis of the written representations received from the Directors of the Company as on 31st March, 2018 taken on record by the Board of Directors, none of the Directors is disqualified as on 31st March, 2018, from being appointed as a Director in terms of sub-section (2) of Section 164 of the Act.
- f) With respect to the adequacy of the internal financial controls over financial reporting of the Company and the operating effectiveness of such controls, the provisions of Section 143(3)(i) of the Act is not applicable to the Company in terms of Notification dated 13-06-2017 of the Ministry of Corporate Affairs, Government of India.
- g) With respect to the other matters to be included in the Auditor's Report in accordance with Rule 11 of the Companies (Audit and Auditors) Rules, 2014, in our opinion and to the best of our information and according to the explanations given to us :
- i. The Company does not have any pending litigations which would impact its financial position.
 - ii. The Company did not have any long-term contracts including derivative contracts for which there were any material foreseeable losses requiring provision as required under the applicable law or accounting standards.
 - iii. There were no amounts which required to be transferred to the Investor Education and Protection Fund by the Company during the year under audit.

Place of Signature: Trivandrum.

Date : 01-09-2018.



For PHILIP & MATHEW
Chartered Accountants
Firm Regn. No. 002646S

K. GEORGE PHILIP
Partner
Membership No. 019928

"ANNEXURE" TO THE AUDITORS' REPORT
(Referred to in Audit Report of even date)

To
The Members
WattSun Energy India Private Limited
TC: 36/38(1), Aiswarya Tower, First Floor, Chackai
TRIVANDRUM - 695 024

(i) (a) The Company has maintained proper records showing full particulars including quantitative details and situation of fixed assets.

(b) According to the best of our information and the explanations given to us, all the fixed assets of the Company have been physically verified by the management at reasonable intervals during the year. No material discrepancies were noticed on such verification.

(c) According to the best of our information and the explanations given to us, the title deeds of immovable properties, to the extent applicable, owned by the Company are held in the name of the Company.

(ii) The inventory of the Company has been physically verified during the year by the management. In our opinion, the frequency of verification is reasonable. The discrepancies noticed on verification between the physical stocks and the book records were not material in so far as it appears from our examination of the books.

(iii) The Company has not granted any loans, secured or unsecured, to companies, firms, Limited Liability Partnerships or other parties covered in the Register maintained under Section 189 of the Companies Act, 2013.

(iv) In our opinion and according to the information and the explanations given to us, in respect of loans, investments, guarantees and security, the provisions of Sections 185 and 186 of the Companies Act, 2013 have been complied with.

(v) According to the information and the explanations given to us, the Company has not accepted any deposit as defined under Sections 73 to 76 of the Companies Act, 2013 and the rules framed there under, during the year under review.

(vi) As far as we are aware, the Central Government has not specified the maintenance of cost records by the Company under sub-section (1) of Section 148 of the Companies Act, 2013.

(vii) (a) In our opinion and according to the information and the explanations given to us, the Company has been generally regular during the year under review in depositing the undisputed statutory dues including provident fund, employees' state insurance, income-tax, sales-tax, service tax, duty of customs, duty of excise, value added tax, cess and any other statutory dues to the appropriate authorities, wherever applicable. On the basis of the verification of the books of account and other relevant records, the scheme and rules cess are not applicable to the Company.

(b) According to the information and the explanations given to us, there are no dues of income tax or sales tax or service tax or duty of customs or duty of excise or value added tax which have not been deposited on account of any dispute.



"ANNEXURE" TO THE AUDITORS' REPORT

(Referred to in Audit Report of even date)

To
The Members
WattSun Energy India Private Limited
TC: 36/38(1), Aiswarya Tower, First Floor, Chackai
TRIVANDRUM - 695 024

(i) (a) The Company has maintained proper records showing full particulars including quantitative details and situation of fixed assets.

(b) According to the best of our information and the explanations given to us, all the fixed assets of the Company have been physically verified by the management at reasonable intervals during the year. No material discrepancies were noticed on such verification.

(c) According to the best of our information and the explanations given to us, the title deeds of immovable properties, to the extent applicable, owned by the Company are held in the name of the Company.

(ii) The inventory of the Company has been physically verified during the year by the management. In our opinion, the frequency of verification is reasonable. The discrepancies noticed on verification between the physical stocks and the book records were not material in so far as it appears from our examination of the books.

(iii) The Company has not granted any loans, secured or unsecured, to companies, firms, Limited Liability Partnerships or other parties covered in the Register maintained under Section 189 of the Companies Act, 2013.

(iv) In our opinion and according to the information and the explanations given to us, in respect of loans, investments, guarantees and security, the provisions of Sections 185 and 186 of the Companies Act, 2013 have been complied with.

(v) According to the information and the explanations given to us, the Company has not accepted any deposit as defined under Sections 73 to 76 of the Companies Act, 2013 and the rules framed there under, during the year under review.

(vi) As far as we are aware, the Central Government has not specified the maintenance of cost records by the Company under sub-section (1) of Section 148 of the Companies Act, 2013.

(vii) (a) In our opinion and according to the information and the explanations given to us, the Company has been generally regular during the year under review in depositing the undisputed statutory dues including provident fund, employees' state insurance, income-tax, sales-tax, service tax, duty of customs, duty of excise, value added tax, cess and any other statutory dues to the appropriate authorities, wherever applicable. On the basis of the verification of the books of account and other relevant records, the scheme and rules cess are not applicable to the Company.

(b) According to the information and the explanations given to us, there are no dues of income tax or sales tax or service tax or duty of customs or duty of excise or value added tax which have not been deposited on account of any dispute.



(viii) In our opinion and according to the information and the explanations given to us, the Company has not defaulted in repayment of loans or borrowing to a financial institution, bank, Government or dues to debenture holders.

(ix) In our opinion and according to the information and the explanations given to us, moneys raised by way of term loans were applied for the purposes for which those are raised. The Company has not raised any monies by way of initial public offer or further public offer (including debt instruments).

(x) According to the information and the explanations given to us, no fraud by the Company or any fraud on the Company by its officers or employees has been noticed or reported during the year.

(xi) In our opinion, managerial remuneration has been paid or provided in accordance with the requisite approvals mandated by the provisions of Section 197 read with Schedule V to the Companies Act, 2013, wherever applicable.

(xii) The Company is not a Nidhi Company and hence the question of compliance with the Net Owned Funds to Deposits in the ratio of 1:20 to meet out the liability and also the maintenance of ten per cent unencumbered term deposits as specified in the Nidhi Rules, 2014 to meet out the liability, does not arise.

(xiii) In our opinion, all transactions with the related parties are in compliance with Sections 177 and 188 of Companies Act, 2013 where applicable and the details have been disclosed in the financial statements etc., as required by the applicable accounting standards.

(xiv) According to the information and the explanations given to us, the Company has not made any preferential allotment or private placement of shares or fully or partly convertible debentures during the year under review.

(xv) According to the information and explanations given to us, the Company has not entered into any non-cash transactions with Directors or persons connected with him during the year under review in terms of Section 192 of Companies Act, 2013.

(xvi) In our opinion and according to the information and the explanations given to us, the Company is not required to be registered under Section 45-IA of the Reserve Bank of India Act, 1934.

Place of Signature: Trivandrum.

Date : 01-09-2018.



For PHILIP & MATHEW
Chartered Accountants
Firm Regn. No. 006546S

[Signature]

K. GEORGE PHILIP
Partner
Membership No. 019928



INDEPENDENT AUDITORS' REPORT

To
The Members
WattSun Energy India Private Limited
TC: 36/38(1), Aiswarya Tower, First Floor, Chackai
TRIVANDRUM - 695 024

Report on the Audit of the Financial Statements

Opinion

We have audited the financial statements of **WattSun Energy India Private Limited** ("the Company"), which comprise the Balance Sheet as at 31 March, 2019, the Statement of Profit and Loss, the Cash Flow Statement for the year then ended and notes to the financial statement including a summary of significant accounting policies and other explanatory information.

In our opinion and to the best of our information and according to the explanations given to us, the aforesaid financial statements give the information required by the Companies Act, 2013 ("the Act") in the manner so required and give a true and fair view in conformity with the accounting principles generally accepted in India of state of affairs of the Company as at 31st March, 2019 and the profit and its cash flows for the year ended on that date.

Basis for Opinion

We conducted our audit in accordance with the Standards on Auditing (SAs) specified under Section 143(10) of the Act. Our responsibilities under those Standards are further described in the Auditor's Responsibilities for the Audit of the Financial Statements section of our report. We are independent of the Company in accordance with the Code of Ethics issued by the Institute of Chartered Accountants of India together with the ethical requirements that are relevant to our audit of the financial statements under the provisions of the Act and the Rules thereunder and we have fulfilled our other ethical responsibilities in accordance with these requirements and the Code of Ethics. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our opinion.

Responsibilities of Management for the Financial Statements

The Company's Board of Directors is responsible for the matters stated in Section 134(5) of the Act with respect to the preparation of these financial statements that give a true and fair view of the financial position and financial performance and cash flows of the Company in accordance with the accounting principles generally accepted in India, including the Accounting Standards specified under Section 133 of the Act. This responsibility also includes maintenance of adequate accounting records in accordance with the provisions of the Act for safeguarding of the assets of the Company and for preventing and detecting frauds and other irregularities; selection and application of



appropriate accounting policies; making judgments and estimates that are reasonable and prudent; and design, implementation and maintenance of adequate internal financial controls, that were operating effectively for ensuring the accuracy and completeness of the accounting records, relevant to the preparation and presentation of the financial statements that give a true and fair view and are free from material misstatement, whether due to fraud or error.

In preparing the financial statements, management is responsible for assessing the Company's ability to continue as a going concern, disclosing, as applicable, matters related to going concern and using the going concern basis of accounting unless management either intends to liquidate the Company or to cease operations, or has no realistic alternative but to do so.

Those Board of Directors are also responsible for overseeing the Company's financial reporting process.

Auditor's Responsibilities for the Audit of the Financial Statements

Our objectives are to obtain reasonable assurance about whether the financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue an Auditor's Report that includes our opinion. Reasonable assurance is a high level of assurance, but is not a guarantee that an audit conducted in accordance with SAs will always detect a material misstatement when it exists. Misstatements can arise from fraud or error and are considered material if, individually or in the aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of these financial statements.

A further description of our responsibilities for the audit of the financial statements is included in **Annexure A** of this Auditor's Report. This description, which is located at page number 4, forms part of our Auditor's Report.

Report on Other Legal and Regulatory Requirements

1. As required by the Companies (Auditor's Report) Order, 2017 ("the Order"), issued by the Central Government of India in terms of Section 143(11) of the Act, we give in the **Annexure B** a statement on the matters specified in paragraphs 3 and 4 of the Order, to the extent applicable. This statement, which is located at page number 5, forms part of our Auditor's Report.
2. As required by Section 143(3) of the Act, we report that:
 - (a) We have sought and obtained all the information and explanations which to the best of our knowledge and belief were necessary for the purposes of our audit.
 - (b) In our opinion, proper books of account as required by law have been kept by the Company so far as it appears from our examination of those books.
 - (c) According to the information and explanations given to us, the Company has no Branch Offices within the meaning of Section 143(8) of the Act.



- (d) The Balance Sheet, the Statement of Profit and Loss and the Cash Flow Statement dealt with by this Report are in agreement with the books of account.
- (e) In our opinion, the aforesaid financial statements comply with the Accounting Standards specified under Section 133 of the Act, read with Rule 7 of the Companies (Accounts) Rules, 2014.
- (f) On the basis of the written representations received from the Directors of the Company as on 31st March, 2019 taken on record by the Board of Directors, none of the Directors is disqualified as on 31st March, 2019 from being appointed as a director in terms of Section 164(2) of the Act.
- (g) With respect to the adequacy of the internal financial controls over financial reporting of the Company and the operating effectiveness of such controls, the provisions of Section 143(3)(i) of the Act is not applicable to the Company in terms of Notification dated 13-06-2017 of the Ministry of Corporate Affairs, Government of India.
- (h) With respect to the other matters to be included in the Auditor's Report in accordance with Rule 11 of the Companies (Audit and Auditors) Rules, 2014, in our opinion and to the best of our information and according to the explanations given to us :
- i. The Company does not have any pending litigations which would impact its financial position.
 - ii. The Company did not have any long-term contracts including derivative contracts for which there were any material foreseeable losses requiring provision as required under the applicable law or accounting standards.
 - iii. There were no amounts which required to be transferred to the Investor Education and Protection Fund by the Company during the year under audit.

Place of Signature: Trivandrum.

Date : 29-06-2019.



For PHILIP & MATHEW
Chartered Accountants
Firm Regn. No. 002646S

[Signature]
K. GEORGE PHILIP
Partner
Membership No. 019928



"ANNEXURE A" TO THE AUDITORS' REPORT
(Referred to in Audit Report of even date)

To
The Members
WattSun Energy India Private Limited
TC: 36/38(1), Aiswarya Tower, First Floor, Chackai
TRIVANDRUM - 695 024

As part of an audit in accordance with Standards on Auditing (SAs), we exercise professional judgment and maintain professional skepticism throughout the audit.

We also:

- Identify and assess the risks of material misstatement of the financial statements, whether due to fraud or error, design and perform audit procedures responsive to those risks and obtain audit evidence that is sufficient and appropriate to provide a basis for our opinion. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations or the override of internal control.
- Obtain an understanding of internal control relevant to the audit in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the entity's internal control.
- Evaluate the appropriateness of accounting policies used and the reasonableness of accounting estimates and related disclosures made by management.
- Conclude on the appropriateness of management's use of the going concern basis of accounting and based on the audit evidence obtained, whether a material uncertainty exists related to events or conditions that may cast significant doubt on the Company's ability to continue as a going concern. Our conclusions are based on the audit evidence obtained up to the date of our Auditors' Report. However, future events or conditions may cause the Company to cease to continue as a going concern.
- Evaluate the overall presentation, structure and content of the financial statements including the disclosures and whether the financial statements represent the underlying transactions and events in a manner that achieves fair presentation.

We communicate with those charged with governance regarding, among other matters, the planned scope and timing of the audit and significant audit findings, including any significant deficiencies in internal control that we identify during our audit.

We also provide those charged with governance with a statement that we have complied with relevant ethical requirements regarding independence and to communicate with them all relationships and other matters that may reasonably be thought to bear on our independence, and where applicable, related safeguards.

Place of Signature: Trivandrum.
Date : 29-06-2019.



For PHILIP & MATHEW
Chartered Accountants
Firm Regn. No. 092646S


K. GEORGE PHILIP
Partner
Membership No. 019928



"ANNEXURE B" TO THE AUDITORS' REPORT
(Referred to in Audit Report of even date)

To
The Members
WattSun Energy India Private Limited
TC: 36/38(1), Aiswarya Tower, First Floor, Chackai
TRIVANDRUM - 695 024

(i) (a) The Company has maintained proper records showing full particulars including quantitative details and situation of fixed assets.

(b) According to the best of our information and the explanations given to us, all the fixed assets of the Company have been physically verified by the management at reasonable intervals during the year. No material discrepancies were noticed on such verification.

(c) According to the best of our information and the explanations given to us, the title deeds of immovable properties, to the extent applicable, owned by the Company are held in the name of the Company.

(ii) The inventory of the Company has been physically verified during the year by the management. In our opinion, the frequency of verification is reasonable. The discrepancies noticed on verification between the physical stocks and the book records were not material in so far as it appears from our examination of the books.

(iii) The Company has not granted any loans, secured or unsecured, to companies, firms, Limited Liability Partnerships or other parties covered in the Register maintained under Section 189 of the Companies Act, 2013.

(iv) In our opinion and according to the information and the explanations given to us, in respect of loans, investments, guarantees and security, the provisions of Sections 185 and 186 of the Companies Act, 2013 have been complied with.

(v) According to the information and the explanations given to us, the Company has not accepted any deposit as defined under Sections 73 to 76 of the Companies Act, 2013 and the rules framed there under, during the year under review.

(vi) As far as we are aware, the Central Government has not specified the maintenance of cost records by the Company under sub-section (1) of Section 148 of the Companies Act, 2013.

(vii) (a) In our opinion and according to the information and the explanations given to us, the Company has been generally regular during the year under review in depositing the undisputed statutory dues including provident fund, employees' state insurance, income-tax, sales-tax, service tax, duty of customs, duty of excise, value added tax, cess and any other statutory dues to the appropriate authorities. On the basis of the verification of the books of account and other relevant records, the scheme and rules cess are not applicable to the Company.

(b) According to the information and the explanations given to us, there are no dues of income tax or sales tax or service tax or duty of customs or duty of excise or value added tax which have not been deposited on account of any dispute.



(viii) In our opinion and according to the information and the explanations given to us, the Company has not defaulted in repayment of loans or borrowing to a financial institution, bank, Government or dues to debenture holders.

(ix) In our opinion and according to the information and the explanations given to us, moneys raised by way of term loans were applied for the purposes for which those are raised. The Company has not raised any monies by way of initial public offer or further public offer (including debt instruments).

(x) According to the information and the explanations given to us, no fraud by the Company or any fraud on the Company by its officers or employees has been noticed or reported during the year.

(xi) In our opinion, managerial remuneration has been paid or provided in accordance with the requisite approvals mandated by the provisions of Section 197 read with Schedule V to the Companies Act, 2013, wherever applicable.

(xii) The Company is not a Nidhi Company and hence the question of compliance with the Net Owned Funds to Deposits in the ratio of 1:20 to meet out the liability and also the maintenance of ten per cent unencumbered term deposits as specified in the Nidhi Rules, 2014 to meet out the liability, does not arise.

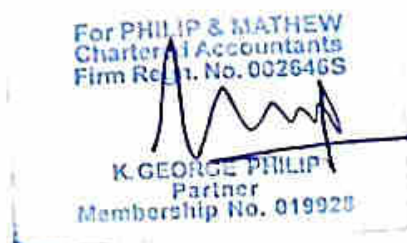
(xiii) In our opinion, all transactions with the related parties are in compliance with Sections 177 and 188 of Companies Act, 2013 where applicable and the details have been disclosed in the financial statements etc., as required by the applicable accounting standards.

(xiv) According to the information and explanations given to us, the Company has allotted 90,000 Equity Shares of Rs.10 each of the Company to its existing member. The company has not made any other preferential allotment or private placement of shares or fully or partly convertible debentures during the year under review.

(xv) According to the information and explanations given to us, the Company has not entered into any non-cash transactions with Directors or persons connected with him during the year under review in terms of Section 192 of Companies Act, 2013.

(xvi) In our opinion and according to the information and the explanations given to us, the Company is not required to be registered under Section 45-IA of the Reserve Bank of India Act, 1934.

Place of Signature: Trivandrum.
Date : 29-06-2019.



INDEPENDENT AUDITORS' REPORT

To the Members of 'WattSun Energy India Private Limited'

Opinion

We have audited the financial statements of **WattSun Energy India Private Limited** ("the Company") which comprise the Balance Sheet as at 31st March, 2020, the Statement of Profit and Loss, the Cash Flow Statement for the year then ended and notes to the financial statement including a summary of significant accounting policies and other explanatory information.

In our opinion and to the best of our information and according to the explanations given to us, the aforesaid financial statements give the information required by the Companies Act, 2013 ("the Act") in the manner so required and give a true and fair view in conformity with the accounting principles generally accepted in India:

- i) In the case of Balance Sheet, of the state of affairs of the Company as at 31st March, 2020; and
- ii) In the case of Statement of Profit and Loss, of the profit for the year ended on that date; and
- iii) In the case of Cash Flow Statement, of the cash flows for the year ended on that date.

Basis for Opinion

We conducted our audit in accordance with the Standards on Auditing (SAs) specified under section 143(10) of the Act. Our responsibilities under those Standards are further described in the Auditor's Responsibilities for the Audit of the Financial Statements section of our report. We are independent of the Company in accordance with the Code of Ethics issued by the Institute of Chartered Accountants of India together with the ethical requirements that are relevant to our audit of the financial statements under the provisions of the Act and the Rules thereunder and we have fulfilled our other ethical responsibilities in accordance with these requirements and the Code of Ethics.



We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our opinion.

Key audit matters

Key audit matters are those matters that, in our professional judgement, were of most significance in our audit of the financial statements of the current period. These matters were addressed in the context of our audit of the financial statements as a whole, and in forming our opinion thereon, and we do not provide a separate opinion on these matters.

Reporting of key audit matters as per SA 701, Key Audit Matters are not applicable to the Company as it is an unlisted company.

Information other than the financial statements and auditors' report thereon

The Company's board of directors is responsible for the preparation of the other information. The other information comprises the information included in the Board's Report including Annexures to Board's Report, Business Responsibility Report but does not include the financial statements and our auditor's report thereon.

Our opinion on the financial statements does not cover the other information and we do not express any form of assurance conclusion thereon.

In connection with our audit of the financial statements, our responsibility is to read the other information and, in doing so, consider whether the other information is materially inconsistent with the financial statements or our knowledge obtained during the course of our audit or otherwise appears to be materially misstated.

If, based on the work we have performed, we conclude that there is a material misstatement of this other information, we are required to report that fact. We have nothing to report in this regard.



Management's Responsibility for the Financial Statements

The Company's Board of Directors is responsible for the matters stated in Section 134(5) of the Act with respect to the preparation of these financial statements that give a true and fair view of the financial position and financial performance and cash flows of the Company in accordance with the accounting principles generally accepted in India, including the Accounting Standards specified under Section 133 of the Act, read with Rule 7 of the Companies (Accounts) Rules, 2014.

This responsibility also includes maintenance of adequate accounting records in accordance with the provisions of the Act for safeguarding of the assets of the Company and for preventing and detecting frauds and other irregularities; selection and application of appropriate accounting policies; making judgments and estimates that are reasonable and prudent; and design, implementation and maintenance of adequate internal financial controls, that were operating effectively for ensuring the accuracy and completeness of the accounting records, relevant to the preparation and presentation of the financial statements that give a true and fair view and are free from material misstatement, whether due to fraud or error.

In preparing the financial statements, management is responsible for assessing the Company's ability to continue as a going concern, disclosing, as applicable, matters related to going concern and using the going concern basis of accounting unless management either intends to liquidate the Company or to cease operations, or has no realistic alternative but to do so.

Those Board of Directors are also responsible for overseeing the Company's financial reporting process.

Emphasis of matter

We draw attention of the shareholders to Note No.22 of the accompanying financial statements regarding outbreak of the COVID-19 pandemic and the consequential lock-down restrictions imposed by the Government, which, as per the assessment of the management, has not significantly impacted the operations and financial position of the Company.



Auditor's Responsibilities for the Audit of the Financial Statements

Our objectives are to obtain reasonable assurance about whether the financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue an Auditor's Report that includes our opinion. Reasonable assurance is a high level of assurance, but is not a guarantee that an audit conducted in accordance with SAs will always detect a material misstatement when it exists. Misstatements can arise from fraud or error and are considered material if, individually or in the aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of these financial statements.

A further description of our responsibilities for the audit of the financial statements is included in **Annexure A** of this Auditor's Report. This description, which is located at page number 4, forms part of our Auditor's Report.

Report on Other Legal and Regulatory Requirements

1. As required by Companies (Auditor's Report) Order, 2017 ("the Order"), issued by the Central Government of India in terms of Section 143(11) of the Act, we give in the "**Annexure B**" a statement on the matters specified in paragraphs 3 and 4 of the Order, to the extent applicable. This statement, which is located at page number 5, forms part of our Auditor's Report.
2. As required by Section 143 (3) of the Act, we report that:
 - (a) We have sought and obtained all the information and explanations which to the best of our knowledge and belief were necessary for the purposes of our audit.
 - (b) In our opinion, proper books of account as required by law have been kept by the Company so far as it appears from our examination of those books.
 - (c) According to the information and explanations given to us, the Company has no Branch Offices within the meaning of Section 143(8) of the Act.
 - (d) The Balance Sheet, the Statement of Profit and Loss and the Cash Flow Statement dealt with by this Report are in agreement with the books of account.
 - (e) In our opinion, the aforesaid financial statements comply with the Accounting Standards specified under Section 133 of the Act, read with Rule 7 of the Companies (Accounts) Rules, 2014.



- (f) On the basis of the written representations received from the Directors of the Company as on 31st March, 2020 taken on record by the Board of Directors, none of the directors is disqualified as on 31st March, 2020 from being appointed as a director in terms of Section 164(2) of the Act.
- (g) With respect to the adequacy of the internal financial controls over financial reporting of the Company and the operating effectiveness of such controls, the provisions of Section 143(3)(i) of the Act is not applicable to the Company in terms of Notification dated 13-06-2017 of the Ministry of Corporate Affairs, Government of India.
- (h) With respect to the other matters to be included in the Auditor's Report in accordance with Rule 11 of the Companies (Audit and Auditors) Rules, 2014, in our opinion and to the best of our information and according to the explanations given to us:
- i) The Company does not have any pending litigations which would impact its financial position.
 - ii) The Company did not have any long-term contracts including derivative contracts for which there were any material foreseeable losses requiring provision as required under the applicable law or accounting standards.
 - iii) There were no amounts which required to be transferred to the Investor Education and Protection Fund by the Company during the year under audit.

For J A K S & Associates
Chartered Accountants
FRN: 001360S



Jose Zachariah, F.C.A.
(Partner, Mem. No 080570)
(UDIN: 21080570AAAAAO3674)

Place of Signature: Trivandrum.

Date: 03/12/2020



“ANNEXURE A” TO THE AUDITORS’ REPORT
(Referred to in Audit Report of even date)

To the Members of ‘WattSun Energy India Private Limited’

As part of an audit in accordance with Standards on Auditing (SAs), we exercise professional judgment and maintain professional skepticism throughout the audit.

We also:

- Identify and assess the risks of material misstatement of the financial statements, whether due to fraud or error, design and perform audit procedures responsive to those risks and obtain audit evidence that is sufficient and appropriate to provide a basis for our opinion. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations or the override of internal control.
- Obtain an understanding of internal control relevant to the audit in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the entity’s internal control.
- Evaluate the appropriateness of accounting policies used and the reasonableness of accounting estimates and related disclosures made by management.
- Conclude on the appropriateness of management’s use of the going concern basis of accounting and based on the audit evidence obtained, whether a material uncertainty exists related to events or conditions that may cast significant doubt on the Company’s ability to continue as a going concern. Our conclusions are based on the audit evidence obtained up to the date of our auditor’s report. However, future events or conditions may cause the Company to cease to continue as a going concern.
- Evaluate the overall presentation, structure and content of the financial statements including the disclosures and whether the financial statements represent the underlying transactions and events in a manner that achieves fair presentation.

We communicate with those charged with governance regarding, among other matters, the planned scope and timing of the audit and significant audit findings, including any significant deficiencies in internal control that we identify during our audit.



We also provide those charged with governance with a statement that we have complied with relevant ethical requirements regarding independence and to communicate with them all relationships and other matters that may reasonably be thought to bear on our independence, and where applicable, related safeguards.

For J A K S & Associates
Chartered Accountants
FRN: 001360S



Jose Zachariah, F.C.A.
(Partner, Mem. No 080570)
(UDIN: 21080570AAAAAO3674)

Place of Signature: Thiruvananthapuram
Date: 03/12/2020



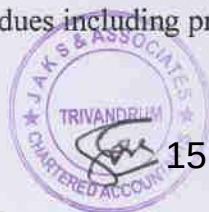
“ANNEXURE B” TO THE AUDITORS’ REPORT
(Referred to in Audit Report of even date)

To the Members of ‘WattSun Energy India Private Limited’

1. (a) The Company has maintained proper records showing full particulars including quantitative details and situation of fixed assets.

(b) According to the best of our information and the explanations given to us, all the fixed assets of the company have been physically verified by the management at reasonable intervals during the year. No material discrepancies were noticed on such verification.

(c) According to the best of our information and the explanations given to us, the title deeds of immovable properties, to the extent applicable, owned by the Company are held in the name of the Company.
2. The inventory of the Company has been physically verified during the year by the management. In our opinion, the frequency of verification is reasonable. The discrepancies noted on verification between the physical stocks and the book records were not material in so far as it appears from our examination of the books.
3. The Company has not granted any loans, secured or unsecured, to companies, firms, Limited Liability Partnerships or other parties covered in the Register maintained under Section 189 of the Companies Act, 2013.
4. In our opinion and according to the information and explanations given to us, in respect of loans, investments, guarantees and security, the provisions of Sections 185 and 186 of the Companies Act, 2013 have been complied with.
5. According to the information and explanations given to us, the company has not accepted any deposit as defined under Sections 73 to 76 of the Companies Act, 2013 and the rules framed there under, during the year under review.
6. As far as we are aware, the Central Government has not specified the maintenance of cost records by the Company under sub-section (1) of Section 148 of the Companies Act, 2013.
7. (a) In our opinion and according to the information and the explanations given to us, the Company has been generally regular during the year under review in depositing the undisputed statutory dues including provident fund, employees’ state insurance,



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income-tax, sales-tax, service tax, duty of customs, duty of excise, value added tax, cess and any other statutory dues to the appropriate authorities. On the basis of the verification of the books of account and other relevant records, the scheme and rules cess are not applicable to the Company.

(b) According to the information and the explanations given to us, there are no dues of income tax or sales tax or service tax or duty of customs or duty of excise or value added tax which have not been deposited on account of any dispute.

8. In our opinion and according to the information and the explanations given to us, the Company has not defaulted in repayment of loans or borrowing to a financial institution, bank, Government or dues to debenture holders.
9. In our opinion and according to the information and the explanations given to us, moneys raised by way of term loans were applied for the purposes for which those are raised. The Company has not raised any monies by way of initial public offer or further public offer (including debt instruments).
10. According to the information and the explanations given to us, no fraud by the Company or any fraud on the Company by its officers or employees has been noticed or reported during the year.
11. In our opinion, managerial remuneration has been paid or provided in accordance with the requisite approvals mandated by the provisions of Section 197 read with Schedule V to the Companies Act, 2013, wherever applicable.
12. The Company is not a Nidhi Company and hence the question of compliance with the Net Owned Funds to Deposits in the ratio of 1:20 to meet out the liability and also the maintenance of ten per cent unencumbered term deposits as specified in the Nidhi Rules, 2014 to meet out the liability, does not arise.
13. In our opinion, all transactions with the related parties are in compliance with Sections 177 and 188 of Companies Act, 2013 where applicable and the details have been disclosed in the financial statements etc., as required by the applicable accounting standards.
14. According to the information and explanations given to us, the Company has not entered into any non-cash transactions with Directors or persons connected with him during the year under review in terms of Section 192 of Companies Act, 2013.



15. In our opinion and according to the information and the explanations given to us, the Company is not required to be registered under Section 45-IA of the Reserve Bank of India Act, 1934.

For J A K S & Associates
Chartered Accountants
FRN: 001360S



Jose Zachariah, F.C.A.
(Partner, Mem. No 080570)
(UDIN: 21080570AAAAAO3674)

Place of Signature: Thiruvananthapuram
Date: 03/12/2020



INDEPENDENT AUDITORS' REPORT

To the Members of 'Wattsun Energy India Private Limited'

Opinion

We have audited the financial statements of **Wattsun Energy India Private Limited** ("the Company") which comprise the Balance Sheet as at 31st March, 2021, the Statement of Profit and Loss, the Cash Flow Statement for the year then ended and notes to the financial statement including a summary of significant accounting policies and other explanatory information.

In our opinion and to the best of our information and according to the explanations given to us, the aforesaid financial statements give the information required by the Companies Act, 2013 ("the Act") in the manner so required and give a true and fair view in conformity with the accounting principles generally accepted in India:

- i) In the case of Balance Sheet, of the state of affairs of the Company as at 31st March, 2021; and
- ii) In the case of Statement of Profit and Loss, of the profit for the year ended on that date; and
- iii) In the case of Cash Flow Statement, of the cash flows for the year ended on that date.

Basis for Opinion

We conducted our audit in accordance with the Standards on Auditing (SAs) specified under section 143(10) of the Act. Our responsibilities under those Standards are further described in the Auditor's Responsibilities for the Audit of the Financial Statements section of our report. We are independent of the Company in accordance with the Code of Ethics issued by the Institute of Chartered Accountants of India together with the ethical requirements that are relevant to our audit of the financial statements under the provisions of the Act and the Rules



there under and we have fulfilled our other ethical responsibilities in accordance with these requirements and the Code of Ethics.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our opinion.

Key audit matters

Key audit matters are those matters that, in our professional judgment, were of most significance in our audit of the financial statements of the current period. These matters were addressed in the context of our audit of the financial statements as a whole, and in forming our opinion thereon, and we do not provide a separate opinion on these matters.

Reporting of key audit matters as per SA 701, Key Audit Matters are not applicable to the Company as it is an unlisted company.

Information other than the financial statements and auditors' report thereon

The Company's board of directors is responsible for the preparation of the other information. The other information comprises the information included in the Board's Report including Annexure to Board's Report, Business Responsibility Report but does not include the financial statements and our auditor's report thereon.

Our opinion on the financial statements does not cover the other information and we do not express any form of assurance conclusion thereon.

In connection with our audit of the financial statements, our responsibility is to read the other information and, in doing so, consider whether the other information is materially inconsistent with the financial statements or our knowledge obtained during the course of our audit or otherwise appears to be materially misstated.

If, based on the work we have performed, we conclude that there is a material misstatement of this other information, we are required to report that fact. We have nothing to report in this regard



Management's Responsibility for the Financial Statements

The Company's Board of Directors is responsible for the matters stated in Section 134(5) of the Act with respect to the preparation of these financial statements that give a true and fair view of the financial position and financial performance and cash flows of the Company in accordance with the accounting principles generally accepted in India, including the Accounting Standards specified under Section 133 of the Act, read with Rule 7 of the Companies (Accounts) Rules, 2014.

This responsibility also includes maintenance of adequate accounting records in accordance with the provisions of the Act for safeguarding of the assets of the Company and for preventing and detecting frauds and other irregularities; selection and application of appropriate accounting policies; making judgments and estimates that are reasonable and prudent; and design, implementation and maintenance of adequate internal financial controls, that were operating effectively for ensuring the accuracy and completeness of the accounting records, relevant to the preparation and presentation of the financial statements that give a true and fair view and are free from material misstatement, whether due to fraud or error.

In preparing the financial statements, management is responsible for assessing the Company's ability to continue as a going concern, disclosing, as applicable, matters related to going concern and using the going concern basis of accounting unless management either intends to liquidate the Company or to cease operations, or has no realistic alternative but to do so.

Those Board of Directors are also responsible for overseeing the Company's financial reporting process.

Emphasis of matter

We draw attention of the shareholders regarding outbreak of the COVID-19 pandemic and the consequential lock-down restrictions imposed by the Government, which, as per the assessment of the management, has not significantly impacted the operations and financial position of the Company.



Auditor's Responsibility for the Audit of the Financial Statements

Our objectives are to obtain reasonable assurance about whether the financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue an Auditor's Report that includes our opinion. Reasonable assurance is a high level of assurance, but is not a guarantee that an audit conducted in accordance with SAs will always detect a material misstatement when it exists. Misstatements can arise from fraud or error and are considered material if, individually or in the aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of these financial statements.

A further description of our responsibilities for the audit of the financial statements is included in **Annexure A** of this Auditor's Report. This description forms part of our Auditor's Report.

Report on Other Legal and Regulatory Requirements

1. As required by Companies (Auditor's Report) Order, 2017 ("the Order"), issued by the Central Government of India in terms of Section 143(11) of the Act, we give in the "**Annexure B**" a statement on the matters specified in paragraphs 3 and 4 of the Order, to the extent applicable. This statement, which is located at page number 5, forms part of our Auditor's Report.
2. As required by Section 143 (3) of the Act, we report that:
 - (a) We have sought and obtained all the information and explanations which to the best of our knowledge and belief were necessary for the purposes of our audit.
 - (b) In our opinion, proper books of account as required by law have been kept by the Company so far as it appears from our examination of those books.
 - (c) According to the information and explanations given to us, the Company has no Branch Offices within the meaning of Section 143(8) of the Act.
 - (d) The Balance Sheet, the Statement of Profit and Loss and the Cash Flow Statement dealt with by this Report are in agreement with the books of account.
 - (e) In our opinion, the aforesaid financial statements comply with the Accounting Standards specified under Section 133 of the Act, read with Rule 7 of the Companies (Accounts) Rules, 2014.

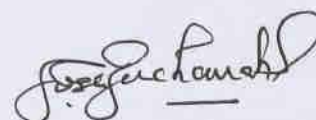


- (f) On the basis of the written representations received from the Directors of the Company as on 31st March, 2021 taken on record by the Board of Directors, none of the directors is disqualified as on 31st March, 2021 from being appointed as a director in terms of Section 164(2) of the Act.
- (g) With respect to the adequacy of the internal financial controls over financial reporting of the Company and the operating effectiveness of such controls, the provisions of Section 143(3)(i) of the Act is not applicable to the Company in terms of Notification dated 13-06-2017 of the Ministry of Corporate Affairs, Government of India.
- (h) With respect to the other matters to be included in the Auditor's Report in accordance with Rule 11 of the Companies (Audit and Auditors) Rules, 2014, in our opinion and to the best of our information and according to the explanations given to us:
- i) The Company does not have any pending litigations which would impact its financial position.
 - ii) The Company did not have any long-term contracts including derivative contracts for which there were any material foreseeable losses requiring provision as required under the applicable law or accounting standards.
 - iii) There were no amounts which required to be transferred to the Investor Education and Protection Fund by the Company during the year under audit.

Place: Trivandrum.

Date: 28-01-2022

For J A K S & Associates
Chartered Accountants
FRN: 001360S



Jose Zachariah, F.C.A.
(Partner - M. No 080570)
(UDIN: 22080570AAAAAX2059)



“ANNEXURE A” TO THE AUDITORS’ REPORT
(Referred to in Audit Report of even date)

To the Members of ‘Wattsun Energy India Private Limited’

As part of an audit in accordance with Standards on Auditing (SAs), we exercise professional judgment and maintain professional skepticism throughout the audit.

We also:

- Identify and assess the risks of material misstatement of the financial statements, whether due to fraud or error, design and perform audit procedures responsive to those risks and obtain audit evidence that is sufficient and appropriate to provide a basis for our opinion. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations or the override of internal control.
- Obtain an understanding of internal control relevant to the audit in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the entity’s internal control.
- Evaluate the appropriateness of accounting policies used and the reasonableness of accounting estimates and related disclosures made by management.
- Conclude on the appropriateness of management’s use of the going concern basis of accounting and based on the audit evidence obtained, whether a material uncertainty exists related to events or conditions that may cast significant doubt on the Company’s ability to continue as a going concern. Our conclusions are based on the audit evidence obtained up to the date of our auditor’s report. However, future events or conditions may cause the Company to cease to continue as a going concern.
- Evaluate the overall presentation, structure and content of the financial statements including the disclosures and whether the financial statements represent the underlying transactions and events in a manner that achieves fair presentation.

We communicate with those charged with governance regarding, among other matters, the planned scope and timing of the audit and significant audit findings, including any significant deficiencies in internal control that we identify during our audit.

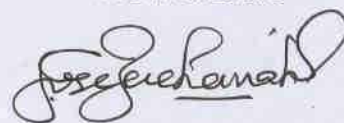


We also provide those charged with governance with a statement that we have complied with relevant ethical requirements regarding independence and to communicate with them all relationships and other matters that may reasonably be thought to bear on our independence, and where applicable, related safeguards.

Place: Thiruvananthapuram

Date: 28-01-2022

For J A K S & Associates
Chartered Accountants
FRN: 001360S



Jose Zachariah, F.C.A.
(Partner - M. No 080570)
(UDIN: 22080570AAAAAX2059)



“ANNEXURE B” TO THE AUDITORS’ REPORT
(Referred to in Audit Report of even date)

To the Members of ‘Wattsun Energy India Private Limited’

1. (a) The Company has maintained proper records showing full particulars including quantitative details and situation of fixed assets.

(b) According to the best of our information and the explanations given to us, all the fixed assets of the company have been physically verified by the management at reasonable intervals during the year. No material discrepancies were noticed on such verification.

(c) According to the best of our information and the explanations given to us, the title deeds of immovable properties, to the extent applicable, owned by the Company are held in the name of the Company.
2. The inventory of the Company has been physically verified during the year by the management. In our opinion, the frequency of verification is reasonable. The discrepancies noted on verification between the physical stocks and the book records were not material in so far as it appears from our examination of the books.
3. The Company has not granted any loans, secured or unsecured, to companies, firms, Limited Liability Partnerships or other parties covered in the Register maintained under Section 189 of the Companies Act, 2013.
4. In our opinion and according to the information and explanations given to us, in respect of loans, investments, guarantees and security, the provisions of Sections 185 and 186 of the Companies Act, 2013 have been complied with.
5. According to the information and explanations given to us, the company has not accepted any deposit as defined under Sections 73 to 76 of the Companies Act, 2013 and the rules framed there under, during the year under review.
6. As far as we are aware, the Central Government has not specified the maintenance of cost records by the Company under sub-section (1) of Section 148 of the Companies Act, 2013.



7. (a) In our opinion and according to the information and the explanations given to us, the Company has been generally regular during the year under review in depositing the undisputed statutory dues including provident fund, employees' state insurance, income-tax, sales-tax, service tax, duty of customs, duty of excise, value added tax, cess and any other statutory dues to the appropriate authorities. On the basis of the verification of the books of account and other relevant records, the scheme and rules cess are not applicable to the Company.
- (b) According to the information and the explanations given to us, there are no dues of income tax or sales tax or service tax or duty of customs or duty of excise or value added tax which have not been deposited on account of any dispute.
8. In our opinion and according to the information and the explanations given to us, the Company has not defaulted in repayment of loans or borrowing to a financial institution, bank, Government or dues to debenture holders.
9. In our opinion and according to the information and the explanations given to us, moneys raised by way of term loans were applied for the purposes for which those are raised. The Company has not raised any monies by way of initial public offer or further public offer (including debt instruments).
10. According to the information and the explanations given to us, no fraud by the Company or any fraud on the Company by its officers or employees has been noticed or reported during the year.
11. In our opinion, managerial remuneration has been paid or provided in accordance with the requisite approvals mandated by the provisions of Section 197 read with Schedule V to the Companies Act, 2013, wherever applicable.
12. The Company is not a Nidhi Company and hence the question of compliance with the Net Owned Funds to Deposits in the ratio of 1:20 to meet out the liability and also the maintenance of ten per cent unencumbered term deposits as specified in the Nidhi Rules, 2014 to meet out the liability, does not arise.
13. In our opinion, all transactions with the related parties are in compliance with Sections 177 and 188 of Companies Act, 2013 where applicable and the details have been disclosed in the financial statements etc., as required by the applicable accounting standards.



14. According to the information and explanations given to us, the Company has not entered into any non-cash transactions with Directors or persons connected with him during the year under review in terms of Section 192 of Companies Act, 2013.
15. In our opinion and according to the information and the explanations given to us, the Company is not required to be registered under Section 45-IA of the Reserve Bank of India Act, 1934.

For J A K S & Associates
Chartered Accountants
FRN: 001360S



Jose Zachariah, F.C.A.
(Partner – M. No 080570)

(UDIN: 22080570AAAAAX2059)

Place: Thiruvananthapuram

Date: 28-01-2022



INDEPENDENT AUDITORS' REPORT

To the Members of 'Wattsun Energy India Private Limited'

Opinion

We have audited the financial statements of **Wattsun Energy India Private Limited** ("the Company") which comprise the Balance Sheet as at 31st March, 2022, the Statement of Profit and Loss, the Cash Flow Statement for the year then ended and notes to the financial statement including a summary of significant accounting policies and other explanatory information.

In our opinion and to the best of our information and according to the explanations given to us, the aforesaid financial statements give the information required by the Companies Act, 2013 ("the Act") in the manner so required and give a true and fair view in conformity with the accounting principles generally accepted in India:

- i) In the case of Balance Sheet, of the state of affairs of the Company as at 31st March, 2022; and
- ii) In the case of Statement of Profit and Loss, of the profit for the year ended on that date; and
- iii) In the case of Cash Flow Statement, of the cash flows for the year ended on that date.

Basis for Opinion

We conducted our audit in accordance with the Standards on Auditing (SAs) specified under section 143(10) of the Act. Our responsibilities under those Standards are further described in the Auditor's Responsibilities for the Audit of the Financial Statements section of our report. We are independent of the Company in accordance with the Code of Ethics issued by the



relevant to our audit of the financial statements under the provisions of the Act and the Rules there under and we have fulfilled our other ethical responsibilities in accordance with these requirements and the Code of Ethics.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our opinion.

Key audit matters

Key audit matters are those matters that, in our professional judgment, were of most significance in our audit of the financial statements of the current period. These matters were addressed in the context of our audit of the financial statements as a whole, and in forming our opinion thereon, and we do not provide a separate opinion on these matters.

Reporting of key audit matters as per SA 701, Key Audit Matters are not applicable to the Company as it is an unlisted company.

Information other than the financial statements and auditors' report thereon

The Company's board of directors is responsible for the preparation of the other information. The other information comprises the information included in the Board's Report including Annexure to Board's Report, Business Responsibility Report but does not include the financial statements and our auditor's report thereon.

Our opinion on the financial statements does not cover the other information and we do not express any form of assurance conclusion thereon.

In connection with our audit of the financial statements, our responsibility is to read the other information and, in doing so, consider whether the other information is materially inconsistent with the financial statements or our knowledge obtained during the course of our audit or otherwise appears to be materially misstated.

If, based on the work we have performed, we conclude that there is a material misstatement of this other information, we are required to report that fact. We have nothing to report in this regard



Management's Responsibility for the Financial Statements

The Company's Board of Directors is responsible for the matters stated in Section 134(5) of the Act with respect to the preparation of these financial statements that give a true and fair view of the financial position and financial performance and cash flows of the Company in accordance with the accounting principles generally accepted in India, including the Accounting Standards specified under Section 133 of the Act, read with Rule 7 of the Companies (Accounts) Rules, 2014.

This responsibility also includes maintenance of adequate accounting records in accordance with the provisions of the Act for safeguarding of the assets of the Company and for preventing and detecting frauds and other irregularities; selection and application of appropriate accounting policies; making judgments and estimates that are reasonable and prudent; and design, implementation and maintenance of adequate internal financial controls, that were operating effectively for ensuring the accuracy and completeness of the accounting records, relevant to the preparation and presentation of the financial statements that give a true and fair view and are free from material misstatement, whether due to fraud or error.

In preparing the financial statements, management is responsible for assessing the Company's ability to continue as a going concern, disclosing, as applicable, matters related to going concern and using the going concern basis of accounting unless management either intends to liquidate the Company or to cease operations, or has no realistic alternative but to do so.

Those Board of Directors are also responsible for overseeing the Company's financial reporting process.

Auditor's Responsibility for the Audit of the Financial Statements

Our objectives are to obtain reasonable assurance about whether the financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue an Auditor's Report that includes our opinion. Reasonable assurance is a high level of assurance, but is not a guarantee that an audit conducted in accordance with SAs will always detect a material misstatement when it exists. Misstatements can arise from fraud or error and are considered material if, individually or in the aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of these financial statements.



A further description of our responsibilities for the audit of the financial statements is included in **Annexure A** of this Auditor's Report. This description forms part of our Auditor's Report.

Report on Other Legal and Regulatory Requirements

1. As required by Companies (Auditor's Report) Order, 2020 ("the Order"), issued by the Central Government of India in terms of Section 143(11) of the Act, we give in the "**Annexure B**" a statement on the matters specified in paragraphs 3 and 4 of the Order, to the extent applicable. This statement, which is located at page number 5, forms part of our Auditor's Report.
2. As required by Section 143 (3) of the Act, we report that:
 - (a) We have sought and obtained all the information and explanations which to the best of our knowledge and belief were necessary for the purposes of our audit.
 - (b) In our opinion, proper books of account as required by law have been kept by the Company so far as it appears from our examination of those books.
 - (c) According to the information and explanations given to us, the Company has no Branch Offices within the meaning of Section 143(8) of the Act.
 - (d) The Balance Sheet, the Statement of Profit and Loss and the Cash Flow Statement dealt with by this Report are in agreement with the books of account.
 - (e) In our opinion, the aforesaid financial statements comply with the Accounting Standards specified under Section 133 of the Act, read with Rule 7 of the Companies (Accounts) Rules, 2014.
 - (f) On the basis of the written representations received from the Directors of the Company as on 31st March, 2022 taken on record by the Board of Directors, none of the directors is disqualified as on 31st March, 2022 from being appointed as a director in terms of Section 164(2) of the Act.
 - (g) With respect to the adequacy of the internal financial controls over financial reporting of the Company and the operating effectiveness of such controls, the provisions of Section 143(3)(i) of the Act is not applicable to the Company in terms of Notification dated 13-06-2017 of the Ministry of Corporate Affairs, Government of India.
 - (h) With respect to the other matters to be included in the Auditor's Report in accordance with Rule 11 of the Companies (Audit and Auditors) Rules, 2014, in our opinion and to the best of our information and according to the explanations given to us:



- i) The Company does not have any pending litigations which would impact its financial position.
- ii) The Company did not have any long-term contracts including derivative contracts for which there were any material foreseeable losses requiring provision as required under the applicable law or accounting standards.
- iii) There were no amounts which required to be transferred to the Investor Education and Protection Fund by the Company during the year under audit.

The management has represented that, to the best of its knowledge and belief, other than as disclosed in the notes to the accounts, no funds have been advanced or loaned or invested (either from borrowed funds or share premium or any other sources or kind of funds) by the company to or in any other person(s) or entity(ies), including foreign entities ("Intermediaries"), with the understanding, whether recorded in writing or otherwise, that the Intermediary shall, whether, directly or indirectly lend or invest in other persons or entities identified in any manner whatsoever by or on behalf of the company ("Ultimate Beneficiaries") or provide any guarantee, security or the like on behalf of the Ultimate Beneficiaries;

Based on the audit procedures which we considered reasonable and appropriate in the circumstances, nothing has come to their notice that has caused them to believe that the representations under sub-clause (i) and (ii) contain any material mis-statement.

The company has not declared or paid any dividend during the year in contravention of the provisions of section 123 of the Companies Act, 2013.

With respect to the matter to be included in the Auditors' Report under Section 197(16) of the Act, in our opinion and according to the information and explanations given to us, the limit prescribed by section 197 for maximum permissible managerial remuneration is not applicable to a private limited company.

For J A K S & Associates
Chartered Accountants
FRN: 001360S



Jose Zachariah, F.C.A.
(Partner - M. No 080570)

(UDIN: 22080570BBHFOB7009)

Place: Trivandrum.

Date: 31-10-2022



“ANNEXURE A” TO THE AUDITORS’ REPORT
(Referred to in Audit Report of even date)

To the Members of ‘Wattsun Energy India Private Limited’

As part of an audit in accordance with Standards on Auditing (SAs), we exercise professional judgment and maintain professional skepticism throughout the audit.

We also:

- Identify and assess the risks of material misstatement of the financial statements, whether due to fraud or error, design and perform audit procedures responsive to those risks and obtain audit evidence that is sufficient and appropriate to provide a basis for our opinion. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations or the override of internal control.
- Obtain an understanding of internal control relevant to the audit in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the entity’s internal control.
- Evaluate the appropriateness of accounting policies used and the reasonableness of accounting estimates and related disclosures made by management.
- Conclude on the appropriateness of management’s use of the going concern basis of accounting and based on the audit evidence obtained, whether a material uncertainty exists related to events or conditions that may cast significant doubt on the Company’s ability to continue as a going concern. Our conclusions are based on the audit evidence obtained up to the date of our auditor’s report. However, future events or conditions may cause the Company to cease to continue as a going concern.
- Evaluate the overall presentation, structure and content of the financial statements including the disclosures and whether the financial statements represent the underlying transactions and events in a manner that achieves fair presentation.

We communicate with those charged with governance regarding, among other matters, the planned scope and timing of the audit and significant audit findings, including any significant deficiencies in internal control that we identify during our audit.



We also provide those charged with governance with a statement that we have complied with relevant ethical requirements regarding independence and to communicate with them all relationships and other matters that may reasonably be thought to bear on our independence, and where applicable, related safeguards.

For J A K S & Associates
Chartered Accountants
FRN: 001360S



Jose Zachariah, F.C.A.
(Partner - M. No 080570)
(UDIN: 22080570BBHFOB7009)

Place: Thiruvananthapuram

Date: 31-10-2022



“ANNEXURE B” TO THE AUDITORS’ REPORT
(Referred to in Audit Report of even date)

To the Members of ‘Wattsun Energy India Private Limited’

Report as required by the Companies (Auditor’s Report) Order, 2020 (“the Order”), issued by the Central Government of India in terms of sub-section (11) of section 143 of the Companies Act, 2013 (Refer to in paragraph 1 under ‘Report on Other Legal and Regulatory Requirements’ section of our report of even date) With reference to the Annexure A referred to in the Independent Auditors’ Report to the members of the Company on the financial statements for the year ended March 31, 2022, we report the following:

- (i) (a) The Company has maintained proper records showing full particulars, including quantitative details and situation of Property, plant and equipment and proper records relating to Intangible assets.
- (b) According to the information and explanations given to us, all the Property, plant and equipment were physically verified at reasonable intervals. In our opinion, this periodicity of physical verification is reasonable having regard to the size of the Company and the nature of its assets. No material discrepancies were noticed on such verification.
- (c) According to the information and explanations given to us and on the basis of our examination of the records of the Company, there are no immovable properties held in the name of the Company.
- (d) According to the information and explanations given to us and on the basis of our examination of the records of the Company, the Company has not revalued its Property, plant and equipment (including Right-of-use assets) or Intangible assets or both during the year.
- (e) According to the information and explanations given to us and on the basis of our examination of the records of the Company, there are no proceedings initiated or pending against the Company for holding any benami property under the Prohibition of Benami Property Transactions Act, 1988 and rules made there under.



(ii) (a) As explained to us the management has conducted physical verification of inventories at reasonable intervals. Based on the information and explanation given to us we are of the opinion that the coverage and procedure of such verification by the management is appropriate. We were informed that that no discrepancies in excess of 10% or more in the aggregate for each class of inventory were noticed.

(b) The company has not been sanctioned with any working capital limits from banks or financial institutions and therefore this clause is not applicable.

(iii) According to the information and explanations given to us and on the basis of our examination of the records of the Company, the Company has not made any investments, provided guarantee or security or granted any loans or advances in the nature of loans, secured or unsecured, to companies, firms, limited liability partnerships or any other parties during the year and hence Clauses (iii) (a) to (iii) (f) are not applicable to the company.

(iv) According to the information and explanations given to us and on the basis of our examination of the records, the Company has not given any loans, investments or provided any guarantee or security as specified under Section 185 of the Companies Act, 2013 and the Company has not provided any guarantee or security as specified under Section 186 of the Companies Act, 2013.

(v) The Company has not accepted any deposits or amounts which are deemed to be deposits from the public as per the provisions of sections 73 to 76 or any other relevant provisions of the Companies Act and the rules made thereunder. Accordingly, clause 3(v) of the Order is not applicable.

(vi) The Company is not a manufacturing concern and hence clause 3(vi) of the Order is not applicable.

(vii) (a) The Company is generally regular in depositing undisputed applicable statutory dues to the appropriate authorities during the year. According to the information and explanations given to us, no undisputed amounts payable in respect of the statutory dues were in arrears as at March 31, 2022 for a period of more than six months from the date on when they become payable.



(b) As informed, there are no dues of Income Tax, Sales Tax, Service Tax, Customs Duty, Excise Duty, VAT, GST, etc. outstanding on account of any dispute.

(viii) According to the information and explanations given to us and on the basis of our examination of the records of the Company, the Company has not been assessed in any of the tax assessments U/s 1961 with incomes/expenses that were not accounted in the Books of account.

(ix) (a) According to the information and explanations given to us and on the basis of our examination of the records of the Company, the Company did not have any loans or borrowings from any lender other than the loans repayable on demand from the Directors. Considering the working capital requirements of the Company, the Directors had not demanded the loans as on 31st March 2022.

(b) According to the information and explanations given to us and on the basis of our examination of the records of the Company, the Company has not been declared a wilful defaulter by any bank or financial institution or government or government authority.

(c) According to the information and explanations given to us by the management, the Company has not obtained any term loans. Accordingly, clause 3(ix)(c) of the Order is not applicable.

(d) the company has not raised funds on short term basis and utilised for long term purposes.

(e) The Company does not have any subsidiaries, associates or joint ventures and accordingly, clause 3(ix)(e) and (f) of the Order are not applicable.

(x) (a) The Company has not raised any moneys by way of initial public offer or further public offer (including debt instruments) during the year. Accordingly, clause 3(x)(a) of the Order is not applicable.

(b) According to the information and explanations given to us and on the basis of our examination of the records of the Company, the Company has not made any preferential allotment or private placement of shares or fully or partly convertible debentures during the year as per requirements of the section 42 and section 62 of the Companies Act, 2013. Accordingly, clause 3(x)(b) of the Order is not applicable.



(xi) (a) Based on the examination of the books and records of the Company and according the information and explanations given to us, considering the principles of materiality outlined in Standards on Auditing, we report that no fraud by the Company or on the Company has been noticed or reported during the course of the audit.

(b) According to the information and explanations given to us, no report under sub-section (12) of Section 143 of the Companies Act, 2013 has been filed by the auditors in Form ADT-4 as prescribed under Rule 13 of Companies (Audit and Auditors) Rules, 2014 with the Central Government.

(c) According to the information and explanations given to us, no whistle blower complaints were received by the Company during the year and hence clause (xi)(c) is not applicable.

(xii) According to the information and explanations given to us, the Company is not a Nidhi Company. Accordingly, clauses 3(xii) (a) to (c) of the Order are not applicable.

(xiii) In our opinion and according to the information and explanations given to us, the transactions with related parties are in compliance with Sections 177 and 188 of the Companies Act, 2013, where applicable, and the details of the related party transactions have been disclosed in the standalone financial statements as required by the applicable Indian Accounting Standards.

(xiv)(a) The company does not maintain an internal audit system, therefore clause (xiv)(a) is not applicable.

(b) No internal audit reports were issued during the fin./yr. and hence clause (xiv) (b) is not applicable.

(xv) In our opinion and according to the information and explanations given to us, the Company has not entered into any non-cash transactions with its directors or persons connected to its directors and hence, provisions of Section 192 of the Companies Act, 2013 are not applicable to the Company.

(xvi) (a) The Company is not required to be registered under Section 45-IA of the Reserve Bank of India Act, 1934. Accordingly, clauses 3(xvi)(a) and 3(xvi)(b) of the Order are not applicable.



(c) The Company is not a Core Investment Company (CIC) as defined in the regulations made by the Reserve Bank of India. Accordingly, clause 3(xvi)(c) of the Order is not applicable.

(d) According to the information and explanations provided to us during the course of audit, the Group does not have any CIC. Accordingly, the requirements of clause 3(xvi)(d) are not applicable.

(xvii) The Company has not incurred any cash losses during the fin./yrs. 2020-21 and 2021-22.

(xviii) There has been no resignation of the statutory auditors during the year. Accordingly, clause 3(xviii) of the Order is not applicable.

(xix) According to the information and explanations given to us and on the basis of the financial ratios, ageing and expected dates of realisation of financial assets and payment of financial liabilities, other information accompanying the financial statements, our knowledge of the Board of Directors and management plans and based on our examination of the evidence supporting the assumptions, there does not exist a material uncertainty as on the date of the audit report that the Company is not capable of meeting its liabilities existing at the date of balance sheet as and when they fall due within a period of one year from the Balance Sheet date.

(xx) In our opinion and according to the information and explanations given to us, subsection (5) of Section 135 of the Companies Act, 2013 is not applicable to the company. Accordingly, clauses 3(xx)(a) and 3(xx)(b) of the Order are not applicable.

(xxi) Consolidated Financial Statements are not applicable to this Company. Accordingly, clause 3(xxi) of the Order is not applicable.

For J A K S & Associates
Chartered Accountants
FRN: 001360S

Jose Zachariah

Jose Zachariah, F.C.A.
(Partner – M. No 080570)

(UDIN: 22080570BBHFOB7009)

Place: Thiruvananthapuram

Date: 31-10-2022



WATTSUN ENERGY INDIA PRIVATE LIMITED, TRIVANDRUM
Balance Sheet as at 31st March, 2018

PARTICULARS	Note No.	Figures as at the end of current reporting period	Figures as at the end of previous reporting period
1	2	3.00	4
I. EQUITY AND LIABILITIES			
(1) Shareholders' funds			
(a) Share Capital	1	100,000.00	100,000.00
(b) Reserves and Surplus	2	330,471.85	75,835.98
(c) Money received against share warrants		0.00	0.00
(2) Share application money pending allotment		0.00	0.00
(3) Non-current liabilities			
(a) Long-term borrowings	3	766,973.00	1,399,450.00
(b) Deferred tax liabilities (Net)		0.00	0.00
(c) Other Long term liabilities		0.00	0.00
(d) Long-term provisions		0.00	0.00
(4) Current liabilities			
(a) Short-term borrowings	4	0.00	0.00
(b) Trade payables	5	10,004,467.57	9,423,927.88
(c) Other Current liabilities	6	3,477,138.41	1,234,270.00
(d) Short-term provisions	7	165,120.00	42,390.00
TOTAL		14,844,170.83	12,275,873.86
II. ASSETS			
(1) Non-current assets			
(a) Fixed assets			
(i) Tangible assets	8	372,058.72	335,559.00
(ii) Intangible assets	8	0.00	0.00
(iii) Capital work-in-progress		0.00	0.00
(iv) Intangible assets under development		0.00	0.00
(b) Non-current investments		0.00	0.00
(c) Deferred tax assets (net)	9	37,762.00	20,218.00
(d) Long-term loans and advances	10	837,188.00	742,375.00
(e) Other non-current assets	11	0.00	0.00
(2) Current assets			
(a) Current investments		350,000.00	350,000.00
(b) Inventories		2,222,417.48	4,537,250.02
(c) Trade receivables	12	5,315,316.01	3,628,276.10
(d) Cash and cash equivalents	13	2,654,678.27	654,512.21
(e) Short-term loans and advances	14	1,986,100.35	1,810,103.00
(f) Other current assets	15	1,068,650.00	197,580.53
TOTAL		14,844,170.83	12,275,873.86

FOR AND ON BEHALF OF THE BOARD OF DIRECTORS


TERANCE ALEX
MANAGING DIRECTOR
DIN: 06808744
TRIVANDRUM
1-Sep-18


JIMMY SILUVAYYAN
DIRECTOR
DIN: 06808773



As per our report of even date

For PHILIP & MATHEW
Chartered Accountants
Firm Regn. No. 002646S


K. GEORGE-PHILIP
Partner
Membership No. 019928

WATTSUN ENERGY INDIA PRIVATE LIMITED, TRIVANDRUM
Statement of Profit and Loss for the year ended 31st March, 2018

PARTICULARS	Note No.	Figures for the Current reporting period	Figures for the Previous reporting period
1	2	3	4
I. Revenue from operations	16	37,178,364.11	9,609,932.00
II. Other income	17	185,640.46	88,594.25
III. Total Revenue (I + II)		37,364,004.57	9,698,526.25
IV. Expenses:			
Cost of materials consumed		371,697.26	337,469.00
Purchases of Stock-in-trade		24,836,606.20	8,641,333.09
Changes in inventories of finished goods work-in-progress and Stock-in-Trade	18	2,314,632.54	-4,192,050.02
Employee benefits expense, Finance costs	19	4,444,366.30	1,590,573.00
Depreciation and amortization expense	20	157,784.00	159,660.00
Other expenses	21	4,836,506.40	3,126,997.30
Total expenses		36,961,792.70	9,663,982.37
V. Profit before exceptional and extraordinary Items and tax (III - IV)		402,211.87	34,543.88
VI. Exceptional Items		0.00	0.00
VII. Profit before extraordinary Items and tax (V - VI)		402,211.87	34,543.88
VIII. Extraordinary Items		0.00	0.00
IX. Profit before tax (VII - VIII)		402,211.87	34,543.88
X. Tax expense:			
(1) Current Tax		165,120.00	42,390.00
(2) Deferred Tax		17,544.00	25,221.00
XI. Profit (Loss) for the period from continuing operations (IX - X)		254,635.87	17,374.88
XII. Profit/(loss) from discontinuing operations		0.00	0.00
XIII. Tax expense of discontinuing operations		0.00	0.00
XIV. Profit/(loss) from discontinuing operations (after tax) (XII - XIII)		0.00	0.00
XV. Profit/(Loss) for the period (XI + XIV)		254,635.87	17,374.88
XVI. Earnings per equity share:	22		
(1) Basic		25.46	1.74
(2) Diluted		25.46	1.74

FOR AND ON BEHALF OF THE BOARD OF DIRECTORS


TERANCE ALEX
MANAGING DIRECTOR
DIN: 06808744
TRIVANDRUM
1-Sep-18


JIMMY SILUVAYYAN
DIRECTOR
DIN: 06808773

As per our report of even date



1 SEP 2018

For PHILIP & MATHEW
Chartered Accountants
Firm Regn. No. 002646S


K. GEORGE PHILIP
Partner
Membership No. 019928

WATTSUN ENERGY INDIA PRIVATE LIMITED, TRIVANDRUM
CASH FLOW STATEMENT FOR THE YEAR ENDED 31 MARCH 2018

Sl. No.	Particulars	2017-18 ₹	2016-17 ₹
A	CASH FLOWS FROM OPERATING ACTIVITIES		
	Net Profit before Tax & Extraordinary Items	402,211.87	34,543.88
	Adjustment for:-		
	Add: Depreciation and Amortization	150,508.00	152,384.00
	Add: Adjustment for Interest Expenses	102,413.22	112,294.44
	Add: Adjustment for Prior Period Expenses	0.00	0.00
		655,133.09	299,222.32
	Operating Profit before working capital changes		
	Movements in Working Capital:	580,539.69	5,866,872.46
	Increase/Decrease in Trade Payables	-1,687,039.91	-2,012,243.20
	Increase/Decrease in Receivables	-871,069.47	-77,132.63
	Increase/Decrease in Other Current Assets	-94,813.00	-592,375.00
	Increase/Decrease in Long Term Loans and Advances	-175,997.35	-95,367.00
	Decrease/Increase in Short Term Loans and Advances	2,314,832.54	-4,192,050.02
	Increase/Decrease in Inventories	2,242,868.41	1,176,384.00
	Increase/Decrease in Current Liabilities	0.00	0.00
	Decrease in Short Term Provisions	2,309,320.91	74,088.61
	Sub Total	42,390.00	16,700.00
		2,922,064.00	356,610.93
	Less: Income tax paid		
	Net cash from operating activities (A)		
		-187,007.72	0.00
B	CASH FLOWS FROM INVESTING ACTIVITIES		
	Purchase of Fixed Assets	0.00	0.00
	Sale of Fixed Assets	0.00	0.00
	Interest Received		
	Net Cash from Investing Activities (B)	-187,007.72	0.00
C	CASH FLOWS FROM FINANCING ACTIVITIES		
	Proceeds from Issuance of Share Capital	0.00	0.00
	Interest paid	-102,413.22	-112,294.44
	Increase/Decrease in Long Term Borrowings	-632,477.00	-72,064.90
	Increase/Decrease in Cash Credit	0.00	0.00
	Increase/Decrease in long term Other loans and advances	0.00	0.00
	Net Cash from Financing Activities (C)	-734,890.22	-184,359.34
		2,000,166.06	172,251.59
D	Net Decrease in Cash & Cash Equivalents (A+B+C)		
	Opening Cash and Cash Equivalent	654,512.21	482,260.62
	Closing Cash and Cash Equivalent	2,654,678.27	654,512.21
		2,000,166.06	172,251.59
E	Net Increase/Decrease in Cash and Cash Equivalents		

Note: The cash flow is prepared under indirect method as set out in Accounting Standards -3 whereby net profit is adjusted for the effects of transactions of a non-cash nature, any deferrals or accruals of past or future operating cash receipts and payments and items of income and expense associated with investing and financing cash flows.

FOR AND ON BEHALF OF THE BOARD OF DIRECTORS


TERANCE ALEX
 MANAGING DIRECTOR
 DIN: 06808744
 TRIVANDRUM
 1-Sep-18


JIMMY SILUVAYYAN
 DIRECTOR
 DIN: 06808773



As per our report of even date

For **PHILIP & MATHEW**
 Chartered Accountants
 Firm Regn. No. 0026468


K. GEORGE PHILIP
 Partner
 Membership No. 019928

1 SEP 2018

3 Long-term borrowings		
(a) Loans payable on demand		
From Banks		
From other parties	0.00	0.00
(b) Loans and advances from related parties	731,971.00	994,450.00
Unsecured		
(c) Deposits	35,000.00	405,000.00
(d) Other loans and advances	0.00	0.00
Total	766,971.00	1,399,450.00
Loans guaranteed by Directors or others	731,971.00	994,450.00
Periods and amount of default as on the Balance Sheet date:		
In respect of loan	0.00	0.00
In payment of interest	0.00	0.00
4 Short-term borrowings	0.00	0.00
5 Trade Payables		
(i) Due to Micro, Small & Medium Enterprises	0.00	0.00
(ii) Due to Others	10,004,467.52	9,423,927.98
Total	10,004,467.52	9,423,927.98
6 Other Current Liabilities		
TDS Payable	38,600.00	58,550.00
VAT Payable	30,107.32	0.00
Expenses Payable	769,873.00	155,189.10
Director's Current Account	2,640,558.04	1,020,520.90
Total	3,477,138.41	1,334,270.00
7 Short Term Provisions		
Provision for Tax	165,120.00	47,190.00
Total	165,120.00	47,190.00
8 Deferred Tax Asset (Net)		
(1) Deferred Tax Liability:		
In respect of Depreciation on Fixed Assets:	20,218.00	-5,003.00
At the beginning of the year	0.00	0.00
Addition / (deduction) for the year	20,218.00	-5,003.00
Total	17,544.00	25,221.00
(2) Deferred Tax Asset	0.00	0.00
Deferred Tax Reversed	0.00	0.00
In respect of loss during the year	37,762.00	20,218.00
Net Deferred Tax Asset	(1) + (2)	37,762.00
10 Long-term loans and advances		
(Unsecured considered good)	0.00	0.00
(a) Capital Advances	837,188.00	742,375.00
(b) Security Deposits	0.00	0.00
(c) Loans and advances to related parties	0.00	0.00
(d) Other loans and advances	837,188.00	742,375.00
Total	0.00	0.00
Advances due by Directors or other officers of the Company or any of them either severally or jointly with any other person	0.00	0.00
Debts due by firms or private companies respectively in which any Director is a partner or a director or a member	0.00	0.00
11 Other Non Current Assets	0.00	0.00
Total	0.00	0.00
12 Trade Receivables		
(Unsecured considered good)	1,886,060.01	1,078,497.10
Outstanding for a period exceeding six months	3,429,256.00	2,549,729.00
Other trade receivables	3,215,216.01	3,628,276.19
Total	605,678.01	605,678.01
Debts due by Directors or other officers of the Company or any of them either severally or jointly with any other person	0.00	0.00
Debts due by firms or private companies respectively in which any Director is a partner or a director or a member	0.00	0.00
13 Cash and cash equivalents		
(a) Balances with banks	2,638,559.27	628,572.85
(b) Cheques, drafts on hand	0.00	0.00
(c) Cash on hand	16,119.00	25,939.36
(d) Others	0.00	0.00
Total	2,654,678.27	654,512.21
earmarked balances with banks	0.00	0.00
Balances with banks to the extent held as margin money or security against the borrowings, guarantees, other commitments	0.00	0.00
Repatriation restrictions, if any, in respect of cash and bank balances	0.00	0.00
Bank deposits with more than 12 months maturity	0.00	0.00
14 Short-term loans and advances		
(Unsecured considered good)	0.00	0.00
(a) Loans and advances to related parties	1,096,100.35	1,010,101.00
(b) Advance to suppliers	1,986,100.35	1,810,103.00
Total	0.00	0.00
Advances due by Directors or other officers of the Company or any of them either severally or jointly with any other person	0.00	0.00
Debts due by firms or private companies respectively in which any Director is a partner or a director or a member	0.00	0.00

15 Other current assets		
(a) Unamortised Expenses:		
Preliminary Expenses		
Balance brought forward	14,551.00	21,827.00
Less: Amortised during the year	7,276.00	7,276.00
Balance	7,275.00	14,551.00
(b) Others	1,061,375.00	183,028.52
Total	1,068,650.00	197,580.52
16 Revenue from Operations		
(a) Sale of products	27,178,364.11	9,609,932.00
(b) Sale of services	0.00	0.00
(c) Other operating revenues	0.00	0.00
Sub total	27,178,364.11	9,609,932.00
Less:		
(d) Excise duty	0.00	0.00
Balance	27,178,364.11	9,609,932.00
17 Other Income		
Commission	0.00	266.25
Delhi Programme Refund	0.00	1,150.00
Discounts	1,328.60	1,500.00
Interest Subsidy on KFC Loan	90,021.00	43,578.00
Interest Received	94,290.66	41,260.00
Tax refund	0.00	140.00
TOTAL	185,640.66	48,594.25
18 Changes in inventories of finished goods		
1) Opening Stock	4,537,250.02	4,537,250.02
2) Closing Stock	2,222,417.48	4,192,050.02
	-2,314,632.54	
19 Employee Benefits Expense		
(i) salaries and wages	4,236,719.30	1,890,573.00
(ii) contribution to provident and other funds	0.00	0.00
(iii) expense on Employee Stock Option Scheme (ESOP) and Employee Stock Purchase Plan (ESPP)	0.00	0.00
(iv) staff welfare expenses	207,647.00	1,590,573.00
Total	4,444,366.30	
20 Depreciation and Amortization Expenses		
(a) Depreciation of Tangible Assets	150,508.00	152,384.00
(b) Depreciation of Intangible Assets	0.00	0.00
(c) Amortisation of Expenses - Preliminary Expenses	7,276.00	7,276.00
Total	157,784.00	159,660.00
21 Other Expenses		
Accounting Charges	18,000.00	15,000.00
Advertisement	0.00	135,966.30
Asset Registration and Affiliation Expenses	110,805.00	29,000.00
Asset Tender Fee	11,000.00	126,224.37
Discounts	216,275.75	0.00
Rent	266,000.00	372,750.00
Sales Promotion Expenses	157,901.00	420,617.58
Marketing expenses	499,990.00	116,279.00
Interest and Bank Charges	102,413.22	112,294.44
Newspaper and Periodicals	7,980.00	0.00
Insurance	19,875.00	8,943.00
Internet and Telephone Charges	124,784.00	84,555.60
Labour Charges	0.00	2,620.46
Electricity and Water charges	44,230.00	28,263.00
Office Expenses	121,779.00	2,000.00
Printing and Stationery	72,519.30	47,741.00
Postage and Courier	15,306.00	17,159.00
Rates and Taxes	22,515.00	0.00
Refreshment Expenses	0.00	2,940.00
Repairs & Maintenance	529,189.22	159,662.50
Worksite Expenses	1,407,335.00	985,255.00
Freight & Carriage	114,572.43	214,443.00
Travelling Expenses	264,464.00	220,006.75
Professional Fees	21,000.00	0.00
Piling Fee	800.00	1,200.00
Audit Fees	25,000.00	11,800.00
Miscellaneous Expenses	61,772.48	11,277.30
Total	4,834,506.40	3,136,997.30
22 Earnings per Share		
Profit after tax (Rs.)	(Numerator: A) 254,635.87	17,374.88
Weighted Average Number of Shares	(Denominator: B) 10,000	10,000
Basic/Diluted EPS (Rs.)	(A / B) 25.46	1.73
23 Contingent liabilities and commitments		
(To the extent not provided for)		
(i) Contingent liabilities:-	0.00	0.00
(a) Claims against the company not acknowledged as debt	0.00	0.00
(b) Guarantees	0.00	0.00
(c) Other money for which the company is contingently liable		
(ii) Commitments:-		
(a) Estimated amount of contracts remaining to be executed on capital account and not provided for	0.00	0.00
(b) Uncalled liability on shares and other investments partly paid	0.00	0.00
(c) Other commitments	0.00	0.00

24 Additional Information

(1) The amount of dividends proposed to be distributed to equity and preference shareholders for the period	0.00	0.00
(2) The related amount per share	0.00	0.00
(3) Arrears of fixed cumulative dividends on preference shares	0.00	0.00
(iv) Where in respect of an issue of securities made for a specific purpose, the whole or part of the amount has not been used for the specific purpose at the balance-sheet date, there shall be indicated by way of note how such unutilized amounts have been used or invested.	Not Applicable	Not Applicable
(v) In the opinion of the Board, all of the assets other than fixed assets and non-current investments have a value on realization in the ordinary course of business at least equal to the amount at which they are stated in the Balance Sheet.		
(vi) Payments to the auditor as:-	25,000.00	11,800.00
(a) auditor	0.00	0.00
(b) for taxation matters	0.00	0.00
(c) for company law matters	0.00	0.00
(d) for management services	0.00	0.00
(e) for other services	0.00	0.00
(f) for reimbursement of expenses	25,000.00	11,800.00
Total	0.00	0.00
(v) Details of items of exceptional and extraordinary nature	0.00	0.00
(vi) Prior period items:-	0.00	0.00
Prior period income	0.00	0.00
Prior period expenditure	0.00	0.00
(vii) Value of imports calculated on C.I.F basis by the company during the financial year	0.00	0.00
(viii) Expenditure in foreign currency during the financial year	0.00	0.00
(ix) A. Total value of all imported raw materials, spare parts and components consumed during the financial year	0.00	0.00
B. The total value of all indigenous raw materials, spare parts and components similarly consumed	0.00	0.00
C. Percentage of each to the total consumption	0.00	0.00
(x) The amount remitted during the year in foreign currencies on account of dividends	0.00	0.00
(xi) Earnings in foreign exchange		
(xii) Transaction with the associates, vide Accounting Standard 19 of ICAI:		

Sr. No.	Particulars	Key Management Personnel	Relatives of Key Management Personnel	Total
1	Salary	480,000.00	0.00	480,000.00
2	Travelling Expenses	102,482.00	0.00	102,482.00
3	Unsecured Loan taken	4,938,607.00	0.00	4,938,607.00
4	Unsecured Loan returned	3,283,579.86	0.00	3,283,579.86
	Total	8,804,668.86	0.00	8,804,668.86

Relatives of Key Management Personnel:
 Name of Related Parties and Description of Relationship:
 Key Management Personnel: Terance Alex (DIN: 06808744)
 Jimmy Siluvayyan (DIN: 06808773)

- (xiii) The input tax credit available to the Company under the Goods and Services Tax Act, 2017 is not fully claimed in the accounts of the Company due to the non-availability of relevant data with the Company and also reportedly due to the non-filing of the data by the concerned suppliers and service providers. The amount of purchases and the relevant expenditure are over-stated to the extent of such input tax credits and the amount so involved are not determined by the Company.
- (xiv) Dues to Micro, Small and Medium enterprises could not be identified as the Company did not get any notification to that effect.
- (xv) (a) The Fixed Deposit for Rs. 3,50,000 with State Bank of India has a lien in favour of Kerala Financial Corporation towards security.
 (b) The Fixed Deposit for Rs. 2,00,000 with State Bank of India has a lien in favour of The Director, ANERT towards security.
 (c) The Fixed Deposit for Rs. 12,188 with the Treasury Savings Bank has a lien in favour of Kerala Irrigation Infrastructure Development Corporation Ltd towards security.
 (d) The Bank Guarantee for Rs. 4,75,000 with State Bank of India has a lien in favour of ANERT towards security.
- (xvi) Balances of parties other than Banks are pending confirmation.
- (xvii) Since there are no dilutive options or other dilutive potential equity shares of the Company, the basic and diluted Earnings Per Share of the Company are the same.
- (xviii) Previous year figures have been re-grouped or recast wherever necessary to suit current year's disclosure and lay out.

As per our report of even date

FOR AND ON BEHALF OF THE BOARD OF DIRECTORS

TERANCE ALEX
 MANAGING DIRECTOR
 DIN: 06808744
 TRIVANDRUM
 1-Sep-18

JIMMY SILUVAYYAN
 DIRECTOR
 DIN: 06808773



For PHILIP & MATHEW
 Chartered Accountants
 Firm Regn. No. 002646S

K. GEORGE PHILIP
 Partner
 Membership No. 019928

NOTE 8: FIXED ASSETS

WATTSUN ENERGY INDIA PRIVATE LIMITED, TRINAMOLUR

Sl. No.	PARTICULARS	GROSS BLOCK			DEPRECIATION & AMORTISATION				NET BLOCK		
		Balance as on 1-Apr-17	Additions	Deductions / Adjustments	Balance as on 31-Mar-18	Balance as on 1-Apr-17	Depreciation / amortisation expense for the year	Deductions / Adjustments	Balance as on 31-Mar-18	Balance as on 31-Mar-18	Balance as on 31-Mar-17
1	2	3	4	5	6	7	8	9	10	11	12
TANGIBLE ASSETS											
	Motor Car	510,000.00	0.00	0.00	510,000.00	174,441.00	104,795.00	0.00	279,236.00	230,764.00	335,559.00
	Ordnal Van	0.00	30,000.00	0.00	30,000.00	0.00	2,355.00	0.00	2,355.00	27,645.00	0.00
	Fire Extinguisher	0.00	1,408.00	0.00	1,408.00	0.00	127.00	0.00	127.00	1,281.00	0.00
	Computer & Accessory	0.00	155,599.72	0.00	155,599.72	0.00	43,231.00	0.00	43,231.00	112,368.72	0.00
	Sub-total	510,000.00	187,007.72	0.00	697,007.72	174,441.00	150,508.00	0.00	324,949.00	372,058.72	335,559.00
	GRAND TOTAL	510,000.00	187,007.72	0.00	697,007.72	174,441.00	150,508.00	0.00	324,949.00	372,058.72	335,559.00

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WATTSUN ENERGY INDIA PRIVATE LIMITED, TRIVANDRUM
Balance Sheet as at 31st March, 2019

PARTICULARS	Note No.	Figures as at the end of current reporting period	Figures as at the end of previous reporting period
1	2	3	4
I. EQUITY AND LIABILITIES			
(1) Shareholders' funds			
(a) Share Capital	1	1,000,000.00	100,000.00
(b) Reserves and Surplus	2	640,575.00	330,471.85
(c) Money received against share warrants		0.00	0.00
(2) Share application money pending allotment		0.00	0.00
(3) Non-current liabilities			
(a) Long-term borrowings	3	6,787,510.57	3,407,531.04
(b) Deferred tax liabilities (Net)		0.00	0.00
(c) Other Long term liabilities		0.00	0.00
(d) Long-term provisions		0.00	0.00
(4) Current liabilities			
(a) Short-term borrowings	4	0.00	0.00
(b) Trade payables	5	9,070,743.58	10,004,467.57
(c) Other Current liabilities	6	4,088,035.96	836,580.37
(d) Short-term provisions	7	0.00	165,120.00
TOTAL		21,586,865.11	14,844,170.83
II. ASSETS			
(1) Non-current assets			
(a) Property, Plant and Equipment			
(i) Tangible assets	8	2,455,324.70	372,058.72
(ii) Intangible assets		0.00	0.00
(iii) Capital work-in-progress		0.00	0.00
(iv) Intangible assets under development		0.00	0.00
(b) Non-current investments		0.00	0.00
(c) Deferred tax assets (net)	9	166,123.00	31,162.00
(d) Long-term loans and advances	10	200,000.00	162,188.00
(e) Other non-current assets	11	0.00	0.00
(2) Current assets			
(a) Current investments		0.00	0.00
(b) Inventories		1,330,585.00	2,222,417.48
(c) Trade receivables	12	15,163,451.00	5,315,316.01
(d) Cash and cash equivalents	13	1,255,270.78	3,679,678.27
(e) Short-term loans and advances	14	422,301.65	1,986,100.35
(f) Other current assets	15	573,808.98	1,068,650.00
TOTAL		21,586,865.11	14,844,170.83

FOR AND ON BEHALF OF THE BOARD OF DIRECTORS

TERANCE ALEX
MANAGING DIRECTOR
DIN: 06808744
TRIVANDRUM
29-Jun-19

JIMMY SILUVAYYAN
DIRECTOR
DIN: 06808773

As per our report of even date



For PHILIP & MATHEW
Chartered Accountants
Firm Regn. No. 002546S

K. GEORGE PHILIP
Partner
Membership No. 019923

29 JUN 2019

WATTSUN ENERGY INDIA PRIVATE LIMITED, TRIVANDRUM
Statement of Profit and Loss for the year ended 31st March, 2019

PARTICULARS	Note No.	Figures for the Current reporting period	Figures for the Previous reporting period
1	2	3	4
I. Revenue from operations	16	57,172,428.62	37,178,364.11
II. Other income	17	165,882.33	185,640.46
III. Total Revenue (I+ II)		57,338,310.95	37,364,004.57
IV. Expenses:			
Cost of materials consumed		70,178.50	371,697.26
Purchases of Stock-in-trade		32,383,872.09	24,836,606.20
Changes in inventories of finished goods work-in-progress and Stock-in-Trade	18	891,832.48	2,314,832.54
Employee benefits expense, Finance costs	19	8,087,188.65	4,444,366.30
Depreciation and amortization expense	20	1,062,518.00	157,784.00
Other expenses	21	14,421,568.08	4,836,506.40
Total expenses		56,917,157.80	36,961,792.70
V. Profit before exceptional and extraordinary items and tax (III - IV)		421,153.15	402,211.87
VI. Exceptional items		0.00	0.00
VII. Profit before extraordinary items and tax (V - VI)		421,153.15	402,211.87
VIII. Extraordinary Items		0.00	0.00
IX. Profit before tax (VII - VIII)		421,153.15	402,211.87
X. Tax expense:			
(1) Current Tax		253,039.00	165,120.00
(2) Deferred Tax		148,361.00	17,544.00
XI. Profit (Loss) for the period from continuing operations (IX - X)		316,475.15	254,635.87
XII. Profit/(loss) from discontinuing operations		0.00	0.00
XIII. Tax expense of discontinuing operations		0.00	0.00
XIV. Profit/(loss) from discontinuing operations (after tax) (XII - XIII)		0.00	0.00
XV. Profit/(Loss) for the period (XI + XIV)		316,475.15	254,635.87
XVI. Earnings per equity share:	22		
(1) Basic		12.52	26.46
(2) Diluted		12.52	25.46

FOR AND ON BEHALF OF THE BOARD OF DIRECTORS


TERANCE ALEX
MANAGING DIRECTOR
DIN: 06808744
TRIVANDRUM
29-Jun-19


JIMMY BILUVAYYAN
DIRECTOR
DIN: 06808773



As per our report of even date

For PHILIP & MATHEW
Chartered Accountants
Firm Regn. No. 002546S


K. GEORGE PHILIP
Partner
Membership No. 019826

29 JUN 2019

WATTSUN ENERGY INDIA PRIVATE LIMITED, TRIVANDRUM
CASH FLOW STATEMENT FOR THE YEAR ENDED 31 MARCH 2019

Sl. No	Particulars	2018-19	2017-18
	₹	₹	
A	CASH FLOWS FROM OPERATING ACTIVITIES		
	Net Profit before Tax & Extraordinary Items	421,153.15	402,211.87
	Adjustment for:-		
	Add: Depreciation and Amortization	1,055,243.00	150,508.00
	Add: Adjustment for Interest Expenses	236,177.00	102,413.22
	Less: Adjustment for Prior Period Expenses	6,372.00	0.00
	Less: Profit on Sale of Fixed Assets	6,181.00	0.00
	Operating Profit before working capital changes	1,700,020.15	655,133.09
	Movements in Working Capital:		
	Increase/Decrease in Trade Payables	-933,723.99	580,539.69
	Increase/Decrease in Receivables	-9,848,134.99	-1,687,039.91
	Increase/Decrease in Other Current Assets	494,841.02	-871,069.47
	Increase/Decrease in Long Term Loans and Advances	-37,812.00	-94,813.00
	Decrease/Increase in Short Term Loans and Advances	1,563,798.70	-175,997.95
	Increase/Decrease in Inventories	891,832.48	2,314,832.54
	Increase/Decrease in Current Liabilities	3,251,455.59	2,242,868.41
	Decrease in Short Term Provisions	-165,120.00	0.00
	Sub Total	-4,782,863.19	2,309,320.91
	Less: Income tax paid	-253,039.00	42,390.00
	Net cash from operating activities (A)	-3,335,882.04	2,922,064.00
B	CASH FLOWS FROM INVESTING ACTIVITIES		
	Purchase of Fixed Assets	-3,152,327.98	-187,007.72
	Sale of Fixed Assets	20,000.00	0.00
	Interest Received	0.00	0.00
	Net Cash from Investing Activities (B)	-3,132,327.98	-187,007.72
C	CASH FLOWS FROM FINANCING ACTIVITIES		
	Proceeds from Issuance of Share Capital	900,000.00	0.00
	Interest paid	-236,177.00	-102,413.22
	Increase/Decrease in Long Term Borrowings	3,379,979.53	-632,477.00
	Increase/Decrease in Cash Credit	0.00	0.00
	Increase/Decrease in long term Other loans and advances	0.00	0.00
	Net Cash from Financing Activities (C)	4,043,802.53	-734,890.22
D	Net Decrease in Cash & Cash Equivalents (A+B+C)	-2,424,407.49	2,000,166.06
	Opening Cash and Cash Equivalent	3,679,678.27	654,512.21
	Closing Cash and Cash Equivalent	1,255,270.78	2,654,678.27
E	Net Increase/Decrease in Cash and Cash Equivalents	-2,424,407.49	2,000,166.06

Note: The cash flow is prepared under indirect method as set out in Accounting Standards -3 whereby net profit is adjusted for the effects of transactions of a non-cash nature, any deferrals or accruals of past or future operating cash receipts and payments and items of income and expense associated with investing and financing cash flows.

FOR AND ON BEHALF OF THE BOARD OF DIRECTORS

TERANCE ALEX
MANAGING DIRECTOR
DIN: 06808744
TRIVANDRUM
29-Jun-19

JIMMY SILUVAYYAN
DIRECTOR
DIN: 06808773

As per our report of even date

For PHILIP & MATHEW
Chartered Accountants
Firm Regn. No. 0028465

K. GEORGE PHILIP
Partner
Membership No. 019928



29 JUN 2019

**SIGNIFICANT ACCOUNTING POLICIES AND NOTES
FORMING PART OF BALANCE SHEET AS AT 31st MARCH, 2019 AND
STATEMENT OF PROFIT AND LOSS FOR THE YEAR ENDED ON THAT DATE**

1 SIGNIFICANT ACCOUNTING POLICIES

- The following significant accounting policies have been adopted by the Company during the year:-
- Mercantile system of accounting is followed and revenue is recognized on accrual basis.
 - Depreciation is provided on Property, Plant and Equipment on written down value method at the rates prescribed in Schedule II of Companies Act, 2013.
 - No provision has been made in the accounts for Provident Fund, Employees State Insurance, Employees Gratuity and Bonus, as the relative provisions are not applicable to the Company.
 - Tax on income for the current period is determined on the basis of taxable income and tax credits computed in accordance with the provisions of Income Tax Act, 1961 and based on the expected outcome of assessments. Deferred tax is recognized on timing difference, in respect of depreciation on fixed assets, between the income accounted in financial statements and the taxable income for the year and quantified using the tax rates and laws enacted as on date of the Balance Sheet and in accordance with the Accounting Standard - 22 issued by the Council of the Institute of Chartered Accountants of India.
 - All assets and liabilities have been classified as current or non-current as per the Company's normal operating cycle and other criteria set out in the Schedule III to the Companies Act, 2013. Based on the nature of products of the Company and the time between the acquisition of assets for processing and their realisation in cash and cash equivalents, the Company has ascertained its operating cycle as 12 months for the purpose of current or non-current classification of assets and liabilities.
 - The financial statements have been prepared under the historical cost convention, in accordance with the generally accepted accounting principles and the provisions of the Companies Act, 2013 as consistently adopted by the Company.
 - Preliminary expenses are amortised annually at 10%.

22 NOTES TO BALANCE SHEET AND STATEMENT OF PROFIT AND LOSS**1 Share Capital**

- (a) The number and amount of shares authorized:

Number	Amount (Rs. Ps.)
100,000	1,000,000.00

Current Year	Previous Year
100,000	100,000
1,000,000.00	1,000,000.00

- (b) (1) The number of shares issued, subscribed and fully paid

Number	Amount (Rs. Ps.)
100,000	1,000,000.00

Current Year	Previous Year
100,000	100,000
1,000,000.00	1,000,000.00

- (2) The number of Equity Shares, issued & subscribed but not fully paid

Number	Amount (Rs. Ps.)
0	0

Current Year	Previous Year
0	0

- (c) Par value per Equity Share

Amount (Rs. Ps.)
10.00

Current Year	Previous Year
10.00	10.00

- (d) Reconciliation of shares:

Number of Equity Shares at the beginning of the period	Number of Equity Shares allotted as fully paid during the period	Number of Equity Shares at the end of the period
10,000	90,000	100,000

Current Year	Previous Year
10,000	10,000
90,000	0
100,000	10,000

- (e) The rights, preferences and restrictions attaching to each class of shares including restrictions on the distribution of dividends and the repayment of capital

Current Year	Previous Year
Nil	Nil

- (f) Shares in respect of each class in the Company held by its holding company or its ultimate holding company including shares held by or by subsidiaries or associates of the holding company or the ultimate holding company in aggregate

Current Year	Previous Year
0	0

- (g) Shares in the Company held by each shareholder holding more than 5 percent shares specifying the number of shares held:

1) Terence Alex	2) Jimmy Siluvayyan
99,000	1,000

Current Year	Previous Year
99,000	9,000
1,000	1,000

- (h) Shares reserved for issue under options and contracts/commitments for the sale of shares/disinvestment, including the terms and amounts

Current Year	Previous Year
0	0

- (i) For the period of five years immediately preceding the date as at which the Balance Sheet is prepared:

Aggregate number and class of shares allotted as fully paid up pursuant to contract(s) without payment being received in cash	Aggregate number and class of shares allotted as fully paid up by way of bonus shares	Aggregate number and class of shares bought back
0	0	0

Current Year	Previous Year
0	0
0	0
0	0

- (j) Terms of any securities convertible into equity/preference shares issued along with the earliest date of conversion in descending order starting from the farthest such date.

Current Year	Previous Year
Not Applicable	Not Applicable

- (k) Calls unpaid:-

Aggregate value of calls unpaid by Directors	Aggregate value of calls unpaid by other officers
0.00	0.00

Current Year	Previous Year
0.00	0.00
0.00	0.00

- (l) Forfeited shares (amount originally paid up)

Current Year	Previous Year
0.00	0.00

3 Reserves and Surplus

- Capital Reserves
- Capital Redemption Reserve
- Securities Premium
- Debt Redemption Reserve
- Revaluation Reserve
- Share Options Outstanding Account
- Other Reserves

Total

Current Year	Previous Year
0.00	0.00
0.00	0.00
0.00	0.00
0.00	0.00
0.00	0.00
0.00	0.00
0.00	0.00
0.00	0.00



(N) Surplus:		
Surplus:		
Profit brought forward	330,471.85	75,835.98
Add: Profit for the year	216,475.15	254,635.87
Less: Prior Period Income	0.00	0.00
Less: Prior Period Expenses	6,372.00	0.00
Amount available for appropriations	640,575.00	330,471.85
Less: Appropriations:-		
Transfer to General Reserve	0.00	0.00
Proposed Final Dividend on Equity Shares	0.00	0.00
Tax on Distributed Profits on Final Dividend	0.00	0.00
Total	640,575.00	330,471.85
3 Long-term borrowings		
(a) Loans receivable on demand:		
From Banks	2,246,009.00	0.00
From other parties	339,281.00	731,973.00
(b) Loans and advances from related parties:		
Unsecured	4,202,220.57	2,679,358.04
(c) Deposits	0.00	0.00
(d) Other loans and advances	0.00	0.00
Total	6,787,510.57	3,407,531.04
Loans guaranteed by Directors or others	339,281.00	731,973.00
Period and amount of default as on the		
Balance Sheet date:	0.00	0.00
In repayment of loan	6372.00	0.00
In payment of interest	0.00	0.00
4 Short-term borrowings	0.00	0.00
5 Trade Payables		
(A) Total outstanding dues of micro enterprises and small enterprises	0.00	0.00
(B) Total outstanding dues of creditors other than micro enterprises and small enterprises	9,079,743.58	10,604,467.87
Total	9,079,743.58	10,604,467.87
6 Other Current Liabilities		
TDS Payable	96,294.00	36,400.00
VAT Payable	30,107.37	30,107.37
Expenses Payable	1,361,634.55	769,873.00
Total	4,088,035.92	836,580.37
7 Short Term Provisions		
Provision for Tax	0.00	165,120.00
Total	0.00	165,120.00
8 Deferred Tax Asset (Net)		
(1) Deferred Tax Liability:		
In respect of Depreciation on Fixed Assets:		
At the beginning of the year	37,762.00	20,218.00
Addition / (deduction) for the year	0.00	0.00
Total	37,762.00	20,218.00
(2) Deferred Tax Asset	148,361.00	17,544.00
Deferred Tax Reversed	0.00	0.00
In respect of loss during the year	0.00	0.00
Net Deferred Tax Asset: (1) - (2)	188,123.00	37,762.00
10 Long-term loans and advances		
(Unsecured considered good)		
(a) Capital Advances	0.00	0.00
(b) Security Deposits	200,000.00	162,188.00
(c) Loans and advances to related parties	0.00	0.00
(d) Other loans and advances	0.00	0.00
Total	200,000.00	162,188.00
Advances due by Directors or other officers of the Company or		
any of them either severally or jointly with any other person	0.00	0.00
Debts due to firms or private companies respectively in which		
any Director is a partner or a director or a member	0.00	0.00
11 Other Non Current Assets	0.00	0.00
12 Trade Receivables		
(Unsecured considered good)		
Outstanding for a period exceeding six months	224,124.00	1,888,060.01
Other trade receivables	14,939,327.00	3,429,256.02
Total	15,163,451.00	5,317,316.01
Debts due by Directors or other officers of the Company or		
any of them either severally or jointly with any other person	0.00	605,678.01
Debts due to firms or private companies respectively in which		
any Director is a partner or a director or a member	0.00	0.00
13 Cash and cash equivalents		
(a) Balances with banks	1,241,341.31	3,863,559.27
(b) Cheques, drafts on hand	0.00	0.00
(c) Cash on hand	13,829.47	16,119.00
(d) Others	0.00	0.00
Total	1,255,270.78	3,679,678.27
Excluded balances with banks		
Balances with banks to the extent held as margin money or		
security against the borrowings, guarantees, other		
commitments	1,015,000.00	1,015,000.00
Repatriation restrictions, if any, in respect of cash and		
bank balances	0.00	0.00
Bank deposits with more than 12 months maturity	0.00	0.00



WATTSUN ENERGY INDIA PRIVATE LIMITED, TRIVANDRUM

NOTE B: PROPERTY, PLANT AND EQUIPMENT

Sl. No.	PARTICULARS	GROSS BLOCK			DEPRECIATION & AMORTISATION					NET BLOCK	
		Balance as on 1-Apr-18	Additions	Deductions / Adjustments	Balance as on 31-Mar-19	Balance as on 1-Apr-18	Depreciation / amortisation expense for the year	Deductions / Adjustments	Balance as on 31-Mar-19	Balance as on 31-Mar-18	
1	2	3	4	5	6	7	8	9	10	11	12
	TANGIBLE ASSETS										
	Motor Car	510,000.00	2,369,322.00	0.00	2,879,322.00	279,236.00	803,898.00	0.00	1,083,134.00	1,796,188.00	230,764.00
	Omni Van	30,000.00	783,005.98	15,000.00	798,005.98	2,355.00	180,141.00	1,181.00	181,315.00	616,690.98	27,645.00
	Fire Extinguisher	1,408.00	0.00	0.00	1,408.00	127.00	232.00	0.00	359.00	1,049.00	1,281.00
	Computer & Accessories	155,599.72	0.00	0.00	155,599.72	43,231.00	70,972.00	0.00	114,203.00	41,396.72	112,368.72
	Sub-total	697,007.72	3,152,327.98	15,000.00	3,834,335.70	324,949.00	1,055,243.00	1,181.00	1,379,011.00	2,455,324.70	372,058.72
	GRAND TOTAL	697,007.72	3,152,327.98	15,000.00	3,834,335.70	324,949.00	1,055,243.00	1,181.00	1,379,011.00	2,455,324.70	372,058.72
	Previous Year	510,000.00	187,007.72	0.00	697,007.72	174,441.00	150,508.00	*0.00	324,949.00	372,058.72	335,559.00





14 Short-term loans and advances (unsecured considered good)		
(a) Loans and advances to related parties	360,000.00	0.00
(b) Advance to Suppliers	62,301.65	1,986,100.35
Total	422,301.65	1,986,100.35
Advances due by Directors or other officers of the Company or any of them either severally or jointly with any other person		
Debts due by firms or private companies respectively in which any Director is a partner or a director or a member	360,000.00	0.00
	0.00	0.00
15 Other current assets		
(a) Unamortized Expenses:		
Preliminary Expenses:-		
Balance brought forward	7,275.00	14,551.00
Less: Amortized during the year	7,275.00	7,275.00
Balance	0.00	7,275.00
(b) Others:	463,578.98	1,061,375.00
(c) Income Tax Refund due	108,236.00	0.00
Total	573,809.98	1,068,650.00
16 Revenue from Operations		
(a) Sale of products	56,710,597.62	37,170,304.11
(b) Sale of services	453,831.00	0.00
(c) Other operating revenues	0.00	0.00
Sub total	57,172,428.62	37,170,304.11
Less:		
(d) Expense due	0.00	0.00
Balance	57,172,428.62	37,170,304.11
17 Other Income		
Other Income	22,889.33	0.00
Discounts	0.00	1,328.60
Profit on Sale of Vehicle	6,181.00	0.00
Interest Subsidy on KPC Loan	48,118.00	90,921.00
Interest Received	88,694.00	94,790.96
TOTAL	165,882.33	195,640.56
18 Changes in inventories of finished goods		
1) Opening Stock	2,222,417.48	4,537,250.02
2) Closing Stock	1,330,585.00	2,222,417.48
	-891,832.48	-2,314,832.54
19 Employee Benefits Expense		
(i) salaries and wages	8,033,862.65	4,236,719.30
(ii) contribution to provident and other funds	0.00	0.00
(iii) expense on Employee Stock Option Scheme (ESOP) - and Employee Stock Purchase Plan (ESPP)	0.00	0.00
(iv) staff welfare expenses	51,316.00	207,647.00
Total	8,085,178.65	4,444,366.30
20 Depreciation and Amortization Expenses		
(a) Depreciation of Tangible Assets	1,055,243.00	150,508.00
(b) Depreciation of Intangible Assets	0.00	0.00
(c) Amortisation of Expenses - Preliminary Expenses	7,275.00	7,275.00
Total	1,062,518.00	157,783.00
21 Other Expenses		
Accounting Charges	29,700.00	18,000.00
Advertisement	104,200.00	0.00
Arrest Registration and Affiliation Expenses	300,616.00	310,805.00
Arrest Tender Fee	0.00	12,000.00
Discounts	6,074,742.65	216,275.75
Rent	564,324.00	366,000.00
Sales Promotion Expenses	0.00	157,901.00
Marketing expenses	2,043,799.00	499,990.00
Interest and Bank Charges	145,307.44	102,413.22
Newspaper and Periodicals	1,680.00	7,980.00
Insurance	7,265.00	19,825.00
Internet and Telephones Charges	88,578.00	124,294.00
Electricity and Water charges	33,708.00	44,230.00
Membership Fee	45,550.00	0.00
Office Expenses	258,001.00	121,779.00
Printing and Stationery	195,605.50	72,519.30
Postage and Courier Charges	33,425.00	15,350.00
Rates and Taxes	14,123.00	22,515.00
Refreshment Expenses	4,619.00	0.00
Repairs and Maintenance	630,229.70	529,189.22
Workshop Expenses	2,305,692.50	1,407,335.00
Freight and Carriage	92,646.70	114,572.43
Travelling Expenses	1,066,765.79	564,464.00
Professional Fees	150,300.00	21,000.00
Filing Fee	19,900.00	800.00
Audit Fees	35,000.00	25,000.00
Miscellaneous Expenses	19,290.70	61,772.48
Total	14,421,968.08	4,826,906.40
22 Earnings per Share		
Profit after tax (Rs.)	(Numerator: A) 316,475.15	254,635.87
Weighted Average Number of Shares	(Denominator: B) 25,287	10,000
Basic/Diluted EPS (Rs.)	(A / B) 12.52	25.46
23 Contingent liabilities and commitments (to the extent not provided for)		
(i) Contingent liabilities:-		
(a) Claims against the company not acknowledged as debt	0.00	0.00
(b) Guarantees	675,000.00	675,000.00
(c) Other money for which the company is contingently liable	0.00	0.00
(ii) Commitments:-		
(a) Estimated amount of contracts remaining to be executed on capital account and not provided for	0.00	0.00
(b) Unpaid liability on shares and other investments partly paid	0.00	0.00
(c) Other commitments	0.00	0.00



24. Additional Information

- (i) (1) The amount of dividends proposed to be distributed to equity and preference shareholders for the period
- (2) The related amount per share
- (3) Arrears of fixed cumulative dividends on preference shares
- (ii) Where in respect of an issue of securities made for a specific purpose, the whole or part of the amount has not been used for the specific purpose at the balance-sheet date, there shall be indicated by way of note how such unutilized amounts have been used or invested.
- (iii) In the opinion of the Board, all of the assets other than fixed assets and non-current investments have a value on realization in the ordinary course of business at least equal to the amount at which they are stated in the Balance Sheet.
- (iv) Payments to the auditor as:-
- (a) auditor
- (b) for taxation matters
- (c) for company law matters
- (d) for management services
- (e) for other services
- (f) for reimbursement of expenses
- Total**
- (v) Details of items of exceptional and extraordinary nature
- (vi) Prior period items:-
- Prior period income
- Prior period expenditure
- (vii) Value of imports calculated on C.I.F. basis by the company during the financial year
- (viii) Expenditure in foreign currency during the financial year
- (ix) A. Total value of all imported raw materials, spare parts and components consumed during the financial year
- B. The total value of all indigenous raw materials, spare parts and components similarly consumed
- C. Percentage of each to the total consumption
- (x) The amount remitted during the year in foreign currencies on account of dividends
- (xi) Earnings in foreign exchange
- (xii) Transaction with the associates vide Accounting Standard 18 of ICAI:

	0.00	0.00
	0.00	0.00
	0.00	0.00
	0.00	0.00
Not Applicable	Not Applicable	Not Applicable
	35,000.00	25,000.00
	0.00	0.00
	0.00	0.00
	0.00	0.00
	0.00	0.00
	0.00	0.00
Total	35,000.00	25,000.00
	0.00	0.00
	0.00	0.00
	6372.00	0.00
	0.00	0.00
	0.00	0.00
	0.00	0.00
	0.00	0.00
	0.00	0.00
	0.00	0.00
	0.00	0.00
	0.00	0.00
	0.00	0.00

Sl. No.	Particulars	By Manager & Personnel	Relatives of Key Management Personnel	Total
1	Salary	840,000.00	0.00	840,000.00
2	Travelling Expenses	275,002.00	0.00	275,002.00
3	Unsecured Loan taken	3,764,638.00	0.00	3,764,638.00
4	Unsecured Loan returned	2,237,875.47	0.00	2,237,875.47
	Total	7,117,615.47	0.00	7,117,615.47

Name of Related Parties and Description of Relationship:

Key Management Personnel: Terence Alex (DIN: 06808744)
Jimmy Siluvayyan (DIN: 06808773)

Relatives of Key Management Personnel:

- (xiii) The input tax credit available to the Company under the Goods and Services Tax Act, 2017 is not fully claimed in the accounts of the Company due to the non-availability of relevant data with the Company and also reportedly due to the non-filing of the data by the concerned suppliers and service providers. The amount of purchases and the relevant expenditure are over-stated to the extent of such input tax credits and the amount so involved are not determined by the Company.
- (xiv) Dues to Micro, Small and Medium enterprises could not be identified as the Company did not put any notification to that effect.
- (xv) (a) The Fixed Deposit for Rs.3,50,000 with State Bank of India has a lien in favour of Kerala Financial Corporation towards security.
- (b) The Fixed Deposit for Rs.2,00,000 with State Bank of India has a lien in favour of The Director, ANERT towards security.
- (c) The Bank Guarantee for Rs.4,75,000 with State Bank of India has a lien in favour of ANERT towards security.
- (xvi) Balances of parties other than Banks are pending confirmation.
- (xvii) Since there are no dilutive options or other dilution potential equity shares of the Company, the basic and diluted Earnings Per Share of the Company are the same.
- (xviii) Previous year figures have been re-grouped or recast wherever necessary to suit current year's disclosure and lay out.

FOR AND ON BEHALF OF THE BOARD OF DIRECTORS

TERENCE ALEX
MANAGING DIRECTOR
DIN: 06808744
TRIVANDRUM
29-Jun-19JIMMY SILUVAYYAN
DIRECTOR
DIN: 06808773

As per our report of even date

For PHILIP & MATHEW
Chartered Accountants
Firm Regn. No. 002046SK. GEORGE PHILIP
Partner
Membership No. 019928

29 JUN 2019

Wattsun Energy India (P) Ltd
Balance Sheet as at 31st March 2020

Particulars	Note No.	As at	
		31.03.2020	31.03.2019
Equity and Liabilities			
Shareholders' funds			
Share Capital	1	10,00,000	10,00,000
Reserves and Surplus	2	7,88,446	6,40,575
Non current liabilities	3	83,72,906	67,87,511
Long term borrowings			
Current liabilities			
Short term borrowings	4	50,11,330	-
Trade payables	5	51,83,591	90,70,743
Other current liabilities	6	77,98,195	40,88,036
Total		2,81,54,468	2,15,86,865
Assets			
Non current Assets			
(a)Property Plant and Equipment'	7	25,18,676	24,55,325
(i)Tangible Assets			
(b) Deferred tax Assets(Net)	8	2,76,274	1,86,123
(c)Long term loans and advances	9	2,00,000	2,00,000
Current Assets			
(a)Inventories	10	2,97,689	13,30,585
(b) Trade receivables	11	2,10,99,116	1,51,63,451
(c)Cash and cash equivalents	12	33,42,529	12,55,271
(d) Short term loans and advances	13	77,124	4,22,301
(e)Other current assets		3,43,060	5,73,809
Total		2,81,54,468	2,15,86,865

For and on behalf of the Board

As per our report of even date


Terence Alex
Managing Director
DIN: 06808744


Jimmy Siluvayan
Director
DIN: 06808773



For J A K S & Associates
Chartered Accountants
FRN:0013605


Jose Zachariah, FCA
(Partner - M.No 080570)

UDIN:21080570AAAAAO3674

Place: Trivandrum
Date: 03/12/2020



WATTSUN ENERGY INDIA PRIVATE LIMITED, TRIVANDRUM
Statement of Profit or Loss for the year ended 31st March, 2020

Particulars	Note No.	31.03.2020	31.03.2019
Revenue from Operations	14	4,94,39,051	5,71,72,429
Other Income	15	1,88,782	1,65,882
Total Revenue		4,96,27,833	5,73,38,311
Expenses			
Materials purchased		2,96,89,449	3,23,83,872
Direct Expenses		46,256	70,179
Changes in inventories of finished goods work in progress and Stock in trade	16	10,32,896	8,91,832
Employee Benefits expense, Finance costs	17	47,66,720	80,87,189
Depreciation and amortization expense	18	8,42,700	10,62,518
Other Expenses	19	1,30,71,386	1,44,21,568
Total Expenses		4,94,49,407	5,69,17,158
Profit/(loss) Before exceptional and extraordinary items and tax		1,78,426	4,21,153
Exceptional and Extraordinary items		-	-
Profit/(loss) Before Tax		1,78,426	4,21,153
Tax Expense			
1.Current Tax		1,20,706	2,53,039
2.Deferred Tax		-90,151	-1,48,361
Profit/(loss) for the period from continuing operations		1,47,871	3,16,475
Profit/(loss) for the period from discontinued operations		-	-
Tax Expense of discontinuing operations		-	-
Profit/(loss) from discontinuing operations (After Tax)		1,47,871	3,16,475
Profit/(loss) for the period		1,47,871	3,16,475
Earning per equity share			
1.Basic	20	1	13
2.Diluted		1	13

For and on behalf of the Board

As per our report of even date


Terance Alex
Managing Director
DIN: 06808744


Jimmy Siluvayyan
Director
DIN: 06808773

For J A K S & Associates
Chartered Accountants
FRN:0013605

Jose Zachariah, FCA
(Partner - M.No 080570)
UDIN:21080570AAAAA03674



Place: Trivandrum
Date: 03/12/2020

WATTSUN ENERGY INDIA PRIVATE LIMITED, TRIVANDRUM

CASH FLOW STATEMENT FOR THE YEAR ENDED 31.03.2020

Particulars	2019-20	2018-19
CASH FLOW FROM OPERATING ACTIVITIES		
Net Profit Before Tax & Extraordinary Items		
Adjustments for:	1,78,425.71	4,21,153.15
Add: Depreciation and Amortization	8,42,699.54	10,55,243.00
Add: Adjustment for Interest Expenses	2,69,024.00	2,36,177.00
Less: Adjustment for prior period expenses	-	6,372.00
Less: Profit on Sale of Fixed Assets	-	6,181.00
Operating profit before working capital changes	12,90,149.25	17,00,020.15
Movements in Working Capital		
Increase/Decrease in Trade Payables	-38,87,152.18	-9,33,723.99
Increase/Decrease in Receivables	-59,35,664.62	-98,48,134.99
Increase/Decrease in Other Current Assets	2,30,748.98	4,94,841.02
Increase/Decrease in Long term loans and Advances	-	-37,812.00
Decrease/Increase in Short term Loans and Advances	3,45,177.65	15,63,798.70
Increase/Decrease in Inventories	10,32,896.00	8,91,832.48
Increase/Decrease in Current Liabilities	37,10,159.50	32,51,455.59
Decrease in Short Term Provisions	-	-1,65,120.00
SubTotal	-45,03,834.67	-47,82,863.19
Less: Income Tax Paid	1,20,706.00	-2,53,039.00
Net Cash from Operating Activities (A)	-33,34,391.42	-33,35,882.04
CASH FLOWS FROM INVESTING ACTIVITIES		
Purchase of Fixed Assets	-9,06,051.00	-31,52,327.98
Sale of Fixed Assets	-	20,000.00
Interest received	-	-
Net cash from Investing activities (B)	-9,06,051.00	-31,32,327.98
CASH FLOWS FROM FINANCING ACTIVITIES		
Proceeds from Issuance of Share Capital	-	9,00,000.00
Interest Paid	-2,69,024.00	-2,36,177.00
Increase/Decrease in Long Term Borrowings	15,85,395.00	33,79,979.53
Increase/Decrease in Short Term Borrowings	50,11,329.72	-
Net Cash from Financing Activities (C)	63,27,700.72	40,43,802.53
Net Increase/Decrease in Cash and Cash Equivalents(A+B+C)	20,87,258.30	-24,24,407.49
Opening Cash and Cash equivalent	12,55,270.78	36,79,678.27
Closing Cash and Cash equivalent	33,42,529.08	12,55,270.78
Net Increase/Decrease in Cash and Cash Equivalents	20,87,258.30	-24,24,407.49

Note: The cash flow is prepared under indirect method as set out in Accounting Standards -3 whereby net profit is adjusted for the effects of transactions of a non-cash nature, any deferrals or accruals of past or future operating cash receipts and payments and items of income and expense associated with investing and financing cash flows.

For and on behalf of the Board

As per our report of even date



Terance Alex
Managing Director
DIN: 06808744



Jimmy Siluvayyan
Director
DIN: 06808773



For J A K S & Associates
Chartered Accountants
FRN:0013605



Jose Zachariah, FCA
(Partner - M.No 080570)
UDIN:21080570AAAAAO3674

Place: Trivandrum

Date: 03/12/2020

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Notes to the Financial Statements for the year ended 31.03.2020

1. Share Capital

Particulars	Current Year	Previous Year
(a) The number and amount of shares authorized:		
Number	1,00,000	1,00,000
Amount (Rs.)	10,00,000	10,00,000
(b) The number of shares issued, subscribed and fully paid		
Number	1,00,000	1,00,000
Amount (Rs.)	10,00,000	10,00,000
Total	10,00,000	10,00,000

Reconciliation of shares outstanding	31.03.2020	31.03.2019
Opening balance	1,00,000	10,000
Additional issue	-	90,000
Closing balance	1,00,000	1,00,000

2. Reserves and Surplus

Particulars	31.03.2020	31.03.2019
Surplus:		
Profit Brought Forward	6,40,575	3,30,472
Add: Profit for the year	1,47,871	3,16,475
Less: Prior Period Expenses	-	6,372
Amount available for appropriations	7,88,446	6,40,575
Less: Appropriations		
Transfer to General reserve	-	-
Proposed final dividend on Equity Shares	-	-
Tax on Distributed profits on final dividend	-	-
Total	7,88,446	6,40,575

3. Long term borrowings

Particulars	31.03.2020	31.03.2019
Loans from banks	19,20,932	22,46,009
Loans from other parties	9,27,047	3,39,281
Loans and advances from related parties	55,24,927	42,02,221
Total	83,72,906	67,87,511

4. Short term borrowings

Particulars	31.03.2020	31.03.2019
Demand Loan	50,11,330	-
Total	50,11,330	-



5. Trade payables

Particulars	31.03.2020	31.03.2019
Total outstanding dues to micro enterprises and small enterprises	-	-
Total outstanding dues of other creditors	51,83,591	90,70,744
Total	51,83,591	90,70,744

6. Other current liabilities

Particulars	31.03.2020	31.03.2019
TDS Payable	77,783	96,294
VAT Payable	30,107	30,107
Expenses Payable	76,55,306	39,61,635
Audit Fee Payable	35,000	-
Total	77,98,195	40,88,036

8. Deferred Tax Asset(Net)

Particulars	31.03.2020	31.03.2019
Deferred Tax Liability in respect of depreciation of Fixed Assets	1,86,123	37,762
Additions/Deductions for the year	-	-
Deferred Tax Asset	90,151	1,48,361
Deferred Tax reversed	-	-
In respect of loss during the year	-	-
Net deferred tax asset	2,76,274	1,86,123

9. Long term loans and advances

Particulars	31.03.2020	31.03.2019
Capital Advances	-	-
Security Deposits	2,00,000	2,00,000
Loans and advances to related parties	-	-
Other loans and advances	-	-
Total	2,00,000	2,00,000



10. Trade Receivables

Particulars	31.03.2020	31.03.2019
Outstanding for a period exceeding 6 months		
Other trade receivables	-	2,24,124
Total	2,10,99,116	1,49,39,327
	2,10,99,116	1,51,63,451

11. Cash and Cash equivalents

Particulars	31.03.2020	31.03.2019
(a) Balance with banks	33,11,037	12,41,341
(b) Cash in hand	31,492	13,929
Total	33,42,529	12,55,271

12. Short term loans and advances

Particulars	31.03.2020	31.03.2019
Loans and advances to related parties	-	3,60,000
Advance to suppliers	77,124	62,302
Total	77,124	4,22,302

13. Other current assets

Particulars	31.03.2020	31.03.2019
Interest accrued	1,22,841	2,03,949
GST receivable	-	2,61,630
TDS receivable	1,11,989	-
Income tax refund due	1,08,230	1,08,230
Total	3,43,060	5,73,809



Notes to the Financial Statements for the year ended 31.03.2020

14. Revenue from operations

Particulars	31.03.2020	31.03.2019
(a) Sale of products	4,75,32,852	5,67,18,598
(b) Sale of services	19,06,199	4,53,831
Total	4,94,39,051	5,71,72,429

15. Other Income

Particulars	31.03.2020	31.03.2019
Other Income	73,907	22,889
Discounts	6,305	-
Profit on sale of vehicle	-	6,181
Interest subsidy on KFC loan	12,322	48,118
Interest received	96,248	88,694
Total	1,88,782	1,65,882

16. Changes in inventories of finished goods

Particulars	31.03.2020	31.03.2019
Opening stock	13,30,585	22,41,417
Closing stock	2,97,689	13,30,585
Change	-10,32,896	-8,91,832

17. Employee Benefits Expense

Particulars	31.03.2020	31.03.2019
Salaries and wages	46,84,524	80,35,863
Staff Welfare Expenses	82,196	51,326
Total	47,66,720	80,87,189

18. Depreciation and amortization expenses

Particulars	31.03.2020	31.03.2019
Depreciation of Tangible Assets	8,42,700	10,55,243
Amortisation of Expenses	-	7,277
Total	8,42,700	10,62,518



19. Other Expenses

Particulars	31.03.2020	31.03.2019
Accounting Charges	17,300	29,700
Advertisement	1,46,000	1,04,200
Anert Registration and Affiliation Expenses	11,85,724	3,00,616
Discounts	26,13,720	60,74,743
Rent	5,86,821	5,64,324
Marketing Expenses	20,48,528	20,43,299
Interest and Bank Charges	3,48,157	2,45,907
Newspaper and Periodicals	5,270	1,680
Insurance	60,545	7,265
Internet and telephone charges	58,857	88,578
Electricity and Water charges	82,454	33,708
Membership fee	-	45,550
Office Expenses	13,74,553	2,58,001
Printing and stationery	21,247	1,55,606
Postage and courier charges	5,088	33,425
Rates and taxes	42,620	14,123
Refreshment expenses	58,780	4,019
Repairs and maintenance	3,68,310	6,38,230
Worksite expenses	15,83,261	23,95,692
Freight and carriage	1,81,951	92,647
Travelling expenses	9,70,354	10,68,766
Professional fees	1,86,450	1,50,300
Filing fee	4,300	19,900
Audit fee	35,000	35,000
Miscellaneous expenses	12,956	16,290
Booting Material	1,29,137	-
Donation	1,30,700	-
Hotel Accomodation Expense	1,05,982	-
License Fee	6,90,312	-
Tender Fee Expenses	17,010	-
Total	1,30,71,386	1,44,21,568

20. Earnings per Share

Particulars	31.03.2020	31.03.2019
Profit after tax(Rs.)	1,47,871	3,16,475
Weighted average number of shares	1,00,000	25,287
Basic/Diluted EPS	1.48	12.52



21. Related Parties Disclosures

a. List of Related Parties and Relationship

Key Management Personnel (As per AS:18)

Terence Alex-Managing Director

Jimmy Siluvayyan-Director

b. Related Party transactions

Salary to Terence Alex

Salary to Jimmy Siluvayyan

Travelling Allowance

Unsecured Loan from Related parties

Unsecured Loan returned

2019-20

6,00,000

2,40,000

3,60,000

28,99,952

15,77,246

56,77,198

22.Impact of COVID-19

Following the global outbreak of Coronavirus (COVID-19) pandemic, lock-down restrictions were imposed by the Government during the last week of the financial year ended March 31, 2020. However, as per the assessment of the management, there has been no significant impact on the operations and financial position of the Company for the year due to the lock-down restrictions.

For and on behalf of the Board



Terance Alex
Managing Director
DIN: 06808744

Jimmy Siluvayyan
Director
DIN: 06808773

As per our report of even date

For J A K S & Associates
Chartered Accountants
FRN:001360S

Jose Zachariah, FCA
(Partner - M.No 080570)
UDIN:21080570AAAAA03674



Place: Trivandrum
Date: 03/12/2020

7. Property Plant and Equipment

7. Property Plant and Equipment										
Particulars	Gross Block				Depreciation/Amortisation			Net Block		
	Balance as on 01.04.2019	Additions	Deductions/ Adjustments	Balance as on 31.03.2020	Balance as on 01.04.2019	Depreciation/A mortisation expense for the year	Deduction s/Adjustm ents	Balance as on 31.03.2020	Bal as on 31.03.20	Bal as on 31.03.2019
Tangible Assets										
Motor Car	28,79,322.00	8,62,051.00	-	37,41,373.00	10,83,134.00	5,99,303.93	-	16,82,437.93	20,58,935.07	17,96,188.00
Omni Van	7,98,005.98	-	-	7,98,005.98	1,81,315.00	1,92,592.59	-	3,73,907.59	4,24,098.39	6,16,690.98
Bike	-	38,000.00	-	38,000.00	-	7,608.14	-	7,608.14	30,391.86	-
Mobile Phone	-	6,000.00	-	6,000.00	-	1,609.28	-	1,609.28	4,390.72	1,049.00
Fire Extinguisher	1,408.00	-	-	1,408.00	359.00	189.87	-	548.87	859.13	-
Computers and Accessories	1,55,599.72	-	-	1,55,599.72	1,14,203.00	41,395.72	-	1,55,598.72	1.00	41,396.72
Sub Total	38,34,335.70	9,06,051.00	-	47,40,386.70	13,79,011.00	8,42,699.54	-	22,21,710.54	25,18,676.16	24,55,324.70
Grand Total	38,34,335.70	9,06,051.00	-	47,40,386.70	13,79,011.00	8,42,699.54	-	22,21,710.54	25,18,676.16	24,55,324.70
Previous Year	6,97,007.72	31,52,327.97	15,000.00	38,34,335.70	3,24,949.00	10,55,243.00	1,181.00	13,79,011.00	24,55,324.70	3,72,58.72

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WATTSUN ENERGY INDIA PRIVATE LIMITED, TRIVANDRUM

(CIN: U40300KL2014PTC036294)

Balance Sheet as at 31st March 2021

Particulars	Note No.	As at 31.03.2021	31.03.2020
Equity and Liabilities			
Shareholders' funds			
Share Capital	2	10,00,000	10,00,000
Reserves and Surplus	3	8,94,508	7,88,446
Non current liabilities			
Long term borrowings	4	82,94,196	83,72,906
Current liabilities			
Short term borrowings	5	-	50,11,330
Trade payables	6	11,40,867	51,83,590
Other current liabilities	7	64,76,619	77,98,195
Total		1,78,06,189	2,81,54,468
Assets			
Non current Assets			
(a) Property Plant and Equipment	8		
(i) Tangible Assets		18,52,868	25,18,676
(b) Deferred tax Assets(Net)	9	3,41,941	2,76,274
(c) Long term loans and advances	10	26,16,252	2,00,000
Current Assets			
(a) Inventories		45,35,072	2,97,689
(b) Trade receivables	11	64,19,224	2,10,99,116
(c) Cash and cash equivalents	12	10,21,525	33,42,529
(d) Short term loans and advances	13	2,00,838	77,123
(e) Other current assets	14	8,18,469	3,43,060
Total		1,78,06,189	2,81,54,468

Significant Accounting Policies

1

For and on behalf of the Board

As per our report of even date

For J A K S & Associates
Chartered Accountants
FRN:001360S

Terance Alex
Managing Director
DIN: 06808744

Jimmy Siluvayyan
Director
DIN: 06808773

Jose Zachariah, FCA
(Partner - M.No 080570)

UDIN:22080570AAAAAX 2059

Place: Trivandrum

Date: 28-01-2022

WATTSUN ENERGY INDIA PRIVATE LIMITED, TRIVANDRUM
(CIN: U40300KL2014PTC036294)

Statement of Profit or Loss for the year ended 31st March, 2021

Particulars	Note No.	Year ended 31.03.2021	Year ended 31.03.2020
Revenue from Operations	15	2,14,21,919	4,94,39,051
Other Income	16	33,50,438	1,88,782
Total Revenue		2,67,72,357	4,96,27,833
Expenses			
Materials purchased		2,08,32,064	2,96,89,449
Direct Expenses			46,256
Changes in inventories of finished goods work in progress and Stock in trade	17	-42,37,383	10,32,896
Employee Benefits expense	18	46,47,971	47,66,720
Depreciation and amortization expense	19	8,30,557	8,42,700
Other Expenses	20	45,60,223	1,30,71,386
Total Expenses		2,66,33,431	4,94,49,407
 Profit/(loss) Before exceptional and extraordinary items and tax		 1,38,926	 1,78,426
Exceptional and Extraordinary items		-	-
Profit/(loss) Before Tax		1,38,926	1,78,426
Tax Expense			
1.Current Tax		98,531	1,20,706
2.Deferred Tax		-65,667	-90,151
 Profit/(Loss) for the period from continuing operations		 1,06,062	 1,47,871
Profit/(Loss) for the period from discontinuing operations		-	-
Tax Expense of discontinuing operations		-	-
Profit/(Loss) from discontinuing operations (After Tax)		-	-
Profit/(Loss) for the period		1,06,062	1,47,871
 Earning per equity share	21		
1.Basic		1	1
2.Diluted		1	1

For and on behalf of the Board


Terence Alex
Managing Director
DIN: 06808744


Jimmy Jiluvayyan
Director
DIN: 06016773

Place: Trivandrum
Date: 28-01-2022

As per our report of even date

For J A K S & Associates
Chartered Accountants
FRN:001360S


Jose Zachariah, FCA
(Partner - M.No 080570)

UDIN: 22080570AAAAAX2059



WATTSUN ENERGY INDIA PRIVATE LIMITED, TRIVANDRUM

CASH FLOW STATEMENT FOR THE YEAR ENDED 31.03.2021

Particulars	2020-21	2019-20
CASH FLOW FROM OPERATING ACTIVITIES		
Net Profit Before Tax & Extraordinary Items	1,38,925.97	1,78,425.71
Adjustments for:		
Add: Depreciation and Amortization	8,30,557.46	8,42,699.54
Add: Adjustment for Interest Expenses	4,32,050.87	2,69,024.00
Less: Adjustment for prior period expenses		-
Less: Profit on Sale of Fixed Assets		-
Less: Interest income	1,49,972.00	
Operating profit before working capital changes	12,51,562.30	12,90,149.25
Movements in Working Capital		
Increase/Decrease in Trade Payables	-40,42,724.86	-38,87,152.18
Increase/Decrease in Receivables	1,46,79,891.19	-59,35,664.62
Increase/Decrease in Other Current Assets	-4,75,409.47	2,30,748.98
Increase/Decrease in Long term loans and Advances	-24,16,252.00	
Decrease/Increase in Short term Loans and Advances	-1,23,713.53	3,45,177.65
Increase/Decrease in Inventories	-42,37,382.98	10,32,896.00
Increase/Decrease in Current Liabilities	-13,21,576.37	37,10,159.50
Decrease in Short Term Provisions		
Sub Total	20,62,831.98	-45,03,634.67
Less: Income Tax Paid	98,531.00	1,20,706.00
Net Cash from Operating Activities (A)	32,15,863.28	-33,34,391.42
CASH FLOWS FROM INVESTING ACTIVITIES		
Purchase of Fixed Assets	-1,64,749.00	-9,06,051.00
Sale of Fixed Assets		
Interest received	1,49,972.00	
Net cash from Investing activities (B)	-14,777.00	-9,06,051.00
CASH FLOWS FROM FINANCING ACTIVITIES		
Interest Paid	-4,32,050.87	-2,69,024.00
Increase/Decrease in Long Term Borrowings	-78,710.05	15,85,395.00
Increase/Decrease in Short Term Borrowings	-50,11,329.72	50,11,329.72
Net Cash from Financing Activities (C)	-55,22,090.64	63,27,700.72
Net Increase/Decrease in Cash and Cash Equivalents (A+B+C)	-23,21,004.36	20,87,258.30
Opening Cash and Cash equivalent	33,42,529.08	12,55,270.78
Closing Cash and Cash equivalent	10,21,524.72	33,42,529.08
Net Increase/Decrease in Cash and Cash Equivalents	-23,21,004.36	20,87,258.30

Note: The cash flow is prepared under indirect method as set out in Accounting Standards -3 whereby net profit is adjusted for the effects of transactions of a non-cash nature, any deferrals or accruals of past or future operating cash receipts and payments and items of income and expense associated with investing and financing cash flows.

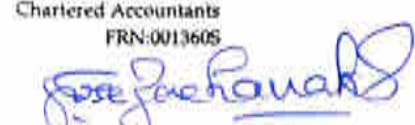
For and on behalf of the Board


Terence Alex
Managing Director
DIN: 06808744


Jimmy B. Divayyan
Director
DIN: 06808773

As per our report of even date

For J A K S & Associates
Chartered Accountants
FRN: 0013605


Jose Zachariah, FCA
(Partner - M.No 080570)

UDIN: 22080570AAAAAX2059

Place: Trivandrum
Date: 28-01-2022

2. Share Capital

	Particulars	Current Year	Previous Year
(a) The number and amount of shares authorized:			
	Number	1,00,000	1,00,000
	Amount (Rs.)	10,00,000	10,00,000
(b) The number of shares issued, subscribed and fully paid			
	Number	1,00,000	1,00,000
	Amount (Rs.)	10,00,000	10,00,000
Total		10,00,000	10,00,000

Reconciliation of shares outstanding	31.03.2021	31.03.2020
Opening balance	1,00,000	10,000
Additional issue	-	90,000
Closing balance	1,00,000	1,00,000

3. Reserves and Surplus

Particulars	31.03.2021	31.03.2020
Surplus:		
Profit Brought Forward	7,88,446	6,40,575
Add: Profit for the year	1,06,062	1,47,871
Less: Prior Period Expenses	-	-
Amount available for appropriations	8,94,508	7,88,446
Less: Appropriations	-	-
Transfer to General reserve	-	-
Proposed final dividend on Equity Shares	-	-
Tax on Distributed profits on final dividend	-	-
Total	8,94,508	7,88,446

4. Long term borrowings

Particulars	31.03.2021	31.03.2020
Loans from banks	15,59,559	19,20,932
Loans from other parties	7,63,211	9,27,047
Loans and advances from related parties	59,71,426	55,24,927
Total	82,94,196	83,72,906

5. Short term borrowings

Particulars	31.03.2021	31.03.2020
Demand Loan	-	50,11,330
Total	-	50,11,330

6. Trade payables

Particulars	31.03.2021	31.03.2020
Total outstanding dues to micro enterprises and small enterprises	-	-
Total outstanding dues of other creditors	11,40,867	51,83,591
Total	11,40,867	51,83,591



7. Other current liabilities

Particulars	31.03.2021	31.03.2020
TDS Payable	25,646	77,783
VAT Payable	-	30,107
Expenses Payable	46,39,442	76,55,306
Statutory Liabilities Payable	66,651	-
Advance from Customers	17,09,880	-
Audit Fee Payable	35,000	35,000
Total	64,76,619	77,98,195

9. Deferred Tax Asset(Net)

Particulars	31.03.2021	31.03.2020
Deferred Tax Liability in respect of depreciation of Fixed Assets at the beginning of the year	2,76,274	1,86,123
Additions/Deductions for the year	-	-
Deferred Tax Asset	65,667	90,151
Deferred Tax reversed	-	-
In respect of loss during the year	-	-
Net deferred tax asset	3,41,941	2,76,274

10. Long term loans and advances

Particulars	31.03.2021	31.03.2020
Capital Advances	26,16,252	2,00,000
Security Deposits	-	-
Loans and advances to related parties	-	-
Other loans and advances	-	-
Total	26,16,252	2,00,000

11. Trade Receivables

Particulars	31.03.2021	31.03.2020
Outstanding for a period exceeding 6 months	-	-
Other trade receivables	64,19,224	2,10,99,116
Total	64,19,224	2,10,99,116



12. Cash and Cash equivalents

Particulars	31.03.2021	31.03.2020
(a) Balance with banks	9,77,191	33,11,037
(b) Cash in hand	44,334	31,492
Total	10,21,525	33,42,529

13. Short term loans and advances

Particulars	31.03.2021	31.03.2020
Loans and advances to related parties	1,000	-
Advance for Expenses	20,102	-
Advance to suppliers	1,79,736	77,124
Total	2,00,838	77,124

14. Other current assets

Particulars	31.03.2021	31.03.2020
Interest accrued	1,95,233	1,22,841
GST receivable	2,44,972	-
TDS receivable	2,46,435	1,11,989
Income tax refund due	1,08,230	1,08,230
Other Receivables	23,600	-
Total	8,18,469	3,43,060



A. Property Plant and Equipment

Particulars	Gross Block				Depreciation/Amortisation				Net Block	
	Balance as on 01.04.2020	Additions	Deductions/ Adjustments	Balance as on 31.3.2021	Balance as on 01.04.2020	Depreciation/Amo- rtisation expense for the year	Deductions/Adju- stments	Balance as on 31.3.2021	Bal as on 31.3.2021	Bal as on 31.03.2020
Tangible Assets										
Motor Car	37,41,371.00	-	-	37,41,371.00	16,82,437.93	6,41,005.42	-	23,23,443.35	14,15,929.65	20,58,935.07
Omni Van	7,99,005.98	-	-	7,99,005.98	3,73,937.59	1,32,445.50	-	5,06,263.52	2,91,652.46	4,24,098.39
Bike	38,000.00	-	-	38,000.00	7,608.14	9,491.38	-	17,099.52	20,900.48	30,291.86
Mobile Phone	6,000.00	50,749.00	-	64,749.00	1,609.28	15,118.51	-	16,719.79	48,029.21	4,190.72
Fire Extinguisher	1,400.00	-	-	1,400.00	548.87	105.50	-	704.37	701.63	859.13
Computers and Accessories	1,50,599.72	-	-	1,50,599.72	1,55,590.72	-	-	1,55,595.72	1.00	1.00
Air Conditioner	-	1,06,000.00	-	1,06,000.00	-	30,348.72	-	30,348.72	75,651.28	-
Sub Total	47,40,386.70	1,64,749.00	-	49,05,135.70	22,21,710.53	8,30,557.46	-	30,51,267.99	18,52,667.71	25,18,676.17
Grand Total	47,40,386.70	1,64,749.00	-	49,05,135.70	22,21,710.53	8,30,557.46	-	30,51,267.99	18,52,667.71	25,18,676.17
Previous Year	38,34,335.70	9,16,051.00	-	47,40,386.70	13,79,011.00	8,42,699.54	-	22,21,710.54	25,18,676.17	24,55,234.70



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Notes to the Financial Statements for the year ended 31.03.2021

15. Revenue from operations

Particulars	31.03.2021	31.03.2020
(a) Sale of products	2,14,21,919	4,75,32,852
(b) Sale of services		19,06,199
Total	2,14,21,919	4,94,39,051

16. Other Income

Particulars	31.03.2021	31.03.2020
Other Income	1,15,993	73,907
Discounts	4,412	6,305
Interest subsidy on KFC Loan	-	12,322
Interest received	1,49,972	96,248
Unclaimed Discount	22,21,428	-
Unclaimed liabilities	28,58,633	-
Total	53,50,438	1,88,782

17. Changes in inventories of finished goods

Particulars	31.03.2021	31.03.2020
Opening stock	2,97,689	13,30,585
Closing stock	45,35,072	2,97,689
Change	42,37,383	-10,32,896

18. Employee Benefits Expense

Particulars	31.03.2021	31.03.2020
Salaries and wages	45,46,135	46,84,524
Staff Welfare Expenses	1,01,835	82,196
Total	46,47,971	47,66,720

19. Depreciation and amortization expenses

Particulars	31.03.2021	31.03.2020
Depreciation of Tangible Assets	8,30,557	8,42,700
Total	8,30,557	8,42,700



20. Other Expenses

Particulars	31.03.2021	31.03.2020
Accounting Charges	-	17,300
Advertisement	1,00,153	1,46,000
Anert Registration and Affiliation Expenses	2,910	11,85,724
Discounts	5,165	26,13,720
Rent	5,97,501	5,86,821
Marketing Expenses	2,60,016	20,48,528
Interest and Bank Charges	5,00,132	3,48,157
Newspaper and Periodicals	5,934	5,270
Insurance	34,674	60,545
Internet and telephone charges	74,452	58,857
Electricity and Water charges	37,172	82,454
Office Expenses	6,71,781	13,74,553
Printing and stationery	45,748	21,247
Postage and courier charges	10,142	5,088
Rates and taxes	1,21,846	42,620
Refreshment expenses	17,408	58,780
Repairs and maintenance	1,70,026	3,68,310
Worksite expenses	4,10,036	15,83,261
Freight and carriage	43,294	1,81,951
Travelling expenses	8,59,959	9,70,354
Professional fees	1,20,730	1,86,450
Filing fee	650	4,300
Audit fee	35,000	35,000
Miscellaneous expenses	25,784	12,956
Booting Material	-	1,29,137
Donation	6,050	1,30,700
Hotel Accomodation Expense	-	1,05,982
License Fee	3,32,209	6,90,312
Tender Fee Expenses	71,450	17,010
Total	45,60,223	1,30,71,386



21. Earnings per Share

Particulars	31.03.2021	31.03.2020
Profit after tax(Rs.)	1,06,062	1,47,871
Weighted average number of shares	1,00,000	1,00,000
Basic/Diluted EPS	1.06	1.48

22. Related Parties Disclosures

a. List of Related Parties and Relationship
Key Management Personnel (As per AS:18)
Terence Alex-Managing Director
Jimmy Siluvayyan-Director

b. Related Party transactions
Salary to Terence Alex
Salary to Jimmy Siluvayyan
Unsecured Loan from Related parties
Unsecured Loan returned

	2020-21	2019-20
Salary to Terence Alex	6,00,000	6,00,000
Salary to Jimmy Siluvayyan	3,00,000	2,40,000
Unsecured Loan from Related parties	50,49,130	28,99,952
Unsecured Loan returned	24,00,692	15,77,246
	83,49,822	56,77,198

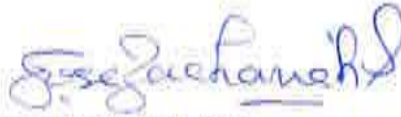
For and on behalf of the Board

As per our report of even date

For J A K S & Associates
Chartered Accountants
FRN:0013605


Terance Alex
Managing Director
DIN: 06808744


Jimmy Siluvayyan
Director
DIN: 06808773


Jose Zachariah, FCA
(Partner - M.No 080570)

Place: Trivandrum
Date : 28-01-2022



WATTSUN ENERGY INDIA PRIVATE LIMITED, TRIVANDRUM
TC:36/38(1), Aiswarya Tower (First Floor) Chackai Trivandrum
(CIN: U40300KL2014PTC036294)
Balance Sheet as at 31st March 2022

Particulars	Note No.	As at 31.03.2022	31.03.2021
EQUITY & LIABILITIES			
Shareholders' funds			
Share Capital	2	10,00,000	10,00,000
Reserves and Surplus	3	9,87,357	8,94,508
Non current liabilities			
Long term borrowings	4	90,10,955	82,94,196
Current liabilities			
Short term borrowings	5	37,26,172	
Trade payables	6	27,93,658	11,40,867
Other current liabilities	7	2,08,29,856	64,76,619
Total		3,83,47,998	1,78,06,189
ASSETS			
Non current Assets			
(a)Property Plant and Equipment & Intangible Assets			
(i)Property Plant and Equipment	8	34,24,852	18,52,868
(b) Deferred tax Assets(Net)	9	3,26,943	3,41,941
(c)Long term loans and advances	10	35,56,457	26,16,252
Current Assets			
(a) Inventories		42,13,303	45,35,072
(b) Trade receivables	11	2,32,31,095	64,19,224
(c) Cash and cash equivalents	12	18,57,316	10,21,525
(d) Short term loans and advances	13	8,00,639	2,00,838
(e) Other current assets	14	9,37,394	8,18,469
Total		3,83,47,998	1,78,06,189

Significant Accounting Policies

1

For and on behalf of the Board

As per our report of even date



Terance Alex
Managing Director
DIN: 06808744



Jimmy Siluvayyan
Director
DIN: 06808773

For J A K S & Associates
Chartered Accountants
FRN:001360S



Jose Zachariah, FCA
(Partner - M.No 080570)
UDIN: 22080570BBPOVC3629

Place: Trivandrum
Date : 31-10-2022



WATTSUN ENERGY INDIA PRIVATE LIMITED
TC:36/38(1), Aiswarya Tower (First Floor) Chackai Trivandrum
(CIN: U40300KL2014PTC036294)

Statement of Profit or Loss for the year ended 31st March, 2022

		(In ₹)	
Particulars	Note No.	Year ended 31.03.2022	Year ended 31.03.2021
Revenue from Operations	15	6,28,49,293	2,14,21,919
Other Income	16	40,08,214	53,50,438
Total Revenue		6,68,57,506	2,67,72,357
Expenses			
Materials purchased		4,97,83,270	2,08,32,064
Direct Expenses			
Changes in inventories of finished goods work in progress and			
Stock in trade	17	3,21,769	(42,37,383)
Employee Benefits expense	18	59,06,113	46,47,971
Finance Charges	19	3,67,642	2,20,543
Depreciation and amortization expense	20	7,43,040	8,30,557
Other Expenses	21	95,22,569	43,39,680
Total Expenses		6,66,44,404	2,66,33,431
Profit/(loss) Before exceptional and extraordinary items and tax		2,13,103	1,38,926
Exceptional and Extraordinary items			
Profit/(loss) Before Tax		2,13,103	1,38,926
Tax Expense			
1.Current Tax		1,05,255	98,531
2.Deferred Tax		14,998	(65,667)
Profit/(Loss) for the period from continuing operations		92,849	1,06,062
Profit/(Loss) for the period from discontinuing operations		-	-
Tax Expense of discontinuing operations		-	-
Profit/(Loss) from discontinuing operations (After Tax)		-	-
Profit/(Loss) for the period		92,849	1,06,062
Earning per equity share	22		
1.Basic		0.93	1.06
2.Diluted		0.93	1.06

For and on behalf of the Board



Terance Alex
Managing Director
DIN: 06808744

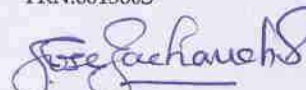


Jimmy Siluvayyan
Director
DIN: 06808773

Place: Trivandrum
Date : 31-10-2022

As per our report of even date

For J A K S & Associates
Chartered Accountants
FRN:001360S



Jose Zachariah. FCA
(Partner - M.No 080570)
UDIN: 22080570BBPOVC3629



WATTSUN ENERGY INDIA PRIVATE LIMITED
TC:36/38(1), Aiswarya Tower (First Floor) Chackai Trivandrum
(CIN: U40300KL2014PTC036294)
CASH FLOW STATEMENT FOR THE YEAR ENDED 31.03.2022

Particulars	2021-22	2020-21
CASH FLOW FROM OPERATING ACTIVITIES		
Net Profit Before Tax & Extraordinary Items	2,13,103	1,38,926
Adjustments for:		
Add: Depreciation and Amortization	7,43,040	8,30,557
Add: Adjustment for Interest Expenses	3,67,642	4,32,051
Less: interest income	1,47,191	1,49,972
Operating profit before working capital changes	11,76,594	12,51,562
Movements in Working Capital		
Increase/Decrease in Trade Payables	16,52,791	(40,42,725)
Increase/Decrease in Receivables	(1,68,11,871)	1,46,79,891
Increase/Decrease in Other Current Assets	(1,18,924)	(4,75,409)
Increase/Decrease in Long term loans and Advances	(9,40,205)	(24,16,252)
Decrease/Increase in Short term Loans and Advances	(5,99,801)	(1,23,714)
Increase/Decrease in Inventories	3,21,769	(42,37,383)
Increase/Decrease in Current Liabilities	1,43,53,237	(13,21,576)
SubTotal	(21,43,004)	20,62,832
Less: Income Tax Paid	1,05,255	98,531
Net Cash from Operating Activities (A)	(10,71,665)	32,15,863
CASH FLOWS FROM INVESTING ACTIVITIES		
Purchase of Fixed Assets	(23,15,024)	(1,64,749)
Sale of Fixed Assets		
Interest received	1,47,191	1,49,972
Net cash from Investing activities (B)	(21,67,833)	(14,777)
CASH FLOWS FROM FINANCING ACTIVITIES		
Interest Paid	(3,67,642)	(4,32,051)
Increase/Decrease in Long Term Borrowings	7,16,759	(78,710)
Increase/Decrease in Short Term Borrowings	37,26,172	(50,11,330)
Net Cash from Financing Activities (C)	40,75,289	(55,22,091)
Net Increase/Decrease in Cash and Cash Equivalents(A+B+C)	8,35,791	(23,21,004)
Opening Cash and Cash equivalent	10,21,525	33,42,529
Closing Cash and Cash equivalent	18,57,316	10,21,525
Net Increase/Decrease in Cash and Cash Equivalents	8,35,791	(23,21,004)

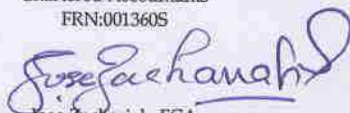
Note: The cash flow is prepared under indirect method as set out in Accounting Standards -3 whereby net profit is adjusted for the effects of transactions of a non-cash nature, any deferrals or accruals of past or future operating cash receipts and payments and items of income and expense associated with investing and financing cash flows.

For and on behalf of the Board


Terance Alex
Managing Director
DIN: 06808744


Jimmy Siluyayyan
Director
DIN: 06808773

As per our report of even date

For J A K S & Associates
Chartered Accountants
FRN:001360S

Jose Zachariah, FCA
(Partner - M.No 080570)
UDIN: 22080570BEPOVC3629

Place: Trivandrum
Date : 31-10-2022



Notes to the Financial Statements as at 31.03.2022

2. Share Capital

Particulars	Current Year	Previous Year
(a) The number and amount of shares authorized:		
Number	1,00,000	1,00,000
Amount (Rs.)	10,00,000	10,00,000
(b) The number of shares issued, subscribed and fully paid		
Number	1,00,000	1,00,000
Amount (Rs.)	10,00,000	10,00,000
Total	10,00,000	10,00,000

Reconciliation of shares outstanding	31.03.2022	31.03.2021
Opening balance	1,00,000	1,00,000
Additional issue	-	-
Closing balance	1,00,000	1,00,000

3. Reserves and Surplus

Particulars	31.03.2022	31.03.2021
Surplus:		
Profit Brought Forward	8,94,508	7,88,446
Add: Profit for the year	92,849	1,06,062
Less: Prior Period Expenses		-
Amount available for appropriations	9,87,357	8,94,508
Less: Appropriations		
Transfer to General reserve		
Proposed final dividend on Equity Shares		
Tax on Distributed profits on final dividend		
Total	9,87,357	8,94,508

4. Long term borrowings

Particulars	31.03.2022	31.03.2021
Loans from banks	36,98,127	15,59,559
Loans from other parties	-	7,63,211
Loans and advances from related parties	53,12,828	59,71,426
Total	90,10,955	82,94,196

5. Short term borrowings

Particulars	31.03.2022	31.03.2021
Bank Overdraft	37,26,172	-
Total	37,26,172	-

6. Trade Payable

Particulars	31.03.2022	31.03.2021
Total outstanding dues to micro enterprises and small enterprises	-	-
Total outstanding dues of other creditors	27,93,658	11,40,867
Total	27,93,658	11,40,867



7. Other current liabilities

Particulars	31.03.2022	31.03.2021
TDS Payable	21,864	25,646
Expenses Payable	43,96,792	46,39,442
Statutory Liabilities Payable	92,847	66,651
Advance from Customers	1,61,91,352	17,09,880
Audit Fee Payable	50,000	35,000
Other Payables	77,000	-
Total	2,08,29,855	64,76,619

9. Deferred Tax Asset(Net)

Particulars	31.03.2022	31.03.2021
Deferred Tax Liability in respect of depreciation of Fixed Assets at the beginning of the year	3,41,941	2,76,274
Additions/Deductions for the year	-	-
Deferred Tax Asset	-14,998	65,667
Net deferred tax asset	3,26,943	3,41,941

10. Long term loans and advances

Particulars	31.03.2022	31.03.2021
Security Deposits	35,56,457	26,16,252
Total	35,56,457	26,16,252

11. Trade Receivables

Particulars	31.03.2022	31.03.2021
Outstanding for a period exceeding 6 months	-	-
Other trade receivables	2,32,31,095	64,19,224
Total	2,32,31,095	64,19,224

12. Cash and Cash equivalents

Particulars	31.03.2022	31.03.2021
(a) Balance with banks	17,32,684	9,77,191
(b) Cash in hand	1,24,632	44,334
Total	18,57,316	10,21,525

13. Short term loans and advances

Particulars	31.03.2022	31.03.2021
Loans and advances	33,000	1,000
Advance for Expenses	2,24,351	20,102
Advance to suppliers	5,43,288	1,79,736
Total	8,00,639	2,00,838

14. Other current assets

Particulars	31.03.2022	31.03.2021
Interest accrued	2,97,969	1,95,233
GST receivable	2,85,590	2,44,972
Income Tax Refund due	3,30,234	3,54,665
Other Receivables	23,600	23,600
Total	9,37,394	8,18,469



8. Property Plant and Equipment

Particulars	Gross Block			Depreciation/Amortisation			Net Block			
	Balance as on 01.04.2021	Additions	Deductions/ Adjustments	Balance as on 31.3.2022	Balance as on 01.04.2021	Depreciation/A mortisation expense for the year	Deductions/A djustments	Balance as on 31.3.2022	Bal as on 31.3.2022	Bal as on 31.03.2021
Property, Plant & Equipment										
Motor Car	37,41,373	15,53,833.97	-	52,95,207	23,25,443	5,39,237.35	-	28,64,681	24,30,526	14,15,930
Motor Van	-	6,67,736.50	-	6,67,737	-	17,711.12	-	17,711	6,50,025	-
Omni Van	7,98,006	-	-	7,98,006	5,06,354	91,083.06	-	5,97,437	2,00,569	2,91,652
Bike	38,000	-	-	38,000	17,100	6,527.22	-	23,627	14,373	20,900
Mobile Phone	64,749	10,402.88	-	75,152	16,720	32,525.43	-	49,245	25,907	48,029
Fire Extinguisher	1,408	-	-	1,408	704	127.36	-	832	576	704
Computers and Accessories	1,55,600	19,491.52	-	1,75,091	1,55,599	1,720.10	-	1,57,319	17,772	1
Air Conditioner	1,06,000	-	-	1,06,000	30,349	23,625.90	-	53,975	52,025	75,651
Furniture	-	63,559.30	-	63,559	-	30,482.63	-	30,483	33,077	-
Sub Total	49,05,136	23,15,024	-	72,20,160	30,52,268	7,43,040	-	37,95,308	34,24,852	18,52,868
Grand Total	49,05,136	23,15,024	-	72,20,160	30,52,268	7,43,040	-	37,95,308	34,24,852	18,52,868
Previous Year	47,40,387	1,67,749	-	49,08,136	22,21,711	8,30,591	-	30,52,301	18,55,834	25,18,676



Notes to the Financial Statements for the year ended 31.03.2022

15. Revenue from operations

Particulars	31.03.2022	31.03.2021
(a) Sale of products	4,22,88,827	1,55,31,814
(b) Sale of services	2,05,60,466	58,90,160
Total	6,28,49,293	2,14,21,919

16. Other Income

Particulars	31.03.2022	31.03.2021
Subsidy Received	38,03,179	1,15,993
Discounts	22,593	4,412
Interest received	1,47,191	1,49,972
Unclaimed Discount	-	22,21,428
Tender Fee (Prior Period Income)	35,250	-
Unclaimed liabilities	-	28,58,633
Total	40,08,214	53,50,438

17. Changes in inventories of finished goods

Particulars	31.03.2022	31.03.2021
Opening stock	45,35,072	2,97,689
Closing stock	42,13,303	45,35,072
Change	3,21,769	42,37,383

18. Employee Benefits Expense

Particulars	31.03.2022	31.03.2021
Salaries and wages	50,52,050	45,46,135
Staff Welfare Expenses	8,54,064	1,01,835
Total	59,06,113	46,47,971

19. Finance Charges

Particulars	31.03.2022	31.03.2021
ICICI Bank OD Interest	1,58,325	-
Interest Loan 663	17,091	26,880
Interest on Bolero Loan-00389	5,686	1,16,839
Interest On EECO Loan-01307	1,789	-
Interest on Federal Bank EECO-1299	1,789	-
Interest on Loan 606	93,706	-
Interest on Toyota Finance	61,447	76,824
Interet on Loan EECO 117	27,809	-
Total	3,67,642	2,20,543

20. Depreciation and amortization expenses

Particulars	31.03.2022	31.03.2021
Depreciation of Tangible Assets	7,43,040	8,30,557
Total	7,43,040	8,30,557



21. Other Expenses

Particulars	31.03.2022	31.03.2021
Advertisement	1,10,281	1,00,153
Anert Registration and Affiliation Expenses	59,059	2,910
Discounts	1,57,250	5,165
Rent	8,91,105	5,97,501
Marketing Expenses	1,22,858	2,60,016
Fabrication Expenses	21,92,380	-
Bank Charges	59,852	2,78,960
Newspaper and Periodicals	4,410	5,934
Insurance	45,637	34,674
Internet and telephone charges	76,803	74,452
Electricity and Water charges	36,112	37,172
Office Expenses	14,56,506	6,71,781
Printing and stationery	2,98,772	45,748
Postage and courier charges	17,278	10,142
Rates and taxes	-	62,841
Refreshment expenses	1,00,335	17,408
Repairs and maintenance	1,66,558	1,70,026
Worksite expenses	15,25,905	4,10,036
Freight and carriage	1,98,729	43,294
Travelling expenses	13,96,290	8,59,959
Professional fees	1,88,321	1,29,080
Filing fee	-	650
Audit fee	50,000	35,000
Miscellaneous expenses	8,466	25,784
Donation	1,500	6,050
License Fee	24,194	3,32,209
Tender Fee Expenses	5,970	71,450
Sub Contract Charges	3,28,000	-
Total	95,22,569	42,88,395

22. Earnings per Share

Particulars	31.03.2022	31.03.2021
Profit after tax(Rs.)	92,849	1,06,062
Weighted average number of shares	1,00,000	1,00,000
Basic/Diluted EPS	0.93	1.06

Related Parties Disclosures**a. List of Related Parties and Relationship****Key Management Personnel (As per AS:18)**

Terence Alex-Managing Director

Jimmy Siluvayyan-Director

b. Related Party transactions

	2021-22	2020-21
Salary to Terence Alex	6,00,000	6,00,000
Salary to Jimmy Siluvayyan	3,00,000	3,00,000
Unsecured Loan from Related parties	50,12,373	50,49,130
Unsecured Loan returned	2,25,000	24,00,692
	61,37,373	83,49,822



23 : Additional Regulatory Information**1. Title deeds of Immovable Property not held in name of the Company**

No immovable property is held in the name of the company.

2. Disclosure on revaluation of assets

No revaluation of assets has been done till the date of Balance Sheet

3. Loan/ Advance to directors, KMP, related parties that are

(a) repayable on demand or

(b) without specifying any terms or period of repayment

No loans/ advance to the directors, KMP, related parties as on the date of Balance Sheet.

4. Capital-Work-in Progress (CWIP)

No Capital-Work-in Progress held by the company

5. Intangible assets under development:

There are no Intangible assets under development.

6. Details of Benami Property held

There is no such Benami Property held as on the date of Balance Sheet

7. Working Capital loan/ borrowings with current assets as security

Though there is a working capital loan none of the company's current assets are

8. Wilful Defaulter

The company has not been declared a wilful defaulter by any bank or financial institution or other lender

9. Relationship with Struck off Companies

The company has not entered into any transactions with struck off companies.

10. Registration of charges or satisfaction with Registrar of Companies

There has been no charges or satisfaction yet to be registered with Registrar of Companies beyond the

11. Compliance with number of layers of companies

The Company does not have any subsidiaries and therefore compliance with respect to number of layers is not applicable.

12. Ratios

Ratio	Numerator	Denominator	2022	2021	% of change(explanati on required if 25% or more)	Explanation
(a) Current Ratio	Current Assets	Current Liabilities	1.13	1.71	-33%	Increase in Current Liability was disproportionate to increase in Current Assets
(b) Debt-Equity Ratio	Total Borrowings	Shareholder's Equity	6.41	4.38	46%	There was additional three vehicle loans availed during the Current FY
(c) Debt Service Coverage Ratio	Revenue - Operating Expenses	Debt Service (Int+Principal)	0.20%	0.66%	-71%	There was additional three vehicle loans availed during the Current FY
(d) Return on Equity Ratio	Net Profit after Tax	Average Shareholder's Equity	4.67%	5.60%	-17%	One major project executed during the year resulted in loss
(e) Inventory turnover ratio	COGS	Average Inventory	11.89	3.66	225%	Due to the increase of Purchase compared to the previous FY
(f) Trade Receivables turnover ratio	Net Sales	Average trade receivables	2.71	3.34	-19%	
(g) Trade payables turnover ratio	Net Credit Purchases	Closing Trade Payables	17.82	18.26	-2%	
(h) Net capital turnover ratio	Sales	Working capital	17.03	3.98	328%	Compared to the previous FY, turnover got increased by nearly 3 times
(i) Net profit ratio	Net Profit	Sales	0.34%	0.65%	-48%	One major project executed during the year resulted in loss
(j) Return on Capital employed	Earnings before interest and tax	Capital Employed (Fixed Assets + Working Capital)	8.16%	4.97%	64%	Improved earnings due to increase in turnover by nearly 3 times
(k) Return on investment	Net Profit after Tax	Total Assets including Debt Balance in Reserves & Surplus	0.24%	0.61%	-60%	Reduction in RoI is mainly on account of Deferred Tax Expense factor

Ratios not applicable since the numerator or denominator to calculate the ratio does not exist in financial statements.

13. Compliance with approved Scheme(s) of Arrangements

No Scheme of Arrangement till date

14. Utilisation of Borrowed funds and share premium:

The company has not advanced or loaned or invested funds in any of the intermediar

For and on behalf of the Board


 Terance Alex
 Managing Director
 DIN: 06808744


 Jimmy Siluvayyan
 Director
 DIN: 06808773

As per our report of even date attached

 For J A K S & Associates
 Chartered Accountants
 FRN: 001360S


 Jose Zachariah, FCA
 (Partner - M.No 080570)
 UDIN: 22080570BBHF087009

 Place: Trivandrum
 Date : 31-10-2022


ITR-6

[For Companies other than companies claiming exemption under section 11]

(Please see rule 12 of the Income-tax Rules,1962)

PERSONAL INFORMATION

Name	WATTSUN ENERGY INDIA PRIVATE LIMITED		
Corporate Identity Number (CIN) issued by MCA	U40300KL2014PTC036294	Is there any change in the name? If yes, please furnish the old name	
PAN	AABCW4979N	Date of incorporation (DDMMYYYY)	04/03/2014
Address			
Flat/Door/Block No	TC.36/38(1)	Town/ City/ District	TRIVANDRUM
Name of Premises / Building / Village	AISWARYA TOWER, FIRST FLOOR OR	Road/Street/Post Office	CHACKAI
Area/ Locality	TRIVANDRUM	State	KERALA
Country	INDIA	PIN Code	695024
Type of company	Domestic Company	If a public company select 6, and if private company select 7 (as defined in section 3 of The Company Act)	7-Private Company
Office Phone Number with STD code	-	Income Tax Ward / Circle	1(1)
Mobile no.1	91 - 8943345700	Mobile no.2	-
Email Address-1	terance.alex@gmail.com	Email Address-2	

Filing Status

Section	Voluntarily after the due date under section 139(4)	Filing Type	Original
If revised/in response to defective/Modified/Rectification, then enter Receipt No		Date of filing original return (DD/MM/YYYY)	
Notice number (Where the original return filed was Defective and a notice was issued to the assessee to file a fresh return Sec139(9))			
If filed, in response to a notice u/s 139(9)/142(1)/148/153A/153C or Order u/s 170A enter date of such notice/order or if filed u/s 92CD enter date of advance pricing agreement			
Residential Status		RES - Resident	
Whether opting for section 115BA? (Yes/No) (applicable on Domestic Company)		No	
Whether total turnover/ gross receipts in the previous year 2015-16 exceeds 50 crore rupees? (Yes/No) (applicable on Domestic Company)		No	
Whether assessee is a resident of a country or specified territory with which India has an agreement referred to in sec 90 (1) or Central Government has adopted any agreement under sec 90A(1)			
In the case of non-resident, is there a permanent establishment (PE) in India			

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Whether assessee is required to seek registration under any law for the time being in force relating to companies?			
Whether the financial statements of the company are drawn up in compliance to the Indian Accounting Standards specified in Annexure to the companies (Indian Accounting Standards) Rules, 2015			No
Whether assessee is located in an International Financial Services Centre and derives income solely in convertible foreign exchange?			No
Whether the assessee company is under liquidation			No
Whether you are an FII / FPI?			No
If yes, please provide SEBI Regn. No.			
Whether any transaction has been made with a person located in a jurisdiction notified u/s 94A of the Act?			No
Other Details			
Whether this return is being filed by a representative assessee? If yes, please furnish following information			No
Name of the representative assessee			
Address of the representative assessee			
Permanent Account Number (PAN) of the representative assessee			
AUDIT DETAILS			
(a)	Whether liable to maintain accounts as per section 44AA?		No
(b)	Whether liable for audit under section 44AB?		Yes
(c)	If (b) is Yes, whether the accounts have been audited by an accountant? If Yes, furnish the following information		Yes
	(i)	Date of furnishing of the audit report (DD/MM/YYYY)	31/01/2019
	(ii)	Name of the auditor signing the tax audit report	George Philip Kocheemoola yil
	(iii)	Membership no. of the auditor	019928
	(iv)	Name of the auditor (proprietorship/ firm)	Philip & Mathew
	(v)	Proprietorship/firm registration number	0002646S
	(vi)	Permanent Account Number (PAN) of the auditor (proprietorship/ firm)	AACFP7719F
	(vii)	Date of audit report	31/10/2018
(d.i)	Are you liable for Audit u/s 92E?		
	No		
(d.ii)	If liable to furnish other audit report under the Income-tax Act, mention the date of furnishing of the audit report? (DD/MM/YYYY) (Please see Instruction 6(ii))		
	Sl.No	Section Code	Date (DD/MM/YYYY)
	1	115JB	31/01/2019
(e)	Mention the Act, section and date of furnishing the audit report under any Act other than the Income-tax Act		
	Sl.No	Act	Section Code
			Date (DD/MM/YYYY)

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	1	Companies Act, 2013	139	01/09/2018					
PART A - GENERAL (2)									
HOLDING STATUS									
(a)	Nature of company (write 1 if holding company, write 2 if a subsidiary company, write 3 if both, write 4 if any other)			4- If any other					
(b)	If subsidiary company, mention the details of the Holding Company								
Sl.No.	PAN	Name of Holding Company	Address of Holding Company	City	State	Country	Pin code/ Zip code	Percentage of Shares held	
(c)	If holding company, mention the details of the subsidiary companies.								
Sl.No.	PAN	Name of Subsidiary Company	Address of Subsidiary Company	City	State	Country	Pin code/ Zip code	Percentage of Shares held	
BUSINESS ORGANISATION									
Sl.No.	Business Type	PAN	Company Name	Address	City	State	Country	Pin code/Zip code	
KEY PERSONS									
Particulars of Managing Director, Directors, Secretary and Principal officer(s) who have held the office during the previous year.									
Sl.No.	Name	Designation	PAN	Residential Address	City	State	Country	Pin code/ Zip code	Director Identification Number (DIN) issued by MCA, in case of Director
1	TERANCE ALEX	Managing Director	AGUPA1453H	304, HOLY HOUSE, PO ZHIYOOR P O, POOYA PALLIVIL AKAM	TRIVANDRUM	KERALA	INDIA	695513	06808744
2	JIMMY SILUVAYAN	Director	CKBPS9118J	VARAVILA THOPPU, P OOOVAR P O	TRIVANDRUM	KERALA	INDIA	695024	06808773
SHAREHOLDERS INFORMATION									
Particulars of persons who were beneficial owners of shares holding not less than 10% of the voting power at any time of the previous year.									
Sl.No.	Name	PAN	Address	City	State	Country	Pin code/ Zip code	Percentage of shares held	
1	TERANCE ALEX	AGUPA1453H	304, HOLY HOUSE, POZHIYUM	TRIVANDRUM	KERALA	INDIA	695513	90	

			OOOR P O, POO YA PALLIVIL AKAM					
2	JIMMY SILUVAY YAN	CKBPS9118J	VARAVILATH OPPU, POOVA R P O	TRIVANDR UM	KERALA	INDIA	695024	10

OWNERSHIP INFORMATION

In case of unlisted company, particulars of natural persons who were the ultimate beneficial owners, directly or indirectly, of shares holding not less than 10% of the voting power at any time of the previous year

Sl.No.	Name	PAN	Address	City	State	Country	Pin code/ Zip code	Percentage of shares held
--------	------	-----	---------	------	-------	---------	-----------------------	---------------------------

NATURE OF COMPANY AND ITS BUSINESS

Nature of company

1	Whether a public sector company as defined in section 2(36A) of the Income-tax Act	No	
2	Whether a company owned by the Reserve Bank of India	No	
3	Whether a company in which not less than forty percent of the shares are held (whether singly or taken together) by the Government or the Reserve Bank of India or a corporation owned by that Bank	No	
4	Whether a banking company as defined in clause (c) of section 5 of the Banking Regulation Act, 1949	No	
5	Whether a scheduled Bank being a bank included in the Second Schedule to the Reserve Bank of India Act	No	
6	Whether a company registered with Insurance Regulatory and Development Authority (established under sub-section (1) of section 3 of the Insurance Regulatory and Development Authority Act, 1999)	No	
7	Whether a company being a non-banking Financial Institution	No	

Nature of business or profession, if more than one business or profession indicate the three main activities/ products

Sl.No.	Code	Tradenname	Tradenname	Tradenname
1	05001 - Production, collection and distribution of electricity			

Part A-BS**BALANCE SHEET AS ON 31ST DAY OF MARCH, 2018 OR AS ON THE DATE OF AMALGAMATION****I. Equity and Liabilities****1. Shareholder's fund**

A.	Share capital					
	i	Authorised	Ai	1000000		
	ii	Issued, Subscribed and fully Paid up	Aii	100000		
	iii	Subscribed but not fully paid	Aiii	0		
	iv	Total (Aii + Aiii)			Aiv	100000
B.	Reserves and Surplus					
	i	Capital Reserve	Bi	0		

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ii	Capital Redemption Reserve	Bii	0
iii	Securities Premium Reserve	Biii	0
iv	Debenture Redemption Reserve	Biv	0
v	Revaluation Reserve	Bv	0
vi	Share options outstanding amount	Biv	0
vii	Other reserve (specify nature and amount)		
Sl No.	Nature	Amount	
Total		Bvii	0
viii	Surplus i.e. Balance in profit and loss account (Debit balance to be shown as - ve figure)	Bviii	330472
ix	Total (Bi + Bii + Biii + Biv + Bv + Bvi + Bvii + Bviii) (Debit balance to be shown as - ve figure)	Bix	330472
C	Money received against share warrants	1C	0
D	Total Shareholder's fund (Aiv + Bix + 1C)	1D	430472
2. Share application money pending allotment			
i	Pending for less than one year	i	0
ii	Pending for more than one year	ii	0
iii	Total (i + ii)	2	0
3. Non-current liabilities			
A	Long-term borrowings		
i	Bonds/ debentures		
	a. Foreign currency	ia	0
	b. Rupee	ib	0
	c. Total (ia + ib)	ic	0
ii	Term loans		
	a. Foreign currency	iiia	0
	b. Rupee loans		
	1. From Banks	b1	0
	2. From others	b2	0
	3. Total (b1 + b2)	b3	0
	c. Total Term loans (iiia + b3)	iic	0
iii	Deferred payment liabilities	iii	0
iv	Deposits from related parties (see instructions)	iv	0
v	Other deposits	v	0
vi	Loans and advances from related parties (see instructions)	vi	35000
vii	Other loans and advances	vii	731973
viii	Long term maturities of finance lease obligations	viii	0

	ix	Total Long term borrowings (ic + iic + iii + iv + v + vi + vii + viii)	3A	766973
B.	Deferred tax liabilities (net)		3B	0
C	Other long-term liabilities			
	i	Trade payables	i	0
	ii	Others	ii	0
	iii	Total Other long-term liabilities (i + ii)	3C	0
D	Long-term provisions			
	i	Provision for employee benefits	i	0
	ii	Others	ii	0
	iii	Total (i + ii)	3D	0
E.	Total Non-current liabilities (3A + 3B + 3C + 3D)		3E	766973

4. Current liabilities

A	Short-term borrowings			
	i	Loans repayable on demand		
		a. From Banks	ia	0
		b.From Non-Banking Finance Companies	ib	0
		c.From other financial institutions	ic	0
		d. From others	id	0
		e.Total Loans repayable on demand (ia + ib + ic + id)	ie	0
	ii	Deposits from related parties (see instructions)	ii	0
	iii	Loans and advances from related parties (see instructions)	iii	0
	iv	Other loans and advances	iv	0
	v	Other deposits	v	0
	vi	Total Short-term borrowings (ie + ii + iii + iv + v)	4A	0
B.	Trade payables			
	i	Outstanding for more than 1 year	i	0
	ii	Others	ii	10004468
	iii	Total Trade payables (i + ii)	4B	10004468
C.	Other current liabilities			
	i	Current maturities of long-term debt	i	0
	ii	Current maturities of finance lease obligations	ii	0
	iii	Interest accrued but not due on borrowings	iii	0
	iv	Interest accrued and due on borrowings	iv	0
	v	Income received in advance	v	0
	vi	Unpaid dividends	vi	0
	vii	Application money received for allotment of securities and due for refund and interest accrued	vii	0

	viii	Unpaid matured deposits and interest accrued thereon	viii	0	
	ix	Unpaid matured debentures and interest accrued thereon	ix	0	
	x	Other payables	x	3477138	
	xi	Total Other current liabilities (i + ii + iii + iv + v + vi + vii + viii + ix + x)	4C		3477138
D.	Short-term provisions				
	i	Provision for employee benefit	i	0	
	ii	Provision for Income-tax	ii	165120	
	iii	Proposed Dividend	iii	0	
	iv	Tax on dividend	iv	0	
	v	Other	v	0	
	vi	Total Short-term provisions (i + ii +iii + iv + v)	4D		165120
E	Total Current liabilities (4A + 4B + 4C + 4D)		4E		13646726
Total Equity and liabilities (1D + 2 + 3E + 4E)			I		14844171
II. ASSETS					
1. Non-current assets					
A.	Fixed assets				
	i	Tangible assets			
	a.	Gross block	ia	697008	
	b.	Depreciation	ib	324949	
	c.	Impairment losses	ic	0	
	d.	Net block (ia - ib - ic)	id	372059	
	ii	Intangible assets			
	a.	Gross block	iiia	0	
	b.	Amortization	iiib	0	
	c.	Impairment losses	iiic	0	
	d.	Net block (iiia - iiib - iiic)	iiid	0	
	iii	Capital work-in-progress	iii	0	
	iv	Intangible assets under development	iv	0	
	v	Total Fixed assets (id + iid + iii + iv)	Av		372059
B	Non-current investments				
	i	Investment in property	i	0	
	ii	Investments in Equity instruments			
	a.	Listed equities	iiia	0	
	b.	Unlisted equities	iiib	0	
	c.	Total (iiia + iiib)	iiic	0	
	iii	Investments in Preference shares	iii	0	
	iv	Investments in Government or trust securities	iv	0	

	v	Investments in Debenture or bonds	v	0	
	vi	Investments in Mutual funds	vi	0	
	vii	Investments in Partnership firms	vii	0	
	viii	Others Investments	viii	0	
	ix	Total Non-current investments (i + iic + iii + iv + v + vi + vii + viii)	Bix		0
C	Deferred tax assets (Net)		C		37762
D	Long-term loans and advances				
	i	Capital advances	i	0	
	ii	Security deposits	ii	837188	
	iii	Loans and advances to related parties (see instructions)	iii	0	
	iv	Other Loans and advances	iv	0	
	v	Total Long-term loans and advances (i + ii + iii + iv)	Dv		837188
	vi	Long-term loans and advances included in Dv which is			
		a. for the purpose of business or profession	via	0	
		b. not for the purpose of business or profession	vib	0	
		c. given to shareholder, being the beneficial owner of share, or to any concern or on behalf/ benefit of such shareholder as per section 2(22)(e) of I.T. Act	vic	0	
E	Other non-current assets				
	i	Long-term trade receivables			
		a. Secured, considered good	ia	0	
		b. Unsecured, considered good	ib	0	
		c. Doubtful	ic	0	
		d. Total Other non-current assets (ia + ib + ic)	id	0	
	ii	Others	ii	0	
	iii	Total (id + ii)	Eiii		0
	iv	Non-current assets included in Eiii which is due from shareholder, being the beneficial owner of share, or from any concern or on behalf/ benefit of such shareholder as per section 2(22)(e) of I.T. Act	iv	0	
F	Total Non-current assets (Av + Bix + C + Dv + Eiii)		1F	1247009	

2. Current assets

A.	Current investments				
	i	Investment in Equity instruments			
		a. Listed equities	ia	0	
		b. Unlisted equities	ib	0	
		c. Total (ia + ib)	ic	0	
	ii	Investment in Preference shares	ii	0	

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	iii	Investment in government or trust securities	iii	0	
	iv	Investment in debentures or bonds	iv	0	
	v	Investment in Mutual funds	v	0	
	vi	Investment in partnership firms	vi	0	
	vii	Other investment	vii	350000	
	viii	Total Current investments (ic + ii + iii + iv + v + vi + vii)	Aviii		350000
B	Inventories				
	i	Raw materials	i	0	
	ii	Work-in-progress	ii	0	
	iii	Finished goods	iii	2222418	
	iv	Stock-in-trade (in respect of goods acquired for trading)	iv	0	
	v	Stores and spares	v	0	
	vi	Loose tools	vi	0	
	vii	Others	vii	0	
	viii	Total Inventories (i + ii + iii + iv + v + vi + vii)	Bviii		2222418
C	Trade receivables				
	i	Outstanding for more than 6 months	i	1886060	
	ii	Others	ii	3429256	
	iii	Total Trade receivables (i + ii)	Ciii		5315316
D	Cash and cash equivalents				
	i	Balances with Banks	i	2638559	
	ii	Cheques, drafts in hand	ii	0	
	iii	Cash in hand	iii	16119	
	iv	Others	iv	0	
	v	Total Cash and cash equivalents (i + ii + iii + iv)	Dv		2654678
E	Short-term loans and advances				
	i	Loans and advances to related parties (see instructions)	i	0	
	ii	Others	ii	1986100	
	iii	Total Short-term loans and advances (i + ii)	Eiii		1986100
	iv	Short-term loans and advances included in Eiii which is			
		a. for the purpose of business or profession	iva	0	
		b. not for the purpose of business or profession	ivb	0	
		c. given to a shareholder, being the beneficial owner of share, or to any concern or on behalf/ benefit of such shareholder as per section 2(22)(e) of I.T. Act	ivc	0	
F	Other current assets			F	1068650
G	Total Current assets (Aviii + Bviii + Ciii + Dv + Eiii + F)			2G	13597162

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Total Assets (1F + 2G)					II		14844171		
Part A-BS – Ind AS									
Balance Sheet as on 31st day of March, 2018 or as on the date of business combination [applicable for a company whose financial statements are drawn up in compliance to the Indian Accounting Standards specified in Annexure to the companies (Indian Accounting Standards) Rules, 2015]									
I	Equity and Liabilities								
	1	Equity							
		A	Equity share capital						
			i	Authorised	Ai	0			
			ii	Issued, Subscribed and fully paid up	Aii	0			
			iii	Subscribed but not fully paid	Aiii	0			
			iv	Total (Aii + Aiii)			Aiv	0	
		B	Other Equity						
			i	Other Reserves					
				a	Capital Redemption Reserve	ia	0		
				b	Debenture Redemption Reserve	ib	0		
				c	Share Options Outstanding account	ic	0		
				d	Other (specify nature and amount)				
				Sl. No.	Nature	Amount			
				Total			id	0	
			e	Total other reserves (ia + ib + ic + id)			ie	0	
			ii	Retained earnings (Debit balance of statement of P & L to be shown as –ve figure)			ii	0	
			iii	Total (Bie + ii) (Debit balance to be shown as –ve figure)			Biii	0	
		C	Total Equity (Aiv + Biii)			1C	0		
	2	Liabilities							
		A	Non-current liabilities						
		I	Financial Liabilities						
			Borrowings						
			a	Bonds or debentures					
				1	Foreign currency	a1	0		
				2	Rupee	a2	0		
				3	Total (1 + 2)			a3	0
			b	Term loans					
				1	Foreign currency	b1	0		
				2	Rupee loans				
				i	From Banks	i	0		
				ii	From other parties	ii	0		

			iii	Total (i + ii)	b2	0			
		3	Total Term loans (b1 + b2)			b3	0		
		c	Deferred payment liabilities			c	0		
		d	Deposits			d	0		
		e	Loans from related parties (see instructions)			e	0		
		f	Long term maturities of finance lease obligations			f	0		
		g	Liability component of compound financial instruments			g	0		
		h	Other loans			h	0		
		i	Total borrowings (a3 + b3 + c + d + e + f + g + h)			i	0		
		j	Trade Payables			j	0		
		k	Other financial liabilities (Other than those specified in II under provisions)			k	0		
		II	Provisions						
		a	Provision for employee benefits		a	0			
		b	Others (specify nature)						
			Sl. No	Nature	Amount				
			Total				b	0	
		c	Total Provisions			IIc	0		
		III	Deferred tax liabilities (net)					III	0
		a	Advances			a	0		
		b	Other (specify nature and amount)						
			Sl. No	Nature	Amount				
			Total				b	0	
		c	Total Other non-current liabilities			IVc	0		
			Total Non-Current Liabilities (Ii + Ij + Ik + IIC + III + IVc)					2A	0
		B	Current liabilities						
		I	Financial Liabilities						
		i	Borrowings						
		a	Loans repayable on demand						
			1	From Banks	1	0			
			2	From Other parties	2	0			
			3	Total Loans repayable on demand (1 + 2)	3	0			
		b	Loans from related parties			b	0		
		c	Deposits			c	0		
		d	Other loans (specify nature)						
			Sl. No	Nature	Amount				

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				Total	d	0
				Total Borrowings (a3 + b + c + d)	Ii	0
			ii	Trade payables	Iii	0
			iii	Other financial liabilities		
			a	Current maturities of long-term debt	a	0
			b	Current maturities of finance lease obligations	b	0
			c	Interest accrued	c	0
			d	Unpaid dividends	d	0
			e	Application money received for allotment of securities to the extent refundable and interest accrued thereon	e	0
			f	Unpaid matured deposits and interest accrued thereon	f	0
			g	Unpaid matured debentures and interest accrued thereon	g	0
			h	Other (specify nature and amount)		
			Sl. No	Nature	Amount	
				Total	h	0
			i	Total Other financial liabilities (a + b +c +d +e +f +g+ h)	i	0
			iv	Total Financial Liabilities (Ii + Iii + Iiii)	Iiv	0
		II		Other Current liabilities		
			a	Revenue received in advance	a	0
			b	Other advances(specify nature and amount)		
			Sl. No	Nature	Amount	
				Total	B	0
			c	Others (specify nature)		
			Sl. No	Nature	Amount	
				Total	c	0
			d	Total Other current liabilities (a + b+ c)	IId	0
		III		Provisions		
			a	Provision for employee benefits	a	0
			b	Others (specify nature)		
			Sl. No	Nature	Amount	
				Total	b	0

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			c	Total provisions (a + b)			IIIc	0	
		IV	ProCurrent Tax Liabilities (Net)visions					IV	0
		Total Current liabilities (Iiv + IId + IIIc+ IV)						2B	0
	Total Equity and liabilities (1C + 2A +2B)						I	0	
II	ASSETS								
	1	Non-current assets							
		A	Property, Plant and Equipment						
			a	Gross block	a	0			
			b	Depreciation	b	0			
			c	Impairment losses	c	0			
			d	Net block (a – b - c)			Ad	0	
		B	Capital work-in-progress					B	0
		C	Investment Property						
			a	Gross block	a	0			
			b	Depreciation	b	0			
			c	Impairment losses	c	0			
			d	Net block (a – b - c)			Cd	0	
		D	Goodwill						
			a	Gross block	a	0			
			b	Impairment losses	b	0			
			c	Net block (a – b - c)			Dc	0	
		E	Other Intangible Assets						
			a	Gross block	a	0			
			b	Amortisation	b	0			
			c	Impairment losses	c	0			
			d	Net block (a – b - c)			Ed	0	
		F	Intangible assets under development					F	0
		G	Biological assets other than bearer plants						
			a	Gross block	a	0			
			b	Impairment losses	b	0			
			c	Net block (a – b - c)			Gc	0	
		H	Financial Assets						
			I	Investments					
			i	Investments in Equity instruments					
				a	Listed equities	ia	0		
				b	Unlisted equities	ib	0		
				c	Total (ia + ib)			ic	0
				1595					

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		ii	Investments in Preference shares	ii	0	
		iii	Investments in Government or trust securities	iii	0	
		iv	Investments in Debenture or bonds	iv	0	
		v	Investments in Mutual funds	v	0	
		vi	Investments in Partnership firms	vi	0	
		vii	Others Investments (specify nature)			
		Sl. No	Nature	Amount		
			Total	vii	0	
		viii	Total non-current investments (ic + ii + iii + iv + v + vi + vii)			0
	II	Trade Receivables				
		a	Secured, considered good	a	0	
		b	Unsecured, considered good	b	0	
		c	Doubtful	c	0	
		d	Total Trade receivables	HII	0	
	III	Loans				
		i	Security deposits	i	0	
		ii	Loans to related parties (see instructions)	ii	0	
		iii	Other loans (specify nature)			
		Sl. No	Nature	Amount		
			Total	iii	0	
		iv	Total Loans (i + ii + iii)			0
	v	Loans included in HIII above which is-				
		a	for the purpose of business or profession	va	0	
		b	not for the purpose of business or profession	vb	0	
		c	given to shareholder, being the beneficial owner of share, or to any concern or on behalf/ benefit of such shareholder as per section 2(22)(e) of I.T. Act	vc	0	
	IV	Other Financial Assets				
		i	Bank Deposits with more than 12 months maturity	i	0	
		ii	Others	ii	0	
		iii	Total of Other Financial Assets (i + ii)			0
	I	Deferred Tax Assets (Net)				0
	J	Other non-current Assets				

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	i	Capital Advances	i	0	
	ii	Advances other than capital advances	ii	0	
	iii	Others (specify nature)			
		Sl. No	Nature	Amount	
		Total			vii 0
	iv	Total non-current assets (i + ii + iii)			iv 0
	v	Non-current assets included in J above which is due from shareholder, being the beneficial owner of share, or from any concern or on behalf/ benefit of such shareholder as per section 2(22)(e) of I.T. Act			v 0
	Total Non-current assets (Ad + B + Cd + Dc + Ed + F + Gc + HI + HII + HIII + HIV + I + J)				1 0
2	Current assets				
	A	Inventories			
	i	Raw materials	i	0	
	ii	Work-in-progress	ii	0	
	iii	Finished goods	iii	0	
	iv	Stock-in-trade (in respect of goods acquired for trading)	iv	0	
	v	Stores and spares	v	0	
	vi	Loose tools	vi	0	
	vii	Others	vii	0	
	viii	Total Inventories (i + ii + iii + iv + v + vi + vii)			2A 0
	B	Financial Assets			
	I	Investments			
	i	Investment in Equity instruments			
	a	Investment in Equity instruments	ia	0	
	a	Unlisted equities	ib	0	
	c	Total (ia + ib)	ic	0	
	ii	Investment in Preference shares	ii	0	
	iii	Investment in government or trust securities	iii	0	
	iv	Investment in debentures or bonds	iv	0	
	v	Investment in Mutual funds	v	0	
	vi	Investment in partnership firms	vi	0	
	vii	Other Investments	vii	0	
	viii	Total Current investments (ic + ii + iii + iv + v + vi + vii)			viii 0
	II	Trade receivables			
	i	Secured, considered good	i	0	

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		ii	Unsecured, considered good	ii	0		
		iii	Doubtful	iii	0		
		iv	Total Trade receivables (i + ii + iii)	II	0		
	III	Cash and cash equivalents					
		i	Balances with Banks (of the nature of cash and cash equivalents)	i	0		
		ii	Cheques, drafts in hand	ii	0		
		iii	Cash on hand	iii	0		
		iv	Others (specify nature)	iv			
		Sl. No	Nature	Amount			
		Total			vii	0	
	v	Total Cash and cash equivalents (i + ii + iii + iv)			III	0	
	IV	Bank Balances other than III above			IV	0	
	V	Loans					
		i	Security Deposits	i	0		
		ii	Loans to related parties (see instructions)	ii	0		
		iii	Others(specify nature)				
		Sl. No	Nature	Amount			
		Total			vii	0	
	iv	Total loans (i + ii + iii)			V	0	
	v	Loans and advances included in V above which is-					
		a	for the purpose of business or profession	va	0		
		b	not for the purpose of business or profession	vb	0		
		c	given to a shareholder, being the beneficial owner of share, or to any concern or on behalf/ benefit of such shareholder as per section 2(22)(e) of I.T. Act	vc	0		
	VI	Other Financial Assets			VI	0	
	Total Financial Assets (I + II + III + IV + V + VI)				2B	0	
	C	Current Tax Assets (Net)			2C	0	
	D	Other current assets					
		i	Advances other than capital advances	i	0		
		ii	Others(specify nature)				
		Sl. No	Nature	Amount			
		Total			vii	0	

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	iii	Total	2D	0
	Total Current assets (2A + 2B + 2C + 2D)		2	0
Total Assets (1 + 2)			II	0
Part A-P and L- Profit and Loss Account for the financial year 2017-18 (fill items 1 to 52 in a case where regular books of accounts are maintained, otherwise fill item 53)				
1	Revenue from operations			
	A	Sales/ Gross receipts of business (net of returns and refunds and duty or tax, if any)		
	i.	Sale of products/goods	i	37178364
	ii.	Sale of services	ii	0
	iii.	Other operating revenues (specify nature and amount)		
		Nature	Amount	
	Total	iii	0	
	iv.	Interest (in case of finance company)	iv	0
	v.	Other financial services (in case of finance company)	v	0
	vi.	Total (i + ii + iii + iv + v)	Avi	37178364
	B	Duties, taxes and cess, received or receivable, in respect of goods and services sold or supplied		
	i.	Union Excise duties	i	0
	ii.	Service tax	ii	0
	iii.	VAT/ Sales tax	iii	0
	iv.	Central Goods and Service Tax (CGST)	iv	0
	v.	State Goods and Services Tax (SGST)	v	0
	vi.	Integrated Goods and Services Tax (IGST)	vi	0
	vii.	Union Territory Goods and Services Tax (UTGST)	vii	0
	viii.	Any other duty, tax and cess	viii	0
	ix.	Total (i + ii + iii + iv + v + vi + vii + viii)	Bix	0
	C	Total Revenue from operations (Aiv + Bix)	1C	37178364
2	Other income			
	i.	Interest income (in case of a company, other than a finance company)	i	94291
	ii.	Dividend income	ii	0
	iii.	Profit on sale of fixed assets	iii	0
	iv.	Profit on sale of investment being securities chargeable to Securities Transaction Tax (STT)	iv	0
	v.	Profit on sale of other investment	v	0
	vi.	Rent	vi	0
	vii.	Commission	vii	0
	viii.	Profit on account of currency fluctuation	viii	0
	ix.	Agricultural income	ix	0
	x.	Any other income (specify nature and amount)		
				1599

		Nature	Amount
	1	DISCOUNT RECEIVED	1329
	2	INTEREST SUBSIDY ON KFC LOAN	90021
	x	Total	91350
	xi	Total of other income (i + ii + iii + iv + v + vi + vii + viii + ix + x)	2xi 185641
3	Closing Stock		
	i.	Raw Material	3i 0
	ii.	Work-in-progress	3ii 0
	iii.	Finished Goods	3iii 2222417
		Total (3i + 3ii + 3iii)	3iv 2222417
	4	Totals of credits to profit and loss account (1C+2xi+3iv)	4 39586422
DEBITS TO PROFIT AND LOSS ACCOUNT			
5	Opening Stock		
	i.	Raw Material	5i 0
	ii.	Work-in-progress	5ii 0
	iii.	Finished Goods	5iii 4537250
	iv	Total (5i + 5ii + 5iii)	5iv 4537250
	6	Purchases (net of refunds and duty or tax, if any)	6 24836606
7	Duties and taxes, paid or payable, in respect of goods and services purchased		
	i.	Custom duty	7i 0
	ii.	Counter veiling duty	7ii 0
	iii.	Special additional duty	7iii 0
	iv.	Union excise duty	7iv 0
	v.	Service tax	7v 0
	vi.	VAT/ Sales tax	7vi 0
	vii.	Central Goods & Service Tax (CGST)	7vii 0
	viii.	State Goods & Services Tax (SGST)	7viii 0
	ix.	Integrated Goods & Services Tax (IGST)	7ix 0
	x.	Union Territory Goods & Services Tax (UTGST)	7x 0
	xi.	Any other tax, paid or payable	7xi 0
	xii.	Total (7i + 7ii + 7iii + 7iv + 7v + 7vi + 7vii+7viii+7ix+7x+7xi)	7xii 0
	8	Freight	8 114572
	9	Consumption of stores and spare parts	9 371697
	10	Power and fuel	10 44230
	11	Rents	11 366000
	12	Repairs to building	12 0
	13	Repairs to plant, machinery or furniture	13 529189
		1600	

14	Compensation to employees			
	i.	Salaries and wages	14i	4236719
	ii.	Bonus	14ii	0
	iii.	Reimbursement of medical expenses	14iii	0
	iv.	Leave encashment	14iv	0
	v.	Leave travel benefits	14v	0
	vi.	Contribution to approved superannuation fund	14vi	0
	vii.	Contribution to recognised provident fund	14vii	0
	viii.	Contribution to recognised gratuity fund	14viii	0
	ix.	Contribution to any other fund	14ix	0
	x.	Any other benefit to employees in respect of which an expenditure has been incurred	14x	0
	xi	Total compensation to employees (14i + 14ii + 14iii + 14iv + 14v + 14vi + 14vii + 14viii + 14ix + 14x)	14xi	4236719
	14xii	Whether any compensation, included in 14xi, paid to non-residents	xiia	No
		If Yes, amount paid to non-residents	xiib	0
15	Insurance			
	i.	Medical Insurance	15i	0
	ii.	Life Insurance	15ii	0
	iii.	Keyman's Insurance	15iii	0
	iv.	Other Insurance including factory, office, car, goods, etc.	15vi	19875
	v.	Total expenditure on insurance (15i + 15ii + 15iii + 15iv)	15v	19875
16.	Workmen and staff welfare expenses		16	207647
17.	Entertainment		17	0
18.	Hospitality		18	0
19.	Conference		19	0
20.	Sales promotion including publicity (other than advertisement)		20	157901
21.	Advertisement		21	0
22	Commission			
	i.	Paid outside India, or paid in India to a non-resident other than a company or a foreign company	i	0
	ii.	To others	ii	0
	iii.	Total (i + ii)	22iii	0
23	Royalty			
	i.	Paid outside India, or paid in India to a non-resident other than a company or a foreign company	i	0
	ii.	To others	ii	0
	iii.	Total (i + ii)	23iii	0
24	Professional / Consultancy fees / Fee for technical services			
	i.	Paid outside India, or paid in India to a non-resident other than a company or a foreign company	i	0

	ii.	To others	ii	21000
	iii.	Total (i + ii)	24iii	21000
25.		Hotel , boarding and Lodging	25	0
26.		Traveling expenses other than on foreign traveling	26	564464
27.		Foreign travelling expenses	27	0
28.		Conveyance expenses	28	0
29.		Telephone expenses	29	124784
30.		Guest House expenses	30	0
31.		Club expenses	31	0
32.		Festival celebration expenses	32	0
33.		Scholarship	33	0
34.		Gift	34	0
35.		Donation	35	0
36	Rates and taxes, paid or payable to Government or any local body (excluding taxes on income)			
	i.	Union excise duty	36i	0
	ii.	Service tax	36ii	0
	iii.	VAT/ Sales tax	36iii	0
	iv.	Cess	36iv	0
	v.	Central Goods and Service Tax (CGST)	36v	0
	vi.	State Goods and Services Tax (SGST)	36vi	0
	vii.	Integrated Goods and Services Tax (IGST)	36vii	0
	viii.	Union Territory Goods and Services Tax (UTGST)	36viii	0
	ix.	Any other rate, tax, duty or cess incl. STT and CTT	36ix	22515
	x.	Total rates and taxes paid or payable (36i + 36ii + 36iii + 36iv + 36v+36vi+36vii+36viii+36ix)	x	22515
37.		Audit fee	36vi	25000
38	Other expenses (specify nature and amount)			
		Nature	Amount	
	1	Accounting Charges	18000	
	2	ANERT Registration and Affiliation Expenses	310805	
	3	ANERT Tender Fees	12000	
	4	Discount Allowed	216276	
	5	Marketing Expenses	499990	
	6	Interest and Bank Charges	102413	
	7	Newspaper and Periodicals	7980	
	8	Office Expenses	121779	
	9	Printing and Stationery	72519	
	10	Postage and Courier	15306	
			1602	

		11	Worksite Expenses		1407335
		12	MCA Filing Fees		800
		13	Miscellaneous Expenses		61774
			Total		2846977
39	Bad debts (specify PAN of the person, if available, for whom Bad Debt for amount of Rs. 1 lakh or more is claimed and amount)				
	i	PAN		Amount	
	ii.	Others (more than Rs. 1 lakh) where PAN is not available		ii	0
	iii.	Others (amounts less than Rs. 1 lakh)		iii	0
	iv.	Total Bad Debt (39i (All PAN) + 39ii + 39iii)		39iv	0
40.	Provision for bad and doubtful debts			40	0
41.	Other provisions			41	0
42.	Profit before interest, depreciation and taxes [4 – (5iv + 6 + 7xii+8 to 13 + 14xi + 15v + 16 to 21 + 22iii + 23iii + 24iii + 25 to 35 + 36x+37 + 38iii + 39vi + 40 + 41)]			42	559996
43.	Interest				
	i.	Paid outside India, or paid in India to a non-resident other than a company or a foreign company		i	0
	ii.	To others		ii	0
	iii.	Total (i + ii)		43iii	0
44	Depreciation and amortization.			44	157784
45	Profit before taxes (42 - 43iii - 44)			45	402212
PROVISIONS FOR TAX AND APPROPRIATIONS					
46	Provision for current tax			46	165120
47	Provision for Deferred Tax and Deferred Liability			47	-17544
48	Profit after tax (45 - 46 - 47)			48	254636
49	Balance brought forward from previous year			49	0
50	Amount available for appropriation (48 + 49)			50	254636
51.	Appropriations				
	i.	Transfer to reserves and surplus		51i	0
	ii.	Proposed dividend/ Interim dividend		51ii	0
	iii.	Tax on dividend/ Tax on dividend for earlier years		51iii	0
	iv.	Appropriation towards Corporate Social Responsibility (CSR) activities (in case of companies covered under section 135 of Companies Act, 2013)		51iv	0
	v.	Any other appropriation		51v	0
	vi.	Total (51i + 51ii + 51iii + 51iv+51v)		51vi	0
52	Balance carried to balance sheet (50 – 51vi)			52	254636
NO ACCOUNT CASE					
53	In a case where regular books of account of business or profession are not maintained, furnish the following information for previous year 2017-18 in respect of business or profession.				

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	a.	Gross receipts	53a	0		
	b.	Gross profit	53b	0		
	c.	Expenses	53c	0		
	d.	Net profit	53d	0		
Part A-P & L – Ind AS						
Profit and Loss Account for the financial year 2017-18 (fill items 1 to 54 in a case where regular books of accounts are maintained, otherwise fill item 55) [applicable for a company whose financial statements are drawn up in compliance to the Indian Accounting Standards specified in Annexure to the companies (Indian Accounting Standards) Rules, 2015]						
1	Revenue from operations					
	A	Sales/ Gross receipts of business (net of returns and refunds and duty or tax, if any)				
	i	Sale of products/goods	i	0		
	ii	Sale of services	ii	0		
	iii	Other operating revenues (specify nature and amount)				
		Sl. No	Nature	Amount		
		Total			iii	0
	iv	Interest (in case of finance company)		iv	0	
	v	Other financial services (in case of finance company)		v	0	
	vi	Total (i + ii + iii + iv + v)			v	0
	B	Duties, taxes and cess received or receivable in respect of goods and services sold or supplied				
	i	Union Excise duties		i	0	
	ii	Service tax		ii	0	
	iii	VAT/ Sales tax		iii	0	
	iv	Central Goods & Service Tax (CGST)		iv	0	
	v	State Goods & Services Tax (SGST)		v	0	
	vi	Integrated Goods & Services Tax (IGST)		vi	0	
	vii	Union Territory Goods & Services Tax (UTGST)		vii	0	
	viii	Any other duty, tax and cess		viii	0	
	ix	Total (i + ii + iii + iv + v + vi + vii + viii)			Bix	0
	C	Total Revenue from operations (A + Bix)			1C	0
2	Other income					
	i	Interest income (in case of a company, other than a finance company)		i	0	
	ii	Dividend income		ii	0	
	iii	Profit on sale of fixed assets		iii	0	
	iv	Profit on sale of investment being securities chargeable to Securities Transaction Tax (STT)		iv	0	
	v	Profit on sale of other investment		v	0	
	vi	Rent		vi	0	

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	vii	Commission			vii	0	
	viii	Profit on account of currency fluctuation			viii	0	
	ix	Agricultural income			ix	0	
	x	Any other income (specify nature and amount)					
			Sl. No	Nature	Amount		
			Total			x	0
	xi	Total of other income (i + ii + iii + iv + v + vi + vii + viii + ix + xc)				2xi	0
3	Closing Stock						
	i	Raw material			3i	0	
	ii	Work-in-progress			3ii	0	
	iii	Finished goods			3iii	0	
	Total (3i + 3ii + 3iii)					3iv	0
4	Total of credits to profit and loss account (1C + 2xi + 3iv)					4	0
5	Opening Stock						
	i	Raw material			5i	0	
	ii	Work-in-progress			5ii	0	
	iii	Finished goods			5iii	0	
	Total (5i + 5ii + 5iii)					5iv	0
	6	Purchases (net of refunds and duty or tax, if any)				6	0
7	Duties and taxes, paid or payable, in respect of goods and services purchased						
	i	Custom duty			7i	0	
	ii	Counter veiling duty			7ii	0	
	iii	Special additional duty			7iii	0	
	iv	Union excise duty			7iv	0	
	v	Service tax			7v	0	
	vi	VAT/ Sales tax			7vi	0	
	vii	Central Goods & Service Tax (GST)			7vii	0	
	viii	State Goods & Services Tax (SGST)			7viii	0	
	ix	Integrated Goods & Services Tax (IGST)			7ix	0	
	x	Union Territory Goods & Services Tax (UTGST)			7x	0	
	xi	Any other tax, paid or payable			7xi	0	
	xii	Total (7i + 7ii + 7iii + 7iv + 7v + 7vi + 7vii+7viii + 7ix + 7x + 7xi)				7xii	0
8	Freight					8	0
9	Consumption of stores and spare parts					9	0
10	Power and fuel					10	0
11	Rents					11	0
12	Repairs to building					12	0

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13	Repairs to plant, machinery or furniture				13	0
14	Compensation to employees					
	i	Salaries and wages	14i	0		
	ii	Bonus	14ii	0		
	iii	Reimbursement of medical expenses	14iii	0		
	iv	Leave encashment	14iv	0		
	v	Leave travel benefits	14v	0		
	vi	Contribution to approved superannuation fund	14vi	0		
	vii	Contribution to recognised provident fund	14vii	0		
	viii	Contribution to recognised gratuity fund	14viii	0		
	ix	Contribution to any other fund	14ix	0		
	x	Any other benefit to employees in respect of which an expenditure has been incurred	14x	0		
	xi	Total compensation to employees (14i + 14ii + 14iii + 14iv + 14v + 14vi + 14vii + 14viii + 14ix + 14x)			14xi	0
	xii	Whether any compensation, included in 14xi, paid to non-resident	xiia			
	If Yes, amount paid to non-residents	xiib	0			
15	Insurance					
	i	Medical Insurance	15i	0		
	ii	Life Insurance	15ii	0		
	iii	Keyman's Insurance	15iii	0		
	iv	Other Insurance including factory, office, car, goods, etc.	15iv	0		
	v	Total expenditure on insurance (15i + 15ii + 15iii + 15iv)			15v	0
16	Workmen and staff welfare expenses				16	0
17	Entertainment				17	0
18	Hospitality				18	0
19	Conference				19	0
20	Sales promotion including publicity (other than advertisement)				20	0
21	Advertisement				21	0
22	Commission					
	i	Paid outside India, or paid in India to a non-resident other than a company or a foreign company	i	0		
	ii	To others	ii	0		
	iii	Total (i + ii)			22iii	0
23	Royalty					
	i	Paid outside India, or paid in India to a non-resident other than a company or a foreign company	i	0		
	ii	To others	ii	0		

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	iii	Total (i + ii)		23iii	0
24	Professional / Consultancy fees / Fee for technical services				
	i	Paid outside India, or paid in India to a non-resident other than a company or a foreign company	i	0	
	ii	To others	ii	0	
	iii	Total (i + ii)		24iii	0
25	Hotel, boarding and Lodging				0
26	Traveling expenses other than on foreign traveling				0
27	Foreign traveling expenses				0
28	Conveyance expenses				0
29	Telephone expenses				0
30	Guest House expenses				0
31	Club expenses				0
32	Festival celebration expenses				0
33	Scholarship				0
34	Gift				0
35	Donation				0
36	Rates and taxes, paid or payable to Government or any local body (excluding taxes on income)				
	i	Union excise duty	36i	0	
	ii	Service tax	36ii	0	
	iii	VAT/ Sales tax	36iii	0	
	iv	Cess	36iv	0	
	v	Goods & Service Tax (GST)	36v	0	
	vi	State Goods & Services Tax (SGST)	36vi	0	
	vii	Integrated Goods & Services Tax (IGST)	36vii	0	
	viii	Union Territory Goods & Services Tax (UTGST)	36viii	0	
	ix	Any other rate, tax, duty or cess incl. STT and CTT	36ix	0	
	x	Total rates and taxes paid or payable (36i + 36ii + 36iii + 36iv + 36v + 36vi + 36vii + 36viii + 36ix)			0
37	Audit fee				0
38	Other expenses (specify nature and amount)				
		Sl. No	Nature	Amount	
		Total			0
39	Bad debts written off (specify PAN of the person, if it is available, for whom Bad Debt for amount of Rs. 1 lakh or more is claimed and amount)				
		Sl. No	PAN	Amount	
	ii	Others (more than Rs. 1 lakh) where PAN is not available		0	
	ii	Others (amounts less than Rs. 1 lakh)		0	
	vi	Total Bad Debt (39i (All PAN) + 39ii + 39iii)			0

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40	Provision for bad and doubtful debts			40	0
41	Other provisions			41	0
42	Profit before interest, depreciation and taxes [4 – (5iv + 6 + 7xii + 8 to 13 + 14xi + 15v + 16 to 21 + 22iii + 23iii + 24iii + 25 to 35 + 36x + 37 + 38iii + 39vi + 40 + 41)]			42	0
43	Interest				
	i	Paid outside India, or paid in India to a non-resident other than a company or a foreign company	i	0	
	ii	To others	ii	0	
	iii	Total (i + ii)		43iii	0
44	Depreciation and amortization			44	0
45	Profit before taxes (42 – 43iii – 44)			45	0
46	Provision for current tax			46	0
47	Provision for Deferred Tax and deferred liability			47	0
48	Profit after tax (45 - 46 - 47)			48	0
49	Balance brought forward from previous year			49	0
50	Amount available for appropriation (48 + 49)			50	0
51	Appropriations				
	i	Transfer to reserves and surplus	51i	0	
	ii	Proposed dividend/ Interim dividend	51ii	0	
	iii	Tax on dividend/ Tax on dividend for earlier years	51iii	0	
	iv	Appropriation towards Corporate Social Responsibility (CSR) activities (in case of companies covered under section 135 of Companies Act, 2013)	51iv	0	
	v	Any other appropriation	51v	0	
	vi	Total (51i + 51ii + 51iii + 51iv+51v)		51vi	0
52	Balance carried to balance sheet (50 – 51vi)			52	0
53	Other Comprehensive Income				
	A	Items that will not be reclassified to P&L			
		i	Changes in revaluation surplus	i	0
		ii	Re-measurements of the defined benefit plans	ii	0
		iii	Equity instruments through OCI	iii	0
		iv	Fair value Changes relating to own credit risk of financial liabilities designated at FVTPL	iv	0
		v	Share of Other comprehensive income in associates and joint ventures , to the extent not to be classified to P&L	v	0
		vi	Others (Specify nature)	vi	
		Sl. No	Nature	Amount	
		Total			38iii
		1608			0

	vii	Income tax relating to items that will not be reclassified to P&L	vii	0	
	viii	Total		53A	0
	B	Items that will be reclassified to P&L			
	i	Exchange differences in translating the financial statements of a foreign operation	i		0
	ii	Debt instruments through OCI	ii		0
	iii	The effective portion of gains and loss on hedging instruments in a cash flow hedge	iii	0	
	iv	Share of OCI in associates and joint ventures to the extent to be classified into P&L	iv	0	
	v	Other expenses (specify nature and amount)	v		
		Sl. No	Nature	Amount	
		Total	38iii	0	
	vi	Income tax relating to items that will be reclassified to P&L	vi	0	
	vii	Total		53B	0
54	Total Comprehensive Income (48 + 53A + 53B)				54 0
55	In a case where regular books of account of business or profession are not maintained, furnish the following information for previous year 2017-18 in respect of business or profession				
	a	Gross receipts		55a	0
	b	Gross profit		55b	0
	c	Expenses		55c	0
	d	Net profit		55d	0
Part A OI-Other Information (optional in a case not liable for audit under section 44AB)					
1	Method of accounting employed in the previous year			1	Mercantile
2	Is there any change in method of accounting			2	No
3	3a	Increase in the profit or decrease in loss because of deviation, if any, as per Income Computation Disclosure Standards notified under section 145(2) [column 11a(iii) of Schedule ICDS]	3a		0
	3b	Decrease in the profit or increase in loss because of deviation, if any, as per Income Computation Disclosure Standards notified under section 145(2) [column 11b(iii) of Schedule ICDS]	3b		0
4	Method of valuation of closing stock employed in the previous year				
	a	Raw Material (if at cost or market rates whichever is less write 1, if at cost write 2, if at market rate write 3)	4a	1. Cost or market rate , whichever is less	
	b	Finished goods (if at cost or market rates whichever is less write 1, if at cost write 2, if at market rate write 3)	4b	1. Cost or market rate , whichever is less	
	c	Is there any change in stock valuation method	4c	No	

	d	Increase in the profit or decrease in loss because of deviation, if any, from the method of valuation specified under section 145A	4d	0
	e	Decrease in the profit or increase in loss because of deviation, if any, from the method of valuation specified under section 145A	4e	0
5	Amounts not credited to the profit and loss account, being			
	a	the items falling within the scope of section 28	5a	0
	b	The proforma credits, drawbacks, refund of duty of customs or excise or service tax, or refund of sales tax or value added tax, or refund of GST, where such credits, drawbacks or refunds are admitted as due by the authorities concerned	5b	0
	c	escalation claims accepted during the previous year	5c	0
	d	Any other item of income	5d	0
	e	Capital receipt, if any	5e	0
	f	Total of amounts not credited to profit and loss account (5a+5b+5c+5d+5e)	5f	0
6	Amounts debited to the profit and loss account, to the extent disallowable under section 36 due to non-fulfilment of condition specified in relevant clauses :-			
	a	Premium paid for insurance against risk of damage or destruction of stocks or store[36(1)(i)]	6a	0
	b	Premium paid for insurance on the health of employees[36(1)(ib)]	6b	0
	c	Any sum paid to an employee as bonus or commission for services rendered, where such sum was otherwise payable to him as profits or dividend[36(1)(ii)]	6c	0
	d	Any amount of interest paid in respect of borrowed capital[36(1)(iii)]	6d	0
	e	Amount of discount on a zero-coupon bond[36(1)(iia)]	6e	0
	f	Amount of contributions to a recognised provident fund[36(1)(iv)]	6f	0
	g	Amount of contributions to an approved superannuation fund[36(1)(iv)]	6g	0
	h	Amount of contribution to a pension scheme referred to in section 80CCD[36(1)(iva)]	6h	0
	i	Amount of contributions to an approved gratuity fund[36(1)(v)]	6i	0
	j	Amount of contributions to any other fund	6j	0
	k	Any sum received from employees as contribution to any provident fund or superannuation fund or any fund set up under ESI Act or any other fund for the welfare of employees to the extent not credited to the employees account on or before the due date [36(1)(va)]	6k	0
	l	Amount of bad and doubtful debts [36(1)(vii)]	6l	0
	m	Provision for bad and doubtful debts [36(1)(viiia)]	6m	0
	n	Amount transferred to any special reserve [36(1)(viii)]	6n	0
	o	Expenditure for the purposes of promoting family planning amongst employees [36(1)(ix)]	6o	0
	p	Amount of securities transaction paid in respect of transaction in securities if such income is not included in business income [36(1)(xv)]	6p	0

	q	Any other disallowance	6q	0
	r	Total amount disallowable under section 36(total of 6a to 6q)	6r	0
	s	Total number of employees employed by the company (mandatory in case company has recognized Provident Fund)		
	i	deployed in India	i	0
	ii	deployed outside India	ii	0
	iii	Total	iii	0
7	Amounts debited to the profit and loss account, to the extent disallowable under section 37			
	a	Expenditure of capital nature [37(1)]	7a	0
	b	Expenditure of personal nature[37(1)]	7b	0
	c	Expenditure laid out or expended wholly and exclusively NOT for the purpose of business or profession[37(1)]	7c	0
	d	Expenditure on advertisement in any souvenir, brochure, tract, pamphlet or the like, published by a political party[37(2B)]	7d	0
	e	Expenditure by way of penalty or fine for violation of any law for the time being in force	7e	10665
	f	Any other penalty or fine	7f	0
	g	Expenditure incurred for any purpose which is an offence or which is prohibited by law	7g	0
	h	Expenditure incurred on corporate social responsibility (CSR)	7h	0
	i	Amount of any liability of a contingent nature	7i	0
	j	Any other amount not allowable under section 37	7j	0
	k	Total amount disallowable under section 37 (total of 7a to 7j)	7k	10665
8	A	Amounts debited to the profit and loss account, to the extent disallowable under section 40		
	a	Amount disallowable under section 40(a)(i) on account of non-compliance with provisions of Chapter XVII-B	Aa	0
	b	Amount disallowable under section 40(a)(ia) on account of non-compliance with the provisions of Chapter XVII-B	Ab	0
	c	Amount disallowable under section 40(a)(ib) on account of non-compliance with the provisions of Chapter VIII of the Finance Act, 2016	Ac	0
	d	Amount disallowable under section 40(a)(iii) on account of non-compliance with the provisions of Chapter XVII-B	Ad	0
	e	Amount of tax or rate levied or assessed on the basis of profits[40(a)(ii)]	Ae	0
	f	Amount paid as wealth tax[40(a)(ia)]	Af	0
	g	Amount paid by way of royalty, license fee, service fee etc. as per section 40(a)(iib)	Ag	0
	h	Amount of interest, salary, bonus, commission or remuneration paid to any partner or member[40(b)]	Ah	0
	i	Any other disallowance	Ai	0
	j	Total amount disallowable under section 40(total of Aa to Ai)	Aj	0

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	B	Any amount disallowed under section 40 in any preceding previous year but allowable during the previous year	8B	0
9	Amounts debited to the profit and loss account, to the extent disallowable under section 40A			
	a	Amounts paid to persons specified in section 40A(2)(b)	9a	0
	b	Amount paid in excess of twenty thousand rupees, otherwise than by account payee cheque or account payee bank draft or use of electronic clearing system through a bank account, disallowable under section 40A(3)	9b	0
	c	Provision for payment of gratuity [40A(7)]	9c	0
	d	any sum paid by the assessee as an employer for setting up or as contribution to any fund, trust, company, AOP, or BOI or society or any other institution [40A(9)]	9d	0
	e	Any other disallowance	9e	0
	f	Total amount disallowable under section 40A (total of 9a to 9e)	9f	0
10	Any amount disallowed under section 43B in any preceding previous year but allowable during the previous year			
	a	Any sum in the nature of tax, duty, cess or fee under any law	10a	0
	b	Any sum payable by way of contribution to any provident fund or superannuation fund or gratuity fund or any other fund for the welfare of employees	10b	0
	c	Any sum payable to an employee as bonus or commission for services rendered	10c	0
	d	Any sum payable as interest on any loan or borrowing from any public financial institution or a State financial corporation or a State Industrial investment corporation	10d	0
	e	Any sum payable by the assessee as interest on any loan or borrowing from a scheduled bank or a co-operative bank other than a primary agricultural credit society or a primary co-operative agricultural and rural development bank	10e	0
	f	Any sum payable towards leave encashment	10f	0
	g	Any sum payable to the Indian Railways for the use of railway assets	10g	0
	h	Total amount allowable under section 43B (total of 10a to 10g)	10h	0
11	Any amount debited to profit and loss account of the previous year but disallowable under section 43B			
	a	Any sum in the nature of tax, duty, cess or fee under any law	11a	30107
	b	Any sum payable by way of contribution to any provident fund or superannuation fund or gratuity fund or any other fund for the welfare of employees	11b	0
	c	Any sum payable to an employee as bonus or commission for services rendered	11c	0
	d	Any sum payable as interest on any loan or borrowing from any public financial institution or a State financial corporation or a State Industrial investment corporation	11d	0
	e	Any sum payable as interest on any loan or borrowing from any scheduled bank or a co-operative bank other than a primary agricultural credit society or a primary co-operative agricultural and rural development bank	11e	0
	f	Any sum payable towards leave encashment	11f	0
	g	Any sum payable by the assessee to the Indian Railways for the use of railway assets.	11g	0

	h	Total amount disallowable under Section 43B(total of 11a to 11g)	11h	30107
12	Amount of credit outstanding in the accounts in respect of			
	a	Union Excise Duty	12a	0
	b	Service tax	12b	0
	c	VAT/sales tax	12c	0
	d	Central Goods and Service Tax (CGST)	12d	0
	e	State Goods and Services Tax (SGST)	12e	0
	f	Integrated Goods and Services Tax (IGST)	12f	0
	g	Union Territory Goods and Services Tax (UTGST)	12g	0
	h	Any other tax	12h	0
	e	Total amount outstanding (total of 12a to 12h)	12e	0
13	Amounts deemed to be profits and gains under section 33AB or 33ABA or 33AC		13	0
	i	Section 33AB	13i	0
	ii	Section 33ABA	13ii	0
	iii	Section 33AC	13iii	0
14	Any amount of profit chargeable to tax under section 41		14	0
15	Amount of income or expenditure of prior period credited or debited to the profit and loss account (net)		15	0

Quantitative details (optional in a case not liable for audit under section 44AB)**(a)In the case of a trading concern**

	Item Name	Unit	Opening stock	Purchase during the previous year	Sales during the previous year	Closing stock	Shortage/ excess, if any
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(b)In the case of a manufacturing concern -Raw Materials

	Item Name	Unit of measure	Opening stock	Purchase during the previous year	Consumption during the previous year	Sales during the previous year	Closing stock	Yield Finished Products	Percentage of yield	Shortage/ excess, if any
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(c) In the case of a manufacturing concern - Finished products/ By-products

	Item Name	Unit	Opening stock	Purchase during the previous year	quantity manufactured during the previous year	Sales during the previous year	Closing stock	Shortage/ excess, if any
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Schedule OL**Receipt and payment account of company under liquidation**

1	Opening Balance			
	i	Cash in hand	1i	
	ii	Bank	1ii	
	iii	Total opening balance (1i + 1ii)	1iii	

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2	Receipts				
i	Interest	2i			
ii	Dividend	2ii			
iii	Sale of assets(pls. specify nature and amount)				
	S. No.	Nature	Amount		
	Total(iia + iib + iic)				
iv	Realisation of dues/debtors	2iv			
v	Others(pls. specify nature and amount)				
	S. No.	Nature	Amount		
	Total of other receipts(va + vb)				2v
vi	Total receipts (2i + 2ii + 2iia + 2iv + 2vc)		2vi		
3	Total of opening balance and receipts		3		
4	Payments				
i	Repayment of secured loan		4i		
ii	Repayment of unsecured loan		4ii		
iii	Repayment to creditors		4iii		
iv	Commission		4iv		
v	Others (pls. specify)				
	S. No.	Nature	Amount		
	Total of other payments(4va + 4vb)				4v
vi	Total payments(4i + 4ii + 4iii + 4iv + 4vi)		4vi		
5	Closing balance				
i	Cash in hand		5i		
ii	Bank		5ii		
iii	Total Closing balance (5i + 5ii)		5iii		
6	Total of closing balance and payments (4vi + 5iii)		6		
Part B-TI Computation of Total Income					
1	Income from house property (3b of Schedule-HP) (enter nil if loss)				1
2	Profits and gains from business or profession				
i	Profits and gains from business other than speculative business and specified business (A39 of Schedule-BP) (enter nil if loss)		2i	506039	
ii	Profits and gains from speculative business (B43 of Schedule BP) (enter nil if loss and carry this figure to Schedule CFL)		2ii	0	

	iii	Profits and gains from specified business (C49 of Schedule BP) (enter nil if loss and carry this figure to Schedule CFL)	2iii	0	
	iv	Income from patent u/s 115BBF (3d of Schedule BP)	2iv	0	
	v	Income from transfer of carbon credits u/s 115BBG (3e of Schedule BP)	2v	0	
	vi	Total (2i + 2ii + 2iii + 2iv + 2v)	2vi		506039
3	Capital gains				
	a	Short term Capital Gain			
	i	Short-term chargeable @ 15% (7ii of item E of schedule CG)	3ai	0	
	ii	Short-term chargeable @ 30% (7iii of item E of schedule CG)	3aii	0	
	iii	Short-term chargeable at applicable rate (7iv of item E of schedule CG)	3aiii	0	
	iv	STCG chargeable at special rates in India as per DTAA	3aiv	0	
	v	Total short-term Capital Gain (ai+aii+aiii+aiv)	3aiv	0	
	b	Long term Capital Gain			
	i	Long-term chargeable @ 10% (7v of item E of schedule CG)	3bi	0	
	ii	Long-term chargeable @ 20% (7vi of item E of schedule CG)	3bii	0	
	iii	LTCG chargeable at special rates as per DTAA	3biii	0	
	iv	Total Long-Term (bi+bii+biii)(enter nil if loss)	3biv	0	
	c	Total Capital Gains(3av + 3biv) (enter nil if loss)	3c		0
4	Income from other sources				
	a	From sources other than from owning and maintaining race horses and income chargeable to tax at special rate (1k of Schedule OS) (enter nil if loss)	4a	0	
	b	Income chargeable to tax at special rate (1fvi of Schedule OS)	4b	0	
	c	from owning and maintaining race horses (3e of Schedule OS) (enter nil if loss)	4c	0	
	d	Total (4a + 4b + 4c)	4d		0
5	Total (1 + 2vi + 3c + 4d)			5	506039
6	Losses of current year to be set off against 5 (total of 2xiii,3xiii and 4xiii of Schedule CYLA)			6	0
7	Balance after set off current year losses (5 - 6)(total of column 5 of Schedule CYLA + 4b)			7	506039
8	Brought forward losses to be set off against 7 (total of 2xii, 3xii and 4xii of Schedule BFLA)			8	0
9	Gross Total income (7 – 8) (also 5xiii of Schedule BFLA + 4b)			9	506039
10	Income chargeable to tax at special rate under section 111A, 112 etc. included in 9			10	0
11	Deduction u/s 10AA (e of Sch. 10AA)			11	0
12	Deductions under Chapter VI-A				
	a	Part-B of Chapter VI-A [1 of Schedule VI-A and limited upto (9-10)]	12a		0
	b	Part-C of Chapter VI-A [(2 of Schedule VI-A and limited upto (9-10-2iii)]	12b		0

	c	Total (12a + 12b) [limited upto (9-10)]	12c	0
13	Total income (9 – 11-12c)		13	506040
14	Income chargeable to tax at special rates (total of (i) of schedule SI)		14	0
15	Income chargeable to tax at normal rates (13 - 14)		15	506040
16	Net agricultural income (4 of Schedule EI)		16	0
17	Losses of current year to be carried forward (total of xi of Schedule CFL)		17	0
18	Deemed total income under section 115JB (9 of Schedule MAT)		18	402212
Part B-TTI - Computation of tax liability on total income				
1	a	Tax Payable on deemed total Income under section 115JB (10 of Schedule MAT)	1a	74409
	b	Surcharge on (a) above	1b	0
	c	Education cess, including secondary and higher education cess on (1a+1b) above	1c	2232
	d	Total Tax Payable u/s 115JB (1a+1b+1c)	1d	76641
2	Tax payable on total income			
	a	Tax at normal rates on 15 of Part B-TI	2a	126510
	b	Tax at special rates (total of col. (ii) of Schedule-SI)	2b	0
	c	Tax Payable on Total Income (2a + 2b)	2c	126510
	d	Surcharge		
	di	25% of 12(ii) of Schedule SI	2di	0
	dii	On [(2d) – (12(ii) of Schedule SI)]	2dii	0
	diii	Total (i + ii)	2diii	0
	e	Education cess, including secondary and higher education cess on (2c+2diii)	2e	3795
	f	Gross tax liability (2c+2diii+2e)	2f	130305
3	Gross tax payable (higher of 1d and 2f)		3	130305
4	Credit under section 115JAA of tax paid in earlier years (if 2f is more than 1d)(5 of Schedule MATC)		4	0
5	Tax payable after credit under section 115JAA [(3 - 4)]		5	130305
6	Tax relief			
	a	Section 90/90A(2 of Schedule TR)	6a	0
	b	Section 91(3 of Schedule TR)	6b	0
	c	Total (6a + 6b)	6c	0
7	Net tax liability (5 – 6c) (enter zero,if negative)		7	130305
8	Interest and fee payable			
	a	Interest For default in furnishing the return (section 234A)	8a	5212
	b	Interest For default in payment of advance tax (section 234B)	8b	13030
	c	Interest For deferment of advance tax (section 234C)	8c	6577
	d	Fee for default in furnishing return of income (section 234F)	8d	10000
	e	Total Interest and Fee Payable (8a+8b+8c+8d)	8e	34819
9	Aggregate liability (7 + 8e)		9	165124

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10	Taxes Paid			
a	Advance Tax (from column 5 of 15A)			10a 0
b	TDS (total of column 9 of 15B)			10b 0
c	TCS (total of column 7 of 15C)			10c 0
d	Self-Assessment Tax (from column 5 of 15A)			10d 165120
e	Total Taxes Paid (10a + 10b + 10c + 10d)			10e 165120
11	Amount payable (9 - 10e) (Enter if 9 is greater than 10e, else enter 0)			11 0
Refund				
12	Refund (If 10e is greater than 9) (Refund, if any, will be directly credited into the bank account)			12 0
Bank Account Details				
13	Do you have a bank account in India (Non-residents claiming refund with no bank account in India may select NO)?			Yes
a) Bank Account in which refund, if any, shall be credited				
	Sl No.	IFSC Code of the BANK	Name of the BANK	Account Number (the number should be 9 digits or more as per CBS system of the bank)
	1	SBIN0007211	State Bank of India	33708912624
b) Other Bank account details				
	Sl No.	IFSC Code of the BANK	Name of the BANK	Account Number (the number should be 9 digits or more as per CBS system of the bank)
c) Non-residents, who are claiming income-tax refund and not having bank account in India may, at their option, furnish the details of one foreign bank account				
	Sl No.	SWIFT Code	Name of the Bank	Country of Location IBAN
14	Do you at any time during the previous year,- (i) hold, as beneficial owner, beneficiary or otherwise, any asset (including financial interest in any entity) located outside India; or (ii) have signing authority in any account located outside India; or (iii) have income from any source outside India? [applicable only in case of a resident] [Ensure Schedule FA is filled up if the answer is Yes]			NO

VERIFICATION

I, **TERANCE ALEX**, son/ daughter of **ALEX**, solemnly declare that to the best of my knowledge and belief, the information given in the return and the schedules thereto is correct and complete and is in accordance with the the provisions of the Income-tax Act, 1961. I further declare that I am making this return in my capacity as **MANAGING DIRECTOR**, and I am also competent to make this return and verify it. I am holding permanent account number **AGUPA1453H** (if allotted) (Please see instruction). I further declare that the critical assumptions specified in the agreement have been satisfied and all the terms and conditions of the agreement have been complied with. (Applicable, in a case where return is furnished under section 92CD)

Place - **TRIVANDRUM**

Date - **31/01/2019**

15 A. Details of payments of Advance Tax and Self-Assessment

Acknowledgement Number : 415048571310119

Assessment Year : 2018-19

Sl. No.	BSR Code	Date of deposit(DD/MM/YYYY)	Serial number of challan	Amount(Rs)
(1)	(2)	(3)	(4)	(5)
1	0011349	31/01/2019	00668	165120
Total				165120

15 B1 - Sch TDS1 Details of Tax Deducted at Source on Income [As per FORM 16A issued by Deductor(s)]

Sl. No.	TDS credit in the name of	Tax Deduction Account Number (TAN) of the Deductor	Name of the Deductor	Unique TDS Certificate Number	Unclaimed TDS brought forward (b/f)		TDS of the current fin. Year			TDS credit out of (6), (7) or (8) being claimed this Year (only if corresponding income is being offered for tax this year)			TDS credit out of (6), (7) or (8) being carried forward			
					Fin. Year in which deducted	Amount b/f	Deducted in own hands	Deducted in the hands of any other person as per rule 37BA(2) (if applicable)	Claimed in own hands	Claimed in the hands of any other person as per rule 37BA(2) (if applicable)						
										Income	TDS	PAN of other person				
(1)	(1a)	(2)	(3)	(4)	(5)	(6)	(7)	(8)			(9)	(10)			(11)	
								Income	TDS	PAN of other person		Income	TDS	PAN of other person		
Total																

Note:Please enter total of column 8 of 15B1 and column 8 of 15B2 in 10b of Part B-TTI

15 B2 - TDS2 Details of Tax Deducted at Source (TDS) on Sale of Immovable Property u/s 194IA (For seller of property) [Refer Form 26QB]

Sl. No.	TDS credit in the name of	PAN of the buyer/ Tenant	Name of the Buyer/ Tenant	Unique TDS Certificate Number	Unclaimed TDS brought forward (b/f)		TDS of the current fin. Year			TDS credit out of (6), (7) or (8) being claimed this Year (only if corresponding income is being offered for tax this year)			TDS credit out of (6), (7) or (8) being carried forward		
					Fin. Year in which deducted	Amount b/f	Deducted in own hands	Deducted in the hands of any other person as per rule 37BA(2) (if applicable)	Claimed in own hands	Claimed in the hands of any other person as per rule 37BA(2) (if applicable)					
(1)	(1a)	(2)	(3)	(4)	(5)	(6)	(7)	(8)			(9)	(10)			(11)
								Income	TDS	PAN of other person		Income	TDS	PAN of other person	
Total															

Note:Please enter total of column 8 of 15B1 and column 8 of 15B2 in 10b of Part B-TTI

15 C. Details of Tax Collected at Source (TCS) [As per Form 27D issued by the Collector(s)]

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Sl.No.	Tax Deduction and Tax Collection Account Number of the Collector	Name of the Collector	Unclaimed TCS brought forward (b/f)		TCS of the current fin. year	Amount out of (5) or (6) being claimed this year (only if corresponding income is being offered for tax this year)	Amount out of (5) or (6) being carried forward
			Financial year in which Collected	Amount b/f			
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Total							
Note: Please enter total of column (7) in 10c of Part B-TTI							

Schedule HP - Details of Income from House Property					
1	Income under the head "Income from house property"				
(a)	Unrealized rent and Arrears of rent received during the year under section 25A after deducting 30%			1a	
(b)	Total (1j + 2j + 3a)			1b	
NOTE	Please include the income of the specified persons referred to in Schedule SPI while computing the income under this head.				
Schedule BP - Computation of income from business or profession					
A	From business or profession other than speculative business and specified business				
1.	Profit before tax as per profit and loss account (item 45 and or 53 of Part A-P & L) / (item 45 or 55 of Part A-P & L – Ind AS) (as applicable)			1	402212
2a.	Net profit or loss from speculative business included in 1 (enter -ve sign in case of loss)			2a	0
2b.	Net profit or Loss from Specified Business u/s 35AD included in 1 (enter -ve sign in case of loss)			2b	0
3.	Income/ receipts credited to profit and loss account considered under other heads of income/chargeable u/s 115BBF/chargeable u/s 115BBG				
a.	House property			3a	0
b.	Capital gains			3b	0
c.	Other sources			3c	0
d.	u/s 115BBF			3d	0
e.	u/s 115BBG			3e	0
4.	Profit or loss included in 1, which is referred to in section 44AE/44B/44BB/44BBA/44BBB/ 44D/44DA/ Chapter-XII-G/ First Schedule of Income-tax Act			4	
a.	u/s 115B			4a	0
b.	Other			4b	0
5.	Income credited to Profit and Loss account (included in 1) which is exempt				
a.	Share of income from firm(s)			5a	0
b.	Share of income from AOP/ BOI			5b	0
c.	Any other exempt income (specify nature and amount)				

			SI.No.	Nature	Amount	
			Total	5C	0	
		d	Total exempt income (5a + 5b + 5c)	5d	0	
	6.	Balance(1– 2a – 2b – 3a - 3b – 3c -3e- 3d – 4– 5d)			6	402212
	7.	Expenses debited to profit and loss account considered under other heads of income/related to income chargeable u/s 115BBF or u/s 115BBG				
		a.	House property	7a	0	
		b.	Capital gains	7b	0	
		c.	Other sources	7c	0	
		d.	u/s 115BBF	7d	0	
		e.	u/s 115BBG	7e	0	
	8.	Expenses debited to profit and loss account which relate to exempt income			8	0
	9.	Total (7a + 7b +7c + 7d+ 7e + 8)			9	0
	10.	Adjusted profit or loss (6+9)			10	402212
	11.	Depreciation and amortisation debited to profit and loss account			11	157784
	12.	Depreciation allowable under Income-tax Act				
		i	Depreciation allowable under section 32(1)(ii) and 32(1)(iia) (item 6 of Schedule-DEP)	12i	93729	
		ii	Depreciation allowable under section 32(1)(i) (Make your own computation refer Appendix-IA of IT Rules)	12ii	0	
		iii	Total (12i + 12ii)	12iii	93729	
	13.	Profit or loss after adjustment for depreciation (10 +11 - 12iii)			13	466267
	14.	Amounts debited to the profit and loss account, to the extent disallowable under section 36 (6r of PartA-OI)			14	0
	15.	Amounts debited to the profit and loss account, to the extent disallowable under section 37 (7k of Part A-OI)			15	10665
	16.	Amounts debited to the profit and loss account, to the extent disallowable under section 40 (8Aj of Part A-OI)			16	0
	17.	Amounts debited to the profit and loss account, to the extent disallowable under section 40A (9f of Part A-OI)			17	0
	18.	Any amount debited to profit and loss account of the previous year but disallowable under section 43B (11h of Part A-OI)			18	30107
	19.	Interest disallowable under section 23 of the Micro, Small and Medium Enterprises Development Act, 2006			19	0
	20.	Deemed income under section 41			20	0
	21.	Deemed income under section 32AC/ 32AD/ 33AB/ 33ABA/35ABA/ 35ABB/ 35AC/ 40A(3A)/ 33AC/ 72A/ 80HHD/ 80-IA			21	0
		(i)	Section 32AC	21(i)	0	
		(ii)	Section 32AD	21(ii)	0	
		(iii)	Section 33AB	21(iii)	0	
		(iv)	Section 33ABA	21(iv)	0	
		(v)	Section 35ABA	21(v)	0	
		(vi)	Section 35ABB	21(vi)	0	
		(vii)	Section 35AC	21(vii)	0	

		(viii)	Section 40A(3A)	21(viii)	0
		(ix)	Section 33AC	21(ix)	0
		(x)	Section 72A	21(x)	0
		(xi)	Section 80HHD	21(xi)	0
		(xii)	Section 80-1A	21(xii)	0
	22.		Deemed income under section 43CA	22	0
	23.		Any other item or items of addition under section 28 to 44DA	23	0
	24.		Any other income not included in profit and loss account/any other expense not allowable (including income from salary, commission, bonus and interest from firms in which company is a partner)	24	0
	24.	24(a)	Salary	24(a)	0
	24.	24(b)	Bonus	24(b)	0
	24.	24(c)	Commission	24(c)	0
	24.	24(d)	Interest	24(d)	0
	24.	24(e)	Others	24(e)	0
	25.		Increase in profit or decrease in loss on account of ICDS adjustments and deviation in method of valuation of stock (Column 3a + 4d of Schedule OI)	25	0
	26.		Total (14 + 15 + 16 + 17 + 18 + 19 + 20 + 21+ 22 + 23 + 24 + 25)	26	40772
	27.		Deduction allowable under section 32(1)(iii)	27	0
	28.		Deduction allowable under section 32AD	28	0
	29.		Amount allowable as deduction under section 32AC	29	0
	30.		Amount of deduction under section 35 or 35CCC or 35CCD in excess of the amount debited to profit and loss account (item x(4) of Schedule ESR) (if amount deductible under section 35 or 35CCC or 35CCD is lower than amount debited to P&L account, it will go to item 24)	30	0
	31.		Any amount disallowed under section 40 in any preceding previous year but allowable during the previous year(8B of Part A-OI)	31	0
	32.		Any amount disallowed under section 43B in any preceding previous year but allowable during the previous year (10g of Part A-OI)	32	0
	33.		Any other amount allowable as deduction	33	1000
	34.		Decrease in profit or increase in loss on account of ICDS adjustments and deviation in method of valuation of stock (Column 3b + 4e of Schedule OI)	34	0
	35.		Total (27 + 28 + 29 +30 + 31 + 32c + 33 + 34)	35	1000
	36.		Income (13 + 26 – 35)	34	506039
	37.		Profits and gains of business or profession deemed to be under -		
		i	Section 44AE	36i	0
		ii	Section 44B	36ii	0
		iii	Section 44BB	36iii	0
		iv	Section 44BBA	36iv	0

		v	Section 44BBB	36v	0	
		vi	Section 44D	36vi	0	
		vii	Section 44DA	36vii	0	
		viii	Chapter-XII-G (tonnage)	36viii	0	
		ix	First Schedule of Income-tax Act			
		a	u/s 115B	a	0	
		b	Others	b	0	
		x	Total (37 i to 37ix)	36x	0	
	38.	Net profit or loss from business or profession other than speculative and specified business (36 + 37x)			38	506039
	39.	Net Profit or loss from business or profession other than speculative business and specified business after applying rule 7A, 7B or 8, if applicable (If rule 7A, 7B or 8 is not applicable, enter same figure as in 36) (If loss take the figure to 2i of item E)			A39	506039
B. Computation of income from speculative business						
	40	Net profit or loss from speculative business as per profit or loss account			40	0
	41	Additions in accordance with section 28 to 44DA			41	0
	42	Deductions in accordance with section 28 to 44DA			42	0
	43	Income from speculative business (38 + 39 - 40) (if loss, take the figure to 6xi of schedule CFL)			B43	0
C. Computation of income from specified business under section 35AD						
	44	Net profit or loss from specified business as per profit or loss account			44	0
	45	Additions in accordance with section 28 to 44DA			45	0
	46	Deductions in accordance with section 28 to 44DA (other than deduction u/s 35AD, (ii) 32 or 35 on which deduction u/s 35AD is claimed))			46	0
	47	Profit or loss from specified business (43 + 44 - 45)			47	0
	48	Deductions in accordance with section 35AD(1) or 35AD(1A)			48	
		i	Section 35AD(1)	46i	0	
		ii	Section 35AD(1A)	46ii		
	49	Income from Specified Business (45 - 46) (if loss, take the figure to 7xi of schedule CFL)			C49	0
	50	S.No.	Relevant clause of sub-section (5) of section 35AD which covers the specified business (to be selected from drop down menu)			
D. Income chargeable under the head 'Profits and gains from business or profession' (A36+B41+C47)					D	506039
E. Intra head set off of business loss of current year						
	SI	Type of Business income	Income of current year (Fill this column only if figure is zero or positive)	Business loss set off	Business income remaining after set off	
			(1)	(2)	(3) = (1) - (2)	

	i	Loss to be set off (Fill this row only if figure is negative)		0	
	ii	Income from speculative business	0	0	0
	iii	Income from specified business	0	0	0
	iv	Total loss set off (ii + iii)		0	
	v	Loss remaining after set off (i – iv)		0	

Schedule DPM - Depreciation on Plant and Machinery (Other than assets on which full capital expenditure is allowable as deduction under any other section)

1	Block of assets	Plant and machinery			
2	Rate (%)	15	30	40	
		(i)	(ii)	(iii)	
3a	Written down value on the first day of previous year	400988	0	0	0
3b	Written down value on the first day of previous year, of those block of assets which were eligible for depreciation @ 50%, 60% or 80% as per the old Table	0	0	0	0
4	Additions for a period of 180 days or more in the previous year	1408	0	0	0
5	Consideration or other realization during the previous year out of 3 or 4	0	0	0	0
6	Amount on which depreciation at full rate to be allowed (3a+3b + 4 – 5) (enter 0, if result is negative)	402396	0	0	0

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7	Additions for a period of less than 180 days in the previous year	30000	0	155600
8	Consideration or other realizations during the year out of 7	0	0	0
9	Amount on which depreciation at half rate to be allowed (7 - 8)(enter 0, if result is negative)	30000	0	155600
10	Depreciation on 6 at full rate	60359	0	0
11	Depreciation on 9 at half rate	2250	0	31120
12	Additional depreciation, if any, on 4	0	0	0
13	Additional depreciation, if any, on 7	0	0	0
14	Additional depreciation relating to immediately preceding year' on asset put to use for less than 180 days	0	0	0
15	Total depreciation (10+11+12+13+14)	62609	0	31120
16	Depreciation disallowed under section 38(2) of the I.T. Act (out of column 15)	0	0	0
17	Net aggregate depreciation (15-16)	62609	0	31120
18	Proportionate aggregate depreciation allowable in the event of succession, amalgamation, demerger etc. (out of column 17)	0	0	0
19	Expenditure incurred in connection with transfer of asset/ assets	0	0	0
20	Capital gains/ loss under section 50(5 + 8 -3a - 3b -4 -7 -19) (enter negative only if block ceases to exist)	0	0	0
21	Written down value on the last day of previous year (6+ 9 -15) (enter 0 if result is negative)	369787	0	124480

Schedule DOA - Depreciation on other assets (Other than assets on which full capital expenditure is allowable as deduction)

1	Block of assets	Land	Building (not including land)			Furniture and Fittings	Intangible assets	Ships
2	Rate (%)	nil	5	10	40	10	25	20
			(i)	(ii)	(iii)	(iv)	(v)	(vi)
3	Written down value on the first day of previous year							

4	Additions for a period of 180 days or more in the previous year							
5	Consideration or other realization during the previous year out of 3 or 4							
6	Amount on which depreciation at full rate to be allowed(3 + 4 -5) (enter 0, if result is negative)							
7	Additions for a period of less than 180 days in the previous year							
8	Consideration or other realizations during the year out of 7							
9	Amount on which depreciation at half rate to be allowed (7 -8) (enter 0, if result is negative)							
10	Depreciation on 6 at full rate							
11	Depreciation on 9 at half rate							
12	Total depreciation (10+11)							
13	Depreciation disallowed under section 38(2) of the I.T. Act (out of column 12)							
14	Net aggregate depreciation (12-13)							
15	Proportionate aggregate depreciation allowable in the event of succession, amalgamation, demerger etc. (out of column 14)							
16	Expenditure incurred in connection with transfer of asset/ assets							
17	Capital gains/ loss under section 50 (5 + 8 -3-4 -7 -16)* (enter negative only if block ceases to exist)							
18	Written down value on the last day of previous year* (6+ 9 -12)(enter 0 if result is negative)							

Schedule DEP - Summary of depreciation on assets(Other than assets on which full capital expenditure is allowable as deduction under any other section)

1	Plant and machinery						
	a	Block entitled for depreciation @ 15 per cent (Schedule DPM - 17i or 18i as applicable)				1a	62609
	b	Block entitled for depreciation @ 30 per cent (Schedule DPM - 17ii or 18ii as applicable)				1b	0

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	c	Block entitled for depreciation @ 40 per cent (Schedule DPM - 17iii or 18iii as applicable)	1c	31120
	d	Total depreciation on plant and machinery (1a + 1b + 1c)	1d	93729
2	Building (not including land)			
	a	Block entitled for depreciation @ 5 per cent (Schedule DOA- 14ii or 15ii as applicable)	2a	0
	b	Block entitled for depreciation @ 10 per cent (Schedule DOA- 14iii or 15iii as applicable)	2b	0
	c	Block entitled for depreciation @ 40 per cent (Schedule DOA- 14iv or 15iv as applicable)	2c	0
	d	Total depreciation on building (total of 2a + 2b + 2c)	2d	0
3	Furniture and fittings (Schedule DOA- 14v or 15v as applicable)			
3				
4	Intangible assets (Schedule DOA- 14vi or 15vi as applicable)			
4				
5	Ships (Schedule DOA- 14vii or 15vii as applicable)			
5				
6	Total depreciation (1d+2d+3+4+5)			
6				

Schedule DCG - Deemed Capital Gains on sale of depreciable assets

1	Plant and machinery			
	a	Block entitled for depreciation @ 15 per cent (Schedule DPM - 20i)	1a	
	b	Block entitled for depreciation @ 30 per cent (Schedule DPM - 20ii)	1b	
	c	Block entitled for depreciation @ 40 per cent (Schedule DPM - 20iii)	1c	
	d	Total (1a +1b + 1c)	1d	
2	Building (not including land)			
	a	Block entitled for depreciation @ 5 per cent (Schedule DOA- 17ii)	2a	
	b	Block entitled for depreciation @ 10 per cent (Schedule DOA- 17iii)	2b	
	c	Block entitled for depreciation @ 40 per cent (Schedule DOA- 17iv)	2c	
	d	Total (2a + 2b + 2c)	2d	
3	Furniture and fittings (Schedule DOA- 17v)			
3				
4	Intangible assets (Schedule DOA- 17vi)			
4				
5	Ships (Schedule DOA- 17vii)			
5				
6	Total (1d+2d+3+4+5)			
6				

Schedule ESR - Deduction under section 35 or 35CCC or 35CCD

Sl.No.	Expenditure of the nature referred to in section (1)	Amount, if any, debited to profit and loss account (2)	Amount of deduction allowable (3)	Amount of deduction in excess of the amount debited to profit and loss account (4) = (3) - (2)
i	35(1)(i)			
ii	35(1)(ii)			
iii	35(1)(ia)			
iv	35(1)(iii)			
v	35(1)(vi)			
vi	35(2AA)			
vii	35(2AB)			

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viii	35CCC			
ix	35CCD			
x	Total			

Schedule CG Capital Gains				
A	Short-term capital gain (Sub-items 4 & 5 are not applicable for residents)			
1	From sale of land or building or both			
a	i	Full value of consideration received/receivable	ai	0
	ii	Value of property as per stamp valuation authority	aii	0
	iii	Full value of consideration adopted as per section 50C for the purpose of Capital Gains (ai or aii)	aiii	0
b	Deductions under section 48			
	i	Cost of acquisition without indexation	bi	0
	ii	Cost of Improvement without indexation	bii	0
	iii	Expenditure wholly and exclusively in connection with transfer	biii	0
	iv	Total (bi + bii + biii)	biv	0
c	Balance (aiii – biv)			1c 0
d	Deduction under section 54D/ 54G/54GA (Specify details in item D below)			
	S. No.	Nature	Amount	
	Total			1d 0
e	Short-term Capital Gains on Immovable property (1c - 1d)			A1e 0
2	From slump sale			
a	Full value of consideration			2a 0
b	Net worth of the under taking or division			2b 0
c	Short term capital gains from slump sale(2a-2b)			A2c 0
4	For NON-RESIDENT, not being an FII- from sale of shares or debentures of an Indian company (to be computed with foreign exchange adjustment under first proviso to section 48)			
a	STCG on transactions on which securities transaction tax (STT) is paid			A4a 0
b	STCG on transactions on which securities transaction tax (STT) is not paid			A4b 0
5	For NON-RESIDENTS- from sale of securities (other than those at A3 above) by an FII as per section 115AD			
a	i	In case securities sold include shares of a company other than quoted shares, enter the following details		
	a	Full value of consideration received/receivable in respect of unquoted share	5aia	0
	b	Fair market value of unquoted shares determined in the prescribed manner	5aib	0
	c	Full value of consideration in respect of unquoted shares adopted as per section 50CA for the purpose of Capital Gains (higher of a or b)	5aic	0
	ii	Full value of consideration in respect of securities other than unquoted shares	5aia	0
	iii	Total (ic + ii)	5aiii	0
b	Deductions under section 48			
	i	Cost of acquisition without indexation	bi	0

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	ii	Cost of improvement without indexation			bii	0	
	iii	Expenditure wholly and exclusively in connection with transfer			biii	0	
	iv	Total (i + ii + iii)			biv	0	
c	Balance (5aiii – biv)			5c	0		
d	Loss to be disallowed u/s 94(7) or 94(8)- for example if security bought/acquired within 3 months prior to record date and dividend/income/bonus units are received, then loss arising out of sale of such security to be ignored (Enter positive value only)			5d	0		
e	Short-term capital gain on securities (other than those at A3 above) by an FII (5c +5d)			A5e	0		
6	From sale of assets other than at A1 or A2 or A3 or A4 or A5 above						
a	i	In case assets sold include shares of a company other than quoted shares, enter the following details					
		a	Full value of consideration received/receivable in respect of unquoted share		6aia	0	
		b	Fair market value of unquoted shares determined in the prescribed manner		6aib	0	
		c	Full value of consideration in respect of unquoted shares adopted as per section 50CA for the purpose of Capital Gains (higher of a or b)		6ic	0	
	ii	Full value of consideration in respect of assets other than unquoted shares			6aii	0	
	iii	Total (ic + ii)			6aiii	0	
b	Deductions under section 48						
	i	Cost of acquisition without indexation			bi	0	
	ii	Cost of Improvement without indexation			bii	0	
	iii	Expenditure wholly and exclusively in connection with transfer			biii	0	
	iv	Total (i + ii + iii)			biv	0	
c	Balance (6aiii – biv)			6c	0		
d	In case of asset (security/unit) loss to be disallowed u/s 94(7) or 94(8)- for example if asset bought/acquired within 3 months prior to record date and dividend/income/bonus units are received, then loss arising out of sale of such asset to be ignored (Enter positive value only)			6d	0		
e	Deemed short term capital gains on depreciable assets (6 of schedule- DCG)			6e	0		
f	Deduction under section 54D/54G/54GA			6f			
	S. No.	Nature			Amount		
	Total			6f	0		
g	STCG on assets other than at A1 or A2 or A3 or A4 or A5 above (6c + 6d + 6e – 6f)			A6g	0		
7	Amount Deemed to be short-term capital gains						
a	Whether any amount of unutilized capital gain on asset transferred during the previous years shown below was deposited in the Capital Gains Accounts Scheme within due date for that year? If yes, then provide the details below					NA	
	Sl.No.	Previous year in which asset transferred	Section under which deduction claimed in that year	New asset acquired/constructed		Amount not used for new asset or remained unutilized in Capital gains account (X)	
				Year in which asset acquired/constructed	Amount utilised out of Capital Gains account		
b	Amount deemed to be short term capital gains u/s 54D/54G/54GA, other than at 'a'						

Amount deemed to be short term capital gains (Xi + b)										A7	0	
8	Amount of STCG included in A1-A7 but not chargeable to tax or chargeable at special rates in India as per DTAA											
	Sl. No.	Amount of income	Item no. A1 to A7 above in which included	Country Name, Code	Article of DTAA	Rate as per Treaty (enter NIL, if not chargeable)	Whether TRC obtained (Y/N)	Section of I.T. Act	Rate as per I.T. Act	Applicable rate [lower of (6) or (9)]		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)		
	a	Total amount of STCG not chargeable to tax under DTAA								A8a	0	
	b	Total amount of STCG chargeable at special rates in India as per DTAA								A8b	0	
9	Total short term capital gain (A1e+ A2c+ A3e+ A4a+ A4b+ A5e+ A6g+A7-A8)										A9	0
B	Long-term capital gain (LTCG) (Sub-items 5 & 6 are not applicable for residents)											
1	From sale of land or building or both											
	a	i	Full value of consideration received/receivable							ai	0	
		ii	Value of property as per stamp valuation authority							aii	0	
		iii	Full value of consideration adopted as per section 50C for the purpose of Capital Gains (ai or aii)							aiii	0	
	b	Deductions under section 48										
		i	Cost of acquisition with indexation							bi	0	
		ii	Cost of Improvement with indexation							bii	0	
		iii	Expenditure wholly and exclusively in connection with transfer							biii	0	
		iv	Total (bi + bii + biii)							biv	0	
	c	Balance (aiii – biv)							1c	0		
	d	Deduction under section 54D/54EC/54EE /54G/54GA (Specify details in item D below)										
		S. No.	Section							Amount		
			Total							1d	0	
	e	Long-term Capital Gains on Immovable property (1c - 1d)							B1e	0		
2	From slump sale											
	a	Full value of consideration							2a	0		
	b	Net worth of the under taking or division							2b	0		
	c	Balance(2a-2b)							2c	0		
	d	Deduction u/s 54EC/54EE										
		S. No.	Section							Amount		
		Total							2d	0		
	e	Long term capital gains from slump sale (2c-2d)							B2e	0		
3	From sale of bonds or debenture (other than capital indexed bonds issued by Government)											
	a	Full value of consideration							3a	0		
	b	Deductions under section 48										

	i	Cost of acquisition without indexation	bi	0
	ii	Cost of improvement without indexation	bii	0
	iii	Expenditure wholly and exclusively in connection with transfer	biii	0
	iv	Total (bi + bii +biii)	biv	0
	c	Balance (3a - biv)	3c	0
	d	Deduction under sections 54EC/54EE (Specify details in item D below)		
	S. No.	Section	Amount	
	Total		3d	0
e	LTCG on bonds or debenture (3c – 3d)	B3e	0	
4	From sale of listed securities (other than a unit) or zero coupon bonds where proviso under section 112(1) is applicable			
a	Full value of consideration		4a	0
b	Deductions under section 48			
	i	Cost of acquisition without indexation	bi	0
	ii	Cost of improvement without indexation	bii	0
	iii	Expenditure wholly and exclusively in connection with transfer	biii	0
	iv	Total (bi + bii +biii)	biv	0
c	Balance (4a - 4biv)		4c	0
d	Deduction under sections 54EC/54EE (Specify details in item D below)			
S. No.	Section	Amount		
Total		4d	0	
e	Long-term Capital Gains on assets at B4 above (4c – 4d)	B4e	0	
5	For NON-RESIDENTS- from sale of shares or debenture of Indian company (to be computed with foreign exchange adjustment under first proviso to section 48)			
a	LTCG computed without indexation benefit		5a	0
b	Deduction under sections 54EC/54EE (Specify details in item D below)			
S. No.	Section	Amount		
Total		5b	0	
c	LTCG on share or debenture (5a – 5b)		B5c	0
7	From sale of assets where B1 to B6 above are not applicable			
a	i	In case assets sold include shares of a company other than quoted shares, enter the following details		
	a	Full value of consideration received/receivable in respect of unquoted shares	ia	0
	b	Fair market value of unquoted shares determined in the prescribed manner	ib	0
	c	Full value of consideration in respect of unquoted shares adopted as per section 50CA for the purpose of Capital Gains (higher of a or b)	ic	0
	ii	Full value of consideration in respect of assets other than unquoted shares	iii	0
	iii	Total (ic + ii)	iii	0

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b		Deductions under section 48								
i		Cost of acquisition with indexation					bi	0		
ii		Cost of Improvement with indexation					bii	0		
iii		Expenditure wholly and exclusively in connection with transfer					biii	0		
iv		Total (bi + bii + biii)					biv	0		
c		Balance (7a - biv)					7c	0		
d		Deduction under sections 54D/54EC/54EE/54G/54GA (Specify details in item D below)								
		S. No.		Section		Amount				
		Total							7d	0
e		Long-term Capital Gains on assets at B7 above (7c-7d)					B7e	0		
8		Amount deemed to be long-term capital gains								
a		Whether any amount of unutilized capital gain on asset transferred during the previous years shown below was deposited in the Capital Gains Accounts Scheme within due date for that year? If yes, then provide the details below							NA	
		Sl.No.	Previous year in which asset transferred	Section under which deduction claimed in that year	New asset acquired/constructed		Amount not used for new asset or remained unutilized in Capital gains account (X)			
					Year in which asset acquired/constructed	Amount utilised out of Capital Gains account				
b		Amount deemed to be long-term capital gains, other than at 'a'								
		Amount deemed to be long-term capital gains (Xi + b)							B8	0
9		Amount of LTCG included in B1- B8 but not chargeable to tax or chargeable at special rates in India as per DTAA (to be taken to schedule SI)								
Sl. No	Amount of income	Item B1 to B8 above in which included	Country Name, Code	Article of DTAA	Rate as per Treaty (enter NIL, if not chargeable)	Whether Tax Residency Certificate obtained?	Section of I.T. Act	Rate as per I.T. Act	Applicable rate [lower of (6) or (9)]	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	
a	Total amount of LTCG not chargeable to tax under DTAA							B9a	0	
b	Total amount of LTCG chargeable at special rates in India as per DTAA							B9b	0	
10	Total long term capital gain [B1e +B2e+ B3e +B4e + B5c + B6e + B7e + B8 - B9a](In case of loss take the figure to 9xi of schedule CFL)							B10	0	
C	Income chargeable under the head "CAPITAL GAINS" (A9 + B10) (take B10 as nil, if loss)							C	0	
D		Information about deduction claimed								
1		In case of deduction u/s 54B/54D/54EC/54EE /54G/54GA give following details								
		a	Deduction claimed u/s 54B							
		Sl.No	Date of transfer of original asset	Cost of new agricultural land	Date of purchase of new agricultural land	Amount deposited in Capital Gains	Amount of deduction claimed			

					Accounts Scheme before due date			
b	Deduction claimed u/s 54D							
	Sl.No	Date of transfer of original asset	Cost of purchase/ construction of new land or building for industrial undertaking	Date of purchase of new land or building	Amount deposited in Capital Gains Accounts Scheme before due date	Amount of deduction claimed		
c	Deduction claimed u/s 54EC							
	Sl.No	Date of transfer of original asset	Amount invested in specified/notified bonds	Date of investment	Amount of deduction claimed			
d	Deduction claimed u/s 54EE							
	Sl.No	Date of transfer of original asset	Amount invested in specified asset	Date of investment	Amount of deduction claimed			
e	Deduction claimed u/s 54G							
	Sl.No	Date of transfer of original asset	Cost and expenses incurred for purchase or construction of new asset	Date of purchase/construction of new asset in an area other than urban area	Amount deposited in Capital Gains Accounts Scheme before due date	Amount of deduction claimed		
f	Deduction claimed u/s 54GA							
	Sl.No	Date of transfer of original asset	Cost and expenses incurred for purchase or construction of new asset	Date of purchase/construction of new asset in SEZ	Amount deposited in Capital Gains Accounts Scheme before due date	Amount of deduction claimed		
g	Total deduction claimed (1a + 1b + 1c + 1d + 1e + 1f)				g			
E	Set-off of current year capital losses with current year capital gains (excluding amounts included in A8 and B9 which is chargeable under DTAA)							
Sl.No	Type of Capital	Gain of current year (Fill this column only if computed figure is positive)	Short term capital loss set off			Long term capital loss set off		Current year's capital gains remaining after set off (7= 1-2-3-4-5-6)
	Gain		15%	30%	appli cable rate	10%	20%	
		1	2	3	4	5	6	7
i	Loss to be set off (Fill this row if		0	0	0	0	0	

	figure computed is negative)							
ii	Short	15%	0		0	0		0
iii	term	30%	0	0		0		0
iv	capital gain	applicable rate	0	0	0			0
v	Long	10%	0	0	0		0	0
vi	term	20%	0	0	0	0		0
vii	Total loss set off (ii + iii + iv + v + vi)		0	0	0	0	0	
viii	Loss remaining after set off (i – vii)		0	0	0	0	0	

F	Information about accrual/receipt of capital gain					
	Type of Capital gain / Date	Upto 15/6 (i)	16/6 to 15/09 (ii)	16/9 to 15/12 (iii)	16/12 to 15/3 (iv)	16/3 to 31/3 (v)
1	Short-term capital gains taxable at the rate of 15% Enter value from item 3iii of schedule BFLA, if any.	0	0	0	0	0
2	Short-term capital gains taxable at the rate of 30% Enter value from item 3iv of schedule BFLA, if any.	0	0	0	0	0
3	Short-term capital gains taxable at applicable rates Enter value from item 3v of schedule BFLA, if any..	0	0	0	0	0
4	Long- term capital gains taxable at the rate of 10% Enter value from item 3vi of schedule BFLA, if any.	0	0	0	0	0
5	Long- term capital gains taxable at the rate of 20% Enter value from item 3vii of schedule BFLA, if any.	0	0	0	0	0

Note: Please include the income of the specified persons referred to in Schedule SPI while computing the income under this head

Schedule OS: Income from other sources

1	Income				
a	Dividend (Excluding taxable at special Rates),Gross	1a	0		
b	Interest (Excluding taxable at special Rates), Gross	1b	0		
b(i)	From Term Deposit	1b(i)	0		
b(ii)	From Income Tax refund	1b(ii)	0		
b(iii)	From others	1b(iii)	0		
c	Rental income from machinery, plants, buildings, etc., Gross	1c	0		
d	Others, Gross (excluding income from owning race horses)Mention the nature				
	Source	Income			
	Income by way of winnings from lotteries, crossword puzzles etc.	0			
	(a) Cash credits u/s 68	0			
	(b) Unexplained investments u/s 69	0			

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j	Profits chargeable to tax u/s 59	1j	0
k	Income from other sources (other than from owning race horses and amount chargeable to tax at special rate) (1g – hiii + 1i + 1j) (If negative take the figure to 4i of schedule CYLA)	1k	0
2	Income from other sources (other than from owning and maintaining race horses) (1fvii + 1k) (enter 1i as nil, if negative)	2	0
3	Income from the activity of owning race horses		
a	Receipts	3a	0
b	Deductions under section 57 in relation to (4)	3b	0
c	Amounts not deductible u/s 58	3c	0
d	Profits chargeable to tax u/s 59	3d	0
e	Balance (3a – 3b + 3c + 3d)(if negative take the figure to 10xi of Schedule CFL)	3e	0
4	Income under the head “Income from other sources” (2 + 3e) (take 3e as nil if negative)	4	0
NOTE	Please include the income of the specified persons referred to in Schedule SPI while computing the income under this head.		

Schedule CYLA**Details of Income after set-off of current years losses**

Sl.No.	Head/ Source of Income	Income of current year (Fill this column only if income is zero or positive)	House property loss of the current year set off	Business Loss (other than speculation or specified business loss) of the current year set off	Other sources loss (other than loss from race horses) of the current year set off	Current year's Income remaining after set off
			Total loss (3b of Schedule -HP)	Total loss (2v of item E of Schedule BP)	Total loss (1i) of Schedule-OS	
		1	2	3	4	
i	Loss to be set off		0	0	0	
ii	House property	0		0	0	0
iii	Business (excluding speculation income and income from specified business)	506039	0		0	506039
iv	Speculation Income	0	0		0	0
v	Specified business income u/s 35AD	0	0		0	0
vi	Short-term capital gain taxable @ 15%	0	0	0	0	0
vii	Short-term capital gain taxable @ 30%	0	0	0	0	0

viii	Short-term capital gain taxable at applicable rates	0	0	0	0	0
ix	Long term capital gain taxable @ 10%	0	0	0	0	0
x	Long term capital gain taxable @ 20%	0	0	0	0	0
xi	Other sources (excluding profit from owning race horses and amount chargeable to special rate of tax)	0	0	0		0
xii	Profit from owning and maintaining race horses	0	0	0	0	0
xiii	Total loss set-off (ii+ iii + iv+ v+ vi+ vii+ viii+ ix+ x+ xi+ xii)		0	0	0	
xiv	Loss remaining after set-off (i - xiii)		0	0	0	

Schedule BFLA**Details of Income after Set off of Brought Forward Losses of earlier years**

Sl.No	Head/ Source of Income	Income after set off, if any, of current year's losses as per col. 4 of Schedule CYLA	Brought forward loss set off	Brought forward depreciation set off	Brought forward allowance under section 35(4) set off	Current year's income remaining after set off
		1	2	3	4	5
i	House property	0	0	0	0	0
ii	Business (excluding speculation profit and income from specified business)	506039	0	0	0	506039
iii	Speculation Income	0	0	0	0	0
iv	Specified Business Income	0	0	0	0	0
v	Short-term capital gain taxable at 15%	0	0	0	0	0
vi	Short-term capital gain taxable at 30%	0	0	0	0	0
vii	Short-term capital gain taxable at applicable rates	0	0	0	0	0
viii	Long term capital gain taxable at 10%	0	0	0	0	0
ix	Long term capital gain taxable at 20%	0	0	0	0	0

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x	Other sources income (excluding profit from owning and maintaining race horses and amount chargeable to special rate of tax)	0		0	0	0
xi	Profit from owning and maintaining race horses	0	0	0	0	0
xii	Total of brought forward loss set off		0	0	0	
xiii	Current year's income remaining after set off Total (i5 + ii5 + iii5 + iv5+v5 + vi5 + vii5 + viii5 + ix5 + x5 + xi5)					506039

Schedule CFL**Details of Losses to be carried forward to future years**

Sl.No.	Assessment Year	Date of Filing (DD/MM/YYYY)	House property loss	Loss from business other than loss from speculative Business and specified business	Loss from speculative Business	Loss from specified business	Short-term capital loss	Long-term Capital loss	Loss from owning and maintaining race horses
i	2010-11								
ii	2011-12								
iii	2012-13								
iv	2013-14								
v	2014-15								
vi	2015-16								
vii	2016-17								
viii	2017-18								
ix	Total of earlier year losses b/f								
x	Adjustment of above losses in Schedule BFLA								
xi	2018-19 (Current year losses)								
xii	Total loss Carried Forward to future years								

Schedule UD - Unabsorbed depreciation and allowance under section 35(4)

Sl.No (1)	Assessment Year (2)	Depreciation			Allowance under section 35(4)		
		Amount of brought forward unabsorbed depreciation (3)	Amount of depreciation set-off against the current year income (4)	Balance Carried forward to the next year (5)	Amount of brought forward unabsorbed allowance (6)	Amount of allowance set-off against the current year income (7)	Balance Carried forward to the next year (8)
1	2018-19			0			0
	Total	0	0	0	0	0	0

Schedule ICDS - Effect of Income Computation Disclosure Standards on profit

Sl.No.	ICDS	Amount (+) or (-)
(i)	(ii)	(iii)
I	Accounting Policies	
II	Valuation of Inventories	
III	Construction Contracts	
IV	Revenue Recognition	
V	Tangible Fixed Assets	
VI	Changes in Foreign Exchange Rates	
VII	Government Grants	
VIII	Securities	
IX	Borrowing Costs	
X	Provisions, Contingent Liabilities and Contingent Assets	
11a	Total effect of ICDS adjustments on profit (I+II+III+IV+V+VI+VII+VIII+IX+X) (if positive)	
11b	Total effect of ICDS adjustments on profit (I+II+III+IV+V+VI+VII+VIII+IX+X) (if negative)	

Schedule 10A - Deduction under section 10A**Deduction in respect of units located in Special Economic Zone**

Sl.No.	Undertaking	Assessment year in which unit begins to manufacture/produce/provide services	Amount of deduction
Total deduction under section 10A(a+b)			

Schedule 10AA -Deduction under section 10AA**Deduction in respect of units located in Special Economic Zone**

Sl.No.	Undertaking	Assessment year in which unit begins to manufacture/produce/provide services	Amount of deduction
Total deduction under section 10AA			

Details of donations entitled for deduction under section 80G**A. Donations entitled for 100% deduction without qualifying limit**

Sl.No.	Name of donee	Address Detail	City or Town or District	State Code	PinCode	PAN of Donee	Amount of donation	Eligible Amount of Donation
Total A								

B.Donations entitled for 50% deduction without qualifying limit

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Sl.No.	Name of donee	Address Detail	City or Town or District	State Code	PinCode	PAN of Donee	Amount of donation	Eligible Amount of Donation
Total B								

C. Donations entitled for 100% deduction subject to qualifying limit

Sl.No.	Name of donee	Address Detail	City or Town or District	State Code	PinCode	PAN of Donee	Amount of donation	Eligible Amount of Donation
Total C								

D. Donations entitled for 50% deduction subject to qualifying limit

Sl.No.	Name of donee	Address Detail	City or Town or District	State Code	PinCode	PAN of Donee	Amount of donation	Eligible Amount of Donation
Total D								

E.Total amount of Donations(A + B + C + D)

F.Total Eligible amount of Donations (A + B + C + D)

Schedule 80-IA - Deductions under section 80-IA

a	Deduction in respect of profits of an enterprise referred to in section 80-IA(4)(i) [Infrastructure facility]							
	1	Undertaking No. 1				0		
b	Deduction in respect of profits of an undertaking referred to in section 80-IA(4)(ii) [Telecommunication services]							
	1	Undertaking No. 1				0		
c	Deduction in respect of profits of an undertaking referred to in section 80-IA(4)(iii) [Industrial park and SEZs]							
	1	Undertaking No. 1				0		
d	Deduction in respect of profits of an undertaking referred to in section 80-IA(4)(iv) [Power]							
	1	Undertaking No. 1				0		
e	Deduction in respect of profits of an undertaking referred to in section 80-IA(4)(v) [Revival of power generating plant] and deduction in respect of profits of an undertaking referred to in section 80-IA(4)(vi) [Cross-country natural gas distribution network]							
	1	Undertaking No. 1				0		
f	Total deductions under section 80-IA (a + b + c + d + e)						f	0

Sch 80- IB Deductions under Section 80-IB

a	Deduction in respect of industrial undertaking located in Jammu and Kashmir [Section 80-IB(4)]							
	1	Undertaking No. 1				0		
b	Deduction in respect of industrial undertaking located in industrially backward states specified in Eighth Schedule [Section 80-IB(4)]							
	1	Undertaking No. 1				0		
c	Deduction in respect of industrial undertaking located in industrially backward districts [Section 80-IB(5)]							

	1	Undertaking No. 1	0	
d	Deduction in the case of multiplex theatre [Section 80-IB(7A)]			
	1	Undertaking No. 1	0	
e	Deduction in the case of convention centre [Section 80-IB(7B)]			
	1	Undertaking No. 1	0	
f	Deduction in the case of company carrying on scientific research [Section 80-IB(8A)]			
	1	Undertaking No. 1	0	
g	Deduction in the case of undertaking which begins commercial production or refining of mineral oil [Section 80-IB(9)]			
	1	Undertaking No. 1	0	
h	Deduction in the case of an undertaking developing and building housing projects [Section 80-IB(10)]			
	1	Undertaking No. 1	0	
i	Deduction in the case of an undertaking operating a cold chain facility [Section 80-IB(11)]			
	1	Undertaking No. 1	0	
j	Deduction in the case of an undertaking engaged in processing, preservation and packaging of fruits, vegetables, meat, meat products, poultry, marine or dairy products [Section 80-IB(11A)]			
	1	Undertaking No. 1	0	
k	Deduction in the case of an undertaking engaged in integrated business of handling, storage and transportation of foodgrains [Section 80-IB(11A)]			
	1	Undertaking No. 1	0	
l	Deduction in the case of an undertaking engaged in operating and maintaining a rural hospital [Section 80-IB(11B)]			
	1	Undertaking No. 1	0	
m	Deduction in the case of an undertaking engaged in operating and maintaining a hospital in any area, other than excluded area [Section 80-IB(11C)]			
	1	Undertaking No. 1	0	
n	Total deduction under section 80-IB (Total of a1 to m2)			n 0
Sch 80-IC or 80-IE Deductions under section 80-IC or 80-IE				
a	Deduction in respect of undertaking located in Sikkim			
	1	Undertaking No. 1	0	
b	Deduction in respect of undertaking located in Himachal Pradesh			
	1	Undertaking No. 1	0	
c	Deduction in respect of undertaking located in Uttaranchal			
	1	Undertaking No. 1	0	
d	Deduction in respect of undertaking located in North-East			
da	Assam			
	1	Undertaking No. 1	1640 0	

db	Arunachal Pradesh		
	1	Undertaking No. 1	0
dc	Manipur		
	1	Undertaking No. 1	0
dd	Mizoram		
	1	Undertaking No. 1	0
de	Meghalaya		
	1	Undertaking No. 1	0
df	Nagaland		
	1	Undertaking No. 1	0
dg	Tripura		
	1	Undertaking No. 1	0
dh	Total deduction for undertakings located in North-east (total of da1 to dg2)		dh 0
e	Total deduction under section 80-IC or 80-IE (a + b + c + dh)		e 0
Deductions under Chapter VI-A			
1. Part B- Deduction in respect of certain payments			
a	80G - Donations to certain funds, charitable institutions, etc		
b	80GGB - Contribution given by companies to political parties		
c	80GGA - Certain donations for scientific research or rural development		
d	80GGC - Donation to Political party		
	Total Deduction under Part B (a + b + c + d)		
2. Part C- Deduction in respect of certain incomes			
e	80-IA (f of Schedule 80-IA) - Profits and gains from industrial undertakings or enterprises engaged in infrastructure development, etc.		
f	80-IAB - Profits and gains by an undertaking or enterprise engaged in development of Special Economic Zone		
g	80-IAC - Special provision in respect of specified business		
h	80-IB (n of Schedule 80-IB)- Profits and gains from certain industrial undertakings other than infrastructure development undertakings		
i	80-IBA - Profits and gains from housing projects		
j	80-IC/ 80-IE (e of Schedule 80-IC/ 80-IE)-Special provisions in respect of certain undertakings or enterprises in certain special category States/ North-Eastern States.		
k	80JJA-Profits and gains from business of collecting and processing of bio-degradable waste.		
l	80JJAA-Employment of new employees		

m	80LA-Certain Income Of Offshore Banking Units And International Financial Services Center		
	Total Deduction under Part C (total of e to m)		
3	Total deductions under Chapter VI-A (1 + 2)		

Schedule SI**Income chargeable to tax at special rates [Please see instruction Number-7(ii) for section and rate of tax]**

Sl.No.	Section/Description	Special rate (%)	Income (i)	Tax thereon (ii)
1	111 - Tax on accumulated balance of recognised PF	1	0	0
2	Chargeable under DTAA rate	1	0	0
3	115B - Profits and gains of life insurance business	12.5	0	0
4	111A (STCG on shares where STT paid)	15	0	0
5	112 (LTCG on others)	20	0	0
6	112 proviso (LTCG on listed securities/ units without indexation)	10	0	0
7	112(1)(c)(iii)(LTCG on unlisted securities in case of non-residents)	10	0	0
8	115BB (Winnings from lotteries, puzzles, races, games etc.)	30	0	0
9	115AD(1)(ii) -STCG (other than on equity share or equity oriented mutual fund referred to in section 111A) by an FII	30	0	0
10	115BBF - Tax on income from patent (Income under head business or profession)	10	0	0
11	115BBG - Tax on Transfer of carbon credits(Income under head business or profession)	10	0	0
Total				0

Schedule EI**Details of Exempt Income (Income not to be included in Total Income)**

1	Interest income	1	
2	Dividend income	2	
3	Long-term capital gains from transactions on which Securities Transaction Tax is paid	3	

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4	i	Gross Agricultural receipts (other than income to be excluded under rule 7A, 7B or 8 of I.T. Rules)	i	
	ii	Expenditure incurred on agriculture	ii	
	iii	Unabsorbed agricultural loss of previous eight assessment years	iii	
	iv	Net Agricultural income for the year (i – ii – iii) (enter nil if loss)	4	
5	Others, including exempt income of minor child (please specify)			
	Sl.No.	Nature of Income	Amount	
			5	
6	Total (1 + 2 + 3 + 4 + 5)		6	

Schedule PTI - Pass Through Income details from business trust or investment fund as per section 115UA,115UB

Sl		Name of business trust/ investment fund	PAN of the business trust/investment fund	Sl	Head of income	Amount of income	TDS on such amount,if any
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NOTE : Please refer to the instructions for filling out this schedule

Schedule MAT**Computation of Minimum Alternate Tax payable under section 115JB**

1	Whether the Profit and Loss Account is prepared in accordance with the provisions of Parts II of Schedule III to the Companies Act, 2013 (If yes, write 'Y', if no write 'N')					Yes
2	If 1 is no, whether profit and loss account is prepared in accordance with the provisions of the Act governing such company (If yes, write 'Y', if no write 'N')					Yes
3	Whether, for the Profit and Loss Account referred to in item 1 above, the same accounting policies, accounting standards and same method and rates for calculating depreciation have been followed as have been adopted for preparing accounts laid before the company at its annual general body meeting? (If yes, write 'Y', if no write 'N')					Yes
4	Profit after tax as shown in the Profit and Loss Account (enter item 48 of Part A-P&L)				4	254636
5	Additions (if debited in profit and loss account)					
	a	Income-tax paid or payable or its provision including the amount of deferred tax and the provision thereof			5a	165120
	b	Reserve (except reserve under section 33AC)			5b	0
	c	Provisions for unascertained liability			5c	0
	d	Provisions for losses of subsidiary companies			5d	0
	e	Dividend paid or proposed			5e	0
	f	Expenditure related to exempt income under sections 10, 11 or 12 [exempt income excludes income exempt under section 10(38)]			5f	0
	g	Expenditure related to share in income of AOP/ BOI on which no income-tax is payable as per section 86			5g	0
	h	Expenditure in case of foreign company referred to in clause (fb) of explanation 1 to section 115JB			5h	0

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	i	Notional loss on transfer of certain capital assets or units referred to in clause (fc) of explanation 1 to section 115JB	5i	0
	j	Expenditure relatable to income by way of royalty in respect of patent chargeable to tax u/s 115BBF	5j	0
	k	Depreciation attributable to revaluation of assets	5k	0
	l	Gain on transfer of units referred to in clause (k) of explanation 1 to section 115JB	5l	0
	m	Others (including residual unadjusted items and provision for diminution in the value of any asset)	5m	0
	n	Total additions (5a+5b+5c+5d+5e+5f+5g+5h+5i+5j+5k+5l+5m)	5n	165120
6	Deductions			
	a	Amount withdrawn from reserve or provisions if credited to Profit and Loss account	6a	0
	b	Income exempt under sections 10, 11 or 12 [exempt income excludes income exempt under section 10(38)]	6b	0
	c	Amount withdrawn from revaluation reserve and credited to profit and loss account to the extent it does not exceed the amount of depreciation attributable to revaluation of asset	6c	0
	d	Share in income of AOP/ BOI on which no income-tax is payable as per section 86 credited to Profit and Loss account	6d	0
	e	Income in case of foreign company referred to in clause (iid) of explanation 1 to section 115JB	6e	0
	f	Notional gain on transfer of certain capital assets or units referred to in clause (iie) of explanation 1 to section 115JB	6f	0
	g	Loss on transfer of units referred to in clause (iif) of explanation 1 to section 115JB	6g	0
	h	Income by way of royalty referred to in clause (iig) of explanation 1 to section 115JB	6h	0
	i	Loss brought forward or unabsorbed depreciation whichever is less	6i	0
	j	Profit of sick industrial company till net worth is equal to or exceeds accumulated losses	6j	0
	k	Others (including residual unadjusted items and the amount of deferred tax credited to P&L A/c)	6k	17544
	l	Total deductions (6a+6b+6c+6d+6e+6f+6g+6h+6i+6j+6k)	6l	17544
7	Book profit under section 115JB (4+ 5n – 6l)		7	402212
8	Whether the financial statements of the company are drawn up in compliance to the Indian Accounting Standards (Ind-AS) specified in Annexure to the companies (Indian Accounting Standards) Rules, 2015. If yes, furnish the details below:-		8	N
	A. Additions to book profit under sub-sections (2A) to (2C) of section 115JB			
	a	Amounts credited to other comprehensive income in statement of profit & loss under the head "items that will not be reclassified to profit & loss"	8	0
	b	Amounts debited to the statement of profit & loss on distribution of non-cash assets to shareholders in a demerger	8	0

	c	One fifth of the transition amount as referred to in section 115JB (2C) (if applicable)	8	0
	d	Others (including residual adjustment)	8	0
	e	Total additions (8a + 8b + 8c + 8d)	8	0
B. Deductions from book profit under sub-sections (2A) to (2C) of section 115JB				
	f	Amounts debited to other comprehensive income in statement of profit & loss under the head "items that will not be reclassified to profit & loss"	8f	0
	g	Amounts credited to the statement of profit & loss on distribution of non-cash assets to shareholders in a demerger	8g	0
	h	One fifth of the transition amount as referred to in section 115JB (2C) (if applicable)	8h	0
	i	Others (including residual adjustment)	8i	0
	j	Total deductions (8f + 8g + 8h + 8i)	8j	0
9	Deemed total income under section 115JB (7 + 8e – 8j)		9	402212
10	Tax payable under section 115JB		10	74409

Schedule MATC**Computation of tax credit under section 115JAA**

1	Tax under section 115JB in assessment year 2018-19 (1d of Part-B-TTI)				1	76641	
2	Tax under other provisions of the Act in assessment year 2018-19 (2f of Part-B-TTI)				2	130305	
3	Amount of tax against which credit is available [enter (2 – 1) if 2 is greater than 1, otherwise enter 0]				3	53664	
4	Utilisation of MAT credit Available [Sum of MAT credit utilized during the current year is subject to maximum of amount mentioned in 3 above and cannot exceed the sum of MAT Credit Brought Forward]						
	Sl.No.	Assessment Year	MAT Credit			MAT Credit	Balance MAT
		(A)	Gross (B1)	Set-off in earlier years (B2)	Balance Brought forward (B3)=(B1)-(B2)	Utilised during the Current Year (C)	Credit Carried Forward (D)= (B3) - (C)
	i	2008-09	0	0	0	0	0
	ii	2009-10	0	0	0	0	0
	iii	2010-11	0	0	0	0	0
	iv	2011-12	0	0	0	0	0
	v	2012-13	0	0	0	0	0
	vi	2013-14	0	0	0	0	0
	vii	2014-15	0	0	0	0	0
	viii	2015-16	0	0	0	0	0
	ix	2016-17	0	0	0	0	0
	x	2017-18	0	0	0	0	0
	xi	2018-19 (enter 1 -2, if 1>2 else enter 0)	0				0
	xii	Total	0	1645	0	0	0

5	Amount of tax credit under section 115JAA utilised during the year [enter 4(C)xi]	5	0
6	Amount of MAT liability available for credit in subsequent assessment years [enter 4(D)xi]	6	0

Schedule DDT**Details of tax on distributed profits of domestic companies and its payment**

	1	2	3	4	5				6	7	8	9
Sl.No	Date of declaration or distribution or payment, whichever is earliest, of dividend by domestic company	Rate of Dividend, declared, distributed or paid	Amount of dividend declared, distributed or paid	Amount of reduction as per section 115-O(1A)	Tax payable on dividend declared, distributed or paid				Interest payable under section 115P	Additional income-tax and interest payable (5d + 6)	Tax And Interest Paid	Net payable/ refundable (7-8)
					Additional Income-tax @15% payable under section 115-O (3-4)(5a)	Surcharge on "a" (5b)	Education Cess on (a +b)(5c)	Total tax payable (a + b + c)) (5d)				

Schedule BBS**Details of tax on distributed income of a domestic company on buy back of shares, not listed on stock exchange**

	1	2	3	4	5				6	7	8	9
Sl.No	Date of payments of any consideration to the shareholder on buy back of share	Amount of consideration paid by the company on buy-back of shares	Amount received by the company for issue of such shares	Distributed Income of the company (2 – 3)	Tax payable on distributed income				Interest payable under section 115QB	Additional income-tax and interest payable (5d + 6)	Tax and Interest Paid	Net payable/ refundable (7-8)
					Additional income-tax @20% payable under section 115QA on 4 (5a)	Surcharge on "a" (5b)	Education Cess on (a +b)(5c)	Total tax payable (a + b + c)) (5d)				

Schedule FSI**Details of Income from outside India and tax relief**

Sl		Country Code	Taxpayer Identification Number	Sl.No.	Head of income	Income from outside India(included in PART B-TI)	Tax paid outside India	Tax payable on such income under normal provisions in India	Tax relief available in India(e)= (c) or (d) whichever is lower	Relevant article of DTAA if relief claimed u/s 90 or 90A
					(a)	(b) 1646	(c)	(d)	(e)	(f)

Note: Please refer to the instructions for filling out this schedule														
Schedule TR														
Summary of tax relief claimed for taxes paid outside India														
1	Details of Tax Relief claimed													
	Sl.No	Country Code	Taxpayer Identification Number		Total taxes paid outside India (total of (c) of Schedule FSI in respect of each country)		Total tax relief available (total of (e) of Schedule FSI in respect of each country)		Tax Relief Claimed under section (specify 90, 90A or 91)					
		(a)	(b)		(c)		(d)		(e)					
	Total													
2	Total Tax relief available in respect of country where DTAA is applicable (section 90/90A) (Part of total of 1(d))										2			
3	Total Tax relief available in respect of country where DTAA is not applicable (section 91) (Part of total of 1(d))										3			
4	Whether any tax paid outside India, on which tax relief was allowed in India, has been refunded/credited by the foreign tax authority during the year? If yes, provide the details below										4			
4a	Amount of tax refunded										4a			
4b	Assessment year in which tax relief allowed in India										4b			
Note: Please refer to the instructions for filling out this schedule.														
Schedule FA														
Details of Foreign Assets and Income from any source outside India														
A	Details of Foreign Bank Accounts held (including any beneficial interest) at any time during the previous year													
Sl.No.	Country	Zip	Name of	Address	Account	Status (5)	Account	SWIFT	Account	Peak	Interest	Interest taxable and offered in		
(1)	Name	Code	the Bank	of the	holder		Number	Code	opening	Balance	accrued	this return		
	and Code	(2b)	(3a)	Bank	name (4)		(6a)	(6b)	date (7)	During	in the	Amount	Schedule	Item
	(2a)		(3b)							the	account	(10)	where	number
										Year (in	(9)		offered	of
										rupees)	(8)		(11)	schedule
														(12)
B	Details of Financial Interest in any Entity held (including any beneficial interest) at any time during the previous year													
Sl.No.	Country	Zip	Nature of	Name of	Address	Nature of Interest-	Date	Total	Income	Nature of	Income taxable and offered in			
(1)	Name	Code	entity (3)	the Entity	of the	Direct/ Beneficial	since	Investment	accrued	Income	this return			
	and Code	(2b)		(4a)	Entity	owner/ Beneficiary	held (6)	(at cost)	from	(9)	Amount	Schedule	Item	
	(2a)			(4b)	(5)			(in	such		(10)	where	number	
								rupees)	Interest(8)			offered	of	
								(7)				(11)	schedule	
													(12)	
C	Details of Immovable Property held (including any beneficial interest) at any time during the previous year													

Acknowledgement Number : 415048571310119

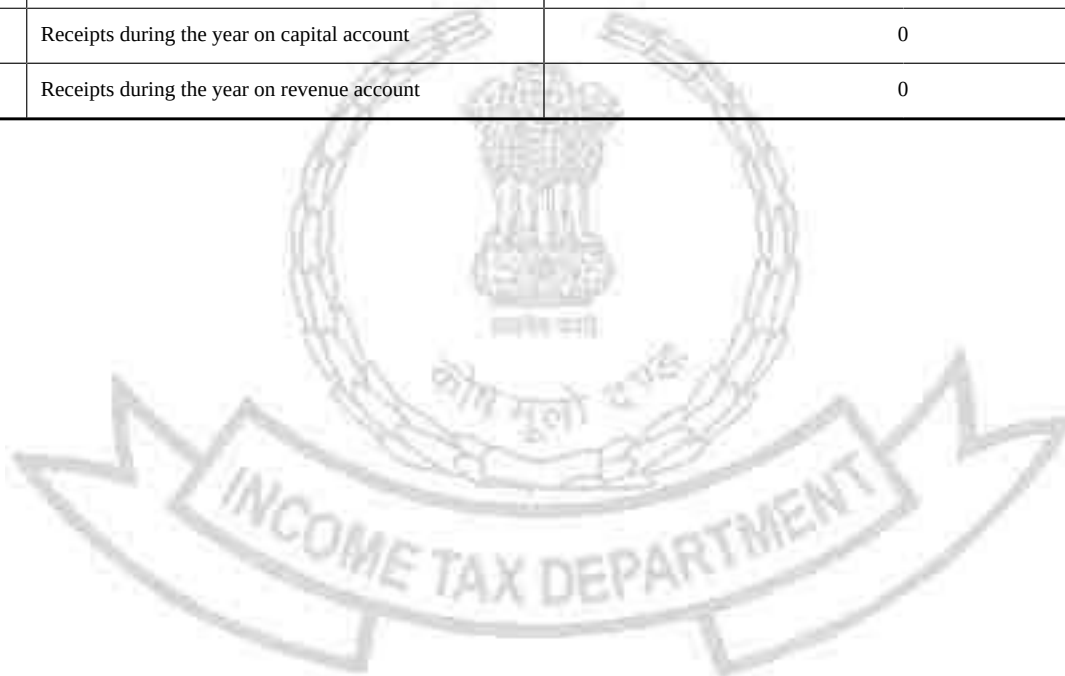
Assessment Year : 2018-19

Sl.No.	Country	Zip	Address of	Ownership	Date of	Total	Income	Nature of	Income taxable and offered in this return							
(1)	Name and Code(2a)	Code(2b)	the Property (3)	(4)	acquisition (5)	Investment (at cost) (in rupees) (6)	derived from the property (7)	Income (8)	Amount (9)	Schedule where offered (10)	Item number of schedule (11)					
D	Details of any other Capital Asset held (including any beneficial interest) at any time during the previous year															
Sl.No.	Country	Zip	Nature of	Ownership	Date of	Total	Income	Nature of	Income taxable and offered in this return							
(1)	Name and Code(2a)	Code(2b)	Asset (3)	(4)	acquisition (5)	Investment (at cost) (in rupees) (6)	derived from the property (7)	Income (8)	Amount (9)	Schedule where offered (10)	Item number of schedule (11)					
E	Details of account(s) in which you have signing authority held (including any beneficial interest) at any time during the previous year and which has not been included in A to D above.															
Sl.No.	Name	Address	Country	Zip Code	Name	Account	Peak	Whether	If (7)	If (7) is yes, Income offered in this return						
(1)	of the Institution in which the account is held (2)	of the Institution (3a)	Code and Name (3b)	(3c)	of the account holder (4)	Number (5)	Balance/ Investment during the year (6)	income accrued is taxable in your hands? (7)	is yes, Income accrued in the account (8)	Amount (9)	Schedule where offered (10)	Item number of schedule (11)				
F	Details of trusts, created under the laws of a country outside India, in which you are a trustee, beneficiary or settlor.															
Sl.No.	Country	Zip	Name	Address	Name	Address	Name	Address	Name	Address	Date	Whether	If (8)	If (8) is yes, Income offered in this return		
(1)	Name and Code (2a)	Code (2b)	of the trust (3)	of the trust (3a)	of trustees (4)	of trustees (4a)	of Settlor (5)	of Settlor (5a)	of Benefic iaries (6)	of Benefic iaries (6a)	since position held (7)	income derived is taxable in your hands? (8)	is yes, Income accrued in the account (9)	Amount (10)	Schedule where offered (11)	Item number of schedule (12)
G	Details of any other income derived from any source outside India which is not included in, - (i) items A to F above and, (ii) income under the head business or profession															
Sl.No.	Country	Zip Code(2b)	Name of	Address of the	Income	Nature of	Whether	If (6) is yes, Income offered in this return								
(1)	Name and Code(2a)		the person from whom derived (3a)	person from whom derived (3b)	derived (4)	income (5)	taxable in your hands? (6)	Amount (7)	Schedule where offered (8)	Item number of schedule (9)						
Note: Please refer to the instructions for filling up this schedule																
Schedule GST																
Break-up of total expenditure with entities registered or not registered under the GST (Details in respect of expenditure on or after 01st July, 2017 to be filled up by the assessee who is not liable to get accounts audited u/s 44AB)																
1648																

Sl No	Total amount of Expenditure during the year (aggregate of expenditure reported at items 6, 8 to 35, 37 & 38 of Part-A-P&L / P&L – Ind AS)	Expenditure in respect of entities registered under GST				Expenditure relating to entities not registered under GST
		Relating to goods or services exempt from GST	Relating to entities falling under composition scheme	Relating to other registered entities	Total payment to registered entities	
1.	0	0	0	0	0	0

Schedule FD**Break-up of payments/receipts in Foreign currency (to be filled up by the assessee who is not liable to get accounts audited u/s 44AB)**

Sl No		Amount (in Rs.)
i	Payments made during the year on capital account	0
ii	Payments made during the year on revenue account	0
iii	Receipts during the year on capital account	0
iv	Receipts during the year on revenue account	0



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[For Companies other than companies claiming exemption under section 11]

(Please see rule 12 of the Income-tax Rules,1962)

Schedule Part-A General(1)

PERSONAL INFORMATION

Name	WATTSUN ENERGY INDIA PRIVATE LIMITED		
Corporate Identity Number (CIN) issued by MCA	U40300KL2014PTC036294	Is there any change in the name? If yes, please furnish the old name	
PAN	AABCW4979N	Date of incorporation (DDMMYYYY)	04/03/2014
Address			
Flat/Door/Block No	TC.36/38(1)	Town/ City/ District	TRIVANDRUM
Name of Premises / Building / Village	AISWARYA TOWER, FIRST FLOOR OR	Road/Street/Post Office	CHACKAI
Area/ Locality	TRIVANDRUM	State	KERALA
Country	INDIA	PIN Code	695024
Type of company	Domestic Company	If a public company select 6, and if private company select 7 (as defined in section 3 of The Companies Act)	7-Private Company
Office Phone Number with STD code	-		
Mobile no.1	91 - 8943345700	Mobile no.2	-
Email Address-1	terance.alex@gmail.com	Email Address-2	
Filing Status			
Filed u/s or Filed in Response to Notice u/s		139(4)-After due date	
If revised/in response to notice for Defective/Modified, then enter Receipt No		Date of filing original return (DD/MM/YYYY)	
If filed, in response to a notice u/s 139(9)/142(1)/148/153A/153C/170A or order u/s 119(2)(b) enter date of such notice/order, or if filed u/s 92CD enter date of advance pricing agreement			
Residential Status		RES - Resident	
Whether opting for section 115BA? (Yes/No) (applicable on Domestic Company)		No	
Whether total turnover/ gross receipts in the previous year 2016-17 exceeds 250 crore rupees? (Yes/No) (applicable for Domestic Company)		No	
Whether assessee is a resident of a country or specified territory with which India has an agreement referred to in sec 90 (1) or Central Government has adopted any agreement under sec 90A(1)			
In the case of non-resident, is there a permanent establishment (PE) in India			
Whether assessee is required to seek registration under any law for the time being in force relating to companies?			

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Whether the financial statements of the company are drawn up in compliance to the Indian Accounting Standards specified in Annexure to the companies (Indian Accounting Standards) Rules, 2015	No
Whether assessee is located in an International Financial Services Centre and derives income solely in convertible foreign exchange?	No
Whether the assessee company is under liquidation	No
Whether you are an FII / FPI?	No
If yes, please provide SEBI Regn. No.	
Whether the company is a producer company as defined in Sec.581A of Companies Act, 1956?	No
Other Details	
Whether this return is being filed by a representative assessee? If yes, please furnish following information	No
Name of the representative assessee	
Capacity of representative	
Address of the representative assessee	
Permanent Account Number (PAN) of the representative assessee	
Whether you are recognized as start up by DPIIT	No
If yes, please provide start up recognition number allotted by the DPIIT	
Whether certificate from inter-ministerial board for certification is received?	
If yes provide the certification number	
Whether declaration in Form-2 in accordance with para 5 of DPIIT notification dated 19/02/2019 has been filed before filing of the return?	
If yes, provide date of filing Form-2	
AUDIT DETAILS	
(a) Whether liable to maintain accounts as per section 44AA?	No
(b) Whether liable for audit under section 44AB?	Yes
(c) If (b) is Yes, whether the accounts have been audited by an accountant? If Yes, furnish the following information	Yes
(i) Date of furnishing of the audit report (DD/MM/YYYY)	11/11/2019
(ii) Name of the auditor signing the tax audit report	George Philip Kocheemoola yil
(iii) Membership no. of the auditor	019928
(iv) Name of the auditor (proprietorship/ firm)	Philip & Mathew
(v) Proprietorship/firm registration number	0002646S
(vi) Permanent Account Number (PAN) of the auditor (proprietorship/ firm)	AACFP7719F
(vii) Date of furnishing audit report	11/11/2019
(d.i) Are you liable for Audit u/s 92E?	No
Date of furnishing audit report (DD/MM/YYYY)	

(d.ii)	If liable to furnish other audit report under the Income-tax Act, mention the date of furnishing of the audit report? (DD/MM/YYYY) (Please see Instruction 6(ii))								
	Sl.No	Section Code				Date (DD/MM/YYYY)			
	1	115JB				11/11/2019			
(e)	Mention the Act, section and date of furnishing the audit report under any Act other than the Income-tax Act								
	Sl.No	Act	Description		Section Code		Date (DD/MM/YYYY)		
	1	Companies Act, 2013			139		29/06/2019		
Schedule PART A - GENERAL (2)									
HOLDING STATUS									
(a)	Nature of company (write 1 if holding company, write 2 if a subsidiary company, write 3 if both, write 4 if any other)							4- If any other	
(b)	If subsidiary company, mention the details of the Holding Company								
Sl.No.	PAN	Name of Holding Company	Address of Holding Company	City	State	Country	Pin code/ Zip code	Percentage of Shares held	
(c)	If holding company, mention the details of the subsidiary companies.								
Sl.No.	PAN	Name of Subsidiary Company	Address of Subsidiary Company	City	State	Country	Pin code/ Zip code	Percentage of Shares held	
BUSINESS ORGANISATION									
Sl.No.	Business Type	PAN	Company Name	Address	City	State	Country	Pin code/ Zip code	Date of event
KEY PERSONS									
Particulars of Managing Director, Directors, Secretary and Principal officer(s) who have held the office during the previous year.									
Sl.No.	Name	Designation	PAN	Residential Address	City	State	Country	Pin code/ Zip code	Director Identification Number (DIN) issued by MCA, in case of Director
1	TERANCE ALEX	Managing Director	AGUPA1453H	304, HOLY HOUSE, PO ZHIYOOR P O, POOYA PALLIVIL AKAM	TRIVANDRUM	KERALA	INDIA	695513	06808744

4	Whether a banking company as defined in clause (c) of section 5 of the Banking Regulation Act, 1949	No	
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5	Whether a scheduled Bank being a bank included in the Second Schedule to the Reserve Bank of India Act	No	
6	Whether a company registered with Insurance Regulatory and Development Authority (established under sub-section (1) of section 3 of the Insurance Regulatory and Development Authority Act, 1999)	No	
7	Whether a company being a non-banking Financial Institution	No	
8	Whether the Company is Unlisted? If yes, please ensure to fill up the Schedule SH-1 and Schedule AL-1	Yes	

Schedule - Nature of business

Nature of business/profession, if more than one business or profession indicate the three main activities/ products (Other than those declaring income under section 44AE)

Sl.No.	Code-Sub Sector	Tradename				
1	06001-Site preparation works					

Schedule PART A-BS Balance sheet as on 31st day of March, 2019 or as on the Date of Amalgamation

I. Equity and Liabilities

1. Shareholder's fund

A.	Share capital				
	i	Authorised	Ai	1000000	
	ii	Issued, Subscribed and fully Paid up	Aii	1000000	
	iii	Subscribed but not fully paid	Aiii	0	
	iv	Total (Aii + Aiii)		Aiv	1000000
B.	Reserves and Surplus				
	i	Capital Reserve	Bi	0	
	ii	Capital Redemption Reserve	Bii	0	
	iii	Securities Premium Reserve	Biii	0	
	iv	Debenture Redemption Reserve	Biv	0	
	v	Revaluation Reserve	Bv	0	
	vi	Share options outstanding amount	Biv	0	
	vii	Other reserve (specify nature and amount)			
	Sl No.	Nature	Amount		
	Total	Bvii		0	
	viii	Surplus i.e. Balance in profit and loss account (Debit balance to be shown as - ve figure)	Bviii	640575	
	ix	Total (Bi + Bii + Biii + Biv + Bv + Bvi + Bvii + Bviii) (Debit balance to be shown as - ve figure)		Bix	640575
	C	Money received against share warrants		1C	0
	D	Total Shareholder's fund (Aiv + Bix + 1C)		1D	1640575
	2.	Share application money pending allotment			
i	Pending for less than one year	i	0		
ii	Pending for more than one year	ii	0		

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	iii	Total (i + ii)	2	0
3. Non-current liabilities				
A	Long-term borrowings			
i	Bonds/ debentures			
	a. Foreign currency	ia	0	
	b. Rupee	ib	0	
	c. Total (ia + ib)	ic	0	
ii	Term loans			
	a. Foreign currency	iia	0	
	b. Rupee loans			
	1. From Banks	b1	2246009	
	2. From others	b2	339281	
	3. Total (b1 + b2)	b3	2585290	
	c. Total Term loans (iia + b3)	iic	2585290	
iii	Deferred payment liabilities			iii 0
iv	Deposits from related parties (see instructions)			iv 0
v	Other deposits			v 0
vi	Loans and advances from related parties (see instructions)			vi 4202220
vii	Other loans and advances			vii 0
viii	Long term maturities of finance lease obligations			viii 0
ix	Total Long term borrowings (ic + iic + iii + iv + v + vi + vii + viii)			3A 6787510
B.	Deferred tax liabilities (net)			3B 0
C	Other long-term liabilities			
i	Trade payables		i	0
ii	Others		ii	0
iii	Total Other long-term liabilities (i + ii)			3C 0
D	Long-term provisions			
i	Provision for employee benefits		i	0
ii	Others		ii	0
iii	Total (i + ii)			3D 0
E.	Total Non-current liabilities (3A + 3B + 3C + 3D)			3E 6787510
4. Current liabilities				
A	Short-term borrowings			
i	Loans repayable on demand			
	a. From Banks	ia	0	
	b. From Non-Banking Finance Companies	ib	0	
	c. From other financial institutions	ic	0	

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	d. From others	id	0	
	e.Total Loans repayable on demand (ia + ib + ic + id)	ie	0	
ii	Deposits from related parties (see instructions)	ii	0	
iii	Loans and advances from related parties (see instructions)	iii	0	
iv	Other loans and advances	iv	0	
v	Other deposits	v	0	
vi	Total Short-term borrowings (ie + ii + iii + iv + v)	4A		0
B.	Trade payables			
i	Outstanding for more than 1 year	i	0	
ii	Others	ii	9070744	
iii	Total Trade payables (i + ii)	4B		9070744
C.	Other current liabilities			
i	Current maturities of long-term debt	i	0	
ii	Current maturities of finance lease obligations	ii	0	
iii	Interest accrued but not due on borrowings	iii	0	
iv	Interest accrued and due on borrowings	iv	0	
v	Income received in advance	v	0	
vi	Unpaid dividends	vi	0	
vii	Application money received for allotment of securities and due for refund and interest accrued	vii	0	
viii	Unpaid matured deposits and interest accrued thereon	viii	0	
ix	Unpaid matured debentures and interest accrued thereon	ix	0	
x	Other payables	x	4088036	
xi	Total Other current liabilities (i + ii + iii + iv + v + vi + vii + viii + ix + x)	4C		4088036
D.	Short-term provisions			
i	Provision for employee benefit	i	0	
ii	Provision for Income-tax	ii	0	
iii	Proposed Dividend	iii	0	
iv	Tax on dividend	iv	0	
v	Other	v	0	
vi	Total Short-term provisions (i + ii + iii + iv + v)	4D		0
E	Total Current liabilities (4A + 4B + 4C + 4D)	4E		13158780
Total Equity and liabilities (1D + 2 + 3E + 4E)			I	21586865
II. ASSETS				
1. Non-current assets				
A.	Fixed assets			
i	Tangible assets	1656		

	a. Gross block	ia	3834336	
	b. Depreciation	ib	1379011	
	c. Impairment losses	ic	0	
	d. Net block (ia - ib - ic)	id	2455325	
ii	Intangible assets			
	a. Gross block	iia	0	
	b. Amortization	iib	0	
	c. Impairment losses	iic	0	
	d. Net block (iia - iib - iic)	iid	0	
iii	Capital work-in-progress	iii	0	
iv	Intangible assets under development	iv	0	
v	Total Fixed assets (id + iid + iii + iv)		Av	2455325
B	Non-current investments			
i	Investment in property	i	0	
ii	Investments in Equity instruments			
	a. Listed equities	iia	0	
	b. Unlisted equities	iib	0	
	c. Total (iia + iib)	iic	0	
iii	Investments in Preference shares	iii	0	
iv	Investments in Government or trust securities	iv	0	
v	Investments in Debenture or bonds	v	0	
vi	Investments in Mutual funds	vi	0	
vii	Investments in Partnership firms	vii	0	
viii	Others Investments	viii	0	
ix	Total Non-current investments (i + iic + iii + iv + v + vi + vii + viii)		Bix	0
C	Deferred tax assets (Net)		C	186123
D	Long-term loans and advances			
i	Capital advances	i	0	
ii	Security deposits	ii	200000	
iii	Loans and advances to related parties (see instructions)	iii	0	
iv	Other Loans and advances	iv	0	
v	Total Long-term loans and advances (i + ii + iii + iv)		Dv	200000
vi	Long-term loans and advances included in Dv which is			
	a. for the purpose of business or profession	via	0	
	b. not for the purpose of business or profession	vib	0	

		c. given to shareholder, being the beneficial owner of share, or to any concern or on behalf/ benefit of such shareholder as per section 2(22)(e) of I.T. Act	vic	0	
E	Other non-current assets				
	i	Long-term trade receivables			
		a. Secured, considered good	ia	0	
		b. Unsecured, considered good	ib	0	
		c. Doubtful	ic	0	
		d. Total Other non-current assets (ia + ib + ic)	id	0	
	ii	Others	ii	0	
	iii	Total (id + ii)	Eiii		0
	iv	Non-current assets included in Eiii which is due from shareholder, being the beneficial owner of share, or from any concern or on behalf/ benefit of such shareholder as per section 2(22)(e) of I.T. Act	iv	0	
F	Total Non-current assets (Av + Bix + C + Dv + Eiii)		1F	2841448	
2. Current assets					
A.	Current investments				
	i	Investment in Equity instruments			
		a. Listed equities	ia	0	
		b. Unlisted equities	ib	0	
		c. Total (ia + ib)	ic	0	
	ii	Investment in Preference shares	ii	0	
	iii	Investment in government or trust securities	iii	0	
	iv	Investment in debentures or bonds	iv	0	
	v	Investment in Mutual funds	v	0	
	vi	Investment in partnership firms	vi	0	
	vii	Other investment	vii	0	
	viii	Total Current investments (ic + ii + iii + iv + v + vi + vii)	Aviii		0
B	Inventories				
	i	Raw materials	i	0	
	ii	Work-in-progress	ii	0	
	iii	Finished goods	iii	0	
	iv	Stock-in-trade (in respect of goods acquired for trading)	iv	1330585	
	v	Stores and spares	v	0	
	vi	Loose tools	vi	0	
	vii	Others	vii	0	
	viii	Total Inventories (i + ii + iii + iv + v + vi + vii)	Bviii		1330585

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C	Trade receivables					
	i	Outstanding for more than 6 months	i	224124		
	ii	Others	ii	14939327		
	iii	Total Trade receivables (i + ii)		Ciii	15163451	
D	Cash and cash equivalents					
	i	Balances with Banks	i	1241341		
	ii	Cheques, drafts in hand	ii	0		
	iii	Cash in hand	iii	13930		
	iv	Others	iv	0		
	v	Total Cash and cash equivalents (i + ii + iii + iv)		Dv	1255271	
E	Short-term loans and advances					
	i	Loans and advances to related parties (see instructions)	i	360000		
	ii	Others	ii	62301		
	iii	Total Short-term loans and advances (i + ii)		Eiii	422301	
	iv	Short-term loans and advances included in Eiii which is				
		a. for the purpose of business or profession		iva	0	
		b. not for the purpose of business or profession		ivb	0	
		c. given to a shareholder, being the beneficial owner of share, or to any concern or on behalf/ benefit of such shareholder as per section 2(22)(e) of I.T. Act		ivc	0	
	F	Other current assets			F	573809
G	Total Current assets (Aviii + Bviii + Ciii + Dv + Eiii + F)			2G	18745417	
Total Assets (1F + 2G)				II	21586865	

Schedule Part A-BS – Ind AS

Balance Sheet as on 31st day of March, 2019 or as on the date of business combination [applicable for a company whose financial statements are drawn up in compliance to the Indian Accounting Standards specified in Annexure to the companies (Indian Accounting Standards) Rules, 2015] (fill items below in a case where regular books of accounts are maintained, otherwise fill item III)

I	Equity and Liabilities											
	1	Equity										
		A	Equity share capital									
			i	Authorised			Ai	0				
			ii	Issued, Subscribed and fully paid up			Aii	0				
			iii	Subscribed but not fully paid			Aiii	0				
			iv	Total (Aii + Aiii)					Aiv	0		
		B	Other Equity									
			i	Other Reserves								
			a	Capital Redemption Reserve			ia	0				

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			b	Debenture Redemption Reserve	ib	0			
			c	Share Options Outstanding account	ic	0			
			d	Other (specify nature and amount)					
				Sl. No.	Nature	Amount			
			Total				id	0	
			e	Total other reserves (ia + ib + ic + id)			ie	0	
			ii	Retained earnings (Debit balance of statement of P & L to be shown as –ve figure)			ii	0	
			iii	Total (Bie + ii) (Debit balance to be shown as –ve figure)			Biii	0	
		C	Total Equity (Aiv + Biii)				1C	0	
	2	Liabilities							
		A	Non-current liabilities						
		I	Financial Liabilities						
			Borrowings						
			a	Bonds or debentures					
			1	Foreign currency	a1	0			
			2	Rupee	a2	0			
			3	Total (1 + 2)			a3	0	
			b	Term loans					
			1	Foreign currency	b1	0			
			2	Rupee loans					
			i	From Banks	i	0			
			ii	From other parties	ii	0			
			iii	Total (i + ii)			b2	0	
			3	Total Term loans (b1 + b2)			b3	0	
			c	Deferred payment liabilities			c	0	
			d	Deposits			d	0	
			e	Loans from related parties (see instructions)			e	0	
			f	Long term maturities of finance lease obligations			f	0	
			g	Liability component of compound financial instruments			g	0	
			h	Other loans			h	0	
			i	Total borrowings (a3 + b3 + c + d + e + f + g + h)			i	0	
			j	Trade Payables			j	0	
			k	Other financial liabilities (Other than those specified in II under provisions)			k	0	
		II	Provisions						
			a	Provision for employee benefits			a	0	
			b	Others (specify nature)			1660		

			Sl. No	Nature	Amount		
			Total			b	0
		c	Total Provisions			IIC	0
		III	Deferred tax liabilities (net)			III	0
		a	Advances			a	0
		b	Other (specify nature and amount)				
			Sl. No	Nature	Amount		
			Total			b	0
		c	Total Other non-current liabilities			IVc	0
			Total Non-Current Liabilities (Ii + Ij + Ik + IIC + III + IVc)			2A	0
		B	Current liabilities				
		I	Financial Liabilities				
		i	Borrowings				
		a	Loans repayable on demand				
			1	From Banks	1	0	
			2	From Other parties	2	0	
			3	Total Loans repayable on demand (1 + 2)	3	0	
		b	Loans from related parties			b	0
		c	Deposits			c	0
		d	Other loans (specify nature)				
			Sl. No	Nature	Amount		
			Total			d	0
			Total Borrowings (a3 + b + c + d)			Ii	0
		ii	Trade payables			Iii	0
		iii	Other financial liabilities				
		a	Current maturities of long-term debt			a	0
		b	Current maturities of finance lease obligations			b	0
		c	Interest accrued			c	0
		d	Unpaid dividends			d	0
		e	Application money received for allotment of securities to the extent refundable and interest accrued thereon			e	0
		f	Unpaid matured deposits and interest accrued thereon			f	0

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			g	Unpaid matured debentures and interest accrued thereon	g	0		
			h	Other (specify nature and amount)				
			Sl. No	Nature	Amount			
			Total					h 0
			i	Total Other financial liabilities (a + b +c +d +e +f +g+ h)			i 0	
			iv	Total Financial Liabilities (Ii + Iii + Iiii)			Iiv 0	
		II	Other Current liabilities					
			a	Revenue received in advance	a	0		
			b	Other advances(specify nature and amount)				
			Sl. No	Nature	Amount			
			Total					B 0
			c	Others (specify nature)				
			Sl. No	Nature	Amount			
			Total					c 0
			d	Total Other current liabilities (a + b+ c)			IId 0	
		III	Provisions					
			a	Provision for employee benefits	a	0		
			b	Others (specify nature)				
			Sl. No	Nature	Amount			
			Total					b 0
			c	Total provisions (a + b)			IIIc 0	
		IV	ProCurrent Tax Liabilities (Net)visions				IV 0	
		Total Current liabilities (Iiv + IId + IIIc+ IV)					2B 0	
		Total Equity and liabilities (1C + 2A +2B)					I 0	
II	ASSETS							
	1	Non-current assets						
		A	Property, Plant and Equipment					
			a	Gross block	a	0		
			b	Depreciation	b	0		
			c	Impairment losses	c	0		
			d	Net block (a – b - c)			Ad 0	
		B	Capital work-in-progress				B 0	
		C	Investment Property					
			a	Gross block	a	1662	0	

		b	Depreciation	b	0		
		c	Impairment losses	c	0		
		d	Net block (a – b - c)	Cd	0		
		D	Goodwill				
		a	Gross block	a	0		
		b	Impairment losses	b	0		
		c	Net block (a – b - c)	Dc	0		
		E	Other Intangible Assets				
		a	Gross block	a	0		
		b	Amortisation	b	0		
		c	Impairment losses	c	0		
		d	Net block (a – b - c)	Ed	0		
		F	Intangible assets under development			F	0
		G	Biological assets other than bearer plants				
		a	Gross block	a	0		
		b	Impairment losses	b	0		
		c	Net block (a – b - c)	Gc	0		
		H	Financial Assets				
		I	Investments				
		i	Investments in Equity instruments				
		a	Listed equities	ia	0		
		b	Unlisted equities	ib	0		
		c	Total (ia + ib)	ic	0		
		ii	Investments in Preference shares			ii	0
		iii	Investments in Government or trust securities			iii	0
		iv	Investments in Debenture or bonds			iv	0
		v	Investments in Mutual funds			v	0
		vi	Investments in Partnership firms			vi	0
		vii	Others Investments (specify nature)				
		Sl. No	Nature	Amount			
			Total	vii	0		
		viii	Total non-current investments (ic + ii + iii + iv + v + vi + vii)			viii	0
		II	Trade Receivables				
		a	Secured, considered good	a	0		
		b	Unsecured, considered good	b	0		
		c	Doubtful	c	0		

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		d	Total Trade receivables	HII	0	
	III	Loans				
		i	Security deposits	i	0	
		ii	Loans to related parties (see instructions)	ii	0	
		iii	Other loans (specify nature)			
		Sl. No	Nature	Amount		
		Total			iii	0
		iv	Total Loans (i + ii + iii)		HIII	0
	v	Loans included in HIII above which is-				
		a	for the purpose of business or profession	va	0	
		b	not for the purpose of business or profession	vb	0	
		c	given to shareholder, being the beneficial owner of share, or to any concern or on behalf/ benefit of such shareholder as per section 2(22)(e) of I.T. Act	vc	0	
	IV	Other Financial Assets				
		i	Bank Deposits with more than 12 months maturity	i	0	
		ii	Others	ii	0	
		iii	Total of Other Financial Assets (i + ii)		HIV	0
	I	Deferred Tax Assets (Net)			I	0
	J	Other non-current Assets				
		i	Capital Advances	i	0	
		ii	Advances other than capital advances	ii	0	
		iii	Others (specify nature)			
		Sl. No	Nature	Amount		
		Total			vii	0
	iv	Total non-current assets (i + ii + iii)			iv	0
	v	Non-current assets included in J above which is due from shareholder, being the beneficial owner of share, or from any concern or on behalf/ benefit of such shareholder as per section 2(22)(e) of I.T. Act		v	0	
	Total Non-current assets (Ad + B + Cd + Dc + Ed + F + Gc + HI + HII + HIII + HIV + I + J)				1	0
2	Current assets					
	A	Inventories				

	i	Raw materials	i	0	
	ii	Work-in-progress	ii	0	
	iii	Finished goods	iii	0	
	iv	Stock-in-trade (in respect of goods acquired for trading)	iv	0	
	v	Stores and spares	v	0	
	vi	Loose tools	vi	0	
	vii	Others	vii	0	
	viii	Total Inventories (i + ii + iii + iv + v + vi + vii)	2A	0	
B	Financial Assets				
I	Investments				
	i	Investment in Equity instruments			
	a	Investment in Equity instruments	ia	0	
	a	Unlisted equities	ib	0	
	c	Total (ia + ib)	ic	0	
	ii	Investment in Preference shares	ii	0	
	iii	Investment in government or trust securities	iii	0	
	iv	Investment in debentures or bonds	iv	0	
	v	Investment in Mutual funds	v	0	
	vi	Investment in partnership firms	vi	0	
	vii	Other Investments	vii	0	
	viii	Total Current investments (ic + ii + iii + iv + v + vi + vii)	viii	0	
II	Trade receivables				
	i	Secured, considered good	i	0	
	ii	Unsecured, considered good	ii	0	
	iii	Doubtful	iii	0	
	iv	Total Trade receivables (i + ii + iii)	II	0	
III	Cash and cash equivalents				
	i	Balances with Banks (of the nature of cash and cash equivalents)	i	0	
	ii	Cheques, drafts in hand	ii	0	
	iii	Cash on hand	iii	0	
	iv	Others (specify nature)	iv		
	Sl. No	Nature	Amount		
		Total	vii	0	
	v	Total Cash and cash equivalents (i + ii + iii + iv)	III	0	
IV	Bank Balances other than III above			1665	IV
				0	

	V	Loans						
		i	Security Deposits	i	0			
		ii	Loans to related parties (see instructions)	ii	0			
		iii	Others(specify nature)					
		Sl. No	Nature	Amount				
		Total				vii	0	
		iv	Total loans (i + ii + iii)			V	0	
		v	Loans and advances included in V above which is-					
		a	for the purpose of business or profession	va	0			
		b	not for the purpose of business or profession	vb	0			
		c	given to a shareholder, being the beneficial owner of share, or to any concern or on behalf/ benefit of such shareholder as per section 2(22)(e) of I.T. Act	vc	0			
	VI	Other Financial Assets				VI	0	
	Total Financial Assets (I + II + III + IV + V + VI)					2B	0	
	C	Current Tax Assets (Net)				2C	0	
	D	Other current assets						
		i	Advances other than capital advances	i	0			
		ii	Others(specify nature)					
		Sl. No	Nature	Amount				
		Total				vii	0	
		iii	Total			2D	0	
	Total Current assets (2A + 2B + 2C + 2D)					2	0	
	Total Assets (1 + 2)					II	0	
NO ACCOUNT CASE								
III	In a case where regular books of account of business or profession are not maintained - (furnish the following information as on 31st day of March, 2019, in respect of business or profession)							
a	Amount of total sundry debtors					a	0	
b	Amount of total sundry creditors					b	0	
c	Amount of total stock-in-trade					c	0	
d	Amount of the cash balance					d	0	
Schedule Part A-Manufacturing Account- Manufacturing Account for the financial year 2018-19 (fill items 1 to 3 in a case where regular books of accounts are maintained, otherwise fill items 61 to 62 as applicable)								
1	Opening Inventory							
	A	(i)	Opening stock of raw-material			A(i)	1666	

		(ii)	Opening stock of Work in progress	A(ii)		
		(iii)	Total (i + ii)	A(iii)	0	
	B	Purchases (net of refunds and duty or tax, if any)		B		
	C	Direct wages		C		
	D	Direct expenses(Di + Dii + Diii)		D	0	
		(i)	Carriage inward	(i)		
		(ii)	Power and fuel	(ii)		
		(iii)	Other direct expenses	(iii)		
	E	Factory Overheads				
		(i)	Indirect wages	(i)		
		(ii)	Factory rent and rates	(ii)		
		(iii)	Factory Insurance	(iii)		
		(iv)	Factory fuel and power	(iv)		
		(v)	Factory general expenses	(v)		
		(vi)	Depreciation of factory machinery	(vi)	0	
		(vii)	Total (i+ii+iii+iv+v+vi)	(vii)	0	
	F	Total of Debits to Manufacturing Account (Aiii+B+C+D+Evii)		F	0	
2	Closing Stock					
	(i)	Raw material		(i)		
	(ii)	Work-in-progress		(ii)		
		Total (2i + 2ii)			0	
3	Cost of Goods Produced – transferred to Trading Account (1F-2)				0	
Schedule Part A-Trading Account -Trading Account for the financial year 2018-19 (fill items 4 to 12 in a case where regular books of accounts are maintained, otherwise fill items 61 to 62 as applicable)						
4	Revenue from operations					
	A	Sales/ Gross receipts of business (net of returns and refunds and duty or tax, if any)				
		(i)	Sale of goods	(i)	56718598	
		(ii)	Sale of services	(ii)	453831	
		(iii)	Other operating revenues (specify nature and amount)			
			S. No.	Nature of other operating revenue	Amount	
			Total			0
		(iv)	Total(i+ii+iiic)		A(iv)	57172429
	B	Gross receipts from Profession		B	0	
	C	Duties, taxes and cess received or receivable in respect of goods and services sold or supplied				
		(i)	Union Excise duties		Ci	
		(ii)	Service Tax		Cii	
		(iii)	VAT/ Sales tax		Ciii	1667

		(iv)	Central Goods & Service Tax (CGST)		Civ	0
		(v)	State Goods & Services Tax (SGST)		Cv	0
		(vi)	Integrated Goods & Services Tax (IGST)		Cvi	0
		(vii)	Union Territory Goods & Services Tax (UTGST)		Cvii	0
		(viii)	Any other duty, tax and cess		Cviii	
		(ix)	Total (i + ii + iii + iv +v+ vi+vii+viii)		Cix	0
	D	Total Revenue from operations (Aiv + B +Cix)			D	57172429
5	Closing Stock of Finished Stocks				5	1330585
6	Total of credits to Trading Account (4D + 5)				6	58503014
7	Opening Stock of Finished Goods				7	2222417
8	Purchases (net of refunds and duty or tax, if any)				8	32383872
9	Direct Expenses(9i + 9ii + 9iii)				9	0
	(i)	Carriage inward			9(i)	0
	(ii)	Power and fuel			9(ii)	0
	(iii)	Other direct expenses			9(iii)	0
		S. No.	Nature of direct expenses	Amount		
10	Duties and taxes, paid or payable, in respect of goods and services purchased					
	(i)	Custom duty			10i	0
	(ii)	Counter veiling duty			10ii	0
	(iii)	Special additional duty			10iii	0
	(iv)	Union excise duty			10iv	0
	(v)	Service Tax			10v	0
	(vi)	VAT/ Sales tax			10vi	0
	(vii)	Central Goods & Service Tax (CGST)			10vii	0
	(viii)	State Goods & Services Tax (SGST)			10viii	0
	(ix)	Integrated Goods & Services Tax (IGST)			10ix	0
	(x)	Union Territory Goods & Services Tax (UTGST)			10x	0
	(xi)	Any other tax, paid or payable			10xi	0
	(xii)	Total (10i + 10ii + 10iii + 10iv + 10v + 10vi + 10vii + 10viii + 10ix + 10x+10xi)			10xii	0
11	Cost of goods produced – Transferred from Manufacturing Account				11	0
12	Gross Profit/Loss from Business/Profession - transferred to Profit and Loss account (6-7-8-9-10xii-11)				12	23896725
12a	Turnover from Intraday Trading				12a	0
12b	Income from Intraday Trading				12b	0
Schedule Part A-P and L- Profit and Loss Account for financial year 2018-19. (fill items 13 to 60 in a case where regular books of accounts are maintained, otherwise fill items 61 to 62 as applicable)						
	CREDITS TO PROFIT AND LOSS ACCOUNT					
13	Gross profit transferred from Trading Account				13	23896725

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14	Other income				
	i.	Rent		i	0
	ii.	Commission		ii	0
	iii.	Dividend income		iii	0
	iv.	Interest income		iv	88694
	v.	Profit on sale of fixed assets		v	6181
	vi.	Profit on sale of investment being securities chargeable to Securities Transaction Tax (STT)		vi	0
	vii.	Profit on sale of other investment		vii	0
	viii.	Gain(Loss) on account of foreign exchange fluctuation u/s 43AA		viii	0
	ix.	Profit on conversion of inventory into capital asset u/s 28(via) (Fair Market Value of inventory as on the date of conversion)		ix	0
	x.	Agriculture income		x	0
	xi.	Any other income (specify nature and amount)			
		Sl.No	Nature	Amount	
		1	Other Income	22889	
		2	Interest Subsidy on KFC Loan	48118	
		xix	Total	71007	
	xii.	Total of other income (i + ii + iii + iv + v + vi + vii + viii + ix + x + xix)			14xii 165882
15	Total of credits to profit and loss account (13+14xii)				15 24062607
16	Freight outward				16 92647
17	Consumption of stores and spare parts				17 70179
18	Power and fuel				18 33708
19	Rents				19 564324
20	Repairs to building				20 0
21	Repairs to machinery				21 638230
22	Compensation to employees				
	i.	Salaries and wages		22i	8035863
	ii.	Bonus		22ii	0
	iii.	Reimbursement of medical expenses		22iii	0
	iv.	Leave encashment		22iv	0
	v.	Leave travel benefits		22v	0
	vi.	Contribution to approved superannuation fund		22vi	0
	vii.	Contribution to recognised provident fund		22vii	0
	viii.	Contribution to recognised gratuity fund		22viii	0
	ix.	Contribution to any other fund		22ix	0
	x.	Any other benefit to employees in respect of which an expenditure has been incurred		22x	0
	xi.	Total compensation to employees (total of 22i to 22x)		22xi	8035863

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	22xii	Whether any compensation, included in 22xi, paid to non-residents	xiia	No
		If Yes, amount paid to non-residents	xiib	0
23	Insurance			
	i.	Medical Insurance	23i	0
	ii.	Life Insurance	23ii	0
	iii.	Keyman's Insurance	23iii	0
	iv.	Other Insurance including factory, office, car, goods,etc.	23iv	7265
	v.	Total expenditure on insurance (23i+23ii+23iii+23iv)	23v	7265
24.	Workmen and staff welfare expenses		24	51326
25.	Entertainment		25	0
26.	Hospitality		26	0
27.	Conference		27	0
28.	Sales promotion including publicity (other than advertisement)		28	0
29.	Advertisement		29	104200
30	Commission			
	i.	Paid outside India, or paid in India to a non-resident other than a company or a foreign company	i	0
	ii.	To others	ii	0
	iii.	Total (i + ii)	30iii	0
31	Royalty			
	i.	Paid outside India, or paid in India to a non-resident other than a company or a foreign company	i	0
	ii.	To others	ii	0
	iii.	Total (i + ii)	31iii	0
32	Professional / Consultancy fees / Fee for technical services			
	i.	Paid outside India, or paid in India to a non-resident other than a company or a foreign company	i	0
	ii.	To others	ii	150300
	iii.	Total (i + ii)	32iii	150300
33.	Hotel , boarding and Lodging		33	0
34.	Traveling expenses other than on foreign traveling		34	1068765
35.	Foreign travelling expenses		35	0
36.	Conveyance expenses		36	0
37.	Telephone expenses		37	88578
38.	Guest House expenses		38	0
39.	Club expenses		39	0
40.	Festival celebration expenses		40	0
41.	Scholarship		41	0
42.	Gift		42	0
43.	Donation		43	0

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44	Rates and taxes, paid or payable to Government or any local body (excluding taxes on income)												
	i.	Union excise duty								44i	0		
	ii.	Service tax								44ii	0		
	iii.	VAT/ Sales tax								44iii	0		
	iv.	Cess								44iv	0		
	v.	Central Goods and Service Tax (CGST)								44v	0		
	vi.	State Goods and Services Tax (SGST)								44vi	0		
	vii.	Integrated Goods and Services Tax (IGST)								44vii	0		
	viii.	Union Territory Goods and Services Tax (UTGST)								44viii	0		
	ix.	Any other rate, tax, duty or cess incl. STT and CTT								44ix	14123		
	x.	Total rates and taxes paid or payable (44i + 44ii + 44iii + 44iv + 44v+44vi+44vii+44viii+44ix)								44x	14123		
45.	Audit fee								45	35000			
46	Other expenses (specify nature and amount)												
			Nature							Amount			
		1	Accounting Charges							29700			
		2	Anert Registration and Affiliation Expenses							300616			
		3	Discounts							6074743			
		4	Marketing expenses							2043299			
		5	Newspaper and Periodicals							1680			
		6	Membership Fee							45550			
		7	Office Expenses							258001			
		8	Printing and Stationery							155606			
		9	Postage and Courier							33425			
		10	Refreshment Expenses							4019			
		11	Worksite Expenses							2395692			
		12	Filing Fee							19900			
		13	Miscellaneous Expenses							16290			
		14	Bank Charges							9730			
			Total							11388251			
47	Bad debts (specify PAN of the person, if available, for whom Bad Debt for amount of Rs. 1 lakh or more is claimed and amount)												
	i	PAN								Amount			
	ii.	Others (more than Rs. 1 lakh) where PAN is not available(provide name and complete address)											
		Sl. No.	Name	Flat/ Door/ Block No.	Name of Premises / Building / Village	Road/ Street/ Post office	Area/ Locality	Town/ City/ District	State	Country	PIN Code/ ZIP Code	Amount	
	iii.	Others (amounts less than Rs. 1 lakh)								1671	iii	0	

	iv.	Total Bad Debt (47i + 47ii + 47iii)	39iv	0				
48.	Provision for bad and doubtful debts		48	0				
49.	Other provisions		49	0				
50.	Profit before interest, depreciation and taxes [15 – (16 to 21 + 22xi + 23v + 24 to 29 + 30iii + 31iii + 32iii + 33 to 43 + 44x + 45 + 46iii+ 47iv + 48 + 49)]		50	1719848				
51.	Interest							
	i.	Paid outside India, or paid in India to a non-resident other than a company or a foreign company	i	0				
	ii.	To others	ii	236177				
	iii.	Total (i + ii)	51iii	236177				
52	Depreciation and amortization.		52	1062518				
53	Net Profit before taxes (50 - 51iii - 52)		53	421153				
PROVISIONS FOR TAX AND APPROPRIATIONS								
54	Provision for current tax		54	253039				
55	Provision for Deferred Tax		55	-148361				
56	Profit after tax (53 - 54 - 55)		56	316475				
57	Balance brought forward from previous year		57	0				
58	Amount available for appropriation (56+57)		58	316475				
59.	Appropriations							
	i.	Transfer to reserves and surplus	59i	0				
	ii.	Proposed dividend/ Interim dividend	59ii	0				
	iii.	Tax on dividend/ Tax on dividend for earlier years	59iii	0				
	iv.	Appropriation towards Corporate Social Responsibility (CSR) activities (in case of companies covered under section 135 of Companies Act, 2013)	59iv	0				
	v.	Any other appropriation	59v	0				
	vi.	Total (59i + 59ii + 59iii + 59iv+59v)	59vi	0				
60	Balance carried to balance sheet (58 – 59vi)		60	316475				
61	COMPUTATION OF PRESUMPTIVE INCOME FROM GOODS CARRIAGES UNDER SECTION 44AE							
	Sl. No.	Name of the Business	Business Code	Description				
	i	Sl.No	Registration No. of goods carriage	Whether owned/ leased/hired	Tonnage Capacity of goods carriage(in MT)	Number of months for which goods carriage was owned / leased / hired by assessee	Presumptive income u/s 44AE for the goods carriage (Computed @ Rs.1000 per ton per month in case tonnage exceeds 12MT, or else @ Rs.7500 per month) or the amount claimed to have been actually earned, whichever is higher	
		Total				0	0	
	ii	Total presumptive income from goods carriage u/s 44AE [total of column (5) of table at Point 6i(i)]					61ii	0

NO ACCOUNT CASE				
62	In case of Foreign Company whose total income comprises solely of profits and gains from business referred to in section 44B, 44BB, 44BBA or 44BBB, furnish the following information			
	a.	Gross receipts / Turnover	62a	0
	b.	Net profit	62b	0
Schedule Part A-Manufacturing Account Ind As- Manufacturing Account for the financial year 2018-19 [applicable for a company whose financial statements are drawn up in compliance to the Indian Accounting Standards specified in Annexure to the companies (Indian Accounting Standards) Rules, 2015] (fill items 1 to 3 in a case where regular books of accounts are maintained, otherwise fill items 63 to 64 as applicable)				
1	Opening Inventory			
	A	(i)	Opening stock of raw-material	A(i)
		(ii)	Opening stock of Work in progress	A(ii)
		(iii)	Total (i + ii)	A(iii) 0
	B	Purchases (net of refunds and duty or tax, if any)		B
	C	Direct wages		C
	D	Direct expenses (Di + Dii + Diii)		D
		(i)	Carriage inward	(i)
		(ii)	Power and fuel	(ii)
		(iii)	Other direct expenses	(iii)
	E	Factory Overheads		
		(i)	Indirect wages	(i)
		(ii)	Factory rent and rates	(ii)
		(iii)	Factory Insurance	(iii)
		(iv)	Factory fuel and power	(iv)
		(v)	Factory general expenses	(v)
		(vi)	Depreciation of factory machinery	(vi) 0
		(vii)	Total (i+ii+iii+iv+v+vi)	(vii) 0
	F	Total of Debits to Manufacturing Account (Aiii+B+C+D+Evii)		F 0
2	Closing Stock			
	(i)	Raw material		(i)
	(ii)	Work-in-progress		(ii)
		Total (2i + 2ii)		0
3	Cost of Goods Produced – transferred to Trading Account (1F-2)			0
Schedule Part A-Trading Account Ind As -Trading Account for the financial year 2018-19 [applicable for a company whose financial statements are drawn up in compliance to the Indian Accounting Standards specified in Annexure to the companies (Indian Accounting Standards) Rules, 2015] (fill items 4 to 12 in a case where regular books of accounts are maintained, otherwise fill items 63 to 64 as applicable)				

4	Revenue from operations					
	A	Sales/ Gross receipts of business (net of returns and refunds and duty or tax, if any)				
		(i)	Sale of goods		(i)	0
		(ii)	Sale of services		(ii)	0
		(iii)	Other operating revenues (specify nature and amount)			
			S. No.	Nature of other operating revenue	Amount	
			Total			0
		(iv)	Total(i+ii+iiic)		A(iv)	0
	B	Gross receipts from Profession			B	0
	C	Duties, taxes and cess received or receivable in respect of goods and services sold or supplied				
		(i)	Union Excise duties		Ci	
		(ii)	Service Tax		Cii	
		(iii)	VAT/ Sales tax		Ciii	
		(iv)	Central Goods & Service Tax (CGST)		Civ	0
		(v)	State Goods & Services Tax (SGST)		Cv	0
		(vi)	Integrated Goods & Services Tax (IGST)		Cvi	0
		(vii)	Union Territory Goods & Services Tax (UTGST)		Cvii	0
		(viii)	Any other duty, tax and cess		Cviii	
		(ix)	Total (i + ii + iii + iv +v+ vi+vii+viii)		Cix	0
	D	Total Revenue from operations (Aiv + B +Cix)			D	0
5	Closing Stock of Finished Stocks				5	0
6	Total of credits to Trading Account (4D + 5)				6	0
7	Opening Stock of Finished Goods				7	0
8	Purchases (net of refunds and duty or tax, if any)				8	0
9	Direct Expenses (9i + 9ii + 9iii)				9	0
	(i)	Carriage inward			9(i)	0
	(ii)	Power and fuel			9(ii)	0
	(iii)	Other direct expenses			9(iii)	0
		S. No.	Nature of direct expenses		Amount	
10	Duties and taxes, paid or payable, in respect of goods and services purchased					
	(i)	Custom duty			10i	
	(ii)	Counter veiling duty			10ii	
	(iii)	Special additional duty			10iii	
	(iv)	Union excise duty			10iv	
	(v)	Service Tax			10v	
	(vi)	VAT/ Sales tax			10vi	
	(vii)	Central Goods & Service Tax (CGST)			10vii	

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	(viii)	State Goods & Services Tax (SGST)	10viii		
	(ix)	Integrated Goods & Services Tax (IGST)	10ix		
	(x)	Union Territory Goods & Services Tax (UTGST)	10x		
	(xi)	Any other tax, paid or payable	10xi		
	(xii)	Total (10i + 10ii + 10iii + 10iv + 10v + 10vi + 10vii + 10viii + 10ix + 10x+10xi)	10xii	0	
11		Cost of goods produced – Transferred from Manufacturing Account	11	0	
12		Gross Profit/Loss from Business/Profession - transferred to Profit and Loss account (6-7-8-9-10xii-11)	12	0	
12a		Turnover from Intraday Trading	12a	0	
12b		Income from Intraday Trading	12b	0	
Schedule A-P &L Profit and Loss Account for the financial year 2018-19 [applicable for a company whose financial statements are drawn up in compliance to the Indian Accounting Standards specified in Annexure to the companies (Indian Accounting Standards) Rules, 2015](fill items 13 to 60 in a case where regular books of accounts are maintained, otherwise fill items 63 to 64 as applicable)					
	CREDITS TO PROFIT AND LOSS ACCOUNT				
13		Gross profit transferred from Trading Account	13	0	
14		Other income			
	i.	Rent	i	0	
	ii.	Commission	ii	0	
	iii.	Dividend income	iii	0	
	iv.	Interest income	iv	0	
	v.	Profit on sale of fixed assets	v	0	
	vi.	Profit on sale of investment being securities chargeable to Securities Transaction Tax (STT)	vi	0	
	vii.	Profit on sale of other investment	vii	0	
	viii.	Gain(Loss) on account of foreign exchange fluctuation u/s 43AA	viii	0	
	ix.	Profit on conversion of inventory into capital asset u/s 28(via) (Fair Market Value of inventory as on the date of conversion)	ix	0	
	x.	Agriculture income	x	0	
	xi.	Any other income (specify nature and amount)			
		Sl.No	Nature	Amount	
		xix	Total	0	
	xii.	Total of other income (i + ii + iii + iv + v + vi + vii + viii + ix + x + xix)		14xii	0
15		Total of credits to profit and loss account (13+14xii)	15	0	
16		Freight outward	16	0	
17		Consumption of stores and spare parts	17	0	
18		Power and fuel	18	0	
19		Rents	19	0	
20		Repairs to building	20	0	

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21	Repairs to machinery	21	0
22	Compensation to employees		
	i. Salaries and wages	22i	0
	ii. Bonus	22ii	0
	iii. Reimbursement of medical expenses	22iii	0
	iv. Leave encashment	22iv	0
	v. Leave travel benefits	22v	0
	vi. Contribution to approved superannuation fund	22vi	0
	vii. Contribution to recognised provident fund	22vii	0
	viii. Contribution to recognised gratuity fund	22viii	0
	ix. Contribution to any other fund	22ix	0
	x. Any other benefit to employees in respect of which an expenditure has been incurred	22x	0
	xi. Total compensation to employees (total of 22i to 22x)	22xi	0
	22xii. Whether any compensation, included in 22xi, paid to non-residents	xiia	
	If Yes, amount paid to non-residents	xiib	0
23	Insurance		
	i. Medical Insurance	23i	0
	ii. Life Insurance	23ii	0
	iii. Keyman's Insurance	23iii	0
	iv. Other Insurance including factory, office, car, goods, etc.	23iv	0
	v. Total expenditure on insurance (23i+23ii+23iii+23iv)	23v	0
24.	Workmen and staff welfare expenses	24	0
25.	Entertainment	25	0
26.	Hospitality	26	0
27.	Conference	27	0
28.	Sales promotion including publicity (other than advertisement)	28	0
29.	Advertisement	29	0
30	Commission		
	i. Paid outside India, or paid in India to a non-resident other than a company or a foreign company	i	0
	ii. To others	ii	0
	iii. Total (i + ii)	30iii	0
31	Royalty		
	i. Paid outside India, or paid in India to a non-resident other than a company or a foreign company	i	0
	ii. To others	ii	0
	iii. Total (i + ii)	31iii	0
32	Professional / Consultancy fees / Fee for technical services		
	i. Paid outside India, or paid in India to a non-resident other than a company or a foreign company	i	0

	ii.	To others							ii	0			
	iii.	Total (i + ii)							32iii	0			
33.	Hotel , boarding and Lodging							33	0				
34.	Traveling expenses other than on foreign traveling							34	0				
35.	Foreign travelling expenses							35	0				
36.	Conveyance expenses							36	0				
37.	Telephone expenses							37	0				
38.	Guest House expenses							38	0				
39.	Club expenses							39	0				
40.	Festival celebration expenses							40	0				
41.	Scholarship							41	0				
42.	Gift							42	0				
43.	Donation							43	0				
44	Rates and taxes, paid or payable to Government or any local body (excluding taxes on income)												
	i.	Union excise duty							44i	0			
	ii.	Service tax							44ii	0			
	iii.	VAT/ Sales tax							44iii	0			
	iv.	Cess							44iv	0			
	v.	Central Goods and Service Tax (CGST)							44v	0			
	vi.	State Goods and Services Tax (SGST)							44vi	0			
	vii.	Integrated Goods and Services Tax (IGST)							44vii	0			
	viii.	Union Territory Goods and Services Tax (UTGST)							44viii	0			
	ix.	Any other rate, tax, duty or cess incl. STT and CTT							44ix	0			
	x.	Total rates and taxes paid or payable (44i + 44ii + 44iii + 44iv + 44v+44vi+44vii+44viii+44ix)							44x	0			
45.	Audit fee							45	0				
46	Other expenses (specify nature and amount)												
			Nature						Amount				
			Total						0				
47	Bad debts (specify PAN of the person, if available, for whom Bad Debt for amount of Rs. 1 lakh or more is claimed and amount)												
	i	PAN							Amount				
	ii.	Others (more than Rs. 1 lakh) where PAN is not available(provide name and complete address)											
		Sl. No.	Name	Flat/ Door/ Block No.	Name of Premises / Building / Village	Road/ Street/ Post office	Area/ Locality	Town/ City/ District	State	Country	PIN Code/ ZIP Code	Amount	
	iii.	Others (amounts less than Rs. 1 lakh)							iii	0			
	iv.	Total Bad Debt (47i + 47ii + 47iii)							39iv	0			

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48.	Provision for bad and doubtful debts	48	0
49.	Other provisions	49	0
50.	Profit before interest, depreciation and taxes [15 – (16 to 21 + 22xi + 23v + 24 to 29 + 30iii + 31iii + 32iii + 33 to 43 + 44x + 45 + 46iii+ 47iv + 48 + 49)]	50	0
51.	Interest		
	i. Paid outside India, or paid in India to a non-resident other than a company or a foreign company	i	0
	ii. To others	ii	0
	iii. Total (i + ii)	51iii	0
52	Depreciation and amortization.	52	0
53	Net Profit before taxes (50 - 51iii - 52)	53	0
PROVISIONS FOR TAX AND APPROPRIATIONS			
54	Provision for current tax	54	0
55	Provision for Deferred Tax	55	0
56	Profit after tax (53 - 54 - 55)	56	0
57	Balance brought forward from previous year	57	0
58	Amount available for appropriation (56+57)	58	0
59.	Appropriations		
	i. Transfer to reserves and surplus	59i	0
	ii. Proposed dividend/ Interim dividend	59ii	0
	iii. Tax on dividend/ Tax on dividend for earlier years	59iii	0
	iv. Appropriation towards Corporate Social Responsibility (CSR) activities (in case of companies covered under section 135 of Companies Act, 2013)	59iv	0
	v. Any other appropriation	59v	0
	vi. Total (59i + 59ii + 59iii + 59iv+59v)	59vi	0
60	Balance carried to balance sheet (58 – 59vi)	60	0
61	A Items that will not be reclassified to P&L	61	
	i Changes in revaluation surplus	i	0
	ii Re-measurements of the defined benefit plans	ii	0
	iii Equity instruments through OCI	iii	0
	iv Fair value Changes relating to own credit risk of financial liabilities designated at FVTPL	iv	0
	v Share of Other comprehensive income in associates and joint ventures , to the extent not to be classified to P&L	v	0
	vi Others (Specify nature)		
	Nature	Amount	
	Total of (vi)	vi	0
	vii Income tax relating to items that will not be reclassified to P&L	vii	0
	viii Total	viii	0

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	B	Items that will be reclassified to P&L					B	
	i	Exchange differences in translating the financial statements of a foreign operation					i	0
	ii	Debt instruments through OCI					ii	0
	iii	The effective portion of gains and loss on hedging instruments in a cash flow hedge					iii	0
	iv	Share of OCI in associates and joint ventures to the extent to be classified into P&L					iv	0
	v	Others (Specify nature)						
		Nature					Amount	
		Total of (v)					v	0
	vi	Income tax relating to items that will be reclassified to P&L					vi	0
	vii	Total					vii	0
62		Total Comprehensive Income(56 + 61A + 61B)					62	0
63		COMPUTATION OF PRESUMPTIVE INCOME FROM GOODS CARRIAGES UNDER SECTION 44AE					63	
	Sl. No.	Name of the Business			Business Code		Description	
	i	Sl.No	Registration No. of goods carriage	Whether owned/ leased/hired	Tonnage Capacity of goods carriage(in MT)	Number of months for which goods carriage was owned / leased / hired by assessee	Presumptive income u/s 44AE for the goods carriage (Computed @ Rs.1000 per tone per month in case tonnage exceeds 12MT, or else @ Rs.7500 per month) or the amount claimed to have been earned, whichever is higher	
		Total					0	0
	ii	Total presumptive income from goods carriage u/s 44AE [total of column (5) of table at Point 63(i)]					63ii	0
NO ACCOUNT CASE								
64	IF REGULAR BOOKS OF ACCOUNT OF BUSINESS OR PROFESSION ARE NOT MAINTAINED, furnish the following information for previous year 2018-19 in respect of business or profession – (OTHER THAN COVERED U/S 44AE)							
	(i)	For assessee carrying on Business						
	a.	Gross receipts/ Turnover (a1 + a2)					64ia	0
	i	Through a/c payee cheque or a/c payee bank draft or bank electronic clearing system received before specified date					64iai	0
	ii	Any other mode					64iaii	0
	b.	Gross profit					64ib	0
	c.	Expenses					64ic	0
	d.	Net profit					64id	0
	(ii)	For assessee carrying on Profession						
	a.	Gross receipts (a1 + a2)					64iia	0

	i	Through a/c payee cheque or a/c payee bank draft or bank electronic clearing system received before specified date	64iiai	0
	ii	Any other mode	64iiaii	0
b.		Gross profit	64iib	0
c.		Expenses	64iic	0
d.		Net profit	64iid	0
(iii)		Total Profit (64(i)+ 64(ii))		0
Part A OI-Other Information ((mandatory if liable for audit under section 44AB, for other fill, if applicable)				
1		Method of accounting employed in the previous year	1	Mercantile
2		Is there any change in method of accounting	2	No
3	3a	Increase in the profit or decrease in loss because of deviation, if any, as per Income Computation Disclosure Standards notified under section 145(2) [column 11a(iii) of Schedule ICDS]	3a	0
	3b	Decrease in the profit or increase in loss because of deviation, if any, as per Income Computation Disclosure Standards notified under section 145(2) [column 11b(iii) of Schedule ICDS]	3b	0
4		Method of valuation of closing stock employed in the previous year (If applicable, fill all serial nos in red, since blank will be treated as zeroes)(optional in case of professionals)		
	a	Raw Material (if at cost or market rates whichever is less write 1, if at cost write 2, if at market rate write 3)	4a	1. Cost or market rate , whichever is less
	b	Finished goods (if at cost or market rates whichever is less write 1, if at cost write 2, if at market rate write 3)	4b	1. Cost or market rate , whichever is less
	c	Is there any change in stock valuation method	4c	No
	d	Increase in the profit or decrease in loss because of deviation, if any, from the method of valuation specified under section 145A	4d	0
	e	Decrease in the profit or increase in loss because of deviation, if any, from the method of valuation specified under section 145A	4e	0
5		Amounts not credited to the profit and loss account, being		
	a	the items falling within the scope of section 28	5a	0
	b	The proforma credits, drawbacks, refund of duty of customs or excise or service tax, or refund of sales tax or value added tax, or refund of GST, where such credits, drawbacks or refunds are admitted as due by the authorities concerned	5b	0
	c	escalation claims accepted during the previous year	5c	0
	d	Any other item of income	5d	0
	e	Capital receipt, if any	5e	0
	f	Total of amounts not credited to profit and loss account (5a+5b+5c+5d+5e)	5f	0
6		Amounts debited to the profit and loss account, to the extent disallowable under section 36 due to non-fulfilment of condition specified in relevant clauses :-		

a	Premium paid for insurance against risk of damage or destruction of stocks or store[36(1)(i)]	6a	0
b	Premium paid for insurance on the health of employees[36(1)(ib)]	6b	0
c	Any sum paid to an employee as bonus or commission for services rendered, where such sum was otherwise payable to him as profits or dividend[36(1)(ii)]	6c	0
d	Any amount of interest paid in respect of borrowed capital[36(1)(iii)]	6d	0
e	Amount of discount on a zero-coupon bond[36(1)(iiia)]	6e	0
f	Amount of contributions to a recognised provident fund[36(1)(iv)]	6f	0
g	Amount of contributions to an approved superannuation fund[36(1)(iv)]	6g	0
h	Amount of contribution to a pension scheme referred to in section 80CCD[36(1)(iva)]	6h	0
i	Amount of contributions to an approved gratuity fund[36(1)(v)]	6i	0
j	Amount of contributions to any other fund	6j	0
k	Any sum received from employees as contribution to any provident fund or superannuation fund or any fund set up under ESI Act or any other fund for the welfare of employees to the extent not credited to the employees account on or before the due date [36(1)(va)]	6k	0
l	Amount of bad and doubtful debts [36(1)(vii)]	6l	0
m	Provision for bad and doubtful debts [36(1)(viiia)]	6m	0
n	Amount transferred to any special reserve [36(1)(viii)]	6n	0
o	Expenditure for the purposes of promoting family planning amongst employees [36(1)(ix)]	6o	0
p	Amount of securities transaction paid in respect of transaction in securities if such income is not included in business income [36(1)(xv)]	6p	0
q	Marked to market loss or other expected loss as computed in accordance with the ICDS notified u/s 145(2) [36(1)(xviii)]	6q	0
r	Any other disallowance	6r	0
s	Total amount disallowable under section 36(total of 6a to 6r)	6s	0
t	Total number of employees employed by the company (mandatory in case company has recognized Provident Fund)		
i	deployed in India	i	0
ii	deployed outside India	ii	0
iii	Total i+ii	iii	0
7	Amounts debited to the profit and loss account, to the extent disallowable under section 37		
a	Expenditure of capital nature [37(1)]	7a	0
b	Expenditure of personal nature[37(1)]	7b	0
c	Expenditure laid out or expended wholly and exclusively NOT for the purpose of business or profession[37(1)]	7c	0

	d	Expenditure on advertisement in any souvenir, brochure, tract, pamphlet or the like, published by a political party[37(2B)]	7d	0
	e	Expenditure by way of penalty or fine for violation of any law for the time being in force	7e	0
	f	Any other penalty or fine	7f	15119
	g	Expenditure incurred for any purpose which is an offence or which is prohibited by law	7g	0
	h	Expenditure incurred on corporate social responsibility (CSR)	7h	0
	i	Amount of any liability of a contingent nature	7i	0
	j	Any other amount not allowable under section 37	7j	0
	k	Total amount disallowable under section 37 (total of 7a to 7j)	7k	15119
8	A	Amounts debited to the profit and loss account, to the extent disallowable under section 40		
	a	Amount disallowable under section 40(a)(i) on account of non-compliance with provisions of Chapter XVII-B	Aa	0
	b	Amount disallowable under section 40(a)(ia) on account of non-compliance with the provisions of Chapter XVII-B	Ab	0
	c	Amount disallowable under section 40(a)(ib) on account of non-compliance with the provisions of Chapter VIII of the Finance Act, 2016	Ac	0
	d	Amount disallowable under section 40(a)(iii) on account of non-compliance with the provisions of Chapter XVII-B	Ad	0
	e	Amount of tax or rate levied or assessed on the basis of profits[40(a)(ii)]	Ae	0
	f	Amount paid as wealth tax[40(a)(ia)]	Af	0
	g	Amount paid by way of royalty, license fee, service fee etc. as per section 40(a)(iib)	Ag	0
	h	Amount of interest, salary, bonus, commission or remuneration paid to any partner or member[40(b)]	Ah	0
	i	Any other disallowance	Ai	0
	j	Total amount disallowable under section 40(total of Aa to Ai)	Aj	0
	B	Any amount disallowed under section 40 in any preceding previous year but allowable during the previous year	8B	0
9	Amounts debited to the profit and loss account, to the extent disallowable under section 40A			
	a	Amounts paid to persons specified in section 40A(2)(b)	9a	0
	b	Amount paid otherwise than by account payee cheque or account payee bank draft or use of electronic clearing system through a bank account, disallowable under section 40A(3)	9b	0
	c	Provision for payment of gratuity [40A(7)]	9c	0
	d	any sum paid by the assessee as an employer for setting up or as contribution to any fund, trust, company, AOP, or BOI or society or any other institution [40A(9)]	9d	0
	e	Any other disallowance	9e	0
	f	Total amount disallowable under section 40A (total of 9a to 9e)	9f	0
10	Any amount disallowed under section 43B in any preceding previous year but allowable during the previous year			

	a	Any sum in the nature of tax, duty, cess or fee under any law	10a	0
	b	Any sum payable by way of contribution to any provident fund or superannuation fund or gratuity fund or any other fund for the welfare of employees	10b	0
	c	Any sum payable to an employee as bonus or commission for services rendered	10c	0
	d	Any sum payable as interest on any loan or borrowing from any public financial institution or a State financial corporation or a State Industrial investment corporation	10d	0
	e	Any sum payable as interest on any loan or borrowing from any scheduled bank or a co-operative bank other than a primary agricultural credit society or a primary co-operative agricultural and rural development bank	10e	0
	f	Any sum payable towards leave encashment	10f	0
	g	Any sum payable to the Indian Railways for the use of railway assets	10g	0
	h	Total amount allowable under section 43B (total of 10a to 10g)	10h	0
11	Any amount debited to profit and loss account of the previous year but disallowable under section 43B			
	a	Any sum in the nature of tax, duty, cess or fee under any law	11a	30107
	b	Any sum payable by way of contribution to any provident fund or superannuation fund or gratuity fund or any other fund for the welfare of employees	11b	0
	c	Any sum payable to an employee as bonus or commission for services rendered	11c	0
	d	Any sum payable as interest on any loan or borrowing from any public financial institution or a State financial corporation or a State Industrial investment corporation	11d	0
	e	Any sum payable as interest on any loan or borrowing from any scheduled bank or a co-operative bank other than a primary agricultural credit society or a primary co-operative agricultural and rural development bank	11e	0
	f	Any sum payable towards leave encashment	11f	0
	g	Any sum payable by the assessee to the Indian Railways for the use of railway assets.	11g	0
	h	Total amount disallowable under Section 43B(total of 11a to 11g)	11h	30107
12	Amount of credit outstanding in the accounts in respect of			
	a	Union Excise Duty	12a	0
	b	Service tax	12b	0
	c	VAT/sales tax	12c	0
	d	Central Goods and Service Tax (CGST)	12d	0
	e	State Goods and Services Tax (SGST)	12e	0
	f	Integrated Goods and Services Tax (IGST)	12f	0
	g	Union Territory Goods and Services Tax (UTGST)	12g	0
	h	Any other tax	12h	0
	e	Total amount outstanding (total of 12a to 12h)	12e	0
13	Amounts deemed to be profits and gains under section 33AB or 33ABA or 33AC			0
	i	Section 33AB	13i	0

	ii	Section 33ABA	13ii	0
	iii	Section 33AC	13iii	0
14	Any amount of profit chargeable to tax under section 41		14	0
15	Amount of income or expenditure of prior period credited or debited to the profit and loss account (net)		15	0
16	Amount of expenditure disallowed u/s 14A		16	0

Schedule QD-Quantitative details (mandatory if liable for audit under section 44AB)

(a) In the case of a trading concern

	Item Name	Unit	Opening stock	Purchase during the previous year	Sales during the previous year	Closing stock	Shortage/ excess, if any
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(b) In the case of a manufacturing concern -Raw Materials

	Item Name	Unit of measure	Opening stock	Purchase during the previous year	Consumption during the previous year	Sales during the previous year	Closing stock	Yield Finished Products	Percentage of yield	Shortage/ excess, if any
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(c) In the case of a manufacturing concern - Finished products/ By-products

	Item Name	Unit	Opening stock	Purchase during the previous year	quantity manufactured during the previous year	Sales during the previous year	Closing stock	Shortage/ excess, if any
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Schedule OL-Receipt and payment account of company under liquidation

1	Opening Balance									
	i	Cash in hand				1i				
	ii	Bank				1ii				
	iii	Total opening balance (1i + 1ii)				1iii				
2	Receipts									
	i	Interest				2i				
	ii	Dividend				2ii				
	iii	Sale of assets(pls. specify nature and amount)								
		S. No.	Nature					Amount		
		Total(iiiia + iiib + iiic)								
	iv	Realisation of dues/debtors				2iv				
	v	Others(pls. specify nature and amount)								
		S. No.	Nature					Amount		
		Total of other receipts(va + vb)							2v	
	vi	Total receipts (2i + 2ii + 2iiid+ 2iv + 2vc)				2vi				

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3	Total of opening balance and receipts				3		
4	Payments						
	i	Repayment of secured loan			4i		
	ii	Repayment of unsecured loan			4ii		
	iii	Repayment to creditors			4iii		
	iv	Commission			4iv		
	v	Others (pls. specify)					
		S. No.	Nature				Amount
		Total of other payments(4va + 4vb)					4v
	vi	Total payments(4i + 4ii + 4iii + 4iv + 4vi)			4vi		
5	Closing balance						
	i	Cash in hand			5i		
	ii	Bank			5ii		
	iii	Total Closing balance (5i + 5ii)			5iii		
6	Total of closing balance and payments (4vi + 5iii)				6		

Schedule HP - Details of Income from House Property

1	Pass through income if any			
2	Income under the head "Income from house property" (1k+2k+3)(if negative take the figure to 2i of schedule CYLA)			
NOTE	Furnishing PAN of tenant is mandatory, if tax is deducted under section 194-IB.			
	Furnishing TAN of tenant is mandatory, if tax is deducted under section 194-I.			

Schedule BP - Computation of income from business or profession

A	From business or profession other than speculative business and specified business			
1.	Profit before tax as per profit and loss account (item 53 ,61(ii) and 62(b) of Part A-P &L) / (item 53,63(ii) and 64(iii) of Part A-P&L – Ind AS) (as applicable)			421153
2a.	Net profit or loss from speculative business included in 1 (enter -ve sign in case of loss)			0
2b.	Net profit or Loss from Specified Business u/s 35AD included in 1 (enter -ve sign in case of loss)			0
3.	Income/ receipts credited to profit and loss account considered under other heads of income/chargeable u/s 115BBF/chargeable u/s 115BBG			
a.	House property		3a	0
b.	Capital gains		3b	6181
c.	Other sources		3c	88694
d.	u/s 115BBF		3d	0
e.	u/s 115BBG		3e	0
4a.	Profit or loss included in 1, which is referred to in section 44AE/44B/44BB/44BBA/44BBB/ 44D/44DA/ Chapter-XII-G/ First Schedule of Income-tax Act(other than 115B)			0
	Sl.No	Section	Amount	

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	i.	44AE		0	
	ii.	44B		0	
	iii.	44BB		0	
	iv.	44BBA		0	
	v.	44BBB		0	
	vi.	44D		0	
	vii.	44DA		0	
	viii.	Chapter-XII-G		0	
	ix.	First Schedule of Income Tax Act (other than 115B)		0	
4b.	Profit and gains from life insurance business referred to in section 115B			4b	0
4c.	Profit from activities covered under rule 7, 7A, 7B(1), 7B(1A) and 8			4c	0
	i	Profit from activities covered under rule 7		4i	0
	ii	Profit from activities covered under rule 7A		4ii	0
	iii	Profit from activities covered under rule 7B(1)		4iii	0
	iv	Profit from activities covered under rule 7B(1A)		4iv	0
	v	Profit from activities covered under rule 8		4v	0
5.	Income credited to Profit and Loss account (included in 1) which is exempt				
	a.	Share of income from firm(s)		5a	0
	b.	Share of income from AOP/ BOI		5b	0
	c.	Any other exempt income (specify nature and amount)			
		Sl.No.	Nature	Amount	
		Total	5C		0
	d	Total exempt income (5a + 5b + 5c)	5d		0
6.	Balance(1- 2a - 2b - 3a - 3b - 3c -3e- 3d - 4- 5d)			6	326278
7.	Expenses debited to profit and loss account considered under other heads of income/related to income chargeable u/s 115BBF or u/s 115BBG				
	a.	House property		7a	0
	b.	Capital gains		7b	0
	c.	Other sources		7c	0
	d.	u/s 115BBF		7d	0
	e.	u/s 115BBG		7e	0
8a.	Expenses debited to profit and loss account which relate to exempt income			8a	0
8b.	Expenses debited to profit and loss account which relate to exempt income and disallowed u/s 14A (16 of Part A-OI)			8b	0
9.	Total (7a + 7b +7c + 7d+ 7e + 8)			9	0
10.	Adjusted profit or loss (6+9)			10	326278
11.	Depreciation and amortisation debited to profit and loss account			11	1062518

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	12.	Depreciation allowable under Income-tax Act			
		i	Depreciation allowable under section 32(1)(ii) and 32(1)(ia) (item 6 of Schedule-DEP)	12i	575109
		ii	Depreciation allowable under section 32(1)(i) (Make your own computation refer Appendix-IA of IT Rules)	12ii	0
		iii	Total (12i + 12ii)	12iii	575109
	13.	Profit or loss after adjustment for depreciation (10 +11 - 12iii)		13	813687
	14.	Amounts debited to the profit and loss account, to the extent disallowable under section 36 (6r of Part A-OI)		14	0
	15.	Amounts debited to the profit and loss account, to the extent disallowable under section 37 (7k of Part A-OI)		15	15119
	16.	Amounts debited to the profit and loss account, to the extent disallowable under section 40 (8Aj of Part A-OI)		16	0
	17.	Amounts debited to the profit and loss account, to the extent disallowable under section 40A (9f of Part A-OI)		17	0
	18.	Any amount debited to profit and loss account of the previous year but disallowable under section 43B (11h of Part A-OI)		18	30107
	19.	Interest disallowable under section 23 of the Micro, Small and Medium Enterprises Development Act, 2006		19	0
	20.	Deemed income under section 41		20	0
	21.	Deemed income under section 32AC/ 32AD/ 33AB/ 33ABA/35ABA/ 35ABB/ 35AC/ 40A(3A)/ 33AC/ 72A/ 80HHD/ 80-IA		21	0
		(i)	Section 32AC	21(i)	0
		(ii)	Section 32AD	21(ii)	0
		(iii)	Section 33AB	21(iii)	0
		(iv)	Section 33ABA	21(iv)	0
		(v)	Section 35ABA	21(v)	0
		(vi)	Section 35ABB	21(vi)	0
		(vii)	Section 35AC	21(vii)	0
		(viii)	Section 40A(3A)	21(viii)	0
		(ix)	Section 33AC	21(ix)	0
		(x)	Section 72A	21(x)	0
		(xi)	Section 80HHD	21(xi)	0
		(xii)	Section 80-IA	21(xii)	0
	22.	Deemed income under section 43CA		22	0
	23.	Any other item or items of addition under section 28 to 44DA		23	6372
	24.	Any other income not included in profit and loss account/any other expense not allowable (including income from salary, commission, bonus and interest from firms in which company is a partner)		24	0
		(a)	Salary	24(a)	0
		(b)	Bonus	24(b)	0
		(c)	Commission	24(c)	0
		(d)	Interest	24(d)	0

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	(e)	Others	24(e)	0
25.	Increase in profit or decrease in loss on account of ICDS adjustments and deviation in method of valuation of stock (Column 3a + 4d of Schedule OI)		25	0
26.	Total (14 + 15 + 16 + 17 + 18 + 19 + 20 + 21 + 22 + 23 + 24 + 25)		26	51598
27.	Deduction allowable under section 32(1)(iii)		27	0
28.	Deduction allowable under section 32AD		28	0
29.	Amount allowable as deduction under section 32AC		29	0
30.	Amount of deduction under section 35 or 35CCC or 35CCD in excess of the amount debited to profit and loss account (item x(4) of Schedule ESR) (if amount deductible under section 35 or 35CCC or 35CCD is lower than amount debited to P&L account, it will go to item 24)		30	0
31.	Any amount disallowed under section 40 in any preceding previous year but allowable during the previous year(8B of Part A-OI)		31	0
32.	Any amount disallowed under section 43B in any preceding previous year but allowable during the previous year (10g of Part A-OI)		32	0
33.	Any other amount allowable as deduction		33	0
34.	Decrease in profit or increase in loss on account of ICDS adjustments and deviation in method of valuation of stock (Column 3b + 4e of Schedule OI)		34	0
35.	Total (27 + 28 + 29 + 30 + 31 + 32c + 33 + 34)		35	0
36.	Income (13 + 26 – 35)		34	865285
37.	Profits and gains of business or profession deemed to be under -			
	i	Section 44AE(62(ii) of schedule P&L or 63(ii) of Ind As P&L)	36i	0
	ii	Section 44B	36ii	0
	iii	Section 44BB	36iii	0
	iv	Section 44BBA	36iv	0
	v	Section 44BBB	36v	0
	vi	Section 44D	36vi	0
	vii	Section 44DA	36vii	0
	viii	Chapter-XII-G (tonnage)	36viii	0
	ix	First Schedule of Income-tax Act (other than 115B)	36ix	0
	x	Total (37 i to 37ix)	36x	0
38.	Net profit or loss from business or profession other than speculative and specified business (34 + 37x)		38	865285
39.	Net Profit or loss from business or profession other than speculative business and specified business after applying rule 7A, 7B or 8, if applicable (If rule 7A, 7B or 8 is not applicable, enter same figure as in 36) (If loss take the figure to 2i of item E)(39a+ 39b + 39c + 39d + 39e + 39f)		39	865285
a.	Income Chargeable under Rule 7		39a	0
b.	Deemed chargeable Income under Rule 7A		39b	0
c.	Deemed chargeable Income under Rule 7B(1)		39c	0

	d.	Deemed chargeable Income under Rule 7B(1A)		39d	0
	e.	Deemed chargeable Income under Rule 8		39e	0
	f.	Income other than Rule 7A, 7B & 8 (Item No. 38)		39f	865285
	40.	Balance of income deemed to be from agriculture, after applying Rule 7, 7A, 7B(1), 7B(1A) and Rule 8 for the purpose of aggregation of income as per Finance Act [4c-(39a+39b+39c+39d+39e)]		40f	0
B. Computation of income from speculative business					
	41	Net profit or loss from speculative business as per profit or loss account		41	0
	42	Additions in accordance with section 28 to 44DA		42	0
	43	Deductions in accordance with section 28 to 44DA		43	0
	44	Income from speculative business (41+42-43) (if loss, take the figure to 6xi of schedule CFL)		B44	0
C. Computation of income from specified business under section 35AD					
	45	Net profit or loss from specified business as per profit or loss account		45	0
	46	Additions in accordance with section 28 to 44DA		46	0
	47	Deductions in accordance with section 28 to 44DA (other than deduction u/s 35AD, (ii) 32 or 35 on which deduction u/s 35AD is claimed))		47	0
	48	Profit or loss from specified business (45 + 46 - 47)		48	0
	49	Deductions in accordance with section 35AD(1) or 35AD(1A)		49	0
	50	Income from Specified Business (if loss, take the figure to 7xii of schedule CFL)(48-49)		C50	0
	51	S.No.	Relevant clause of sub-section (5) of section 35AD which covers the specified business (to be selected from drop down menu)		
D.		Income chargeable under the head 'Profits and gains from business or profession' (A39+B44+C50)		D	865285
E. Intra head set off of business loss of current year					
	SI	Type of Business income	Income of current year (Fill this column only if figure is zero or positive)	Business loss set off	Business income remaining after set off
			(1)	(2)	(3) = (1) – (2)
	i	Loss to be set off (Fill this row only if figure is negative)		0	
	ii	Income from speculative business	0	0	0
	iii	Income from specified business	0	0	0
	iv	Profit and gains from life insurance business u/s 115B	0	0	0
	v	Total loss set off (ii + iii + iv)		0	
	vi	Loss remaining after set off (i – v)		0	
Schedule DPM - Depreciation on Plant and Machinery(Other than assets on which full capital expenditure is allowable as deduction under any other section)					
1	Block of assets		Plant and machinery		
2	Rate (%)		15	30	40

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		(i)	(ii)	(iii)
3	Written down value on the first day of previous year	369787	0	124480
4	Additions for a period of 180 days or more in the previous year	3152328	0	0
5	Consideration or other realization during the previous year out of 3 or 4	20000	0	0
6	Amount on which depreciation at full rate to be allowed (3 + 4 – 5) (enter 0, if result is negative)	3502115	0	124480
7	Additions for a period of less than 180 days in the previous year	0	0	0
8	Consideration or other realizations during the year out of 7	0	0	0
9	Amount on which depreciation at half rate to be allowed (7 - 8)(enter 0, if result is negative)	0	0	0
10	Depreciation on 6 at full rate	525317	0	49792
11	Depreciation on 9 at half rate	0	0	0
12	Additional depreciation, if any, on 4	0	0	0
13	Additional depreciation, if any, on 7	0	0	0
14	Additional depreciation relating to immediately preceding year' on asset put to use for less than 180 days	0	0	0
15	Total depreciation (10+11+12+13+14)	525317	0	49792
16	Depreciation disallowed under section 38(2) of the I.T. Act (out of column 15)	0	0	0
17	Net aggregate depreciation (15-16)	525317	0	49792
18	Proportionate aggregate depreciation allowable in the event of succession, amalgamation, demerger etc. (out of column 17)	0	0	0
19	Expenditure incurred in connection with transfer of asset/ assets	0	0	0
20	Capital gains/ loss under section 50(5 + 8 -3 -4 -7 -19) (enter negative only if block ceases to exist)	0	0	0

21	Written down value on the last day of previous year (6+ 9 -15) (enter 0 if result is negative)	2976798	0	74688
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Schedule DOA - Depreciation on other assets (Other than assets on which full capital expenditure is allowable as deduction)

1	Block of assets	Land	Building (not including land)			Furniture and Fittings	Intangible assets	Ships
2	Rate (%)	nil	5	10	40	10	25	20
			(i)	(ii)	(iii)	(iv)	(v)	(vi)
3	Written down value on the first day of previous year							
4	Additions for a period of 180 days or more in the previous year							
5	Consideration or other realization during the previous year out of 3 or 4							
6	Amount on which depreciation at full rate to be allowed(3 + 4 -5) (enter 0, if result is negative)							
7	Additions for a period of less than 180 days in the previous year							
8	Consideration or other realizations during the year out of 7							
9	Amount on which depreciation at half rate to be allowed (7 -8) (enter 0, if result is negative)							
10	Depreciation on 6 at full rate							
11	Depreciation on 9 at half rate							
12	Total depreciation (10+11)							
13	Depreciation disallowed under section 38(2) of the I.T. Act (out of column 12)							
14	Net aggregate depreciation (12-13)							
15	Proportionate aggregate depreciation allowable in the event of succession, amalgamation, demerger etc. (out of column 14)							
16	Expenditure incurred in connection with transfer of asset/ assets							

17	Capital gains/ loss under section 50 (5 + 8 -3-4 -7 -16)* (enter negative only if block ceases to exist)						
18	Written down value on the last day of previous year* (6+ 9 -12)(enter 0 if result is negative)						

Schedule DEP - Summary of depreciation on assets(Other than assets on which full capital expenditure is allowable as deduction under any other section)

1	Plant and machinery			
	a	Block entitled for depreciation @ 15 per cent (Schedule DPM - 17i or 18i as applicable)	1a	525317
	b	Block entitled for depreciation @ 30 per cent (Schedule DPM - 17ii or 18ii as applicable)	1b	0
	c	Block entitled for depreciation @ 40 per cent (Schedule DPM - 17iii or 18iii as applicable)	1c	49792
	d	Total depreciation on plant and machinery (1a + 1b + 1c)	1d	575109
2	Building (not including land)			
	a	Block entitled for depreciation @ 5 per cent (Schedule DOA- 14ii or 15ii as applicable)	2a	0
	b	Block entitled for depreciation @ 10 per cent (Schedule DOA- 14iii or 15iii as applicable)	2b	0
	c	Block entitled for depreciation @ 40 per cent (Schedule DOA- 14iv or 15iv as applicable)	2c	0
	d	Total depreciation on building (total of 2a + 2b + 2c)	2d	0
3	Furniture and fittings (Schedule DOA- 14v or 15v as applicable)		3	0
4	Intangible assets (Schedule DOA- 14vi or 15vi as applicable)		4	0
5	Ships (Schedule DOA- 14vii or 15vii as applicable)		5	0
6	Total depreciation (1d+2d+3+4+5)		6	575109

Schedule DCG - Deemed Capital Gains on sale of depreciable assets

1	Plant and machinery			
	a	Block entitled for depreciation @ 15 per cent (Schedule DPM - 20i)	1a	
	b	Block entitled for depreciation @ 30 per cent (Schedule DPM – 20ii)	1b	
	c	Block entitled for depreciation @ 40 per cent (Schedule DPM - 20iii)	1c	
	d	Total (1a +1b + 1c)	1d	
2	Building (not including land)			
	a	Block entitled for depreciation @ 5 per cent (Schedule DOA- 17ii)	2a	
	b	Block entitled for depreciation @ 10 per cent (Schedule DOA- 17iii)	2b	
	c	Block entitled for depreciation @ 40 per cent (Schedule DOA- 17iv)	2c	
	d	Total (2a + 2b + 2c)	2d	
3	Furniture and fittings (Schedule DOA- 17v)		3	
4	Intangible assets (Schedule DOA- 17vi)		4	
5	Ships (Schedule DOA- 17vii)		5	
6	Total (1d+2d+3+4+5)		6	

Schedule ESR - Expenditure on scientific Research etc. (Deduction under section 35 or 35CCC or 35CCD)							
Sl.No.	Expenditure of the nature referred to in section (1)		Amount, if any, debited to profit and loss account (2)	Amount of deduction allowable (3)	Amount of deduction in excess of the amount debited to profit and loss account (4) = (3) - (2)		
i	35(1)(i)						
ii	35(1)(ii)						
iii	35(1)(ia)						
iv	35(1)(iii)						
v	35(1)(iv)						
vi	35(2AA)						
vii	35(2AB)						
viii	35CCC						
ix	35CCD						
x	Total						
Schedule CG-Capital Gains							
A	Short-term capital gain (Sub-items 4 & 5 are not applicable for residents)						
	1	From sale of land or building or both (fill up details separately for each property)					
	a	i	Full value of consideration received/receivable			ai	0
		ii	Value of property as per stamp valuation authority			aii	0
		iii	Full value of consideration adopted as per section 50C for the purpose of Capital Gains [in case (aii) does not exceed 1.05 times (ai), take this figure as (ai), or else take (aii)]			aiii	0
	b	Deductions under section 48					
		i	Cost of acquisition without indexation			bi	0
		ii	Cost of Improvement without indexation			bii	0
		iii	Expenditure wholly and exclusively in connection with transfer			biii	0
		iv	Total (bi + bii + biii)			biv	0
	c	Balance (aiii – biv)				1c	0
	d	Deduction under section 54D/ 54G/54GA (Specify details in item D below)					
		S. No.	Nature		Amount		
		Total				1d	0
	e	Short-term Capital Gains on Immovable property (1c - 1d)				A1e	0
	f	In case of transfer of immovable property, please furnish - the following details (see note)					
	Sl No	Name of Buyer(s)	PAN of Buyer(s)	Percentage share	Amount	Address of Property	Pincode
Note 1 : Furnishing of PAN is mandatory, if the tax is deduced under section 194-IA. Note 2 : In case of more than one buyer, please indicate the respective percentage share and amount.							
2	From slump sale						
	a	Full value of consideration				2a	0

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	b	Net worth of the under taking or division	2b	0
	c	Short term capital gains from slump sale(2a-2b)	A2c	0
4	For NON-RESIDENT, not being an FII- from sale of shares or debentures of an Indian company (to be computed with foreign exchange adjustment under first proviso to section 48)			
	a	STCG on transactions on which securities transaction tax (STT) is paid	A4a	0
	b	STCG on transactions on which securities transaction tax (STT) is not paid	A4b	0
5	For NON-RESIDENTS- from sale of securities (other than those at A3 above) by an FII as per section 115AD			
	a	i	In case securities sold include shares of a company other than quoted shares, enter the following details	
		a	Full value of consideration received/receivable in respect of unquoted share	5aia 0
		b	Fair market value of unquoted shares determined in the prescribed manner	5aib 0
		c	Full value of consideration in respect of unquoted shares adopted as per section 50CA for the purpose of Capital Gains (higher of a or b)	5aic 0
		ii	Full value of consideration in respect of securities other than unquoted shares	5aia 0
		iii	Total (ic + ii)	5aiii 0
	b	Deductions under section 48		
		i	Cost of acquisition without indexation	bi 0
		ii	Cost of improvement without indexation	bii 0
		iii	Expenditure wholly and exclusively in connection with transfer	biii 0
		iv	Total (i + ii + iii)	biv 0
	c	Balance (5aiii – biv)		5c 0
	d	Loss to be disallowed u/s 94(7) or 94(8)- for example if security bought/acquired within 3 months prior to record date and dividend/income/bonus units are received, then loss arising out of sale of such security to be ignored (Enter positive value only)		5d 0
	e	Short-term capital gain on securities (other than those at A3 above) by an FII (5c +5d)		A5e 0
6	From sale of assets other than at A1 or A2 or A3 or A4 or A5 above			
	a	i	In case assets sold include shares of a company other than quoted shares, enter the following details	
		a	Full value of consideration received/receivable in respect of unquoted share	6aia 0
		b	Fair market value of unquoted shares determined in the prescribed manner	6aib 0
		c	Full value of consideration in respect of unquoted shares adopted as per section 50CA for the purpose of Capital Gains (higher of a or b)	6ic 0
		ii	Full value of consideration in respect of assets other than unquoted shares	6aia 0
		iii	Total (ic + ii)	6aiii 0
	b	Deductions under section 48		
		i	Cost of acquisition without indexation	bi 0
		ii	Cost of Improvement without indexation	bii 0
		iii	Expenditure wholly and exclusively in connection with transfer	biii 0
		iv	Total (i + ii + iii)	biv 0

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	c	Balance (6aiii – biv)						6c	0				
	d	In case of asset (security/unit) loss to be disallowed u/s 94(7) or 94(8)- for example if asset bought/acquired within 3 months prior to record date and dividend/income/bonus units are received, then loss arising out of sale of such asset to be ignored (Enter positive value only)						6d	0				
	e	Deemed short term capital gains on depreciable assets (6 of schedule- DCG)						6e	0				
	f	Deduction under section 54D/54G/54GA (Specify details in item D below)						6f					
	S. No.	Nature					Amount						
	Total						6f	0					
	g	STCG on assets other than at A1 or A2 or A3 or A4 or A5 above (6c + 6d + 6e – 6f)						A6g	0				
7	Amount Deemed to be short-term capital gains												
	a	Whether any amount of unutilized capital gain on asset transferred during the previous years shown below was deposited in the Capital Gains Accounts Scheme within due date for that year? If yes, then provide the details below									NA		
		Sl.No.	Previous year in which asset transferred	Section under which deduction claimed in that year	New asset acquired/constructed		Amount not used for new asset or remained unutilized in Capital gains account (X)						
					Year in which asset acquired/constructed	Amount utilised out of Capital Gains account							
	b	Amount deemed to be short term capital gains u/s 54D/54G/54GA, other than at 'a'											
	Total Amount deemed to be short term capital gains (aXi + b)									A7	0		
8	Pass Through Income in the nature of Short Term Capital Gain, (Fill up schedule PTI)(A8a + A8b + A8c)											A8	0
	a	Pass Through Income in the nature of Short Term Capital Gain, chargeable @ 15%									A8a	0	
	b	Pass Through Income in the nature of Short Term Capital Gain, chargeable @ 30%									A8b	0	
	c	Pass Through Income in the nature of Short Term Capital Gain, chargeable at applicable rates									A8c	0	
9	Amount of STCG included in A1-A8 but not chargeable to tax or chargeable at special rates in India as per DTAA												
	Sl. No.	Amount of income	Item no. A1 to A8 above in which included	Country Name,Code	Article of DTAA	Rate as per Treaty(enter NIL, if not chargeable)	Whether TRC obtained (Y/N)	Section of I.T. Act	Rate as per I.T. Act	Applicable rate [lower of (6) or (9)]			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)			
	a	Total amount of STCG not chargeable to tax in India as per DTAA									A9a	0	
	b	Total amount of STCG chargeable to tax at special rates in India as per DTAA									A9b	0	
10	Total short term capital gain (A1e+ A2c+ A3e+ A4a+ A4b+ A5e+ A6g+A7+A8-A9a)											A10	0
B	Long-term capital gain (LTCG) (Sub-items 6, 7 & 8 are not applicable for residents)												
	1	From sale of land or building or both (fill up details separately for each property)											
	a	i	Full value of consideration received/receivable							ai	0		
		ii	Value of property as per stamp valuation authority							aii	0		
		iii	Full value of consideration adopted as per section 50C for the purpose of Capital Gains [in case (aii) does not exceed 1.05 times (ai), take this figure as (ai), or else take (aii)]							aiii	0		

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b	Deductions under section 48								
i	Cost of acquisition with indexation						bi	0	
ii	Cost of Improvement with indexation						bii	0	
iii	Expenditure wholly and exclusively in connection with transfer						biii	0	
iv	Total (bi + bii + biii)						biv	0	
c	Balance (aiii – biv)						1c	0	
d	Deduction under section 54D/54EC/54EE /54G/54GA (Specify details in item D below)								
S. No.		Section					Amount		
		Total					1d	0	
e	Long-term Capital Gains on Immovable property (1c - 1d)						B1e	0	
f	In case of transfer of immovable property, please furnish - the following details (see note)								
	S.No.	Name of Buyer	PAN of Buyer (s)	Percentage share	Amount	Address of Property	Pincode		
2	From slump sale								
a	Full value of consideration						2a	0	
b	Net worth of the under taking or division						2b	0	
c	Balance(2a-2b)						2c	0	
d	Deduction u/s								
S. No.		Section					Amount		
Total							2d	0	
e	Long term capital gains from slump sale (2c-2d)						B2e	0	
3	From sale of bonds or debenture (other than capital indexed bonds issued by Government)								
a	Full value of consideration						3a	0	
b	Deductions under section 48								
i	Cost of acquisition without indexation						bi	0	
ii	Cost of improvement without indexation						bii	0	
iii	Expenditure wholly and exclusively in connection with transfer						biii	0	
iv	Total (bi + bii +biii)						biv	0	
c	Balance (3a - biv)						3c	0	
d	Deduction under sections 54EE (Specify details in item D below)						3d	0	
e	LTCG on bonds or debenture (3c – 3d)						B3e	0	
4	From sale of listed securities (other than a unit) or zero coupon bonds where proviso under section 112(1) is applicable								
a	Full value of consideration						4a	0	
b	Deductions under section 48								
i	Cost of acquisition without indexation						bi	0	
ii	Cost of improvement without indexation						bii	0	
iii	Expenditure wholly and exclusively in connection with transfer						biii	0	

	iv	Total (bi + bii + biii)	biv	0
c	Balance (4a - 4biv)		4c	0
d	Deduction under sections 54EE (Specify details in item D below)		4d	0
e	Long-term Capital Gains on assets at B4 above (4c – 4d)		B4e	0
5	From sale of equity share in a company or unit of equity oriented fund or unit of a business trust on which STT is paid under section 112A			
a	Full value of consideration		5a	0
b	Deductions under section 48			
	ia	Cost of acquisition without indexation if the long term capital asset was acquired before 01.02.2018 (higher of iA and iB)	5ia	0
	ia A	Cost of acquisition	5iaA	0
	ia B	If the long term capital asset was acquired before 01.02.2018, lower of B1 and B2	5iaB	0
	ia B1	Fair Market Value of capital asset as per section 55(2)(ac)	5ia B1	0
	ia B2	Full value of consideration	5ia B2	0
	bii	Cost of improvement without indexation	5bii	0
	biii	Expenditure wholly and exclusively in connection with transfer	5biii	0
	biv	Total (bi + bii + biii)	5biv	0
c	Balance (5a – biv)		5c	0
d	Less-LTCG threshold limit as per section 112A (5c – Rs. 1 lakh) This exemption shall be considered in Schedule SI		5d	
e	Deduction under sections 54EE (Specify details in item D below)		5e	0
f	Long-term Capital Gains on assets at B5 above (5c – 5e)		B5f	0
6	For NON-RESIDENTS- from sale of shares or debenture of Indian company (to be computed with foreign exchange adjustment under first proviso to section 48)			
a	LTCG computed without indexation benefit		6a	0
b	Deduction under sections 54EE (Specify details in item D below)		6b	0
c	LTCG on share or debenture (6a – 6b)		B6c	0
8	For NON-RESIDENTS - From sale of equity share in a company or unit of equity oriented fund or unit of a business trust on which STT is paid under section 112A			
a	Full value of consideration		8a	0
b	Deductions under section 48			
	ia	Cost of acquisition without indexation (higher of iA and iB)	8ia	0
	ia A	Cost of acquisition	8iaA	0
	ia B	If the long term capital asset was acquired before 01.02.2018, lower of B1 and B2	8iaB	0
	ia B1	Fair Market Value of capital asset as per section 55(2)(ac)	8ia B1	0
	ia B2	Full value of consideration	8ia B2	0
	bii	Cost of improvement without indexation	8bii	0
	biii	Expenditure wholly and exclusively in connection with transfer	8biii	0
	biv	Total (bi + bii + biii)	8biv	0

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	c	Balance (8a – biv)						8c	0		
	d	Less- LTCG threshold limit as per section 112A (8c – Rs. 1 lakh) This exemption shall be considered in Schedule SI						8d			
	e	Deduction under sections 54EE (Specify details in item D below)						8e	0		
	f	Long-term Capital Gains on assets at B5 above (8c – 8e)						B8f	0		
9	From sale of assets where B1 to B8 above are not applicable										
	a	i	In case assets sold include shares of a company other than quoted shares, enter the following details								
		a	Full value of consideration received/receivable in respect of unquoted shares				ia	0			
		b	Fair market value of unquoted shares determined in the prescribed manner				ib	0			
		c	Full value of consideration in respect of unquoted shares adopted as per section 50CA for the purpose of Capital Gains (higher of a or b)				ic	0			
		ii	Full value of consideration in respect of assets other than unquoted shares				iii	0			
		iii	Total (ic + ii)				iii	0			
	b	Deductions under section 48									
		i	Cost of acquisition with indexation				bi	0			
		ii	Cost of Improvement with indexation				bii	0			
		iii	Expenditure wholly and exclusively in connection with transfer				biii	0			
		iv	Total (bi + bii + biii)				biv	0			
	c	Balance (7a - biv)						7c	0		
	d	Deduction under sections 54D/54G/54GA (Specify details in item D below)									
			S. No.	Section	Amount						
		Total							9d	0	
	e	Long-term Capital Gains on assets at B9 above (9c-9d)						B9e	0		
10	Amount deemed to be long-term capital gains										
	a	Whether any amount of unutilized capital gain on asset transferred during the previous years shown below was deposited in the Capital Gains Accounts Scheme within due date for that year? If yes, then provide the details below							NA		
		Sl.No.	Previous year in which asset transferred	Section under which deduction claimed in that year	New asset acquired/constructed		Amount not used for new asset or remained unutilized in Capital gains account (X)				
					Year in which asset acquired/constructed	Amount utilised out of Capital Gains account					
	b	Amount deemed to be long-term capital gains, other than at 'a'									
		Amount deemed to be long-term capital gains (Xi + b)							B8	0	
11	Pass Through Income in the nature of Long Term Capital Gain, (Fill up schedule PTI) (B12a + B12b)							B11	0		
	a	Pass Through Income in the nature of Long Term Capital Gain, chargeable @ 10%						B11a	0		
	b	Pass Through Income in the nature of Long Term Capital Gain, chargeable @ 20%						B11b	0		
12	Amount of LTCG included in B1- B11 but not chargeable to tax or chargeable at special rates in India as per DTAA (to be taken to schedule SI)										
	Sl. No	Amount of income	Item B1 to B11 above	Country Name, Code	Article of DTAA	Rate as per Treaty	Whether Tax Residency	Section of I.T. Act	Rate as per I.T. Act	Applicable rate [lower of (6) or (9)]	

			in which included			NIL, if not chargeable)	Certificate obtained?			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
a	Total amount of LTCG not chargeable to tax under DTAA								B12a	0
b	Total amount of LTCG chargeable at special rates in India as per DTAA								B12b	0
13	Total long term capital gain [B1e + B2e + B3e + B4e + B5f + B6e + B7e + B8f + B9e + B10 + B11 - B12a](In case of loss take the figure to 9xi of schedule CFL)								B13	0
C	Income chargeable under the head "CAPITAL GAINS" (A10 + B13) (take B13 as nil, if loss)								C	0
D	Information about deduction claimed									
1	In case of deduction u/s 54D/54EC /54G/54GA give following details									
a	Deduction claimed u/s 54D									
	Sl.No	Date of transfer of original asset	Cost of purchase/ construction of new land or building for industrial undertaking	Date of purchase of new land or building	Amount deposited in Capital Gains Accounts Scheme before due date	Amount of deduction claimed				
b	Deduction claimed u/s 54EC									
	Sl.No	Date of transfer of original asset	Amount invested in specified/notified bonds	Date of investment	Amount of deduction claimed					
c	Deduction claimed u/s 54EE									
	Sl.No	Date of transfer of original asset	Amount invested in specified asset	Date of investment	Amount of deduction claimed					
d	Deduction claimed u/s 54G									
	Sl.No	Date of transfer of original asset	Cost and expenses incurred for purchase or construction of new asset	Date of purchase/construction of new asset in an area other than urban area	Amount deposited in Capital Gains Accounts Scheme before due date	Amount of deduction claimed				
e	Deduction claimed u/s 54GA									
	Sl.No	Date of transfer of original asset	Cost and expenses incurred for purchase or construction of new asset	Date of purchase/construction of new asset in an area other than urban area	Amount deposited in Capital Gains Accounts Scheme before due date	Amount of deduction claimed				
g	Total deduction claimed (1a + 1b + 1c + 1d)						g	0		
E	Set-off of current year capital losses with current year capital gains (excluding amounts included in A9(a) and B12(a) which is not chargeable under DTAA)									

Sl.No	Type of Capital Gain		Capital Gain of current year (Fill this column only if computed figure is positive)	Short term capital loss				Long term capital loss			Current year's capital gains remaining after set off (9=1-2-3-4-5-6-7-8)
				15%	30%	applicable rate	DTAA rate	10%	20%	DTAA rate	
	1	2	3	4	5	6	7	8	9		
i	Capital Loss to be set off (Fill this row only if figure computed is negative)			0	0	0	0	0	0	0	
ii	Short term capital gain	15%	0		0	0	0				0
iii		30%	0	0	0	0				0	
iv		applicable rate	0	0	0	0				0	
v		DTAA rates	0	0	0	0				0	
vi	Long term capital gain	10%	0	0	0	0	0		0	0	0
vii		20%	0	0	0	0	0	0	0	0	
viii		DTAA rates	0	0	0	0	0	0	0	0	
ix	Total loss set off (ii + iii + iv + v + vi + vii + viii)			0	0	0	0	0	0	0	
x	Loss remaining after set off(i – ix)			0	0	0	0	0	0	0	
F	Information about accrual/receipt of capital gain										
	Type of Capital gain / Date						Upto 15/6 (i)	16/6 to 15/9 (ii)	16/9 to 15/12 (iii)	16/12 to 15/3 (iv)	16/3 to 31/3 (v)
1	Short-term capital gains taxable at the rate of 15% Enter value from item 5vi of schedule BFLA, if any.						0	0	0	0	0
2	Short-term capital gains taxable at the rate of 30% Enter value from item 5vii of schedule BFLA, if any.						0	0	0	0	0
3	Short-term capital gains taxable at applicable rates Enter value from item 5viii of schedule BFLA, if any.						0	0	0	0	0
4	Short-term capital gains taxable at DTAA rates Enter value from item 5ix of schedule BFLA, if any.						0	0	0	0	0

5	Long- term capital gains taxable at the rate of 10% Enter value from item 5x of schedule BFLA, if any. Enter value from item 3vi of schedule BFLA, if any.	0	0	0	0	0
6	Long- term capital gains taxable at the rate of 20% Enter value from item 5xi of schedule BFLA, if any.	0	0	0	0	0
7	Long-term capital gains taxable at DTAA rates Enter value from item 5xii of schedule BFLA, if any.	0	0	0	0	0

Note: Please include the income of the specified persons referred to in Schedule SPI while computing the income under this head

Tool-112A - From sale of equity share in a company or unit of equity oriented fund or unit of a business trust on which STT is paid under section 112A

Sl.No	ISIN Code	Name of the Share/ Unit	No. of Shares/ Units	Sale- price per Share/ Unit	Total Sale Value (4*5)	Cost of acquisition without indexation Item 5 (a) of LTCG Schedule of ITR6	Cost of acquisition (b)(i) of LTCG Schedule of ITR6	If the long term capital asset was acquired before 01.02.2018, lower of B1 and B2 -Lower of 11 & 12-item 5 (b)(i) (B) of LTCG Schedule of ITR6	Fair Market Value per share/ unit as on 31st January, 2018, (ac)- (4*10) - (i)(B)(1) of LTCG Schedule of ITR6	Total Fair Market Value of capital asset as per section 58(2) (ac)- (4*10) - (i)(B)(1) of LTCG Schedule of ITR6	Full value of Consideration - item 4 (b)(i) (B)(2) of LTCG Schedule of ITR6	Cost of improvement without indexation - item 5 (b) (ii) of LTCG Schedule of ITR6	Expenditure wholly and exclusively in connection with transfer - item 5 (b) (iii) of LTCG Schedule of ITR6	Total deduction (bi + bii + biii) - item 5 (b) (iv) of LTCG Schedule of ITR6	Balance \$5a – biv) - (c) of LTCG Schedule of ITR6
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
Total															

Tool-115AD (1)(iii)(p) -For NON-RESIDENTS - From sale of equity share in a company or unit of equity oriented fund or unit of a business trust on which STT is paid under section 112A

Sl.No	ISIN Code	Name of the Share/ Unit	No. of Shares/ Units	Sale- price per Share/ Unit	Total Sale Value (4*5)	Cost of acquisition without indexation Item 8 (a) of LTCG Schedule of ITR6	Cost of acquisition (b)(i) of LTCG Schedule of ITR6	If the long term capital asset was 1701	Fair Market Value per share/ unit as	Total Fair Market Value of capital asset as per	Full value of Consideration - item 8 (b)(i) (B)(2) of	Cost of improvement without indexation - item 8 (b) (ii) of LTCG	Expenditure wholly and exclusively in connection	Total deduction (bi + bii + biii) - item 8 (b) (iv) of LTCG	Balance \$8a – biv) - (c) of LTCG
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					LTCG Schedule of ITR6	LTCG Schedule of ITR6	Schedule of ITR6	acquired before 01.02.2018, lower of B1 and B2 -Lower of 11 & 12-item 8 (b)(i) (B) of LTCG Schedule of ITR6	on 31st January, 2018	section 56(2) (ac)- (4*10) - item 8 (b) (i)(B)(1) of LTCG Schedule of ITR6	LTCG Schedule of ITR6	Schedule of ITR6	with transfer - item 8 (b) (iii) of LTCG Schedule of ITR6	(iv) of LTCG Schedule of ITR6	Schedule of ITR6
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
Total															

Schedule OS: Income from other sources

1	Gross income chargeable to tax at normal applicable rates (1a+ 1b+ 1c+ 1d + 1e)											1	88694
	a	Dividend, Gross										1a	0
	b	Interest, Gross(bi + bii + biii + biv + bv)										1b	88694
	bi	From Savings Bank										1bi	0
	bii	From Deposit (Bank/ Post Office/ Co-operative Society)										1bii	88694
	biii	From Income Tax Refund										1biii	0
	biv	In the nature of Pass through income										1biv	0
	bv	Others										1bv	0
	c	Rental income from machinery, plants, buildings, etc., Gross										1c	0
	d	Income of the nature referred to in section 56(2)(x) which is chargeable to tax (di + dii + diii + div + dv)										1d	0
	di	Aggregate value of sum of money received without consideration										1di	0
	dii	In case immovable property is received without consideration, stamp duty value of property										1dii	0
	diiii	In case immovable property is received for inadequate consideration, stamp duty value of property in excess of such consideration										1diiii	0
	div	In case any other property is received without consideration, fair market value of property										1div	0
	dv	In case any other property is received for inadequate consideration, fair market value of property in excess of such consideration										1dv	0
	1e	Any other income (please specify nature)											0
		SL No	Nature									Amount	
		Total											0

2	Income chargeable at special rates (2a+ 2b+ 2c+ 2d + 2e)							2	0	
a	Income by way of winnings from lotteries, crossword puzzles etc.							0		
b	Income chargeable u/s 115BBE (bi + bii + biii + biv+ bv + bvi)							0		
i	Cash credits u/s 68							0		
ii	Unexplained investments u/s 69							0		
iii	Unexplained money etc. u/s 69A							0		
iv	Undisclosed investments etc. u/s 69B							0		
v	Unexplained expenditure etc. u/s 69C							0		
vi	Amount borrowed or repaid on hundi u/s 69D							0		
c	Accumulated balance of recognized provident fund taxable u/s 111									
	SL No	Assessment Year	Income Benefit				Tax Benefit			
		Total	0				0			
d	Any other income chargeable at special rate (total of di to dxviii) dxix)							0		
	SL No	Nature					Amount			
e	Pass through income in the nature of income from other sources chargeable at special rates							0		
	SL No	Nature					Amount			
f	Amount included in 1 and 2 above, which is chargeable at special rates in India as per DTAA (total of column (2) of table below)							0		
	Sl.No (1)	Amount of income (2)	Item 1 and 2 in which included (3)	Country Name,Code (4)	Article of DTAA (5)	Rate as per Treaty (enter NIL, if not chargeable) (6)	Whether TRC obtained(Y/N) (7)	Section of I.T. Act (8)	Rate as per I.T. Act (9)	Applicable rate [lower of (6) or (9)] (10)
3	Deductions under section 57:- (other than those relating to income chargeable at special rates under 2a, 2b & 2d)									
a	Expenses / Deductions							a	0	
b	Depreciation							b	0	
c	Total							c	0	
4	Amounts not deductible u/s 58							4		
5	Profits chargeable to tax u/s 59							5		
6	Net Income from other sources chargeable at normal applicable rates (1 – 3 + 4 + 5) (If negative take the figure to 3xi of schedule CYLA)							6	88694	
7	Income from other sources (other than from owning race horses)(2+6) (enter 6 as nil, if negative)							7	88694	
8	Income from the activity of owning and maintaining race horses									
a	Receipts							8a	0	
b	Deductions under section 57 in relation to receipts at 8a only							8b	0	
c	Amounts not deductible u/s 58							8c	0	
d	Profits chargeable to tax u/s 59							8d	0	

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	e	Balance (8a - 8b + 8c + 8d) (if negative take the figure to 10xii of Schedule CFL)					8e	0
9	Income under the head "Income from other sources" (7+8e) (take 8e as nil if negative)					9	88694	
10	Information about accrual/receipt of income from Other Sources							
	S. No.	Other Source Income	Upto 15/6(i)	From 16/6 to 15/9(ii)	From 16/9 to 15/12(iii)	From 16/12 to 15/3(iv)	From 16/3 to 31/3(v)	
	1	Dividend Income u/s 115BBDA	0	0	0	0	0	
	2	Income by way of winnings from lotteries, crossword puzzles, races, games, gambling, betting etc. referred to in section 2(24)(ix)	0	0	0	0	0	

NOTE: Please include the income of the specified persons referred to in Schedule SPI while computing the income under this head.

Schedule CYLA-Details of Income after set-off of current years losses

Sl.No.	Head/ Source of Income	Income of current year (Fill this column only if income is zero or positive)	House property loss of the current year set off Total loss(4 of Schedule - HP)	Business Loss (other than speculation or specified business loss) of the current year set off(2vi of item E of Schedule BP)	Other sources loss (other than loss from race horses) of the current year set off Total loss 6 of Schedule-OS	Current year's Income remaining after set off
		1	2	3	4	5=1-2-3-4
i	Loss to be set off (Fill this row only if computed figure is negative)		0	0	0	
ii	House property	0		0	0	0
iii	Income from Business (excluding speculation profit and income from specified business) or profession	865285	0		0	865285
iv	Profit and gains from life insurance business u/s 115B	0	0		0	0
v	Speculation Income	0	0		0	0
vi	Specified business income u/s 35AD	0	0		0	0
vii	Short-term capital gain taxable @ 15%	0	0	0	0	0
viii	Short-term capital gain taxable @ 30%	0	0	0	0	0

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ix	Short-term capital gain taxable at applicable rates	0	0	0	0	0
x	Short-term capital gain taxable at special rates in India as per DTAA rates	0	0	0	0	0
xi	Long term capital gain taxable @ 10%	0	0	0	0	0
xii	Long term capital gain taxable @ 20%	0	0	0	0	0
xiii	Long term capital gains taxable at special rates in India as per DTAA rates	0	0	0	0	0
xiv	Net income from Other sources chargeable at normal applicable rates	88694	0	0		88694
xv	Profit from owning and maintaining race horses	0	0	0	0	0
xvi	Other sources income taxable at special rates as per DTAA rates	0	0	0	0	0
xiii	Total loss set-off		0	0	0	
xiv	Loss remaining after set-off (i - xvii)		0	0	0	

Schedule BFLA-Details of Income after Set off of Brought Forward Losses of earlier years

Sl.No	Head/ Source of Income	Income after set off, if any, of current year's losses as per 5 of Schedule CYLA	Brought forward loss set off	Brought forward depreciation set off	Brought forward allowance under section 35(4) set off	Current year's income remaining after set off
		1	2	3	4	5
i	House property	0	0	0	0	0
ii	Business (excluding speculation profit and income from specified business)	865285	0	0	0	865285
iii	Profit and gains from life insurance business u/s 115B	0	0	0	0	0
iv	Speculation Income	0	0	0	0	0
v	Specified Business Income	0	0	0	0	0

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vi	Short-term capital gain taxable at 15%	0	0	0	0	0
vii	Short-term capital gain taxable at 30%	0	0	0	0	0
viii	Short-term capital gain taxable at applicable rates	0	0	0	0	0
ix	Short-term capital gain taxable at special rates in India as per DTAA	0	0	0	0	0
x	Long term capital gain taxable at 10%	0	0	0	0	0
xi	Long term capital gain taxable at 20%	0	0	0	0	0
xii	Long term capital gains taxable at special rates in India as per DTAA	0	0	0	0	0
xiii	Net income from other sources chargeable at normal applicable rates	88694		0	0	88694
xiv	Profit from the activity of owning and maintaining race horses	0	0	0	0	0
xv	Income from other sources income taxable at special rates in India as per DTAA	0		0	0	0
xii	Total of brought forward loss set off		0	0	0	
xiii	Current year's income remaining after set off Total (i5 + ii5 + iii5 + iv5 + v5+ vi5+ vii5 + viii5+ ix5 + x3 + xi3 + xii5 + xiii5 + xiv5 +xv5)					953979

Schedule CFL-Details of Losses to be carried forward to future years

Sl.No.	Assessment Year	Date of Filing (DD/MM/YYYY)	House property loss	Loss from business other than loss from speculative Business and specified business	Loss from speculative Business	Loss from specified business	Short-term capital loss	Long-term Capital loss	Loss from owning and maintaining race horses
i	2010-11								
ii	2011-12								
iii	2012-13								
iv	2013-14								
v	2014-15								
vi	2015-16								
vii	2016-17								
viii	2017-18								
viii	2018-19								
ix	Total of earlier year losses b/f								
x	Adjustment of above losses in Schedule BFLA								

xi	2019-20 (Current year losses)							
xii	Total loss Carried Forward to future years							

Schedule UD - Unabsorbed depreciation and allowance under section 35(4)

Sl.No (1)	Assessment Year (2)	Depreciation			Allowance under section 35(4)		
		Amount of brought forward unabsorbed depreciation (3)	Amount of depreciation set-off against the current year income (4)	Balance Carried forward to the next year (5)	Amount of brought forward unabsorbed allowance (6)	Amount of allowance set-off against the current year income (7)	Balance Carried forward to the next year (8)
1	2019-20			0			0
	Total	0	0	0	0	0	0

Schedule ICDS - Effect of Income Computation Disclosure Standards on profit

Sl.No.	ICDS	Amount (+) or (-)
(i)	(ii)	(iii)
I	Accounting Policies	
II	Valuation of Inventories (other than the effect of change in method of valuation u/s 145A, if the same is separately reported at col. 4d or 4e of Part A-OI)	
III	Construction Contracts	
IV	Revenue Recognition	
V	Tangible Fixed Assets	
VI	Changes in Foreign Exchange Rates	
VII	Government Grants	
VIII	Securities (other than the effect of change in method of valuation u/s 145A, if the same is separately reported at col. 4d or 4e of Part A-OI)	
IX	Borrowing Costs	
X	Provisions, Contingent Liabilities and Contingent Assets	
11a	Total effect of ICDS adjustments on profit (I+II+III+IV+V+VI+VII+VIII+IX+X) (if positive)	
11b	Total effect of ICDS adjustments on profit (I+II+III+IV+V+VI+VII+VIII+IX+X) (if negative)	

Schedule 10A - Deduction under section 10A

Deduction in respect of units located in Special Economic Zone

Sl.No.	Undertaking	Assessment year in which unit begins to manufacture/produce/provide services	Amount of deduction
Total deduction under section 10A(a+b)			

Schedule 10AA -Deduction under section 10AA

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Deduction in respect of units located in Special Economic Zone										
Sl.No.	Undertaking	Assessment year in which unit begins to manufacture/produce/provide services					Amount of deduction			
Total deduction under section 10AA										
Schedule 80G:Details of donation entitled for deduction under Section 80G										
A. Donations entitled for 100% deduction without qualifying limit										
Sl.No.	Name of donee	Address Detail	City or Town or District	State Code	PinCode	PAN of Donee	Amount of donation			Eligible
							Donation in cash	Donation in other mode	Total Donation	Amount of Donation
Total A										
B. Donations entitled for 50% deduction without qualifying limit										
Sl.No.	Name of donee	Address Detail	City or Town or District	State Code	PinCode	PAN of Donee	Amount of donation			Eligible
							Donation in cash	Donation in other mode	Total Donation	Amount of Donation
Total B										
C. Donations entitled for 100% deduction subject to qualifying limit										
Sl.No.	Name of donee	Address Detail	City or Town or District	State Code	PinCode	PAN of Donee	Amount of donation			Eligible
							Donation in cash	Donation in other mode	Total Donation	Amount of Donation
Total C										
D. Donations entitled for 50% deduction subject to qualifying limit										
Sl.No.	Name of donee	Address Detail	City or Town or District	State Code	PinCode	PAN of Donee	Amount of donation			Eligible
							Donation in cash	Donation in other mode	Total Donation	Amount of Donation
Total D										
E. Donations (A + B + C+ D)										
F.Total Eligible amount of Donations (A + B + C + D)										
Schedule 80GGA - Details of donations for scientific research or rural development										
S.No		Name of Donee	Address		State Code	Pin Code	PAN of Donee	Amount of Donation		

	Relevant Clause under which deduction is claimed			City Or Town Or District				Donation in Cash	Donation in Other Mode	Total Donation	Eligible Amount of Donation
Donation in cash											
Donation in other mode											
Total Donation											
Eligible Amount of Donation											
Schedule RA Details of donations to research associations etc.											
[deduction under sections 35(1)(ii) or 35(1)(ia) or 35(1)(iii) or 35(2AA)]											
S No.	Name of donee	Address Detail	City or Town or District	State Code	PinCode	PAN of Donee	Amount of donation			Eligible Amount of Donation	
							Donation in cash	Donation in other mode	Total Donation		
Total A											
Schedule 80-IA - Deductions under section 80-IA											
a	Deduction in respect of profits of an enterprise referred to in section 80-IA(4)(i) [Infrastructure facility]										
1	Undertaking No. 1						0				
b	Deduction in respect of profits of an undertaking referred to in section 80-IA(4)(ii) [Telecommunication services]										
1	Undertaking No. 1						0				
c	Deduction in respect of profits of an undertaking referred to in section 80-IA(4)(iii) [Industrial park and SEZs]										
1	Undertaking No. 1						0				
d	Deduction in respect of profits of an undertaking referred to in section 80-IA(4)(iv) [Power]										
1	Undertaking No. 1						0				
e	Deduction in respect of profits of an undertaking referred to in section 80-IA(4)(v) [Revival of power generating plant] and deduction in respect of profits of an undertaking referred to in section 80-IA(4)(vi) [Cross-country natural gas distribution network]										
1	Undertaking No. 1						0				
f	Total deductions under section 80-IA (a + b + c + d + e)						f	0			
Sch 80- IB Deductions under Section 80-IB											
a	Deduction in respect of industrial undertaking located in Jammu and Kashmir [Section 80-IB(4)]										
1	Undertaking No. 1						0				
b	Deduction in respect of industrial undertaking located in industrially backward states specified in Eighth Schedule [Section 80-IB(4)]										
1	Undertaking No. 1						0				
c	Deduction in respect of industrial undertaking located in industrially backward districts [Section 80-IB(5)]										
1	Undertaking No. 1						0				
d	Deduction in the case of multiplex theatre [Section 80-IB(7A)]										
1	Undertaking No. 1						1709		0		

e	Deduction in the case of convention centre [Section 80-IB(7B)]		
1	Undertaking No. 1	0	
f	Deduction in the case of company carrying on scientific research [Section 80-IB(8A)]		
1	Undertaking No. 1	0	
g	Deduction in the case of undertaking which begins commercial production or refining of mineral oil [Section 80-IB(9)]		
1	Undertaking No. 1	0	
h	Deduction in the case of an undertaking developing and building housing projects [Section 80-IB(10)]		
1	Undertaking No. 1	0	
i	Deduction in the case of an undertaking operating a cold chain facility [Section 80-IB(11)]		
1	Undertaking No. 1	0	
j	Deduction in the case of an undertaking engaged in processing, preservation and packaging of fruits, vegetables, meat, meat products, poultry, marine or dairy products [Section 80-IB(11A)]		
1	Undertaking No. 1	0	
k	Deduction in the case of an undertaking engaged in integrated business of handling, storage and transportation of foodgrains [Section 80-IB(11A)]		
1	Undertaking No. 1	0	
l	Deduction in the case of an undertaking engaged in operating and maintaining a rural hospital [Section 80-IB(11B)]		
1	Undertaking No. 1	0	
m	Deduction in the case of an undertaking engaged in operating and maintaining a hospital in any area, other than excluded area [Section 80-IB(11C)]		
1	Undertaking No. 1	0	
n	Total deduction under section 80-IB (Total of a1 to m2)		n 0
Sch 80-IC or 80-IE Deductions under section 80-IC or 80-IE			
a	Deduction in respect of undertaking located in Sikkim		
1	Undertaking No. 1	0	
b	Deduction in respect of undertaking located in Himachal Pradesh		
1	Undertaking No. 1	0	
c	Deduction in respect of undertaking located in Uttaranchal		
1	Undertaking No. 1	0	
d	Deduction in respect of undertaking located in North-East		
da	Assam		
1	Undertaking No. 1	0	
db	Arunachal Pradesh		
1	Undertaking No. 1	0	
dc	Manipur		

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	1	Undertaking No. 1	0	
dd	Mizoram			
	1	Undertaking No. 1	0	
de	Meghalaya			
	1	Undertaking No. 1	0	
df	Nagaland			
	1	Undertaking No. 1	0	
dg	Tripura			
	1	Undertaking No. 1	0	
dh	Total deduction for undertakings located in North-east (total of da1 to dg2)			dh 0
e	Total deduction under section 80-IC or 80-IE (a + b + c + dh)			e 0

Deductions under Chapter VI-A

1. Part B- Deduction in respect of certain payments			
a	80G - Donations to certain funds, charitable institutions, etc.(Please fill 80G Schedule. This field is auto-populated from schedule.)		
b	80GGB - Contribution given by companies to political parties		
c	80GGA - Certain donations for scientific research or rural development(Please fill 80GGA Schedule. This field is auto-populated from schedule.)		
d	80GGC - Donation to Political party		
	Total Deduction under Part B (a + b + c + d)		
2. Part C- Deduction in respect of certain incomes			
e	80-IA (f of Schedule 80-IA) - Profits and gains from industrial undertakings or enterprises engaged in infrastructure development, etc.		
f	80-IAB - Profits and gains by an undertaking or enterprise engaged in development of Special Economic Zone		
g	80-IAC - Special provision in respect of specified business		
h	80-IB (n of Schedule 80-IB)- Profits and gains from certain industrial undertakings other than infrastructure development undertakings		
i	80-IBA - Profits and gains from housing projects		
j	80-IC/ 80-IE (e of Schedule 80-IC/ 80-IE)-Special provisions in respect of certain undertakings or enterprises in certain special category States/ North-Eastern States.		
k	80JJA-Profits and gains from business of collecting and processing of bio-degradable waste.		
l	80JJAA-Employment of new employees		

m	80LA-Certain Income Of Offshore Banking Units And International Financial Services Center		
n	80PA- Deduction in respect of certain Income of Producer Companies		
o	Total Deduction under Part C (total of e to n)		
3	Total deductions under Chapter VI-A (1 + 2)		

Schedule SI-Income chargeable to tax at special rates [Please see instruction Number-7(ii) for section and rate of tax]

Sl.No.	Section/Description	Special rate (%)	Income (i)	Tax thereon (ii)
1	111 - Tax on accumulated balance of recognized provident fund	1	0	0
2	115B - Profits and gains of life insurance business	12.5	0	0
3	111A Short term capital gains on equity share or equity oriented fund chargeable to STT	15	0	0
4	112 (LTCG on others)	20	0	0
5	112 proviso (LTCG on listed securities/ units without indexation)	10	0	0
6	112(1)(c)(iii)(LTCG on unlisted securities in case of non-residents)	10	0	0
7	112A LTCG on equity shares/units of equity oriented fund/units of business trust on which STT is paid	10	0	0
8	115BB - Income by way of winnings from lotteries, crossword puzzles etc.	30	0	0
9	115AD(1)(ii) -STCG (other than on equity share or equity oriented mutual fund referred to in section 111A) by an FII	30	0	0
10	115BBF_BP - Tax on income from patent (Income under head business or profession)	10	0	0
11	115BBG_BP - Income under head business or profession (Income under head business or profession)	10	0	0
12	115AD(1)(iii) Proviso For NON-RESIDENTS - From sale of equity share in a company or unit of equity	10	0	0

	oriented fund or unit of a business trust on which STT is paid under section 112A			
13	STCGDTAARate - STCG Chargeable at special rates in India as per DTAA	1	0	0
14	LTCGDTAARate - LTCG Chargeable at special rates in India as per DTAA	1	0	0
15	OSDTAARate - Other source Chargeable at special rates in India as per DTAA	1	0	0
Total				0

Schedule EI-Details of Exempt Income (Income not to be included in Total Income or not chargeable to tax)

1	Interest income				1		
2	Dividend income				2		
3	i	Gross Agricultural receipts (other than income to be excluded under rule 7A, 7B or 8 of I.T. Rules)			i		
	ii	Expenditure incurred on agriculture			ii		
	iii	Unabsorbed agricultural loss of previous eight assessment years			iii		
	iv	Agricultural income portion relating to Rule 7, 7A, 7B(1), 7B(2) and 8 (from Sl. No. 40 of Sch. BP)			iv		
	v	Net Agricultural income for the year (i – ii – iii + iv) (enter nil if loss)			4		
	vi	In case the net agricultural income for the year exceeds Rs.5 lakh, please furnish the following details					
		Sl.No.	Name of district along with pin code in which agricultural land is located		Measurement of agricultural land in Acre	Whether the agricultural land is owned or held on lease	Whether the agricultural land is irrigated or rain-fed
			Name of district.	Pin code			
4	Other exempt income, including exempt income of minor child (please specify)						
	Sl.No.	Nature of Income			Amount		
	Total				4		
5	Income not chargeable to tax as per DTAA						
	Sl.No.	Amount of Income	Nature of Income	Country name & code	Article of DTAA	Head of Income	Whether TRC obtained
	Total Income from DTAA not chargeable to tax				5		
6	Pass through income not chargeable to tax (Schedule PTI)				6		
7	Total (1 + 2 + 3 + 4 + 5 + 6)				7		

Schedule PTI - Pass Through Income details from business trust or investment fund as per section 115UA,115UB

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Sl	Name of business trust/ investment fund	PAN of the business trust/investment fund	Sl	Head of income	Amount of income	TDS on such amount,if any
NOTE : Please refer to the instructions for filling out this schedule						
Schedule MAT - Computation of Minimum Alternate Tax payable under section 115JB						
1	Whether the Profit and Loss Account is prepared in accordance with the provisions of Parts II of Schedule III to the Companies Act, 2013 (If yes, write 'Y', if no write 'N')				Yes	
2	If 1 is no, whether profit and loss account is prepared in accordance with the provisions of the Act governing such company (If yes, write 'Y', if no write 'N')				Yes	
3	Whether, for the Profit and Loss Account referred to in item 1 above, the same accounting policies, accounting standards and same method and rates for calculating depreciation have been followed as have been adopted for preparing accounts laid before the company at its annual general body meeting? (If yes, write 'Y', if no write 'N')				Yes	
4	Profit after tax as shown in the Profit and Loss Account (enter item 56 of Part A-P&L)/(enter item 56 of Part A- P&L Ind AS) (as applicable)			4	316475	
5	Additions (if debited in profit and loss account)					
a	Income-tax paid or payable or its provision including the amount of deferred tax and the provision thereof			5a	253039	
b	Reserve (except reserve under section 33AC)			5b	0	
c	Provisions for unascertained liability			5c	0	
d	Provisions for losses of subsidiary companies			5d	0	
e	Dividend paid or proposed			5e	0	
f	Expenditure related to exempt income under sections 10, 11 or 12 [exempt income excludes income exempt under section 10(38)]			5f	0	
g	Expenditure related to share in income of AOP/ BOI on which no income-tax is payable as per section 86			5g	0	
h	Expenditure in case of foreign company referred to in clause (fb) of explanation 1 to section 115JB			5h	0	
i	Notional loss on transfer of certain capital assets or units referred to in clause (fc) of explanation 1 to section 115JB			5i	0	
j	Expenditure relatable to income by way of royalty in respect of patent chargeable to tax u/s 115BBF			5j	0	
k	Depreciation attributable to revaluation of assets			5k	0	
l	Gain on transfer of units referred to in clause (k) of explanation 1 to section 115JB			5l	0	
m	Others (including residual unadjusted items and provision for diminution in the value of any asset)			5m	0	
n	Total additions (5a+5b+5c+5d+5e+5f+5g+5h+5i+5j+5k+5l+5m)			5n	253039	
6	Deductions					

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a	Amount withdrawn from reserve or provisions if credited to Profit and Loss account	6a	0
b	Income exempt under sections 10, 11 or 12 [exempt income excludes income exempt under section 10(38)]	6b	0
c	Amount withdrawn from revaluation reserve and credited to profit and loss account to the extent it does not exceed the amount of depreciation attributable to revaluation of asset	6c	0
d	Share in income of AOP/ BOI on which no income-tax is payable as per section 86 credited to Profit and Loss account	6d	0
e	Income in case of foreign company referred to in clause (iid) of explanation 1 to section 115JB	6e	0
f	Notional gain on transfer of certain capital assets or units referred to in clause (iie) of explanation 1 to section 115JB	6f	0
g	Loss on transfer of units referred to in clause (iif) of explanation 1 to section 115JB	6g	0
h	Income by way of royalty referred to in clause (iig) of explanation 1 to section 115JB	6h	0
i	Loss brought forward or unabsorbed depreciation whichever is less or both as may be applicable	6i	0
j	Profit of sick industrial company till net worth is equal to or exceeds accumulated losses	6j	0
k	Others (including residual unadjusted items and the amount of deferred tax credited to P&L A/c)	6k	148361
l	Total deductions (6a+6b+6c+6d+6e+6f+6g+6h+6i+6j+6k)	6l	148361
7	Book profit under section 115JB (4+ 5n – 6l)	7	421153
8	Whether the financial statements of the company are drawn up in compliance to the Indian Accounting Standards (Ind-AS) specified in Annexure to the companies (Indian Accounting Standards) Rules, 2015. If yes, furnish the details below:-	8	N
A. Additions to book profit under sub-sections (2A) to (2C) of section 115JB			
a	Amounts credited to other comprehensive income in statement of profit & loss under the head “items that will not be reclassified to profit & loss”	8	0
b	Amounts debited to the statement of profit & loss on distribution of non-cash assets to shareholders in a demerger	8	0
c	One fifth of the transition amount as referred to in section 115JB (2C) (if applicable)	8	0
d	Others (including residual adjustment)	8	0
e	Total additions (8a + 8b + 8c + 8d)	8	0
B. Deductions from book profit under sub-sections (2A) to (2C) of section 115JB			
f	Amounts debited to other comprehensive income in statement of profit & loss under the head “items that will not be reclassified to profit & loss”	8f	0
g	Amounts credited to the statement of profit & loss on distribution of non-cash assets to shareholders in a demerger	8g	0
h	One fifth of the transition amount as referred to in section 115JB (2C) (if applicable)	8h	0

	i	Others (including residual adjustment)	8i	0
	j	Total deductions (8f + 8g + 8h + 8i)	8j	0
9	Deemed total income under section 115JB (7 + 8e – 8j)		9	421153
10	Tax payable under section 115JB		10	77913

Schedule MATC - Computation of tax credit under section 115JAA

1	Tax under section 115JB in assessment year 2019-20 (1d of Part-B-TTI)		1	81030
2	Tax under other provisions of the Act in assessment year 2019-20 (2f of Part-B-TTI)		2	248040
3	Amount of tax against which credit is available [enter (2 – 1) if 2 is greater than 1, otherwise enter 0]		3	167010

4	Utilisation of MAT credit Available [Sum of MAT credit utilized during the current year is subject to maximum of amount mentioned in 3 above and cannot exceed the sum of MAT Credit Brought Forward]			
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	Sl.No.	Assessment Year (A)	MAT Credit			MAT Credit Utilised during the Current Year (C)	Balance MAT Credit Carried Forward (D)= (B3) - (C)
			Gross (B1)	Set-off in earlier years (B2)	Balance Brought forward (B3)=(B1)- (B2)		
	i	2008-09	0	0	0	0	0
	ii	2009-10	0	0	0	0	0
	iii	2010-11	0	0	0	0	0
	iv	2011-12	0	0	0	0	0
	v	2012-13	0	0	0	0	0
	vi	2013-14	0	0	0	0	0
	vii	2014-15	0	0	0	0	0
	viii	2015-16	0	0	0	0	0
	ix	2016-17	0	0	0	0	0
	x	2017-18	0	0	0	0	0
	xi	2018-19	0	0	0	0	0
	xii	2019-20 (enter 1 -2, if 1>2 else enter 0)	0				0
	xii	Total	0	0	0	0	0
5	Amount of tax credit under section 115JAA utilised during the year [enter 4(C)xii]					5	0
6	Amount of MAT liability available for credit in subsequent assessment years [enter 4(D)xii]					6	0

Schedule DDT - Details of tax on distributed profits of domestic companies and its payment

	1	2	3	4	5	6				7	8	9	10
Sl.No	Section	Date of	Rate of	Amount	Amount	Tax payable on dividend declared, distributed or				Interest	Additional	Tax And	Net
	Under	declaration	Dividend,	of	of	paid				payable	income-	Interest	payable/
	which	or	declared,	dividend	reduction	Additional	Surcharge	Health &	Total tax	under	tax and	Paid	refundable
	dividend	distribution	distributed	declared,	as per	Income-	on	Education	payable (a	section	interest		(8-9)
		or	or paid		section	tax @15%	"a" (5b)			115P			

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is being declared	payment, whichever is earliest, of dividend by domestic company	distributed or paid	115-O(1A)	or 30% as applicable payable under section 115-O (4-5)(5a)	Cess on (a + b)(5c)	+ b + c)) (5d)	payable (6d + 7)		
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Schedule BBS - Details of tax on distributed income of a domestic company on buy back of shares, not listed on stock exchange

	1	2	3	4	5				6	7	8	9
Sl.No	Date of payments of any consideration to the shareholder on buy back of share	Amount of consideration paid by the company on buy-back of shares	Amount received by the company for issue of such shares	Distributed Income of the company (2 – 3)	Tax payable on distributed income				Interest payable under section 115QB	Additional income-tax and interest payable (5d + 6)	Tax and Interest Paid	Net payable/ refundable (7-8)
					Additional income-tax @20% payable under section 115QA on 4 (5a)	Surcharge on "a" (5b)	Health & Education Cess on (a +b)(5c)	Total tax payable (a + b + c)) (5d)				

Schedule FSI - Details of Income from outside India and tax relief

Sl	Country Code	Taxpayer Identification Number	Sl.No.	Head of income	Income from outside India (included in PART B-TI)	Tax paid outside India	Tax payable on such income under normal provisions in India	Tax relief available in India (e) = (c) or (d) whichever is lower	Relevant article of DTAA if relief claimed u/s 90 or 90A
				(a)	(b)	(c)	(d)	(e)	(f)

Note: Please refer to the instructions for filling out this schedule

Schedule TR - Summary of tax relief claimed for taxes paid outside India

1	Details of Tax Relief claimed					
	Sl.No	Country Code	Taxpayer Identification Number	Total taxes paid outside India (total of (c) of Schedule FSI in respect of each country)	Total tax relief available (total of (e) of Schedule FSI in respect of each country)	Tax Relief Claimed under section (specify 90, 90A or 91)
		(a)	(b)	(c)	(d)	(e)
	Total					
2	Total Tax relief available in respect of country where DTAA is applicable (section 90/90A) (Part of total of 1(d))					2

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3	Total Tax relief available in respect of country where DTAA is not applicable (section 91) (Part of total of 1(d))	3	
4	Whether any tax paid outside India, on which tax relief was allowed in India, has been refunded/credited by the foreign tax authority during the year? If yes, provide the details below	4	
4a	Amount of tax refunded	4a	
4b	Assessment year in which tax relief allowed in India	4b	

Note: Please refer to the instructions for filling out this schedule.

Schedule FA - Details of Foreign Assets and Income from any source outside India

A1	Details of Foreign Depository Accounts held (including any beneficial interest) at any time during the relevant accounting period)										
Sl.No. (1)	Country Name and Code (2)	Name of the financial institution(3)	Address of the financial institution(4)	Zip Code(5)	Account Number (6)	Status (7)	Account opening date (8)	Peak Balance During the period (in rupees) (9)	Closing balance (10)	Gross interest paid/ credited to the account during the period(11)	
A2	Details of Foreign Custodial Accounts held (including any beneficial interest) at any time during the relevant accounting period										
Sl.No. (1)	Country Name and code(2)	Name of the financial institution(3)	Address of the financial institution(4)	ZIP Code(5)	Account Number(6)	Status(7)	Account opening date(8)	Peak Balance During the Period(9)	Closing balance(10)	Gross interest paid/credited to the account during the period(11)	
										Nature	Amount
A3	Details of Foreign Equity and Debt Interest held (including any beneficial interest) in any entity at any time during the relevant accounting period										
Sl.No. (1)	Country Name and code(2)	Name of entity(3)	Address of entity(4)	ZIP Code(5)	Nature of entity(6)	Date of acquiring the interest(7)	Initial value of the investment(8)	Peak value of investment During the Period(9)	Closing balance(10)	Total gross amount paid/ credited with respect to the holding during the period(11)	Total gross proceeds from sale or redemption of investment during the period(12)
A4	Details of Foreign Cash Value Insurance Contract or Annuity Contract held (including any beneficial interest) at any time during the relevant accounting period										
Sl.No. (1)	Country Name and code(2)	Name of financial institution in which insurance contract held(3)	Address of the financial institution(4)	ZIP Code(5)		Date of contract(6)		The cash value or surrender value of the contract(7)	Total gross amount paid/credited with respect to the contract during the period(8)		
B	Details of Financial Interest in any Entity held (including any beneficial interest) at any time during the relevant accounting period										
Sl.No. (1)	Country Name	Zip Code (2b)	Nature of entity (3)	Name of the Entity (4a)	Address of the	Nature of Interest (5)	Date since held (6)	Total Investment (at cost)	Income accrued from	Nature of Income (9)	Income taxable and offered in this return

Acknowledgement Number : 253356851111119

Assessment Year : 2019-20

	and Code (2a)				Entity (4b)			(in rupees) (7)	such Interest(8)		Amount (10)	Schedule where offered (11)	Item number of schedule (12)			
C	Details of Immovable Property held (including any beneficial interest) at any time during the relevant accounting period															
Sl.No. (1)	Country Name and Code(2a)	Zip Code(2b)	Address of the Property (3)	Ownership (4)	Date of acquisition (5)	Total Investment (at cost) (in rupees) (6)	Income derived from the property (7)	Nature of Income (8)	Income taxable and offered in this return							
									Amount (9)	Schedule where offered (10)	Item number of schedule (11)					
D	Details of any other Capital Asset held (including any beneficial interest) at any time during the relevant accounting period															
Sl.No. (1)	Country Name and Code(2a)	Zip Code(2b)	Nature of Asset (3)	Ownership (4)	Date of acquisition (5)	Total Investment (at cost) (in rupees) (6)	Income derived from the property (7)	Nature of Income (8)	Income taxable and offered in this return							
									Amount (9)	Schedule where offered (10)	Item number of schedule (11)					
E	Details of account(s) in which you have signing authority held (including any beneficial interest) at any time during the relevant accounting period and which has not been included in A to D above.															
Sl.No. (1)	Name of the Institution in which the account is held (2)	Address of the Institution (3a)	Country Code and Name (3b)	Zip Code (3c)	Name of the account holder (4)	Account Number (5)	Peak Balance/ Investment during the year (6)	Whether income accrued is taxable in your hands? (7)	If (7) is yes, Income accrued in the account (8)	If (7) is yes, Income offered in this return						
										Amount (9)	Schedule where offered (10)	Item number of schedule (11)				
F	Details of trusts, created under the laws of a country outside India, in which you are a trustee, beneficiary or settlor.															
Sl.No. (1)	Country Name and Code (2a)	Zip Code (2b)	Name of the trust (3)	Address of the trust (3a)	Name of trustees (4)	Address of trustees (4a)	Name of Settlor (5)	Address of Settlor (5a)	Name of Benefic iaries (6)	Address of Benefic iaries (6a)	Date since position held (7)	Whether income derived is taxable in your hands? (8)	If (8) is yes, Income accrued in the account (9)	If (8) is yes, Income offered in this return		
													Amount (10)	Schedule where offered (11)	Item number of schedule (12)	
G	Details of any other income derived from any source outside India which is not included in,- (i) items A to F above and, (ii) income under the head business or profession															
Sl.No. (1)		Zip Code(2b)	Name of the person	Address of the person from	Income derived (4)	Nature of income (5)	Whether taxable in	If (6) is yes, Income offered in this return								

Acknowledgement Number : 253356851111119

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	Country Name and Code(2a)		from whom derived (3a)	whom derived (3b)			your hands? (6)	Amount (7)	Schedule where offered (8)	Item number of schedule (9)
Note:Please refer to the instructions for filling up this schedule										

Schedule SH-1 - SHAREHOLDING OF UNLISTED COMPANY
(other than a start-up for which Schedule SH-2 is to be filled up)

Are you a Company registered under section 8 of Companies Act,2013 (Previously Section 25 of Companies Act,1956) or Company Formed Limited by Guarantee under section 3(2) of Companies Act, 2013? No

A	Details of shareholding at the end of the previous year										
	Sl No	Name of the shareholder	Residential status in India	Type of share	Others	PAN	Date of allotment	Number of shares held	Face value per share	Issue Price per share	Amount received
	1	TERANCE A LEX	Resident	Equity Shares		AGUPA14 53H	2019-01-28	99000	10	10	900000

B	Details of equity share application money pending allotment at the end of the previous year										
	Sl No	Name of the applicant	Residential status in India	Type of share	Others	PAN	Date of application	Number of shares applied for	Application money received	Face value per share	Proposed issue price

C	Details of shareholders who is not a shareholder at the end of the previous year but was a shareholder at any time during the previous year												
	Sl No	Name of the shareholder	Residential status in India	Type of share	PAN	Number of shares held	Face value per share	Issue Price per share	Amount received	Date of allotment	Date on which cease to be shareholder	Mode of cessation	In case of transfer, PAN of the new shareholder

Schedule SH-2 - SHAREHOLDING OF START-UPS

If you are a start-up which has filed declaration in Form-2 under para 5 of DPIIT notification dated 19.02.2019, please furnish the following details of shareholding

A	Details of shareholding at the end of the previous year												
	Sl No	Name of the shareholder	Category of shareholder	Type of share	Others	PAN	Date of allotment	Number of shares held	Face value per share	Issue Price per share	Paid up value per share	Share premium	
B	Details of share application money pending allotment at the end of the previous year												
	Sl No	Name of the applicant	Category of applicant	Type of share	Others	PAN	Date of application	Number of shares applied for	Face value per share	Proposed issue price per share	Share application money	Share application premium	
C	Details of shareholders who is not a shareholder at the end of the previous year but was a shareholder at any time during the previous year												
	Sl No	Name of the shareholder	Category of shareholder	Type of share	PAN	Date of allotment	Number of shares held	Face value per share	Issue Price per share	Paid up value per share	Date on which	Mode of cessation	In case of transfer, PAN of

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	Sl No	Name of entity	PAN	Opening balance	Amount contributed during the year	Amount withdrawn during the year	Amount of profit/ loss/ dividend/ interest debited or credited during the year	Closing balance	
G	Details of Loans & Advances to any other concern (If money lending is not assessee's substantial business)								
	Sl No	Name of the person	PAN	Opening balance	Amount received during the year	Amount paid	Interest credited if any	Closing balance	Rate of interest (%)
H	Details of motor vehicle, aircraft, yacht or other mode of transport								
	Sl No	Particulars of asset	Description	Registration number of vehicle	Cost of acquisition	Date of acquisition	Purpose for which used		
	1	Motor Vehicle		KL-01-CF-7008	2369322	2018-04-05	Own Business Use		
	2	Motor Vehicle		KL-01-CA-6529	395494	2018-07-19	Own Business Use		
	3	Motor Vehicle		KL-01-CA-8310	387512	2018-07-19	Own Business Use		
I	Details of Jewellery, archaeological collections, drawings, paintings, sculptures, any work of art or bullion								
	Sl No	Particulars of asset	Description	Quantity	Cost of acquisition	Date of acquisition	Purpose of use		
J	Details of liabilities								
	Details of loans, deposits and advances taken from a person other than financial institution								
	Sl No	Name of the person	PAN	Opening Balance	Amount received	Amount paid	Interest credited if any	Closing balance	Rate of interest (%)
Schedule AL-2 - Assets and liabilities as at the end of the year (applicable for start-ups only)									
Do you have Assets and liabilities as at the end of the year as mentioned in Schedule AL-2 ?									
If you are a start-up which has filed declaration in Form-2 under para 5 of DPIIT notification dated 19.02.2019, please furnish the following information for the period from the date of incorporation upto end of the year									
A	Details of building or land appurtenant there to, or both, being a residential house acquired since incorporation								
	Sl No	Address	Pin code	Date of acquisition	Cost of acquisition Rs.	Purpose for which used (dropdown to be provided)	Whether transferred on or before the end of the previous year	If Yes date of transfer	
B	Details of land or building or both not being a residential house acquired since incorporation								
	Sl No	Address	Pin code	Date of acquisition	Cost of acquisition Rs.	Purpose for which used (dropdown to be provided)	Whether transferred on or before the end of the previous year	If Yes date of transfer	

C	Details of Loans & Advances made since incorporation (If lending of money is not assessee's substantial business)									
	Sl No	Name of the person	PAN	Date on which loans and advances has been made	Amount of loans and advances	Amount	Whether loans and advances has been repaid	If Yes date of such repayment	Closing balance as at the end of the previous year, if any	Rate of interest, if any
D	Details of capital contribution made to any other entity since incorporation									
	Sl No	Name of entity	PAN	Date on which capital contribution has been made	Amount of contribution	Amount withdrawn, if any	Amount of profit/loss/dividend/interest debited or credited during the year	Closing balance as at the end of the previous year, if any		
E	Details of acquisition of shares and securities									
	Sl No	Name of company/entity	PAN	Type of shares/securities	Number of shares/securities acquired	Cost of acquisition	Date of acquisition	Whether transferred	If Yes date of transfer	Closing balance as at the end of the previous year, if any
F	Details of motor vehicle, aircraft, yacht or other mode of transport, the actual cost of which exceeds ten lakh rupees acquired since incorporation									
	Sl No	Particulars of asset	Registration number of vehicle	Cost of acquisition	Date of acquisition	Purpose for which used	Whether transferred	If Yes date of transfer		
G	Details of Jewellery acquired since incorporation									
	Sl No	Particulars of asset	Quantity	Cost of acquisition	Date of acquisition	Purpose for which used	Whether transferred	If Yes date of transfer	Closing balance as at the end of the previous year, if any	
H	Details of archaeological collections, drawings, paintings, sculptures, any work of art or bullion acquired since incorporation									
	Sl No	Particulars of asset	Quantity	Cost of acquisition	Date of acquisition	Purpose for which used	Whether transferred	If Yes date of transfer	Closing balance as at the end of the previous year, if any	
I	Details of liabilities									
	Details of loans, deposits and advances taken from a person other than financial institution									

Sl No	Name of the person	PAN	Opening Balance	Amount received	Amount paid	Interest credited if any	Closing balance	Rate of interest, if any		
Schedule GST - INFORMATION REGARDING TURNOVER/GROSS RECEIPT REPORTED FOR GST										
Sl No	GSTIN No(s).				Annual value of outward supplies as per the GST return(s) filed					
Schedule FD - Break-up of payments/receipts in Foreign currency (to be filled up by the assessee who is not liable to get accounts audited u/s 44AB)										
Sl No					Amount (in Rs.)					
i	Payments made during the year on capital account									
ii	Payments made during the year on revenue account									
iii	Receipts during the year on capital account									
iv	Receipts during the year on revenue account									
Schedule Part B-TI Computation of Total Income										
1	Income from house property (4 of Schedule-HP) (enter nil if loss)					1	0			
2	Profits and gains from business or profession									
i	Profits and gains from business other than speculative business and specified business (A39 of Schedule-BP) (enter nil if loss)			2i	865285					
ii	Profits and gains from speculative business (B44 of Schedule BP) (enter nil if loss and carry this figure to Schedule CFL)			2ii	0					
iii	Profits and gains from specified business (C50 of Schedule BP) (enter nil if loss and carry this figure to Schedule CFL)			2iii	0					
iv	Income chargeable to tax at special rate (3d,3e and 3iv of table E of Schedule BP)			2iv	0					
v	Total (2i + 2ii + 2iii + 2iv)					2v	865285			
3	Capital gains									
a	Short term Capital Gain									
i	Short-term chargeable @ 15% (9ii of item E of schedule CG)			3ai	0					
ii	Short-term chargeable @ 30% (9iii of item E of schedule CG)			3aii	0					
iii	Short-term chargeable at applicable rate (9iv of item E of schedule CG)			3aiii	0					
iv	STCG chargeable at special rates in India as per DTAA(9v of item E of Schedule CG)			3aiv	0					
v	Total short-term Capital Gain (ai+aii+aiii+aiv)			3aiv	0					
b	Long term Capital Gain									
i	Long-term chargeable @ 10% (9vi of item E of schedule CG)			3bi	0					
ii	Long-term chargeable @ 20% (9vii of item E of schedule CG)			3bii	0					
iii	LTCG chargeable at special rates as per DTAA (9viii of item E of schedule CG)			3biii	0					

	iv	Total Long-Term (bi+bii+biii)(enter nil if loss)	3biv	0		
	c	Total Capital Gains(3av + 3biv) (enter nil if loss)			3c	0
4	Income from other sources					
	a	Net income from other sources chargeable to tax at normal applicable rates (6 of Schedule OS) (enter nil if loss)	4a	88694		
	b	Income chargeable to tax at special rate (2 of Schedule OS)	4b	0		
	c	from owning and maintaining race horses (8e of Schedule OS) (enter nil if loss)	4c	0		
	d	Total (4a + 4b + 4c)			4d	88694
5	Total of head wise income(1 + 2vi + 3c + 4d)				5	953979
6	Losses of current year to be set off against 5 (total of 2xvii, 3xvii and 4xvii of Schedule CYLA)				6	0
7	Balance after set off current year losses (5 - 6)(total of column 5 of Schedule CYLA + 4b + 2iv)				7	953979
8	Brought forward losses to be set off against 7 (total of 2xvi, 3xvi and 4xvi of Schedule BFLA)				8	0
9	Gross Total income (7 – 8) (also 5xvii of Schedule BFLA + 4b + 2iv)				9	953979
10	Income chargeable to tax at special rate under section 111A, 112, 112A etc. included in 9				10	0
11	Deductions under Chapter VI-A					
	a	Part-B of Chapter VI-A [1 of Schedule VI-A and limited upto (9-10)]			11a	0
	b	Part-C of Chapter VI-A [(2 of Schedule VI-A and limited upto (9-10-5(v) of Schedule BFLA)]			11b	0
	c	Total (11a + 11b) [limited upto (9-10)]			11c	0
12	Deduction u/s 10AA (c of Sch. 10AA)				12	0
13	Total income (9 - 11c - 12)				13	953980
14	Income chargeable to tax at special rates (total of (i) of schedule SI)				14	0
15	Income chargeable to tax at normal rates (13 - 14)				15	953980
16	Net agricultural income (3 of Schedule EI)				16	0
17	Losses of current year to be carried forward (total of xi of Schedule CFL)				17	0
18	Deemed total income under section 115JB (9 of Schedule MAT)				18	421153
Schedule Part B-TTI - Computation of tax liability on total income						
1	a	Tax Payable on deemed total Income under section 115JB (10 of Schedule MAT)			1a	77913
	b	Surcharge on (a) above(if applicable)			1b	0
	c	Health & Education Cess @ 4% on (1a+1b) above			1c	3117
	d	Total Tax Payable u/s 115JB (1a+1b+1c)			1d	81030
2	Tax payable on total income					
	a	Tax at normal rates on 15 of Part B-TI			2a	238500
	b	Tax at special rates (total of col. (ii) of Schedule-SI)			2b	0
	c	Tax Payable on Total Income (2a + 2b)			2c	238500
	d	Surcharge				
	di	25% of 12(ii) of Schedule SI			2di	0
				1725		

	dii	On [(2d) – (12(ii) of Schedule SI)]	2dii	0
	diii	Total (i + ii)	2diii	0
	e	Health & Education cess @ 4% on 2c+2diii	2e	9540
	f	Gross tax liability (2c+2diii+2e)	2f	248040
3	Gross tax payable (higher of 1d and 2f)		3	248040
4	Credit under section 115JAA of tax paid in earlier years (if 2f is more than 1d)(5 of Schedule MATC)		4	0
5	Tax payable after credit under section 115JAA [(3 - 4)]		5	248040
6	Tax relief			
	a	Section 90/90A(2 of Schedule TR)	6a	0
	b	Section 91(3 of Schedule TR)	6b	0
	c	Total (6a + 6b)	6c	0
7	Net tax liability (5 – 6c) (enter zero,if negative)		7	248040
8	Interest and fee payable			
	a	Interest For default in furnishing the return (section 234A)	8a	0
	b	Interest For default in payment of advance tax (section 234B)	8b	0
	c	Interest For deferment of advance tax (section 234C)	8c	0
	d	Fee for default in furnishing return of income (section 234F)	8d	5000
	e	Total Interest and Fee Payable (8a+8b+8c+8d)	8e	5000
9	Aggregate liability (7 + 8e)		9	253040
10	Taxes Paid			
	a	Advance Tax (from column 5 of 15A)	10a	0
	b	TDS (total of column 9 of 15B)	10b	341667
	c	TCS (total of column 7 of 15C)	10c	19602
	d	Self-Assessment Tax (from column 5 of 15A)	10d	0
	e	Total Taxes Paid (10a + 10b + 10c + 10d)	10e	361269
11	Amount payable (9 - 10e) (Enter if 9 is greater than 10e, else enter 0)		11	0

Refund

12	Refund (If 10e is greater than 9) (Refund, if any, will be directly credited into the bank account)	12	108230
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Bank Account Details

13	Sl No.	IFSC Code of the BANK	Name of the BANK	Account Number (the number should be 9 digits or more as per CBS system of the bank)	Indicate the accounts in which you prefer to get your refund credited
	1	SBIN0007211	STATE BANK OF INDIA	33708912624	
	b) Non-residents, who are claiming income-tax refund and not having bank account in India may, at their option, furnish the details of one foreign bank account				
	Sl No.	SWIFT Code	Name of the Bank	Country of Location	IBAN

14	Do you at any time during the previous year,- (i) hold, as beneficial owner, beneficiary or otherwise, any asset (including financial interest in any entity) located outside India; or (ii) have signing authority in any account located outside India; or (iii) have income from any source outside India? [applicable only in case of a resident] [Ensure Schedule FA is filled up if the answer is Yes]												NO		
15 A. Sch IT - Details of payments of Advance Tax and Self-Assessment Tax															
Sl. No.	BSR Code			Date of deposit(DD/MM/YYYY)			Serial number of challan			Amount(Rs)					
(1)	(2)			(3)			(4)			(5)					
Total															
TDS1															
15 B1 - Details of Tax Deducted at Source (TDS) on Income [As per FORM 16A issued by Deductor(s)]															
Sl. No.	TDS credit in the name of[TDS credit relating to self / other person as per rule 37BA(2)]	PAN of Other Person (if TDS credit related to other person)	Tax Deduction Account Number (TAN) of the Deductor	Unclaimed TDS brought forward (b/f)		TDS of current financial year(TDS deducted during the FY 2018-19)		TDS credit out of (6), (7) or (8) being claimed this Year (only if corresponding income is being offered for tax this year)			Corresponding Income offered		TDS credit out of (6), (7) or (8) being carried forward		
				Fin. Year in which deducted	TDS b/f	Deducted in own hands	Deducted in the hands of any other person as per rule 37BA(2) (if applicable)	Claimed in own hands	Claimed in the hands of any other person as per rule 37BA(2) (if applicable)		Gross Amount	Head of Income			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)		(8)	(9)		(10)	(11)	(12)	
							Income	TDS		Income	TDS	PAN of other person			
1	Self		TVDK02113G			9750			9750				487500	Income from Business and Profession	0
2	Self		TVDC00412G			40000			40000				2000000	Income from Business and Profession	0

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3	Self		MUMS 89575D			8700			8700			86969	Income from Other Sources	0
4	Self		TVDM 01592D			7500			7500			375000	Income from Business and Profession	0
5	Self		TVDM 01998D			55273			55273			2763661	Income from Business and Profession	0
6	Self		TVDA0 0193E			85873			85873			4293665	Income from Business and Profession	0
7	Self		TVDJ0 0040F			105000			105000			5250000	Income from Business and Profession	0
8	Self		CHNS0 2681A			29571			29571			1478571	Income from Business and Profession	0
Total										312096				

Note: Please enter total of column 8 of 15B1 and column 8 of 15B2 in 10b of Part B-TTI

TDS2

15 B2 - Details of Tax Deducted at Source (TDS) on Income [As per Form 16B/16C furnished issued by Deductor(s)]

Sl. No.	TDS credit in the name of TDS	PAN of Other Person	PAN of the buyer/ Tenant	Unclaimed TDS brought forward (b/ f)	TDS of current financial year (TDS deducted during the FY 2018-19)	TDS credit out of (6), (7) or (8) being claimed this Year (only if corresponding income is being offered for tax this year)	Corresponding Income offered	TDS credit out of (6), (7) or (8)
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credit relating to self / other person as per rule 37BA(2)]			Fin. Year in which deducted	TDS b/f	Deducted in own hands	Deducted in the hands of any other person as per rule 37BA(2) (if applicable)	Claimed in own hands	Claimed in the hands of any other person as per rule 37BA(2) (if applicable)	Gross Amount	Head of Income	being carried forward
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
						Income	TDS	Income	TDS	PAN of other person	

Total

Note:Please enter total of column 8 of 15B1 and column 8 of 15B2 in 10b of Part B-TTI

TCS

15 C - Details of Tax Collected at Source (TCS) [As per Form 27D issued by the Collector(s)]

Sl.No.	Tax Deduction and Tax Collection Account Number of the Collector	Name of the Collector	Unclaimed TCS brought forward (b/f)		TCS of current financial year(TCS collected during the FY 2018-19)	Amount out of (5) or (6) being claimed this year (only if corresponding income is being offered for tax this year)	Amount out of (5) or (6) being carried forward
			Financial year in which Collected	Amount b/f			
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1	TVDD00466E	DEEDI MOTORS PRIVATE LIMITED			19602	19602	0

Total

19602

Note:Please enter total of column (7) in 10c of Part B-TTI

VERIFICATION

I, **TERANCE ALEX**, son/ daughter of **ALEX**, solemnly declare that to the best of my knowledge and belief, the information given in the return and the schedules thereto is correct and complete and is in accordance with the the provisions of the Income-tax Act, 1961. I further declare that I am making this return in my capacity as **Managing Director**, and I am also competent to make this return and verify it. I am holding permanent account number **AGUPA1453H** (if allotted) (Please see instruction).

ITR-6

[For Companies other than companies claiming exemption under section 11]

(Please see rule 12 of the Income-tax Rules,1962)

Schedule Part-A General(1)**PERSONAL INFORMATION**

Name	WATTSUN ENERGY INDIA PRIVATE LIMITED		
Corporate Identity Number (CIN) issued by MCA	U40300KL2014PTC036294	Is there any change in the name? If yes, please furnish the old name	
PAN	AABCW4979N	Date of incorporation (DDMMYYYY)	04/03/2014
Address			
Flat/Door/Block No	Tc.36/38(1)	Town/ City/ District	Trivandrum
Name of Premises / Building / Village	Aiswarya Tower, First Floor	Road/Street/Post Office	Chackai
Area/ Locality	Trivandrum	State	KERALA
Country	INDIA	PIN Code	695024
Type of company	Domestic Company	If a public company select 6, and if private company select 7 (as defined in section 3 of The Companies Act)	7-Private Company
Office Phone Number with STD code		-	
Mobile no.1	91 - 8943345700	Mobile no.2	-
Email Address-1	terance.alex@gmail.com	Email Address-2	joseandco@rediffmail.c om

Filing Status

Filed u/s or Filed in Response to Notice u/s		139(1)-On or before due date	
If revised/in response to notice for Defective/Modified, then enter Receipt No		Date of filing original return (DD/MM/YYYY)	
If filed, in response to a notice u/s 139(9)/142(1)/148/153A/153C or order under section 119(2)(b), enter unique number /Document Identification Number (DIN) and date of such notice/Order, or if filed u/s 92CD enter date of advance pricing agreement			
Unique number/ Document Identification number (DIN)			
Date of such Notice or Order or if filed u/s 92CD enter date of advance pricing agreement			
Residential Status		RES - Resident	
Whether the assessee has opted for taxation under section 115BA/115BAA/115BAB? (applicable on Domestic Company)		Section 115BAA	
Whether total turnover/ gross receipts in the previous year 2017-18 exceeds 400 crore rupees? (Yes/No) (applicable for Domestic Company)			
Whether assessee is a resident of a country or specified territory with which India has an agreement referred to in sec 90 (1) or Central Government has adopted any agreement under sec 90A(1)			
In the case of non-resident, is there a permanent establishment (PE) in India			

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Whether assessee is required to seek registration under any law for the time being in force relating to companies?	
Whether the financial statements of the company are drawn up in compliance to the Indian Accounting Standards specified in Annexure to the companies (Indian Accounting Standards) Rules, 2015	No
Whether assessee is located in an International Financial Services Centre and derives income solely in convertible foreign exchange?	No
Whether the assessee company is under liquidation	No
Whether you are an FII / FPI?	No
If yes, please provide SEBI Regn. No.	
Whether the company is a producer company as defined in Sec.581A of Companies Act, 1956?	No
Other Details	
Whether this return is being filed by a representative assessee? If yes, please furnish following information	No
Name of the representative assessee	
Capacity of representative	
Address of the representative assessee	
Permanent Account Number (PAN) of the representative assessee	
Aadhaar No. of the representative	
Whether you are recognized as start up by DPIIT	No
If yes, please provide start up recognition number allotted by the DPIIT	
Whether certificate from inter-ministerial board for certification is received?	
If yes provide the certification number	
Whether declaration in Form-2 in accordance with para 5 of DPIIT notification dated 19/02/2019 has been filed before filing of the return?	
If yes, provide date of filing Form-2	
Audit Information	
(a1) Whether liable to maintain accounts as per section 44AA?	No
(a2) Whether assessee is declaring income only under section 44AE/44B/44BB/44BBA/44BBB?	No
(a2i) If No , Whether during the year Total sales/turnover/gross receipts of business exceeds Rs. 1 crore but does not exceeds Rs. 5 Crore?	Yes
(a2ii) If Yes is selected at a2i, whether aggregate of all amounts received including amount received for sales, turnover or gross receipts or on capital account such as capital contribution, loans etc. during the previous year, in cash, does not exceed five per cent of said amount?	Yes
(a2iii) If yes is selected at a2i, whether aggregate of all payments made including amount incurred for expenditure or on capital account such as asset acquisition, repayment of loan etc. in cash, during the previous year does not exceed five per cent of the said payment ?	Yes
(b) Whether liable for audit under section 44AB?	Yes

(c)	If (b) is Yes, whether the accounts have been audited by an accountant? If Yes, furnish the following information					Yes			
(i)	Date of furnishing of the audit report (DD/MM/YYYY)					11/01/2021			
(ii)	Name of the auditor signing the tax audit report					JOSE ZACHARIAH			
(iii)	Membership no. of the auditor					080570			
(iv)	Name of the auditor (proprietorship/ firm)					JAKS & ASSOCIATES			
(v)	Proprietorship/firm registration number					0001360S			
(vi)	Permanent Account Number (PAN) of the auditor (proprietorship/ firm)					AACFJ0207A			
(vii)	Aadhaar No. of the Auditor								
(viii)	Date of furnishing audit report					03/12/2020			
(d.i)	Are you liable for Audit u/s 92E?					No			
(d.i)(a)	If (di) is Yes, whether the accounts have been audited u/s. 92E?								
	Date of furnishing audit report (DD/MM/YYYY)								
(d.ii)	If liable to furnish other audit report under the Income-tax Act, mention the date of furnishing of the audit report? (DD/MM/YYYY) (Please see Instruction 6(ii))								
	Sl.No	Section Code	Other Section	Whether have you furnished such other audit report?		Date (DD/MM/YYYY)			
(e)	Mention the Act, section and date of furnishing the audit report under any Act other than the Income-tax Act								
	Sl.No	Act	Description	Section Code	Have you got audited under the selected Act other than the Income-tax Act?		Date (DD/MM/YYYY)		
	1	Companies Act, 2013		139	Yes		03/12/2020		
Schedule PART A - GENERAL (2)									
HOLDING STATUS									
(a)	Nature of company (write 1 if holding company, write 2 if a subsidiary company, write 3 if both, write 4 if any other)							4- If any other	
(b)	If subsidiary company, mention the details of the Holding Company								
Sl.No.	PAN	Name of Holding Company	Address of Holding Company	City	State	Country	Pin code/ Zip code	Percentage of Shares held	
(c)	If holding company, mention the details of the subsidiary companies.								
Sl.No.	PAN	Name of Subsidiary Company	Address of Subsidiary Company	City	State	Country	Pin code/ Zip code	Percentage of Shares held	
BUSINESS ORGANISATION									
Sl.No.	Business Type	PAN	Company Name	Address	City	State	Country	Pin code/ Zip code	Date of event
KEY PERSONS									

Particulars of Managing Director, Directors, Secretary and Principal officer(s) who have held the office during the previous year and the details of eligible person who is verifying the return.										
Sl.No.	Name	Designation	PAN	Aadhaar No.	Residential Address	City	State	Country	Pin code/ Zip code	Director Identification Number (DIN) issued by MCA, in case of Director
1	TERANCE ALEX	Managing Director	AGUPA1453H		304, HOLY HOUSE, POZHIOOR P O, POOYA PALLIVILAKAM	TRIVANDRUM	KERALA	INDIA	695513	06808744
2	JIMMY SILUVAYYAN	Director	CKBPS9118J		VARAVILATHOPPU, POOVAR P O	TRIVANDRUM	KERALA	INDIA	695024	06808773

SHAREHOLDERS INFORMATION									
Particulars of persons who were beneficial owners of shares holding not less than 10% of the voting power at any time of the previous year.									
Sl.No.	Name	PAN	Aadhaar No.	Address	City	State	Country	Pin code/ Zip code	Percentage of shares held (If determinate)
1	TERANCE ALEX	AGUPA1453H		304, HOLY HOUSE, POZHIOOR P O, POOYA PALLIVILAKAM	TRIVANDRUM	KERALA	INDIA	695513	90
2	JIMMY SILUVAYYAN	CKBPS9118J		VARAVILATHOPPU, POOVAR P O	TRIVANDRUM	KERALA	INDIA	695024	10

OWNERSHIP INFORMATION
In case of unlisted company, particulars of natural persons who were the ultimate beneficial owners, directly or indirectly, of shares holding not less than 10% of the voting power at any time of the previous year

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Assessment Year : 2020-21

Sl.No.	Name	PAN	Aadhaar No.	Address	City	State	Country	Pin code/ Zip code	Percentage of shares held
In case of Foreign Company , please furnish the details of Immediate Parent Company									
Sl.No.	Name	PAN	Address	City	State	Country of Residence	Pin code/ Zip code	Taxpayer's registration number or any unique identification number allotted in the country of residence	
In case of Foreign Company , please furnish the details of Ultimate Parent Company									
Sl.No.	Name	PAN	Address	City	State	Country of Residence	Pin code/ Zip code	Taxpayer's registration number or any unique identification number allotted in the country of residence	

NATURE OF COMPANY AND ITS BUSINESS

Nature of company		
1	Whether a public sector company as defined in section 2(36A) of the Income-tax Act	No
2	Whether a company owned by the Reserve Bank of India	No
3	Whether a company in which not less than forty percent of the shares are held (whether singly or taken together) by the Government or the Reserve Bank of India or a corporation owned by that Bank	No
4	Whether a banking company as defined in clause (c) of section 5 of the Banking Regulation Act, 1949	No
5	Whether a scheduled Bank being a bank included in the Second Schedule to the Reserve Bank of India Act	No
6	Whether a company registered with Insurance Regulatory and Development Authority (established under sub-section (1) of section 3 of the Insurance Regulatory and Development Authority Act, 1999)	No
7	Whether a company being a non-banking Financial Institution	No
8	Whether the Company is Unlisted? If yes, please ensure to fill up the Schedule SH-1 and Schedule AL-1	Yes

Schedule - Nature of business

Nature of business/profession, if more than one business or profession indicate the three main activities/ products (Other than those declaring income under section 44AE)		
Sl.No.	Code-Sub Sector	Tradename
1	21008-Other services n.e.c.	WATTSUN ENERGY INDIA PRIVATE LIMITED

Schedule PART A-BS Balance sheet as on 31st day of March, 2020 or as on the Date of Amalgamation**I. Equity and Liabilities****1. Shareholder's fund**

A.	Share capital				
	i	Authorised	Ai	1000000	
	ii	Issued, Subscribed and fully Paid up	Aii	1000000	
	iii	Subscribed but not fully paid	Aiii	0	
	iv	Total (Aii + Aiii)	Aiv	1000000	

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B.	Reserves and Surplus			
	i	Capital Reserve	Bi	0
	ii	Capital Redemption Reserve	Bii	0
	iii	Securities Premium Reserve	Biii	0
	iv	Debenture Redemption Reserve	Biv	0
	v	Revaluation Reserve	Bv	0
	vi	Share options outstanding amount	Bvi	0
	vii	Other reserve (specify nature and amount)		
	Sl No.	Nature	Amount	
	1	General Reserve	640575	
Total	Bvii	640575		
viii	Surplus i.e. Balance in profit and loss account (Debit balance to be shown as - ve figure)	Bviii	147871	
ix	Total (Bi + Bii + Biii + Biv + Bv + Bvi + Bvii + Bviii) (Debit balance to be shown as - ve figure)	Bix	788446	
C	Money received against share warrants		1C	0
D	Total Shareholder's fund (Aiv + Bix + 1C)		1D	1788446
2. Share application money pending allotment				
i	Pending for less than one year	i	0	
ii	Pending for more than one year	ii	0	
iii	Total (i + ii)	2	0	
3. Non-current liabilities				
A	Long-term borrowings			
	i	Bonds/ debentures		
		a. Foreign currency	ia	0
		b. Rupee	ib	0
		c. Total (ia + ib)	ic	0
	ii	Term loans		
		a. Foreign currency	iia	0
		b. Rupee loans		
		1. From Banks	b1	1920932
		2. From others	b2	927047
		3. Total (b1 + b2)	b3	2847979
		c. Total Term loans (iia + b3)	iic	2847979
	iii	Deferred payment liabilities	iii	0
	iv	Deposits from related parties (see instructions)	iv	0
	v	Other deposits	v	0

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	vi	Loans and advances from related parties (see instructions)	vi	5524927	
	vii	Other loans and advances	vii	0	
	viii	Long term maturities of finance lease obligations	viii	0	
	ix	Total Long term borrowings (ic + iic + iii + iv + v + vi + vii + viii)		3A	8372906
B.	Deferred tax liabilities (net)			3B	0
C	Other long-term liabilities				
	i	Trade payables	i	0	
	ii	Others	ii	0	
	iii	Total Other long-term liabilities (i + ii)		3C	0
D	Long-term provisions				
	i	Provision for employee benefits	i	0	
	ii	Others	ii	0	
	iii	Total (i + ii)		3D	0
E.	Total Non-current liabilities (3A + 3B + 3C + 3D)			3E	8372906
4. Current liabilities					
A	Short-term borrowings				
	i	Loans repayable on demand			
		a. From Banks	ia	5011330	
		b.From Non-Banking Finance Companies	ib	0	
		c.From other financial institutions	ic	0	
		d. From others	id	0	
		e.Total Loans repayable on demand (ia + ib + ic + id)	ie	5011330	
	ii	Deposits from related parties (see instructions)	ii	0	
	iii	Loans and advances from related parties (see instructions)	iii	0	
	iv	Other loans and advances	iv	0	
	v	Other deposits	v	0	
	vi	Total Short-term borrowings (ie + ii + iii + iv + v)		4A	5011330
B.	Trade payables				
	i	Outstanding for more than 1 year	i	0	
	ii	Others	ii	5183591	
	iii	Total Trade payables (i + ii)		4B	5183591
C.	Other current liabilities				
	i	Current maturities of long-term debt	i	0	
	ii	Current maturities of finance lease obligations	ii	0	
	iii	Interest accrued but not due on borrowings	iii	0	
	iv	Interest accrued and due on borrowings	iv	0	
	v	Income received in advance	v	0	

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1736^v

	vi	Unpaid dividends	vi	0	
	vii	Application money received for allotment of securities and due for refund and interest accrued	vii	0	
	viii	Unpaid matured deposits and interest accrued thereon	viii	0	
	ix	Unpaid matured debentures and interest accrued thereon	ix	0	
	x	Other payables	x	7798195	
	xi	Total Other current liabilities (i + ii + iii + iv + v + vi + vii + viii + ix + x)	4C		7798195
D.	Short-term provisions				
	i	Provision for employee benefit	i	0	
	ii	Provision for Income-tax	ii	0	
	iii	Proposed Dividend	iii	0	
	iv	Tax on dividend	iv	0	
	v	Other	v	0	
	vi	Total Short-term provisions (i + ii +iii + iv + v)	4D		0
E	Total Current liabilities (4Avi + 4Biii + 4Cxi + 4Dvi)		4E		17993116
Total Equity and liabilities (1D + 2 + 3E + 4E)			I		28154468
II. ASSETS					
1. Non-current assets					
A.	Fixed assets				
	i	Tangible assets			
		a. Gross block	ia	4740387	
		b. Depreciation	ib	2221710	
		c. Impairment losses	ic	0	
		d. Net block (ia - ib - ic)	id	2518677	
	ii	Intangible assets			
		a. Gross block	iiia	0	
		b. Amortization	iiib	0	
		c. Impairment losses	iiic	0	
		d. Net block (iiia - iiib - iiic)	iiid	0	
	iii	Capital work-in-progress	iii	0	
	iv	Intangible assets under development	iv	0	
	v	Total Fixed assets (id + iid + iii + iv)	Av		2518677
B	Non-current investments				
	i	Investment in property	i	0	
	ii	Investments in Equity instruments			
		a. Listed equities	iiia	0	
		b. Unlisted equities	iiib	0	

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		c. Total (iia + iib)	iic	0	
	iii	Investments in Preference shares	iii	0	
	iv	Investments in Government or trust securities	iv	0	
	v	Investments in Debenture or bonds	v	0	
	vi	Investments in Mutual funds	vi	0	
	vii	Investments in Partnership firms	vii	0	
	viii	Others Investments	viii	0	
	ix	Total Non-current investments (i + iic + iii + iv + v + vi + vii + viii)	Bix		0
C	Deferred tax assets (Net)			C	276274
D	Long-term loans and advances				
	i	Capital advances	i	0	
	ii	Security deposits	ii	200000	
	iii	Loans and advances to related parties (see instructions)	iii	0	
	iv	Other Loans and advances	iv	0	
	v	Total Long-term loans and advances (i + ii + iii + iv)	Dv		200000
	vi	Long-term loans and advances included in Dv which is			
		a. for the purpose of business or profession	via	200000	
		b. not for the purpose of business or profession	vib	0	
		c. given to shareholder, being the beneficial owner of share, or to any concern or on behalf/ benefit of such shareholder as per section 2(22)(e) of I.T. Act	vic	0	
E	Other non-current assets				
	i	Long-term trade receivables			
		a. Secured, considered good	ia	0	
		b. Unsecured, considered good	ib	0	
		c. Doubtful	ic	0	
		d. Total Other non-current assets (ia + ib + ic)	id	0	
	ii	Others	ii	0	
	iii	Total (id + ii)	Eiii		0
	iv	Non-current assets included in Eiii which is due from shareholder, being the beneficial owner of share, or from any concern or on behalf/ benefit of such shareholder as per section 2(22)(e) of I.T. Act	iv	0	
F	Total Non-current assets (Av + Bix + C + Dv + Eiii)			1F	2994951
2. Current assets					
A.	Current investments				
	i	Investment in Equity instruments			
		a. Listed equities	ia	0	

		b. Unlisted equities	ib	0	
		c. Total (ia + ib)	ic	0	
	ii	Investment in Preference shares	ii	0	
	iii	Investment in government or trust securities	iii	0	
	iv	Investment in debentures or bonds	iv	0	
	v	Investment in Mutual funds	v	0	
	vi	Investment in partnership firms	vi	0	
	vii	Other investment	vii	0	
	viii	Total Current investments (ic + ii + iii + iv + v + vi + vii)	Aviii		0
B	Inventories				
	i	Raw materials	i	0	
	ii	Work-in-progress	ii	0	
	iii	Finished goods	iii	297689	
	iv	Stock-in-trade (in respect of goods acquired for trading)	iv	0	
	v	Stores and spares	v	0	
	vi	Loose tools	vi	0	
	vii	Others	vii	0	
	viii	Total Inventories (i + ii + iii + iv + v + vi + vii)	Bviii		297689
C	Trade receivables				
	i	Outstanding for more than 6 months	i	0	
	ii	Others	ii	21099115	
	iii	Total Trade receivables (i + ii)	Ciii		21099115
D	Cash and cash equivalents				
	i	Balances with Banks	i	3311037	
	ii	Cheques, drafts in hand	ii	0	
	iii	Cash in hand	iii	31492	
	iv	Others	iv	0	
	v	Total Cash and cash equivalents (i + ii + iii + iv)	Dv		3342529
E	Short-term loans and advances				
	i	Loans and advances to related parties (see instructions)	i	0	
	ii	Others	ii	77124	
	iii	Total Short-term loans and advances (i + ii)	Eiii		77124
	iv	Short-term loans and advances included in Eiii which is			
		a. for the purpose of business or profession	iva	77124	
		b. not for the purpose of business or profession	ivb	0	

	c. given to a shareholder, being the beneficial owner of share, or to any concern or on behalf/ benefit of such shareholder as per section 2(22)(e) of I.T. Act	ivc	0
F	Other current assets	F	343060
G	Total Current assets (Aviii + Bviii + Ciii + Dv + Eiii + F)	2G	25159517
Total Assets (1F + 2G)		II	28154468

Schedule Part A-BS – Ind AS

Balance Sheet as on 31st day of March, 2020 or as on the date of business combination [applicable for a company whose financial statements are drawn up in compliance to the Indian Accounting Standards specified in Annexure to the companies (Indian Accounting Standards) Rules, 2015] (fill items below in a case where regular books of accounts are maintained, otherwise fill item III)

I	Equity and Liabilities				
	1	Equity			
		A	Equity share capital		
		i	Authorised	Ai	0
		ii	Issued, Subscribed and fully paid up	Aii	0
		iii	Subscribed but not fully paid	Aiii	0
		iv	Total (Aii + Aiii)	Aiv	0
		B	Other Equity		
		i	Other Reserves		
		a	Capital Redemption Reserve	ia	0
		b	Debenture Redemption Reserve	ib	0
		c	Share Options Outstanding account	ic	0
		d	Other (specify nature and amount)		
			Sl. No.	Nature	Amount
			Total		
				id	0
		e	Total other reserves (ia + ib + ic + id)		
				ie	0
		ii	Retained earnings (Debit balance of statement of P & L to be shown as –ve figure)		
				ii	0
		iii	Total (Bie + ii) (Debit balance to be shown as –ve figure)		
				Biii	0
		C	Total Equity (Aiv + Biii)		
				1C	0
	2	Liabilities			
		A	Non-current liabilities		
		I	Financial Liabilities		
			Borrowings		
		a	Bonds or debentures		
		1	Foreign currency	a1	0
		2	Rupee	a2	0

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			3	Total (1 + 2)	a3	0		
			b	Term loans				
			1	Foreign currency	b1	0		
			2	Rupee loans				
			i	From Banks	i	0		
			ii	From other parties	ii	0		
			iii	Total (i + ii)	b2	0		
			3	Total Term loans (b1 + b2)	b3	0		
			c	Deferred payment liabilities	c	0		
			d	Deposits	d	0		
			e	Loans from related parties (see instructions)	e	0		
			f	Long term maturities of finance lease obligations	f	0		
			g	Liability component of compound financial instruments	g	0		
			h	Other loans	h	0		
			i	Total borrowings (a3 + b3 + c + d + e + f + g + h)	i	0		
			j	Trade Payables	j	0		
			k	Other financial liabilities (Other than those specified in II under provisions)	k	0		
		II	Provisions					
			a	Provision for employee benefits	a	0		
			b	Others (specify nature)				
			Sl. No	Nature	Amount			
			Total				b	0
			c	Total Provisions	IIC	0		
		III	Deferred tax liabilities (net)				III	0
			a	Advances	a	0		
			b	Other (specify nature and amount)				
			Sl. No	Nature	Amount			
			Total				b	0
			c	Total Other non-current liabilities	IVc	0		
			Total Non-Current Liabilities (Ii + Ij + Ik + IIC + III + IVc)				2A	0
		B	Current liabilities					
		I	Financial Liabilities					
			i	Borrowings				
			a	Loans repayable on demand				
			1	From Banks	1	0		
			2	From Other parties	2	1741	0	

				3	Total Loans repayable on demand (1 + 2)	3	0	
				b	Loans from related parties	b	0	
				c	Deposits	c	0	
				d	Other loans (specify nature)			
				Sl. No	Nature	Amount		
				Total		d	0	
				Total Borrowings (a3 + b + c + d)		Ii	0	
			ii	Trade payables		Iii	0	
			iii	Other financial liabilities				
				a	Current maturities of long-term debt	a	0	
				b	Current maturities of finance lease obligations	b	0	
				c	Interest accrued	c	0	
				d	Unpaid dividends	d	0	
				e	Application money received for allotment of securities to the extent refundable and interest accrued thereon	e	0	
				f	Unpaid matured deposits and interest accrued thereon	f	0	
				g	Unpaid matured debentures and interest accrued thereon	g	0	
				h	Other (specify nature and amount)			
				Sl. No	Nature	Amount		
				Total		h	0	
			i	Total Other financial liabilities (a + b +c +d +e +f +g+ h)		i	0	
			iv	Total Financial Liabilities (Ii + Iii + Iiii)		Iiv	0	
			II	Other Current liabilities				
				a	Revenue received in advance	a	0	
				b	Other advances(specify nature and amount)			
				Sl. No	Nature	Amount		
				Total		B	0	
				c	Others (specify nature)			
				Sl. No	Nature	Amount		
				Total		c	0	
				d	Total Other current liabilities (a + b+ c)	IId	0	

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		III	Provisions					
			a	Provision for employee benefits	a	0		
			b	Others (specify nature)				
			Sl. No	Nature	Amount			
			Total				b	0
			c	Total provisions (a + b)			IIIc	0
		IV	ProCurrent Tax Liabilities (Net)visions				IV	0
		Total Current liabilities (Iiv + IId + IIIC+ IV)					2B	0
		Total Equity and liabilities (1C + 2A +2B)					I	0
II	ASSETS							
	1	Non-current assets						
		A	Property, Plant and Equipment					
			a	Gross block	a	0		
			b	Depreciation	b	0		
			c	Impairment losses	c	0		
			d	Net block (a – b - c)			Ad	0
		B	Capital work-in-progress				B	0
		C	Investment Property					
			a	Gross block	a	0		
			b	Depreciation	b	0		
			c	Impairment losses	c	0		
			d	Net block (a – b - c)			Cd	0
		D	Goodwill					
			a	Gross block	a	0		
			b	Impairment losses	b	0		
			c	Net block (a – b - c)			Dc	0
		E	Other Intangible Assets					
			a	Gross block	a	0		
			b	Amortisation	b	0		
			c	Impairment losses	c	0		
			d	Net block (a – b - c)			Ed	0
		F	Intangible assets under development				F	0
		G	Biological assets other than bearer plants					
			a	Gross block	a	0		
			b	Impairment losses	b	0		
			c	Net block (a – b)			Gc	0

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		H	Financial Assets							
			I	Investments						
			i	Investments in Equity instruments						
			a	Listed equities	ia	0				
			b	Unlisted equities	ib	0				
			c	Total (ia + ib)			ic	0		
			ii	Investments in Preference shares		ii	0			
			iii	Investments in Government or trust securities		iii	0			
			iv	Investments in Debenture or bonds		iv	0			
			v	Investments in Mutual funds		v	0			
			vi	Investments in Partnership firms		vi	0			
			vii	Others Investments (specify nature)						
			Sl. No	Nature		Amount				
			Total					vii	0	
			viii	Total non-current investments (ic + ii + iii + iv + v + vi + vii)					viii	0
		II	Trade Receivables							
			a	Secured, considered good		a	0			
			b	Unsecured, considered good		b	0			
			c	Doubtful		c	0			
			d	Total Trade receivables			HII	0		
		III	Loans							
			i	Security deposits		i	0			
			ii	Loans to related parties (see instructions)		ii	0			
			iii	Other loans (specify nature)						
			Sl. No	Nature		Amount				
			Total					iii	0	
			iv	Total Loans (i + ii + iii)					IIII	0
		v	Loans included in IIII above which is-							
			a	for the purpose of business or profession		va	0			
			b	not for the purpose of business or profession		vb	0			
			c	given to shareholder, being the beneficial owner of share, or to any concern or on behalf/ benefit of such shareholder as per section 2(22)(e) of I.T. Act		vc	0			
		IV	Other Financial Assets							

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			i	Bank Deposits with more than 12 months maturity	i	0			
			ii	Others	ii	0			
			iii	Total of Other Financial Assets (i + ii)			HIV	0	
	I	Deferred Tax Assets (Net)					I	0	
	J	Other non-current Assets							
		i	Capital Advances			i	0		
		ii	Advances other than capital advances			ii	0		
		iii	Others (specify nature)						
			Sl. No	Nature	Amount				
			Total					vii	0
		iv	Total non-current assets (i + ii + iii)					iv	0
		v	Non-current assets included in J above which is due from shareholder, being the beneficial owner of share, or from any concern or on behalf/ benefit of such shareholder as per section 2(22)(e) of I.T. Act			v	0		
	Total Non-current assets (Ad + B + Cd + Dc + Ed + F + Gc + HI + HII + HIII + HIV + I + J)						1	0	
2	Current assets								
	A	Inventories							
		i	Raw materials			i	0		
		ii	Work-in-progress			ii	0		
		iii	Finished goods			iii	0		
		iv	Stock-in-trade (in respect of goods acquired for trading)			iv	0		
		v	Stores and spares			v	0		
		vi	Loose tools			vi	0		
		vii	Others			vii	0		
		viii	Total Inventories (i + ii + iii + iv + v + vi + vii)					2A	0
	B	Financial Assets							
	I	Investments							
		i	Investment in Equity instruments						
		a	Investment in Equity instruments			ia	0		
		a	Unlisted equities			ib	0		
		c	Total (ia + ib)			ic	0		
		ii	Investment in Preference shares			ii	0		
		iii	Investment in government or trust securities			iii	0		
		iv	Investment in debentures or bonds			iv	0		

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	v	Investment in Mutual funds	v	0
	vi	Investment in partnership firms	vi	0
	vii	Other Investments	vii	0
	viii	Total Current investments (ic + ii + iii + iv + v + vi + vii)	viii	0
II	Trade receivables			
	i	Secured, considered good	i	0
	ii	Unsecured, considered good	ii	0
	iii	Doubtful	iii	0
	iv	Total Trade receivables (i + ii + iii)	II	0
III	Cash and cash equivalents			
	i	Balances with Banks (of the nature of cash and cash equivalents)	i	0
	ii	Cheques, drafts in hand	ii	0
	iii	Cash on hand	iii	0
	iv	Others (specify nature)	iv	
	Sl. No	Nature	Amount	
	Total			vii
	v	Total Cash and cash equivalents (i + ii + iii + iv)	III	0
IV	Bank Balances other than III above			IV
V	Loans			
	i	Security Deposits	i	0
	ii	Loans to related parties (see instructions)	ii	0
	iii	Others(specify nature)		
	Sl. No	Nature	Amount	
	Total			vii
	iv	Total loans (i + ii + iii)	V	0
	v	Loans and advances included in V above which is-		
	a	for the purpose of business or profession	va	0
	b	not for the purpose of business or profession	vb	0
	c	given to a shareholder, being the beneficial owner of share, or to any concern or on behalf/ benefit of such shareholder as per section 2(22)(e) of I.T. Act	vc	0
VI	Other Financial Assets			VI
Total Financial Assets (I + II + III + IV + V + VI)			2B	0
C	Current Tax Assets (Net)			2C

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	D	Other current assets					
		i	Advances other than capital advances	i	0		
		ii	Others(specify nature)				
			Sl. No	Nature	Amount		
			Total			vii	0
		iii	Total			2D	0
	Total Current assets (2A + 2B + 2C + 2D)					2	0
Total Assets (1 + 2)						II	0

Schedule Part A-Manufacturing Account- Manufacturing Account for the financial year 2019-20 (fill items 1 to 3 in a case where regular books of accounts are maintained, otherwise fill items 61 to 62 as applicable)

1	Opening Inventory				
	A	(i)	Opening stock of raw-material	A(i)	
		(ii)	Opening stock of Work in progress	A(ii)	
		(iii)	Total (i + ii)	A(iii)	
	B	Purchases (net of refunds and duty or tax, if any)			B
	C	Direct wages			C
	D	Direct expenses(Di + Dii + Diii)			D
		(i)	Carriage inward	(i)	
		(ii)	Power and fuel	(ii)	
		(iii)	Other direct expenses	(iii)	
	E	Factory Overheads			
		(i)	Indirect wages	(i)	
		(ii)	Factory rent and rates	(ii)	
		(iii)	Factory Insurance	(iii)	
		(iv)	Factory fuel and power	(iv)	
		(v)	Factory general expenses	(v)	
		(vi)	Depreciation of factory machinery	(vi)	
		(vii)	Total (i+ii+iii+iv+v+vi)	(vii)	
	F	Total of Debits to Manufacturing Account (Aiii+B+C+D+Evii)			F
2	Closing Stock				
	(i)	Raw material			(i)
	(ii)	Work-in-progress			(ii)
		Total (2i +2ii)			
3	Cost of Goods Produced – transferred to Trading Account (1F-2)				

Schedule Part A-Trading Account -Trading Account for the financial year 2019-20 (fill items 4 to 12 in a case where regular books of accounts are maintained, otherwise fill items 61 to 62 as applicable)

4	Revenue from operations						
	A	Sales/ Gross receipts of business (net of returns and refunds and duty or tax, if any)					
		(i)	Sale of goods		(i)	47532852	
		(ii)	Sale of services		(ii)	1906199	
		(iii)	Other operating revenues (specify nature and amount)				
			S. No.	Nature of other operating revenue	Amount		
			Total				
		(iv)	Total(i+ii+iiic)		A(iv)	49439051	
	B	Gross receipts from Profession				B	
	C	Duties, taxes and cess received or receivable in respect of goods and services sold or supplied					
		(i)	Union Excise duties		Ci		
		(ii)	Service Tax		Cii		
		(iii)	VAT/ Sales tax		Ciii		
		(iv)	Central Goods & Service Tax (CGST)		Civ		
		(v)	State Goods & Services Tax (SGST)		Cv		
		(vi)	Integrated Goods & Services Tax (IGST)		Cvi		
		(vii)	Union Territory Goods & Services Tax (UTGST)		Cvii		
		(viii)	Any other duty, tax and cess		Cviii		
		(ix)	Total (i + ii + iii + iv +v+ vi+vii+viii)		Cix		
	D	Total Revenue from operations (Aiv + B +Cix)				D	49439051
5	Closing Stock of Finished Stocks				5	297689	
6	Total of credits to Trading Account (4D + 5)				6	49736740	
7	Opening Stock of Finished Goods				7	1330585	
8	Purchases (net of refunds and duty or tax, if any)				8	29689449	
9	Direct Expenses(9i + 9ii + 9iii)				9	46256	
	(i)	Carriage inward			9(i)	705	
	(ii)	Power and fuel			9(ii)		
	(iii)	Other direct expenses					
		S. No.	Nature of direct expenses		Amount		
		1	Works Contract		45551		
		Total		45551			
10	Duties and taxes, paid or payable, in respect of goods and services purchased						
	(i)	Custom duty			10i		
	(ii)	Counter veiling duty			10ii		
	(iii)	Special additional duty			10iii		
	(iv)	Union excise duty			10iv		
	(v)	Service Tax			10v		
						1748	

	(vi)	VAT/ Sales tax	10vi	
	(vii)	Central Goods & Service Tax (CGST)	10vii	
	(viii)	State Goods & Services Tax (SGST)	10viii	
	(ix)	Integrated Goods & Services Tax (IGST)	10ix	
	(x)	Union Territory Goods & Services Tax (UTGST)	10x	
	(xi)	Any other tax, paid or payable	10xi	
	(xii)	Total (10i + 10ii + 10iii + 10iv + 10v + 10vi + 10vii + 10viii + 10ix + 10x+10xi)	10xii	
11		Cost of goods produced – Transferred from Manufacturing Account	11	
12		Gross Profit/Loss from Business/Profession - transferred to Profit and Loss account (6-7-8-9-10xii-11)	12	18670450
12a		Turnover from Intraday Trading	12a	
12b		Income from Intraday Trading	12b	
Schedule Part A-P and L- Profit and Loss Account for financial year 2019-20. (fill items 13 to 60 in a case where regular books of accounts are maintained, otherwise fill items 61 to 62 as applicable)				
	CREDITS TO PROFIT AND LOSS ACCOUNT			
13		Gross profit transferred from Trading Account	13	18670450
14		Other income		
	i.	Rent	i	0
	ii.	Commission	ii	3802
	iii.	Dividend income	iii	0
	iv.	Interest income	iv	96248
	v.	Profit on sale of fixed assets	v	0
	vi.	Profit on sale of investment being securities chargeable to Securities Transaction Tax (STT)	vi	0
	vii.	Profit on sale of other investment	vii	0
	viii.	Gain(Loss) on account of foreign exchange fluctuation u/s 43AA	viii	0
	ix.	Profit on conversion of inventory into capital asset u/s 28(via) (Fair Market Value of inventory as on the date of conversion)	ix	0
	x.	Agriculture income	x	0
	xi.	Any other income (specify nature and amount)		
		Sl.No	Nature	Amount
		1	Interest subsidy on KFC Loan	12322
		2	Discounts	6305
		3	Anert Subsidy Received	24536
		4	Kreepa ExhibitionSubsidy Received	45000
		5	Miscellaneous Income	569
		xix	Total	88732
	xii.	Total of other income (i + ii + iii + iv + v + vi + vii + viii + ix + x + xi)	14xii	188782
15		Total of credits to profit and loss account (13+14xii)	15	18859232

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16	Freight outward		16	181951
17	Consumption of stores and spare parts		17	0
18	Power and fuel		18	0
19	Rents		19	586821
20	Repairs to building		20	86475
21	Repairs to machinery		21	281835
22	Compensation to employees			
	i.	Salaries and wages	22i	4684524
	ii.	Bonus	22ii	0
	iii.	Reimbursement of medical expenses	22iii	0
	iv.	Leave encashment	22iv	0
	v.	Leave travel benefits	22v	0
	vi.	Contribution to approved superannuation fund	22vi	0
	vii.	Contribution to recognised provident fund	22vii	0
	viii.	Contribution to recognised gratuity fund	22viii	0
	ix.	Contribution to any other fund	22ix	0
	x.	Any other benefit to employees in respect of which an expenditure has been incurred	22x	0
	xi	Total compensation to employees (total of 22i to 22x)	22xi	4684524
	22xii	Whether any compensation, included in 22xi, paid to non-residents	xiia	No
		If Yes, amount paid to non-residents	xiib	0
23	Insurance			
	i.	Medical Insurance	23i	0
	ii.	Life Insurance	23ii	0
	iii.	Keyman's Insurance	23iii	0
	iv.	Other Insurance including factory, office, car, goods,etc.	23iv	60545
	v.	Total expenditure on insurance (23i+23ii+23iii+23iv)	23v	60545
24.	Workmen and staff welfare expenses		24	82196
25.	Entertainment		25	0
26.	Hospitality		26	0
27.	Conference		27	0
28.	Sales promotion including publicity (other than advertisement)		28	0
29.	Advertisement		29	146000
30	Commission			
	i.	Paid outside India, or paid in India to a non-resident other than a company or a foreign company	i	0
	ii.	To others	ii	0
	iii.	Total (i + ii)	30iii	0
31	Royalty		1750	

	i.	Paid outside India, or paid in India to a non-resident other than a company or a foreign company	i	0
	ii.	To others	ii	0
	iii.	Total (i + ii)	31iii	0
32	Professional / Consultancy fees / Fee for technical services			
	i.	Paid outside India, or paid in India to a non-resident other than a company or a foreign company	i	0
	ii.	To others	ii	186450
	iii.	Total (i + ii)	32iii	186450
33.	Hotel , boarding and Lodging		33	105982
34.	Traveling expenses other than on foreign traveling		34	970354
35.	Foreign travelling expenses		35	0
36.	Conveyance expenses		36	0
37.	Telephone expenses		37	0
38.	Guest House expenses		38	0
39.	Club expenses		39	0
40.	Festival celebration expenses		40	0
41.	Scholarship		41	0
42.	Gift		42	0
43.	Donation		43	130700
44	Rates and taxes, paid or payable to Government or any local body (excluding taxes on income)			
	i.	Union excise duty	44i	0
	ii.	Service tax	44ii	0
	iii.	VAT/ Sales tax	44iii	0
	iv.	Cess	44iv	0
	v.	Central Goods and Service Tax (CGST)	44v	0
	vi.	State Goods and Services Tax (SGST)	44vi	0
	vii.	Integrated Goods and Services Tax (IGST)	44vii	0
	viii.	Union Territory Goods and Services Tax (UTGST)	44viii	0
	ix.	Any other rate, tax, duty or cess incl. STT and CTT	44ix	42620
	x.	Total rates and taxes paid or payable (44i + 44ii + 44iii + 44iv + 44v+44vi+44vii+44viii+44ix)	44x	42620
45.	Audit fee		45	35000
46	Other expenses (specify nature and amount)			
		Nature	Amount	
	1	Marketing Expenses	2048528	
	2	Anert Registration and Affiliation Expenses	1185723	
	3	Interest and Bank Charges	348157	
	4	Newspaper and Periodicals	5270	
	5	Electricity and Water charges	82454	
		1751		

		6	Internet and telephone charges										58857
		7	Office Expenses										1374553
		8	Printing and stationery										21247
		9	Postage and courier charges										5088
		10	Refreshment expenses										58780
		11	Worksite expenses										1583261
		12	Filing fee										4300
		13	Miscellaneous expenses										12956
		14	Booting Material										129137
		15	License Fee										690312
		16	Tender Fee Expenses										17010
		17	Discounts										2613720
		18	Accounting Charges										17300
			Total										10256653
47	Bad debts (specify PAN of the person, if available, for whom Bad Debt for amount of Rs. 1 lakh or more is claimed and amount)												
	i	PAN					Aadhaar			Amount			
		Total								0			
	ii.	Others (more than Rs. 1 lakh) where PAN is not available(provide name and complete address)											
		Sl. No.	Name	Flat/ Door/ Block No.	Name of Premises / Building / Village	Road/ Street/ Post office	Area/ Locality	Town/ City/ District	State	Country	PIN Code/ ZIP Code	Amount	
		Total										0	
	iii.	Others (amounts less than Rs. 1 lakh)								iii	0		
	iv.	Total Bad Debt (47i + 47ii + 47iii)								39iv	0		
48.	Provision for bad and doubtful debts									48	0		
49.	Other provisions									49	0		
50.	Profit before interest, depreciation and taxes [15 – (16 to 21 + 22xi + 23v + 24 to 29 + 30iii + 31iii + 32iii + 33 to 43 + 44x + 45 + 46iii+ 47iv + 48 + 49)]									50	1021126		
51.	Interest												
	i.	Paid outside India, or paid in India to a non-resident other than a company or a foreign company								i	0		
	ii.	To others								ii	0		
	iii.	Total (i + ii)								51iii	0		
52	Depreciation and amortization.									52	842700		
53	Net Profit before taxes (50 - 51iii - 52)									53	178426		
PROVISIONS FOR TAX AND APPROPRIATIONS													
54	Provision for current tax									54	120706		

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55	Provision for Deferred Tax				55	-90151	
56	Profit after tax (53 - 54 - 55)				56	147871	
57	Balance brought forward from previous year				57	0	
58	Amount available for appropriation (56+57)				58	147871	
59.	Appropriations						
	i.	Transfer to reserves and surplus			59i	0	
	ii.	Proposed dividend/ Interim dividend			59ii	0	
	iii.	Tax on dividend/ Tax on dividend for earlier years			59iii	0	
	iv.	Appropriation towards Corporate Social Responsibility (CSR) activities (in case of companies covered under section 135 of Companies Act, 2013)			59iv	0	
	v.	Any other appropriation			59v	0	
	vi.	Total (59i + 59ii + 59iii + 59iv+59v)			59vi	0	
60	Balance carried to balance sheet (58 – 59vi)				60	147871	
61	COMPUTATION OF PRESUMPTIVE INCOME FROM GOODS CARRIAGES UNDER SECTION 44AE						
	Sl. No.	Name of the Business			Business Code		Description
	i	Sl.No	Registration No. of goods carriage	Whether owned/ leased/hired	Tonnage Capacity of goods carriage(in MT)	Number of months for which goods carriage was owned / leased / hired by assessee	Presumptive income u/s 44AE for the goods carriage (Computed @ Rs.1000 per ton per month in case tonnage exceeds 12MT, or else @ Rs.7500 per month) or the amount claimed to have been actually earned, whichever is higher
		Total					
	ii	Total presumptive income from goods carriage u/s 44AE [total of column (5) of table at Point 6i(i)]					61ii
NO ACCOUNT CASE							
62	In case of Foreign Company whose total income comprises solely of profits and gains from business referred to in section 44B, 44BB, 44BBA or 44BBB, furnish the following information						
	a.	Gross receipts / Turnover				62a	0
	b.	Net profit				62b	0
Schedule Part A-Manufacturing Account Ind As- Manufacturing Account for the financial year 2019-20 [applicable for a company whose financial statements are drawn up in compliance to the Indian Accounting Standards specified in Annexure to the companies (Indian Accounting Standards) Rules, 2015]							
1	Debits to Manufacturing Account						
	A	Opening Inventory					
		(i)	Opening stock of raw-material			A(i)	
		(ii)	Opening stock of Work in progress			A(ii)	
		(iii)	Total (i + ii)			A(iii)	

	B	Purchases (net of refunds and duty or tax, if any)			B	
	C	Direct wages			C	
	D	Direct expenses (Di + Dii + Diii)			D	
		(i)	Carriage inward		(i)	
		(ii)	Power and fuel		(ii)	
		(iii)	Other direct expenses		(iii)	
	E	Factory Overheads				
		(i)	Indirect wages		(i)	
		(ii)	Factory rent and rates		(ii)	
		(iii)	Factory Insurance		(iii)	
		(iv)	Factory fuel and power		(iv)	
		(v)	Factory general expenses		(v)	
		(vi)	Depreciation of factory machinery		(vi)	
		(vii)	Total (i+ii+iii+iv+v+vi)		(vii)	
	F	Total of Debits to Manufacturing Account (Aiii+B+C+D+Evii)			F	
2	Closing Stock					
	(i)	Raw material			(i)	
	(ii)	Work-in-progress			(ii)	
		Total (2i +2ii)				
3	Cost of Goods Produced – transferred to Trading Account (1F-2)					
Schedule Part A-Trading Account Ind As -Trading Account for the financial year 2019-20 [applicable for a company whose financial statements are drawn up in compliance to the Indian Accounting Standards specified in Annexure to the companies (Indian Accounting Standards) Rules, 2015]						
4	Revenue from operations					
	A	Sales/ Gross receipts of business (net of returns and refunds and duty or tax, if any)				
		(i)	Sale of goods		(i)	
		(ii)	Sale of services		(ii)	
		(iii)	Other operating revenues (specify nature and amount)			
			S. No.	Nature of other operating revenue	Amount	
			Total			
		(iv)	Total(i+ii+iiic)		A(iv)	
	B	Gross receipts from Profession			B	
	C	Duties, taxes and cess received or receivable in respect of goods and services sold or supplied				
		(i)	Union Excise duties		Ci	
		(ii)	Service Tax		Cii	
		(iii)	VAT/ Sales tax		Ciii	
		(iv)	Central Goods & Service Tax (CGST)		Civ	

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	(v)	State Goods & Services Tax (SGST)	Cv	
	(vi)	Integrated Goods & Services Tax (IGST)	Cvi	
	(vii)	Union Territory Goods & Services Tax (UTGST)	Cvii	
	(viii)	Any other duty, tax and cess	Cviii	
	(ix)	Total (i + ii + iii + iv +v+ vi+vii+viii)	Cix	
	D	Total Revenue from operations (Aiv + B +Cix)	D	
5		Closing Stock of Finished Stocks	5	
6		Total of credits to Trading Account (4D + 5)	6	
7		Opening Stock of Finished Goods	7	
8		Purchases (net of refunds and duty or tax, if any)	8	
9		Direct Expenses (9i + 9ii + 9iii)	9	
	(i)	Carriage inward	9(i)	
	(ii)	Power and fuel	9(ii)	
	(iii)	Other direct expenses	9(iii)	
	S. No.	Nature of direct expenses	Amount	
		Total		
10		Duties and taxes, paid or payable, in respect of goods and services purchased		
	(i)	Custom duty	10i	
	(ii)	Counter veiling duty	10ii	
	(iii)	Special additional duty	10iii	
	(iv)	Union excise duty	10iv	
	(v)	Service Tax	10v	
	(vi)	VAT/ Sales tax	10vi	
	(vii)	Central Goods & Service Tax (CGST)	10vii	
	(viii)	State Goods & Services Tax (SGST)	10viii	
	(ix)	Integrated Goods & Services Tax (IGST)	10ix	
	(x)	Union Territory Goods & Services Tax (UTGST)	10x	
	(xi)	Any other tax, paid or payable	10xi	
	(xii)	Total (10i + 10ii + 10iii + 10iv + 10v + 10vi + 10vii + 10viii + 10ix + 10x+10xi)	10xii	
11		Cost of goods produced – Transferred from Manufacturing Account	11	
12		Gross Profit/Loss from Business/Profession - transferred to Profit and Loss account (6-7-8-9-10xii-11)	12	
12a		Turnover from Intraday Trading	12a	
12b		Income from Intraday Trading	12b	

Schedule A-P & L Profit and Loss Account for the financial year 2019-20 [applicable for a company whose financial statements are drawn up in compliance to the Indian Accounting Standards specified in Annexure to the companies (Indian Accounting Standards) Rules, 2015]

CREDITS TO PROFIT AND LOSS ACCOUNT

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13	Gross profit transferred from Trading Account			13	0
14	Other income				
	i.	Rent		i	0
	ii.	Commission		ii	0
	iii.	Dividend income		iii	0
	iv.	Interest income		iv	0
	v.	Profit on sale of fixed assets		v	0
	vi.	Profit on sale of investment being securities chargeable to Securities Transaction Tax (STT)		vi	0
	vii.	Profit on sale of other investment		vii	0
	viii.	Gain(Loss) on account of foreign exchange fluctuation u/s 43AA		viii	0
	ix.	Profit on conversion of inventory into capital asset u/s 28(via) (Fair Market Value of inventory as on the date of conversion)		ix	0
	x.	Agriculture income		x	0
	xi.	Any other income (specify nature and amount)			
		Sl.No	Nature	Amount	
		xic	Total	0	
	xii.	Total of other income (i + ii + iii + iv + v + vi + vii + viii + ix + x + xic)			14xii 0
15	Total of credits to profit and loss account (13+14xii)			15	0
16	Freight outward			16	0
17	Consumption of stores and spare parts			17	0
18	Power and fuel			18	0
19	Rents			19	0
20	Repairs to building			20	0
21	Repairs to machinery			21	0
22	Compensation to employees				
	i.	Salaries and wages		22i	0
	ii.	Bonus		22ii	0
	iii.	Reimbursement of medical expenses		22iii	0
	iv.	Leave encashment		22iv	0
	v.	Leave travel benefits		22v	0
	vi.	Contribution to approved superannuation fund		22vi	0
	vii.	Contribution to recognised provident fund		22vii	0
	viii.	Contribution to recognised gratuity fund		22viii	0
	ix.	Contribution to any other fund		22ix	0
	x.	Any other benefit to employees in respect of which an expenditure has been incurred		22x	0
	xi	Total compensation to employees (total of 22i to 22x)			22xi 0
	22xii	Whether any compensation, included in 22xi, paid to non-residents			xiia 1756

		If Yes, amount paid to non-residents	xiib	0
23	Insurance			
	i.	Medical Insurance	23i	0
	ii.	Life Insurance	23ii	0
	iii.	Keyman's Insurance	23iii	0
	iv.	Other Insurance including factory, office, car, goods,etc.	23iv	0
	v.	Total expenditure on insurance (23i+23ii+23iii+23iv)	23v	0
24.	Workmen and staff welfare expenses		24	0
25.	Entertainment		25	0
26.	Hospitality		26	0
27.	Conference		27	0
28.	Sales promotion including publicity (other than advertisement)		28	0
29.	Advertisement		29	0
30	Commission			
	i.	Paid outside India, or paid in India to a non-resident other than a company or a foreign company	i	0
	ii.	To others	ii	0
	iii.	Total (i + ii)	30iii	0
31	Royalty			
	i.	Paid outside India, or paid in India to a non-resident other than a company or a foreign company	i	0
	ii.	To others	ii	0
	iii.	Total (i + ii)	31iii	0
32	Professional / Consultancy fees / Fee for technical services			
	i.	Paid outside India, or paid in India to a non-resident other than a company or a foreign company	i	0
	ii.	To others	ii	0
	iii.	Total (i + ii)	32iii	0
33.	Hotel , boarding and Lodging		33	0
34.	Traveling expenses other than on foreign traveling		34	0
35.	Foreign travelling expenses		35	0
36.	Conveyance expenses		36	0
37.	Telephone expenses		37	0
38.	Guest House expenses		38	0
39.	Club expenses		39	0
40.	Festival celebration expenses		40	0
41.	Scholarship		41	0
42.	Gift		42	0
43.	Donation		43	0
44	Rates and taxes, paid or payable to Government or any local body (excluding taxes on income)			

	i.	Union excise duty										44i	0
	ii.	Service tax										44ii	0
	iii.	VAT/ Sales tax										44iii	0
	iv.	Cess										44iv	0
	v.	Central Goods and Service Tax (CGST)										44v	0
	vi.	State Goods and Services Tax (SGST)										44vi	0
	vii.	Integrated Goods and Services Tax (IGST)										44vii	0
	viii.	Union Territory Goods and Services Tax (UTGST)										44viii	0
	ix.	Any other rate, tax, duty or cess incl. STT and CTT										44ix	0
	x.	Total rates and taxes paid or payable (44i + 44ii + 44iii + 44iv + 44v+44vi+44vii+44viii+44ix)										44x	0
45.	Audit fee											45	0
46	Other expenses (specify nature and amount)												
			Nature								Amount		
			Total								0		
47	Bad debts (specify PAN/Aadhar No. of the person, if it is available, for whom Bad Debt for amount of Rs. 1 lakh or more is claimed and amount)												
	i	PAN						Aadhaar			Amount		
		Total									0		
	ii.	Others (more than Rs. 1 lakh) where PAN/Aadhaar No. is not available (provide name and complete address)											
		Sl. No.	Name	Flat/ Door/ Block No.	Name of Premises / Building / Village	Road/ Street/ Post office	Area/ Locality	Town/ City/ District	State	Country	PIN Code/ ZIP Code	Amount	
		Total										0	
	iii.	Others (amounts less than Rs. 1 lakh)								iii	0		
	iv.	Total Bad Debt (47i + 47ii + 47iii)								39iv	0		
48.	Provision for bad and doubtful debts											48	0
49.	Other provisions											49	0
50.	Profit before interest, depreciation and taxes [15 – (16 to 21 + 22xi + 23v + 24 to 29 + 30iii + 31iii + 32iii + 33 to 43 + 44x + 45 + 46iii+ 47iv + 48 + 49)]											50	0
51.	Interest												
	i.	Paid outside India, or paid in India to a non-resident other than a company or a foreign company										i	0
	ii.	To others										ii	0
	iii.	Total (i + ii)										51iii	0
52	Depreciation and amortization.											52	0
53	Net Profit before taxes (50 - 51iii - 52)											53	0
PROVISIONS FOR TAX AND APPROPRIATIONS													
54	Provision for current tax											54	0

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55	Provision for Deferred Tax	55	0
56	Profit after tax (53 - 54 - 55)	56	0
57	Balance brought forward from previous year	57	0
58	Amount available for appropriation (56+57)	58	0
59.	Appropriations		
	i. Transfer to reserves and surplus	59i	0
	ii. Proposed dividend/ Interim dividend	59ii	0
	iii. Tax on dividend/ Tax on dividend for earlier years	59iii	0
	iv. Appropriation towards Corporate Social Responsibility (CSR) activities (in case of companies covered under section 135 of Companies Act, 2013)	59iv	0
	v. Any other appropriation	59v	0
	vi. Total (59i + 59ii + 59iii + 59iv+59v)	59vi	0
60	Balance carried to balance sheet (58 – 59vi)	60	0
61	A Items that will not be reclassified to P&L	61	
	i Changes in revaluation surplus	i	0
	ii Re-measurements of the defined benefit plans	ii	0
	iii Equity instruments through OCI	iii	0
	iv Fair value Changes relating to own credit risk of financial liabilities designated at FVTPL	iv	0
	v Share of Other comprehensive income in associates and joint ventures , to the extent not to be classified to P&L	v	0
	vi Others (Specify nature)		
	Nature	Amount	
	Total of (vi)	vi	0
	vii Income tax relating to items that will not be reclassified to P&L	vii	0
	viii Total	viii	0
	B Items that will be reclassified to P&L	B	
	i Exchange differences in translating the financial statements of a foreign operation	i	0
	ii Debt instruments through OCI	ii	0
	iii The effective portion of gains and loss on hedging instruments in a cash flow hedge	iii	0
	iv Share of OCI in associates and joint ventures to the extent to be classified into P&L	iv	0
	v Others (Specify nature)		
	Nature	Amount	
	Total of (v)	v	0
	vi Income tax relating to items that will be reclassified to P&L	vi	0
	vii Total	vii	0
62	Total Comprehensive Income(56 + 61A + 61B)	62	0

Part A OI-Other Information ((mandatory if liable for audit under section 44AB, for other fill, if applicable)

1	Method of accounting employed in the previous year		1	Mercantile
2	Is there any change in method of accounting		2	No
3	3a	Increase in the profit or decrease in loss because of deviation, if any, as per Income Computation Disclosure Standards notified under section 145(2) [column 11a(iii) of Schedule ICDS]	3a	0
	3b	Decrease in the profit or increase in loss because of deviation, if any, as per Income Computation Disclosure Standards notified under section 145(2) [column 11b(iii) of Schedule ICDS]	3b	0
4	Method of valuation of closing stock employed in the previous year (If applicable, fill all serial nos in red, since blank will be treated as zeroes)(optional in case of professionals)			
	a	Raw Material (if at cost or market rates whichever is less write 1, if at cost write 2, if at market rate write 3)	4a	1. Cost or market rate , whichever is less
	b	Finished goods (if at cost or market rates whichever is less write 1, if at cost write 2, if at market rate write 3)	4b	1. Cost or market rate , whichever is less
	c	Is there any change in stock valuation method	4c	No
	d	Increase in the profit or decrease in loss because of deviation, if any, from the method of valuation specified under section 145A	4d	
	e	Decrease in the profit or increase in loss because of deviation, if any, from the method of valuation specified under section 145A	4e	
5	Amounts not credited to the profit and loss account, being			
	a	the items falling within the scope of section 28	5a	0
	b	The proforma credits, drawbacks, refund of duty of customs or excise or service tax, or refund of sales tax or value added tax, or refund of GST, where such credits, drawbacks or refunds are admitted as due by the authorities concerned	5b	0
	c	escalation claims accepted during the previous year	5c	0
	d	Any other item of income	5d	0
	e	Capital receipt, if any	5e	0
	f	Total of amounts not credited to profit and loss account (5a+5b+5c+5d+5e)	5f	0
6	Amounts debited to the profit and loss account, to the extent disallowable under section 36 due to non-fulfilment of condition specified in relevant clauses :-			
	a	Premium paid for insurance against risk of damage or destruction of stocks or store[36(1)(i)]	6a	0
	b	Premium paid for insurance on the health of employees[36(1)(ib)]	6b	0
	c	Any sum paid to an employee as bonus or commission for services rendered, where such sum was otherwise payable to him as profits or dividend[36(1)(ii)]	6c	0
	d	Any amount of interest paid in respect of borrowed capital[36(1)(iii)]	6d	0
	e	Amount of discount on a zero-coupon bond[36(1)(iia)]	6e	0
	f	Amount of contributions to a recognised provident fund[36(1)(iv)]	6f	0

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g	Amount of contributions to an approved superannuation fund[36(1)(iv)]	6g	0
h	Amount of contribution to a pension scheme referred to in section 80CCD[36(1)(iva)]	6h	0
i	Amount of contributions to an approved gratuity fund[36(1)(v)]	6i	0
j	Amount of contributions to any other fund	6j	0
k	Any sum received from employees as contribution to any provident fund or superannuation fund or any fund set up under ESI Act or any other fund for the welfare of employees to the extent not credited to the employees account on or before the due date [36(1)(va)]	6k	6425
l	Amount of bad and doubtful debts [36(1)(vii)]	6l	0
m	Provision for bad and doubtful debts [36(1)(viiia)]	6m	0
n	Amount transferred to any special reserve [36(1)(viii)]	6n	0
o	Expenditure for the purposes of promoting family planning amongst employees [36(1)(ix)]	6o	0
p	Amount of securities transaction paid in respect of transaction in securities if such income is not included in business income [36(1)(xv)]	6p	0
q	Marked to market loss or other expected loss as computed in accordance with the ICDS notified u/s 145(2) [36(1)(xviii)]	6q	0
r	Any other disallowance	6r	0
s	Total amount disallowable under section 36(total of 6a to 6r)	6s	6425
t	Total number of employees employed by the company (mandatory in case company has recognized Provident Fund)		
i	deployed in India	i	
ii	deployed outside India	ii	
iii	Total i+ii	iii	
7	Amounts debited to the profit and loss account, to the extent disallowable under section 37		
a	Expenditure of capital nature [37(1)]	7a	0
b	Expenditure of personal nature[37(1)]	7b	0
c	Expenditure laid out or expended wholly and exclusively NOT for the purpose of business or profession[37(1)]	7c	0
d	Expenditure on advertisement in any souvenir, brochure, tract, pamphlet or the like, published by a political party[37(2B)]	7d	0
e	Expenditure by way of penalty or fine for violation of any law for the time being in force	7e	0
f	Any other penalty or fine	7f	0
g	Expenditure incurred for any purpose which is an offence or which is prohibited by law	7g	0
h	Expenditure incurred on corporate social responsibility (CSR)	7h	0
i	Amount of any liability of a contingent nature	7i	0
j	Any other amount not allowable under section 37	7j	0

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	k	Total amount disallowable under section 37 (total of 7a to 7j)	7k	0
8	A	Amounts debited to the profit and loss account, to the extent disallowable under section 40		
	a	Amount disallowable under section 40(a)(i) on account of non-compliance with provisions of Chapter XVII-B	Aa	0
	b	Amount disallowable under section 40(a)(ia) on account of non-compliance with the provisions of Chapter XVII-B	Ab	0
	c	Amount disallowable under section 40(a)(ib) on account of non-compliance with the provisions of Chapter VIII of the Finance Act, 2016	Ac	0
	d	Amount disallowable under section 40(a)(iii) on account of non-compliance with the provisions of Chapter XVII-B	Ad	0
	e	Amount of tax or rate levied or assessed on the basis of profits[40(a)(ii)]	Ae	0
	f	Amount paid as wealth tax[40(a)(iia)]	Af	0
	g	Amount paid by way of royalty, license fee, service fee etc. as per section 40(a)(iib)	Ag	0
	h	Amount of interest, salary, bonus, commission or remuneration paid to any partner or member inadmissible under section [40(b)/40(ba)]	Ah	0
	i	Any other disallowance	Ai	0
	j	Total amount disallowable under section 40(total of Aa to Ai)	Aj	0
	B	Any amount disallowed under section 40 in any preceding previous year but allowable during the previous year	8B	0
9	Amounts debited to the profit and loss account, to the extent disallowable under section 40A			
	a	Amounts paid to persons specified in section 40A(2)(b)	9a	0
	b	Amount paid otherwise than by account payee cheque or account payee bank draft or use of electronic clearing system through a bank account or through such electronic mode as may be prescribed, disallowable under section 40A(3)	9b	0
	c	Provision for payment of gratuity [40A(7)]	9c	0
	d	any sum paid by the assessee as an employer for setting up or as contribution to any fund, trust, company, AOP, or BOI or society or any other institution [40A(9)]	9d	0
	e	Any other disallowance	9e	0
	f	Total amount disallowable under section 40A (total of 9a to 9e)	9f	0
10	Any amount disallowed under section 43B in any preceding previous year but allowable during the previous year			
	a	Any sum in the nature of tax, duty, cess or fee under any law	10a	0
	b	Any sum payable by way of contribution to any provident fund or superannuation fund or gratuity fund or any other fund for the welfare of employees	10b	0
	c	Any sum payable to an employee as bonus or commission for services rendered	10c	0
	d	Any sum payable as interest on any loan or borrowing from any public financial institution or a State financial corporation or a State Industrial investment corporation	10d	0

	e	Any sum payable as interest on any loan or borrowing from any scheduled bank or a co-operative bank other than a primary agricultural credit society or a primary co-operative agricultural and rural development bank	10e	0
	f	Any sum payable towards leave encashment	10f	0
	g	Any sum payable to the Indian Railways for the use of railway assets	10g	0
	h	Total amount allowable under section 43B (total of 10a to 10g)	10h	0
11	Any amount debited to profit and loss account of the previous year but disallowable under section 43B			
	a	Any sum in the nature of tax, duty, cess or fee under any law	11a	0
	b	Any sum payable by way of contribution to any provident fund or superannuation fund or gratuity fund or any other fund for the welfare of employees	11b	0
	c	Any sum payable to an employee as bonus or commission for services rendered	11c	0
	d	Any sum payable as interest on any loan or borrowing from any public financial institution or a State financial corporation or a State Industrial investment corporation	11d	0
	da	Any sum payable by the assessee as interest on any loan or borrowing from a deposit taking non-banking financial company or systemically important non-deposit taking non-banking financial company, in accordance with the terms and conditions of the agreement governing such loan or borrowing	11da	0
	e	Any sum payable as interest on any loan or borrowing from any scheduled bank or a co-operative bank other than a primary agricultural credit society or a primary co-operative agricultural and rural development bank	11e	0
	f	Any sum payable towards leave encashment	11f	0
	g	Any sum payable by the assessee to the Indian Railways for the use of railway assets.	11g	0
	h	Total amount disallowable under Section 43B(total of 11a to 11g)	11h	0
12	Amount of credit outstanding in the accounts in respect of			
	a	Union Excise Duty	12a	
	b	Service tax	12b	
	c	VAT/sales tax	12c	
	d	Central Goods and Service Tax (CGST)	12d	
	e	State Goods and Services Tax (SGST)	12e	
	f	Integrated Goods and Services Tax (IGST)	12f	
	g	Union Territory Goods and Services Tax (UTGST)	12g	
	h	Any other tax	12h	
	e	Total amount outstanding (total of 12a to 12h)	12e	0
13	Amounts deemed to be profits and gains under section 33AB or 33ABA or 33AC			0
	i	Section 33AB	13i	0
	ii	Section 33ABA	13ii	0
	iii	Section 33AC	13iii	

14	Any amount of profit chargeable to tax under section 41	14	0
15	Amount of income or expenditure of prior period credited or debited to the profit and loss account (net)	15	0
16	Amount of expenditure disallowed u/s 14A	16	0
17	Whether assessee is exercising option under subsection 2A of section 92CE	17	No

Schedule QD-Quantitative details (mandatory if liable for audit under section 44AB)

(a) In the case of a trading concern

	Item Name	Unit	Opening stock	Purchase during the previous year	Sales during the previous year	Closing stock	Shortage/ excess, if any
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(b) In the case of a manufacturing concern -Raw Materials

	Item Name	Unit of measure	Opening stock	Purchase during the previous year	Consumption during the previous year	Sales during the previous year	Closing stock	Yield Finished Products	Percentage of yield	Shortage/ excess, if any
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(c) In the case of a manufacturing concern - Finished products/ By-products

	Item Name	Unit	Opening stock	Purchase during the previous year	quantity manufactured during the previous year	Sales during the previous year	Closing stock	Shortage/ excess, if any
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Schedule OL - Receipt and payment account of company under liquidation

1	Opening Balance										
	i	Cash in hand				1i					
	ii	Bank				1ii					
	iii	Total opening balance (1i + 1ii)				1iii					
2	Receipts										
	i	Interest				2i					
	ii	Dividend				2ii					
	iii	Sale of assets(pls. specify nature and amount)									
		S. No.	Nature					Amount			
		Total(iiiia + iiib + iiic)									
	iv	Realisation of dues/debtors				2iv					
	v	Others(pls. specify nature and amount)									
		S. No.	Nature of receipt					Amount			
		Total of other receipts(va + vb)							2v		
	vi	Total receipts (2i + 2ii + 2iiid+ 2iv + 2vc)				2vi					
3	Total of opening balance and receipts					3					

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4	Payments					
	i	Repayment of secured loan		4i		
	ii	Repayment of unsecured loan		4ii		
	iii	Repayment to creditors		4iii		
	iv	Commission		4iv		
	v	Others (pls. specify)				
		S. No.	Nature of payment			Amount
		Total of other payments(4va + 4vb)				4v
	vi	Total payments(4i + 4ii + 4iii + 4iv + 4vi)		4vi		
5	Closing balance					
	i	Cash in hand		5i		
	ii	Bank		5ii		
	iii	Total Closing balance (5i + 5ii)		5iii		
6	Total of closing balance and payments (4vi + 5iii)			6		

Schedule HP - Details of Income from House Property

1	Pass through income if any			
2	Income under the head "Income from house property" (1k+2k+3)(if negative take the figure to 2i of schedule CYLA)			
NOTE	Furnishing PAN of tenant is mandatory, if tax is deducted under section 194-IB.			
	Furnishing TAN of tenant is mandatory, if tax is deducted under section 194-I.			

Schedule BP - Computation of income from business or profession

A	From business or profession other than speculative business and specified business			
	1.	Profit before tax as per profit and loss account (item 53 ,61(ii) and 62(b) of Part A-P &L) / (item 53 of Part A-P&L – Ind AS) (as applicable)	1	178426
	2a.	Net profit or loss from speculative business included in 1 (enter -ve sign in case of loss)	2a	0
	2b.	Net profit or Loss from Specified Business u/s 35AD included in 1 (enter -ve sign in case of loss)	2b	0
	3.	Income/ receipts credited to profit and loss account considered under other heads of income/chargeable u/s 115BBF/chargeable u/s 115BBG		
	a.	House property	3a	0
	b.	Capital gains	3b	0
	c.	Other sources	3c	96248
	d.	u/s 115BBF	3d	0
	e.	u/s 115BBG	3e	0
	4a.	Profit or loss included in 1, which is referred to in section 44AE/44B/44BB/44BBA/44BBB/ 44D/44DA/ Chapter-XII-G/ First Schedule of Income-tax Act(other than 115B)	4a	0
		Sl.No	Section	Amount
	i.		44AE	0

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	ii.	44B	0	
	iii.	44BB	0	
	iv.	44BBA	0	
	v.	44BBB	0	
	vi.	44D	0	
	vii.	44DA	0	
	viii.	Chapter-XII-G	0	
	ix.	First Schedule of Income Tax Act (other than 115B)	0	
4b.	Profit and gains from life insurance business referred to in section 115B		4b	0
4c.	Profit from activities covered under rule 7, 7A, 7B(1), 7B(1A) and 8		4c	0
	i	Profit from activities covered under rule 7	4i	0
	ii	Profit from activities covered under rule 7A	4ii	0
	iii	Profit from activities covered under rule 7B(1)	4iii	0
	iv	Profit from activities covered under rule 7B(1A)	4iv	0
	v	Profit from activities covered under rule 8	4v	0
5.	Income credited to Profit and Loss account (included in 1) which is exempt			
	a.	Share of income from firm(s)	5a	0
	b.	Share of income from AOP/ BOI	5b	0
	c.	Any other exempt income (specify nature and amount)		
		Sl.No.	Nature	Amount
		Total	5C	0
	d	Total exempt income (5a + 5b + 5c)	5d	0
6.	Balance(1- 2a - 2b - 3a - 3b - 3c -3e- 3d - 4- 5d)		6	82178
7.	Expenses debited to profit and loss account considered under other heads of income/related to income chargeable u/s 115BBF or u/s 115BBG			
	a.	House property	7a	0
	b.	Capital gains	7b	0
	c.	Other sources	7c	0
	d.	u/s 115BBF	7d	0
	e.	u/s 115BBG	7e	0
8a.	Expenses debited to profit and loss account which relate to exempt income		8a	0
8b.	Expenses debited to profit and loss account which relate to exempt income and disallowed u/s 14A (16 of Part A-OI)		8b	0
9.	Total (7a + 7b +7c + 7d+ 7e + 8a+ 8b)		9	0
10.	Adjusted profit or loss (6+9)		10	82178
11.	Depreciation and amortisation debited to profit and loss account		11	842700
12.	Depreciation allowable under Income-tax Act		1766	

	i	Depreciation allowable under section 32(1)(ii) and 32(1)(iia) (item 6 of Schedule-DEP)	12i	547949
	ii	Depreciation allowable under section 32(1)(i) (Make your own computation refer Appendix-IA of IT Rules)	12ii	0
	iii	Total (12i + 12ii)	12iii	547949
13.	Profit or loss after adjustment for depreciation (10 +11 - 12iii)		13	376929
14.	Amounts debited to the profit and loss account, to the extent disallowable under section 36 (6r of Part A-OI)		14	6425
15.	Amounts debited to the profit and loss account, to the extent disallowable under section 37 (7k of Part A-OI)		15	0
16.	Amounts debited to the profit and loss account, to the extent disallowable under section 40 (8Aj of Part A-OI)		16	0
17.	Amounts debited to the profit and loss account, to the extent disallowable under section 40A (9f of Part A-OI)		17	0
18.	Any amount debited to profit and loss account of the previous year but disallowable under section 43B (11h of Part A-OI)		18	0
19.	Interest disallowable under section 23 of the Micro, Small and Medium Enterprises Development Act, 2006		19	0
20.	Deemed income under section 41		20	0
21.	Deemed income under section 32AC/ 32AD/ 33AB/ 33ABA/35ABA/ 35ABB/ 35AC/ 40A(3A)/ 33AC/ 72A/ 80HHD/ 80-IA		21	0
	(i)	Section 32AC	21(i)	0
	(ii)	Section 32AD	21(ii)	0
	(iii)	Section 33AB	21(iii)	0
	(iv)	Section 33ABA	21(iv)	0
	(v)	Section 35ABA	21(v)	0
	(vi)	Section 35ABB	21(vi)	0
	(vii)	Section 35AC	21(vii)	0
	(viii)	Section 40A(3A)	21(viii)	0
	(ix)	Section 33AC	21(ix)	0
	(x)	Section 72A	21(x)	0
	(xi)	Section 80HHD	21(xi)	0
	(xii)	Section 80-IA	21(xii)	0
22.	Deemed income under section 43CA		22	0
23.	Any other item or items of addition under section 28 to 44DA		23	0
24.	Any other income not included in profit and loss account/any other expense not allowable (including income from salary, commission, bonus and interest from firms in which company is a partner)		24	0
	(a)	Salary	24(a)	0
	(b)	Bonus	24(b)	0
	(c)	Commission	24(c)	0
	(d)	Interest	24(d)	0
	(e)	Others	24(e)	0

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25.	Increase in profit or decrease in loss on account of ICDS adjustments and deviation in method of valuation of stock (Column 3a + 4d of Schedule OI)	25	0
26.	Total (14 + 15 + 16 + 17 + 18 + 19 + 20 + 21+ 22 + 23 + 24 + 25)	26	6425
27.	Deduction allowable under section 32(1)(iii)	27	0
28.	Deduction allowable under section 32AD	28	0
29.	Amount allowable as deduction under section 32AC	29	0
30.	Amount of deduction under section 35 or 35CCC or 35CCD in excess of the amount debited to profit and loss account (item x(4) of Schedule ESR) (if amount deductible under section 35 or 35CCC or 35CCD is lower than amount debited to P&L account, it will go to item 24)	30	0
31.	Any amount disallowed under section 40 in any preceding previous year but allowable during the previous year(8B of Part A-OI)	31	0
32.	Any amount disallowed under section 43B in any preceding previous year but allowable during the previous year (10g of Part A-OI)	32	0
33.	Any other amount allowable as deduction	33	0
34.	Decrease in profit or increase in loss on account of ICDS adjustments and deviation in method of valuation of stock (Column 3b + 4e of Schedule OI)	34	0
35.	Total (27 + 28 + 29 +30 + 31 + 32c + 33 + 34)	35	0
36.	Income (13 + 26 – 35)	34	383354
37.	Profits and gains of business or profession deemed to be under -		
i	Section 44AE(61(ii) of schedule P&L)	36i	0
ii	Section 44B	36ii	0
iii	Section 44BB	36iii	0
iv	Section 44BBA	36iv	0
v	Section 44BBB	36v	0
vi	Section 44D	36vi	0
vii	Section 44DA	36vii	0
viii	Chapter-XII-G (tonnage)	36viii	0
ix	First Schedule of Income-tax Act (other than 115B)	36ix	0
x	Total (37 i to 37ix)	36x	0
38.	Net profit or loss from business or profession other than speculative and specified business (34 + 37x)	38	383354
39.	Net Profit or loss from business or profession other than speculative business and specified business after applying rule 7A, 7B or 8, if applicable (If rule 7A, 7B or 8 is not applicable, enter same figure as in 36) (If loss take the figure to 2i of item F)(39a+ 39b + 39c + 39d + 39e + 39f)	39	383354
a.	Income Chargeable under Rule 7	39a	0
b.	Deemed income chargeable under Rule 7A	39b	0
c.	Deemed income chargeable under Rule 7B(1)	39c	0
d.	Deemed income chargeable under Rule 7B(1A)	39d	0

	e.	Deemed income chargeable under Rule 8		39e	0
	f.	Income other than Rule 7A, 7B & 8 (Item No. 38)		39f	383354
	40.	Balance of income deemed to be from agriculture, after applying Rule 7, 7A, 7B(1), 7B(1A) and Rule 8 for the purpose of aggregation of income as per Finance Act [4c-(39a+39b+39c+39d+39e)]		40f	0
B. Computation of income from speculative business					
	41	Net profit or loss from speculative business as per profit or loss account		41	0
	42	Additions in accordance with section 28 to 44DA		42	0
	43	Deductions in accordance with section 28 to 44DA		43	0
	44	Income from speculative business (41+42-43) (if loss, take the figure to 6xv of schedule CFL)		B44	0
C. Computation of income from specified business under section 35AD					
	45	Net profit or loss from specified business as per profit or loss account		45	0
	46	Additions in accordance with section 28 to 44DA		46	0
	47	Deductions in accordance with section 28 to 44DA (other than deduction u/s 35AD, (ii) 32 or 35 on which deduction u/s 35AD is claimed))		47	0
	48	Profit or loss from specified business (45 + 46 - 47)		48	0
	49	Deductions in accordance with section 35AD(1) or 35AD(1A)		49	0
	50	Income from Specified Business (if loss, take the figure to 7xii of schedule CFL)(48-49)		C50	0
	51	S.No.	Relevant clause of sub-section (5) of section 35AD which covers the specified business (to be selected from drop down menu)		
D. Income chargeable under the head 'Profits and gains from business or profession' (A39+B44+C50)				D	383354
E. Computation of income from life insurance business referred to in section 115B					
	(i)	Net Profit or loss from life insurance business referred to in section 115B		E(i)	0
	(ii)	Additions in accordance with section 30 to 43B		E(ii)	
	(iii)	Deductions in accordance with section 30 to 43B		E(iii)	
	(iv)	Income from life insurance business under section 115B		E(iv)	0
F. Intra head set off of business loss of current year					
	SI	Type of Business income	Income of current year (Fill this column only if figure is zero or positive)	Business loss set off	Business income remaining after set off
			(1)	(2)	(3) = (1) - (2)
	i	Loss to be set off (Fill this row only if figure is negative)		0	
	ii	Income from speculative business	0	0	0
	iii	Income from specified business	0	0	0
	iv	Profit and gains from life insurance business u/s 115B			
	v	Total loss set off (ii + iii + iv)		0	
	vi	Loss remaining after set off (i - v)		0	

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Schedule DPM - Depreciation on Plant and Machinery(Other than assets on which full capital expenditure is allowable as deduction under any other section)					
1	Block of assets	Plant and machinery			
2	Rate (%)	15	30	40	45
		(i)	(ii)	(iii)	(iv)
3	Written down value on the first day of previous year	0		0	
3a	Amount as adjusted on account of opting for taxation under section 115BAA /115BA	2976798		74688	
3b	Adjusted Written down value on the first day of previous year (3) + (3a)\	2976798		74688	
4	Additions for a period of 180 days or more in the previous year	38000		0	
5	Consideration or other realization during the previous year out of 3b or 4	0		0	
6	Amount on which depreciation at full rate to be allowed (3b + 4 – 5) (enter 0, if result is negative)	3014798		74688	
7	Additions for a period of less than 180 days in the previous year	862051		6000	
8	Consideration or other realizations during the year out of 7	0		0	
9	Amount on which depreciation at half rate to be allowed (7 - 8)(enter 0, if result is negative)	862051		6000	
10	Depreciation on 6 at full rate	452220		29875	
11	Depreciation on 9 at half rate	64654		1200	
12	Additional depreciation, if any, on 4	0		0	
13	Additional depreciation, if any, on 7	0		0	
14	Additional depreciation relating to immediately preceding year' on asset put to use for less than 180 days	0		0	
15	Total depreciation (10+11+12+13+14)	516874		31075	

16	Depreciation disallowed under section 38(2) of the I.T. Act (out of column 15)	0		0	
17	Net aggregate depreciation (15-16)	516874		31075	
18	Proportionate aggregate depreciation allowable in the event of succession, amalgamation, demerger etc. (out of column 17)	0		0	
19	Expenditure incurred in connection with transfer of asset/ assets	0		0	
20	Capital gains/ loss under section 50(5 + 8 -3b -4 -7 -19) (enter negative only if block ceases to exist)	0		0	
21	Written down value on the last day of previous year (6+ 9 -15) (enter 0 if result is negative)	3359975		49613	

Schedule DOA - Depreciation on other assets (Other than assets on which full capital expenditure is allowable as deduction)

1	Block of assets	Land	Building (not including land)			Furniture and Fittings	Intangible assets	Ships
2	Rate (%)	nil	5	10	40	10	25	20
			(i)	(ii)	(iii)	(iv)	(v)	(vi)
3	Written down value on the first day of previous year							
4	Additions for a period of 180 days or more in the previous year							
5	Consideration or other realization during the previous year out of 3 or 4							
6	Amount on which depreciation at full rate to be allowed(3 + 4 -5) (enter 0, if result is negative)							
7	Additions for a period of less than 180 days in the previous year							
8	Consideration or other realizations during the year out of 7							
9	Amount on which depreciation at half rate to be allowed (7 -8) (enter 0, if result is negative)							
10	Depreciation on 6 at full rate			1771				

11	Depreciation on 9 at half rate						
12	Total depreciation (10+11)						
13	Depreciation disallowed under section 38(2) of the I.T. Act (out of column 12)						
14	Net aggregate depreciation (12-13)						
15	Proportionate aggregate depreciation allowable in the event of succession, amalgamation, demerger etc. (out of column 14)						
16	Expenditure incurred in connection with transfer of asset/ assets						
17	Capital gains/ loss under section 50 (5 + 8 -3-4 -7 -16)* (enter negative only if block ceases to exist)						
18	Written down value on the last day of previous year* (6+ 9 -12)(enter 0 if result is negative)						

Schedule DEP - Summary of depreciation on assets(Other than assets on which full capital expenditure is allowable as deduction under any other section)

1	Plant and machinery						
	a	Block entitled for depreciation @ 15 per cent (Schedule DPM - 17i or 18i as applicable)	1a		516874		
	b	Block entitled for depreciation @ 30 per cent (Schedule DPM - 17ii or 18ii as applicable)	1b		0		
	c	Block entitled for depreciation @ 40 per cent (Schedule DPM - 17iii or 18iii as applicable)	1c		31075		
	d	Block entitled for depreciation @ 45 per cent (Schedule DPM - 17iv or 18iv as applicable)	1d		0		
	e	Total depreciation on plant and machinery (1a + 1b + 1c + 1d)	1e		547949		
2	Building (not including land)						
	a	Block entitled for depreciation @ 5 per cent (Schedule DOA- 14ii or 15ii as applicable)	2a				
	b	Block entitled for depreciation @ 10 per cent (Schedule DOA- 14iii or 15iii as applicable)	2b				
	c	Block entitled for depreciation @ 40 per cent (Schedule DOA- 14iv or 15iv as applicable)	2c				
	d	Total depreciation on building (total of 2a + 2b + 2c)	2d				
3	Furniture and fittings (Schedule DOA- 14v or 15v as applicable)						
4	Intangible assets (Schedule DOA- 14vi or 15vi as applicable)						
5	Ships (Schedule DOA- 14vii or 15vii as applicable)						
6	Total depreciation (1e+2d+3+4+5)						

Schedule DCG - Deemed Capital Gains on sale of depreciable assets

1	Plant and machinery						
	a	Block entitled for depreciation @ 15 per cent (Schedule DPM - 20i)	1a				

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	b	Block entitled for depreciation @ 30 per cent (Schedule DPM – 20ii)	1b	
	c	Block entitled for depreciation @ 40 per cent (Schedule DPM - 20iii)	1c	
	d	Block entitled for depreciation @ 45 per cent (Schedule DPM - 20iv)	1d	
	e	Total (1a +1b + 1c + 1d)	1e	
2	Building (not including land)			
	a	Block entitled for depreciation @ 5 per cent (Schedule DOA- 17ii)	2a	
	b	Block entitled for depreciation @ 10 per cent (Schedule DOA- 17iii)	2b	
	c	Block entitled for depreciation @ 40 per cent (Schedule DOA- 17iv)	2c	
	d	Total (2a + 2b + 2c)	2d	
3	Furniture and fittings (Schedule DOA- 17v)			
4	Intangible assets (Schedule DOA- 17vi)			
5	Ships (Schedule DOA- 17vii)			
6	Total (1e+2d+3+4+5)			

Schedule ESR - Expenditure on scientific Research etc. (Deduction under section 35 or 35CCC or 35CCD)

Sl.No.	Expenditure of the nature referred to in section (1)	Amount, if any, debited to profit and loss account (2)	Amount of deduction allowable (3)	Amount of deduction in excess of the amount debited to profit and loss account (4) = (3) - (2)
i	35(1)(i)			
ii	35(1)(ii)			
iii	35(1)(ia)			
iv	35(1)(iii)			
v	35(1)(iv)			
vi	35(2AA)			
vii	35(2AB)			
viii	35CCC			
ix	35CCD			
x	Total			

Schedule CG-Capital Gains

A	Short-term capital gain (Sub-items 4 & 5 are not applicable for residents)			
Note 1 : Furnishing of PAN is mandatory, if the tax is deduced under section 194-IA. Note 2 : In case of more than one buyer, please indicate the respective percentage share and amount.				
2	From slump sale			
	a	Full value of consideration	2a	0
	b	Net worth of the under taking or division	2b	0
	c	Short term capital gains from slump sale(2a-2b)	A2c	0
4	For NON-RESIDENT, not being an FII- from sale of shares or debentures of an Indian company (to be computed with foreign exchange adjustment under first proviso to section 48)			

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	a	STCG on transactions on which securities transaction tax (STT) is paid	A4a	0
	b	STCG on transactions on which securities transaction tax (STT) is not paid	A4b	0
5	For NON-RESIDENTS- from sale of securities (other than those at A3 above) by an FII as per section 115AD			
	a	i	In case securities sold include shares of a company other than quoted shares, enter the following details	
		a	Full value of consideration received/receivable in respect of unquoted share	5aia 0
		b	Fair market value of unquoted shares determined in the prescribed manner	5aib 0
		c	Full value of consideration in respect of unquoted shares adopted as per section 50CA for the purpose of Capital Gains (higher of a or b)	5aic 0
		ii	Full value of consideration in respect of securities other than unquoted shares	5aia 0
		iii	Total (ic + ii)	5aiii 0
	b	Deductions under section 48		
		i	Cost of acquisition without indexation	bi 0
		ii	Cost of improvement without indexation	bii 0
		iii	Expenditure wholly and exclusively in connection with transfer	biii 0
		iv	Total (i + ii + iii)	biv 0
	c	Balance (5aiii – biv)		5c 0
	d	Loss to be disallowed u/s 94(7) or 94(8)- for example if security bought/acquired within 3 months prior to record date and dividend/income/bonus units are received, then loss arising out of sale of such security to be ignored (Enter positive value only)		5d 0
	e	Short-term capital gain on securities (other than those at A3 above) by an FII (5c +5d)		A5e 0
6	From sale of assets other than at A1 or A2 or A3 or A4 or A5 above			
	a	i	In case assets sold include shares of a company other than quoted shares, enter the following details	
		a	Full value of consideration received/receivable in respect of unquoted share	6aia 0
		b	Fair market value of unquoted shares determined in the prescribed manner	6aib 0
		c	Full value of consideration in respect of unquoted shares adopted as per section 50CA for the purpose of Capital Gains (higher of a or b)	6aic 0
		ii	Full value of consideration in respect of assets other than unquoted shares	6aia 0
		iii	Total (ic + ii)	6aiii 0
	b	Deductions under section 48		
		i	Cost of acquisition without indexation	bi 0
		ii	Cost of Improvement without indexation	bii 0
		iii	Expenditure wholly and exclusively in connection with transfer	biii 0
		iv	Total (i + ii + iii)	biv 0
	c	Balance (6aiii – biv)		6c 0
	d	In case of asset (security/unit) loss to be disallowed u/s 94(7) or 94(8)- for example if asset bought/acquired within 3 months prior to record date and dividend/income/bonus units are received, then loss arising out of sale of such asset to be ignored (Enter positive value only)		6d 0

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e	Deemed short term capital gains on depreciable assets (6 of schedule- DCG)						6e	0				
f	Deduction under section 54D/54G/54GA (Specify details in item D below)						6f					
S. No.		Nature				Amount						
Total						6f	0					
g	STCG on assets other than at A1 or A2 or A3 or A4 or A5 above (6c + 6d + 6e – 6f)						A6g	0				
7	Amount Deemed to be short-term capital gains											
a	Whether any amount of unutilized capital gain on asset transferred during the previous years shown below was deposited in the Capital Gains Accounts Scheme within due date for that year? If yes, then provide the details below										NA	
	Sl.No.	Previous year in which asset transferred	Section under which deduction claimed in that year	New asset acquired/constructed		Amount not used for new asset or remained unutilized in Capital gains account (X)						
				Year in which asset acquired/constructed	Amount utilised out of Capital Gains account							
b	Amount deemed to be short term capital gains u/s 54D/54G/54GA, other than at 'a'											
Total Amount deemed to be short term capital gains (aXi + b)								A7	0			
8	Pass Through Income/loss in the nature of Short Term Capital Gain, (Fill up schedule PTI)(A8a + A8b + A8c)							A8	0			
a	Pass Through Income/loss in the nature of Short Term Capital Gain, chargeable @ 15%							A8a	0			
b	Pass Through Income/loss in the nature of Short Term Capital Gain, chargeable @ 30%							A8b	0			
c	Pass Through Income in the nature of Short Term Capital Gain, chargeable at applicable rates							A8c	0			
9	Amount of STCG included in A1-A8 but not chargeable to tax or chargeable at special rates in India as per DTAA											
	Sl. No.	Amount of income	Item no. A1 to A8 above in which included	Country Name,Code	Article of DTAA	Rate as per Treaty(enter NIL, if not chargeable)	Whether TRC obtained (Y/N)	Section of I.T. Act	Rate as per I.T. Act	Applicable rate [lower of (6) or (9)]		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)		
a	Total amount of STCG not chargeable to tax in India as per DTAA										A9a	0
b	Total amount of STCG chargeable to tax at special rates in India as per DTAA										A9b	0
10	Total short term capital gain (A1e+ A2c+ A3e+ A4a+ A4b+ A5e+ A6g+A7+A8-A9a)										A10	0
B	Long-term capital gain (LTCG) (Sub-items 6, 7 & 8 are not applicable for residents)											
2	From slump sale											
a	Full value of consideration										2a	0
b	Net worth of the under taking or division										2b	0
c	Balance(2a-2b)										2c	0
d	Deduction u/s 54EC										2d	0
e	Long term capital gains from slump sale (2c-2d)										B2e	0
3	From sale of bonds or debenture (other than capital indexed bonds issued by Government)											
a	Full value of consideration										3a	0
b	Deductions under section 48											

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	i	Cost of acquisition without indexation	bi	0
	ii	Cost of improvement without indexation	bii	0
	iii	Expenditure wholly and exclusively in connection with transfer	biii	0
	iv	Total (bi + bii +biii)	biv	0
c	LTCG on bonds or debenture(other than capital indexed bonds issued by Government(3a – biv)		3c	0
4	From sale of i) listed securities (other than a unit) or zero coupon bonds where proviso under section 112(1) is applicable			
a	Full value of consideration		4a	0
b	Deductions under section 48			
	i	Cost of acquisition without indexation	bi	0
	ii	Cost of improvement without indexation	bii	0
	iii	Expenditure wholly and exclusively in connection with transfer	biii	0
	iv	Total (bi + bii +biii)	biv	0
c	Long-term Capital Gains on assets at 7 above in case of NON-REESIDENT (4a – biv)		4c	0
5	From sale of equity share in a company or unit of equity oriented fund or unit of a business trust on which STT is paid under section 112A			
	Long-term Capital Gains on sale of capital assets at B5 above (column 14 of Schedule 112A)			0
6	For NON-RESIDENTS- from sale of shares or debenture of Indian company (to be computed with foreign exchange adjustment under first proviso to section 48)			
a	LTCG computed without indexation benefit		6a	0
8	For NON-RESIDENTS - From sale of equity share in a company or unit of equity oriented fund or unit of a business trust on which STT is paid under section 112A			
	Long-term Capital Gains on assets at B5 above (column 14 of Schedule 115AD(1)(b)(iii)-Proviso)			0
9	From sale of assets where B1 to B8 above are not applicable			
a	i	In case assets sold include shares of a company other than quoted shares, enter the following details		
	a	Full value of consideration received/receivable in respect of unquoted shares	ia	0
	b	Fair market value of unquoted shares determined in the prescribed manner	ib	0
	c	Full value of consideration in respect of unquoted shares adopted as per section 50CA for the purpose of Capital Gains (higher of a or b)	ic	0
	ii	Full value of consideration in respect of assets other than unquoted shares	ii	0
	iii	Total (ic + ii)	iii	0
b	Deductions under section 48			
	i	Cost of acquisition with indexation	bi	0
	ii	Cost of Improvement with indexation	bii	0
	iii	Expenditure wholly and exclusively in connection with transfer	biii	0
	iv	Total (bi + bii + biii)	biv	0
c	Balance (9aiii - biv)		9c	0
d	Deduction under sections 54D/54G/54GA (Specify details in item D below)			
		S. No.	Section	Amount
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		Deduction under sections 54D/54G/54GA (Specify details in item D below)							9d	0	
e		Long-term Capital Gains on assets at B9 above (9c-9d)						B9e	0		
10	Amount deemed to be long-term capital gains										
a		Whether any amount of unutilized capital gain on asset transferred during the previous years shown below was deposited in the Capital Gains Accounts Scheme within due date for that year? If yes, then provide the details below							NA		
		Sl.No.	Previous year in which asset transferred	Section under which deduction claimed in that year	New asset acquired/constructed		Amount not used for new asset or remained unutilized in Capital gains account (X)				
					Year in which asset acquired/constructed	Amount utilised out of Capital Gains account					
b		Amount deemed to be long-term capital gains, other than at 'a'									
		Amount deemed to be long-term capital gains (Xi + b)							B10	0	
11	Pass Through Income/Loss in the nature of Long Term Capital Gain,(Fill up schedule PTI) (B11a+B11b)								B11	0	
	a1	Pass Through Income/ Loss in the nature of Long Term Capital Gain, chargeable @ 10% u/s 112A							B11a1	0	
	a2	Pass Through Income/ Loss in the nature of Long Term Capital Gain, chargeable @ 10% under section other than u/s 112A							B11a2	0	
	b	Pass Through Income/Loss in the nature of Long Term Capital Gain, chargeable @ 20%							B11b	0	
12	Amount of LTCG included in B1- B11 but not chargeable to tax or chargeable at special rates in India as per DTAA (to be taken to schedule SI)										
	Sl. No	Amount of income	Item B1 to B11 above in which included	Country Name, Code	Article of DTAA	Rate as per Treaty (enter NIL, if not chargeable)	Whether Tax Residency Certificate obtained?	Section of I.T. Act	Rate as per I.T. Act	Applicable rate [lower of (6) or (9)]	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	
a	Total amount of LTCG not chargeable to tax under DTAA								B12a	0	
b	Total amount of LTCG chargeable at special rates in India as per DTAA								B12b	0	
13	Total long term capital gain [B1e + B2c + B3c + B4c + B5 + B6 + B7c + B8 + B9e + B10+B11-B12a](In case of loss take the figure to 9xi of schedule CFL)								B13	0	
C	Income chargeable under the head "CAPITAL GAINS" (A10 + B13) (take B13 as nil, if loss)								C	0	
D	Information about deduction claimed										
1		In case of deduction u/s 54D/54EC /54G/54GA give following details									
a		Deduction claimed u/s 54D									
		Sl.No	Date of acquisition of original asset	Cost of purchase/ construction of new land or building for industrial undertaking	Date of purchase of new land or building	Amount deposited in Capital Gains Accounts Scheme before due date	Amount of deduction claimed				
b		Deduction claimed u/s 54EC									

		Sl.No	Date of transfer of original asset	Amount invested in specified/notified bonds (not exceeding fifty lakh rupees)	Date of investment	Amount of deduction claimed				
c	Deduction claimed u/s 54G									
	Sl.No	Date of transfer of original asset	Cost and expenses incurred for purchase or construction of new asset	Date of purchase/construction of new asset in an area other than urban area	Amount deposited in Capital Gains Accounts Scheme before due date	Amount of deduction claimed				
d	Deduction claimed u/s 54GA									
	Sl.No	Date of transfer of original asset	Cost and expenses incurred for purchase or construction of new asset	Date of purchase/construction of new asset in an area other than urban area	Amount deposited in Capital Gains Accounts Scheme before due date	Amount of deduction claimed				
e	Total deduction claimed (1a + 1b + 1c + 1d)				g					
E	Set-off of current year capital losses with current year capital gains (excluding amounts included in A9(a) and B12(a) which is not chargeable under DTAA)									
Sl.No	Type of Capital Gain	Capital Gain of current year (Fill this column only if computed figure is positive)	Short term capital loss set off				Long term capital loss set off			Current year's capital gains remaining after set off (9=1-2-3-4-5-6-7-8)
			15%	30%	applicable rate	DTAA rate	10%	20%	DTAA rate	
		1	2	3	4	5	6	7	8	9
i	Capital Loss to be set off (Fill this row only if figure computed is negative)		0	0	0	0	0	0	0	
ii	Short term capital gain	15%	0		0	0				0
iii		30%	0	0		0				0
iv		applicable rate	0	0	0		0			0
v		DTAA rates	0	0	0	0				0
vi	Long term	10%	0	0	0	0		0	0	0
vii		20%	0	0	0	0	0		0	0

viii	capital gain	DTAA rates	0	0	0	0	0	0	0	0
ix	Total loss set off (ii + iii + iv + v + vi + vii + viii)		0	0	0	0	0	0	0	
x	Loss remaining after set off(i – ix)		0	0	0	0	0	0	0	
F	Information about accrual/receipt of capital gain									
	Type of Capital gain / Date					Upto 15/6 (i)	16/6 to 15/9 (ii)	16/9 to 15/12 (iii)	16/12 to 15/3 (iv)	16/3 to 31/3 (v)
1	Short-term capital gains taxable at the rate of 15% Enter value from item 5vi of schedule BFLA, if any.					0	0	0	0	0
2	Short-term capital gains taxable at the rate of 30% Enter value from item 5vii of schedule BFLA, if any.					0	0	0	0	0
3	Short-term capital gains taxable at applicable rates Enter value from item 5viii of schedule BFLA, if any.					0	0	0	0	0
4	Short-term capital gains taxable at DTAA rates Enter value from item 5ix of schedule BFLA, if any.					0	0	0	0	0
5	Long- term capital gains taxable at the rate of 10% Enter value from item 5x of schedule BFLA, if any. Enter value from item 3vi of schedule BFLA, if any.					0	0	0	0	0
6	Long- term capital gains taxable at the rate of 20% Enter value from item 5xi of schedule BFLA, if any.					0	0	0	0	0
7	Long-term capital gains taxable at DTAA rates Enter value from item 5xii of schedule BFLA, if any.					0	0	0	0	0

Note:Please include the income of the specified persons referred to in Schedule SPI while computing the income under this head

Tool-112A - From sale of equity share in a company or unit of equity oriented fund or unit of a business trust on which STT is paid under section 112A

Sl. No	Share/ Unit	ISIN Code	Name of the Share/ Unit	No. of Shares/ Units	Sale- price per Share/ Unit	Full Value of Consideration If shares/ units are acquired on or before 31st January, 2018 (Total	Cost of acquisition without indexation (higher of 8 or 9)	Cost of acquisition	If the long term capital asset was acquired before 01.02.2018, lower of 11 &	Fair Market Value per share/ unit as on 31st January, 2018	Total Fair Market Value as on 31st January, 2018 of capital asset as per section 55(2)(ac)-(4*10)	Expenditure wholly and exclusively in connection with transfer	Total deduct ions (7 + 12)	Balance (6-13) -Item 5 of LTCG Schedule CG
	Acquired													

						Sale Value) (4*5) or If shares/ units are acquired after 31st January, 2018 - Please enter Full Value of Considera tion								
(1)	(1a)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
Total														

Tool-115AD (1)(iii)(p) -For NON-RESIDENTS - From sale of equity share in a company or unit of equity oriented fund or unit of a business trust on which STT is paid under section 112A

Sl. No	Share/ Unit Acquired	ISIN Code	Name of the Share/ Unit	No. of Shares/ Units	Sale- price per Share/ Unit	Full Value of Consideration If shares/ units are acquired on or before 31st January, 2018 (Total Sale Value) (4*5) or If shares/ units are acquired after 31st	Cost of acquisition without indexation (higher of 8 or 9)	Cost of acquisition	If the long term capital asset was acquired before 01.02.2018, 11 & 6	Fair Market Value per share/ unit as on 31st January, 2018	Total Fair Market Value as on 31st January, 2018 of capital asset as per section 55(2)(ac)-(4*10)	Expenditure wholly and exclusively in connection with transfer	Total deduct ions (7+12)	Balance (6-13) -Item 8 of LTCG Schedule CG

						January, 2018 - Please enter Full Value of Considera tion								
(1)	(1a)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
Total														

Schedule OS: Income from other sources

1	Gross income chargeable to tax at normal applicable rates (1a+ 1b+ 1c+ 1d + 1e)			1	96248
	a	Dividend, Gross [(not exempt u/s 10(34) and 10(35)]		1a	0
	b	Interest, Gross(bi + bii + biii + biv + bv)		1b	96248
	bi	From Savings Bank		1bi	0
	bii	From Deposit (Bank/ Post Office/ Co-operative Society)		1bii	96248
	biii	From Income Tax Refund		1biii	0
	biv	In the nature of Pass through income/loss		1biv	0
	bv	Others		1bv	0
	c	Rental income from machinery, plants, buildings, etc., Gross		1c	0
	d	Income of the nature referred to in section 56(2)(x) which is chargeable to tax (di + dii + diii + div + dv)		1d	0
	di	Aggregate value of sum of money received without consideration		1di	0
	dii	In case immovable property is received without consideration, stamp duty value of property		1dii	0
	dihi	In case immovable property is received for inadequate consideration, stamp duty value of property in excess of such consideration		1diii	0
	div	In case any other property is received without consideration, fair market value of property		1div	0
	dv	In case any other property is received for inadequate consideration, fair market value of property in excess of such consideration		1dv	0
	1e	Any other income (please specify nature)			0
		SL No	Nature	Amount	
		Total			0
2	Income chargeable at special rates (2a+ 2b+ 2c+ 2d + 2e)			2	0
	a	Income by way of winnings from lotteries, crossword puzzles etc.		0	
	b		Income chargeable u/s 115BBE (bi + bii + biii + biv+ bv + bvi)	0	
		i	Cash credits u/s 68	0	
		ii	Unexplained investments u/s 69	0	
		iii	Unexplained money etc. u/s 69A	0	
		iv	Undisclosed investments etc. u/s 69B	0	

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	v	Unexplained expenditure etc. u/s 69C								0
	vi	Amount borrowed or repaid on hundi u/s 69D								0
c	Any other income chargeable at special rate (total of ci to cxix)								0	
	SL No	Nature							Amount	
d	Pass through income in the nature of income from other sources chargeable at special rates								0	
	SL No	Nature							Amount	
e	Amount included in 1 and 2 above, which is chargeable at special rates or not chargeable to tax in India as per DTAA (total of column (2) of table below)								0	
	Sl.No (1)	Amount of income (2)	Item No. 1a to 1d, 2a, 2c & 2d in which included	Country Name, Code (4)	Article of DTAA (5)	Rate as per Treaty (enter NIL, if not chargeable) (6)	Whether TRC obtained(Y/N) (7)	Section of I.T. Act (8)	Rate as per I.T. Act (9)	Applicable rate [lower of (6) or (9)] (10)
3	Deductions under section 57:- (other than those relating to income chargeable at special rates under 2a, 2b & 2d)									
	a	Expenses / Deductions							a	0
	b	Depreciation							b	0
	c	Total							c	0
4	Amounts not deductible u/s 58							4	0	
5	Profits chargeable to tax u/s 59							5	0	
6	Net Income from other sources chargeable at normal applicable rates 1(after reducing income related to DTAA portion)-3+4+5 (If negative take the figure to 4i of schedule CYLA)							6	96248	
7	Income from other sources (other than from owning & maintaining race horses)(2+6) (enter 6 as nil, if negative)							7	96248	
8	Income from the activity of owning race horses									
	a	Receipts							8a	0
	b	Deductions under section 57 in relation to receipts at 8a only							8b	0
	c	Amounts not deductible u/s 58							8c	0
	d	Profits chargeable to tax u/s 59							8d	0
	e	Balance (8a - 8b + 8c + 8d) (if negative take the figure to 10xii of Schedule CFL)							8e	0
9	Income under the head "Income from other sources" (7+8e) (take 8e as nil if negative)							9	96248	
10	Information about accrual/receipt of income from Other Sources									
	S. No.	Other Source Income				Upto 15/6(i)	From 16/6 to 15/9(ii)	From 16/9 to 15/12(iii)	From 16/12 to 15/3(iv)	From 16/3 to 31/3(v)
	1	Dividend Income u/s 115BBDA				0	0	0	0	0
	2	Income by way of winnings from lotteries, crossword puzzles, races, games, gambling, betting etc. referred to in section 2(24)(ix)				0	0	0	0	0

NOTE: Please include the income of the specified persons referred to in Schedule SPI while computing the income under this head.

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Schedule CYLA-Details of Income after set-off of current years losses						
Sl.No.	Head/ Source of Income	Income of current year (Fill this column only if income is zero or positive)	House property loss of the current year set off Total loss(4 of Schedule – HP)	Business Loss (other than speculation loss or Income from life insurance business u/ s 115B or specified business loss) of the current year set off (2v of item E of Schedule BP)	Other sources loss (other than loss from race horses) of the current year set off Total loss (6) of Schedule-OS	Current year's Income remaining after set off
		1	2	3	4	5=1-2-3-4
i	Loss to be set off (Fill this row only if computed figure is negative)		0	0	0	
ii	House property	0		0	0	0
iii	Income from Business (excluding Profit and gains from life insurance business u/s 115B or speculation profit and income from specified business) or profession	383354	0		0	383354
iv	Profit and gains from life insurance business u/s 115B	0	0		0	0
v	Speculation Income	0	0		0	0
vi	Specified business income u/s 35AD	0	0		0	0
vii	Short-term capital gain taxable @ 15%	0	0	0	0	0
viii	Short-term capital gain taxable @ 30%	0	0	0	0	0
ix	Short-term capital gain taxable at applicable rates	0	0	0	0	0

x	Short-term capital gain taxable at special rates in India as per DTAA rates	0	0	0	0	0
xi	Long term capital gain taxable @ 10%	0	0	0	0	0
xii	Long term capital gain taxable @ 20%	0	0	0	0	0
xiii	Long term capital gains taxable at special rates in India as per DTAA rates	0	0	0	0	0
xiv	Net income from Other sources chargeable at normal applicable rates	96248	0	0		96248
xv	Profit from owning and maintaining race horses	0	0	0	0	0
xvi	Other sources income taxable at special rates as per DTAA rates	0	0	0	0	0
xvii	Total loss set-off		0	0	0	
xviii	Loss remaining after set-off (i - xvii)		0	0	0	

Schedule BFLA-Details of Income after Set off of Brought Forward Losses of earlier years

Sl.No	Head/ Source of Income	Income after set off, if any, of current year's losses as per 5 of Schedule CYLA	Brought forward loss set off	Brought forward depreciation set off	Brought forward allowance under section 35(4) set off	Current year's income remaining after set off
		1	2	3	4	5
i	House property	0	0	0	0	0
ii	Business (excluding Profit and gains from life insurance business u/s 115B or speculation profit and income from specified business)	383354	0	0	0	383354
iii	Profit and gains from life insurance business u/s 115B	0	0	0	0	0
iv	Speculation Income	0	0	0	0	0
v	Specified Business Income	0	0	0	0	0
vi	Short-term capital gain taxable at 15%	0	0	0	0	0
vii	Short-term capital gain taxable at 30%	0	0	0	0	0
viii	Short-term capital gain taxable at applicable rates	0	0	0	0	0

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ix	Short-term capital gain taxable at special rates in India as per DTAA	0	0	0	0	0
x	Long term capital gain taxable at 10%	0	0	0	0	0
xi	Long term capital gain taxable at 20%	0	0	0	0	0
xii	Long term capital gains taxable at special rates in India as per DTAA	0	0	0	0	0
xiii	Net income from other sources chargeable at normal applicable rates	96248		0	0	96248
xiv	Profit from the activity of owning and maintaining race horses	0	0	0	0	0
xv	Income from other sources income taxable at special rates in India as per DTAA	0		0	0	0
xii	Total of brought forward loss set off		0	0	0	
xiii	Current year's income remaining after set off Total (i5 + ii5 + iii5 + iv5 + v5+ vi5+ vii5+ viii5+ ix5 + x3 + xi3 + xii5 + xiii5 + xiv5 + xv5)					479602

Schedule CFL:Details of Losses to be carried forward to future years

Sl.No	Assessment Year	Date of Filing (DD/MM/YYYY)	House property loss			Loss from business other than loss from speculative Business , specified business & Insurance business as referred in section 115B			Loss from speculative Business	Loss from specified business	Loss from Life insurance business u/s 115B	Short-term capital loss			Long-term Capital loss			Loss from owning and maintaining race horses
1	2	3	4			5			6	7	8	9			10			11
			House property loss (4a)	PTI (4b)	Total (4c=4a+4b)	Brought forward loss as adjusted on business account of opting for taxation under section 115BAA/115BA (5b)	Amount as brought forward loss available for set off during the year (5c)				Normal (9a)	PTI (9b)	Total (9c=9a+9b)	Normal (10a)	PTI (10b)	Total (10c=10a+10b)		
i	2010-11																	
ii	2011-12																	
iii	2012-13																	
iv	2013-14																	
v	2014-15																	

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vi	2015-16																
vii	2016-17																
viii	2017-18																
ix	2018-19																
x	2019-20																
xi	Total of earlier year losses b/f																
xii	Loss distributed among the unit holder (Applicable for Investment Fund only)																
xiii	Balance available of Total of earlier year b/f (xi-xii)																
xiv	Adjustment of above losses in Schedule BFLA																
xv	2020-21 (Current year losses)																
xvi	Total loss Carried Forward to future years																
xvii	Current year loss distributed																

among the unit-holder (Applicable for Investment fund only)																	
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Schedule UD - Unabsorbed depreciation and allowance under section 35(4)

Sl.No (1)	Assessment Year (2)	Depreciation			Allowance under section 35(4)			
		Amount of brought forward unabsorbed depreciation (3)	Amount as adjusted on account of opting for taxation under section 115BAA (3a)	Amount of depreciation set-off against the current year income (4)	Balance Carried forward to the next year (5)	Amount of brought forward unabsorbed allowance (6)	Amount of allowance set-off against the current year income (7)	Balance Carried forward to the next year (8)
1	2020-21				0			0
	Total	0	0	0	0	0	0	0

Schedule ICDS - Effect of Income Computation Disclosure Standards (ICDS) on profit

Sl.No.	ICDS	Amount (+) or (-)
(i)	(ii)	(iii)
I	Accounting Policies	
II	Valuation of Inventories (other than the effect of change in method of valuation u/s 145A, if the same is separately reported at col. 4d or 4e of Part A-OI)	
III	Construction Contracts	
IV	Revenue Recognition	
V	Tangible Fixed Assets	
VI	Changes in Foreign Exchange Rates	
VII	Government Grants	
VIII	Securities (other than the effect of change in method of valuation u/s 145A, if the same is separately reported at col. 4d or 4e of Part A-OI)	
IX	Borrowing Costs	
X	Provisions, Contingent Liabilities and Contingent Assets	
11a	Total effect of ICDS adjustments on profit (I+II+III+IV+V+VI+VII+VIII+IX+X) (if positive)	
11b	Total effect of ICDS adjustments on profit (I+II+III+IV+V+VI+VII+VIII+IX+X) (if negative)	

Schedule 10A - Deduction under section 10A**Deduction in respect of units located in Special Economic Zone**

Sl.No.	Undertaking	Assessment year in which unit begins to manufacture/produce/provide services	Amount of deduction
Total deduction under section 10A(a+b)			

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Schedule 10AA -Deduction under section 10AA										
Deduction in respect of units located in Special Economic Zone										
Sl.No.	Undertaking	Assessment year in which unit begins to manufacture/produce/provide services						Amount of deduction		
Total deduction under section 10AA (In case deduction is claimed u/s 10AA, please fill sl no "B" of schedule DI)										
Schedule 80G:Details of donation entitled for deduction under Section 80G										
A. Donations entitled for 100% deduction without qualifying limit										
Sl.No.	Name of donee	Address Detail	City or Town or District	State Code	PinCode	PAN of Donee	Amount of donation			Eligible
							Donation in cash	Donation in other mode	Total Donation	Amount of Donation
Total A										
B.Donations entitled for 50% deduction without qualifying limit										
Sl.No.	Name of donee	Address Detail	City or Town or District	State Code	PinCode	PAN of Donee	Amount of donation			Eligible
							Donation in cash	Donation in other mode	Total Donation	Amount of Donation
Total B										
C. Donations entitled for 100% deduction subject to qualifying limit										
Sl.No.	Name of donee	Address Detail	City or Town or District	State Code	PinCode	PAN of Donee	Amount of donation			Eligible
							Donation in cash	Donation in other mode	Total Donation	Amount of Donation
Total C										
D. Donations entitled for 50% deduction subject to qualifying limit										
Sl.No.	Name of donee	Address Detail	City or Town or District	State Code	PinCode	PAN of Donee	Amount of donation			Eligible
							Donation in cash	Donation in other mode	Total Donation	Amount of Donation
Total D										
E. Total Amount of Donations (Aix + Bix + Cix + Dix)										
F.Total Eligible amount of Donations (A + B + C + D)										
Schedule 80GGA - Details of donations for scientific research or rural development										

S.No	Relevant Clause under which deduction is claimed	Name of Donee	Address	City Or Town Or District	State Code	Pin Code	PAN of Donee	Amount of Donation			Eligible Amount of Donation
								Donation in Cash	Donation in Other Mode	Total Donation	
Donation in cash											
Donation in other mode											
Total Donation											
Eligible Amount of Donation											

Schedule RA Details of donations to research associations etc.

[deduction under sections 35(1)(ii) or 35(1)(iia) or 35(1)(iii) or 35(2AA)]

S No.	Name of donee	Address Detail	City or Town or District	State Code	PinCode	PAN of Donee	Amount of donation			Eligible Amount of Donation
							Donation in cash	Donation in other mode	Total Donation	
Total A										

Schedule 80-IA - Deductions under section 80-IA

a	Deduction in respect of profits of an enterprise referred to in section 80-IA(4)(i) [Infrastructure facility]								
b	Deduction in respect of profits of an undertaking referred to in section 80-IA(4)(ii) [Telecommunication services]								
c	Deduction in respect of profits of an undertaking referred to in section 80-IA(4)(iii) [Industrial park and SEZs]								
d	Deduction in respect of profits of an undertaking referred to in section 80-IA(4)(iv) [Power]								
e	Deduction in respect of profits of an undertaking referred to in section 80-IA(4)(v) [Revival of power generating plant] and deduction in respect of profits of an undertaking referred to in section 80-IA(4)(vi) [Cross-country natural gas distribution network]								
f	Total deductions under section 80-IA (a + b + c + d + e)								f

Sch 80- IB Deductions under Section 80-IB

a	Deduction in respect of industrial undertaking located in Jammu and Kashmir or Ladakh [Section 80-IB(4)]								
b	Deduction in respect of industrial undertaking located in industrially backward states specified in Eighth Schedule [Section 80-IB(4)]								
c	Deduction in respect of industrial undertaking located in industrially backward districts [Section 80-IB(5)]								
d	Deduction in the case of multiplex theatre [Section 80-IB(7A)]								
e	Deduction in the case of convention centre [Section 80-IB(7B)]								
f	Deduction in the case of company carrying on scientific research [Section 80-IB(8A)]								
g	Deduction in the case of undertaking which begins commercial production or refining of mineral oil [Section 80-IB(9)]								
h	Deduction in the case of an undertaking developing and building housing projects [Section 80-IB(10)]								
i	Deduction in the case of an undertaking operating a cold chain facility [Section 80-IB(11)]								
j	Deduction in the case of an undertaking engaged in processing, preservation and packaging of fruits, vegetables, meat, meat products, poultry, marine or dairy products [Section 80-IB(11A)]								

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k	Deduction in the case of an undertaking engaged in integrated business of handling, storage and transportation of foodgrains [Section 80-IB(11A)]	
l	Deduction in the case of an undertaking engaged in operating and maintaining a rural hospital [Section 80-IB(11B)]	
m	Deduction in the case of an undertaking engaged in operating and maintaining a hospital in any area, other than excluded area [Section 80-IB(11C)]	
n	Total deduction under section 80-IB (Total of a1 to m2)	n
Sch 80-IC or 80-IE Deductions under section 80-IC or 80-IE		
a	Deduction in respect of undertaking located in Sikkim	
b	Deduction in respect of undertaking located in Himachal Pradesh	
c	Deduction in respect of undertaking located in Uttaranchal	
d	Deduction in respect of undertaking located in North-East	
da	Assam	
db	Arunachal Pradesh	
dc	Manipur	
dd	Mizoram	
de	Meghalaya	
df	Nagaland	
dg	Tripura	
dh	Total deduction for undertakings located in North-east (total of da1 to dg2)	dh
e	Total deduction under section 80-IC or 80-IE (a + b + c + dh)	e
Deductions under Chapter VI-A		
1. Part B- Deduction in respect of certain payments		
Whether, you have made any investment/ deposit/ payments between 01.04.2020 to 31.07.2020 for the purpose of claiming any deduction under Part B of Chapter VIA? (If yes, please fill sl no "A" of schedule DI)		No
a	80G - Donations to certain funds, charitable institutions, etc.(Please fill 80G Schedule. This field is auto-populated from schedule.)	0
b	80GGB - Contribution given by companies to political parties	0
c	80GGA - Certain donations for scientific research or rural development(Please fill 80GGA Schedule. This field is auto-populated from schedule.)	0
d	80GGC - Donation to Political party	0
	Total Deduction under Part B (a + b + c + d)	0
2. Part C- Deduction in respect of certain incomes		
e	80-IA (f of Schedule 80-IA) - Profits and gains from industrial undertakings or enterprises engaged in infrastructure development, etc.	0

f	80-IAB - Profits and gains by an undertaking or enterprise engaged in development of Special Economic Zone		0
g	80-IAC - Special provision in respect of specified business		0
h	80-IB (n of Schedule 80-IB)- Profits and gains from certain industrial undertakings other than infrastructure development undertakings	0	0
i	80-IBA - Profits and gains from housing projects	0	0
j	80-IC/ 80-IE (e of Schedule 80-IC/ 80-IE)-Special provisions in respect of certain undertakings or enterprises in certain special category States/ North-Eastern States.	0	0
k	80JJA-Profits and gains from business of collecting and processing of bio-degradable waste.	0	0
l	80JJAA-Employment of new employees	0	0
m	80LA(1)-Certain Income Of Offshore Banking Units	0	0
n	80LA(1A)-Certain Income Of International Financial Services Centre	0	0
o	80PA- Income of co-operative societies		
	Total Deduction under Part C (total of e to o)	0	0
3	Total deductions under Chapter VI-A (1 + 2)	0	0

Schedule SI-Income chargeable to tax at special rates [Please see instruction Number-7(ii) for section and rate of tax]

Sl.No.	Section/Description	Special rate (%)	Income (i)	Tax thereon (ii)
	Total			

Schedule EI-Details of Exempt Income (Income not to be included in Total Income or not chargeable to tax)

1	Interest income			1		
2	Dividend income			2		
3	i	Gross Agricultural receipts (other than income to be excluded under rule 7A, 7B or 8 of I.T. Rules)		i		
	ii	Expenditure incurred on agriculture		ii		
	iii	Unabsorbed agricultural loss of previous eight assessment years		iii		
	iv	Agricultural income portion relating to Rule 7, 7A, 7B(1), 7B(2) and 8 (from Sl. No. 40 of Sch. BP)		iv		
	v	Net Agricultural income for the year (i – ii – iii + iv) (enter nil if loss)		4		
	vi	In case the net agricultural income for the year exceeds Rs.5 lakh, please furnish the following details				
		Sl.No.	Name of district along with pin code in which agricultural land is located	Measurement of agricultural land in Acre	Whether the agricultural land is owned or held on lease	Whether the agricultural land is irrigated or rain-fed
			Name of district. Pin code			
4	Other exempt income (please specify)					
	Sl.No.	Nature of Income			Amount	
	Total			4		

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5	Income not chargeable to tax as per DTAA								
	Sl.No.	Amount of Income	Nature of Income	Country name & code	Article of DTAA	Head of Income	Whether TRC obtained		
	Total Income from DTAA not chargeable to tax					5			
6	Pass through income not chargeable to tax (Schedule PTI)					6			
7	Total (1 + 2 + 3(v) + 4 + 5 +6)					7			
Schedule PTI - Pass Through Income details from business trust or investment fund as per section 115UA,115UB									
Sl	Investment entity covered by section 115UA/115UB	Name of business trust/ investment fund	PAN of the business trust/ investment fund	Sl	Head of income	Current year income	Share of current year loss distributed by Investment fund (8)	Net Income/ Loss 9=7-8	TDS on such amount,if any
NOTE : Please refer to the instructions for filling out this schedule									
Schedule MAT - Computation of Minimum Alternate Tax payable under section 115JB									
1	Whether the Profit and Loss Account is prepared in accordance with the provisions of Parts II of Schedule III to the Companies Act, 2013 (If yes, write 'Y', if no write 'N')						Yes		
2	If 1 is no, whether profit and loss account is prepared in accordance with the provisions of the Act governing such company (If yes, write 'Y', if no write 'N')								
3	Whether, for the Profit and Loss Account referred to in item 1 above, the same accounting policies, accounting standards and same method and rates for calculating depreciation have been followed as have been adopted for preparing accounts laid before the company at its annual general body meeting? (If yes, write 'Y', if no write 'N')						Yes		
4	Profit after tax as shown in the Profit and Loss Account (enter item 56 of Part A-P&L)/(enter item 56 of Part A- P&L Ind AS) (as applicable)					4	0		
5	Additions (if debited in profit and loss account)								
a	Income-tax paid or payable or its provision including the amount of deferred tax and the provision thereof					5a	0		
b	Reserve (except reserve under section 33AC)					5b	0		
c	Provisions for unascertained liability					5c	0		
d	Provisions for losses of subsidiary companies					5d	0		
e	Dividend paid or proposed					5e	0		
f	Expenditure related to exempt income under sections 10, 11 or 12 [exempt income excludes income exempt under section 10(38)]					5f	0		
g	Expenditure related to share in income of AOP/ BOI on which no income-tax is payable as per section 86					5g	0		

	h	Expenditure in case of foreign company referred to in clause (fb) of explanation 1 to section 115JB	5h	0
	i	Notional loss on transfer of certain capital assets or units referred to in clause (fc) of explanation 1 to section 115JB	5i	0
	j	Expenditure relatable to income by way of royalty in respect of patent chargeable to tax u/s 115BBF	5j	0
	k	Depreciation attributable to revaluation of assets	5k	0
	l	Gain on transfer of units referred to in clause (k) of explanation 1 to section 115JB	5l	0
	m	Others (including residual unadjusted items and provision for diminution in the value of any asset)	5m	0
	n	Total additions (5a+5b+5c+5d+5e+5f+5g+5h+5i+5j+5k+5l+5m)	5n	0
6	Deductions			
	a	Amount withdrawn from reserve or provisions if credited to Profit and Loss account	6a	0
	b	Income exempt under sections 10, 11 or 12 [exempt income excludes income exempt under section 10(38)]	6b	0
	c	Amount withdrawn from revaluation reserve and credited to profit and loss account to the extent it does not exceed the amount of depreciation attributable to revaluation of asset	6c	0
	d	Share in income of AOP/ BOI on which no income-tax is payable as per section 86 credited to Profit and Loss account	6d	0
	e	Income in case of foreign company referred to in clause (iid) of explanation 1 to section 115JB	6e	0
	f	Notional gain on transfer of certain capital assets or units referred to in clause (iie) of explanation 1 to section 115JB	6f	0
	g	Loss on transfer of units referred to in clause (iif) of explanation 1 to section 115JB	6g	0
	h	Income by way of royalty referred to in clause (iig) of explanation 1 to section 115JB	6h	0
	i	Loss brought forward or unabsorbed depreciation whichever is less or both as may be applicable	6i	0
	j	Profit of sick industrial company till net worth is equal to or exceeds accumulated losses	6j	0
	k	Others (including residual unadjusted items and the amount of deferred tax credited to P&L A/c)	6k	0
	l	Total deductions (6a+6b+6c+6d+6e+6f+6g+6h+6i+6j+6k)	6l	0
7	Book profit under section 115JB (4+ 5n – 6l)			0
8	Whether the financial statements of the company are drawn up in compliance to the Indian Accounting Standards (Ind-AS) specified in Annexure to the companies (Indian Accounting Standards) Rules, 2015. If yes, furnish the details below:-			N
	A. Additions to book profit under sub-sections (2A) to (2C) of section 115JB			

	a	Amounts credited to other comprehensive income in statement of profit & loss under the head "items that will not be reclassified to profit & loss"	8	0
	b	Amounts debited to the statement of profit & loss on distribution of non-cash assets to shareholders in a demerger	8	0
	c	One fifth of the transition amount as referred to in section 115JB (2C) (if applicable)	8	0
	d	Others (including residual adjustment)	8	0
	e	Total additions (8a + 8b + 8c + 8d)	8	0
B. Deductions from book profit under sub-sections (2A) to (2C) of section 115JB				
	f	Amounts debited to other comprehensive income in statement of profit & loss under the head "items that will not be reclassified to profit & loss"	8f	0
	g	Amounts credited to the statement of profit & loss on distribution of non-cash assets to shareholders in a demerger	8g	0
	h	One fifth of the transition amount as referred to in section 115JB (2C) (if applicable)	8h	0
	i	Others (including residual adjustment)	8i	0
	j	Total deductions (8f + 8g + 8h + 8i)	8j	0
9	Deemed total income under section 115JB (7 + 8e – 8j)		9	0
10	Tax payable under section 115JB		10	0

Schedule MATC - Computation of tax credit under section 115JAA

1	Tax under section 115JB in assessment year 2020-21 (1d of Part-B-TTI)					1	0
2	Tax under other provisions of the Act in assessment year 2020-21 (2f of Part-B-TTI)					2	0
3	Amount of tax against which credit is available [enter (2 – 1) if 2 is greater than 1, otherwise enter 0]					3	0
4	Utilisation of MAT credit Available [Sum of MAT credit utilized during the current year is subject to maximum of amount mentioned in 3 above and cannot exceed the sum of MAT Credit Brought Forward]						
	Sl.No.	Assessment Year (A)	MAT Credit			MAT Credit Utilised during the Current Year (C)	Balance MAT Credit Carried Forward (D)= (B3) - (C)
			Gross (B1)	Set-off in earlier years (B2)	Balance Brought forward (B3)=(B1)- (B2)		
	xiii	2020-21 (enter 1 -2, if 1>2 else enter 0)	0				0
	xiv	Total	0	0	0	0	0
5	Amount of tax credit under section 115JAA utilised during the year [enter 4(C)xii]					5	0
6	Amount of MAT liability available for credit in subsequent assessment years [enter 4(D)xii]					6	0

Schedule DDT - Details of tax on distributed profits of domestic companies and its payment

	1	2	3	4	5	6	7	8	9	10
Sl.No	Section	Date of declaration or	Rate of Dividend, declared,	Amount of dividend	Amount of reduction	Tax payable on dividend declared, distributed or paid	Interest payable under	Additional income- tax and	Tax And Interest Paid	Net payable/
	Under which									

	dividend is being declared	distribution or payment, whichever is earliest, of dividend by domestic company	distributed or paid	declared, distributed or paid	as per section 115-O(1A)	Additional Income-tax @15% or 30% as applicable under section 115-O (4-5)(5a)	Surcharge on "a" (5b)	Health & Education Cess on (a +b)(5c)	Total tax payable (a + b + c)) (5d)	section 115P	interest payable (6d + 7)		refundable (8-9)
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Schedule BBS - Details of tax on distributed income of a domestic company on buy back of shares

	1	2	3	4	5				6	7	8	9
Sl.No	Date of payments of any consideration to the shareholder on buy back of share	Amount of consideration paid by the company on buy-back of shares	Amount received by the company for issue of such shares	Distributed Income of the company (2 – 3)	Tax payable on distributed income				Interest payable under section 115QB	Additional income-tax and interest payable (5d + 6)	Tax and Interest Paid	Net payable/ refundable (7-8)
					Additional income-tax @20% payable under section 115QA on 4 (5a)	Surcharge on "a" (5b)	Health & Education Cess on (a +b)(5c)	Total tax payable (a + b + c)) (5d)				

Schedule TPSA: Details of Tax on secondary adjustments as per section 92CE(2A)

1	Amount of primary adjustment on which option u/s 92CE(2A) is exercised & such excess money has not been repatriated within the prescribed time		
2	a	Additional Income tax payable @ 18% on above	
	b	Surcharge @ 12% on “a”	
	c	Health & Education cess on (a+b)	
	d	Total Additional tax payable (a+b+c)	
3	Taxes paid		
4	Net tax payable (2d-3)		

Details of Taxes Paid

Sl.No.	BSR Code	Name of Bank and Branch	Date of Deposit (DD/MM/YYYY)	Serial number of challan	Amount
Amount deposited					

Schedule FSI - Details of Income from outside India and tax relief (available only in case of resident)

Sl		Country Code	Taxpayer Identification Number	Sl.No.	Head of income	Income from outside India(included in PART B-TI)	Tax paid outside India	Tax payable on such income under normal provisions in India	Tax relief available in India(e)=(c) or (d) whichever is lower	Relevant article of DTAA if relief claimed u/s 90 or 90A
					(a)	(b)	(c)	(d)	(e)	(f)

Note: Please refer to the instructions for filling out this schedule

Schedule TR - Summary of tax relief claimed for taxes paid outside India (available only in case of resident)

1	Details of Tax Relief claimed					
	Sl.No	Country Code	Taxpayer Identification Number	Total taxes paid outside India (total of (c) of Schedule FSI in respect of each country)	Total tax relief available(total of (e) of Schedule FSI in respect of each country)	Tax Relief Claimed under section (specify 90, 90A or 91)
		(a)	(b)	(c)	(d)	(e)
	Total					
2	Total Tax relief available in respect of country where DTAA is applicable (section 90/90A) (Part of total of 1(d))				2	
3	Total Tax relief available in respect of country where DTAA is not applicable (section 91) (Part of total of 1(d))				3	
4	Whether any tax paid outside India, on which tax relief was allowed in India, has been refunded/credited by the foreign tax authority during the year? If yes, provide the details below				4	
4a	Amount of tax refunded				4a	
4b	Assessment year in which tax relief allowed in India				4b	

Note:Please refer to the instructions for filling out this schedule.

Schedule FA - Details of Foreign Assets and Income from any source outside India

A1	Details of Foreign Depository Accounts held (including any beneficial interest) at any time during the relevant accounting period)										
Sl.No.	Country	Name of the	Address of	Zip	Account	Status (7)	Account	Peak Balance During	Closing	Gross interest paid/	
(1)	Name	financial	the financial	Code(5)	Number		opening	the period (in rupees)	balance	credited to the	
	and Code	institution(3)	institution(4)		(6)		date (8)	(9)	(10)	account during the	
	(2)									period(11)	
A2	Details of Foreign Custodial Accounts held (including any beneficial interest) at any time during the relevant accounting period										
Sl.No.	Country	Name of the	Address of	ZIP	Account	Status(7)	Account	Peak	Closing	Gross amount paid/credited	
(1)	Name and	financial	the financial	Code(5)	Number(6)		opening	Balance	balance(10)	to the account during the	
	code(2)	institution(3)	institution(4)				date(8)	During the		period(11)	
								Period(9)			
										Nature	Amount
A3	Details of Foreign Equity and Debt Interest held (including any beneficial interest) in any entity at any time during the relevant accounting period										

Sl.No. (1)	Country Name and code(2)	Name of entity(3)	Address of entity(4)	ZIP Code(5)	Nature of entity(6)	Date of acquiring the interest(7)	Initial value of the investment(8)	Peak value of investment During the Period(9)	Closing balance(10)	Total gross amount paid/ credited with respect to the holding during the period(11)	Total gross proceeds from sale or redemption of investment during the period(12)		
A4	Details of Foreign Cash Value Insurance Contract or Annuity Contract held (including any beneficial interest) at any time during the relevant accounting period												
Sl.No. (1)	Country Name and code(2)	Name of financial institution in which insurance contract held(3)		Address of the financial institution(4)		ZIP Code(5)		Date of contract(6)		The cash value or surrender value of the contract(7)		Total gross amount paid/credited with respect to the contract during the period(8)	
B	Details of Financial Interest in any Entity held (including any beneficial interest) at any time during the relevant accounting period												
Sl.No. (1)	Country Name and Code (2a)	Zip Code (2b)	Nature of entity (3)	Name of the Entity (4a)	Address of the Entity (4b)	Nature of Interest (5)	Date since held (6)	Total Investment (at cost) (in rupees) (7)	Income accrued from such Interest(8)	Nature of Income (9)	Income taxable and offered in this return		
											Amount (10)	Schedule where offered (11)	Item number of schedule (12)
C	Details of Immovable Property held (including any beneficial interest) at any time during the relevant accounting period												
Sl.No. (1)	Country Name and Code(2a)	Zip Code(2b)	Address of the Property (3)	Ownership (4)	Date of acquisition (5)	Total Investment (at cost) (in rupees) (6)	Income derived from the property (7)	Nature of Income (8)	Income taxable and offered in this return				
									Amount (9)	Schedule where offered (10)	Item number of schedule (11)		
D	Details of any other Capital Asset held (including any beneficial interest) at any time during the relevant accounting period												
Sl.No. (1)	Country Name and Code(2a)	Zip Code(2b)	Nature of Asset (3)	Ownership (4)	Date of acquisition (5)	Total Investment (at cost) (in rupees) (6)	Income derived from the property (7)	Nature of Income (8)	Income taxable and offered in this return				
									Amount (9)	Schedule where offered (10)	Item number of schedule (11)		
E	Details of account(s) in which you have signing authority held (including any beneficial interest) at any time during the relevant accounting period and which has not been included in A to D above.												

Sl.No. (1)	Name of the Institution in which the account is held (2)	Address of the Institution (3a)	Country Code and Name (3b)	Zip Code (3c)	Name of the account holder (4)	Account Number (5)	Peak Balance/ Investment during the year (6)	Whether income accrued is taxable in your hands? (7)	If (7) is yes, Income accrued in the account (8)	If (7) is yes, Income offered in this return Amount (9) Schedule where offered (10) Item number of schedule (11)						
F	Details of trusts, created under the laws of a country outside India, in which you are a trustee, beneficiary or settlor.															
Sl.No. (1)	Country Name and Code (2a)	Zip Code (2b)	Name of the trust (3)	Address of the trust (3a)	Name of trustees (4)	Address of trustees (4a)	Name of Settlor (5)	Address of Settlor (5a)	Name of Benefic iaries (6)	Address of Benefic iaries (6a)	Date since position held (7)	Whether income derived is taxable in your hands? (8)	If (8) is yes, Income accrued in the account (9)	If (8) is yes, Income offered in this return Amount (10) Schedule where offered (11) Item number of schedule (12)		
G	Details of any other income derived from any source outside India which is not included in,- (i) items A to F above and, (ii) income under the head business or profession															
Sl.No. (1)	Country Name and Code(2a)	Zip Code(2b)	Name of the person from whom derived (3a)	Address of the person from whom derived (3b)	Income derived (4)	Nature of income (5)	Whether taxable in your hands? (6)	If (6) is yes, Income offered in this return Amount (7) Schedule where offered (8) Item number of schedule (9)								
Note:Please refer to the instructions for filling up this schedule																
Schedule SH-1 - SHAREHOLDING OF UNLISTED COMPANY (other than a start-up for which Schedule SH-2 is to be filled up)																
Are you a Company registered under section 8 of the Companies Act, 2013 (or section 25 of the Companies Act, 1956) or Company Formed Limited by Guarantee under section 3(2) of Companies Act, 2013?												No				
A	Details of shareholding at the end of the previous year															
	Sl No	Name of the shareholder	Residential status in India	Type of share	Others	PAN	Aadhaar	Date of allotment	Number of shares held	Face value per share	Issue Price per share	Amount received				
	1	Terance A lex	Resident	Equity Shares		AGUPA1 453H		14/02/2014	9000	10	10	90000				
	2	Jimmy Silu vayyan	Resident	Equity Shares		CKBPS9 118J		14/02/2014	1000	10	10	10000				
	3	Terance A lex	Resident	Equity Shares		AGUPA1 453H		28/01/2019	90000	10	10	900000				
B	Details of equity share application money pending allotment at the end of the previous year															

	Sl No	Name of the applicant	Residential status in India	Type of share	Others	PAN	Aadhaar	Date of application	Number of shares applied for	Application money received	Face value per share	Proposed issue price
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C Details of shareholders who is not a shareholder at the end of the previous year but was a shareholder at any time during the previous year

	Sl No	Name of the shareholder	Residential status in India	Type of share	PAN	Aadhaar	Number of shares held	Face value per share	Issue Price per share	Amount received	Date of allotment	Date on which cease to be shareholder	Mode of cessation	In case of transfer, PAN of the new shareholder	Aadhaar of new shareholder
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Schedule SH-2 - SHAREHOLDING OF START-UPS

If you are a start-up which has filed declaration in Form-2 under para 5 of DPIIT notification dated 19.02.2019, please furnish the following details of shareholding

A Details of shareholding at the end of the previous year

	Sl No	Name of the shareholder	Category of shareholder	Type of share	Others	PAN	Aadhaar	Date of allotment	Number of shares held	Face value per share	Issue Price per share	Paid up value per share	Share premium
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B Details of share application money pending allotment at the end of the previous year

	Sl No	Name of the applicant	Category of applicant	Type of share	Others	PAN	Aadhaar	Date of application	Number of shares applied for	Face value per share	Proposed issue price per share	Share application money	Share premium
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C Details of shareholders who is not a shareholder at the end of the previous year but was a shareholder at any time during the previous year

	Sl No	Name of the shareholder	Category of shareholder	Type of share	PAN	Aadhaar	Date of allotment	Number of shares held	Face value per share	Issue Price per share	Paid up value per share	Date on which cease to be shareholder	Mode of cessation	In case of transfer, PAN of the new shareholder	Aadhaar of new shareholder
--	-------	-------------------------	-------------------------	---------------	-----	---------	-------------------	-----------------------	----------------------	-----------------------	-------------------------	---------------------------------------	-------------------	---	----------------------------

Schedule AL-1 -Assets and liabilities as at the end of the year (mandatorily required to be filled by an unlisted company) (other than a start-up for which Schedule AL-2 is to be filled up)

Do you have Assets and liabilities as at the end of the year as mentioned in Schedule AL-1 ?

Yes

A Details of building or land appurtenant there to, or both, being a residential house

	Sl No	Address	Pin code	Date of acquisition	Cost of acquisition Rs.	Purpose for which used (dropdown to be provided)
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B Details of land or building or both not being in the nature of residential house

	Sl No	Address	Pin code	Date of acquisition	Cost of acquisition Rs.	Purpose for which used (dropdown to be provided)
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C Details of listed equity shares

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		Opening balance			Shares acquired during the year			Shares transferred during the year			Closing balance				
	Sl No	Number of shares	Type of share	Cost of acquisition	Number of shares	Type of share	Cost of acquisition	Number of shared	Type of share	Sale consideration	No. of shares	Type of share	Cost of acquisition		
D	Details of unlisted equity shares														
		Opening balance			Shares acquired during the year					Shares transferred during the year		Closing balance			
	Sl No	Name of company	PAN	Number of shares	Cost of acquisition	Number of shares	Date of subscription / purchase	Face value per share	Issue price per share (in case of fresh issue)	Purchase price per share (in case of purchase from existing shareholder)	Number of shares	Sale consideration	Number of shares	Cost of acquisition	
E	Details of other securities														
		Opening balance				Securities acquired during the year					Securities transferred during the year		Closing balance		
	Sl No	Type of securities	Description	Whether listed or unlisted	Number of securities	Cost of acquisition	Number of securities	Date of subscription / purchase	Face value per share	Issue price per share (in case of fresh issue)	Purchase price per share (in case of purchase from existing shareholder)	Number of securities	Sale consideration	Number of securities	Cost of acquisition
F	Details of capital contribution to any other entity														
	Sl No	Name of entity		PAN	Opening balance		Amount contributed during the year		Amount withdrawn during the year		Amount of profit/ loss/ dividend/ interest debited or credited during the year		Closing balance		
G	Details of Loans & Advances to any other concern (If money lending is not assessee's substantial business)														
	Sl No	Name of the person		PAN	Opening balance		Amount received during the year		Amount paid		Interest credited/ Received if any	Closing balance		Rate of interest (%)	
H	Details of motor vehicle, aircraft, yacht or other mode of transport														

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	Sl No	Particulars of asset	Description	Registration number of vehicle	Cost of acquisition	Date of acquisition	Purpose for which used			
	1	Motor Vehicle		KI-01-cf-7008	2369322	2018-04-05	Own Business Use			
	2	Motor Vehicle		KI-01-ca-6529	395494	2018-07-19	Own Business Use			
	3	Motor Vehicle		KI-01-ca-8310	387512	2018-07-19	Own Business Use			
	4	Motor Vehicle		KL-01-BJ-8129	38000	2019-08-10	Own Business Use			
	5	Motor Vehicle		KL-01-CN-7008	862051	2020-01-29	Own Business Use			
I	Details of Jewellery, archaeological collections, drawings, paintings, sculptures, any work of art or bullion									
	Sl No	Particulars of asset	Description	Quantity	Cost of acquisition	Date of acquisition	Purpose of use			
J	Details of liabilities									
	Details of loans, deposits and advances taken from a person other than financial institution									
	Sl No	Name of the person	PAN	Opening Balance	Amount received	Amount paid	Interest credited if any	Closing balance	Rate of interest (%)	
Schedule AL-2 - Assets and liabilities as at the end of the year (applicable for start-ups only)										
Do you have Assets and liabilities as at the end of the year as mentioned in Schedule AL-2 ?										
If you are a start-up which has filed declaration in Form-2 under para 5 of DPIIT notification dated 19.02.2019, please furnish the following information for the period from the date of incorporation upto end of the year										
A	Details of building or land appurtenant there to, or both, being a residential house acquired since incorporation									
	Sl No	Address	Pin code	Date of acquisition	Cost of acquisition	Purpose for which used (dropdown to be provided)	Whether transferred on or before the end of the previous year	If Yes date of transfer		
B	Details of land or building or both not being a residential house acquired since incorporation									
	Sl No	Address	Pin code	Date of acquisition	Cost of acquisition Rs.	Purpose for which used	Whether transferred on or before the end of the previous year	If Yes date of transfer		
C	Details of Loans & Advances made since incorporation (If lending of money is not assessee's substantial business)									
	Sl No	Name of the person	PAN	Date on which loans and advances has been made	Amount of loans and advances	Amount	Whether loans and advances has been repaid	If Yes date of such repayment	Closing balance as at the end of the previous year, if any	Rate of interest, if any
D	Details of capital contribution made to any other entity since incorporation									

	Sl No	Name of entity	PAN	Date on which capital contribution has been made	Amount of contribution	Amount withdrawn, if any	Amount of profit/loss/dividend/interest debited or credited during the year	Closing balance as at the end of the previous year, if any		
E	Details of acquisition of shares and securities									
	Sl No	Name of company/entity	PAN	Type of shares/securities	Number of shares/securities acquired	Cost of acquisition	Date of acquisition	Whether transferred	If Yes date of transfer	Closing balance as at the end of the previous year, if any
F	Details of motor vehicle, aircraft, yacht or other mode of transport, the actual cost of which exceeds ten lakh rupees acquired since incorporation									
	Sl No	Particulars of asset	Registration number of vehicle	Cost of acquisition	Date of acquisition	Purpose for which used	Whether transferred	If Yes date of transfer		
G	Details of Jewellery acquired since incorporation									
	Sl No	Particulars of asset	Quantity	Cost of acquisition	Date of acquisition	Purpose for which used	Whether transferred	If Yes date of transfer	Closing balance as at the end of the previous year, if any	
H	Details of archaeological collections, drawings, paintings, sculptures, any work of art or bullion acquired since incorporation									
	Sl No	Particulars of asset	Quantity	Cost of acquisition	Date of acquisition	Purpose for which used	Whether transferred	If Yes date of transfer	Closing balance	
I	Details of liabilities									
	Details of loans, deposits and advances taken from a person other than financial institution									
	Sl No	Name of the person	PAN	Opening Balance	Amount received	Amount paid	Interest credited if any	Closing balance	Rate of interest, if any	
Schedule DI - Details of investments										
A	Investment/ Deposit/ Payments for the purpose of claiming deduction under Chapter VIA									
S.No.	Section (1)					Eligible amount of deduction during FY 2019-20 (2)	Deduction attributable to investment/expenditure made between 01.04.2020 to 31.07.2020 (3)			
1	80G					1802	0			0

2	80GGA	0	0
3	80GGB	0	0
4	80GGC	0	0
Total		0	0

B	Eligible amount of deduction u/s 10AA			
S.No.	Undertaking as per schedule 10AA (1)	Amount of deduction as per schedule 10AA (2)	Date of letter of approval issued in accordance with the provisions of the SEZ Act, 2005 (3)	Is this the first year of claiming deduction u/s 10AA AND whether conditions have been complied between 01.04.2020 to 30.09.2020[Yes/ No] (4)
Total		0		

C	Payment/Acquisition/Purchase/Construction for the purpose of claiming deduction u/s 54 to 54GA			
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i	Long Term Capital Gain			
	S.No.	Section (1)	Amount utilised out of Capital Gains account (2)	Amount utilised between 01.04.2020 to 30.09.2020 out of Col 2 (3)
	1	54D	0	0
	2	54G	0	0
	3	54GA	0	0
Total			0	0

ii	Short Term Capital Gain			
	S.No.	Section (1)	Amount utilised out of Capital Gains account (2)	Amount utilised between 01.04.2020 to 30.09.2020 out of Col 2 (3)
	1	54D	0	0
	2	54G	0	0
	3	54GA	0	0
Total			0	0

Schedule GST - INFORMATION REGARDING TURNOVER/GROSS RECEIPT REPORTED FOR GST

Sl No	GSTIN No(s).	Annual value of outward supplies as per the GST return(s) filed
1	32AABCW4979N2ZO	49338925

Schedule FD - Break-up of payments/receipts in Foreign currency (to be filled up by the assessee who is not liable to get accounts audited u/s 44AB)

Sl No	Amount (in Rs.)
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i	Payments made during the year on capital account	
ii	Payments made during the year on revenue account	
iii	Receipts during the year on capital account	
iv	Receipts during the year on revenue account	

Schedule Part B-TI Computation of Total Income							
1	Income from house property (4 of Schedule-HP) (enter nil if loss)				1	0	
2	Profits and gains from business or profession						
	i	Profit and gains from business other than Insurance Business u/s 115B or Speculative business and Specified Business (A39 of Schedule-BP) (enter nil if loss)	2i	383354			
	ii	Profit and gains from speculative business (3(ii) of table F of Sch BP of Schedule-BP) (enter nil if loss and carry this figure to Schedule CFL)	2ii	0			
	iii	Profit and gains from Specified Business (3(iii) of table F of Sch BP) (enter nil if loss and carry this figure to Schedule CFL)	2iii	0			
	iv	Income chargeable to tax at special rate (3d,3e and 3iv of Table F of schedule BP)	2iv	0			
	v	Total (2i + 2ii + 2iii + 2iv)			2v	383354	
3	Capital gains						
	a	Short term Capital Gain					
		i	Short-term chargeable @ 15% (9ii of item E of schedule CG)	3ai	0		
		ii	Short-term chargeable @ 30% (9iii of item E of schedule CG)	3aii	0		
		iii	Short-term chargeable at applicable rate (9iv of item E of schedule CG)	3aiii	0		
		iv	STCG chargeable at special rates in India as per DTAA(9v of item E of Schedule CG)	3aiv	0		
	v	Total short-term Capital Gain (ai+aii+aiii+aiv)	3aiv	0			
	b	Long term Capital Gain					
		i	Long-term chargeable @ 10% (9vi of item E of schedule CG)	3bi	0		
		ii	Long-term chargeable @ 20% (9vii of item E of schedule CG)	3bii	0		
		iii	LTCG chargeable at special rates as per DTAA (9viii of item E of schedule CG)	3biii	0		
iv	Total Long-Term (bi+bii+biii)(enter nil if loss)	3biv	0				
c	Total Capital Gains(3av + 3biv) (enter nil if loss)				3c	0	
4	Income from other sources						
	a	Net income from other sources chargeable to tax at normal applicable rates (6 of Schedule OS) (enter nil if loss)	4a	96248			
	b	Income chargeable to tax at special rate (2 of Schedule OS)	4b	0			

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	c	from owning and maintaining race horses (8e of Schedule OS) (enter nil if loss)	4c	0	
	d	Total (4a + 4b + 4c)		4d	96248
5		Total of head wise income(1 + 2vi + 3c + 4d)		5	479602
6		Losses of current year to be set off against 5 (total of 2xvii, 3xvii and 4xvii of Schedule CYLA)		6	0
7		Balance after set off current year losses (5 - 6) (also total of column 5 of Schedule CYLA +4b+2iv- 2e of schedule OS - 3iv of Table F of schedule BP)		7	479602
8		Brought forward losses to be set off against 7 (total of 2xvi, 3xvi and 4xvi of Schedule BFLA)		8	0
9		Gross Total income (7 - 8) Field Total of column 5 of Schedule Sch BFLA+4b+2iv- 2e of schedule OS - 3iv of Table F of schedule BP)		9	479602
10		Income chargeable to tax at special rate under section 111A, 112, 112A etc. included in 9		10	0
11		Deductions under Chapter VI-A			
	a	Part-B of Chapter VI-A [1 of Schedule VI-A and limited upto total of (i,ii,iv,v,viii,xiii,xiv) of column 5 of schedule BFLA		11a	0
	b	Part-C of Chapter VI-A [2 of Schedule VI-A and limited upto ii5 of BFLA		11b	0
	c	Total (11a + 11b)		11c	0
12		Deduction u/s 10AA (Total of Sch. 10AA)		12	0
13		Total income (9 - 11c - 12)		13	479600
14		Income chargeable to tax at special rates (total of (i) of schedule SI)		14	0
15		Income chargeable to tax at normal rates (13 - 14)		15	479600
16		Net agricultural income (3 of Schedule EI)		16	0
17		Losses of current year to be carried forward (total of xv of Schedule CFL)		17	0
18		Deemed total income under section 115JB (9 of Schedule MAT)		18	0
Schedule Part B-TTI - Computation of tax liability on total income					
1	a	Tax Payable on deemed total Income under section 115JB (10 of Schedule MAT)		1a	0
	b	Surcharge on (a) above(if applicable)		1b	0
	c	Health & Education Cess @ 4% on (1a+1b) above		1c	0
	d	Total Tax Payable u/s 115JB (1a+1b+1c)		1d	0
2		Tax payable on total income			
	a	Tax at normal rates on 15 of Part B-TI		2a	105512
	b	Tax at special rates (total of col. (ii) of Schedule-SI)		2b	0
	c	Tax Payable on Total Income (2a + 2b)		2c	105512
	d	Surcharge			
	di	25% of 12(ii) of Schedule SI		2di	0
	dii	On [(2d) – (12(ii) of Schedule SI)]		2dii	10551
	diii	Total (i + ii)		2diii	10551
	e	Health & Education cess @ 4% on 2c+2diii		2e	4643
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	f	Gross tax liability (2c+2diii+2e)	2f	120706		
3	Gross tax payable (higher of 1d and 2f)		3	120706		
4	Credit under section 115JAA of tax paid in earlier years (if 2f is more than 1d)(5 of Schedule MATC)		4	0		
5	Tax payable after credit under section 115JAA [(3 - 4)]		5	120706		
6	Tax relief					
	a	Section 90/90A(2 of Schedule TR)	6a	0		
	b	Section 91(3 of Schedule TR)	6b	0		
	c	Total (6a + 6b)	6c	0		
7	Net tax liability (5 – 6c) (enter zero,if negative)		7	120706		
8	Interest and fee payable					
	a	Interest For default in furnishing the return (section 234A)	8a	0		
	b	Interest For default in payment of advance tax (section 234B)	8b	0		
	c	Interest For deferment of advance tax (section 234C)	8c	0		
	d	Fee for default in furnishing return of income (section 234F)	8d	0		
	e	Total Interest and Fee Payable (8a+8b+8c+8d)	8e	0		
9	Aggregate liability (7 + 8e)		9	120706		
10	Taxes Paid					
	a	Advance Tax (from column 5 of 15A /Schedule IT)	10a	0		
	b	TDS(total of column 9 of 15B/schedule TDS 1 & 2)	10b	232695		
	c	TCS(total of column 7 of 15C schedule TCS)	10c	0		
	d	Self Assessment Tax (from column 5 of 15A/Schedule IT)	10d	0		
	e	Total Taxes Paid (10a + 10b + 10c + 10d)	10e	232695		
11	Amount payable (9 - 10e) (Enter if 9 is greater than 10e, else enter 0)		11	0		
Refund						
12	Refund (If 10e is greater than 9) (Refund, if any, will be directly credited into the bank account)		12	111990		
Bank Account Details						
13	Sl No.	IFSC Code of the BANK	Name of the BANK	Account Number	Indicate the accounts in which you prefer to get your refund credited	
	1	SBIN0007211	State bank of india	33708912624	☒	
b) Non-residents, who are claiming income-tax refund and not having bank account in India may, at their option, furnish the details of one foreign bank account						
	Sl No.	SWIFT Code	Name of the Bank	Country of Location	IBAN	
14	Do you at any time during the previous year,- (i) hold, as beneficial owner, beneficiary or otherwise, any asset (including financial interest in any entity) located outside India; or (ii) have signing authority in any account located outside India; or (iii) have income from any source outside India? [applicable only in case of a resident] [Ensure Schedule FA is filled up if the answer is Yes]					NO

15 A. Sch IT - Details of payments of 1806 Tax and Self-Assessment Tax

Sl. No.	BSR Code				Date of deposit(DD/MM/YYYY)		Serial number of challan				Amount(Rs)						
(1)	(2)				(3)		(4)				(5)						
Total																	
TDS1																	
15 B1 - Details of Tax Deducted at Source (TDS) on Income [As per FORM 16A issued by Deductor(s)]																	
Sl. No.	TDS credit in the name of [TDS credit relating to self / other person as per rule 37BA(2)]	PAN of Other Person (if TDS related to other person)	Aadhaar No. Of Other Person (If TDS credit related to other person)	Tax Deduction Account Number (TAN) of the Deductor	Unclaimed TDS brought forward (b/f)		TDS of current financial year(TDS deducted during the FY 2019-20)		TDS credit out of (6), (7) or (8) being claimed this Year (only if corresponding income is being offered for tax this year)				Corresponding Income offered		TDS credit out of (6), (7) or (8) being carried forward		
					Fin. Year in which deducted	TDS b/f	Deducted in own hands	Deducted in the hands of any other person as per rule 37BA(2) (if applicable)	Claimed in own hands	Claimed in the hands of any other person as per rule 37BA(2) (if applicable)	Gross Amount	Head of Income					
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)		(9)	(10)			(11)	(12)	(13)	
								Income	TDS		Income	TDS	PAN of other person	Aadhaar No.			
1	Self			TVD A001 93E			94331			94331					4716 610	Income from Business and Profession	0
2	Self			TVD C004 12G			7699			7699					3849 48	Income from Business and Profession	0
															1807	Page 79	

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3	Self			TVD J0004 0F			5000			5000					2500 00	Income from Busine ss and Profe ssion	0
4	Self			TVD M019 98D			55273			55273					2763 661	Income from Busine ss and Profe ssion	0
5	Self			TVD S008 53G			11752			11752					5875 72	Income from Busine ss and Profe ssion	0
6	Self			MUM S895 75D			8680			8680					86786	Income from Other Sources	0
7	Self			CHN T009 69D			49960			49960					2498 000	Income from Busine ss and Profe ssion	0
Total							232695										

Note: Please enter total of column 8 of 15B1 and column 8 of 15B2 in 10b of Part B-TTI

TDS2

15 B2 - Details of Tax Deducted at Source (TDS) on Income [As per Form 16B/16C/16D furnished issued by Deductor(s)]

Sl. No.	TDS credit in the name of [TDS	PAN of Other Person (if TDS	Aadhaar No. Of Other Person (If	PAN of the buyer/ Tenant/ Deductor	Aadhaar of the buyer/ Tenant/ Deductor	Unclaimed TDS brought forward (b/f)		TDS of current financial year (TDS deducted during the FY 2019-20)		TDS credit out of (6), (7) or (8) being claimed this Year (only if corresponding income is being offered for tax this year)		Corresponding Income offered		TDS credit out of (6), (7) or (8) being
						Fin.	TDS	Deduct	Deducted	Claim	Claimed in the hands of any other person as per rule 37BA(2) (if applicable)	Gross Amount	Head of Income	

credit relati ng to self / other person as per rule 37BA (2)]	credit related to other person)	TDS credit related to other person) (Col 3b)			which deduc ted		own hands	person as per rule 37BA(2) (if applicable)	own hands				carried forward			
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)				(12)	(13)	(14)
								Income	TDS		Income	TDS	PAN of other person	Aadhaar No.		
Total																
Note:Please enter total of column 8 of 15B1 and column 8 of 15B2 in 10b of Part B-TTI																
TCS																
15 C - Details of Tax Collected at Source (TCS) [As per Form 27D issued by the Collector(s)]																
Sl.No.	Tax Deduction and Tax Collection Account Number of the Collector	Name of the Collector	Unclaimed TCS brought forward (b/f)		TCS of current financial year(TCS collected during the FY 2018-19)	Amount out of (5) or (6) being claimed this year (only if corresponding income is being offered for tax this year)	Amount out of (5) or (6) being carried forward									
			Financial year in which Collected	Amount b/f												
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)									
Total																
Note:Please enter total of column (7) in 10c of Part B-TTI																

VERIFICATION

I, **TERANCE ALEX** , son/ daughter of **ALEX** , solemnly declare that to the best of my knowledge and belief, the information given in the return and the schedules thereto is correct and complete and is in accordance with the the provisions of the Income-tax Act, 1961. I further declare that I am making this return in my capacity as **Managing Director** , and I am also competent to make this return and verify it. I am holding permanent account number **AGUPA1453H** (if allotted) (Please see instruction).

Acknowledgement Number : 236278280210222

FORM	ITR-6	INDIAN INCOME TAX RETURN [For Companies other than companies claiming exemption under section 11] (Please see rule 12 of the Income-tax Rules,1962) (Please refer instructions)				Assessment Year				
		2	0	2	1	-	2	2		
Part A-GEN										
GENERAL										
PERSONAL INFORMATION & RESIDENTIAL ADDRESS	Name WATTSUN ENERGY INDIA PRIVATE LIMITED				PAN AABCW4979N					
	Is there any change in the company's name? If yes, please furnish the old name				Corporate Identity Number (CIN) issued by MCA U40300KL2014PTC036294					
	Flat/Door/Block No Tc.36/38(1)		Name of Premises /Building/Village Aiswarya Tower, First Floor		Date of incorporation (DD/MM/YYYY) 04-Mar-2014			Date of commencement of business (DD/MM/YYYY) 04-Mar-2014		
	Road/Street/Post Office Chackai		Area/Locality Trivandrum		Type of company (Tick any one)					
					(i) Domestic Company					
					(ii) Foreign Company					
	Town/City/District Trivandrum		State 16-Kerala		Pin code/Zip code 695024		If a public company write 6, and if private company write 7 (as defined in section 3 of The Companies Act)			
			Country 91-India					public company private company		
	Office Phone Number with STD code		Mobile No. 1 91 8943345700		Mobile No. 2		Email Address-1 terance.alex@gmail.com			
	Email Address-2 joseandco@rediffmail.com									
(a)	Filed u/s (Tick)[Please see instruction]		139(1)- On or Before due date, 139(4)- After due date, 139(5)- Revised Return, 92CD-Modified return, 119(2)(b)- after condonation of delay, 139(8a)-Updated return 170A- After order by the tribunal or court.							
	Or filed in response to notice u/s		139(9), 142(1), 148 153C							
(b)	If revised/ defective/Modified, then enter Receipt No and Date of filing original return (DD/MM/YYYY)									
(c)	If filed, in response to a notice u/s 139(9)/142(1)/148/153C or order under section 119(2)(b)/170A, enter unique number /Document Identification Number (DIN) and date of such notice/Order, or if filed u/s 92CD enter date of advance pricing agreement									
(d)	Residential Status (Tick) Resident Non-Resident									
(e)	Whether the assessee has opted for taxation under section 115BA/115BAA/115BAB? (drop down to be provided in e-filing utility) (applicable on Domestic Company)									
(f)	Whether total turnover/ gross receipts in the previous year 2018-19 exceeds 400 crore rupees? (Yes/No) (applicable for Domestic Company)									
(g)	Whether assessee is a resident of a country or specified territory with which India has an agreement referred to in sec 90 (1) or Central Government has adopted any agreement under sec 90A(1)? (Tick) Yes No									
(h)	In the case of non-resident, is there a Permanent Establishment (PE) in India (Tick) Yes No									
(i)	Whether assessee is required to seek registration under any law for the time being in force relating to companies? (Tick) Yes No									
(j)	Whether the financial statements of the company are drawn up in compliance to the Indian Accounting Standards specified in Annexure to the companies (Indian Accounting Standards) Rules, 2015 (Tick) Yes No									
1810										
Whether assessee is located in an International Financial Services Centre and derives income solely in convertible foreign exchange? (Tick)										

FILING STATUS	(k)	Yes	No			
	(l)	Whether the assessee company is under liquidation (Tick)		Yes	No	
	(m)	Whether you are an FII / FPI? Yes/No If yes, please provide SEBI Regn. No.				No
	(n)	Whether the company is a producer company as defined in Sec.581A of Companies Act, 1956? (Tick)		Yes	No	
	(o)	Whether this return is being filed by a representative assessee? (Tick) Yes No If yes, please furnish following information -				
		(1)	Name of the representative assessee			
		(2)	Capacity of the Representative (drop down to be provided)			
		(3)	Address of the representative assessee			
		(4)	Permanent Account Number (PAN)/Aadhaar No. of the representative assessee			
	(p)	Whether you are recognized as start up by DPIIT (Tick)				Yes No
AUDIT INFORMATION	1	If yes, please provide start up recognition number allotted by the DPIIT				
	2	Whether certificate from inter-ministerial board for certification is received?				Yes No
	3	If yes provide the certification number				
	4	Whether declaration in Form-2 in accordance with para 5 of DPIIT notification dated 19/02/2019 has been filed before filing of the return?				Yes No
	5	If yes, provide date of filing Form-2				
	(a1)	Whether liable to maintain accounts as per section 44AA? (Tick) Yes No				
	(a2)	Whether assessee is declaring income only under section 44AE/ 44B/ 44BB/ 44BBA/ 44BBB? (Tick) Yes No				
	(a2i)	If No, Whether during the year total sales/turnover/gross receipts of business exceeds 1 Crore Rupees but does not exceed 10 Crore Rupees? (Tick) Yes No				
	(a2ii)	If (a2i) is Yes, whether aggregate of all amounts received, including amount received for sales, turnover or gross receipts or on capital account such as capital contribution, loans etc. during the previous year, in cash, does not exceed five per cent of said amount? (Tick) Yes No				
	(a2iii)	If (a2i) is Yes, whether aggregate of all payments made including amount incurred for expenditure or on capital account such as asset acquisition, repayment of loan etc., in cash, during the previous year does not exceed five per cent of the said payment (Tick) Yes No				
	(b)	Whether liable for audit under section 44AB? (Tick) Yes No				
	(c)	If (b) is Yes, whether the accounts have been audited by an accountant? (Tick) Yes No If Yes, furnish the following information below				
		(1)	Mention the date of furnishing of audit report (DD/MM/YYYY) 28-Jan-2022			
		(2)	Name of the auditor signing the tax audit report JOSE ZACHARIAH			
		(3)	Membership No. of the auditor 080570			
	(4)	Name of the auditor (proprietorship/ firm) JAKS & ASSOCIATES				
	(5)	Proprietorship/firm registration number 0001360S				
	(6)	Permanent Account Number (PAN/Aadhaar No.) of the auditor (proprietorship/ firm) AACFJ0207A /				
	(7)	Date of audit report 10-Feb-2022				
(di)	Are you liable for Audit u/s 92E? (Tick) Yes No					
(dii)	If (di) is Yes, whether the accounts have been audited u/s. 92E?		Yes No	Date of furnishing audit report?		
(diii)	If liable to furnish other audit report under the Income-tax Act, mention whether have you furnished such report. If yes, please provide the details as under:) (Please see Instruction 5)					
	Sl. No.	Section Code	1811 Description	Whether	Date of furnishing the audit report (DD	

					have you furnished such report?	/MMM/YYYY)	
(e) Mention the Act, section and date of furnishing the audit report under any Act other than the Income-tax Act							
	Sl. No	Act and section	Description	Have you got audited under the selected Act other than the Income-tax Act?		Date of furnishing of the audit report (DD/MMM/YYYY)	
	1	Companies Act, 2013 / 139		Yes		28-Jan-2022	
HOLDING STATUS	(a)	Nature of company (select 1 if holding company, select 2 if a subsidiary company, select 3 if both, select 4 if any other)					Any Other
	(b)	If subsidiary company, mention the details of the Holding Company					
		Sl. No.	PAN of Holding Company	Name of the Holding Company	Address of Holding Company	Percentage of shares held	
	(c)	If holding company, mention the details of the subsidiary companies					
		Sl. No.	PAN of subsidiary Company	Name of the subsidiary Company	Address of Subsidiary Company	Percentage of shares held	
BUSINESS ORGANISATION	Details of Amalgamating, Amalgamated, Demerged and Resulting Company (as the case may be)						
	Sl. No.	Business Type	Date of event	PAN	Name of the Company	Address	
KEY PERSONS	Particulars of Managing Director, Directors, Secretary and Principal officer(s) who have held the office during the previous year and the details of eligible person who is verifying the return.						
	Sl. No.	Name	Designation	Residential Address	PAN	Aadhaar No.	Director Identification Number (DIN) issued by MCA
	1	TERANCE ALEX	MD - Managing Director	304, HOLY HOUSE, POZHIOOR P O, POOYA PALLIVILAKAM , TRIVANDRUM , 16-Kerala , 91-India , 695513	AGUPA1453H		06808744
	2	JIMMY SILUVAYYAN	DIR - Director	VARAVILATHOPPU, POOVAR P O , TRIVANDRUM , 16-Kerala , 91-India , 695024	CKBPS9118J		06808773
SHAREHOLDERS INFORMATION	Particulars of persons who were beneficial owners of shares holding not less than 10% of the voting power at any time of the previous year						
	Sl. No.	Name and Address			Percentage of shares held (if determinate)	PAN (if allotted)	Aadhaar No.
	1	TERANCE ALEX 304, HOLY HOUSE, POZHIOOR P O, POOYA PALLIVILAKAM , TRIVANDRUM , 16-Kerala , 91-India , 695513			90 %	AGUPA1453H	
	2	JIMMY SILUVAYYAN VARAVILATHOPPU, POOVAR P O , TRIVANDRUM , 16-Kerala , 91-India , 695024			10 %	CKBPS9118J	
OWNERSHIP INFORMATION	In case of unlisted company, particulars of natural persons who were the ultimate beneficial owners, directly or indirectly, of shares holding not less than 10% of the voting power at any time of the previous year						
	Sl. No.	Name	Address	Percentage of shares held		PAN/Aadhaar No. (if allotted)	
	In case of Foreign company, please furnish the details of immediate parent company.						
	Sl. No.	Name	Address	Country of residenc	PAN (if allotted)	Taxpayer?s registration number or any unique identification number allotted in the country of residence	
	In case of foreign company, please furnish the details of ultimate parent company						
	Sl. No.	Name	Address	Country of residenc	PAN (if allotted)	Taxpayer?s registration number or any unique identification number allotted in the country of residence	
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NATURE OF COMPANY AND ITS BUSINESS	1	Whether a public sector company as defined in section 2(36A) of the Income-tax Act	Yes	No
	2	Whether a company owned by the Reserve Bank of India	Yes	No
	3	Whether a company in which not less than forty percent of the shares are held (whether singly or taken together) by the Government or the Reserve Bank of India or a corporation owned by that Bank	Yes	No
	4	Whether a banking company as defined in clause (c) of section 5 of the Banking Regulation Act, 1949	Yes	No
	5	Whether a scheduled Bank being a bank included in the Second Schedule to the Reserve Bank of India Act	Yes	No
	6	Whether a company registered with Insurance Regulatory and Development Authority (established under sub-section (1) of section 3 of the Insurance Regulatory and Development Authority Act, 1999)	Yes	No
	7	Whether a company being a non-banking Financial Institution	Yes	No
	8	Whether the company is unlisted? If yes, please ensure to fill up the Schedule SH-1 and Schedule AL-1	Yes	No
Nature of business or profession, if more than one business or profession indicate the three main activities/ products (Other than those declaring income under section 44AE)				



Nature of business or profession, *if more than one business or profession indicate the three main activities/ products (Other than those declaring income under section 44AE)*

Sl. No.	Code [Please see instruction No.7(i)]	Description
i	21008 - 21008 - Other services n.e.c.	WATTSUN ENERGY INDIA PRIVATE LIMITED



Part A-BS**BALANCE SHEET AS ON 31 DAY OF MARCH, 2021 OR AS ON THE DATE OF AMALGAMATION****1 Equity and Liabilities**

1 Shareholder's fund								
A Share capital								
	i	Authorised	Ai	10,00,000				
	ii	Issued,Subscribed and fully Paid up	Aii	10,00,000				
	iii	Subscribed but not fully Paid	Aiii	0				
	iv	Total(Aii + Aiii)			Aiv	10,00,000		
B Reserves and Surplus								
	i	Capital Reserve	Bi	0				
	ii	Capital Redemption Reserve	Bii	0				
	iii	Securities Premium Reserve	Biii	0				
	iv	Debentures Redemption Reserve	Biv	0				
	v	Revaluation Reserve	Bv	0				
	vi	Share options outstanding amount	Bvi	0				
	vii	Other reserve(specify nature and amount)						
		Sl.No	Other reserve nature		Amount			
		1	General Reserve		7,88,446			
			Total		7,88,446			
	viii	Surplus i.e. Balance in profit and loss account (Debit balance to be shown as -ve figure)		Bviii	1,06,062			
	ix	Total(Bi + Bii + Biii + Biv + Bv + Bvi + Bvii + Bviii)(Debit balance to be shown as -ve figure)			Bix	8,94,508		
C Money received against share warrants							1C	0
D Total Shareholder's fund(Aiv + Bix + 1C)							1D	18,94,508
2 Share application money pending allotment								
	i	Pending for less than one year	i	0				
	ii	Pending for more than one year	ii	0				
	iii	Total (ia + ib)			2	0		
3 Non-current liabilities								
A Long -term borrowings								
	i	Bonds/debentures						
		a	Foreign currency	ia	0			
		b	Rupee	ib	0			
		c	Total(ia + ib)			ic	0	
	ii	Term loans						
		a	Foreign currency	ia	0			
		b	Rupee Loans					
		1	From Banks	ia	15,59,559			
		2	From others	iiib	7,63,211			
		3	Total(b1 + b2)	iiib	23,22,770			

	c	Total Term loans (iia + b3)	iic	23,22,770
iii		Deferred payment liabilities	iii	0
iv		Deposits from related parties	iv	0
v		Other deposits	v	0
vi		Loan and advnaces from related parties	vi	59,71,426
vii		Other loans and advances	vii	0
viii		Long term maturities of finance lease obligations	vii	0
ix		Total long term borrowings(ic + iic + iii + iv + v + vi + vii + viii)	3A	82,94,196
B		Deferred tax liabilities(net)	3B	0
C		Other long-term liabilities		
	i	Trade payables	i	0
	ii	Others	ii	0
	iii	Total Long-term other liabilities(i + ii)	3C	0
D		Long-term provisions		
	i	Provision for employee benefits	i	0
	ii	Others	ii	0
	iii	Total(i + ii)	3D	0
E		Total Non-current liabilities(3A + 3B + 3C)	3E	82,94,196
4		Current liabilities		
A		Short-term borrowings		
	i	Loans repayable n demand		
	a	From banks	ia	0
	b	From Non-Banking Finance Companies	ib	0
	c	From other financial institutions	ic	0
	d	From others	id	0
	e	Total Loans repayable on demand(ia + ib + ic + ie)	ie	0
	ii	Deposits from related parties	ii	0
	iii	Loans and advances from related parties	iii	0
	iv	Other loans and advances	iv	0
	v	Other deposits	v	0
	vi	Total Short-term borrowings(ie + ii + iii + iv + v)	4A	0
B		Trade payables		
	i	Outstanding for more than 1 year	i	0
	ii	Others	ii	11,40,867
	iii	Total Trade payables(i + ii)	4B	11,40,867
C		Other current liabilities		
	i	Current maturities of long-term debt	i	0
	ii	Current maturities of finance lease obligation	ii	0
	iii	Interest accrued but not due on borrowings	iii	0
	iv	Interest accrued and due on borrowings	iv	0

	v	Income received in advance	v	0			
	vi	Unpaid dividends	vi	0			
	vii	Application money received for allotment of securities and due for refund and interest accrued	vii	0			
	viii	Unpaid matured deposits and interest accrued thereon	viii	0			
	ix	Unpaid matured debentures and interest accrued thereon	ix	0			
	x	Other payables	x	64,76,619			
	xi	Total Other current liabilities(i + ii + iii + iv + v + vi + vii + viii + ix + x)			4C	64,76,619	
D	Short-term provisions						
	i	Provision for employee benefit	i	0			
	ii	Provision for income tax	ii	0			
	iii	Provision Dividend	iii	0			
	iv	Tax on dividend	iv	0			
	v	Others	v	0			
	vi	Total Short-term provisions(i + ii + iii + iv + v)			4D	0	
E	Total Current liabilities(4A + 4B + 4C + 4D)				4E	76,17,486	
Total Equity and liabilities(1D + 2 + 3E + 4E)					I	1,78,06,190	
II	Assets						
1	Non-current assets						
	A	Fixed assets					
	i	Tangible assets					
	a	Gross block	ia	49,05,136			
	b	Depreciation	ib	30,52,268			
	c	Impairment losses	ic	0			
	d	Net block(ia - ib - ic)	id	18,52,868			
	ii	Intangible assets					
	a	Gross block	iiia	0			
	b	Amortization	iiib	0			
	c	Impairment losses	iiic	0			
	d	Net block(iiia - iiib - iiic)	iid	0			
	iii	Capital work-in progress				id	0
	iv	Intangible assets under development				id	0
	v	Total Fixed assets(id + iid + iii + iv)				Av	18,52,868
	B	Non-current investments					
	i	Investments in property	i	0			
	ii	Investments in Equity instrument					
	a	Listed equities	iiia	0			
	b	Unlisted equities	iiib	0			
	c	Total(iiia + iiib)	iiic	0			

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	iii	Investments in Preference shares	iic	0		
	iv	Investments in Government or trust securities	iv	0		
	v	Investments in Debenture or bonds	v	0		
	vi	Investments in Mutual funds	vi	0		
	vii	Investments in Partnership firms	vii	0		
	viii	Others Investments	viii	0		
	ix	Total Non-current investments(i + iic + iii + iv + v + vi + vii + viii)			Bix	0
C	Deferred tax assets(Net)				C	3,41,941
D	Long-term loans and advance					
	i	Capital advances	i	0		
	ii	Security deposits	ii	26,16,252		
	iii	Loans and advances to related parties	iii	0		
	iv	Other Loans and advances	iv	0		
	v	Total long-term loans and advances(i + ii + iii + iv)			Dv	26,16,252
	vi	Long-term loans and advances included in Dv which is				
	a	For the purpose of business or profession	via	26,16,252		
	b	not for the purpose of business or profession	vib	0		
	c	given to shareholder, being the beneficial owner of share, or to any concern or on behalf/benefit of such shareholder as per section 2(22)(e) of I.T. Act	vic	0		
E	Other non-current assets					
	i	Long-term trade receivables				
	a	Secured, considered good	ia	0		
	b	Unsecured, considered good	ib	0		
	c	Doubtful	ic	0		
	d	Total Other non-current assets(ia + ib + ic)	id	0		
	ii	Others	ii	0		
	iii	Total(id + ii)			Eiii	0
	iv	Non-current assets included in Eii which is due from shareholder, being the beneficial owner of share, or from any concern or on behalf/benefit of such shareholder as per section 2(22)(e) of I.T. Act				0
F	Total Non-current assets(Av + Bix + C + Dv + Eiii)				IF	48,11,061
Current assets						
A	Current investments					
	i	Investments in Equity instruments				
	a	Listed equities	ia	0		
	b	Unlisted equities	ib	0		
	c	Total(ia + ib)	ic	0		
	ii	Investments in Prefrence shares		ii	0	

iii	Investments in Government or trust securities	iii	0		
iv	Investments in debentures or bonds	iv	0		
v	Investments in Mutual funds	v	0		
vi	Investments in partnership firms	vi	0		
vii	Other investment	vii	0		
viii	Total Current investments(ic + ii + iii + iv + v + vi + vii)	Aviii	0		
B	Inventories				
i	Raw material	i	0		
ii	Work-in-progress	ii	0		
iii	Finished goods	iii	45,35,072		
iv	Stock-in-trade(in respect of goods acquired for trading)	iv	0		
v	Store and spares	v	0		
vi	Loose tools	vi	0		
vii	Others	vii	0		
viii	Total Inventories(i + ii + iii + iv + v + vi + vii)	Bviii	45,35,072		
C	Trade receivables				
i	Outstanding for more than 6 months	i	0		
ii	Others	ii	64,19,224		
iii	Total Trade receivables(i + ii + iii)	Ciii	64,19,224		
D	Cash and cash equivalents				
i	Balance with Banks	i	9,77,191		
ii	Cheques, draft in hands	ii	0		
iii	Cash in hand	iii	44,334		
iv	Others	iv	0		
v	Total cash and equivalents(i + ii + iii + iv)	Dv	10,21,525		
E	Short-term loans and advances				
i	Loans and advances to related parties	i	21,102		
ii	Others	ii	1,79,736		
iii	Total short-term loans and advances(i + ii)	Eiii	2,00,838		
iv	Short-term loans and advances included in Eii which is				
a	for the purpose of business or profession	iva	2,00,838		
b	not for the purpose of business or profession	ivb	0		
c	given to a shareholder, being the beneficial owner of share , or to any concern or on behalf/benefit of such shareholder as per section 2(22)(e) of I.T. Act.	ivc	0		
F	Other current assets	F	8,18,470		
G	Total Current assets (Aviii + Bviii + Cviii + Dv + Eiii + F)	G	1,29,95,129		

		Total Assets (1F + 2G)	II	1,78,06,190
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Part A - BS - Ind AS		BALANCE SHEET AS ON 31 DAY OF MARCH, 2021 OR AS ON THE DATE OF BUSINESS COMBINATION [applicable for a company whose financial statements are drawn up in compliance to the Indian Accounting Standards specified in Annexure to the companies (Indian Accounting Standards) Rules, 2015]					
1	Equity and Liabilities						
EQUITY AND LIABILITIES	1	Equity					
	A	Equity share capital					
		i	Authorised	Ai	0		
		ii	Issued,Subscribed and fully Paid up	Aii	0		
		iii	Subscribed but not fully paid	Aiii	0		
		iv	Total(Aii + Aiii)			Aiv	0
	B	Other Equity					
		i	Other Reserves				
		a	Capital Redemption Reserve	ia	0		
		b	Debentures Redemption Reserve	ib	0		
		c	Share Options Outstanding account	ic	0		
		d	Others(specify nature and amount)	id	0		
		e	Total other reserve(ia + ib + ic + id)		ie	0	
		ii	Retained earnings(Debit balance of statement of P&L to be shown as -ve figure)		ii	0	
		iii	Total(Bie + ii)(Debit balance to be shown as -ve figure)			Biii	0
	C	Total Equity(Aiv + Biii)			1C	0	
	2	Liabilities					
	A	Non-current liabilities					
	I	Financial Liabilities					
		Borrowings					
	a	Bonds or debentures					
	1	Foreign currency	a1	0			
	2	Rupee	a2	0			
	3	Total(1 + 2)			a3	0	
	b	Term loans					
	1	Foreign currency	b1	0			
	b	Rupee Loans					
	i	From Banks	i	0			
	ii	From others parties	ii	0			
	3	Total(i + ii)		b2	0		
	3	Total Term loans (b1 + b2)			b3	0	
	c	Deferred payment liabilities				c	0
	d	Deposits				d	0
	e	Loans from related parties				e	0
	f	Loan term maturities of finance lease obligation				f	0

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	g	Liability component of compound financial instruments		g	0
	h	Other loans		h	0
	i	Total borrowings(a3 + b3 + c + d + e + f + g + h)		i	0
	j	Trade Payables		j	0
	k	Other financial liabilities(Other than those specified in II under provisions)		k	0
II	Provisions				
	a	Provision for employee benefits	a	0	
	b	Others(specify nature)	b	0	
	c	Total Provision		IIC	0
III	Deferred tax liabilities (net)				III 0
IV	Other non-current liabilities				
	a	Advances	a	0	
	b	Others(specify nature)	b	0	
	c	Total Other non-current liabilities		IVC	0
Total Non-current liabilities(li + lj + lk + IIC + III + IVc)				2A	0
B	Current liabilities				
I	Financial Liabilities				
	i	Borrowings			
	a	Loans repayable on demand			
	1	From banks	1	0	
	2	From other parties	2	0	
	3	Total Loans repayable on demand(1 + 2)	3	0	
	b	Loans from related parties	b	0	
	c	Deposits	c	0	
	d	Other loans(specify nature)	d	0	
	Total Borrowings(a3 + b + c + d)			li	0
	ii	Trade payables			lii 0
	iii	Other financial liabilities			
	a	Current maturities of long-term debt	a	0	
	b	Current maturities of finance lease obligation	b	0	
	c	Interest accrued	c	0	
	d	Unpaid dividends	d	0	
	e	Application money received for allotment of securities to the extend refundable and interest accrued thereon	e	0	
	f	Unpaid matured deposits and interest accrued thereon	f	0	
	g	Unpaid matured debentures and interest accrued thereon	g	0	
	h	Others (specify nature)	h	0	
	i	Total Other financial liabilities(a + b + c + d + e + f + g + h)		liii	0
	iv	Total Financial liabilities (li + lii + liii)		liv	0

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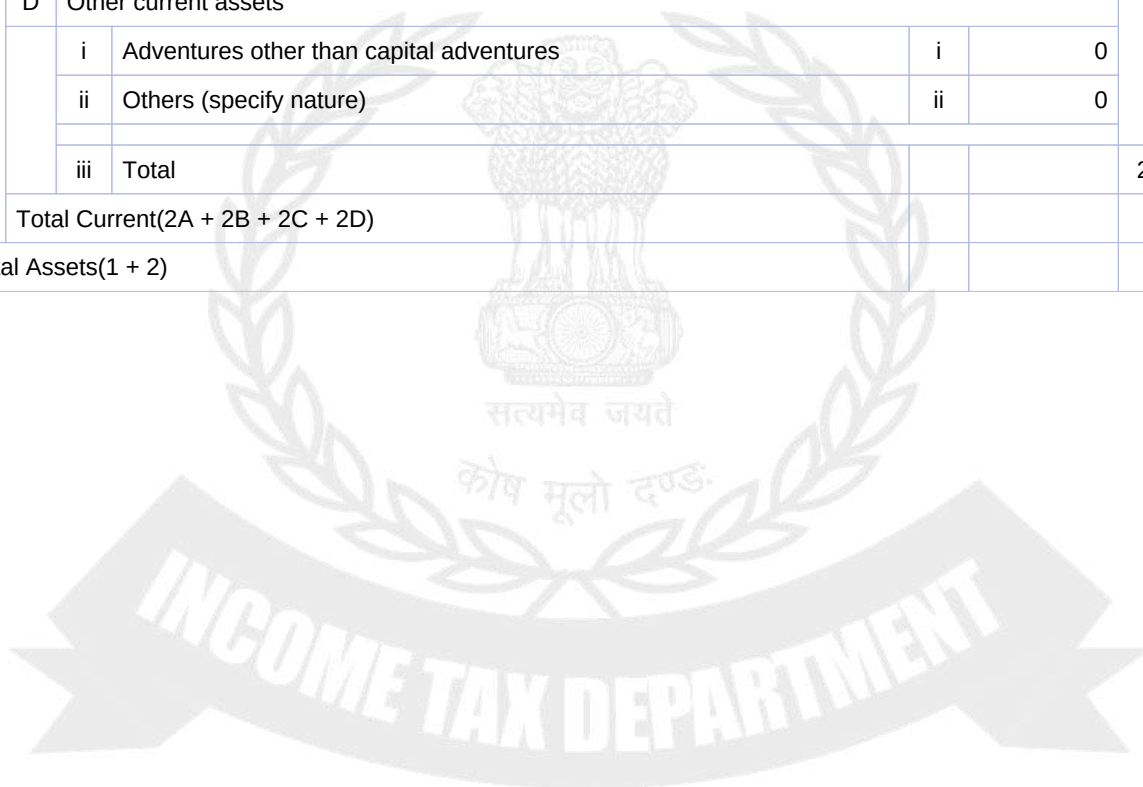
II		Other Current liabilities			
a	Revenue received in advance	a	0		
b	Other advances (specify nature)	b	0		
c	Others (specify nature)	c	0		
d Total Other current liabilities(a + b + c)				IId	0
III		Provisions			
a	Provision for employee benefits	a	0		
b	Others(specify nature)	b	0		
c Total provisions (a + b)				IIIc	0
IV		Current Tax Liabilities (Net)		IV	0
Total Current liabilities (Iiv + IId + IIIc + IV)				2B	0
Total Equity and liabilities(1C + 2A + 2B)				I	0
II		Assets			
1		Non-current assets			
A		Property, Plant and Equipment			
a	Gross block	a	0		
b	Depreciation	b	0		
c	Impairment losses	c	0		
d Net block(a - b - c)				Ad	0
B		Capital work-in progress		B	0
C		Investment Property			
a	Gross block	a	0		
b	Depreciation	b	0		
c	Impairment losses	c	0		
d Net block(a - b - c)				Cd	0
D		Goodwill			
a	Gross block	a	0		
b	Impairment losses	b	0		
c Net block(a-b)				Dc	0
E		Other intangible Assets			
a	Gross block	a	0		
b	Amortisation	b	0		
c	Impairment losses	c	0		
d Net block(a - b - c)				Ed	0
F		Intangible assets under development		F	0
G		Biological assets other than bearer plants			
a	Gross block	a	0		
b	Impairment losses	b	0		
c Net block(a-b)				Gc	0

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H		Financial Assets				
I	Investments					
i	Investments in Equity instruments					
a	Listed equities	ia	0			
b	Unlisted equities	ib	0			
c	Total (ia + ib)			ic	0	
ii	Investments in Preference shares	ii	0			
iii	Investments in Government or trust securities	iii	0			
iv	Investments in Debentures or bonds	iv	0			
v	Investments in Mutual funds	v	0			
vi	Investments in partnership firms	vi	0			
vii	Others Investment(specify nature)	vii	0			
viii	Total non-current investments(ic + ii + iii + iv + v + vi + vii)			HI	0	
II	Trade receivables					
a	Secured, considered good	a	0			
b	Unsecured, considered good	b	0			
c	Doubtful	c	0			
d	Total Trade receivables			HII	0	
III	Loans					
i	Security deposits	i	0			
ii	Loans to related parties	ii	0			
iii	Other loans (specify nature)	iii	0			
iv	Total Loans(i + ii + iii)			HIII	0	
v	Loans included in HIII above which is:					
a	for the purpose of business or profession	a	0			
b	not for the purpose of business or profession	b	0			
c	given to shareholder, being the beneficial owner of share, or to any concern or on behalf/benefits of such shareholder as per the section 2(22)(e) of I.T. Act	c	0			
IV	Other Financial Assets					
i	Bank deposits with more than 12 month maturity	i	0			
ii	Others	ii	0			
iii	Total of Other Financial Assets (i + ii)			HIV	0	
I	Deferred Tax Assets (Net)				I	0
J	Other Non-current Assets					
i	Capital Assets	i	0			
ii	Advances other than capital advnaces	ii	0			
iii	Others(specify nature)	iii	0			
iv	Total non-current assets(i + ii + iii)			J	0	
Non-current assets included in J above which is due from shareholder,						

	v	being the beneficial owner of share, or from the concern or on behalf /benefits of such shareholder as per the section 2(22)(e) of I.T. Act.	v	0		
	Total Non-current assets (Ad + B + Cd + Dc + Ed + F + Gc + HI + HII + HIII + HIV + I + J)				1	0
2	Current assets					
	A	Inventories				
	i	Raw Materials	i	0		
	ii	Work-in progress	ii	0		
	iii	Finished goods	iii	0		
	iv	Stock-in-trade (in respect of goods acquired for trading)	iv	0		
	v	Stores and spares	v	0		
	vi	Loose tools	vi	0		
	vii	Others	vii	0		
	viii	Total Inventories (i + ii + iii + iv + v + vi + vii)			2A	0
	B	Financial Assets				
	I	Investments				
	i	Investment in Equity instruments				
	a	Listed equities	ia	0		
	b	Unlisted equities	ib	0		
	c	Total (ia + ib)	ic	0		
	ii	Investment in Preference share	ii	0		
	iii	Investment in government or trust securities	iii	0		
	iv	Investment in debentures or bonds	iv	0		
	v	Investment in Mutual funds	v	0		
	vi	Investment in partnership firm	vi	0		
	vii	Others investment	vii	0		
	viii	Total Current Investments(ic + ii + iii + iv + v + vi + vii)			I	0
	II	Trade receivables				
	i	Secured, considered goods	i	0		
	ii	Unsecured, considered goods	ii	0		
	iii	Doubtful	iii	0		
	iv	Total Trade receivables(i + ii + iii)			II	0
	III	Cash and cash equivalents				
	i	Balances with Banks(of the nature of cash and cash equivalents)	i	0		
	ii	Cheques, drafts in hand	ii	0		
	iii	Cash on hand	iii	0		
	iv	Others(specify nature)	iv	0		
	v	Total cash and cash equivalents(i + ii + iii + iv)			III	0
	IV	Bank Balances other than III above			IV	0
	V	Loans				
		1825				
	i	Security Deposits	i	0		

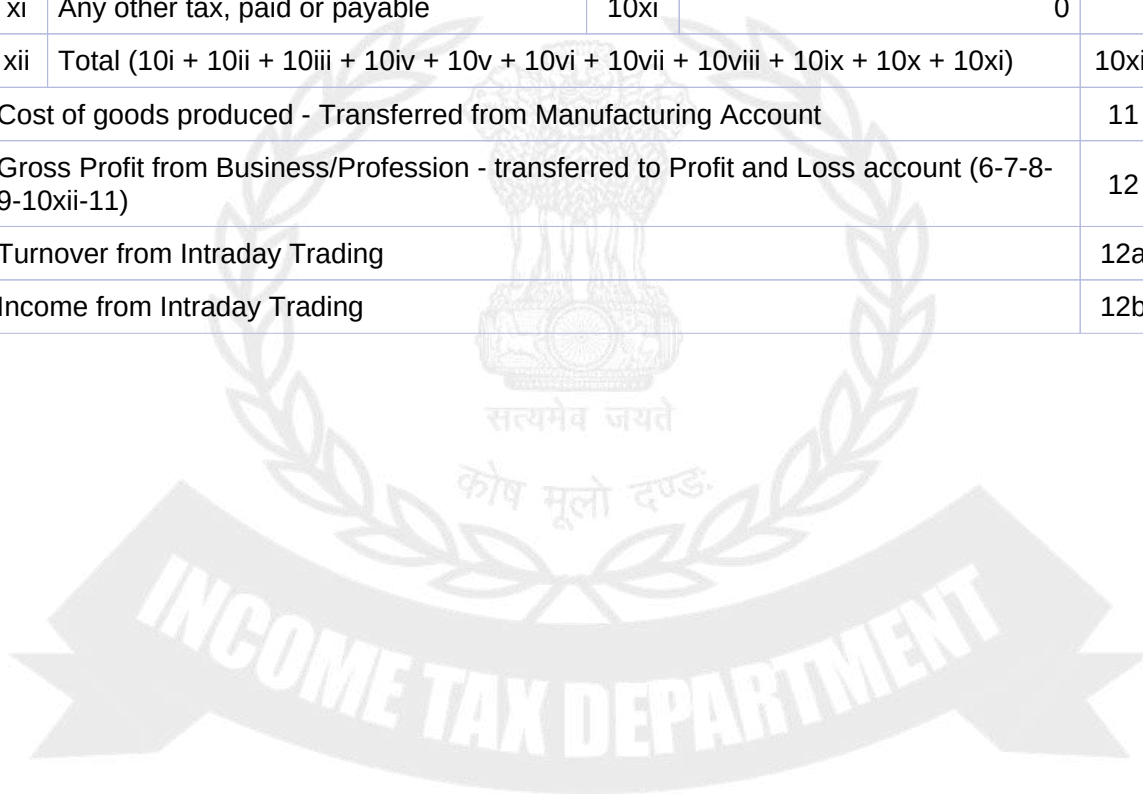
	ii	Loans to related parties	ii	0		
	iii	Others(specify nature)	iii	0		
	iv	Total Loans(i + ii + iii)			V	0
	v	Loans and advances included in V above which is-				
	a	for the purpose of business or profession	a	0		
	b	not for the purpose of business or profession	b	0		
	c	given to shareholder, being the beneficial owner of share, or to any concern or on behalf/benefits of such shareholder as per the section 2(22)(e) of I.T. Act	c	0		
	VI	Other Financial Assets			VI	0
		Total Financial Assets(i + ii + iii + iv + v + vi)			2B	0
	C	Current Tax Assets(Net)			2C	0
	D	Other current assets				
	i	Adventures other than capital adventures	i	0		
	ii	Others (specify nature)	ii	0		
	iii	Total			2D	0
		Total Current(2A + 2B + 2C + 2D)			2	0
		Total Assets(1 + 2)			II	0



Part A - Manufacturing Account		Manufacturing Account for the financial year 2020-21 (fill items 1 to 3 in a case where regular books of accounts are maintained, otherwise fill items 61 to 62 as applicable)						
1	Debits to Manufacturing Account							
	A Opening Inventory							
	i	Opening stock of raw-material	i		0			
	ii	Opening stock of Work in progress	ii		0			
	iii	Total (i + ii)				Aiii	0	
	B Purchases (net of refunds and duty or tax, if any)						B	0
	C Direct wages						C	0
	D Direct expenses (Di + Dii + Diii)						D	0
	i	Carriage inward	i		0			
	ii	Power and fuel	ii		0			
	iii	Other direct expenses	iii		0			
	E Factory Overheads							
	i	Indirect wages	i		0			
	ii	Factory rent and rates	ii		0			
	iii	Factory Insurance	iii		0			
	iv	Factory fuel and power	iv		0			
	v	Factory general expenses	v		0			
	vi	Depreciation of factory machinery	vi		0			
	vii	Total (i+ii+iii+iv+v+vi)				Evii	0	
	F Total of Debits to Manufacturing Account (Aiii+B+C+D+Evii)						F	0
2	Closing Stock							
	i	Raw material	2i		0			
	ii	Work-in-progress	2ii		0			
	Total (2i + 2ii)						2	0
3	Cost of Goods Produced - transferred to Trading Account (1F - 2)						3	0

Part A-Trading Account		Trading Account for the financial year 2020-21 (fill items 4 to 12 in a case where regular books of accounts are maintained, otherwise fill items 61 to 62as applicable)						
CREDITS TO TRADING ACCOUNT	4	Revenue from operations						
	A	Sales/ Gross receipts of business (net of returns and refunds and duty or tax, if any)						
		i	Sale of goods	i	2,14,21,919			
		ii	Sale of services	ii	0			
		iii	Other operating revenues (specify nature and amount)					
		Sl.No.		Nature of Revenue	Amount			
		Total			0			
		iv	Total (i + ii + iiic)			Aiv	2,14,21,919	
		B	Gross receipts from Profession			B	0	
		C	Duties, taxes and cess received or receivable in respect of goods and services sold or supplied					
		i	Union Excise duties	i	0			
		ii	Service tax	ii	0			
		iii	VAT/Sales tax	iii	0			
		iv	Central Goods & Service Tax (CGST)	iv	0			
		v	State Goods & Services Tax (SGST)	v	0			
		vi	Integrated Goods & Services Tax (IGST)	vi	0			
		vii	Union Territory Goods & Services Tax (UTGST)	vii	0			
		viii	Any other duty, tax and cess	viii	0			
		ix	Total (i + ii + iii + iv +v+ vi+vii+viii)			Cix	0	
		D	Total Revenue from operations (Aiv + B +Cix)			4D	2,14,21,919	
	5	Closing Stock of Finished Stocks				5	45,35,072	
	6	Total of credits to Trading Account (4D + 5)				6	2,59,56,991	
	7	Opening Stock of Finished Goods				7	2,97,689	
	8	Purchases (net of refunds and duty or tax, if any)				8	2,08,32,064	
	9	Direct Expenses (9i + 9ii + 9iii)				9	0	
		i	Carriage inward	9i	0			
		ii	Power and fuel	9ii	0			
		iii	Other direct expenses	9iii	0			
		Sl. No.		Nature of Expense	Amount			
		i	Works Contract		0			
	10	Duties and taxes, paid or payable, in respect of goods and services purchased						

DEBITS TO TRADING ACCOUNT	i	Custom duty	10i	0
	ii	Counter veiling duty	10ii	0
	iii	Special additional duty	10iii	0
	iv	Union excise duty	10iv	0
	v	Service tax	10v	0
	vi	VAT/ Sales tax	10vi	0
	vii	Central Goods & Service Tax (CGST)	10vii	0
	viii	State Goods & Services Tax (SGST)	10viii	0
	ix	Integrated Goods & Services Tax (IGST)	10ix	0
	x	Union Territory Goods & Services Tax (UTGST)	10x	0
	xi	Any other tax, paid or payable	10xi	0
	xii	Total (10i + 10ii + 10iii + 10iv + 10v + 10vi + 10vii + 10viii + 10ix + 10x + 10xi)	10xii	0
	11	Cost of goods produced - Transferred from Manufacturing Account	11	0
	12	Gross Profit from Business/Profession - transferred to Profit and Loss account (6-7-8-9-10xii-11)	12	48,27,238
	12a	Turnover from Intraday Trading	12a	0
	12b	Income from Intraday Trading	12b	0



Part
A-
P&L

Profit and Loss Account for the financial year 2020-21 (fill items 13 to 60 in a case where regular books of accounts are maintained, otherwise fill items 61 to 62 as applicable)

13	Gross profit transferred from Trading Account				13	48,27,238
14	Other income					
	i	Rent	i	0		
	ii	Commission	ii	258		
	iii	Dividend income	iii	0		
	iv	Interest income	iv	1,49,972		
	v	Profit on sale of fixed assets	v	0		
	vi	Profit on sale of investment being securities chargeable to Securities Transaction Tax (STT)	vi	0		
	vii	Profit on sale of other investment	vii	0		
	viii	Gain (loss) on account of foreign exchange fluctuation u/s 43AA	viii	0		
	ix	Profit on conversion of inventory into capital asset u/s 28(via) (FMV of inventory as on the date of conversion)	ix	0		
	x	Agricultural income	x	0		
	xi	Any other income (specify nature and amount)				
		Sl.No	Nature of Income	Amount		
		1	Covid Ex-Gratia	1,537		
		2	Discounts	4,412		
		3	Loan Service Charge Refund From FB	25,000		
		4	Other Income	62,532		
		5	Petrol Rebate	1,466		
		6	Registration and Feasibility Fee	25,200		
		7	Unclaimed Liabilities	28,58,633		
		8	Unclaimed Discount	22,21,428		
			Total	52,00,208		
	xii	Total of other income (i + ii + iii + iv + v + vi + vii + viii + ix + x+ xi)			14xii	53,50,438
15	Total of credits to profit and loss account (13+14xii)				15	1,01,77,676
16	Freight outward				16	43,294
17	Consumption of stores and spare parts				17	0
18	Power and fuel				18	0
19	Rents				19	5,97,501
20	Repairs to building				20	0
21	Repairs to machinery				21	1,70,026
22	Compensation to employees					
	i	Salaries and wages	22i	45,46,135		
	ii	Bonus	22ii	0		
	iii	Reimbursement of medical expenses	22iii	0		
	iv	Leave encashment	22iv	0		
	v	Leave travel benefits	22v	0		
	vi	Contribution to approved superannuation fund	22vi	0		
	vii	Contribution to recognised provident fund	22vii	0		
	viii	Contribution to recognised gratuity fund	22viii	0		

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	ix	Contribution to any other fund	22ix	0		
	x	Any other benefit to employees in respect of which an expenditure has been incurred	22x	0		
	xi	Total compensation to employees (total of 22i to 22x)			22xi	45,46,135
	xii	Whether any compensation, included in 22xi, paid to non-residents	xiiia	No		
		If Yes, amount paid to non-residents	xiiib	0		
23	Insurance					
	i	Medical Insurance	23i	0		
	ii	Life Insurance	23ii	0		
	iii	Keyman's Insurance	23iii	0		
	iv	Other Insurance including factory, office, car, goods, etc.	23iv	34,674		
	v	Total expenditure on insurance (23i + 23ii + 23iii + 23iv)			23v	34,674
24	Workmen and staff welfare expenses					24 1,01,835
25	Entertainment					25 0
26	Hospitality					26 0
27	Conference					27 0
28	Sales promotion including publicity (other than advertisement)					28 0
29	Advertisement					29 1,00,153
30	Commission					
	i	Paid outside India, or paid in India to a non-resident other than a company or a foreign company	i	0		
	ii	To others	ii	0		
	iii	Total (i + ii)			30iii	0
31	Royalty					
	i	Paid outside India, or paid in India to a non-resident other than a company or a foreign company	i	0		
	ii	To others	ii	0		
	iii	Total (i + ii)			31iii	0
32	Professional / Consultancy fees / Fee for technical services					
	i	Paid outside India, or paid in India to a non-resident other than a company or a foreign company	i	0		
	ii	To others	ii	1,20,730		
	iii	Total (i + ii)			32iii	1,20,730
33	Hotel, boarding and Lodging					33 0
34	Traveling expenses other than on foreign traveling					34 859959
35	Foreign travelling expenses					35 0
36	Conveyance expenses					36 0
37	Telephone expenses					37 0
38	Guest House expenses					38 0
39	Club expenses					39 0
40	Festival celebration expenses					40 0
41	Scholarship					41 0
42	Gift					42 0
43	Donation					43 6,050
44	Rates and taxes, paid or payable to Government or any local body (excluding taxes on income)					
	i	Union excise duty	44i	0		
	ii	Service tax	44ii	0		
	iii	VAT/ Sales tax	44ii	0		
	iv	Cess	44iv	0		
	v	Central Goods & Service Tax (CGST)	44v	0		
	vi	State Goods & Services Tax (SGST)	44vi	0		
	vii	Integrated Goods & Services Tax (IGST)	44vii	0		

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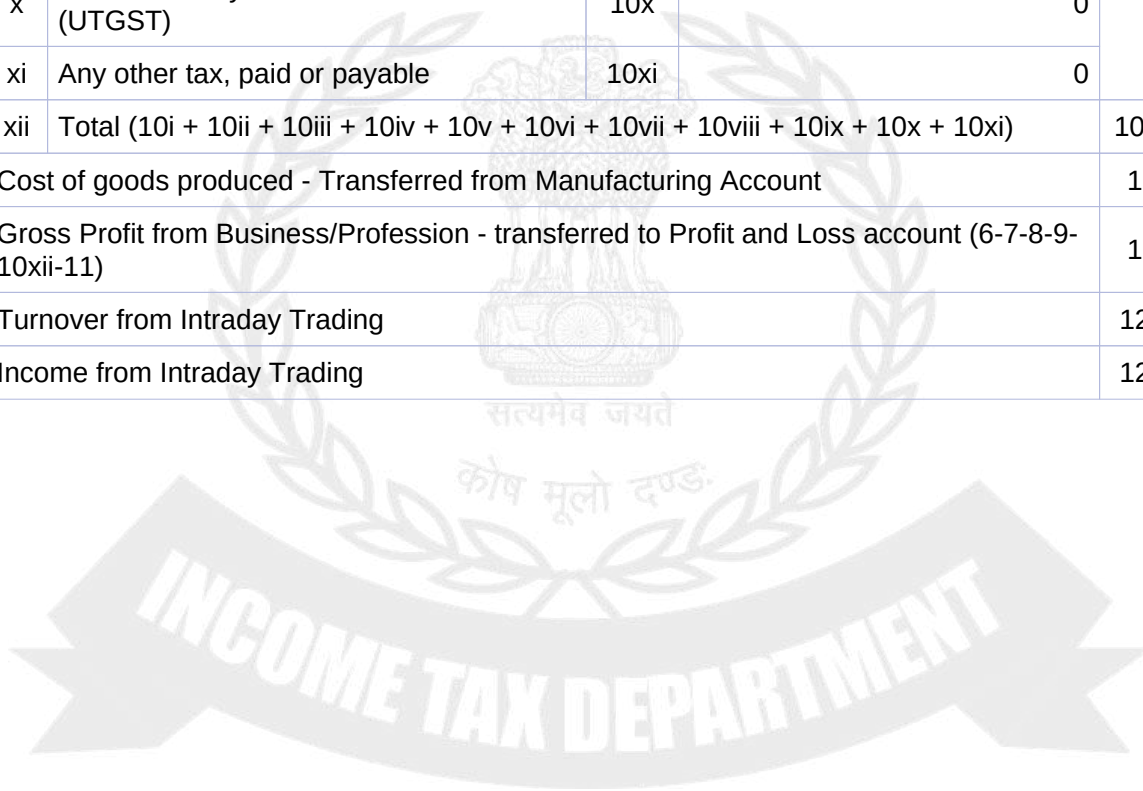
	viii	Union Territory Goods & Services Tax (UTGST)										44viii	0		
	ix	Any other rate, tax, duty or cess incl STT and CTT										44ix	1,21,846		
	X	Total rates and taxes paid or payable (44i + 44ii +44iii +44iv + 44v + 44vi + 44vii + 44viii +44ix)										44ix	1,21,846		
45	Audit fee												45	35,000	
46	Other expenses (specify nature and amount)														
	Sl. No.	Nature of Expense									Amount				
	1	Marketing Expenses									2,60,016				
	2	Anert Registration and Affiliation Expenses									2,910				
	3	Interest and Bank Charges									5,00,132				
	4	Newspaper and Periodicals									5,934				
	5	Electricity and Water charges									37,172				
	6	Internet and telephone charges									74,452				
	7	Office Expenses									6,71,781				
	8	Printing and stationery									45,748				
	9	Postage and courier charges									10,142				
	10	Refreshment expenses									17,408				
	11	Worksite expenses									4,10,036				
	12	Filing fee									650				
	13	Miscellaneous expenses									25,784				
	14	License Fee									3,32,209				
	15	Tender Fee Expenses									71,450				
	16	Discounts									5,165				
		Total									24,70,989				
47	Bad debts (specify PAN/ Aadhaar No. of the person, if available, for whom Bad Debt for amount of Rs. 1 lakh or more is claimed and amount)														
	Sl. No.	PAN of the person				Aadhaar Number of the person				Amount					
	i	(Rows can be added as required) Total [47i(1)+47i(2)+47i(3)]										47i	0		
	ii	Others (more than Rs. 1 lakh) where PAN/ Aadhaar No. is not available (provide name and complete address)										47ii	0		
	Sl. No.	Name	Flat / Door/ Block No	Name of Premises/ Building/ Village	Road/ Street/ Post Office	Area/ Locality	Town/ City/ District	State	Country	PIN Code	ZIP Code	Amount			
	iii	Others (amounts less than Rs. 1 lakh)										47iii	0		
	iv	Total Bad Debt (47i + 47ii + 47iii)										47iv	0		
48	Provision for bad and doubtful debts												48	0	
49	Other provisions												49	0	
50	Profit before interest, depreciation and taxes [15 - (16 to 21 + 22xi + 23v + 24 to 29 + 30iii + 31iii + 32iii + 33 to 43 + 44x + 45 + 46iii + 47iv + 48 + 49)]												50	9,69,484	
51	Interest												1832		
	i	Paid outside India, or paid in India to a non-resident other than a company or a foreign company										i	0		

		ii	To others		ii	0		
		iii	Total (i + ii)				51iii	0
52	Depreciation and amortisation						52	8,30,557
53	Net profit before taxes (50 - 51iii - 52)						53	1,38,927
54	Provision for current tax						54	98,531
55	Provision for Deferred Tax						55	-65,667
56	Profit after tax (53 - 54 - 55)						57	1,06,063
57	Balance brought forward from previous year						57	0
58	Amount available for appropriation (56 + 57)						58	1,06,063
59	Appropriations							
	i	Transfer to reserves and surplus				59i	0	
	ii	Proposed dividend/ Interim dividend				59ii	0	
	iii	Tax on dividend/ Tax on dividend for earlier years				59iii	0	
	iv	Appropriation towards Corporate Social Responsibility (CSR) activities (in case of companies covered under section 135 of Companies Act, 2013) Appropriation towards Corporate Social Responsibility (CSR) activities				59iv	0	
	v	Any other appropriation				59v	0	
	vi	Total (59i + 59ii + 59iii + 59iv+59v)				59vi	0	
60	Balance carried to balance sheet (58 - 59vi)						60	1,06,063
61	COMPUTATION OF PRESUMPTIVE INCOME FROM GOODS CARRIAGES UNDER SECTION 44AE							
SR.NO.		Name of Business			Business code		Description	
	Registration No. of goods carriage	Whether owned /leased /hired	Tonnage capacity of goods carriage (in MT)	Number of months for which goods carriage was owned/leased /hired by assessee	Presumptive income u/s 44AE for the goods carriage (Computed @ Rs.1000 per ton per month in case tonnage exceeds 12MT, or else @ Rs.7500 per month) or the amount claimed to have been actually earned, whichever is higher			
(i)	(1)	(2)	(3)	(4)	(5)			
Add row options as necessary (Please Note : At any time during the year the number of vehicles should not exceed 10 vehicles)								
(ii)	Total presumptive income from goods carriage u/s 44AE [total of column (5) of table 61]						61	0
NOTE- If the profits are lower than prescribed under S.44AE or the number of goods carriage owned / leased / hired at any time during the year exceeds 10, then , it is mandatory to maintain books of accounts and have a tax audit under section 44AB								
62	In case of Foreign Company whose total income comprises solely of profits and gains from business referred to in sections 44B, 44BB, 44BBA or 44BBB, furnish the following information							
	a	Gross receipts / Turnover				62a	0	
	b	Net profit				62b	0	

Part A- Manufacturing Account Ind- AS		Manufacturing Account for the financial year 2020-21 [applicable for a company whose financial statements are drawn up in compliance to the Indian Accounting Standards specified in Annexure to the companies (Indian Accounting Standards) Rules, 2015]					
1	Debits to Manufacturing account						
	A Opening Inventory						
	i	Opening stock of raw-material	i	0			
	ii	Opening stock of Work in progress	ii	0			
	iii	Total (i + ii)			Aiii	0	
	B Purchases (net of refunds and duty or tax, if any)				B	0	
	C Direct wages				C	0	
	D Direct expenses				D	0	
	i	Carriage inward	i	0			
	ii	Power and fuel	ii	0			
	iii	Other direct expenses	iii	0			
	E Factory Overheads						
	i	Indirect wages		0			
	ii	Factory rent and rates		0			
	iii	Factory Insurance		0			
	iv	Factory fuel and power		0			
	v	Factory general expenses		0			
	vi	Depreciation of factory machinery		0			
	vii	Total (i+ii+iii+iv+v+vi)			Evii	0	
	F Total of Debits to Manufacturing Account (Aiii+B+C+D+Evii)				1F	0	
2	Closing Stock						
	i	Raw material	2i	0			
	ii	Work-in-progress	2ii	0			
	Total (2i + 2ii)				2	0	
3	Cost of Goods Produced - transferred to Trading Account (1F - 2)				3	0	

Part A- Trading Account Ind- AS		Trading Account for the financial year 2020-21 [applicable for a company whose financial statements are drawn up in compliance to the Indian Accounting Standards specified in Annexure to the companies (Indian Accounting Standards) Rules, 2015]							
CREDITS TO TRADING ACCOUNT	4	Revenue from operations							
	A	Sales/ Gross receipts of business (net of returns and refunds and duty or tax, if any)							
		i	Sale of goods	i		0			
		ii	Sale of services	ii		0			
		iii	Other operating revenues (specify nature and amount)						
		Sl.No.		Nature of Revenue		Amount			
		Total				0			
		iv	Total (i + ii + iiic)				Aiv	0	
		B	Gross receipts from Profession				B	0	
		C	Duties, taxes and cess received or receivable in respect of goods and services sold or supplied						
		i	Union Excise duties	i		0			
		ii	Service tax	ii		0			
		iii	VAT/Sales tax	iii		0			
		iv	Central Goods & Service Tax (CGST)	iv		0			
		v	State Goods & Services Tax (SGST)	v		0			
		vi	Integrated Goods & Services Tax (IGST)	vi		0			
		vii	Union Territory Goods & Services Tax (UTGST)	vii		0			
		viii	Any other duty, tax and cess	viii		0			
		ix	Total (i + ii + iii + iv +v+ vi+vii+viii)				Cix	0	
		D	Total Revenue from operations (Aiv + B +Cix)				4D	0	
	5	Closing Stock of Finished Stocks					5	0	
	6	Total of credits to Trading Account (4D + 5)					6	0	
	7	Opening Stock of Finished Goods					7	0	
	8	Purchases (net of refunds and duty or tax, if any)					8	0	
	9	Direct Expenses (9i + 9ii + 9iii)					9	0	
		i	Carriage inward	9i		0			
		ii	Power and fuel	9ii		0			
		iii	Other direct expenses Note: Row can be added as per the nature of Direct Expenses	9iii		0			
				1835					
		Sl.No.	Other direct expenses		Amount				

DEBITS TO TRADING ACCOUNT	10	Duties and taxes, paid or payable, in respect of goods and services purchased		
	i	Custom duty	10i	0
	ii	Counter veiling duty	10ii	0
	iii	Special additional duty	10iii	0
	iv	Union excise duty	10iv	0
	v	Service tax	10v	0
	vi	VAT/ Sales tax	10vi	0
	vii	Central Goods & Service Tax (CGST)	10vii	0
	viii	State Goods & Services Tax (SGST)	10viii	0
	ix	Integrated Goods & Services Tax (IGST)	10ix	0
	x	Union Territory Goods & Services Tax (UTGST)	10x	0
	xi	Any other tax, paid or payable	10xi	0
	xii	Total (10i + 10ii + 10iii + 10iv + 10v + 10vi + 10vii + 10viii + 10ix + 10x + 10xi)	10xii	0
	11	Cost of goods produced - Transferred from Manufacturing Account	11	0
	12	Gross Profit from Business/Profession - transferred to Profit and Loss account (6-7-8-9-10xii-11)	12	0
	12a	Turnover from Intraday Trading	12a	0
	12b	Income from Intraday Trading	12b	0



Part A-P& L Ind-AS		Profit and Loss Account for the financial year 2020-21 [applicable for a company whose financial statements are drawn up in compliance to the Indian Accounting Standards specified in Annexure to the companies (Indian Accounting Standards) Rules, 2015]					
CREDITS TO PROFIT AND LOSS ACCOUNT	13	Gross profit transferred from Trading Account				13	0
	14	Other income					
		i	Rent	i	0		
		ii	Commission	ii	0		
		iii	Dividend income	iii	0		
		iv	Interest income	iv	0		
		v	Profit on sale of fixed assets	v	0		
		vi	Profit on sale of investment being securities chargeable to Securities Transaction Tax (STT)	vi	0		
		vii	Profit on sale of other investment	vii	0		
		viii	Gain (loss) on account of foreign exchange fluctuation u/s 43AA	viii	0		
		ix	Profit on conversion of inventory into capital asset u/s 28(via) (Fair Market Value of inventory as on the date of conversion)	ix	0		
		x	Agricultural income	x	0		
		xi	Any other income (specify nature and amount)				
			Sl. No.	Nature of Income	Amount		
				Total (xia + xib)	0		
	xii	Total of other income (i + ii + iii + iv + v + vi + vii + viii + ix + x + xic)				14xii	0
	15	Total of credits to profit and loss account (13+14xii)				15	0
	16	Freight outward				16	0
	17	Consumption of stores and spare parts				17	0
	18	Power and fuel				18	0
	19	Rents				19	0
	20	Repairs to building				20	0
	21	Repairs to machinery				21	0
	22	Compensation to employees					
		i	Salaries and wages	22i	0		
		ii	Bonus	22ii	0		
		iii	Reimbursement of medical expenses	22iii	0		
		iv	Leave encashment	22iv	0		
		v	Leave travel benefits	22v	0		
		vi	Contribution to approved superannuation fund	22vi	0		
		vii	Contribution to recognised provident fund	22vii	0		
		viii	Contribution to recognised gratuity fund	22viii	0		
		ix	Contribution to any other fund	22ix	0		
		x	Any other benefit to employees in respect of which an expenditure has been incurred	22x	0		
		xi	Total compensation to employees (total of 22i to 22x)		22xi	0	

DEBITS TO PROFIT AND LOSS ACCOUNT

	xiia	Whether any compensation, included in 22xi, paid to non-residents	xiia		
	xiib	If Yes, amount paid to non-residents	xiib	0	
23	Insurance				
	i	Medical Insurance	23i	0	
	ii	Life Insurance	23ii	0	
	iii	Keyman's Insurance	23iii	0	
	iv	Other Insurance including factory, office, car, goods, etc.	23iv	0	
	v	Total expenditure on insurance (23i + 23ii + 23iii + 23iv)	23v		0
24	Workmen and staff welfare expenses				24 0
25	Entertainment				25 0
26	Hospitality				26 0
27	Conference				27 0
28	Sales promotion including publicity (other than advertisement)				28 0
29	Advertisement				29 0
30	Commission				
	i	Paid outside India, or paid in India to a non-resident other than a company or a foreign company	i	0	
	ii	To others	ii	0	
	iii	Total (i + ii)	iii		0
31	Royalty				
	i	Paid outside India, or paid in India to a non-resident other than a company or a foreign company	i	0	
	ii	To others	ii	0	
	iii	Total (i + ii)	31iii		0
32	Professional / Consultancy fees / Fee for technical services				
	i	Paid outside India, or paid in India to a non-resident other than a company or a foreign company	i	0	
	ii	To others	ii	0	
	iii	Total (i + ii)	32iii		0
33	Hotel, boarding and Lodging				33 0
34	Traveling expenses other than on foreign traveling				34 0
35	Foreign travelling expenses				35 0
36	Conveyance expenses				36 0
37	Telephone expenses				37 0
38	Guest House expenses				38 0
39	Club expenses				39 0
40	Festival celebration expenses				40 0
41	Scholarship				41 0
42	Gift				42 0
43	Donation				43 0
44	Rates and taxes, paid or payable to Government or any local body (excluding taxes on income)				

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PROVISIONS PROVISION FOR TAX AND APPROPRIATIONS

i	Union excise duty	44i	0																																																																																																														
ii	Service tax	44ii	0																																																																																																														
iii	VAT/ Sales tax	44ii	0																																																																																																														
iv	Cess	44iv	0																																																																																																														
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ix	Any other rate, tax, duty or cess incl STT and CTT	44ix	0																																																																																																														
x	Total rates and taxes paid or payable (44i + 44ii + 44iii + 44iv + 44v + 44vi + 44vii + 44viii + 44ix)	44ix	0																																																																																																														
45	Audit fee	45	0																																																																																																														
46	Other expenses (specify nature and amount)																																																																																																																
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47	Bad debts (specify PAN/ Aadhaar No. of the person, if available, for whom Bad Debt for amount of Rs. 1 lakh or more is claimed and amount)																																																																																																																
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59	Appropriations				
	i	Transfer to reserves and surplus	59i	0	
	ii	Proposed dividend/ Interim dividend	59ii	0	
	iii	Tax on dividend/ Tax on dividend for earlier years	59iii	0	
	iv	Appropriation towards Corporate Social Responsibility (CSR) activities (in case of companies covered under section 135 of Companies Act, 2013)	59iv	0	
	v	Any other appropriation	59v	0	
	vi	Total (59i + 59ii + 59iii + 59iv+59v)	59vi	0	
60	Balance carried to balance sheet (58 - 59vi)				60 0
61	A	Items that will not be reclassified to P&L			
		i	Changes in revaluation surplus	i	0
		ii	Re-measurements of the defined benefit plans	ii	0
		iii	Equity instruments through OCI	iii	0
		iv	Fair value Changes relating to own credit risk of financial liabilities designated at FVTPL	iv	0
		v	Share of Other comprehensive income in associates and joint ventures , to the extent not to be classified to P&L	v	0
		vi	Others (Specify nature)	vi	0
		Sl. No.	Nature	Amount	
		vii	Income tax relating to items that will not be reclassified to P&L	vii	0
		viii	Total	61A	0
	B	Items that will be reclassified to P&L			
		i	Exchange differences in translating the financial statements of a foreign operation	i	0
		ii	Debt instruments through OCI	ii	0
		iii	The effective portion of gains and loss on hedging instruments in a cash flow hedge	iii	0
		iv	Share of OCI in associates and joint ventures to the extent to be classified into P&L	iv	0
		v	Others (Specify nature)	v	0
		Sl. No.	Nature	Amount	
		vi	Income tax relating to items that will be reclassified to P&L	vi	0
		vii	Total	61B	0
62	Total Comprehensive Income (56 + 61A + 61B)				62 0

Part A - OI		Other Information (mandatory if liable for audit under section 44AB, for other fill, if applicable)			
1	Method of accounting employed in the previous year (Tick)		mercantile	cash	
2	Is there any change in method of accounting (Tick)		Yes	No	
3a	Increase in the profit or decrease in loss because of deviation, if any, as per Income Computation Disclosure Standards notified under section 145(2) [column 11a(iii) of Schedule ICDS]		3a	0	
3b	Decrease in the profit or increase in loss because of deviation, if any, as per Income Computation Disclosure Standards notified under section 145(2) [column 11b(iii) of Schedule ICDS]		3b	0	
4	Method of valuation of closing stock employed in the previous year				
a	Raw Material (if at cost or market rates whichever is less write 1, if at cost write 2, if at market rate write 3)			1	
b	Finished goods (if at cost or market rates whichever is less write 1, if at cost write 2, if at market rate write 3)			1	
c	Is there any change in stock valuation method (Tick)		Yes	No	
d	Increase in the profit or decrease in loss because of deviation, if any, from the method of valuation specified under section 145A		4d	0	
e	Decrease in the profit or increase in loss because of deviation, if any, from the method of valuation specified under section 145A		4e	0	
5	Amounts not credited to the profit and loss account, being -				
a	the items falling within the scope of section 28	5a	0		
b	the proforma credits, drawbacks, refund of duty of customs or excise or service tax, or refund of sales tax or value added tax, or refund of GST, where such credits, drawbacks or refunds are admitted as due by the authorities concerned	5b	0		
c	escalation claims accepted during the previous year	5c	0		
d	any other item of income	5d	0		
e	capital receipt, if any	5e	0		
f	Total of amounts not credited to profit and loss account (5a+5b+5c+5d+5e)	5f	0		
6	Amounts debited to the profit and loss account, to the extent disallowable under section 36 due to non-fulfilment of conditions specified in relevant clauses				
a	Premium paid for insurance against risk of damage or destruction of stocks or store [36(1)(i)]	6a	0		
b	Premium paid for insurance on the health of employees [36(1)(ib)]	6b	0		
c	Any sum paid to an employee as bonus or commission for services rendered, where such sum was otherwise payable to him as profits or dividend [36(1)(ii)]	6c	0		

d	Any amount of interest paid in respect of borrowed capital [36(1)(iii)]	6d	0
e	Amount of discount on a zero-coupon bond [36(1)(iia)]	6e	0
f	Amount of contributions to a recognised provident fund [36(1)(iv)]	6f	0
g	Amount of contributions to an approved superannuation fund [36(1)(iv)]	6g	0
h	Amount of contribution to a pension scheme referred to in section 80CCD [36(1)(iva)]	6h	0
i	Amount of contributions to an approved gratuity fund [36(1)(v)]	6i	0
j	Amount of contributions to any other fund	6j	0
k	Any sum received from employees as contribution to any provident fund or superannuation fund or any fund set up under ESI Act or any other fund for the welfare of employees to the extent not credited to the employees account on or before the due date [36(1)(va)]	6k	5,054
l	Amount of bad and doubtful debts [36(1)(vii)]	6l	0
m	Provision for bad and doubtful debts [36(1)(vii)]	6m	0
n	Amount transferred to any special reserve [36(1)(viii)]	6n	0
o	Expenditure for the purposes of promoting family planning amongst employees [36(1)(ix)]	6o	0
p	Amount of securities transaction paid in respect of transaction in securities if such income is not included in business income [36(1)(xv)]	6p	0
q	Marked to market loss or other expected loss as computed in accordance with the ICDS notified u/s 145(2) [36(1)(xviii)]	6q	0
r	Any other disallowance	6r	4,921
s	Total amount disallowable under section 36 (total of 6a to 6r)	6s	9,975
t	Total number of employees employed by the company (mandatory in case company has recognized Provident Fund)		
	i deployed in India	i	
	ii deployed outside India	ii	
	iii Total	iii	
7	Amounts debited to the profit and loss account, to the extent disallowable under section 37		
			1842
a	Expenditure of capital nature [37(1)]	7a	0

	b	Expenditure of personal nature [37(1)]	7b	0
	c	Expenditure laid out or expended wholly and exclusively NOT for the purpose of business or profession [37(1)]	7c	0
	d	Expenditure on advertisement in any souvenir, brochure, tract, pamphlet or the like, published by a political party [37(2B)]	7d	0
	e	Expenditure by way of penalty or fine for violation of any law for the time being in force	7e	0
	f	Any other penalty or fine	7f	0
	g	Expenditure incurred for any purpose which is an offence or which is prohibited by law	7g	0
	h	Expenditure incurred on corporate social responsibility (CSR)	7h	0
	i	Amount of any liability of a contingent nature	7i	0
	j	Any other amount not allowable under section 37	7j	0
	k	Total amount disallowable under section 37 (total of 7a to 7j)	7k	0
8	A	Amounts debited to the profit and loss account, to the extent disallowable under section 40		
	a	Amount disallowable under section 40 (a)(i), on account of non-compliance with the provisions of Chapter XVII-B	Aa	0
	b	Amount disallowable under section 40 (a)(ia) on account of non-compliance with the provisions of Chapter XVII-B	Ab	37,544
	c	Amount disallowable under section 40 (a)(ib), on account of non-compliance with the provisions of Chapter VIII of the Finance Act, 2016	Ac	0
	d	Amount disallowable under section 40 (a)(iii) on account of non-compliance with the provisions of Chapter XVII-B	Ad	0
	e	Amount of tax or rate levied or assessed on the basis of profits [40 (a)(ii)]	Ae	0
	f	Amount paid as wealth tax [40(a)(iia)]	Af	0
	g	Amount paid by way of royalty, license fee, service fee etc. as per section 40(a)(iib)	Ag	0
	h	Amount of interest, salary, bonus, commission or remuneration paid to any partner or member inadmissible under section [40(b)/40(ba)]	Ah 1843	0

	i	Any other disallowance	Ai	0		
	j	Total amount disallowable under section 40(total of Aa to Ai)			8Aj	37,544
8B	B	Any amount disallowed under section 40 in any preceding previous year but allowable during the previous year			8B	0
9	Amounts debited to the profit and loss account, to the extent disallowable under section 40A					
	a	Amounts paid to persons specified in section 40A(2)(b)	9a	0		
	b	Amount paid otherwise than by account payee cheque or account payee bank draft or use of electronic clearing system through a bank account or through such electronic mode as may be prescribed, disallowable under section 40A(3)	9b	0		
	c	Provision for payment of gratuity [40A(7)]	9c	0		
	d	Any sum paid by the assessee as an employer for setting up or as contribution to any fund, trust, company, AOP, or BOI or society or any other institution [40A(9)]	9d	0		
	e	Any other disallowance	9e	0		
	f	Total amount disallowable under section 40A(total of 9a to 9e)			9f	0
10	Any amount disallowed under section 43B in any preceding previous year but allowable during the previous year					
	a	Any sum in the nature of tax, duty, cess or fee under any law	10a	0		
	b	Any sum payable by way of contribution to any provident fund or superannuation fund or gratuity fund or any other fund for the welfare of employees	10b	0		
	c	Any sum payable to an employee as bonus or commission for services rendered	10c	0		
	d	Any sum payable as interest on any loan or borrowing from any public financial institution or a State financial corporation or a State Industrial investment corporation	10d	0		
	e	Any sum payable as interest on any loan or borrowing from any scheduled bank or a co-operative bank other than a primary agricultural credit or a primary co-operative agricultural and rural development bank	10e	0		
	f	Any sum payable towards leave encashment	10f	0		
	g	Any sum payable to the Indian Railways for the use of railway assets	10g	0		
	h	Total amount allowable under section 43B (total of 10a to 10g)			10h	0

11	Any amount debited to profit and loss account of the previous year but disallowable under section 43B			
a	Any sum in the nature of tax, duty, cess or fee under any law	11a	0	
b	Any sum payable by way of contribution to any provident fund or superannuation fund or gratuity fund or any other fund for the welfare of employees	11b	0	
c	Any sum payable to an employee as bonus or commission for services rendered	11c	0	
d	Any sum payable as interest on any loan or borrowing from any public financial institution or a State financial corporation or a State Industrial investment corporation	11d	0	
da	Any sum payable by the assessee as interest on any loan or borrowing from a deposit taking non-banking financial company or systemically important non-deposit taking nonbanking financial company, in accordance with the terms and conditions of the agreement governing such loan or borrowing	11da	0	
e	Any sum payable as interest on any loan or borrowing from any scheduled bank or a co-operative bank other than a primary agricultural credit society or a primary co-operative agricultural and rural development bank	11e	0	
f	Any sum payable towards leave encashment	11f	0	
g	Any sum payable to the Indian Railways for the use of railway assets	11g	0	
h	Total amount disallowable under Section 43B (total of 11a to 11g)	11h	0	
12	Amount of credit outstanding in the accounts in respect of			
a	Union Excise Duty	12a	0	
b	Service tax	12b	0	
c	VAT/sales tax	12c	0	
d	Central Goods & Service Tax (CGST)	12d	0	
e	State Goods & Services Tax (SGST)	12e	0	
f	Integrated Goods & Services Tax (IGST)	12f	0	
g	Union Territory Goods & Services Tax (UTGST)	12g	0	
h	Any other tax	12h	0	
i	Total amount outstanding (total of 12a to 12h)	12i	0	
	Amounts deemed to be profits and gains under section 33AB or			

13	33ABA or 33AC				13	0
	13a	33AB	13a	0		
	13b	33ABA	13b	0		
	13c	33AC	13c	0		
14	Any amount of profit chargeable to tax under section 41				14	0
15	Amount of income or expenditure of prior period credited or debited to the profit and loss account (net)				15	0
16	Amount of expenditure disallowed u/s 14A				16	0
17	Whether assessee is exercising option under subsection 2A of section 92CE (<i>Tick</i>) Yes No [If yes , please fill schedule TPSA]				17	



Part A - QD			Quantitative details (mandatory, if liable for audit under section 44AB)									
	(a)	In the case of a trading concern										
		S.No.	Item Name	Unit	Opening stock	Purchase during the previous year		Sales during the previous year		Closing stock	Shortage/ excess, if any	
			(1)	(2)	(3)	(4)		(5)		(6)	(7)	
	(b)	In the case of a manufacturing concern										
		(6) Raw materials										
		S. No.	Item Name	Unit of measure	Opening stock	Purchase during the previous year	Consumption during the previous year	Sales during the previous year	Closing stock	Yield finished products	Percentage of yield	Shortage/ excess, if any
			(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)
		(7) Finished products/ By-products										
		S. No.	Item Name	Unit	Opening stock	Purchase during the previous year	quantity manufactured during the previous year		Sales during the previous year		Closing stock	shortage/ excess, if any
			(a)	(b)	(c)	(d)	(e)		(f)		(g)	(h)



Part A - OL		Receipt and payment account of company under liquidation					
SOURCES OF FUNDS	1	Opening balance					
		i	Cash in hand	1i	0		
		ii	Bank	1ii	0		
		iii	Total Opening balance	1iii	0		
	2	Receipts					
		i	Interest	2i	0		
		ii	Dividend	2ii	0		
		iii	Sale of assest(pls specify nature and amount)				
			SI. No.	Nature	Amount		
				Total	0		
		iv	Realisation of dues/debtors	2iv	0		
		v	Others(pls. specify nature and amount)				
			SI. No.	Nature	Amount		
				Total	0		
		vi	Total receipts(2i + 2ii + 2iiid + 2iv + 2v)	2vi	0		
	3	Total of opening balance and receipts				3	0
	4	Payments					
		i	Repayment of secured loan	4i	0		
		ii	Repayment of unsecured loan	4ii	0		
		iii	Repayment to creditors	4iii	0		
		iv	Commission	4iv	0		
		v	Others(pls. specify)				
			SI. No.	Nature of Payment	Amount		
				Total of other payments	0		
	vi	Total Payments(4i + 4ii + 4iii + 4iv + 4v)	4vi	0			
5	Closing balance						
	i	Cash in hand	5i	0			
	ii	Bank	5ii	0			
	iii	Total of closing balance(5i + 5ii)	5iii	0			
6	Total of closing balance and payments(4vi + 5iii)				6	0	

Schedule HP	Details Of Income From House Property (Please refer to instructions) (Drop down to be provided indicating ownership of property)		
3	Pass through income/loss if any *	3	0
4	Income under the head "Income from house property" (1k + 2k + 3) (if negative take the figure to 2i of schedule CYLA)	4	0
Furnishing of PAN/ Aadhaar No. of tenant is mandatory, if tax is deducted under section 194-IB. Furnishing of TAN of tenant is mandatory, if tax is deducted under section 194-I.			



Schedule BP		Computation of income from business or profession					
A	From business or profession other than speculative business and specified business						
	1	Profit before tax as per profit and loss account (item 53, 61(ii) and 62(b) of Part A-P&L) / (item 53 of Part A-P&L - Ind AS) (as applicable)			1	1,38,927	
	2a	Net profit or loss from speculative business included in 1 (enter -ve sign in case of loss)		2a	0		
	2b	Net profit or Loss from Specified Business u/s 35AD included in 1 (enter -ve sign in case of loss)		2b	0		
	3	Income/ receipts credited to profit and loss account considered under other heads of income/chargeable u/s 115BBF/ chargeable u/s 115BBG	a	House property	3a	0	
			b	Capital gains	3b	0	
			c	Other sources	3c	1,49,972	
			ci	Dividend Income	3ci	0	
			cii	Other than Dividend Income	3cii	1,49,972	
			d	u/s 115BBF	3d	0	
			e	u/s 115BBG	3e	0	
	4	a	Profit or loss included in 1, which is referred to in section 44B/44BB/44BBA/44BBB/44AE/44D/44DA/ Chapter-XII-G/ First Schedule of Income-tax Act (other than 115B)		4a	0	
		Sl. No	Section		Amount		
		i	44B		4ai	0	
		ii	44BB		4aii	0	
iii		44BBA		4aiii	0		
iv		44BBB		4aiv	0		
v		44AE		4av	0		
vi		44D		4avi	0		
vii		44DA		4avii	0		
viii		Chapter XII-G		4aviii	0		
ix		First Schedule of Income Tax Act (other than 115B)		4aix	0		
b		Profit and gains from life insurance business referred to in section 115B		4b	0		
c		Profit from activities covered under rule 7, 7A, 7B(1), 7B(1A) and 8		4c	0		
ci		i. Profit from activities covered under rule 7		4ci	0		
cii	ii. Profit from activities covered under rule 7A		4cii	0			
ciii	iii. Profit from activities covered under rule 7B(1)		4ciii	0			

civ	iv. Profit from activities covered under rule 7B (1A)	4civ	0		
cv	v. Profit from activities covered under rule 8	4cv	0		
5	Income credited to Profit and Loss account (included in 1) which is exempt				
a	Share of income from firm(s)	5a	0		
b	Share of income from AOP/ BOI	5b	0		
c	Any other exempt income (specify nature and amount)				
	Sl. No.	Nature of Exempt Income	Amount		
	Total		0		
d	Total exempt income (5a + 5b + 5c)	5d	0		
6	Balance (1 - 2a - 2b - 3a - 3b - 3c - 3d - 3e - 4a - 4b - 4c - 5d)		6	-11,045	
7	Expenses debited to profit and loss account considered under other heads of income /related to income chargeable u/s 115BBF or u/s 115BBG	a	House property	7a	0
		b	Capital gains	7b	0
		c	Other sources	7c	0
		d	u/s 115BBF	7d	0
		e	u/s 115BBG	7e	0
8a	Expenses debited to profit and loss account which relate to exempt income		8a	0	
8b	Expenses debited to profit and loss account which relate to exempt income and disallowed u/s 14A (16 of Part A-OI)		8b	0	
9	Total (7a + 7b + 7c + 7d + 7e + 8a + 8b)		9	0	
10	Adjusted profit or loss (6+9)		10	-11,045	
11	Depreciation and amortisation debited to profit and loss account		11	8,30,557	
12	Depreciation allowable under Income-tax Act				
i	Depreciation allowable under section 32(1)(ii) and 32(1)(ia) (item 6 of Schedule-DEP)		12i	5,79,191	
	Depreciation allowable under section 32(1)(i) (Make your own computation refer Appendix-IA of IT Rules)		12ii	0	
	Total (12i + 12ii)		12iii	5,79,191	
13	Profit or loss after adjustment for depreciation (10 + 11 - 12iii)		13	2,40,321	
14	Amounts debited to the profit and loss account, to the extent disallowable under section 36 (6s of Part A-OI)		14	9,975	
15	Amounts debited to the profit and loss account, to the extent disallowable under section 37 (7k of Part A-OI)		15	0	
16	Amounts debited to the profit and loss account, to the extent disallowable under section 40 (8A) of 1851 (OI)		16	37,544	

INCOME FROM BUSINESS OR PROFESSION

17	Amounts debited to the profit and loss account, to the extent disallowable under section 40A (9f of PartA-OI)	17	0
18	Any amount debited to profit and loss account of the previous year but disallowable under section 43B (11h of PartA-OI)	18	0
19	Interest disallowable under section 23 of the Micro, Small and Medium Enterprises Development Act, 2006	19	0
20	Deemed income under section 41	20	0
21	Deemed income under section 32AC/ 32AD/ 33AB/ 33ABA/35ABA/ 35ABB/ 35AC/ 40A(3A)/ 33AC/ 72A/ 80HHD/ 80-IA	21	0
	i 32AC	21i	0
	ii 32AD	21ii	0
	iii 33AB	21iii	0
	iv 33ABA	21iv	0
	v 35ABA	21v	0
	vi 35ABB	21vi	0
	vii 35AC	21vii	0
	viii 40A(3A)	21viii	0
	ix 33AC	21ix	0
	x 72A	21x	0
	xi 80HHD	21xi	0
	xii 80-IA	21xii	0
22	Deemed income under section 43CA	22	0
23	Any other item of addition under section 28 to 44DA	23	0
24	Any other income not included in profit and loss account/any other expense not allowable (including income from salary, commission, bonus and interest from firms in which company is a partner)	24	0
	i Salary	24i	0
	ii Bonus	24ii	0
	iii Commission	24iii	0
	iv Interest	24iv	0
	v Others	24v	0
25	Increase in profit or decrease in loss on account of ICDS adjustments and deviation in method of valuation of stock (Column 3a + 4d of Part A - OI)	25	0
26	Total (14 + 15 + 16 + 17 + 18 + 19 + 20 + 21 + 22 + 23 + 24 + 25)	26	47,519
27	Deduction allowable under section 32(1)(iii)	27	0
28	Deduction allowable under section 32AD	28	0

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29	Amount allowable as deduction under section 32AC	29	0
30	Amount of deduction under section 35 or 35CCC or 35CCD in excess of the amount debited to profit and loss account (<i>item x(4) of Schedule ESR</i>) (<i>if amount deductible under section 35 or 35CCC or 35CCD is lower than amount debited to P&L account, it will go to item 24</i>)	30	0
31	Any amount disallowed under section 40 in any preceding previous year but allowable during the previous year(8B of PartA-OI)	31	0
32	Any amount disallowed under section 43B in any preceding previous year but allowable during the previous year(10h of PartA-OI)	32	0
33	Any other amount allowable as deduction	33	9,975
34	Decrease in profit or increase in loss on account of ICDS adjustments and deviation in method of valuation of stock (Column 3b + 4e of Part A- OI)	34	0
35	Total (27+28+29+30+31+32+33+34)	35	9,975
36	Income (13+26-35)	36	2,77,865
37	Profits and gains of business or profession deemed to be under -		
i	Section 44AE[61(ii) of schedule P&L]	37i	0
ii	Section 44B	37ii	0
iii	Section 44BB	37iii	0
iv	Section 44BBA	37iv	0
v	Section 44BBB	37v	0
vi	Section 44D	37vi	0
vii	Section 44DA	37vii	0
viii	Chapter-XII-G (tonnage)	37viii	0
ix	First Schedule of Income-tax Act (other than 115B)	37ix	0
x	Total (37i to 37ix)	37x	0
38	Net profit or loss from business or profession other than speculative and specified business (36+37x)	38	2,77,865
39	Net Profit or loss from business or profession other than speculative business and specified business after applying rule 7A, 7B or 8, if applicable e (<i>If rule 7A, 7B or 8 is not applicable, enter same figure as in 38</i>) (<i>If loss take the figure to 2i of item F</i>) (39a+ 39b + 39c + 39d + 39e + 39f)	A39	2,77,865
a	Income chargeable under Rule 7	39a	0
b	Deemed income chargeable under Rule 7A	39b	0
c	Deemed income chargeable under Rule 7B(1)	39c	0
d	Deemed income chargeable under Rule 7B(1A)	39d	0
e	Deemed income chargeable under Rule 8	39e	0
	Income other than Rule 7A, 7B & 8 (<i>Item No.</i> 1853)		

	f	38)	39f	2,77,865	
40	Balance of income deemed to be from agriculture, after applying Rule 7, 7A, 7B (1), 7B(1A) and Rule 8 for the purpose of aggregation of income as per Finance Act [4c-(39a+39b+39c+39d+39e)]			40	0
B Computation of income from speculative business					
41	Net profit or loss from speculative business as per profit or loss account			41	0
42	Additions in accordance with section 28 to 44DA			42	0
43	Deductions in accordance with section 28 to 44DA			43	0
44	Income from speculative business (41+42-43) (if loss, take the figure of 6xv of schedule CFL)			B44	0
C Computation of income from specified business under section 35AD					
45	Net profit or loss from specified business as per profit or loss account			45	0
46	Additions in accordance with section 28 to 44DA			46	0
47	Deductions in accordance with section 28 to 44DA (other than deduction under section,- (i) 35AD, (ii) 32 or 35 on which deduction u/s 35AD is claimed)			47	0
48	Profit or loss from specified business (45+46-47)			48	0
49	Deductions in accordance with section 35AD(1)			49	0
50	Income from Specified Business (48-49) (if loss, take the figure to 7xiv of schedule CFL)			C50	0
51	Relevant clause of sub-section (5) of section 35AD which covers the specified business (to be selected from drop down menu)			C51	
D	Income chargeable under the head 'Profits and gains from Business or profession' (A39+B44+C50)			D	2,77,865
E Intra head set off of business loss of current year					
Sl.	Type of Business income	Income of current year (Fill this column only if figure is zero or positive)	Business loss set off	Business income remaining after set off	
		(1)	(2)	(3) = (1) - (2)	
i	Loss to be set off (Fill this row only if figure is negative)		0		
ii	Income from speculative business	0	0	0	
iii	Income from specified business	0	0	0	
iv	Income from Life Insurance business u/s. 115B	0	0	0	
v	Total loss set off (ii + iii)		0		
vi	Loss remaining after set off (i - v)		0		

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Schedule DPM		Depreciation on Plant and Machinery (Other than assets on which full capital expenditure is allowable as deduction under any other section)			
1	Block of assets	Plant and machinery			
2	Rate (%)	15	30	40	45
		(i)	(ii)	(iii)	(iv)
3	Written down value on the first day of previous year	33,59,975	0	49,613	0
4	Additions for a period of 180 days or more in the previous year	0	0	1,09,000	
5	Consideration or other realization during the previous year out of 3 or 4	0	0	0	0
6	Amount on which depreciation at full rate to be allowed (3 + 4 - 5) (enter 0, if result is negative)	33,59,975	0	1,58,613	0
7	Additions for a period of less than 180 days in the previous year	0	0	58,749	
8	Consideration or other realizations during the year out of 7	0	0	0	
9	Amount on which depreciation at half rate to be allowed (7-8) (enter 0, if result is negative)	0	0	58,749	
10	Depreciation on 6 at full rate	5,03,996	0	63,445	0
11	Depreciation on 9 at half rate	0	0	11,750	
12	Additional depreciation, if any, on 4	0	0	0	
13	Additional depreciation, if any, on 7	0	0	0	
14	Additional depreciation relating to immediately preceding year on asset put to use for less than 180 days	0	0	0	0
15	Total depreciation (10+11+12+13+14)	5,03,996	0	75,195	0
16	Depreciation disallowed under section 38(2) of the I.T. Act (out of column 15)	0	0	0	0
17	Net aggregate depreciation (15-16)	5,03,996	0	75,195	0
18	Proportionate aggregate depreciation allowable in the event of succession, amalgamation, demerger etc (out of column 17)	0	0	0	0
19	Expenditure incurred in connection with transfer of asset/ assets	0	0	0	0
20	Capital gains/ loss under section 50 (5 + 8 - 3 - 4 - 7 - 19) (enter negative only, if block ceases to exist)	0	0	0	0
21	Written down value on the last day of previous year* (6+ 9 -15) (enter 0, if result is negative)	28,55,979	0	1,42,167	0

Schedule DOA		Depreciation on other assets (Other than assets on which full capital expenditure is allowable as deduction)						
1	Block of assets	Land	Building (not including land)			Furniture and fittings	Intangible assets	Ships
2	Rate (%)	Nil	5	10	40	10	25	20
		(i)	(ii)	(iii)	(iv)	(v)	(vi)	(vii)
3	Written down value on the first day of previous year	0	0	0	0	0	0	0
4	Additions for a period of 180 days or more in the previous year	0	0	0	0	0	0	0
5	Consideration or other realization during the previous year out of 3 or 4	0	0	0	0	0	0	0
6	Amount on which depreciation at full rate to be allowed (3 + 4 -5) (enter 0, if result is negative)	0	0	0	0	0	0	0
7	Additions for a period of less than 180 days in the previous year	0	0	0	0	0	0	0
8	Consideration or other realizations during the year out of 7	0	0	0	0	0	0	0
9	Amount on which depreciation at half rate to be allowed (7-8) (enter 0, if result is negative)	0	0	0	0	0	0	0
10	Depreciation on 6 at full rate	0	0	0	0	0	0	0
11	Depreciation on 9 at half rate	0	0	0	0	0	0	0
12	Total depreciation* (10+11)	0	0	0	0	0	0	0
13	Depreciation disallowed under section 38(2) of the I. T. Act (out of column 12)	0	0	0	0	0	0	0
14	Net aggregate depreciation (12-13)	0	0	0	0	0	0	0
15	Proportionate aggregate depreciation allowable in the event of succession.	0	0	0	0	0	0	0

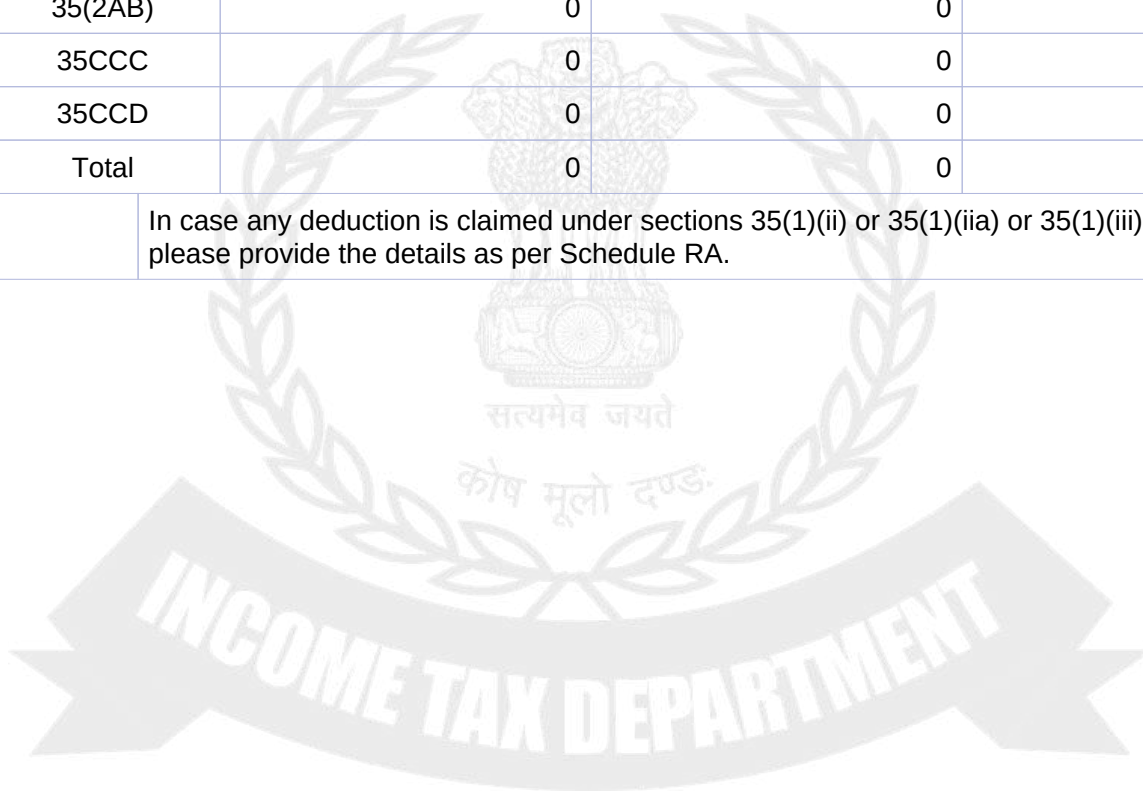
	amalgamation, demerger etc. (out of column 14)								
16	Expenditure incurred in connection with transfer of asset/ assets	0	0	0	0	0	0	0	0
17	Capital gains/ loss under section 50 (5 + 8 -3-4 -7 -16) (enter negative only if block ceases to exist)	0	0	0	0	0	0	0	0
18	Written down value on the last day of previous year* (6+ 9 -12) (enter 0 if result is negative)	0	0	0	0	0	0	0	0



Schedule DEP		Summary of depreciation on assets (Other than assets on which full capital expenditure is allowable as deduction under any other section)			
SUMMARY OF DEPRECIATION ON ASSETS	1	Plant and machinery			
	a	Block entitled for depreciation @ 15 per cent (<i>Schedule DPM - 17i or 18i as applicable</i>)	1a	5,03,996	
	b	Block entitled for depreciation @ 30 per cent (<i>Schedule DPM - 17ii or 18ii as applicable</i>)	1b	0	
	c	Block entitled for depreciation @ 40 per cent (<i>Schedule DPM - 17iii or 18iii as applicable</i>)	1c	75,195	
	d	Block entitled for depreciation @ 45 per cent (<i>Schedule DPM - 17iv or 18iv as applicable</i>)	1d	0	
	e	Total depreciation on plant and machinery (1a + 1b + 1c+1d)			1e 5,79,191
	2	Building (not including land)			
	a	Block entitled for depreciation @ 5 per cent (<i>Schedule DOA- 14ii or 15ii as applicable</i>)	2a	0	
	b	Block entitled for depreciation @ 10 per cent (<i>Schedule DOA- 14iii or 15iii as applicable</i>)	2b	0	
	c	Block entitled for depreciation @ 40 per cent (<i>Schedule DOA- 14iv or 15iv as applicable</i>)	2c	0	
	d	Total depreciation on building (total of 2a + 2b + 2c)			2d 0
	3	Furniture and fittings (<i>Schedule DOA- 14v or 15v as applicable</i>)			3 0
	4	Intangible assets (<i>Schedule DOA- 14vi or 15vi as applicable</i>)			4 0
	5	Ships (<i>Schedule DOA- 14vii or 15vii as applicable</i>)			5 0
	6	Total depreciation (1e+2d+3+4+5)			6 5,79,191

Schedule DCG		Deemed Capital Gains on sale of depreciable assets			
1	Plant and machinery				
	a	Block entitled for depreciation @ 15 percent (schedule DPM - 20i)	1a	0	
	b	Block entitled for depreciation @ 30 percent (schedule DPM - 20ii)	1b	0	
	c	Block entitled for depreciation @ 40 percent (schedule DPM - 20iii)	1c	0	
	d	Block entitled for depreciation @ 45 percent (schedule DPM - 20iii)	1d	0	
	e	Total (1a + 1b + 1c+1d)		1e	0
2	Building (not including land)				
	a	Block entitled for depreciation @ 5 percent (schedule DOA - 17ii)	2a	0	
	b	Block entitled for depreciation @ 10 percent (schedule DOA - 17iii)	2b	0	
	c	Block entitled for depreciation @ 40 percent (schedule DOA - 17iv)	2c	0	
	d	Total (2a + 2b + 2c)		2d	0
3	Furniture and fittings (schedule DOA - 17v)				3 0
4	Intangible assets (schedule DOA - 17vi)				4 0
5	Ships (schedule DOA - 17vii)				5 0
6	Total depreciation (1e+2d+3+4+5)				6 0

Schedule ESR		Expenditure on scientific Research etc. (Deduction under section 35 or 35CCC or 35CCD)			
Sl.No.	Expenditure of the nature referred to in section (1)	Amount, if any, debited to profit and loss account (2)	Amount of deduction allowable (3)	Amount of deduction in excess of the amount debited to profit and loss account (4) = (3) - (2)	
i	35(1)(i)	0	0	0	
ii	35(1)(ii)	0	0	0	
iii	35(1)(ia)	0	0	0	
iv	35(1)(iii)	0	0	0	
v	35(1)(iv)	0	0	0	
vi	35(2AA)	0	0	0	
vii	35(2AB)	0	0	0	
viii	35CCC	0	0	0	
ix	35CCD	0	0	0	
x	Total	0	0	0	
NOTE		In case any deduction is claimed under sections 35(1)(ii) or 35(1)(ia) or 35(1)(iii) or 35(2AA), please provide the details as per Schedule RA.			



Schedule CG		Capital Gains			
A	Short-term Capital Gains (STCG) (Sub-items 4 and 5 are not applicable for residents)				
2	From slump sale				
	a	Full value of consideration	2a	0	
	b	Net worth of the under taking or division	2b	0	
	c	Short term capital gains from slump sale (2a-2b)			A2c 0
3	From sale of equity share or unit of equity oriented Mutual Fund (MF) or unit of a business trust on which STT is paid under section 111A or 115AD(1)(b)(ii) proviso (for FII)				
4	For NON-RESIDENT, not being an FII- from sale of shares or debentures of an Indian company (to be computed with foreign exchange adjustment under first proviso to section 48)				
	a	STCG on transactions on which securities transaction tax (STT) is paid			A4a
	b	STCG on transactions on which securities transaction tax (STT) is not paid			A4b
5	For NON-RESIDENTS- from sale of securities (other than those at A3 above) by an FII as per section 115AD				
	a	i	In case securities sold include shares of a company other than quoted shares, enter the following details		
		a	Full value of consideration received/receivable in respect of unquoted shares	ia	0
		b	Fair market value of unquoted shares determined in the prescribed manner	ib	0
		c	Full value of consideration in respect of unquoted shares adopted as per section 50CA for the purpose of Capital Gains (higher of a or b)	ic	0
		ii	Full value of consideration in respect of securities other than unquoted shares	aii	0
		iii	Total (ic + ii)	aiii	0
	b	Deductions under section 48			
		i	Cost of acquisition without indexation	bi	0
		ii	Cost of improvement without indexation	bii	0
		iii	Expenditure wholly and exclusively in connection with transfer	biii	0
		iv	Total (i + ii + iii)	biv	0
	c	Balance (5aiii - biv)			5c 0
	d	Loss to be disallowed u/s 94(7) or 94(8)- for example if security bought/acquired within 3 months prior to record date and dividend/income/bonus units are received, then loss arising out of sale of such security to be ignored (Enter positive value only)			5d 0
	e	Short-term capital gain on securities (other than those at A3 above) by an FII (5c +5d)			A5e 0
6	From sale of assets other than at A1 or A2 or A3 or A4 or A5 above				
	a	i	In case securities sold include shares of a company other than quoted shares, enter the following details		
		a	Full value of consideration received/receivable in respect of unquoted shares	ia	0
		b	Fair market value of unquoted shares determined in the prescribed manner	ib	0
		c	Full value of consideration in respect of unquoted shares adopted as per section 50CA for the purpose of Capital Gains (higher of a or b)	ic	0
		ii	Full value of consideration in respect of assets other than unquoted shares	aii	0
		iii	Total (ic + ii)	aiii	0
	b	Deductions under section 48			
		i	Cost of acquisition without indexation	bi	0
		ii	Cost of improvement without indexation	bii	0
		iii	Expenditure wholly and exclusively in connection with transfer	biii	0
		iv	Total (i + ii + iii)	biv	0
	c	Balance (6aiii - biv)			6c 0

d	In case of asset (security/unit) loss to be disallowed u/s 94(7) or 94(8)- for example if asset bought/acquired within 3 months prior to record date and dividend/income /bonus units are received, then loss arising out of sale of such asset to be ignored (Enter positive value only)	6d	0																																																																																																		
e	Deemed short term capital gains on depreciable assets (6 of schedule DCG)	6e	0																																																																																																		
f	Deduction under section 54D/54G/54GA	6f	0																																																																																																		
g	SSTCG on assets other than at A1 or A2 or A3 or A4 or A5 above (6c + 6d + 6e - 6f)	A6g	0																																																																																																		
7	Amount deemed to be short term capital gains																																																																																																				
a	Whether any amount of unutilized capital gain on asset transferred during the previous years shown below was deposited in the Capital Gains Accounts Scheme within due date for that year? Yes No Not Applicable If yes, then provide the details below (Note : In case any amount is utilised out of Capital Gains account please fill sl no "C" of schedule DI)																																																																																																				
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Sl.	Previous year in which asset transferred	Section under which deduction claimed in that year	New asset acquired /constructed Year in which asset acquired /constructed Amount utilised out of Capital Gains account	Amount not used for new asset or remained unutilized in Capital gains account (X)																																																																																																	
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2	From slump sale																																																																																																				
a	Full value of consideration	2a	0																																																																																																		
b	Net worth of the under taking or division	2b	0																																																																																																		
c	Balance (2a - 2b)	2c	0																																																																																																		
d	Deduction u/s 54EC	2d	0																																																																																																		
e	Long term capital gains from slump sale (2c-2d)	B2e	0																																																																																																		
3	From sale of bonds or debenture (other than capital indexed bonds issued by Government)																																																																																																				
a	Full value of consideration	3a	0																																																																																																		
b	Deductions under section 48																																																																																																				
i	Cost of acquisition without indexation	bi	0																																																																																																		
ii	Cost of improvement without indexation	bii	0																																																																																																		
iii	Expenditure wholly and exclusively in connection with transfer	biii	0																																																																																																		
iv	Total (bi + bii +biii)	biv	0																																																																																																		

	c	LTCG on bonds or debenture (3a - 3biv)				B3c	0	
4	From sale of listed securities (other than a unit) or zero coupon bonds where proviso under section 112(1) is applicable							
	a	Full value of consideration			4a	0		
	b	Deductions under section 48						
	i	Cost of acquisition without indexation			bi	0		
	ii	Cost of improvement without indexation			bii	0		
	iii	Expenditure wholly and exclusively in connection with transfer			biii	0		
	iv	Total (bi + bii + biii)			biv	0		
	c	Long-term Capital Gains on assets at B4 above (4a - 4biv)				B4c	0	
5	From sale of equity share in a company or unit of equity oriented fund or unit of a business trust on which STT is paid under section 112A							
	Long-term Capital Gains on sale of capital assets at B5 above) (Column 14 of schedule 112A)					B5	0	
6	For NON-RESIDENTS- from sale of shares or debenture of Indian company (to be computed with foreign exchange adjustment under first proviso to section 48)							
	LTCG on share or debenture computed without indexation benefit					B6		
7	For NON-RESIDENTS- from sale of, (i) unlisted securities as per sec. 112(1)(c), (ii) units referred in sec. 115AB, (iii) bonds or GDR as referred in sec. 115AC, (iv) securities by FIIL as referred to in sec. 115AD							
8	For NON-RESIDENTS - From sale of equity share in a company or unit of equity oriented fund or unit of a business trust on which STT is paid under section 112A							
	Long-term Capital Gains on sale of capital assets at B8 above (Column 14 of Schedule 115AD(1)(b)(iii) proviso)					B8	0	
9	From sale of assets where B1 to B8 above are not applicable							
	a	i	In case assets sold include shares of a company other than quoted shares, enter the following details					
		a	Full value of consideration received/receivable in respect of unquoted shares			ia	0	
		b	Fair market value of unquoted shares determined in the prescribed manner			ib	0	
		c	Full value of consideration in respect of unquoted shares adopted as per section 50CA for the purpose of Capital Gains (higher of a or b)			ic	0	
		ii	Full value of consideration in respect of assets other than unquoted			aii	0	
		iii	Total (ic + ii)			aiii	0	
	b	Deductions under section 48						
		i	Cost of acquisition with indexation			bi	0	
		ii	Cost of improvement with indexation			bii	0	
		iii	Expenditure wholly and exclusively in connection with transfer			biii	0	
		iv	Total (bi + bii + biii)			biv	0	
	c	Balance (aiii - biv)			9c	0		
	d	Deduction under section 54D/54G/54GA (Specify details in item D below)			9d	0		
	e	Long-term Capital Gains on assets at B9 above (9c- 9d)				B9e	0	
10	Amount deemed to be long-term capital gains							
a	Whether any amount of unutilized capital gain on asset transferred during the previous year shown below was deposited in the Capital Gains Accounts Scheme within due date for that year? Yes No Not Applicable If yes, then provide the details below (Note : In case any amount is utilised out of Capital Gains account please fill sl no "C" of schedule DI)							
	Sl.	Previous year in which asset transferred	Section under which deduction claimed in that year	New asset acquired/constructed		Amount not used for new asset or remained unutilized in Capital gains account (X)		
				Year in which asset acquired /constructed	Amount utilised out of Capital Gains account			
b	Amount deemed to be long-term capital gains, other than at 'a'					0		
c	Amount deemed to be long-term capital gains (Xi + b)					B10	0	
11	Pass Through Income in the nature of Long Term Capital Gain, (Fill up schedule 11B) (B11a1+B11a2 + B11b)					B11	0	

a1	Pass Through Income/Loss in the nature of Long Term Capital Gain, chargeable @ 10% u/s 112A									B11a1	0	
a2	2 Pass Through Income/Loss in the nature of Long Term Capital Gain, chargeable @ 10% under sections other than 112A									B11a2	0	
b	Pass Through Income/ Loss in the nature of Long Term Capital Gain, chargeable @ 20%									B11b	0	
12	Amount of LTCG included in items B1 to B11 but not chargeable to tax or chargeable at special rates in India as per DTAA											
	Sl. No.	Amount of income	Item No. B1 to B11 above in which included	Country name & Code	Article of DTAA	Rate as per Treaty (enter NIL, if not chargeable)	Whether TRC obtained (Y/N)	Section of I.T. Act	Rate as per I.T. Act	Applicable rate [lower of (6) or (9)]		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)		
a	Total amount of LTCG not chargeable to tax in India as per DTAA										B12a	0
b	Total amount of LTCG chargeable to tax at special rates in India as per DTAA										B12b	0
13	Total long term capital gain] [B1e + B2e + B3c + B4c + B5 + B6 + B7c + B8 + B9f+ B10 + B11 - B12a]										B13	0
C	Income chargeable under the head "CAPITAL GAINS" (A10+ B13) (take B13 as nil, if loss)										C	0
D	Information about deduction claimed against Capital Gains											
1	In case of deduction u/s 54D/54EC/54G/54GA give following details											
a	Deduction claimed u/s 54D											
	Sl. No.	Date of acquisition of original asset	Cost of purchase/ construction of new land or building for industrial undertaking			Date of purchase of new land or building	Amount deposited in Capital Gains Accounts Scheme before due date		Amount of deduction claimed			
b	Deduction claimed u/s 54EC											
	Sl.No.	Date of transfer of original asset		Amount invested in specified/notified bonds			Date of investment		Amount of deduction claimed			
c	Deduction claimed u/s 54G											
	Sl. No.	Date of transfer of original asset	Cost and expenses incurred for purchase or construction of new asset		Date of purchase/construction of new asset in an area other than urban area		Amount deposited in Capital Gains Accounts Scheme before due date		Amount of deduction claimed			
d	Deduction claimed u/s 54GA											
	Sl. No.	Date of transfer of original asset from urban area		Cost and expenses incurred for purchase or construction of new asset		Date of purchase /construction of new asset in SEZ		Amount deposited in Capital Gains Accounts Scheme before due date		Amount of deduction claimed		
e	Total deduction claimed (1a + 1b + 1c + 1d)									e	0	
E	Set-off of current year capital losses with current year capital gains											
	Sl.No.	Type of Capital Gain	Capital Gain of current year (Fill this column only if computed figure is positive)	Short term capital loss				Long term capital loss			Current year's capital gains remaining after set off (9=1-2-3-4-5-6-7-8)	
				15%	30%	applicable rate	Covered by DTAA	10%	20%	Covered by DTAA		
			1	2	3	4	5	6	7	8	9	
i		Capital Loss to be set off (Fill this row only if computed figure is negative)		0	0	0	0	0	0	0		
ii	Short term capital gain	15%	0		0	-	0				0	
iii		30%	0	0		0	0				0	
iv		applicable rate	0	0	0		0				0	
v		DTAA Rates	0	0	0		0				0	
vi	Long term capital gain	10%	0	0	0	0	0		0	0	0	
vii		20%	0	0	0	0	0	0	0	0	0	
viii		DTAA Rates	0	0	0	0	0	0	0	0	0	
ix	Total loss set off (ii + iii + iv + v + vi + vii + viii)			0	0	0	0	0	0	0	0	
x	Loss remaining after set off (i - ix)			0	0	0	0	0	0	0	0	
F	Information about accrual/receipt of capital gain											
		Type of Capital gain / Date	Upto 15/6 (i)	16/6 to 15/9 (ii)		16/9 to 15/12 (iii)		16/12 to 15/3 (iv)		16/3 to 31/3 (v)		
1		Short-term capital gains taxable at the rate of 15%	0	0		0		0		0		
1864												

	Enter value from item 5v of schedule BFLA, if any.					
2	Short-term capital gains taxable at the rate of 30% Enter value from item 5vi of schedule BFLA, if any	0	0	0	0	0
3	Short-term capital gains taxable at applicable rates Enter value from item 5vii of schedule BFLA, if any.	0	0	0	0	0
4	Short-term capital gains taxable at DTAA rates Enter value from item 5viii of schedule BFLA, if any	0	0	0	0	0
5	Long- term capital gains taxable at the rate of 10% Enter value from item 5ix of schedule BFLA, if any.	0	0	0	0	0
6	Long- term capital gains taxable at the rate of 20% Enter value from item 5x of schedule BFLA, if any.	0	0	0	0	0
7	Long- term capital gains taxable at the rate DTAA rates Enter value from item 5xi of schedule BFLA, if any.	0	0	0	0	0

Schedule 112A					From sale of equity share in a company or unit of equity oriented fund or unit of a business trust on which STT is paid under section 112A									
Sl. No.	Share /Unit acquired	ISIN Code	Name of the Share /Unit	No. of Shares /Units	Sale-price per Share /Unit	Full Value Consideration -If shares are acquired on or before 31.01.2018 (Total Sale Value) (4*5) - If shares are Acquired after 31st January, 2018 - Please enter Full Value of Consideration	Cost of acquisition without indexation(higher of 8 or 9)	Cost of acquisition	If the long term capital asset was acquired before 01.02.2018, Lower of 6 & 11	Fair Market Value per share /unit as on 31st January,2018	Total Fair Market Value of capital asset as per section 55(2)(ac)- (4*10)	Expenditure wholly and exclusively in connection with transfer	Total deductions (7+12)	Balance (6-13) Item 5 of LTCG Schedule of ITR6
(Col 1)	(Col 1a)	(Col 2)	(Col 3)	(Col 4)	(Col 5)	(Col 6)	(Col 7)	(Col 8)	(Col 9)	(Col 10)	(Col 11)	(Col 12)	(Col 13)	(Col 14)
Total						0	0	0	0		0	0	0	0



Schedule 115AD(1) (b)(iii)-Proviso					For NON-RESIDENTS - From sale of equity share in a company or unit of equity oriented fund or unit of a business trust on which STT is paid under section 112A									
Sl. No.	Share /Unit acquired	ISIN Code	Name of the Share /Unit	No. of Shares /Units	Sale-price per Share /Unit	Full Value Consideration -If shares are acquired on or before 31.01.2018 (Total Sale Value)(4*5) -If shares are Acquired after 31st January 2018 - Please enter Full Value of Consideration.	Cost of acquisition without indexation (higher of 8 or 9)	Cost of acquisition	If the long term capital asset was acquired before 01.02.2018, Lower of 6 & 11	Fair Market Value per share /unit as on 31st January,2018	Total Fair Market Value of capital asset as per section 55(2)(ac)-(4 *10)	Expenditure wholly and exclusively in connection with transfer	Total deductions (7+12)	Balance (6-13) Item 8 of LTCG Schedule of ITR6
(Col 1)	(Col 1a)	(Col 2)	(Col 3)	(Col 4)	(Col 5)	(Col 6)	(Col 7)	(Col 8)	(Col 9)	(Col 10)	(Col 11)	(Col 12)	(Col 13)	(Col 14)
Total						0	0	0	0		0	0	0	0



Schedule OS		Income from other sources	
1	Gross income chargeable to tax at normal applicable rates (1a+ 1b+ 1c+ 1d + 1e)		1,49,972
a	Dividends, Gross	1a	0
ai	Dividend income [other than (ii)]	ai	0
a ii	Dividend income u/s 2(22)(e)	a ii	0
b	Interest, Gross (bi + bii + biii + biv+ bv)	1b	1,49,972
i	From Savings Bank	bi	0
ii	From Deposits (Bank/ Post Office/ Co-operative) Society/)	bii	1,49,972
iii	From Income-tax Refund	biii	0
iv	In the nature of Pass through income/ loss	biv	0
v	Others	bv	0
c	Rental income from machinery, plants, buildings, etc., Gross	1c	0
d	Income of the nature referred to in section 56 (2)(x) which is chargeable to tax (di + dii + diii + div + dv)	1d	0
i	Aggregate value of sum of money received without consideration	di	0
ii	In case immovable property is received without consideration, stamp duty value of property	dii	0
iii	In case immovable property is received for inadequate consideration, stamp duty value of property in excess of such consideration	diii	0
iv	In case any other property is received without consideration, fair market value of property	div	0
v	In case any other property is received for inadequate consideration, fair market value of property in excess of such consideration	dv	0
e	Any other income (please specify nature)	1e	0
Sl. No.	Nature	Amount	
2	Income chargeable at special rates (2a+ 2b+ 2c+ 2d + 2e elements related to Sl. No.1)		0
a	Winnings from lotteries, crossword puzzles etc. chargeable u/s 115BB	2a	0
b	Income chargeable u/s 115BBE (bi + bii + biii + biv+ bv + bvi)	2b	0
i	Cash credits u/s 68	1868	0

	ii	Unexplained investments u/s 69	bii	0						
	iii	Unexplained money etc. u/s 69A	biii	0						
	iv	Undisclosed investments etc. u/s 69B	biv	0						
	v	Unexplained expenditure etc. u/s 69C	bv	0						
	vi	Amount borrowed or repaid on hundi u/s 69D	bvi	0						
c	Any other income chargeable at special rate (total of ci to cxx)		2c	0						
	Sl. No.	Nature	Amount							
d	Pass through income in the nature of income from other sources chargeable at special rates (drop down to be provided)		2d	0						
	Sl. No.	Nature	Amount							
e	Amount included in 1 and 2 above, which is chargeable at special rates in India as per DTAA (total of column (2) of table below)		2e	0						
	Sl. No.	Amount of income	Item No.1 & 2 in which included	Country name & Code	Article of DTAA	Rate as per Treaty (enter NIL, if not chargeable)	Whether TRC obtained (Y/N)	Section of I.T. Act	Rate as per I.T. Act	Applicable rate [lower of (6) or (10)] Applicable rate
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
3	Deductions under section 57 (other than those relating to income chargeable at special rates under 2a, 2b, 2c & 2d)									
a	Expenses / Deductions						3a	0		
b	Depreciation (available only if income offered in 1c)						3b	0		
c	Interest expenditure u/s 57(1) (available only if income offered in 1a)						3c	0		
	Interest expenditure claimed							0		
d	Total						3d	0		
4	Amounts not deductible u/s 58								4	0
5	Profits chargeable to tax u/s 59								5	0
6	Net Income from other sources chargeable at normal applicable rates (1(after reducing income related to DTAA portion) - 3 + 4 + 5) (If negative take the figure to 4i of schedule CYLA)								6	1,49,972
7	Income from other sources (other than from owning race horses) (2 + 6) (enter 6 as nil, if negative)								7	1,49,972
8	Income from the activity of owning and maintaining race horses									
a	Receipts						8a	0		
b	Deductions under section 57 in relation to receipts at 8a only						8b	0		
c	Amounts not deductible u/s 58						8c	0		
d	Profits chargeable to tax u/s 59						8d	0		
	Balance (8a - 8b + 8c + 8d) (if negative take)						1869			

	e	the figure to 11xv of Schedule CFL)				8e	0	
9	Income under the head "Income from other sources" (7 + 8e) (take 8e as nil if negative)						9	1,49,972
10	Information about accrual/receipt of income from Other Sources							
	S. No.	Other Source Income	Upto 15/6	From 16/6 to 15/9	From 16/9 to 15/12	From 16/12 to 15/3	From 16/3 to 31/3	
			(i)	(ii)	(iii)	(iv)	(v)	
	1	Dividend Income	0	0	0	0	0	
	2	Income by way of winnings from lotteries, crossword puzzles, races, games, gambling, betting etc. referred to in section 2(24) (ix)	0	0	0	0	0	
	3	Dividend Income chargeable under DTAA rates	0	0	0	0	0	



Schedule CYLA		Details of Income after Set off of current year losses				
Sl. No	Head/ Source of Income	Income of current year (Fill this column only if income is zero or positive)	House property loss of the current year set off	Business Loss (other than speculation or specified business loss) of the current year set off	Other sources loss (other than loss from race horses and amount chargeable to special rate of tax) of the current year set off	Current year's income remaining after set off
		1	2	3	4	5=1-2-3-4
i	Loss to be set off (Fill this row only, if computed figure is negative)		0	0	0	
ii	House property	0		0	0	0
iii	Business (excluding Income from life insurance business u/s 115B speculation income and income from specified business)	2,77,865	0		0	2,77,865
iv	Income from life insurance business u/s 115B	0	0		0	0
v	Speculation income	0	0		0	0
vi	Specified business income u/s 35AD	0	0		0	0
vii	Short-term capital gain taxable @ 15%	0	0	0	0	0
viii	Short-term capital gain taxable @ 30%	0	0	0	0	0
ix	Short-term capital gain taxable at applicable rates	0	0	0	0	0
x	Short-term capital gain taxable at special rates in India as per DTAA	0	0	0	0	0
xi	Long term capital gain taxable @ 10%	0	0	0	0	0
xii	Long term capital gain taxable @ 20%	0	0	0	0	0
xiii	Long term capital gains taxable at special rates in India as per DTAA	0	0	0	0	0
xiv	Net income from other sources chargeable at normal applicable rates	1,49,972	0	0		1,49,972
xv	Profit from the activity of owning and maintaining race horses	0	0	0	0	0
xvi	Income from other sources taxable at special rates in India as per DTAA	0	0	0	0	0

1871

xvii	Total loss set off	0	0	0
xviii	Loss remaining after set-off (i - xvii)	0	0	0



Schedule BFLA			Details of Income after Set off of Brought Forward Losses of earlier years				
Sl. No.	Head/ Source of Income	Income after set off, if any, of current year's losses as per 5 of Schedule CYLA)	Brought forward loss set off	Brought forward depreciation set off	Brought forward allowance under section 35(4) set off	Current year's income remaining after set off	
		1	2	3	4	5	
i	House property	0	0	0	0	0	
ii	Business (excluding Income from life insurance business u/s 115B speculation income and income from specified business)	2,77,865	0	0	0	2,77,865	
iii	Profit and gains from life insurance business u/s 115B	0	0	0	0	0	
iv	Speculation Income	0	0	0	0	0	
v	Specified Business Income	0	0	0	0	0	
vi	Short-term capital gain taxable @ 15%	0	0	0	0	0	
vii	Short-term capital gain taxable @ 30%	0	0	0	0	0	
viii	Short-term capital gain taxable at applicable rates	0	0	0	0	0	
ix	Short-term capital gain taxable at special rates in India as per DTAA	0	0	0	0	0	
x	Long-term capital gain taxable @ 10%	0	0	0	0	0	
xi	Long-term capital gain taxable @ 20%	0	0	0	0	0	
xii	Long term capital gains taxable at special rates in India as per DTAA	0	0	0	0	0	
xiii	Net income from other sources chargeable at normal applicable rates	1,49,972		0	0	1,49,972	
xiv	Profit from owning and maintaining race horses	0	0	0	0	0	
xv	Income from other sources income taxable at special rates in India as per DTAA	0		0	0	0	
xvi	Total of brought forward loss set off		0	0	0		
xvii	Current year's income remaining after set off Total of (5i + 5ii + 5iii + 5iv+ 5v + 5vi + 5vii + 5viii + 5ix + 5x + 5xi +5xii+ 5xiii+ 5xiv + 5xv)					4,27,837	

1873

Schedule CFL				Details of Losses to be carried forward to future years									
CARRY FORWARD OF LOSS	Sl. No.	Assessment Year	Date of Filing (DD /MMM /YYYY)	House Property Loss	Loss from business other than loss from speculative business and specified business			Loss from speculative business	Loss from specified business	Loss from life insurance business u/s 115B	Short-term Capital Loss	Long-term Capital Loss	Loss from owning and maintaining race horses
	1	2	3	4	5a	5b	5c=5a-5b	6	7	8	9	10	11
	i	2010-11							0				
	ii	2011-12							0				
	iii	2012-13							0				
	iv	2013-14		0	0	0	0		0	0	0	0	
	v	2014-15		0	0	0	0		0	0	0	0	
	vi	2015-16		0	0	0	0		0	0	0	0	
	vii	2016-17		0	0	0	0		0	0	0	0	
	viii	2017-18		0	0	0	0	0	0	0	0	0	0
	ix	2018-19		0	0	0	0	0	0	0	0	0	0
	x	2019-20		0	0	0	0	0	0	0	0	0	0
	xi	2020-21		0	0	0	0	0	0	0	0	0	0
	xii	Total of earlier year losses b /f		0			0	0	0	0	0	0	0
	xiii	Adjustment of above losses in schedule BFLA		0			0	0	0	0	0	0	0
	xiv	2021-22 (Current year losses)		0			0	0	0	0	0	0	0
	xv	Current year loss distributed among the unit-holder (Applicable for Investment fund only)		0							0	0	0
	xvi	Current year losses to be carried forward (xiv-		0			0	0	0	0	0	0	0

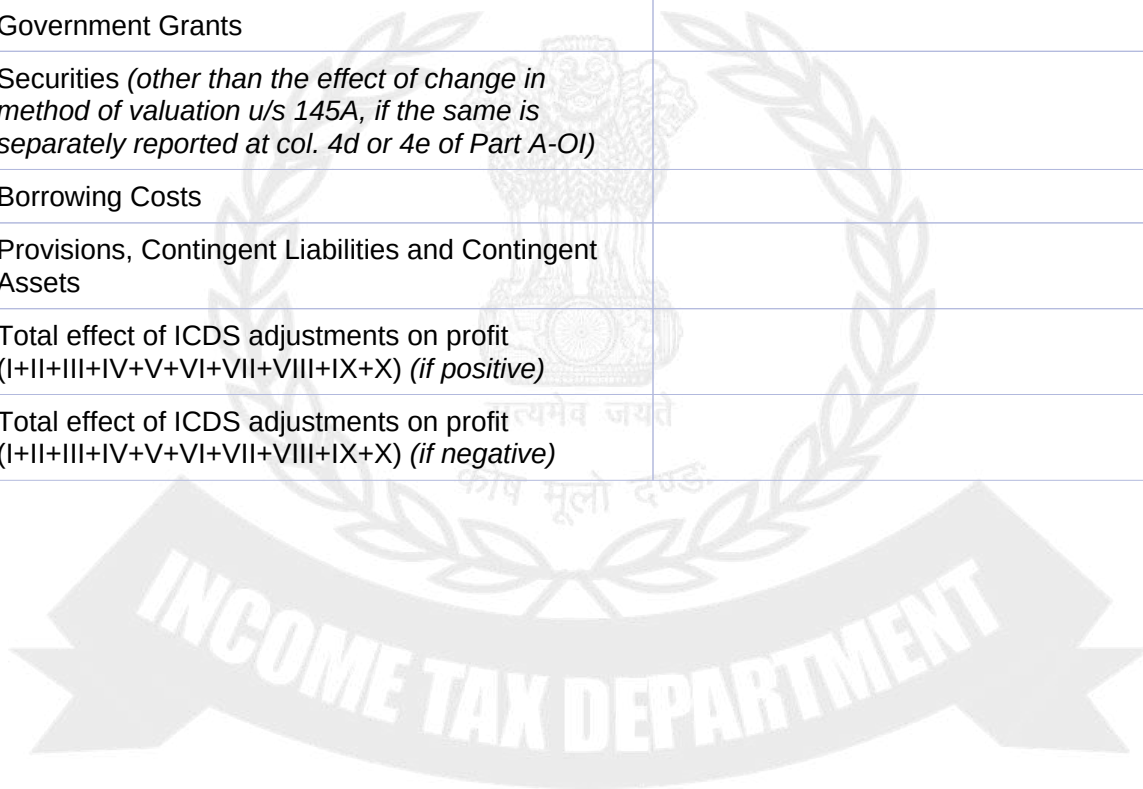
	xvii	Total loss Carried forward to future years (xii-xiii+xvi)		0			0	0	0	0	0	0	0
--	------	---	--	---	--	--	---	---	---	---	---	---	---



Schedule UD		Unabsorbed depreciation and allowance under section 35(4)						
Sl No	Assessment Year	Depreciation				Allowance under section 35(4)		
		Amount of brought forward unabsorbed depreciation	Amount as adjusted on account of opting for taxation section 115BAA	Amount of depreciation set-off against the current year income	Balance carried forward to the next year	Amount of brought forward unabsorbed allowance	Amount of allowance set-off against the current year income	Balance Carried forward to the next year
(1)	(2)	(3)	(3a)	(4)	(5)	(6)	(7)	(8)
i					0			0
	Total	0	0	0	0	0	0	0



Schedule ICDS		Effect of Income Computation Disclosure Standards on profit
Sl.No.	ICDS	Amount (+) or (-)
(i)	(ii)	(iii)
I	Accounting Policies	0
II	Valuation of Inventories (<i>other than the effect of change in method of valuation u/s 145A, if the same is separately reported at col. 4d or 4e of Part A-OI</i>)	0
III	Construction Contracts	0
IV	Revenue Recognition	0
V	Tangible Fixed Assets	0
VI	Changes in Foreign Exchange Rates	0
VII	Government Grants	0
VIII	Securities (<i>other than the effect of change in method of valuation u/s 145A, if the same is separately reported at col. 4d or 4e of Part A-OI</i>)	0
IX	Borrowing Costs	0
X	Provisions, Contingent Liabilities and Contingent Assets	0
11a.	Total effect of ICDS adjustments on profit (I+II+III+IV+V+VI+VII+VIII+IX+X) (<i>if positive</i>)	0
11b.	Total effect of ICDS adjustments on profit (I+II+III+IV+V+VI+VII+VIII+IX+X) (<i>if negative</i>)	0



Schedule 80G		Details of donations entitled for deduction under section 80G					
DETAILS OF DONATIONS	A	Donations entitled for 100% deduction without qualifying limit					
		Name and address of Donee	PAN of Donee	Amount of donation			Eligible Amount of donation
				Donation in cash	Donation in other mode	Total Donation	
		Total		0	0	0	0
	B	Donations entitled for 50% deduction without qualifying limit					
		Name and address of Donee	PAN of Donee	Amount of donation			Eligible Amount of donation
				Donation in cash	Donation in other mode	Total Donation	
		Total		0	0	0	0
	C	Donations entitled for 100% deduction subject to qualifying limit					
		Name and address of Donee	PAN of Donee	Amount of donation			Eligible Amount of donation
				Donation in cash	Donation in other mode	Total Donation	
		Total		0	0	0	0
	D	Donations entitled for 50% deduction subject to qualifying limit					
		Name and address of Donee	PAN of Donee	Amount of donation			Eligible Amount of donation
				Donation in cash	Donation in other mode	Total Donation	
		Total		0	0	0	0
	E	Total donations (A + B + C + D)					0

Schedule 80GGA		Details of donations for scientific research or rural development						
Sl. No.	Relevant clause under which deduction is claimed (drop down to be provided)	Name and address of Donee	PAN of Donee	Date of Donation in Cash	Amount of donation			Eligible Amount of donation
					Donation in cash	Donation in other mode	Total Donation	
	Total donation				0	0	0	0



Schedule RA	Details of donations to research associations etc. [deduction under sections 35(1)(ii) or 35(1)(ia) or 35(1)(iii) or 35(2AA)]						
	Name and address of donee		PAN of Donee	Amount of donation			Eligible Amount of donation
				Donation in cash	Donation in other mode	Total Donation	
	Total			0	0	0	0



Schedule 80-IA		Deductions under section 80-IA	
a	Deduction in respect of profits of an enterprise referred to in section 80-IA(4)(i) [Infrastructure facility]		
b	Deduction in respect of profits of an undertaking referred to in section 80-IA(4) (ii) [Telecommunication services]		
c	Deduction in respect of profits of an undertaking referred to in section 80-IA(4) (iii) [Industrial park and SEZs]		
d	Deduction in respect of profits of an undertaking referred to in section 80-IA(4) (iv) [Power]		
e	Deduction in respect of profits of an undertaking referred to in section 80-IA(4) (v) [Revival of power generating plant] and deduction in respect of profits of an undertaking referred to in section 80-IA (4)(vi) [Cross-country natural gas distribution network]		
f	Total deductions under section 80-IA (a + b + c + d + e)		0



Schedule 80-IB		Deductions under section 80-IB		
a	Deduction in respect of industrial undertaking located in Jammu & Kashmir or Ladakh [Section 80-IB(4)]			
b	Deduction in the case of multiplex theatre [Section 80-IB(7A)]			
c	Deduction in the case of convention centre [Section 80-IB(7B)]			
d	Deduction in the case of company carrying on scientific research [Section 80-IB(8A)]			
e	Deduction in the case of undertaking which begins commercial production or refining of mineral oil [Section 80-IB(9)]			
f	Deduction in the case of an undertaking developing and building housing projects [Section 80-IB(10)]			
g	Deduction in the case of an undertaking engaged in processing, preservation and packaging of fruits, vegetables, meat, meat products, poultry, marine or dairy products [Section 80-IB(11A)]			
h	Deduction in the case of an undertaking engaged in integrated business of handling, storage and transportation of food grains [Section 80-IB(11A)]			
i	Deduction in the case of an undertaking engaged in operating and maintaining a rural hospital [Section 80-IB(11B)]			
j	Deduction in the case of an undertaking engaged in operating and maintaining a hospital in any area, other than excluded area [Section 80-IB(11C)]			
k	Total deduction under section 80-IB or 80-IE (Total of a to j)			0

Schedule 80-IC or 80-IE			Deductions under section 80-IC or 80-IE		
DEDUCTION U/S 80-IC or 80-IE	a	Deduction in respect of undertaking located in Sikkim			
	b	Deduction in respect of undertaking located in Himachal Pradesh			
	c	Deduction in respect of undertaking located in Uttaranchal			
	d	Deduction in respect of undertaking located in North-East			
	da	Assam			
	db	Arunachal Pradesh			
	dc	Manipur			
	dd	Mizoram			
	de	Meghalaya			
	df	Nagaland			
dg	Tripura				
dh	Total deduction for undertakings located in North-east (total of da1 to dg2)		dh	0	
e	Total deduction under section 80-IC or 80-IE (a + d + c + dh)			e	0



Schedule VI-A		Deductions under Chapter VI-A			
TOTAL DEDUCTION	1	Part B- Deduction in respect of certain payments			
	Please note that the deduction in respect of the investment/ deposit/ payments for the period 01-04-2020 to 31- 07-2020 cannot be claimed again, if already claimed in the AY 2020-21.				System Calculated
	a	80G		0	0
	b	80GGB		0	0
	c	80GGA		0	0
	d	80GGC		0	0
	Total Deduction under Part B (a + b + c +d)		1	0	0
	2	Part C- Deduction in respect of certain incomes			
	e	80-IA		0	0
	f	80-IAB		0	0
	g	80-IAC		0	0
	h	80-IB		0	0
	i	80-IBA		0	0
	j	80-IC/ 80-IE		0	0
	k	80JJA		0	0
	l	80JJAA		0	0
	m	80LA(1)		0	0
	n	80LA(1A)		0	0
	o	80M- Details of distribution of dividend as provided in e-filing utility		0	0
		A	Schedule OS	0	0
		B	Schedule BP	0	0
	p	80-PA		0	0
	Total Deduction under Part C (total of e to p)		2	0	0
	3	Total deductions under Chapter VI-A (1 + 2)		3	0

Schedule SI		Income chargeable to tax at special rates <i>[Please see instructions for section and rate of tax]</i>			
SI No.	Section/ Description		Special rate (%)	Income	Tax thereon
	Total			0	0



Schedule EI		Details of Exempt Income (Income not to be included in Total Income or not chargeable to tax)						
EXEMPT INCOME	1	Interest income					1	0
	2	i	Gross Agricultural receipts (other than income to be excluded under rule 7A, 7B or 8 of I.T. Rules)	i	0			
		ii	Expenditure incurred on agriculture	ii	0			
		iii	Unabsorbed agricultural loss of previous eight assessment years	iii	0			
		iv	Agricultural income portion relating to Rule 7, 7A, 7B(1), 7B (1A) and 8 (from Sl. No. 40 of Sch. BP)	iv	0			
		v	Net Agricultural income for the year (i - ii - iii + iv) (enter nil if loss)			2	0	
		vi	In case the net agricultural income for the year exceeds Rs.5 lakh, please furnish the following details (Fill up details separately for each agricultural land)					
		Sl. No.	Name of district along with pin code in which agricultural land is located	Measurement of agricultural land in acre	Whether the agricultural land is owned or held on lease?	Whether the agricultural land is irrigated or rain-fed?		
	3	Other exempt income (please specify)						
		Sl. No.	Nature of Income				Amount	
		Total				0		
4	Income not chargeable to tax as per DTAA							
	Sl. No.	Nature of income	Country name & Code	Article of DTAA	Head of Income	Whether TRC obtained (Y/N)	Amount of income	
		Total Income from DTAA not chargeable to tax					0	
5	Pass through income not chargeable to tax (Schedule PTI)					5	0	
	1887							
6	Total (1 + 2v + 3+ 4 + 5)					6	0	

Schedule PTI

Pass Through Income details from business trust or investment fund as per section 115UA, 115UB

Note: Please refer to the instructions for filling out this schedule.



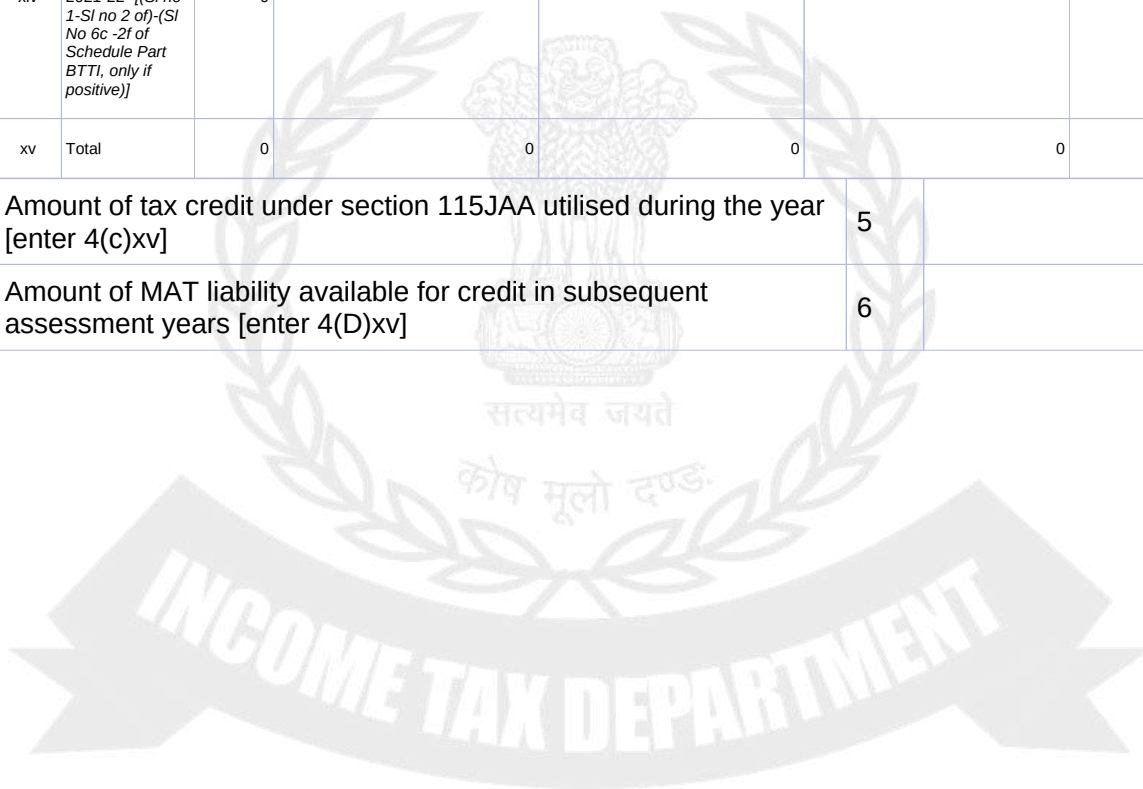
Schedule MAT		Computation of Minimum Alternate Tax payable under section 115JB			
1	Whether the Profit and Loss Account is prepared in accordance with the provisions of Parts II of Schedule III to the Companies Act, 2013 (If yes, write "Y", if no write "N")				Yes
2	If 1 is no, whether profit and loss account is prepared in accordance with the provisions of the Act governing such company (If yes, write "Y", if no write "N")				
3	Whether, for the Profit and Loss Account referred to in item 1 above, the same accounting policies, accounting standards and same method and rates for calculating depreciation have been followed as have been adopted for preparing accounts laid before the company at its annual general body meeting? (If yes, write "Y", if no write "N")				Yes
4	Profit after tax as shown in the Profit and Loss Account (enter item 56 of Part A-P&L) / (enter item 56 of Part A- P&L Ind AS) (as applicable)				4 0
5	Additions (if debited in profit and loss account)				
a	Income-tax paid or payable or its provision including the amount of deferred tax and the provision thereof	5a	0		
b	Reserve (except reserve under section 33AC)	5b	0		
c	Provisions for unascertained liability	5c	0		
d	Provisions for losses of subsidiary companies	5d	0		
e	Dividend paid or proposed	5e	0		
f	Expenditure related to exempt income under sections 10, 11 or 12 [exempt income excludes income exempt under section 10(38)]	5f	0		
g	Expenditure related to share in income of AOP/ BOI on which no income-tax is payable as per section 86	5g	0		
h	Expenditure in case of foreign company referred to in clause (fb) of explanation 1 to section 115JB	5h	0		
i	Notional loss on transfer of certain capital assets or units referred to in clause (fc) of explanation 1 to section 115JB	5i	0		
j	Expenditure relatable to income by way of royalty in respect of patent chargeable to tax u/s 115BBF	5j	0		
k	Depreciation attributable to revaluation of assets	5k	0		
l	Gain on transfer of units referred to in clause (k) of explanation 1 to section 115JB	5l	0		
Others (including residual unadjusted		1889			

Minimum Alternate Tax

m	items and provision for diminution in the value of any asset)	5m	0
n	Total additions (5a+5b+5c+5d+5e+5f+5g+5h+5i+5j+5k+5l+5m)		5n 0
6	Deductions		
a	Amount withdrawn from reserve or provisions if credited to Profit and Loss account	6a	0
b	Income exempt under sections 10, 11 or 12 [exempt income excludes income exempt under section 10(38)]	6b	0
c	Amount withdrawn from revaluation reserve and credited to profit and loss account to the extent it does not exceed the amount of depreciation attributable to revaluation of asset	6c	0
d	Share in income of AOP/ BOI on which no income-tax is payable as per section 86 credited to Profit and Loss account	6d	0
e	Income in case of foreign company referred to in clause (iid) of explanation 1 to section 115JB	6e	0
f	Notional gain on transfer of certain capital assets or units referred to in clause (iie) of explanation 1 to section 115JB	6f	0
g	Loss on transfer of units referred to in clause (iif) of explanation 1 to section 115JB	6g	0
h	Income by way of royalty referred to in clause (iig) of explanation 1 to section 115JB	6h	0
i	Loss brought forward or unabsorbed depreciation whichever is less or both as may be applicable	6i	0
j	Profit of sick industrial company till net worth is equal to or exceeds accumulated losses	6j	0
k	Others (including residual unadjusted items and the amount of deferred tax credited to P&L A/c)	6k	0
l	Total deductions (6a+6b+6c+6d+6e+6f+6g+6h+6i+6j+6k)	6l	0
7	Book profit under section 115JB (4 + 5n - 6l)		7 0
8	Whether the financial statements of the company are drawn up in compliance to the Indian Accounting Standards (Ind-AS) specified in Annexure to the companies (Indian Accounting Standards) Rules, 2015. If yes, furnish the details below:-	yes No	1890

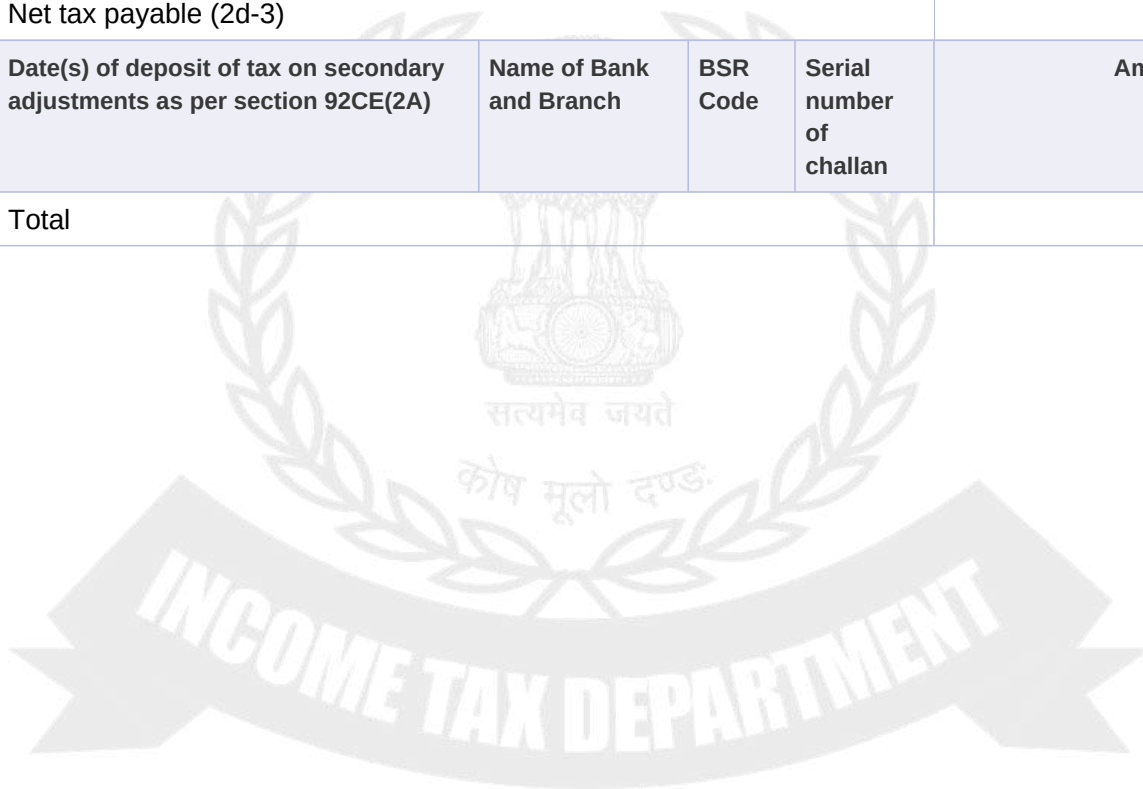
A. Additions to book profit under sub-sections (2A) to (2C) of section 115JB			
a	Amounts credited to other comprehensive income in statement of profit & loss under the head "items that will not be reclassified to profit & loss"	8a	0
b	Amounts debited to the statement of profit & loss on distribution of non-cash assets to shareholders in a demerger	8b	0
c	One fifth of the transition amount as referred to in section 115JB (2C)	8c	0
d	Others (including residual adjustment)	8d	0
e	Total additions (8a + 8b + 8c + 8d)	8e	0
B. Deductions from book profit under sub-sections (2A) to (2C) of section 115JB			
f	Amounts debited to other comprehensive income in statement of profit & loss under the head "items that will not be reclassified to profit & loss"	8f	0
g	Amounts credited to the statement of profit & loss on distribution of non-cash assets to shareholders in a demerger	8g	0
h	One fifth of the transition amount as referred to in section 115JB (2C)	8h	0
i	Others (including residual adjustment)	8i	0
j	Total deductions (8f + 8g + 8h + 8i)	8j	0
9	Deemed total income under section 115JB (7 + 8e - 8j)		9 0
a	Deemed total income from Units located in IFSC, if any	9a	0
b	Deemed total income from other Units (9-9a)	9b	0
10	Tax payable under section 115JB		10 0

Schedule MATC		Computation of tax credit under section 115JAA						
MAT CREDIT	1	Tax under section 115JB in assessment year 2021-22 (1d of Part-B-TTI)				1	0	
	2	Tax under other provisions of the Act in assessment year 2021-22 (2f of Part-B-TTI)				2	0	
	3	Amount of tax against which credit is available [enter (2 - 1) if 2 is greater than 1, otherwise enter 0]				3	0	
	4	Utilisation of MAT credit Available [Sum of MAT credit utilised during the current year is subject to maximum of amount mentioned in 3 above and cannot exceed the sum of MAT Credit Brought Forward]						
		S. No	Assessment Year (A)	MAT Credit		MAT Credit Utilised during the Current Year (C)	Balance MAT Credit Carried Forward (D)= (B3) - (C)	
				Gross (B1)	Set-off in earlier years (B2)			Balance Brought forward (B3)=(B2)-(B1)
		xiv	2021-22 [(SI no 1-SI no 2 of)-SI No 6c -2f of Schedule Part BTTI, only if positive]	0				0
		xv	Total	0	0	0	0	0
	5	Amount of tax credit under section 115JAA utilised during the year [enter 4(c)xv]				5	0	
	6	Amount of MAT liability available for credit in subsequent assessment years [enter 4(D)xv]				6	0	





Schedule TPSA		Details of Tax on secondary adjustments as per section 92CE(2A) as per the schedule provided in e-filing utility				
TAX ON SECONDARY ADJUSTMENTS AS PER SECTION 92CE(2A)	1	Amount of primary adjustment on which option u/s 92CE(2A) is exercised & such excess money has not been repatriated within the prescribed time				0
	Financial Year for which claiming benefit under Section 92CE(2A)					
		Sl.No	Financial Year	Amount deposited		
	2	a	Additional Income tax payable @ 18% on above			0
		b	Surcharge @ 12% on "a"			0
		c	Health & Education cess on (a+b)			0
		d	Total Additional tax payable (a+b+c)			0
	3	Taxes paid				0
	4	Net tax payable (2d-3)				0
		Date(s) of deposit of tax on secondary adjustments as per section 92CE(2A)	Name of Bank and Branch	BSR Code	Serial number of challan	Amount deposited
	Total				0	



Schedule FSI

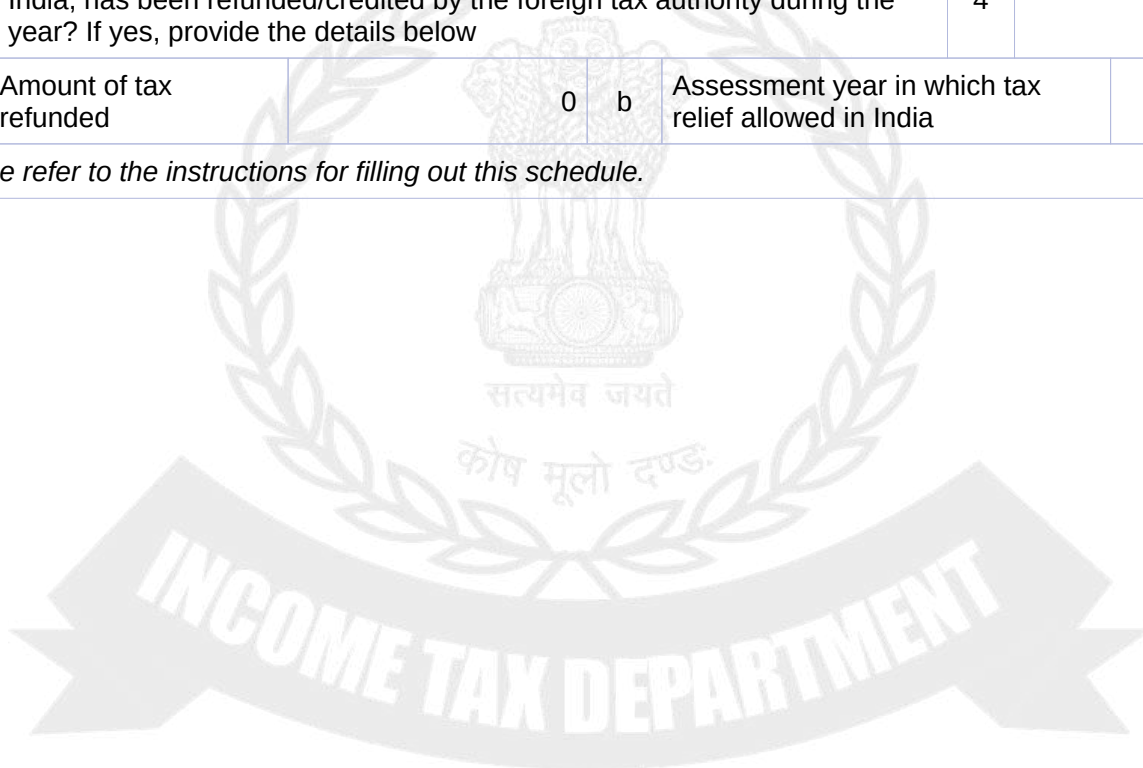
Details of Income from outside India and tax relief (Available only in case of resident)

Note: Please refer to the instructions for filling out this schedule.



Schedule TR		Summary of tax relief claimed for taxes paid outside India (Available only in case of resident)					
TAX RELIEF FOR TAX PAID OUTSIDE INDIA	1	Details of Tax relief claimed					
		Country Code	Tax Identification Number	Total taxes paid outside India (total of (c) of Schedule FSI in respect of each country)	Total tax relief available (total of (e) of Schedule FSI in respect of each country)	Section under which relief claimed (specify 90, 90A or 91)	
		(a)	(b)	(c)	(d)	(e)	
		Total		0	0		
	2	Total Tax relief available in respect of country where DTAA is applicable (section 90/90A) (Part of total of 1(d))				2	0
	3	Total Tax relief available in respect of country where DTAA is not applicable (section 91) (Part of total of 1(d))				3	0
4	Whether any tax paid outside India, on which tax relief was allowed in India, has been refunded/credited by the foreign tax authority during the year? If yes, provide the details below				4		
	a	Amount of tax refunded	0	b	Assessment year in which tax relief allowed in India		

Note: Please refer to the instructions for filling out this schedule.



Schedule FA		Details of Foreign Assets and Income from any source outside India												
DETAILS OF FOREIGN ASSETS	A1		Details of Foreign Depository Accounts held (including any beneficial interest) at any time during the relevant accounting period)											
	SI No	Country name	Country code	Name of financial institution	Address of financial institution	ZIP Code	Account Number	Status	Account opening date	Peak balance during the period	Closing balance	Gross interest paid/credited to the account during the period		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)		
	A2		Details of Foreign Custodial Accounts held (including any beneficial interest) at any time during the relevant accounting period											
	SI No	Country name	Country code	Name of financial institution	Address of financial institution	ZIP Code	Account Number	Status	Account opening date	Peak balance during the period	Closing balance	Gross amount paid/credited to the account during the period (drop down to be provided specifying nature of amount viz. interest/dividend /proceeds from sale or redemption of financial assets/ other income)		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)		
A3		Details of Foreign Equity and Debt Interest held (including any beneficial interest) in any entity at any time during the relevant accounting period												
SI No	Country name	Country code	Name of entity	Address of entity	ZIP Code	Nature of entity	Date of acquiring the interest	Initial value of the investment	Peak value of investment during the period	Closing value	Total gross amount paid /credited with respect to the holding during the period	Total gross proceeds from sale or redemption of investment during the period		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)		
A4		Details of Foreign Cash Value Insurance Contract or Annuity Contract held (including any beneficial interest) at any time during the relevant accounting period												
SI No	Country name	Country code	Name of financial institution in which insurance contract held				Address of financial institution		ZIP Code	Date of contract	The cash value or surrender value of the contract	Total gross amount paid /credited with respect to the contract during the period		
(1)	(2)	(3)	(4)				(5)		(6)	(7)	(8)	(9)		
B		Details of Financial Interest in any Entity held (including any beneficial interest) at any time during the relevant accounting period												
SI No	Country Name and Code	ZIP Code	Nature of entity	Name and Address of the Entity	Nature of Interest-Direct/ Beneficial owner/Beneficiary	Date since held	Total Investment (at cost) (in rupees)	Income accrued from such Interest	Nature of Income	Income taxable and offered in this return				
										Amount	Schedule where offered	Item number of schedule		
(1)	(2a)	(2b)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)		
C		Details of Immovable Property held (including any beneficial interest) at any time during the relevant accounting period												
SI No	Country Name and Code	ZIP Code	Address of the property	Ownership-Direct/ Beneficial owner/ Beneficiary		Date of acquisition	Total Investment (at cost) (in rupees)	Income derived from the property	Nature of Income	Income taxable and offered in this return				
										Amount	Schedule where offered	Item number of schedule		
1897														

(1)	(2a)	(2b)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	
D		Details of any other Capital Asset held (including any beneficial interest) at any time during the relevant accounting period										
SI No	Country Name and Code	ZIP Code	Nature of Asset	Ownership-Direct/ Beneficial owner/ Beneficiary	Date of acquisition	Total Investment (at cost) (in rupees)	Income derived from the asset	Nature of Income	Income taxable and offered in this return			
									Amount	Schedule where offered	Item number of schedule	
(1)	(2a)	(2b)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	
E		Details of account(s) in which you have signing authority held (including any beneficial interest) at any time during the relevant accounting period and which has not been included in A to D above.										
SI No	Name of the Institution in which the account is held	Address of the institution	Country Name & Code	ZIP Code	Name of the account holder	Account Number	Peak Balance /Investment during the year (in rupees)	Whether income accrued is taxable in your hands?	If (7) is yes, Income accrued in the account	If (7) is yes, Income offered in this return		
										Amount	Schedule where offered	Item number of schedule
(1)	(2)	(3a)	(3b)	(3c)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
F		Details of trusts, created under the laws of a country outside India, in which you are a trustee, beneficiary or settlor										
SI No	Country Name and Code	ZIP Code	Name and address of the trust	Name and address of the trustees	Name and address of the Settlor	Name and address of the Beneficiaries	Date since position held	Whether income derived is taxable in your hands?	If (8) is yes, Income derived from the trust	If (8) is yes, Income offered in this return		
										Amount	Schedule where offered	Item number of schedule
(1)	(2a)	(2b)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
G		Details of any other income derived from any source outside India which is not included in,- (i) items A to F above and, (ii) income under the head business or profession										
SI No	Country Name and Code	ZIP Code	Name and address of the person from whom derived			Income derived	Nature of income	Whether taxable in your hands?	If (6) is yes, Income offered in this return			
									Amount	Schedule where offered	Item number of schedule	
(1)	(2a)	(2b)	(3)				(4)	(5)	(6)	(7)	(8)	(9)

Note : Please refer to instructions for filling out this schedule

SCHEDULE SH-1

SHAREHOLDING OF UNLISTED COMPANY (other than a company that is registered under section 8 of the Companies Act, 2013 (or section 25 of the Companies Act, 1956) or a company limited by guarantee under section 3(2) of Companies Act, 2013 or a start-up for which Schedule SH-2 is to be filled up)

If you are an unlisted company, please furnish the following details:-

Details of shareholding at the end of the previous year

Sl.No	Name of the shareholder	Residential status in India	Type of share	Others	PAN /Aadhaar No.	Date of allotment	Number of shares held	Face value per share	Issue Price per share	Amount received
i	Terance Alex	Resident	Equity Share		AGUPA1453H /	14-Feb-2014	9000	10	10	90,000
ii	Jimmy Siluvayyan	Resident	Equity Share		CKBPS9118J /	14-Feb-2014	1000	10	10	10,000
iii	Terance Alex	Resident	Equity Share		AGUPA1453H /	28-Jan-2019	90000	10	10	9,00,000

Details of equity share application money pending allotment at the end of the previous year

Sl. No	Name of the applicant	Residential status in India	Type of share	Others	PAN /Aadhaar No.	Date of application	Number of shares applied for	Application money received	Face value per share	Proposed issue price
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Details of shareholders who is not a shareholder at the end of the previous year but was a shareholder at any time during the previous year

Sl. No	Name of the shareholder	Residential status in India	Type of share	PAN /Aadhaar No.	Number of shares held	Face value per share	Issue Price per share	Amount received	Date of allotment	Date on which cease to be shareholder	Mode of cessation	In case of transfer/sale, PAN /Aadhaar of the new shareholder
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SCHEDULE SH-2**SHAREHOLDING OF START-UPS**

If you are a start-up which has filed declaration in Form-2 under para 5 of DPIIT notification dated 19.02.2019, please furnish the following details of shareholding:-

Details of shareholding as at the end of the previous year

Name of the shareholder	Category of shareholder (drop down to be provided- nonresident/ venture capital company/ venture capital fund/ specified company/ any other person)	Type of share	Others	PAN /Aadhaar No.	Date of allotment	Number of shares held	Face value per share	Issue Price per share	Paid up value per share	Share premium
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Details of share application money pending allotment as at the end of the previous year

Name of the applicant	Category of applicant (drop down to be provided- nonresident/ venture capital company/ venture capital fund/ specified company/ any other person)	Type of share	Others	PAN /Aadhaar No.	Date of application	Number of shares applied for	Face value per share	Proposed issue price per share	Share application money	Share application premium
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Details of shareholder who is not a shareholder at the end of the previous year but was a shareholder at any time during the previous year

Name of the shareholder	Category of shareholder (drop down to be provided- nonresident/ venture capital company/ venture capital fund/ specified company/ any other person)	Type of share	Others	PAN /Aadhaar No.	Date of allotment	Number of shares held	Face value per share	Issue Price per share	Paid up value per share	Date on which ceased to be shareholder	Mode of cessation	In case of transfer, PAN/Aadhaar of the new shareholder
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Note: For definition of expressions - "venture capital company", "venture capital fund" and "specified company", please refer DPIIT notification dated 19.02.2019.

Schedule AL-1

Assets and liabilities as at the end of the year (mandatorily required to be filled up by an unlisted company) (other than a start-up for which Schedule AL-2 is to be filled up)

DETAILS OF ASSETS AND LIABILITIES

A

Details of building or land appurtenant there to, or both, being a residential house

Sl.No	Address	Pin Code	Date of Acquisition	Cost of acquisition Rs.	Purpose for which used (dropdown to be provided)
(1)	(2)	(3)	(4)	(5)	(6)

B

Details of land or building or both not being in the nature of residential house

Sl.No	Address	Pin Code	Date of Acquisition	Cost of acquisition Rs.	Purpose for which used (dropdown to be provided)
(1)	(2)	(3)	(4)	(5)	(6)

C

Details of listed equity shares

Opening balance			Shares acquired during the year			Shares transferred during the year			Closing balance		
Number of Shares	Type of shares	Cost of acquisition	Number of Shares	Type of shares	Cost of acquisition	Number of Shares	Type of shares	Sale consideration	Number of Shares	Type of shares	Cost of acquisition
1	2	3	4	5	6	7	8	9	10	11	12

D

Details of unlisted equity shares

Name of Company	PAN	Opening balance		Shares acquired during the year					Shares transferred during the year		Closing balance	
		No of Shares	Cost of acquisition	Date of subscription/ purchase	No of Shares	Face value per share	Issue price per share (in case of fresh issue)	Purchase price per share (in case of purchase from existing shareholder)	No of Shares	Sale consideration	No of Shares	Cost of acquisition

E

Details of other securities

Type of securities	Others	Whether listed or unlisted	Opening balance		Securities acquired during the year					Securities transferred during the year		Closing balance	
			No of Securities	Cost of acquisition	Date of subscription/ purchase	No of Securities	Face value per share	Issue price of security (in case of fresh issue)	Purchase price per share (in case of purchase from existing shareholder)	No of Securities	Sale consideration	No of Securities	Cost of acquisition

F

Details of capital contribution to other entity

Name of entity	PAN	Opening balance	Amount contributed during the year	Amount withdrawn during the year	Amount of profit/loss/ dividend/interest debited or credited during the year	Closing balance
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G

Details of Loans & Advances to any other concern (If money lending is not assessee's substantial business)

Name of Person	PAN	Opening balance	Amount received	Amount paid	Interest debited, if any	Closing balance	Rate of interest (%)
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H

Details of motor vehicle, aircraft, yacht or other mode of transport

Particulars of asset	Others	Registration number of vehicle	Cost of acquisition	Date of acquisition	Purpose for which used (dropdown to be provided)
Motor vehicle		KI-01-cf-7008	23,69,322	05-Apr-2018	Own Business Use
Motor vehicle		KI-01-ca-6529	3,95,494	19-Jul-2018	Own Business Use
Motor vehicle		KI-01-ca-8310	3,87,512	19-Jul-2018	Own Business Use
Motor vehicle		KL-01-BJ-8129	38,000	10-Aug-2019	Own Business Use
Motor vehicle		KL-01-CN-7008	8,62,051	29-Jan-2020	Own Business Use

I

Details of Jewellery, archaeological collections, drawings, paintings, sculptures, any work of art or bullion

Particulars of asset	Others	Quantity	Cost of acquisition	Date of acquisition	Purpose for which used (dropdown to be provided)
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J

Details of liabilities

Details of loans, deposits and advances taken from a person other than financial institution

Name of Person	PAN	Opening balance	Amount received	Amount paid	Interest debited, if any	Closing balance	Rate of interest (%)
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Schedule AL2		Assets and liabilities as at the end of the year (applicable for start-ups only)								
If you are a start-up which has filed declaration in Form-2 under para 5 of DPIIT notification dated 19.02.2019, Please furnish the following information for the period from the date of incorporation upto end of the year:										
DETAILS OF ASSETS AND LIABILITIES	A		Details of building or land appurtenant there to, or both, being a residential house acquired since incorporation.							
	Sl.No	Address	Pin Code	Date of acquisition	Cost of acquisition Rs.	Purpose for which used (dropdown to be provided)		Whether transferred on or before the end of the previous year, if Yes date of transfer		
	(1)	(2)	(3)	(4)	(5)	(6)		(7)		
	B		Details of land or building or both not being a residential house acquired since incorporation.							
	Sl.No	Address	Pin Code	Date of acquisition	Cost of acquisition Rs.	Purpose for which used (dropdown to be provided)		Whether transferred on or before the end of the previous year, if Yes date of transfer		
	(1)	(2)	(3)	(4)	(5)	(6)		(7)		
	C		Details of Loans & Advances made since incorporation (If lending of money is not asses's substantial business)							
	Sl. No	Name of Person	PAN	Date on which loans and advances has been made	Amount of loans and advances	Amount	Whether loans and advances has been repaid, if Yes date of such repayment		Closing balance as at the end of the previous year, if any	Rate of interest, if any
	D		Details of capital contribution made to any other entity since incorporation							
	Sl. No	Name of entity	PAN	Date on which capital contribution has been made	Amount of contribution	Amount withdrawn, if any	Amount of profit/loss/ dividend/ interest debited or credited		Closing balance as at the end of the previous year, if any	
	E		Details of acquisition of shares and securities							
	Sl. No	Name of company/entity	PAN	Type of shares /securities	Others	Number of shares /securities	Cost of acquisition	Date of acquisition	Whether transferred, if Yes date of transfer	Closing balance as the end of the previous year, if any
	F		Details of motor vehicle, aircraft, yacht or other mode of transport, the actual cost of which exceeds ten lakh rupees acquired since incorporation							
	Sl. No	Particulars of asset	Others	Registration number of vehicle	Cost of acquisition	Date of acquisition	Purpose for which used (dropdown to be provided)		Whether transferred, if Yes date of transfer	
	G		Details of Jewellery acquired since incorporation							
	Sl. No	Particulars of asset	Description	Quantity	Cost of acquisition	Date of acquisition	Purpose for which used (dropdown to be provided)		Whether transferred, if Yes date of transfer	Closing balance as at the end of the previous year, if any
	(1)	(2)	(3)	(4)	(5)	(6)	(7)		(8)	
	H		Details of archaeological collections, drawings, paintings, sculptures, any work of art or bullion acquired since incorporation							
Sl. No	Particulars of asset	Others	Quantity	Cost of acquisition	Date of acquisition	Purpose for which used (dropdown to be provided)		Whether transferred, if Yes date of transfer	Closing balance as at the end of the previous year, if any	
(1)	(2)	(3)	(4)	(5)	(6)	(7)		(8)	(9)	
I		Details of liabilities								
		Details of loans, deposits and advances taken from a person other than financial institution								
Sl.No	Name of Person	PAN	Opening balance	Amount received	Amount paid	Interest debited, if any		Closing balance	Rate of interest (%)	
(1)	(2)	(3)	(4)	(5)	(6)	(7)		(8)	(9)	

Schedule GST		INFORMATION REGARDING TURNOVER/GROSS RECEIPT REPORTED FOR GST	
DETAILS OF GST	Sl.No.	GSTIN No(s).	Annual value of outward supplies as per the GST return(s) filed
	(1)	(2)	(3)
	1	32AABCW4979N2ZO	2,14,22,269
		Total	2,14,22,269
	Note: Please furnish the information above for each GSTIN No. separately		



Schedule FD		Break-up of payments/receipts in Foreign currency (to be filled up by the assessee who is not liable to get accounts audited u/s 44AB)	
Foreign Currency Transaction	S.No.	Currency-wise Break-Up	Amount (in Rs.)
	i	Payments made during the year on capital account	0
	ii	Payments made during the year on revenue account	0
	iii	Receipts during the year on capital account	0
	iv	Receipts during the year on revenue account	0
	NOTE	Please refer to instructions for filling out this schedule.	



Part B - TI		Computation of total income			
1	Income from house property (4 of schedule HP)(enter nil if loss)			1	0
2	Profits and gains from business or profession				
	i	Profits and gains from business other than speculative business and specified business (A39 of schedule BP)(enter nil if loss)	2i	2,77,865	
	ii	Profits and gains from speculative business (3 (ii) of Table E of schedule BP)(enter nil if loss and take the figure of schedule CFL)	2ii	0	
	iii	Profits and gains from specified business (3 (iii) of Table E of schedule BP)(enter nil if loss and take the figure of schedule CFL)	2iii	0	
	iv	Income chargeable to tax at special rate (3d and 3e & 3iv of Table E of schedule BP)	2iv	0	
	v	Total (2i + 2ii + 2iii + 2iv)	2v	2,77,865	
3	Capital gains				
	a	Short term			
	i	Short-term chargeable @ 15% (9ii of item E of schedule CG)	ai	0	
	ii	Short-term chargeable @ 30% (9iii of item E of schedule CG)	a ii	0	
	iii	Short-term chargeable at applicable rate (9iv of item E of schedule CG)	a iii	0	
	iv	Short-term chargeable at special rates in India as per DTAA (9v of item E of schedule CG)	a iv	0	
	v	Total Short-term (ai + a ii + a iii + a iv) (enter nil if loss)	3av	0	
	b	Long term			
	i	Long-term chargeable @ 10% (9vi of item E of schedule CG)	bi	0	
	ii	Long-term chargeable @ 20% (9vii of item E of schedule CG)	b ii	0	
	iii	Long-term chargeable at special rates in India as per DTAA (9viii of item E of schedule CG)	b iii	0	
	iv	Total Long-term (bi + b ii + b iii)(enter nil if loss)	b iv	0	
	c	Total capital gains (3av + 3biv) (enter nil if loss)		3c	0
4	Income from other sources				
	a	Net income from other sources chargeable to tax at normal applicable rates (6 of schedule OS)(enter nil if loss)	4a	1,49,972	
	b	Income chargeable to tax at special rate (2 of schedule OS)	4b	0	

	c	Income from the activity of owning and maintaining race horses (8e of schedule OS) (enter nil if loss)	4c	0	
	d	Total (4a + 4b + 4c)	4d	1,49,972	
5		Total of head wise income (1 + 2v + 3c +4d)	5	4,27,837	
6		Losses of current year to be set off against 5 (total of 2xvii,3xvii and 4xvii of schedule CYLA)	6	0	
7		Balance after set off of current year losses (5 - 6) (Also total of (ii,iii,v to xv of column 5 of schedule CYLA + 4b + 2iv)	7	4,27,837	
8		Brought forward losses to be set off against 7 (total of 2xvi,3xvi and 4xvi of schedule BFLA)	8	0	
9		Gross Total income (7 - 8) Field Total of column 5 of Schedule Sch BFLA+4b+2iv- 2e of schedule OS - 3iv of Table E of schedule BP)	9	4,27,837	
10		Income chargeable to tax at special rate under section 111A, 112, 112A etc. included in 9	10	0	
11		Deductions under Chapter VI-A			
	a	Part-B of Chapter VI-A [1 of schedule VI-A and limited upto total of (i, ii,iv,v,vii,xii,xiv) of column 5 of schedule BFLA]	11a	0	
	b	Part-C of Chapter VI-A [2 of schedule VI-A and limited upto (ii) of column 5 of schedule BFLA]	11b	0	
	c	Total (11a + 11b) [limited upto (9-10)]	11c	0	
12		Deduction u/s 10AA (Total sch. 10AA)	12	0	
13		Total income (9 - 11c - 12)	13	4,27,840	
14		Income chargeable to tax at special rates (total of (i) of schedule SI)	14	0	
15		Income chargeable to tax at normal rates (13-14)	15	4,27,840	
16		Net agricultural income (3v of schedule EI)	16	0	
17		Losses of current year to be carried forward (total of xvi of schedule CFL)	17	0	
18		Deemed total income under section 115JB (9 of schedule MAT)	18	0	

Part B - TTI		Computation of tax liability on total income					
COMPUTATION OF TAX LIABILITY	1	a	Tax payable on deemed total income under section 115JB (10 of Schedule MAT)		1a	0	
		b	Surcharge on (a) above (if applicable)		1b	0	
		c	Health and Education Cess @ 4% on 1a+1b above		1c	0	
		d	Total Tax Payable u/s 115JB (1a+1b+1c)		1d	0	
	2	Tax payable on total income					
		a	Tax at normal rates on 15 of Part B-TI	2a	94,125		
		b	Tax at special rates (total of col. (ii) of Schedule-SI)	2b	0		
		c	Tax Payable on Total Income (2a+2b)		2c	94,125	
		d	Surcharge				
		i	25% of 12(ii) of Schedule SI	2di	0		
		ii	on[(2c) -(12(ii) of Schedule SI)]	2dii	9,413		
		iii	Total (i+ii)		2diii	9,413	
		e	Health and Education Cess @ 4% on (2c+2diii)		2e	4,142	
		f	Gross tax liability (2c + 2diii + 2e)		2f	1,07,680	
	3	Gross tax payable (higher of 1d or 2f)				3	1,07,680
	4	Credit under section 115JAA of tax paid in earlier years (if 2f is more than 1d) (5 of Schedule AMTC)				4	0
	5	Tax payable after credit under section 115JAA [(3 - 4)]				5	1,07,680
	6	Tax relief					
		a	Section 90/90A (2 of Schedule TR)	6a	0		
		b	Section 91 (3 of Schedule TR)	6b	0		
		c	Total (6a + 6b)		6c	0	
	7	Net tax liability (5 - 6c) (enter zero, if negative)				7	1,07,680
	8	Interest and fee payable					
		a	Interest for default in furnishing the return (section 234A)	8a	0		
	b	Interest for default in payment of advance tax (section 234B)	8b	0			
	c	Interest for deferment of advance tax (section 234C)	8c	0			
	d	Fee for default in furnishing return of income (section 234F)	8d	0			
	e	Total Interest and Fee Payable (8a+8b+8c+8d)		8e	0		
9	Aggregate liability (7 + 8e)				9	1,07,680	
10	Taxes Paid						
	a	Advance Tax (from column 5 of 15A)	10a	0			
	b	TDS (total of column 9 of 15B)	10b	2,32,986			
	c	TCS (total of column 7 of 15C)	10c	0			
	d	Self-Assessment Tax (from column 5 of 15A)	10d	0			
	e	Total Taxes Paid (10a+10b+10c+10d)		10e	2,32,986		
		1907					

TAXES PAID AND BANK DETAILS	11	Amount payable(9-10e) (Enter if 9 is greater than 10e, else enter 0)				11	0
	12	Refund (If 10e is greater than 9) (refund, if any, will be directly credited into the bank account)				12	1,25,310
BANK ACCOUNT	13	Do you have a bank account in India (Non- Residents claiming refund with no bank account in India may select No)				Yes No	
		a) Details of all Bank Accounts held in India at any time during the previous year (excluding dormant accounts)					
		SI.	IFS Code of the Bank in case of Bank Accounts held in India	Name of the Bank	Account Number	Indicate the account in which you prefer to get your refund credited, if any (tick one account)	
		i	SBIN0007211	State bank of india	33708912624		
		Note: 1) Minimum one account should be selected for refund credit 2) In case of refund, multiple accounts are selected for refund credit, then refund will be credited to one of the account decided by CPC after processing the return b) Non- residents, who are claiming income-tax refund and not having bank account in India may, at their option, furnish the details of one foreign bank account:					
	SI. No.	SWIFT Code	Name of the Bank	Country of Location	IBAN		
	14	Do you at any time during the previous year,- (i) hold, as beneficial owner, beneficiary or otherwise, any asset (including financial interest in any entity) located outside India; or (ii) have signing authority in any account located outside India; or (iii) have income from any source outside India? [applicable only in case of a resident] [Ensure Schedule FA is filled up if the answer is Yes]				Yes No	

15	TAX PAYMENTS																																																		
A	Details of payments of Advance Tax and Self-Assessment Tax																																																		
<table><tr><td>SI No</td><td>BSR Code</td><td colspan="3">Date of Deposit (DD/MMM/YYYY)</td><td colspan="4">Serial Number of Challan</td><td colspan="3">Amount (Rs)</td></tr><tr><td>(1)</td><td>(2)</td><td colspan="3">(3)</td><td colspan="4">(4)</td><td colspan="3">(5)</td></tr><tr><td colspan="10">Total</td><td colspan="3">0</td></tr></table>															SI No	BSR Code	Date of Deposit (DD/MMM/YYYY)			Serial Number of Challan				Amount (Rs)			(1)	(2)	(3)			(4)				(5)			Total										0		
SI No	BSR Code	Date of Deposit (DD/MMM/YYYY)			Serial Number of Challan				Amount (Rs)																																										
(1)	(2)	(3)			(4)				(5)																																										
Total										0																																									
Note: Enter the totals of Advance tax and Self-Assessment tax in SI No. 10a & 10d of Part B-TTI																																																			
B	Details of Tax Deducted at Source (TDS) on Income [As per Form 16 A issued or Form 16B/16C furnished by Deductor(s)]																																																		
SI No	TDS credit relating to self /other person [spouse as per section 5A/other person as per rule 37BA(2)]	PAN/ Aadhaar of Other Person (if TDS credit related to other person)	TAN of the Deductor/ PAN/ Aadhaar of Tenant/ Buyer	Unclaimed TDS brought forward (b /f)		TDS of the current Financial Year (TDS deducted during FY 2020-21)			TDS credit being claimed this Year (only if corresponding income is being offered for tax this year)			Corresponding Receipt offered		TDS credit being carried forward																																					
				Fin. Year in which deducted	TDS b/f	Deducted in own hands	Deducted in the hands of spouse as per section 5A or any other person as per rule 37BA(2) (if applicable)	Claimed in own hands	Claimed in the hands of spouse as per section 5A or any other person as per rule 37BA(2) (if applicable)	Gross Amount	Head of Income																																								
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)		(9)	(10)			(11)	(12)	(13)																																				
							Income	TDS		Income	TDS	PAN/ Aadhaar																																							
1	Self	/	TVDA00193E		0	1,83,623	0	0	1,83,623	0	0	/	1,21,87,387	Income from Business & Profession	0																																				
2	Self	/	CHNA07821C		0	2,588	0	0	2,588	0	0	/	1,72,500	Income from Business & Profession	0																																				
3	Self	/	MRIC01389D		0	8,250	0	0	8,250	0	0	/	82,500	Income from Business & Profession	0																																				
4	Self	/	TVDF00194F		0	763	0	0	763	0	0	/	50,867	Income from Business & Profession	0																																				
5	Self	/	MUMS89575D		0	4,049	0	0	4,049	0	0	/	53,976	Income from Other Sources	0																																				
6	Self	/	CHNT00969D		0	5,856	0	0	5,856	0	0	/	78,067	Income from Other Sources	0																																				
7	Self	/	CHNT00969D		0	12,679	0	0	12,679	0	0	/	8,45,250	Income from Business & Profession	0																																				
8	Self	/	CHNE00277E		0	15,178	0	0	15,178	0	0	/	7,58,900	Income from Business & Profession	0																																				
TDS claimed in own hands (total of column 9)									2,32,986																																										
NOTE	Please enter total of column 9 in10b of Part B- TTI																																																		
C	Details of Tax Deducted at Source (TDS) on Income [As per Form 16A issued or Form 16B/16C/16D furnished by Deductor(s)]																																																		
SI No	TDS credit relating to self /other person [spouse as per section 5A/other person as per rule 37BA(2)]	PAN/ Aadhaar of Other Person (if TDS credit related to other person)	PAN/Aadhaar No. of the Buyer / Tenant	Unclaimed TDS brought forward (b /f)		TDS of the current Financial Year (TDS deducted during FY 2020-21)			TDS credit being claimed this Year (only if corresponding income is being offered for tax this year)			Corresponding Receipt offered		TDS credit being carried forward																																					
				Fin. Year in which deducted	TDS b/f	Deducted in own hands	Deducted in the hands of spouse as per section 5A or any other person as per rule 37BA(2) (if applicable)	Claimed in own hands	Claimed in the hands of spouse as per section 5A or any other person as per rule 37BA(2) (if applicable)	Gross Amount	Head of Income																																								
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)		(9)	(10)			(11)	(12)	(13)																																				
							Income	TDS		Income	TDS	PAN/ Aadhaar																																							
TDS claimed in own hands (total of column 9)									0																																										
Note: Please enter total of column 9 in11b of Part B- TTI																																																			
D	Details of Tax Collected at Source (TCS) [As per Form 27D issued by the Collector(s)]																																																		
SI	Tax Deduction and Tax		Name of	Unclaimed TCS		TCS of the current financial		Amount out of (5) or (6) being claimed this Year			Amount out of (5)																																								
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No	Collection Account Number of the Collector	the Collector	brought forward (b/f)		Year (TCS collected during the FY 2020-21)	(only if corresponding income is being offered for tax this year)	or (6) being carried forward
			Fin. Year in which collected	Amount b/f			
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	TCS being claimed this year (total of column 7)					0	
	Note: Please enter total of column (7) in 10c of Part B-TTI						



FORM	ITR-6	INDIAN INCOME TAX RETURN [For Companies other than companies claiming exemption under section 11] (Please see rule 12 of the Income-tax Rules,1962) (Please refer instructions)				Assessment Year						
		2	0	2	2	-	2	3				
Part A-GEN		GENERAL										
PERSONAL INFORMATION & RESIDENTIAL ADDRESS	Name WATTSUN ENERGY INDIA PRIVATE LIMITED					PAN AABCW4979N						
	Is there any change in the company's name? If yes, please furnish the old name					Corporate Identity Number (CIN) issued by MCA U40300KL2014PTC036294						
	Flat/Door/Block No Tc.36/38(1)			Name of Premises/Building /Village Aiswarya Tower, First Floor		Date of incorporation (DD/MM/YYYY) 04-Mar-2014			Date of commencement of business (DD /MM/YYYY) 04-Mar-2014			
	Road/Street/Post Office Chackai			Area/Locality Trivandrum		Type of company (Tick any one)						
						(i) Domestic Company						
						(ii) Foreign Company						
	Town/City/District Trivandrum			State 16-Kerala		Pin code/Zip code 695024			If a public company write 6, and if private company write 7 (as defined in section 3 of The Companies Act)			public company
	Country/Region 91-India											
	Office Phone Number with STD code		Mobile No. 1 91 8943345700			Mobile No. 2		Email Address-1 terance.alex@gmail.com				
	Email Address-2											
(a)	Filed u/s (Tick)[Please see instruction]				139(1)- On or Before due date, 139(4)- After due date, 139(5)- Revised Return, 92CD-Modified return, 119(2)(b)- after condonation of delay							
	Or filed in response to notice u/s				139(9), 142(1), 148							
(b)	If revised/ defective/Modified, then enter Receipt No and Date of filing original return (DD/MM/YYYY)				738413991201022			20-Oct-2022				
(c)	If filed, in response to notice u/s 139(9)/142(1)/148/or order u/s 119(2)(b), enter Unique Number /Document Identification Number and date of such notice/order, or if filed u/s 92CD enter date of advance pricing agreement											
(d)	Residential Status (Tick) Resident Non-Resident											
(e)	Have you opted for taxation under section 115BA/115BAA/115BAB? (drop down to be provided in efilling utility) (applicable on Domestic Company) If yes, please furnish the AY in which said option is exercised for the first time along with date of filing of relevant form (10-IB/ 10-IC/ 10-ID) & acknowledgment number											
	Assesment Year 2020-21			Acknowledgment number 236250690210222			Date of filing 21-Feb-2022					
	If no, whether you are choosing to opt for taxation under section 115BA/115BAA/115BAB this year? Yes No											
	If yes, Please provide the date of filing of relevant form (10-IB/10-IC/10-ID) & acknowledgment number											
	Acknowledgment number								Date of filing			
(f)	Whether total turnover/ gross receipts in the previous year 2019-20 exceeds 400 crore rupees? (Yes/No) (applicable for Domestic Company)											
(g)	Whether assessee is a resident of a country or specified territory with which India has an agreement referred to in sec 90 (1) or Central Government has adopted any agreement under sec 90A(1)? (Tick) Yes No 1911											

FILING STATUS	(h)	In the case of non-resident, is there a Permanent Establishment (PE) in India (Tick) Yes No		
	In the case of non-resident, is there a Significant Economic Presence (SEP) in India (Tick) Yes No			
	(i)	(a)	aggregate of payments arising from the transaction or transactions during the previous year as referred in Explanation 2A(a) to Section 9(1)(i)	0
		(b)	number of users in India as referred in Explanation 2A(b) to Section 9(1)(i)	
	(j)	Whether assessee is required to seek registration under any law for the time being in force relating to companies? (Tick) Yes No If yes, please provide details.		
		Act under which registration required	Registration Number	Date of registration
	(k)	Whether the financial statements of the company are drawn up in compliance to the Indian Accounting Standards specified in Annexure to the companies (Indian Accounting Standards) Rules, 2015 (Tick) Yes No		
	(l)	Whether assessee has a unit located in an International Financial Services Centre and derives income solely in convertible foreign exchange? (Tick) Yes No		
	(m)	Whether the assessee company is under liquidation (Tick) Yes No		
	(n)	Whether you are an FII / FPI? Yes/No If yes, please provide SEBI Regn. No.		No /
	(o)	Whether the company is a producer company as defined in Sec.581A of Companies Act, 1956? (Tick) Yes No		
	(p)	Whether this return is being filed by a representative assessee? (Tick) Yes No If yes, please furnish following information -		
		(1)	Name of the representative assessee	
		(2)	Capacity of the Representative (drop down to be provided)	
		(3)	Address of the representative assessee	
		(4)	Permanent Account Number (PAN)/Aadhaar No. of the representative assessee	
	(q)	Whether you are recognized as start up by DPIIT (Tick)		Yes No
		1	If yes, please provide start up recognition number allotted by the DPIIT	
		2	Whether certificate from inter-ministerial board for certification is received?	Yes No
		3	If yes provide the certification number	
	4	Whether declaration in Form-2 in accordance with para 5 of DPIIT notification dated 19/02/2019 has been filed before filing of the return?	Yes No	
	5	If yes, provide date of filing Form-2		
(a1)	Whether liable to maintain accounts as per section 44AA? (Tick) Yes No			
(a2)	Whether assessee is declaring income only under section 44AE / 44B / 44BB / 44BBA / 44BBB / 44D? (Tick) Yes No			
(a2i)	If No, Whether during the year Total sales/turnover/gross receipts of business is between Rs. 1 crore Rupees and does not exceed Rs. 10 Crore Rupees? (Tick) Yes No, turnover does not exceed 1 crore No, turnover exceeds 10 crores			
(a2ii)	If (a2i) is Yes, Whether aggregate of all amounts received including amount received for sales, turnover or gross receipts or on capital account such as capital contribution, loans etc. during the previous year, in cash & non-a/c payee cheque/DD, does not exceed five per cent of said amount? (Tick) Yes No			
(a2iii)	If (a2i) is Yes, Whether aggregate of all payments made including amount incurred for expenditure or on capital account such as asset acquisition, repayment of loan etc., in cash & non-a/c payee cheque/DD, during the previous year does not exceed five per cent of the said payment? (Tick) Yes No			
(b)	Whether liable for audit under section 44AB? (Tick) Yes No			
(c)	If (b) is Yes, whether the accounts have been audited by an accountant? (Tick) Yes No If Yes, furnish the following information below			

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AUDIT INFORMATION	(1)	Mention the date of furnishing of audit report (DD/MM/YYYY) 28-Sep-2022					
	(2)	Name of the auditor signing the tax audit report JOSE ZACHARIAH					
	(3)	Membership No. of the auditor 080570					
	(4)	Name of the auditor (proprietorship/ firm) JAKS & ASSOCIATES					
	(5)	Proprietorship/firm registration number 0001360S					
	(6)	Permanent Account Number (PAN/Aadhaar No.) of the auditor (proprietorship/ firm) AACFJ0207A					
	(7)	Date of audit report 28-Sep-2022					
	(di)	Are you liable for Audit u/s 92E? (Tick) Yes No					
(dii)	If (di) is Yes, whether the accounts have been audited u/s. 92E?		Yes No		Date of furnishing audit report?		
(diii)	If liable to furnish other audit report under the Income-tax Act, mention whether have you furnished such report. If yes, please provide the details as under:) (Please see Instruction 5)						
	SI. No.	Section Code	Description	Whether have you furnished such report?	Date (DD-MM-YYYY)		
(e)	Mention the Act, section and date of furnishing the audit report under any Act other than the Income-tax Act						
	SI. No	Act and section	Description	Have you got audited under the selected Act other than the Income-tax Act?	(DD-MM-YYYY)		
	1	Companies Act, 2013 / 139		Yes	28-Sep-2022		
HOLDING STATUS	(a)	Nature of company (select 1 if holding company, select 2 if a subsidiary company, select 3 if both, select 4 if any other)				Any Other	
	(b)	If subsidiary company, mention the details of the Holding Company					
		SI. No.	PAN of Holding Company	Name of the Holding Company	Address of Holding Company	Percentage of shares held	
	(c)	If holding company, mention the details of the subsidiary companies					
		SI. No.	PAN of subsidiary Company	Name of the subsidiary Company	Address of Subsidiary Company	Percentage of shares held	
BUSINESS ORGANISATION	Details of Amalgamating, Amalgamated, Demerged and Resulting Company (as the case may be)						
	SI. No.	Business Type	Date of event	PAN	Name of the Company	Address	
KEY PERSONS	Particulars of Managing Director, Directors, Secretary and Principal officer(s) who have held the office during the previous year and the details of eligible person who is verifying the return.						
	SI. No.	Name	Designation	Residential Address	PAN	Aadhaar No.	Director Identification Number (DIN) issued by MCA, in case of Director
	1	TERANCE ALEX	MD - Managing Director	304, HOLY HOUSE, POZHIOOR P O, POOYA PALLIVILAKAM , TRIVANDRUM , 16-Kerala , 91-India , 695513	AGUPA1453H		06808744
	2	JIMMY SILUVAYYAN	DIR - Director	VARAVILATHOPPU, POOVAR P O , TRIVANDRUM , 16-Kerala , 91-India , 695024	CKBPS9118J		06808773
	Particulars of persons who were beneficial owners of shares holding not less than 10% of the voting power at any time of the previous year						
	SI. No.	Name and Address		Percentage of shares held (if determinate)	PAN (if allotted)	Aadhaar No.	
	1	TERANCE ALEX		90 %	AGUPA1453H		

SHAREHOLDERS INFORMATION		304, HOLY HOUSE, POZHIOOR P O, POOYA PALLIVILAKAM , TRIVANDRUM , 16-Kerala , 91-India , 695513											
	2	JIMMY SILUVAYYAN VARAVILATHOPPU, POOVAR P O , TRIVANDRUM , 16-Kerala , 91-India , 695024				10 %	CKBPS9118J						
OWNERSHIP INFORMATION	In case of unlisted company, particulars of natural persons who were the ultimate beneficial owners, directly or indirectly, of shares holding not less than 10% of the voting power at any time of the previous year												
	Sl. No.		Name		Address		Percentage of shares held		PAN/Aadhaar No. (if allotted)				
	In case of Foreign company, please furnish the details of immediate parent company.												
	Sl. No.		Name		Address		Country/Region of residence		PAN (if allotted)		Taxpayer's registration number or any unique identification number allotted in the country of residence		
	In case of foreign company, please furnish the details of ultimate parent company												
	Sl. No.		Name		Address		Country/Region of residence		PAN (if allotted)		Taxpayer's registration number or any unique identification number allotted in the country of residence		
NATURE OF COMPANY AND ITS BUSINESS	Nature of company										(Tick)		
	1	Whether a public sector company as defined in section 2(36A) of the Income-tax Act										Yes	No
	2	Whether a company owned by the Reserve Bank of India										Yes	No
	3	Whether a company in which not less than forty percent of the shares are held (whether singly or taken together) by the Government or the Reserve Bank of India or a corporation owned by that Bank										Yes	No
	4	Whether a banking company as defined in clause (c) of section 5 of the Banking Regulation Act,1949										Yes	No
	5	Whether a scheduled Bank being a bank included in the Second Schedule to the Reserve Bank of India Act										Yes	No
	6	Whether a company registered with Insurance Regulatory and Development Authority (established under sub-section (1) of section 3 of the Insurance Regulatory and Development Authority Act, 1999)										Yes	No
	7	Whether a company being a non-banking Financial Institution										Yes	No
	8	Whether the company is unlisted? If yes, please ensure to fill up the Schedule SH-1 and Schedule AL-1										Yes	No

FORM	ITR-6	INDIAN INCOME TAX RETURN [For Companies other than companies claiming exemption under section 11] (Please see Rule 12 of the Income-tax Rules,1962) (Please refer instructions)	Assessment Year					
			2	0	2	2	-	2
Nature of business or profession, <i>if more than one business or profession indicate the three main activities/ products (Other than those declaring income under section 44AE)</i>								
Sl. No.	Code [Please see instruction No.7(i)]	Description						
i	21008 - Other services n.e.c.	WATTSUN ENERGY INDIA PRIVATE LIMITED						

FORM	ITR-6	INDIAN INCOME TAX RETURN [For Companies other than companies claiming exemption under section 11] (Please see Rule 12 of the Income-tax Rules,1962) (Please refer instructions)				Assessment Year						
		2	0	2	2	-	2	3				
Part A-BS BALANCE SHEET AS ON 31 ST DAY OF MARCH, 2022 OR AS ON THE DATE OF AMALGAMATION												
1	Equity and Liabilities											
1	Shareholder's fund											
A	Share capital											
i	Authorised	Ai	10,00,000									
ii	Issued,Subscribed and fully Paid up	Aii	10,00,000									
iii	Subscribed but not fully Paid	Aiii	0									
iv	Total(Aii + Aiii)	Aiv	10,00,000									
B	Reserves and Surplus											
i	Capital Reserve	Bi	0									
ii	Capital Redemption Reserve	Bii	0									
iii	Securities Premium Reserve	Biii	0									
iv	Debentures Redemption Reserve	Biv	0									
v	Revaluation Reserve	Bv	0									
vi	Share options outstanding amount	Bvi	0									
vii	Other reserve(specify nature and amount)											
	Sl.No	Other reserve nature							Amount			
	1	General Reserve							8,94,508			
		Total							8,94,508			
viii	Surplus i.e. Balance in profit and loss account (Debit balance to be shown as -ve figure)										Bviii	92,849
ix	Total(Bi + Bii + Biii + Biv + Bv + Bvi + Bvii + Bviii) (Debit balance to be shown as -ve figure)										Bix	9,87,357
C	Money received against share warrants										1C	0
D	Total Shareholder's fund(Aiv + Bix + 1C)										1D	19,87,357
2	Share application money pending allotment											
i	Pending for less than one year	i	0									
ii	Pending for more than one year	ii	0									
iii	Total (i + ii)										2	0
3	Non-current liabilities											
A	Long -term borrowings											
i	Bonds/debentures											
a	Foreign currency	ia	0									
b	Rupee	ib	0									
c	Total(ia + ib)										ic	0

EQUITY AND LIABILITIES	ii		Term loans					
	a	Foreign currency		iia	0			
		b		Rupee Loans				
		1	From Banks		b1	36,98,127		
			2	From others		b2	0	
				3	Total(b1 + b2)		b3	36,98,127
	c		Total Term loans (iia + b3)		iic	36,98,127		
	iii		Deferred payment liabilities		iii	0		
	iv		Deposits from related parties (See instructions)		iv	0		
	v		Other deposits		v	0		
	vi		Loan and advances from related parties (See instructions)		vi	53,12,828		
	vii		Other loans and advances		vii	0		
	viii		Long term maturities of finance lease obligations		viii	0		
	ix		Total long term borrowings(ic + iic + iii + iv + v + vi + vii + viii)		3A	90,10,955		
	B		Deferred tax liabilities(net)		3B	0		
	C		Other long-term liabilities					
			i	Trade payables	i	0		
			ii	Others	ii	0		
			iii		Total Long-term other liabilities(i + ii)		3C	0
	D		Long-term provisions					
			i	Provision for employee benefits	i	0		
			ii	Others	ii	0		
			iii		Total(i + ii)		3D	0
	E		Total Non-current liabilities(3A + 3B + 3C + 3D)		3E	90,10,955		
	4		Current liabilities					
	A		Short-term borrowings					
			i	Loans repayable on demand				
				a	From banks	ia	0	
					b	From Non-Banking Finance Companies	ib	0
					c	From other financial institutions	ic	0
					d	From others	id	0
			e		Total Loans repayable on demand(ia + ib + ic + id)		ie	0
			ii		Deposits from related parties (see instructions)		ii	0
			iii		Loans and advances from related parties (see instructions)		iii	0
			iv		Other loans and advances		iv	0
			v		Other deposits		v	0
			vi		Total Short-term borrowings(ie + ii + iii + iv + v)		4A	0
	B		Trade payables					
			i	Outstanding for more than 1 year	1917	0		

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	ii	Others	ii	27,93,657		
	iii	Total Trade payables(i + ii)			4B	27,93,657
C	Other current liabilities					
	i	Current maturities of long-term debt	i	0		
	ii	Current maturities of finance lease obligation	ii	0		
	iii	Interest accrued but not due on borrowings	iii	0		
	iv	Interest accrued and due on borrowings	iv	0		
	v	Income received in advance	v	0		
	vi	Unpaid dividends	vi	0		
	vii	Application money received for allotment of securities and due for refund and interest accrued	vii	0		
	viii	Unpaid matured deposits and interest accrued thereon	viii	0		
	ix	Unpaid matured debentures and interest accrued thereon	ix	0		
	x	Other payables	x	2,45,56,029		
	xi	Total Other current liabilities(i + ii + iii + iv + v + vi + vii + viii + ix + x)			4C	2,45,56,029
D	Short-term provisions					
	i	Provision for employee benefit	i	0		
	ii	Provision for income tax	ii	0		
	iii	Provision Dividend	iii	0		
	iv	Tax on dividend	iv	0		
	v	Others	v	0		
	vi	Total Short-term provisions(i + ii + iii + iv + v)			4D	0
E	Total Current liabilities(4A + 4B + 4C + 4D)				4E	2,73,49,686
Total Equity and liabilities(1D + 2 + 3E + 4E)					I	3,83,47,998
II	ASSETS					
	1	Non-current assets				
		A	Fixed assets			
			i	Tangible assets		
				a	Gross block	ia 72,20,160
				b	Depreciation	ib 37,95,308
				c	Impairment losses	ic 0
				d	Net block(ia - ib - ic)	id 34,24,852
			ii	Intangible assets		
				a	Gross block	iiia 0
				b	Amortization	iiib 0
				c	Impairment losses	iiic 0
				d	Net block(iiia - iiib - iiic)	iid 0
			iii	Capital work-in progress		1918 0

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ASSETS		iv	intangible assets under development	id	0		
		v	Total Fixed assets(id + iid + iii + iv)			Av	34,24,852
	B	Non-current investments					
		i	Investments in property	i	0		
		ii	Investments in Equity instrument				
		a	Listed equities	iaa	0		
		b	Unlisted equities	iib	0		
		c	Total(iaa + iib)	iic	0		
		iii	Investments in Preference shares	iic	0		
		iv	Investments in Government or trust securities	iv	0		
		v	Investments in Debenture or bonds	v	0		
		vi	Investments in Mutual funds	vi	0		
		vii	Investments in Partnership firms	vii	0		
		viii	Others Investments	viii	0		
		ix	Total Non-current investments(i + iic + iii + iv + v + vi + vii + viii)			Bix	0
	C	Deferred tax assets(Net)					
						C	3,26,943
	D	Long-term loans and advance					
		i	Capital advances	i	0		
		ii	Security deposits	ii	35,56,457		
		iii	Loans and advances to related parties (see instructions)	iii	0		
		iv	Other Loans and advances	iv	0		
		v	Total long-term loans and advances(i + ii + iii + iv)			Dv	35,56,457
		vi	Long-term loans and advances included in Dv which is				
		a	For the purpose of business or profession	via	35,56,457		
		b	not for the purpose of business or profession	vib	0		
		c	given to shareholder, being the beneficial owner of share, or to any concern or on behalf/benefit of such shareholder as per section 2(22)(e) of I.T. Act	vic	0		
	E	Other non-current assets					
		i	Long-term trade receivables				
		a	Secured, considered good	ia	0		
		b	Unsecured, considered good	ib	0		
		c	Doubtful	ic	0		
		d	Total Other non-current assets(ia + ib + ic)	id	0		
		ii	Others	ii	0		
		iii	Total(id + ii)		1919	Eiii	0

			iv	Non-current assets included in Eiii which is due from shareholder, being the beneficial owner of share, or from any concern or on behalf/ benefit of such shareholder as per section 2(22)(e) of I.T. Act		0	
	F	Total Non-current assets(Av + Bix + C + Dv + Eiii)				IF	73,08,252
2	Current assets						
	A	Current investments					
		i	Investments in Equity instruments				
		a	Listed equities	ia	0		
		b	Unlisted equities	ib	0		
		c	Total(ia + ib)	ic	0		
		ii	Investments in Prefernce shares		0		
		iii	Investments in Government or trust securities		0		
		iv	Investments in debentures or bonds		0		
		v	Investments in Mutual funds		0		
		vi	Investments in partnership firms		0		
		vii	Other investment		0		
		viii	Total Current investments(ic + ii + iii + iv + v + vi + vii)			Aviii0	
	B	Inventories					
		i	Raw material	i	0		
		ii	Work-in-progress	ii	0		
		iii	Finished goods	iii	42,13,303		
		iv	Stock-in-trade(in respect of goods acquired for trading)	iv	0		
		v	Store and spares	v	0		
		vi	Loose tools	vi	0		
		vii	Others	vii	0		
		viii	Total Inventories(i + ii + iii + iv + v + vi + vii)			Bviii42,13,303	
	C	Trade receivables					
		i	Outstanding for more than 6 months	i	0		
		ii	Others	ii	2,32,31,095		
		iii	Total Trade receivables(i + ii + iii)			Ciii2,32,31,095	
	D	Cash and cash equivalents					
		i	Balance with Banks	i	17,32,684		
		ii	Cheques, draft in hands	ii	0		
		iii	Cash in hand	iii	1,24,632		
		iv	Others	iv	0		
		v	Total cash and equivalents(i + ii + iii + iv)			Dv18,57,316	
	E	Short-term loans and advances					
		i	Loans and advances to related parties	i	0		
		ii	Others	1920	8,00,639		

				iii	Total short-term loans and advances(i + ii)			Eiii	8,00,639
				iv	Short-term loans and advances included in Eiii which is				
				a	for the purpose of business or profession	iva	8,00,639		
				b	not for the purpose of business or profession	ivb	0		
				c	given to a shareholder, being the beneficial owner of share , or to any concern or on behalf/benefit of such shareholder as per section 2(22)(e) of I.T. Act.	ivc	0		
				F	Other current assets				
				G	Total Current assets (Aviii + Bviii + Cviii + Dv + Eiii + F)			2G	3,10,39,746
				Total Assets (1F + 2G)					

FORM	ITR-6	INDIAN INCOME TAX RETURN [For Companies other than companies claiming exemption under section 11] (Please see Rule 12 of the Income-tax Rules,1962) (Please refer instructions)		Assessment Year							
				2	0	2	2	-	2	3	
Part A-BS – Ind AS		BALANCE SHEET AS ON 31 ST DAY OF MARCH, 2022 OR AS ON THE DATE OF BUSINESS COMBINATION <i>[applicable for a company whose financial statements are drawn up in compliance to the Indian Accounting Standards specified in Annexure to the companies (Indian Accounting Standards) Rules,2015]</i>									
1	Equity and Liabilities										
EQUITY AND LIABILITIES	1	Equity									
	A	Equity share capital									
		i	Authorised	Ai	0						
		ii	Issued,Subscribed and fully Paid up	Aii	0						
		iii	Subscribed but not fully paid	Aiii	0						
		iv	Total(Aii + Aiii)		Aiv					0	
	B	Other Equity									
		i	Other Reserves								
		a	Capital Redemption Reserve	ia	0						
		b	Debentures Redemption Reserve	ib	0						
		c	Share Options Outstanding account	ic	0						
		d	Others(specify nature and amount)	id	0						
		e	Total other reserves(ia + ib + ic + id)	ie	0						
		ii	Retained earnings(Debit balance of statement of P&L to be shown as -ve figure)	ii	0						
		iii	Total(Bie + ii)(Debit balance to be shown as -ve figure)		Biii					0	
	C	Total Equity(Aiv + Biii)								1C	0
	2	Liabilities									
	A	Non-current liabilities									
	I	Financial Liabilities									
		Borrowings									
	a	Bonds or debentures									
	1	Foreign currency	a1	0							
	2	Rupee	a2	0							
	3	Total(1 + 2)		a3					0		
	b	Term loans									
	1	Foreign currency	b1	0							
	2	Rupee Loans									
	i	From Banks	i	0							
	ii	From others parties	ii	0							
	iii	Total(i + ii)	b2	0							

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	3	Total Term loans (b1 + b2)		b3	0
	c	Deferred payment liabilities		c	0
	d	Deposits		d	0
	e	Loans from related parties (see instructions)		e	0
	f	Loan term maturities of finance lease obligation		f	0
	g	Liability component of compound financial instruments		g	0
	h	Other loans		h	0
	i	Total borrowings(a3 + b3 + c + d + e + f + g + h)		i	0
	j	Trade Payables		j	0
	k	Other financial liabilities(Other than those specified in II under provisions)		k	0
II	Provisions				
	a	Provision for employee benefits	a	0	
	b	Others(specify nature)	b	0	
	c	Total Provision		IIC	0
III	Deferred tax liabilities (net)				III 0
IV	Other non-current liabilities				
	a	Advances	a	0	
	b	Others(specify nature)	b	0	
	c	Total Other non-current liabilities		IVC	0
Total Non-current liabilities(li + lj + lk + IIC + III + IVC)				2A	0
B	Current liabilities				
I	Financial Liabilities				
	i	Borrowings			
	a	Loans repayable on demand			
	1	From banks	1	0	
	2	From other parties	2	0	
	3	Total Loans repayable on demand(1 + 2)	3	0	
	b	Loans from related parties	b	0	
	c	Deposits	c	0	
	d	Other loans(specify nature)	d	0	
	Total Borrowings(a3 + b + c + d)			li	0
	ii	Trade payables			lii 0
	iii	Other financial liabilities			
	a	Current maturities of long-term debt	a	0	
	b	Current maturities of finance lease obligation	b	0	
	c	Interest accrued	c	0	
	d	Unpaid dividends	d	0	
	e	Application money received for allotment of securities to the extent refundable and interest accrued thereon	e	0	

			f	Unpaid matured deposits and interest accrued thereon	f	0	
			g	Unpaid matured debentures and interest accrued thereon	g	0	
			h	Others (specify nature)	h	0	
			i	Total Other financial liabilities(a + b + c + d + e + f + g + h)			liii 0
		iv		Total Financial liabilities (li + lii + liii)			liv 0
	II			Other Current liabilities			
		a		Revenue received in advance	a	0	
		b		Other advances (specify nature)	b	0	
		c		Others (specify nature)	c	0	
		d		Total Other current liabilities(a + b + c)			liid 0
	III			Provisions			
		a		Provision for employee benefits	a	0	
		b		Others(specify nature)	b	0	
		c		Total provisions (a + b)			IIIc 0
	IV			Current Tax Liabilities (Net)			IV 0
				Total Current liabilities (liv + liid + IIIc + IV)			2B 0
				Total Equity and liabilities(1C + 2A + 2B)			I 0
	II			Assets			
		1		Non-current assets			
		A		Property, Plant and Equipment			
			a	Gross block	a	0	
			b	Depreciation	b	0	
			c	Impairment losses	c	0	
			d	Net block(a - b - c)			Ad 0
		B		Capital work-in progress			B 0
		C		Investment Property			
			a	Gross block	a	0	
			b	Depreciation	b	0	
			c	Impairment losses	c	0	
			d	Net block(a - b - c)			Cd 0
		D		Goodwill			
			a	Gross block	a	0	
			b	Impairment losses	b	0	
			c	Net block(a-b)			Dc 0
		E		Other intangible Assets			
			a	Gross block	a	0	
			b	Amortisation	b	0	
			c	Impairment losses	c	0	

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	d	Net block(a - b - c)		Ed	0
F		Intangible assets under development		F	0
G		Biological assets other than bearer plants			
	a	Gross block	a		0
	b	Impairment losses	b		0
	c	Net block(a-b)		Gc	0
H		Financial Assets			
	I	Investments			
	i	Investments in Equity instruments			
	a	Listed equities	ia		0
	b	Unlisted equities	ib		0
	c	Total (ia + ib)		ic	0
	ii	Investments in Preference shares	ii		0
	iii	Investments in Government or trust securities	iii		0
	iv	Investments in Debentures or bonds	iv		0
	v	Investments in Mutual funds	v		0
	vi	Investments in partnership firms	vi		0
	vii	Others Investment(specify nature)	vii		0
	viii	Total non-current investments(ic + ii + iii + iv + v + vi + vii)		HI	0
	II	Trade receivables			
	a	Secured, considered good	a		0
	b	Unsecured, considered good	b		0
	c	Doubtful	c		0
	d	Total Trade receivables		HII	0
	III	Loans			
	i	Security deposits	i		0
	ii	Loans to related parties (see instructions)	ii		0
	iii	Other loans (specify nature)	iii		0
	iv	Total Loans(i + ii + iii)		HIII	0
	v	Loans included in HIII above which is:			
	a	for the purpose of business or profession	a		0
	b	not for the purpose of business or profession	b		0
	c	given to shareholder, being the beneficial owner of share, or to any concern or on behalf/benefits of such shareholder as per the section 2(22)(e) of I.T. Act	c		0
	IV	Other Financial Assets			
	i	Bank deposits with more than 12 month maturity	i		0
	ii	Others	ii		0
	iii	Total of Other Financial Assets (i + ii)		HIV	0
					1925

ASSETS			I	Deferred Tax Assets (Net)		I	0
			J	Other Non-current Assets			
			i	Capital Advances	i	0	
			ii	Advances other than capital advances	ii	0	
			iii	Others(specify nature)	iii	0	
			iv	Total non-current assets(i + ii + iii)		J	0
			v	Non-current assets included in J above which is due from shareholder, being the beneficial owner of share, or from the concern or on behalf/benefits of such shareholder as per the section 2(22)(e) of I.T. Act.	v	0	
				Total Non-current assets (Ad + B + Cd + Dc + Ed + F + Gc + HI + HII + HIII + HIV + I + J)		1	0
			2	Current assets			
			A	Inventories			
			i	Raw Materials	i	0	
			ii	Work-in progress	ii	0	
			iii	Finished goods	iii	0	
			iv	Stock-in-trade (in respect of goods acquired for trading)	iv	0	
			v	Stores and spares	v	0	
			vi	Loose tools	vi	0	
			vii	Others	vii	0	
			viii	Total Inventories (i + ii + iii + iv + v + vi + vii)		2A	0
			B	Financial Assets			
			I	Investments			
			i	Investment in Equity instruments			
			a	Listed equities	ia	0	
			b	Unlisted equities	ib	0	
			c	Total (ia + ib)	ic	0	
			ii	Investment in Prefernce share	ii	0	
			iii	Investment in government or trust securities	iii	0	
			iv	Investment in debentures or bonds	iv	0	
			v	Investment in Mutual funds	v	0	
			vi	Investment in partneship firm	vi	0	
			vii	Others investment	vii	0	
			viii	Total Current Investments(ic + ii + iii + iv + v + vi + vii)		I	0
			II	Trade receivables			
			i	Secured, considered goods	i	0	
			ii	Unsecured, considered goods	ii	0	
			iii	Doubtful	iii	0	
			iv	Total Trade receivables(i + ii + iii)		II	0
			III	Cash and cash equivalents			
				1926			

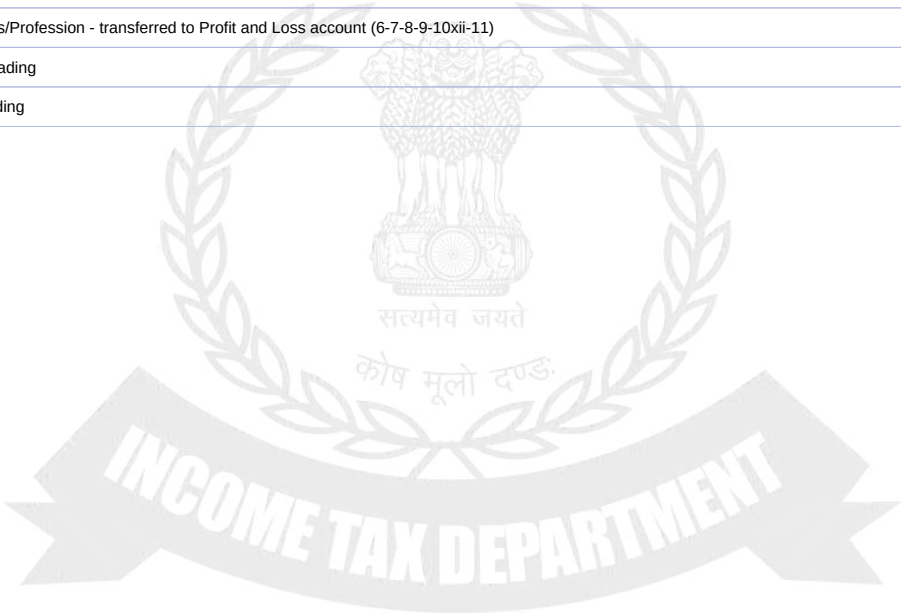
				i	Balances with Banks(of the nature of cash and cash equivalents)	i	0			
				ii	Cheques, drafts in hand	ii	0			
				iii	Cash on hand	iii	0			
				iv	Others(specify nature)	iv	0			
				v	Total cash and cash equivalents(i + ii + iii + iv)			III	0	
	IV	Bank Balances other than III above							IV	0
	V	Loans								
				i	Security Deposits	i	0			
				ii	Loans to related parties	ii	0			
				iii	Others(specify nature)	iii	0			
				iv	Total Loans(i + ii + iii)			V	0	
				v	Loans and advances included in V above which is-					
					a for the purpose of business or profession	a	0			
					b not for the purpose of business or profession	b	0			
					c given to shareholder, being the beneficial owner of share, or to any concern or on behalf/benefits of such shareholder as per the section 2 (22)(e) of I.T. Act	c	0			
	VI	Other Financial Assets							VI	0
		Total Financial Assets(i + ii + iii + iv + v + vi)							2B	0
	C	Current Tax Assets(Net)							2C	0
	D	Other current assets								
				i	Adventures other than capital adventures	i	0			
				ii	Others (specify nature)	ii	0			
				iii	Total			2D	0	
		Total Current assets (2A + 2B + 2C + 2D)							2	0
	Total Assets(1 + 2)								II	0

FORM	ITR-6	INDIAN INCOME TAX RETURN [For Companies other than companies claiming exemption under section 11] (Please see Rule 12 of the Income-tax Rules,1962) (Please refer instructions)		Assessment Year					
				2	0	2	2	-	2
Part A - Manufacturing Account		Manufacturing Account for the financial year 2021-22 (fill items 1 to 3 in a case where regular books of accounts are maintained, otherwise fill items 61 to 62 as applicable)							
1	Debits to Manufacturing Account								
	A	Opening Inventory							
		i	Opening stock of raw-material				i	0	
		ii	Opening stock of Work in progress				ii	0	
		iii	Total (i + ii)				Aiii	0	
	B	Purchases (net of refunds and duty or tax, if any)						B	0
	C	Direct wages						C	0
	D	Direct expenses (Di + Dii + Diii)						D	0
		i	Carriage inward				i	0	
		ii	Power and fuel				ii	0	
		iii	Other direct expenses				iii	0	
	E	Factory Overheads							
		i	Indirect wages				i	0	
		ii	Factory rent and rates				ii	0	
		iii	Factory Insurance				iii	0	
		iv	Factory fuel and power				iv	0	
		v	Factory general expenses				v	0	
		vi	Depreciation of factory machinery				vi	0	
		vii	Total (i+ii+iii+iv+v+vi)				Evii	0	
	F	Total of Debits to Manufacturing Account (Aiii+B+C+D+Evii)						1F	0
2	Closing Stock								
		i	Raw material				2i	0	
		ii	Work-in-progress				2ii	0	
		Total (2i +2ii)						2	0
3	Cost of Goods Produced – transferred to Trading Account (1F - 2)							3	0

FORM	ITR-6	INDIAN INCOME TAX RETURN [For Companies other than companies claiming exemption under section 11] (Please see Rule 12 of the Income-tax Rules,1962) (Please refer instructions)		Assessment Year						
				2	0	2	2	-	2	3
Part A-Trading Account Trading Account for the financial year 2021-22 (fill items 4 to 12 in a case where regular books of accounts are maintained, otherwise fill items 61 to 62as applicable)										
CREDITS TO TRADING ACCOUNT	4	Revenue from operations								
	A	Sales/ Gross receipts of business (net of returns and refunds and duty or tax, if any)								
	i	Sale of goods					i	6,28,49,293		
	ii	Sale of services					ii	0		
	iii	Other operating revenues (specify nature and amount)								
		Sl.No.	Nature of Revenue				Amount			
		Total					0			
	iv	Total (i + ii + iiic)					Aiv	6,28,49,293		
	B	Gross receipts from Profession							B	0
	C	Duties, taxes and cess received or receivable in respect of goods and services sold or supplied								
	i	Union Excise duties					i	0		
	ii	Service tax					ii	0		
	iii	VAT/Sales tax					iii	0		
	iv	Central Goods & Service Tax (CGST)					iv	0		
	v	State Goods & Services Tax (SGST)					v	0		
vi	Integrated Goods & Services Tax (IGST)					vi	0			
vii	Union Territory Goods & Services Tax (UTGST)					vii	0			
viii	Any other duty, tax and cess					viii	0			
ix	Total (i + ii + iii + iv +v+ vi+vii+viii)					Cix	0			
D	Total Revenue from operations (Aiv + B +Cix)							4D	6,28,49,293	
5	Closing Stock of Finished Stocks							5	42,13,303	
6	Total of credits to Trading Account (4D + 5)							6	6,70,62,596	
DEBITS TO TRADING ACCOUNT	7	Opening Stock of Finished Goods							7	45,35,072
	8	Purchases (net of refunds and duty or tax, if any)							8	4,97,83,270
	9	Direct Expenses (9i + 9ii + 9iii)							9	0
	i	Carriage inward					9i	0		
	ii	Power and fuel					9ii	0		
	iii	Other direct expenses					9iii	0		
		Sl. No.	Nature of Expense				Amount			
	10	Duties and taxes, paid or payable, in respect of goods and services purchased								
	i	Custom duty					10i	0		
	ii	Counter veiling duty					10ii	0		
	iii	Special additional duty					10iii	0		
	iv	Union excise duty					10iv	0		
	v	Service tax					10v	0		
	vi	VAT/ Sales tax					10vi	0		
	vii	Central Goods & Service Tax (CGST)					10vii	0		
viii	State Goods & Services Tax (SGST)					10viii	0			
ix	Integrated Goods & Services Tax (IGST)					10ix	0			

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	x	Union Territory Goods & Services Tax (UTGST)	10x	0		
	xi	Any other tax, paid or payable	10xi	0		
	xii	Total (10i + 10ii + 10iii + 10iv + 10v + 10vi + 10vii + 10viii + 10ix + 10x + 10xi)			10xii	0
	11	Cost of goods produced – Transferred from Manufacturing Account			11	0
	12	Gross Profit from Business/Profession - transferred to Profit and Loss account (6-7-8-9-10xii-11)			12	1,27,44,254
	12a	Turnover from Intraday Trading			12a	0
	12b	Income from Intraday Trading			12b	0



FORM	ITR-6	INDIAN INCOME TAX RETURN [For Companies other than companies claiming exemption under section 11] (Please see Rule 12 of the Income-tax Rules,1962) (Please refer instructions)		Assessment Year							
				2	0	2	2	-	2	3	
Part A- P&L Profit and Loss Account for the financial year 2021-22. (fill items 13 to 60 in a case where regular books of accounts are maintained, otherwise fill items 61 to 62 as applicable)											
CREDITS TO PROFIT AND LOSS ACCOUNT	13	Gross profit transferred from Trading Account							13	1,27,44,254	
	14	Other income									
		i	Rent					i	0		
		ii	Commission					ii	0		
		iii	Dividend income					iii	0		
		iv	Interest income					iv	1,47,191		
		v	Profit on sale of fixed assets					v	0		
		vi	Profit on sale of investment being securities chargeable to Securities Transaction Tax (STT)					vi	0		
		vii	Profit on sale of other investment					vii	0		
		viii	Gain (loss) on account of foreign exchange fluctuation u/s 43AA					viii	0		
		ix	Profit on conversion of inventory into capital asset u/s 28(via) (FMV of inventory as on the date of conversion)					ix	0		
		x	Agricultural income					x	0		
		xi	Any other income (specify nature and amount)								
			Sl.No	Nature of Income			Amount				
			1	Discounts			22,593				
			2	Subsidy Received			38,03,179				
			3	Tender fee			35,250				
				Total			38,61,022				
		xii	Total of other income (i + ii + iii + iv + v + vi + vii + viii + ix + x + xi)							14xii	40,08,213
		15	Total of credits to profit and loss account (13+14xii)							15	1,67,52,467
	16	Freight outward							16	0	
	17	Consumption of stores and spare parts							17	0	
	18	Power and fuel							18	0	
	19	Rents							19	0	
	20	Repairs to building							20	0	
	21	Repairs to machinery							21	0	
	22	Compensation to employees									
		i	Salaries and wages					22i	59,06,113		
		ii	Bonus					22ii	0		
		iii	Reimbursement of medical expenses					22iii	0		
		iv	Leave encashment					22iv	0		
		v	Leave travel benefits					22v	0		
		vi	Contribution to approved superannuation fund					22vi	0		
		vii	Contribution to recognised provident fund					22vii	0		
		viii	Contribution to recognised gratuity fund					22viii	0		
		ix	Contribution to any other fund					22ix	0		

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DEBITS TO PROFIT AND LOSS ACCOUNT	x	Any other benefit to employees in respect of which an expenditure has been incurred	22x	0		
	xi	Total compensation to employees (total of 22i to 22x)			22xi	59,06,113
	xia	Whether any compensation, included in 22xi, paid to non-residents	xia	No		
	xiib	If Yes, amount paid to non-residents	xiib	0		
PROVISIONS PROVISION FOR TAX AND APPROPRIATIONS	23	Insurance				
	i	Medical Insurance	23i	0		
	ii	Life Insurance	23ii	0		
	iii	Keyman's Insurance	23iii	0		
	iv	Other Insurance including factory, office, car, goods, etc.	23iv	0		
	v	Total expenditure on insurance (23i + 23ii + 23iii + 23iv)			23v	0
	24	Workmen and staff welfare expenses			24	0
	25	Entertainment			25	0
	26	Hospitality			26	0
	27	Conference			27	0
	28	Sales promotion including publicity (other than advertisement)			28	0
	29	Advertisement			29	0
	30	Commission				
	i	Paid outside India, or paid in India to a non-resident other than a company or a foreign company	i	0		
	ii	To others	ii	0		
	iii	Total (i + ii)			30iii	0
	31	Royalty				
	i	Paid outside India, or paid in India to a non-resident other than a company or a foreign company	i	0		
	ii	To others	ii	0		
	iii	Total (i + ii)			31iii	0
	32	Professional / Consultancy fees / Fee for technical services				
	i	Paid outside India, or paid in India to a non-resident other than a company or a foreign company	i	0		
	ii	To others	ii	0		
	iii	Total (i + ii)			32iii	0
	33	Hotel, boarding and Lodging			33	0
	34	Traveling expenses other than on foreign traveling			34	0
	35	Foreign travelling expenses			35	0
	36	Conveyance expenses			36	0
	37	Telephone expenses			37	0
	38	Guest House expenses			38	0
	39	Club expenses			39	0
	40	Festival celebration expenses			40	0

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41	Scholarship	41	0
42	Gift	42	0
43	Donation	43	0
44	Rates and taxes, paid or payable to Government or any local body (excluding taxes on income)		
	i Union excise duty	44i	
	ii Service tax	44ii	
	iii VAT/ Sales tax	44iii	
	iv Cess	44iv	
	v Central Goods & Service Tax (CGST)	44v	
	vi State Goods & Services Tax (SGST)	44vi	
	vii Integrated Goods & Services Tax (IGST)	44vii	
	viii Union Territory Goods & Services Tax (UTGST)	44viii	
	ix Any other rate, tax, duty or cess incl STT and CTT	44ix	
	x Total rates and taxes paid or payable (44i + 44ii +44iii +44iv + 44v + 44vi + 44vii + 44viii +44ix)	44x	0
45	Audit fee	45	0
46	Other expenses (specify nature and amount)		
	Sl. No.	Nature of Expense	
	1	Interest and Bank Charges	
	2	Advertisement	
	3	Anert Registration and Affiliation Expenses	
	4	Discounts	
	5	Rent	
	6	Marketing Expenses	
	7	Fabrication Expenses	
	8	Bank Charges	
	9	Newspaper and Periodicals	
	10	Insurance	
	11	Internet and telephone charges	
	12	Electricity and Water charges	
	13	Office Expenses	
	14	Printing and stationery	
	15	Postage and courier charges	
	16	Refreshment expenses	
	17	Repairs and maintenance	
	18	Worksite expenses	
	19	Freight and carriage	
	20	Travelling expenses	

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	21	Professional fees										1,88,321		
	22	Audit fee										50,000		
	23	Miscellaneous expenses										8,466		
	24	License Fee										24,194		
	25	Donation										1,500		
	26	Tender Fee Expenses										5,970		
	27	Sub Contract Charges										3,28,000		
		Total										98,90,211		
47	Bad debts (specify PAN/ Aadhaar No. of the person, if available, for whom Bad Debt for amount of Rs. 1 lakh or more is claimed and amount)													
	SI. No.	PAN of the person					Aadhaar Number of the person					Amount		
	i	(Rows can be added as required) Total [47i(1)+47i(2)+47i(3)]										47i	0	
	ii	Others (more than Rs. 1 lakh) where PAN/ Aadhaar No. is not available (provide name and complete address)										47ii	0	
	SI. No.	Name	Flat / Door/ Block No	Name of Premises/ Building/ Village	Road/ Street/ Post Office	Area/ Locality	Town/ City/ District	State	Country /Region	PIN Code	ZIP Code	Amount		
	iii	Others (amounts less than Rs. 1 lakh)										47iii	0	
	iv	Total Bad Debt (47i + 47ii + 47iii)										47iv	0	
48	Provision for bad and doubtful debts												48	0
49	Other provisions												49	0
50	Profit before interest, depreciation and taxes [15 – (16 to 21 + 22xi + 23v + 24 to 29 + 30iii + 31iii + 32iii + 33 to 43 + 44x + 45 + 46iii+ 47iv + 48 + 49)]												50	9,56,143
51	Interest													
	i	Paid outside India, or paid in India to a non-resident other than a company or a foreign company										i	0	
	ii	To others										ii	0	
	iii	Total (i + ii)										51iii	0	
52	Depreciation and amortization												52	7,43,040
53	Net profit before taxes (50 – 51iii – 52)												53	2,13,103
54	Provision for current tax												54	1,05,255
55	Provision for Deferred Tax												55	14,998
56	Profit after tax (53 - 54 - 55)												56	92,850
57	Balance brought forward from previous year												57	0
58	Amount available for appropriation (56 + 57)												58	92,850
59	Appropriations													
	i	Transfer to reserves and surplus										59i	0	
	ii	Proposed dividend/ Interim dividend										59ii	0	
	iii	Tax on dividend/ Tax on dividend for earlier years										59iii	0	
	iv	Appropriation towards Corporate Social Responsibility (CSR) activities (in case of companies covered under section 135 of Companies Act, 2013)										59iv	0	
	v	Any other appropriation										59v	0	
	vi	Total (59i + 59ii + 59iii + 59iv+59v)										59vi	0	
60	Balance carried to balance sheet (58 - 59vi)												60	92,850
61	COMPUTATION OF PRESUMPTIVE INCOME FROM GOODS CARRIAGES UNDER SECTION 44AE													
	SR.NO.	Name of Business					Business code					Description		
		Registration No. of goods carriage	Whether owned /leased	Tonnage capacity of goods carriage	Number of months for which goods carriage was owned/leased /hired by assessee	Presumptive income u/s 44AE for the goods carriage (Computed @ Rs.1000 per ton per month in case tonnage exceeds 12MT, or else @ Rs.7500 per month) or the amount claimed to have been actually earned, whichever is higher								

		/hired	(in MT)			
(i)	(1)	(2)	(3)	(4)	(5)	
Add row options as necessary (Please Note : At any time during the year the number of vehicles should not exceed 10 vehicles)						
(ii)	Total presumptive income from goods carriage u/s 44AE [total of column (5) of table 61(i)]				61 (ii)	0
NOTE— If the profits are lower than prescribed under S.44AE or the number of goods carriage owned / leased / hired at any time during the year exceeds 10, then , it is mandatory to maintain books of accounts and have a tax audit under section 44AB						
No Account Case	62	In case of Foreign Company whose total income comprises solely of profits and gains from business referred to in sections 44B, 44BB, 44BBA or 44BBB, furnish the following information				
	a	Gross receipts / Turnover			62a	0
	b	Net profit			62b	0

FORM	ITR-6	INDIAN INCOME TAX RETURN [For Companies other than companies claiming exemption under section 11] (Please see Rule 12 of the Income-tax Rules,1962) (Please refer instructions)				Assessment Year							
						2	0	2	2	-	2	3	
Part A- Manufacturing Account Ind- AS		Manufacturing Account for the financial year 2021-22 [applicable for a company whose financial statements are drawn up in compliance to the Indian Accounting Standards specified in Annexure to the companies (Indian Accounting Standards) Rules, 2015]											
1	Debits to Manufacturing account												
	A	Opening Inventory											
		i	Opening stock of raw-material	i	0								
		ii	Opening stock of Work in progress	ii	0								
		iii	Total (i + ii)			Aiii					0		
	B	Purchases (net of refunds and duty or tax, if any)									B	0	
	C	Direct wages									C	0	
	D	Direct expenses									D	0	
		i	Carriage inward	i	0								
		ii	Power and fuel	ii	0								
		iii	Other direct expenses	iii	0								
	E	Factory Overheads											
		i	Indirect wages		0								
		ii	Factory rent and rates		0								
		iii	Factory Insurance		0								
		iv	Factory fuel and power		0								
		v	Factory general expenses		0								
		vi	Depreciation of factory machinery		0								
		vii	Total (i+ii+iii+iv+v+vi)			Evii					0		
	F	Total of Debits to Manufacturing Account (Aiii+B+C+D+Evii)									1F	0	
2	Closing Stock												
		i	Raw material	2i	0								
		ii	Work-in-progress	2ii	0								
		Total (2i + 2ii)				2					0		
3	Cost of Goods Produced – transferred to Trading Account (1F - 2)											3	0

FORM	ITR-6	INDIAN INCOME TAX RETURN [For Companies other than companies claiming exemption under section 11] (Please see Rule 12 of the Income-tax Rules,1962) (Please refer instructions)		Assessment Year						
		2	0	2	2	-	2	3		
Part A-Trading Account Ind-AS		Trading Account for the financial year 2021-22 [applicable for a company whose financial statements are drawn up in compliance to the Indian Accounting Standards specified in Annexure to the companies (Indian Accounting Standards) Rules, 2015]								
CREDITS TO TRADING ACCOUNT	4	Revenue from operations								
	A	Sales/ Gross receipts of business (net of returns and refunds and duty or tax, if any)								
		i	Sale of goods				0			
		ii	Sale of services				0			
		iii	Other operating revenues (specify nature and amount)							
		Sl.No.		Nature of Revenue			Amount			
		Total					0			
		iv	Total (i + ii + iiic)				Aiv	0		
		B	Gross receipts from Profession						B	0
		C	Duties, taxes and cess received or receivable in respect of goods and services sold or supplied							
			i	Union Excise duties			i	0		
			ii	Service tax			ii	0		
			iii	VAT/Sales tax			iii	0		
			iv	Central Goods & Service Tax (CGST)			iv	0		
			v	State Goods & Services Tax (SGST)			v	0		
			vi	Integrated Goods & Services Tax (IGST)			vi	0		
			vii	Union Territory Goods & Services Tax (UTGST)			vii	0		
			viii	Any other duty, tax and cess			viii	0		
			ix	Total (i + ii + iii + iv +v+ vi+vii+viii)				Cix	0	
		D	Total Revenue from operations (Aiv + B +Cix)						4D	0
	5	Closing Stock of Finished Stocks						5	0	
	6	Total of credits to Trading Account (4D + 5)						6	0	
	7	Opening Stock of Finished Goods						7	0	
	8	Purchases (net of refunds and duty or tax, if any)						8	0	
	9	Direct Expenses (9i + 9ii + 9iii)						9	0	
		i	Carriage inward			9i	0			
		ii	Power and fuel			9ii	0			
		Other direct expenses			1937					

DEBITS TO TRADING ACCOUNT	iii	Note: Row can be added as per the nature of Direct Expenses	9iii	0	
	Sl.No.	Other direct expenses		Amount	
	10	Duties and taxes, paid or payable, in respect of goods and services purchased			
	i	Custom duty	10i	0	
	ii	Counter veiling duty	10ii	0	
	iii	Special additional duty	10iii	0	
	iv	Union excise duty	10iv	0	
	v	Service tax	10v	0	
	vi	VAT/ Sales tax	10vi	0	
	vii	Central Goods & Service Tax (CGST)	10vii	0	
	viii	State Goods & Services Tax (SGST)	10viii	0	
	ix	Integrated Goods & Services Tax (IGST)	10ix	0	
	x	Union Territory Goods & Services Tax (UTGST)	10x	0	
	xi	Any other tax, paid or payable	10xi	0	
	xii	Total (10i + 10ii + 10iii + 10iv + 10v + 10vi + 10vii + 10viii + 10ix + 10x + 10xi)			10xii 0
	11	Cost of goods produced – Transferred from Manufacturing Account			11 0
	12	Gross Profit from Business/Profession - transferred to Profit and Loss account (6-7-8-9-10xii-11)			12 0
	12a	Turnover from Intraday Trading			12a 0
	12b	Income from Intraday Trading			12b 0

FORM	ITR-6	INDIAN INCOME TAX RETURN [For Companies other than companies claiming exemption under section 11] (Please see Rule 12 of the Income-tax Rules,1962) (Please refer instructions)				Assessment Year					
		2	0	2	2	-	2	3			
Part A-P& L Ind-AS		Profit and Loss Account for the financial year 2021-22 [applicable for a company whose financial statements are drawn up in compliance to the Indian Accounting Standards specified in Annexure to the companies (Indian Accounting Standards) Rules, 2015]									
13	Gross profit transferred from Trading Account								13	0	
14	Other income										
	i	Rent						i	0		
	ii	Commission						ii	0		
	iii	Dividend income						iii	0		
	iv	Interest income						iv	0		
	v	Profit on sale of fixed assets						v	0		
	vi	Profit on sale of investment being securities chargeable to Securities Transaction Tax (STT)						vi	0		
	vii	Profit on sale of other investment						vii	0		
	viii	Gain (loss) on account of foreign exchange fluctuation u/s 43AA						viii	0		
	ix	Profit on conversion of inventory into capital asset u/s 28(via) (Fair Market Value of inventory as on the date of conversion)						ix	0		
	x	Agricultural income						x	0		
	xi	Any other income (specify nature and amount)									
		Sl. No.	Nature of Income				Amount				
			Total (xia + xib)				0				
	xii	Total of other income (i + ii + iii + iv + v + vi + vii + viii + ix + x + xic)						14xii	0		
15	Total of credits to profit and loss account (13+14xii)								15	0	
16	Freight outward								16	0	
17	Consumption of stores and spare parts								17	0	
18	Power and fuel								18	0	
19	Rents								19	0	
20	Repairs to building								20	0	
21	Repairs to machinery								21	0	
22	Compensation to employees										
	i	Salaries and wages						22i	0		
	ii	Bonus						22ii	0		
	iii	Reimbursement of medical expenses						22iii	0		
	iv	Leave encashment						22iv	0		
	v	Leave travel benefits						22v	0		
	vi	Contribution to approved superannuation fund						22vi	0		

CREDITS TO PROFIT AND LOSS ACCOUNT		vii	Contribution to recognised provident fund	22vii	0		
		viii	Contribution to recognised gratuity fund	22viii	0		
		ix	Contribution to any other fund	22ix	0		
		x	Any other benefit to employees in respect of which an expenditure has been incurred	22x	0		
		xi	Total compensation to employees (total of 22i to 22x)	22xi		0	
		xii	Whether any compensation, included in 22xi, paid to non-residents	xii			
		xii	If Yes, amount paid to non-residents	xii	0		
	23	Insurance					
		i	Medical Insurance	23i	0		
		ii	Life Insurance	23ii	0		
		iii	Keyman's Insurance	23iii	0		
		iv	Other Insurance including factory, office, car, goods, etc.	23iv	0		
		v	Total expenditure on insurance (23i + 23ii + 23iii + 23iv)	23v		0	
	24	Workmen and staff welfare expenses					
	25	Entertainment					
	26	Hospitality					
	27	Conference					
	28	Sales promotion including publicity (other than advertisement)					
	29	Advertisement					
	30	Commission					
		i	Paid outside India, or paid in India to a non-resident other than a company or a foreign company	i	0		
		ii	To others	ii	0		
		iii	Total (i + ii)	30iii		0	
	31	Royalty					
		i	Paid outside India, or paid in India to a non-resident other than a company or a foreign company	i	0		
		ii	To others	ii	0		
		iii	Total (i + ii)	31iii		0	
	32	Professional / Consultancy fees / Fee for technical services					
		i	Paid outside India, or paid in India to a non-resident other than a company or a foreign company	i	0		
		ii	To others	ii	0		
		iii	Total (i + ii)	32iii		0	
	33	Hotel, boarding and Lodging					
	34	Traveling expenses other than on foreign traveling					
	35	Foreign travelling expenses					
	36	Conveyance expenses					
	37	Telephone expenses					
	38	Guest House expenses					
			1940				

39	Club expenses											39	0
40	Festival celebration expenses											40	0
41	Scholarship											41	0
42	Gift											42	0
43	Donation											43	0
44	Rates and taxes, paid or payable to Government or any local body (excluding taxes on income)												
	i	Union excise duty									44i	0	
	ii	Service tax									44ii	0	
	iii	VAT/ Sales tax									44ii	0	
	iv	Cess									44iv	0	
	v	Central Goods & Service Tax (CGST)									44v	0	
	vi	State Goods & Services Tax (SGST)									44vi	0	
	vii	Integrated Goods & Services Tax (IGST)									44vii	0	
	viii	Union Territory Goods & Services Tax (UTGST)									44viii	0	
	ix	Any other rate, tax, duty or cess incl STT and CTT									44ix	0	
	x	Total rates and taxes paid or payable (44i + 44ii + 44iii + 44iv + 44v + 44vi + 44vii + 44viii + 44ix)									44x	0	
45	Audit fee											45	0
46	Other expenses (specify nature and amount)											46	0
	Sl. No.	Nature of Other expenses									Amount		
		Total									0		
47	Bad debts (specify PAN/ Aadhaar No. of the person, if available, for whom Bad Debt for amount of Rs. 1 lakh or more is claimed and amount)												
	Sl. No.	PAN of the person				Aadhaar Number of the person				Amount			
	i	(Rows can be added as required) Total [47i(1)+47i(2)+47i(3)]									47i	0	
	ii	Others (more than Rs. 1 lakh) where PAN/ Aadhaar No. is not available (provide name and complete address)									47ii	0	
	Sl. No.	Name	Flat / Door /Block No	Name of Premises/ Building/ Village	Road/ Street/ Post Office	Area/ Locality	Town/ City/ District	State	Country /Region	PIN Code	ZIP Code	Amount	
	iii	Others (amounts less than Rs. 1 lakh)									47iii	0	
	iv	Total Bad Debt (47i + 47ii + 47iii)									47iv	0	
48	Provision for bad and doubtful debts											48	0
49	Other provisions											49	0
50	Profit before interest, depreciation and taxes [15 – (16 to 21 + 22xi + 23v + 24 to 29 + 30iii + 31iii + 32iii + 33 to 43 + 44x + 45 + 46iii + 47iv + 48 + 49)]											50	0
51	Interest												
	i	Paid outside India, or paid in India to a non-resident other than a company or a foreign company									i	0	
	ii	To others									ii	0	
	iii	Total (i + ii)									51iii	0	
											1941		

PROVISIONS PROVISION FOR TAX AND APPROPRIATIONS	52	Depreciation and amortisation			52	0
	53	Net profit before taxes (50 – 51iii – 52)			53	0
	54	Provision for current tax			54	0
	55	Provision for Deferred Tax			55	0
	56	Profit after tax (53 - 54 - 55)			56	0
	57	Balance brought forward from previous year			57	0
	58	Amount available for appropriation (56 + 57)			58	0
	59	Appropriations				
	i	Transfer to reserves and surplus	59i	0		
	ii	Proposed dividend/ Interim dividend	59ii	0		
	iii	Tax on dividend/ Tax on dividend for earlier years	59iii	0		
	iv	Appropriation towards Corporate Social Responsibility (CSR) activities (in case of companies covered under section 135 of Companies Act, 2013)	59iv	0		
	v	Any other appropriation	59v	0		
	vi	Total (59i + 59ii + 59iii + 59iv+59v)	59vi	0		
	60	Balance carried to balance sheet (58 - 59vi)			60	0
	61	A Items that will not be reclassified to P&L				
		i	Changes in revaluation surplus	i	0	
		ii	Re-measurements of the defined benefit plans	ii	0	
		iii	Equity instruments through OCI	iii	0	
		iv	Fair value Changes relating to own credit risk of financial liabilities designated at FVTPL	iv	0	
		v	Share of Other comprehensive income in associates and joint ventures , to the extent not to be classified to P&L	v	0	
		vi	Others (Specify nature)	vi	0	
		Sl. No.	Nature	Amount		
		vii	Income tax relating to items that will not be reclassified to P&L	vii	0	
		viii	Total			61A 0
	B	Items that will be reclassified to P&L				
		i	Exchange differences in translating the financial statements of a foreign operation	i	0	
		ii	Debt instruments through OCI	ii	0	
		iii	The effective portion of gains and loss on hedging instruments in a cash flow hedge	iii	0	
		iv	Share of OCI in associates and joint ventures to the extent to be classified into P&L	iv	0	
		v	Others (Specify nature)	v	0	
		Sl. No.	Nature	Amount		
		vi	Income tax relating to items that will be reclassified to P&L	vi	0	
		vii	Total			61B 0

62	Total Comprehensive Income (56 + 61A + 61B)	62	0
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FORM	ITR6	INDIAN INCOME TAX RETURN [For Companies other than companies claiming exemption under section 11] (Please see Rule 12 of the Income-tax Rules, 1962) (Please refer instructions)				Assessment Year					
						2	0	2	2	-	2
Part A - OI		Other Information (mandatory if liable for audit under section 44AB, for other fill, if applicable)									
1	Method of accounting employed in the previous year (Tick) mercantile cash										
2	Is there any change in method of accounting (Tick) Yes No										
3a	Increase in the profit or decrease in loss because of deviation, if any, as per Income Computation Disclosure Standards notified under section 145 (2) [column 11a(iii) of Schedule ICDS]							3a	0		
3b	Decrease in the profit or increase in loss because of deviation, if any, as per Income Computation Disclosure Standards notified under section 145 (2) [column 11b(iii) of Schedule ICDS]							3b	0		
4	Method of valuation of closing stock employed in the previous year (optional in case of professionals)										
a	Raw Material (if at cost or market rates whichever is less write 1, if at cost write 2, if at market rate write 3)										
b	Finished goods (if at cost or market rates whichever is less write 1, if at cost write 2, if at market rate write 3)										
c	Is there any change in stock valuation method (Tick) Yes No										
d	Increase in the profit or decrease in loss because of deviation, if any, from the method of valuation specified under section 145A							4d	0		
e	Decrease in the profit or increase in loss because of deviation, if any, from the method of valuation specified under section 145A							4e	0		
5	Amounts not credited to the profit and loss account, being -										
a	the items falling within the scope of section 28					5a	0				
b	the proforma credits, drawbacks, refund of duty of customs or excise or service tax, or refund of sales tax or value added tax, or refund of GST, where such credits, drawbacks or refunds are admitted as due by the authorities concerned					5b	0				
c	escalation claims accepted during the previous year					5c	0				
d	any other item of income					5d	0				
e	capital receipt, if any					5e	0				
f	Total of amounts not credited to profit and loss account (5a+5b+5c+5d+5e)							5f	0		
6	Amounts debited to the profit and loss account, to the extent disallowable under section 36 due to non-fulfilment of conditions specified in relevant clauses										
	Premium paid for insurance against risk of 1944										

a	damage or destruction of stocks or store [36(1)(i)]	6a	0	
b	Premium paid for insurance on the health of employees [36(1)(ib)]	6b	0	
c	Any sum paid to an employee as bonus or commission for services rendered, where such sum was otherwise payable to him as profits or dividend [36(1)(ii)]	6c	0	
d	Any amount of interest paid in respect of borrowed capital [36(1)(iii)]	6d	0	
e	Amount of discount on a zero-coupon bond [36(1)(iia)]	6e	0	
f	Amount of contributions to a recognised provident fund [36(1)(iv)]	6f	0	
g	Amount of contributions to an approved superannuation fund [36(1)(iv)]	6g	0	
h	Amount of contribution to a pension scheme referred to in section 80CCD [36(1)(iva)]	6h	0	
i	Amount of contributions to an approved gratuity fund [36(1)(v)]	6i	0	
j	Amount of contributions to any other fund	6j	0	
k	Any sum received from employees as contribution to any provident fund or superannuation fund or any fund set up under ESI Act or any other fund for the welfare of employees to the extent not credited to the employees account on or before the due date [36(1)(va)]	6k	0	
l	Amount of bad and doubtful debts [36(1)(vii)]	6l	0	
m	Provision for bad and doubtful debts [36(1)(viiia)]	6m	0	
n	Amount transferred to any special reserve [36(1)(viii)]	6n	0	
o	Expenditure for the purposes of promoting family planning amongst employees [36(1)(ix)]	6o	0	
p	Amount of securities transaction paid in respect of transaction in securities if such income is not included in business income [36(1)(xv)]	6p	0	
q	Marked to market loss or other expected loss as computed in accordance with the ICDS notified u/s 145(2) [36(1)(xviii)]	6q	0	
r	Any other disallowance	6r	0	
s	Total amount disallowable under section 36 (total of 6a to 6r)	6s	0	
t	Total number of employees employed by the company (mandatory in case company has recognized Provident Fund)	6t	1045	

OTHER INFORMATION		i	deployed in India	i	0		
		ii	deployed outside India	ii	0		
		iii	Total	iii	0		
	7	Amounts debited to the profit and loss account, to the extent disallowable under section 37					
		a	Expenditure of capital nature [37(1)]	7a	0		
		b	Expenditure of personal nature [37(1)]	7b	0		
		c	Expenditure laid out or expended wholly and exclusively NOT for the purpose of business or profession [37(1)]	7c	0		
		d	Expenditure on advertisement in any souvenir, brochure, tract, pamphlet or the like, published by a political party [37(2B)]	7d	0		
		e	Expenditure by way of penalty or fine for violation of any law for the time being in force	7e	0		
		f	Any other penalty or fine	7f	0		
		g	Expenditure incurred for any purpose which is an offence or which is prohibited by law	7g	0		
		h	Expenditure incurred on corporate social responsibility (CSR)	7h	0		
		i	Amount of any liability of a contingent nature	7i	0		
		j	Any other amount not allowable under section 37	7j	0		
		k	Total amount disallowable under section 37 (total of 7a to 7j)			7k	0
	8	A	Amounts debited to the profit and loss account, to the extent disallowable under section 40				
		a	Amount disallowable under section 40 (a) (i), on account of non-compliance with the provisions of Chapter XVII-B	Aa	0		
		b	Amount disallowable under section 40(a) (ia) on account of non-compliance with the provisions of Chapter XVII-B	Ab	0		
		c	Amount disallowable under section 40(a) (ib), on account of non-compliance with the provisions of Chapter VIII of the Finance Act, 2016	Ac	0		
		d	Amount disallowable under section 40(a) (iii) on account of non-compliance with the provisions of Chapter XVII-B	Ad	0		
		e	Amount of tax or rate levied or assessed on the basis of profits [40(a)(ii)]	Ae	0		
		f	Amount paid as wealth tax [40(a)(ia)]	Af	0		
		g	Amount paid by way of royalty, license fee, service fee etc. as per section 40(a)(iib)	Ag	0		

		h	Amount of interest, salary, bonus, commission or remuneration paid to any partner or member inadmissible under section [40(b)/40(ba)]	Ah	0		
		i	Any other disallowance	Ai	0		
		j	Total amount disallowable under section 40(total of Aa to Ai)			8Aj	0
	B	Any amount disallowed under section 40 in any preceding previous year but allowable during the previous year				8B	0
9	Amounts debited to the profit and loss account, to the extent disallowable under section 40A						
	a	Amounts paid to persons specified in section 40A(2)(b)		9a	0		
	b	Amount paid otherwise than by account payee cheque or account payee bank draft or use of electronic clearing system through a bank account or through such electronic mode as may be prescribed, disallowable under section 40A(3)		9b	0		
	c	Provision for payment of gratuity [40A(7)]		9c	0		
	d	Any sum paid by the assessee as an employer for setting up or as contribution to any fund, trust, company, AOP, or BOI or society or any other institution [40A(9)]		9d	0		
	e	Any other disallowance		9e	0		
	f	Total amount disallowable under section 40A(total of 9a to 9e)				9f	0
10	Any amount disallowed under section 43B in any preceding previous year but allowable during the previous year						
	a	Any sum in the nature of tax, duty, cess or fee under any law		10a	0		
	b	Any sum payable by way of contribution to any provident fund or superannuation fund or gratuity fund or any other fund for the welfare of employees		10b	0		
	c	Any sum payable to an employee as bonus or commission for services rendered		10c	0		
	d	Any sum payable as interest on any loan or borrowing from any public financial institution or a State financial corporation or a State Industrial investment corporation		10d	0		
	da	Any sum payable as interest on any loan or borrowing from a deposit taking non-banking financial company or systemically important non-deposit taking non-banking financial company, in accordance with the terms and conditions of the agreement governing such loan or borrowing		10da	0		
		Any sum payable as interest on any loan or borrowing from any scheduled bank or a co-		1947			

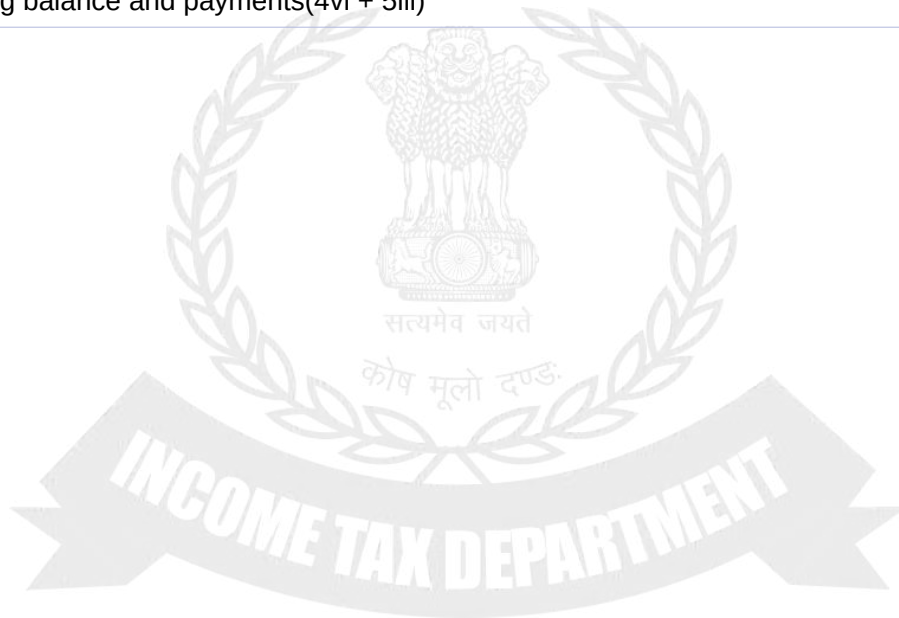
11	e	operative bank other than a primary agricultural credit or a primary co-operative agricultural and rural development bank	10e	0		
	f	Any sum payable towards leave encashment	10f	0		
	g	Any sum payable to the Indian Railways for the use of railway assets	10g	0		
	h	Total amount allowable under section 43B (total of 10a to 10g)	10h	0		
	Any amount debited to profit and loss account of the previous year but disallowable under section 43B					
	a	Any sum in the nature of tax, duty, cess or fee under any law	11a	0		
	b	Any sum payable by way of contribution to any provident fund or superannuation fund or gratuity fund or any other fund for the welfare of employees	11b	0		
	c	Any sum payable to an employee as bonus or commission for services rendered	11c	0		
	d	Any sum payable as interest on any loan or borrowing from any public financial institution or a State financial corporation or a State Industrial investment corporation	11d	0		
	da	Any sum payable as interest on any loan or borrowing from a deposit taking non-banking financial company or systemically important non-deposit taking non-banking financial company, in accordance with the terms and conditions of the agreement governing such loan or borrowing	11da	0		
	e	Any sum payable as interest on any loan or borrowing from any scheduled bank or a co-operative bank other than a primary agricultural credit society or a primary co-operative agricultural and rural development bank	11e	0		
	f	Any sum payable towards leave encashment	11f	0		
	g	Any sum payable to the Indian Railways for the use of railway assets	11g	0		
	h	Total amount disallowable under Section 43B (total of 11a to 11g)	11h	0		
12 Amount of credit outstanding in the accounts in respect of						
a	Union Excise Duty	12a	0			
b	Service tax	12b	0			
c	VAT/sales tax	12c	0			
d	Central Goods & Service Tax (CGST)	12d	0			
e	State Goods & Services Tax (SGST)	12e	0			
f	Integrated Goods & Services Tax (IGST)	12f	0			
Union Territory Goods & Services Tax						

		g	(UTGST)	12g	0		
		h	Any other tax	12h	0		
		i	Total amount outstanding (total of 12a to 12h)			12i	0
13	Amounts deemed to be profits and gains under section 33AB or 33ABA or 33AC				13	0	
	13a	33AB		13a	0		
	13b	33ABA		13b	0		
	13c	33AC		13c	0		
14	Any amount of profit chargeable to tax under section 41				14	0	
15	Amount of income or expenditure of prior period credited or debited to the profit and loss account (net)				15	0	
16	Amount of expenditure disallowed u/s 14A				16	0	
17	Whether assessee is exercising option under subsection 2A of section 92CE (Tick) Yes No [If yes , please fill schedule TPSA]				17		

FORM	ITR-6	INDIAN INCOME TAX RETURN [For Companies other than companies claiming exemption under section 11] (Please see Rule 12 of the Income-tax Rules,1962) (Please refer instructions)					Assessment Year																		
							2	0	2	2	-	2	3												
Part A – QD													Quantitative details (mandatory, if liable for audit under section 44AB)												
QUANTITATIVE DETAILS	(a)		In the case of a trading concern																						
			S.No.	Item Name	Unit	Opening stock	Purchase during the previous year		Sales during the previous year		Closing stock	Shortage/ excess, if any													
			(1)	(2)	(3)	(4)		(5)		(6)	(7)														
	(b)		In the case of a manufacturing concern																						
			(6) Raw materials																						
			S. No.	Item Name	Unit of measure	Opening stock	Purchase during the previous year	Consumption during the previous year	Sales during the previous year	Closing stock	Yield finished products	Percentage of yield	Shortage/ excess, if any												
			(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)													
			(7) Finished products/ By-products																						
			S. No.	Item Name	Unit	Opening stock	Purchase during the previous year	quantity manufactured during the previous year		Sales during the previous year		Closing stock	shortage/ excess, if any												
			(a)	(b)	(c)	(d)	(e)	(f)		(g)		(h)													

FORM	ITR-6	INDIAN INCOME TAX RETURN [For Companies other than companies claiming exemption under section 11] (Please see Rule 12 of the Income-tax Rules,1962) (Please refer instructions)		Assessment Year						
				2	0	2	2	-	2	3
Part A – OL		Receipt and payment account of company under liquidation								
Receipt and payment account of company under liquidation	1	Opening balance								
	i	Cash in hand	1i						0	
	ii	Bank	1ii						0	
	iii	Total Opening balance	1iii						0	
	2	Receipts								
	i	Interest	2i						0	
	ii	Dividend	2ii						0	
	iii	Sale of assest(pls specify nature and amount)								
		Sl. No.	Nature				Amount			
		Total					0			
	iv	Realisation of dues/debtors	2iv						0	
	v	Others (pls. specify whether revenue/capital, nature and amount)								
		Sl. No.	Nature of receipt		whether revenue/capital		Amount			
		Total					0			
	vi	Total receipts(2i + 2ii + 2iiid + 2iv + 2v)		2vi						0
	3	Total of opening balance and receipts							3	0
	4	Payments								
	i	Repayment of secured loan	4i						0	
	ii	Repayment of unsecured loan	4ii						0	
	iii	Repayment to creditors	4iii						0	
iv	Commission	4iv						0		
v	Others(pls. specify)									
	Sl. No.	Nature of Payment				Amount				
	Total of other payments					0				
vi	Total Payments(4i + 4ii + 4iii + 4iv + 4v)		4vi						0	
5	Closing balance									
i	Cash in hand	5i						0		

	ii	Bank	5ii	0	
	iii	Total of closing balance(5i + 5ii)	5iii	0	
6	Total of closing balance and payments(4vi + 5iii)			6	0



FORM	ITR-6	INDIAN INCOME TAX RETURN [For Companies other than companies claiming exemption under section 11] (Please see Rule 12 of the Income-tax Rules, 1962) (Please refer instructions for guidance)		Assessment Year						
				2	0	2	2	-	2	3
Schedule HP Details Of Income From House Property <i>(Please refer to instructions) (Drop down to be provided indicating ownership of property)</i>										
HOUSE PROPERTY	3	Pass through income/loss if any *							3	0
	4	Income under the head "Income from house property" (1k + 2) <i>(if negative take the figure to 2i of schedule CYLA)</i>							4	0
	<i>Furnishing of PAN/ Aadhaar No. of tenant is mandatory, if tax is deducted under section 194-IB. Furnishing of TAN of tenant is mandatory, if tax is deducted under section 194-I.</i>									

FORM	ITR-6	INDIAN INCOME TAX RETURN [For Companies other than companies claiming exemption under section 11] (Please see Rule 12 of the Income-tax Rules,1962) (Please refer instructions)				Assessment Year					
						2	0	2	2	-	2
Schedule BP											
Computation of income from business or profession											
A From business or profession other than speculative business and specified business											
1 Profit before tax as per profit and loss account (item 53, 61(ii) and 62(b) of Part A-P&L) / (item 53 of Part A-P&L - Ind AS) (as applicable)											
1 2,13,103											
2a Net profit or loss from speculative business included in 1 (enter -ve sign in case of loss)											
2a 0											
2b Net profit or Loss from Specified Business u/s 35AD included in 1 (enter -ve sign in case of loss)											
2b 0											
3 Income/ receipts credited to profit and loss account considered under other heads of income or chargeable u/s 115BBF or chargeable u/s 115BBG											
a House property 3a 0											
b Capital gains 3b 0											
c Other sources 3c 0											
ci Dividend Income 3ci 0											
cii other than Dividend income 3cii 0											
d u/s 115BBF 3d 0											
e u/s 115BBG 3e 0											
4 a Profit or loss included in 1, which is referred to in section 44B/44BB/44BBA/44BBB/44AE/44D/44DA/ Chapter-XII-G/ First Schedule of Income-tax Act (other than 115B)											
4a 0											
Sl. No Section Amount											
i 44B 4ai 0											
ii 44BB 4aii 0											
iii 44BBA 4aiii 0											
iv 44BBB 4aiv 0											
v 44AE 4av 0											
vi 44D 4avi 0											
vii 44DA 4avii 0											
viii Chapter XII-G 4aviii 0											
ix First Schedule of Income Tax Act (other than 115B) 4aix 0											
b Profit and gains from life insurance business referred to in section 115B 4b 0											

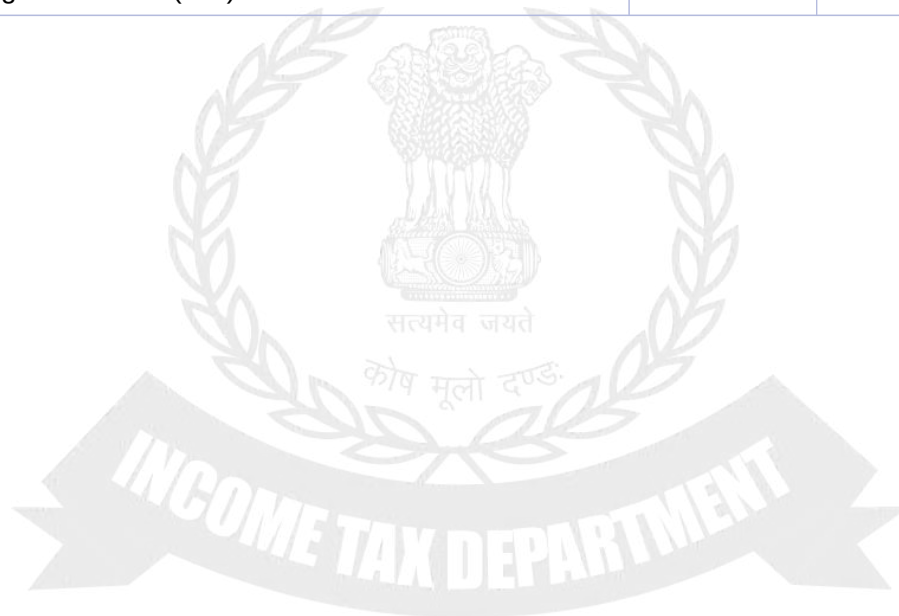
c	Profit from activities covered under rule 7, 7A, 7B (1), 7B(1A) and 8	4c	0	
ci	i. Profit from activities covered under rule 7	4ci	0	
cii	ii. Profit from activities covered under rule 7A	4cii	0	
ciii	iii. Profit from activities covered under rule 7B(1)	4ciii	0	
civ	iv. Profit from activities covered under rule 7B(1A)	4civ	0	
cv	v. Profit from activities covered under rule 8	4cv	0	
5	Income credited to Profit and Loss account (included in 1) which is exempt			
a	Share of income from firm(s)	5a	0	
b	Share of income from AOP/ BOI	5b	0	
c	Any other exempt income (specify nature and amount)			
	SI. No.	Nature of Exempt Income		Amount
	Total			0
d	Total exempt income (5a + 5b + 5ciii)	5d	0	
6	Balance (1 - 2a - 2b - 3a - 3b - 3c - 3d - 3e - 4 - 5d)			6 2,13,103
7	Expenses debited to profit and loss account considered under other heads of income related to income chargeable u/s 115BBF or u/s 115BBG	a	House property	7a 0
b		Capital gains	7b 0	
c		Other sources	7c 0	
d		u/s 115BBF	7d 0	
e		u/s 115BBG	7e 0	
8a	Expenses debited to profit and loss account which relate to exempt income			8a 0
8b	Expenses debited to profit and loss account which relate to exempt income and disallowed u/s 14A (16 of Part A-OI)			8b 0
9	Total (7a + 7b + 7c + 7d + 7e + 8a + 8b)			9 0
10	Adjusted profit or loss (6+9)			10 2,13,103
11	Depreciation and amortisation debited to profit and loss account			11 7,43,040
12	Depreciation allowable under Income-tax Act			
i	Depreciation allowable under section 32(1)(ii) and 32(1)(iia) (item 6 of Schedule-DEP)	12i	6,94,135	
ii	Depreciation allowable under section 32(1)(i) (Make your own computation refer Appendix-IA of IT Rules)	12ii	0	
iii	Total (12i + 12ii)			12iii 6,94,135
13	Profit or loss after adjustment for depreciation (10 + 11 - 12iii)			13 2,62,008
	Amounts debited to the profit and loss account, to the			

INCOME FROM BUSINESS OR PROFESSION	14	extent disallowable under section 36 (6s of Part A-OI)	14	0
	15	Amounts debited to the profit and loss account, to the extent disallowable under section 37 (7k of Part A-OI)	15	0
	16	Amounts debited to the profit and loss account, to the extent disallowable under section 40 (8Aj of Part A-OI)	16	0
	17	Amounts debited to the profit and loss account, to the extent disallowable under section 40A (9f of Part A-OI)	17	0
	18	Any amount debited to profit and loss account of the previous year but disallowable under section 43B (11h of Part A-OI)	18	0
	19	Interest disallowable under section 23 of the Micro, Small and Medium Enterprises Development Act,2006	19	0
	20	Deemed income under section 41	20	0
	21	Deemed income under section 32AC/ 32AD/ 33AB/ 33ABA/35ABA/ 35ABB/ 35AC/ 40A(3A)/ 33AC/ 72A/ 80HHD/ 80-IA	21	0
	i	32AC	21i	0
	ii	32AD	21ii	0
	iii	33AB	21iii	0
	iv	33ABA	21iv	0
	v	35ABA	21v	0
	vi	35ABB	21vi	0
	vii	35AC	21vii	0
	viii	40A(3A)	21viii	0
	ix	33AC	21ix	0
	x	72A	21x	0
	xi	80HHD	21xi	0
	xii	80-IA	21xii	0
	22	Deemed income under section 43CA	22	0
	23	Any other item of addition under section 28 to 44DB	23	0
	24	Any other income not included in profit and loss account /any other expense not allowable (including income from salary, commission, bonus and interest from firms in which company is a partner)	24	0
	i	Salary	24i	0
	ii	Bonus	24ii	0
	iii	Commission	24iii	0
	iv	Interest	24iv	0
	v	Others	24v	0
	25	Increase in profit or decrease in loss on account of CDS adjustments and deviation in method of valuation of	25	0

		stock (Column 3a + 4d of Part A - OI)			
26	Total (14 + 15 + 16 + 17 + 18 + 19 + 20 + 21 + 22 + 23 + 24 + 25)		26		0
27	Deduction allowable under section 32(1)(iii)	27		0	
28	Deduction allowable under section 32AD	28			
29	Amount allowable as deduction under section 32AC	29		0	
30	Amount of deduction under section 35 or 35CCC or 35CCD in excess of the amount debited to profit and loss account (item x(4) of Schedule ESR) (if amount deductible under section 35 or 35CCC or 35CCD is lower than amount debited to P&L account, it will go to item 24)	30		0	
31	Any amount disallowed under section 40 in any preceding previous year but allowable during the previous year(8B of Part A-OI)	31		0	
32	Any amount disallowed under section 43B in any preceding previous year but allowable during the previous year(10h of Part A-OI)	32		0	
33	Any other amount allowable as deduction	33		0	
34	Decrease in profit or increase in loss on account of ICDS adjustments and deviation in method of valuation of stock (Column 3b + 4e of Part A- OI)	34		0	
35	Total (27+28+29+30+31+32+33+34)		35		0
36	Income (13+26-35)		36		2,62,008
37	Profits and gains of business or profession deemed to be under -				
	i Section 44AE[61(ii) of schedule P&L]	37i		0	
	ii Section 44B	37ii		0	
	iii Section 44BB	37iii		0	
	iv Section 44BBA	37iv		0	
	v Section 44BBB	37v		0	
	vi Section 44D	37vi		0	
	vii Section 44DA	37vii		0	
	viii Chapter-XII-G (tonnage)	37viii		0	
	ix First Schedule of Income-tax Act (other than 115B)	37ix		0	
	x Total (37i to 37ix)		37x		0
38	Net profit or loss from business or profession other than speculative and specified business (36+37x)		38		2,62,008
39	Net Profit or loss from business or profession other than speculative business and specified business after applying rule 7A, 7B or 8, if applicable (If rule 7A, 7B or 8 is not applicable, enter same figure as in 38) (If loss take the figure to 2i of item F) (39a+ 39b + 39c + 39d + 39e + 39f)		A39		2,62,008
	a Income chargeable under Rule 7	39a		0	
	b Deemed income chargeable under Rule 7A	39b		0	

	c	Deemed income chargeable under Rule 7B(1)	39c	0	
	d	Deemed income chargeable under Rule 7B(1A)	39d	0	
	e	Deemed income chargeable under Rule 8	39e	0	
	f	Income other than Rule 7A, 7B & 8 (Item No. 38)	39f	2,62,008	
40	Balance of income deemed to be from agriculture, after applying Rule 7, 7A, 7B(1), 7B(1A) and Rule 8 for the purpose of aggregation of income as per Finance Act [4c-(39a+39b+39c+39d+39e)]				40 0
B Computation of income from speculative business					
41	Net profit or loss from speculative business as per profit or loss account				41 0
42	Additions in accordance with section 28 to 44DB				42 0
43	Deductions in accordance with section 28 to 44DB				43 0
44	Income from speculative business (41+42-43) (if loss, take the figure of 6xv of schedule CFL)				B44 0
C Computation of income from specified business under section 35AD					
45	Net profit or loss from specified business as per profit or loss account				45 0
46	Additions in accordance with section 28 to 44DB				46 0
47	Deductions in accordance with section 28 to 44DB (other than deduction under section, - (i) 35AD, (ii) 32 or 35 on which deduction u/s 35AD is claimed)				47 0
48	Profit or loss from specified business (45+46-47)				48 0
49	Deductions in accordance with section 35AD(1)				49 0
50	Income from Specified Business (48-49) (if loss, take the figure to 7xv of schedule CFL)				C50 0
51	Relevant clause of sub-section (5) of section 35AD which covers the specified business (to be selected from drop down menu)				C51
	SI. No.	Relevant clause			
D	Income chargeable under the head 'Profits and gains from Business or profession' (A39+B44+C50)				D 2,62,008
E Intra head set off of business loss of current year					
Sl.	Type of Business income	Income of current year (Fill this column only if figure is zero or positive)	Business loss set off	Business income remaining after set off	
		(1)	(2)	(3) = (1) - (2)	
i	Loss to be set off (Fill this row only if figure is negative)		0		
ii	Income from speculative business	0	0	0	
iii	Income from specified business	1958 0	0	0	

iv	Income from Life Insurance business u/s. 115B	0	0	0
v	Total loss set off (ii + iii)		0	
vi	Loss remaining after set off (i - v)		0	



FORM	ITR-6	INDIAN INCOME TAX RETURN [For Companies other than companies claiming exemption under section 11] (Please see Rule 12 of the Income-tax Rules,1962) (Please refer instructions)		Assessment Year					
				2	0	2	2	-	2

Schedule DPM		Depreciation on Plant and Machinery (Other than assets on which full capital expenditure is allowable as deduction under any other section)			
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DEPRECIATION ON PLANT AND MACHINERY	1	Block of assets	Plant and machinery			
	2	Rate (%)	15	30	40	45
			(i)	(ii)	(iii)	(iv)
	3	Written down value on the first day of previous year	28,55,979	0	1,42,167	0
	4	Additions for a period of 180 days or more in the previous year	4,38,304	0	0	
	5	Consideration or other realization during the previous year out of 3 or 4	0	0	0	0
	6	Amount on which depreciation at full rate to be allowed (3 + 4 -5) (enter 0, if result is negative)	32,94,283	0	1,42,167	0
	7	Additions for a period of less than 180 days in the previous year	17,93,666	0	19,491	
	8	Consideration or other realizations during the year out of 7	0	0	0	
	9	Amount on which depreciation at half rate to be allowed (7-8) (enter 0, if result is negative)	17,93,666	0	19,491	
	10	Depreciation on 6 at full rate	4,94,142	0	56,867	0
	11	Depreciation on 9 at half rate	1,34,525	0	3,898	
	12	Additional depreciation, if any, on 4	0	0	0	
	13	Additional depreciation, if any, on 7	0	0	0	
	14	Additional depreciation relating to immediately preceding year on asset put to use for less than 180 days	0	0	0	
	15	Total depreciation (10+11+12+13+14)	6,28,667	0	60,765	0
	16	Depreciation disallowed under section 38(2) of the I.T. Act (out of column 15)	0	0	0	0
	17	Net aggregate depreciation (15-16)	6,28,667	0	60,765	0
	18	Proportionate aggregate depreciation allowable in the event of succession, amalgamation, demerger etc (out of column 17)	0	0	0	0
	19	Expenditure incurred in connection with transfer of asset/ assets	0	0	0	0
	20	Capital gains/ loss under section 50 (5 + 8 -3 - 4 -7 -19) (enter negative only, if block ceases to exist)	0	0	0	0
21	Written down value on the last day of previous year* (6+ 9 -15) (enter 0, if result is negative)	44,59,282	0	1,00,893	0	

FORM	ITR-6	INDIAN INCOME TAX RETURN [For Companies other than companies claiming exemption under section 11] (Please see Rule 12 of the Income-tax Rules,1962) (Please refer instructions)				Assessment Year					
						2	0	2	2	-	2
Schedule DOA											
Depreciation on other assets (Other than assets on which full capital expenditure is allowable as deduction)											
DEPRECIATION ON OTHER ASSETS	1	Block of assets	Land	Building (not including land)			Furniture and fittings	Intangible assets	Ships		
	2	Rate (%)	Nil	5	10	40	10	25	20		
			(i)	(ii)	(iii)	(iv)	(v)	(vi)	(vii)		
	3	Written down value on the first day of previous year	0	0	0	0	0	0	0		
	4	Additions for a period of 180 days or more in the previous year		0	0	0	30,509	0	0		
	5	Consideration or other realization during the previous year out of 3 or 4		0	0	0	0	0	0		
	6	Amount on which depreciation at full rate to be allowed (3 + 4 -5) (enter 0, if result is negative)		0	0	0	30,509	0	0		
	7	Additions for a period of less than 180 days in the previous year		0	0	0	33,050	0	0		
	8	Consideration or other realizations during the year out of 7		0	0	0	0	0	0		
	9	Amount on which depreciation at half rate to be allowed (7-8) (enter 0, if result is negative)		0	0	0	33,050	0	0		
	10	Depreciation on 6 at full rate		0	0	0	3,050	0	0		
	11	Depreciation on 9 at half rate		0	0	0	1,653	0	0		
	12	Total depreciation* (10+11)		0	0	0	4,703	0	0		
	13	Depreciation disallowed under section 38(2) of the I.T. Act (out of column 12)		0	0	0	0	0	0		
	14	Net aggregate depreciation (12-13)		0	0	0	4,703	0	0		
	15	Proportionate aggregate depreciation allowable in the event of succession, amalgamation, demerger etc. (out of column 14)		0	0	0	0	0	0		
	16	Expenditure incurred in connection with transfer of asset/ assets		0	0	0	0	0	0		
	17	Capital gains/ loss under section 50 (5 + 8 -3-4 -7 -16) (enter negative only if block ceases to exist)		0	0	0	0	0	0		
18	Written down value on the last day of previous year* (6+ 9 -12) (enter 0 if result is negative)	0	0	0	0	58,856	0	0			

FORM	ITR-6	INDIAN INCOME TAX RETURN [For Companies other than companies claiming exemption under section 11] (Please see Rule 12 of the Income-tax Rules,1962) (Please refer instructions)				Assessment Year					
						2	0	2	2	-	2
Schedule DEP		Summary of depreciation on assets (Other than assets on which full capital expenditure is allowable as deduction under any other section)									
SUMMARY OF DEPRECIATION ON ASSETS	1	Plant and machinery									
	a	Block entitled for depreciation @ 15 per cent (Schedule DPM - 17i or 18i as applicable)				1a	6,28,667				
	b	Block entitled for depreciation @ 30 per cent (Schedule DPM - 17ii or 18ii as applicable)				1b	0				
	c	Block entitled for depreciation @ 40 per cent (Schedule DPM - 17iii or 18iii as applicable)				1c	60,765				
	d	Block entitled for depreciation @ 45 per cent (Schedule DPM - 17iv or 18iv as applicable)				1d	0				
	e	Total depreciation on plant and machinery (1a + 1b + 1c+1d)						1e	6,89,432		
	2	Building (not including land)									
	a	Block entitled for depreciation @ 5 per cent (Schedule DOA- 14ii or 15ii as applicable)				2a	0				
	b	Block entitled for depreciation @ 10 per cent (Schedule DOA- 14iii or 15iii as applicable)				2b	0				
	c	Block entitled for depreciation @ 40 per cent (Schedule DOA- 14iv or 15iv as applicable)				2c	0				
	d	Total depreciation on building (total of 2a + 2b + 2c)						2d	0		
	3	Furniture and fittings (Schedule DOA- 14v or 15v as applicable)								3	4,703
	4	Intangible assets (Schedule DOA- 14vi or 15vi as applicable)								4	0
	5	Ships (Schedule DOA- 14vii or 15vii as applicable)								5	0
	6	Total depreciation (1e+2d+3+4+5)								6	6,94,135

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FORM	ITR-6	INDIAN INCOME TAX RETURN [For Companies other than companies claiming exemption under section 11] (Please see Rule 12 of the Income-tax Rules,1962) (Please refer instructions)				Assessment Year					
						2	0	2	2	-	2
Schedule DCG											
Deemed Capital Gains on sale of depreciable assets											
1	Plant and machinery										
	a	Block entitled for depreciation @ 15 percent (schedule DPM - 20i)	1a	0							
	b	Block entitled for depreciation @ 30 percent (schedule DPM - 20ii)	1b	0							
	c	Block entitled for depreciation @ 40 percent (schedule DPM - 20iii)	1c	0							
	d	Block entitled for depreciation @ 45 percent (schedule DPM - 20iv)	1d	0							
	e	Total (1a + 1b + 1c+1d)						1e	0		
2	Building (not including land)										
	a	Block entitled for depreciation @ 5 percent (schedule DOA - 17ii)	2a	0							
	b	Block entitled for depreciation @ 10 percent (schedule DOA - 17iii)	2b	0							
	c	Block entitled for depreciation @ 40 percent (schedule DOA - 17iv)	2c	0							
	d	Total (2a + 2b + 2c)						2d	0		
3	Furniture and fittings (schedule DOA - 17v)										
4	Intangible assets (schedule DOA - 17vi)										
5	Ships (schedule DOA - 17vii)										
6	Total (1e+2d+3+4+5)										

FORM	ITR6	INDIAN INCOME TAX RETURN [For Companies other than companies claiming exemption under section 11] (Please see Rule 12 of the Income-tax Rules, 1962) (Please refer instructions)			Assessment Year						
					2	0	2	2	-	2	3
Schedule ESR											
Expenditure on scientific Research etc. (Deduction under section 35 or 35CCC or 35CCD)											
Sl.No.	Expenditure of the nature referred to in section (1)	Amount, if any, debited to profit and loss account (2)	Amount of deduction allowable (3)	Amount of deduction in excess of the amount debited to profit and loss account (4) = (3) - (2)							
i	35(1)(i)	0	0	0							
ii	35(1)(ii)	0	0	0							
iii	35(1)(ia)	0	0	0							
iv	35(1)(iii)	0	0	0							
v	35(1)(iv)	0	0	0							
vi	35(2AA)	0	0	0							
vii	35(2AB)	0	0	0							
viii	35CCC	0	0	0							
ix	35CCD	0	0	0							
x	Total	0	0	0							
NOTE		In case any deduction is claimed under sections 35(1)(ii) or 35(1)(ia) or 35(1)(iii) or 35(2AA), please provide the details as per Schedule RA.									

FORM	ITR-6	INDIAN INCOME TAX RETURN [For Companies other than companies claiming exemption under section 11] (Please see Rule 12 of the Income-tax Rules,1962) (Please refer instructions)				Assessment Year					
		2	0	2	2	-	2	3			
Schedule CG Capital Gains											
A	Short-term Capital Gains (STCG) (Sub-items 4 & 5 are not applicable for residents)										
2	From slump sale										
	ai	Fair market value as per Rule 11UAE(2)				2ai	0				
	aii	Fair market value as per Rule 11UAE(3)				2aii	0				
	aiii	Full value of consideration (higher of ai or aii)				2aiii	0				
	b	Net worth of the under taking or division				2b	0				
	c	Short term capital gains from slump sale (2aiii-2b)							A2c	0	
3	From sale of equity share or unit of equity oriented Mutual Fund (MF) or unit of a business trust on which STT is paid under section 111A or 115AD(1)(b)(ii) proviso (for FII)										
4	For NON-RESIDENT, not being an FII- from sale of shares or debentures of an Indian company (to be computed with foreign exchange adjustment under first proviso to section 48)										
	a	STCG on transactions on which securities transaction tax (STT) is paid							A4a		
	b	STCG on transactions on which securities transaction tax (STT) is not paid							A4b		
5	For NON-RESIDENTS- from sale of securities (other than those at A3 above) by an FII as per section 115AD										
	a	i	In case securities sold include shares of a company other than quoted shares, enter the following details								
			a	Full value of consideration received/receivable in respect of unquoted shares			ia	0			
			b	Fair market value of unquoted shares determined in the prescribed manner			ib	0			
			c	Full value of consideration in respect of unquoted shares adopted as per section 50CA for the purpose of Capital Gains (higher of a or b)			ic	0			
		ii	Full value of consideration in respect of assets other than unquoted shares				aii	0			
		iii	Total (ic + ii)				aiii	0			
	b	Deductions under section 48									
		i	Cost of acquisition without indexation				bi	0			
		ii	Cost of improvement without indexation				bii	0			
		iii	Expenditure wholly and exclusively in connection with transfer				biii	0			
		iv	Total (i + ii + iii)				biv	0			
	c	Balance (5aiii - biv)				5c	0				
	d	Loss to be disallowed u/s 94(7) or 94(8)- for example if security bought/acquired within 3 months prior to record date and dividend/income/bonus units are received, then loss arising out of sale of such security to be ignored (Enter positive value only)				5d	0				
	e	Short-term capital gain on securities (other than those at A3 above) by an FII (5c +5d)							A5e	0	
6	From sale of assets other than at A1 or A2 or A3 or A4 or A5 above										
	a	i	In case securities sold include shares of a company other than quoted shares, enter the following details								
			a	Full value of consideration received/receivable in respect of unquoted shares			ia	0			
			b	Fair market value of unquoted shares determined in the prescribed manner			ib	0			
			c	Full value of consideration in respect of unquoted shares adopted as			ic	0			

				per section 50CA for the purpose of Capital Gains (higher of a or b)									
		ii	Full value of consideration in respect of assets other than unquoted shares					aii	0				
		iii	Total (ic + ii)					aiii	0				
	b	Deductions under section 48											
		i	Cost of acquisition without indexation					bi	0				
		ii	Cost of improvement without indexation					bii	0				
		iii	Expenditure wholly and exclusively in connection with transfer					biii	0				
		iv	Total (i + ii + iii)					biv	0				
	c	Balance (6aiii - biv)					6c	0					
	d	In case of asset (security/unit) loss to be disallowed u/s 94(7) or 94(8)- for example if asset bought/acquired within 3 months prior to record date and dividend/income /bonus units are received, then loss arising out of sale of such asset to be ignored (Enter positive value only)					6d	0					
	e	Deemed short term capital gains on depreciable assets (6 of schedule-DCG)					6e	0					
	f	Deduction under section 54D/54G/54GA					6f	0					
	g	STCG on assets other than at A1 or A2 or A3 or A4 or A5 above (6c + 6d + 6e - 6f)					A6g		0				
7	Amount deemed to be short term capital gains												
a	Whether any amount of unutilized capital gain on asset transferred during the previous years shown below was deposited in the Capital Gains Accounts Scheme within due date for that year? Yes No Not Applicable If yes, then provide the details below												
	Sl.	Previous year in which asset transferred	Section under which deduction claimed in that year	New asset acquired /constructed		Amount not used for new asset or remained unutilized in Capital gains account (X)							
				Year in which asset acquired /constructed	Amount utilised out of Capital Gains account								
b	Amount deemed to be short term capital gains u/s 54D/54G/54GA, other than at 'a'					0							
	Amount deemed to be short term capital gains (Xi + b)					A7					0		
8	Pass Through Income/ Loss in the nature of Short Term Capital Gain (Fill up schedule PTI) (A8a + A8b + A8c)					A8					0		
	a	Pass Through Income/ Loss in the nature of Short Term Capital Gain, chargeable @ 15%					A8a	0					
	b	Pass Through Income/ Loss in the nature of Short Term Capital Gain, chargeable @ 30%					A8b	0					
	c	Pass Through Income/ Loss in the nature of Short Term Capital Gain, chargeable at applicable rates					A8c	0					
9	Amount of STCG included in A1 - A8 but not chargeable to tax or chargeable at special rates in India as per DTAA												
	Sl. No.	Amount of income	Item No. A1 to A8 above in which included	Country /Region name & Code	Article of DTAA	Rate as per Treaty (enter NIL, if not chargeable)	Whether TRC obtained (Y /N)	Section of I.T. Act	Rate as per I.T. Act	Applicable rate [lower of (6) or (9)]			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)			
	a	Total amount of STCG not chargeable to tax in India as per DTAA								A9a	0		
	b	Total amount of STCG chargeable to tax at special rates in India as per DTAA								A9b	0		
10	Total Short-term Capital Gain (A1e+ A2c+ A3e+ A4a+ A4b+ A5e+ A6g+A7 + A8 - A9a)										A10	0	
B	Long-term capital gain (LTCG) (Sub-items 6, 7 & 8 are not applicable for residents)												
2	From slump sale												
	ai	Fair market value as per Rule 11UAE(2)					2ai	0					
	aii	Fair market value as per Rule 11UAE(3)					2aii	0					

	aiii	Full value of consideration (higher of ai or aii)	2aiii	0	
	b	Net worth of the under taking or division	2b	0	
	c	Balance (2aiii - 2b)	2c	0	
	d	Deduction u/s 54EC	2d	0	
	e	Long term capital gains from slump sale (2c-2d)			B2e 0
3	From sale of bonds or debenture (other than capital indexed bonds issued by Government)				
	a	Full value of consideration	3a	0	
	b	Deductions under section 48			
	i	Cost of acquisition without indexation	bi	0	
	ii	Cost of improvement without indexation	bii	0	
	iii	Expenditure wholly and exclusively in connection with transfer	biii	0	
	iv	Total (bi + bii +biii)	biv	0	
	c	LTCG on bonds or debenture - (3a - biv)			B3c 0
4	From sale of listed securities (other than a unit) or zero coupon bonds where proviso under section 112(1) is applicable				
	a	Full value of consideration	4a	0	
	b	Deductions under section 48			
	i	Cost of acquisition without indexation	bi	0	
	ii	Cost of improvement without indexation	bii	0	
	iii	Expenditure wholly and exclusively in connection with transfer	biii	0	
	iv	Total (bi + bii +biii)	biv	0	
	c	Long-term Capital Gains on assets at B4 above (4a - 4biv)			B4c 0
5	From sale of equity share in a company or unit of equity oriented fund or unit of a business trust on which STT is paid under section 112A				
	Long-term Capital Gains on sale of capital assets at B5(Column 14 of schedule 112A)				B5 0
6	For NON-RESIDENTS- from sale of shares or debenture of Indian company (to be computed with foreign exchange adjustment under first proviso to section 48)				
	LTCG computed without indexation benefit				B6
7	For NON-RESIDENTS- from sale of, (i) unlisted securities as per sec. 112(1)(c), (ii) units referred in sec. 115AB, (iii) bonds or GDR as referred in sec. 115AC, (iv) securities by FII as referred to in sec. 115AD				
8	For NON-RESIDENTS - From sale of equity share in a company or unit of equity oriented fund or unit of a business trust on which STT is paid under section 112A				
	Long-term Capital Gains on sale of capital assets at B8 above (Column 14 of Schedule 115AD(1)(b)(iii) proviso)				B8 0
9	From sale of assets where B1 to B8 above are not applicable				
	a	i	In case assets sold include shares of a company other than quoted shares, enter the following details		
		a	Full value of consideration received/receivable in respect of unquoted shares	ia	0
		b	Fair market value of unquoted shares determined in the prescribed manner	ib	0
		c	Full value of consideration in respect of unquoted shares adopted as per section 50CA for the purpose of Capital Gains (higher of a or b)	ic	0
		ii	Full value of consideration in respect of assets other than unquoted	aii	0
		iii	Total (ic + ii)	aiii	0
	b	Deductions under section 48			
		i	Cost of acquisition with indexation	bi	0
		ii	Cost of improvement with indexation	bii	0
		iii	Expenditure wholly and exclusively in connection with transfer	biii	0
		iv	Total (bi + bii +biii)	biv	0
	c	Balance (aiii - biv)			9c 0

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	d	Deduction under section 54D/54G/54GA (Specify details in item D below)								9d	0			
	e	Long-term Capital Gains on assets at B9 above (9c- 9d)										B9e	0	
10	Amount deemed to be long-term capital gains													
a	Whether any amount of unutilized capital gain on asset transferred during the previous year shown below was deposited in the Capital Gains Accounts Scheme within due date for that year? Yes No Not Applicable If yes, then provide the details below (Note : In case any amount is utilised out of Capital Gains account please fill sl no "C" of schedule DI)													
	Sl.	Previous year in which asset transferred	Section under which deduction claimed in that year	New asset acquired/constructed		Amount not used for new asset or remained unutilized in Capital gains account (X)								
				Year in which asset acquired /constructed	Amount utilised out of Capital Gains account									
b	Amount deemed to be long-term capital gains, other than than at 'a'										0			
c	Amount deemed to be long-term capital gains (Xi + b)											B10	0	
11	Pass Through Income / Loss in the nature of Long Term Capital Gain, (Fill up schedule PTI) (B11a1+B11a2 + B11b)											B11	0	
a1	Pass Through Income/Loss in the nature of Long Term Capital Gain, chargeable @ 10% u/s 112A										B11a1	0		
a2	Pass Through Income/Loss in the nature of Long Term CapitalGain, chargeable @ 10% under sections other than 112A										B11a2	0		
b	Pass Through Income/ Loss in the nature of Long Term Capital Gain, chargeable @ 20%										B11b	0		
12	Amount of LTCG included in items B1 to B11 but not chargeable to tax or chargeable at special rates in India as per DTAA													
	Sl. No.	Amount of income	Item No. B1 to B11 above in which included	Country/Region name & Code	Article of DTAA	Rate as per Treaty (enter NIL, if not chargeable)	Whether TRC obtained (Y/N)	Section of I.T. Act	Rate as per I.T. Act	Applicable rate [lower of (6) or (9)]				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)				
a	Total amount of LTCG not chargeable to tax in India as per DTAA										B12a	0		
b	Total amount of LTCG chargeable to tax at special rates in India as per DTAA										B12b	0		
13	Total long term capital gain] [B1e + B2e + B3c + B4c + B5 + B6 + B7c + B8 + B9e + B10 + B11 - B12a]										B13	0		
C	Income chargeable under the head "CAPITAL GAINS" (A10+ B13) (take B13 as nil, if loss)										C	0		
D	Information about deduction claimed against Capital Gains													
1	In case of deduction u/s 54D/54EC/54G/54GA give following details													
a	Deduction claimed u/s 54D													
	Sl. No.	Date of acquisition of original asset	Cost of purchase/ construction of new land or building for industrial undertaking	Date of purchase of new land or building	Amount deposited in Capital Gains Accounts Scheme before due date	Amount of deduction claimed								
b	Deduction claimed u/s 54EC													
	Sl. No.	Date of transfer of original asset	Amount invested in specified/notified bonds(not exceeding fifty lakh rupees)	Date of investment	Amount of deduction claimed									
c	Deduction claimed u/s 54G													
	Sl. No.	Date of transfer of original asset	Cost and expenses incurred for purchase or construction of new asset	Date of purchase/construction of new asset in an area other than urban area	Amount deposited in Capital Gains Accounts Scheme before due date	Amount of deduction claimed								
d	Deduction claimed u/s 54GA													
	Sl. No.	Date of transfer of original asset from urban area	Cost and expenses incurred for purchase or construction of new asset	Date of purchase /construction of new asset in SEZ	Amount deposited in Capital Gains Accounts Scheme before due date	Amount of deduction claimed								
e	Total deduction claimed (1a + 1b + 1c + 1d)										e	0		
E	Set-off of current year capital losses with current year capital gains (excluding amounts included in A9a & B12a which is NOT chargeable under DTAA)													
	Sl.No.	Type of Capital Gain	Capital Gain of current year (Fill this column only if computed figure is positive)	Short term capital loss				Long term capital loss			Current year's capital gains remaining after set off (9=1-2-3-4-5-6-7-8)			
				15%	30%	applicable rate	DTAA rates	10%	20%	DTAA rates				
			1	2	3	4	5	6	7	8	9			
i		Capital Loss to be set off (Fill this row only if computed figure is negative)		0	0	0	0	0	0	0				
ii		Short term capital gain	15%	0	0	1968	0				0			
iii			30%	0	0		0				0			

iv		applicable rate	0	0	0			0
v		DTAA Rates	0	0	0	0		0
vi	Long term capital gain	10%	0	0	0	0	0	0
vii		20%	0	0	0	0	0	0
viii		DTAA Rates	0	0	0	0	0	0
ix	Total loss set off (ii + iii + iv + v + vi + vii + viii)		0	0	0	0	0	0
x	Loss remaining after set off (i - ix)		0	0	0	0	0	0

The figures of STCG in this table (A1e* etc.) are the amounts of STCG computed in respective column (A1-A8) as reduced by the amount of STCG not chargeable to tax or chargeable at special rates as per DTAA, which is included therein, if any.

The figures of LTCG in this table (B1e* etc.) are the amounts of LTCG computed in respective column (B1-B11) as reduced by the amount of LTCG not chargeable to tax or chargeable at special rates as per DTAA, which is included therein, if any.

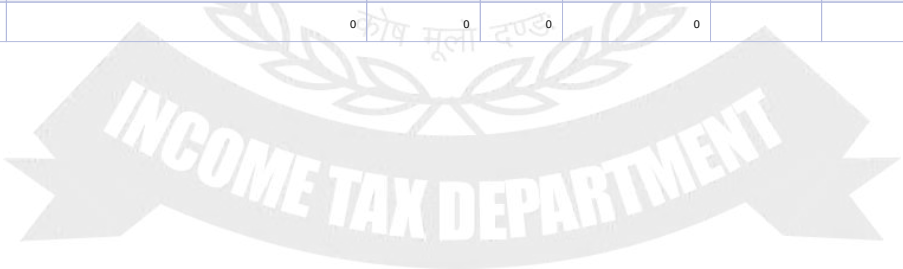
F Information about accrual/receipt of capital gain

	Type of Capital gain / Date	Upto 15/6 (i)	16/6 to 15/9 (ii)	16/9 to 15/12 (iii)	16/12 to 15/3 (iv)	16/3 to 31/3 (v)
1	Short-term capital gains taxable at the rate of 15% <i>Enter value from item 5vi of schedule BFLA, if any.</i>	0	0	0	0	0
2	Short-term capital gains taxable at the rate of 30% <i>Enter value from item 5vii of schedule BFLA, if any</i>	0	0	0	0	0
3	Short-term capital gains taxable at applicable rates <i>Enter value from item 5viii of schedule BFLA, if any.</i>	0	0	0	0	0
4	Short-term capital gains taxable at DTAA rates <i>Enter value from item 5ix of schedule BFLA, if any</i>	0	0	0	0	0
5	Long- term capital gains taxable at the rate of 10% <i>Enter value from item 5x of schedule BFLA, if any.</i>	0	0	0	0	0
6	Long- term capital gains taxable at the rate of 20% <i>Enter value from item 5xi of schedule BFLA, if any.</i>	0	0	0	0	0
7	Long- term capital gains taxable at the rate DTAA rates <i>Enter value from item 5xii of schedule BFLA, if any.</i>	0	0	0	0	0

FORM		ITR-6		INDIAN INCOME TAX RETURN [For Companies other than companies claiming exemption under section 11] (Please see Rule 12 of the Income-tax Rules,1962) (Please refer instructions)						Assessment Year 2022-23					
Schedule 112A				From sale of equity share in a company or unit of equity oriented fund or unit of a business trust on which STT is paid under section 112A											
Sl. No.	Share /Unit acquired	ISIN Code	Name of the Share /Unit	No. of Shares /Units	Sale-price per Share /Unit	Full Value Consideration -If shares are acquired on or before 31.01.2018 (Total Sale Value) (4*5) - If shares are Acquired after 31st January, 2018 - Please enter Full Value of Consideration	Cost of acquisition without indexation (higher of 8 or 9)	Cost of acquisition	If the long term capital asset was acquired before 01.02.2018, Lower of 6 & 11	Fair Market Value per share/unit as on 31st January, 2018	Total Fair Market Value of capital asset as per section 55(2)(ac) (11) = (4*10)	Expenditure wholly and exclusively in connection with transfer	Total deductions (7+12)	Balance (6 - 13)- Item 5 of LTCG Schedule CG	
(Col 1)	(Col 1a)	(Col 2)	(Col 3)	(Col 4)	(Col 5)	(Col 6)	(Col 7)	(Col 8)	(Col 9)	(Col 10)	(Col 11)	(Col 12)	(Col 13)	(Col 14)	
Total						0	0	0	0		0	0	0	0	



FORM	ITR-6	INDIAN INCOME TAX RETURN [For Companies other than companies claiming exemption under section 11] (Please see Rule 12 of the Income-tax Rules,1962) (Please refer instructions)										Assessment Year							
		2	0	2	2	-	2	3											
Schedule 115AD(1)(b) (iii)-Proviso						For NON-RESIDENTS - From sale of equity share in a company or unit of equity oriented fund or unit of a business trust on which STT is paid under section 112A													
Sl. No.	Share /Unit acquired	ISIN Code	Name of the Share /Unit	No. of Shares /Units	Sale-price per Share /Unit	Full Value Consideration -If shares are acquired on or before 31.01.2018 (Total Sale Value)(4*5) -If shares are Acquired after 31st January 2018 - Please enter Full Value of Consideration.	Cost of acquisition without indexation (higher of 8 or 9)	Cost of acquisition	If the long term capital asset was acquired before 01.02.2018, Lower of 6 & 11	Fair Market Value per share /unit as on 31st January,2018	Total Fair Market Value of capital asset as per section 55(2)(ac)-(4*10)	Expenditure wholly and exclusively in connection with transfer	Total deductions (7+12)	Balance (6-13) Item 8 of LTCG Schedule of ITR6					
(Col 1)	(Col 1a)	(Col 2)	(Col 3)	(Col 4)	(Col 5)	(Col 6)	(Col 7)	(Col 8)	(Col 9)	(Col 10)	(Col 11)	(Col 12)	(Col 13)	(Col 14)					
Total						0	0	0	0		0	0	0	0					



FORM	ITR-6	INDIAN INCOME TAX RETURN [For Companies other than companies claiming exemption under section 11] (Please see Rule 12 of the Income-tax Rules, 1962) (Please refer instructions)				Assessment Year					
		2	0	2	2	-	2	3			
Schedule OS		Income from other sources									
1	Gross income chargeable to tax at normal applicable rates (1a+ 1b+ 1c+ 1d + 1e)									1	1,54,292
a	Dividends, Gross				1a	0					
ai	Dividend income [other than (ii)]				ai	0					
a ii	Dividend income u/s 2(22)(e)				a ii	0					
b	Interest, Gross (bi + bii + biii + biv+ bv)				1b	1,54,292					
i	From Savings Bank				bi	0					
ii	From Deposits (Bank/ Post Office/ Co-operative/ Society)				bii	1,54,292					
iii	From Income-tax Refund				biii	0					
iv	In the nature of Pass through income/ loss				biv	0					
v	Others				bv	0					
c	Rental income from machinery, plants, buildings, etc., Gross				1c	0					
d	Income of the nature referred to in section 56(2) (x) which is chargeable to tax (di + dii + diii + div + dv)				1d	0					
i	Aggregate value of sum of money received without consideration				di	0					
ii	In case immovable property is received without consideration, stamp duty value of property				dii	0					
iii	In case immovable property is received for inadequate consideration, stamp duty value of property in excess of such consideration				diii	0					
iv	In case any other property is received without consideration, fair market value of property				div	0					
v	In case any other property is received for inadequate consideration, fair market value of property in excess of such consideration				dv	0					
e	Any other income (please specify nature)				1e	0					
Sl. No.	Nature				Amount						
2	Income chargeable at special rates (2a+ 2b+ 2c+ 2d + 2e elements related to Sl. No.1)									2	0
Income by way of Winnings from lotteries,											

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OTHER SOURCES	a	crossword puzzles etc. chargeable u/s 115BB				2a	0			
	b	Income chargeable u/s 115BBE (bi + bii + biii + biv+ bv + bvi)				2b	0			
	i	Cash credits u/s 68				bi	0			
	ii	Unexplained investments u/s 69				bii	0			
	iii	Unexplained money etc. u/s 69A				biii	0			
	iv	Undisclosed investments etc. u/s 69B				biv	0			
	v	Unexplained expenditure etc. u/s 69C				bv	0			
	vi	Amount borrowed or repaid on hundi u/s 69D				bvi	0			
	c	Any other income chargeable at special rate (total of ci to cxxiii)				2c	0			
	Sl. No.		Nature		Amount					
	d	Pass through income in the nature of income from other sources chargeable at special rates (drop down to be provided)				2d	0			
	Sl. No.		Nature		Amount					
	e	Amount included in 1 and 2 above, which is chargeable at special rates in India as per DTAA (total of column (2) of table below)				2e	0			
	Sl. No.	Amount of income	Item No. 1ai to 1d, 2a, 2c & 2d in which included	Country /Region name & Code	Article of DTAA	Rate as per Treaty (enter NIL, if not chargeable)	Whether TRC obtained (Y /N)	Section of I.T. Act	Rate as per I.T. Act	Applicable rate [lower of (6) or (9)]
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
3	Deductions under section 57 (other than those relating to income chargeable at special rates under 2a, 2b ,2c & 2d)									
a	Expenses / Deductions (Other than entered in C)				3a	0				
b	Depreciation (available only if income offered in 1c)				3b	0				
c	Interest expenditure on dividend u/s 57(1) (only if income offered in 1a)				3c	0				
ci	Eligible Interest expenditure u/s 57(1) – computed value				3ci	0				
	Interest expenditure claimed					0				
d	Total				3d	0				
4	Amounts not deductible u/s 58							4	0	
5	Profits chargeable to tax u/s 59							5	0	
6	Net Income from other sources chargeable at normal applicable rates (1(after reducing income related to DTAA portion) – 3 + 4 + 5) (If negative take the figure to 4i of schedule CYLA)							6	1,54,292	
7	Income from other sources (other than from owning and maintaining race horses) (2 + 6) (enter 6 as nil, if negative)							7	1,54,292	

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8	Income from the activity of owning race horses							
a	Receipts	8a	0					
b	Deductions under section 57 in relation to receipts at 8a only	8b	0					
c	Amounts not deductible u/s 58	8c	0					
d	Profits chargeable to tax u/s 59	8d	0					
e	Balance (8a - 8b + 8c + 8d) (if negative take the figure to 11xv of Schedule CFL)	8e	0					
9	Income under the head "Income from other sources" (7 + 8e) (take 8e as nil if negative)						9	1,54,292
10	Information about accrual/receipt of income from Other Sources							
S. No.	Other Source Income	Upto 15/6	From 16/6 to 15/9	From 16/9 to 15/12	From 16/12 to 15/3	From 16/3 to 31/3		
		(i)	(ii)	(iii)	(iv)	(v)		
1	Income by way of winnings from lotteries, crossword puzzles, races, games, gambling, betting etc. referred to in section 2(24)(ix)	0	0	0	0	0		
2	Dividend Income referred in 1a(i)	0	0	0	0	0		
3	Dividend Income u/s 115A(1)(a)(i) @ 20% (Including PTI Income)	0	0	0	0	0		
4	Dividend Income u/s 115AC @ 10% (Including PTI Income)	0	0	0	0	0		
5	Dividend Income u/s 115BBD @ 15% (Including PTI Income)	0	0	0	0	0		
6	Dividend Income (other than units referred to in section 115AB) received by a FII u/s 115AD(1)(i) @ 20% (Including PTI Income)	0	0	0	0	0		
7	Dividend Income (other than units referred to in section 115AB) received by a specified fund u/s 115AD(1)(i) @ 10% (Including PTI Income)	0	0	0	0	0		
8	Dividend income chargeable at DTAA rates	0	0	0	0	0		

FORM	ITR-6	INDIAN INCOME TAX RETURN [For Companies other than companies claiming exemption under section 11] (Please see Rule 12 of the Income-tax Rules,1962) (Please refer instructions)		Assessment Year					
				2	0	2	2	-	2
Schedule CYLA									
Details of Income after Set off of current year losses									
CURRENT YEAR LOSS ADJUSTMENT	Sl.No	Head/ Source of Income	Income of current year (Fill this column only if income is zero or positive)	House property loss of the current year set off	Business Loss (other than speculation or specified business loss) of the current year set off	Other sources loss (other than loss from race horses and amount chargeable to special rate of tax) of the current year set off	Current year's income remaining after set off		
			1	2	3	4	5=1-2-3-4		
	i	Loss to be set off (Fill this row only, if computed figure is negative)		0	0	0			
	ii	House property	0		0	0	0		
	iii	Business (excluding Income from life insurance business u/s 115B speculation income and income from specified business)	2,62,008	0		0	2,62,008		
	iv	Income from life insurance business u/s 115B	0	0		0	0		
	v	Speculation income	0	0		0	0		
	vi	Specified business income u/s 35AD	0	0		0	0		
	vii	Short-term capital gain taxable @ 15%	0	0	0	0	0		
	viii	Short-term capital gain taxable @ 30%	0	0	0	0	0		
	ix	Short-term capital gain taxable at applicable rates	0	0	0	0	0		
	x	Short-term capital gain taxable at special rates in India as per DTAA	0	0	0	0	0		
	xi	Long term capital gain taxable @ 10%	0	0	0	0	0		
	xii	Long term capital gain taxable @ 20%	0	0	0	0	0		
	xiii	Long term capital gains taxable at special rates in India as per DTAA	0	0	0	0	0		
	xiv	Net income from other sources chargeable at normal applicable rates	1,54,292	0	0		1,54,292		
	xv	Profit from the activity of owning and maintaining race horses	0	0	0	0	0		
	xvi	Income from other sources taxable at special rates in India as per DTAA	0	0	0	0	0		
	xvii	Total loss set off		0	0	0			
	xviii	Loss remaining after set-off (i – xvii)		0	0	0			

FORM	ITR-6	INDIAN INCOME TAX RETURN [For Companies other than companies claiming exemption under section 11] (Please see Rule 12 of the Income-tax Rules,1962) (Please refer instructions)				Assessment Year					
		2	0	2	2	-	2	3			
Schedule BFLA		Details of Income after Set off of Brought Forward Losses of earlier years									
Sl. No.	Head/ Source of Income	Income after set off, if any, of current year's losses as per 5 of Schedule CYLA)	Brought forward loss set off	Brought forward depreciation set off	Brought forward allowance under section 35 (4) set off	Current year's income remaining after set off					
		1	2	3	4	5					
i	House property	0	0	0	0	0					
ii	Business (excluding Income from life insurance business u/s 115B speculation income and income from specified business)	2,62,008	0	0	0	2,62,008					
iii	Profit and gains from life insurance business u/s 115B	0	0	0	0	0					
iv	Speculation Income	0	0	0	0	0					
v	Specified Business Income	0	0	0	0	0					
vi	Short-term capital gain taxable @ 15%	0	0	0	0	0					
vii	Short-term capital gain taxable @ 30%	0	0	0	0	0					
viii	Short-term capital gain taxable at applicable rates	0	0	0	0	0					
ix	Short-term capital gain taxable at special rates in India as per DTAA	0	0	0	0	0					
		1976									

BROUGHT FORWARD LOSS ADJUSTMENT	x	Long-term capital gain taxable @ 10%	0	0	0	0	0
	xi	Long-term capital gain taxable @ 20%	0	0	0	0	0
	xii	Long term capital gains taxable at special rates in India as per DTAA	0	0	0	0	0
	xiii	Net income from other sources chargeable at normal applicable rates	1,54,292	0	0	1,54,292	
	xiv	Profit from owning and maintaining race horses	0	0	0	0	0
	xv	Income from other sources income taxable at special rates in India as per DTAA	0	0	0	0	0
	xvi	Total of brought forward loss set off	0	0	0	0	
	xvii	Current year's income remaining after set off Total of (5i + 5ii + 5iii + 5iv+ 5v + 5vi + 5vii + 5viii + 5ix + 5x + 5xi +5xii +5xiii+ 5xiv + 5xv)					4,16,300

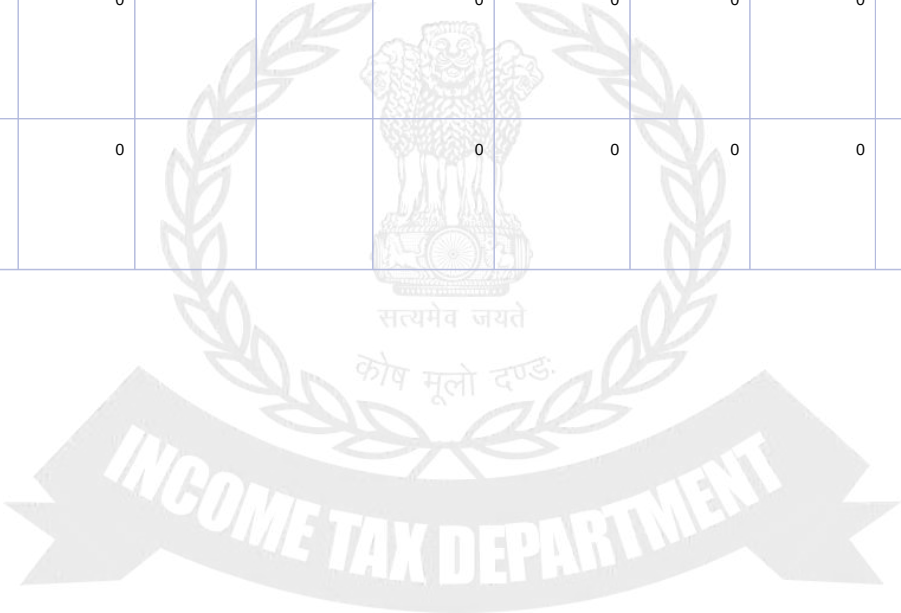
FORM	ITR-6	INDIAN INCOME TAX RETURN [For Companies other than companies claiming exemption under section 11] (Please see Rule 12 of the Income-tax Rules, 1962) (Please refer instructions)						Assessment Year					
		2	0	2	2	-	2	3					

Schedule CFL

Details of Losses to be carried forward to future years

CARRY FORWARD OF LOSS	Sl. No.	Assessment Year	Date of Filing (DD/MMM /YYYY)	House Property Loss	Loss from business other than loss from speculative business and specified business			Loss from speculative business	Loss from specified business	Loss from life insurance business u/s 115B	Short-term Capital Loss	Long-term Capital Loss	Loss from owning and maintaining race horses
					Brought forward Business Loss	Amount as adjusted on account of opting for taxation u/s 115BAA	Brought forward Business Loss available for set off during the year						
	1	2	3	4	5a	5b	5c=5a-5b	6	7	8	9	10	11
	i	2010-11							0				
	ii	2011-12							0				
	iii	2012-13							0				
	iv	2013-14							0				
	v	2014-15		0	0	0	0		0	0	0	0	
	vi	2015-16		0	0	0	0		0	0	0	0	
	vii	2016-17		0	0	0	0		0	0	0	0	
	viii	2017-18		0	0	0	0		0	0	0	0	
	ix	2018-19		0	0	0	0	0	0	0	0	0	0
	x	2019-20		0	0	0	0	0	0	0	0	0	0
	xi	2020-21		0	0	0	0	0	0	0	0	0	0
	xii	2021-22		0	0	0	0	0	0	0	0	0	0
	xiii	Total of earlier year losses b/f		0			0	0	0	0	0	0	0
xiv	Adjustment of above losses in schedule BFLA		0			0	0	0	0	0	0	0	
xv	2022-23 (Current year losses)		0			0	0	0	0	0	0	0	
xvi	Current year loss distributed among the unit-holder		0								0	0	0
							1978						

	(Applicable for Investment fund only)												
xvii	Current year losses to be carried forward (xv-xvi)		0			0	0	0	0	0	0	0	0
xviii	Total loss Carried forward to future years (xiii-xiv+xvii)		0			0	0	0	0	0	0	0	0



FORM	ITR-6	INDIAN INCOME TAX RETURN [For Companies other than companies claiming exemption under section 11] (Please see Rule 12 of the Income-tax Rules,1962) (Please refer instructions)				Assessment Year					
						2	0	2	2	-	2

Schedule UD

Unabsorbed depreciation and allowance under section 35(4)

Sl No	Assessment Year	Depreciation				Allowance under section 35(4)		
		Amount of brought forward unabsorbed depreciation	Amount as adjusted on account of opting for taxation section 115BAA	Amount of depreciation set-off against the current year income	Balance carried forward to the next year	Amount of brought forward unabsorbed allowance	Amount of allowance set-off against the current year income	Balance Carried forward to the next year
(1)	(2)	(3)	(3a)	(4)	(5)	(6)	(7)	(8)
i	2022-23				0			0
	Total	0	0	0	0	0	0	0

FORM	ITR-6	INDIAN INCOME TAX RETURN [For Companies other than companies claiming exemption under section 11] (Please see Rule 12 of the Income-tax Rules,1962) (Please refer instructions)		Assessment Year					
				2	0	2	2	-	2
Schedule ICDS									
Effect of Income Computation Disclosure Standards on profit									
Sl.No.	ICDS						Amount (+) or (-)		
(i)	(ii)						(iii)		
I	Accounting Policies						0		
II	Valuation of Inventories (other than the effect of change in method of valuation u/s 145A, if the same is separately reported at col. 4d or 4e of Part A-OI)						0		
III	Construction Contracts						0		
IV	Revenue Recognition						0		
V	Tangible Fixed Assets						0		
VI	Changes in Foreign Exchange Rates						0		
VII	Government Grants						0		
VIII	Securities (other than the effect of change in method of valuation u/s 145A, if the same is separately reported at col. 4d or 4e of Part A-OI)						0		
IX	Borrowing Costs						0		
X	Provisions, Contingent Liabilities and Contingent Assets						0		
11a.	Total effect of ICDS adjustments on profit (I+II+III+IV+V+VI+VII+VIII+IX+X) (if positive)						0		
11b.	Total effect of ICDS adjustments on profit (I+II+III+IV+V+VI+VII+VIII+IX+X) (if negative)						0		

FORM	ITR-6	INDIAN INCOME TAX RETURN [For Companies other than companies claiming exemption under section 11] (Please see Rule 12 of the Income-tax Rules,1962) (Please refer instructions)			Assessment Year						
					2	0	2	2	-	2	3
Schedule 10AA Deduction under section 10AA											
Deductions in respect of units located in Special Economic Zone											
DEDUCTION U/S 10AA											
	SI	Undertaking	Assessment year in which unit begins to manufacture/produce /provide services					Amount of deduction			
		Total deduction under section 10AA								0	

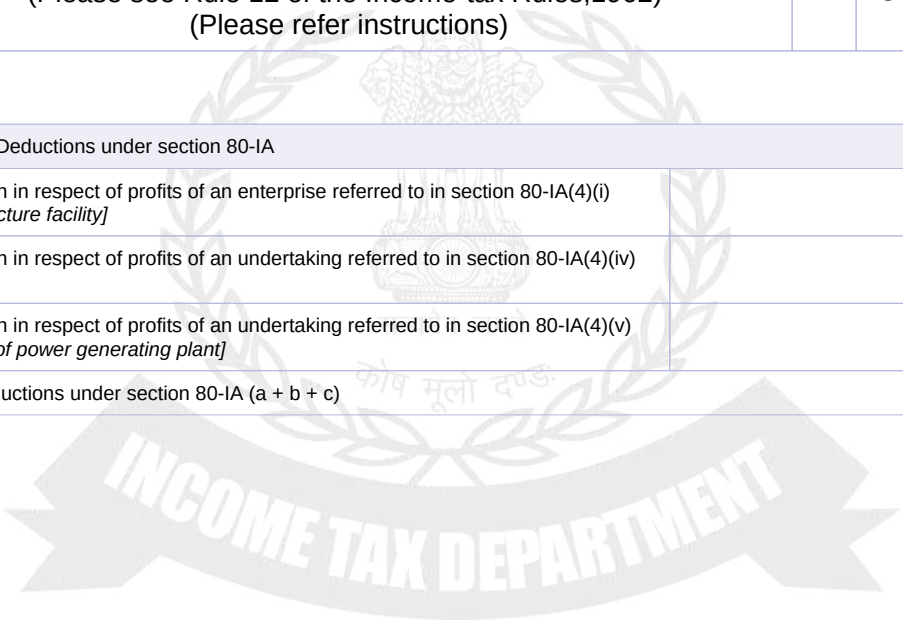
FORM	ITR-6	INDIAN INCOME TAX RETURN [For Companies other than companies claiming exemption under section 11] (Please see Rule 12 of the Income-tax Rules,1962) (Please refer instructions)				Assessment Year					
						2	0	2	2	-	2

Schedule 80G		Details of donations entitled for deduction under section 80G									
DETAILS OF DONATIONS	A	Donations entitled for 100% deduction without qualifying limit									
		Name and address of Donee		PAN of Donee		Amount of donation				Eligible Amount of donation	
						Donation in cash		Donation in other mode		Total Donation	
		Total				0		0		0	
	B	Donations entitled for 50% deduction without qualifying limit									
		Name and address of Donee		PAN of Donee		Amount of donation				Eligible Amount of donation	
						Donation in cash		Donation in other mode		Total Donation	
		Total				0		0		0	
	C	Donations entitled for 100% deduction subject to qualifying limit									
		Name and address of Donee		PAN of Donee		Amount of donation				Eligible Amount of donation	
						Donation in cash		Donation in other mode		Total Donation	
		Total				0		0		0	
	D	Donations entitled for 50% deduction subject to qualifying limit									
		Name and address of Donee		PAN of Donee		Amount of donation				Eligible Amount of donation	
						Donation in cash		Donation in other mode		Total Donation	
	Total				0		0		0		
E	Total donations (A + B + C + D)								0		

FORM	ITR-6	INDIAN INCOME TAX RETURN [For Companies other than companies claiming exemption under section 11] (Please see Rule 12 of the Income-tax Rules,1962) (Please refer instructions)				Assessment Year					
						2	0	2	2	-	2
Schedule 80GGA											
Details of donations for scientific research or rural development											
Sl. No.	Relevant clause under which deduction is claimed (drop down to be provided)	Name and address of Donee	PAN of Donee	Amount of donation			Eligible Amount of donation				
				Donation in cash	Donation in other mode	Total Donation					
	Total donation			0	0	0	0				

FORM	ITR-6	INDIAN INCOME TAX RETURN [For Companies other than companies claiming exemption under section 11] (Please see Rule 12 of the Income-tax Rules,1962) (Please refer instructions)		Assessment Year					
				2	0	2	2	-	2
Schedule RA									
Details of donations to research associations etc. [deduction under sections 35(1)(ii) or 35(1)(ia) or 35(1)(iii) or 35(2AA)]									
Name and address of donee		PAN of Donee		Amount of donation				Eligible Amount of donation	
				Donation in cash		Donation in other mode		Total Donation	
Total				0		0		0	

FORM	ITR-6	INDIAN INCOME TAX RETURN [For Companies other than companies claiming exemption under section 11] (Please see Rule 12 of the Income-tax Rules,1962) (Please refer instructions)		Assessment Year					
				2	0	2	2	-	2
Schedule 80-IA		Deductions under section 80-IA							
DEDUCTION I/S 80-IA	a	Deduction in respect of profits of an enterprise referred to in section 80-IA(4)(i) [Infrastructure facility]							
	b	Deduction in respect of profits of an undertaking referred to in section 80-IA(4)(iv) [Power]							
	c	Deduction in respect of profits of an undertaking referred to in section 80-IA(4)(v) [Revival of power generating plant]							
	d	Total deductions under section 80-IA (a + b + c)						0	

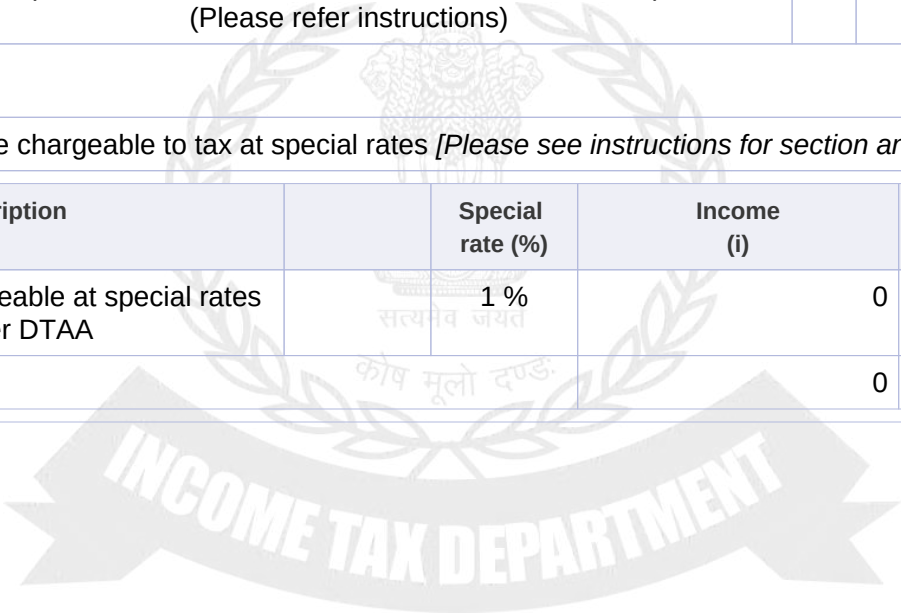


FORM	ITR-6	INDIAN INCOME TAX RETURN [For Companies other than companies claiming exemption under section 11] (Please see Rule 12 of the Income-tax Rules,1962) (Please refer instructions)		Assessment Year					
				2	0	2	2	-	2
Schedule 80-IB Deductions under section 80-IB									
a	Deduction in respect of industrial undertaking located in Jammu & Kashmir or Ladakh [Section 80-IB(4)]								
b	Deduction in the case of company carrying on scientific research [Section 80-IB(8A)]								
c	Deduction in the case of undertaking which begins commercial production or refining of mineral oil [Section 80-IB(9)]								
d	Deduction in the case of an undertaking developing and building housing projects [Section 80-IB(10)]								
e	Deduction in the case of an undertaking engaged in processing, preservation and packaging of fruits, vegetables, meat, meat products, poultry, marine or dairy products [Section 80-IB(11A)]								
f	Deduction in the case of an undertaking engaged in integrated business of handling, storage and transportation of food grains [Section 80-IB (11A)]								
g	Total deduction under section 80-IB (Total of a to f)		0						

FORM	ITR-6	INDIAN INCOME TAX RETURN [For Companies other than companies claiming exemption under section 11] (Please see Rule 12 of the Income-tax Rules,1962) (Please refer instructions)		Assessment Year					
				2	0	2	2	-	2
Schedule 80-IC or 80-IE									
DEDUCTION U/S 80-IC or 80-IE	a	Deduction in respect of undertaking located in Sikkim							
	b	Deduction in respect of undertaking located in Himachal Pradesh							
	c	Deduction in respect of undertaking located in Uttaranchal							
	d	Deduction in respect of undertaking located in North-East							
	da	Assam							
	db	Arunachal Pradesh							
	dc	Manipur							
	dd	Mizoram							
	de	Meghalaya							
	df	Nagaland							
	dg	Tripura							
	dh	Total deduction for undertakings located in North-east (total of da to dg)						dh	0
e	Total deduction under section 80-IC or 80-IE (a + d + c + dh)							e	0

FORM	ITR-6	INDIAN INCOME TAX RETURN [For Companies other than companies claiming exemption under section 11] (Please see Rule 12 of the Income-tax Rules,1962) (Please refer instructions)			Assessment Year							
					2	0	2	2	-	2	3	
Schedule VI-A Deductions under Chapter VI-A												
TOTAL DEDUCTION	1	Part B- Deduction in respect of certain payments										
	a	80G			0			0				
	b	80GGB			0			0				
	c	80GGA			0			0				
	d	80GGC			0			0				
	Total Deduction under Part B (a + b + c +d)			1			0			0		
	2	Part C- Deduction in respect of certain incomes										
	e	80-IA			0			0				
	f	80-IAB			0			0				
	g	80-IAC			0			0				
	h	80-IB			0			0				
	i	80-IBA			0			0				
	j	80-IC/ 80-IE			0			0				
	k	80JJA			0			0				
	l	80JJAA			0			0				
	m	80LA(1)			0			0				
	n	80LA(1A)			0			0				
	o	80M- Details of distribution of dividend as provided in e-filing utility			0			0				
		A	Schedule OS			0			0			
		B	Schedule BP			0			0			
	p	80-PA			0			0				
	Total Deduction under Part C (total of e to p)			2			0			0		
	3	Total deductions under Chapter VI-A (1 + 2)			3			0			0	

FORM	ITR-6	INDIAN INCOME TAX RETURN [For Companies other than companies claiming exemption under section 11] (Please see Rule 12 of the Income-tax Rules,1962) (Please refer instructions)			Assessment Year					
					2	0	2	2	-	2
Schedule SI Income chargeable to tax at special rates <i>[Please see instructions for section and rate of tax]</i>										
SPECIAL RATE	SI No.	Section/ Description		Special rate (%)	Income (i)	Tax thereon (ii)				
	1	STCG Chargeable at special rates in India as per DTAA		1 %	0	0				
		Total			0	0				

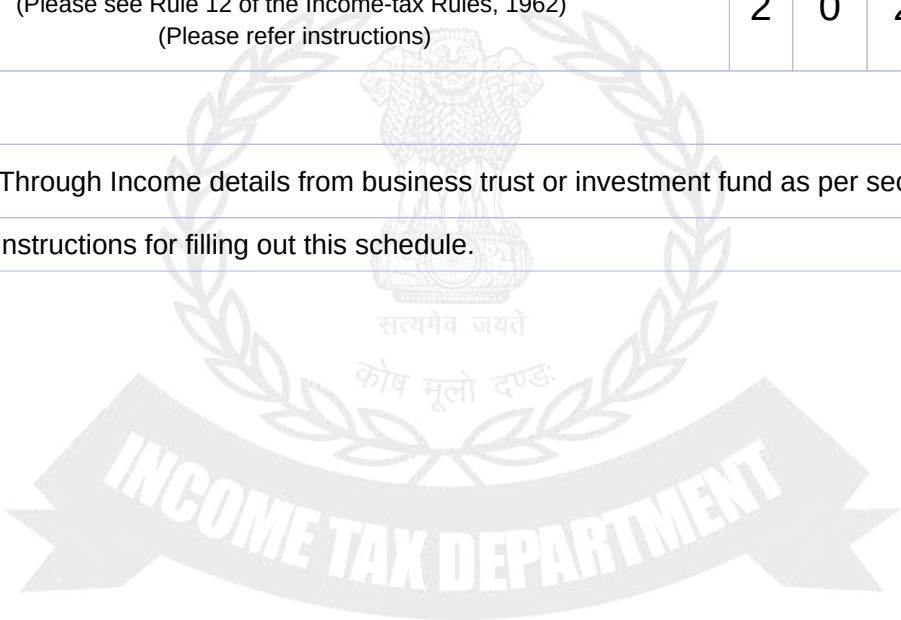


FORM	ITR-6	INDIAN INCOME TAX RETURN (For individuals and HUFs having income from profits and gains of business or profession) (Please see Rule 12 of the Income-tax Rules,1962) (Please refer instructions)					Assessment Year																					
							2	0	2	2	-	2	3															
Schedule IF														Information regarding investment in unincorporated entities														
ENTITIES IN WHICH INVESTMENT IS HELD	Number of entities in which investment is held																											
	SI No	Name of the entity	Type of the entity	PAN of the entity	Whether the entity is liable for audit? (Yes /No)	Whether section 92E is applicable to entity? (Yes/ No)	Percentage Share in the profit of the entity	Amount of share in profit		Capital balance on 31st March in the entity																		
								i	ii																			
	Total							0		0																		

FORM	ITR-6	INDIAN INCOME TAX RETURN [For Companies other than companies claiming exemption under section 11] (Please see Rule 12 of the Income-tax Rules,1962) (Please refer instructions)					Assessment Year					
		2	0	2	2	-	2	3				

Schedule EI		Details of Exempt Income (Income not to be included in Total Income or not chargeable to tax)										
EXEMPT INCOME	1	Interest income								1	0	
	2	i	Gross Agricultural receipts (other than income to be excluded under rule 7A, 7B or 8 of I.T. Rules)					i	0			
		ii	Expenditure incurred on agriculture					ii	0			
		iii	Unabsorbed agricultural loss of previous eight assessment years					iii	0			
		iv	Agricultural income portion relating to Rule 7, 7A, 7B(1), 7B(1A) and 8 (from Sl. No. 40 of Sch. BP)					iv	0			
		v	Net Agricultural income for the year (i – ii – iii+iv) (enter nil if loss)					2	0			
		vi	In case the net agricultural income for the year exceeds Rs.5 lakh, please furnish the following details (Fill up details separately for each agricultural land)									
		Sl. No.	Name of district along with pin code in which agricultural land is located			Measurement of agricultural land in acre		Whether the agricultural land is owned or held on lease?		Whether the agricultural land is irrigated or rain-fed?		
	3	Other exempt income (please specify)										
		Sl. No.	Nature of Income		Acknowledgement Number		Form Filled		Description		Amount	
		Total								0		
4	Income not chargeable to tax as per DTAA											
	Sl. No.	Nature of income		Country/Region name & Code		Article of DTAA		Head of Income		Whether TRC obtained (Y/N)		Amount of income
		Total Income from DTAA not chargeable to tax										0
5	Pass through income not chargeable to tax (Schedule PTI)										5	0
6	Total (1 + 2 + 3+ 4 + 5)										6	0

FORM	ITR6	INDIAN INCOME TAX RETURN [For Companies other than companies claiming exemption under section 11] (Please see Rule 12 of the Income-tax Rules, 1962) (Please refer instructions)	Assessment Year						
			2	0	2	2	-	2	3
Schedule PTI									
Pass Through Income details from business trust or investment fund as per section 115UA, 115UB									
Note: Please refer to the instructions for filling out this schedule.									



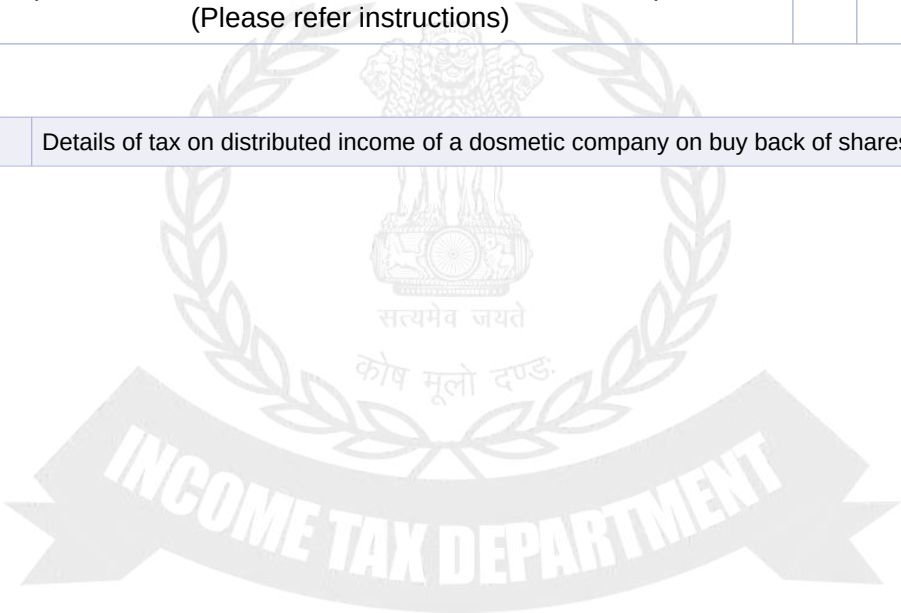
FORM	ITR-6	INDIAN INCOME TAX RETURN [For Companies other than companies claiming exemption under section 11] (Please see Rule 12 of the Income-tax Rules,1962) (Please refer instructions)		Assessment Year					
				2	0	2	2	-	2
Schedule MAT		Computation of Minimum Alternate Tax payable under section 115JB							
	1	Whether the Profit and Loss Account is prepared in accordance with the provisions of Parts II of Schedule III to the Companies Act, 2013 (If yes, write "Y", if no write "N")						Yes	No
	2	If 1 is no, whether profit and loss account is prepared in accordance with the provisions of the Act governing such company (If yes, write "Y", if no write "N")						Yes	No
	3	Whether, for the Profit and Loss Account referred to in item 1 above, the same accounting policies, accounting standards and same method and rates for calculating depreciation have been followed as have been adopted for preparing accounts laid before the company at its annual general body meeting? (If yes, write "Y", if no write "N")						Yes	No
	4	Profit after tax as shown in the Profit and Loss Account (enter item 56 of Part A-P&L) / (enter item 56 of Part A- P&L Ind AS) (as applicable)						4	0
	5	Additions (if debited in profit and loss account)							
	a	Income-tax paid or payable or its provision including the amount of deferred tax and the provision thereof	5a					0	
	b	Reserve (except reserve under section 33AC)	5b					0	
	c	Provisions for unascertained liability	5c					0	
	d	Provisions for losses of subsidiary companies	5d					0	
	e	Dividend paid or proposed	5e					0	
	f	Expenditure related to exempt income under sections 10, 11 or 12 [exempt income excludes income exempt under section 10(38)]	5f					0	
	g	Expenditure related to share in income of AOP/ BOI on which no income-tax is payable as per section 86	5g					0	
	h	Expenditure in case of foreign company referred to in clause (fb) of explanation 1 to section 115JB	5h					0	
	i	Notional loss on transfer of certain capital assets or units referred to in clause (fc) of explanation 1 to section 115JB	5i					0	
	j	Expenditure relatable to income by way of royalty in respect of patent chargeable to tax u/s 115BBF	5j					0	

Minimum Alternate Tax		k	Depreciation attributable to revaluation of assets	5k	0			
		l	Gain on transfer of units referred to in clause (k) of explanation 1 to section 115JB	5l	0			
		m	Others (including residual unadjusted items and provision for diminution in the value of any asset)	5m	0			
		n	Total additions (5a+5b+5c+5d+5e+5f+5g+5h+5i+5j+5k+5l+5m)			5n	0	
	6	Deductions						
		a	Amount withdrawn from reserve or provisions if credited to Profit and Loss account	6a	0			
		b	Income exempt under sections 10, 11 or 12 [exempt income excludes income exempt under section 10(38)]	6b	0			
		c	Amount withdrawn from revaluation reserve and credited to profit and loss account to the extent it does not exceed the amount of depreciation attributable to revaluation of asset	6c	0			
		d	Share in income of AOP/ BOI on which no income-tax is payable as per section 86 credited to Profit and Loss account	6d	0			
		e	Income in case of foreign company referred to in clause (iid) of explanation 1 to section 115JB	6e	0			
		f	Notional gain on transfer of certain capital assets or units referred to in clause (iie) of explanation 1 to section 115JB	6f	0			
		g	Loss on transfer of units referred to in clause (iif) of explanation 1 to section 115JB	6g	0			
		h	Income by way of royalty referred to in clause (iig) of explanation 1 to section 115JB	6h	0			
		i	Loss brought forward or unabsorbed depreciation whichever is less or both as may be applicable	6i	0			
		j	Profit of sick industrial company till net worth is equal to or exceeds accumulated losses	6j	0			
		k	Others (including residual unadjusted items and the amount of deferred tax credited to P&L A/c)	6k	0			
		l	Total deductions (6a+6b+6c+6d+6e+6f+6g+6h+6i+6j+6k)	6l	0			
				1995				

7	Book profit under section 115JB (4+ 5n – 6l)			7	0
8	Whether the financial statements of the company are drawn up in compliance to the Indian Accounting Standards (Ind-AS) specified in Annexure to the companies (Indian Accounting Standards) Rules, 2015. If yes, furnish the details below:-		yes No		
	A. Additions to book profit under sub-sections (2A) to (2C) of section 115JB				
a	Amounts credited to other comprehensive income in statement of profit & loss under the head "items that will not be reclassified to profit & loss"	8a	0		
b	Amounts debited to the statement of profit & loss on distribution of non-cash assets to shareholders in a demerger	8b	0		
c	One fifth of the transition amount as referred to in section 115JB (2C)	8c	0		
d	Others (including residual adjustment)	8d	0		
e	Total additions (8a + 8b + 8c + 8d)	8e	0		
	B. Deductions from book profit under sub-sections (2A) to (2C) of section 115JB				
f	Amounts debited to other comprehensive income in statement of profit & loss under the head "items that will not be reclassified to profit & loss"	8f	0		
g	Amounts credited to the statement of profit & loss on distribution of non-cash assets to shareholders in a demerger	8g	0		
h	One fifth of the transition amount as referred to in section 115JB (2C)	8h	0		
i	Others (including residual adjustment)	8i	0		
j	Total deductions (8f + 8g + 8h + 8i)	8j	0		
9	Deemed total income under section 115JB (7 + 8e – 8j)			9	0
a	Deemed total income from Units located in IFSC, if any	9a	0		
b	Deemed total income from other Units (9-9a)	9b	0		
10	Tax payable under section 115JB [(9% of (9a) + 15% of (9b))]			10	0

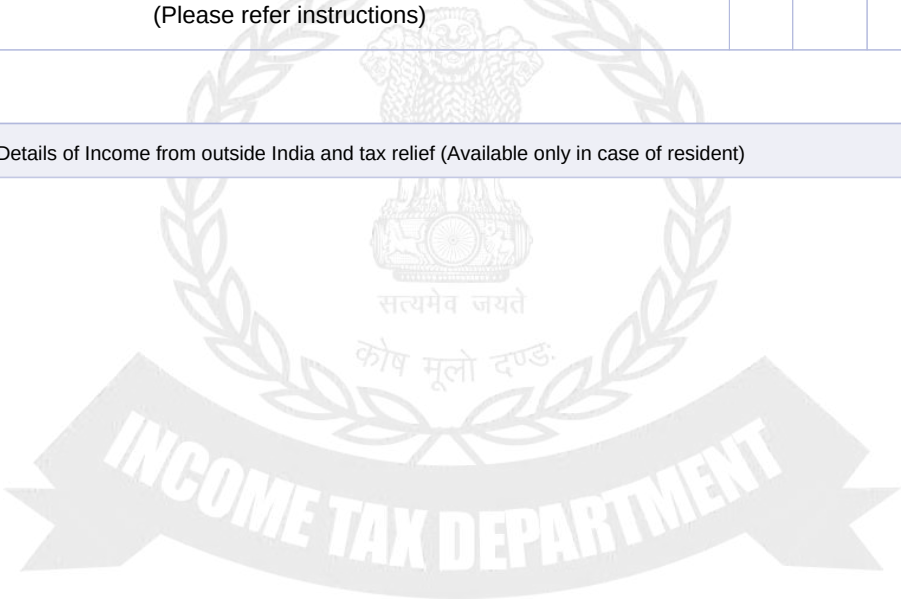
FORM	ITR-6	INDIAN INCOME TAX RETURN [For Companies other than companies claiming exemption under section 11] (Please see Rule 12 of the Income-tax Rules,1962) (Please refer instructions)				Assessment Year						
						2	0	2	2	-	2	3
Schedule MATC												
Computation of tax credit under section 115JAA												
MAT CREDIT	1	Tax under section 115JB in assessment year 2022-23 (1d of Part-B-TTI)					1	0				
	2	Tax under other provisions of the Act in assessment year 2022-23 (2f of Part-B-TTI)					2	1,04,775				
	3	Amount of tax against which credit is available [enter (2 – 1) if 2 is greater than 1, otherwise enter 0]					3	1,04,775				
	4	Utilisation of MAT credit Available [Sum of MAT credit utilised during the current year is subject to maximum of amount mentioned in 3 above and cannot exceed the sum of MAT Credit Brought Forward]										
		S.No	Assessment Year (A)	MAT Credit			MAT Credit Utilised during the Current Year (C)		Balance MAT Credit Carried Forward (D)= (B3) – (C)			
				Gross (B1)	Set-off in earlier years (B2)	Balance Brought forward (B3) = (B2)-(B1)						
		xv	2022-23 [(SI no 1-SI no 2 of)-(SI No 6c -2f of Schedule Part BTTI, only if positive)]	0					0			
		xvi	Total	0	0	0	0		0			
	5	Amount of tax credit under section 115JAA utilized during the year [enter 4(C)xvi]					5	0				
	6	Amount of MAT liability available for credit in subsequent assessment years [enter 4(D)xvi]					6	0				

FORM	ITR-6	INDIAN INCOME TAX RETURN [For Companies other than companies claiming exemption under section 11] (Please see Rule 12 of the Income-tax Rules,1962) (Please refer instructions)	Assessment Year					
			2	0	2	2	-	2
Schedule BBS								
Details of tax on distributed income of a dosmetic company on buy back of shares								



FORM	ITR-6	INDIAN INCOME TAX RETURN [For Companies other than companies claiming exemption under section 11] (Please see Rule 12 of the Income-tax Rules,1962) (Please refer instructions)				Assessment Year						
						2	0	2	2	-	2	3
Schedule TPSA												
Details of Tax on secondary adjustments as per section 92CE(2A) as per the schedule provided in e-filing utility												
TAX ON SECONDARY ADJUSTMENTS AS PER SECTION 92CE(2A)	1	Amount of primary adjustment on which option u/s 92CE(2A) is exercised & such excess money has not been repatriated within the prescribed time (please indicate the total of adjustments made in respect of all the AYS)									0	
	2	a	Additional Income tax payable @ 18% on above									0
		b	Surcharge @ 12% on "a"									0
		c	Health & Education cess on (a+b)									0
		d	Total Additional tax payable (a+b+c)									0
	3	Taxes paid									0	
	4	Net tax payable (2d-3)									0	
		Date(s) of deposit of tax on secondary adjustments as per section 92CE(2A) (5)		Name of Bank and Branch (6)		BSR Code (7)	Serial number of challan (8)		Amount deposited (9)			
	Amount Deposited									0		

FORM	ITR6	INDIAN INCOME TAX RETURN [For Companies other than companies claiming exemption under section 11] (Please see Rule 12 of the Income-tax Rules, 1962) (Please refer instructions)	Assessment Year					
			2	0	2	2	-	2
Schedule FSI		Details of Income from outside India and tax relief (Available only in case of resident)						



FORM	ITR-6	INDIAN INCOME TAX RETURN [For Companies other than companies claiming exemption under section 11] (Please see Rule 12 of the Income-tax Rules,1962) (Please refer instructions)			Assessment Year					
					2	0	2	2	-	2

Schedule TRSummary of tax relief claimed for taxes paid outside India (Available only in case of resident)

TAX RELIEF FOR TAX PAID OUTSIDE INDIA	1	Details of Tax relief claimed				
		Country /Region Code	Tax Identification Number	Total taxes paid outside India (total of (c) of Schedule FSI in respect of each country)	Total tax relief available (total of (e) of Schedule FSI in respect of each country)	Section under which relief claimed (specify 90, 90A or 91)
		(a)	(b)	(c)	(d)	(e)
		Total		0	0	
	2	Total Tax relief available in respect of country where DTAA is applicable (section 90/90A) (Part of total of 1(d))				0
	3	Total Tax relief available in respect of country where DTAA is not applicable (section 91) (Part of total of 1(d))				0
	4	Whether any tax paid outside India, on which tax relief was allowed in India, has been refunded/credited by the foreign tax authority during the year? If yes, provide the details below				
	a	Amount of tax refunded		0	b	Assessment year in which tax relief allowed in India

Note: Please refer to the instructions for filling out this schedule.

FORM	ITR-6	INDIAN INCOME TAX RETURN [For Companies other than companies claiming exemption under section 11] (Please see Rule 12 of the Income-tax Rules,1962) (Please refer instructions)								Assessment Year									
		2	0	2	2	-	2	3											
Schedule FA														Details of Foreign Assets and Income from any source outside India					
A1														Details of Foreign Depository Accounts held (including any beneficial interest) at any time during the calendar year ending as on 31st December, 2021					
SI No	Country /Region name	Country /Region code	Name of financial institution	Address of financial institution	ZIP Code	Account Number	Status	Account opening date	Peak balance during the period	Closing balance	Gross interest paid/credited to the account during the period								
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)								
A2														Details of Foreign Custodial Accounts held (including any beneficial interest) at any time during the calendar year ending as on 31st December, 2021					
SI No	Country /Region name	Country /Region code	Name of financial institution	Address of financial institution	ZIP Code	Account Number	Status	Account opening date	Peak balance during the period	Closing balance	Gross amount paid/credited to the account during the period (drop down to be provided specifying nature of amount viz. interest /dividend/proceeds from sale or redemption of financial assets/ other income)								
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)								
A3														Details of Foreign Equity and Debt Interest held (including any beneficial interest) in any entity at any time during the calendar year ending as on 31st December, 2021					
SI No	Country /Region name	Country /Region code	Name of entity	Address of entity	ZIP Code	Nature of entity	Date of acquiring the interest	Initial value of the investment	Peak value of investment during the period	Closing value	Total gross amount paid /credited with respect to the holding during the period	Total gross proceeds from sale or redemption of investment during the period							
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)							
A4														Details of Foreign Cash Value Insurance Contract or Annuity Contract held (including any beneficial interest) at any time during the calendar year ending as on 31st December, 2021					
SI No	Country /Region name	Country /Region code	Name of financial institution in which insurance contract held			Address of financial institution		ZIP Code	Date of contract	The cash value or surrender value of the contract		Total gross amount paid/credited with respect to the contract during the period							
(1)	(2)	(3)	(4)			(5)		(6)	(7)	(8)		(9)							
B														Details of Financial Interest in any Entity held (including any beneficial interest) at any time during the calendar year ending as on 31st December, 2021					
SI No	Country/Region Name and Code	ZIP Code	Nature of entity	Name and Address of the Entity	Nature of Interest- Direct/ Beneficial owner /Beneficiary		Date since held	Total Investment (at cost) (in rupees)	Income accrued from such Interest	Nature of Income	Income taxable and offered in this return								
											Amount	Schedule where offered	Item number of schedule						
(1)	(2a)	(2b)	(3)	(4)	(5)		(6)	(7)	(8)	(9)	(10)	(11)	(12)						
C														Details of Immovable Property held (including any beneficial interest) at any time during the calendar year ending as on 31st December, 2021					
SI No	Country/Region Name and Code	ZIP Code	Address of the property	Ownership-Direct/ Beneficial owner/ Beneficiary		Date of acquisition	Total Investment (at cost) (in rupees)	Income derived from the property	Nature of Income	Income taxable and offered in this return									
										Amount	Schedule where offered	Item number of schedule							
(1)	(2a)	(2b)	(3)	(4)		(5)	2002	(7)	(8)	(9)	(10)	(11)							

D		Details of any other Capital Asset held (including any beneficial interest) at any time during the calendar year ending as on 31st December, 2021										
SI No	Country/Region Name and Code	ZIP Code	Nature of Asset	Ownership-Direct/ Beneficial owner/ Beneficiary	Date of acquisition	Total Investment (at cost) (in rupees)	Income derived from the asset	Nature of Income	Income taxable and offered in this return			
									Amount	Schedule where offered	Item number of schedule	
(1)	(2a)	(2b)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	
E		Details of account(s) in which you have signing authority held (including any beneficial interest) at any time during the calendar year ending as on 31st December, 2021 and which has not been included in A to D above.										
SI No	Name of the Institution in which the account is held	Address of the institution	Country /Region Name & Code	ZIP Code	Name of the account holder	Account Number	Peak Balance /Investment during the year (in rupees)	Whether income accrued is taxable in your hands?	If (7) is yes, Income accrued in the account	If (7) is yes, Income offered in this return		
										Amount	Schedule where offered	Item number of schedule
(1)	(2)	(3a)	(3b)	(3c)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
F		Details of trusts, created under the laws of a country outside India, in which you are a trustee, beneficiary or settlor										
SI No	Country /Region Name and Code	ZIP Code	Name and address of the trust	Name and address of the trustees	Name and address of the Settlor	Name and address of the Beneficiaries	Date since position held	Whether income derived is taxable in your hands?	If (8) is yes, Income derived from the trust	If (8) is yes, Income offered in this return		
										Amount	Schedule where offered	Item number of schedule
(1)	(2a)	(2b)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
G		Details of any other income derived from any source outside India which is not included in,- (i) items A to F above and, (ii) income under the head business or profession										
SI No	Country/Region Name and Code	ZIP Code	Name and address of the person from whom derived	Income derived	Nature of income	Whether taxable in your hands?	If (6) is yes, Income offered in this return					
							Amount	Schedule where offered	Item number of schedule			
(1)	(2a)	(2b)	(3)	(4)	(5)	(6)	(7)	(8)	(9)			

Note : Please refer to instructions for filling out this schedule

FORM	ITR-6	INDIAN INCOME TAX RETURN [For Companies other than companies claiming exemption under section 11] (Please see rule 12 of the Income-tax Rules,1962) (Please refer instructions)						Assessment Year					
		2	0	2	2	-	2	3					
SCHEDULE SH-1 SHAREHOLDING OF UNLISTED COMPANY (other than a company that is registered under section 8 of the Companies Act, 2013 (or section 25 of the Companies Act, 1956) or a company limited by guarantee under section 3(2) of Companies Act, 2013 or a start-up for which Schedule SH-2 is to be filled up)													
If you are an unlisted company, please furnish the following details:													
Details of shareholding at the end of the previous year सत्यमेव जयते													
Sl.No	Name of the shareholder	Residential status in India	Type of share	Others	PAN/Aadhaar No.	Date of allotment	Number of shares held	Face value per share	Issue Price per share	Amount received			
i	Terance Alex	Resident	Equity Share		AGUPA1453H /	14-Feb-2014	9000	10	10	90,000			
ii	Jimmy Siluvayyan	Resident	Equity Share		CKBPS9118J /	14-Feb-2014	1000	10	10	10,000			
iii	Terance Alex	Resident	Equity Share		AGUPA1453H /	28-Jan-2019	90000	10	10	9,00,000			
Details of equity share application money pending allotment at the end of the previous year													
Sl. No	Name of the applicant	Residential status in India	Type of share	Others	PAN/Aadhaar No.	Date of application	Number of shares applied for	Application money received	Face value per share	Proposed issue price			
Details of shareholders who is not a shareholder at the end of the previous year but was a shareholder at any time during the previous year													
Sl. No	Name of the shareholder	Residential status in India	Type of share	PAN /Aadhaar No.	Number of shares held	Face value per share	Issue Price per share	Amount received	Date of allotment	Date on which cease to be shareholder	Mode of cessation	In case of transfer/sale, PAN /Aadhaar of the new shareholder	

FORM	ITR-6	INDIAN INCOME TAX RETURN [For Companies other than companies claiming exemption under section 11] (Please see rule 12 of the Income-tax Rules,1962) (Please refer instructions)	Assessment Year					
			2	0	2	2	-	2

SCHEDULE SH-2

SHAREHOLDING OF START-UPS

If you are a start-up which has filed declaration in Form-2 under para 5 of DPIIT notification dated 19.02.2019, please furnish the following details of shareholding:

Details of shareholding as at the end of the previous year

Name of the shareholder	Category of shareholder (drop down to be provided- non-resident/ venture capital company/ venture capital fund/ specified company/ any other person)	Type of share	Others	PAN /Aadhaar No.	Date of allotment	Number of shares held	Face value per share	Issue Price per share	Paid up value per share	Share premium
-------------------------	--	---------------	--------	------------------	-------------------	-----------------------	----------------------	-----------------------	-------------------------	---------------

Details of share application money pending allotment as at the end of the previous year

Name of the applicant	Category of applicant (drop down to be provided- non-resident/ venture capital company/ venture capital fund/ specified company/ any other person)	Type of share	Others	PAN /Aadhaar No.	Date of application	Number of shares applied for	Face value per share	Proposed issue price per share	Share application money	Share application premium
-----------------------	--	---------------	--------	------------------	---------------------	------------------------------	----------------------	--------------------------------	-------------------------	---------------------------

Details of shareholder who is not a shareholder at the end of the previous year but was a shareholder at any time during the previous year

Name of the shareholder	Category of shareholder (drop down to be provided- non-resident/ venture capital company/ venture capital fund/ specified company/ any other person)	Type of share	Others	PAN /Aadhaar No.	Date of allotment	Number of shares held	Face value per share	Issue Price per share	Paid up value per share	Date on which ceased to be shareholder	Mode of cessation	In case of transfer, PAN/Aadhaar of the new shareholder
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Note: For definition of expressions– “venture capital company”, “venture capital fund” and “specified company”, please refer DPIIT notification dated 19.02.2019.

FORM

ITR-6

INDIAN INCOME TAX RETURN
[For Companies other than companies claiming exemption under section 11]
(Please see Rule 12 of the Income-tax Rules,1962)
(Please refer instructions)

Assessment Year
2022 - 23

Schedule AL-1Assets and liabilities as at the end of the year (mandatorily required to be filled up by an unlisted company) (other than a start-up for which Schedule AL-2 is to be filled up)

DETAILS OF ASSETS AND LIABILITIES

A

Details of building or land appurtenant there to, or both, being a residential house

Sl.No	Address	Pin Code	Date of Acquisition	Cost of acquisition Rs.	Purpose for which used (dropdown to be provided)
(1)	(2)	(3)	(4)	(5)	(6)

B

Details of land or building or both not being in the nature of residential house

Sl.No	Address	Pin Code	Date of Acquisition	Cost of acquisition Rs.	Purpose for which used (dropdown to be provided)
(1)	(2)	(3)	(4)	(5)	(6)

C

Details of listed equity shares

Opening Balance			Shares acquired during the year			Shares transferred during the year			Closing balance		
Number of Shares	Type of shares	Cost of acquisition	Number of Shares	Type of shares	Cost of acquisition	Number of Shares	Type of shares	Sale consideration	Number of Shares	Type of shares	Cost of acquisition
1	2	3	4	5	6	7	8	9	10	11	12

D

Details of unlisted equity shares

Name of Company	PAN	Opening Balance		Shares acquired during the year					Shares transferred during the year		Closing balance	
		No. of Shares	Cost of acquisition	No. of Shares	Date of subscription/ purchase	Face value per share	Issue price per share (in case of fresh issue)	Purchase price per share (in case of purchase from existing shareholder)	No. of Shares	Sale consideration	No. of Shares	Cost of acquisition

E

Details of other securities

Type of securities	Others	Whether listed or unlisted	Opening Balance		Securities acquired during the year					Securities transferred during the year		Closing balance	
			No. of Securities	Cost of acquisition	No. of Securities	Date of subscription/ purchase	Face value per share	Issue price of security (in case of fresh issue)	Purchase price per security (in case of purchase from existing shareholder)	No. of Securities	Sale consideration	No of Securities	Cost of acquisition

F

Details of capital contribution to other entity

Name of entity	PAN	Opening Balance	Amount contributed during the year	Amount withdrawn during the year	Amount of profit/loss/ dividend/interest debited or credited during the year	Closing balance
----------------	-----	-----------------	------------------------------------	----------------------------------	--	-----------------

G

Details of Loans & Advances to any other concern (If money lending is not assessee's substantial business)

Name of the person	PAN	Opening Balance	Amount received	Amount paid	Interest debited, if any	Closing balance	Rate of interest (%)
--------------------	-----	-----------------	-----------------	-------------	--------------------------	-----------------	----------------------

H

Details of motor vehicle, aircraft, yacht or other mode of transport

Particulars of asset	Others	Registration number of vehicle	Cost of acquisition	Date of acquisition	Purpose for which used (dropdown to be provided)
Motor vehicle		KI-01-cf-7008	23,69,322	05-Apr-2018	Own Business Use
Motor vehicle		KI-01-ca-6529	3,95,494	19-Jul-2018	Own Business Use
Motor vehicle		KI-01-ca-8310	3,87,512	19-Jul-2018	Own Business Use
Motor vehicle		KL-01-BJ-8129	38,000	10-Aug-2019	Own Business Use
Motor vehicle		KL-01-CN-7008	8,62,051	29-Jan-2020	Own Business Use
Motor vehicle		KL-01-CU-2672	6,67,736	01-Mar-2022	Own Business Use
Motor vehicle		KL-01-CU-2521	4,53,196	28-Feb-2022	Own Business Use
Motor vehicle		KL-01-CU-2556	4,60,478	28-Feb-2022	Own Business Use
Motor vehicle		KL-01-CS-2855	3,44,090	07-Jul-2021	Own Business Use

I

Details of Jewellery, archaeological collections, drawings, paintings, sculptures, any work of art or bullion

Particulars of asset	Others	Quantity	Cost of acquisition	Date of acquisition	Purpose of use (dropdown to be provided)
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	J	Details of liabilities						
	Details of loans, deposits and advances taken from a person other than financial institution							
	Name of the person	PAN	Opening Balance	Amount received	Amount paid	Interest debited, if any	Closing balance	Rate of interest (%)



FORM	ITR-6	INDIAN INCOME TAX RETURN [For Companies other than companies claiming exemption under section 11] (Please see Rule 12 of the Income-tax Rules,1962) (Please refer instructions)	Assessment Year					
			2	0	2	2	-	2

Schedule AL2 Assets and liabilities as at the end of the year(applicable for start-ups only)

If you are a start-up which has filed declaration in Form-2 under para 5 of DPIIT notification dated 19.02.2019, please furnish the following information for the period from the date of incorporation upto end of the year;-

A

Details of building or land appurtenant there to, or both, being a residential house acquired since incorporation.

Sl.No	Address	Pin Code	Date of acquisition	Cost of acquisition Rs.	Purpose for which used (dropdown to be provided)	Whether transferred on or before the end of the previous year, if Yes date of transfer
(1)	(2)	(3)	(4)	(5)	(6)	(7)

B

Details of land or building or both not being a residential house acquired since incorporation.

Sl.No	Address	Pin Code	Date of acquisition	Cost of acquisition Rs.	Purpose for which used (dropdown to be provided)	Whether transferred on or before the end of the previous year, if Yes date of transfer
(1)	(2)	(3)	(4)	(5)	(6)	(7)

C

Details of Loans & Advances made since incorporation(If lending of money is not assessee's substantial business)

Sl. No	Name of the Person	PAN	Date on which loans and advances has been made	Amount of loans and advances	Amount	Whether loans and advances has been repaid, if Yes date of such repayment	Closing balance as at the end of the previous year, if any	Rate of interest, if any
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D

Details of capital contribution made to any other entity since incorporation

Sl. No	Name of entity	PAN	Date on which capital contribution has been made	Amount of contribution	Amount withdrawn, if any	Amount of profit/loss/ dividend/ interest debited or credited	Closing balance as at the end of the previous year, if any
--------	----------------	-----	--	------------------------	--------------------------	---	--

E

Details of acquisition of shares and securities

Sl. No	Name of company/entity	PAN	Type of shares /securities	Others	Number of shares /securities	Cost of acquisition	Date of acquisition	Whether transferred, if Yes date of transfer	Closing balance as the end of the previous year, if any
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F

Details of motor vehicle, aircraft, yacht or other mode of transport, the actual cost of which exceeds ten lakh rupees acquired since incorporation

Sl. No	Particulars of asset	Others	Registration number of vehicle	Cost of acquisition	Date of acquisition	Purpose for which used (dropdown to be provided)	Whether transferred, if Yes date of transfer
--------	----------------------	--------	--------------------------------	---------------------	---------------------	--	--

G

Details of Jewellery acquired since incorporation

Sl. No	Particulars of asset	Description	Quantity	Cost of acquisition	Date of acquisition	Purpose for which used (dropdown to be provided)	Whether transferred, if Yes date of transfer	Closing balance as at the end of the previous year, if any
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	

H

Details of archaeological collections, drawings, paintings, sculptures, any work of art or bullion acquired since incorporation

Sl. No	Particulars of asset	Others	Quantity	Cost of acquisition	Date of acquisition	Purpose for which used (dropdown to be provided)	Whether transferred, if Yes date of transfer	Closing balance as at the end of the previous year, if any
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)

I

Details of liabilities

Details of loans, deposits and advances taken from a person other than financial institution

Sl.No	Name of the person	PAN	Opening Balance	Amount received	Amount paid	Interest credited, if any	Closing balance	Rate of interest (%)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)

NOTE: Please refer to instructions for filling out this schedule.
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FORM	ITR-6	INDIAN INCOME TAX RETURN [For Companies other than companies claiming exemption under section 11] (Please see Rule 12 of the Income-tax Rules, 1962) (Please refer instructions)		Assessment Year						
				2	0	2	2	-	2	3
Schedule GST		INFORMATION REGARDING TURNOVER/GROSS RECEIPT REPORTED FOR GST								
DETAILS OF GST	Sl.No.	GSTIN No(s).		Annual value of outward supplies as per the GST return(s) filed						
	(1)	(2)		(3)						
	1	32AABCW4979N2ZO		6,28,49,293						
		Total		6,28,49,293						
Note: Please furnish the information above for each GSTIN No. separately										

FORM	ITR-6	INDIAN INCOME TAX RETURN [For Companies other than companies claiming exemption under section 11] (Please see rule 12 of the Income-tax Rules,1962) (Please refer instructions)		Assessment Year					
				2	0	2	2	-	2
Schedule FD Break-up of payments/receipts in Foreign currency (to be filled up by the assessee who is not liable to get accounts audited u/s 44AB)									
Foreign Currency Transaction	S.No.	Foreign Currency Transaction				Amount (in Rs.)			
	i	Payments made during the year on capital account				0			
	ii	Payments made during the year on revenue account				0			
	iii	Receipts during the year on capital account				0			
	iv	Receipts during the year on revenue account				0			
	NOTE	Please refer to instructions for filling out this schedule.							

FORM	ITR-6	INDIAN INCOME TAX RETURN [For Companies other than companies claiming exemption under section 11] (Please see Rule 12 of the Income-tax Rules,1962) (Please refer instructions)		Assessment Year					
				2	0	2	2	-	2
Part B – TI Computation of total income									
1	Income from house property (4 of schedule HP)(enter nil if loss)			1	0				
2	Profits and gains from business or profession								
	i	Profits and gains from business other than speculative business and specified business (A39 of schedule BP)(enter nil if loss)	2i	2,62,008					
	ii	Profits and gains from speculative business (3 (ii) of Table E of schedule BP)(enter nil if loss and take the figure of schedule CFL)	2ii	0					
	iii	Profits and gains from specified business (3 (iii) of Table E of schedule BP)(enter nil if loss and take the figure of schedule CFL)	2iii	0					
	iv	Income chargeable to tax at special rate (3d and 3e & 3iv of Table E of schedule BP)	2iv	0					
	v	Total (2i + 2ii + 2iii + 2iv)	2v	2,62,008					
3	Capital gains								
	a	Short term							
	i	Short-term chargeable @ 15% (9ii of item E of schedule CG)	ai	0					
	ii	Short-term chargeable @ 30% (9iii of item E of schedule CG)	a ii	0					
	iii	Short-term chargeable at applicable rate (9iv of item E of schedule CG)	a iii	0					
	iv	Short-term chargeable at special rates in India as per DTAA (9v of item E of schedule CG)	a iv	0					
	v	Total Short-term (ai + a ii + a iii + a iv) (enter nil if loss)	3av	0					
	b	Long term							
	i	Long-term chargeable @ 10% (9vi of item E of schedule CG)	bi	0					
	ii	Long-term chargeable @ 20% (9vii of item E of schedule CG)	b ii	0					
	iii	Long-term chargeable at special rates in India as per DTAA (9viii of item E of schedule CG)	b iii	0					
	iv	Total Long-term (bi + b ii + b iii)(enter nil if loss)	3bi	0					

TOTAL INCOME	c	Total capital gains (3av + 3biv) (enter nil if loss)	3c	0
	4	Income from other sources		
	a	Net income from other sources chargeable to tax at normal applicable rates (6 of schedule OS)(enter nil if loss)	4a	1,54,292
	b	Income chargeable to tax at special rate (2 of schedule OS)	4b	0
	c	Income from the activity of owning and maintaining race horses (8e of schedule OS) (enter nil if loss)	4c	0
	d	Total (4a + 4b + 4c)	4d	1,54,292
	5	Total of head wise income (1 + 2v + 3c +4d)	5	4,16,300
	6	Losses of current year to be set off against 5 (total of 2xvii,3xvii and 4xvii of schedule CYLA)	6	0
	7	Balance after set off of current year losses (5 – 6) (Also total of (ii,iii,v to xv of column 5 of schedule CYLA + 4b + 2iv)	7	4,16,300
	8	Brought forward losses to be set off against 7 (total of 2xvi,3xvi and 4xvi of schedule BFLA)	8	0
	9	Gross Total income (7 - 8) Field Total of column 5 of Schedule Sch BFLA+4b+2iv- 2e of schedule OS - 3iv of Table E of schedule BP)	9	4,16,300
	10	Income chargeable to tax at special rate under section 111A, 112, 112A etc. included in 9	10	0
	11	Deductions under Chapter VI-A		
	a	Part-B of Chapter VI-A [1 of schedule VI-A and limited upto total of (i, ii,iv,v,vii,xii,xiv) of column 5 of schedule BFLA]	11a	0
	b	Part-C of Chapter VI-A [2 of schedule VI-A]	11b	0
	c	Total (11a + 11b) [limited upto (9-10)]	11c	0
	12	Deduction u/s 10AA (Total sch. 10AA)	12	0
	13	Total income (9 - 11c - 12)	13	4,16,300
	14	Income chargeable to tax at special rates (total of (i) of schedule SI)	14	0
	15	Income chargeable to tax at normal rates (13-14)	15	4,16,300
	16	Net agricultural income (2v of schedule EI)	16	0
	17	Losses of current year to be carried forward (total of xvii of Schedule CFL)	17	0
	18	Deemed total income under section 115JB (9 of schedule MAT)	18	0

FORM	ITR-6	INDIAN INCOME TAX RETURN [For Companies other than companies claiming exemption under section 11] (Please see Rule 12 of the Income-tax Rules,1962) (Please refer instructions)		Assessment Year						
				2	0	2	2	-	2	3
Part B – TTI Computation of tax liability on total income										
COMPUTATION OF TAX LIABILITY	1	a	Tax payable on deemed total income under section 115JB (10 of Schedule MAT)					1a	0	
		b	Surcharge on (a) above (if applicable)					1b	0	
		c	Health & Education Cess @ 4% on (1a+1b) above					1c	0	
		d	Total Tax Payable u/s 115JB (1a+1b+1c)					1d	0	
	2	Tax payable on total income								
		a	Tax at normal rates on 15 of Part B-TI			2a	91,586			
		b	Tax at special rates (total of col. (ii) of Schedule-SI)			2b	0			
		c	Tax Payable on Total Income (2a+2b)					2c	91,586	
		d	Surcharge							
			i	25% of 16(ii) of Schedule SI			2di	0		
			ii	on[(2c) -(16(ii) of Schedule SI)]			2dii	9,159		
			iii	Total (i+ii)			2diii	9,159		
		e	Health and Education Cess @ 4% on (2c+2diii)					2e	4,030	
		f	Gross tax liability (2c + 2diii + 2e)					2f	1,04,775	
	3	Gross tax payable (higher of 1d or 2f)							3	1,04,775
	4	Credit under section 115JAA of tax paid in earlier years (if 2f is more than 1d) (5 of Schedule AMTC)							4	0
	5	Tax payable after credit under section 115JAA [(3 - 4)]							5	1,04,775
	6	Tax relief								
		a	Section 90/90A (2 of Schedule TR)			6a	0			
		b	Section 91 (3 of Schedule TR)			6b	0			
		c	Total (6a + 6b)					6c	0	
	7	Net tax liability (5 – 6c) (enter zero, if negative)							7	1,04,775
	8	Interest and fee payable								
		a	Interest for default in furnishing the return (section 234A)			8a	0			
	b	Interest for default in payment of advance tax (section 234B)			8b	0				
	c	Interest for deferment of advance tax (section 234C)			8c	0				
	d	Fee for default in furnishing return of income (section 234F)			8d	0				
	e	Total Interest and Fee Payable (8a+8b+8c+8d)					8e	0		
9	Aggregate liability (7 + 8e)							9	1,04,775	
10		Taxes Paid					2014			

TAXES PAID AND BANK DETAILS	a	Advance Tax (from column 5 of 15A)			10a	0	
	b	TDS (total of column 9 of 15B)			10b	2,66,763	
	c	TCS (total of column 7 of 15C)			10c	7,294	
	d	Self-Assessment Tax (from column 5 of 15A)			10d	0	
	e	Total Taxes Paid (10a+10b+10c+10d)			10e	2,74,057	
11	Amount payable(9-10e) (Enter if 9 is greater than 10e, else enter 0)					11	0
12	Refund (If 10e is greater than 9) (refund, if any, will be directly credited into the bank account)					12	1,69,280
BANK ACCOUNT	13	Do you have a bank account in India (Non- Residents claiming refund with no bank account in India may select No)					Yes No
	a) Details of all Bank Accounts held in India at any time during the previous year (excluding dormant accounts)						
	Sl.	IFS Code of the Bank in case of Bank Accounts held in India		Name of the Bank	Account Number	Indicate the account in which you prefer to get your refund credited, if any (tick one account)	
	i	SBIN0007211		State bank of india	33708912624		
	Note: 1) Minimum one account should be selected for refund credit 2) In case of refund, multiple accounts are selected for refund credit, then refund will be credited to one of the account decided by CPC after processing the return b) Non- residents, who are claiming income-tax refund and not having bank account in India may, at their option, furnish the details of one foreign bank account:						
	Sl. No.	SWIFT Code	Name of the Bank		Country/Region of Location		IBAN
14	Do you at any time during the previous year,- (i) hold, as beneficial owner, beneficiary or otherwise, any asset (including financial interest in any entity) located outside India; or (ii) have signing authority in any account located outside India; or (iii) have income from any source outside India? [applicable only in case of a resident] [Ensure Schedule FA is filled up if the answer is Yes]						Yes No

FORM	ITR-6	INDIAN INCOME TAX RETURN [For Companies other than companies claiming exemption under section 11] (Please see rule 12 of the Income-tax Rules,1962) (Please refer instructions)				Assessment Year										
		2	0	2	2	-	2	3								
15	TAX PAYMENTS															
A	Details of payments of Advance Tax and Self-Assessment Tax															
ADVANCE / SELF ASSESSMENT TAX	SI No	BSR Code	Date of Deposit (DD/MM/YYYY)	Serial Number of Challan				Amount (Rs)								
	(1)	(2)	(3)	(4)				(5)								
	Total								0							
	Note: Enter the totals of Advance tax and Self-Assessment tax in SI No. 10a & 10d of Part B-TT1															
B	Details of Tax Deducted at Source (TDS) on Income [As per Form 16A issued by Deductor(s)]															
SI No	TDS credit relating to self [other person as per rule 37BA(2)]	PAN/ Aadhaar No. of Other Person (if TDS credit related to other person)	TAN of the Deductor/ PAN/ Aadhaar No of Tenant/ Buyer	Unclaimed TDS brought forward (b/f)		TDS of the current Financial Year (TDS deducted during FY 2021-22)				TDS credit being claimed this Year (only if corresponding income is being offered for tax this year not applicable if TDS is deducted u/s 194N)				Corresponding Receipt /Withdrawals offered		TDS credit being carried forward
				Fin. Year in which deducted	TDS b/f	Deducted in own hands	Deducted in the hands of any other person as per rule 37BA(2) (if applicable)	Claimed in own hands	Claimed in the hands of any other person as per rule 37BA(2) (if applicable)			Gross Amount	Head of Income			
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)		(9)	(10)			(11)	(12)	(13)	
							Income	TDS		Income	TDS	PAN/ Aadhaar No.				
1	/	/	TVDA00193E		0	36,814	0	0	36,814	0	0	/	18,40,700	Income from Business & Profession	0	
2	/	/	TVDA00193E		0	4,070	0	0	4,070	0	0	/	40,700	Income from Business & Profession	0	
3	/	/	MRIC01389D		0	5,125	0	0	5,125	0	0	/	51,250	Income from Business & Profession	0	
4	/	/	TVDF00194F		0	17,027	0	0	17,027	0	0	/	8,51,350	Income from Business & Profession	0	
5	/	/	TVDK03554F		0	65,505	0	0	65,505	0	0	/	32,75,272	Income from Business & Profession	0	
6	/	/	CHNP03629D		0	74,832	0	0	74,832	0	0	/	37,41,591	Income from Business & Profession	0	
7	/	/	CHNP03629D		0	3,469	0	0	3,469	0	0	/	34,68,469	Income from Business & Profession	0	
8	/	/	TVDS00853G		0	5,624	0	0	5,624	0	0	/	2,81,196	Income from Business & Profession	0	
9	/	/	MUMS84120B		0	2,750	0	0	2,750	0	0	/	27,500	Income from Business & Profession	0	
10	/	/	CHNS02681A		0	4,126	0	0	4,126	0	0	/	2,06,261	Income from Business & Profession	0	
11	/	/	MUMS89575D		0	5,591	0	0	5,591	0	0	/	55,896	Income from Other Sources	0	
12	/	/	MRI08493C		0	4,125	0	0	4,125	0	0	/	41,250	Income from Business & Profession	0	

2016

13		/	CHNT00969D		0	9,840	0	0	9,840	0	0	/	98,396	Income from Other Sources	0
14		/	CHNT00969D		0	27,865	0	0	27,865	0	0	/	13,93,125	Income from Other Sources	0
TDS claimed in own hands (total of column 9)										2,66,763					
NOTE		Please enter total of column 9 in10b of Part B- TTI													
C		Details of Tax Deducted at Source (TDS) on Income [As per Form 16B/16C/16D furnished by Deductor(s)]													
SI No	TDS credit relating to self /other person [other person as per rule 37BA(2)]	PAN/ Aadhaar No. of Other Person (if TDS credit related to other person)	PAN/Aadhaar No. of the Buyer / Tenant	Unclaimed TDS brought forward (b/f)		TDS of the current Financial Year (TDS deducted during FY 2021-22)		TDS credit being claimed this Year (only if corresponding income is being offered for tax this year not applicable if TDS is deducted u/s 194N)				Corresponding Receipt /Withdrawals offered		TDS credit being carried forward	
				Fin. Year in which deducted	TDS b/f	Deducted in own hands	Deducted in the hands of any other person as per rule 37BA(2) (if applicable)	Claimed in own hands	Claimed in the hands of any other person as per rule 37BA(2) (if applicable)			Gross Amount	Head of Income		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)			(11)	(12)	(13)	
							Income	TDS		Income	TDS	PAN/ Aadhaar No.			
TDS claimed in own hands (total of column 9)										0					
Note: Please enter total of column 9 in11b of Part B- TTI															
D		Details of Tax Collected at Source (TCS) [As per Form 27D issued by the Collector(s)]													
TCS ON INCOME	SI No	Tax Deduction and Tax Collection Account Number of the Collector	Name of the Collector	Unclaimed TCS brought forward (b/f)		TCS of the current financial Year (TCS collected during the FY 2021-22)	Amount out of (5) or (6) being claimed this Year (only if corresponding Receipt is being offered for tax this year)				Amount out of (5) or (6) being carried forward				
				Fin. Year in which collected	Amount b/f										
	(1)	(2)	(3)	(4)	(5)	(6)	(7)				(8)				
	1	DELH12273C	HEYDAY VENTUR ES		0	7,294	7,294				0				
	TCS being claimed this year (total of column 7)										7,294				
Note: Please enter total of column (7) in 10c of Part B-TTI															

VERIFICATION

I, **JIMMY S** ,Son/daughter of **SILUVAYYAN**, solemnly declare that to the best of my knowledge and belief, the information given in the return and the schedules thereto is correct and complete is in accordance with the provisions of the Income-tax Act, 1961.

I further declare that I am making this return in my capacity as **Director** and I am also competent to make this return and verify it. I am holding permanent account number **CKBPS9118J** (if allotted)(Please see instruction)

I further declare that the critical assumptions specified in the agreement have been satisfied and all the terms and conditions of the agreement have been complied with. (Applicable, in a case where return is furnished under section 92CD)

Date : 01-Nov-2022

Sign here

2017



Petronet LNG Limited

Survey No. 347, Puthuvypu P.O.

Kochi - 682 508, India.

Tel: +91- 484 - 2757302 Fax: +91- 484-2502264

www.petronetlng.in

CIN L74899DL1998PLC093073

PAN: AAACP8148D. GST: 32AAACP8148D1ZP

COMPLETION CERTIFICATE

Name of Services/ Consultancy/Work	Design, Supply, Installation and Commissioning of 200 KWp Solar PV unit
Name of Contractor/ Consultant	M/s Wattsun Energy (India) Pvt Ltd
LOA No. and date	LOA: PLL/KOCHI/EL/SER/4852/ 2020-21/LOA dated 04.11.2020
Contractual Start Date	05.11.2020
Contractual Completion Date	19.12.2021
Actual Completion Date	31.03.2022
Awarded Value of Services/ consultancy/ Work	INR 1, 41, 93, 104/- (Rupees One Crore Forty One Lakhs Ninety Three Thousand One Hundred Four Only).
Executed Value of Services/ consultancy/ Work	INR 1, 34, 83, 448/- (Rupees One Crore Thirty Four Lakhs Eighty Three Thousand Four Hundred Forty Eight Only).

Place: Kochi

Date: 23.08.2022

Mithilesh Singh

General Manager (Electrical)



Registered & Corporate Office:

World Trade Centre, First Floor, Babar Road, Barakhamba Lane,
New Delhi - 110 001 (INDIA)

Tel: +91-11-23411411 / 23472525 Fax: +91-11-23472550

Dahej LNG Terminal:

GIDC Industrial Estate, Plot No. 7/A, Dahej Taluka: Vagra, Dist.
Bharuch - 392130 (Gujarat)

Tel: +91-2641-257249 Fax: +91-2641-257252

Government of Kerala
 Department of Electrical Inspectorate
 Office of the Deputy Chief Electrical Inspector
 Forth Floor, Corporation Building Vikas Bhavan PO
 Thiruvananthapuram 695033
 Phone: 04712934159,
 Email: deecitvm@gmail.com Website:
 www.ceikerala.gov.in



An IS 15700 : 2005 Certified Department

Proceedings of the
 Deputy Chief Electrical Inspector
 Thiruvananthapuram
Present: Rafiyuddin K K

Subject: Installation of 200 kWp Grid connected solar installation at the premises of M/s PMS COLLEGE OF DENTAL SCIENCE AND RESEARCH,, Vattappara, Thiruvananthapuram, 695028 - Sanction for energisation orders issued - regarding.

Reference:

1. Scheme Approval No. B5-08104/22/EIT dated 27.08.2022
2. Completion report submitted by WATTSUN ENERGY INDIA PVT. LTD., INTERNATIONAL AIRPORT ROAD, CHACKAI, Kerala, 695024 dated received on 27.10.2022
3. Inspection conducted on 03.11.2022

Order No: B5-08104/22/EIT Dated 09-11-2022

Sanction under Section 54 of The Electricity Act-2003, Regulation 32 of the CEA (Measures relating to Safety and Electric Supply) Regulations-2010, Central Electricity Authority (Technical Standards for connectivity of the Distributed Generation Resources) Regulations-2013 and Kerala State Electricity Regulatory Commission (Renewable Energy and Net Metering) Regulations 2020 is hereby accorded for energisation of the electrical installation covered under the Completion Report read as (2) above and installed at the premises of M/s PMS COLLEGE OF DENTAL SCIENCE AND RESEARCH,, Vattappara, Thiruvananthapuram, 695028 subject to following conditions and as detailed in the annexure appended



1. Supply from the Solar Panel should not be extended out of the premises.
2. Any addition or alteration to the existing installation shall be carried out only after getting prior written approval from this office.
3. The owner should rectify any defects that may be pointed out during subsequent inspection of the installation by the Electrical Inspector.
4. The whole installation should be in conformity with CEA (Technical Standards for connectivity of the distributed generation resources) Regulation, 2013 and and Kerala State Electricity Regulatory Commission (Renewable Energy and Net Metering) Regulations 2020 to ensure the safety of associated equipments and operating personnel at the premises as well as the KSEB personnel working on their system after switching off the grid supply. The protection incorporated in the solar in restore, switching off the output when grid supply is absent should be ensured by the owner of solar system and he/she would be solely responsible for any accident in case of failure violation of the same
5. Only authorised person shall be in charge of the operation and maintenance of the installation
6. Consent from licensee shall be obtained for this Solar installation

Solar PV Module

Make - AXITEC; Pmax - 550W; Voc - 49.8V; Isc - 13.96A

No.of Modules = 364Nos

STRING DETAILS

10 Strings with 15 PV modules each and 2 Strings with 16 PV modules each

PV INVERTER - 2 Nos

1. Make - Fronius; SI No.33422804; 100KVA

2. Make - Fronius; SI No.33422803; 100KVA

Deputy Chief Electrical Inspector



To:

Administrator
PMS College of Dental Science and Research,

Copy To:

- 1 WATTSUN ENERGY INDIA PVT. LTD., INTERNATIONAL AIRPORT ROAD, CHACKAI, Kerala, 695024
- 2 TERANCE ALEX, WATTSUN ENERGY INDIA PVT. LTD. AISWARYA TOWERS INTERNATIONAL AIRPORT ROAD, CHAKAI, THIRUVANANTHAPURAM,



Annexure (Order No: B5-08104/22/EIT Dated 10.11.2022)		
Items	Quantity(in numbers)	
Solar Inverter (100 kVA)		
SB Panel Name : ISOLATOR 1		
Incomer Isolator 200 Amps	1	
SB Panel Name : ISOLATOR 2		
Incomer Isolator 200 Amps	1	
SSB Panel Name : Solar ACDB		
Incomer MCCB 200 Amps	2	
Outgoing MCCB 400 Amps	1	
Earth Electrodes	4	
Inverter (150 kVA)	2	
Load Details HT Motor – 0 kW HT Capacitor – 0 kVAr Fire Pump Load – 0 kW Lift Load – 0 kW Other Load – 0 kW + 0 kVA + 0 kVAr		
Deputy Chief Electrical Inspector 		
This is a computer generated document. Signature is not required.		



സോളാർ പ്ലാന്റ് കണക്കുകൾ റിപ്പോർട്ട്

സെക്ഷൻ : Vattiyorkavu
 കൺസ്യൂമർ നമ്പർ : 1145093017180 (13 അക്കം)
 പേര് : Raveendran
 സ്റ്റാൻ നമ്പർ : 450100048
 സോളാർ കപ്പാസിറ്റി : 3Kwp കിലോവാട്ട്
 കണക്ട് ചെയ്ത ദിവസം : 9-11-2020
 സോളാർ മീറ്റർ ഇൻഷുൽ റീഡിംഗ് : -0-
 നെറ്റ് മീറ്റർ ഇൻഷുൽ റീഡിംഗ് : -0-

തീയതി : അസിസ്റ്റന്റ് എഞ്ചിനീയർ പേര് ROSHIN ALBERT

ഒപ്പ് Roshin Albert
20/11/2021

Assistant Engineer
 Electrical Section
 Vattiyorkavu
 Thiruvananthapuram

പകർപ്പ് :

ഡെപ്യൂട്ടി ചീഫ് എഞ്ചിനീയർ

എക്സിക്യൂട്ടീവ് എഞ്ചിനീയർ

സോളാർ പ്ലാന്റ് കണക്കുകൾ വിവരങ്ങൾ

സംയോജനം : Cantonment
 കൺസ്യൂമർ നമ്പർ : 1145065007027 (13 അക്കം)
 പേര് : FR. Mathew Karier Stovers Church
 സ്ഥിതി നമ്പർ : _____
 സോളാർ കപ്പാസിറ്റി : 10kWp കിലോവാട്ട്
 കണക്ക് ചെയ്ത ദിവസം : 3/09/2021
 സോളാർ മീറ്റർ ഇൻഷുൽ റീഡിംഗ് : -0-
 നെറ്റ് മീറ്റർ ഇൻഷുൽ റീഡിംഗ് : -0-

തീയതി : അസിസ്റ്റന്റ് എഞ്ചിനീയർ പേര് Vinay P

ഒപ്പ് : [Signature]

ചർച്ച :

ഡെപ്യൂട്ടി ചീഫ് എഞ്ചിനീയർ _____
 എക്സിക്യൂട്ടീവ് എഞ്ചിനീയർ _____

Assistant Engineer
 Electrical Section
 Cantonment, Tm-33

അനുബന്ധം-14

സോളാർ പ്ലാന്റ് കണക്കൻ വിവരങ്ങൾ

സംഭരണി: Contourment
കൺസ്യൂമർ നമ്പർ: 114063002220 (13 അക്കം)
പേര്: Hariboy Perenna
സ്റ്റീൽ നമ്പർ: _____
സോളാർ ക്യാപസിറ്റി: 5Kwp കിലോവാട്ട്
കണ്ടക്ട് ചെയ്ത തീയതി: 18-9-2021
സോളാർ മീറ്റർ ഇൻഷാൻ റിഡിംഗ്: -0-
ബാറ്റി മീറ്റർ ഇൻഷാൻ റിഡിംഗ്: -0-

തീയതി: അറിസ്റ്റർ ഏജൻസിയിൽ പേര് Vimal.PV

ഒപ്പ്: [Signature]
Assistant Engineer
Electrical Section
Calicut TTD-13

പങ്കാളി: _____
സോളാർ മീറ്റർ ഏജൻസിയിൽ _____
ബാറ്റി മീറ്റർ ഏജൻസിയിൽ _____

സോളാർ പ്ലാന്റ് കണക്കുകൾ റിപ്പോർട്ട്

സ്ഥലം: Contonment
 കൺസ്യൂമർ നമ്പർ: 1145064013996 (13 അക്കം)
 പേര്: George Varghese
 സ്കീം നമ്പർ: _____
 സോളാർ കപ്പാസിറ്റി: 10kw കിശോരവർഗ്ഗം
 കണക്ക് ചെയ്ത തീയതി: 6-7-2021
 സോളാർ മീറ്റർ ഇൻഷുറൻസ് റീഡിംഗ്: -0-
 ഗ്രാമ്പ് മീറ്റർ ഇൻഷുറൻസ് റീഡിംഗ്: -0-

തീയതി: _____
 അസിസ്റ്റന്റ് എഞ്ചിനീയർ പേര്: Vimalan

ഒപ്പ്: _____
[Signature]

പകർപ്പ്:

സോൾട്ടറി ഓഫ് എഞ്ചിനീയർ: _____

ഇൻസ്പെക്ടർ ഓഫ് എഞ്ചിനീയർ: _____

Assistant Engineer
 Electrical Section
 Contonment, Twp-33

Annexure to Order No: BS-03983/2021/EIT dated 17/12/2021

		Quantity (in numbers)
Solar Panel	50kWp	94 Nos.
PV modules: 540Wp Make: Trina Solar Maximum Power Voltage: 31.20V Maximum Power Current: 17.33A Open Circuit Voltage: 37.5V Short Circuit Current: 18.41A		1 st String= 18 Nos. 2 nd String= 18 Nos. 3 rd String= 18 Nos. 4 th String= 18 Nos. 5 th String= 22 Nos.
50kVA Inverter		1 No.
Inverter Details:- Make: ABB SI No: 2112116591, Vdc(Max) = (300-980)Vdc, Vdc(MPPT) = 480Vdc- 800Vdc Idc(Max) = 105A, Isc(Max) = 165A		
DC DB, 32A DC Iso		5 Nos.
AC Isolator for Inverter, 100A		1 No.
Solar Combiner Panel, 250A		2 Nos.
Solar Combiner Panel, 100A		1 No.
Earth Pits		2 Nos.


 Electrical Inspector




Government of Kerala
Department of Electrical Inspection
Office of the Deputy Chief Electrical Inspector
4th Floor, Corporation Buildings,
Vikar Bhavan P.O., Thiruvananthapuram 695 033.
Phone: 0471 2322934, Email: deci@vsnl.com



**Proceedings of the
Electrical Inspector, Thiruvananthapuram**

(Present: - P.K. Uthakumari)

Subject:- Installation of 1 No. 50KWp on Grid Solar Power Plant with 1 No. 50KVA Solar inverter and connected electric to the existing HT installation at the premise of M/s. Christ Nagar Senior Secondary School, Thiruvananthapuram - Sanction for energisation - orders issued - /EG/

Read:-

1. Scheme Approval No. BS-03983/2021/EIT dated 16/11/2021
2. Completion report No. 441 dated 05/07/2021 of M/s. Wattsun Energy (India) Pvt.Ltd. FF, Adawaya Towers, International Airport Road, Chekka, Thiruvananthapuram (CB-7809)
2. Inspection conducted on 09/12/2021
3. Balance fee remittance on 16/12/2021

Order No. BS-03983/2021/EIT dated 17/12/2021

Sanction under Section 54 of The Electricity Act, 2003 (Regulation 32 and 43(7) of the CEA (Measures relating to Safety and Electric Supply) Regulations-2010, Central Electricity Authority (Technical Standards for connectivity of the Distributed Generation Resources) Regulations-2013 and Kerala State Electricity Regulatory Commission (Renewable Energy and Net Metering) Regulations 2020 is hereby accorded for energisation of the electrical installation covered under the Completion Report read as 2nd above and installed at the premises of M/s. Christ Nagar Senior Secondary School, Thiruvananthapuram with the following specifications subject to the conditions mentioned here under

Conditions -

1. Supply from the Solar Panel should not be extended out of the premises
2. Any addition or alteration to the existing installation shall be carried out only after getting prior written approval from this office.
3. The owner should rectify any defects that may be pointed out during subsequent inspection of the installation by the Electrical Inspector.
4. Electricity duty for the units produced from this solar energy system should be remitted to the government.
5. Only authorised person shall be in charge of the operation and maintenance of the installation.
6. Power allocation for additional loads, if necessary, should be obtained from KSEB/Licensee.
7. Consent from licensee shall be obtained for this Solar installation.
8. The whole installation should be in conformity with CEA (Technical Standards for connectivity of the distributed generation resources) Regulation, 2013 and Kerala State Electricity Regulatory Commission (Renewable Energy and Net Metering) Regulations 2020 to ensure the safety of associated equipments and operating personnel at the premises as well as the KSEB personnel working on their system after switching off the grid supply. The protection incorporated in the solar inverter, switching off the output when grid supply is absent should be ensured by the owner of solar system and hence he would be safety responsible for any accident in case of failure violation of the same.

Load Details: Appended.

Electrical Inspector

To,

The Principal,

M/s. Christ Nagar Senior Secondary School, Thiruvananthapuram

2027

Annexure to Order No: BS-03983/2021/EIT dated 17/12/2021

		Quantity (in numbers)
Solar Panel	50kWp	94 Nos.
PV modules: 540Wp Make: Trina Solar Maximum Power Voltage: 31.20V Maximum Power Current: 17.33A Open Circuit Voltage: 37.5V Short Circuit Current: 18.41A		1 st String= 18 Nos. 2 nd String= 18 Nos. 3 rd String= 18 Nos. 4 th String= 18 Nos. 5 th String= 22 Nos.
50kVA Inverter		1 No.
Inverter Details:- Make: ABB SI No: 2112115591, Vdc(Max) = (300-980)Vdc, Vdc(MPPT) = 480Vdc- 800Vdc Idc(Max) = 105A, Isc(Max) = 165A		
DC DB, 32A DC Iso		5 Nos.
AC Isolator for Inverter, 100A		1 No.
Solar Combiner Panel, 250A		2 Nos.
Solar Combiner Panel, 100A		1 No.
Earth Pits		2 Nos.


 Electrical Inspector


സോളാർ പ്ലാന്റ് കണക്കുകൾ റിപ്പോർട്ട്

സെക്ഷൻ : Cantonment
 കൺസ്യൂമർ നമ്പർ : 1145064013996 (13 അക്കം)
 പേര് : George Varghese
 സ്കീം നമ്പർ : _____
 സോളാർ ക്യാപാസിറ്റി : 10kw കിരണവൽക്
 കണക്ക് ചെയ്ത തീയതി : 6-7-2021
 സോളാർ മീറ്റർ ഇൻഷുൽ റീഡിംഗ് : -0-
 ഗ്രാറ്റ് മീറ്റർ ഇൻഷുൽ റീഡിംഗ് : -0-

തീയതി : _____ അസിസ്റ്റന്റ് എഞ്ചിനീയർ പേര് Vinay P

ഒപ്പ് : _____

പകർപ്പ് :

സാമ്പത്തിക ഓഫീസ് എഞ്ചിനീയർ : _____

ഇൻസ്പെക്ടർ ഓഫീസ് എഞ്ചിനീയർ : _____

Assistant Engineer
 Electrical Section
 Cantonment, Twp-33

സോളാർ പ്ലാന്റ് കണക്കുകൾ റിപ്പോർട്ട്

ഉടമസ്ഥൻ : Vattiyoor Karu
 കൺസ്യൂമർ നമ്പർ : 1145093017180 (13 അക്കം)
 പേര് : Raveendran
 സ്റ്റാൻ നമ്പർ : 450100048
 സോളാർ കമ്പാസിറ്റി : 3 Kw കിലോവാട്ട്
 കണക്ക് ചെയ്ത ദിവസം : 9-11-2020
 സോളാർ മീറ്റർ ഇൻഷുറൻസ് റീഡിംഗ് : -0-
 നെറ്റ് മീറ്റർ ഇൻഷുറൻസ് റീഡിംഗ് : -0-

തീയതി : അസിസ്റ്റന്റ് എഞ്ചിനീയർ പേര് ROSHIN ALBERT

ഒപ്പ് Roshin Albert
20/11/2021

Assistant Engineer
 Electrical Section
 Vattiyoor Karu
 Thiruvananthapuram

പകർപ്പ് :

ഡെപ്യൂട്ടി ചീഫ് എഞ്ചിനീയർ
 എക്സിക്യൂട്ടീവ് എഞ്ചിനീയർ

സോളാർ പ്ലാന്റ് കണക്കുകൾ വിവരങ്ങൾ

പ്രദേശം: Mavelikara
പ്രദേശത്തിൻ്റെ നമ്പർ: 115532 500.1335 (13 അക്കം)
പേര്: Prithvi. Bishopnure College
പ്ലാൻ നമ്പർ: 50442 വിവരങ്ങൾ
പ്ലാന്റ് കമ്പൗണ്ട്: 12-11-2021
പ്ലാന്റ് കമ്പൗണ്ട് നമ്പർ: - 0 -
പ്ലാന്റ് കമ്പൗണ്ട് നമ്പർ: - 0 -



സംവിധാനം നൽകിയവർക്ക് മാത്രം: [Signature]
RANIL KUMAR B
ASSISTANT ENGINEER
ELECTRICAL SECTION
MAVELIKARA
തീയതി: 12-11-2021

പ്ലാന്റ് കമ്പൗണ്ട് നമ്പർ: _____
പ്ലാന്റ് കമ്പൗണ്ട് നമ്പർ: _____

സോളാർ പ്ലാന്റ് കണക്കുകൾ റിപ്പോർട്ട്

സൊളാർ : Pettah
 കൺസ്യൂമർ നമ്പർ : 1145144017425 (13 അക്കം)
 പേര് : John Antony Redricks
 സ്റ്റാൻ നമ്പർ : _____
 സോളാർ കമ്പാസിറ്റി : SKmp ഓരോന്നും
 കണക്ട് ചെയ്ത തീയതി : 19-03-2021
 സോളാർ മീറ്റർ ഇൻഷുറൻസ് റീഡിംഗ് : - 0 -
 നെറ്റ് മീറ്റർ ഇൻഷുറൻസ് റീഡിംഗ് : - 0 -

തീയതി : _____
 അസിസ്റ്റന്റ് എഞ്ചിനീയർ പേര് : Ajaye Kumar. K. S.

ഒപ്പ് : _____


പകർപ്പ് :
 ഡെപ്യൂട്ടി ചീഫ് എഞ്ചിനീയർ : _____
 എക്സിക്യൂട്ടീവ് എഞ്ചിനീയർ : _____

സോളാർ പ്ലാന്റ് കണക്കുകൾ റിപ്പോർട്ട്

സെക്ഷൻ : Vattiyonkavu
കൺസ്യൂമർ നമ്പർ : 1145892005402 (3 അക്കം)
പേര് : Vikraman Alwin
സ്കീം നമ്പർ : 450900047
സോളാർ കപ്പാസിറ്റി : 3Kwp കിലോവാട്ട്
കണക്ക് ചെയ്ത തീയതി : 9-11-2020
സോളാർ മീറ്റർ ഇൻഷുറൻസ് റീഡിംഗ് : -0-
നെറ്റ് മീറ്റർ ഇൻഷുറൻസ് റീഡിംഗ് : -0-

തീയതി : അസസ്സന്റ് എഞ്ചിനീയർ പേര് Rishi Albat

ഒപ്പ് Rishi Albat
20/4/2021
Assistant Engineer
Electrical Section
Vattiyonkavu
Thuvankulam

പകർപ്പ് :

ഡെപ്യൂട്ടി ചീഫ് എഞ്ചിനീയർ
എക്സിക്യൂട്ടീവ് എഞ്ചിനീയർ

അനുബന്ധം-14

ബാറ്ററിയുടെ പ്ലാറ്റ് കണക്കുകൾ വിവരങ്ങൾ

പേര്: Vellayambalam
കമ്പ്യൂട്ടർ നമ്പർ: 1145072004790 (13 അക്കങ്ങൾ)
പേര്: Kprthomas
സ്ഥലം: _____
ബാറ്ററിയുടെ ക്യാപാസിറ്റി: 7.5 KW മെട്രിക് വാട്ടർ
ബാറ്ററി പ്ലാറ്റ് തീയതി: 12-11-2021 2/12/2021
ബാറ്ററി മറ്റും ഇൻഷുറൻസ് നമ്പർ: -0-
ബാറ്ററി മറ്റും ഇൻഷുറൻസ് നമ്പർ: -0-



PEER
In-Charge
Vellayambalam

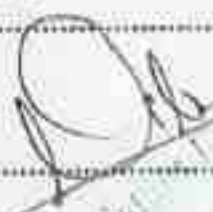
Mr. Prakash Kumar P

ബാറ്ററി മറ്റും ഇൻഷുറൻസ്
ബാറ്ററി മറ്റും ഇൻഷുറൻസ്

സോളാർ പ്ലാന്റ് കണക്കുകൾ റിപ്പോർട്ട്

സംയോജിത : U1100n
 കൺസ്യൂമർ നമ്പർ : 1145177016229 (13 അക്കം)
 പേര് : Rakhi S Alwin
 സ്റ്റിൽ നമ്പർ :
 സോളാർ കപ്പാസിറ്റി : 2.5 KW കിലോവാട്ട്
 കണക്ക് ചെയ്ത ദിവസം : 10.06.2021
 സോളാർ മീറ്റർ ഇൻഷുറൻസ് റിഡിംഗ് : -0-
 കമ്പ്ലൈൻഡ് മീറ്റർ ഇൻഷുറൻസ് റിഡിംഗ് : -0-

തീയതി : അസിസ്റ്റന്റ് എഞ്ചിനീയർ പേര്
 ഒപ്പ് :

Vibha V.S.

 Assistant Engineer
 Electrical Division
 KSEB-1000

പങ്കാളി :
 ഡെപ്യൂട്ടി മീറ്റർ എഞ്ചിനീയർ
 എക്സിക്യൂട്ടീവ് എഞ്ചിനീയർ

സോളാർ പ്ലാന്റ് കണക്കുകൾ റിപ്പോർട്ട്

സെക്ഷൻ : Villor
 കൺസ്യൂമർ നമ്പർ : 114120001158 (13 അക്കം)
 പേര് : Domen Ajay Jacob
 സ്റ്റിൽ നമ്പർ :
 സോളാർ കമ്പാസിറ്റി : 5 kw കിറോവാട്ട്
 കണക്ക് ചെയ്ത തീയതി : 8-01-2020
 സോളാർ മീറ്റർ ഇൻഷുൽ റീഡിംഗ് : -0-
 നെറ്റ് മീറ്റർ ഇൻഷുൽ റീഡിംഗ് : -0-

തീയതി : അസിസ്റ്റന്റ് എഞ്ചിനീയർ പേര് Vibin. V

ഒപ്പ് [Signature]
 Assistant Engineer
 Electrical Division

പകർപ്പ് :

ഡെപ്യൂട്ടി ചീഫ് എഞ്ചിനീയർ
 എക്സിക്യൂട്ടീവ് എഞ്ചിനീയർ

സോളാർ പ്ലാന്റ് കണക്കുകൾ നിർവ്വഹിച്ച്

തൊഴിലാളി :

കൺസ്യൂമർ നമ്പർ :

പേര്

സ്റ്റാൻ നമ്പർ :

സോളാർ കമ്പോസിറ്റി :

കണക്ക് ചെയ്ത തീയതി :

സോളാർ മീറ്റർ ഇൻഷുറൻസ് നിരവധി :

നെറ്റ് മീറ്റർ ഇൻഷുറൻസ് നിരവധി :

Kanayapuram

1145222015204

Resonance Convent

15 kwp

-0-

-0-

തീയതി :

അസിസ്റ്റന്റ് എഞ്ചിനീയർ പേര്

ഒപ്പ്

Judy ✓



Assistant Engineer
Electrical Section
KSEB Ltd.
Kanayapuram

പകർപ്പ് :

ഡെപ്യൂട്ടി ചീഫ് എഞ്ചിനീയർ

എക്സിക്യൂട്ടീവ് എഞ്ചിനീയർ

അനുബന്ധം-14

സോളാർ പ്ലാന്റ് കണക്കുകൾ റിപ്പോർട്ട്

സെക്ഷൻ :

കൺസ്യൂമർ നമ്പർ :

പേര് :

സ്റ്റാൻ നമ്പർ :

സോളാർ കപ്പാസിറ്റി :

കണക്ക് ചെയ്ത തീയതി :

സോളാർ മീറ്റർ ഇൻഷ്യൂർ റീഡിംഗ് :

നെറ്റ് മീറ്റർ ഇൻഷ്യൂർ റീഡിംഗ് :

Cantonment

114506.800240

Roger Oscar Christians

(13 അക്കം)

10Kwp

കിബോവാട്ട്

08/03/2021

-0-

-0-

ജിയോമെട്രി :

അസിസ്റ്റന്റ് എഞ്ചിനീയർ പേര്

സെ

Vinay P

[Signature]

Assistant Engineer
Electrical Section
Cantonment, Tm-33

ചുമതലപ്പട്ടി :

ഡെപ്യൂട്ടി ചീഫ് എഞ്ചിനീയർ

എക്സിക്യൂട്ടീവ് എഞ്ചിനീയർ

അനുബന്ധം-14

സോളാർ പ്ലാന്റ് കണക്കു രിപ്പോർട്ട്

സംരക്ഷൻ :

കൺസ്യൂമർ നമ്പർ :

പേര് :

സ്റ്റിൽ നമ്പർ :

സോളാർ കപ്പാസിറ്റി :

കണക്ക് ചെയ്ത തീയതി :

സോളാർ മീറ്റർ ഇൻഷുൽ റീഡിംഗ് :

ബാറ്ററി മീറ്റർ ഇൻഷുൽ റീഡിംഗ് :

Contenement
1145066011209
Sabu

(13 അക്കം)

5Kwp

കിരളാവട്ട

9/12/2020

-0-

-0-

തീയതി :

അസിസ്റ്റന്റ് എഞ്ചിനീയർ പേര്

Vimal .pv

ഒപ്പ്


Electrical Section
Contenment, Tm-33

പകർപ്പ് :

സംരക്ഷണ ചീഫ് എഞ്ചിനീയർ

എക്സിക്യൂട്ടീവ് എഞ്ചിനീയർ

സോളാർ പ്ലാന്റ് കണക്കുകൾ റിപ്പോർട്ട്

സെക്ഷൻ : Vattiyorkavu
 കൺസ്യൂമർ നമ്പർ : 1145095032126 (13 അക്കം)
 പേര് : Raghu
 സ്റ്റീൻ നമ്പർ : 450900059
 സോളാർ കമ്പോസിറ്റി : 5 kwp കിരണോദ്യമം
 കണക്ക് ചെയ്ത തീയതി : 5-3-2020
 സോളാർ മീറ്റർ ഇൻഷുറൻസ് റീഡിംഗ് : -0-
 നെറ്റ് മീറ്റർ ഇൻഷുറൻസ് റീഡിംഗ് : -0-

തീയതി : അസിസ്റ്റന്റ് എഞ്ചിനീയർ പേര് ROSHIN ALBERT

ഒപ്പ് Roshin Albert
20/4/2021
 Assistant Engineer
 Electrical Section
 Vattiyorkavu
 Thiruvananthapuram

പരിശോധന :

ഡെപ്യൂട്ടി ചീഫ് എഞ്ചിനീയർ
 എക്സിക്യൂട്ടീവ് എഞ്ചിനീയർ

സോളാർ പ്ലാന്റ് കണക്കുകൾ റിപ്പോർട്ട്

സെക്ഷൻ : Vattiyorkavu
 കൺസ്യൂമർ നമ്പർ : 1145095032126 (13 അക്കം)
 പേര് : Raghu
 സ്റ്റീൻ നമ്പർ : 450900059
 സോളാർ കമ്പോസിറ്റി : 5 kwp കിരണോദ്യമം
 കണക്ക് ചെയ്ത തീയതി : 5-3-2021
 സോളാർ മീറ്റർ ഇൻഷുറൻസ് റീഡിംഗ് : -0-
 നെറ്റ് മീറ്റർ ഇൻഷുറൻസ് റീഡിംഗ് : -0-

മിതയി : അസിസ്റ്റന്റ് എഞ്ചിനീയർ പേര് ROSHIN ALBERT

ഒപ്പ് Roshin Albert
20/4/2021
 Assistant Engineer
 Electrical Section
 Vattiyorkavu
 Thiruvananthapuram

പകർപ്പ് :

ഡെപ്യൂട്ടി ചീഫ് എഞ്ചിനീയർ
 എക്സിക്യൂട്ടീവ് എഞ്ചിനീയർ

സോളാർ പ്ലാന്റ് കണക്കുകൾ റിപ്പോർട്ട്

സെക്ഷൻ :

V1100r

കൺസ്യൂമർ നമ്പർ :

1145172002424

(13 അക്കം)

പേര് :

C.K. George

സ്റ്റീൻ നമ്പർ :

3

സോളാർ കമ്പാസിറ്റി :

5 Kwp

കിരണവാദ്യ

കണക്ക് ചെയ്ത ദിവസം :

31-03-2021

സോളാർ ഫീറ്റർ ഇനഷ്യൂൽ റീഡിംഗ് :

-0-

നെറ്റ് ഫീറ്റർ ഇനഷ്യൂൽ റീഡിംഗ് :

-0-

തീയതി :

അസിസ്റ്റന്റ് എഞ്ചിനീയർ പേര്

Vibha. VS

ഒപ്പ്

Assisted Engineer
Electrical Section
KSTP - Ernakulam

പകർപ്പ് :

ഡെപ്യൂട്ടി ചീഫ് എഞ്ചിനീയർ

എക്സിക്യൂട്ടീവ് എഞ്ചിനീയർ

അനുബന്ധം-14

സോളാർ പ്ലാന്റ് കണക്കു രിപ്പോർട്ട്

സെക്ഷൻ :

കൺസ്യൂമർ നമ്പർ :

പേര് :

സ്റ്റിൽ നമ്പർ :

സോളാർ കപ്പാസിറ്റി :

കണക്ക് ചെയ്ത തീയതി :

സോളാർ മീറ്റർ ഇൻഷുൽ റീഡിംഗ് :

ഗ്രാറ്റ് മീറ്റർ ഇൻഷുൽ റീഡിംഗ് :

Condomement
1145066011209
Sabu

(13 അക്കം)

5Kwp

കിലോവാട്ട്

9/12/2020

-0-

-0-

മേധവി :

അസിസ്റ്റന്റ് എഞ്ചിനീയർ പേര്

Vimal .pv

ഒപ്പ്


Electrical Section
Condoment, Twp-33

പകർപ്പ് :

ഡയറക്ടർ ഓഫ് എഞ്ചിനീയറിംഗ്

എക്സിക്യൂട്ടീവ് എഞ്ചിനീയർ

സോളാർ പ്ലാന്റ് കണക്കൻ റിപ്പോർട്ട്

സെക്ഷൻ : Varkala
കൺസ്യൂമർ നമ്പർ : 1145254000985 (13 അക്കം)
പേര് : Head Master Varkala Lps School
സ്റ്റീൻ നമ്പർ :
സോളാർ കമ്പാസിറ്റി : 5kwp കിലോവാട്ട്
കണക്ക് ചെയ്ത ദിവസം : 8-04-2021
സോളാർ മീറ്റർ ഇൻഷുർ റീഡിംഗ് : -0-
നെറ്റ് മീറ്റർ ഇൻഷുർ റീഡിംഗ് : -0-

തീയതി : 8/4/2021 അസിസ്റ്റന്റ് എഞ്ചിനീയർ പേര്
അസിസ്റ്റന്റ് എഞ്ചിനീയർ
ഇലക്ട്രിക്കൽ സെക്ഷൻ
കെ.എസ്.ഇ.ബി. വർകാല
വർക്കല



ഒപ്പ് Adh

പകർപ്പ് :
ഡെപ്യൂട്ടി ചീഫ് എഞ്ചിനീയർ
എക്സിക്യൂട്ടീവ് എഞ്ചിനീയർ

അനുബന്ധം-14

സോളാർ പ്ലാന്റ് കുണക്ഷൻ റിപ്പോർട്ട്

സെക്ഷൻ :

Cantonment

കൺസ്യൂമർ നമ്പർ :

114506800240

(13 അക്കം)

പേര് :

Roger Oscar Christians

സ്റ്റീൻ നമ്പർ :

10Kwp

കിബോവാട്ട്

സോളാർ കപ്പാസിറ്റി :

08/03/2021

കണക്ക് ചെയ്ത ദിവസം :

-0-

സോളാർ മീറ്റർ ഇൻഷ്യൂൽ റീഡിംഗ് :

-0-

മനസ്സ് മീറ്റർ ഇൻഷ്യൂൽ റീഡിംഗ് :

ചിത്രം :

അസിസ്റ്റന്റ് എഞ്ചിനീയർ പേര്

Vinay P

സെ

[Signature]

Assistant Engineer
Electrical Section
Cantonment, Irm-33

ചുമതലപ്പി :

ഡെപ്യൂട്ടി ചീഫ് എഞ്ചിനീയർ

എക്സിക്യൂട്ടീവ് എഞ്ചിനീയർ

സോളാർ പ്ലാന്റ് കണക്കുകൾ റിപ്പോർട്ട്

സെക്ഷൻ : Fort - TVM
 കൺസ്യൂമർ നമ്പർ : 1145039007364 (13 അക്കം)
 പേര് : Govt. VP School Chalai
 സ്കീം നമ്പർ : 4503000.30
 സോളാർ കപ്പാസിറ്റി : 5kwp കിഴക്കാമ്പാട്ട്
 കണക്ക് ചെയ്ത തീയതി : 03-04-2021
 സോളാർ മീറ്റർ ഇൻഷുറൻസ് റീഡിംഗ് : -0-
 നെറ്റ് മീറ്റർ ഇൻഷുറൻസ് റീഡിംഗ് : -0-

തീയതി: 7/4/21. അസിസ്റ്റന്റ് എഞ്ചിനീയർ പേര്

ഒപ്പ്

ASSISTANT ENGINEER
 ELECTRICAL SECTION, FORT
 THIRUVANANTHAPURAM

പകർപ്പ് :

ഡെപ്യൂട്ടി ചീഫ് എഞ്ചിനീയർ

എക്സിക്യൂട്ടീവ് എഞ്ചിനീയർ



സോളാർ പ്ലാന്റ് കണക്കുകൾ റിപ്പോർട്ട്

സെക്ഷൻ :

Pettah

കൺസ്യൂമർ നമ്പർ :

1145140024267

(13 അക്കം)

പേര് :

Sujendra prasad

സ്മിൽ നമ്പർ :

സോളാർ ക്യാസിറ്റി :

10/kwp

കിഴക്കൻ

കണക്ക് ചെയ്ത തീയതി :

19-03-2021

സോളാർ മീറ്റർ ഇൻഷുറൻസ് റീഡിംഗ് :

- 0 -

നെറ്റ് മീറ്റർ ഇൻഷുറൻസ് റീഡിംഗ് :

- 0 -

Name : Ajaykumar. F

തീയതി :

അസിസ്റ്റന്റ് എഞ്ചിനീയർ

പേര്

പകർപ്പ് :

ഡെപ്യൂട്ടി ചീഫ് എഞ്ചിനീയർ

എക്സിക്യൂട്ടീവ് എഞ്ചിനീയർ

സോളാർ പ്ലാന്റ് കണക്കുകൾ നിർവ്വഹിച്ച്

തൊഴിലാളി:

Kanayapuram

കൺസ്യൂമർ നമ്പർ:

1145222015204

(13 ഡിജിറ്റുകൾ)

പേര്

Resonance Convent

സ്റ്റീൻ നമ്പർ:

സോളാർ കമ്പോസിറ്റി:

15 kwp

കിലോവാട്ട്

കണക്ക് ചെയ്ത തീയതി:

സോളാർ മീറ്റർ ഇൻഷ്യൂൽ റിഡിംഗ്:

-0-

നെറ്റ് മീറ്റർ ഇൻഷ്യൂൽ റിഡിംഗ്:

-0-

തീയതി:

അസിസ്റ്റന്റ് എഞ്ചിനീയർ പേര്

Judy ✓

ഒപ്പ്



Assistant Engineer

Electrical Section

KSEB Ltd.

Kanayapuram

പകർപ്പ്:

ഡെപ്യൂട്ടി ചീഫ് എഞ്ചിനീയർ

എക്സിക്യൂട്ടീവ് എഞ്ചിനീയർ

സോളാർ പ്ലാന്റ് കണക്കുകൾ റിപ്പോർട്ട്

സ്ഥലം : Villor
 കൺസ്യൂമർ നമ്പർ : 114120001158 (13 അക്കം)
 പേര് : Domen Ajay Jacob
 സ്ഥിര നമ്പർ : _____
 സോളാർ കമ്പാസിറ്റി : 5 kw കിറോവാട്ട്
 കണക്ക് ചെയ്ത തീയതി : 8-01-2020
 സോളാർ മീറ്റർ ഇൻഷുറർ റിഡിംഗ് : -0-
 നെറ്റ് മീറ്റർ ഇൻഷുറർ റിഡിംഗ് : -0-

തീയതി : _____
 അസിസ്റ്റന്റ് എഞ്ചിനീയർ പേര് : Vibin. V

ഒപ്പ് : _____
 Assistant Engineer
 Electrical Division
 Kuttuvilla

പകർപ്പ് :

ഡെപ്യൂട്ടി ചീഫ് എഞ്ചിനീയർ _____
 എക്സിക്യൂട്ടീവ് എഞ്ചിനീയർ _____

സോളാർ പ്ലാന്റ് കണക്കുകൾ റിപ്പോർട്ട്

Minu Shaji

വസിക്കൽ : Ullur
 കൺസ്യൂമർ നമ്പർ : 1145126005972 (13 അക്കം)
 പേര് : Shaji M S
 സ്റ്റിൽ നമ്പർ : _____
 സോളാർ കപ്പാസിറ്റി : 5 kw കിമോറാട്ട്
 കണക്ക് ചെയ്ത ദിവസം : 26.08.2021
 സോളാർ മീറ്റർ ഇൻഷുറൻസ് റീഡിംഗ് : -0-
 ഹെറ്റ് മീറ്റർ ഇൻഷുറൻസ് റീഡിംഗ് : -0-

മറിയത്തി : അസിസ്റ്റന്റ് എഞ്ചിനീയർ പേര് : _____
 ഒപ്പ് : _____

Vibul V S

പകർപ്പ് :
 ഡെപ്യൂട്ടി ചീഫ് എഞ്ചിനീയർ _____
 ഏജൻസി എഞ്ചിനീയർ _____

സോളാർ പ്ലാന്റ് കണക്കുകൾ റിപ്പോർട്ട്

സംയമനം :
കുടുംബശ്രീ നമ്പർ : 1145177016229 (13 അക്കം)
പേര് : Rakhi S Alex
സ്റ്റിൽ നമ്പർ :
സോളാർ കപ്പാസിറ്റി : 2.5 KW കിലോവാട്ട്
കണക്ക് ചെയ്ത ദിവസം : 10.06.2021
സോളാർ മീറ്റർ ഇൻഷുറൻസ് റിഡിംഗ് : - 0 -
നെറ്റ് മീറ്റർ ഇൻഷുറൻസ് റിഡിംഗ് : - 0 -

തീയതി :
അസിസ്റ്റന്റ് എഞ്ചിനീയർ പേര് :
ഒപ്പ് :
Vibha V.S.
Asstt. Engineer
Electrical
KSHETRA

പകർപ്പ് :
ഡെപ്യൂട്ടി മീറ്റർ എഞ്ചിനീയർ
എക്സിക്യൂട്ടീവ് എഞ്ചിനീയർ

സോളാർ പ്ലാന്റ് കണക്കുകൾ റിപ്പോർട്ട്

സെക്ഷൻ :

Vattiyankavu

കൺസ്യൂമർ നമ്പർ :

1145097020748

(13 അക്കം)

പേര് :

Shekaran

സ്റ്റീൽ നമ്പർ :

450900049

സോളാർ ക്യാസിറ്റി :

3 kwp

കിളോവാട്ട്

കണക്ക് ചെയ്ത ദിവസം :

15/12/2020

സോളാർ മീറ്റർ ഇനിഷ്യൽ റീഡിംഗ് :

-0-

നെറ്റ് മീറ്റർ ഇനിഷ്യൽ റീഡിംഗ് :

-0-

തീയതി :

അസിസ്റ്റന്റ് എഞ്ചിനീയർ ഹെൽ

ROSHIN ALBERT

ഒപ്പ്

Roshin Albert
20/11/2021

Assistant Engineer
Electrical Section
Vattiyankavu
Thiruvananthapuram

പകർപ്പ് :

ഡെപ്യൂട്ടി ചീഫ് എഞ്ചിനീയർ

എക്സിക്യൂട്ടീവ് എഞ്ചിനീയർ

doi:10.1093/bioinformatics/bti068

ബോംബേയിൽ പൂർണ്ണ കണക്കിലെ വിലപ്പത്രം

positive

Vellaspambalam

കോർപ്പറേറ്റ് നഗരം :

1145072004790

13. 11. 2004

626

Kyphomas

types of trust

Abstract

2.5 kW

500000

உலக அமைதி நிறுவனம்

12-11-2021 2/2/2021

આપણાં સૌથી જુની-ઘણી નીચીય

പോസ്റ്റ് മീറ്റിംഗ് ഇന്റർവ്യൂവിൽ നീലമിശ്ര

-0-

of the

അനുകൂലമായ വാർത്തകൾ ൨൫

1999

Callaghan

800

Frankfurter Pfl

1999

അദ്ധ്യക്ഷൻ: ഷർട്ട് - അംഗീകരിക്കുന്നു.

Abstract

സോളാർ പ്ലാന്റ് കണക്കുകൾ റിപ്പോർട്ട്

സംയോജിത : VIIION
 കൺസ്യൂമർ നമ്പർ : 1145122002424 (13 അക്കം)
 പേര് : C.K. George
 സ്ഥിര നമ്പർ :
 സോളാർ കമ്പാസിറ്റി : 5kw കിമോവാട്ട്
 കണക്ക് ചെയ്ത തീയതി : 1-4-2021
 സോളാർ മീറ്റർ ഇൻഷുൽ റീഡിംഗ് : -0-
 നെറ്റ് മീറ്റർ ഇൻഷുൽ റീഡിംഗ് : -0-

തീയതി :
 അസിസ്റ്റന്റ് എഞ്ചിനീയർ പേര് : Vibish . VT

ഒപ്പ് :



Assistant Engineer
 Electrical
 K.S. 0-1-100r

പങ്കാളിപ്പ് :

ഡെപ്യൂട്ടി ചീഫ് എഞ്ചിനീയർ

എക്സിക്യൂട്ടീവ് എഞ്ചിനീയർ

സോളാർ പ്ലാന്റ് കണക്കുകൾ റിപ്പോർട്ട്

സെക്ഷൻ : Vattiyonkara
കൺസ്യൂമർ നമ്പർ : 1145892005402 (13 അക്കം)
പേര് : Vikraman Alair
സ്കീം നമ്പർ : 450900047
സോളാർ കപ്പാസിറ്റി : 3Kwp കിലോവാട്ട്
കണക്ക് ചെയ്ത ദിവസം : 9-11-2020
സോളാർ മീറ്റർ ഇൻഷുറൻസ് റീഡിംഗ് : -0-
നെറ്റ് മീറ്റർ ഇൻഷുറൻസ് റീഡിംഗ് : -0-

തീയതി : അസസ്സന്റ് എഞ്ചിനീയർ പേര് Rishi Alair

ഒപ്പ് Rishi Alair
20/4/2021
Assistant Engineer
Electrical Section
Vattiyonkara
Thuvattupuzha

പകർപ്പ് :

ഡെപ്യൂട്ടി ചീഫ് എഞ്ചിനീയർ
എക്സിക്യൂട്ടീവ് എഞ്ചിനീയർ



സോളാർ പ്ലാന്റ് കണക്കുകൾ റിപ്പോർട്ട്

വസതി : Attingal - 4531
കൺസ്യൂമർ നമ്പർ : 1145314008031 (13 അക്കം)
പേര് : Principal Govt College
സ്റ്റിൽ നമ്പർ : _____
സോളാർ കപ്പാസിറ്റി : 20 kwp കിലോവാട്ട്
കണക്ക് ചെയ്ത തീയതി : 08/09/19
സോളാർ മീറ്റർ ഇൻഷുൽ റീഡിംഗ് : 23 kWh
നേറ്റ് മീറ്റർ ഇൻഷുൽ റീഡിംഗ് : Import - 8.27 kWh
Export - 3.27 kWh

തീയതി : അസിസ്റ്റന്റ് എഞ്ചിനീയർ പേര് മധു റീട്ടൺ നമ്പർ

ഒപ്പ് : [Signature] [Signature]

പകർപ്പ് :

സോൾട്ടി ചീഫ് എഞ്ചിനീയർ _____
ഓഫീസിലെ എഞ്ചിനീയർ _____

ASSISTANT ENGINEER
ATTINGAL ELECTRICAL
SECTION TVM

സോളാർ പ്ലാന്റ് കണക്കുകൾ വിവരങ്ങൾ

സംഭവം : Villan
 കൺസ്യൂമർ നമ്പർ : 1145120008634 (13 അക്കം)
 പേര് : Girija
 സ്ത്രീ നമ്പർ :
 സോളാർ കമ്പാനിറ്റി : 5 kwp കി.വോൾട്ട്
 കണക്ക് ചെയ്ത ദിവസം :
 സോളാർ മീറ്റർ ഇൻഷുറൻസ് റീഡിംഗ് : -0-
 നെറ്റ് മീറ്റർ ഇൻഷുറൻസ് റീഡിംഗ് : -0-

തീയതി : അസിസ്റ്റന്റ് എഞ്ചിനീയർ പേര് Vibin V S
 ഒപ്പ് :

Assistant Engineer
 Electrical Section
 KS. H. Pillai

പകർപ്പ് :

ഡെപ്യൂട്ടി ചീഫ് എഞ്ചിനീയർ
 എക്സിക്യൂട്ടീവ് എഞ്ചിനീയർ

സോളാർ പ്ലാന്റ് കണക്കൽ റിപ്പോർട്ട്

സോളാർ : Pettah
 കൺസ്യൂമർ നമ്പർ : 1145144017425 (13 അക്കം)
 പേര് : John Antony Redricks
 സ്റ്റാൻ നമ്പർ : _____
 സോളാർ കമ്പാസിറ്റി : 5 Kwp ഓരോറത്ത്
 കണക്ക് ചെയ്ത തീയതി : 19-03-2021
 സോളാർ മീറ്റർ ഇൻഷുൽ റീഡിംഗ് : - 0 -
 നെറ്റ് മീറ്റർ ഇൻഷുൽ റീഡിംഗ് : - 0 -

തീയതി : _____
 അസിസ്റ്റന്റ് എഞ്ചിനീയർ പേര് : Ajaye Kumar. L. S.

ഒപ്പ് : _____


പകർപ്പ് :
 ഡെപ്യൂട്ടി ചീഫ് എഞ്ചിനീയർ : _____
 എക്സിക്യൂട്ടീവ് എഞ്ചിനീയർ : _____

സോളാർ പ്ലാന്റ് കണക്കൻ റിപ്പോർട്ട്

സംഖ്യ: U/1100r
കൺസ്യൂമർ നമ്പർ: 114517200 5367 (13 അക്കം)
പേര്: Sam George
സ്റ്റീൽ നമ്പർ: _____
സോളാർ കമ്പാസിറ്റി: 5Kwp കിഴക്കോട്ട്
കണക്ക് ചെയ്ത തീയതി: 22-09-2021
സോളാർ മീറ്റർ ഇൻഷുറർ റിഡിംഗ്: -0-
ഗ്രാറ്റ് മീറ്റർ ഇൻഷുറർ റിഡിംഗ്: -0-

തീയതി: അസിസ്റ്റന്റ് എഞ്ചിനീയർ പേര് Nibin. V.S
ഒപ്പ്: [Signature]
പങ്കാളി: _____
സംസ്കൃത ചീഫ് എഞ്ചിനീയർ _____
ഇക്സിക്യൂട്ടീവ് എഞ്ചിനീയർ _____

4/20/2008

continued

540

or less normal.

1999

1000

അനുകൂലമായ ഒരു സാമ്പത്തിക സാഹചര്യം ഉണ്ടാകുമെന്ന് പ്രതീക്ഷിക്കുന്നു.

പ്രായസ്കരണത്തിന്റെ രീതികൾ :

Mavelikara

115532500.1338

(13 425 400)

Postgraduate Bishopman College

Schwarz

01/04/2012

12-11-2021

 Δ 

അപ്രകാരം ഏകദേശം 1000

ANIL KUMAR, B
ASSISTANT ENGINEER
ELECTRICAL SECTION
MADIKARA

61

استاذة في اللغة العربية وآدابها

02/01/2012 10:00 AM

സോളാർ പ്ലാന്റ് കണക്കു നിർവ്വഹിപ്പാൻ

സംരക്ഷൻ :

Ranni

കൺസ്യൂമർ നമ്പർ :

1146072016353

(13 അക്കം)

പേര് :

The Secretary Pazhavangudi Grama panchayathu

സ്റ്റീൻ നമ്പർ :

സോളാർ കപ്പാസിറ്റി :

20 kwp

കിലോവാട്ട്

കണക്ക് ചെയ്ത ദിവസം :

6-01-2021

സോളാർ മീറ്റർ ഇനിഷ്യൽ റീഡിംഗ് :

-0-

നെറ്റ് മീറ്റർ ഇനിഷ്യൽ റീഡിംഗ് :

-0-

തീയതി :

അസിസ്റ്റന്റ് എഞ്ചിനീയർ പേര്

റാണി പാർമിപ്പി

ASSISTANT ENGINEER
KSER LTD.
ELECTRICAL SECTION
RANNY NORTH

പകർപ്പ് :

ഡെപ്യൂട്ടി ചീഫ് എഞ്ചിനീയർ

എക്സിക്യൂട്ടീവ് എഞ്ചിനീയർ

സോളാർ പ്ലാന്റ് കണക്കുകൾ വിവരങ്ങൾ

പേര്:

Neyyattinkara

കൺസ്യൂമർ നമ്പർ:

1145376001395

(3 അക്കം)

പേര്:

The Head Master JES School

സ്കീം നമ്പർ:

5kwp

സോളാർ കമ്പോസിറ്റി:

കിരണശക്തി

കണക്ക് ചെയ്ത തീയതി:

9-4-2021

സോളാർ മീറ്റർ ഇൻഷുറൻസ് നമ്പർ:

-0-

ബാങ്ക് മീറ്റർ ഇൻഷുറൻസ് നമ്പർ:

-0-

തീയതി

അസിസ്റ്റന്റ് എഞ്ചിനീയർ പേര്

Sairil Kumar S R

ഒപ്പ്

ASSISTANT ENGINEER
ELECTRIC SECTION
NEYYATTINKARA

പരിശോധന

ഡെപ്യൂട്ടി ചീഫ് എഞ്ചിനീയർ

പ്രൊജക്ട് എഞ്ചിനീയർ



സോളാർ പ്ലാന്റ് കണക്കുകൾ റിപ്പോർട്ട്

സെക്ഷൻ : Varkala
കൺസ്യൂമർ നമ്പർ : 1145254000985 (13 അക്കം)
പേര് : Head Master Varkala Lps School
സ്റ്റീൻ നമ്പർ :
സോളാർ കപ്പാസിറ്റി : 5kwp കിലോവാട്ട്
കണക്ക് ചെയ്ത ദിവസം : 8-04-2021
സോളാർ മീറ്റർ ഇൻഷുറൻസ് റീഡിംഗ് : -0-
നെറ്റ് മീറ്റർ ഇൻഷുറൻസ് റീഡിംഗ് : -0-

തീയതി : 8/4/2021 അസിസ്റ്റന്റ് എഞ്ചിനീയർ പേര്

അനിൽ എസ്
അസിസ്റ്റന്റ് എഞ്ചിനീയർ
ഇലക്ട്രിക്കൽ സെക്ഷൻ
കെ.എസ്.ഇ.ബി. ലക്ഷദ്വീപ്
വർക്കല



ഒപ്പ്

Adk

പകർപ്പ് :

ഡെപ്യൂട്ടി ചീഫ് എഞ്ചിനീയർ
എക്സിക്യൂട്ടീവ് എഞ്ചിനീയർ



செய்துள்ள பணிகளைக் குறிப்பிடுக

பணியின் விவரம்:

பணியின் விவரம்:

பணியின் விவரம்:

பணியின் விவரம்:

பணியின் விவரம்:

பணியின் விவரம்:

பணியின் விவரம்:

பணியின் விவரம்:

Vellamadu

11/11/2021

The Headmaster Vellamadu School

Elkump

31/12/2021

செய்துள்ள பணிகளைக் குறிப்பிடுக



செய்துள்ள பணிகளைக் குறிப்பிடுக

செய்துள்ள பணிகளைக் குறிப்பிடுக

செய்துள்ள பணிகளைக் குறிப்பிடுக



താലോലപരമ്പ-14

സോളാർ പ്ലാന്റ് കണക്കുകൾ വിവരങ്ങൾ

സംസ്ഥാനം : Thalassaparamba
കൺസ്യൂമർ നമ്പർ : 1146505040488 (13 സംസ്ഥാനം)
പേര് : The Manager Federal Bank
സ്റ്റാൻ നമ്പർ : _____
സോളാർ കമ്പോസിറ്റി : 10 Kwp കി.വാട്ട്
കണക്ക് ചെയ്ത തീയതി : 13/07/2021
സോളാർ യൂണിറ്റ് ഇൻഷുറൻസ് റീഡിംഗ് : -0-
ബാങ്ക് യൂണിറ്റ് ഇൻഷുറൻസ് റീഡിംഗ് : -0-

തീയതി : 13/07/21 അസിസ്റ്റന്റ് എഞ്ചിനീയർക്ക് ചുരുക്കം

ഒപ്പ്

ASSISTANT ENGINEER
ELECTRICAL SECTION
THALASSAPARAMBA

പങ്കാളി :

റവന്യൂ ഓഫീസ് എഞ്ചിനീയർ

എക്സിക്യൂട്ടീവ് എഞ്ചിനീയർ

Government of Kerala
 Department of Electrical Inspectorate
 Office of the Electrical Inspector
 Ninan's Complex Palakkad
 Palakkad 678001
 Phone: 04912548023,
 Email: eipkd@ceikerala.gov.in Website:
 www.ceikerala.gov.in



An IS 15700 : 2005 Certified Department

Proceedings of the
 Electrical Inspector
 Palakkad
Present: ARIA O K

Subject: MV addition of 240kWp On-Grid Solar Power Plant at the premises of M/s Indian Products Private Limited, Pathinalangal, Palakkad, Pin-678624 - Sanction for energisation orders issued - regarding.

Reference:

1. Scheme Approval No. B1-02550/21/EIP dated 29.04.2021
2. Completion report submitted by M/s. WATTSUN ENERGY (INDIA) PVT. LTD., International Airport Road, Chackai, Kerala, Pin- 695024 dated 30.06.2021 and received on 05.07.2021
3. Inspection conducted on 19.07.2021
4. Non conformity report dated 19.07.2021
5. Compliance report submitted by M/s. WATTSUN ENERGY (INDIA) PVT. LTD., International Airport Road, Chackai, Kerala, Pin- 695024 dated 13.08.2021 and received on 17.08.2021

Order No: B1-02550/21/EIP Dated 02-09-2021

Sanction is hereby accorded under section 54 of The Electricity Act, 2003 and Regulation 32 and 43(7) of the Central Electricity Authority (Measures Relating to Safety and Electric Supply) Regulations, 2010 for the energisation of the installations covered under completion report read as (2) above, installed at the premises of M/s Indian Products Private Limited, Pathinalangal, Palakkad, Pin-678624 subject to following conditions and as detailed in the annexure appended.

Specifications:

PV Modules : Make: WAAREE, 335Wp, 46.8 Voc, 9.3 Isc, 8.8 Imp, 38.1 Vmp, Total no. of strings per Inverter: 14, No. of PV modules in Inverter-1&2: 308 each , No. of PV modules in Inverter-3: 294.

Solar Inverter-1: Make: GOODWE, 80kW, 1100 Vdc, S/N. 9080KMTU211W0087.

Solar Inverter-2: Make: GOODWE, 80kW, 1100 Vdc, S/N. 9080KMTU211W0187.

Solar Inverter-3: Make: GOODWE, 80kW, 1100 Vdc, S/N. 9080KMTU211W0185.

1. Date of energization shall be intimated.
2. Operation and maintenance of electrical installation shall be done only by authorized persons.
3. All the maintenance works shall be recorded in the maintenance register.
4. Addition/alteration in the existing installation shall be carried out only with prior approval from the electrical inspectorate.
5. Consent from the Licensee shall be obtained.

Electrical Inspector



To:

Karunakar Narayan- General Manager,
Indian Products Private Limited; Door No : IX / 721-728, 14th mile stone, Coimbatore-Walayar National
Highway,Pathinalangal, Walayar Dam (P.O), Palakkad

Copy To:

- 1 WATTSUN ENERGY INDIA PVT. LTD. , INTERNATIONAL AIRPORT ROAD , CHACKAI, Kerala , 695024
- 2 TERANCE ALEX , WATTSUN ENERGY INDIA PVT. LTD. AISWARYA TOWERS INTERNATIONAL
AIRPORT ROAD, CHAKAI, THIRUVANANTHAPURAM ,
- 3 Assistant Engineer, , KSEB Ltd; Electrical section- WALAYAR ,

Annexure (Order No: B1-02550/21/EIP Dated 02.09.2021)			
Items			Quantity(in numbers)
Solar Inverter (80 kVA)			
SSB	Panel Name : AC DB		
Incomer	MCCB	160 Amps	3
Outgoing	MCCB	500 Amps	1
Earth Electrodes			6
MSB	Panel Name : MSB		
Outgoing	MCCB	500 Amps	1
SSB	Panel Name : AJB		
Incomer	MCB	25 Amps	12
Load Details HT Motor – 0 kW HT Capacitor – 0 kVAr Fire Pump Load – 0 kW Lift Load – 0 kW Other Load – 0 kW + 0 kVA + 0 kVAr			
			Electrical Inspector 
This is a computer generated document. Signature is not required.			



രസാജാർ പ്ലാന്റ് കണക്കിൻ വിവരങ്ങൾ

സ്ഥലം:

Nalamchira

ജനറൽ നമ്പർ:

1145186010981

(13 അക്കം)

പേര്:

George Mathew

സ്ത്രീ നമ്പർ:

രസാജാർ പ്ലാന്റിന്റെ

skip

കിടപ്പുമുറ

കണക്ക് ചെയ്ത തീയതി:

6-1-2020

രസാജാർ പ്ലാന്റ് ഇൻഷുറൻസ് നമ്പർ:

- 0 -

പ്ലാന്റ് പ്ലാന്റ് ഇൻഷുറൻസ് നമ്പർ:

- 0 -

തീയതി:

അനുബന്ധം 14 എൻട്രി നമ്പർ: പേര്:

ഒപ്പ്

പകർപ്പ്:

റേഡിയോ ഓഫീസ് എൻട്രി നമ്പർ:

റേഡിയോ ഓഫീസ് എൻട്രി നമ്പർ:

സോളാർ പ്ലാന്റ് കണക്കുകൾ നിർവ്വഹിച്ച്

താലൂക്ക് :

Attingal

കൺസ്യൂമർ നമ്പർ :

1145310022869

(13 അക്കം)

പേര് :

Jalaludeen

സ്കീം നമ്പർ :

സോളാർ കമ്പോസിറ്റ് :

Skwp

മിറബറവട്ട്

കണക്ക് ചെയ്ത തീയതി :

4-12-2020

സോളാർ മീറ്റർ ഇൻഷുറൻസ് നിരവധി :

-0-

ബാങ്ക് മീറ്റർ ഇൻഷുറൻസ് നിരവധി :

-0-

തീയതി :

അസിസ്റ്റന്റ് എഞ്ചിനീയർക്ക് പേര്

Binnu Kumar.

for

ഒപ്പ്



ASSISTANT ENGINEER
ELECTRICAL SECTION
ATTINGAL

പരിശോധിച്ച് :

ബാങ്ക് മീറ്റർ എഞ്ചിനീയർ :

ബാങ്ക് മീറ്റർ എഞ്ചിനീയർ :

സോളാർ പ്ലാന്റ് കണക്കുകൾ റിപ്പോർട്ട്

ഉടമസ്ഥൻ:

Ulloon

കൺസ്യൂമർ നമ്പർ:

1145170001158

(13 അക്കം)

പേര്:

Omman Rajaglob

സ്റ്റിൽ നമ്പർ:

സോളാർ കച്ചവടവിതരണം:

5 kWp

ചിരമുദ്ര

കണക്ക് തുടങ്ങിയ തീയതി:

8-01-2021

സോളാർ ഫീറ്റർ ഇൻഷുറൻസ് നിരവധി:

-0-

ബാങ്ക് ഫീറ്റർ ഇൻഷുറൻസ് നിരവധി:

-0-

തീയതി:

അസിസ്റ്റന്റ് എഞ്ചിനീയർക്ക് പേര്:

ഒപ്പ്:

പങ്കിട്ട്:

സംയജ്ഞി ചീഫ് എഞ്ചിനീയർ:

ഹെൽപ്പ് ഡെസ്ക് എഞ്ചിനീയർ:

Assistant Engineer
Electrical Section
KSEB - Kollam

സംസ്ഥാന പ്ലാൻ കണക്കുകൾ വിവരങ്ങൾ

പേര്:

ജനനത്തീയതി:

പേര്:

സ്ഥിര വാസം:

സംസ്ഥാന പ്ലാൻ നമ്പർ:

കാർഡ് പേജ് നമ്പർ:

സംസ്ഥാന പ്ലാൻ ഇൻഷുറൻസ് നമ്പർ:

പ്ലാൻ പ്ലാൻ ഇൻഷുറൻസ് നമ്പർ:

alalanchira

1145188019469

Same

5 kmp

-0-

-0-

തീയതി:

അസിസ്റ്റന്റ് എഞ്ചിനീയർ പേര്:

ചുവ

ASSISTANT ENGINEER
ELECTRICAL SECTION
NEELAMANGALAM

പേരിൽ:

ഡെപ്യൂട്ടി ചീഫ് എഞ്ചിനീയർ:

എക്സിക്യൂട്ടീവ് എഞ്ചിനീയർ:

സോളാർ പ്ലാന്റ് കണക്കുകൾ നിർവ്വഹിച്ച്

നാമം :

Nalamchira

കൺസ്യൂമർ നമ്പർ :

1145181023780

(13 അക്കം)

പേര് :

Treara Alex

സ്റ്റാൾ നമ്പർ :

5kwp

കിരണവോൾട്ട്

സോളാർ കമ്പോസിറ്റി :

കണ്ടക്ട് ചെയ്ത തീയതി :

24-12-2020

സോളാർ യൂട്ടിൽ ഇൻഷുറൻസ് നിരവധി :

- 0 -

ഗ്രാഫ് യൂട്ടിൽ ഇൻഷുറൻസ് നിരവധി :

- 0 -

തീയതി :

അസിസ്റ്റന്റ് എഞ്ചിനീയർ പേര്

ഒപ്പ്

ASSISTANT ENGINEER
ELECTRICAL SECTION
IGEB, NALANCHIRA

പകർപ്പ് :

ഡെപ്യൂട്ടി ചീഫ് എഞ്ചിനീയർ

എക്സിക്യൂട്ടീവ് എഞ്ചിനീയർ

സോളാർ പ്ലാന്റ് കണക്കുകൾ വിവരങ്ങൾ

പ്രോജക്ട്:

കൺസൾട്ടന്റ് നമ്പർ:

പേര്:

സ്ഥിതി നമ്പർ:

സോളാർ ക്യാമ്പിറ്റി:

കണക്ക് ചെയ്ത തീയതി:

സോളാർ മീറ്റർ ഇൻഷുറൻസ് നിരവധി:

ഗ്രാൻ്റ് മീറ്റർ ഇൻഷുറൻസ് നിരവധി:

Nalanelara

1143185029245

(13 അക്കം)

Managing Director Veeva projects

5 kwp

കിടപാടുകൾ

4-11-2020

-0-

-0-

തീയതി:

അനുബന്ധം എണ്ണിയിരുന്ന് പേര്:

ഒപ്പ്:

ANERT-TECH/99/2022-T2
COMPUTER NO. 5311

പരിശോധന:

ഡയറക്ടർ ഓഫ് ഫ്രോജക്ട്:

പ്രോജക്ട് ഓഫ് ഫ്രോജക്ട്:



സോളാർ പ്ലാന്റ് കണക്കുകൾ റിപ്പോർട്ട്

സെക്ഷൻ :

Varkala

കൺസ്യൂമർ നമ്പർ :

1145254000985

(13 അക്കം)

പേര് :

Head Master Varkala Lps School

സ്റ്റീൻ നമ്പർ :

സോളാർ കപ്പാസിറ്റി :

5kwp

കിലോവാട്ട്

കണക്ക് ചെയ്ത ദിവസം :

8-04-2021

സോളാർ മീറ്റർ ഇനിഷ്യൽ റീഡിംഗ് :

-0-

നെറ്റ് മീറ്റർ ഇനിഷ്യൽ റീഡിംഗ് :

-0-

തീയതി : 8/4/2021 അസിസ്റ്റന്റ് എഞ്ചിനീയർ പേര്

അനിൽ എസ്
അഡീഷണൽ എഞ്ചിനീയർ
ഇലക്ട്രിക്കൽ സെക്ഷൻ
കെ.എസ്.ഇ.ബി. ലക്ഷദ്വീപ്
വർക്കല



ഒപ്പ്

(Signature)

പകർപ്പ് :

ഡെപ്യൂട്ടി ചീഫ് എഞ്ചിനീയർ

എക്സിക്യൂട്ടീവ് എഞ്ചിനീയർ

സോളാർ പ്ലാന്റ് കണക്കുകൾ റിപ്പോർട്ട്

സ്ഥലം : Fort - TVM
കണിസ്സുകൾ നമ്പർ : 1145039007.364 (13 അക്കം)
പേര് : Govt. up school Chalai
സ്മിൻ നമ്പർ : 4503000.30
സോളാർ ക്യാസിറ്റി : 5kwp കിലോവാട്ട്
കണക്ക് ചെയ്ത ദിവസം : 03-04-2021
സോളാർ മീറ്റർ ഇൻഷുറൻസ് റിഡിംഗ് : -0-
നെറ്റ് മീറ്റർ ഇൻഷുറൻസ് റിഡിംഗ് : -0-

തീയതി : 7/4/21 അസിസ്റ്റന്റ് എഞ്ചിനീയർ പേര് :
[Signature]
ഒപ്പ് : _____

ASSISTANT ENGINEER
ELECTRICAL SECTION FORT
THIRUVANANTHAPURAM

പരിശോധന :
ഡെപ്യൂട്ടി ചീഫ് എഞ്ചിനീയർ : _____
എക്സിക്യൂട്ടീവ് എഞ്ചിനീയർ : _____



ANERT/TECH/99/2022-T2

സംസ്ഥാന ഊർജ്ജ കണക്കുകൾ വിഭാഗം

കമ്പ്യൂട്ടർ : Palade
കമ്പ്യൂട്ടർ നമ്പർ : 1145457023049
പേര് : The Headmaster Palade Lp School
സ്റ്റീൽ നമ്പർ : 45480007
സംസ്ഥാന കോഡ് : 5kwp
കമ്പ്യൂട്ടർ വിവരങ്ങൾ : 31.03.21
സംസ്ഥാന വിറ്റൽ ഇൻവെൻററി നമ്പർ : -0-
സെറ്റ് വിറ്റൽ ഇൻവെൻററി നമ്പർ : -0-

തീയതി : 31.03.21
സംസ്ഥാന ഊർജ്ജ കണക്കുകൾ വിഭാഗം : Vinod S/R

പദവി : ASSISTANT ENGINEER ELECTRICAL SECTION KALODE

പ്രൊജക്ട് വിവരങ്ങൾ :
പ്രൊജക്ട് വിവരങ്ങൾ :

സോളാർ പ്ലാന്റ് കണക്കുകൾ വിവരങ്ങൾ

പേര്:

Neyyattinkara

കൺസ്യൂമർ നമ്പർ:

1145376001395

(13 അക്കം)

പേര്:

The Head Master JES School

സ്കീം നമ്പർ:

5kwp

സോളാർ കമ്പോസിറ്റി:

കിരണശക്തി

കണക്ക് ചെയ്ത തീയതി:

9-4-2021

സോളാർ മീറ്റർ ഇൻഷുറൻസ് നമ്പർ:

-0-

ബാങ്ക് മീറ്റർ ഇൻഷുറൻസ് നമ്പർ:

-0-

തീയതി

അസിസ്റ്റന്റ് എഞ്ചിനീയർ പേര്

Sairil Kumar S R

ഒപ്പ്

ASSISTANT ENGINEER
ELECTRICAL SECTION
NEYYATTINKARA

പരിശോധന

ഡെപ്യൂട്ടി ചീഫ് എഞ്ചിനീയർ

പ്രൊജക്ട് എഞ്ചിനീയർ



സോളാർ പ്ലാന്റ് കണക്കു നിർവ്വഹിപ്പാൻ

സംരക്ഷൻ :

Ranni

കൺസ്യൂമർ നമ്പർ :

1146072016353

(13 അക്കം)

പേര് :

The Secretary Pazhavangudi Grama panchayathu

സ്റ്റീൻ നമ്പർ :

സോളാർ കപ്പാസിറ്റി :

20 kwp

കിലോവാട്ട്

കണക്ക് ചെയ്ത ദിവസം :

6-01-2021

സോളാർ മീറ്റർ ഇനിഷ്യൽ റീഡിംഗ് :

-0-

നെറ്റ് മീറ്റർ ഇനിഷ്യൽ റീഡിംഗ് :

-0-

തീയതി :

അസിസ്റ്റന്റ് എഞ്ചിനീയർ പേര്

റാണി വർഗ്ഗീസ്

ASSISTANT ENGINEER
KSER LTD.
ELECTRICAL SECTION
RANNY NORTH

പകർപ്പ് :

ഡെപ്യൂട്ടി ചീഫ് എഞ്ചിനീയർ

എക്സിക്യൂട്ടീവ് എഞ്ചിനീയർ

6. M.V Installation should conform to I.S.732.
7. Installation of all cables should be as per standards.
8. Only materials with I.S certification as required under Quality Control Order should be used.
9. Only energy efficient equipments shall be used in the installation.
10. The validity of the scheme approval is upto 31.10.2023.
11. The acoustic enclosure of DG set shall be of CPCB approved type.
12. Energy meters should be provided in the generators circuits which may be tested and sealed with CTs, if any by the KSEB / Meter Testing and Standards Laboratory attached to this Department and copy of the test report shall be forwarded to the Office of the Deputy Chief Electrical Inspector, Thiruvananthapuram.
13. All relays & meters shall be tested in Meter Testing and Standards Laboratory Thiruvananthapuram / Labs in District Office and test certificate shall be submitted along with completion report.
14. Completion report should be submitted to the Office of the Deputy Chief Electrical Inspector, Thiruvananthapuram for arranging inspection.

If the installation is found defective in actual practice such additions or alterations as may be found necessary by the Electrical Inspectorate at the time of inspection or subsequently shall be carried out by the owner.

Yours Faithfully

Deputy Chief Electrical Inspector



Scrutiny Fee Details				
Sl No	Challan No	Date	Amount	Remarks
1	0101-2021-18609	16.09.2021	180.00	Paid
2	0101202118412	18.10.2021	180.00	Paid

Copy to

1. WAYTSUN ENERGY INDIA PVT. LTD. - INTERNATIONAL AIRPORT ROAD : CHACKAL, Kerala - 695024
 2. TERANCE ALEX : WAYTSUN ENERGY INDIA PVT. LTD. AISWARYA TOWERS INTERNATIONAL AIRPORT ROAD, CHACKAL, THIRUVANANTHAPURAM,

2081

Government of Kerala
 Department of Electrical Inspection
 Office of the Deputy Chief Electrical Inspector
 Palayam, Vikas Bhavan PO
 Thiruvananthapuram, 695033
 Phone: 04712934159,
 Email: dceitvm@gmail.com
 Website: www.ceikerala.gov.in



An IS 15700 : 2005 Certified Department

Thiruvananthapuram
 01.11.2021

Application No: 0220048092021

File No : 85-06083/21/EIT

From

Deputy Chief Electrical Inspector

To

P.K.SUKUMARAN
 POORNNA PRINTING & PUBLISHING HOUSE PALACHIRA, VARKALA

Sir,

Subject: Scheme for the installation of 50KW solar power plant and connected electric at the premises of M/s. POORNNA PRINTING & PUBLISHING HOUSE, VARKALA, Thiruvananthapuram, 695143 - Issue of scheme approval - regarding.

Reference:

1. Scheme submitted by WATTSUN ENERGY INDIA PVT. LTD., INTERNATIONAL AIRPORT ROAD, CHACKAL, Kerala, 695024 received on 17.09.2021
2. Non conformity report dated 12.10.2021
3. Compliance report submitted by WATTSUN ENERGY INDIA PVT. LTD., INTERNATIONAL AIRPORT ROAD, CHACKAL, Kerala, 695024 dated 19.10.2021

Scheme for the installation of 50KW solar power plant and connected electric at the premises of M/s. POORNNA PRINTING & PUBLISHING HOUSE, VARKALA, Thiruvananthapuram, 695143 is approved subject to following conditions:

1. Power allocation sanction should be obtained from the Kerala State Electricity Board/Licensee and a copy of the same forwarded to the Office of the Deputy Chief Electrical Inspector, Thiruvananthapuram.
2. Installation of all switch boards and distribution boards should be in conformity with Regulation 37 (iii) of the Central Electricity Authority (Measures relating to safety and Electric Supply) Regulation, 2010.
3. Fuses should be graded properly and selected based on the rating of cables. Low sun loss fuses shall be selected.
4. Earthing of the installation should conform to IS 3043/1987.
5. Isolation facility should be provided for all equipments within a distance of 3 meters from equipments conforming to Regulation 35(5) of the Central Electricity Authority (Measures relating to Safety and Electric Supply) Regulation, 2010.



WATTSUN
ENERGY (INDIA) PVT. LTD.
Never ending energy



COVERING LETTER

Sir,

I/We hereby e-tender to supply, under annexed terms and conditions of contract, the whole of the articles referred to and described in the attached specification and quantity decided by the Agency for New and Renewable Energy Research & Technology (ANERT), at the rates quoted against each item. The articles will be delivered and installed/commissioned operated and maintained for 10 years thereafter within the time and at the place(s) specified in the schedule.

I am/We are remitting herewith the required amount of Rs. towards the cost of e-tender and Earnest Money Deposit by electronic payment vide transaction No dtd.....

Yours faithfully

Place: Chackai

Date : 17/04/2023

Signature :

Name : Mrs. Sreeja SS
Designation : Purchase Manager



www.wattsun.in
info@wattsun.in
+91 938 810 6363

WATTSUN
ENERGY (INDIA) PVT. LTD.
Never ending energy

South India's First ISO 50001:2011 Energy Management System Certified Company



WATTSUN
ENERGY (INDIA) PVT. LTD.
Never ending energy



FORMAT 2-GENERAL PARTICULARS

Name of the Agency	Wattsun Energy India Private Limited
Registered Office	Wattsun Energy(India) Pvt. Ltd. FF Aiswarya Towers International Airport Road Chackai, Trivandrum, Kerala 695024
Nature of Agency (Ltd. Co., Partnership etc.) Attach Copy of partnership Deed/ Certification of Incorporation	Private Limited
Year of Establishment	2013
Registration of Number	U40300KL2014PTC036294
Address for Communication	Wattsun Energy(India) Pvt. Ltd. FF Aiswarya Towers International Airport Road Chackai, Trivandrum, Kerala 695024 Email: info@wattsun.in
Telephone number of Contact person (Mobile if any)	+91 9388106363
Name of CEOs/ Proprietor/Partners (with address and Telephone No)	Mr. Terance Alex,
GST Registration Number (Copy to be Attached)	32AABCW4979N2ZO
PAN Number	AABCW4979N
TAN Number	TWDW00206D
Whether the bidder wishes to form a project company for execution of work	No
Whether any Civil Suit / Litigation arisen in the contract executed during the last five years/being executed. If yes, please furnish the name of the Contract, employer nature of work, contract value,	

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info@wattsun.in
+91 938 810 6363

Wattsun Energy (India) Pvt. Ltd.
FF Aiswarya Towers
International Airport Road
Chackai, Trivandrum, Kerala 695 024
CIN: U40300KL2014PTC036294



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ENERGY (INDIA) PVT. LTD.
Never ending energy



work order and date and brief details of litigation.	No
Details of Total Experience in general since inception(Details of similar systems installed till the date of bid)	10 years
Details of Turnover for last Two years. (Copy Audited Statements has to be submitted for last two financial years)	INR 6,28,49,294 FY 2021-2022 INR 20,12,80039 FY 2022-2023
Details of offices in Kerala, India and abroad- address and contact details	1. Trivandrum WattSun Energy India Pvt Ltd FF Aiswarya Towers International Airport Road Chackai, Trivandrum-695024 2 Kollam WattSun Energy India Pvt Ltd Near Govt hospital, Mayyanadu, Kollam-691303

Documentary evidence for the bid qualification requirements are submitted along with this document and the details furnished above are true and correct.

Signature of authorised signatory

Date: 17/04/2023

Name : Mrs. Sreeja SS

Designation : Purchase Manager



www.wattsun.in
info@wattsun.in
+91 938 810 6363

WattSun Energy (India) Pvt. Ltd.
FF Aiswarya Towers
International Airport Road
Chackai, Trivandrum, Kerala 695 024
CIN: U40300KL2014PTC036294

WATTSUN
ENERGY (INDIA) PVT. LTD.
Never ending energy

South India's First ISO 50001:2011 Energy Management System Certified Company



കേരളം KERALA

DZ 072583

FORMAT 2 - POWER OF ATTORNEY

Power of Attorney to be provided by the Bidding Company in favour of its representative as evidence of authorized signatory's authority.

Know all men by these presents, We Wattsun Energy Private Limited, FF Aiswarya Towers, International Airport Road, Chackai, Trivandrum-695024 do hereby constitute, appoint and authorize Mrs. Sreeja SS, Gomathi Bhavan, AP Road, Peringamala, Trivandrum who is presently employed with us and holding the position of Purchase Manager as our true and lawful attorney, to do in our name and on our behalf, all such acts, deeds and things necessary in connection with or incidental to submission of our Bid for Implementation of 2 MW Solar Power Plant at Travancore Titanium Products Ltd., Kochuveli, Thiruvananthapuram, Kerala in response to the RFS. No ANERT-TECH/99/2022-T2 dated 12/04/2023 issued by ANERT including signing and submission of the Bid and all other documents related to the Bid, including but not limited to undertakings, letters, certificates, acceptances, clarifications, guarantees or any other



Pangappara K. RAMACHANDRAN NAIR
NOTARY PUBLIC
Roll No. 738552, F. No. 3/2010 Typo
Trivandrum-695035, Mob: 9846011366, 9888804197

Page 1 of 3



2086 SURESH KUMAR
STAMP VENDOR KARAMANA



കേരളം KERALA

DZ 072585

document which the ANERT may require us to submit. The aforesaid Attorney is further authorized for making representations to the ANERT and providing information / responses to ANERT representing us in all matters before ANERT and generally dealing with ANERT in all matters in connection with this Bid till the completion of the bidding process as per the terms of the above mentioned RFS. We hereby agree to ratify all acts, deeds and things done by our said attorney pursuant to this Power of Attorney and that all acts, deeds and things done by our aforesaid attorney shall be binding on us and shall always be deemed to have been done by us. All the terms used herein but not defined shall have the meaning ascribed to such terms under the RFS.

Signed by the within named Terance Alex, MD Wattsun Energy India Private Limited through the hand of Mrs. Sreeja SS

duly authorized by the Board (vide Board Resolution No.:WE031/2023) to issue such Power of Attorney

Dated this First day of March 2023

Accepted

Signature of Attorney
Mrs. Sreeja SS, Gomathi Bhavan, AP Road, Peringamala, Trivandrum



Page 2 of 3

Handwritten signature of the attorney.

1188-11-30-5-2023

Wattsun Energy India Pvt. Ltd.
Chadai B-100L

A. SURESH KUMAR
STAMP VENDOR, KARAMANA



Accepted

..... Signature of Attorney
 Mrs. Sreeja SS, Gomathi Bhavan, AP Road, Peringamala, Trivandrum

Attested (Signature of the executant)
 Poippallil House, Nelivial Road, Kulathoor, Uchakada, Trivandrum-695505
 Signature and stamp of Notary of the place of execution

Common seal of has been affixed in my/our presence pursuant to
 Board of Directors's Resolution dated 01/03/2023. (Board of Director's
 Resolution is also enclosed)

WITNESS

1.

.....

Name: Mr. Aslam

Designation : Project Manager

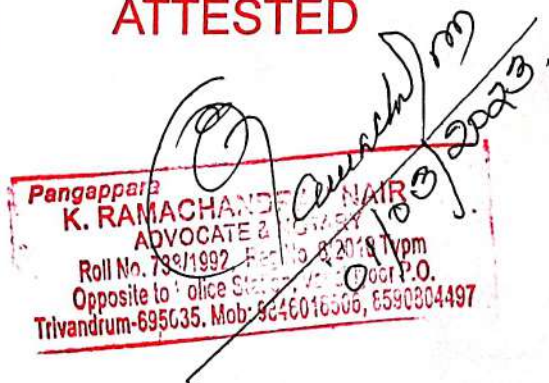
2.

.....
 Name: Mr. Jimmy Siluvayyan

Designation: Director



ATTESTED



Page 3 of 3

ANNEXURE D – DECLARATION OF RELATIONSHIP WITH ANERT EMPLOYEE

Tender Notification No.:ANERT-TECH/99/2022-T2 Request for Selection (RFS) of agency for the Implementation of 2 MW Solar Power Plant at Travancore Titanium Products Ltd., Kochuveli, Thiruvananthapuram under Solar City project funded by Smart City Thiruvananthapuram Ltd

To
The CEO
ANERT

Name of the ANERT employee with Designation:
Name of the bidder related to the employee:

This is to put on record that Shri/Smt
currently working as in ANERT is
related to....., who is the bidder in the bid. We
are aware of the Anti-corruption policy of ANERT and will observe the highest
standards during the procurement and the execution of contract and shall retain
from corrupt, fraudulent, collusive or coercive practices on competing for the
contract.

Date:17/04/2023



Signature
Name: Mrs. Sreeja SS

ANNEXURE A – BIDDERS TECHNICAL INFORMATION

TECHNICAL PARTICULAR DATA

Solar PV Module

Sl. No	Particulars	Required	Offered
1	PV Module Manufacture name & Country of origin	Manufacture name to be specified	RAYZON & India
2	PV Module type	Poly/Mono Crystalline, Mono PERC	Mono PERC
3	No. of PV cells per Module		144(12X6 / 12X6)
4	Total number of PV modules		
5	Max. Power, P_{mp} @STC	330 Wp or above	545
6	Max. Power tolerance (%)	Not more than 3%	0~ +or-5W
7	Max. Power voltage (V_{mp}) @STC	To be specified	42.01V
8	Max. Power current (I_{mp}) @STC	To be specified	12.98A
9	Open circuit voltage, V_{oc} @ STC	To be specified	49.91V
10	Short circuit current, I_{sc} @STC	To be specified	13.59A
11	Nominal voltage	To be specified	38.68V
12	Nominal Wattage	To be specified	403W
13	Fill Factor	Not less than 0.7	80.39%
14	Temp. coefficient of V_{oc} (%/C)		-0.02355%/C
15	Temp. coefficient of P_{mp} (%/C)		-0.3164%/C
16	Temperature Co-efficient of I_{sc} (%/°C)		0.0271%/C
17	Normal Operating Cell Temperature (NOCT) (°C)		20 Degree Celsius
18	Operating Temperature (°C)		-40 Degree Celsius to +85 Degree Celsius
19	Module efficiency	$\geq 17\%$	21/13%
20	No. of By-pass Diodes		
21	Mounting arrangement for Solar Module	Fixed Arrangement	Fixed
22	Solar Module frame material	Anodized Aluminium	Silver Anodized Aluminium Alloy

Request for Selection (RfS) of vendor for the Implementation of 1 MW Grid connected Solar Power Plant at Kerala University Karyavattom Campus, Thiruvananthapuram under Solar City project funded by Smart City Thiruvananthapuram Ltd

2090

Sl. No	Particulars	Required	Offered
23	Module dimensions' cm (L x W x H)	To be specified	(2278 X 1133 X 40) in mm
24	PV panel Weight (kg)	To be specified	28.6Kg
25	Output Cables	Polarized, UV protected & Weather Proof DC rated multi-contact connector	
26	Output Terminal	PV Connectors	
27	Junction Box	Weather resistant HDPE (IP65)	Split Junction box(3 no's with bypass diode)-Weather proof(IP68), MC4 Compatible
28	Copies of test certificates	IS 14286 and IEC 61215,61730 part 1&2, IEC 61701	

Request for Selection (RfS) of vendor for the Implementation of 1 MW Grid connected Solar Power Plant at Kerala University Karyavattom Campus, Thiruvananthapuram under Solar City project funded by Smart City Thiruvananthapuram Ltd

2091

INVERTER

Sl. No.	Particulars	Required	Offered
1	Manufacturer		Sungrow
2	Model name/No.		5 RT 6 RT 8 RT 10 RT 12 RT 15 RT 20 RT 33 CX 50 CX
3	Number of units		
4	Nominal AC power		Datasheet attached
5	Nominal AC voltage		Datasheet attached
6	Nominal AC Current		Datasheet attached
7	AC grid Frequency range	50Hz $\pm$ 0.5%	Datasheet attached
8	AC grid voltage range		Datasheet attached
9	Power Factor (+ and -)		Datasheet attached
10	Total Harmonic Distortion	As per IEEE-519 2014	Datasheet attached

Request for Selection (RfS) of vendor for the Implementation of 1 MW Grid connected Solar Power Plant at Kerala University Karyavattom Campus, Thiruvananthapuram under Solar City project funded by Smart City Thiruvananthapuram Ltd

2092

Sl. No.	Particulars	Required	Offered
11	AC over / under voltage over / under frequency protection		Datasheet attached
12	Max PV input power		Datasheet attached
13	Maximum DC voltage	Less than 1000 V	Datasheet attached
14	MPPT voltage range		Datasheet attached
15	Maximum DC current		Datasheet attached
16	No. of DC input ports		Datasheet attached
17	Maximum Efficiency	as per IEC 61683	Datasheet attached
18	DC voltage ripple		Datasheet attached
19	Ambient temperature range		Datasheet attached
20	Humidity (non-condensing)	95%, non-condensing	Datasheet attached
21	Protective functions - AC over/under voltage, AC over/under frequency, over temperature, AC and DC overcurrent, DC over-voltage, against Islanding		Datasheet attached
22	Communication Interface	RS485, MPI Profi-Bus/Telephone Modem/WiFi	Datasheet attached
22	User-display standard	LCD panel with membrane keypad	Datasheet attached
23	Enclosure environment rating		Datasheet attached
24	Safety and EMC	IS 16221	Datasheet attached
25	Anti-islanding feature	IEC 62116 and IS -16169	Datasheet attached

Request for Selection (RfS) of vendor for the Implementation of 1 MW Grid connected Solar Power Plant at Kerala University Karyavattom Campus, Thiruvananthapuram under Solar City project funded by Smart City Thiruvananthapuram Ltd

2093

SG3K-D/SG5K-D

Residential Single Phase Inverter

SUNGROW

Clean power for all



HIGH YIELD

- Higher yield with Max. efficiency 98.4 %, European efficiency 98.0 %
- Wide MPPT voltage range



SMART MANAGEMENT

- Easy local and online monitoring via App or Web
- Export power control with smart energy meter



SAFE AND DURABLE

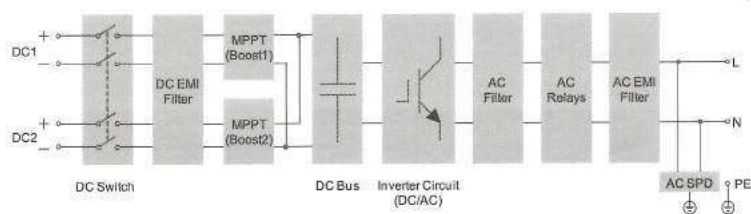
- Built-in surge arresters and residual current protection
- High anti-corrosion with aluminum alloy die casting



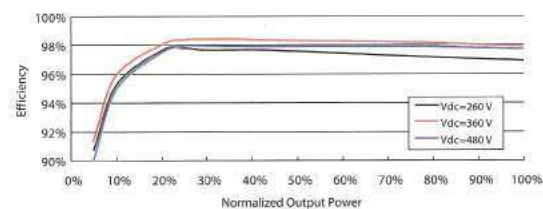
EASY AND USER FRIENDLY

- 11.5 kg compact design, plug and play installation
- Fast commissioning via LCD

CIRCUIT DIAGRAM



EFFICIENCY CURVE



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Type designation	SG3K-D	SG5K-D
Input (DC)		
Max. PV input voltage	600 V	
Min. PV input voltage / Startup voltage	90 / 120 V	
Nominal input voltage	360 V	
MPP voltage range	90 V – 560 V	
MPP voltage range for nominal power	160 V – 480 V	260 V – 480 V
No. of MPPTs	2	
Max. number of PV strings per MPPT	1	
Max. PV input current	20 A (10 A / 10 A)	
Max. current for input connector	24 A (12 A / 12 A)	
Max. PV short-circuit current	24 A (12 A / 12 A)	
Output (AC)		
AC output power	3000 VA	5000 VA
Max. AC output current	13.7 A	22.7 A
Nominal AC voltage	220 Vac / 240 Vac	
AC voltage range	176 Vac – 276 Vac (this may vary with grid standards)	
Nominal grid frequency	50Hz / 60 Hz	
Grid frequency range	45 Hz – 55Hz / 55 Hz – 65 Hz	
Total harmonic distortion (THD)	< 3 % (of nominal power)	
DC current injection	< 0.5 % (of nominal current)	
Power factor	> 0.99 / 0.8 leading – 0.8 lagging	
Feed-in phases / Connection phases	1 / 1	
Efficiency		
Max. efficiency	98.4 %	
Max. European efficiency	97.7 %	98.0 %
Protection		
PV reverse connection protection	Yes	
AC short circuit protection	Yes	
Leakage current protection	Yes	
Grid monitoring	Yes	
PV string current monitoring	Yes	
DC switch	Yes	
Overvoltage protection	AC Type II	
General Data		
Dimensions (W*H*D)	360*390*133 mm	
Weight	11.5 kg	
Isolation method	Transformerless	
Ingress protection rating	IP65	
Power loss in night mode	< 1 W	
Operating ambient temperature	-25 °C to 60 °C (> 45 °C derating)	
Allowable relative humidity (non-condensing)	0 – 100 %	
Cooling method	Natural cooling	
Max. operating altitude	4000 m (> 2000 m derating)	
Display / Communication	LCD / Wi-Fi	
PV connection type	MC4 (Max. 6mm2)	
AC connection type	Plug and play connector (Max. 6mm2)	
Compliance	IEC62109-1, IEC62109-2, IEC62116, IEC61727, EN 61000-6-2, EN 61000-6-3, ABNT NBR 16149, ABNT NBR 16150	
Grid support	Active & reactive power control, power ramp rate control	
Type designation	SG3K-D	SG5K-D

SG5.0/6.0/8.0/10/12RT

Multi-MPPT String Inverter for 1000 Vdc System

NEW



HIGH YIELD

- Lower startup & wider MPPT voltage
- Compatible with bifacial modules



SMART MANAGEMENT

- Optional Smart IV curve scanning
- Remote firmware updates



SAFE AND DURABLE

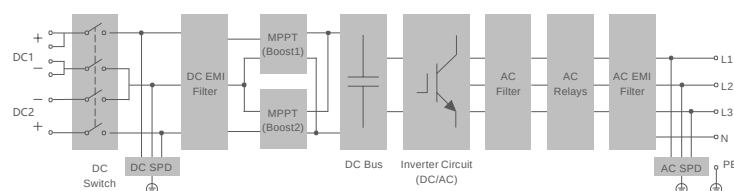
- Build-in Type II DC&AC SPD
- High anti-corrosion rating C5



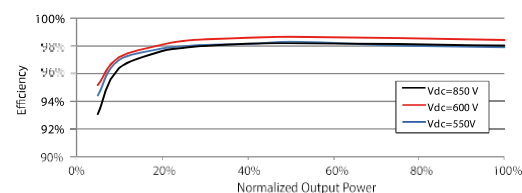
EASY AND USER FRIENDLY

- 18kg compact design
- Fast and easy commissioning via App

CIRCUIT DIAGRAM



EFFICIENCY CURVE



Type designation	SG5.0RT	SG6.0RT	SG8.0RT	SG10RT	SG12RT
Input (DC)					
Recommended max. PV input power	7.5 kW	9.0 kW	12 kW	15 kW	18 kW
Max. PV input voltage	1100 V *				
Min. PV input voltage / Start-up input voltage	180V / 180V				
Nominal input voltage	600 V				
MPP voltage range	160 V – 1000 V				
No. of independent MPP inputs	2				
No. of PV strings per MPPT	1 / 1	1 / 1	2 / 1	2 / 1	2 / 1
Max. PV input current	25 A (12.5 A / 12.5 A)		37.5 A (25 A / 12.5 A)		
Max. DC short-circuit current	32 A (16 A / 16 A)		48 A (32 A / 16 A)		
Output (AC)					
Nominal AC power (@230 V, 50 Hz)	5000 W	6000 W	8000 W	10000 W	12000 W
Max. AC output power	5500 VA	6600 VA	8800 VA	11000 VA	13200 VA
Max. AC output current	8.3 A	10 A	13.3 A	16.7 A	20 A
Nominal AC voltage	3 / N / PE, 220 / 380 V 3 / N / PE, 230 / 400 V 3 / N / PE, 240 / 415 V				
AC voltage range	180 V – 276 V				
Nominal grid frequency /	50 Hz / 45 – 55 Hz				
Grid frequency range	60 Hz / 55 – 65 Hz				
Harmonic (THD)	<3 % (at nominal power)				
Power factor at nominal power /	>0.99 / 0.8 leading – 0.8 lagging				
Adjustable power factor					
Feed-in phases / AC connection	3 / 3				
Efficiency					
Max. efficiency	98.40%	98.40%	98.50%	98.50%	98.50%
European efficiency	97.40%	97.40%	97.80%	97.90%	97.90%
Protection&Function					
Grid monitoring	Yes				
DC reverse connection protection	Yes				
AC short-circuit protection	Yes				
Leakage current protection	Yes				
Surge Protection	DC Type II / AC Type II				
DC switch	Yes				
General Data					
Dimensions (W*H*D)	370*480*195 mm				
Mounting method	Wall-mounting bracket				
Weight	18 kg				
Topology	Transformerless				
Degree of protection	IP65				
Night power consumption	< 1 W				
Operating ambient temperature range	-25℃ to 60 ℃				
Allowable relative humidity range (non-condensing)	0% – 100%				
Cooling method	Natural cooling				
Max. operating altitude	4000 m (> 2000 m derating)				
Noise(Typical)	35 dB (A)				
Display	LED				
Communication	WLAN, Ethernet, RS485, DI, DO				
DC connection type	MC4				
AC connection type	Plug and play				
Compliance	EN 61000-6-1/-3, EN 61000-3-11/-12, IEC62109-2, IEC 61727, IEC 62116, IEC 61683, IEC 60068, EN 50530				

*: The inverter enters the standby state when the input voltage ranges between 1,000V and 1,100V. If the maximum DC voltage in the system can exceed 1000V, the MC4 connectors included in the scope of delivery must not be used. In this case MC4 Evo2 connectors must be used.

SG15/20RT

Multi-MPPT String Inverter for 1000 Vdc System



HIGH YIELD

- Lower startup & wider MPPT voltage
- Compatible with bifacial modules



SMART MANAGEMENT

- Optional Smart IV curve scanning
- Remote firmware updates



SAFE AND DURABLE

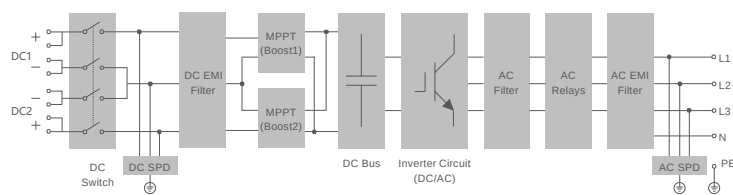
- Build-in Type II DC&AC SPD
- High anti-corrosion rating C5



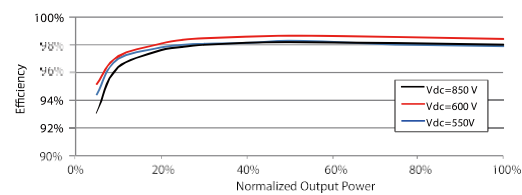
EASY AND USER FRIENDLY

- 21kg compact design
- Fast and easy commissioning via App

CIRCUIT DIAGRAM



EFFICIENCY CURVE



Type designation	SG15RT	SG20RT
Input (DC)		
Recommended max. PV input power	22.5kW	30 kW
Max. PV input voltage		1100 V *
Min. PV input voltage / Start-up input voltage		180V / 180V
Nominal input voltage		600 V
MPP voltage range		160V-1000V
No. of independent MPP inputs		2
No. of PV strings per MPPT		2 / 2
Max. PV input current		50 A (25 A / 25 A)
Max. DC short-circuit current		64 A (32 A / 32 A)
Output (AC)		
Nominal AC power (@230 V, 50 Hz)	15000 W	20000 W
Max. AC output power	16500 VA	22000 VA
Max. AC output current	25 A	31.9 A
Nominal AC voltage		3 / N / PE, 220 / 380 V 3 / N / PE, 230 / 400 V 3 / N / PE, 240 / 415 V
AC voltage range		180 V – 276 V
Nominal grid frequency /		50 Hz / 45 – 55 Hz
Grid frequency range		60 Hz / 55 – 65 Hz
Harmonic(THD)		<3 % (at nominal power)
Power factor at nominal power /		>0.99 / 0.8 leading – 0.8 lagging
Adjustable power factor		
Feed-in phases / AC connection		3 / 3
Efficiency		
Max. efficiency		98.50 %
European efficiency		98.10 %
Protection&Function		
Grid monitoring		Yes
DC reverse connection protection		Yes
AC short-circuit protection		Yes
Leakage current protection		Yes
Surge Protection		DC Type II / AC Type II
DC switch		Yes
General Data		
Dimensions (W*H*D)		370*480*195 mm
Mounting method		Wall-mounting bracket
Weight		21 kg
Topology		Transformerless
Degree of protection		IP65
Night power consumption		< 1 W
Operating ambient temperature range		-25°C to 60 °C
Allowable relative humidity range (non-condensing)		0% – 100%
Cooling method		Smart forced air cooling
Max. operating altitude		4000 m (>2000 m derating)
Noise(Typical)		45 dB(A)
Display		LED
Communication		WLAN, Ethernet, RS485, DI, DO
DC connection type		MC4
AC connection type		Plug and play
Compliance		EN 61000-6-1/-3, EN 61000-3-11/-12, IEC62109-2, IEC 61727, IEC 62116, IEC 61683, IEC 60068, EN 50530

*: The inverter enters the standby state when the input voltage ranges between 1,000V and 1,100V. If the maximum DC voltage in the system can exceed 1000V, the MC4 connectors included in the scope of delivery must not be used. In this case MC4 Evo2 connectors must be used.

SG15KTL-M/SG20KTL-M

Multi-MPPT String Inverter for 1000 Vdc System



High Yield

- Max. efficiency 98.6 %, European efficiency 98.3 %
- 1.1 overload capacity, 10% more yield under high irradiance
- Adapt to complex power grid, extend the grid-connected generation time
- Patented PID recovery function optional



Easy O&M

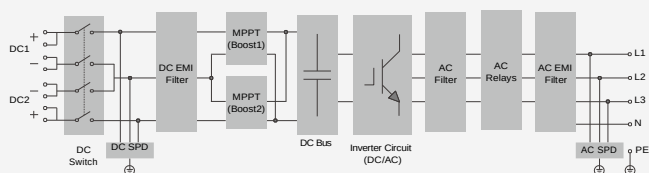
- 24kg, easy O&M
- Plug and play design, easy installation
- String current monitoring function for fast trouble shooting
- Fast commissioning, easy local and on-line monitoring



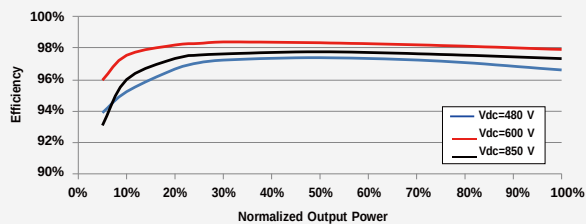
Safe and Reliable

- High power quality, no interference for electrical equipment
- Low radiation, compliance with household equipment standards
- High anti-corrosion with aluminum alloy die casting
- Built-in surge arresters and residual current protection

Circuit Diagram



Efficiency Curve



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SG15KTL-M/SG20KTL-M

Input (DC)	SG15KTL-M	SG20KTL-M
Max. PV input voltage	1100 V	
Min. PV input voltage / Start-up input voltage	200 V / 250 V	
Nominal PV input voltage	600 V	
MPP voltage range	200 V – 1000 V	
MPP voltage range for nominal power	380 V – 850 V	480 V – 850 V
No. of independent MPP inputs	2	
Max. number of PV strings per MPPT	2	
Max. PV input current	44 A (22 A / 22 A)	
Max. current for input connector	15 A	
Max. DC short-circuit current	60 A (30 A / 30 A)	
Output (AC)		
AC output power	16500 VA @ 35 °C / 15000 kVA @ 45 °C	22000 VA @ 35 °C / 20000 kVA @ 45 °C
Max. AC output current	24.0 A	31.9 A
Nominal AC voltage	3 / N / PE, 230 / 400 V	
AC voltage range	270 V – 480 V	
Nominal grid frequency / Grid frequency range	50 Hz / 45 – 55 Hz, 60 Hz / 55 – 65 Hz	
THD	< 3 % (at nominal power)	
DC current injection	< 0.5 % In	
Power factor at nominal power / Adjustable power factor	> 0.99 / 0.8 leading – 0.8 lagging	
Feed-in phases / Connection phases	3 / 3	
Efficiency		
Max. efficiency / Euro. efficiency	98.6 % / 98.3 %	
Protection		
DC reverse connection protection	Yes	
AC short-circuit protection	Yes	
Leakage current protection	Yes	
Grid monitoring	Yes	
DC switch / AC switch	Yes* / No	
PV string current monitoring	Yes	
PID recovery function	Optional	
Overvoltage protection	DC Type II / AC Type II	
General Data		
Dimensions (W*H*D)	370*485*210 mm	
Weight	24 kg	
Isolation method	Transformerless	
Degree of protection	IP65	
Night power consumption	< 1 W	
Operating ambient temperature range	-25 to 60 °C (> 45 °C derating)	
Allowable relative humidity range (non-condensing)	0 – 100 %	
Cooling method	Smart forced air cooling	
Max. operating altitude	4000 m (> 3000 m derating)	
Display / Communication	LED, Bluetooth + APP / RS485 (Optional: WiFi / Ethernet)	
DC connection type	MC4 (Max. 6 mm ²)	
AC connection type	Plug and play connector (Max. 16 mm ²)	
Compliance	EN 62109-1, EN 62109-2, EN 61000-3-11, EN 61000-3-12, IEC 61727, IEC 62116, VDE0126-1-1/4105, AS 4777.2, IEC 60068, IEC 61683, EN 50530, CEI 0-21,NB/T32004-2013, UNE 206007-1, G59/3, UTE C15-712-1	
Grid support	Active & reactive power control and power ramp rate control	
Type designation	SG15KTL-M-10	SG20KTL-M-10

*:Devices for Australia are not equipped with DC switches



SG33CX/SG40CX/SG50CX New

Multi-MPPT String Inverter for 1000 Vdc System



High Yield

- 5 MPPTs with max. efficiency 98.7%
- Compatible with bifacial module Built-in PID recovery function



Smart O&M

- Touch free commissioning and remote firmware upgrade
- Online IV curve scan and diagnosis
- Fuse free design with smart string current monitoring



Low Cost

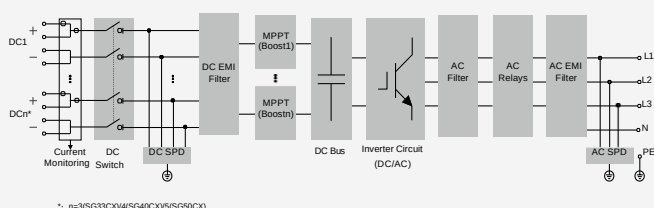
- Compatible with Al and Cu AC cables
- DC 2 in 1 connection enabled
- Cable free communication with optional Wi-Fi



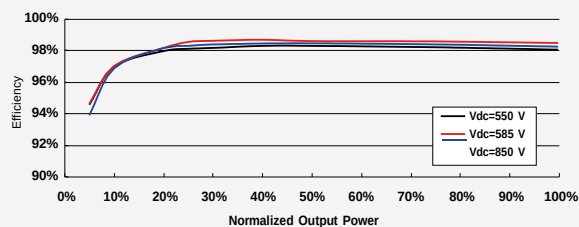
Proven Safety

- IP66 and C5 protection
- Type II SPD for both DC and AC
- Compliant with global safety and grid code

Circuit Diagram



Efficiency Curve



Input (DC)	SG33CX	SG40CX	SG50CX
Max. PV input voltage	1100 V		
Min. PV input voltage / Start-up input voltage	200 V / 250 V		
Nominal PV input voltage	585 V		
MPP voltage range	200 – 1000 V		
MPP voltage range for nominal power	550 – 850V		
No. of independent MPP inputs	3	4	5
Max. number of PV strings per MPPT	2		
Max. PV input current	78 A	104 A	130 A
Max. current for input connector	30 A		
Max. DC short-circuit current	120 A	160 A	200 A
Output (AC)			
AC output power	36.3 kVA @ 40 °C / 33 kVA @ 45 °C	44 kVA @ 40 °C / 40 kVA @ 45 °C	55 kVA @ 40 °C / 50 kVA @ 45 °C
Max. AC output current	55.2 A	66.9 A	83.6 A
Nominal AC voltage	3 / N / PE, 230 / 400 V		
AC voltage range	312 – 528 V		
Nominal grid frequency / Grid frequency range	50 Hz / 45 – 55 Hz, 60 Hz / 55 – 65 Hz		
THD	< 3 % (at nominal power)		
DC current injection	< 0.5 % I _n		
Power factor at nominal power / Adjustable power factor	> 0.99 / 0.8 leading – 0.8 lagging		
Feed-in phases / connection phases	3 / 3		
Efficiency			
Max. efficiency / European efficiency	98.6 % / 98.3 %	98.6 % / 98.3 %	98.7 % / 98.4 %
Protection			
DC reverse connection protection	Yes		
AC short circuit protection	Yes		
Leakage current protection	Yes		
Grid monitoring	Yes		
DC switch / AC switch	Yes / No		
PV String current monitoring	Yes		
Q at night	Yes		
PID recovery function	optional		
Overvoltage protection	DC Type II / AC Type II		
General Data			
Dimensions (W*H*D)	702*595*310mm	782*645*310mm	782*645*310mm
Weight	50 kg	58 kg	62 kg
Isolation method	Transformerless		
Degree of protection	IP66		
Night power consumption	≤2 W		
Operating ambient temperature range	-30 to 60 °C (> 45 °C derating)		
Allowable relative humidity range (non-condensing)	0 – 100 %		
Cooling method	Smart forced air cooling		
Max. operating altitude	4000 m (> 3000 m derating)		
Display	LED, Bluetooth+APP		
Communication	RS485 / Optional: Wi-Fi, Ethernet		
DC connection type	MC4 (Max. 6 mm ²)		
AC connection type	OT or DT terminal (Max.70 mm ²)		
Compliance	IEC 62109, IEC 61727, IEC 62116, IEC 60068, IEC 61683, VDE-AR-N 4105:2018, VDE-AR-N 4110:2018, IEC 61000-6-3, EN 50438, AS/NZS 4777.2:2015, CEI 0-21, VDE 0126-1-1/A1 VFR 2014, UTE C15-712-1:2013, DEWA		
Grid Support	Q at night function, LVRT, HVRT, active & reactive power control and power ramp rate control		



SG60KTL

String Inverter for 1000 Vdc System



High Yield

- Max. efficiency 98.9 %, European efficiency 98.7 %
- Long-time overload at 1.1 P_n
- Full power operation without derating at 50 °C



Easy O&M

- Compact design and light weight for easy installation
- Plug-in design of fan and SPD, convenient for on-site maintenance
- Integrated string current monitoring function for fast trouble shooting



Saved Investment

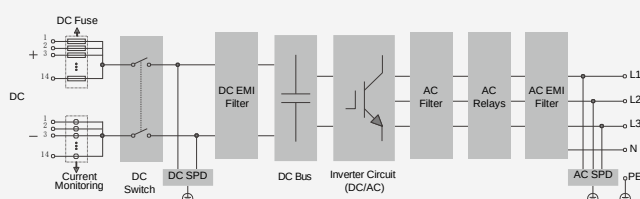
- Max. DC/AC ratio up to 1.4
- Integrated DC combiner box and DC/AC overvoltage protection



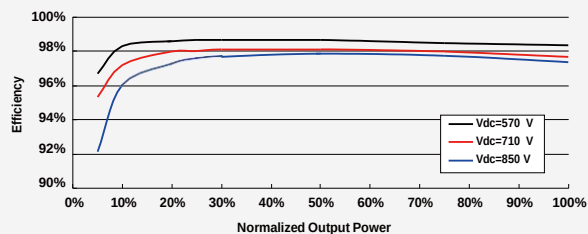
Grid Support

- Compliance with standards: IEC 62109, IEC 61727, IEC 62116, VDE0126-1-1, G59/3, VDE-AR-N-4105, VDE-AR-N-4120, BDEW
- Low/High voltage ride through (L/HVRT)
- Active & reactive power control and power ramp rate control

Circuit Diagram



Efficiency Curve



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Input (DC)**SG60KTL**

Max. PV input voltage	1000 V
Min. PV input voltage / Startup input voltage	570 V / 620 V
Nominal input voltage	710 V
MPP voltage range	570 – 950 V
MPP voltage range for nominal power	570 – 850 V
No. of independent MPP inputs	1
Max. number of PV strings per MPPT	14
Max. PV input current	120 A
Max. current for input connector	12 A
Max. DC short-circuit current	140 A

Output (AC)

AC output power	66000 VA @ 45 °C / 60000 VA @ 50 °C
Max. AC output current	96 A
Nominal AC voltage	3 / N / PE or 3 / PE, 230 / 400 V
AC voltage range	310 – 480 V
Nominal grid frequency / Grid frequency range	50 Hz / 45 – 55 Hz, 60 Hz / 55 – 65 Hz
THD	< 3 % (at nominal power)
DC current injection	< 0.5 % I _n
Power factor at nominal power / Adjustable power factor	> 0.99 / 0.8 leading – 0.8 lagging
Feed-in phases / Connection phases	3 / 3

Efficiency

Max. efficiency / Euro. efficiency	98.9 % / 98.7 %
------------------------------------	-----------------

Protection

DC reverse connection protection	Yes
AC short-circuit protection	Yes
Leakage current protection	Yes
Grid monitoring	Yes
DC switch / AC switch	Yes / No
DC fuse	Yes (positive, 15A)
PV string current monitoring	Yes
Overvoltage protection	DC Type II / AC Type III

General Data

Dimensions (W*H*D)	634*959*267 mm
Weight	60 kg
Isolation method	Transformerless
Degree of protection	IP65
Night power consumption	< 1 W
Operating ambient temperature range	-25 to 60 °C (> 50 °C derating)
Allowable relative humidity range (non-condensing)	0 – 100 %
Cooling method	Smart forced air cooling
Max. operating altitude	4000 m (> 3000 m derating)
Display / Communication	Graphic LCD / RS485
DC connection type	MC4 (Max. 6mm ²)
AC connection type	Screw clamp terminal (Max. 95 mm ²)
Compliance	IEC 62109, IEC 61727, IEC 62116, IEC 60068, IEC 61683, VDE0126-1-1, G59/3, VDE-AR-N-4105, VDE-AR-N-4120, BDEW, IEC 61000-3-11/-12, EN 50438, UTE C 15-712-1/07.13, CEA, PEA, MEA
Grid support	LVRT, HVRT, active & reactive power control and power ramp rate control
Type designation	SG60KTL-182



SG110CX New

Multi-MPPT String Inverter for 1000 Vdc System



High Yield

- 9 MPPTs with max. efficiency 98.7%
- Compatible with bifacial module Built-in PID recovery function



Smart O&M

- Touch free commissioning and remote firmware upgrade
- Online IV curve scan and diagnosis
- Fuse free design with smart string current monitoring



Low Cost

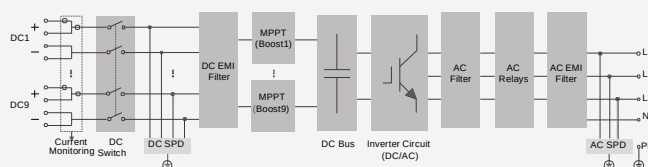
- Compatible with Al and Cu AC cables
- DC 2 in 1 connection enabled
- Q at night function



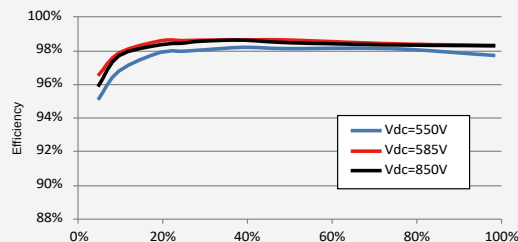
Proven Safety

- IP66 and C5 protection
- Type II SPD for both DC and AC
- Compliant with global safety and grid code

Circuit Diagram



Efficiency Curve



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Input (DC)

SG110CX

Max. PV input voltage	1100 V
Min. PV input voltage / Startup input voltage	200 V / 250 V
Nominal PV input voltage	585 V
MPP voltage range	200 – 1000 V
MPP voltage range for nominal power	550V – 850 V
No. of independent MPP inputs	9
Max. number of PV strings per MPPT	2
Max. PV input current	26 A * 9
Max. current for input connector	30 A
Max. DC short-circuit current	40 A * 9

Output (AC)

AC output power	110 kVA @ 45 °C / 100 kVA @ 50 °C
Max. AC output current	158.8 A
Nominal AC voltage	3 / N / PE, 400 V
AC voltage range	320 – 460 V
Nominal grid frequency / Grid frequency range	50 Hz / 45 – 55 Hz, 60 Hz / 55 – 65 Hz
THD	< 3 % (at nominal power)
DC current injection	< 0.5 % In
Power factor at nominal power / Adjustable power factor	> 0.99 / 0.8 leading – 0.8 lagging
Feed-in phases / connection phases	3 / 3

Efficiency

Max. efficiency / Euro. efficiency	98.7 % / 98.5 %
------------------------------------	-----------------

Protection

DC reverse connection protection	Yes
AC short circuit protection	Yes
Leakage current protection	Yes
Grid monitoring	Yes
Ground fault monitoring	Yes
DC switch / AC switch	Yes / No
PV String current monitoring	Yes
Q at night function	Yes
PID recovery function	Optional
Overvoltage protection	DC Type II / AC Type II

General Data

Dimensions (W*H*D)	1051*660*362.5 mm
Weight	85 kg
Isolation method	Transformerless
Ingress protection rating	IP66
Night power consumption	< 2W
Operating ambient temperature range	-30 to 60 °C (> 50 °C derating)
Allowable relative humidity range (non-condensing)	0 – 100 %
Cooling method	Smart forced air cooling
Max. operating altitude	4000 m (> 3000 m derating)
Display	LED, Bluetooth+APP
Communication	RS485 / Optional: Wi-Fi, Ethernet
DC connection type	MC4 (Max. 6 mm ²)
AC connection type	OT terminal (Max. 240 mm ²)
Compliance	IEC 62109, IEC 61727, IEC 62116, IEC 60068, IEC 61683, VDE-AR-N 4110:2018, VDE-AR-N 4120:2018, IEC 61000-6-3, EN 50438, AS/NZS 4777.2:2015, CEI 0-21, VDE 0126-1-1/A1 VFR 2014, UTE C15-712-1:2013, DEWA
Grid Support	Q at night function, LVRT, HVRT, active & reactive power control and power ramp rate control



SG250HX-IN New

SUNGROW
Clean power for all

Multi-MPPT String Inverter for 1500 Vdc System



HIGH YIELD

- 12 MPPTs with max. efficiency 99%
- Compatible with bifacial module
- Built-in An-ti PID and PID recovery function



SMART O&M

- Touch free commissioning and remote firmware upgrade
- Online IV curve scan and diagnosis*
- Fuse free design with smart string current monitoring



LOW COST

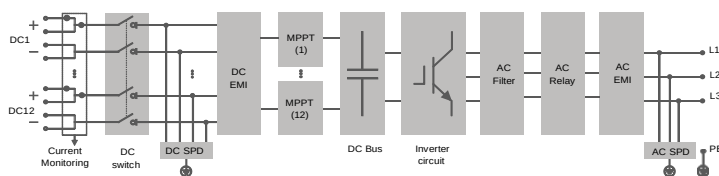
- Compatible with Al and Cu AC cables
- DC 2 in 1 connection enabled
- Power line communication (PLC)
- Q at night function



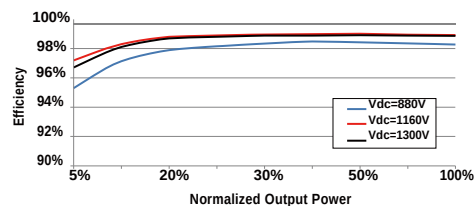
PROVEN SAFETY

- IP66 and C5 protection
- Type II SPD for both DC and AC
- Compliant with global safety and grid code

CIRCUIT DIAGRAM



EFFICIENCY CURVE



Type designation	SG250HX-IN
Input (DC)	
Max. PV input voltage	1500 V
Min. PV input voltage / Startup input voltage	600 V / 600 V
Nominal PV input voltage	1160 V
MPP voltage range	600 V – 1500 V
MPP voltage range for nominal power	860 V – 1300 V
No. of independent MPP inputs	12
Max. number of input connectors per MPPT	2
Max. PV input current	26 A * 12
Max. current for input connector	30 A
Max. DC short-circuit current	50 A * 12
Output (AC)	
AC output power	250 kVA @ 30 °C / 200 KVA @50 °C
Max. AC output current	180.5 A
Nominal AC voltage	3 / PE, 800 V
AC voltage range	680 – 880V
Nominal grid frequency / Grid frequency range	50 Hz / 45 – 55 Hz, 60 Hz / 55 – 65 Hz
THD	< 3 % (at nominal power)
DC current injection	< 0.5 % In
Power factor at nominal power / Adjustable power factor	> 0.99 / 0.8 leading – 0.8 lagging
Feed-in phases / connection phases	3 / 3
Efficiency	
Max. efficiency	99.0 %
European efficiency	98.8 %
Protection	
DC reverse connection protection	Yes
AC short circuit protection	Yes
Leakage current protection	Yes
Grid monitoring	Yes
Ground fault monitoring	Yes
DC switch / AC switch	Yes / No
PV String current monitoring	Yes
Q at night function	Yes
PID protection	Anti-PID or PID recovery
Overvoltage protection	DC Type II / AC Type II
General Data	
Dimensions (W*H*D)	1051 * 660 * 363 mm
Weight	95kg
Isolation method	Transformerless
Ingress protection rating	IP66
Night power consumption	< 2 W
Operating ambient temperature range	-30 to 60 °C (> 50 °C derating)
Allowable relative humidity range (non-condensing)	0 – 100 %
Cooling method	Smart forced air cooling
Max. operating altitude	4000 m (> 3000 m derating)
Display	LED, Bluetooth+APP
Communication	RS485 / PLC
DC connection type	Amphenol UTX (Max. 6 mm ²)
AC connection type	OT terminal (Max. 300 mm ²)
Compliance	IEC 62109, IEC 61727, IEC 62116, IEC 60068, IEC 61683, IEC 61000-6-3
Grid Support	Q at night function, LVRT, HVRT, active & reactive power control and power ramp rate control

*: Only compatible with Sungrow logger and iSolarCloud

WiFi



Smart and Flexible

- Supporting mainstream WLAN networking protocols, with favourable compatibility



Simple and Efficient

- Supporting remote operation and maintenance functions including remote upgrading, parameter setting
- Supporting direct connection configuration with APP, quickly and easily
- Plug and play, quick installation



Safe and Reliable

- Professional design in wireless communication, and high quality signal
- IP65, wide temperature range



Basic Data

Supported device number	1
Display	LED * 3
Configuration	APP

Max. Communication Range

RS485	1
WLAN	2.4 GHz 802.11 b/g/n

Power Supply

Input voltage	5.0 ± 0.25 Vdc
Power consumption	Typ. 2 W

Ambient Parameters

Operating temperature	-25 °C to 60 °C
Allowable relative humidity range (non-condensing)	≤ 95 %
Max. operating altitude	≤ 4000 m
Protection class	IP65

Mechanical Parameters

Dimensions (W*H*D)	48*97*36 mm
Installation	Plug-in type





Simple and Flexible

- One-click access to iSolarCloud
- One module can manage up to 10 inverters for remote maintenance and control
- Plug and play, easy installation



Convenient O&M

- Built-in Web server for monitoring and configuration, by PC or smartphone browser; no APP required
- Support of plant maintenance by remote Web access, optimized OPEX
- Support of local and remote parameter setting and firmware updates



Communication

Max. number of devices	10
LED display	LED × 3

Wireless communication

4G communication	LTE(FDD): B1, B3, B5, B8
	LTE(TDD): B38, B39, B40, B41
WiFi communicatoin	TD-SCDMA: B34, B39
	CDMA: BC0
	GSM:900MHz / 1800MHz
	WCDMA:B1, B8
WiFi communicatoin	802.11 b / g / n / ac
	HT20 / 40 / 80 MHz
	2.4 GHz / 5 GHz

Ordering information

EyeM4A	Support of 4G and WiFi wireless communication Apply to China, India, Malaysia
EyeM4B	Support of 4G wireless communication Apply to China
EyeM4C	Support of WiFi wireless communication Apply to Global

Power Supply

DC input	5 VDC, 0.8 A
Power consumption	<4 W

Ambient conditions

Operating Temperature	-30 °C ~ 60 °C
Relative air humidity	≤95 % (non-condensing)
Elevation	≤4000 m
Protection class	IP66

Mechanical parameters

Dimensions (W * H * D)	48 mm * 130 mm * 36 mm
Mounting type	Plug and Play



COM100D

Smart Communication Box

SUNGROW
Clean power for all



SMART AND FLEXIBLE

- Support of RS485, Ethernet and WiFi communication
- Support of energy meter, meteo station, sensors and other equipment



CONVENIENT O&M

- Inverter batch parameter settings and firmware updates
- PV-Plant maintenance via remote Web access for optimized OPEX
- Active and reactive power control
- Local monitoring



EASY OPERATION

- Night light for maintenance
- Robust enclosure, easy to install

Type designation		COM100D	
Communication		Mechanical parameters	
Max. number of devices	30	Dimensions (W * H * D)	460 mm * 315 mm * 126 mm
RS485 interface	3	Weight	6 kg
Ethernet	1 * RJ45, 10 / 100 / 1000 Mbps	Mounting type	Wall mounted, outdoor and indoor
Digital input	5, Max. 24 VDC	Box material	PC
Analog input	4, support 4 ~ 20 mA or 0~10 VDC	Cable specification	AC cable: outdoor UV protection cable of 1~1.5 mm2, outside diameter 13~18mm RS485 cable: outdoor UV protection shielded twisted pair (STP) of 0.75~1.5 mm, outside diameter 6~18mm Ethernet: CAT5 cable, outdoor UV protection shielded, outside diameter 6~18mm AI, DI: outdoor UV protection cable of 1~1.5 mm2, outside diameter 4.5~6mm
Wireless Communication		Ordering information	
4G communication	LTE (FDD): B1, B3, B5, B8 LTE (TDD): B38, B39, B40, B41 TD-SCDMA: B34, B39 CDMA: BC0 GSM:900MHz / 1800MHz WCDMA:B1, B8	COM100D	The COM100D includes Logger1000A, AC adapter, SPD, Air switch, Night light Support of 4G and WiFi wireless communication Apply to China, India, Malaysia
WiFi communication	802.11 b / g / n / ac HT20 / 40 / 80 MHz 2.4GHz / 5GHz		
Power Supply			
AC input	100 VAC ~ 300 VAC, 50 / 60 Hz		
Power consumption	Typ. 20 W, Max. 30 W		
Night light for maintenance	<1 W		
Ambient Conditions			
Operating Temperature	30 °C ~ 60 °C		
Storage Temperature	-40 °C ~ 80 °C		
Relative air humidity	≤95 % (non-condensing)		
Elevation	≤4000 m		
Protection class	IP66		



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2112



WATTSUN
ENERGY (INDIA) PVT. LTD.
Never ending energy



Date: 01/03/2023

BOARD RESOLUTION
Reference No.: WS031/2023

CERTIFIED TRUE COPY OF THE RESOLUTION PASSED AT THE MEETING OF THE BOARD OF "WATTSUN ENERGY INDIA (P) LTD" held on 01/03/2023 at FF Aiswarya Towers, International Airport Road, Chackai, Trivandrum.

RESOLVED THAT the board of directors have decided to authorize, **Mrs. Sreeja SS** and is hereby authorized to sign and submit all the necessary documents to be submitted Wattsun Energy India Private in connection with tenders published by all Government and Non-Government Organizations.

Specimen signature of power of Attorney

.....

Name: Mrs. Sreeja SS
Designation: Purchase Manager

For Wattsun Energy India(P) Ltd

.....

Name: Mr. Terance Alex
Designation: Managing Director



www.wattsun.in
info@wattsun.in
+91 938 810 6363

WATTSUN
ENERGY (INDIA) PVT. LTD.
Never ending energy

Wattsun Energy (India) Pvt. Ltd.
FF Aiswarya Towers
International Airport Road
Chackai, Trivandrum, Kerala 695 024
CIN: U40300KL2014PTC036294

South India's First ISO 50001-2011 Energy Management System Certified Company



WATT SUN
ENERGY (INDIA) PVT. LTD.
Never ending energy



FORMAT 6– COMPONENT WISE SPLIT UP OF COSTS

S/N	Component	Percentage (%)
1	SPV Modules	50
2	Module Mounting Structure	10
3	Grid Tied Inverter as per specification	8
4	Balance of System	5
5	Cost for 10 Year Warranty and Preventive Maintenance	4
6	Installation and Commissioning Charges	15
7	Insurance (From Material dispatch till 10 years warranty period)	2
8	Any miscellaneous expenses required for the successful commissioning of the plant	5
9	Remote Monitoring and associated costs	1
Total		100%

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WATT SUN
ENERGY (INDIA) PVT. LTD.
Never ending energy

WattSun Energy (India) Pvt. Ltd.
FF Aiswarya Towers
International Airport Road
Chackai, Trivandrum, Kerala 695 024
CIN: U40300KL2014PTC036294

C E R T I F I C A T E



of Conformity
Low Voltage Directive 2014/35/EU

Registration No.: AN 50485653 0001

Report No.: 60388400 001

Holder: Sungrow Power Supply Co., Ltd.
No.1699 Xiyou Rd., New & High
Technology Industrial
Development Zone,
Hefei
230088 Anhui
P.R. China

Product: PV-Inverter
(Grid-connected PV Inverter)

Identification: Type Designation: SG3.0RT SG4.0RT SG5.0RT SG6.0RT SG7.0RT
SG8.0RT SG10RT SG12RT SG15RT SG17RT
SG20RT

Serial Number : Engineering Sample

Remark(s) : Issued in conjunction with TÜV Rheinland
license R 50485651 0001-0005.

This certificate of conformity is based on an evaluation of a sample of the above mentioned product. Technical Report and documentation are at the Licence Holder's disposal. This is to certify that the tested sample is in conformity with Annex I of Council Directive 2014/35/EU, referred to as the Low Voltage Directive. This certificate does not imply assessment of the series-production of the product and does not permit the use of a TÜV Rheinland mark of conformity. The holder of the certificate is authorized to use this certificate in connection with the EC declaration of conformity according to Annex IV of the Directive.



Weichun Li

Date 05.11.2020

TÜV Rheinland LGA Products GmbH - Tillystraße 2 - 90431 Nürnberg

2115

CE The CE marking may be used if all relevant and effective EC Directives are complied with. CE

TÜV Rheinland (China) Ltd.
Member of TÜV Rheinland Group



Sungrow Power Supply Co., Ltd.
Daniel Du

Date : 12.11.2020
Our ref. : DJW 01
Your ref.: Daniel Du

No.1699 Xiyou Rd., New & High
Technology Industrial
Development Zone,
Hefei
230088 Anhui
P.R. China

Ref : AN Certificate of Conf. Low Voltage D.

Type of Equipment : Grid-connected PV Inverter
Model Designation : See Certificate
Certificate No. : AN 50485653 0001
Report No. : 60388400 001

Dear Daniel Du,

We herewith confirm that a sample of the above mentioned technical equipment has been tested and was found to be in accordance with the relevant requirements.

Enclosed please find your Certificate of Conformity.

We appreciate your kind support and would like to offer our assistance and continuous services in the future.

With kind regards,

Certification Body


Weichun Li

Enclosure

证书的详细信息请登录www.certipedia.com查阅,或拨打我司客服热线800 999 3668 / 400 883 1300咨询

TÜV Rheinland (China) Ltd.
莱茵检测认证服务(中国)有限公司

Unit 707, AVIC Bldg., No. 10B, 北京市朝阳区东三环中路乙10号
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Road, Chaoyang District, 邮编: 100022
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Tel: (8610)6566 6660
Fax: (8610)6566 6667
e-mail: info@bj.chn.tuv.com
Internet: <http://www.chn.tuv.com>

2116

Zertifikat**Certificate**

Zertifikat Nr. Certificate No.
R 50485651

Blatt Sheet
0001

Ihr Zeichen Client Reference
Wang Kai

Unser Zeichen Our Reference
01-DJW-60388400 001

Ausstellungsdatum Date of Issue
05.11.2020 (day/mo/yr)

Genehmigungsinhaber License Holder

Sungrow Power Supply Co., Ltd.
No.1699 Xiyou Rd., New & High
Technology Industrial
Development Zone,
Hefei
230088 Anhui
P.R. China

Fertigungsstätte Manufacturing Plant

Sungrow Power Supply Co., Ltd.
No.1699 Xiyou Rd., New & High
Technology Industrial
Development Zone,
Hefei
230088 Anhui
P.R. China

Prüfzeichen Test Mark

Bauart geprüft
Sicherheit
Regelmäßige
Produktions-
überwachung

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ID 1111231848

Geprüft nach Tested acc. to

IEC 62109-1:2010
IEC 62109-2:2011
EN 62109-1:2010
EN 62109-2:2011

Zertifiziertes Produkt (Geräteidentifikation)
Certified Product (Product Identification)

Lizenzentgelte - Einheit
License Fee - Unit

PV-Wechselrichter (Grid-connected PV Inverter)

Type Designation	: SG3.0RT SG4.0RT SG5.0RT	12
Vmax PV[Vd.c.]	: 1100	
Isc PV[Ad.c.]	: 16/16	
MPP Voltage Range[Vd.c.]	: 160-1000	
Max.Input Current[Ad.c.]	: 12.5/12.5	
Overvoltage Category(OVC)	: II for PV	

Rated Output Voltage[Va.c.]: 3/N/PE, AC 220/230/240
Rated Output Frequency[Hz]: 50/60
Rated Output Power[kW]: 3 4 5
Max. Output Current[Aa.c.]: 5.1 6.8 8.3
Power Factor: 0.80(leading), 0.80(lagging)
Overvoltage Category(OVC): III for AC Mains

continued on page 0002

12

ANLAGE (Appendix): 1.0

Dem Zertifikat liegt unsere Prüf- und Zertifizierungsordnung zugrunde und es bestätigt die Konformität des Produktes mit den oben genannten Standards und Prüfgrundlagen. Zusätzliche Anforderungen in Ländern, in denen das Produkt in Verkehr gebracht werden soll, müssen zusätzlich betrachtet werden. Die Herstellung des zertifizierten Produktes wird überwacht.
This certificate is based on our Testing and Certification Regulation and states the conformity of the product with the standards and testing requirements as indicated above. Any additional requirements in countries where the product is going to be marketed have to be considered additionally. The manufacturing of the certified product is subject to surveillance.

TÜV Rheinland LGA Products GmbH, Tillystraße 2, 90431 Nürnberg

Tel.: +49 221 806-1371 e-mail: cert-validity@de.tuv.com

Fax: +49 221 806-2035 http://www.tuv.com/safety



Weichun Li

Zertifikat**Certificate**

Zertifikat Nr. Certificate No.
R 50485651

Blatt Sheet
0002

Ihr Zeichen Client Reference	Unser Zeichen Our Reference	Ausstellungsdatum Date of Issue	(day/mo/yr)
Wang Kai	01-DJW-60388400 001	05.11.2020	

Genehmigungsinhaber License Holder

Sungrow Power Supply Co., Ltd.
No.1699 Xiyou Rd., New & High
Technology Industrial
Development Zone,
Hefei
230088 Anhui
P.R. China

Fertigungsstätte Manufacturing Plant

Sungrow Power Supply Co., Ltd.
No.1699 Xiyou Rd., New & High
Technology Industrial
Development Zone,
Hefei
230088 Anhui
P.R. China

Prüfzeichen Test Mark

Bauart geprüft
Sicherheit
Regelmäßige
Produktions-
überwachung

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ID 1111231848

Geprüft nach Tested acc. to

IEC 62109-1:2010
IEC 62109-2:2011
EN 62109-1:2010
EN 62109-2:2011

Zertifiziertes Produkt (Geräteidentifikation)
Certified Product (Product Identification)

Lizenzentgelte - Einheit
License Fee - Unit

PV-Wechselrichter (Grid-connected PV Inverter)

Type Designation	SG6.0RT	SG7.0RT	SG8.0RT	
Vmax PV[Vd.c.]	: 1100			3
Isc PV[Ad.c.]	: 16/16	32/16	32/16	
MPP Voltage Range[Vd.c.]	: 160-1000			
Max.Input Current[Ad.c.]	: 12.5/12.5	25/12.5	25/12.5	
Overvoltage Category(OVC)	: II for PV			

Rated Output Voltage[Va.c.]: 3/N/PE, AC 220/230/240
Rated Output Frequency[Hz]: 50/60
Rated Output Power[kW]: 6 7 8
Max. Output Current[Aa.c.]: 10.0 11.7 13.3
Power Factor: 0.80(leading), 0.80(lagging)
Overvoltage Category(OVC): III for AC Mains

continued on page 0003

3

ANLAGE (Appendix): 1.0

Dem Zertifikat liegt unsere Prüf- und Zertifizierungsordnung zugrunde und es bestätigt die Konformität des Produktes mit den oben genannten Standards und Prüfgrundlagen. Zusätzliche Anforderungen in Ländern, in denen das Produkt in Verkehr gebracht werden soll, müssen zusätzlich betrachtet werden. Die Herstellung des zertifizierten Produktes wird überwacht.
This certificate is based on our Testing and Certification Regulation and states the conformity of the product with the standards and testing requirements as indicated above. Any additional requirements in countries where the product is going to be marketed have to be considered additionally. The manufacturing of the certified product is subject to surveillance.

TÜV Rheinland LGA Products GmbH, Tillystraße 2, 90431 Nürnberg

Tel.: +49 221 806-1371 e-mail: cert-validity@de.tuv.com

Fax: +49 221 806-2075 http://www.tuv.com/safety



Weichun Li

Zertifikat**Certificate**

Zertifikat Nr. Certificate No.
R 50485651

Blatt Sheet
0003

Ihr Zeichen Client Reference
Wang Kai

Unser Zeichen Our Reference
01-DJW-60388400 001

Ausstellungsdatum Date of Issue
05.11.2020 (day/mo/yr)

Genehmigungsinhaber License Holder

Sungrow Power Supply Co., Ltd.
No.1699 Xiyou Rd., New & High
Technology Industrial
Development Zone,
Hefei
230088 Anhui
P.R. China

Fertigungsstätte Manufacturing Plant

Sungrow Power Supply Co., Ltd.
No.1699 Xiyou Rd., New & High
Technology Industrial
Development Zone,
Hefei
230088 Anhui
P.R. China

Prüfzeichen Test Mark

Bauart geprüft
Sicherheit
Regelmäßige
Produktions-
überwachung

www.tuv.com
ID 1111231848

Geprüft nach Tested acc. to

IEC 62109-1:2010
IEC 62109-2:2011
EN 62109-1:2010
EN 62109-2:2011

Zertifiziertes Produkt (Geräteidentifikation)
Certified Product (Product Identification)

Lizenzentgelte - Einheit
License Fee - Unit

PV-Wechselrichter (Grid-connected PV Inverter)

Type Designation : SG10RT SG12RT

2

Vmax PV[Vd.c.] : 1100
Isc PV[Ad.c.] : 32/16
MPP Voltage Range[Vd.c.] : 160-1000
Max.Input Current[Ad.c.] : 25/12.5
Overvoltage Category(OVC) : II for PV

Rated Output Voltage[Va.c.] : 3/N/PE, AC 220/230/240
Rated Output Frequency [Hz] : 50/60
Rated Output Power[kW] : 10 12
Max. Output Current[Aa.c.] : 16.7 20.0
Power Factor : 0.80(leading), 0.80(lagging)
Overvoltage Category(OVC) : III for AC Mains

continued on page 0004

2

ANLAGE (Appendix) : 1.0

Dem Zertifikat liegt unsere Prüf- und Zertifizierungsordnung zugrunde und es bestätigt die Konformität des Produktes mit den oben genannten Standards und Prüfgrundlagen. Zusätzliche Anforderungen in Ländern, in denen das Produkt in Verkehr gebracht werden soll, müssen zusätzlich betrachtet werden. Die Herstellung des zertifizierten Produktes wird überwacht.
This certificate is based on our Testing and Certification Regulation and states the conformity of the product with the standards and testing requirements as indicated above. Any additional requirements in countries where the product is going to be marketed have to be considered additionally. The manufacturing of the certified product is subject to surveillance.

TÜV Rheinland LGA Products GmbH, Tillystraße 2, 90431 Nürnberg

Tel.: +49 221 806-1371 e-mail: cert-validity@de.tuv.com
Fax: +49 221 806-3935 http://www.tuv.com/safety

2119



Weichun Li

Zertifikat**Certificate**

Zertifikat Nr. Certificate No.
R 50485651

Blatt Sheet
0004

Ihr Zeichen Client Reference
Wang Kai

Unser Zeichen Our Reference
01-DJW-60388400 001

Ausstellungsdatum Date of Issue
05.11.2020 (day/mo/yr)

Genehmigungsinhaber License Holder

Sungrow Power Supply Co., Ltd.
No.1699 Xiyou Rd., New & High
Technology Industrial
Development Zone,
Hefei
230088 Anhui
P.R. China

Fertigungsstätte Manufacturing Plant

Sungrow Power Supply Co., Ltd.
No.1699 Xiyou Rd., New & High
Technology Industrial
Development Zone,
Hefei
230088 Anhui
P.R. China

Prüfzeichen Test Mark

Bauart geprüft
Sicherheit
Regelmäßige
Produktions-
überwachung

www.tuv.com
ID 1111231848

Geprüft nach Tested acc. to

IEC 62109-1:2010
IEC 62109-2:2011
EN 62109-1:2010
EN 62109-2:2011

Zertifiziertes Produkt (Geräteidentifikation)
Certified Product (Product Identification)

Lizenzentgelte - Einheit
License Fee - Unit

PV-Wechselrichter (Grid-connected PV Inverter)

Type Designation : SG15RT SG17RT SG20RT

3

Vmax PV[Vd.c.] : 1100
Isc PV[Ad.c.] : 32/32
MPP Voltage Range[Vd.c.] : 160-1000
Max.Input Current[Ad.c.] : 25/25
Overvoltage Category(OVC) : II for PV

Rated Output Voltage[Va.c.] : 3/N/PE, AC 220/230/240
Rated Output Frequency[Hz] : 50/60
Rated Output Power[kW] : 15 17 20
Max. Output Current[Aa.c.] : 25.0 28.3 31.9
Power Factor : 0.80(leading), 0.80(lagging)
Overvoltage Category(OVC) : III for AC Mains

continued on page 0005

3

ANLAGE (Appendix) : 1.0

Dem Zertifikat liegt unsere Prüf- und Zertifizierungsordnung zugrunde und es bestätigt die Konformität des Produktes mit den oben genannten Standards und Prüfgrundlagen. Zusätzliche Anforderungen in Ländern, in denen das Produkt in Verkehr gebracht werden soll, müssen zusätzlich betrachtet werden. Die Herstellung des zertifizierten Produktes wird überwacht.
This certificate is based on our Testing and Certification Regulation and states the conformity of the product with the standards and testing requirements as indicated above. Any additional requirements in countries where the product is going to be marketed have to be considered additionally. The manufacturing of the certified product is subject to surveillance.

TÜV Rheinland LGA Products GmbH, Tillystraße 2, 90431 Nürnberg

Tel.: +49 221 806-1371 e-mail: cert-validity@de.tuv.com
Fax: +49 221 806-3935 http://www.tuv.com/safety

2120



Weichun Li

Zertifikat**Certificate**

Zertifikat Nr. Certificate No.
R 50485651

Blatt Sheet
0005

Ihr Zeichen Client Reference
Wang Kai

Unser Zeichen Our Reference
01-DJW-60388400 001

Ausstellungsdatum Date of Issue
05.11.2020 (day/mo/yr)

Genehmigungsinhaber License Holder

Sungrow Power Supply Co., Ltd.
No.1699 Xiyou Rd., New & High
Technology Industrial
Development Zone,
Hefei
230088 Anhui
P.R. China

Fertigungsstätte Manufacturing Plant

Sungrow Power Supply Co., Ltd.
No.1699 Xiyou Rd., New & High
Technology Industrial
Development Zone,
Hefei
230088 Anhui
P.R. China

Prüfzeichen Test Mark**Geprüft nach Tested acc. to**

IEC 62109-1:2010
IEC 62109-2:2011
EN 62109-1:2010
EN 62109-2:2011

Zertifiziertes Produkt (Geräteidentifikation)
Certified Product (Product Identification)

Lizenzentgelte - Einheit
License Fee - Unit

PV-Wechselrichter (Grid-connected PV Inverter)

Protective Class : Class I
Ingress Protection (IP) : IP65
Pollution Degree (PD) : PD3
Altitude [m] : <4000
Operating Temperature [°C] : -25 to 60 (> 45 derating)
Type of Inverter : Non-isolated

Remark(s) :

The installation has to be carried out according to the attached installation instruction.
Any additional requirements in countries where the product is going to be marketed have to be considered additionally.

ANLAGE (Appendix) : 1.0

Dem Zertifikat liegt unsere Prüf- und Zertifizierungsordnung zugrunde und es bestätigt die Konformität des Produktes mit den oben genannten Standards und Prüfgrundlagen. Zusätzliche Anforderungen in Ländern, in denen das Produkt in Verkehr gebracht werden soll, müssen zusätzlich betrachtet werden. Die Herstellung des zertifizierten Produktes wird überwacht.
This certificate is based on our Testing and Certification Regulation and states the conformity of the product with the standards and testing requirements as indicated above. Any additional requirements in countries where the product is going to be marketed have to be considered additionally. The manufacturing of the certified product is subject to surveillance.

TÜV Rheinland LGA Products GmbH, Tillystraße 2, 90431 Nürnberg

Tel.: +49 221 806-1371 e-mail: cert-validity@de.tuv.com
Fax: +49 221 806-3935 http://www.tuv.com/safety



Weichun Li

TÜV Rheinland (China) Ltd.
Member of TÜV Rheinland Group



Sungrow Power Supply Co., Ltd.
Wang Kai

Date : 12.11.2020
Our ref. : DJW 01
Your ref.: Wang Kai

No.1699 Xiyou Rd., New & High
Technology Industrial
Development Zone,
Hefei
230088 Anhui
P.R. China

Ref : R TÜV-Bauart-Zeichen o. Akkred. Nr.

Type of Equipment : Grid-connected PV Inverter
Model Designation : See Certificate
Certificate No. : R 50485651 0001
Report No. : 60388400 001

Dear Wang Kai,

The above specified equipment has been tested and found to be in accordance with the relevant requirements.

Please find enclosed your certificate as specified above.

If cancellation of the certificate is submitted by 15 November in a given year, no fee will be charged for the following year.

The certificate is issued with the reservation that the license holder applies all information required in § 6 of the ProdSG related to name and address of the manufacturer or his authorized representative / importer, including their respective contact addresses on the product prior to marketing of the product in the European Economic Area.

With kind regards,

Certification Body


Weichun Li

cc: Sungrow Power Supply Co., Ltd.

Enclosure

证书的详细资料请登陆www.certipedia.com查阅,或拨打我司客服热线800 999 3668 / 400 883 1300咨询

TÜV Rheinland (China) Ltd.
莱茵检测认证服务(中国)有限公司

Unit 707, AVIC Bldg., No. 10B,
Central Road, East 3rd Ring
Road, Chaoyang District,
Beijing, 100022, P.R.China

北京市朝阳区东三环中路乙10号
艾维克大厦707室
邮编: 100022

Tel: (8610)6566 6660
Fax: (8610)6566 6667
e-mail: info@bj.chn.tuv.com
Internet: <http://www.chn.tuv.com>

2122

C E R T I F I C A T E

of Conformity



Registration No.: AK 50492453 0001

Report No.: CN21MPQH 001

Holder: Sungrow Power Supply Co., Ltd.
No.1699 Xiyou Rd., New & High
Technology Industrial
Development Zone,
Hefei
230088 Anhui
P.R. China

Product: PV-Inverter
(Grid Connected PV Inverter)

Identification:

Type Designation	: SG3.0RT SG4.0RT SG5.0RT SG6.0RT SG7.0RT SG8.0RT SG10RT SG12RT SG15RT SG17RT SG20RT
Serial Number	: Engineering Sample
Firmware Version	: BERYL-S_03011.01.01
Remark	: Refer to test report CN21MPQH 001 for detail.

Tested acc. to: IEC 61000-3-11:2000
IEC 61000-3-12:2011

The certificate of conformity refers to the above mentioned product. This is to certify that the specimen is in conformity with the assessment requirement mentioned above. This certificate does not imply assessment of the production of the product and does not permit the use of a TÜV Rheinland mark of conformity.

Date 18.01.2021




Weichun Li

TÜV Rheinland LGA Products GmbH - Tillystraße 2 - 90431 Nürnberg

TÜV Rheinland (China) Ltd.
Member of TÜV Rheinland Group



Sungrow Power Supply Co., Ltd.
Wang Kai

Date : 18.01.2021
Our ref. : DJW 01
Your ref.:

No.1699 Xiyou Rd., New & High
Technology Industrial
Development Zone,
Hefei
230088 Anhui
P.R. China

Ref : AK Certificate of Conformity

Type of Equipment : Grid Connected PV Inverter
Model Designation : See Certificate
Certificate No. : AK 50492453 0001
Report No. : CN21MPQH 001

Dear Wang Kai,

We herewith confirm that a sample of the above mentioned technical equipment has been tested and was found to be in accordance with the relevant requirements.

Enclosed please find your Certificate of Conformity.

We appreciate your kind support and would like to offer our assistance and continuous services in the future.

With kind regards,

Certification Body



Weichun Li

Enclosure

证书的详细资料请登陆www.certipedia.com查阅,或拨打我司客服热线800 999 3668 / 400 883 1300咨询

TÜV Rheinland (China) Ltd.
莱茵检测认证服务(中国)有限公司

Unit 707, AVIC Bldg., No. 10B,
Central Road, East 3rd Ring
Road, Chaoyang District,
Beijing, 100022, P.R.China

北京市朝阳区东三环中路乙10号
艾维克大厦707室
邮编: 100022

Tel: (8610)6566 6660
Fax: (8610)6566 6667
e-mail: info@bj.chn.tuv.com
Internet: <http://www.chn.tuv.com>

2124



C E R T I F I C A T E
of Conformity
EC Council Directive 2014/30/EU
Electromagnetic Compatibility

Registration No.: AE 50484758 0001

Report No.: 60419881 001

Holder: Sungrow Power Supply Co., Ltd.
No.1699 Xiyou Rd., New & High
Technology Industrial
Development Zone,
Hefei
230088 Anhui
P.R. China

Product: PV-Inverter
(Grid-connected PV Inverter)

Identification: See type designations in attachment 1.1
Serial No.: n.a.
Remark: Refer to test report 60419881 001 for details.

Tested acc. to: EN 61000-6-1:2007
EN 61000-6-2:2005
EN 61000-6-3:2007+A1
EN 61000-6-4:2007+A1
IEC 61000-6-1:2005
IEC 61000-6-2:2005
IEC 61000-6-3:2006+A1
IEC 61000-6-4:2006+A1

This certificate of conformity is based on an evaluation of a sample of the above mentioned product. Technical Report and documentation are at the Licence Holder's disposal. This is to certify that the tested sample is in conformity with all provisions of Annex I of Council Directive 2014/30/EU. This certificate does not imply assessment of the production of the product and does not permit the use of a TÜV Rheinland mark of conformity. The holder of the certificate is authorized to use this certificate in connection with the EC declaration of conformity according to the a.m. Directive.

Date 04.11.2020



TÜV Rheinland LGA Products GmbH - Tillystraße 2 - 90431 Nürnberg

CE The CE marking may only be used if all relevant and effective EC Directives are complied with. **CE**



TÜV Rheinland
LGA Products GmbH
Tillystraße 2, 90431 Nürnberg

1.1

Attachment to
Registration No.: AE 50484758 0001
Report No.: 60419881 001

Manufacturer: Sungrow Power Supply Co., Ltd.
No.1699 Xiyou Rd., New & High
Technology Industrial
Development Zone,
Hefei
230088 Anhui
P.R. China

Scope: additional type designation:

SG5.0RT	SG6.0RT	SG7.0RT	SG8.0RT
SG10RT	SG12RT	SG15RT	SG17RT
SG3.0RT	SG4.0RT	SG20RT	

Date: 2020-11-04



Certification Body

Xinhua Lu
Xinhua Lu

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TÜV Rheinland (China) Ltd.
Member of TÜV Rheinland Group



Sungrow Power Supply Co., Ltd.
Wang Kai

Date : 04.11.2020
Our ref. : QYB 01
Your ref.: W.K.

No.1699 Xiyou Rd., New & High
Technology Industrial
Development Zone,
Hefei
230088 Anhui
P.R. China

Ref : AE Certificate of Conformity EMC

Type of Equipment : Grid-connected PV Inverter
Model Designation : See Certificate
Certificate No. : AE 50484758 0001
Report No. : 60419881 001

Dear Wang Kai,

We herewith confirm that a sample of the above mentioned technical equipment has been tested and was found to be in accordance with the relevant requirements.

Enclosed please find your Certificate of Conformity.

We appreciate your kind support and would like to offer our assistance and continuous services in the future.

With kind regards,

Certification Body


Xinhua Lu

CC: Sungrow Power Supply Co., Ltd.

Enclosure

证书的详细资料请登陆 www.tuvdotcom.com 查阅, 或拨打我司客服热线 800 999 3668 / 400 883 1300 咨询

TÜV Rheinland (China) Ltd.
莱茵检测认证服务(中国)有限公司

No. 01/03B-08, Floor 7 and No. 01/
04B-08, Floor 11, AVIC Building,
No.108, Central Road, East 3rd
Ring Road, Chaoyang District,
Beijing, P.R. China

北京市朝阳区东三环中路乙10号
艾维克大厦第7层第01、03B-08号,
第11层第01、04B-08号
邮编: 100022

Tel: (8610)8524 2222
Fax: (8610)8524 2200
e-mail: info@bj.chn.tuv.com
Internet: <http://www.chn.tuv.com>

Test Report No. 219/2018-19/NISE/ IEC 61701



National Institute of Solar Energy

(Formerly known as Solar Energy Centre)

(An autonomous Institute of Ministry of New & Renewable Energy)

Gurugram-Faridabad Road, Gwalpahari, Gurugram-122003

✉ csc.nise@gmail.com ☎ 0124-2579251; FAX: 0124-2579207

2018-2019

TEST REPORT ON SALT MIST CORROSION TEST OF PV MODULE

SERVICE REQUEST NO.: 145/1918

MANUFACTURED BY: M/S RAYZON GREEN ENERGIES. BLOCK NO. 105, B/H ARON PIPES, B/H HARIYA TALAV KIM MANDVI ROAD, KARANJ SURAT, GUJARAT 394110.

SUBMITTED BY: M/S RAYZON GREEN ENERGIES. BLOCK NO. 105, B/H ARON PIPES, B/H HARIYA TALAV KIM MANDVI ROAD, KARANJ SURAT, GUJARAT 394110.

NOTE

This is a report on measurements carried out on PV module (Service Request 145/1918) submitted to the National Institute of Solar Energy as per IEC 61701 specifications. The data reported in this TEST REPORT are valid at the time of and under the stipulated conditions of measurement and the test results are applicable to those items of product which have been tested and do not apply to other products even though declared to be identical. The data contents in this report do not constitute a qualification certificate under any set of specifications. NISE does not accept any liability for any consequences including commercial or otherwise arising out of the utilization of the information contained in this report. The Test Report, if reproduced for any purpose, commercial or otherwise, should be reproduced in full. The contents of the report can be published only after a written approval from the Director General, NISE. The client is requested to collect the tested sample back within 30 days from the date of issue of the report. This report consists of **03 pages**.

Prepared by

Reviewed by



Authorized Signatory

219/2018-19/NISE/ IEC 61701

Date: 19/03/2019

Page 1 of 3

2128



NATIONAL INSTITUTE OF SOLAR ENERGY

(FORMERLY KNOWN AS SOLAR ENERGY CENTRE)

(An autonomous institute of Ministry of New & Renewable Energy, Government of India)

Village & Post-Gwalpahari, Dist.-Gurugram, (Haryana), Pin – 122003.

Ph. 0124-2579251 (CSC), Fax: 0124-2579207

A. SCOPE

1.	Service Request No.	145/1918
2.	Requested By (Name & Address of the organization)	M/S RAYZON GREEN ENERGIES. BLOCK NO. 105, B/H ARON PIPES, B/H HARIYA TALAV KIM MANDVI ROAD, KARANJ SURAT, GUJARAT 394110.
3.	Details of the test item	
	a. Nomenclature	PV Module
	b. Manufactured By	M/S RAYZON GREEN ENERGIES. BLOCK NO. 105, B/H ARON PIPES, B/H HARIYA TALAV KIM MANDVI ROAD, KARANJ SURAT, GUJARAT 394110.
	c. Type/Model No.	Crystalline Si/RGE320W72
	d. Serial No.	RGEAXA1P11181018, RGEAXA1P11181015, RGEAXA1P11181024
4.	Date of Submission of Samples	18/12/2018
6.	Date of Completion of Tests	18/03/2019
7.	Applicable test specifications	Salt mist corrosion testing of Photovoltaic(PV) modules IEC 61701: 2011 and IEC 60068-2-52: 2017, Severity 3, Salt Mist Cyclic Test
9.	Test parameters	Test conditions : 1 cycle (2h spraying @35 °C ± 2 K, & 22 hour humidity storage at 40°C ± 2 K, (93 ± 3) %RH), shall be repeated for four times. 3 days stored at 23 °C ± 2 K and (50 ± 5) %RH. Corrosive atmosphere: 5% NaCl-solution and 95% DM water, pH- value of salt solution: 6.8 to 7.2 @ 25 ± 2°C. Test duration: 7 days

B. MAJOR EQUIPMENTS USED

S. No.	NOMENCLATURE	MAKE	MODEL
1.	SUN SIMULATOR	ENDEAS	QUICKSUN 700A
2.	SALT SPRAY CHAMBER	MATRIX ECO SOLUTIONS	147
3.	INSULATION TESTER	MOTWANE	10K-PI

Prepared by

Reviewed by



219/2018-19/NISE/ IEC 61701

Date: 19/03/2019

Page 2 of 3

2129



NATIONAL INSTITUTE OF SOLAR ENERGY

(FORMERLY KNOWN AS SOLAR ENERGY CENTRE)

(An autonomous institute of Ministry of New & Renewable Energy, Government of India)

Village & Post-Gwalpahari, Dist.-Gurugram, (Haryana), Pin – 122003.

Ph. 0124-2579251 (CSC), Fax: 0124-2579207

C. TEST RESULTS

Make : M/S RAYZON GREEN ENERGIES
 Model No. : Crystalline Si/ RGE320W72
 Cell Area : 243.36 Sq. cm.
 Module Area : 1.94 sq. m

Module Sr. No	Initial P _{max} (Wp)	Final P _{max} (Wp)	ΔP_{max} (%)	Degradation allowed	Observations
RGEAXA1P11181015	321	324	-0.93	5%	No Degradation
RGEAXA1P11181018	322	321	0.31	5%	Degradation with in limit

All the modules meet the criterion of Degradation rate, Dielectric withstand test, Bypass diode functionality test and ground continuity test as per IEC Salt mist corrosion testing of Photovoltaic (PV) modules IEC 61701: 2011 Severity 3 before and after the Salt mist corrosion test. As a result, the modules pass the Salt mist corrosion test.

Prepared by
Manander Bangar
(SRS)

Date.....

Reviewed By
Birinchi Bora
(SRS)

Date.....

Authorized Signatory
Dr. Chandan Banerjee
(D.D.G, NISE)

Date.....



219/2018-19/NISE/ IEC 61701

Date: 19/03/2019

Page 3 of 3



Ref. Certif. No.

US-33193-A1-UL

IEC SYSTEM FOR MUTUAL RECOGNITION OF TEST CERTIFICATES FOR ELECTRICAL EQUIPMENT (IECEE) CB SCHEME

CB TEST CERTIFICATE

Product

Photovoltaic (PV) Module(s)

Name and address of the applicant

RAYZON GREEN ENERGIES
BLOCK NO. 105, B/H ARON PIPES, B/H HARIYA TALAV,
KIM MANDVI ROAD, KARANJ SURAT, GUJARAT 394110
INDIA

Name and address of the manufacturer

RAYZON GREEN ENERGIES
BLOCK NO. 105, B/H ARON PIPES, B/H HARIYA TALAV,
KIM MANDVI ROAD, KARANJ SURAT, GUJARAT 394110
INDIA

Name and address of the factory

RAYZON GREEN ENERGIES
BLOCK NO. 105, B/H ARON PIPES, B/H HARIYA TALAV,
KIM MANDVI ROAD, KARANJ SURAT, Gujarat 394110
INDIA

Note: When more than one factory, please report on page 2

☐ Additional Information on page 2

Ratings and principal characteristics

See page 2

Trademark (if any)

Customer's Testing Facility (CTF) Stage used

Model / Type Ref.

72 Cell Series: Multi Cell, 60 Cell Series: Multi Cell,
54 Cell Series: Multi Cell, 48 Cell Series: Multi Cell,
36 Cell Series: Multi Cell, 18 Cell Series: Multi Cell

☒ Additional Information on page 2

Additional information (if necessary may also be reported on page 2)

The report was revised to include administrative modifications.

☒ Additional Information on page 2

A sample of the product was tested and found to be in conformity with

IEC 61730-1:2004/AMD2:2013, IEC 61730-1:2004/AMD1:2011, IEC 61730-1:2004,
IEC 61730-2:2004/AMD1:2011, IEC 61730-2:2004

As shown in the Test Report Ref. No. which forms part of this Certificate

NC29473-4788175769.2.1- D2 Amendment-1 issued on 2021-06-12

This CB Test Certificate is issued by the National Certification Body



- ☒ UL (US), 333 Pfingsten Rd IL 60062, Northbrook, USA
- ☐ UL (Denko), Borupvang 5A DK-2750 Ballerup, DENMARK
- ☐ UL (JP), Marunouchi Trust Tower Main Building 6F, 1-8-3 Marunouchi, Chiyoda-ku, Tokyo 100-0005, JAPAN
- ☐ UL (CA), 7 Underwriters Road, Toronto, M1R 3B4 Ontario, CANADA

For full legal entity names see www.ul.com/ncbnames

Date: 2021-07-21

Original Issue Date: 2019-02-07

Signature:

Jolanta M. Wroblewska

2131



Ref. Certif. No.

US-33193-A1-UL**Additional Model(s):****Series:**

72 Cell Series: Multi Cell

RGE350W72F, RGE345W72F, RGE340W72F, RGE335W72F, RGE330W72F, RGE325W72F, RGE320W72F, RGE315W72F, RGE310W72F, RGE305W72F, RGE300W72F, RGE250W72C, RGE225W72C, RGE200W72C, RGE180W72C

60 Cell Series: Multi Cell

RGE280W60F, RGE275W60F, RGE270W60F, RGE265W60F, RGE260W60F, RGE255W60F, RGE250W60F

54 Cell Series: Multi Cell

RGE225W54F, RGE230W54F, RGE235W54F, RGE240W54F, RGE245W54F, RGE250W54F

48 Cell Series: Multi Cell

RGE200W48F, RGE205W48F, RGE210W48F, RGE215W48F, RGE220W48F, RGE225W48F

36 Cell Series: Multi Cell

RGE10W36C, RGE15W36C, RGE20W36C, RGE30W36C, RGE37W36C, RGE40W36C, RGE50W36C, RGE55W36C, RGE60W36C, RGE75W36C, RGE80W36C, RGE90W36C, RGE100W36C, RGE110W36C, RGE120W36C, RGE125W36C, RGE150W36F, RGE155W36F, RGE160W36F, RGE165W36F

18 Cell Series: Multi Cell

RGE5W18C, RGE3W18C

Additionally evaluated to EN 61730-1:2007/A1:2012/A2:2013/A11:2014 and EN 61730-2:2007/A1:2012.

Ratngs:

72, 60, 54, 48 Cell Series:

Maximum System Voltage: 1000V, Maximum over current protection rating: 20A

36 Cell Series:

Maximum System Voltage: 1000V, Maximum over current protection rating: 15A

36 Cell Series:

Maximum System Voltage: 1000V, Maximum over current protection rating: 10A

36 Cell Series:

Maximum System Voltage: 600V, Maximum over current protection rating: 10A

36 Cell Series:

Maximum System Voltage: 600V, Maximum over current protection rating: 5A

18 Cell Series:

Maximum System Voltage: 600V, Maximum over current protection rating: 3A

See specific model rating in General Product information

Summary of Modifications:

-change of trade mark logo;

-test report corrections, see test report for detail.

Additional information (if necessary)

- ☒ UL (US), 333 Pfingsten Rd IL 60062, Northbrook, USA
- ☐ UL (Demko), Borupvang 5A DK-2750 Ballerup, DENMARK
- ☐ UL (JP), Marunouchi Trust Tower Main Building 6F, 1-8-3 Marunouchi, Chiyoda-ku, Tokyo 100-0005, JAPAN
- ☐ UL (CA), 7 Underwriters Road, Toronto, M1R 3B4 Ontario, CANADA

For full legal entity names see www.ul.com/ncbnames

Signature:

Jolanta M. Wroblewska

Date: 2021-07-21

Original Issue Date: 2019-02-07

2132

Test Report No. 218/2018-19/PID/NISE



National Institute of Solar Energy

(Formerly known as Solar Energy Centre)

(An autonomous Institute of Ministry of New & Renewable Energy)

Gurugram-Faridabad Road, Gwalpahari, Gurugram-122003
 ✉ csc.nise@gmail.com ☎ 0124-2579251; FAX: 0124-2579207

2018-2019

TEST REPORT ON POTENTIAL INDUCED DEGRADATION TEST OF PV MODULE

SERVICE REQUEST NO.: 144/1918

MANUFACTURED BY: M/S. RAYZON GREEN ENERGIES. BLOCK NO. 105, B/H ARON PIPES, B/H HARIYA TALAV, KIM MANDVI ROAD, KARANJ, SURAT, GUJARAT- 394110, INDIA.

SUBMITTED BY: M/S. RAYZON GREEN ENERGIES. BLOCK NO. 105, B/H ARON PIPES, B/H HARIYA TALAV, KIM MANDVI ROAD, KARANJ, SURAT, GUJARAT- 394110, INDIA.

NOTE

This is a report on measurements carried out on PV module (Service Request **144/1918**) submitted to the National Institute of Solar Energy as per MNRE specifications. The data reported in this TEST REPORT are valid at the time of and under the stipulated conditions of measurement and the test results are applicable to those items of product which have been tested and do not apply to other products even though declared to be identical. The data contents in this report do not constitute a qualification certificate under any set of specifications. NISE does not accept any liability for any consequences including commercial or otherwise arising out of the utilization of the information contained in this report. The Test Report, if reproduced for any purpose, commercial or otherwise, should be reproduced in full. The contents of the report can be published only after a written approval from the Director General, NISE. The client is requested to collect the tested sample back within 30 days from the date of issue of the report. This report consists of **03** pages.

Prepared by
5/3/2019

Reviewed by
5/3/2019



Test Report No. **218/2018-19/PID/NISE**

Date: 05/03/2019

Page 1 of 3

2133



NATIONAL INSTITUTE OF SOLAR ENERGY

(FORMERLY KNOWN AS SOLAR ENERGY CENTRE)

(An autonomous institute of Ministry of New & Renewable Energy, Government of India)

Village & Post-Gwalpahari, Dist-Gurugram, (Haryana), Pin – 122003.

Ph. 0124-2579251 (CSC), Fax: 0124-2579207

A. SCOPE

1.	Service Request No.	144/1918
2.	Requested By (Name & Address of the organization)	M/S. RAYZON GREEN ENERGIES. BLOCK NO. 105, B/H ARON PIPES, B/H HARIYA TALAV, KIM MANDVI ROAD, KARANJ, SURAT, GUJARAT- 394110, INDIA.
3.	Details of the test item	
	a. Nomenclature	PV Module
	b. Manufactured By	M/S. RAYZON GREEN ENERGIES. BLOCK NO. 105, B/H ARON PIPES, B/H HARIYA TALAV, KIM MANDVI ROAD, KARANJ, SURAT, GUJARAT- 394110, INDIA.
	c. Type/Model No.	Crystalline Si/ RGE320W72
	d. Serial No.	RGEAXA1P11181013, RGEAXA1P11181014, RGEAXA1P11181019, RGEAXA1P11181021
4.	Date of Submission of Samples	10/12/2018
6.	Date of Completion of Tests	27/02/2019
7.	Applicable test specifications	Potential induced degradation test as per MNRE specifications
9.	Test parameters	Biased 2(+V), 2(-V) modules at 1000 V. Testing in environmental chamber for 3 cycles at 85% relative humidity and 85°C temperature for 96 hours (test procedure as per IEC TS62804-1: 2015)

B. MAJOR EQUIPMENTS USED

S. No.	NOMENCLATURE	MAKE	MODEL
1.	SUN SIMULATOR	ENDEAS	QUICKSUN 700A
2.	Environmental chamber	CTS	CT 60/10
3.	High voltage DC power supply	EA	EA-PS 81500-30

Prepared by

Reviewed by

Authorized by

Test Report No. 218/2018-19/PID/NISE

Date: 05/03/2019

Page 1 of 3



NATIONAL INSTITUTE OF SOLAR ENERGY

(FORMERLY KNOWN AS SOLAR ENERGY CENTRE)

(An autonomous institute of Ministry of New & Renewable Energy, Government of India)

Village & Post-Gwalpahari, Dist-Gurugram, (Haryana), Pin – 122003.

Ph. 0124-2579251 (CSC), Fax: 0124-2579207

C. Test results

Make : M/S. RAYZON GREEN ENERGIES.
 Model No. : Crystalline Si RGE320W72
 Cell Area : 243.36 Sq. cm.
 Module Area : 1.94 Sq. m.

Sr. No	Module Sr. No	Applied Voltage V dc	Initial Pmax (W)	Final Pmax (W)	Deviation in Pmax (Δ %)	Degradation allowed	Remarks
1	RGEAXA1P11181013	-1000	321	317	1.24	± 5	Degradation is within allowed limit
2	RGEAXA1P11181014	-1000	318	316	0.62	± 5	Degradation is within allowed limit
3	RGEAXA1P11181019	+1000	320	316	1.25	± 5	Degradation is within allowed limit
4	RGEAXA1P11181021	+1000	322	319	0.93	± 5	Degradation is within allowed limit

All the modules meet the power degradation criterion after the PID stress test. As a result the modules pass the PID test.

NOTE: It is required to provide IEC 61215/IS 14286 certificate along with this report.

Prepared by
Manander Bangar
(SRS)

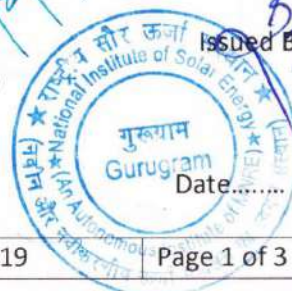
Date.....

Reviewed By
Birinchi Bora
(SRS)

Date.....

Authorized Signatory
Dr. Chandan Banerjee
(D.D.G., NISE)

Date.....



Test Report No. **218/2018-19/PID/NISE**

Date: 05/03/2019

Page 1 of 3



Ref. Certif. No.

US-33191-UL

IEC SYSTEM FOR MUTUAL RECOGNITION OF TEST CERTIFICATES FOR ELECTRICAL EQUIPMENT (IECEE)
CB SCHEME

CB TEST CERTIFICATE

Product

Photovoltaic (PV) Module(s)

Name and address of the applicant

RAYZON GREEN ENERGIES
Block No. 105, B/H Aron Pipes, B/H Hariya Talav, Kim Mandvi
Road, Karanj, Surat-394110, Gujarat, India

Name and address of the manufacturer

RAYZON GREEN ENERGIES
Block No. 105, B/H Aron Pipes, B/H Hariya Talav, Kim Mandvi
Road, Karanj, Surat-394110, Gujarat, India

Name and address of the factory

Note: When more than one factory, please report on page 2

RAYZON GREEN ENERGIES
Block No. 105, B/H Aron Pipes, B/H Hariya Talav, Kim Mandvi
Road, Karanj, Surat-394110, Gujarat
India

☐ [Additional Information on page 2](#)

Ratings and principal characteristics

See Page 2

Trademark (if any)



Type of Customer's Testing Facility (CTF) Stage used

Model / Type Ref.

72 Cell Series: Multi Cell, 60 Cell Series: Multi Cell,
54 Cell Series: Multi Cell, 48 Cell Series: Multi Cell,
36 Cell Series: Multi Cell, 18 Cell Series: Multi Cell,
See Page 2

Additional information (if necessary may also be
reported on page 2)

Additionally evaluated to EN 61215:2005.

☐ [Additional Information on page 2](#)

A sample of the product was tested and found
to be in conformity with

IEC 61215:2005

As shown in the Test Report Ref. No. which forms part
of this Certificate

NC29473-4788175769.2.1-D1 issued on 2019-01-28

This CB Test Certificate is issued by the National Certification Body


☒ UL (US), 333 Pfingsten Rd IL 60062, Northbrook, USA

☐ UL (Denko), Borupvang 5A DK-2750 Ballerup, DENMARK

☐ UL (JP), Marunouchi Trust Tower Main Building 6F, 1-8-3 Marunouchi, Chiyoda-ku, Tokyo 100-0005, JAPAN

☐ UL (CA), 7 Underwriters Road, Toronto, M1R 3B4 Ontario, CANADA
For full legal entity names see www.ul.com/ncbnames

Date: 2019-02-07

Signature:

Jolanta M. Woblewska

2136

	<table border="1"> <tr> <td>Ref. Certif. No.</td> </tr> <tr> <td>US-33191-UL</td> </tr> </table>	Ref. Certif. No.	US-33191-UL						
Ref. Certif. No.									
US-33191-UL									
Model Details: 72 Cell Series: Multi Cell RGE350W72F, RGE345W72F, RGE340W72F, RGE335W72F, RGE330W72F, RGE325W72F, RGE320W72F, RGE315W72F, RGE310W72F, RGE305W72F, RGE300W72F, RGE250W72C, RGE225W72C, RGE200W72C, RGE180W72C 60 Cell Series: Multi Cell RGE280W60F, RGE275W60F, RGE270W60F, RGE265W60F, RGE260W60F, RGE255W60F, RGE250W60F 54 Cell Series: Multi Cell RGE225W54F, RGE230W54F, RGE235W54F, RGE240W54F, RGE245W54F, RGE250W54F 48 Cell Series: Multi Cell RGE200W48F, RGE205W48F, RGE210W48F, RGE215W48F, RGE220W48F, RGE225W48F 36 Cell Series: Multi Cell RGE10W36C, RGE15W36C, RGE20W36C, RGE30W36C, RGE37W36C, RGE40W36C, RGE50W36C, RGE55W36C, RGE60W36C, RGE75W36C, RGE80W36C, RGE90W36C, RGE100W36C, RGE110W36, RGE120W36C, RGE125W36C, RGE150W36F, RGE155W36F, RGE160W36F, RGE165W36F 18 Cell Series: Multi Cell RGE5W18C, RGE3W18C Ratings: 72, 60, 54, 48 Cell Series: Maximum System Voltage: 1000V Maximum over current protection rating: 20A 36 Cell Series: Maximum System Voltage: 1000V Maximum over current protection rating: 15A 36 Cell Series: Maximum System Voltage: 1000V Maximum over current protection rating: 10A 36 Cell Series: Maximum System Voltage: 600V Maximum over current protection rating: 10A 36 Cell Series: Maximum System Voltage: 600V Maximum over current protection rating: 5A 18 Cell Series: Maximum System Voltage: 600V Maximum over current protection rating: 3A See specific model rating in General Product information of Test Report.									
Additional information (if necessary)  <table border="0"> <tr> <td>☒</td> <td>UL (US), 333 Pfingsten Rd IL 60062, Northbrook, USA</td> </tr> <tr> <td>☐</td> <td>UL (Demko), Borupvang 5A DK-2750 Ballerup, DENMARK</td> </tr> <tr> <td>☐</td> <td>UL (JP), Marunouchi Trust Tower Main Building 6F, 1-8-3 Marunouchi, Chiyoda-ku, Tokyo 100-0005, JAPAN</td> </tr> <tr> <td>☐</td> <td>UL (CA), 7 Underwriters Road, Toronto, M1R 3B4 Ontario, CANADA</td> </tr> </table> For full legal entity names see www.ul.com/ncbnames Date: 2019-02-07 Signature:  Jolanta M. Wroblewska		☒	UL (US), 333 Pfingsten Rd IL 60062, Northbrook, USA	☐	UL (Demko), Borupvang 5A DK-2750 Ballerup, DENMARK	☐	UL (JP), Marunouchi Trust Tower Main Building 6F, 1-8-3 Marunouchi, Chiyoda-ku, Tokyo 100-0005, JAPAN	☐	UL (CA), 7 Underwriters Road, Toronto, M1R 3B4 Ontario, CANADA
☒	UL (US), 333 Pfingsten Rd IL 60062, Northbrook, USA								
☐	UL (Demko), Borupvang 5A DK-2750 Ballerup, DENMARK								
☐	UL (JP), Marunouchi Trust Tower Main Building 6F, 1-8-3 Marunouchi, Chiyoda-ku, Tokyo 100-0005, JAPAN								
☐	UL (CA), 7 Underwriters Road, Toronto, M1R 3B4 Ontario, CANADA								

Bill Of Material

2MW

Sl. No.	Item	Make (if any)	Model & Individual Capacity (If any)	Qty (Nos)	Rating / Capacity
1.	PV Module	Rayzon	Datasheet attached		545w
2.	PCU/Inverter	Sungrow	Datasheet attached	320kw*5,125kw*2, 50kw*4, 25kw*2	Numbers of inverters As per site
3.	DC Cables				As req
4.	AC Cables				
5.	AJB/SCB				
6.	Module Mounting Structure (MMS)	Hot dipped structure			As required
7.	ACDB				As per string size
8.	Lightning Arrester				As per site
9.	Earthing System Details and No. of Earth pits				As per site
10.	Data Acquisition System				



കേരളം KERALA

EC 474105

ANNEXURE A – PRE-AGREEMENT

ARTICLES OF AGREEMENT executed on this Seventeenth day of April Two thousand and Twenty Three between the Agency for New & Renewable Energy Research and Technology (hereinafter referred to as ANERT) of the one part and Mrs. Sreeja SS, Purchase Manager, Wattsun Energy India Pvt Ltd, FF Aiswarya Towers, International Airport Road, Chackai, Trivandrum 695024 hereinafter referred to as "the Bounden") of the other part.

WHEREAS in response to the Notification No.: ANERT-TECH/99/2022-T2 dated 12/04/2023 the bounden has submitted to ANERT a e-tender for the Request for Selection (RFS) of agency for the Implementation of 2 MW Solar Power Plant at Travancore Titanium Products Ltd., Kochuvelli, Thiruvananthapuram under Solar City project funded by Smart City Thiruvananthapuram Ltd specified therein subject to the terms and conditions contained in the said e-tender.

AND WHEREAS the bounden has furnished to ANERT a sum of Rs.0/- As Earnest Money Deposit for execution of an agreement undertaking the due fulfilment of the contract in case his e-tender is accepted by ANERT.



No. 5087 dt 17/04/2023
Wattsun Energy India (P) Ltd
Chackai

[Signature]



2139 SURESH KUMAR
VENDOR. KARAMANA



കേരളം KERALA

EC 474106

NOW THESE PRESENTS WITNESS and it is hereby mutually agreed as follows:

-In case the e-tender submitted by the bounden is accepted by ANERT and the contract for *Request for Selection (RFS) of agency for the Implementation of 2 MW Solar Power Plant at Travancore Titanium Products Ltd., Kochuveli, Thiruvananthapuram under Solar City project funded by Smart City Thiruvananthapuram Ltd* is awarded to the bounden, the bounden shall within **Fifteen** days of acceptance of this etender, execute an agreement with ANERT incorporating all the terms and conditions under which ANERT accepts this e-tender. The bounden have visited all the sites as mentioned in the tender document and the rates quoted are in accordance with all the terms and conditions mentioned in the tender documents and corrigenda issued thereafter; In case the bounden fails to execute the agreement as aforesaid incorporating the terms and conditions governing the contract, ANERT shall have power and authority to recover from the bounden any loss or damage caused to ANERT by such breach as may be determined by ANERT by appropriating the moneys inclusive of Earnest Money deposited by the bounden and if the Earnest Money is found to be inadequate the deficit amount may be recovered from the bounden and his properties movable and immovable in the manner hereinafter contained



[Signature]



2140 SURESH KUMAR
TEMP VENDOR, KARAMANA

No. 5088 dt-17/04/2023
Wattsun Energy India (P) Ltd
Chacka

All sums found due to ANERT under or by virtue of this agreement shall be recoverable from the bounden and his properties movable and immovable under the provisions of the Revenue Recovery Act for the time being in force as though such sums are arrears of land revenue and in such other manner as ANERT may deem fit

In witness whereof Sri (Name and Designation) for and on behalf of the Agency for New & Renewable Energy Research & Technology and Mrs. Sreeja SS, Purchase Manager the bounden have hereunto set their hands the day and year shown against their respective signature.

Signed by Sri

(Date)

in the presence of witnesses

1.

Signed by Sri 

(Date)

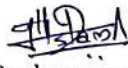
in the presence of witnesses

1.Mr. Praveen S 

TC1/2693, Parakayil road

Kazhakootam

2.

2.Mr.Asam A S 
Aslam Manzil ,Pezhunnoodu,Valavupacha
P O KOLLAM ,691559



FORMAT 3 – GENERAL PARTICULARS

(This letter to be submitted on the official letter head of the tenderer, signed by the authorised signatory.)

Name of the Agency	Enerture Technologies Pvt Ltd
Registered Office	1784, 2nd Floor, Sector 45, Gurgaon 122001
Nature of Agency (Ltd. Co., Partnership etc.)	Pvt Ltd Co
Attach Copy of partnership Deed/ Certification of Incorporation	
Year of Establishment	2012
Registration of Number	U72900HR2012PTC046017
Address for Communication	ABL Workspaces Celebration Gardens NH8 next to Shivmurti, Mahipalpur, New Delhi-110037
Telephone number of Contact person(Mobile if any)	Arman Malik, Snr, Business Executive arman.malik@enerture.co.in 9984272632
Name of CEOs/ Proprietor/Partners(with address and Telephone No)	1. Bhairaw Kumar Mandal, Director 128 2nd Floor Kaveri Apartment D6 Vasant Kunj South West Delhi, Delhi-110070 ; 9555853152 2. Poonam Kumari, Director, 128 2nd Floor Kaveri Apartment D6 Vasant Kunj South West Delhi, Delhi-110070
GST Registration Number (Copy to be Attached)	07AADCE0558K1ZL
PAN Number	AADCE0558K
TAN Number	NA
Whether the bidder wishes to form a project company for execution of work	NO
Whether any Civil Suit / Litigation arisen in the contract executed during the last five years/being executed. If yes, please furnish the name of the Contract, employer nature of work, contract value,	No



work order and date and brief details of litigation.	NA				
Details of Total Experience in general since inception(Details of similar systems installed till the date of bid)	Attached				
Details of Turnover for last Two years. (Copy Audited Statements has to be submitted for last two financial years)	<table> <tr> <td>2021-2022</td><td>INR 230170472</td></tr> <tr> <td>2020-2021</td><td>INR 130643384</td></tr> </table>	2021-2022	INR 230170472	2020-2021	INR 130643384
2021-2022	INR 230170472				
2020-2021	INR 130643384				
Details of offices in Kerala, India and abroad- address and contact details	M/S Enerture Technologies Pvt Ltd; ABL Workspaces Celebration Gardens NH8 next to Shivmurti, Mahipalpur, New Delhi-110037 Bhairaw Kumar Mandal, Director, 9555853152, bhairaw@enerture.co.in				

Documentary evidence for the bid qualification requirements are submitted along with this document and the details furnished above are true and correct.

Signature
of authorised signatory

Name: *Arman Malik*
Designation: *Sr. Business Executive*
Date: 28-04-2023



(office seal)

FORMAT 1 - COVERING LETTER

(This letter to be submitted on the official letter head of the tenderer, signed by the authorised signatory.)

Sir,

I/We hereby e-tender to supply, under annexed terms and conditions of contract, the whole of the articles referred to and described in the attached specification and quantity decided by the Agency for New and Renewable Energy Research & Technology (ANERT), at the rates quoted against each item. The articles will be delivered and installed/commissioned operated and maintained for 10 years thereafter within the time and at the place(s) specified in the schedule.

I am/We are remitting herewith the required amount of Rs. **NA** towards the cost of e-tender and Earnest Money Deposit by electronic payment vide transaction No dtd.....



Authorized Signatory

Name: Arman Malik

Designation: Snr Business Executive

Place: New Delhi

Date: 28-04-2023

Request for Selection (RFS) of agency for the Implementation of 2 MW Solar Power Plant at Travancore
Titanium Products Ltd., Kochuveli, Thiruvananthapuram 2144 Solar City project funded by Smart City
Thiruvananthapuram Ltd

ANNEXURE D – DECLARATION OF RELATIONSHIP WITH ANERT EMPLOYEE

(to be signed and submitted by the bidder along with the bid)

Tender Notification No.: **ANERT-TECH/99/2022-T2**

Request for Selection (RFS) of agency for the Implementation of 2 MW Solar Power Plant at Travancore Titanium Products Ltd., Kochuvelli, Thiruvananthapuram under Solar City project funded by Smart City Thiruvananthapuram Ltd

To

The CEO
ANERT

Name of the ANERT employee with Designation:

Name of the bidder related to the employee:

This is to put on record that Shri/SmtNA.....
currently working asNA..... in ANERT is
related to.....NA....., who is the bidder in the bid. We are aware of
the Anti-corruption policy of ANERT and will observe the highest standards during the
procurement and the execution of contract and shall retain from corrupt, fraudulent,
collusive or coercive practices on competing for the contract.



Signature

Name: Arman Malik, Snr. Business Executive

Date: 28-04-2023

Request for Selection (RFS) of agency for the Implementation of 2 MW Solar Power Plant at Travancore Titanium Products Ltd., Kochuvelli, Thiruvananthapuram under Solar City project funded by Smart City Thiruvananthapuram Ltd

ANNEXURE C – DECLARATION BY THE BIDDER

e-Tender Notification No: **ANERT-TECH/99/2022-T2**, dtd **12/-4/2023** for Request for Selection (RFS) of agency for the Implementation of 2 MW Solar Power Plant at Travancore Titanium Products Ltd., Kochuveli, Thiruvananthapuram under Solar City project funded by Smart City Thiruvananthapuram Ltd

To
The CEO ANERT

We, the undersigned, declare that:

1. We have examined and have no reservations to the Bidding Document, including Addenda No. (if any)
2. We offer to supply in conformity with the Bidding Document and in accordance with the delivery schedule
3. Our Bid shall be valid for a period of 6 months from the date fixed as deadline for the submission of tenders in accordance with the Bidding Document, and it shall remain binding upon us and may be accepted at any time before the expiration of that period;
4. If our Bid is accepted, we commit to submit a Security Deposit in the amount of 5 percent of the Contract Price for the due performance of the Contract;
5. We are not participating, as Bidders, in more than one Bid in this bidding process;
6. Our firm, its affiliates or subsidiaries, including any subcontractors or suppliers for any part of the Contract, has not been declared ineligible by the ANERT or Government of Kerala;
7. We understand that this Bid, together with your written acceptance thereof included in your notification of award, shall constitute a binding contract between us, until a formal Contract is prepared and executed.
8. Our firm has obtained the certifications from MNRE or NABL approved Test laboratories that the goods and services are satisfying the technical criteria specified in the bid.

Date: 28-04-2023

Signature:

Name: Arman Malik, Sr Business
Executive





**AGENCY FOR NEW & RENEWABLE ENERGY
RESEARCH AND TECHNOLOGY (ANERT)**

Department of Power, Government of Kerala

CORRIGENDUM

Corrigendum Type : Technical / Financial Corrigendum - 1

Tender ID : 2023_ANERT_571678_1

1. In the BoQ Excel file, Sheet 2 – The O&M charges for the years Six till Twn to be quoted in SI No. 1.06 – 1.10. The years mentioned in the row to be read accordingly.
2. The Minimum module capacity to be used in the project is 525 Wp or above. It is to be read accordingly wherever mentioned as 600 Wp or above. PV modules of capacity above 600 Wp is preferred owing to the space constraints.
3. The CUF for the power plant to be maintained between 16 – 20% for the overall warranty period.

Thiruvananthapuram

28/04/2023

ACTM





AGENCY FOR NEW & RENEWABLE ENERGY RESEARCH AND TECHNOLOGY (ANERT)

Department of Power, Government of Kerala
Thiruvananthapuram, Kerala – 695 033;
www.anert.gov.in , projects@anert.in

CORRIGENDUM

Corrigendum Type : Date

Tender ID : 2023_ANERT_571678_1

The last date for bid submission is extended to 04/05/2023 and the bids will be opened on
04/05/2023

Thiruvananthapuram
28/04/2023

Sd/-
ACTM





AGENCY FOR NEW & RENEWABLE ENERGY RESEARCH AND TECHNOLOGY (ANERT)

Department of Power, Government of Kerala
Thiruvananthapuram, Kerala – 695 033;
www.anert.gov.in , projects@anert.in

CORRIGENDUM

Corrigendum Type : Date

Tender ID : 2023_ANERT_571678_1

The last date for bid submission is extended to 29/04/2023 and the bids will be opened on
29/04/2023

Thiruvananthapuram
20/04/2023

Sd/-
ACTM





Hem Sandeep & Co.

Chartered Accountants

G-37, Second Floor, Sector – 3, Noida – 201301
Tel.: 0120-2451583, 4359024, Fax: 0120-2451268
Mob: 9818478888, 9312234337

TO WHOM IT MAY CONCERN

This is to certify that M/s. Enerture Technologies Private Limited, is dealing in Solar Plant Installation, Operation & Maintenance and its registered office is situated at 815, Creat Lakes, Udyog Vihar (Behind Trident Hotel) Phase - 5, Gurgaon -122016

Business is small business as per Micro, Small & Medium Enterprises Development (MSMED) Act, 2006.

We have verified the books of accounts of M/s. Enerture Technologies Pvt Ltd and certify the following:

(Rs. In Lacs)

S. No	Description	2018-19	2019-20	2020-21	2021-22
		Audited	Audited	Audited	Audited
1	Annual Turnover	1268.93	1072.15	1306.43	2301.70
2	Net Profit	49.55	37.94	44.30	73.47
3	Net Worth of the Company	56.63	94.57	168.87	242.34

This Certificate is issued on specific request of M/s Enerture Technologies Pvt Ltd. for the purpose of submission of tenders.

For Hem Sandeep & Co.
Chartered Accountants
(FRN- 009907N)

**HIMANSHU
SAXENA**

Digitally signed by
HIMANSHU SAXENA
Date: 2022.12.13
11:50:53 +05'30'

Himanshu Saxena
Partner
M. No- 546385
Date: 13.12.2022
Place: Noida

UDIN: 22546385BFHYHY1871



ENERTURE TECHNOLOGIES PRIVATE LIMITED

CIN : U72900HR2012PTC046017

Standalone Balance Sheet
as at March 31, 2022

(Figures in lakhs unless otherwise stated)

	Note No.	As at March 31, 2022 Rs.	As at March 31, 2021 Rs.
EQUITY AND LIABILITIES			
Shareholders' funds			
Share capital	2	31.00	31.00
Reserves and surplus	3	211.34	137.87
Non-current liabilities			
Long-term borrowings	4	54.16	72.19
Deferred tax liabilities (net)		0.30	-
Current liabilities			
Short Term Borrowings	5	439.02	195.61
Trade payables	6		
total outstanding dues of micro enterprises and small enterprises; and			
total outstanding dues of creditors other than micro enterprises and small enterprises		186.79	151.94
Other current liabilities	7	273.41	270.52
Short-term provisions	8	-	3.27
		1,196.02	862.40
ASSETS			
Non-current assets			
Property, Plant and Equipment and Intangible assets	9		
Property, Plant and Equipment		80.05	2.56
Non-current investments	10	1.00	-
Deferred Tax Assets		-	0.05
Long term loans and Advances	11	2.00	
Other Non Current Assets			
Current assets			
Inventories		465.00	228.00
Trade receivables	12	434.17	408.19
Cash and cash equivalents	13	157.78	160.96
Short-term loans and advances	11	56.01	62.65
		1,196.02	862.40
Summary of Significant Accounting Policies			

Refer accompanying notes. These notes are an integral part of the financial statements.

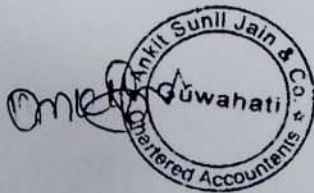
As per our report of even date

For Ankit Sunil Jain & Co

Chartered Accountants

Firm's Registration No: 025109N

For and on behalf of the Board



Ankit Jain

Partner

Membership No: 525396

Date: September 19, 2022

Place: Guwahati

UDIN:22525396BCEESQ2080



Bhairaw Mandal

Director

(DIN: 05268227)



Poonam Kumari

Director

(DIN: 05268234)



ENERTURE TECHNOLOGIES PRIVATE LIMITED

CIN : U72900HR2012PTC046017

Standalone Statement Of Profit And Loss Account
for the year ended March 31, 2022

(Figures in lakhs unless otherwise stated)

Particulars	Note No.	Year Ended March 31, 2022	Year Ended March 31, 2021
		Rs.	Rs.
INCOME			
Revenue from operations	14	2,301.70	1,306.43
Other Income	15	7.79	74.79
		2,309.50	1,381.22
EXPENDITURE			
Cost of materials consumed	16	2,065.70	1,230.26
Changes in inventories of finished goods, work-in-progress and stock-in-trade	17	(237.00)	(228.00)
Employee benefits expenses	18	196.93	167.73
Finance costs	19	56.79	29.88
Depreciation and amortisation expenses	9	1.50	0.49
Other expenses	20	125.76	121.00
		2,209.68	1,321.35
Profit before Exceptional items and Tax		99.82	59.87
Exceptional Items		-	-
Profit before tax		99.82	59.87
Tax Expense:			
Current Tax		26.00	15.57
Deferred Tax		0.35	
Profit for the Year		73.47	44.30
Earnings per equity share (Face value of Rs 10/- each)			
Basic		23.70	14.29
Diluted		23.70	14.29
Summary of Significant Accounting Policies			

Refer accompanying notes. These notes are an integral part of the financial statements.

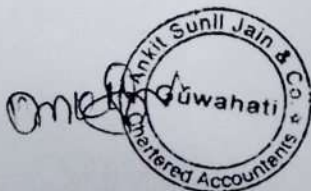
As per our report of even date

For and on behalf of the Board

For Ankit Sunil Jain & Co

Chartered Accountants

Firm's Registration No: 025109N

Ankit Jain
Partner

Membership No: 525396

Bhairaw Mandal
Director
(DIN: 05268227)Poonam Kumari
Director
(DIN: 05268234)

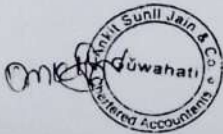
2152

Enerture Technologies Private Limited
CIN : U74994UP2018PTC106805
Balance Sheet as at March 31, 2021

Particulars	Note No	As at March 31, 2021		As at March 31, 2020
I. EQUITY AND LIABILITIES				
Shareholder's Funds				
Share Capital	3	3,100,000	100,000	
Reserves and Surplus	4	13,787,158	9,356,923	9,456,923
Non-Current Liabilities				
Long Term Borrowings	5		7,218,704	6,146,119
Current Liabilities				
Short-term borrowings	6	16,810,725	17,229,393	
Trade payables	7	15,193,915	25,450,762	
Other current liabilities	8	29,802,332	6,138,428	
Short-term provisions	9	2,435,154	1,724,279	50,542,862
TOTAL		88,347,988	66,145,904	
II.Assets				
Non-current assets				
- Tangible assets	10.a	255,575	216,022	216,022
Deferred tax assets (net)			5,174	5,174
Current assets				
Current investments		-	-	-
Inventories		22,800,000	-	-
Trade Receivables	11	40,819,094		32,812,243
Cash and Bank Balances	12	16,095,503		22,441,248
Short Term Loans and Advances	13	8,372,641		9,867,222
Other Current Assets		-		803,996
TOTAL		88,347,988	66,145,904	
Summary of Significant Accounting Policies	2	-	-	-

The accompanying Notes are an integral part of the Financial Statements

As per our report of even date attached
For Ankit Sunil Jain & Co
Chartered Accountants
Firm Reg. No 025109N



(Ankit Jain)
Partner
Membership No - 525396

Place : Guwahati
Dated : 28/10/2021
UDIN: 21525396AAAAFF7629

On behalf of Board of Directors of Enerture Technologies Private Limited



(Bhairaw Kumar Mandal)
Director
(DIN:05268227)



(Poonam Kumari Mandal)
Director
(DIN:05268234)



Enerture Technologies Private Limited
CIN : U72900HR2012PTC046017
Statement of Profit and Loss for the year ended March 31, 2021

Particulars	Note No	Year Ended March 31, 2021	Year Ended March 31, 2020
Income			
Revenue from operations	14	130,643,384	107,214,812
Other Income	15	6,548,593	245,581
Prior Period Income		-	186,426
Total Revenue		137,191,977	107,646,819
Expenses			
Purchase of Stock in Trade	16	118,703,578	72,795,373
Changes in inventories of Work in Progress		(22,800,000)	-
Employee Benefit Expense	17	16,772,787	15,861,058
Financial Costs	18	2,988,339	1,669,278
Depreciation and Amortization Expense	10.a	48,896	67,757
Other Expenses	19	15,491,575	11,879,768
Total Expenses		131,205,174	102,273,234
Profit / (Loss) before Tax		5,986,803	5,373,585
Tax Expense:			
Current Tax / MAT		1,556,569	1,397,132
MAT Credit Entitlement		-	-
Deferred tax		-	-
Tax Adjustments of Prior Years (Net)		-	182,174
Profit / (Loss) after tax		4,430,234	3,794,279
Earnings per Share (Face Value Rs. 10)			
Basic and Diluted Earning Per Share	26	443.02	379.43
Summary of Significant Accounting Policies	2		

The accompanying Notes are an integral part of the Financial Statements

As per our report of even date attached

For Ankit Sunil Jain & Co
Chartered Accountants
Firm Reg. No 025109N

#



(Ankit Jain)
Partner
Membership No - 525396

Place : Guwahati
Dated : 28/10/2021
UDIN: 21525396AAAAFF7629



(Bhairaw Kumar Mandal)
Director
(DIN:05268227)



(Poonam Kumari Mandal)
Director
(DIN:05268234)



Enerture Technologies Private Limited
CIN : U74994UP2018PTC106805
Balance Sheet as at March 31, 2020

		(Amount in Rs.)		
Particulars	Note No	As at March 31, 2020	As at March 31, 2019	
I. EQUITY AND LIABILITIES				
Shareholder's Funds				
Share Capital	3	100,000	100,000	
Reserves and Surplus	4	9,356,923	5,562,644	5,662,644
Non-Current Liabilities				
Long Term Borrowings	5	6,146,119		4,394,419
Current Liabilities				
Short-term borrowings	6	17,229,393	11,289,495	
Trade payables	7	25,450,762	15,286,109	
Other current liabilities	8	6,138,428	50,960,599	
Short-term provisions	9	1,724,279	2,397,757	79,933,960
TOTAL		66,145,904	89,991,023	
II. Assets				
Non-current assets				
- Tangible assets	10.a	216,022	222,250	222,250
Deferred tax assets (net)		5,174		5,174
Current assets				
Trade Receivables	11	32,812,243		49,310,166
Cash and Bank Balances	12	22,441,248		28,846,455
Short Term Loans and Advances	13	9,867,222		9,867,222
Other Current Assets		803,996		1,739,757
TOTAL		66,145,904	89,991,023	
Summary of Significant Accounting Policies	2			

The accompanying Notes are an integral part of the Financial Statements

As per our report of even date attached
For Ankit Sunil Jain & Co
Chartered Accountants
Firm Reg. No 025109

(Ankit Jain)
Partner
Membership No - 525396

Place : Guwahati
Dated : December 2, 2020
UDIN: 21525396AAAAAY9887

On behalf of Board of Directors of Enerture Technologies Private Limited



(Bhaw Kumar Mandal)
Director
(DIN:05268227)



(Poonam Kumari Mandal)
Director
(DIN:05268234)



Enerture Technologies Private Limited
CIN : U72900HR2012PTC046017
Statement of Profit and Loss for the year ended March 31, 2020

			(Amount in Rs.)
Particulars	Note No	Year Ended March 31, 2020	Year Ended March 31, 2019
Income			
Revenue from operations	14	107,214,812	126,893,330
Other Income	15	245,581	735,464
Prior Period Income		186,426	9,360
Total Revenue		107,646,819	127,638,154
Expenses			
Purchase of Stock-in-Trade	16	72,795,373	82,728,673
Changes in inventories of Stock-in-Trade			265,000
Employee Benefit Expense	17	15,861,058	20,998,445
Financial Costs	18	1,669,278	800,884
Depreciation and Amortization Expense	10.a	67,757	64,401
Other Expenses	19	11,879,768	15,668,420
Total Expenses		102,273,234	120,525,822
Profit before Tax		5,373,585	7,112,332
Tax Expense:			
Current Tax / MAT		1,397,132	2,070,610
MAT Credit Entitlement			92,060
Deferred tax			(5,174)
Tax Adjustments of Prior Years (Net)		182,174	
Profit after tax		3,794,279	4,954,836
Earnings per Share (Face Value Rs. 10)			
Basic and Diluted Earning Per Share	26	379.43	495.48
Summary of Significant Accounting Policies	2		

The accompanying Notes are an integral part of the Financial Statements

As per our report of even date attached

For Ankit Sunil Jain & Co.
Chartered Accountants
Firm Reg. No. 1231094

(Ankit Jain)
Partner
Membership No. - 525396

Place : Guwahati
Dated : December 2, 2020
UDIN: 21525396AAAAAY9887

On behalf of Board of Directors of Enerture Technologies Private Limited

(Bhairav Kumar Mandal)
Director
(DIN:05268227)

(Poonam Kumari Mandal)
Director
(DIN:05268234)





प्रारूप 1 पंजीकरण प्रमाण-पत्र

कॉर्पोरेट पहचान संख्या : U72900HR2012PTC046017

2012 - 2013

मैं एतद्वारा सत्यापित करता हूँ कि मैसर्स

ENERTURE TECHNOLOGIES PRIVATE LIMITED

का पंजीकरण, कम्पनी अधिनियम 1956 (1956 का 1) के अंतर्गत आज किया जाता है और यह कम्पनी प्राइवेट लिमिटेड है।

यह निगमन-पत्र आज दिनांक इक्कीस मई दो हजार बारह को दिल्ली में जारी किया जाता है।

Form 1 Certificate of Incorporation

Corporate Identity Number : U72900HR2012PTC046017

2012 - 2013

I hereby certify that ENERTURE TECHNOLOGIES PRIVATE LIMITED is this day incorporated under the Companies Act, 1956 (No. 1 of 1956) and that the company is private limited.

Given at Delhi this Twenty First day of May Two Thousand Twelve.

Validity unknown
Digitally signed by Registrar of Companies
Date: 2012.05.21 17:06:19
GMT+05:30

Registrar of Companies, National Capital Territory of Delhi and Haryana

कम्पनी रजिस्ट्रार, राष्ट्रीय राजधानी क्षेत्र दिल्ली एवं हरियाणा

*Note: The corresponding form has been approved by PREMLAL BHANJURAM MALIK, Deputy Registrar of Companies and this certificate has been digitally signed by the Registrar through a system generated digital signature under rule 5(2) of the Companies (Electronic Filing and Authentication of Documents) Rules, 2006. The digitally signed certificate can be verified at the Ministry website (www.mca.gov.in).

कम्पनी रजिस्ट्रार के कार्यालय अभिलेख में उपलब्ध पत्राचार का पता :

Mailing Address as per record available in Registrar of Companies office:

ENERTURE TECHNOLOGIES PRIVATE LIMITED

#815, Great Lakes, Udyog Vihar (Behind Trident Hotel) Phase - 5,

Gurgaon - 122016,

Haryana, INDIA



2157



(Amended)

Government of India

Form GST REG-06

[See Rule 10(1)]

Registration Certificate

Registration Number :07AADCE0558K1ZL

1.	Legal Name	ENERTURE TECHNOLOGIES PRIVATE LIMITED			
2.	Trade Name, if any	Enerture Technologies Private Limited			
3.	Constitution of Business	Private Limited Company			
4.	Address of Principal Place of Business	Ground, C-2, Celebration Gardens, Avenue Bouganvillea, NH8, Mahipalpur, New Delhi, South West Delhi, Delhi, 110037			
5.	Date of Liability	01/07/2017			
6.	Date of Validity	From	01/07/2017	To	Not Applicable
7.	Type of Registration	Regular			
8.	Particulars of Approving Authority				
Signature					
Name					
Designation					
Jurisdictional Office					
9.	Date of issue of Certificate	04/04/2021			
Note: The registration certificate is required to be prominently displayed at all places of Business/Office(s) in the State.					

This is a system generated digitally signed Registration Certificate issued based on the deemed approval of application on 04/04/2021 .

For Enerture Technologies Pvt. Ltd.
 Authorized Signatory
 (Signature)



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सत्यमेव जयते

INDIA NON JUDICIAL

Government of National Capital Territory of Delhi

₹100

e-Stamp

Certificate No. : IN-DL78140350834509V
Certificate Issued Date : 20-Mar-2023 03:48 PM
Account Reference : IMPACC (IV)/ dl715003/ DELHI/ DL-DLH
Unique Doc. Reference : SUBIN-DL71500328112639868686V
Purchased by : ENERTURE TECHNOLOGIES PVT LTD
Description of Document : Article 48(c) Power of attorney - GPA
Property Description : Not Applicable
Consideration Price (Rs.) : 0
 (Zero)
First Party : ENERTURE TECHNOLOGIES PVT LTD
Second Party : Not Applicable
Stamp Duty Paid By : ENERTURE TECHNOLOGIES PVT LTD
Stamp Duty Amount(Rs.) : 100
 (One Hundred only)

सत्यमेव जयते



Please write or type below this line



Statutory Alert:

1. The authenticity of this Stamp certificate should be verified at 'www.shcilestamp.com' or using e-Stamp Mobile App of Stock Holding.
2. Any discrepancy in the details of this Certificate and as available on the website / Mobile App renders it invalid.
3. The onus of checking the legitimacy is on the users of the certificate.
4. In case of any discrepancy please inform the Competent Authority.

2160

Annexure 2 – Power of Attorney

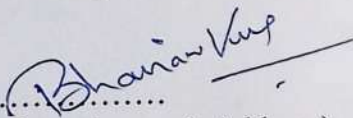
POWER OF ATTORNEY

Know all men by these presents, We M/S Enerture Technologies Pvt Ltd ABL Workspaces Celebration Gardens NH8 next to Shivmurti, Mahipalpur, New Delhi-110037 do hereby constitute, appoint and authorize Mr. Arman Malik, Block-B, Sewakpark, Dwarkamor, Uttamnagar, New Delhi-110059 who is presently employed with us and holding the position of Snr. Business Executive as our attorney in our company, to do in our name and on our behalf, all such acts, deeds and things necessary in connection with or incidental for including signing and submission of all documents and providing information/responses to authority in all matters in connection with our Proposal.

We hereby declare that all acts, deeds and things done by our said attorney pursuant to this Power of Attorney shall always be deemed to have been ratified by us and done by us.

Dated this 15th Day of March 2023

For

Signature: 

(Name, Designation and Address): **Bhairaw Kumar Mandal, Director, 128 2nd Floor Kaveri Apartment D6 Vasant Kunj South West Delhi, Delhi-110070.**

Accepted

Signature)



(Name, Title and Address of the Attorney): **Arman Malik, Snr. Business Executive**

Date: 15-03-2023

Witness:  Parvendar Singh, Designing Manger



ATTESTED

2161

FORMAT 6 – COMPONENT WISE SPLIT UP OF COSTS

To be provided for all capacity quoted by the bidder

S/N	Component	Percentage (%)
1	SPV Modules	60
2	Module Mounting Structure	7
3	Grid Tied Inverter as per specification	5
4	Balance of System	12
5	Cost for 10 Year Warranty and Preventive Maintenance	8
6	Installation and Commissioning Charges	6
7	Insurance (From Material dispatch till 10 years warranty period)	0.5
8	Any miscellaneous expenses required for the successful commissioning of the plant	1
9	Remote Monitoring and associated costs	0.5
Total		100%



Request for Selection (RFS) of agency for the Implementation of 2 MW Solar Power Plant at Travancore
Titanium Products Ltd., Kochuveli, Thiruvananthapuram under Solar City project funded by Smart City
Thiruvananthapuram Ltd

Enerture Technologies Private Limited

2162

Regd. Office :C-3,NH-8, ABL Workspaces, Celebration Garden, Near Shiv Murti ,Mahipalpur, New Delhi-110037,
Website: www.enerture.co.in, E. mail: bhairaw@enerture.co.in

ANNEXURE B – BIDDERS TECHNICAL INFORMATION

TECHNICAL PARTICULAR DATA

Solar PV Module

Sl. No	Particulars	Required	Offered
1	PV Module Manufacture name & Country of origin	Manufacture name to be specified	Saatvik
2	PV Module type	Poly/Mono Crystalline, Mono PERC	Mono PERC
3	No. of PV cells per Module		144
4	Total number of PV modules		3704
5	Max. Power, P_{mp} @STC	330 Wp or above	540 Wp
6	Max. Power tolerance (%)	Not more than 3%	0 to 3%
7	Max. Power voltage (V_{mp}) @STC	To be specified	41.80
8	Max. Power current (I_{mp}) @STC	To be specified	12.94
9	Open circuit voltage, V_{oc} @ STC	To be specified	50.16
10	Short circuit current, I_{sc} @STC	To be specified	13.59
11	Nominal voltage	To be specified	
12	Nominal Wattage	To be specified	
13	Fill Factor	Not less than 0.7	
14	Temp. coefficient of V_{oc} (%/C)		- 28% /° C
15	Temp. coefficient of P_{mp} (%/C)		- 36 % /° C
16	Temperature Co-efficient of I_{sc} (%/°C)		0.048 % /° C
17	Normal Operating Cell Temperature (NOCT) (°C)		45 ± 2/° C
18	Operating Temperature (°C)		40° C ~ + 85 ° C
19	Module efficiency	≥17%	20.90 %
20	No. of By-pass Diodes		
21	Mounting arrangement for Solar Module	Fixed Arrangement	



Sl. No	Particulars	Required	Offered
22	Solar Module frame material	Anodized Aluminium	Silver anodized Al.
23	Module dimensions' cm (L x W x H)	To be specified	2278* 1134* 35 mm
24	PV panel Weight (kg)	To be specified	28 kg
25	Output Cables	Polarized, UV protected &Weather Proof DC rated multi-contact connector	
26	Output Terminal	PV Connectors	MC4 connectors
27	Junction Box	Weather resistant HDPE (IP65)	IP68
28	Copies of test certificates	IS 14286/IEC 61215,61730 part 1&2, IEC 61701	IS14286/ IEC 61215/ 6130/ part 1&2 61701

INVERTER

Sl. No.	Particulars	Required	Offered
1	Manufacturer		Sungrow
2	Model name/No.		SG 110CX
3	Number of units		17
4	Nominal AC power		110 kva@45° C/ 100kva @50° C
5	Nominal AC voltage		3/N/PE, 400 V
6	Nominal AC Current		158.8 A
7	AC grid Frequency range	50Hz ± 0.5%	50 Hz/ 45-55 Hz
8	AC grid voltage range		320-460 V
9	Power Factor (+ and -)		>0.99 / 0.8 lagging-0.8 leading

Request for Selection (RFS) of agency for the Implementation of 2 MW Solar Power Plant at Travancore
Titanium Products Ltd., Kochuveli, Thiruvananthapuram under Solar City project funded by Smart City
Thiruvananthapuram Ltd



Sl. No.	Particulars	Required	Offered
10	Total Harmonic Distortion	As per IEEE-519 2014	<3%
11	AC over / under voltage over / under frequency protection		Yes
12	Max PV input power		1100 v
13	Maximum DC voltage	Less than 1000 V	
14	MPPT voltage range		200-1000v
15	Maximum DC current		40A*9
16	No. of DC input ports		18
17	Maximum Efficiency	as per IEC61683	98.7 %
18	DC voltage ripple		
19	Ambient temperature range		-30 to 60° C
20	Humidity (non-condensing)	95%, non-condensing	0-100%
21	Protective functions - AC over/under voltage, AC over/under frequency, over temperature, AC and DC overcurrent, DC over-voltage, against Islanding		Yes
22	Communication Interface	RS485, MPI Profi-Bus/Telephone Modem/WiFi	RS 485, WLAN, Ethernet
22	User-display standard	LCD panel with membrane keypad	
23	Enclosure environment rating		IP66
24	Safety and EMC		Yes
25	Anti-islanding feature	IEEE1547/UL1741/I EC62116	

To,
M/s. Enerture Technologies Pvt. Ltd.,
K-27 – A, Marwaha Bhawan,
Mahipalpur, New Delhi – 110037
Mobile No: +91-9555853152
Email Id: bhairaw@enerture.co.in

15th September 2021

Subject: Addendum No. 2 to Work-Order No. MBGEPL-SECI-ETPL/EPC-Contract/01

Dear Mr. Bhairaw Kumar Mandal,

The following Addendum is being issued after mutual consent from both parties for change in overall Project Capacity for execution and Pricing Schedule as per the tables give below:

1. The Change in the Pricing Schedule as provided under Schedule 4 is revised as given below:

A. Total Contract Price: 14,47,96,653/-

A.1. Total Contract Price in Words: INR. Fourteen Crores, Forty-Seven Lakhs, Ninety-Six Thousand, Six Hundred and Fifty-Three Only.

B. Terms of Payment:

B.1. Invoicing/Milestone Payment Table/Chart for Modules:

S. No.	Item Description	Unit	Qty.	Unit Rate/kWp (INR)	GST (INR)	Total Amount (INR)
1	CSK - AU	kWp	1,000	18.66	1.66	20.33
2	ICAR - DMR		160			
3	Dr. YSP		640			
4	ICAR - CPRI		100			
5	ICAR - Fisheries		100			
6	Uttarakhand O. U		120			
7	ARIES		100			
8	IISW Dehradun		160			
9	CRPF - Haldwani		500			
10.	HNB Garhwal University		850			
Total Module Contract Amount						7,58,15,308

Amount in words: Indian Rupees Seven Crores, Fifty-Eight Lakhs, Fifteen Thousand, Three Hundred and Eight Only.



Addendum No. 1 to MBGEPL-SECI-ETPL/EPC-Contract/01



Page 2 of 4

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B.2. Invoicing/Milestone Payment Table/Chart for Inverter:

S. No.	Item Description	Unit	Qty.	Unit Rate/kWp (INR)	GST (INR)	Total Amount (INR)
1	CSK - AU	kWp	1,000	3.84	0.34	4.18
2	ICAR - DMR		160			
3	Dr. YSP		640			
4	ICAR - CPRI		100			
5	ICAR - Fisheries		100			
6	Uttarakhand O. U		120			
7	ARIES		100			
8	IISW Dehradun		160			
9	CRPF - Haldwani		500			
10	HNB Garhwal University		850			
Total Module Contract Amount						1,55,98,565

Amount in words: Indian Rupees One Crore, Fifty-Five Lakhs, Ninety-Eight Thousand, Five Thousand and Sixty-Five Only.

B.3. Invoicing/Milestone Payment Table/Chart for Balance of System:

S. No.	Item Description	Unit	Qty.	Unit Rate/kWp (INR)	GST (INR)	Total Amount (INR)
1	CSK - AU	kWp	1,000	13.14	1.17	14.31
2	ICAR - DMR		160			
3	Dr. YSP		640			
4	ICAR - CPRI		100			
5	ICAR - Fisheries		100			
6	Uttarakhand O. U		120			
7	ARIES		100			
8	IISW Dehradun		160			
9	CRPF - Haldwani		500			
10	HNB Garhwal University		850			
Total Balance of System Contract Amount						5,33,82,780

Amount in words: Indian Rupees Five Crores, Thirty-Three Lakhs, Eighty-Two Thousand, Seven Hundred and Eighty Only.

C. Terms and Conditions:

- C.1. The above price includes all applicable taxes, duties, transportation, and installation charges.
C.2. Payment Terms:

- 1. For Modules & Inverter 100% Advance against PI & MDCC
- 2. For BOS:

Addendum No. 1 to MBGEPL-SECI-ETPL/EPC-Contract/01

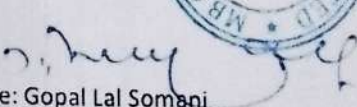


S. No.	Payment Terms	Amount (in INR)
1.	10% Advance against equivalent PDC valid till 3 months or Plant Handover which-ever is earlier after submission of engineering survey, design, layout drawings, and details of BOQ material for each site.	53,38,278
2.	60% up on Material Delivery at site (against proof of dispatch) on pro rata	3,20,29,668
3.	15% up on Commissioning of sites (against testing and charging report) on pro rata	80,07,417
4.	10% up on net metering connectivity, opening of Escrow account in bank for each site and raising first bill on pro rata	53,38,278
5.	5% up on hand-over (against equivalent UDC/PBG valid for 2 years – 6.5% for 1 st Year and 5% for 2 nd Year)	26,69,139
6.	Total	5,33,82,780

This Addendum No. 2 shall be read in conjunction with MBGEPL-SECI-ETPL/EPC-Contract/01 and this Addendum No 2 shall be an integral part of MBGEPL-SECI-ETPL/EPC-Contract/01.

All other terms & conditions of EPC-Contract No. MBGEPL-SECI-ETPL/EPC-Contract/01 shall remain unchanged.

IN WITNESS WHEREOF, the parties hereto have duly executed and delivered this Addendum as of the date set forth above.

EPC-Contractor: Enerture Technologies Pvt. Ltd.	Developer: MB Green Energy Pvt. Ltd.
Name: Bhairaw Kumar Mandal Title: Director Date: 15 th September, 2021	  Name: Gopal Lal Somani Title: CEO Date: 15 th September, 2021

Addendum No. 1 to MBGEPL-SECI-ETPL/EPC-Contract/01

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MB GREEN ENERGY PRIVATE LIMITED

H. No. 6-3-902/2, Maruthi Apartment, Somajiguda,
Hyderabad – 500 082. Telangana

Date: 17.12.2021

To Whomsoever It May Concern

It is certified that **M/s Enerture Technologies Pvt Ltd**, New Delhi has supplied & installed 3.73 MW Solar Rooftop Plant against the order no. MBGEPL-SECI-ETPL/EPC-Contract/01 of value Rs. 14,47,96,653/- at SECI projects of Himachal & Uttarakhand. The work has been completed with Satisfactory remarks in given timeline and agreed terms & condition of SECI.

For MB Green Energy Private Limited



Authorized Signatory



Purchase Order No: 4100001253
 Purchase Order Date: 17.06.2021
 PO Release Date : 24.06.2021
 Amendment No: 0
 Amendment Date: 17.06.2021

PURCHASE ORDER

Vendor Name & Address Enerture Technologies Pvt. Ltd. ,K-27A, Marwaha Bhawan, Main vasant kunj road Mahipalpur-110037 Delhi, India Contact Person: Mr. Bhairaw Kumar Email: bhairaw@enerture.co.in Phone No.: 9555853152		PAN: AADCE0558K GSTIN: 07AADCE0558K1ZL CIN:		Please Deliver To : Dalmia Cement (Bharat) Ltd Chinnakomerla (Village), Mylavaram Mandal, Jammalamadugu (Tq), Kadapa-516434 Andhra Pradesh, India GSTIN: 37AAECH2891P1ZW				
		Communication Address: Hero Rooftop Energy Private Limited 201,First Floor, Okhla Industrial Estate, Phase IIIPlot No.201 New Delhi-110020 Delhi, India		Invoice To : Hero Rooftop Energy Pvt. Ltd. S.NO. 22/1A,22/1B,22/1C and 22/1A1,Thirmapuram Village Anantapuram-515001 Andhra Pradesh, India PAN: AAECH2891P GSTIN: 37AAECH2891P1ZW CIN:				
Purchase Order No: 4100001253	Date 17.06.2021	Vendor Code 211271	Your Reference & Quotation QUOTATION VIA EMAIL ON DATED 04.06.2021					
Subject: Purchase Order for Supply of Material Required for Installation and Commissioning of 16.08 MW Dalmia Cements Solar Project		Warranty Period(Months): Liquidated Damages Min%: 1.00 Max%: 5.00 Triggered Date: 30.09.2021		Created By PUNEET Name PUNEET Mobile No. Land Line No. Email-ID puneet.chawla@herofutureenergies.com				
Please supply in accordance with stipulated terms & conditions attached. Kindly send us your acknowledgement. Please mention your GSTIN as well as the state from where supplies are made.			Incoterm - DDP-Project Site Part Delivery - ALLOWED Validity Start-17.06.2021 Validity End-17.12.2021					
S.NO	HSN	HSN Description	Item Code	Description of Item	Qty	UOM	Unit Price	Total Price
20	85369090	ELECTRICAL APPARATUS FOR SWITCHING OR PROTECTING ELECTRICAL	100302	Short Text: Supply Material for Installation & Comm. Item Text: Basic Price: 0.58 Over tolerance: 0.0 Under tolerance: 0.0 IGST: 18.00 % 1,676,622.24	16,059,600.000	WP	0.58	9,314,568.00
		Basic Value:						9,314,568.00
		GST						1,676,622.24
		Grand Total						10,991,190.24
(Grand Total in Words) One Crore Nine Lakh Ninety One Thousand One Hundred Ninety Rupees Twenty Four Paise Only								
Terms of Payment: 100% within 30 days from the date of delivery of material at site (Please refer clause No. 3 and 4 of General Terms and Conditions enclosed herewith)								
NOTE:The following details are essential to process your invoice for payment purpose.								

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Service Order No : 5100001331
 Service Order Date : 17.06.2021
 SO Release Date : 24.06.2021
 Amendment No: 0
 Amendment Date: 17.06.2021

SERVICE ORDER

Vendor Name & Address: Enerture Technologies Pvt. Ltd. ,K-27A, Marwaha Bhawan, Main vasant Kunj road Mahipalpur-110037, India		PAN: AADCE0558K GSTIN: 07AADCE0558K1ZL CIN:		Please Deliver To : Dalmia Cement (Bharat) Ltd ,Chinnakomerla (Village), Mylavaram Mandal, Andhra Pradesh-516434, India GSTIN: 37AAECH2891P1ZW			
Contact Person : Mr. Bhairaw Kumar Email: bhairaw@enerture.co.in Phone No.: 9555853152		Communication Address: Hero Rooftop Energy Private Limited First Floor, Okhla Industrial Estate, Phase III Plot No.201 New Delhi 110020 Delhi, India		Invoice To Be Billed To: Hero Rooftop Energy Pvt. Ltd. ,S.NO. 22/1A,22/1B,22/1C and 22/1A1,Thimmapuram Village,,Andhra Pradesh-515001,India PAN: AAECH2891P GSTIN: 37AAECH2891P1ZW CIN:			
Service Order No : 5100001331	Date: 17.06.2021	Vendor Code : 211271	Your Reference And Quotation: QUOTATION VIA EMAIL ON DATED 04.06.2021				
Subject : Service Order for Installation and Commissioning of 16 MW Dalmia Cements Solar Project		Warranty Period : Liquidated Damages : Min%:1.00 Max%:5.00 Triggered Date: 14.10.2021	Created By : PUNEET Name : PUNEET Mobile No : Land Line No : Email-ID : puneet.chawla@herofutureenergies.com				
Please provide service in accordance with stipulated terms & conditions attached. Kindly send us your acknowledgement. In your invoice clearly mention the PAN, GSTIN as applicable to service given by you for this project.			Incoterm : DDP-Project Site Part Delivery - NOT ALLOWED Validity Start Date: 17.06.2021 Validity End Date: 17.12.2021				
S.No	Description of Service	SAC	SAC Description	Qty	UOM	Unit Price	Total Price
10	Installation and Commissioning Item Text : Basic Price: 8,029,800.00 Over Tol: 0.0 Under Tol: 0.0 IGST:18.00 % 1,445,364.00	995426	GENERAL CONSTRUCTION SERVICES OF POWER PLANTS AND ITS RELATE	1.000	AU	8,029,800.00	8,029,800.00
1	Installation and Commissioning Gross Price: 8,029,800.00			16,059,600.000	WP	0.50	8,029,800.00
Basic Value						8,029,800.00	
GST						1,445,364.00	
Grand Total:						9,475,164.00	
(Grand Total In Words): Ninety Four Lakh Seventy Five Thousand One Hundred Sixty Four Rupees Only							
Terms Of Payment: 100% within 30 days against work completion to be verified by Project manager Please refer clause No. 3 and 4 of General Terms and Conditions enclosed herewith)							
NOTE: The following details are essential to process your invoice for payment purpose.							
i) Supplier code. ii) Service order no. iii) Item no. iv) Description. v) Quantity.							

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Work Completion Certificate

This is to certify that M/s Enerture Technologies Pvt Ltd, New Delhi has successfully supplied, installed and commissioned Ground Mount Solar Power plant at below mentioned site details as Sub contractor of M/s Hero Rooftop Energy Private Limited.

S. No.	Particulars	Description
1	Name of Project	16.06 MWP GROUND MOUNT DALMIA SOLAR PV PROJECT
2	Owner of Project	Dalmia Cement (Bharat) Ltd
3	EPC Contractor	Hero Rooftop Energy Private Limited, 201, First Floor, Okhla Industrial Estate, Phase III Plot No.201 New Delhi-110020, Delhi, India.
4	EPC Sub Contractor	Enerture Technologies Pvt. Ltd., K-27A, Marwaha Bhawan, Main vasant kunj road Mahipalpur-110037 Delhi, India.
5	Location Of Project	Chinnakomerla (Village), Mylavaram Mandal, Jammaiamadugu (Tq), Kadapa-516434, Andhra Pradesh, India
6	Ref. Contract/ Work order No. / PO/ SO	4100001253, 5100001331 & 5100001335
7	Project Capacity	16,059,600 WP
8	Order Release Date	24 th June 2021
09	Commissioning Date	10 August 2022 (Including CEIG , Metering & synchronisation Permission)

The Work has been executed as per the contract specifications and standards. The project was completed successfully to the level of our satisfaction and agreed terms of PO & SO.

Thanks & Regards,

For Hero Solar Energy Pvt. Ltd

Authorized Signatory



Ref: APIPL/ETPL/WCC/003

Date: 17.12.2019

Work Completion Certificate

It is certified that **M/s Enerture Technologies Pvt Ltd**, New Delhi has supplied & installed 3.61550 MW Solar Rooftop Plant against the order no. 4100003257 of project value INR 13,35,33,097.00 at Howrah Railway Station, Howrah, West Bengal. The work has been completed with Satisfactory remarks in given timeline and agreed terms & condition.

For Azure Power India Private Limited

A handwritten signature in black ink, appearing to read "B Kumar", written over a circular stamp.



Authorized Signatory

**BHAIRAW
KUMAR MANDAL**

Digitally signed by
BHAIRAW KUMAR MANDAL
Date: 2023.05.06 16:37:06
+05'30'



Date: 25-02-2023

TO WHOM IT MAY CONCERN

We **Victoria Auto Pvt Ltd** is to certify that **Enerture Solar One Pvt Ltd** has designed supplied, installed and commissioned the system of 3000 KWp to our satisfaction.

The project was completed on 23 February, 2023

Victoria Auto Pvt Ltd

Authorized Signatory

Enerture Solar One pvt Ltd

Authorized Signatory



सत्यमेव जयते

INDIA NON JUDICIAL

Government of National Capital Territory of Delhi

₹100

e-Stamp

Certificate No.	: IN-DL15602939935632U
Certificate Issued Date	: 07-Apr-2022 10:30 AM
Account Reference	: IMPACC/ dl876003/ DELHI/ DL-DLH
Unique Doc. Reference	: SUBIN-DL87600318848633884469U
Purchased by	: ENERTURE SOLAR ONE PVT LTD
Description of Document	: Article 5 General Agreement
Property Description	: Not Applicable
Consideration Price (Rs.)	: 0 (Zero)
First Party	: ENERTURE SOLAR ONE PVT LTD
Second Party	: VICTORA AUTO LTD
Stamp Duty Paid By	: ENERTURE SOLAR ONE PVT LTD
Stamp Duty Amount(Rs.)	: 100 (One Hundred only)

सत्यमेव जयते



Please write or type below this line

POWER PURCHASE AGREEMENT

THIS POWER PURCHASE AGREEMENT (the "Agreement") is made and entered into at Delhi on this 7th April, 2022 (the "Signing Date"):

BETWEEN:

Enerture Solar One Pvt Ltd, a private limited company incorporated under the Companies Act, 2013, having its registered office at 815 ,Udyog Vihar Phase 5,Gurgaon,Haryana INDIA and its Corporate Office at, **Abl Workspace, Celebration Gardens Nh 8, Avenue Bouganvillea, Mahipalpur, New Delhi, Delhi 110037, India**, (hereinafter referred to as "**Power Producer**", which expression shall, unless repugnant to the context or meaning thereof, include its successors and assigns) as party of the FIRST PART.

AND

M/S Victora Auto Ltd a company incorporated under the Companies Act, 1956, and having its Corporate office at **Plot No. 42, Sec 20A , Near ICAI Bhawan Faridabad, 121001 , Haryana . (CIN no. U34300DL1991PTC203627) India** (hereinafter

Statutory Alert

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1. The authenticity of this Stamp Certificate should be verified at 'www.shcheStamp.com' or using e-Stamp Mobile App of Stock Exchange of India. Any discrepancy in the details on this Certificate and as available on the website / Mobile App renders it invalid.

2. In case of any discrepancy please inform the Competent Authority.

referred to as "Offtaker", which expression shall, unless repugnant to the context or meaning thereof, include all its successors and permitted assigns) as party of the SECOND PART.

1. RECITALS

WHEREAS:

- A. The Power Producer is a company engaged in the business of developing, installing, operating, managing and maintaining solar power plants across India. (Mainly at Haryana, Uttarpradesh & Uttarakhand)
- B. The Offtaker is an industry having office at Corporate office at Plot No. 42, Sec 20A, Near ICAI Bhawan Faridabad, 121001, Haryana **having different manufacturing units at Haryana, Uttarakhand and Uttar Pradesh (As per EXHIBIT 1)**; which the Off taker agrees to make available to the Power Producer or at the Power Producer's discretion, to its assignees for the construction, operation and maintenance of a solar power generating plant having a capacity of **3020KWdc (+/- 10%)** at the roof top area within the premises (To be finalization after physical survey for optimization of generation) (hereinafter referred to as "the Plant"), and to purchase from Power Producer all the solar energy produced from the Plant. Provided that the Power Producer shall provide the Offtaker with a list of such assignees. The Parties agree that the Power Producer or its assignees shall not have any lien on the Premises provided by the Offtaker in any shape or form whatsoever and the Offtaker and its assignees shall not have any lien on the Power Plant in any shape or form whatsoever.
- C. The Power Producer has represented to the Offtaker that the Plant shall be set up by the Power Producer. Further the Parties understand that the Power Producer may create a charge on the Solar Power Plant excluding the Premises on which the plant is erected and/or assign this Agreement, but in no event the creation of charge on the Solar Power Plant or Assignment shall have any effect on this Agreement and shall not affect the business of the Offtaker. The said Assignee shall be liable for all the liabilities and obligations of the Power Producer. In case of Transfer of Ownership during or at the end of the Term of this contract as per provisions of this Agreement the Power Producer shall ensure that the Solar Power Plant is free from any charge, lien or any kind of encumbrances.
- D. The Parties by way of this Agreement wish to record the terms and conditions on the basis of which the Power Producer would set up the Solar Power Plant and supply Electricity to the Offtaker.

NOW, THEREFORE IN VIEW OF THE FOREGOING PREMISES AND IN CONSIDERATION OF THE MUTUAL COVENANTS AND CONDITIONS SET OUT BELOW, THE PARTIES HEREBY AGREE AS FOLLOWS:

2. DEFINITIONS AND INTERPRETATIONS

2.1. Definitions

In this Agreement, unless the context otherwise requires, Capitalized terms otherwise used shall have the respective meanings assigned to them in 0 ("Definitions").

2.2. Interpretations

- 2.2.1 The table of contents and headings in this Agreement are inserted for convenience only and shall not affect its interpretation or construction.

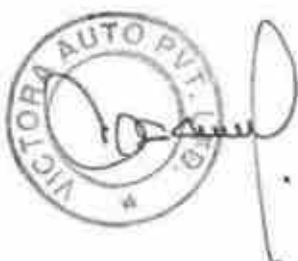


- 2.2.2 All references made in this Agreement to "Clauses", "Exhibits" and "Schedules" shall refer, respectively, to Clauses of and Exhibits and Schedules to this Agreement. The Exhibits and Schedules to this Agreement form part of this Agreement and shall be in full force and effect as though they were expressly set out in the body of this Agreement.
- 2.2.3 Clause headings are for convenience only and shall not affect the interpretation of this Agreement. References to Clauses are specifically made, and where not specifically made, shall mean a reference to the entire Clause of the Agreement along with the numbered clauses or sub-clauses falling under the main clause, which have been appropriately identified by way of numbering and indentations such that an indented clause underneath a main clause shall be construed to be a part of that main clause, if not specifically referred to.
- 2.2.4 The words "hereto", "hereof" and "hereunder" shall refer to this Agreement as a whole and not to any particular provision of this Agreement.
- 2.2.5 The word "person" shall include individuals; partnerships; corporate bodies (including but not limited to corporations, limited partnerships and limited liability companies); non-profit corporations or associations; governmental bodies and agencies; and regulated utilities.
- 2.2.6 The word "including" and "include" shall be deemed to be followed by the words "without limitations".
- 2.2.7 In the event of any conflict between the text of this Agreement and the contents of any Schedule hereto, the text of this Agreement shall govern.
- 2.2.8 Each of the representations and warranties provided in this Agreement is independent of the other representations and warranties in this Agreement and unless the contrary is expressly stated, no clause in this Agreement limits the extent or application of another clause.
- 2.2.9 Any reference to any statute or statutory provision shall include
- a) all subordinate legislation made from time to time under that statute or provision (whether or not amended, modified, re-enacted or consolidated);
 - b) such provision as from time to time amended, modified, re-enacted or consolidated (whether before, on or after the date of this Agreement) to the extent such amendment, modification, re-enactment or consolidation applies or is capable of applying to any transactions entered into under this Agreement as applicable, and (to the extent liability thereunder may exist or can arise) shall include any past statutory provision (as from time to time amended, modified, re-enacted or consolidated) which the provision referred to has directly or indirectly replaced.
- 2.2.10 Any grammatical form or variation of a defined term herein shall have the same meaning as that of such term;
- 2.2.11 The words/ expressions used in this Agreement but not defined herein, unless repugnant to the context, shall have the same meaning as assigned to them in the context in which these have been used in the Agreement provided that the respective meanings, if any, assigned to such undefined words/ expressions in the Electricity Act, 2003 shall also be taken into consideration for harmonious interpretation of the Agreement.

3. TERM

3.1. Segregation into Periods

This Agreement shall consist of an Initial Period and an Operations Period. As used herein, "Term" shall mean all of the Initial Period and the Operations Period, unless the Power Producer or Offtaker terminates the Agreement earlier in accordance with the terms of this Agreement.



3.2. Initial Period

Subject to the availability of the Project Site, the Initial Period will begin on the "Effective Date" asset forth above and will terminate on the earlier of the Commercial Operation Date or the date on which the Agreement is terminated pursuant to the provisions of Clause 4.5 hereof. The Parties agree that the Power Producer shall ensure commissioning of the Project within **180** days from the Effective Date ("**Scheduled Commissioning Date**").

In the event of a delay in achieving the Commercial Operation Date by the Scheduled Commercial Operation Date, provided that such delay was not as a result of getting the necessary government approvals from the concerned authorities or Offtaker's negligence or breach of its obligations hereunder or due to a Force Majeure Event, the Power Producer shall be provided another 30 (Thirty days) to commission the plant & if SCOD is still not achieved in those 30 (Thirty) days, the Power Producer will pay to the Purchaser delay liquidated damages ("**Delay Liquidated Damages**"), as per the following calculation:

Delay Liquidated Damages = Expected Generation during delay period * (Actual Govt. Electricity Distribution Company "Discom" rate/ kWh -demand charges/ kWh - PPA tariff @ 3.95 / kWh)

Delay Liquidated Damages shall be payable on actual basis with maximum ceiling of Rs 1/- per unit. For avoidance of doubt under any circumstance Delay Liquidated Damages shall not be more than INR1/- per kWh. The Delay Liquidated Damages shall be paid to the Offtaker through RTGS/ Cheque payment once such demand has been raised as per provisions of this Agreement by the Offtaker

The total number of Solar Power units lost shall be calculated on a pro-rata basis from the Estimated Annual Production. The Delay Liquidated Damages shall be calculated from the date falling after the Scheduled Commercial Operation Date or the extended SCOD and up to the Commercial Operation Date. The Delay Liquidated Damages shall be subject to a cap of liquidated damages payable for a maximum period of 1 (one) months of delay in achievement of the Commercial Operation Date. If the Commercial Operation Date has not been achieved within 2 (two) months after Scheduled Commercial Operation Date (including notice period), the provisions of Section 21 shall apply.

During the Initial Period, the Offtaker shall ensure that the Project Site is available to the Power Producer without any interruption.

3.3. Operations Period

The Operations Period will commence on the Commercial Operation Date and will terminate on completion of **25 Years** from the date of Commercial Operation Date.

3.4. Access Specifications

3.4.1. The Offtaker hereby grants the Power Producer and its agents, (including its contractors, subcontractors, persons responsible for implementing the Applicable Solar Plant, and the Financing Party) entry permission into the Premises, for the Term of this Agreement, at reasonable times and upon reasonable notice, for the purposes of designing, installing, inspecting, operating, maintaining, repairing and removing the Plant, and any other purpose set forth in this Agreement, and otherwise in accordance with the provisions of this Agreement.

3.4.2. Permission to work at Site of the Offtaker:

- a) Vehicular & Pedestrian Entry Permissions: Offtaker shall provide permission to enter for site vehicles and workers for the purpose of designing, installing, operating, maintaining,



repairing and removing the Plant. In exercising such access, the Power Producer shall reasonably attempt to minimize any disruption to activities occurring on the Site.

- b) **Transmission Lines & Communication Cables:** The right to locate transmission lines and communications cables across the Site. The location of any such transmission lines and communications cables outside the areas designated on Exhibit I shall be subject to the Offtaker's approval and shall be at locations that minimize any disruption to Offtaker's activities occurring on the Site.
- c) **Storage:** Adequate storage space on the Site convenient to the Premises for materials and tools used during construction, installation, and maintenance of the Plant. Offtaker shall be responsible for providing shelter and security for stored items during construction and installation.
- d) **Utilities:** water, drainage and electrical connection in the Premises for use by Power Producer in installing, operating and maintaining the Plant. Further, if the Offtaker wishes to access the plant generation data then Ethernet connections, Display and Data Storage devices in the Premises shall be arranged by the Offtaker at its own expense.
Offtaker needs to provide reasonable and adequate water supply by giving water tapping points near the roof for cleaning of modules and if required by Power Producer, 100 units of electricity monthly will be utilized for the operation and maintenance of the Plant at the account of the Offtaker.
Water tapping points shall not be more than 10 meters far from the roof's where solar modules are being installed, after tapping points module cleaning system will be installed by Power Producer.

3.5 Easement Rights, Permissions, Approvals and Authorizations

- 3.5.1 Immediately upon the commencement of the Initial Period, the Offtaker shall provide entry permissions to Power Producer to execute scope of work as defined in this Agreement.
- 3.5.2 The Offtaker will insulate Power Producer from risk arising from authorities appointed under all applicable laws in relation to usage of Roof such as, but not limited to, the Municipal Authorities, authorities responsible for urban development and regulation, Fire Safety authorities, etc. requisite permissions and approvals relating to the existing building, factory inspectors, lenders, etc. for the purposes of setting up of the Plant.
- 3.5.3 The Power Producer shall provide the relevant support for follow up as and when required by the Offtaker for obtaining the necessary permits/approvals from the relevant authorities as mentioned in clause 3.5.2 above.
- 3.5.4 Power producer shall be responsible for obtaining and maintaining all approvals relating to installation and operation of Solar Plant, all the statutory charges for above approvals will be paid by Power Producer and Offtaker will assist in completing documentation where necessary for obtaining quick approvals.

4. **PLANNING, INSTALLATION AND OPERATION OF PLANT**

4.1. Technical Specifications considerations

The Power Producer shall has considered the following assumptions based on the information provided by the Offtaker: -

- 1. The roof area mentioned in the PPA is within the premises of the Offtaker and the Offtaker has secured the rights of construction of the Solar Power Plant on the roof top area.



2. Offtaker shall provide the Power Producer a shadow free rooftop as given at the time of this Agreement and shall endeavor to make sure that it remains the same for entire PPA tenure, subject to normal wear and tear.
3. The Offtaker shall provide clear access to the roof and as per specification given by the Power Producer at various locations as per requirement of the Solar Plant

The AC cable length from solar inverter to the main LT Panel of the load points is not more than 150 meters. The Offtaker acknowledges that the Power Producer has proposed the Tariff based on the above assumptions, if any of the above conditions changes as per the actual site conditions, the Tariff will increase proportionate to the cost increase in the installation of the system or Offtaker shall pay the increased cost due to additional scope on actual basis to the Power Producer

4.2. Site Assessment and Planning

During the Initial Period, Power Producer shall have the right, at its own expense, to assess the suitability of the Premises for the Plant and shall act diligently in conducting such assessment. The assessment shall include the right to inspect the physical condition of the structures on which the Plant will be located; to apply for permits or other governmental authorizations necessary for the construction of the Plant; to arrange interconnections with the Local Electric Utility; or to make any other investigation or determination necessary for the financing, construction, operation or maintenance of the Plant.

4.3. Commencement of Construction

At any time during the Initial Period, upon at least 45 Business Days' notice to the Offtaker, the Power Producer shall have the right to commence installing the Plant on the Premises, complying to all of the Offtaker's safety norms.

4.4. Major Components of the Plant

As of the date hereof, the Power Producer anticipates that the Plant shall consist of the major components as set forth in SCHEDULE C hereof. During the project execution due to reasons not attributable to Power Producer, if there is a requirement to change the Major components for the benefit of the Project same will be notified to Offtaker by the Power Producer. Approval of such modification of design must not be unreasonably withheld by the Offtaker.

4.5. Termination of Development Activities and Agreement

Notwithstanding anything contained in this Agreement at any time during the Initial Period, Power Producer shall have the right to cease development of the Plant on the Premises, for reasons only dealing with changes in law or government regulations coming into effect after the Effective Date, which would render the Project unviable. If the Power Producer gives the Offtaker notice of such determination, this Agreement shall stand terminated effective as of the delivery of such notice without any further liability of the Parties to each other, provided that

- 4.5.1. Power Producer shall remove any equipment or materials which the Power Producer has placed on the Site;
- 4.5.2. Power Producer shall restore any portions of the Site disturbed by the Power Producer to its pre-existing condition, i.e. prior to the commencement of construction;
- 4.5.3. The Parties shall not be released from any payment or other obligations arising under this Agreement prior to the delivery of the notice; and
- 4.5.4. The confidentiality provisions of Clause 15, the indemnity obligations under Clause 16 hereof, and the dispute resolution provisions of Clause 25 hereof shall continue to apply notwithstanding the termination of this Agreement.



4.6. Contractors

Power Producer shall use contractors / independent agents to perform the work of installing, operating, and maintaining the Plant and shall notify the Offtaker through written notifications. In such Appointment of contractors / independent agents, Power Producer ensures to follow Safety, EHS and other norms as per the industry practice and Offtaker's specific norms. Provided that appointment of such Contractors shall not relieve the Power Producer from its obligations under this Agreement. The insurance and other safety related issues has to be taken care by the Power Producer.

4.7. Site Security

Offtaker will assist with security for the Plant from the commencement of construction till the time that this Agreement is in effect, to the extent of its existing security procedures, practices, and policies that apply to the Premises. Offtaker will advise Power Producer immediately upon observing any damage to the Plant. During the Operations Period, upon request by Power Producer, such as Power Producer receiving data indicating irregularities or interruptions in the operation of the Plant, Offtaker shall, as quickly as reasonably possible, send a person to observe the condition of the Plant and report back to Power Producer on such observations.

4.8. Safety codes

The Power Producer should ensure that all workers working at plant will wear IS approved safety gear as may be required such as Safety Shoes, Safety helmets, and any other safety gear require to perform safe installation and shall take care of all required measures to ensure safety measures to all workers.

4.8 The power supplied would be injected at 415 V, 50Hz, into the LT panel located within the premises of each roof where Solar Plant will be installed with Suitable provisions will be setup by Power Producer to maintain the quality of power as per the provisions of the Indian electricity codes.

5. SALE OF ELECTRIC ENERGY

5.1. Sale of Electricity

Throughout the Operations Period, subject to the terms and conditions of this Agreement, Power Producer shall sell only to Offtaker and Offtaker shall buy from Power Producer all the solar energy produced by the Plant, whether or not Offtaker is able to use all such solar energy. Title to and risk of loss with respect to the solar energy shall Re from Power Producer to Offtaker at the Point of Delivery. Tariff schedule for sale of electricity is as per SCHEDULE A.

- a. Expected Energy Supply & Performance Ratio" (PR)"
- b. Power Producer estimates the amount of solar energy to be produced by the limits on Plant on annual basis subject to Global Horizontal Irradiation ("GHI" FOR RESPECTIVE SITES.) are based on following broad assumptions
- c. Expected Energy Generation /annum= As per Schedule -F
- d. Module Degradation Factor= 0.75%
- e. Plant Capacity- As per Exhibit I – 3020kWp dc (+/-) 10%
- f. Treatment for PR :

Means the ratio of plant output versus installed plant capacity at any instance with respect to the radiation measured.

$$PR = \frac{\text{Annual Generation}}{\text{Capacity} \times \text{Annual Solar Isolation}} \times 100$$



shall mean the electrical energy output power generated from the Power Project.

g. 5.2(a) GUARANTEED PERFORMANCE

Uptime Guarantee: The Company will maintain an annual minimum system uptime of 85% for the duration of the Agreement ("Guaranteed Uptime").

- h. The Guaranteed Uptime will be calculated on an annual basis, with the first year beginning on the Commissioning Date, and each subsequent year being considered a separate Uptime Measurement Period.
- i. The System shall meet minimum guaranteed generation with Performance Ratio (PR) at the time of commissioning and related Capacity Utilization Factor (CUF) as per the daily normalized irradiance levels of the location during the O&M period. PR shall be minimum of 70% at the time of inspection for initial Project acceptance
- j. The System shall be maintained at power factor of Unity (PF = 1.000) and shall not interfere with the existing power setup of the Consumer.
- k. For the purposes of measuring the Guaranteed Uptime, the system will be considered up for a given day if the Main Meter or Check Meter, as the case may be, shows generation of power from the Solar Power Plant on that day.
- l. Exclusions from Uptime Calculation: In the event the Solar Power Plants are unable to generate power due to grid outages, force majeure events, inability of the Power User to offtake power from the Solar Power Plants, or any act or negligence of the Consumer or its employees, visitors or associates, the plant will also be deemed up during those days.

5.2. Joint Meter Reading

Monthly Meter Reading:

For every calendar month, joint meter reading (JMR) of main meter and the check meters installed at the respective locations shall be conducted on 1st working day of every calendar month @ 11:00 AM, in the presence of representatives of both the Parties. If the first day of the month is a public holiday or Sunday, then in such cases the joint meter reading shall be conducted on the immediate next day. However, in such cases, Power Producer shall inform the other Party in advance. The format for monthly joint meter reading is attached. Meter reading can also be taken through the remote monitoring provision provided remote monitoring facility is functional and is cable of reading the energy meter readings. Power Producer can submit JMR through remote monitoring system.

m. Meter Inspection & Sealing:

The energy meter shall be jointly inspected and sealed by Power Producer and shall not be opened, calibrated or tested except in the presence of the representatives of both the Parties. In each case, seal details of old and new seals installed at the meter box to be mentioned on the joint meter reading format or meter testing report. Energy Recording:

i. Difference in energy measurement between main meter and check meters:

At the time of taking monthly joint meter reading, if the electrical energy consumption reading of the main meter differs from the readings of the corresponding check meter by more than +/- 5%, in such case the main meter shall be tested first as per ISI guidelines and if on such testing, the main meter error is found to exceed specific limits prescribed in the standards, then the main meter shall be re-calibrated or replaced by correct meter, within next 7 working days from the date of testing. If the main meter is found correct, the check meter shall be tested and re-calibrated or replaced by correct meter, within next 7 working days from the date of testing. The charges for the meter testing/calibration shall be borne by Power Producer.

ii. Billing in case of faulty meter



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In the event of variation exceeding the permissible limits, the billing should be done based on the correct meter (main or check). The joint metering should be taken after such re-calibration/testing. Tolerance shall be within the calibration of energy meter.

n. **Annual Meter Testing:**

All meters shall be checked/tested for accuracy on a yearly basis in presence of both the Parties and shall be tested as working satisfactory so long as the errors are within the limits prescribed for meters of the specific class. Energy consumption recorded in the main meter will form the basis of billing, so long as the yearly checks show that errors if any are within the permissible limits. If the check or main meter is found defective during the annual checking, the error will be rectified and it shall be immediately replaced at the cost of Power Producer.

o. **Calibration Procedure:**

All meters shall be calibrated on an annual basis by a government approved agency and the cost for the calibration shall be borne by Power Producer. Meter readings shall be taken after the completion of calibration procedure in the presence of authorized representatives of both the parties. Metering system, calibration procedure and the procedure of taking meter readings could be modified from time to time as may be decided by both the parties with mutual understanding.

- (a) The Main Metering System at the Delivery Point shall in terms of its technical standards, description, accuracy, calibration, comply fully with the requirements of the relevant standards under the Applicable Law and shall be regularly tested as per the government regulation. This will consist of main meter and a check meter.
- (b) The Main Metering System shall be installed, maintained and owned by the Power Producer. It shall be installed at a place accessible to the meter readers of both the Parties. The Offtaker shall have full access to the Main Metering System, and to any data generated thereby.
- (c) The Offtaker may install an additional meter, at its own cost, to verify the measurements of the Main Metering System.
- (d) Power Producer shall install the meter(s) to meet the technical and regulatory requirements stipulated by the Jurisdictional Authorities at the Drawal Point

The risk and title to the solar energy supplied by the Power Producer shall pass to the Offtaker at the Delivery Point

6. DAMAGE

6.1. Damage by Offtaker

In the event that the Solar Power Plant is damaged by any act, negligence or omission except Force Majeure events by the Offtaker, or any of its employees, agents, contractors or affiliates, the Offtaker:

- 6.1.1. Shall be responsible for any cost of repairing or replacing any component of the Solar Power Plant and rectifying the damage.
- 6.1.2. Shall continue to be billed as per Deemed Generation until the Solar Power Plant is restored to full capacity, and the Offtaker shall be responsible for the payment of these bills.

6.2. Damage by Power Producer




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In the event that the Solar Power Plant or any other property of the Offtaker is damaged by any act, negligence or omission except Force Majeure events by the Power Producer, or any of its employees, contractors or affiliates, the Power Producer:

- 6.2.1. Shall be responsible for the cost of repairing the Solar Power Plant or replacing the component of the Solar Power Plant or cost of repair or replacement of such other property of the Offtaker.
- 6.2.2. Shall not bill the Offtaker for any Deemed Generation. If such Deemed Generation is billed to the Offtaker, the Offtaker shall not be obliged to pay the amount to the Power Producer.
- 6.2.3. The Power Producer has to supply **Estimated Energy As per Schedule F, each site generation number will be different based upon location** for the first year on annual basis as **Guaranteed Generation** subject to 100% grid availability.

7. RATES, BILLING AND PAYMENT SCHEDULE

7.1. Rates

Offtaker shall pay Power Producer for electricity supplied and Deemed Generation, if any, by the Plant at the rates set forth in SCHEDULE A attached hereto, which shall be exclusive of all Regulatory Charges that may become applicable during the subsistence of this Agreement in future due to any change of law.

7.2. Billing

Offtaker shall pay for the electricity supplied at delivery point, by the Solar Power Plant monthly. Promptly after the end of each calendar month, Power Producer shall provide Offtaker with an invoice setting forth the quantity of electricity produced by the Plant in such month, the applicable rates for such, and the total amount due, which shall be the product of the quantities and the applicable rates. The monthly joint reading format (signed by authorized representatives of Power Producer and Offtaker) will be attached along with the bill otherwise the invoice of the month shall not be accepted by Offtaker. However, if the remote monitoring system is implemented which has the ability of capturing the real time energy meter readings, the same may be used for billing and physical signing of energy meter records shall not be required.

7.3. Invoice Delivery

Invoices shall be in writing and shall be either (i) delivered by hand; (ii) mailed by registered or or certified mail or speed post, return receipt requested, postage prepaid; (iii) delivered by a recognized overnight or personal delivery service; (iv) transmitted by facsimile/email (such transmission to be effective on the day of receipt if received prior to 5:00 pm local time on a Business Day or in any other case as of the next Business Day following the day of transmittal)

7.4. Bank Guarantee

On the date of signing this Agreement, the Offtaker shall be obliged to submit to the Power Producer a sum as indicated in Schedule E as guarantee of payment, in the form of a **Bank Guarantee, which shall be equivalent to 3 months' payment made** towards electricity produced at the applicable rates. The Bank Guarantee shall be issued by Offtaker's scheduled bank and shall be substantially in the form set forth in Exhibit 3. The Bank Guarantee shall be for a period of One year and renewed annually till the term of this Agreement. The Power Producer shall be entitled to invoke such Bank Guarantee for its full face value or part thereof, in case of an Offtaker Event of a Default or any non-fulfillment of its obligations by the Offtaker under this Agreement. Upon such Bank Guarantee being fully or partly invoked by the Power Producer during the Term of this Agreement, the Offtaker shall be liable to replenish such Bank Guarantee to its original value within a period of thirty (30) days. Such encashment of the Bank Guarantee by the Power Producer, shall not impact in any way the recovery of any other monthly arrears that may be due on the part of the Offtaker or any payment at the time of termination of this Agreement including payment of



Buy Out value due as contemplated in this Agreement. At the end of the Term of this Agreement or on termination of this Agreement, whichever is earlier if no Offtaker Event of Default exists, the Power Producer will return to the Offtaker such Bank Guarantee within a period thirty (30) days.

7.5. Payment

Offtaker shall pay each invoice within Twenty (20) days of receipt of the invoice ("**Due Date**"). Payments shall be made by electronic funds transfer to an account designated by Power Producer in the invoice or in a written notice delivered to the Offtaker. Any payment after due date would attract an interest @ 1%/per month.

7.6. Disputed Invoices

7.6.1. If Offtaker objects to all or a portion of an invoice, Offtaker shall, on or before the date payment of the invoice is due:

- (i) Pay 100% of the undisputed portion of the invoice, and
- (ii) Provide an itemized statement of its objections setting forth in reasonable detail the basis for its objections.

7.6.2. If Offtaker does not object prior to the Due Date, Offtaker shall be obligated to pay the full amount of such invoices but Offtaker may subsequently object to such invoice and, if such objection proves to be correct, receive a refund of the disputed amount; PROVIDED, however, that Offtaker may not object to any invoice more than six (6) months after the date on which such invoice is rendered. The right to dispute or object to an invoice, shall, subject to the time limitation provided in this Clause 7.6.2, survive the expiration or termination of this Agreement.

7.6.3. Any adjustments shall be made in the invoice of the subsequent months.

7.6.4. Disputes shall only be entertained on issues pertaining to meter readings and other factual aspects and not on the Tariff for Electricity if the correct Tariff is applied for billing.

8. SUPPLEMENTAL POWER

8.1. Interconnection

8.2. Power Producer shall be responsible for arranging the interconnection of the Plant with Offtaker's Local Electric Utility at HT/LT connection level including net metering approvals and fulfilling any other requirements of the distribution licensees. Cost related to Net Metering application however will have to be borne by the Offtaker.

8.3. Entitlement to Tax Incentives

Power Producer (and/or its assignee as may be identified and appointed at its sole discretion) shall be entitled to any Tax Incentives that may arise as a result of the operation of the Plant and shall be entitled to transfer the ownership over the Plant or construct the Plant for such Financing Party who is able to utilize such Tax Incentives. Offtaker shall provide reasonable assistance to Power Producer in preparing all documents necessary for Power Producer to receive such Tax Incentives. Any tax incentives arising as a result of solar power generation shall be the right of the Power Producer or the Financing Party and any tax incentives arising due to consumption of solar power shall be the right of the Offtaker.

8.4. Environmental Attributes

Power Producer (and/or its assignee as may be identified and appointed at its sole discretion) shall be the owner of any Environmental Attributes which may arise as a result of the operation of the Plant and shall be entitled to transfer such Environmental Attributes to any person. Offtaker shall provide reasonable assistance to Power Producer in preparing all documents necessary for Power Producer to receive such Environmental Attributes, and if Offtaker is deemed to be the owner of any such Environmental Attributes, Offtaker shall assign the same (or the proceeds thereof) to Power Producer. If Offtaker receives any payments in respect of such Environmental Attributes, it shall promptly pay them over to Power Producer.



8.5. No Resale of Electricity

The electricity purchased by Offtaker from Power Producer under this Agreement shall not be resold, assigned or otherwise transferred to any other person without prior approval of the Power Producer, which approval shall not be unreasonably withheld, and Offtaker shall not take any action which would cause Offtaker or Power Producer to become a utility or public service company.

9. OWNERSHIP OF PLANT, LIENS, MORTGAGES

9.1. System Ownership

9.1.1. Except as provided in Clause 10, the Power Producer or its assignee shall be the legal and beneficial owner of the Plant at all times prior to transfer of the same to the Offtaker. The Plant is a movable property of the Power Producer or the Financing Party or their assignee as the case may be, and shall not attach to or be deemed a part of, or fixture to, the Site.

9.1.2. Offtaker covenants that it will place all persons having an interest in or lien upon the real property comprising the Premises, on notice of the ownership of the Plant and the legal status or classification of the Plant as movable and personal property of the Power Producer or its assignee as the case may be. Offtaker shall make any necessary filings to disclaim the Plant as a fixture of its respective Premises and Site with the appropriate authorities to place all interested parties on notice of the ownership of the Plant by Power Producer or its assignee as the case may be.

9.2. Liens

9.2.1. To the extent permitted by Applicable Law, each Party shall not directly or indirectly cause, create, incur, assume or suffer to exist any mortgage, pledge, lien, charge, security interest, encumbrance or claim of any nature, including claims by governmental authorities for taxes (collectively referred to as "Liens" and each, individually, a "Lien") on or with respect to the interests of the other in the Site, the Premises, and the Plant, and in the permission to enter granted hereunder.

9.2.2. Each Party shall promptly notify the other of the imposition of a Lien on the property interests of the other Party, and shall promptly discharge such lien, provided however, that a Party may seek to contest the amount or validity of any Lien affecting the property of the other Party, provided it timely complies with all procedures for contesting such Lien, posts any bond or other security necessary under such procedures, and if such procedures do not require the posting of security, the Party establishes for the benefit of the other Party a deposit, letter of credit, or other security acceptable to the other Party to indemnify the other Party against any Loss which could reasonably be expected to arise if such Lien is not removed or discharged. This clause shall be guided by standard Laws of Lien.

9.3. Non Disturbance Agreements

Offtaker shall pay for and obtain all consents required for it to enter into and perform its obligations under this Agreement from its lenders, landlord, tenants, and any other persons with interests in the Site. If there is any charge against the Premises which could reasonably be construed as prospectively attaching to the Plant, Offtaker shall promptly provide an acknowledgement and consent from such lienholder, in form and substance reasonably acceptable to the Power Producer, stating that the ownership of the property in goods over the Plant remains in the Power Producer and further acknowledging that the Plant is personal property of Power Producer and agreeing not to disturb the rights of Power Producer in the Plant and under this Agreement. Such acknowledgment and consents, or acceptable notices thereof, shall be recorded, at Offtaker's expense, with the appropriate authority. Offtaker may in the future mortgage, pledge, and grant



security interests in all or a portion of the Site and the improvements thereon, provided the mortgagee or other grantee of the encumbrance acknowledges this Agreement, the Plant, the access Permissions granted hereunder, and the priority of Power Producer's rights in the Plant and the access Permissions.

10. PURCHASE OPTIONS, REMOVAL AT END OF TERM

10.1. End of Term Purchase Option

Offtaker or any of its assignee shall have the right to purchase the Plant from Power Producer at the expiration of the Operations Period at the Buyout Value of Rs 1.0 (rupee one only) for the Plant free from any charge, lien or any kind of encumbrances. The Offtaker hereby agrees that it shall be solely liable to bear all taxes as may be applicable for the purchase of the Plant from the Power Producer. The Parties agree that such right under this clause shall be exercised by the Offtaker at least 2 months prior to the termination of this Agreement, the end of the term standard maintenance has to be performed before the handover.

10.2. Transfer of Ownership

Upon Offtaker's notice that it elects to exercise the option set forth in Clause 10.1, the Offtaker and the Power Producer shall enter into an agreement in mutually agreed terms to transfer the Plant and the rights and obligations attached thereto. In case of Transfer of Ownership during or at the end of the Term of this contract, the Power Producer shall ensure that the Solar Power Plant is free from any charge, lien or any kind of encumbrances.

10.3. Operation & Maintenance After Sale

Upon Offtaker's notice that it elects to exercise the option set forth in Clause 10.1, the Offtaker and the Power Producer shall discuss entering into an operation and maintenance agreement under which Power Producer shall perform all or a portion of the operation and maintenance requirements of the Plant following Offtaker's purchase of the Plant. However, neither Party shall be under an obligation to enter into such an agreement.

10.4. No Survival of Purchase Option

The options for Offtaker to purchase the Plant under Clause 10.1 shall not survive the termination of this Agreement.

10.5. Removal of the Plant

Subject to the buy-out/purchase of the Plant by the Offtaker, upon the expiry of the Term or early termination of this Agreement, the Power Producer shall, at its own expense, remove all of its tangible property and equipment comprising the Plant from the Premises on a mutually convenient date but in no case later than ninety (90) days after the date of expiry of the Term or early termination of this Agreement. If the Power Producer fails to remove the Plant by such agreed upon date, Offtaker shall have the right, at its option, to remove the Plant. For the purposes of the Power Producer's removal of the tangible property and equipment comprising the Plant, Offtaker's covenants in relation provision of uninterrupted access to the Power Producer shall remain in effect until the date of actual removal of the tangible property and equipment comprising the Plant.

11. SHUTDOWNS, RELOCATION; CLOSURE OR SALE OF SITE

11.1. Offtaker Requested Shutdown

11.1.1. Deleted



- 11.1.2. During any shutdown period (but not including periods of Force Majeure), Offtaker will pay Power Producer an amount equal to the payments that Offtaker would have made to Power Producer hereunder for electric energy that would have been produced by the Plant during the period of the shutdown;
- 11.1.3. Determination of the amount of energy that would have been produced during the period of the shutdown shall be based on Deemed Generation computed as per Schedule F of this Agreement.

11.2. Power Producer Shutdown

Power Producer may shut down the Plant at any time in order to perform required emergency repairs and/or maintenance to the Plant for a maximum of seven (7) days. Power Producer may shutdown the Plant with intimation to Offtaker. Power Producer agrees to notify Offtaker seven (7) days in advance.

11.3. Plant Relocation

11.3.1. If the Solar Power Plant needs to be temporarily moved or its generation suspended during site repairs or for any other reason, either at the request of the Offtaker or due to acts of negligence or omission of the Offtaker or its employees, agents or contractors, the Offtaker will be responsible for any costs arising from moving or disassembling the Solar Power Plant. In the event the Plant relocation is requested by the Power Producer for reasons solely attributable to the Power Producer, all costs arising from such moving or disassembling the Solar Power Plant shall be solely to the account of the Power Producer. Suspension of Generation

- a) Any interruption in generation of Electricity during such relocation as described hereinabove in Clause 11.3.1, and reasons attributable to the Offtaker will continue to be billed as per Deemed Generation, during the period of interruption.
- b) where the electricity generation is suspended or the Solar Power Plant is to be temporarily moved on account of any acts of negligence or omission of the Power Producer or its employees, agents or contractors, the cost for relocation / disassembling shall be to the account of the Power Producer, who will further compensate to the Offtaker @ Rs. 2.50 per unit for shortfall in solar energy for the period such event occurs.

11.3.2. In addition, during the Relocation Event, except in the circumstances envisaged under Clause 11.3.1(b) above;

- a) Offtaker shall pay Power Producer an amount equal to the payments that Offtaker would have made to Power Producer hereunder for electric energy that would have been produced by the Plant following the Relocation Event;
- b) Determination of the amount of energy that would have been produced following the Relocation Event shall be based, during the first Operations Year, on the Deemed Generation and, after the first Operations Year, based on actual operation of the Plant in the same period in the previous Operations Year, unless Power Producer and Offtaker mutually agree to an alternative methodology.

11.3.3. Premises Shutdown; Interconnection Deactivated

- a) In the event Premises are closed as a result of an event that is not:
 - (i) a Force Majeure Event or
 - (ii) caused by or related to any unexcused action or inaction of Power Producer, Offtaker shall nevertheless continue to pay Power Producer for all electricity produced by the Plant on the Premises and delivered to the Point of Delivery.
- b) If an interconnection with the Local Electric Utility becomes deactivated for reasons that are not:
 - (i) a Force Majeure Event or



- (ii) caused by or related to any unexcused action or inaction of Power Producer such that the Plant is no longer able to produce electricity or transfer electricity to its respective Premises or to the Local Electric Utility, Offtaker will pay Power Producer an amount equal to the sum of payments that Offtaker would have made to Power Producer hereunder for electric energy that would have been produced by the Plant following such clause as per Deemed Generation (Schedule F)
- c) Determination of the amount of energy that would have been produced following such closure shall be based, during the first Operations Year, on the estimated levels of production and, after the first Operations Year, based on actual operation of the Plant in the same period in the previous Operations Year, unless Power Producer and Offtaker mutually agree to an alternative methodology.
- d) If a shutdown pursuant to this Clause 11.3.3 continues for 365 days or longer, Power Producer will be entitled to ask for extension of BG for another year or Offtake has to pay the BuyoutPrice of the plant as specified in Schedule B of this agreement.

11.4. Sale of Site

- 11.4.1. The Parties hereby confirm that they are entering into the Agreement in good faith and have no current plans or discussion of plans of ceasing business operations.
- 11.4.2. In the event Offtaker transfers (by sale, lease, or otherwise) all or a portion of its interest in the Site, Offtaker shall remain primarily liable to Power Producer for the performance of the obligations of Offtaker hereunder notwithstanding such transfer.
- 11.4.3. However, if no Offtaker Event of Default has occurred and is continuing and the transferee is acceptable to Power Producer in their sole discretion and executes agreements assuming this Agreement in form and substance satisfactory to Power Producer in their sole discretion, Offtaker may be released from further obligations under this Agreement.
- 11.4.4. In the event that the Offtaker or the transferee wishes to terminate the Agreement, then they shall pay to the Power Producer applicable Buy Out value.

12. TAXES

12.1. Property Taxes

Offtaker shall be responsible for all ad valorem personal property or real property taxes levied against the Site, improvements thereto and personal property located thereon, except that Power Producer shall be responsible for ad valorem personal property or real property taxes levied against the Plant. If Offtaker is assessed any taxes related to the existence of the Plant on the Premises, Offtaker shall immediately notify Power Producer. Offtaker and Power Producer shall cooperate in contesting any such assessment; provided, however, that Offtaker shall pay such taxes to avoid any penalties or interest on such Taxes, subject to reimbursement by Power Producer. If after resolution of the matter, such tax is imposed upon Offtaker related to the improvement of real property by the existence of the Plant on the Site, Power Producer shall reimburse Offtaker for such tax.

12.2. Tax Contests



Each Party has the right to contest taxes in accordance with Applicable Law and the terms of encumbrances against the Site. Each Party shall use all reasonable efforts to cooperate with the other in any such contests of tax assessments or payments. In no event shall either Party postpone during the pendency of an appeal of a tax assessment the payment of taxes otherwise due except to the extent such postponement in payment has been bonded or otherwise secured in accordance with Applicable Law.

12.3. Payment of Delinquent Taxes

In the event either Party fails to pay any taxes that may become a lien upon the other Party's property, such Party may pay such amounts and in such event shall be entitled to recover such paid amount from the other Party, together with interest thereon at the rate of one percent (1%) per month, compounded monthly.

12.4. Reimbursement Deadline

Any reimbursement of taxes owing pursuant to this Section 12 shall be paid within twenty (20) Business Days of receiving an invoice therefor from the Party who paid the taxes.

13. INSURANCE

13.1. Coverage

Power Producer will maintain the insurance coverage in full force related to the Safety and operational hazards of Solar Power plant (Man, Machine, Milieu) and effect throughout the Term.

14. COOPERATION; SOLAR ACCESS; FUTURE IMPROVEMENTS

14.1. Cooperation

The Parties acknowledge that the performance of each Party's obligations under this Agreement will frequently require the assistance and cooperation of the other Party. Each Party therefore agrees, in addition to those provisions in this Agreement specifically providing for assistance from one Party to the other, that it will at all times during the Term cooperate with the other Party and provide all reasonable assistance to the other Party to help the other Party perform its obligations hereunder.

14.2. Unrestricted Solar Access

Offtaker, or any lessee, grantee or licensee of Offtaker, shall not erect any structures on, or make other modifications to, or plantings on, the Site which will interfere with the construction, operation or maintenance of, or solar access of, the Plant.

15. CONFIDENTIALITY

15.1. Limits on Disclosure of Confidential Information

Subject to the exceptions set forth below in Clause 15.2 each Party agrees that:

- 15.1.1. Without the consent of the other Party, it shall not disclose any Confidential Information received from the other Party to any other person and
- 15.1.2. It shall use any Confidential Information received from the other Party only for the purpose of fulfilling its obligations under this Agreement.
- 15.1.3. The terms of this Agreement also shall be confidential and shall not be disclosed to any third party without prior written approval of the other Party. However the restriction of such disclosure shall not be applicable if the disclosure is made to (i) the professional advisors, agents, employees, financing parties/lenders or to any of its group companies of such Party, which shall be disclosed on need to know basis; (ii) to any government or other similar body or authority; and (iii) pursuant to Applicable Laws.



15.2. Permissible Disclosures

- 15.2.1. Notwithstanding the foregoing, the Parties may, and shall, disclose any information required to be disclosed under rules, regulations required to be disclosed by any Governmental Authority under Applicable Law or pursuant to a validly issued summonses or required filing.
- 15.2.2. Power Producer may provide this Agreement and any correspondence, notices and other information related to this Agreement to any person who has provided or who is interested in providing construction or permanent financing, or any refinancing thereof, to Power Producer in connection with the Plant. In addition, if a receiving Party is required by Applicable Law to disclose any Confidential Information provided by the disclosing Party, the receiving Party may make disclosure as required by law, but the receiving Party shall prior to making any disclosure notify the disclosing Party of the requested disclosure and shall use its reasonable efforts to cooperate with the disclosing Party, but at the expense of the disclosing Party, in any efforts by the disclosing Party to minimize the extent of the Confidential Information disclosed and the persons to whom disclosed.

15.3. Enforcement of Confidentiality Provisions

Each Party acknowledges that it may be impossible to measure the damages which may result from a breach of this Clause 15 and agrees that the provisions of this Clause 15 may be required to be specifically performed and each Party shall have the right to obtain preliminary and permanent injunctive relief to secure specific performance of the terms of this Clause 15. The provisions of this Clause 15 shall survive until one year after the Effective date of any termination of this Agreement.

16. INDEMNIFICATION

16.1. Power Producer Indemnification

- 16.1.1. Power Producer shall indemnify, defend and hold Offtaker and its directors, officers, employees, agents, volunteers, and invitees ("**Offtaker's Indemnified Parties**"), harmless from and against all Losses incurred by the Offtaker Indemnified Parties to the extent arising from or out of the following:
- a) any claim for or arising out of any injury to or death of any Person or loss or damage to property to the extent arising out of Power Producer's (or its contractor's) negligence or willful misconduct;
 - b) Power Producer's violation of Applicable Law;
 - c) any failure to properly interconnect or comply with the procedures of the Local Electric Utility; or
 - d) any failure to properly handle or dispose of any Hazardous Materials brought onto the Site by Power Producer or by any of Power Producer's employees, agents, volunteers, and invitees.
- 16.1.2. Such duty to indemnify with respect to any injuries to persons or damage to property arising from the generation of electricity from the Plant shall not extend to incidents occurring on Offtaker's side of the Point of Delivery except to the extent caused by incidents on Power Producer's side of the Point of Delivery.
- 16.1.3. Such duty to indemnify shall not apply to any action or claim, whether in tort (including negligence and strict liability), contract or otherwise for any loss, injury, or costs resulting from interruptions in service. Power Producer shall not be obligated to indemnify Offtaker or any Offtaker Indemnified Party for any Loss to the extent such Loss is due to the negligence or willful misconduct of Offtaker or any Offtaker Indemnified Party.



16.2 Offtaker Indemnification

16.2.1 Offtaker shall indemnify, defend and hold Power Producer, its contractors, subcontractors, shareholders, directors, officers, employees, agents, and invitees, ("**Power Producer's Indemnified Parties**"), harmless from and against all Losses, damages, cost incurred by the Power Producer's Indemnified Parties to the extent arising from or out of any of the following:

- a) any claim for or injury to or death of any Person or loss or damage to property to the extent arising out of the negligence or willful misconduct of any of Offtaker's Indemnified Parties;
- b) Offtaker's violation of Applicable Law; or
- c) the presence, removal or remediation of any Hazardous Materials on the Site (other than any Hazardous Materials brought on to the Site by Power Producer's Indemnified Parties).

16.2.2 Offtaker shall not be obligated to indemnify Power Producer or any Power Producer Indemnified Parties for any Loss to the extent such Loss is due to the gross negligence or willful misconduct of Power Producer or any Power Producer Indemnified Party.

16.3. Survival of Indemnification

The obligations of indemnification as specified above shall survive termination of this Agreement.

17. REPRESENTATIONS AND WARRANTIES

17.1. Mutual Representations

17.1.1. Each Party hereby represents and warrants to the other, as of date hereof, that:

- a) **Organization.** It is duly organized, incorporated, and in good standing with limited liability and validly existing under the laws of India, of its state of incorporation and of the state in which the Premises are located, respectively, and has the power and authority to enter into, execute and deliver this Agreement and to perform its obligations hereunder.
- b) **No Conflict.** The execution and delivery of this Agreement and the performance of and compliance with the provisions of this Agreement will not conflict with or constitute a breach of or a default under
 - (i) its organizational documents;
 - (ii) any agreement or other obligation by which it is bound;
 - (iii) any law or regulation.
- c) **Enforceability.**
 - (i) all actions required to be taken by or on the part of such Party necessary to make this Agreement effective have been duly and validly taken;
 - (ii) this Agreement has been duly and validly authorized, executed and delivered on behalf of such Party; and
 - (iii) this Agreement constitutes a legal, valid and binding obligation of such Party, enforceable in accordance with its terms, subject to laws of bankruptcy, insolvency, reorganization, moratorium or other similar laws.
- d) **No Material Litigation.** There are no court orders, actions, suits or proceedings at law or in equity by or before any governmental authority, arbitral tribunal or other body, or threatened against or affecting it or brought or asserted by it in any court or before any arbitrator of any kind or before or by any governmental authority that could reasonably be expected to have a material adverse effect on it or its ability to perform its obligations under this Agreement, or the validity or enforceability of this Agreement.
- e) That they perform their obligations hereunder in accordance with all applicable anti-corruption laws and regulations.



17.2. Offtaker Representations

In addition to the representations and warranties in Clause 17.1 above, Offtaker hereby represents and warrants to Power Producer, as of date hereof, that:

- 17.2.1. Electric Usage. Offtaker has provided to Power Producer complete and correct records of its electric usage at the Site for the preceding two years.
- 17.2.2. Condition of Premises. Offtaker has provided to Power Producer Offtaker's complete and correct records of the physical condition of the Premises and the Power Producer has conducted a site visit. If it is discovered that the actual site conditions on part of, or on the entire Premises upon which all or part of the Plant is to be installed, are materially different from the information presented by Offtaker, then if practicable the rates payable by Offtaker hereunder shall be adjusted to compensate Power Producer for the cost of design and construction changes and delays incurred to adapt the Plant to the unknown conditions. If such adjustment is not practicable, Power Producer shall have other rights under this Agreement. Offtaker further agrees not to undertake any sort construction activity which will create shadow, effect performance of the system, restrict personnel to access the plant on the Premises during the subsistence of this Agreement. Any such construction activity on the part of the Offtaker, would require a prior written approval from the Power Producer. The Power Producer shall have a right to terminate this Agreement in case of any construction activity undertaken by the Offtaker on the Premises prior to seeking a written approval and shall be liable to pay the Buy Out as per the terms of this Agreement.
- 17.2.3. Financial Information. The financial statements Offtaker has provided to Power Producer present fairly in all material respects the financial condition and results of operations of Offtaker.

18. FORCE MAJEURE

18.1. Excuse of Force Majeure Event

Except as provided in Clause 18.2 or otherwise specifically provided in this Agreement, neither Party shall be considered in breach of this Agreement or liable for any delay or failure to comply with this Agreement, if and to the extent that such delay or failure is attributable to the occurrence of a Force Majeure Event; provided that the Party claiming relief as a result of the Force Majeure Event shall promptly

- 18.1.1. notify the other Party in writing of the existence and details of the Force Majeure Event, within thirty (30) days of its knowledge of commencement of such event. In case of total disruption of communication, the same must be communicated as soon as practicable after the occurrence of Force Majeure;
- 18.1.2. exercise all reasonable efforts to minimize delay caused by such Force Majeure Event and mitigate the effect of such event as soon as possible;
- 18.1.3. notify the other Party in writing of the cessation of such Force Majeure Event; and
- 18.1.4. resume performance of its obligations hereunder as soon as practicable from the date of cessation of the Force Majeure event or its consequences.
- 18.1.5. Parties shall agree to extend the PPA tenure with a mutually agreed extended period to overcome the loss of revenue to the Power Producer due to such Force Majeure Event.

18.2. No Excuse for Payment for Prior Services

Obligations to make payments for services already provided shall not be excused by a Force Majeure Event.

18.3. Termination for Force Majeure Event

- 18.3.1. Notwithstanding anything to the contrary in this Clause 18, if nonperformance on account of a Force Majeure Event continues beyond a continuous period of three hundred and sixty-five (365)



days, then the Party not claiming Force Majeure shall have the right to terminate this Agreement upon thirty (30) days' notice to the other.

- 18.3.2. In the event of such a termination of this Agreement with respect to the Plant, the Parties shall not be released from any payment or other obligation arising under this Agreement which accrued prior to the shutdown of the Plant or the Premises, and the Indemnity, Confidentiality and Dispute Resolution provisions of this Agreement shall survive the termination of this Agreement.

19. POWER PRODUCER DEFAULT AND OFFTAKER REMEDIES

19.1. Power Producer Default and Offtaker Remedies

Power Producer shall be in default of this Agreement, except for the reasons not attributable to the Power Producer, if any of the following ("Power Producer Events of Default") shall occur:

- 19.1.1. Misrepresentation: Any representation or warranty by Power Producer under Section 16 hereof, is incorrect or incomplete in any material way, or omits to include any information necessary to make such representation or warranty not materially misleading, and such defect is not cured within fifteen (15) days after receipt of notice from Offtaker identifying the defect.
- 19.1.2. Abandonment during Construction and Installation: After commencement of construction of the Plant, Power Producer abandons construction or installation of the Plant for thirty (30) days and fails to resume construction or installation within thirty (30) days after receipt of notice from Offtaker stating that, in Offtaker's reasonable determination, Power Producer has abandoned construction and installation of the Plant;
- 19.1.3. Failure to Operate: After the Commercial Operation Date, Power Producer fails to operate the Plant for a period of ninety (90) days which failure is not due to equipment failure, or damage to the Plant, act of governmental authority, or exercise of Power Producer's rights under this Agreement, or otherwise excused by the provisions of Clause 18.1 (relating to Force Majeure Events); and Power Producer fails to resume operation within thirty(30) days after receipt of notice from Offtaker stating that, in Offtaker's reasonable determination, Power Producer has ceased operation of the Plant, provided, however, that the cure period shall be extended by the number of calendar days during which Power Producer is prevented from taking curative action if Power Producer had begun curative action and was proceeding diligently, using commercially reasonable efforts, to complete such curative action.
- 19.1.4. Obligation Failure: Power Producer fails to perform any obligation hereunder, such failure is material, such failure is not excused by the provisions of Clause 18.1 (relating to Force Majeure Events), and such failure is not cured within: (A) ten (10) days if the failure involves a failure to make payment when due or maintain required insurance; or (B) sixty (60) days if the failure involves an obligation other than payment or the maintenance of insurance, after receipt of notice from Offtaker identifying the failure.
- 19.1.5. Insolvency: Power Producer (A) applies for or consents to the appointment, or the taking of possession by, a receiver, custodian, trustee or liquidator of itself or a substantial portion of its property; (B) admits in writing its inability, or is generally unable, to pay its debts as such debts become due; (C) makes a general assignment for the benefit of its creditors; (D) commences a voluntary case under any bankruptcy law; (E) files a petition seeking to take advantage of any other law relating to bankruptcy, insolvency, reorganization, winding up, or composition or readjustment of debts; (F) acquiesces in, or fails to contest in a timely manner, any petition filed against Power Producer in an involuntary case under bankruptcy law or seeking to dissolve Power Producer under other Applicable Law; or (G) takes any action authorizing its dissolution.

19.2. Oftaker Remedies



Upon an Event of Default by Power Producer, provided that Offtaker complies with its obligations under Clause 21 and Power Producer or its Assignee (Financing Party) does not cure such Event of Default by Power Producer, Offtaker may terminate this Agreement and may ask Power Producer to remove the Plant from its Premises and Power producer shall vacate and leave the site to the original state as it was been handed over at the time of installation of solar power plant subject to normal wear and tear.

20. OFFTAKER DEFAULT AND POWER PRODUCER REMEDIES

20.1. The occurrence and continuation of any of the following events, unless any such event occurs as a result of a Force Majeure event, shall constitute an Offtaker's Event of Default ("Offtaker Event of Default")

- 20.1.1. Bankruptcy, liquidation or dissolution of the Offtaker pursuant to Applicable Law, except for the purpose of a merger, consolidation or re-organization that does not affect the ability of the resulting entity to perform all its obligations under this Agreement and provided that such resulting entity expressly assumes all such obligations.
- 20.1.2. Default in payment of undisputed invoices for a continuous period of six (6) months within a period of twelve (12) months.
- 20.1.3. Failure to perform its obligations under this Agreement.
- 20.1.4. Abandonment of this Agreement by way of failure to pay under the terms of this Agreement: In case the Offtaker fails to make payments under this Agreement for a continuous period of twelve (12) months, then the Power Producer shall be at liberty to consider this Agreement as having been terminated on account of Offtaker's Event of Default. In the event of termination on account of non-payment by the Offtaker as aforesaid, the Offtaker shall be liable to pay, immediately and without demur, the Buy Out value as stated in Schedule B to the Power Producer. The payment of Buy Out value due shall be without prejudice to the rights of the Power Producer to encash the Bank Guarantee (refer clause 7.4) towards outstanding dues and payments towards the dues under this Agreement.

20.2. Default Damages

Upon an Event of Default by Offtaker, it shall pay to Power Producer the amount equivalent to the sum of Buy Out value as specified in Schedule B of this agreement. Upon termination, the Offtaker shall pay the Buy Out price for the relevant year to the Power Producer, no later than seven (7) days from the date of termination.

21. TERMINATION

21.1 Termination for Offtaker's Event of Default

The Power Producer shall have the right to terminate this Agreement if any of the following events ("Offtaker Default") occurs:

- a. Upon occurrence of an Insolvency Event in relation to the Offtaker;
- b. Unless otherwise agreed by the Parties failure of the Offtaker to meet payment obligations as set forth in this Agreement after the Due Date and the same subsists for a period of more than 6 months;
- c. Failure of the Offtaker to maintain the Security Deposit in accordance with this Agreement;
- d. Breach by the Offtaker of any of the representations and/ or warranties set forth in this Agreement;



- e. Power Producer ceasing to have access to the Premises as per the terms of this Agreement;
- f. Commencement of enforcement, attachment or similar proceedings by any mortgagee in respect of the Premises ;or

21.2 Termination for the Power Producer Even to Default

Unless otherwise agreed by the Parties, the Offtaker shall have the right to terminate this Agreement if any of the following events ("**Power Producer Default**") occurs:

- a. Upon occurrence of an Insolvency Event in relation to the Power Producer;
- b. Material breach by the Power Producer of any of the representations and/or warranties set forth in this Agreement;
- c. Failure by the Power Producer to achieve the Commercial Operation Date not later than Sixty (60) days after the Scheduled Commercial Operation Date. It is understood and agreed by the Parties that the Purchaser cannot terminate the Agreement if such delay in Commercial Operation Date is as a result of delay in receiving any government approval.
- d. failure by the Power Producer to pay the loan amount taken from any lender against pledge of the Project equipment's, due to which the Power Producer is unable to provide Solar Power for a continuous period of 6 (six) months.

21.3 If a Power Producer Default or a Offtaker Default has occurred ("**Defaulting Party**" as applicable), the Offtaker or the Power Producer (as the case may be) shall allow the Defaulting Party to cure the default for a period of thirty(30)days ("**Cure Period**").For the avoidance of doubt, it is clarified that such Cure Period shall be applicable in relation to those defaults only which can be cured.In the event the Defaulting Party is unable to cure the default within the Cure Period, then the other Party may terminate the Agreement by giving a notice of not less than sixty(60) days to the Defaulting Party ("**Termination Notice**"). Upon delivery of the Termination Notice by the other Party, this Agreement shall automatically terminate.

21.4 The right of either Party to terminate this Agreement is in addition to the remedies expressly provided herein and the terminating Party may exercise any other remedy it may have at law or equity or under the Agreement.

21.5 With out prejudice to Section 10.5, upon termination, each Party shall pay to the other Party, the amounts that have accrued prior to termination in accordance with the terms of this Agreement.

22. COLLATERAL ASSIGNMENT, FINANCING PROVISIONS

22.1. Financing Arrangements

Power Producer may mortgage, pledge, grant security interests, assign, or otherwise encumber its interests in this Agreement to any persons providing financing for the Plant. Offtaker acknowledges that Power Producer will obtain construction financing for the Plant from third party and that Power Producer may either obtain term financing secured by the Plant or sell or assign the Plant to a Financing Party or may arrange other financing accommodations from one or more financial institutions and may from time to time refinance, or exercise purchase options under such transactions. Offtaker acknowledges that in connection with such transactions Power Producer may secure Power Producer's obligations by, among other collateral, an assignment of this Agreement and a first security interest in the Plant as well as the right to supply solar power to the Offtaker under the terms of an agreement containing provisions similar to this Agreement in relation to "RATES, BILLING AND PAYMENT SCHEDULE". Power Producer agrees to serve prior



notice to Offtaker before any material change in financing arrangements and such changes will not bring any financial obligations to the Offtaker.

In order to facilitate such necessary sale, conveyance, or financing, assignment with respect to any Financing Party, as applicable, Offtaker agrees as follows:

22.1.1. Consent to Assignment

Offtaker hereby consents to both of the sale of the Plant to a Financing Party and the collateral assignment to the Financing Party of the Power Producer's right, title and interest in and to this Agreement either in full or in part.

Format for Consent of Assignment is attached as Schedule -G to this agreement.

22.1.2. Rights of Financing Party

Notwithstanding any contrary term of this Agreement, the Financing Party shall have following rights during the term of this Agreement:

(a) Step-In Rights

The Financing Party, as owner of the Plant, or as collateral assignee of this Agreement, shall be entitled to exercise, in the place and stead of Power Producer, any and all rights and remedies along with liabilities and obligation of Power Producer under this Agreement in accordance with the terms of this Agreement. The Financing Party shall also be entitled to exercise all rights and remedies of owners or secured parties, respectively, generally with respect to this Agreement and the Plant; For the avoidance of doubt, it is agreed that the Power Producer and the Financing Party shall endeavor to appoint a new operation and maintenance agent with proven credentials. If such agent is identified, the Offtaker shall not unreasonably withhold such approval.

(b) Opportunity to Cure Default

The Financing Party shall have the right, to pay all sums due under this Agreement and to perform any other act, duty or obligation required of Power Producer thereunder or cause to be cured any default of Power Producer thereunder in the time and manner provided by the terms of this Agreement. Nothing herein requires the Financing Party to cure any default of Power Producer under this Agreement or (unless the Financing Party has succeeded to Power Producer's interests under this Agreement) to perform any act, duty or obligation of Power Producer under this Agreement, but Offtaker hereby gives it the option to do so;

(c) Exercise of Remedies

Upon the exercise of remedies, including any sale of the Plant by the Financing Party, whether by judicial proceeding or under any power of sale contained herein, or any conveyance from Power Producer to the Financing Party (or any assignee of the Financing Party as defined below) in lieu thereof, the Financing Party shall give notice to Offtaker of the transferee or assignee of this Agreement. Any such exercise of remedies shall not constitute a default under this Agreement;

(d) Cure of Bankruptcy Rejection

Upon any rejection or other termination of this Agreement pursuant to any process undertaken with respect to Power Producer under the Bankruptcy laws of India including the Securitization and Reconstruction of Financial Assets and Enforcement of Security Interest Act, 2002 at the request of Financing Party made within ninety (90) days of such termination or rejection, Offtaker shall enter into a new agreement with Financing Party or its assignee having substantially the same terms and conditions as this Agreement.

i) Right to Cure



A. Cure Period

Offtaker will not exercise any right to terminate or suspend this Agreement unless it shall have given the Financing Party prior written notice of its intent to terminate or suspend this Agreement, as required by this Agreement, specifying the condition giving rise to such right, and the Financing Party shall not have caused to be cured the condition giving rise to the right of termination or suspension within thirty (30) days after such notice or (if longer) the periods provided for in this Agreement; provided that if such Power Producer default reasonably cannot be cured by the Financing Party within such period and the Financing Party commences and continuously pursues cure of such default within such period, such period for cure will be extended for a reasonable period of time under the circumstances, such period not to exceed additional ninety (90) days. The Parties' respective obligations will otherwise remain in effect during any cure period.

B. Continuation of Agreement

If the Financing Party or its assignee (including any purchaser or transferee), pursuant to an exercise of remedies by the Financing Party, shall acquire title to or control of Power Producer's assets and shall, within the time periods described in Clause 22.1.2(d)(i) above, cure all defaults under this Agreement existing as of the date of such change in title or control in the manner required by this Agreement and which are capable of cure by a third person or entity, then such Person shall no longer be in default under this Agreement, and this Agreement shall continue in full force and effect.

23. LIMITATIONS OF DAMAGES

Except as explicitly provided in this Agreement, neither Party nor any of its indemnified persons shall be liable to the other party or its indemnified persons for any special, punitive, exemplary, indirect, or consequential damages, arising out of or in connection with this Agreement.

24. OVER RIDING CLAUSE

It is hereby understood that at any point of time Obligation and Liabilities of this Agreement shall be complied by the Solar Power Developer or its assignee/ transferee or any other party which has become the Solar Power Developer thereof due to the transfer of ownership.

25. DISPUTE RESOLUTION**25.1. Resolution through mutual discussions**

If any dispute or difference of any kind whatsoever shall arise between the Parties in connection with or arising out of this Agreement or out of the breach, termination or invalidity of the Agreement hereof, the Parties shall attempt to resolve through mutual discussions within fifteen (15) days.

25.2. Continuance of Performance



Notwithstanding the existence of any Dispute except for non-payment without justification, the Parties hereto shall continue to perform their respective obligations under this Agreement throughout the Term of this Agreement.

25.3. Negotiation Period

The Parties shall negotiate in good faith and attempt to resolve any dispute, controversy or claim arising out of or relating to this Agreement ("Dispute") within 30 days after the date that a Party gives written notice of such Dispute to the other Party.

25.4. Mediation

If, after such negotiation in accordance with Clause 25.3, the Dispute remains unresolved, either Party may require that a non-binding mediation take place. In such mediation, representatives of the Parties with authority to resolve the dispute shall meet for at least three hours with a mediator whom they choose together. If the Parties are unable to agree on a mediator, then either Party is hereby empowered to request the appropriate Courts at New Delhi to appoint a mediator. The mediator's fee or expenses shall be paid one-half by each Party.

25.5. Arbitration of Disputes

25.5.1. Disputes that remain unresolved after mediation will be resolved through binding arbitration. All such disputes that have not been satisfactorily resolved under Clause 25.4 above shall be referred to arbitration in accordance with the provisions of the Arbitration and Conciliation Act, 1996. Irrespective of the Arbitration/dispute resolution proceedings, the Parties shall continue to perform their respective obligations under this Agreement, during the Term of the Agreement, except for non-payment without justification and / or unless the nature of the dispute is such that a Party is unable to perform its obligations without the resolution of the Dispute under the Arbitration/other proceedings.

25.5.2. The arbitral tribunal shall consist of a Sole Arbitrator to be appointed upon mutual consent of the Parties. If no agreement could be reached on the appointment of the Sole Arbitrator within a reasonable period (say one month of submitting the proposal), then the Parties shall resort to the remedy provided for in the Arbitration & Conciliation Act, 1996.

25.5.3. The place of the arbitration shall be Delhi and the language of the arbitration shall be English. Each Party shall bear its respective legal and arbitration costs.

25.5.4. The award of the arbitral tribunal shall be final and binding on the Parties and shall be enforceable in accordance with its terms. The arbitral tribunal shall state reasons for its findings and the award shall be substantiated in writing. The Parties agree to be bound by the decision thereby and to act accordingly.

25.5.5. The Parties agree that either Party may seek interim measures including injunctive relief in relation to the provisions of this Agreement or the Parties' performance of it from any court of competent jurisdiction.

25.5.6. The Parties expressly waive and forego any right to punitive, exemplary, or similar damages in connection with any Dispute and no such damages shall be awarded or provided for in any Dispute resolution proceeding under or in aid of this Article.

25.6. Survival of Arbitration Provisions

The provisions of this Clause 24 shall survive any termination of this Agreement for any reason whatsoever and shall apply (except as provided herein) to any disputes arising out of this Agreement.

26. NOTICES



26.1. Delivery of Notices

All notices or other communications which may be or are required to be given by any party to any other party pursuant to this Agreement shall be in writing and shall be either:

- 26.1.1. delivered by hand;
- 26.1.2. mailed by registered post, speed post, return receipt requested, postage prepaid;
- 26.1.3. delivered by a recognized overnight or personal delivery service;
- 26.1.4. transmitted by facsimile (such transmission to be effective on the day of receipt if received prior to 5:00 pm local time on a business day or in any other case as of the next business day following the day of transmittal); or
- 26.1.5. transmitted by email if receipt of such transmission by email is specifically acknowledged by the recipient (automatic responses not being sufficient for acknowledgement), addressed as follows:

If to Power Producer:

Company Name: Enerture Solar One Pvt Ltd

Address: ABL workspaces, Celebration Gardens, NH-8, Delhi-37

Attention: Bhairaw Kumar Mandal/PS Naura

Email: -bhairaw@enerture.co.in/psnaura@enerture.co.in

If to Offtaker :

Company Name: Victora Auto Ltd

Address: Plot no 42, Sector 20A, near ICAI bhawan, Faridabad, 121001

Attention: Mr. Harbir Singh Banga

Email: harbirbanga@victora.co.in

26.2. Effectiveness of notices

- 26.2.1. Notices shall be effective when delivered (or in the case of email, when acknowledged by the recipient) in accordance with the foregoing provisions, whether or not (except in the case of email transmission) accepted by, or on behalf of, the Party to whom the notice is sent.
- 26.2.2. Each Party may designate by Notice in accordance with this section to the other Party a new address to which any notice may thereafter be given.

26.3. Change in address:

Any Party may by notice of at least fifteen (15) days to the other Party change the address and/or addresses to which such notices and communication to it are to be delivered or mailed.

27. CHANGE IN LAW

- 27.1 "Change in Law" means the occurrence of any of the following events after the Effective Date resulting into any additional recurring/non- recurring expenditure by the Power Producer or any income to the Power Producer:

- 27.1.1. the change in the taxation or solar incentives regime applicable to the Project as on the Effective Date due to which the Power Producer is entitled to a corresponding increase in Tariff or a suitable reimbursement to compensate the Power Producer for the increased cost or loss of revenue / profit.
- 27.1.2. the enactment, coming into effect, adoption, promulgation, amendment, modification or repeal (without re-enactment or consolidation) in India, of any Applicable Law, including rules and



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regulations framed pursuant to such Applicable Law whereby the change in duties and levies payable changes including but not limited to any duties payable subsequent to signing of this agreement viz. anti-dumping duties, safeguard duties, and any other duties which are made applicable.

- 27.1.3. a change in the interpretation or application of any Applicable Law by any Government Authority having the legal power to interpret or apply such Applicable Law, or any Competent Court of Law.
 - 27.1.4. the imposition of a requirement for obtaining any Consents, Clearances and Permits from any Government authority which h was not required earlier;
 - 27.1.5. a change in the terms and conditions prescribed for obtaining any Consents, Clearances and Permits or the inclusion of any new terms or conditions for obtaining such Consents, Clearances and Permits; except due to any default of the Power Producer;
 - 27.1.6. but shall not include (i) any change in any withholding tax on income or dividends distributed to the shareholders of the Company, or (ii) any change on account of regulatory measures.
- 25.2 If there is any Change in Law affecting the Project, the Power Producer shall notify the Offtaker in writing, describing in reasonable detail the events constituting a Change in Law and the impact it has or would have on the Power Producer's revenues or profits from the Project.
- 25.3 Following such notification, the Tariff shall stand increased by an amount and for such period as would sufficiently compensate the Power Producer for the adverse effects on revenue or profits caused by the Change in Law. All additional cost on such duties and levies made applicable after the date of Signing of this Agreement shall be borne by the Offtaker.
- 25.4 The Offtaker may request the Power Producer to provide such additional information or document as it deems necessary to verify the effect of Change in Law on the Project.

28. MISCELLANEOUS

28.1. Governing Law

This Agreement shall be governed by and construed in accordance with the laws of India, including principles of good faith and fair dealing that will apply to all dealings under this Agreement.

28.2. Jurisdiction

Subject to the provisions of Clause 25.5.3, the courts of Delhi shall have exclusive jurisdiction in relation to all matters arising out of this Agreement.

28.3. Severability

If any non-material part of this Agreement is held to be unenforceable, the rest of the Agreement will continue in effect. If a material provision is determined to be unenforceable and the Party which would have been benefited by the provision does not waive its unenforceability, then the Parties shall negotiate in good faith to amend the Agreement to restore to the Party that was the beneficiary of such unenforceable provision the benefits of such provision. If the Parties are unable to agree upon an amendment that restores the Party's benefits, the matter shall be resolved under Clause 25.5 in order to restore to the Party that was the beneficiary of the unenforceable provision the economic benefits of such provision.

28.4. Amendment and Waiver

28.4.1. This Agreement may only be amended by a writing signed and duly executed by an authorized representative of both Parties. Any waiver of any of the terms hereof shall be enforceable only to



the extent it is waived in a writing signed by the Party against whom the waiver is sought to be enforced.

28.4.2. Any waiver shall be effective only for the particular event for which it is issued and shall not constitute a waiver of a subsequent occurrence of the waived event nor constitute a waiver of any other provision hereof, at the same time or subsequently.

28.5. Assignment

Neither Party may assign, sell, transfer or in any other way convey its rights, duties or obligations under this Agreement, either in whole or in part, without the prior written consent of the other Party unless it is permitted as per the provisions of this Agreement. Consent shall not be unreasonably withheld or delayed. The approval of Offtaker is not required in case the rights and/or obligations of the Power Producer are assigned, transferred or novated to any of its financing parties/lender or to its affiliates.

28.6. Agency

Unless specifically prohibited, the Parties shall be free to employ agents to perform their obligations under this Agreement, so long as the Parties remain primarily liable for the due performance of this Agreement.

28.7. No Joint Venture

This Agreement is not intended, and shall not be construed, to create any association, joint venture, agency relationship or partnership between the Parties or to impose any such obligation or liability upon either Party. Neither Party shall have any right, power, or authority to enter into any agreement or undertaking for, or act as or be an agent or representative of, or otherwise bind, the other Party.

28.8. Entire Agreement

This Agreement, together with any documents referred to in it, supersedes any and all oral and written agreements, drafts, undertakings, representations, warranties and understandings heretofore made relating to the subject matter hereof and constitutes the entire agreement and understanding of the Parties relating to the subject matter hereof.

28.9. Cooperation:

The Parties acknowledge that they are entering into a long-term arrangement in which the cooperation of both of them will be required. If, during the Term hereof, changes in the operations, facilities or methods of either Party will materially benefit a Party without detriment to the other Party, the Parties commit to each other to make reasonable efforts to cooperate and assist each other in making such change.

28.10. Third Party Beneficiaries:

This Agreement is solely for the benefit of the Parties and their respective successors and permitted assigns and shall not be construed as creating any duty, standard of care or any liability to, any person not a party to this Agreement.

28.11. Language:

All agreements, correspondences and communication between the Parties relating to this Agreement and all other documentation to be prepared and supplied under the Agreement shall be written and in English, and the Agreement shall be construed and interpreted in accordance with English language.

26.10 Erection, Commissioning and Operation:




The Power Producer will bear all costs towards staying arrangement, conveyance or any other expenses of executive, consultant, labor or any other associates, vendors or sub-contractors of the Power Producers during the installation, commissioning and operation period.

26.11 Survival of Obligations:

Expiration or early termination of this Agreement shall not relieve the Parties of obligations that by their nature should survive such expiration or termination.

28.12 Counterparts:

This Agreement may be executed in two counterparts, each of which shall be deemed an original, but all of which together shall constitute one and the same instrument. Delivery of signature by fax, or scan delivered by email, receipt acknowledged, or electronic signature are effective to bind a Party hereto.

IN WITNESS WHEREOF, intending to be legally bound hereby, Power Producer and Offtaker have executed this Power Purchase Agreement as of the date first set forth above.

For and on behalf of the

Enerture Solar One Pvt Ltd

Authorized Signatory

Name: Mr PS Naura



For and on behalf of the

Victoria Auto Ltd

Authorized Signatory

Name: Mr Harbir Singh Banga



Exhibits

Exhibit I. Description of the Premises and Site

Premises Overview	
Hours of Operation	operating hours from 8am to 6pm
Security	24 Hrs available

S. No	Site Name	State	Site Address	Capacity (KWp)	Estimated Generation	Guaranteed Generation
1	PANSHIL Haryana	Haryana	PANSHIL ELECTRO PLOT NO 472-473 S.EC-8 IMT MANAGER	74.8	1534	1381
2	Bhunit Haryana	Haryana	BHUNIT ENGG DEVL PALWAL Haryana	252	1449	1304
3	Aliyan Haryana	Haryana	Aliyan Five Enterprises Devli Palwal - Haryana	219	1445	1304
4	IMT Faridabad	Haryana	Victoria Auto Pvt Ltd Plot No. 466 plot no 29 Sector 68, IMT Faridabad	413	1534	1381
5	NSEZ, Noida	UP	Noida Special Economy Zone, Block A, Phase-2, Greater Noida, Uttar Pradesh 201305	278	1486	1337
6	Victoria Auto - Sihi	Haryana	VICTORIA AUTO PVT LIMITED NH-2 5906	321	1507	1356
7	VNI, Haridwar	Uttarakhand	VICTORIA AUTOMOTIVE PVT LIMITED PLOT NO -4,16,17 SEC-1B RE SIDCUL HARIDWAR	274	1400	1260
8	VAPL-1 Haridwar	Uttarakhand	VICTORIA AUTO PVT LIMITED PLOT NO 30 SEC-II RE SIDCUL HARIDWAR	161	1345	1211
9	VAPL-2 Haridwar	Uttarakhand	VICTORIA AUTO PVT LIMITED PLOT NO-2 SEC-3 SIDCUL HARIDWAR	842	1296	1186
10	VAPL - Prithia	Haryana	VICTORIA AUTO PVT LIMITED - Prithia	385	1420	1278
Total Capacity (KWp)				3020		



Exhibit II. Definitions

- 1) "Access Rights" means the rights provided in this Agreement for Power Producer and its designees, including Installer, to enter upon and cross the Site to install, operate, maintain, repair and remove the Project, and to interconnect the Project with the Local Electric Utility and to provide water, electric and other services to the Project.
- 2) "Act" means the Electricity Act, 2003 and the rules and regulations made there under from time to time along with amendments thereto and replacements thereof and any other Applicable Law related to electricity.
- 3) "Affected Party" shall mean a Party whose performance has been affected by an event of Force Majeure.
- 4) "Affiliate" means, as to any Person, any other Person which, directly or indirectly, is in control of, is controlled by, or is under common control with, such Person. For purposes of this definition, "control" of a Person means the power, directly or indirectly, to direct or cause the direction of the management and policies of such Person whether by contract or otherwise.
- 5) "Agreement" means this Power Purchase Agreement, including all its recitals and Schedules attached hereto, as the same may be amended from time to time in accordance with the provisions hereof.
- 6) "Applicable Law" means any constitutional provision, law, statute, rule, regulation, ordinance, treaty, order, decree, judgment, decision, certificate, holding, injunction, registration, license, franchise, permit, authorization, or guideline issued by a Governmental Authority that is applicable to a Party to this Agreement or the transaction described herein. Applicable Law also includes an approval, consent or requirement of any Governmental Authority having jurisdiction over such Party or its property, enforceable at law or in equity. More specifically, it means all laws, brought into force and effect by the Government of India or the State Governments including Electricity Act, 2003, rules, regulations and notifications made there under, and judgments, decrees, injunctions, writs and orders of any court of record, applicable to this Agreement and the exercise, performance and discharge of the respective rights and obligations of the Parties, as may be in force and effect during the subsistence of this Agreement, as amended from time to time.
- 7) "Business Day" means a day other than Saturday, Sunday, or other day on which Scheduled Banks as defined under the Reserve Bank of India Act, 1934 are authorized or required by law to be closed.
- 8) "Buy Out Value" means the amount as specified in SCHEDULE B of this Agreement.
- 9) "Change in Law" means that after the date of this Agreement, an Applicable Law is amended, modified, nullified, suspended, repealed, found unconstitutional or unlawful, or changed or affected in any respect by any Applicable Law or by a judicial pronouncement or by subordinate legislations, or executive orders (including circulars and notifications) issued by jurisdictional authorities, which have an impact or implication upon the mutual or individual rights and obligations under and arising out of this Agreement.
- 10) "Commercial Operation Date/COD" means the date, which shall be specified by Power Producer to the Offtaker pursuant to completion of the Initial Period when the Plant is physically complete and is ready for operations.
- 11) "Confidential Information" means information of a confidential or proprietary nature, whether or not specifically marked as confidential. Such information shall include, but not be limited to, any documentation, records, listing, notes, data, computer disks, files or records, memoranda, designs, financial models, accounts, reference materials, trade-secrets, prices, strategic partners, marketing plans, strategic or other plans, financial analyses, customer names or lists, project opportunities and the like, provided however that Confidential Information does not include information which
 - (i) was in the possession of the receiving Party before receipt from the disclosing Party;
 - (ii) is or becomes publicly available other than as a result of unauthorized disclosure by the receiving Party;

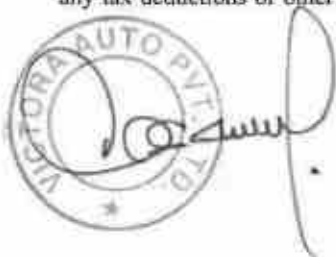


- (iii) is received by the receiving Party from a third party not known by the receiving Party with the exercise of reasonable diligence to be under an obligation of confidentiality respecting the information; or
 - (iv) is independently developed by the receiving Party without reference to information provided by the disclosing Party.
- 12) "Dispute" means a controversy or claim arising out of or relating to this Agreement.
 - 13) "Deemed Generation" As explained in SCHEDULE F
 - 14) "Buy Out" means an amount determined in accordance with SCHEDULE B.
 - 15) "Effective Date" means the later of the following dates: -
 - a. Signing date of the Agreement
 - b. Date on which the Offtaker provides in Original the Bank Guarantee in accordance with the Terms of this Agreement
 - c. Date on which the Parties agree on the sites suitable for putting up the Solar Power Plant and Clear Roof access is provided to the Power Producer.
 - 16) "Electric Service Power Producer" means any person, including the Local Electric Utility, authorized by the State of West Bengal to provide electric energy and related services to retail users of electricity in the area in which the Site is located.
 - 17) "Environmental Attributes" means, carbon trading credits, emissions reductions credits, emissions allowances, green tags, Green-e certifications, or other entitlements, certificates, products, or valuations attributed to the Project and its displacement of conventional energy generation, or any other entitlement pursuant to any central, state, or local program applicable to renewable energy sources, whether legislative or regulatory in origin, as amended from time to time, and excluding, for the avoidance of doubt, any Tax Incentives.
 - 18) "Financing Party" means an entity funding the project and is appointed by the Power Producer in its sole discretion to be the Project Owner in its stead, and the term Financing Party shall be construed in accordance with the context in and for the purpose for which it is so used.
 - 19) "Financing Agreement" shall mean any agreement/documents executed with the Financing Party.
 - 20) "Force Majeure Event" means any act or event that prevents the affected Party from performing its obligations in accordance with this Agreement, if such act or event is beyond the reasonable control, and not the result of the fault or negligence, of the affected Party and such Party had been unable to overcome such act or event with the exercise of due diligence (including the expenditure of reasonable sums). Subject to the foregoing, Force Majeure Event may include but are not limited to the following acts or events:
 - (i) natural phenomena, such as storms, hurricanes, floods, lightning and earthquakes.
 - (ii) explosions or fires arising from lightning or other causes unrelated to the acts or omissions of the Party seeking to be excused from performance.
 - (iii) acts of war or public disorders, civil disturbances, riots, insurrection, sabotage, epidemic, pandemic, terrorist acts, or rebellion; and
 - (iv) lockouts, strikes or labor disputes.

Force Majeure Events shall not include equipment failures or acts or omissions of agents, suppliers or subcontractors, except to the extent such acts or omissions arise from a Force Majeure Event. Changes in prices for electricity shall not constitute Force Majeure Events.
 - 21) "Governmental Authority" means any international, national, federal, provincial, state, municipal, county, regional or local government, administrative, judicial or regulatory entity operating under any Applicable Laws and includes any department, officers, commission, bureau, board, administrative agency or regulatory body of any government.
 - 22) "Hazardous Materials" means all hazardous or toxic substances, wastes or other pollutants, including petroleum, petroleum hydrocarbons or petroleum products, petroleum by-products, radioactive materials, asbestos or asbestos-containing materials, gasoline, diesel fuel, pesticides, radon, urea formaldehyde, lead or lead-containing materials, polychlorinated biphenyls; and any other chemicals, materials, substances or



- wastes in any amount or concentration which are now included in the definition of "hazardous substances," "hazardous materials," "hazardous wastes," "extremely hazardous wastes," "restricted hazardous wastes," "toxic substances," "toxic pollutants," "pollutants," "regulated substances," "solid wastes," or "contaminants" or words of similar import, under any Applicable Law.
- 23) "Indemnified Person" means the person who asserts a right to indemnification under Clause 16.
 - 24) "Indemnifying Party" means the Party who has the indemnification obligation under Clause 16 to the Indemnified Person.
 - 25) "Initial Period" has the meaning provided in Clause 3.2.
 - 26) "Landed Cost of Power" means sum of Energy Charges and Regulatory Charges in State of West Bengal and as specified in Electricity bill provided by State Discom.
 - 27) "Lender" means persons providing construction or permanent financing to Power Producer/Project Owner in connection with installation of the Plant.
 - 28) "Liens" has the meaning provided in Clause 9.2.
 - 29) "Local Electric Utility" means the local electric distribution owner and operator which under the laws of the State of West Bengal is responsible for providing electric distribution and interconnection services to Offtaker at Site.
 - 30) "Losses" means any and all losses, liabilities, claims, demands, suits, causes of action, judgments, awards, damages, cleanup and remedial obligations, interest, fines, fees, penalties, costs, and expenses (including all attorney's fees and other costs and expenses incurred in defending any such claims or matters or in asserting or enforcing any indemnity obligation).
 - 31) "Offtaker" means , and its successors and permitted assigns.
 - 32) "Operations Period" has the meaning provided in Clause 3.3.
 - 33) "Operations Year" means a twelve-month period beginning at 12:00 am on an anniversary of the Commercial Operations Date and ending at 11:59 pm on the day immediately preceding the next anniversary of the Commercial Operations Date, provided that the first Operations Year shall begin on the Commercial Operations Date.
 - 34) "Party" means either Offtaker or Power Producer, as the context shall indicate, and "Parties" means both Offtaker and Power Producer.
 - 35) "Point of Delivery" has the meaning where solar power interconnection has been made to existing electrical infrastructure of
 - 36) "Premises" means approximately 45000 square meter shadow free roof top with undulation of not more than 3 degrees, approximately shadow free roof and surrounding areas in the premises of Offtaker.
 - 37) "Plant" or "Project" or "Solar Plant" or "Solar Project" or "Solar Power Plant" or "Power Plant" means an integrated system for the generation of electricity from solar energy consisting of the photovoltaic panels and associated equipment to be installed on each of the Premises in accordance with this Agreement but does not include roof and its access rights.
 - 38) "Project Owner" means, if applicable, any Person to whom Power Producer transferred the ownership interest in the Project.
 - 39) "Power Producer" means Enerture Solar One Pvt Ltd and all successors and assigns.
 - 40) "Regulatory Charges" means Cross Subsidy, Electricity duty and any other charges as determined and demanded by "Local Electric Utility" or any other government Entity.
 - 41) "Relocation Event" means the relocation of the Project, starting at the shutdown of the Project pursuant to such relocation, and ending at the commercial operation of the Project when such relocated Project is reinstalled at a new location, as determined by the Power Producer in its reasonable discretion.
 - 42) "Scheduled Commercial Operation Date/ SCOD" means the expected date, when the Plant is expected to be commissioned and will be ready for operations.
 - 43) "Site" means the real property described under Exhibit I.
 - 44) "Tax Incentives" means the investment tax credits (including any grants or payments in lieu thereof) and any tax deductions or other benefits under the Income Tax Act, 1961, or applicable central, state, or local



law available as a result of the ownership and operation of the Project or the output generated by the Project (including, without limitation, tax credits, any grants or payments in lieu thereof and accelerated and/or bonus depreciation for the time being in force.)

- 45) "Term" shall have the meaning provided in Clause 3 hereof.
- 46) Transfer/Completion Date shall mean either the date on which the termination is effected as per Clause 10.1 or if the above is not applicable the expiry of the Term of this Agreement
- 47) "Energy Charges" means the sum of energy charges applicable, from time to time to users falling within the category applicable for HT consumers under Local Utility and revised time to time.



Exhibit III Bank Guarantee Format**WHEREAS:**

- (A) **Enerture Solar One Pvt Ltd** having its office at _____ (hereinafter referred to as "Power Producer"), have entered into a Power Purchase Agreement dated [to be inserted] (the "PPA") with _____ **Ltd.**, a company/educational institute/ hospital/commercial tower/ _____ - incorporated under the _____ having its registered office _____ and District _____ Rural _____ (hereinafter referred to as "Offtaker")
- (B) The PPA requires the Offtaker to furnish a Performance Guarantee to the Owner in a sum of [Rs. _____ cr. (Rupees _____ ONLY)] (the "Guarantee Amount") as security for due and faithful performance of its obligations, under and in accordance with the Purchase Order.
- (C) We, _____ through our Branch at _____ (the "Bank") have agreed to furnish this Bank Guarantee by way of Performance Security.

NOW, THEREFORE, the Bank hereby, unconditionally and irrevocably, guarantees and affirms as follows:

1. The Bank hereby unconditionally and irrevocably guarantees the due and faithful performance of the Offtaker's obligations, under and in accordance with the PPA, and agrees and undertakes to pay to the Power Producer, upon its mere first written demand, and without any demur, reservation, recourse, contest or protest, and without any reference to the Offtaker, such sum or sums upto an aggregate sum of the Guarantee Amount as the Power Producer will claim, without the Offtaker being required to prove or to show grounds or reasons for its demand and/or for the sum specified therein.
2. A letter from the Power Producer that the Offtaker has committed default in the due and faithful performance of all or any of its obligations under and in accordance with the PPA shall be conclusive, final and binding on the Bank. The Bank further agrees that the power Producer shall be the sole judge as to whether the Offtaker is in default in due and faithful performance of its obligations under the PPA and its decision that the Offtaker is in default shall be final, and binding on the Bank, notwithstanding any differences between the Power Producer and the Offtaker, or any dispute between them pending before any court, tribunal, arbitrators or any other authority or body, or by the discharge of the Offtaker for any reason whatsoever.
3. In order to give effect to this Guarantee, the Power Producer shall be entitled to act as if the Bank were the principal debtor and any change in the constitution of the Offtaker and/or the Bank, whether by their absorption with any other body or corporation or otherwise, shall not in any way or manner affect the liability or obligation of the Bank under this Guarantee.
4. It shall not be necessary, and the Bank hereby waives any necessity, for the Power Producer to proceed against the Offtaker before presenting to the Bank its demand under this Guarantee.
5. The power Producer shall have the liberty, without affecting in any manner the liability of the Bank under this Guarantee, to vary at any time, the terms and conditions of the PPA or to extend the time or period for the compliance with, fulfilment and/or performance of all or any of the obligations of the Offtaker contained in the PPA or to postpone for any time, and from time to time, any of the rights and powers exercisable by the Power Producer against the Offtaker, and either to enforce or forbear from enforcing any of the terms and conditions contained in the PPA and/or the securities available to the Power Producer, and the Bank shall not be released from its liability and obligation under these presents by any exercise by the Offtaker of the liberty with reference to the matters aforesaid or by reason of time being given to the Offtaker or any other forbearance, indulgence, act or omission on the part of the Owner or of any other matter or thing



whatsoever which under any law relating to sureties and guarantors would but for this provision have the effect of releasing the Bank from its liability and obligation under this Guarantee and the Bank hereby waives all of its rights under any such law.

6. This Guarantee is in addition to and not in substitution of any other guarantee or security now or which may hereafter be held by the Power Producer in respect of or relating to the PPA or for the fulfilment, compliance and/or performance of all or any of the obligations of the Offtaker under the PPA.
7. Notwithstanding anything contained hereinbefore, the liability of the Bank under this Guarantee is restricted to the Guarantee Amount and this Guarantee will remain in force for the period of 12 months and unless a demand or claim in writing is made by the Power Producer on the Bank under this Guarantee, no later than 6 (six) months from the date of expiry of this Guarantee, all rights of the Owner under this Guarantee shall be forfeited and the Bank shall be relieved from its liabilities hereunder.
8. The Bank undertakes not to revoke this Guarantee during its currency, except with the previous express consent of the Owner in writing, and declares and warrants that it has the power to issue this Guarantee and the undersigned has full powers to do so on behalf of the Bank.
9. Any notice by way of request, demand or otherwise hereunder may be sent by post addressed to the Bank at its above referred Branch, which shall be deemed to have been duly authorised to receive such notice and to effect payment thereof forthwith, and if sent by post it shall be deemed to have been given at the time when it ought to have been delivered in due course of post and in proving such notice, when given by post, it shall be sufficient to prove that the envelope containing the notice was posted and a certificate signed by an officer of the Power Producer that the envelope was so posted shall be conclusive.
10. This Guarantee shall come into force with immediate effect and shall remain in force and effect for a period of two years from the date hereof or until it is released earlier by the Power Producer pursuant to the provisions of the PPA.

Signed and sealed this day of, 2022 at

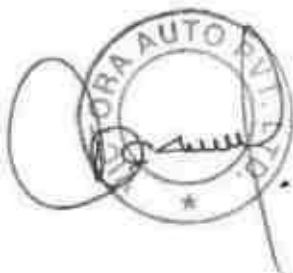
SIGNED, SEALED AND DELIVERED

For and on behalf of
the BANK by:

(Signature)

(Name)

(Designation)



39

(Code Number)

(Address)

NOTES:

- (i) The bank guarantee should contain the name, designation and code number of the officer(s) signing the guarantee.
- (ii) The address, telephone number and other details of the Head Office of the Bank as well as of issuing Branch should be mentioned on the covering letter of issuing Branch.



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SchedulesSCHEDULE A. ENERGY PURCHASE RATES "TARIFF".

YEAR	INR per unit
Year 1	3.95/-
Year 2	3.95/-
Year 3	3.95/-
Year 4	3.95/-
Year 5	3.95/-
Year 6	3.95/-
Year 7	3.95/-
Year 8	3.95/-
Year 9	3.95/-
Year 10	3.95/-
Year 11	3.95/-
Year 12	3.95/-
Year 13	3.95/-
Year 14	3.95/-
Year 15	3.95/-
Year 16	3.95/-
Year 17	3.95/-
Year 18	3.95/-
Year 19	3.95/-
Year 20	3.95/-
Year 21	3.95/-
Year 22	3.95/-
Year 23	3.95/-
Year 24	3.95/-
Year 25	3.95/-



Regulatory charges that may become applicable during the subsistence of the PPA tenure in order to be remain customer of State DISCOM will fall in Offtaker's Scope. The Tariff mentioned above is fixed for entire PPA tenure and will not be having any escalation. Grid net working charges will be into the account of Offtaker.

*Salvage Value to be payed applicable at the end of 25 years else the tariff Rs 3.95 mentioned above is applicable for 25 years



SCHEDULE B. BUY BACK VALUE

No voluntary purchase for a period of PPA Tenure unless in the case of PPA Termination on account of default by Energy Buyer. Buyout Values at the end of different years are provided below and calculated for 3020KWdc applicable buy out shall be calculated on Pro Rata Basis. Year -1 will be commencing from 7th April 2022

Revised Buyback Sheet:																				
	24.8	252	239	413	278	321	224	303	642	385										
Yr	PARSHL Haryana	Shunt Haryana	Ajayan Haryana	INT Faridkot	RSEZ, Banta	Victoria Auto - Slat	VNI, Hardware	VAPL-3 Hardware	VAPL-2 Hardware	VAPL-2 Hardware										
	Buyback Value	Buyback Value	Buyback Value	Buyback Value	Buyback Value	Buyback Value	Buyback Value	Buyback Value	Buyback Value	Buyback Value										
	INR Lacs	Ru/Wp	INR Lacs	Ru/Wp	INR Lacs	Ru/Wp	INR Lacs	Ru/Wp	INR Lacs	Ru/Wp	INR Lacs	Ru/Wp	INR Lacs	Ru/Wp	INR Lacs	Ru/Wp	INR Lacs	Ru/Wp	INR Lacs	Ru/Wp
1	31.27	42.28	105.45	41.85	11.64	41.85	108.63	40.75	117.77	42.18	137.58	41.86	113.78	40.80	68.94	40.67	290.75	40.63	159.64	41.86
2	31.44	41.98	104.62	41.51	10.92	41.51	179.23	43.39	138.38	41.86	136.53	41.53	110.68	40.47	64.94	40.34	258.62	40.28	158.54	41.11
3	31.38	41.83	102.06	41.34	10.09	41.34	177.63	43.01	125.36	41.49	130.33	41.36	109.85	40.09	64.34	39.96	256.22	39.91	156.87	40.74
4	30.89	41.34	102.59	40.71	10.15	40.71	175.84	42.58	124.20	41.08	133.86	41.71	108.69	39.67	63.66	39.54	253.50	39.48	155.20	40.31
5	30.55	40.79	103.37	40.23	10.09	40.23	173.82	42.08	122.89	40.63	132.42	41.25	107.87	39.19	62.89	39.06	250.44	39.01	153.32	39.82
6	30.17	40.28	103.99	39.68	10.30	39.68	171.53	41.53	121.40	40.07	130.68	40.71	106.89	38.64	62.02	38.52	246.98	38.47	151.15	39.27
7	29.74	39.70	104.44	39.06	10.55	39.06	168.81	40.90	119.72	39.47	128.70	40.09	104.21	38.03	61.04	37.81	243.08	37.80	148.80	38.65
8	29.25	39.05	104.89	38.37	10.81	38.37	165.98	40.19	117.83	38.79	126.47	39.40	102.33	37.35	59.94	37.23	238.70	37.18	146.11	37.95
9	28.89	38.31	104.72	37.58	11.32	37.58	162.88	39.33	115.49	38.03	123.96	38.62	100.23	36.58	58.70	36.46	233.76	36.41	143.08	37.16
10	28.37	37.47	102.31	36.71	10.39	36.71	158.95	38.40	113.27	37.13	121.13	37.79	97.84	35.71	57.31	35.60	228.22	35.55	139.68	36.19
11	27.35	36.52	100.02	35.72	10.23	35.72	154.76	37.47	109.56	36.17	117.94	36.74	95.17	34.73	55.75	34.63	223.00	34.58	135.87	35.29
12	26.55	35.45	97.21	34.61	10.40	34.61	150.04	36.39	107.50	35.07	114.35	35.82	92.18	33.84	54.00	33.54	215.05	33.40	131.60	34.10
13	25.84	34.24	94.09	33.37	10.08	33.37	144.34	35.05	104.08	33.83	110.31	34.36	88.83	32.42	52.03	32.31	207.21	32.28	128.81	32.94
14	24.82	32.87	90.37	31.97	10.02	31.97	138.78	33.60	100.19	32.44	105.77	32.95	85.28	31.05	49.84	30.95	198.40	30.91	123.49	31.54
15	23.47	31.33	86.43	30.41	10.40	30.41	132.09	31.98	95.85	30.88	100.68	31.38	80.88	29.52	47.38	29.43	188.67	29.38	115.45	29.39
16	22.18	29.59	82.21	28.66	10.76	28.66	124.58	30.14	90.98	29.11	94.96	29.58	76.18	27.80	44.83	27.71	177.72	27.68	108.34	28.24
17	20.70	27.63	77.28	26.70	10.47	26.70	116.35	28.12	85.51	27.19	88.54	27.58	70.94	25.89	41.55	25.81	165.48	25.78	101.29	26.30
18	19.04	25.43	71.76	24.51	10.47	24.51	106.72	25.84	78.37	24.95	81.34	25.34	65.07	23.75	38.12	23.68	153.80	23.65	92.88	24.12
19	17.38	22.94	65.58	22.06	10.30	22.06	96.12	23.77	72.40	22.68	73.17	22.83	58.51	21.30	34.29	21.30	136.54	21.27	83.52	21.70
20	15.08	20.15	58.67	19.32	10.30	19.32	84.25	20.40	64.78	19.71	64.13	20.01	53.22	18.88	30.01	18.64	119.50	18.61	73.10	18.98
21	12.73	17.00	40.86	16.25	10.60	16.25	70.97	17.18	46.35	16.60	54.11	16.86	43.08	15.72	25.23	15.67	100.49	15.63	61.47	15.87
22	10.09	14.47	32.34	12.83	10.11	12.83	56.30	13.58	36.48	13.12	42.73	13.32	33.99	12.40	19.91	12.37	79.29	12.35	48.50	12.60
23	7.11	9.49	22.72	9.02	10.34	9.02	39.45	9.55	23.60	9.23	30.08	9.37	23.86	8.71	13.98	8.68	55.66	8.67	34.01	8.84
24	5.76	5.92	11.98	4.75	10.41	4.75	20.88	5.94	12.55	4.87	15.88	4.85	12.57	4.58	7.37	4.57	29.33	4.57	17.94	4.68
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

In case of Transfer of Ownership during or at the end of the Term of this contract as per provisions of this Agreement the Power Producer shall ensure that the Solar Power Plant is free from any charge, lien or any kind of encumbrances

The Offtaker will also need to bear all taxes as may be applicable for the purchase of the Plant from the Power Producer including but not limited to indirect and direct taxes and any and all other taxes that may be applicable upon the Offtaker.



SCHEDULE C, Major Components of Solar Power Plant.

The Solar PV power Plant is the total arrangement of PV modules in series and parallel connections. The solar array is comprised of solar modules that generate DC electricity in proportion to the amount of sunlight available, generating the most power on a clear day when the sun is at a normal angle to the array. The microprocessor control circuit shall automatically adjust the DC-DC converter to ensure that it should always match to the PV array Maximum Power Point (MPPT) under varying conditions and transfers the maximum possible power to Inverter. The inverter shall convert DC to AC and exported to the loads. The inverter output shall match the grid in voltage, frequency and phase. AC Distribution board is equipped with Meter to measure the energy generation.

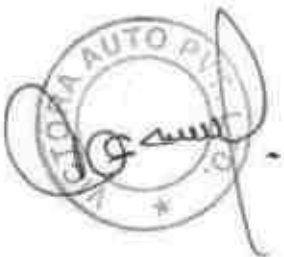
Major Components of a Solar PV Power Plant

1. Solar Modules tier 1 - Mono Crystalline/Poly
2. Module Mounting Structures – Aluminium /GI
3. Array Junction Box- As per IS Standard
4. Solar Power Inverter – String Inverter
5. AC distribution board / LT Panel – As per IS Standards
6. Cables & Accessories.- As per IS Standards
7. Monitoring System – Dongle Based
8. Earthing/ Lightning Arrestors. As per IS Standards
9. Net Metering -As per state regulations



SCHEDULE D: Annual Bank Guarantee Amount
Calculated based on 3 Months Expected Generation

YR	BG AMOUNT IN INR LACS
1	



SCHEDULE E: Deemed Generation

"Deemed Generation" for the year of operation, will be calculated based on methodology as explained below. Deemed Generation settlement will be done on **Monthly basis**.

Methodology

Deemed Generation = Downtime X Expected Units Generation

Whereas:

Downtime= Duration of Downtime, as recorded by plant performance monitoring system, in minutes

Expected Units Generation =Value of energy production in kWh/Min. derived as in table 1

Illustration :Energy Production –Yearly = 14,00,000 kWh(Per MWp) for 1st Year of operation, for 2nd year and rest of the PPA tenure Energy Production values will be summation of Billed units including Deemed Generation Units in preceding year factoring the degradation for that year.

❖ **Table-1 : Methodology to Derive Expected Units Generation (1MWp).**

Description		Values for 1 st Year	Unit
Energy Production –Yearly (EPY)	Yearly Generation	14,00,000	kWh/Year
Monthly Production (MP)	MP=EPY/12	1,16,666	kWh/Month
Daily Production (DP)	DP=MP/30	3,888	kWh/Day
Hourly Production ¹ (HP)	HP=DP/6	648	kWh/Hour
Expected Units Generation (EUP)	EUP=HP/60	10.80	kWh/Min

¹ based on 6 hours of sunshine.



Schedule - F

Minimum Guaranteed Generation (MGG) YoY

Sl. No.	VRSYS, Varanasi		Rishi Varanasi		Alaya Varanasi		NRT Faridkot		KSI2, Noida		Victoria Auto - Sah		SA, Haridwar		VRSYS, Roorkee		VRSYS, Roorkee		VRSYS, Pithor	
	Estimated Generation	Guaranteed Generation	Estimated Generation	Guaranteed Generation	Estimated Generation	Guaranteed Generation	Estimated Generation	Guaranteed Generation	Estimated Generation	Guaranteed Generation	Estimated Generation	Guaranteed Generation	Estimated Generation	Guaranteed Generation	Estimated Generation	Guaranteed Generation	Estimated Generation	Guaranteed Generation	Estimated Generation	Guaranteed Generation
1	2538	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881
2	2538	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881
3	2538	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881
4	2538	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881
5	2538	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881
6	2538	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881
7	2538	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881
8	2538	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881
9	2538	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881
10	2538	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881
11	2538	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881
12	2538	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881
13	2538	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881
14	2538	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881
15	2538	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881
16	2538	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881
17	2538	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881
18	2538	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881
19	2538	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881
20	2538	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881
21	2538	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881
22	2538	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881
23	2538	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881
24	2538	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881
25	2538	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881	1881

*Note:

Based on min.3 Hours of Sunshine availability & DISCOM GRID availability between 8am to 5pm.



SCHEDULE G:**Assignment Agreement**
ASSIGNMENT AGREEMENT

This Assignment Agreement ("Agreement") is executed on this ____ day of _____, 2021, AMONGST

1. **Enerture Solar Pvt Ltd** having its office at _____
(hereinafter referred to as "**Assignor**", which expression, unless repugnant to the context or meaning thereof shall be deemed to include its successors and permitted assigns) of the First Part;
2. _____ a company incorporated under the laws of India and having its registered office at [to be inserted] (hereinafter referred to as "**Assignee**", which expression, unless repugnant to the context or meaning thereof shall be deemed to include its successors and permitted assigns) of the Second Part;

AND

3. _____, a company incorporated under the laws of India and having its registered office at _____ and (hereinafter referred to as "**Offtaker**", which expression, unless repugnant to the context or meaning thereof shall be deemed to include its successors and permitted assigns) of the Third Part;

The Assignor, Assignee and the Offtaker are individually referred to as the "**Party**" and collectively referred to as the "**Parties**".

WHEREAS:

- A. The Assignor is in the business of power generation and executed a power purchase agreement dated _____ ("**PPA**") with the Offtaker for design, engineering, manufacture, supply, erection, testing and commissioning including warranty, operation and maintenance of solar PV system in the Offtaker's facility ("**Project**"). A copy of the PPA is annexed hereto and marked as **Annexure 1** to form part of this Agreement.
- B. The Assignor is desirous of assigning the rights and obligations of the Assignor under the PPA in favour of the Assignee. The PPA provides that it shall not be assigned by any party to the PPA without the prior written consent of the other Party.
- C. Accordingly, the Assignor has sought the permission of the Offtaker and the Offtaker has agreed to assignment of the PPA by the Assignor in favour of the Assignee. Accordingly, this Agreement to assign is executed between the Parties and upon execution of this Agreement, the Assignee shall be bound by the provisions of the PPA and the terms and conditions of the business agreement, if any, executed between the Assignor and the Assignee.

NOW, THEREFORE, in consideration of the foregoing and the respective covenants and agreements set forth in this Agreement, the PPA and the commercial terms and conditions mutually agreed between the Assignee and the Assignor, the receipt and sufficiency of which is hereby acknowledged, and intending to be legally bound hereby, the

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Parties agree as follows:

1. Definitions and interpretation

Capitalized terms used but not defined in this Agreement shall, unless the context otherwise requires, have the respective meanings ascribed thereto in the PPA.

2. Assignment of PPA

2.1 The Assignor hereby and in pursuance of this Agreement unconditionally and absolutely assigns to the Assignee any and all of its rights, title and interest in the concession and obligations under the PPA. The Assignee irrevocably accepts such Assignment in favour of itself and agrees to abide by the terms of the PPA.

2.2 The Assignee hereby acknowledges that it has heretofore received a copy of, and has read and understood the covenants of the PPA and agrees and confirms that it shall be bound by all provisions of the PPA as if it was an original party thereto, including with respect to the rights and obligations of the Assignor contained therein, and the PPA shall have full force and effect on it, and shall be read and construed to be binding on Assignee.

3. Acknowledgment

The Offtaker hereby agrees to assignment of the PPA by the Assignor in favor of the Assignee and confirms that it does not have any objection to such assignment and the terms and conditions of this Agreement subject to the Assignee abiding by the terms thereof and discharging all the obligations towards the Offtaker.

4. Further Assurance

The Assignor agrees that at any time and from time to time upon the written request and at the cost of the Assignee, it will promptly and duly execute and deliver to the Assignee any and all such further instruments and documents and promptly take all such further action as the Assignee may consider desirable, acting reasonably, for it to obtain the full benefit of the assignment contained in Clause 2 of this Agreement, which the Assignee requests and the Assignor approves, such approval not to be unreasonably withheld or delay.

5. Representation

Each Party hereby represents and warrants to the other parties hereto that the execution, delivery and performance hereof by it are within its corporate powers, and have been duly authorized by all necessary corporate or other action and that this Agreement constitutes its legal, valid and binding obligation.

6. Liability

The Parties agree that all the liabilities arising from the date of this Agreement, in relation to the Project, shall be borne by the Assignee. For the avoidance of doubt, all liabilities arising prior to the execution of this Agreement shall be solely borne by the Assignor.

7. Cost

All costs including but not limited to the applicable stamp duties payable on or in connection to this Agreement or any deeds or documents executed by the Assignor or Assignee in connection with such assignment shall be borne equally by the Assignor and the Assignee.

8. Governing Law and dispute resolution



This Agreement shall be governed by and construed in accordance with the laws of the India and the court at Kolkata shall have exclusive jurisdiction. The terms and conditions of the PPA in relation to dispute resolution, the provisions regarding arbitration and other terms and conditions shall be deemed to have been incorporated in this Agreement. **Note: Stamp duty implication to be considered**

9. **Counterparts**

This Agreement may be executed in one or more counterparts, including facsimile counterparts, each of which shall be deemed to be an original copy of this Agreement, and all of which, when taken together, shall be deemed to constitute one and the same agreement.

IN WITNESS WHEREOF THE PARTIES HAVE EXECUTED AND DELIVERED THIS AGREEMENT AS OF THE DATE FIRST ABOVE WRITTE

For and on behalf of the	For and on behalf of the	For and on behalf of the
Assignor	Assignee	Offtaker
 _____	 _____	 _____
Authorized Signatory		
Name: _____		
	 _____	 _____
	Authorized Signatory	Authorized Signatory
	Name: _____	Name: _____

Witnesses:

1.

2.



Making our world
more productive



COMMISSIONING REPORT

TO WHOMSOEVER IT MAY CONCERN

This is to certify that Enerture Solar One private limited has successfully designed, supplied installed and commissioned the following system to our satisfaction. The project is working satisfactorily.

System Capacity	2500 KWp
Date of Commissioning	9 Jan, 2023
Customer Name	LINDE
Project Location	Dehradun, Jamshedpur, Pune and Bengaluru.

For LINDE	For ENERTURE
	
Seal & Signature	Seal & Signature



পশ্চিমবঙ্গ পশ্চিম বঙ্গাল WEST BENGAL

AG 725274

POWER PURCHASE AGREEMENT

THIS **POWER PURCHASE AGREEMENT** (this "**Agreement**") is made, signed and executed on 30 MARCH, 2022

BY AND BETWEEN:

Enerture Solar Private Limited, a Private Limited Company incorporated under the provisions of the Companies Act, 2013 and having its registered office at 128, 2nd Floor, Kaveri Apartment, D-6, Vasant Kunj, New Delhi - 110070 and also has its Corporate Office at ABL Workspace, Celebration Gardens NH8, Avenue Bougainvillea, Mahipalpur, New Delhi - 110037, India (hereinafter referred to as the "**Supplier**", which expression, unless repugnant to or inconsistent with the context, means and includes its successors and permitted assigns) of the **ONE PART**;

AND

Linde India Limited, a company incorporated under the Companies Act, 1913 and having its registered office at Oxygen House, P 43, Taratala Road, Kolkata - 700088, India (hereinafter referred to as the "**Purchaser**", which expression, unless repugnant to or inconsistent with the context, means and includes its successors and permitted assigns) of the **OTHER PART**.

The Supplier and the Purchaser shall hereinafter be collectively referred to as the "**Parties**" and individually as a "**Party**".



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31356

16 MAR 2022

No.....Rs. **100/-** Date.....

Name:.....

Address:.....

Vendor:.....



Alipur Collectorete, 24 Pgs. (S)

SUBHANKAR DAS

STAMP VENDOR

Alipur Police Court, Kol-27

[Handwritten signature]

WHEREAS:

- A. The Supplier is engaged in the business of developing, installing, operating, managing, and maintaining solar power plants across India.
- B. The Purchaser is in the business of manufacturing industrial, medical, and certain other specialty gases at various facilities across India.
- C. Pursuant to discussions held between the Parties, the Supplier has offered and the Purchaser has agreed that the Supplier shall install and set-up Solar Power Plants (*as defined herein below*), for the supply of Solar Energy (*as defined hereinbelow*), as required by the Purchaser on build, own, operate, maintain, and transfer basis on the roof or ground area of the Purchaser's premises located across India and more particularly described in Schedule I hereunder (the "**Premises**"); and
- D. The Parties are now desirous of entering into this Agreement to record the terms and conditions for sale and purchase of the Solar Energy.

NOW, THEREFORE, in consideration of the representations, promises, mutual covenants and agreements set forth herein, and other good and valuable consideration the receipt and sufficiency of which is hereby acknowledged, the Parties duly agreed upon as follows:

1. DEFINITIONS AND INTERPRETATIONS

1.1. Definitions:

"Affiliate"

in relation to any Person means any Person, who directly or indirectly (through one or more intermediaries) Controls, is Controlled by or is under common Control with that Person;

**"Agreement"/
"PPA"**

means this Power Purchase Agreement including its recitals and Schedules, amended, or modified from time to time in accordance with the terms hereof;

**"Applicable
Permits"**

means all authorisations, licenses, approvals, registrations, permits, waivers, privileges, acknowledgements, agreements, clearances, and concessions, required to be obtained from or provided by any Competent Authority for the purpose of installing, commissioning, operating, and transferring the Solar Power Plant and selling Solar Energy generated by such Solar Power Plant;



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"Applicable Law"

means, in relation to this Agreement, all laws in force, statute, decree, ordinance, regulation, notice, circular, code, rule or direction, or any interpretation of any of them by a Governmental Instrumentality and includes all applicable rules, regulations, orders, directions, notifications by a Governmental Instrumentality pursuant to or under any of them;

"Appropriate Commission"

means the Central Electricity Regulatory Commission referred to in sub-section (1) of section 76 or the State Electricity Regulatory Commission referred to in section 82 or the Joint Commission referred to in section 83 of the Electricity Act 2003, as the case may be;

"Bill Dispute Notice"

bears the meaning as ascribed to the term in Clause 6.5 of the Agreement;

"Business Day"

means any day (other than a Sunday or public holiday) on which banks are open for business in Kolkata and Delhi;

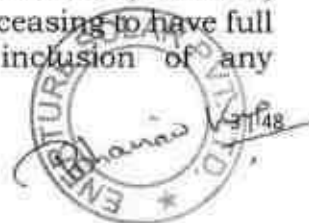
"Change in Law"

means
(a) the enactment, bringing into effect, adoption, promulgation, amendment, modification, or repeal, after the date of this Agreement of any statute, decree, ordinance or other law, regulation, notice, circular, code, rule or direction by any Governmental Instrumentality or a change in its interpretation by a competent court, tribunal, regulatory commission, Government of India, State Governments, or other statutory authority, of any of the above regulations and

(b) the imposition by any Governmental Instrumentality of any material condition in connection with the issuance, renewal, modification (including ceasing to have full force and effect or inclusion of any



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additional consents, permissions, approvals, or actions of similar nature).

**"Commercial
Operation
Date"/ "COD"**

means the actual commissioning date of the Solar Power Plant whereupon the Supplier starts injecting Solar Energy into the Injection Point;

**"Coordination
Committee"**

means the committee comprising of 2 (two) senior officials to be appointed by the Supplier and 2 (two) senior officials to be appointed by the Purchaser.

**"Deemed
Generation"**

means the solar power generated from the Solar Power Plant for the year of operation, shall be calculated based on methodology as explained in Annexure II, and shall be billable to the Purchaser by the Supplier at the Tariff in the event that actual generation from the Solar Power Plant is affected by any act, negligence or omission except Force Majeure events by the Purchaser, or any of its employees, agents, contractors or any of its Affiliates;

"Due Date"

bears the meaning as ascribed to the term in Clause 6.4.1 of this Agreement;

"Effective Date"

means the date on which this Agreement is entered and duly signed and executed upon by the Parties;

"Energy Charges"

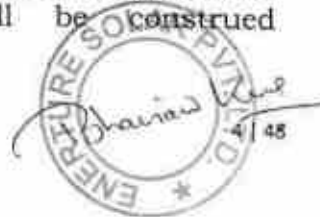
means the value in INR charged by the Supplier from time to time for each kWh of energy supplied by the Supplier to the Purchaser for the respective month at the Injection Point;

"Encumbrances"

means any interest or equity of any Person (including, without limitation, any right to acquire, option or right of pre-emption or conversion) and any charge, mortgage, security interest, pledge, lien (including retention of title claims), assignment, power of sale or hypothecation or any other third party right or encumbrances of any nature whatsoever (whether or not perfected) and the term "**encumber**" shall be construed accordingly;



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"Event of Default"	bears the meaning as ascribed to the term in Clause 16 of the Agreement;
"Force Majeure Event"	bears the meaning as ascribed to the term in Clause 15.2 of the Agreement;
"Government Instrumentality"	means the Government of India, State Governments and any ministry, department, board, authority, agency, corporation, commission under the direct or indirect control of Government of India or any of the state government(s) or both, any political subdivision of any of them including any court or Appropriate Commission(s) or tribunal or judicial or quasi-judicial body of India;
"Injection Point"	means the Solar PV Panel Board in the Solar Power Plant which is the commercial metering point at the Premises of the Purchaser where Solar Energy is injected;
"INR"/ "Rupees"/"Rs."	means Indian Rupees, the lawful currency of the Republic of India;
"Installed Capacity"	means the total capacity of the Solar Power Plant as installed at each of the Premises. The estimated installed capacity is 2,500kWp, whereas the actual capacity for each of the Solar Power Plants shall be assessed and mutually agreed upon by the Parties at the start of the COD;
"Insurances"	means the insurance cover to be obtained and maintained by the Supplier in accordance with Clause 14 of the Agreement for the term of this Agreement;
"kWh"	means Kilowatt-Hours;
"kWp"	means Kilowatt-peak;
"Law(s)"	means any constitutional provision, law, statute, rule, regulation, ordinance, treaty, order, decree, judgment, governmental approval, or any requirement of such governmental authority having the force of law and which is binding on the Parties with



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respect to any of the transactions contemplated herein. Unless the context clearly requires otherwise, the term "Law" shall include each of the foregoing (and each provision thereof) as in effect at the time in question, including any amendments, supplements, replacements or any other modifications thereto, and whether or not in effect at the Effective Date;

"License"

bears the meaning as ascribed to the term in Clause **Error! Reference source not found.** 1 of the Agreement;

"Local Electric Utility"/ "DISCOM"

means the local electric distribution owner and operator which under the laws of that particular State is responsible for providing electric distribution and interconnection services to the Purchaser at Premises.

"LT Panel"

means the panel in the Purchaser's Premises in which control and distribution of electricity would happen as indicated in Schedule II;

"Meter"

means a device suitable for measuring, indicating, and recording the injection of Solar Energy at the Injection Point;

"Person"

shall mean any natural person, firm, the Supplier, governmental authority, joint venture, partnership, association, or other entity (whether or not having separate legal personality);

"Premises"

means the Purchaser's premises as defined in the Recital B of this Agreement;

"Prudent Utility Practices"

means methods, acts, techniques, procedures and standards and the exercise of a degree of skill, diligence and prudence which would reasonably and ordinarily be expected from a first-class reputable, recognised, skilled and experienced solar energy developer in the Solar PV power generation industry of the same or similar size and type as the Supplier and the Solar Power Plant;

"Reply Notice"

bears the meaning as ascribed to the term in



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Clause 6.5.5 (c) of the Agreement;

"Scheduled Commercial Operation Date/ SCOD"

means the expected date, when the Solar Power Plant is expected and agreed to be commissioned and shall be ready for operations.

"Solar Photovoltaic" or "Solar PV"

means solar photovoltaic technology that directly converts sun light into electricity;

"Solar Energy"

means the electrical energy in kWh generated from the Solar Power Plant;

"Solar Power Plant(s)"

means the Solar Photo Voltaic based power generating system located at each of the Premises, and includes components like solar modules, mounting structures, inverters, cables, power management devices, related assets and ancillary equipment required for the operation of the solar energy generation facility;

"Solar PV Panel Board"

means the panel comprising of busbars, switches and electrical wires interconnecting the Solar Power Plant with the LT Panel and as indicated in Schedule II;

"Tariff"

bears the meaning as set out in Clause 5 of the Agreement;

"Taxes"

means any and all statutory taxes, duties, levies and cess, or levy of any nature (whether central, state or local) whatsoever and wherever and whenever charged, levied or imposed on the sale of the Solar Power under the Agreement together with any interest and penalties in relation thereto other than interest and penalties imposed as a result of any act or omission of the Supplier, its Affiliates, servants or agents;

"Term"

bears the meaning as set out in Clause 2 of the Agreement;

"Year"

means every period of 365 days, with the first Year commencing from the date on which the Supplier achieves COD.



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1.2. Interpretation

Save where the contrary is indicated:

- 1.2.1. This Agreement shall be binding upon and shall inure to the benefit of the Parties and their successors. Nothing contained herein shall be construed to provide any benefit to any Person not a Party to the Agreement except as expressly provided for herein;
- 1.2.2. The singular includes the plural and vice versa and, in particular (but without limiting the generality of the foregoing), any word or expression defined in the singular has the corresponding meaning when used in the plural and vice versa;
- 1.2.3. Any reference to any gender includes the other gender;
- 1.2.4. Where a word or phrase is defined, other parts of speech and grammatical forms of that word or phrase shall have the corresponding meanings;
- 1.2.5. Any reference to an article, section, appendix, clause, sub-clause, paragraph, sub-paragraph, Schedule or Recital is a reference to an article, section, appendix, clause, sub-clause, paragraph, sub-paragraph, Schedule or Recital of this Agreement;
- 1.2.6. Any reference to any agreement, instrument or other document (a) shall include all appendices, exhibits and schedules thereto and (b) shall be a reference to such agreement, instrument or other document as amended, supplemented, modified, suspended, restated or novated from time to time;
- 1.2.7. Any reference to any statute shall be construed as including all statutory provisions consolidating, amending or replacing such statute;
- 1.2.8. A reference to a party to any document includes that party's successors;
- 1.2.9. Any reference to "writing" includes printing, typing, lithography and other means of reproducing words in visible form;
- 1.2.10. The terms "hereof", "hereby", "hereto", "hereunder" and similar terms shall refer to the Agreement as a whole;
- 1.2.11. The term, "including" shall mean "including, without limitation";
- 1.2.12. Where the consent or approval of a Party to this Agreement is required hereunder to any act, deed, matter or thing such



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requirement shall in the absence of any express stipulation to the contrary herein mean, the prior consent or approval (as the case may be) in writing;

- 1.2.13. The headings of various Clauses, Articles and Sections in the Agreement are inserted for convenience and reference only and shall not affect the construction of the relative provisions;
- 1.2.14. A reference to a statute, ordinance, code or other law includes regulations and other instruments under it and amendments or re-enactments of any of them;
- 1.2.15. If a period of time is specified and dates from a given day or the day of an act or event, it is to be calculated exclusive of that day; and
- 1.2.16. A reference to a day is to be interpreted as the period of time commencing at midnight (00 Hrs) and ending 2400 Hrs (twenty-four) hours later.

2. **TERM OF THE AGREEMENT**

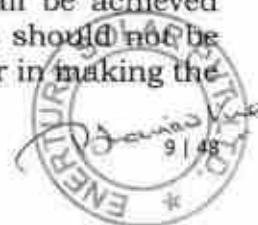
- 2.1 This Agreement shall be effective from Effective Date for a period of 15 (fifteen) Years from the date of actual Commercial Operation Date ("**COD**") as per Clause 3.1 below ("**Term**"). The Term shall exclude the duration of the Force Majeure event as per Clause 16 and shall be extended for the duration of the Force Majeure Event. The Agreement shall stand discharged before the expiry of the Term if either Party terminates the Agreement pursuant to Clause 17 below.
- 2.2 The Purchaser shall have option to extend the Term for ten (10) years to a maximum of twenty five (25) years from COD, on the same commercial terms and conditions. The Purchaser also has the option to buy the Solar Power Plants at all or selected Premises at the applicable Salvage Value as mentioned in Annexure I of this Agreement during the Term of the Agreement after COD has been satisfactorily achieved for the particular Site or Premises.

3. **SALE AND PURCHASE OF SOLAR ENERGY**

- 3.1. Immediately after the Effective Date, the Supplier shall commence the establishment of 2,500 kWp Solar Power Plants on a build, own, operate, maintain, and transfer basis at the Premises, as listed in Schedule I. It is estimated that establishment of the Solar Power Plant for all the Premises shall be completed and COD shall be achieved within seven (7) months from the Effective Date. There should not be any unreasonable delay or disruptions by the Purchaser in making the



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Premises available to the Supplier. Should the Supplier require additional time for achieving COD at any one or all of the Premises, the Parties shall discuss and agree upon an extended date for COD for such Premises. The Parties shall cooperate to obtain all necessary Applicable Permits for the Solar Power Plants as installed in each of the Premises. Notwithstanding anything to the contrary contained hereinabove, the Parties agree that in no event the Supplier shall take more time than seven (7) months from the Effective Date to establish the Solar Power Plants and to also achieve the COD.

- 3.2. On and with effect from the COD, the Supplier shall sell and deliver Solar Energy to the Purchaser at the Injection Point and the Purchaser shall purchase from the Supplier Solar Energy injected into the Injection Point by paying the Tariff in accordance with the terms and conditions of the Agreement including the billing and terms of payment specified in Clause 5.
- 3.3. During the term of the Agreement, the Purchaser shall purchase the entire Solar Energy injected into the Injection Point by the Supplier. The Supplier shall not be entitled to sell the Solar Energy generated by the Solar Power Plants to any third parties for any reasons whatsoever, without the prior written consent of the Purchaser.

4. **PLANNING, INSTALLATION AND OPERATION OF SOLAR POWER PLANTS**

4.1. **Premises Assessment and Planning**

4.1.1. The Supplier shall have the right, at its own expense, to assess the suitability of the Premises for the Solar Power Plants and shall act diligently in conducting such assessment. The assessment shall include the right to inspect the physical condition of the structures on which the Solar Power Plants shall be located; to apply for permits or other governmental authorizations necessary for the construction of the Solar Power Plants; to arrange interconnections with the Local Electric Utility; or to make any other investigations or determination necessary for the financing, construction, operation, or maintenance of the Solar Power Plants.

4.1.2. The Supplier shall commence installation of the Solar Power Plant on the Purchaser's Premises by giving at least 15 (fifteen) days prior notice to the Purchaser immediately after the effective date after complying with all of the Purchaser's safety and security norms. Before commencement of the said construction, the Supplier shall produce complete design and drawings pertaining to Solar Power Plants' construction and shall seek approval from the Purchaser. The Supplier shall provide complete design and drawings with respect to each of the sites earmarked at each of



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the Premises for the Solar Power Plants (hereinafter referred to as "**Site**"). The Purchaser shall provide approval/comments, for same within 7 (seven) working days on receiving same over the E-mail or by other modes in writing. On approval of the design and drawings, the construction of Solar Power Plant for that particular Premises shall begin. The Supplier shall also provide any other documents needed by the Purchaser to seek approvals for the changes at Premises arising from the installation and subsequent operations of the Solar Power Plants.

- 4.1.3. Major Components of the Solar Power Plant: As of the Effective Date hereof, the Supplier anticipates that the Solar Power Plant shall consist of the major components as set forth in Schedule II hereof. During the construction and installation of the Solar Power Plants, due to reasons not attributable to the Supplier, if there is a requirement to change or modification of the major components or design, the same shall be notified to the Purchaser by the Supplier and any change or modification shall be subject to the Purchaser's approval, which shall not be unreasonably withheld. The Purchaser's approval shall be made in writing duly acknowledged by the Supplier.

4.2. Access Specifications

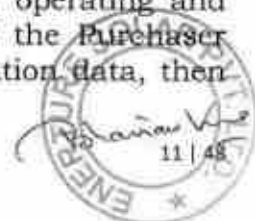
- 4.2.1. The Purchaser hereby grants the Supplier and its agents, (including its contractors, subcontractors, persons responsible for implementing the Solar Power Plant, and the financing party) entry permission into the Premises, for the Term of this Agreement, at reasonable times and upon reasonable notice, for the purposes of designing, installing, inspecting, operating, maintaining, repairing and removing the Solar Power Plant, and any other purpose set forth in this Agreement, and otherwise in accordance with the provisions of this Agreement. In exercising such access, the Supplier shall reasonably attempt to minimize any disruption to activities occurring on the Premises.

- 4.2.2. Storage: Adequate storage space on the Premises convenient to the Supplier for materials and tools used during construction, installation, and maintenance of the Solar Power Plant. The Purchaser shall be responsible for providing shelter and security for stored items during construction and installation. Moreover, if shelter facility is not available at the Premises, then the Purchaser shall provide security and shall allow the Supplier to setup make-shift arrangement for storage facility.

- 4.2.3. Utilities: Water, drainage, and electrical connection in the Premises for use by the Supplier in installing, operating and maintaining the Solar Power Plant. Further, if the Purchaser wishes to access the Solar Power Plants' generation data, then



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ethernet connections, display and data storage devices in the Premises shall be arranged by the Purchaser at its own expense.

4.2.4. The Purchaser needs to provide reasonable and adequate water supply by giving water tapping points near the Site for cleaning of modules and if required by the Supplier, a maximum of 100 units of electricity monthly shall be utilized for the operation and maintenance of the Solar Power Plant at the account of the Purchaser.

4.2.5. Water tapping points shall not be more than 10 meters far from the Sites where solar modules are being installed, after tapping points module cleaning system shall be installed by the Supplier.

4.3. **Technical Specifications considerations**

The Supplier has considered the following assumptions based on the information provided by the Purchaser:

4.3.1. The Site mentioned in this Agreement is within the Premises of the Purchaser and the Purchaser has secured the rights of construction of the Solar Power Plants on the Site at each of the Premises.

4.3.2. The AC cable length from solar inverter to the main LT Panel of the load points is not more than 100 meters.

4.3.3. Installation, operation, and maintenance of all necessary infrastructure for delivery of Solar Energy at Injection Point is within the scope of the Supplier.

4.4. The Purchaser acknowledges that the Supplier has proposed the Tariff based on the above assumptions. If any of the above conditions changes as per the actual Premises conditions, any revision to the Tariff for the particular Site or Premises shall be mutually agreed in writing and duly acknowledged by the other Party, before commencement of installation of the Solar Power Plant at that Site.

4.5. **Contractors:** The Supplier shall use contractors/ independent agents to perform the work of installing, operating, and maintaining the Solar Power Plants and shall notify the Purchaser through written notifications of such appointments. The contractors/ independent agents of the Supplier shall follow safety guidelines, EHS and other norms as per the industry practice and the Purchaser's specific norms, and the most stringent safety norm shall be applicable. However, appointment of any contractors shall not relieve the Supplier from its obligations under this Agreement. The insurance and all safety related issues must be taken care of by the Supplier.



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- 4.6. **Premises Security:** The Purchaser shall assist with security for the Solar Power Plants from the commencement of construction during the entire term of this Agreement, to the extent of its existing security procedures, practices, and policies that apply to the Premises. The Purchaser shall notify the Supplier immediately upon observing any damage to the Solar Power Plants. During the operations period, upon request by the Supplier, such as the Supplier receiving data indicating irregularities or interruptions in the operation of the Solar Power Plant, the Purchaser shall, as quickly as reasonably possible, send a person to observe the condition of the Solar Power Plants and inform the Supplier of the same.

5. **TARIFF**

- 5.1. From the COD, the Purchaser shall pay the Supplier for Solar Energy supplied and Deemed Generation, if any, by the Solar Power Plant at the rate of Rs.3.95 kWh/ during the Term of this Agreement ("**Tariff**") The Tariff payable shall be exclusive of all Regulatory Charges that may become applicable during the subsistence of this Agreement in future due to any change of law.
- 5.2. **Absolute Energy Generation Guarantee:** The Supplier estimates the amount of Solar Energy to be produced at each of the Sites on annual basis subject to Global Horizontal Irradiation ("**GHI**"). Such assessment of expected Solar Energy generation would be carried out at each site based on Installed Capacity for each site and needs to be agreed by both the Parties. This estimate of amount of Solar Energy to be generated for each site should be considered Absolute Energy Generation Guarantee for subsequent reference when actual generation data is not available for the particular Site for that time period of year.
- 5.3. The Supplier guarantees Absolute Energy Generation Guarantee that is defined in aforementioned Clause 5.2 for each of the Premises, failing which the Supplier shall compensate the Purchaser as per the Liquidated Damage charges for the deficit as defined in Clause 9.2.4 of this Agreement.

6. **BILLING AND TERMS OF PAYMENT**

6.1. **Monthly Electricity Bills**

- 6.1.1. For the quantity of Solar Energy billable, including Solar Energy injected into the Injection Point (Metered Generation), the Supplier shall raise monthly Electricity Bill in the name of the Purchaser based on the Tariff and in accordance with this Clause for each of the Solar Power Plant at each of the Premises (the "**Monthly Bill**").
- 6.1.2. Each Monthly Bill shall state the quantity of electricity produced by the Solar Power Plant in such month, the applicable Tariff for



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such, and the total amount due, which shall be the product of the quantities and the applicable Tariff. The monthly joint reading as stated in Clause 6.2 below (signed by authorized representatives of the Supplier and the Purchaser) shall be attached along with the Monthly Bill otherwise the invoice of that particular month shall not be accepted by the Purchaser. However, if the remote monitoring system is implemented which has the ability of capturing the real time energy meter readings, the same may be used for billing and physical signing of energy meter records shall not be required.

- 6.1.3. The Supplier shall raise and send the Monthly Bill to the person authorized by the Purchaser and intimated to the Supplier, within the first 7 (seven) Business Days from the end of the month for which the Monthly Bill pertains to, as scanned copy by E-mail.

6.2. Joint Meter Reading

- 6.2.1. Monthly Meter Reading: For every calendar month, joint meter reading (JMR) of main meter and the check meters installed at the respective locations shall be conducted on 1st working day of every calendar month @ 11:00 AM, in the presence of representatives of both the Parties. If the first day of the month is a public holiday or Sunday, then in such cases the joint meter reading shall be conducted on the immediate next day. However, in such cases, the Supplier shall inform the other Party in advance. Meter reading can also be taken through the remote monitoring provision provided remote monitoring facility is functional and is capable of obtaining instantaneous energy meter readings at a particular time, and both Parties would have agreed on the process of obtaining and subsequent confirmation of the readings. The Supplier can submit JMR based on readings obtained from remote monitoring system at 12 midnight of last day of the calendar month unless a different cut-off time is agreed between the Parties for a particular Site.

- 6.2.2. Meter Inspection & Sealing: The energy meter shall be jointly inspected and sealed by the Supplier and shall not be opened, calibrated or tested except in the presence of the representatives of both the Parties. In each case, seal details of old and new seals installed at the meter box to be mentioned on the joint meter reading format or meter testing report.

- 6.2.3. Energy Recording:



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- (a) Difference in energy measurement between main meter and check meters: At the time of taking monthly joint meter reading, if the electrical energy consumption reading of the main meter differs from the readings of the corresponding check meter by more than $\pm 5\%$, in such case the main meter shall be tested first as per ISI guidelines and if on such testing, the main meter error is found to exceed specific limits prescribed in the standards, then the main meter shall be re-calibrated or replaced by correct meter, within next 7 working days from the date of testing. The main meter if found correct, the check meter shall be tested and re-calibrated or replaced by correct meter, within next 7 (seven) working days from the date of testing. The charges for the meter testing/calibration shall be borne by the Supplier.
- (b) Billing in case of faulty meter: In the event of variation exceeding the permissible limits, the billing should be done based on the correct meter (main or check). The joint metering should be taken after such re-calibration/testing. Tolerance shall be within the calibration of energy meter.

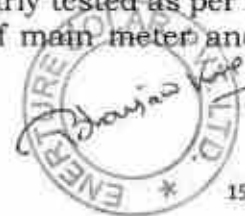
6.2.4. Annual Meter Testing: All meters shall be checked/tested for accuracy on a yearly basis in presence of both the Parties and shall be tested as working satisfactory so long as the errors are within the limits prescribed for meters of the specific class. Energy consumption recorded in the main meter shall form the basis of billing, so long as the yearly checks show that errors if any are within the permissible limits. If the check or main meter is found defective during the annual checking, the error shall be rectified, and it shall be immediately replaced at the cost of The Supplier.

6.2.5. Calibration Procedure: All meters shall be calibrated on an annual basis by a government approved agency and the cost for the calibration shall be borne by The Supplier. Meter readings shall be taken after the completion of calibration procedure in the presence of authorized representatives of both the parties. Metering system, calibration procedure and the procedure of taking meter readings may be modified from time to time as may be decided by both the parties with mutual understanding.

6.2.6. The Main Metering System at the Delivery Point shall in terms of its technical standards, description, accuracy, calibration, comply fully with the requirements of the relevant standards under the Applicable Law and shall be regularly tested as per the government regulation. This shall consist of main meter and a check meter.



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6.2.7. The Main Metering System shall be installed, maintained, and owned by the Supplier. It shall be installed at a place accessible to the meter readers of both the Parties. The Purchaser shall have full access to the Main Metering System, and to any data generated thereby.

6.2.8. The Purchaser may install an additional meter, at its own cost, to verify the measurements of the Main Metering System.

6.2.9. The Supplier shall install the meter(s) to meet the technical and regulatory requirements stipulated by the Jurisdictional Authorities at the Injection Point

6.2.10. The risk and title to the solar energy supplied by the Supplier shall pass to the Purchaser at the Injection Point

6.3. **Bank Guarantee**

Within 15 (fifteen) days from the date of confirmation of the Installed Capacity and Absolute Energy Generation Guarantee (as defined in Clause 5.2 above) from the Supplier for all the sites covered under Schedule 1 of this Agreement, the Purchaser shall provide to the Supplier a Bank Guarantee equivalent to one (1) months' Tariff payable for Absolute Energy Generation Guarantee from Installed Capacity across all the Sites or Premises. The Bank Guarantee shall be issued by the Purchaser's scheduled bank. The Bank Guarantee shall be for a period of 1 (one) Year and renewed annually till the term of this Agreement. The Supplier shall be entitled to invoke such Bank Guarantee for its full face value or part thereof, in case of Purchaser's Event of a Default or any non-fulfilment of its obligations by the Purchaser under this Agreement. Upon such Bank Guarantee being fully or partly invoked by the Supplier during the Term of this Agreement, the Purchaser shall be liable to replenish such Bank Guarantee to its original value within a period of thirty (30) days. Such encashment of the Bank Guarantee by the Supplier shall not impact in any way the recovery of any other monthly arrears that may be due on the part of the Purchaser or any payment at the time of termination of this Agreement including payment of Buy Out value due as contemplated in this Agreement. At the end of the Term of this Agreement or on termination of this Agreement, whichever is earlier if no Purchaser's Event of Default exists, the Supplier shall return to the Purchaser such Bank Guarantee within a period 7 (seven) days.

6.4. **Terms of Payment**

6.4.1. The Due Date of payment shall be 15 (fifteen) days from the date of receipt of the Monthly Bill by the Purchaser (the "Due Date").

6.4.2. The Purchaser shall make payment of the Monthly Bill to the



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Bank Account of the Supplier as specified by the Supplier in the Monthly Bill. Any payment after Due Date would attract an interest @ 1% per month of the monthly bill generated in the name of the Purchaser.

6.5. Disputed Bill

6.5.1. If the Purchaser disputes the amount payable under a Monthly Bill, then it shall within 15 (fifteen) days of receipt of the Monthly Bill, issue a written notice (the "**Bill Dispute Notice**") to the Supplier setting out:

- (a) the details of the disputed amount; and
- (b) the reasons for disputing the amount including all written material in support of its claim.

6.5.2. The Purchaser shall pay the undisputed portion of Monthly Bill thereof to the Supplier within the Due Date.

6.5.3. If the Purchaser does not object prior to the Due Date, the Purchaser shall be obligated to pay the full amount of such invoices but the Purchaser may subsequently object to such invoice and, if such objection proves to be correct, receive a refund of the disputed amount; PROVIDED, however, that the Purchaser may not object to any invoice more than 6 (six) months after the date on which such invoice is rendered. The right to dispute or object to an invoice, shall, subject to the limitation time period provided in this Clause 6.5.3, survive the expiration or termination of this Agreement.

6.5.4. If the Supplier agrees to any part of the claim raised in the Bill Dispute Notice issued pursuant to the aforementioned Clause 6.5.1, the Supplier shall forego that part of the claim from the Monthly Bill which would have been payable by the Purchaser in the usual course within the applicable Due Date.

6.5.5. If the Supplier does not agree to the claim(s) raised in the Bill Dispute Notice issued by the Purchaser pursuant to the aforementioned Clauses, it shall, within 7 (seven) Business Days of receiving the Bill Dispute Notice, furnish a notice to the Purchaser providing:

- (a) reasons for its disagreement;
- (b) its estimate of what the correct amount should be; and
- (c) all written material in support of its counterclaim (the "**Reply Notice**").

6.5.6. Upon receipt of the Reply Notice, authorized representatives of the Supplier and the Purchaser shall meet and make best endeavours to amicably resolve such dispute within 15 (fifteen)



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Business Days of receipt of such Reply Notice.

6.5.7. If the Parties do not amicably resolve the dispute within 15 (fifteen) Business Days of receipt of the Reply Notice, the matter shall be referred to dispute resolution in accordance with the Dispute Resolution Clause of this Agreement.

6.5.8. In case the amounts disputed by the Purchaser are resolved in favour of the Supplier, the Purchaser shall be required pay such disputed amounts to the Supplier within 7 (seven) days of the resolution of the matter between the Parties.

6.5.9. The Parties further agree that irrespective of any unresolved disputes regarding any of the Monthly Bills, the Supplier shall continue to perform its obligations under the Agreement to the fullest extent, without any demur.

7. LICENSE OF THE PREMISES

7.1. The Purchaser hereby grants a non-exclusive license to access to the Supplier or its representatives for the area at the Premises as may be required for the effective and efficient installation, commissioning, operation, and the maintenance of the Solar Power Plant (the "**License**") at the Site during the Term of the Agreement. Provided that all the representatives of the Supplier shall follow all the required timings, formalities, disciplinary guidelines, security, and safety requirements for visitors of the Purchaser while entering and working in the Premises of the Purchaser.

7.2. The Purchaser acknowledges that the Supplier's performance under this Agreement is dependent on the validity of the License for the Term. The License shall be valid for the Term and shall be co-terminus with the Agreement.

7.3. A controlled copy of a plan depicting the Site forming the subject-matter of the License for each Premises shall be jointly signed by the Supplier and the Purchaser.

7.4. The License to access any part of the Premises shall not create any ownership rights in favour of the Supplier and the ownership of the Premises shall always remain with the Purchaser at all times.

7.5. The Supplier shall not directly or indirectly transfer, assign, sell, encumber, or part with its interest in its business in the Premises either in part or in whole in any manner whatsoever, or sublet, underlet, or part with the possession of the licensed Premises without obtaining prior written approval from the Purchaser at any time during the term of the Agreement.



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- 7.6. The Supplier may, subject to prior written approval of the Purchaser, hypothecate and/or charge or/and or create other encumbrances and/or mortgage the assets created, that are the Solar Power Plant installed at the Site, on the Premises for the limited purpose of offering such assets as security in favour of the lenders for securing any amount and payable by it to such lenders which may be any banking institution notified by the Central Government under Section 51 of the Banking Regulations Act, 1949 or a corresponding new bank as defined in clause (d) of Section 2 of the Banking Companies (Acquisition and Transfer of Undertakings) Act, 1970 or any of the Public Financial Institutions which may be notified by the Central Government in this behalf in consultation with the Reserve Bank of India or any other lender in India and abroad. Provided, however, all such mortgages, charges or encumbrances shall be subject to the rights of the Purchaser under this Agreement, and any modification or amendment thereof for the time being in force, and the provision of written consent by the Purchaser.
- 7.7. The Supplier undertakes to inform the Purchaser in writing the details of finance(s) raised on the security of the Solar Power Plants from time to time till the loan(s) is/are repaid to the financial agencies. The Supplier also undertakes to share the hypothecation documents with the Purchaser along with other details of hypothecation /mortgage or charge.
- 7.8. To the extent permitted by Applicable Law, each Party shall not directly or indirectly cause, create, incur, assume or suffer to exist any mortgage, pledge, lien, charge, security interest, encumbrance or claim of any nature, including claims by governmental authorities for taxes (collectively referred to as "**Liens**" and each, individually, a "**Lien**") on or with respect to the interests of the other in the Premises and the Solar Power Plant, and in the permission to enter granted hereunder.
- 7.9. Each Party shall promptly notify the other of the imposition of a Lien on the property interests of the other Party, and shall promptly discharge such lien, provided however, that a Party may seek to contest the amount or validity of any Lien affecting the property of the other Party, provided it timely complies with all procedures for contesting such Lien, posts any bond or other security necessary under such procedures, and if such procedures do not require the posting of security, the Party establishes for the benefit of the other Party a deposit, letter of credit, or other security acceptable to the other Party to indemnify the other Party against any Loss which could reasonably be expected to arise if such Lien is not removed or discharged. This clause shall be guided by standard Laws of Lien.
- 7.10. The Parties agree that the Supplier or its assignees shall not have any Lien on the Premises provided by the Purchaser in any shape or form whatsoever and the Purchaser and its assignees shall not have any lien on the Solar Power Plant in any shape or form whatsoever.



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- 7.11. The Supplier has represented to the Purchaser that the Solar Power Plant shall be set up by the Supplier. Further the Parties understand that the Supplier may create a charge on the Solar Power Plant excluding the Site and the Premises on which the Solar Power Plant is erected and/or assign this Agreement, but in no event the creation of charge on the Solar Power Plant or assignment shall have any effect on this Agreement and shall not affect the business of the Purchaser. In case of Transfer of Ownership by the Supplier during or at the end of the Term of this contract as per provisions of this Agreement the Supplier shall ensure that the Solar Power Plant is free from any charge, lien or any kind of encumbrances. The new assignee shall carry forward the Supplier's liabilities and obligations under this Agreement.
- 7.12. Non-Disturbance Agreements: The Purchaser shall pay for and obtain all consents required for it to enter into and perform its obligations under this Agreement from its lenders, landlord, tenants, and any other persons with interests in the Premises. If there is any charge against the Premises which could reasonably be construed as prospectively attaching to the Solar Power Plant, the Purchaser shall promptly provide an acknowledgement and consent from such lienholder, in form and substance reasonably acceptable to the Supplier, stating that the ownership of the property in goods over the Solar Power Plant remains in the Supplier and further acknowledging that the Solar Power Plant is personal property of the Supplier and agreeing not to disturb the rights of the Supplier in the Solar Power Plant and under this Agreement. Such acknowledgment and consents, or acceptable notices thereof, shall be recorded, at the Purchaser's expense, with the appropriate authority. The Purchaser may in the future mortgage, pledge, and grant security interests in all or a portion of the Premises and the improvements thereon, provided the mortgagee or other grantee of the encumbrance acknowledges this Agreement, the Solar Power Plant, the access Permissions granted hereunder, and the priority of the Supplier's rights in the Solar Power Plant and the access Permissions.
- 7.13. All charges towards stamp duty, court fees & lawyer/coordinator for registration shall be completely borne by the Supplier.
- 7.14. For any dispute between the Parties, the same shall be resolved as per Dispute Resolution mechanism mentioned in this Agreement.

8. **OBLIGATIONS OF THE PARTIES**

8.1. **Obligations of the Supplier**

During the Term, the Supplier shall:

- 8.1.1 Be responsible for obtaining and maintaining all approvals relating to installation and operation of Solar Power Plant, all the



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statutory charges for above approvals shall be paid by the Supplier and the Purchaser shall assist in completing documentation work where necessary for obtaining quick approvals from the concerned Authorities.

- 8.1.2. Undertake the installation and commissioning of the Solar Power Plant on the Premises at its own cost in accordance with the terms and conditions of the Agreement and the Applicable Laws;
- 8.1.3. Install and operate and maintain all necessary infrastructure for delivery of Solar Power at Injection Point;
- 8.1.4. Continue supplying Solar Energy within the agreed timelines for the Term of the Agreement;
- 8.1.5. The Solar Energy supplied would be injected at 415 V, 50Hz, into the LT panel (Injection Point). Suitable provisions shall be setup by Supplier to maintain the quality of power as per the provisions of electricity laws of India, including the Electricity Act, 2003 as amended and modified from time to time and the Electricity Rules, 2005 as amended from time to time for generation, transmission, and distribution of the electricity;
- 8.1.6. Operate and maintain the Solar Power Plant in accordance with the terms and conditions of the Agreement and the Applicable Laws during the Term;
- 8.1.7. Ensure that the Solar Power Plant shall have optimum Installed Capacity at each of the Premises and the Supplier shall ensure operation and maintenance of the Solar Power Plant to ensure smooth operation for the Term at its own cost and expense;
- 8.1.8. The Supplier shall bear all costs pertaining to installation, testing, calibration, maintenance, and repair of the Meter at the Injection Point;
- 8.1.9. Keeping complete and accurate records and all other data required for the purpose of accounting the Solar Energy supplied and consumed;
- 8.1.10. Take maximum care to protect all the assets and belongings to the Purchaser on the Premises while installing, operating, maintaining & removing the Solar Power Plant. Any damage to property of the Purchaser attributable to the Supplier shall be rectified or reimbursed by the Supplier to the Purchaser;
- 8.1.11. Indemnify and hold the Purchaser harmless against all damage and losses caused to the Purchaser arising out of any failure, malfunctioning or faulty functioning of the Solar Power Plant due to any act or omission attributable to the Supplier;



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- 8.1.12. At its own cost and expense obtain and maintain all such Applicable Permits as are necessary for performing its obligations under the Agreement. The Supplier shall be responsible for procuring all the required statutory approvals and licences, including approval for supply of power to industrial establishments and net metering. The Purchaser, shall on the request of the Supplier, provide documentation support for the same;
- 8.1.13. Check the fixing of panels at the Site and give a report in a prescribed format to the Purchaser on the status of fixing on a bi-monthly basis. The Supplier shall take immediate action on any deviation observed in fixing of the PV panels;
- 8.1.14. Arranging the interconnection of the Solar Power Plant with the Purchaser's Local Electric Utility at HT/LT connection level including net metering approvals and fulfilling any other requirements of the distribution licensees. Cost related to net metering application however shall have to be borne by the Purchaser;
- 8.1.15. Produce all the supplier test certificates, inspection report and inspect all the material supplied to the project for adherence to specification specified in Annex VI; and
- 8.1.16. Always ensure and be solely responsible for complying with all the safety standards and requirements of the Purchaser for undertaking any work under this Agreement. Further, the Supplier shall be solely responsible for ensuring compliance with Clause 10 of this agreement relating to 'Safety at Workplace'.

8.2. Obligations of the Purchaser

During the Term of the Agreement, the Purchaser shall:

- 8.2.1. At its own cost and expense undertake, comply with, and perform all its obligations set out in the Agreement;
- 8.2.2. Provide all reasonable assistance necessary to the Supplier during the period of installation and commissioning of the Solar Power Plant and during the entire Term of the Agreement so that the Supplier may perform its obligations without any hindrances;
- 8.2.3. Make timely payments of the Tariff to the Supplier in the manner and in accordance with the terms and conditions set out in the Agreement;



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- 8.2.4. Exercise best endeavors to provide reasonable assistance necessary to the Supplier for obtaining Applicable Permits;
- 8.2.5. Ensure that the Purchaser does not put up any permanent or temporary structure in its Premises which may cause obstruction to sun light falling on all solar modules forming part of the Solar Power Plant, provided however, this shall not prevent the Purchaser from carrying out the proposed expansion of its existing manufacturing facility;
- 8.2.6. Provide at its cost the security for the Premises and the Solar Power Plant. The Supplier and its employees shall at all times, follow the Purchaser's visitor policy and security protocols including timings, formalities, disciplinary guidelines and safety requirements while entering and working in the Premises of the Purchaser;
- 8.2.7. Indemnify and hold the Supplier harmless against all damage and losses caused to the Supplier arising out of any failure, malfunctioning or faulty functioning of the Solar Power Plant due to any act or omission solely attributable to the Purchaser.

9. **DAMAGE**

9.1. **Damage by The Purchaser**

In the event that the Solar Power Plant is damaged, except Force Majeure events, due to any reasons solely attributable to the Purchaser, or any of its employees, agents, contractors or affiliates, the Purchaser:

- 9.1.1. Shall be responsible for any cost of repairing or replacing any component of the Solar Power Plant and rectifying the damage.
- 9.1.2. Shall continue to be billed as per Deemed Generation until the Solar Power Plant is restored to full capacity, and the Purchaser shall be responsible for the payment of these bills.

9.2. **Damage by The Supplier**

In the event that the Solar Power Plant or any other property of the Purchaser is damaged by any act, negligence or omission, except Force Majeure events, by the Supplier, or any of its employees, contractors or affiliates, the Supplier:

- 9.2.1. Shall be responsible for the cost of repairing the Solar Power Plant or replacing the component of the Solar Power Plant or cost of repair or replacement of such other property of the Purchaser.

9.2.2. Shall not bill the Purchaser for any Deemed Generation. If such



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Deemed Generation is billed to the Purchaser, the Purchaser shall not be obliged to pay the amount to the Supplier.

9.2.3. The Supplier shall supply a minimum quantity of Solar Energy from each Site as defined as Absolute Energy Generation Guarantee subject to 100% grid availability. The Absolute Energy Generation Guarantee as defined in Clause 5.2 above for each Site or Premises shall form the basis for the calculation of deficit in Solar Energy units generated for each Site.

9.2.4. The Supplier shall be liable to pay as and by way of liquidated damage charges for deficit against the compliance of Clause 9.2.3 of this Agreement which shall be calculated as mentioned below:
Liquidated Damage Charges for Deficit = (Weighted average rate at which Power procured from other sources per kWh - Demand charges per kWh - PPA tariff @ Rs 3.95/kWh)* Number of units deficit against the Absolute Energy Generation Guarantee for that Site

9.3. In the event of a delay in achieving the COD by the Supplier, provided that such delay was not as a result of getting the necessary government approvals from the concerned authorities or the Purchaser's negligence or breach of its obligations hereunder or due to a Force Majeure Event, the Supplier shall be provided another 30 (thirty) days to commission the respective Solar Power Plant and if SCOD is still not achieved in those 30 (thirty) days, the Supplier shall pay to the Purchaser as and by way of liquidated damages, a sum on account of delay in achieving the SCOD ("**Delay Liquidated Damages**"), as per the following calculation:

Delay Liquidated Damages = Absolute Energy Generation Guarantee during delay period * (Weighted average rate at which Power procured from other sources per kWh - demand charges per kWh - PPA tariff @ Rs 3.95/kWh)

Delay Liquidated Damages shall be payable on actual basis with maximum ceiling of Rs 3/- per kWh. For avoidance of doubt under any circumstance Delay Liquidated Damages shall not be more than Rs 3/- per kWh. The Delay Liquidated Damages shall be paid to the Purchaser through RTGS/ Cheque payment once such demand has been raised as per provisions of this Agreement by the Purchaser.

The total number of Solar Power units lost shall be calculated on a pro-rata basis from the Absolute Energy Generation Guarantee for that Site. The Delay Liquidated Damages shall be calculated from the date falling after the SCOD or the extended SCOD and up to the COD agreed by both Parties. The Delay Liquidated Damages shall be subject to a cap



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of liquidated damages payable for a maximum period of 1 (one) month of delay in achievement of the COD.

- 9.4. In the event of any delay on the part of the Supplier to establish the Solar Power Plant and to also achieve the COD beyond 2 (two) months from the SCOD (including notice period), the Purchaser shall be at liberty to terminate this Agreement without any rights or claims inter-se between the Parties. The Supplier shall also be liable to pay the Purchaser as and by way liquidated damages, an amount equivalent to six (6) months of Delay Liquidated Damages as calculated as per Clause 9.3 above, and the payment of such damages shall in no way limit any other remedies that the Purchaser may have in equity and in law.

10. SAFETY AT WORKPLACE

The Supplier shall strictly comply with the following ensure that: -

- 10.1.1. It appoints a dedicated full time safety supervisor for the purposes of compliance of its obligations under this Agreement, who must be present during execution of any of the works associated with this Agreement, including when access of the Premises is required for such work, and also to ensure that the Supplier is in compliance with all the safety standards of the Purchaser;
- 10.1.2. Appropriate work permits are taken from the Purchaser's Safety Department before starting any work under the Agreement on a daily basis;
- 10.1.3. A Safety talk / briefing shall be given to all the workers of the Supplier tasked with doing any work under the Agreement before starting any work thereon. All such guidelines shall also be mailed in writing to the Supplier and duly acknowledged by the Supplier;
- 10.1.4. All the workers shall wear appropriate Personal Protection Equipment such as Safety shoes, helmets, and goggles while doing any work incidental to the Agreement;
- 10.1.5. Any worker whose work involves working at a height must wear a safety harness with double lanyard;
- 10.1.6. Any worker, whose work involves any welding processes, must wear welding shield and gloves;
- 10.1.7. Any welding machine to be used for the Project must be connected with a Residual Current Circuit Breaker (RCCB) & an industrial power socket;



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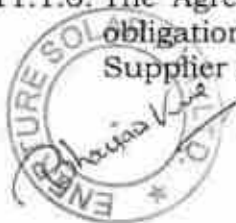


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- 10.1.8. The valves of any Gas cutting blowpipe must be fitted with flash back arrester and valve guard;
- 10.1.9. Any Gas cylinders required for the project must be mounted on gas trolleys with double two-level fastening system and calibrated pressure gauges must be fitted to the valves of the cylinders;
- 10.1.10. Fire extinguishers are placed at any place where any hot work, such as welding is to be carried out;
- 10.1.11. Lifelines must be provided all around the roof of the building where the Solar Power Plant is to be erected;
- 10.1.12. Industrial sockets must be provided for all electrical equipment required for use in the project;
- 10.1.13. Lifting tools and tackles are in compliance with Form 32.; and
- 10.1.14. Any other safety standards / guidelines issued by The Purchaser from time to time shall be followed and strictly adhered to by the Supplier and its workers.

11. REPRESENTATIONS AND WARRANTIES

- 11.1. The Supplier hereby represents and warrants to the Purchaser that as on the Effective Date:
 - 11.1.1. It is duly organized, validly existing and in good standing under the Laws of the Republic of India;
 - 11.1.2. It has taken all necessary corporate and other action under the Laws of the Republic of India to authorize such execution, delivery, and performance of the Agreement;
 - 11.1.3. It has the financial standing and the technical expertise and capacity to perform its obligations under the Agreement;
 - 11.1.4. It shall not breach any of its obligations under this Agreement.
 - 11.1.5. It shall ensure that it has not acted in breach or made any misstatements with respect to its compliance with the Applicable laws;
 - 11.1.6. The Agreement when executed constitutes valid and binding obligations on the Supplier and is enforceable against the Supplier in accordance with the terms of the Agreement;



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11.1.7. The execution, delivery, and performance of its obligations under the Agreement does not and shall not:

- (a) Contravene any Law; or
- (b) Conflict with or result in any breach or default under any agreement, instrument, regulation, licence, or authorisation binding upon it or any of its assets.

11.2. The Purchaser hereby represents and warrants to the Supplier that as on the Effective Date:

11.2.1. It is duly organized, validly existing and in good standing under the Laws of the Republic of India;

11.2.2. It has taken all necessary corporate and other action under the Laws of the Republic of India to authorize such execution, delivery, and performance of the Agreement;

11.2.3. The Agreement when executed constitutes valid and binding obligations on the Purchaser and is enforceable against the Purchaser in accordance with the terms of the Agreement;

11.2.4. It has the financial standing and capacity for payment of the Tariff to the Supplier; and

11.2.5. The execution, delivery, and performance of its obligations under the Agreement does not and shall not:

- (a) contravene any Law; or
- (b) conflict with or result in any breach or default under any agreement, instrument, regulation, licence, or authorisation binding upon it or any of its assets.

11.3. Each of the representations and warranties mentioned above shall be construed as a separate warranty and (save as expressly provided to the contrary herein) shall not be limited or restricted by reference to or inference from the terms of any other warranty or any other term of the Agreement.

12. INSURANCES

12.1. The Supplier shall effect and maintain or cause to be effected and maintained, at its own cost and expense, throughout the term, asset Insurances and insurance for its employees working at the Solar Power Plant.

12.2. Save as expressly provided in the Agreement or the Insurances, the proceeds of any insurance claim made due to loss or damage to the Solar Power Plant, or any part of the Solar Power Plant shall be first applied to reinstatement, replacement or renewal of such loss or



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damage, which shall be carried out within a period of 2 (two) months from the date of receipt of the proceeds of insurance claim. Any surplus generated out of insurance claims shall be equally shared between the Parties.

- 12.3. If a Force Majeure Event renders the Solar Power Plant no longer economically and technically viable and the insurers under the Insurances make payment on a **"total loss"** or equivalent basis, the proceeds of such payment shall be used by the Supplier to restore the Installed Capacity of Solar Power Plant at the particular Site for the benefit of the Purchaser. The differential cost arising on account of Force Majeure clause as mentioned in this Agreement in setting up a new Solar Power Plant by the supplier for the Purchaser on receipt of the insurance claims and other claims by the supplier shall be borne by the Supplier.

13. OWNERSHIP OF THE POWER PLANT

- 13.1. Subject to the terms of this Agreement, the Supplier shall be the legal and beneficial owner of the Solar Power Plant throughout the Term and the Solar Power Plant shall remain the property of the Supplier and shall not attach to or be deemed a part of, or fixture to the Premises.
- 13.2. The Purchaser covenants that it shall place all persons having an interest in or lien upon the real property comprising the Premises, on notice of the ownership of the Solar Power Plant and the legal status or classification of the Solar Power Plant as movable and personal property of the Supplier or its assignee as the case may be. The Purchaser shall make any necessary filings to disclaim the Solar Power Plant as a fixture of its respective Premises with the appropriate authorities to place all interested parties on notice of the ownership of the Solar Power Plant by The Supplier or its assignee as the case may be.
- 13.3. The Parties hereby agree that at the end of the Term or at Termination of the Agreement under any conditions, the Purchaser shall have the first right of refusal to purchase the Solar Power Plant as per the terms of this Agreement, free from any charge, lien or any kind of encumbrances. The Purchaser hereby agrees that it shall be solely liable to bear all taxes as may be applicable for the purchase of the Solar Power Plant from the Supplier. The Parties hereby agree that such right under this clause shall be exercised by the Purchaser at least 2 (two) months prior to the termination of this Agreement, the end of the term standard maintenance has to be performed before the handover.
- 13.4. Transfer of Ownership: Upon the Purchaser's notice that it elects to exercise the option set forth in Clause 13.3, the Purchaser and the Supplier shall enter into an agreement in mutually agreed terms to transfer the Solar Power Plant and the rights and obligations attached thereto. In case of Transfer of Ownership during or at the end of the



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Term of this contract, the Supplier shall ensure that the Solar Power Plant is free from any charge, lien or any kind of encumbrances.

- 13.5. In the event the Purchaser wishes to purchase the Solar Power Plant at any time, then The Supplier shall transfer the Solar Power Plant to the Purchaser at a value as shown in Annexure I. If the Purchaser wishes to purchase anytime during a particular year, then the value shall be pro-rated. However, any taxes or duties applicable for such transfer shall be entirely borne by the Supplier.
- 13.6. Operation & Maintenance After Sale: Upon the Purchaser's notice that it elects to exercise the option set forth in Clause 13.3, the Purchaser and the Supplier shall discuss entering into an operation and maintenance agreement under which the Supplier shall perform all or a portion of the operation and maintenance requirements of the Solar Power Plant following the Purchaser's purchase of the Solar Power Plant. However, neither Party shall be under an obligation to enter into such an agreement.
- 13.7. Removal of the Solar Power Plant: Subject to the buy-out/purchase of the Solar Power Plant by the Purchaser, upon the expiry of the Term or early termination of this Agreement, the Supplier shall, at its own expense, remove all of its tangible property and equipment comprising the Solar Power Plant from the Premises on a mutually convenient date but in no case later than ninety (90) days after the date of expiry of the Term or early termination of this Agreement. If the Supplier fails to remove the Solar Power Plant by such agreed upon date, the Purchaser shall have the right, at its option, to remove the Solar Power Plant. For the purposes of the Supplier's removal of the tangible property and equipment comprising the Solar Power Plant, the Purchaser's covenants in relation provision of uninterrupted access to the Supplier shall remain in effect until the date of actual removal of the tangible property and equipment comprising the Solar Power Plant.

14. SHUTDOWNS, RELOCATION; CLOSURE OR SALE OF PREMISES

14.1. The Purchaser Requested Shutdown

14.1.1. During any shutdown period (but not including periods of Force Majeure), the Purchaser shall pay the Supplier an amount equal to the payments that the Purchaser would have made to the Supplier hereunder for electric energy that would have been produced by the Solar Power Plant during the period of the shutdown;

14.1.2. Determination of the amount of energy that would have been produced during the period of the shutdown shall be based on Deemed Generation computed as per Annexure II of this Agreement.



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- 14.1.3. The Supplier Shutdown: The Supplier may shut down the Solar Power Plant at any time in order to perform required emergency repairs and/or maintenance to the Solar Power Plant for a maximum of seven (7) days. The Supplier may shutdown the Solar Power Plant with intimation to The Purchaser. The Supplier agrees to notify the Purchaser seven (7) days in advance.

14.2. Plant Relocation:

If the Solar Power Plant needs to be temporarily moved or its generation suspended during Premises repairs or for any other reason, either at the request of the Purchaser or due to acts of negligence or omission of the Purchaser or its employees, agents or contractors, the Purchaser shall be responsible for any costs arising from moving or disassembling the Solar Power Plant. In the event the Solar Power Plant relocation is requested by the Supplier for reasons solely attributable to the Supplier, all costs arising from such moving or disassembling the Solar Power Plant shall be solely to the account of the Supplier.

14.3. Suspension of Generation:

- 14.3.1. Any interruption in generation of Electricity during such relocation as described herein above in Clause 14.2, and reasons attributable to the Purchaser shall continue to be billed as per Deemed Generation, during the period of interruption.

- 14.3.2. where the electricity generation is suspended or the Solar Power Plant is to be temporarily moved on account of any acts of negligence or omission of the Supplier or its employees, agents or contractors, the cost for relocation / disassembling shall be to the account of the Supplier, who shall further compensate to the Purchaser as per Clause 9.2.4 for shortfall in solar energy for the period such event occurs.

- 14.3.3. In addition, during the Relocation Event, except in the circumstances envisaged under Clause 14.3.2 above:



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- (a) The Purchaser shall pay the Supplier an amount equal to the payments that the Purchaser would have made to the Supplier hereunder for electric energy that would have been produced by the Solar Power Plant following the Relocation Event;
- (b) Determination of the amount of energy that would have been produced following the Relocation Event shall be based, during the first Operations Year, on the Deemed Generation and, after the first Operations Year, based on actual operation of the Solar Power Plant in the same period in the previous Operations Year, unless the Supplier and the Purchaser mutually agree to an alternative methodology.

14.4. Premises Shutdown; Interconnection Deactivated

14.4.1. In the event Premises are closed as a result of an event that is not:

- (a) a Force Majeure Event or
- (b) caused by or related to any unexcused action or inaction of the Supplier,

the Purchaser shall nevertheless continue to pay the Supplier for all electricity produced by the Solar Power Plant on the Premises and delivered to the Point of Delivery.

14.4.2. If an interconnection with the Local Electric Utility becomes deactivated for reasons that are not:

- (a) a Force Majeure Event or
- (b) caused by or related to any unexcused action or inaction of the Supplier such that the Solar Power Plant is no longer able to produce electricity or transfer electricity to its respective Premises or to the Local Electric Utility,

the Purchaser shall pay the Supplier an amount equal to the sum of payments that the Purchaser would have made to the Supplier hereunder for electric energy that would have been produced by the Solar Power Plant following such clause as per Deemed Generation (Annexure II)

14.4.3. Determination of the amount of energy that would have been produced following such closure shall be based, during the first Operations Year, on the estimated levels of production and, after the first Operations Year, based on actual operation of the Solar Power Plant in the same period in the previous Operations Year, unless the Supplier and the Purchaser mutually agree to an alternative methodology.



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14.4.4. If a shutdown pursuant to this Clause 14.4 continues for 365 days or longer, the Purchaser has the option to buyout the Solar Power Plant as specified in Clause 13.3 of this Agreement.

14.5. Sale of Premises

14.5.1. The Parties hereby confirm that they are entering into the Agreement in good faith and have no current plans or discussion of plans of ceasing business operations.

14.5.2. In the event the Purchaser transfers (by sale, lease, or otherwise) all or a portion of its interest in the Premises, the Purchaser shall remain primarily liable to the Supplier for the performance of the obligations of the Purchaser hereunder notwithstanding such transfer.

14.5.3. However, if no Purchaser Event of Default has occurred and is continuing and the transferee is acceptable to the Supplier in their sole discretion and executes agreements assuming this Agreement in form and substance satisfactory to the Supplier in their sole discretion, the Purchaser may be released from further obligations under this Agreement.

14.5.4. In the event that the Purchaser or the transferee wishes to terminate the Agreement, then they shall pay to the Supplier applicable buy out value.

15. FORCE MAJEURE

15.1. For the purposes of this Clause 15, the term "**Affected Party**" means the Supplier or the Purchaser whose performance has been affected by a Force Majeure Event.

15.2. **Force Majeure:** A Force Majeure Event shall mean any event or circumstance, or combination of events stated below that wholly or partly prevents or delays unavoidably an Affected Party in the performance of its obligations under the Agreement, but only if and to the extent that such event or circumstance is not within the reasonable control, directly or indirectly, of the Affected Party and could not have been avoided if the Affected Party had taken reasonable care:

15.2.1. Act of God, including, but not limited to fire and explosion (to the extent originating from a source external to the Premises), earthquake, epidemic, pandemic, volcanic, eruption, landslide, flood, cyclone, typhoon, or tornado;



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- 15.2.2. Any act of war (whether declared or undeclared), invasion, armed conflict or act of foreign enemy, blockade, embargo, revolution, riot, insurrection, terrorist or military action;
- 15.2.3. General Strikes/lockouts outside the facilities of the Purchaser and affecting the Parties;
- 15.2.4. radioactive contamination or ionising radiation originating from a source in India or resulting from another Force Majeure Event mentioned above excluding circumstances where the source or cause of contamination or radiation is brought or has been brought into or near the Solar Power Plant by the Affected Party or those employed or engaged by the Affected Party; and
- 15.2.5. Any act or event, which is unforeseeable beyond the reasonable control of and has occurred without the fault or negligence of the Affected Party.
- 15.3. **Force Majeure Exclusions:** For avoidance of doubt, Force Majeure Event shall not include the following conditions (which list is not intended to be exhaustive or limitative and is indicative):
- 15.3.1. Unavailability, late delivery, or changes in cost of the Solar Power Plant, machinery, equipment, materials, spare parts, or consumables for the Solar Power Plant;
- 15.3.2. Delay in the performance of any contractor, sub-contractor, or their agents;
- 15.3.3. Non-performance resulting from normal wear and tear typically experienced in projects generating power using Solar PV;
- 15.3.4. Insufficiency of finances or funds or the Agreement becoming onerous to perform; and
- 15.3.5. Non-performance caused by, or connected with, the Affected Party's:
- (a) Negligent or intentional acts, errors, or omissions;
 - (b) Failure to comply with Laws; or
 - (c) Breach of, or default under the Agreement.

15.4. **Notice of Force Majeure Event**

- 15.4.1. The Affected Party shall give notice to the other Party of any Force Majeure Event as soon as reasonably practicable, but not later than thirty (30) Business Days after the date on which such Party knew or should reasonably have known of the commencement of the Force Majeure Event.



15.4.2. The Affected Party shall give notice to the other Party of (i) the cessation of the relevant Force Majeure Event; and (ii) the cessation of the effects of such Force Majeure Event on the performance of its rights or obligations under the Agreement, as soon as practicable after becoming aware of each of these cessations.

15.5. **Duty to Perform and Duty to Mitigate**

To the extent not prevented by a Force Majeure Event, the Affected Party shall continue to perform its obligations pursuant to the Agreement. The Affected Party shall use its reasonable efforts to mitigate the effect of any Force Majeure Event as soon as practicable.

15.6. **Available Relief for a Force Majeure Event**

15.6.1. No Party shall be in breach of its obligations pursuant to the Agreement if the performance of its obligations was prevented, hindered, or delayed due to a Force Majeure Event;

15.6.2. Every Party shall be entitled to claim relief in relation to a Force Majeure Event in regard to its obligations.

15.6.3. For avoidance of doubt, it is categorically agreed upon between both the parties that any money outstanding due to be payable to any of the parties prior to occurrence of Force Majeure events shall not be suspended or excused due to the occurrence of a Force Majeure Event in respect of such Party.

15.7. Both the Parties shall mutually agree upon to extend the Term of the Agreement to overcome the loss of revenue incurred to the Supplier on account of such Force Majeure Event.

15.8. The Parties agree to restore the Solar Power Plant and the Premises to the Installed Capacity.

16. **EVENTS OF DEFAULT AND TERMINATION**

16.1. An Event of Default shall mean in respect to a Party ("**Defaulting Party**"), the occurrence of any one of the following, subject to the applicable opportunity to cure:

16.1.1. No Opportunity to Cure: Unless otherwise agreed to between the Parties an act of insolvency with respect to a Party to the Agreement or such Party is adjudged bankrupt shall constitute an immediate Event of Default, without the opportunity to cure;

16.1.2. Fifteen (15) Day Opportunity to Cure: Unless otherwise agreed to between the Parties, any of the following shall constitute an



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immediate Event of Default, unless the Party shall have cured the same within Fifteen (15) days of receipt of notice of such Event of Default from the other Party:

- (a) The Supplier's failure to supply Solar Power to the Purchaser for any reasons in accordance with the terms of the Agreement after ninety (90) days from the Effective Date;
- (b) The revocation or cancellation or impairment of any license, approval or permit obtained by either Party which has a material adverse effect on the Solar Power Plant;
- (c) The failure or refusal by either Party to perform its material obligations under the Agreement;
- (d) A breach by the Supplier of its obligations under any of the sub-clauses to Clause 8 and/or Clause 9;
- (e) If an Event of Force Majeure has extended for a continuous period of twelve (12) months or beyond; and
- (f) Any representation or warranty made by the Supplier herein is false or misleading in any respect at the time it was made.

16.2. Termination of Development Activities and Agreement

16.2.1. Notwithstanding anything contained in this Agreement at any time before the COD, the Supplier shall have the right to cease development of the Solar Power Plant(s) on the Premises, for reasons only dealing with changes in law or government regulations coming into effect after the Effective Date, which would render the Project unviable. If the Supplier gives the Purchaser notice of such determination, this Agreement shall stand terminated effective as of the delivery of such notice without any further liability of the Parties to each other, provided that

16.2.2. The Supplier shall remove any equipment or materials which the Supplier has placed on the Premises;

16.2.3. The Supplier shall restore any portions of the Premises disturbed by the Supplier to its pre-existing condition, i.e. prior to the commencement of construction;

16.2.4. The Parties shall not be released from any payment or other obligations arising under this Agreement prior to the delivery of the notice.



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16.3. Termination of the Agreement

- 16.3.1. In case of occurrence of any Event of Default with no opportunity to cure as contained in the aforementioned Clause 16.1, the non-Defaulting Party may terminate the Agreement at its own discretion, immediately on happening of such Event of Default.
- 16.3.2. In case of occurrence of any Event of Default with 15 (fifteen) Business Days' opportunity to cure as contained in Clause 16.1.2 above, the non-Defaulting Party shall serve a notice in writing to the Defaulting Party giving 30 (thirty) Business Days from date of receipt of such notice, to cure the said default. Where the Defaulting Party fails to cure the said default within the said period of 30 (thirty) Business Days or any extended period that may be mutually agreed between the Parties, the non-Defaulting Party at its sole discretion can terminate the Agreement without further notice.
- 16.3.3. If the Termination of this Agreement occurs due to default by the Supplier as per aforementioned Clause 16.1, the Supplier shall be under legal obligations to pay the Purchaser an amount equivalent to six (6) months of Delay Liquidated Damages as calculated in Clause 9.3 of this Agreement, and the payment of such damages shall in no way limit any other remedies that the Purchaser may have in equity and in law.
- 16.3.4. Upon an Event of Default by Purchaser, the Purchaser shall pay to the Supplier the amount equivalent to the sum of Buy Out value as specified in Annexure I of this Agreement. Upon termination of this Agreement, the Purchaser shall pay the Buy Out price for the relevant year to the Supplier, no later than fifteen (15) days from the date of termination of this Agreement.
- 16.3.5. In the event of Termination for any of the reasons specified in the Agreement, except for Clause 16.3.4, The Purchaser shall have the first option to Buy Out the Solar Power Plant at the mutually agreed value between the Parties. In case the Purchaser does not exercise the option to Buy Out the Solar Power Plant, the Supplier shall remove the equipment related to the Solar Power Plant within fifteen (15) days and vacate the Premises.
- 16.3.6. The expiry or termination of the Agreement due to any Event of Default shall be without prejudice to the accrued rights and liabilities of the Parties at the date of expiry or termination, unless waived in writing by the Parties.



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16.3.7. The confidentiality provisions of Clause 20, the indemnity obligations under Clause 18 hereof, and the dispute resolution provisions of Clause 21 hereof shall continue to apply notwithstanding the termination of this Agreement.

17. LIMITATIONS OF LIABILITY

Neither Party nor any of its directors, officers, shareholders, partners, members, agents, employees, subcontractors or the Suppliers shall be liable for any loss of revenue, loss of profit, loss of opportunities, loss of use, loss of production, loss of contracts or for any other financial or economic loss whatsoever nor for any indirect or consequential loss of any kind arising out of their performance or non-performance hereinunder and under the law of torts, except those arising from any fraud, intentional or wilful misconduct or illegal or unlawful acts on its part. Notwithstanding however, the total liability of either Party for any default under this Agreement, shall under no circumstances exceed Rs. 50,00,000/- (fifty lacs).

18. INDEMNIFICATION

18.1. Each Party (the "**Indemnifying Party**") shall indemnify, defend, and hold harmless the other Party (the "**Indemnified Party**") and its Affiliates and their respective officers, directors, employees, agents, successors, and assigns, from and against all claims, damages, liabilities, losses and costs including reasonable attorney's fees (the "**Losses**") in connection with or relating to, any claims or proceedings to the extent arising from:

18.1.1. the Indemnifying Party's negligence or intentional act or omissions;

18.1.2. Any claims that the Indemnifying Party has acted in a manner that contravenes any Applicable Permits or Laws;

18.1.3. Any claims arising out of the Indemnifying Party's breach of its representations and warranties under this Agreement;

18.1.4. The Indemnifying Party breaching any obligation with regard to Confidential Information as set out in this Agreement; and

18.1.5. Any claims arising out of the Indemnifying Party's breach of its obligations and responsibilities under this Agreement.

18.1.6. Any failure to properly interconnect or comply with the procedures of the Local Electric Utility; or

18.1.7. Any failure to properly handle or dispose of any Hazardous



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Materials brought onto the Premises by any of the Parties or by any their employees, agents, volunteers, and invitees.

- 18.2. **Survival of Indemnification:** The obligations of indemnification as specified above shall survive termination of this Agreement.

19. **INDEPENDENT CONTRACTOR**

The Supplier acknowledges that it is acting as an independent contractor, and that it is solely responsible for its actions or inactions, and that nothing in this Agreement shall be construed to create an agency or employment relationship between the Purchaser and the Supplier or its employees. The Supplier is not authorized to enter into contracts or agreements on behalf of the Purchaser or to otherwise create obligations of Purchaser to third parties. The Parties hereby acknowledge and agree that any workers or personnel engaged by the Supplier and providing services on-site at the Premises shall be employees of the Supplier and not of the Purchaser or any of its subsidiaries for all purposes, including workers' compensation, taxes, compensation and employee benefits. The Supplier agrees that the Supplier shall be solely responsible for payment of all applicable workers' compensation, disability benefits, employee benefits and unemployment insurance, and for withholding and paying such employment taxes and income withholding taxes as required.

20. **CONFIDENTIALITY**

20.1. **General Obligation**

Each Party undertakes that it shall not reveal and shall use its reasonable efforts to ensure that its directors, officers, managers, partners, members, employees, legal, financial and professional advisors, consultants and bankers (collectively, the "**Representatives**") do not reveal, to any third party any Confidential Information belonging to the other Party and disclosed to it under or in connection with this Agreement, without the prior written consent of the other Party, as the case may be. The term "**Confidential Information**" as used in the Agreement means (a) any information concerning the organization, business, technology, trade secrets, know-how, finance, transactions or affairs of the Parties or any of their respective Affiliates, directors, officers or employees (whether conveyed in written, oral or in any other form and whether such information is furnished before, on or after the date hereof), (b) the contents and the subject matter of the Agreement, (c) the negotiations relating to the Agreement, (d) any information or materials prepared by a Party or its Representatives that contains or otherwise reflects, or is generated from, Confidential Information.

- 20.2. **Exception:** The provisions of the aforementioned Clause 20.1 above shall not apply to:



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- 20.2.1. the disclosure of information which the recipient can reasonably demonstrate is in the public domain through no fault of the recipient Party;
- 20.2.2. disclosure of Confidential Information that is or becomes generally available to the public other than as a result of disclosure by or at the direction of a Party or any of its Representatives in violation of the Agreement;
- 20.2.3. disclosure of Confidential Information by a Person to the extent that any such information is later acquired by a Party from a source not obligated to any other Party hereto, to keep such information confidential or such information was previously known or already in the lawful possession of the Party, prior to such disclosure;
- 20.2.4. disclosure of any information, materially similar to the Confidential Information, and such information shall have been independently developed by the Party without reference to any Confidential Information furnished by any other Party hereto;
- 20.2.5. disclosure by a Party to its Representatives provided such Representatives are bound by similar confidentiality obligations; or
- 20.2.6. disclosure, after giving prior notice to the other Parties to the extent practicable under the circumstances and subject to any practicable arrangements to protect confidentiality, to the extent required under the rules of any stock exchange or under any Law or generally accepted accounting principles applicable to any Party or judicial or regulatory process or in connection with any judicial process regarding any legal action, suit or proceeding arising out of or relating to the Agreement.

21. TAXES AND DUTIES

- 21.1. All Taxes as may be applicable in respect of the Tariff on the date of raising the Monthly Bill shall be charged by the Supplier at actuals and shall be borne and paid exclusively by the Purchaser. If, after the Effective Date, the rates of any Taxes are increased or decreased, or any new Tax is introduced, an existing Tax is abolished, or any change in the interpretation or application of any Tax occurs (each, a "**Change in Tax Law**"), in each case, with respect to the sale of Solar Power under the Agreement, the Supplier shall bear such taxes, if the same are on the generation or sale of power and the Purchaser shall bear such taxes if the same are on the consumption of such power.
- 21.2. Subject to Clause 21.1 above, the adjustment in Tariff and the Monthly Bill shall be effective from the date on which the **Change in Tax Law** is



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brought into force.

- 21.3. **Property Taxes:** The Purchaser shall be responsible for all ad valorem personal property or real property taxes levied against the Premises, improvements thereto and personal property located thereon, except that the Supplier shall be responsible for ad valorem personal property or real property taxes levied against the Solar Power Plant. If the Purchaser is assessed any taxes related to the existence of the Solar Power Plant on the Premises, the Purchaser shall immediately notify the Supplier. The Purchaser and the Supplier shall cooperate in contesting any such assessment; provided, however, that the Purchaser shall pay such taxes to avoid any penalties or interest on such Taxes, subject to reimbursement by the Supplier. If after resolution of the matter, such tax is imposed upon the Purchaser related to the improvement of real property by the existence of the Solar Power Plant on the Premises, the Supplier shall reimburse the Purchaser for such tax.
- 21.4. **Tax Contests:** Each Party has the right to contest taxes in accordance with Applicable Law and the terms of encumbrances against the Premises. Each Party shall use all reasonable efforts to cooperate with the other in any such contests of tax assessments or payments. In no event shall either Party postpone during the pendency of an appeal of a tax assessment the payment of taxes otherwise due except to the extent such postponement in payment has been bonded or otherwise secured in accordance with Applicable Law.
- 21.5. **Payment of Delinquent Taxes:** In the event either Party fails to pay any taxes that may become a lien upon the other Party's property, such Party may pay such amounts and, in such event, shall be entitled to recover such paid amount from the other Party, together with interest thereon at the rate of one percent (1%) per month, compounded monthly.
- 21.6. **Reimbursement Deadline:** Any reimbursement of taxes owing pursuant to this Clause 21 shall be paid within twenty (20) Business Days of receiving an invoice therefor from the Party who paid the taxes.

22. **GOVERNING LAW AND DISPUTE RESOLUTION**

22.1. **Governing Law**

The Agreement and the rights and duties of the Parties hereunder shall be governed by and construed, enforced, and performed in accordance with the laws of the Republic of India and shall be subject to the jurisdiction of courts at Kolkata.

22.2. **Dispute Resolution**



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22.2.1. Any Party who claims that a claim, or dispute or difference in connection with this Agreement or the performance of any provision hereunder ("**Dispute**") has arisen must give notice seeking amicable settlement thereof amongst the Coordination Committee as soon as practicable after the occurrence of the event, matter or thing which is the subject of such Dispute and in such notice such Party shall provide particulars of the circumstances and nature of such Dispute and of its claim(s) in relation thereto to the Coordination Committee.

22.2.2. In the event the Coordination Committee fails to resolve the Dispute within fifteen (15) days from the date of notifying the Dispute to the Coordination Committee, then such Dispute shall be referred for negotiation and discussions between senior executives of the Purchaser and the Supplier (together hereinafter referred as "Representatives") who shall meet within 15 (fifteen) days of the Coordination Committee informing the Representatives, and attempt to resolve and negotiate in good faith, the Dispute between them regarding this Agreement.

22.2.3. If the Dispute is not resolved by the Representatives within 30 (thirty) days of the Representatives meeting, either Party may submit the Dispute to arbitration to be conducted in accordance with the Arbitration and Conciliation Act, 1996, including any amendments and modifications thereto, in accordance with the following procedure:

- (a) The arbitration proceedings shall be conducted by an arbitral tribunal consisting of sole arbitrator to be jointly appointed by the Parties or as appointed by the Court under the Arbitration and Conciliation Act, 1996; who shall be an experienced person of repute from the power sector to act as an arbitrator. The arbitrator shall make the award within 3 (three) months of entering upon the reference unless the time is extended by consent of both Parties;
- (b) Any arbitration under the Agreement shall be conducted in Kolkata, in the English language. The Parties shall bear their respective costs of the arbitration unless the arbitral tribunal otherwise directs; and
- (c) The award of the arbitral tribunal shall be final and binding on the Parties and shall be enforceable in accordance with its terms. The arbitral tribunal shall state reasons for its findings and the award shall be substantiated in writing. The Parties agree to be bound by the decision thereby and to act accordingly. The award shall be enforceable in any court having jurisdiction, subject to Applicable Law.

22.2.4. The Parties agree that either Party may seek interim measures



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including injunctive relief in relation to the provisions of this Agreement or the Parties' performance of it from any court of competent jurisdiction.

22.2.5. The Parties expressly waive and forego any right to punitive, exemplary, or similar damages in connection with any Dispute and no such damages shall be awarded or provided for in any Dispute resolution proceeding under or in aid of this Article.

22.2.6. Survival of Arbitration Provisions: The provisions of this Clause 22 shall survive any termination of this Agreement for any reason whatsoever and shall apply (except as provided herein) to any disputes arising out of this Agreement.

22.2.7. Notwithstanding any dispute referred to arbitration, the Parties shall continue to perform their obligations.

23. NOTICES

23.1. All Monthly Bills, notices, requests, consent, or other communication shall be addressed to the other Party at the addresses noted below or such other address as shall be notified by a Party in writing to the other Party. All such Monthly Bills, notices, requests, consent, or other communication, unless otherwise specified herein, shall be in writing and may be delivered by E-mail, hand delivery, post, courier service or by facsimile.

23.2. The addresses referred to above are:

23.2.1. In case of notice to the Company

Attn: Mr. Bhairaw Kumar
 Address: 128, 2nd Floor, Kaveri Apartment, D - 6, Vasant Kunj, New Delhi - 110070
 Telephone no: 9555853152
 Email: bhairaw@enerture.co.in

23.2.2. In case of notice to Purchaser

Attn: Mrs. Anuradha Singh
 Address: Level 6 Prestige Khoday Towers, No.5 Raj Bhawan Road, Bangalore - 560001
 Telephone no: 8105586609
 Email: bs.anuradha@linde.com

23.3. Unless there is evidence that it was received earlier, a Notice or Monthly Bill shall be deemed delivered if:

23.3.1. sent by mail, except air mail, 15 (fifteen) Business Days after



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posting it;

23.3.2. sent by air mail, 4 (four) Business Days after posting it;

23.3.3. sent by e-mail, 3 (three) Business Days after it was sent, provided the sender did not receive a delivery receipt failure notification or delivery receipt delay notification from the sender's internet service provider/e-mail hosting server; and

23.3.4. sent by hand delivery with date of confirmation stamp on receipt of documents; and

23.3.5. Any notices or communications to either party hereunder shall be deemed to have been given when sent to the specified email address of the party, or deposited in the mail, addressed to the then current address of such party, as the case may be.

23.3.6. Any notices or communication given by the either of the Parties pursuant to this Agreement shall be deemed to be effective only if addressed to the person/address specified herein. For the avoidance or doubt, it is clarified that any oral communication by either party or its representative to the other shall not be acceptable as effective notice or communication under the terms of this agreement.

23.3.7. Date of Effectiveness: Any such notice or communication so mailed shall be deemed delivered and effective when

(a) when a read receipt is received from the email address to which it is sent, if sent electronically,

(b) 48 (Forty-Eight) hours after mailing of the notice or communication, if sent by registered mail.

24. MISCELLANEOUS

24.1. **Entitlement to Tax Incentives:** The Supplier (and/or any of its assignee as may be identified and appointed at its sole discretion) shall be entitled to any tax incentives that may arise as a result of the operation of the Solar Power Plant and shall be entitled to transfer the ownership over the Solar Power Plant or construct the Solar Power Plant for such financing party who is able to utilize such tax incentives. The Purchaser shall provide reasonable assistance to the Supplier in preparing all documents necessary for the Supplier to receive such tax incentives, any tax incentives arising as a result of solar power generation shall be the right of the Supplier or the financing party and any tax incentives arising due to consumption of Solar Energy shall be the right of the Purchaser.

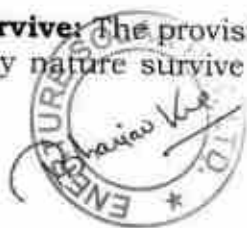


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- 24.2. **Amendments:** The Agreement shall not be changed or amended unless such change or amendment is made in writing and signed by authorized representatives of both Parties.
- 24.3. **Entire Agreement:** The Agreement constitutes the entire agreement between the Parties relating to the subject matter of the Agreement and shall supersede all other prior understandings or agreements, both written and oral, between the Parties relating to the subject matter of the Agreement.
- 24.4. **Assignment:** This Agreement shall be binding upon and inure to the benefit of the Parties and their respective successors and permitted assigns. This Agreement shall not be assigned by any Party without the prior written consent of the other Party. Notwithstanding the foregoing, the Purchaser shall have the right to assign this Agreement or any of its rights and/or obligations contained herein to any of its Affiliates.
- 24.5. **Waiver:** Failure to enforce any right or obligation by any Party with respect to any matter arising in connection with the Agreement shall not constitute a waiver as to that matter or any other matter. Any waiver by any Party of its rights with respect to a default under the Agreement or with respect to any other matters arising in connection with the Agreement must be in writing. Such waiver shall not be deemed a waiver with respect to a subsequent default or other matter.
- 24.6. **Captions; Construction:** All indexes, titles, subject headings, section titles and similar items are provided for the purpose of reference and convenience and are not intended to affect the meaning of the content or scope of the Agreement.
- 24.7. **Costs:** Except as otherwise provided in the Agreement, each Party shall be responsible for its own costs, charges, and expenses (including those of its affiliates) incurred in connection with the negotiation, preparation, entering into and completion of the Agreement and the consummation of the transactions contemplated herein.
- 24.8. **Counterparts:** The Agreement may be executed in two counterparts, each of which shall be an original and all of which together shall **constitute** but one and the same instrument.
- 24.9. **Severability:** If any of the terms of the Agreement is finally held or determined to be invalid, illegal, or void, all other terms of the Agreement shall remain in effect; provided, however, that the Parties shall enter into negotiations concerning the terms affected by such decision for the purpose of achieving conformity with requirements of any Law and the intent of the Parties.
- 24.10. **Survive:** The provisions of this Agreement which expressly or by their very nature survive the Term or termination of this Agreement shall



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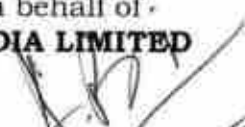
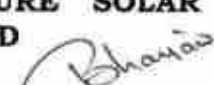
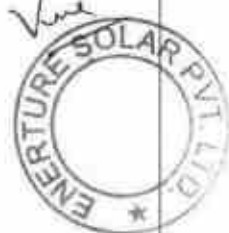


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continue and survive any termination or expiry of this Agreement.

- 24.11. **FCPA:** Each Party represents that it has knowledge and understanding of the Foreign Corrupt Practices Act of the United States of America ("FCPA") and of the Prevention of Corruption Act, 1988 of India. Each Party agrees and undertakes that it shall not, in the conduct of its performance under this Agreement, and with regard to any funds, assets, or records relating thereto, offer, pay, give, or promise to pay or give, directly or indirectly, any payment or gift of any money or thing of value to (i) any government official to influence any acts or decisions of such official or to induce such official to use his influence with the local government to effect or influence the decision of such government in order to assist that party in its performance of its obligations under this order or to benefit the other party; (ii) any political party or candidate for public office for such purpose; or (iii) any person if that party knows or has reason to know that such money or thing of value shall be offered, promised, paid, or given, directly or indirectly, to any official, political party, or candidate for such purpose. Each party shall defend, indemnify, and hold harmless the other Party, from and against any and all claims, losses, damages, expenses and liabilities, including attorney fees, arising from its failure to comply with its aforementioned obligations and undertaking.

IN WITNESS WHEREOF, the Parties hereto have duly executed this Power Purchase Agreement as of the day and year first written above.

PURCHASER For and on behalf of LINDE INDIA LIMITED  Authorized Signatory Mr. <u>Abhijit Banerjee</u>  Date: 30 MARCH 2022 Place: Kolkata	SUPPLIER For and on behalf of ENERTURE SOLAR PRIVATE LIMITED  Authorized Signatory Mr. <u>Bhairaw Kumar</u>  Date: 08 April 2022 Place: Delhi
Witnesses	Witnesses

Schedule I - Premises
LIST OF PURCHASER'S PREMISES

Sr. No.	Plants	Location	State	House No/Street	PIN
1	Paravada PFS	PARAWADA MANDALAM, Vishakhapatnam	Andhra Pradesh	PLOT NO.62, SURVEY NO.14,16	531021
2	TATA 1290	Jamshedpur	Jharkhand	Long Tom Area, Burma Mines,	831007
3	TATA 2550	Jamshedpur	Jharkhand	Long Tom Area, Burma Mines,	831007
4	TATA IGD & ROC	Jamshedpur	Jharkhand	Long Tom Area, Burma Mines,	831007
5	JMP PGP	Jamshedpur	Jharkhand	Long Tom Area, Burma Mines,	831007
6	PMW II Works - Jamshedpur	Jamshedpur	Jharkhand	Mona Road, Burma Mines,	831007
7	SAIL RSP	Rourkela	Odisha	RSP, Near Fertilizer Gate	769007
8	Taloja ASU	Taloja, Navi Mumbai	Maharashtra	T-8, MIDC INDUS. AREA, TALO	410208
9	Taloja PFS	Taloja, Navi Mumbai	Maharashtra	T-25 MIDC Taloja, RAIGAD	410208
10	JSL	Kalinganagar	Odisha	JSL Kalinganagar	755026
11	Selaqui	Selaqui, Dehradun	Uttarakhand	Central Hope town, Twin Indust	248197
12	Food Lab & Training Center	Mangalagiri, Guntur	Andhra Pradesh	APSRTC Depot Rd, Autonagar, Amaravati	522503
13	LI Hyderabad	Medak, Hyderabad	Andhra Pradesh	Plot no:178 & 179 Phase III I.	502307
14	Chakan PFS	Chakan, Pune	Maharashtra	Plot No.4, Gat No.627/2	410501
15	Dobbaspur PFS	Dobbaspur, Bangalore	Karnataka	PlotNo.1 & 2, (Part), Survey, Dobbaspur	562111
16	Bhiwadi PFS	Bhiwadi	Rajasthan	B-821, RIICO IND AREA PH-II	301019
17	Dahej	Dahej	Gujarat	Plot No D-II / 19, Dahej Indus. Estate	392130
18	PMW Works - Kolkata	Kolkata	West Bengal	P-43, Taratala Road, Oxygen House	700088
19	Trichy	Trichy	Tamil Nadu	Plot No. 30/31/32, SIDCO Indus Estate	622515
20	Uluberia PFS	Uluberia, Howrah	West Bengal	C/O. MAHABHARAT MOTOR MANF CO	711316
21	Siliguri PFS	Siliguri, Darjeeling,	West Bengal	Vill. Bonij Jote, PO Rangapani	734434
22	SriCity ASU	Sri City SEZ, Satyavedu, Chittoor	Andhra Pradesh	on NH16, Chittoor and Nellore	517646
23	Ludhiana ASU	Ludhiana	Punjab	Plot C1 & E9, Hi-Tech Cycle Valley (PSIEC),	141112



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Schedule II – Major Components of Solar Power Plant.

The Solar Power Plant is the total arrangement of PV modules in series and parallel connections. The solar array is comprised of solar modules that generate DC electricity in proportion to the amount of sunlight available, generating the most power on a clear day when the sun is at a normal angle to the array. The microprocessor control circuit shall automatically adjust the DC-DC converter to ensure that it should always match to the PV array Maximum Power Point (MPPT) under varying conditions and transfers the maximum possible power to Inverter. The inverter shall convert DC to AC and exported to the loads. The inverter output shall match the grid in voltage, frequency and phase. AC Distribution board is equipped with Meter to measure the energy generation.

Major Components of a Solar Power Plant

1. Solar Modules tier 1 - Mono Crystalline/Poly (1.50% Module Degradation for first year comprising of 12 months for each Site from COD and thereafter 0.65% per year)
2. Module Mounting Structures
3. Array Junction Box
4. Solar Power Inverter
5. AC distribution board / LT Panel
6. Cables & Accessories.
7. Monitoring System
8. Earthing/ Lightning Arrestors.
9. Net Metering (in scope of the Purchaser)



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Annexure I

Salvage Value/Buy Out Value for Solar Power Plant year wise during Term of the PPA

Voluntary purchase for a period of PPA Tenure in the case of Termination or on account of default by Purchaser, the Purchaser can buy Solar Power Plant at particular Site or Premises based upon salvage value at that particular time. Buyout Values at the end of different years, on the anniversaries of 12 months from COD, are provided below and calculated for **2,500 KWdc**. Applicable Buy Out value shall be calculated on pro-rata basis for the installed capacity and the time of the buyout

Year	Salvage Value (INR)
1	101,010,000
2	97,020,000
3	93,030,000
4	89,040,000
5	85,050,000
6	81,060,000
7	77,070,000
8	73,080,000
9	69,090,000
10	65,100,000
11	61,110,000
12	57,120,000
13	53,130,000
14	49,140,000
15	45,150,000
16	41,160,000
17	37,170,000
18	33,180,000
19	29,190,000
20	25,200,000
21	21,210,000
22	17,220,000
23	13,230,000
24	9,240,000
25	NIL

In case of Transfer of Ownership during or at the end of the Term of this contract as per provisions of this Agreement the Supplier shall ensure that the Solar Power Plant is free from any charge, lien, or any kind of encumbrances. The Purchaser shall also need to bear all taxes as may be

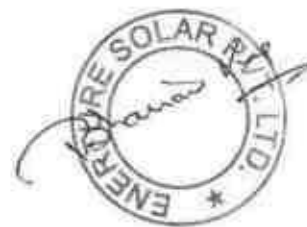


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applicable for the purchase of the Solar Power Plant from the Supplier including but not limited to indirect and direct taxes and any and all other taxes that may be applicable upon the Purchaser.



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Annexure II –Deemed Generation

“Deemed Generation” for the year of operation, shall be calculated based on methodology as explained below, and shall be billable to the Purchaser at the Tariff only if actual generation **Deemed Generation** settlement shall be done on **Monthly basis**.

Methodology:

Deemed Generation = Downtime X Expected Units Generation

Whereas:

Downtime = Duration of Downtime, as recorded by plant performance monitoring system, in minutes

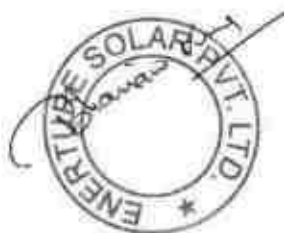
Expected Units Generation = Value of energy production in kWh/Min derived as in Table 1

Energy Production Yearly = Absolute Energy Generation Guarantee for 1st Year of operation, for 2nd year and rest of the PPA tenure, **Energy Production** values shall be summation of Billed units including Deemed Generation Units of preceding year factoring the degradation for that year.

❖ **Table-1: Methodology to derive Expected Units Generation.**

Description		Values	Unit
Energy Production –Yearly (EPY)	Yearly Generation		kWh/Year
Monthly Production (MP)	MP=EPY/12		kWh/Month
Daily Production (DP)	DP=MP/30		kWh/Day
Hourly Production¹(HP)	HP=DP/5.5		kWh/Hour
Expected Units Generation (EUP)	EUP=HP/60		kWh/Min

¹ based on 5.5 hours of sunshine/sunlight.



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ANNEXURE A – PRE-AGREEMENT

(To be on non-judicial Kerala stamp paper of value Rs. 200)

ARTICLES OF AGREEMENT executed on this the day of

Two thousand andbetween the **Agency for**

New & Renewable Energy Research and Technology (hereinafter referred to as

ANERT) of the one part and Sri

(Name and Address of the tenderer) hereinafter referred to as “the Bounden”) of the other part.

WHEREAS in response to the Notification No.

datedthe bounden has submitted to ANERT a e-tender for the **Request for**

Selection (RFS) of agency for the Implementation of 2 MW Solar Power Plant at

Travancore Titanium Products Ltd., Kochuveli, Thiruvananthapuram under Solar

City project funded by Smart City Thiruvananthapuram Ltd specified therein subject to

the terms and conditions contained in the said e-tender.

AND WHEREAS the bounden has furnished to ANERT a sum of Rs. as Earnest Money Deposit for execution of an agreement undertaking the due fulfilment of the contract in case his e-tender is accepted by ANERT. NOW THESE PRESENTS WITNESS and it is hereby mutually agreed as follows: -

In case the e-tender submitted by the bounden is accepted by ANERT and the contract for

is awarded to the bounden, the bounden shall within Fifteen days of acceptance of this e-tender, execute an agreement with ANERT incorporating all the terms and conditions under which ANERT accepts this e-tender.

In case the bounden fails to execute the agreement as aforesaid incorporating the terms and conditions governing the contract, ANERT shall have power and authority to recover

Request for Selection (RFS) of agency for the Implementation of 2 MW Solar Power Plant at Travancore Titanium Products Ltd., Kochuveli, Thiruvananthapuram 2274 Smart City project funded by Smart City Thiruvananthapuram Ltd



from the bounden any loss or damage caused to ANERT by such breach as may be determined by ANERT by appropriating the moneys inclusive of Earnest Money deposited by the bounden and if the Earnest Money is found to be inadequate the deficit amount may be recovered from the bounden and his properties movable and immovable in the manner hereinafter contained.

All sums found due to ANERT under or by virtue of this agreement shall be recoverable from the bounden and his properties movable and immovable under the provisions of the Revenue Recovery Act for the time being in force as though such sums are arrears of land revenue and in such other manner as ANERT may deem fit.

In witness whereof Sri(Name and Designation) for and on behalf of the Agency for New & Renewable Energy Research and Technology and Sri the bounden have hereunto set their hands the day and year shown against their respective signature.

Signed by Sri Signed by Sri

(Date)

(Date)

in the presence of witnesses

in the presence of witnesses

1.

1.

2.



2.



ANERT - BG for Bid Security

SBI SME ASAF ALI ROAD NEW DELHI(62203) <sbi.62203@sbi.co.in>

Mon, Sep 11, 2023 at 4:21 PM

To: "projects@anert.in" <projects@anert.in>

Cc: "bhairaw@enerture.co.in" <bhairaw@enerture.co.in>, "info@enerture.co.in" <info@enerture.co.in>

Dear Sir,

With reference to the above and discussion we had, we advise that we are unable to issue E-BG as beneficiary PAN is not being fetched in the portal and thus we have issued physical BG.

Once Beneficiary PAN card is available in the portal and E-BG option is available, we shall be issuing fresh E-BG (subject to fulfillment Bank's terms and conditions applicable at the material time), and physical BG can be replaced with the same.

Regards,

Chief Manager
State Bank of India
S.M.E Asaf Ali Road Branch (62203)
New Delhi

From: Bhairaw Mandal <bhairaw@enerture.co.in>

Sent: Monday, September 11, 2023 1:57 PM

To: SBI SME ASAF ALI ROAD NEW DELHI(62203) <sbi.62203@sbi.co.in>

Cc: rajesh.dhawan@enerture.co.in <rajesh.dhawan@enerture.co.in>

Subject: FW: ANERT - BG for Bid Security

Warning: This email is not originated from SBI. Do not click on attachment or links/URL unless sender is reliable. Malware/ Viruses can be easily transmitted via email.

Dear Sir,

Kindly forward BG to ANERT by mail to projects@anert.in, ceo@anert.in, also inform that we will submit E-BG shortly once technical issue resolved.

Thanks

Best regards,



Bhairaw Kumar Mandal

Enerture Technologies Pvt Ltd

(MNRE Channel partner & MSME registered,)

An ISO 9001:2015 Certified Company

Mob: +91-9555853152 Tel: 0 11-46-024-024

E.mail: bhairaw@enerture.co.in

Web: <http://enerture.co.in>

Add. : ABL Workspaces, 8 Celebration Garden, Avenue
Bouganvilla, New Delhi-110037

From: Zeeshan Khan <zeeshan.khan@enerture.co.in>

Sent: Tuesday, September 5, 2023 4:06 PM

To: 'ANERT Projects' <projects@anert.in>

Cc: 'Bhairaw Mandal' <bhairaw@enerture.co.in>; info@enerture.co.in; 'ankur' <ankur.gupta@enerture.co.in>;

shubham@enerture.co.in; 'Parvendar Singh' <parvendar.singh@enerture.co.in>; 'Akshayraj K' <akshayraj.k@enerture.co.in>;

'Mahesh' <mahesh@enerture.co.in>; 'Santosh Kumar' <santosh@enerture.co.in>; 'Arman Malik' <arman.malik@enerture.co.in>;

'CEO ANERT' <ceo@anert.in>; 'Chief Technical Manager ANERT' <ctm@anert.in>; 'Kala KG' <kala@anert.in>; 'solarcity tvn' <solarcitytvn@gmail.com>; rajesh.dhawan@enerture.co.in; yogesh.saini@enerture.co.in
Subject: RE: ANERT - BG for Bid Security

Dear Project Team,
Thank you so much for updating us. We have already conveyed our bank regarding the same to proceed E-BG process at earliest.
This is for your information please.

Thanks & Regards



From: ANERT Projects [mailto:projects@anert.in]
Sent: Tuesday, September 5, 2023 03:37 PM
To: zeeshan.khan@enerture.co.in

[Quoted text hidden]

[Quoted text hidden]

Warning: Security parameters for this email (SPF/DMARC/DKIM) is failed, the email falls under the category of spoofed/phishing mail.
Kindly deal with this e-mail with utmost precaution.

. If the disclaimer can't be applied, attach the message to a new disclaimer message.

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 **Bank Guarantee-refe-05051230002080.pdf**
1570K



STATE BANK OF INDIA
TRADE FINANCE CPC,
NEW DELHI
TRADE FINANCE CPC, C
BLOCK, 7TH FLR
11 PARLIAMENT ST,
NEWDELHI, INDIA

Tel No. :
Fax No. : 011-23345757
SWIFT No. : SBININBB593
PIN Code : 110001

To,
ANERT
PMG , LAW COLLEGE ROAD
VIKAS BHAWAN, PO THIRUVANANTHPURAM
KERALA PIN 695033

07-09-2023

DEAR SIR(S),

Guarantee Number	: 0505123BG0002080
Date of Issue	: 07-09-2023
Guarantee Amount	: INR 3,327,990.00
Date of Expiry	: 06-03-2024
Date of Claim	: 06-09-2024
Applicant Name	: ENERTURE TECHNOLOGIES PVT LTD
E Stamp Certificate No.	:
E Stamp Issuance Date & Time	:
State of Execution	:
Stamp Duty Type/Article No.	:
Bank Guarantee Amount	: INR 3,327,990.00
Amount of Stamp duty Paid	: 0.00
Issuing Bank Branch	:
Bank Guarantee Beneficiary	: ANERT

We confirm having Issued / Extended the captioned Bank Guarantee in your favour on behalf of our above named Constituent and the same signed by the officers of the Bank.

YOURS FAITHFULLY,
कृते भारतीय स्टेट बैंक / SBI

Rohini
Authorised Signatory
एन.एम.ई. ब्रांच, 3/8, आसाल रोड, नई दिल्ली-2
SME Branch, 3/8, Asal Ali Road, New Delhi-2

R-1323/

Sep 7, 2023 5:46 PM

कृते भारतीय स्टेट बैंक / SBI

[Signature]
Authorised Signatory
एन.एम.ई. ब्रांच, 3/8, आसाल रोड, नई दिल्ली-2
*AUTHORISED SIGNATORY - 2ई दिल्ली-2
(*2nd signatory required, if BG is for Rs. 50000/- and above)

JAMAL K. JAMAL BABER
P.F. ID.: 4489497
SS No.: AM3170



STATE BANK OF INDIA
TRADE FINANCE CPC, NEW
DELHI
TRADE FINANCE CPC, C
BLOCK, 7TH FLR
11 PARLIAMENT ST,
NEWDELHI, INDIA

Tel No. :
Fax No. : 011-23345757
SWIFT No. : SBININBB593
PIN Code : 110001

Bank Guarantee

Guarantee Number : 0505123BG0002080
Date of Issue : 07-09-2023
Guarantee Amount : INR 3,327,990.00
Expiry Date : 06-03-2024
Date of Claim : 06-09-2024
Applicant Name : ENERTURE TECHNOLOGIES PVT LTD
Beneficiary Name : ANERT
Form of Undertaking : DGAR - Demand Guarantee
Applicable Rule : URDG
Expiry Type : FIXD - Fixed Expiry

This Deed of guarantee executed by the State Bank of India, constituted under the State Bank of India Act, 1955 having its Central Office at Nariman Point, Mumbai and amongst other places, a branch at TRADE FINANCE CPC, NEW DELHI, TRADE FINANCE CPC, C BLOCK, 7TH FLR, 7TH FLOOR, MAIN BRANCH BUILDING,. (hereinafter referred to as 'the Bank') in favour of ANERT. (hereinafter referred to as 'the Beneficiary') of an amount not exceeding INR 33,27,990.00 (Thirty Three Lakh Twenty Seven Thousand Nine Hundred Ninety Rupees Only) at the request of ENERTURE TECHNOLOGIES PVT LTD (hereinafter referred to as 'the Contractor/s').

कृते भारतीय स्टेट बैंक / SBI

Authorised Signatory
एस.एम.ई. शाखा, 3/8, आसफ अली रोड, नई दिल्ली-2
SME Branch, 3/8, Asaf Ali Road, New Delhi-2

R-13231

07-09-2023

1 / 2

कृते भारतीय स्टेट बैंक / SBI

Authorised Signatory
एस.एम.ई. शाखा, 3/8, आसफ अली रोड, नई दिल्ली-2
SME Branch, 3/8, Asaf Ali Road, New Delhi-2

MALIK K. JAMAL BABER

P.F. ID: 4400407

SS No: AN0705123BG0002080



SWIFT

Main Reference NO: 0505123BG0002080 Transaction Reference NO: 0505123BG0002080
Unit Code: 05051 Operator: 6733352
Module Name: BGIF Function Name: Inland_Issue_Bank_Guarantee
Transaction Date: 11-09-2023 Transaction Time: 13:00:29
Event Time: 1

MT760COV ackFlag :Ack received notifyFlag :
B1: Outgoing SWIFT Header 1
F01SBIN000505150000000000
B2: Receiver's BIC Code
I760SBIN0070212N
7020: Transaction Reference Number (Issuing Bank Guarantee Number)
0505123BG0002080
7024: Type of Bank Guarantee : Performance, Financial, Others
PERFORMANCE
7025: Amount of Guarantee Currency Code Amount
INR3327990,
7026: Guarantee Validity Guarantee From Date Guarantee To Date
2023090720240306
7027: Guarantee Effective Date
20230907
7029: End date for lodgement of claim
20240906
7030: Place of lodgement of claim
STATE BANK OF INDIA
7031: Issuing Branch IFSC
SBIN0005051
7032: Issuing branch name and address
STATE BANK OF INDIA
TRADE FINANCE CPC, C BLOCK, 7TH FLR
7TH FLOOR, MAIN BRANCH BUILDING,
11 PARLIAMENT ST, NEWDELHI, INDIA
7033: भारतीय स्टेट बैंक / SBI
Name of applicant and his details / SBI

Authorised Signatory
एस.एम.ई. शाखा, 3/8, आसफ अली रोड, नई दिल्ली-2
SME Branch, 3/8, Asaf Ali Road, New Delhi-2

Authorised Signatory
एस.एम.ई. शाखा, 3/8, आसफ अली रोड, नई दिल्ली-2
SME Branch, 3/8, Asaf Ali Road, New Delhi-2

https://tfeprodwb.statebanktimes.in:7002/EximBillWeb/servlets/WSSTrxOpenWindow? 11-09-2023

R-13231

MALIK K. JAMAL BABER
P.F. ID.: 4489497
SS No.: AM3170

	ENERTURE TECHNOLOGIES PVT LTD 129, KAVERI APARTMENT DELHI
7034:	Name of Beneficiary and his details
	ANERT PMG , LAW COLLEGE ROAD VIKAS BHAWAN, PO THIRUVANANTHPURAM KERALA PIN 695033
7035:	Beneficiary IFSC
	SBIN0070212
7036:	Beneficiary branch name and address
	STATE BANK OF INDIA PATTON (THIRUVANANTHPURAM) P.B.NO.1002, ROHINI BUILDINGS, THIRUVANANTHPURAM
7040:	Stamp Duty Electronically Paid (Y/N)
	N
7046:	Date of Payment
	20230907
7047:	Place of Payment
	TRADE FINANCE CPC, NEW DELHI
7048:	e-Bank Guarantee to be held in Demat Form(Y/N)
	N
20Z:	Transaction Reference Number
	NON-REGULAR

कृते भारतीय स्टेट बैंक SBI
 Authorised Signatory
 एस.एम.ई. शाखा, 3/3, आसफ अली रोड, नई दिल्ली-2
 SME Branch, 3/3, Asaf Ali Road, New Delhi-2
 R-13231

कृते भारतीय स्टेट बैंक SBI
 Authorised Signatory
 एस.एम.ई. शाखा, 3/3, आसफ अली रोड, नई दिल्ली-2
 SME Branch, 3/3, Asaf Ali Road, New Delhi-2
 MALIK K. JAMAL BABER
 P.F. ID.: 4469497
 SS No.: AM3170



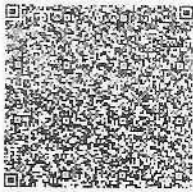
सत्यमेव जयते

INDIA NON JUDICIAL

Government of National Capital Territory of Delhi

e-Stamp

Certificate No.	: IN-DL53117093249075V
Certificate Issued Date	: 19-Aug-2023 11:11 AM
Account Reference	: IMPACC (IV)/ di715003/ DELHI/ DL-DLH
Unique Doc. Reference	: SUBIN-DL71500373844829403930V
Purchased by	: STATE BANK OF INDIA
Description of Document	: Article Bank Guarantee
Property Description	: Not Applicable
Consideration Price (Rs.)	: 0 (Zero)
First Party	: STATE BANK OF INDIA
Second Party	: ANERT
Stamp Duty Paid By	: STATE BANK OF INDIA
Stamp Duty Amount(Rs.)	: 100 (One Hundred only)



Please write or type below this line

This Non-Judicial Stamp Paper is Integral
Part of BG No. 0505123.B.1000208
For Rs. 33,27,990/-
Dated. 07.09.2023

कृते भारतीय स्टेट बैंक / SBI

Rehan

Authorised Signatory

एस.एम.ई. शाखा, 3/8, आसपा अली रोड, नई दिल्ली-2
SME Branch 3/8, Aspa Ali Road, New Delhi-2

R-13231

Statutory Alert:

1. The authenticity of this Stamp certificate should be verified at www.sholestamp.com or using e-Stamp Mobile App of Stock Holding.
2. Any discrepancy in the details of this Certificate and as available on the website / Mobile App renders it invalid.
3. The onus of checking the genuineness is on the users of the certificate.
4. In case of any discrepancy please inform the Competent Authority.

कृते भारतीय स्टेट बैंक / SBI

Malik K. Jamal Baber
Authorised Signatory
एस.एम.ई. शाखा, 3/8, आसपा अली रोड, नई दिल्ली-2
SME Branch 3/8, Aspa Ali Road, New Delhi-2

P.F. ID.: 4488497
SS No.: AM9170

BID SECURITY BANK GUARANTEE

BG No. : 0505123BG0002080
Amount : 33,27,990
Date : 07.09.2023
Valid up to : 06.03.2024

This guarantee is made by the State Bank Of India, SME ASAF ALI ROAD Branch, 3/8 Asaf Ali Road Delhi. hereinafter called 'the Bank', which expression shall unless repugnant to the context or meaning thereof shall include its successors and assigns.

WHEREAS the **ANERT**, having its registered office at PMG-Law College Rd, Vikas Bhavan PO, Thiruvananthapuram, Kerala, PIN - 695 033, hereinafter called as **ANERT**, which expression shall unless repugnant to the context or meaning thereof shall include its successors and assigns in having agreed to exempt M/S **Enerture Technologies Pvt Ltd** (hereinafter called "**contractor(s)**") which expression unless repugnant to the context and meaning thereof shall include its successors and assigns) from depositing with **ANERT**, a sum of Rs. **33,27,990** towards Security Deposit in lieu of the said **contractor(s)** having agreed to furnish a bank guarantee for the said sum of Rs. **33,27,990** as required by the **ANERT**, on the said **contractor(s)** and on specific request on the part of the said **Contractor(s)**, we the **Bank** hereby unconditionally and irrevocably affirm and undertake-

On production of the Bank Guarantee for **Rs. 33,27,990 (Rupees Thirty Three Lakh Twenty Seven Thousand Nine Hundred Ninty only)** we, State Bank of India having our Head Office at Parliament Street, New Delhi-110001 (herein after referred to as "the Bank") at the request of M/s. **Enerture Technologies Pvt Ltd** do hereby undertake to pay to the **ANERT** an amount not exceeding **Rs 33,27,990 (Rupees Thirty Three Lakh Twenty Seven Thousand Nine Hundred Ninty only)**, against any loss or damage caused to or suffered or would be caused to or suffered by the **ANERT** by reason of any breach by the said contractor of any of the terms and conditions contained in the said agreement

कृते भारतीय स्टेट बैंक / SBI

Authorised Signatory
एस.एम.ई. शाखा, 3/8, आसफ अली रोड, नई दिल्ली-2
SME Branch, 3/8, Asaf Ali Road, New Delhi-2

R-13231

कृते भारतीय स्टेट बैंक / SBI

Authorised Signatory
एस.एम.ई. शाखा, 3/8, आसफ अली रोड, नई दिल्ली-2
SME Branch, 3/8, Asaf Ali Road, New Delhi-2

MALIK K. JAMAL BADER
P.F. ID.: 4489487
SS No.: AM3170

We, State Bank Of India, do hereby undertake to pay the amount due and payable under this Guarantee without any demur, merely on a demand from the ANERT stating that the amount claimed is due by way of loss or damage caused to or would be caused to or suffered by the ANERT by reasons of breach by the said contractor of any of the terms or conditions contained in the said agreement. Any such demand made on the Bank shall be conclusive as regards the amount due and payable by the Bank under this guarantee. However, our liability under this guarantee shall be restricted to an amount not exceeding **Rs. 33,27,990 (Rupees Thirty Three Lakh Twenty Seven Thousand Nine Hundred Ninty only)**.

This guarantee will not be discharged due to change in the constitution of the bank or the contractor/supplier.

Notwithstanding anything contrary contained in any law for this time being in force or banking practice, this guarantee shall not be assignable or transferable by the beneficiary. Notice or invocation by any person such as assignee, transferee or agent of beneficiary shall not be entertained by Bank. Any invocation of Guarantee can be made only by the beneficiary directly

Notwithstanding anything to the contrary contained herein

- 1) Our liability under this Bank Guarantee shall not exceed **Rs. 33,27,990 (Rupees Thirty Three Lakh Twenty Seven Thousand Nine Hundred Ninty only)**.
- 2) This Bank Guarantee shall be valid upto **06.03.2024. (date of expiry)**
- 3) We are liable to pay the guaranteed amount or any part thereof under this Bank Guarantee amount only and only if you serve us a written claim or demand on or before 06.09.2024.

कृते भारतीय स्टेट बैंक / SBI

Authorised Signatory

एस.एम.ई. शाखा, 3/8, आसफ अली रोड, नई दिल्ली-2
SME Branch, 3/8, Asaf Ali Road, New Delhi-2

R-13231

कृते भारतीय स्टेट बैंक / SBI

Authorised Signatory

एस.एम.ई. शाखा, 3/8, आसफ अली रोड, नई दिल्ली-2
SME Branch, 3/8, Asaf Ali Road, New Delhi-2

MALIK K. JAMAL BABER

F.F. ID.: 4489487

SS No.: AM3170