MEGHALAYA NON-CONVENTIONAL AND RURAL ENERGY DEVELOPMENT AGENCY

Near BSF Camp Mawpat, Shillong-793012.
Phone No.0364-2537343/2536138/2537611
E-Mail: mnreda_shg@bsnl.in # Website: www.mnreda.Gov.in

TENDER DOCUMENT

NIT No. : MNREDA/1552/2013/5

Name of work : Design, Supply, Installation and Commissioning off grid Solar Photovoltaic Power Plant in the state of Meghalaya

Date of Issue of Tender : 25th March 2013 upto 5th April 1100 Hrs

Category-I

1. Date of Submission of Tender :5th April 2013 up to 1530 Hrs
2. Date of Opening of Tender :8th April 2013 at 1100 Hrs

Category-II

1. Date of Submission of Tender :9th April 2013 up to 1530 Hrs
2. Date of Opening of Tender :11th April 2013 at 1100 Hrs

Category-III

1. Date of Submission of Tender :12th April 2013 up to 1530 Hrs
2. Date of Opening of Tender :15th April 2013 at 1100 Hrs

Tender issue to M/s. _____ against application_____ vide _____ letter no. _____ dated: _____against payment of Rs._____/- (Rupees _____) only vide cash Demand Draft/Banker's cheque No. dated of Bank towards cost of Tender Documents(Non- refundable).

Issued by :_____
For Member-Secretary-Cum-Director
Meghalaya Non-Conventional and Rural Energy Development Agency, Shillong.

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1. NOTICE INVITING TENDER

No. **MNREDA/1552/2013/5** Sealed Tender with 30(sixty) days validity are invited from any Channel Partner/Public Sector Unit and as per Specification under JNNSM and also who had experience in similar kind of works for Design, Supply, Installation and Commissioning of SPV Power Plant in the State of Meghalaya.

The Tender paper will be issued with effect from 25th March 2013 to 5th April 2013 on payment of tender cost of Rs. 5000 (Rupees three thousand) only or it can be downloaded from our website but tender cost has to be furnished before casting of each category of tender. Tender paper/document will not be issued by courier/speed post.

Cost of Tender paper or document should be in the form of cash/Banker's cheque/Demand Draft (Non-Refundable) drawn in favour of Member Secretary-cum-Director, Meghalaya Non-Conventional and Rural Energy Development Agency, Shillong.

In the event of postal delay, the undersigned shall not be held responsible.

Tender document shall be issued on any working day within the specified date.

Tenderers are eligible to submit any one of the category or all three categories separately. All the categories will be treated as separate tender and comparison will be done separately after opening on respective dates.

Member-Secretary-Cum-Director
Meghalaya Non-Conventional and Rural
Energy Development Agency, Shillong.

Non-Conventional And Rural Energy Development Agency SHILLONG

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No. MNREDA/1552/2013/5 **Dated Shillong, the 25th March 2013.**

NOTICE INVITING TENDER SCHEDULE

Category	Tender Description	Solar PV Plant Size	Estimated Project Cost	EMD	Date of submission	Date of Opening
I	Design, Supply, Installation and Commissioning Solar Photovoltaic Power Plant in the state of Meghalaya	2x 100Kwp 4x 50Kwp	10.50Cr	2% of quoted Value	5th April 2013 up to 1530 Hrs	8th April 2013 at 1100 Hrs
II	Design, Supply, Installation and Commissioning Solar Photovoltaic Power Plant in the state of Meghalaya	1x 80Kwp 1x 40Kwp 1x 30Kwp	3.81Cr	2% of quoted Value	9th April 2013 up to 1530 Hrs	11th April 2013 at 1100 Hrs
III	Design, Supply, Installation and Commissioning Solar Photovoltaic Power Plant in the state of Meghalaya	2x 20Kwp 1x 15Kwp 1x 10Kwp 2x2Kwp 50x1Kwp	3.61Cr	2% of quoted Value	12th April 2013 up to 1530 Hrs	15th April 2013 at 1100 Hrs

Tenderers are eligible to submit any one of the category or all three categories separately as per the schedule mentioned above. EMD has to be furnished in each category. Tender document fees should be paid for each category along with the tender in the form of DD. All the categories will be treated as separate tender and comparison will be done separately after opening on respective dates

Member-Secretary-Cum-Director
Meghalaya Non-Conventional and Rural Energy Development Agency, Shillong.

Non-Conventional And Rural Energy Development SHILLONG

Memo No: MNREDA/1552/2013/5(a) Dated Shillong, the 25th March 2013

Copy to:

1. The Additional Chief Secretary
to the Govt of Meghalaya
Power Department

2. Dr. G. Prasad,
Director,
Ministry of New and Renewable Energy,
Block-14, CGO Complex,
New Delhi

3. State Informatics Officer,
National Informatic Centre,
Shillong, Meghalaya } With a request to display the NIT in the tender document on the website enclosed here with both hard and soft copy

4. Sh. Rajashi S. Chaudhary,
Asst. Manager
The Indian Express Ltd.
23, Doctor S. K. Bhuyan Road,
Dighali, Pukhuri(East),
Guwahati-781001 } /with a request to publish in one issue of financial express all edition. Editions Mumbai/Delhi/Kolkota/Chennai/Kochi/ Banglore/Hyderabad/Pune/ Chandigarh/ Ahemadabad/ Gujrat and to be submitted a bill in duplicate along of with all sample of advertisement of all editions for necessary payment.

5. NOTICE BOARD For Display

Member-Secretary-Cum-Director
Meghalaya Non-Conventional and Rural
Energy Development Agency, Shillong.

Non-Conventional And Rural Energy Development Agency * Meghalaya
SHILLONG

2.0 **General Instruction to Tenderer:-**

2.1 **Site Location: -** In the state of Meghalaya

2.2 The cost of tender papers or document should be in the form of Cash/Bankers Cheque No./Demand Draft (Non-refundable) drawn in favour of Member-Secretary, Meghalaya Non-Conventional and Rural Energy Development Agency, Shillong.

2.3 Tender Document will be issued to the only to the bidder against producing valid Id proof of the firm. No representatives will be entertained to receive the tender documents.

2.4 In the event of postal delayed, MNREDA shall not be held responsible.

2.5 Tender document will be issued on any working days within the specified date.

2.6 In case the opening date is declared as holiday tender shall be open in the next working day at the same time and hour.

2.7 Tenderers can submit the tender by downloading from the website but cost of tender document has to be furnished along with the bid document.

2.8 Tenderer are to furnish their offer in a seal cover envelope. For price bid a separate envelope should be enclosed and price bid of only those found technically qualifies will be opened.

2.9 Commercial Terms and Conditions specifically indicating deviations to the terms and conditions stipulated in detailed tender papers including payment terms etc. Must clearly specify the deviation.

2.10 **Basis price quoted:** - The price quoted should be firm and as per the format provided in the tender document. Price break up of various components must be clearly indicated in the format, failing to comply with the above will result in cancellation or rejection of the tender.

2.11 Any other particular information, which are required to be furnished as per detailed tender papers but which have not been specifically indicated.

2.12 The rate should be legible written in English both in figure and in words. In case of any dispute between the figure and words the letter shall be indicated.

2.13 Earnest Money Deposit of 1% for Schedule Tribe and Scheduled Cast and backward classes and 2% for general on amount quoted in the form of Bank Guarantee/Call Deposit/FDR from any Scheduled or Nationalized Bank of India pledged in favour of Director, MNREDA, Shillong should be furnished without which tenders will be rejected.

3. **General/Commercial terms and conditions:-**

3.1 Signing of Tender Paper: - The tender document as issued by MNREDA should be sealed and signed by the Authorized person of the firm and it will be view as acceptance of each and every conditions containing therein.

3.2 Attestation: - All Xerox supporting papers which is not original should be duly attested by Gazetted officer of State/ Central Government.

3.3 VAT/CST: - VAT/CST Registration and VAT/CST clearance certificate upto March, 2012 should be furnished along with the Bid.

3.4 Time of Completion: - The work should be completed within 90 (Ninety Days) days from the date of issue of final work order.

3.5 Supplier :- The Supplier who are not the Module Manufacturer are required to produce a letter from the Manufacturer of Module for commitment of supplying the Module without which offer will be rejected.

3.6 Trading License: - The successful bidder has to produce a Trading License from the proper authority before starting of work at sites.

3.7 Agreement: - An Agreement has to be signed within 7(seven) days of issues of final work order. The Agreement shall be prepared by the purchaser on a stamp paper duly signed by the authorize person of the firm and purchaser. The tender document as issued along with the Bid as submitted by the bidders along with supporting papers shall be part and parcel of the agreement. The maintenance contract agreement shall be separately signed on completion of installation and commissioning work of the system.

3.8 Division of work: - The work may be allotted to more than one party so as to enable to complete the work within the set target date by the Government of India, MNRE.

3.9 Warranty: - The System supplied should be warrantee for a period of 2 years and after that maintenance of system should be 5(five) years after date of commissioning.

3.10 Payment Terms and Conditions :- The Bidders shall be entitled to the following payment terms:-

(a) **Mobilization Advance** : The contractor shall be paid 30% (thirty percent) of value as mobilization advance against a Bank Guarantee of equivalent/like amount from any Nationalized Bank or Scheduled valid for a period of 60(Sixty) days from the date of acceptance of work. PSUs can submit indemnity bond for equal amount for period of 60(Sixty) days.

(b) 45% (forty five percent) of the contract value of the plant/equipment shall be

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paid against receipt of materials at site in good conditions.

(c) 20(twenty percent) of the contract value of the plant/equipment shall be paid on complete installation and commissioning.

(d) Balance 5% (five percent) to be paid at the end of 2(two) years of warranty period or against submission of Bank Guarantee of 5% of the contract value valid for a period of two years from the date of commissioning.

(e) The Annual/comprehensive maintenance contract payment (if any) shall be made on percentage of 30%, 30% and 40% at the end of 3rd, 4th and 5th year's basis.

In the event of contractor not being able to supply or to carry out the work or a part of the work assigned to him in accordance with the terms of this contract, the purchaser shall have the right to recover any sums advanced from the contractor from his/its assets/amount submitted as mobilization advance.

3.11 **Write up of System:** - The write up in English about the system functioning along with Block Diagram of installation of the system should be furnished along with the Bid.

3.12 **Eligibility Criteria: MNRE, Govt of India Channel Partners/PSUs along with the following credentials are eligible to participate the tender.**

3.12.1 **Category-I Off Grid Solar Power Plant of 2x100Kwp and 4x50Kwp at various place in the state of Meghalaya.**

- The firm must have a minimum annual turnover of Rs 32.00 crore in last three years. (Pl. attach copy of audited balance sheet for, 2009-10, 2010-11 and 2011-12) (A summarized sheet of turnover certified by registered CA should be compulsorily enclosed).
- The firm must have designed, supplied, erected, commissioned minimum plant capacity of 1 MW Off Grid (Cumulative over the period of last three years) in which includes at least two numbers of single 100kwp Solar PV Plant in North East. This/These is/are in successful operation on the date of bid opening. (Pl attaches copies of PO's and satisfactory report from previous installations in support of the same).
- The bidders are required to submit the detailed experience during the last 3 years of the work completed of the same system. A statement in this respect has to be compiled in a comprehensive form along with work orders and completion certificate. Due weightage will be given to PSU and who have experience in installation of Solar PV Power Plant of single 100Kwp on Slope Roof in North East in the premises of reputed Government building like State or Central Universities, Govt. Institutes and such other government buildings of national importance and should be organized for any time demonstration.

3.12.2 **Category-II Off Grid Solar Power Plant of 1x80Kwp, 1x40Kwp and 1x30Kwp at various place in the state of Meghalaya.**

- The firm must have a minimum annual turnover of Rs 13.86 crore each in last three years. (Pl. attach copy of audited balance sheet for, 2009-10, 2010-11 and 2011-12) (A summarized sheet of turnover certified by registered CA should be compulsorily enclosed).
- The firm must have designed, supplied, erected, commissioned minimum plant capacity of 500 Kwp Off Grid (Cumulative over the period of last three years) which includes at least one single 100Kwp/80kwp Solar PV Plant in North East. This/These is/are in successful operation on the date of bid opening. (Pl attaches copies of PO's and satisfactory report from previous installations in support of the same).
- The bidders are required to submit the detailed experience during the last 3 years of the

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work completed of the same system. A statement in this respect has to be compiled in a comprehensive form along with work orders and completion certificate. Due weightage will be given to PSU and who have experience in installation of Solar PV Plant systems of single 80Kwp or above on Flat/Slop Roof in North East in the premises of reputed Government building like State or Central Universities, Govt. Institutes and such other government buildings of national importance and should be organized for any time demonstration.

3.12.3 Category-III Off Grid Solar Power Plant of 2x20Kwp, 1x15Kwp, 1x10Kwp, 2x2Kwp, and 50x1Kwp at various place in the state of Meghalaya.

- The firm must have a minimum annual turnover of Rs 10.84 crore in last three years. (Pl. attach copy of audited balance sheet for, 2009-10, 2010-11 and 2011-12) (A summarized sheet of turnover certified by registered CA should be compulsorily enclosed).

- The firm must have designed, supplied, erected, commissioned minimum plant capacity of 200 Kwp Off Grid (Cumulative over the period of last three years) in North East which includes at least one single 20Kwp Solar PV Plant. This/These is/are in successful operation on the date of bid opening. (Pl attaches copies of PO's and satisfactory report from previous installations in support of the same).

- The bidders are required to submit the detailed experience during the last 3 years of the work completed of the same system. A statement in this respect has to be compiled in a comprehensive form along with work orders and completion certificate. Due weightage will be given to PSU and who have experience in installation of Solar PV Plant systems of single 20Kwp or above on Flat/Slop Roof in North East in the premises of reputed Government building like State or Central Universities, Govt. Institutes and such other government buildings of national importance and should be organized for any time demonstration.

3.12.4 Standard Eligibility for Categories

- Bidder's experience should be in supply, installation & commissioning (contracts executed, completed and handed over) of Off Grid Solar Photovoltaic Power Plants. Firm/Company/PSU should have executed Solar Photovoltaic Power Plants under JNNSM Off Grid program of MNRE only.

- The products must conform to minimal technical requirements/ standards for off grid/standalone solar PV power plants /systems to be deployed under the Jawaharlal Nehru National Solar Mission.
  (Pl. attach copies of recent test certificates from SEC/ other authorized Test Centres of MNRE, GOI as proof thereof). The products/ systems/ devices quoted in tender should be as per MNRE specifications.

3.13 **Price Quoted:** - The price quoted as per the bidding scheduled i.e. cost of the system, transportation, installation and commissioning and maintenance contract should be realistic and practical in nature and conform to the actual work to be done. Any figure which is not practically practicable, offer will be rejected.

3.14 **Category-III** is exempted from submitting of EMD against submission of NSIC certification.

3.15 **Contractor to Inform Himself fully :-**

(a) The Contractor shall be deemed to have carefully examined the general conditions, specification and schedules and also to have satisfied himself as to the nature and character of the plant and equipment to be supplied and installed under the contract, the site conditions and all relevant matter and detailed.

(b) If he shall have any doubts as to the meaning of any portion of the contract/work order, he shall before signing/accepting it, set forth the particulars thereof and submit them to the Engineer-in-charge in writing in order to remove such doubts.

3.16 **Financial Soundness:** Documentary evidence in support of Financial Soundness of the Tenderer should be furnished.

3.17 **Submission of Bids :-** The submission of Bids should be strictly in the following order:-

i. Tender paper as issued by the Agency duly signed and sealed by the Authorized persons of

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the firm.

ii. Design and Technical Specification duly filled in as per Tender Document.

iii. Experience in similar kind of works.

iv. VAT/CST Registration and latest clearance certificate upto March, 2012

v. Any deviation with justification thereof.

vi. Price Bid should be in a separate envelope and can be quoted on plain paper but it should be in for Format as given in the NIT.

vii. Earnest Money Deposit.

3.18 **Service Centre: -** It is mandatory that the manufacturer or Supplier should have a local service centre/ Full time Service Engineers/Technicians (minimum 3 persons). Full time Service Engineers/Technicians name, contact no and address in the state or North East should be furnished along with the tender.

3.19 **Breach/cancellation of the contract :-**

(a) In case of Non-performance in any form or change of the convenants and conditions in this contract by the contractor, MNREDA shall have the power to annual, rescind, cancel or terminate the contract and upon its notifying in writing to the contractor that it has so done, this contract shall absolutely determine. The decision of MNREDA in this regard shall be final and binding.

(b) The purchaser may cancel the contract or a portion thereof and if so purchaser or authorized purchase of the plant/equipment not so delivered or order plant equipment of similar description (opinion of the purchaser shall be final) at the risk and cost of the contract. If the contractor had defaulted in the performance of the original contract, the purchaser shall have the right to ignore his tender for risk purchaser even through lowest.

3.20 **Responsibility of the Contractor** :-

The contractor shall guarantee and be entirely responsible for the execution of the contract in accordance with the specification, schedules and appendices. He shall further guarantee and be responsible for the quality and workmanship of all materials and completed works, correct design and drawings, correct delivery of materials, erection, testing and commissioning, within the guaranteed completion and warranty period of 5(five) years including 3 years maintenance period from the date of commissioning

on completion of commissioning a separate agreement shall have to be signed in their respect for comprehensive maintenance contract.

3.21 **Tools and Tackles** :-

The contractor shall provide all tools and tackles conforming to relevant BIS safety and technical standard for proper execution of work, MNREDA shall in no way, responsible for supply of any tools and tackles for implementation of the work.

3.22 **Safety Measures** :-

The Contractor shall have to undertake necessary measures for providing adequate safety and precautions to avoid any accident which may cause damage to any equipment/material or injury to workmen. MNREDA shall not responsible for any such accidents.

3.23 **Delivery of system :-**

(i) The contractor shall deliver the plant/systems in accordance with the terms of the contract at the time/times at the place/places and in the manner specified in the contract. The contractor shall comply with instructions that may be given by the purchaser from time to time regarding the transit of the plant and material.

(ii) Notification of delivery or dispatch in regard to each and every consignment shall be made to the purchaser immediately after dispatch or delivery. The contractor shall supply to the consignee invoice in duplicate and packing account of all stores delivered or dispatch by him.

(iii) In case of any occurrence of loss or damage in transit upto destination, it shall be liability of the contractor to initiate or pursue the claim with Insurance Company. He should take immediate steps to repair the damaged apparatus or replacement thereto. Any extension of time limit required in such contingency will be considered by the purchaser on merit.

3.24 **Arbitration** :-

(i) Except where otherwise provided if anytime question dispute or difference whatever shall arise between the contractor and the purchaser upon or in the relation to or 1(one) connection with this contract either of the parties may give to

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the other notice in writing of the existence of such a question on rejection of the matter, the dispute or difference shall be referred to the sole arbitration appointed by MNREDA at the time of dispute after ascertaining the terms of reference mutually.

(ii) The Arbitration will preferably be a member of Arbitration Council and arbitration proceeding will take place as per provision or arbitration Act 1940 or any statutory modification or re-enactment thereof and the rules made there under and for the time being in force shall apply.

(iii) The contractor will ensure that the work under this contract shall continue during arbitration proceeding and dispute and no payments due from or payment by the purchaser shall be withhold on account of such proceeding except to the extent which may be in dispute.

3.25 **Court of Competent Jurisdiction** :-

The Courts of Gauhati High Courts, Shillong Bench will only have jurisdiction in this case.

4. Standard Scope of work and Technical Design and Specification for All Categories

4.1 Each Solar PV Power Plant Should consists of following

Sl. No	Item Description	Qty per Unit
1	Solar PV Modules	1 Set
2	Solar Modules Mounting Structure	1 Set
3	Power Conditioning Unit	1 No
4	Battery Bank	1 Set
5	Cables & Earthing materials	Required quantity
6	Junction Boxes	1 Set
7	AC & DC Distribution Box	1 Set
8	Earthing & Lightning Arrestors	1 Set
9	Necessary Hardware accessories	1 Set
10	Remote Monitoring Unit	1 Set

Others Requirements:

- Installation and commissioning
- Operation and Maintenance.

4.2 Location of the Site:

Location	:	In the State of Meghalaya
Site Access	:	
Latitude and Longitude	:	

4.3 Scope of Work

The following section of the document describes the scope of work for Solar PV Power Plant System. This job involves design, supply, installation & commissioning of the Solar PV Power Plant with

The Scope of Work shall include the following

- Design, supply, installation & commissioning of Solar PV Power Plant
- Performance testing of the complete system
- Warranty of the system as per MNRE
- Training of at least two persons on the various aspects of maintenance and operation of the offered SPV Plant.
- The module layout as considered by the Bidder should be on the basis of clear open shadow free space available on the roof/ground. Inclined roofs should be provided with Sloped Roof Mounting Structures.

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4.4 System Configuration:-

4.4.1 PV Modules:-

For the solar crystalline silicon module, the capacity of single module should be minimum 200 WP to be provided with high efficiency multi crystalline silicon solar panels.

a) The module should have MNRE (GOI) or from other approved labs IEC-61215 Ed 2/ type approval.

b) In addition, the modules must conform to IEC 61730 Part 1- requirements for construction & Part 2 - requirements for testing, for safety qualification

i. Crystalline high power cells will be used in the Solar Photovoltaic module.

ii. To connect the solar modules interconnection cables will be provided. Photo electric conversion efficiency of SPV module will be greater than 14%. Modules will be made of high transmitted glass front surface giving high encapsulation gain and silicon rubber edge sealant for module protection and mechanical support.

iii. All materials used will have a proven history of reliable and stable operation in external applications. It will perform satisfactorily in relative humidity up to 100% with temperatures between -30 deg C and + 85 deg C and with stand gust up to 200 km/h from the back side of the panel.

iv. Solar module should be crystalline type, employing lamination technology using establish polymer (EVA) and TEDLAR laminate.

4.4.2. Other General Features of PV Modules:-

i) The rated output power of any supplied module will not vary more than 5% from the average power rating of all modules.

(ii) The module frame shall be made of corrosion resistant materials, which are electrolytically compatible with the structural material used for mounting the module.

(ii) Protective devices against surges at the PV module shall be provided, if required. Low voltage drop bypass and /or blocking diode(s) may also be provided, if required.

(iii) Module Junction Box (weather resistant) shall be designed for long life outdoor operation in harsh environment.

(iv) PV modules used in solar power plants must be warranted for output wattage, which should not be less than 90% at the end of 12 years and 80% at the end of 25 years.

(v) The solar modules shall have suitable encapsulation and sealing arrangements to protect the silicon cells from the environment. The arrangement and the material of encapsulation will be compatible with the thermal expansion properties of the silicon cells and the module framing arrangement material. The encapsulation arrangement should ensure complete moisture proofing for the entire life of the solar modules.

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(vi) Each module shall have low iron tempered glass front for strength and superior light transmission. It will also have tough multi layered polymer back sheet for environment protection against moisture and provide high voltage electrical insulation.

(vii) The fill factor of modules should not be less than 0.70

(viii) Other balance of systems components (BOS) must qualify to the latest edition of BIS or IEC standards issued in this regard.

(ix) Array capacity shall not be less than the designed capacity and number of modules required will be worked out accordingly.

(x) Each PV module 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 environment conditions.)

4.4.3. **Module Mounting Structure**:-

i. Mounting array structure plays major role as it hold the module and provides stability and strength to Solar Modules installed. It should have MS L-Channel from standard make, Galvanized, Manual tracking system, SS Hardware with spring watchers; Ground & Roof top installation flexibility. Depending on the roof conditions and design, the panels could also be integrated in the roof (or building) to give the structure a better aesthetic value.

ii. The array structure shall be made of hot dip galvanized iron. The thickness of galvanization will be as per IS1461 standards. All nuts and bolts will be made of very good quality stainless steel. The minimum clearance of the lowest part of the module structure and the developed ground level will not be less than 500 mm.

iii. The SPV panel array shall be mounted facing south and tilted to an angle equal to the latitude where being used for optimum performance.

iv. Leg assembly of module mounting structure made of different diameter galvanized tubes may be accepted. The work should be completed with supply, fitting fixing of clamps, saddles, nut and bolts etc. While quoting the rate, the bidder may mention the design and type of structure offered. All nuts and bolts will be made of high quality stainless steel.

v. The structure shall be designed to allow easy replacement of any module and should be in line with site requirements.

vi. The structure shall be designed for simple mechanical and electrical installation. It should support SPV modules at a given orientation, absorb and transfer the mechanical loads to the ground properly. There will be no requirement of welding or complex machinery at site.

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i. The array structure will be so designed that it will occupy minimum space without sacrificing the output from SPV panels. At the same time it should withstand wind speed up to maximum 150 km/h.

4.4.4. Battery & Battery Bank:-

a. The batteries should be VRLA/Tubular Gel, maintenance free lead batteries and shall confirm to IEC/EN 60896-21 & 22.
b. The batteries shall be of 2V cells with end cut off voltage 1.8 per cell and battery terminal should be provided with covers.
c. Design voltage of system should be 120/240V DC system.
d. Battery capacity of each plant should be designed taken as a full rated load capacity available from the solar array.
e. Batteries should be provided with explosion proof vent plugs with complete assembled set.
f. The batteries shall be suitable for recharging by means partial state of charge. Bidder shall mention the design cycle life of batteries at 80% depth of discharge at 27 deg. C.
g. The batteries shall be designed for operating in ambient temperature of site. The battery container shall be made of polypropylene.
h. The self discharge of batteries shall be less than 3% per month at 20 degree C and less than 6% per month at 30 degree C.
i. The batteries shall consist of individual cells, which can be carried separately with case while transporting.
j. Bidders to specify capacity & end cell voltage at different discharge rates. Battery rack and accessories.
k. Battery interconnecting links shall be provided for interconnecting the cells in series and in parallel as needed. Connectors for inter cell connection (series/parallel) shall be maintained.
l. The battery will have a minimum rating as per following.

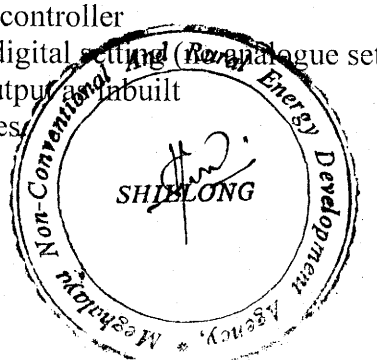
4.4.5. Inverter:

a. Scope:

Off Grid Solar PCU specification defines a high reliability single/three-phase, with integral MPPT charger controller true Bi-directional, digital signal processing (DSP), high frequency pulse width modulated (PWM) system, utilizing MOSFET/IGBTs, hereafter referred to as the "Solar PCU".

Solar PCU shall be designed to utilize renewable solar energy and providing high quality regulated and conditioned AC power to the loads and charging of the connected battery.
Solar PCU shall mandatorily consist of the MPPT charger controller, Bi-directional Inverter and associated items. The PCU should integrate within itself, all of the following systems:

i. PWM Inverter, capable of bi-directional power flow (DG to AC & vise-versa)
ii. MPPT based solar charge controller
iii. 32 bit DSP controller for digital setting (Rotary/analogue set points will be accepted)
iv. Isolation transformer at output as inbuilt
v. Essential protection devices



vi. Suitable breaker/isolator at Array, Battery and PCU along with inbuilt Schottky Diode protection at MPPT charger input to prevent the battery from draining into the PV panel.

b. System Description:

PCU should be a solar priority based system, so as to ensure maximum utilization of available solar energy.

a. PCU Inverter shall be of grid synchronizing type and operate in parallel with the grid electricity supply.
b. The MPPT voltage range of the PCU shall be well within the array voltage of the solar modules over their entire lifetime.
c. It should be possible to charge the batteries through the solar charge controller and grid/ DG fed through bi-directional inverter at its 100% capacity.
d. In the event that battery is in a low state of charge and if grid supply is available, the PCU must have the ability to synchronize with the Grid and optimally use the power to charge battery bank as well as feed the load simultaneously.
e. Whenever the grid condition are beyond the operating range (as mentioned in the detail specification), the Inverter will get disconnected from the grid. PCU will supply continuous power to load without any interruption by discharging the batteries.
f. The changeover time between Grid and Inverter should not be more than 10msec.
g. Due to any reason if battery go out of order and solar power is available, then PCU should be able to deliver output and drive the connected load (within the generated capacity), ensuring full utilization of solar.
h. Array based Inverter function: During night time if load is not connected Inverter will stop to eliminate no load losses/residual discharge of battery. It should automatically switch on the inverter when array power gets available. During this time bi-directional charging of battery through Grid should be possible.
i. PCU should be suitable for computer load application.

c. System Operation Modes (Selectable and settable)

a. Standalone Mode: When grid supply is absent, the Inverter works in a stand-alone configuration. The solar charge controller inside PCU will charge the battery and simultaneously feed the load through the inverter. If neither grid nor solar energy supply is available at a point of time, then battery will support the load.
b. Grid Charging Mode: Battery charging through Grid should be activated via the bidirectional inverter when the battery's state of charge is low.
c. Battery charging mode thru solar or grid shall be user settable with enabling / disabling option.
d. Auto Mode: Depending on the actual situation occurring in field, the system will intelligently select any one of the above operating modes described above.
e. Priority settable: PCU shall be solar priority, further it should be flexible to select priority between Grid and batteries.

d. Standards:

The PCU shall comply with the following standards:

Component	Standard Description	Standard Number
Power Conditioning Unit/Inverters*	Efficiency Measurements Environmental Testing	IEC 61683 IEC 60068 2(6,21,27,30,75,78)
Charge controller/MPPT units*	Design Qualification Environmental Testing	IEC 62093 IEC 60068 2(6,21,27,30,75,78)

*Must additionally conform to the relevant national/international electrical safety standards

REMOTE MONITORING UNIT -CONNECTIVITY FOR DATA & ALARM LOG FOR POWER CONDITIONING UNIT: (Not applicable for systems below 10Kwp)

Port for connectivity:
RS-232 serial port for local PC based monitoring.
RJ45: Ethernet based remote monitoring via TCP/IP.
USB port: for flushing the data logged into a pen drive, along with micro SD memory card slot to be provided for extended memory for storage.
PCU should have a feature where Remote Monitoring can be done through data card connectivity with 2G/3G/4G option.
(Note: User has to provide Data Card with public IP for connecting the above)

Following data and alarm logging function should be performed by the connectivity software.

STORED DATALOG

Store data log will be used to retrieve data from system memory for all parameters with date time logged at specified interval. It should be possible to export all stored data log logs in .csv format

STORED ALARM LOG

Store alarm log will be used to retrieve all alarm logs parameters from system memory along with date time logged whenever any fault occurs. It should be possible to export all stored alarm logs in .csv format

Following minimum Groups should be displayed
Grid Group: To display Grid parameters.

1. R-Y-B Ø Voltage in Volts
2. R-Y-B Ø Currents in Amps
3. R-Y-B Ø Real Power in KW
4. R-Y-B Ø Apparent Power in KVA
5. R-Y-B Ø Power Factor
6. Grid Frequency in Hz

Inverter Group: To display Inverter parameters.

1. U-V-W Ø Voltage in Volts
2. U-V-W Ø Currents in Amps
3. U-V-W Ø Current in %

4. U-V-W Ø Power Factor
5. U-V-W Ø Real Power in KW
6. U-V-W Ø Apparent Power in KVA
7. U-V-V Ø Frequency in Hz
8. Heat sink Temperature in □C

Battery Group: To display Battery parameters;

1. Battery Voltage in Volts
2. Battery Power in KW
3. Battery Current Currents in Amps
   a) Positive when Charging
   b) Negative when Discharging
4. Battery Temperature in degC. (Optional)

Array Group: To display Array parameters.

1. Array Voltage in Volts
2. Array Current Currents in Amps
3. Array Power in KW
4. Solar Radiation in w/m2 (Optional)
5. Cell Temperature in ˚C (Optional)

4.4.6. <u>Junction Boxes :-</u>

i. The Junction Boxes shall be dust, vermin and waterproof and made of ABC/Thermo Plastic. The terminals shall be connected to copper bus bar arrangement of proper sizes. The junction boxes shall have suitable cable entry points fitted with cable glands of appropriate size for both incoming and outgoing cables.
ii. Suitable markings shall be provided on the bus bar for easy identification and cable ferrules shall be fitted at the cable termination points for identification.
iii. Combine groups of modules into independent charging sub-arrays that shall be wired to the controller.
iv. Provide arrangement for disconnection for each of the groups.
v. Provide a test point for each sub-group for quick fault location.
vi. To provide group array isolation.
vii. The rating of the JB's shall be suitable with adequate safety factor to inter connect the Solar PV array.
viii. Metal oxide varistors (MOVs) shall be provided inside the array junction boxes.
ix. Array junction boxes should meet IP 65 certification norms

4.4.7. <u>Copper Cables:-</u>

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 power plant to the minimum.

The bright annealed 99.97% pure bare copper conductors that offer low conductor resistance are used in the power plant. They result in lower heating of the cable thereby increase in life of the cable and also reduction in power losses in the system. These cables are insulated with a special grade FRLS compound formulated for outdoor use. The skin coloration offers high insulation resistance and long life.

Cables are flexible and are used with annealed electrolytic grade copper conductors. They are suitable for outdoor and for 600 VDC application.

4.4.8. DC Distribution Board:-

- An DC DB should be provided.
- It should have MCB of suitable rating with enclosure & meters.

4.4.9. AC Distribution Board/Isolator Box :-

- An AC DB should be provided.
- It should have MCB of suitable rating with enclosure & meters .

The AC distribution board should be designed in such a way that.....

i. Bus Bar minimum 3 times capacity of Solar Power Plant.
ii. Input Grid line should come from such distribution Board of client so that power can feed the load or feed power to the grid even when grid fails (DG runs) in day time and solar insolation is available.
iii. The Solar Power should be exported to the bus bar inside the ACDB through LCD Energy Meter.
iv. The Designated load should be routed through ACDB. Energy generation/consumption should be registered in the PCU for a minimum one week period.

4.4.10. Earthing & Lighting Protection:-

Earthing: - The array structure of the PV yard will have to be grounded properly using adequate number of earthing kits. All metal casing/shielding of the plant will be thoroughly grounded to ensure safety of the power plant.

Lightning: - The SPV power plant shall have to be provided with lightning and over voltage protection. The main aim in this protection will be to be 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 varistors will be provided inside the array junction boxes. In addition suitable MOV's also will be provided in the inverter to protect the inverter from over voltage.

5. **Technical Specification Category wise: Tenderer have to supply Battery and PCU in each category as the specification provided below.**

5.1 Category-I

- 50Kwp Solar PV Power Plant -4 Numbers at different locations
- 100Kwp Solar PV Power Plant-2 Numbers at different locations

Specifications for Battery

Battery Size:

S. No	Plant Capacity	Battery Bank Size
1.	50 kW	240V, 600 Ah
2.	100 kW	240V,1200 Ah

Basic Minimum Technical Specification of the 50 kVA PCU is as follows

No.	System Rating (kVA / kW)	50KVA
1	**Photovoltaic Input**	
1.1	Nominal Input Voltage (Vdc)	240V
1.2	Input voltage range (V)	200 - 600V
1.3	MPPT voltage range (V)	250-440V
1.4	Maximum PV power recommended (KW)	**55 kW**
1.5	No. Of charge controller	Integral part of PCU
2	**MPPT base Charge Controller**	
2.1	Switching Element	IGBT
2.2	Controller	32 Bit DSP controller
2.3	Type of Charger	PWM with MPPT
2.4	Maximum Output Power (KW)	50KW
2.5	Peak Efficiency (%)	96%
3	**Grid Input**	
3.1	Input Supply Phases	3Phase 4 Wire
3.2	Nominal Voltage & Voltage Range	415 VAC , 50Hz
3.3	Active filtering During Load sharing with mains (load Harmonic corrections)	-
	a. THD	< 3%
	b. Power Factor	> 0.99
	c. Harmonic Attenuation ratio	96%
4	**Battery**	
4.1	Type	VRLA/LATB
4.2	Battery Nominal Voltage	240V
4.3	.Grid through Battery charging Capacity (% kW rating)	0 -100%
4.4	Active filtering during Battery charging From grid	
	a. THD	<3%
	b. Power Factor	>0.99
5	**Inverter**	
5.1	Switching Element/ technology	IGBT

	Control	3#2 bit DSP controller
5.2	Nominal Output Voltage (V)	415 VAC L-L (240 VAC L-N)
5.3	Output Supply Phases	3Phase 4 Wire
5.4	Output Waveform	Pure sine wave
5.5	Nominal Frequency (Hz)	50Hz
5.6	Load Power Factor	0.6 lag to 1 (with in KVA and KW rating)
5.7	Nominal Output Current (A)	70A
5.8	Voltage regulation	± 2%
5.9	Voltage Stability in dynamic Condition	Complies with IEC /EN 62040 – 3, Class 1
5.10	Output voltage distortion with 100% linear load (%)	< 2%
5.11	Overload at nominal output voltage for 10 minutes (%)	125%
5.12	Overload at nominal output voltage for 1 minutes (%)	150%
5.13	System peak efficiency	94%
5.14	Noise @ 1 meter (dBA ± 2dBA)	<68
5.15	Enclosure Protection Degree with open Doors	IP 20
5.16	Colour	RAL 7016
5.17	Cooling	Forced Air
5.18	Galvanic Isolation	Inbuilt isolation transformer at inverter output
5.19	Protection	Under/Over voltage for Input, Output, Array & Battery. Array & Battery reverse Polarity. Output overload, short circuit, Over temperature, wound component over temperature. MCB & Surge protection at Input, Output, Array & Battery path.
5.20	Display Parameter (on LCD based 128x 64 graphic display) –	Array - Voltage, Current, Heat Sink temp. Power (KW) Battery - Voltage, current, temp, Grid (True rms) - Voltage, Current, Frequency, Power (kVA/KW) Output (True rms) - Voltage, Current, Frequency, Inverter Voltage Current , Heat Sink temp. Power (kVA/KW) ,KWH Unit
5.21	Indications/Mimic	MPPT Charger - ON /OFF Battery on Boost , Batter Low Battering Charging / Discharging , Grid Switch ON , Inverter Switch ON , Grid ON , Load ON, Inverter ON
6	**Environment**	

6.1	Location	Indoor (Free from Corrosive gases & conductive dust)
6.2	Temperature Operating (°C)	0 to 50
6.3	Max. Relative humidity @25°C (non -condensing) (%)	Up to 95
6.4	Max. Altitude above sea level without de-rating (m)	1000 (Compliance with IEC/EN 62040-3)
7	**Standard compliance**	
7.1	Testing	IEC 62040 – 3:61683: 60068 - 2
7.2	Active Filter Function	Complies to IEEE 519

Basic Minimum Technical Specification of the 100 kVA PCU is as follows

No.	System Rating (kVA / kW)	100kVA
1	**Photovoltaic Input**	
1.1	Nominal Input Voltage (Vdc)	240V
1.2	Input voltage range (V)	200 - 600V
1.3	MPPT voltage range (V)	250-440V
1.4	Maximum PV power recommended (KW)	**110KWp**
1.5	No. Of charge controller	Integral part of PCU
2	**MPPT base Charge Controller**	
2.1	Switching Element	IGBT
2.2	Controller	32 Bit DSP controller
2.3	Type of Charger	PWM with MPPT
2.4	Maximum Output Power (KW)	5KW
2.5	Peak Efficiency (%)	96%
3	**Grid Input**	
3.1	Input Supply Phases	3Phase 4 Wire
3.2	Nominal Voltage & Voltage Range	415 VAC , 50Hz
3.3	Active filtering During Load sharing with mains (load Harmonic corrections)	-
	a. THD	< 3%
	b. Power Factor	> 0.99
	c. Harmonic Attenuation ratio	96%
4	**Battery**	
4.1	Type	VRLA/LATB
4.2	Battery Nominal Voltage	240V
4.3	Grid through Battery charging Capacity (% kW rating)	0 -100%
4.4	Active filtering during Battery charging From grid	
	a. THD	<3%
	b. Power Factor	>0.99
5	**Inverter**	
5.1	Switching Element/ technology	IGBT
	Control	32 bit DSP controller
5.2	Nominal Output Voltage (V)	415 VAC L-L (240 VAC L-N)
5.3	Output Supply Phases	3Phase 4 Wire

5.4	Output Waveform	Pure sine wave
5.5	Nominal Frequency (Hz)	50Hz
5.6	Load Power Factor	0.6 lag to 1 (with in KVA and KW rating)
5.7	Nominal Output Current (A)	139A
5.8	Voltage regulation	± 2%
5.9	Voltage Stability in dynamic Condition	Complies with IEC /EN 62040 – 3, Class 1
5.10	Output voltage distortion with 100% linear load (%)	< 2%
5.11	Overload at nominal output voltage for 10 minutes (%)	125%
5.12	Overload at nominal output voltage for 1 minutes (%)	150%
5.13	System peak efficiency	94%
5.14	Noise @ 1 meter (dBA ± 2dBA)	<68
5.15	Enclosure Protection Degree with open Doors	IP 20
5.16	Colour	RAL 7016
5.17	Cooling	Forced Air
5.18	Galvanic Isolation	Inbuilt isolation transformer at inverter output
5.19	Protection	Under/Over voltage for Input, Output, Array & Battery. Array & Battery reverse Polarity. Output overload, short circuit, Over temperature, wound component over temperature. MCB & Surge protection at Input, Output, Array & Battery path.
5.20	Display Parameter (on LCD based 128x 64 graphic display) –	Array - Voltage, Current, Heat Sink temp. Power (KW) Battery - Voltage, current, temp, Grid (True rms) - Voltage, Current, Frequency, Power (kVA/KW) Output (True rms) - Voltage, Current, Frequency, Inverter Voltage Current , Heat Sink temp. Power (kVA/KW) ,KWH Unit
5.21	Indications/Mimic	MPPT Charger - ON /OFF Battery on Boost , Batter Low Battering Charging / Discharging , Grid Switch ON , Inverter Switch ON , Grid ON , Load ON, Inverter ON
6	**Environment**	
6.1	Location	Indoor (Free from Corrosive gases & conductive dust)

6.2	Temperature Operating (°C)	0 to 50
6.3	Max. Relative humidity @25°C (non -condensing) (%)	Up to 95
6.4	Max. Altitude above sea level without de-rating (m)	1000 (Compliance with IEC/EN 62040-3)
7	**Standard compliance**	
7.1	Testing	IEC 62040 – 3:61683: 60068 - 2
7.2	Active Filter Function	Complies to IEEE 519

5.2 Category-II

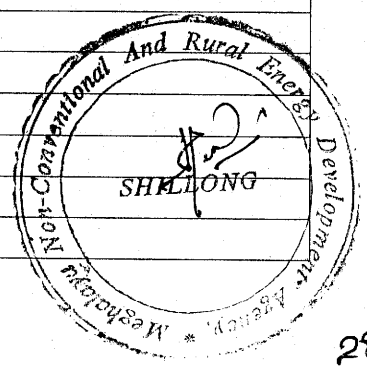
- 80Kwp Solar PV Power Plant -1 Number
- 40Kwp Solar PV Power Plant -1 Number
- 30Kwp Solar PV Power Plant -1 Number

Battery should be supplied as per the below size

S. No	Plant Capacity	Battery Bank Size
1.	30 kW	240V, 360 Ah
2.	40 kW	240V, 480 Ah
3.	80 kW	240V, 960 Ah

Basic Minimum Technical Specification of the 30 kVA PCU is as follows

No.	System Rating (kVA / kW)	30kVA
1	**Photovoltaic Input**	
1.1	Nominal Input Voltage (Vdc)	240V
1.2	Input voltage range (V)	200 - 600V
1.3	MPPT voltage range (V)	250-440V
1.4	Maximum PV power recommended (KW)	**33 KWp**
1.5	No. Of charge controller	Integral part of PCU
2	**MPPT base Charge Controller**	
2.1	Switching Element	IGBT
2.2	Controller	32 Bit DSP controller
2.3	Type of Charger	PWM with MPPT
3	**Grid Input**	
3.1	Input Supply Phases	3Phase 4 Wire
3.2	Nominal Voltage & Voltage Range	415 VAC , 50Hz
3.3	Active filtering During Load sharing with mains (load Harmonic corrections)	-
	a. THD	< 3%
	b. Power Factor	> 0.99
	c. Harmonic Attenuation ratio	96%
4	**Battery**	
4.1	Type	VRLA/LATB
4.2	Battery Nominal Voltage	240V



4.3	Grid through Battery charging Capacity (% kW rating)	0 -100%
4.4	Active filtering during Battery charging From grid	
	a. THD	<3%
	b. Power Factor	>0.99
5	**Inverter**	
5.1	Switching Element/ Technology	IGBT
	Control	#32 bit DSP controller
5.2	Nominal Output Voltage (V)	415 VAC L-L (240 VAC L-N)
5.3	Output Supply Phases	3Phase 4 Wire
5.4	Output Waveform	Pure sine wave
5.5	Nominal Frequency (Hz)	50Hz
5.6	Load Power Factor	0.6 lag to 1 (with in KVA and KW rating)
5.7	Nominal Output Current (A)	42A
5.8	Voltage regulation	± 2%
5.9	Voltage Stability in dynamic Condition	Complies with IEC /EN 62040 – 3, Class 1
5.10	Output voltage distortion with 100% linear load (%)	< 2%
5.11	Overload at nominal output voltage for 10 minutes (%)	125%
5.12	Overload at nominal output voltage for 1 minutes (%)	150%
5.13	System peak efficiency	92%
5.14	Noise @ 1 meter (dBA ± 2dBA)	<68
5.15	Enclosure Protection Degree with open Doors	IP 20
5.16	Colour	RAL 7016
5.17	Cooling	Forced Air
5.18	Galvanic Isolation	Inbuilt isolation transformer at inverter output
5.19	Protection	Under/Over voltage for Input, Output, Array & Battery. Array & Battery reverse Polarity. Output overload, short circuit, Over temperature, wound component over temperature. MCB & Surge protection at Input, Output, Array & Battery path.
5.20	Display Parameter (on LCD based 128x 64 graphic display) –	Array - Voltage, Current, Heat Sink temp. Power (KW) Battery - Voltage, current, temp, Grid (True rms) - Voltage, Current, Frequency, Power (kVA/KW) Output (True rms) - Voltage, Current, Frequency, Inverter Voltage Current , Heat Sink temp. Power (kVA/KW) ,KWH Unit

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5.21	Indications/Mimic	MPPT Charger - ON /OFF Battery on Boost , Batter Low Battering Charging / Discharging , Grid Switch ON , Inverter Switch ON , Grid ON , Load ON, Inverter ON
6	**Environment**	
6.1	Location	Indoor (Free from Corrosive gases & conductive dust)
6.2	Temperature Operating (°C)	0 to 50
6.3	Max. Relative humidity @25°C (non -condensing) (%)	Up to 95
6.4	Max. Altitude above sea level without de-rating (m)	1000 (Compliance with IEC/EN 62040-3)
7	**Standard compliance**	
7.1	Testing	IEC 62040 – 3:61683: 60068 – 2
7.2	Active Filter Function	Complies to IEEE 519

Basic Minimum Technical Specification of the 40 kVA PCU

No.	System Rating (kVA / kW)	50KVA
1	**Photovoltaic Input**	
1.1	Nominal Input Voltage (Vdc)	240V
1.2	Input voltage range (V)	200 - 600V
1.3	MPPT voltage range (V)	250-440V
1.4	Maximum PV power recommended (KW)	**55 kW**
1.5	No. Of charge controller	Integral part of PCU
2	**MPPT base Charge Controller**	
2.1	Switching Element	IGBT
2.2	Controller	32 Bit DSP controller
2.3	Type of Charger	PWM with MPPT
2.4	Maximum Output Power (KW)	50KW
2.5	Peak Efficiency (%)	96%
3	**Grid Input**	
3.1	Input Supply Phases	3Phase 4 Wire
3.2	Nominal Voltage & Voltage Range	415 VAC , 50Hz
3.3	Active filtering During Load sharing with mains (load Harmonic corrections)	-
	a. THD	< 3%
	b. Power Factor	> 0.99
	c. Harmonic Attenuation ratio	96%
4	**Battery**	
4.1	Type	VRLA/LATB
4.2	Battery Nominal Voltage	240V
4.3	Grid through Battery charging Capacity (% kW rating)	0 -100%
4.4	Active filtering during Battery charging From grid	

	a. THD	<3%
	b. Power Factor	>0.99
5	**Inverter**	
5.1	Switching Element/ technology	IGBT
	Control	3#2 bit DSP controller
5.2	Nominal Output Voltage (V)	415 VAC L-L (240 VAC L-N)
5.3	Output Supply Phases	3Phase 4 Wire
5.4	Output Waveform	Pure sine wave
5.5	Nominal Frequency (Hz)	50Hz
5.6	Load Power Factor	0.6 lag to 1 (with in KVA and KW rating)
5.7	Nominal Output Current (A)	70A
5.8	Voltage regulation	± 2%
5.9	Voltage Stability in dynamic Condition	Complies with IEC /EN 62040 – 3, Class 1
5.10	Output voltage distortion with 100% linear load (%)	< 2%
5.11	Overload at nominal output voltage for 10 minutes (%)	125%
5.12	Overload at nominal output voltage for 1 minutes (%)	150%
5.13	System peak efficiency	94%
5.14	Noise @ 1 meter (dBA ± 2dBA)	<68
5.15	Enclosure Protection Degree with open Doors	IP 20
5.16	Colour	RAL 7016
5.17	Cooling	Forced Air
5.18	Galvanic Isolation	Inbuilt isolation transformer at inverter output
5.19	Protection	Under/Over voltage for Input, Output, Array & Battery. Array & Battery reverse Polarity. Output overload, short circuit, Over temperature, wound component over temperature. MCB & Surge protection at Input, Output, Array & Battery path.
5.20	Display Parameter (on LCD based 128x 64 graphic display) –	Array - Voltage, Current, Heat Sink temp. Power (KW) Battery - Voltage, current, temp, Grid (True rms) - Voltage, Current, Frequency, Power (kVA/KW) Output (True rms) - Voltage, Current, Frequency, Inverter Voltage Current , Heat Sink temp. Power (kVA/KW) ,KWH Unit

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5.21	Indications/Mimic	MPPT Charger - ON /OFF Battery on Boost , Batter Low Battering Charging / Discharging , Grid Switch ON , Inverter Switch ON , Grid ON , Load ON, Inverter ON
6	**Environment**	
6.1	Location	Indoor (Free from Corrosive gases & conductive dust)
6.2	Temperature Operating (°C)	0 to 50
6.3	Max. Relative humidity @25°C (non -condensing) (%)	Up to 95
6.4	Max. Altitude above sea level without de-rating (m)	1000 (Compliance with IEC/EN 62040-3)
7	**Standard compliance**	
7.1	Testing	IEC 62040 – 3:61683: 60068 – 2
7.2	Active Filter Function	Complies to IEEE 519

Basic Minimum Technical Specification of the 100 kVA PCU for 80Kwp SPV Plant is as follows

No.	System Rating (kVA / kW)	100kVA
1	**Photovoltaic Input**	
1.1	Nominal Input Voltage (Vdc)	240V
1.2	Input voltage range (V)	200 - 600V
1.3	MPPT voltage range (V)	250-440V
1.4	Maximum PV power recommended (KW)	**110KWp**
1.5	No. Of charge controller	Integral part of PCU
2	**MPPT base Charge Controller**	
2.1	Switching Element	IGBT
2.2	Controller	32 Bit DSP controller
2.3	Type of Charger	PWM with MPPT
2.4	Maximum Output Power (KW)	5KW
2.5	Peak Efficiency (%)	96%
3	**Grid Input**	
3.1	Input Supply Phases	3Phase 4 Wire
3.2	Nominal Voltage & Voltage Range	415 VAC , 50Hz
3.3	Active filtering During Load sharing with mains (load Harmonic corrections)	-
	a. THD	< 3%
	b. Power Factor	> 0.99
	c. Harmonic Attenuation ratio	96%
4	**Battery**	
4.1	Type	VRLA/LATB
4.2	Battery Nominal Voltage	240V
4.3	Grid through Battery charging Capacity (% kW	0 -100%

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	rating)	
4.4	Active filtering during Battery charging From grid	
	a. THD	<3%
	b. Power Factor	>0.99
5	**Inverter**	
5.1	Switching Element/ technology	IGBT
	Control	3#2 bit DSP controller
5.2	Nominal Output Voltage (V)	415 VAC L-L (240 VAC L-N)
5.3	Output Supply Phases	3Phase 4 Wire
5.4	Output Waveform	Pure sine wave
5.5	Nominal Frequency (Hz)	50Hz
5.6	Load Power Factor	0.6 lag to 1 (with in KVA and KW rating)
5.7	Nominal Output Current (A)	139A
5.8	Voltage regulation	± 2%
5.9	Voltage Stability in dynamic Condition	Complies with IEC /EN 62040 – 3, Class 1
5.10	Output voltage distortion with 100% linear load (%)	< 2%
5.11	Overload at nominal output voltage for 10 minutes (%)	125%
5.12	Overload at nominal output voltage for 1 minutes (%)	150%
5.13	System peak efficiency	94%
5.14	Noise @ 1 meter (dBA ± 2dBA)	<68
5.15	Enclosure Protection Degree with open Doors	IP 20
5.16	Colour	RAL 7016
5.17	Cooling	Forced Air
5.18	Galvanic Isolation	Inbuilt isolation transformer at inverter output
5.19	Protection	Under/Over voltage for Input, Output, Array & Battery. Array & Battery reverse Polarity. Output overload, short circuit, Over temperature, wound component over temperature. MCB & Surge protection at Input, Output, Array & Battery path.
5.20	Display Parameter (on LCD based 128x 64 graphic display) –	Array - Voltage, Current, Heat Sink temp. Power (KW) Battery - Voltage, current, temp, Grid (True rms) - Voltage, Current, Frequency, Power (kVA/KW) Output (True rms) - Voltage, Current, Frequency, Inverter Voltage Current , Heat Sink temp. Power (kVA/KW) ,KWH Unit

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5.21	Indications/Mimic	MPPT Charger - ON /OFF Battery on Boost , Batter Low Battering Charging / Discharging , Grid Switch ON , Inverter Switch ON , Grid ON , Load ON, Inverter ON
6	**Environment**	
6.1	Location	Indoor (Free from Corrosive gases & conductive dust)
6.2	Temperature Operating (°C)	0 to 50
6.3	Max. Relative humidity @25°C (non -condensing) (%)	Up to 95
6.4	Max. Altitude above sea level without de-rating (m)	1000 (Compliance with IEC/EN 62040-3)
7	**Standard compliance**	
7.1	Testing	IEC 62040 – 3:61683: 60068 - 2
7.2	Active Filter Function	Complies to IEEE 519

5.3 <u>Category-III</u>

- 20Kwp Solar PV Power Plant -2 Number
- 15Kwp Solar PV Power Plant -1 Number
- 10Kwp Solar PV Power Plant -1 Number
- 2 Kwp Solar PV Power Plant -2 Number
- 1Kwp Solar PV Power Plant -50 Number

Battery should be supplied as per the below size

S. No	Plant Capacity	Battery Bank Size
1.	1 kW	24V, 150 Ah
2.	2 kW	48V, 150 Ah
3.	10 kW	120V, 240 Ah
4.	15 kW	240V, 200 Ah
5.	20 kW	240V, 240 Ah

Basic Minimum Technical Specification of the 1 kVA PCU is as follows

No.	System Rating (kVA / kW)	1kVA
1	**Photovoltaic Input**	
1.1	Nominal Input Voltage (Vdc)	
1.2	Input voltage range (V)	40 - 120V
1.3	MPPT voltage range (V)	
1.4	Maximum PV power recommended (KW)	**1.1 KW**
1.5	No. Of charge controller	Integral part of PCU
2	**MPPT base Charge Controller**	

2.1	Switching Element	MOSFET
2.2	Controller	32 Bit DSP controller
2.3	Type of Charger	PWM with MPPT
3	**Grid Input**	
3.1	Input Supply Phases	1Phase 2 Wire
3.2	Nominal Voltage & Voltage Range	230 VAC , 50Hz
4	**Battery**	
4.1	Type	VRLA/LATB
4.2	Battery Nominal Voltage	48V
4.3	Grid through Battery charging Capacity (% kW rating)	0 -100%
5	**Inverter**	
5.1	Switching Element/ technology	MOSFET
	Control	#32 bit DSP controller
5.2	Nominal Output Voltage (V)	230 VAC (L-N)
5.3	Output Supply Phases	1Phase 2 Wire
5.4	Output Waveform	Sine Wave
5.5	Nominal Frequency (Hz)	50Hz
5.6	Load Power Factor	0.6 lag to 1 (within KVA and KW rating)
5.7	Nominal Output Current (A)	4A
5.8	Voltage regulation	$\pm$ 2%
5.9	Voltage Stability in dynamic Condition	Complies with IEC /EN 62040 – 3, Class 1
5.10	Output voltage distortion with 100% linear load (%)	< 2%
5.11	Overload at nominal output voltage for 10 minutes (%)	125%
5.12	Overload at nominal output voltage for 1 minutes (%)	150%
5.13	System peak efficiency	91%
5.14	Noise @ 1 meter (dBA ± 2dBA)	<58
5.15	Enclosure Protection Degree with open Doors	IP20
5.16	Colour	RAL 7016
5.17	Cooling	Forced Air
5.18	Galvanic Isolation	Inbuilt isolation transformer at inverter output

5.19	Protection	Under/Over voltage for Input, Output, Array & Battery. Array & Battery reverse Polarity. Output overload, short circuit, Over temperature, wound component over temperature. MCB & Surge protection at Input, Output, Array & Battery path.
5.20	Display Parameter (on LCD based 128x 64 graphic display) –	Array - Voltage, Current, Heat Sink temp. Power (KW) Battery - Voltage, current, temp, Grid (True rms) - Voltage, Current, Frequency, Power (kVA/KW) Output (True rms) - Voltage, Current, Frequency, Inverter Voltage Current , Heat Sink temp. Power (kVA/KW) ,KWH Unit
5.21	Indications/Mimic	MPPT Charger - ON /OFF Battery on Boost , Batter Low Battering Charging / Discharging , Grid Switch ON , Inverter Switch ON , Grid ON , Load ON, Inverter ON
6	**Environment**	
6.1	Location	Indoor (Free from Corrosive gases & conductive dust)
6.2	Temperature Operating (°C)	0 to 50
6.3	Max. Relative humidity @25°C (non -condensing) (%)	Up to 95
6.4	Max. Altitude above sea level without de-rating (m)	1000 m Compliance with IEC/EN 62040-3)

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7	**Standard compliance**	
7.1	Testing	IEC 62040 – 3:61683: 60068 - 2
7.2	Active Filter Function	Complies to IEEE 519

Basic Minimum Technical Specification of the 2 kVA PCU is as follows

No.	System Rating (kVA / kW)	2kVA
1	**Photovoltaic Input**	
1.1	Nominal Input Voltage (Vdc)	
1.2	Input voltage range (V)	40 - 120V
1.3	MPPT voltage range (V)	
1.4	Maximum PV power recommended (KW)	**2.2 KW**
1.5	No. Of charge controller	Integral part of PCU
2	**MPPT base Charge Controller**	
2.1	Switching Element	MOSFET
2.2	Controller	32 Bit DSP controller
2.3	Type of Charger	PWM with MPPT
3	**Grid Input**	
3.1	Input Supply Phases	1Phase 2 Wire
3.2	Nominal Voltage & Voltage Range	230 VAC , 50Hz
4	**Battery**	
4.1	Type	VRLA/LATB
4.2	Battery Nominal, Voltage	48V
4.3	Grid through Battery charging Capacity (% kW rating)	0 -100%
5	**Inverter**	
5.1	Switching Element/ technology	MOSFET
	Control	#32 bit DSP controller
5.2	Nominal Output Voltage (V)	230 VAC (L-N)
5.3	Output Supply Phases	1Phase 2 Wire
5.4	Output Waveform	Sine Wave
5.5	Nominal Frequency (Hz)	50Hz
5.6	Load Power Factor	0.6 lag to 1 (within KVA and KW rating)
5.7	Nominal Output Current (A)	9A
5.8	Voltage regulation	± 2%
5.9	Voltage Stability in dynamic Condition	Complies with IEC /EN 62040 – 3, Class 1
5.10	Output voltage distortion with 100% linear load (%)	< 2%
5.11	Overload at nominal output voltage for 10 minutes (%)	125%

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5.12	Overload at nominal output voltage for 1 minutes (%)	150%
5.13	System peak efficiency	91%
5.14	Noise @ 1 meter (dBA ± 2dBA)	<58
5.15	Enclosure Protection Degree with open Doors	IP20
5.16	Colour	RAL 7016
5.17	Cooling	Forced Air
5.18	Galvanic Isolation	Inbuilt isolation transformer at inverter output
5.19	Protection	Under/Over voltage for Input, Output, Array & Battery. Array & Battery reverse Polarity. Output overload, short circuit, Over temperature, wound component over temperature. MCB & Surge protection at Input, Output, Array & Battery path.
5.20	Display Parameter (on LCD based 128x 64 graphic display) –	Array - Voltage, Current, Heat Sink temp. Power (KW) Battery - Voltage, current, temp, Grid (True rms) - Voltage, Current, Frequency, Power (kVA/KW) Output (True rms) - Voltage, Current, Frequency, Inverter Voltage Current , Heat Sink temp. Power (kVA/KW) ,KWH Unit
5.21	Indications/Mimic	MPPT Charger - ON /OFF Battery on Boost , Batter Low Battering Charging / Discharging , Grid Switch ON , Inverter Switch ON , Grid ON , Load ON, Inverter ON

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6	**Environment**	
6.1	Location	Indoor (Free from Corrosive gases & conductive dust)
6.2	Temperature Operating (°C)	0 to 50
6.3	Max. Relative humidity @25°C (non -condensing) (%)	Up to 95
6.4	Max. Altitude above sea level without de-rating (m)	1000 m (Compliance with IEC/EN 62040-3)
7	**Standard compliance**	
7.1	Testing	IEC 62040 – 3:61683: 60068 - 2
7.2	Active Filter Function	Complies to IEEE 519

Basic Minimum Technical Specification of the 10 kVA PCU (10 kW SPV Plant) is as follows

No.	System Rating (kVA / kW)	10kVA
1	**Photovoltaic Input**	
1.1	Nominal Input Voltage (Vdc)	120
1.2	Input voltage range (V)	100 – 300
1.3	MPPT voltage range (V)	140-200
1.4	Maximum PV power recommended (KW)	**11 KW**
1.5	Charge controller	Integral part of PCU
2	**MPPT base Charge Controller**	
2.1	Switching Element	IGBT
2.2	Controller	32 Bit DSP controller
2.3	Type of Charger	PWM with MPPT
3	**Grid Input**	
3.1	Input Supply Phases	1Phase 2 Wire
3.2	Nominal Voltage & Voltage Range	230 VAC , 50Hz
3.3	Active filtering During Load sharing with mains (load Harmonic corrections)	-
	a. THD	<3%
	b. Power Factor	> 0.99
	c. Harmonic Attenuation ratio	96%
4	**Battery**	
4.1	Type	VRLA/LATB
4.2	Battery Nominal Voltage	120V
4.3	Grid through Battery charging Capacity (% kW rating)	0 -100%
4.4	Active filtering during Battery charging From grid	-

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	a. THD	<3%
	b. Power Factor	>0.99
5	**Inverter**	
5.1	Switching Element/ technology	IGBT
	Control	#32 bit DSP controller
5.2	Nominal Output Voltage (V)	230 VAC (L-N)
5.3	Output Supply Phases	1Phase 2 Wire
5.4	Output Waveform	Sine Wave
5.5	Nominal Frequency (Hz)	50Hz
5.6	Load Power Factor	0.6 lag to 1 (within KVA and KW rating)
5.7	Nominal Output Current (A)	14A
5.8	Voltage regulation	± 2%
5.9	Voltage Stability in dynamic Condition	Complies with IEC /EN 62040 – 3, Class 1
5.10	Output voltage distortion with 100% linear load (%)	< 2%
5.11	Overload at nominal output voltage for 10 minutes (%)	125%
5.12	Overload at nominal output voltage for 1 minute (%)	150%
5.13	System peak efficiency	92%
5.14	Noise @ 1 meter (dBA ± 2dBA)	<60
5.15	Enclosure Protection Degree with open Doors	IP20
5.16	Colour	RAL 7016
5.17	Cooling	Forced Air
5.18	Galvanic Isolation	Inbuilt isolation transformer at inverter output
5.19	Protection	Under/Over voltage for Input, Output, Array & Battery. Array & Battery reverse Polarity. Output overload, short circuit, Over temperature, wound component over temperature. MCB & Surge protection at Input, Output, Array & Battery path.

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5.20	Display Parameter (on LCD based 128x 64 graphic display) –	Array - Voltage, Current, Heat Sink temp. Power (KW) Battery - Voltage, current, temp, Grid (True rms) - Voltage, Current, Frequency, Power (kVA/KW) Output (True rms) - Voltage, Current, Frequency, Inverter Voltage Current , Heat Sink temp. Power (kVA/KW) ,KWH Unit
5.21	Indications/Mimic	MPPT Charger - ON /OFF Battery on Boost , Batter Low Battering Charging / Discharging , Grid Switch ON , Inverter Switch ON , Grid ON , Load ON, Inverter ON
6	**Environment**	
6.1	Location	Indoor (Free from Corrosive gases & conductive dust)
6.2	Temperature Operating (°C)	0 to 50
6.3	Max. Relative humidity @25°C (non -condensing) (%)	Up to 95
6.4	Max. Altitude above sea level without de-rating (m)	1000 m (Compliance with IEC/EN 62040-3)
7	**Standard compliance**	
7.1	Testing	IEC 62040 – 3:61683: 60068 - 2
7.2	Active Filter Function	Complies to IEEE 519

Basic Minimum Technical Specification of the 15KVA PCU (15 kW SPV Plant) is as follows

No.	System Rating (kVA / kW)	15kVA
1	**Photovoltaic Input**	
1.1	Nominal Input Voltage (Vdc)	240V
1.2	Input voltage range (V)	200 - 600V
1.3	MPPT voltage range (V)	250-440V
1.4	Maximum PV power recommended (KW)	**16.5 kW**
1.5	No. Of charge controller	Integral part of PCU
2	**MPPT base Charge Controller**	
2.1	Switching Element	IGBT
2.2	Controller	32 Bit DSP controller
2.3	Type of Charger	PWM with MPPT
3	**Grid Input**	
3.1	Input Supply Phases	3Phase 4 Wire
3.2	Nominal Voltage & Voltage Range	415 VAC , 50Hz
3.3	Active filtering During Load sharing with mains (load Harmonic corrections)	
	a. THDi	<3%
	b. Power Factor	> 0.99
	c. Harmonic Attenuation ratio	96%
4	**Battery**	
4.1	Type	VRLA/LATB
4.2	Battery Nominal Voltage	240V
4.3	Grid through Battery charging Capacity (% kW rating)	0 -100%
4.4	Active filtering during Battery charging From grid	
	a. THDi	<3%
	b. Power Factor	>0.99
5	**Inverter**	
5.1	Switching Element/ Technology	IGBT
	Control	#32 bit DSP controller
5.2	Nominal Output Voltage (V)	415 VAC L-L (240 VAC L-N)
5.3	Output Supply Phases	3Phase 4 Wire
5.4	Output Waveform	Pure sine wave
5.5	Nominal Frequency (Hz)	50Hz
5.6	Load Power Factor	0.6 lag to 1 (with in KVA and KW rating)
5.7	Nominal Output Current (A)	21A
5.8	Voltage regulation	± 2%
5.9	Voltage Stability in dynamic Condition	Complies with IEC /EN 62040 – 3, Class 1
5.10	Output voltage distortion with 100% linear load (%)	< 2%
5.11	Overload at nominal output voltage for 10 minutes (%)	125%

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5.12	Overload at nominal output voltage for 1 minutes (%)	150%
5.13	System peak efficiency	92%
5.14	Noise @ 1 meter (dBA ± 2dBA)	<60
5.15	Enclosure Protection Degree with open Doors	IP 20
5.16	Colour	RAL 7016
5.17	Cooling	Forced Air
5.18	Galvanic Isolation	Inbuilt isolation transformer at inverter output
5.19	Protection	Under/Over voltage for Input, Output, Array & Battery. Array & Battery reverse Polarity. Output overload, short circuit, Over temperature, wound component over temperature. MCB & Surge protection at Input, Output, Array & Battery path.
5.20	Display Parameter (on LCD based 128x 64 graphic display) –	Array - Voltage, Current, Heat Sink temp. Power (KW) Battery - Voltage, current, temp, Grid (True rms) - Voltage, Current, Frequency, Power (kVA/KW) Output (True rms) - Voltage, Current, Frequency, Inverter Voltage Current , Heat Sink temp. Power (kVA/KW) ,KWH Unit
5.21	Indications/Mimic	MPPT Charger - ON /OFF Battery on Boost , Batter Low Battering Charging / Discharging , Grid Switch ON , Inverter Switch ON , Grid ON , Load ON, Inverter ON
6	**Environment**	
6.1	Location	Indoor (Free from Corrosive gases & conductive dust)
6.2	Temperature Operating (°C)	0 to 50
6.3	Max. Relative humidity @25°C (non -condensing) (%)	Up to 95
6.4	Max. Altitude above sea level without de-rating (m)	1000 (Compliance with IEC/EN 62040-3)
7	**Standard compliance**	
7.1	Testing	IEC 62040 – 3:61683: 60068 - 2
7.2	Active Filter Function	Complies to IEEE 519

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Basic Minimum Technical Specification of the 20 KVA PCU (20 kW SPV Plant) is as follows

No.	System Rating (kVA / kW)	20kVA
1	**Photovoltaic Input**	
1.1	Nominal Input Voltage (Vdc)	240V
1.2	Input voltage range (V)	200 - 600V
1.3	MPPT voltage range (V)	250-440V
1.4	Maximum PV power recommended (KW)	**22 KWp**
1.5	No. Of charge controller	Integral part of PCU
2	**MPPT base Charge Controller**	
2.1	Switching Element	IGBT
2.2	Controller	32 Bit DSP controller
2.3	Type of Charger	PWM with MPPT
3	**Grid Input**	
3.1	Input Supply Phases	3Phase 4 Wire
3.2	Nominal Voltage & Voltage Range	415 VAC , 50Hz
3.3	Active filtering During Load sharing with mains (load Harmonic corrections)	-
	a. THD	<3%
	b. Power Factor	> 0.99
	c. Harmonic Attenuation ratio	96%
4	**Battery**	
4.1	Type	VRLA/LATB
4.2	Battery Nominal Voltage	240V
4.3	Grid through Battery charging Capacity (% kW rating)	0 -100%
4.4	Active filtering during Battery charging From grid	
	a. THD	<3%
	b. Power Factor	>0.99
5	**Inverter**	
5.1	Switching Element/ Technology	IGBT
	Control	#32 bit DSP controller
5.2	Nominal Output Voltage (V)	415 VAC L-L (240 VAC L-N)
5.3	Output Supply Phases	3Phase 4 Wire
5.4	Output Waveform	Pure sine wave
5.5	Nominal Frequency (Hz)	50Hz
5.6	Load Power Factor	0.6 lag to 1 (with in KVA and KW rating)
5.7	Nominal Output Current (A)	28A
5.8	Voltage regulation	± 2%
5.9	Voltage Stability in dynamic Condition	Complies with IEC /EN 62040 – 3, Class 1
5.10	Output voltage distortion with 100% linear load (%)	< 2%
5.11	Overload at nominal output voltage for 10 minutes (%)	125%

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5.12	Overload at nominal output voltage for 1 minutes (%)	150%
5.13	System peak efficiency	92%
5.14	Noise @ 1 meter (dBA ± 2dBA)	<62
5.15	Enclosure Protection Degree with open Doors	IP 20
5.16	Colour	RAL 7016
5.17	Cooling	Forced Air
5.18	Galvanic Isolation	Inbuilt isolation transformer at inverter output
5.19	Protection	Under/Over voltage for Input, Output, Array & Battery. Array & Battery reverse Polarity. Output overload, short circuit, Over temperature, wound component over temperature. MCB & Surge protection at Input, Output, Array & Battery path.
5.20	Display Parameter (on LCD based 128x 64 graphic display) –	Array - Voltage, Current, Heat Sink temp. Power (KW) Battery - Voltage, current, temp, Grid (True rms) - Voltage, Current, Frequency, Power (kVA/KW) Output (True rms) - Voltage, Current, Frequency, Inverter Voltage Current , Heat Sink temp. Power (kVA/KW) ,KWH Unit
5.21	Indications/Mimic	MPPT Charger - ON /OFF Battery on Boost , Batter Low Battering Charging / Discharging , Grid Switch ON , Inverter Switch ON , Grid ON , Load ON, Inverter ON
6	**Environment**	
6.1	Location	Indoor (Free from Corrosive gases & conductive dust)
6.2	Temperature Operating (°C)	0 to 50
6.3	Max. Relative humidity @25°C (non -condensing) (%)	Up to 95
6.4	Max. Altitude above sea level without de-rating (m)	1000 (Compliance with IEC/EN 62040-3)
7	**Standard compliance**	
7.1	Testing	IEC 62040 – 3:61683: 60068 - 2
7.2	Active Filter Function	Complies to IEEE 519

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6. Bidding Scheduled for all Categories:-

Quotation should be submitted for each Solar PV Plant separately in each category.

Break up Project Hardware Cost:

S. No.	SPV Power Plant capacity (kWp)	Cost in Rupees					
		Module	Battery	Inverter	Structures	Balance of System	Total

Costing of the Project

S. No	Systems	Unit Cost(Rs.)	Quantity (No.)	Total Cost (Rs. in Lakh)
1.	Cost of System Hardware			
2.	Cost of transportation and insurance			
3.	Cost of civil works and electrical works			
4.	Cost of Installation and commissioning			
5.	Cost of Annual Maintenance for 5 years			
6.	Cost of Battery replacement			
7.	Any other related costs			
			Total Cost	
			Total Round off	

(Rupees_____)only

Note : 1. Quantity of each item should be clearly specify in the bidding scheduled.

2. Any additional add on equipments as per design of power plant should be clearly mentioned in price bidding.

3. Bidding Scheduled in plain paper but as per format may be submitted in a separate envelope inside the offer.

Dated: -

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Seal & Signature of authorized person of the Firm.

1. Tender should be submitted for each category separtly mentioning the Category on the top of each enlovop.

2. The tender should be submitted in two separate sealed envelopes as mentioned below & addressed to the MEGHALAYA NON-CONVENTIONAL AND RURAL ENERGY DEVELOPMENT AGENCY, Near BSF Camp Mawpat, Shillong-793012. Phone No.0364-2537343/2536138/2537611,inside a sealed envelope super scribed with " **Category No: , The tender for supply, installation, commissioning and maintenance of SPV power plants against Tender Call Notice No MNREDA/1552/2013/5.**

3. First sealed envelope should contain Technical Bid containing Technical Specification, valid STCC/ VAT clearance certificate Commercial terms & conditions, tender document duly signed & stamped in all pages, Turnover, Experience etc. It should be super scribed with "PART-I Technical Bid ".All the papers of tender documents except the price bid duly signed should be submitted in the first envelope.

4. Second sealed envelope (part-II) should contain Price bid and Earnest Money Deposit. It should be super scribed with "PART- II PRICE BID".

For Example

Main Big Envelope

Category-I
The tender for supply, installation, commissioning and maintenance of SPV power plants against Tender Call Notice No MNREDA/1552/2013/5

Technical Bid Envelope (to be kept in the Main Big Envelope)

Category-I
The tender for supply, installation, commissioning and maintenance of SPV power plants against Tender Call Notice No MNREDA/1552/2013/5
PART-1 Technical Bid

Price Bid Envelope (to be Kept in the Main Big Envelope)

Category-I
The tender for supply, installation, commissioning and maintenance of SPV power plants against Tender Call Notice No MNREDA/1552/2013/5
PART-II Price Bid

5. The procedure of opening of the tender shall be as under

   a) First envelope "PART-I TECHNICAL BID" shall be opened at the time & date mentioned in the tender notice by MNREDA representative in the presence of bidders, who choose to be present.
   b) Second envelope (part-II) containing Price bids shall be opened after evaluation of technical suitability of the offer. If required, the date for opening of second envelope (Price bid) shall be communicated later on. Second envelope (price bid) of only those Bidders shall be opened whose Technical bid shall be found Techno-commercially suitable.

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