



HARYANA RENEWABLE ENERGY DEVELOPMENT AGENCY (HAREDA)

(DEPARTMENT OF RENEWABLE ENERGY, HARYANA)

Akshay Urja Bhawan, Sector-17, Panchkula

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Rate contract No/HAREDA/2016-17/2202-04 Dated: 08.08.2016

To

- 1- M/s OFCA Power Technologies Pvt Ltd,
Plot No-124, Sector-4, IMT, Manesar, Gurgaon-122050
Ph-01246520001, Mob- 7814342715, email-info@ofcasolar.com,
- 2- M/s Kirloskar Integrated Technologies Ltd.
13/A Karve Road, Kothrude, Pune-411038
Ph-02025457939/40, Mob- 7774033364, email- abhishek.das@kirloskar.com
- 3- M/s Ritika System Pvt. Ltd.,
C-22/18, Sector-57, Noida, UP
Ph-. 01202586610. Mob-9811051315, email- info@ritikasystems.in

Subject- RATE CONTRACT FOR SUPPLY, INSTALLATION AND COMMISSIONING OF 300 and 500 WATT SOLAR CHARGERS WITH INTERFACE CHARGE CONTROLLER TO CHARGE THE BATTERIES OF EXISTING INVERTERS (Qty-3500)

- Reference:
- i. This office tender enquiry no. **HAREDA/ SIC/3186/2015-16 DATED: 18/11/2015** and technically opened on 31.12. 2015 and financial opened on 19.02.2016.
 - ii. Your offer submitted against the said tender enquiry & subsequent last correspondence in the matter.

Dear Sir,

You are hereby informed that your offer for the supply, installation and commissioning of 300 and 500 watt watt Solar chargers with interface charge controller has been accepted on rate contract by High Power Purchase Committee in its meeting held on 14.07.2016 at the rate given in **schedule-A** inclusive of all taxes with 5 years warranty of complete system including interface charge controller and with warranty of module 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 . This Rate Contract will be governed by the terms and conditions given in **schedule-B** and specification in **schedule-C** as under.

- i. This rate contract shall be valid up to one year i.e. up to 7.08.2017 or placing of cumulative work order/s of capacity 2100 Kwp i.e. 1.5 times of the aggregate capacity of 1400 Kwp of tender, whichever is earlier.
- ii. The technical specifications, terms and conditions if any left out in the schedule-B and C, shall be as per DNIT.
- iii. Please acknowledge receipt of this Rate Contract within a week's time from the date of issue by returning the second copy duly signed and stamped by authorized representative of your firm.
- iv. This Rate Contract contains 11 pages including this page.

Annexures:

1. Schedule "A" -Description of Stores, Prices, Duties/Taxes.
2. Schedule "B" -Terms & Conditions of the rate contract.
3. Schedule "C" - Technical specifications.

Sd-
Technical Advisor,
for Director, Renewable Energy Deptt
Haryana & HAREDA.

Encl: As above



Schedule-A

DESCRIPTION OF STORES, PRICES, DUTIES/ TAXES ETC.

S. No	Item	Description of Stores	Rates inclusive of all taxes with 5 years warranty of interface charge controller and with warranty of module 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 (In Rs.)	Names of firms and make of their SPV modules and charge controller	State of billing	Approved for the supply of systems
1	300 Watt solar chargers as per specifications at schedule C)	Supply, installation and commissioning of 300 watt solar Charger with interface charge controller to charge the batteries of existing inverters	19,000/- per system	M/s OFCA Power Technologies Pvt. Ltd., Gurgaon Make of Modules- "PV Power Tech" Make of Charge Controller- "OFCA"	Haryana	100% of the required quantity
2	500 Watt solar chargers as per specifications at schedule C)	Supply, installation and commissioning of 500 watt solar Charger with interface charge controller to charge the batteries of existing inverters	28,500/- per system	i. M/s Kirloskar Integrated Technologies Ltd., Pune Make of Modules- "Kirloskar" Make of Charge Controller- "Kirloskar" ii. M/s Ritika System Pvt. Ltd., Noida Make of Modules- "Ritika" Make of Charge Controller- "Ritika" iii. M/s OFCA Power Technologies Pvt. Ltd., Gurgaon Make of Modules- PV Power Tech Make of Charge Controller- OFCA	Maharashtra/ (UP)	50% of the required quantity
					(UP)	30% of the required quantity
					Haryana	20% of the required quantity



Schedule -B

DETAILED TERMS & CONDITIONS FOR SUPPLY, INSTALLATION AND COMMISSIONING OF SOLAR CHARGERS OF 300 AND 500 WATT CAPACITIES WITH INTERFACE SMART CHARGE CONTROLLER TO CHARGE THE BATTERIES OF EXISTING CONVENTIONAL INVERTORS

1. SCOPE OF WORK

Supply, installation & commissioning of Solar Chargers of capacity 300 watt/ 500 watt at various locations in the State of Haryana on annual rate contract, as per the technical specifications given in schedule-C with five years warranty of the complete system(s) from the date of commissioned and PV modules used in the power plant 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

The scope of work shall include the following:

- a. Supply, installation & commissioning of Solar Chargers of capacity 300 watt/ 500 watt. The Solar Charger consists of Solar PV Modules, Interface Charge Controller, connecting wires & other mechanical as well as electric/ electronics components etc.
- b. Detailed planning of smooth execution of the project in the prescribed time line.
- c. Wiring up to the existing inverter from the Solar Panels will be in the scope of the successful bidder(s). The maximum cable length of 15m for every solar charger installed shall be in the scope of the bidder and supply of excess cable length if required shall be in the scope of user/ beneficiary.
- d. Performance testing of the complete system.
- e. The installer shall undertake to supply spares free of cost for the maintenance of the offered items during the warranty period.
- f. After sales service , directly or through local service network
- g. A leaflet containing the details of the service centers shall be provided to each purchaser as well as to HAREDA.
- h. If the operation or use of the system proves to be unsatisfactory during the warranty period, the installer shall replace the faulty ones or carry out necessary repairs as per the warranty terms and conditions.

2. PERFORMANCE SECURITY DEPOSIT

The successful tenderer shall have to deposit Security Deposit (SD) equivalent to **10% of the work order value within 30 days** from the date of issue of the work order. The EMD of such successful bidders shall be released on submission of SD in the shape of DD or Bank guarantee valid for a period of five year & six months. After the successful completion of the work order, the SD shall be treated as Performance Security Deposit (PSD) & shall be released on successful completion of the warrantee period of five years from the date of commissioning of the project/system. In case of delays, the validity of the SD/PSD will be extended by the firm failing which it will be encashed.

3. PAYMENT TERMS

The payments shall be made as per the following terms and conditions:

- a. **85% of the ordered value** after the supply of the complete system at site (O/o concerned ADC-cum-CPO or the place communicated by the concerned ADC-cum-CPO) supported with material receipt issued by PO/ APO of the concerned district and bill of material.



- b. **15% of the ordered value** after satisfactory installation & commissioning of the systems within 30 days after submission of Joint Commissioning Report (JCR), along with satisfactory performance report, duly signed by the district PO/APO, supplier and end user.

4. **WARRANTY PERIOD**

- (i) The Warranty period shall be 25 Years for the PV modules and 5 years for complete system from the date of commissioning of the system(s). The contractor shall rectify defects developed in the system within Warranty period promptly. **The procedure to rectify the complaint/service to be provided during warrantee period** is as follows :

During the warrantee period, the firm shall ensure proper functioning of the systems and complaint, if any, forwarded to the supplier against the system, will have to be attended within 7 days of forwarding such complaints. The procedure to rectify the complaints shall be as under:

- a) The notice through E-mail/hard copy to rectify the complaints shall be issued by the HQ/district officer/User to the supplier with copy to the HAREDA. This shall be followed by two reminders on 7 days intervals each. The district office shall maintain proper record of the complaints.
- b) Even after this, the complaints remain unattended the penalty @ Rs. 20 per day per system will be imposed from the expiry of 21 days & same will be deducted from the payment due to the supplier / out of the Performance Security Deposit/ bank Guarantee. The firm if failed to repair/ replace the defective system within next 10 days after expiry of the earlier specified 21 days of forwarding of the complaint then concerned ADC-cum-CPO shall forward the case to the Director, HAREDA along with estimated expenditure for the replacement/ repair. Director, HAREDA may consider repairing / replacing such defective system on the cost of the supplier. **The firm who shall be penalized by revoking PSD/Bank guarantee shall deemed to be considered as unfit to participate in all the tenders floated by HAREDA in future and shall be treated as unsatisfactory performer.**
- c) If the whole PSD/ bank guarantee is utilized and the complaints are still pending then an online/registered notice will be sent to the firm to attend the complaint within 15 days.
- d) If the firm still does not attend the complaint within the above mentioned period then the firm may be blacklisted and a legal proceeding may be initiated against the firm for Breach the agreement.
- (ii) The supplier shall affirm as per standards for quality that anything to be furnished shall be new, free from all defects and faults in material, workmanship and manufacture, shall be of the highest grade and consistent with established and generally accepted standards for material of the type ordered, shall be in full conformity with the specifications, drawing or samples, if any and shall if operable, operate properly.
- (iii) HAREDA/the consignee will have the liberty to get the sample for the item(s) supplied tested from any of the Govt. approved lab. at any time during the inspection or warranty period to ascertain the performance of the item(s) as per DNIT specifications. The cost of testing will be borne by the supplier.
- (iv) The Contractor in consultation with concerned District Officer will conduct training programme for users, focusing on main features, operation and maintenance of the systems.



- (v) The Contractor/supplier shall continue to provide spare parts after the expiry of warranty period at the users cost. If the contractor fails to continue to supply spare parts and services to users then HAREDA shall take appropriate action against the firm, if any complaint is received from the user(s).

5. TIME SCHEDULE, PENALTY/LIQUIDATED DAMAGES

- a. The systems will be **supplied, installed and commissioned** within **four months** time from the date of issue of work order. It shall be the sole responsibility of the supplier to plan in such a manner that pre-dispatch inspection, supply, installation & commissioning work is completed within the defined time period. The supplier shall also ensure to give Call for inspection within 90 days through email/Fax. Inspection notice should be reached in the HAREDA office at **least 10 days prior** to the proposed date of inspection.
- b. The time for and date of delivery or dispatch stipulated in the order shall be deemed to be the essence of the contract, and should the contractor fail to deliver or dispatch any consignment within the period prescribed for such delivery or dispatch stipulated in the order, the delayed consignment will be subject to **2% penalty per consignment per month** subject to max. of 10% of the work order value recoverable on the value of the stores supplied. Once the maximum is reached, the "HAREDA" may consider termination of the contract. In case of non-payment by the contractor, recovery will be made from his bills or amount of Earnest money or security deposited with Director, HAREDA

6. INSPECTION OF MATERIAL

- (i) After receipt of call for inspection, the material shall be inspected by the Director, HAREDA or a committee authorized by him at firms premises or in exceptional cases at site and material shall be dispatched/erected after acceptance of the same by the Inspection Committee.

Call for inspection should be given within 90 days through email/Fax. Inspection notice should be given **at least 10 days prior** to the proposed date of inspection. To illustrate it further, if the last date of supply is 31st March & supplier sends the inspection call on 30th March for inspection on 31st March, the inspection date shall be considered as 9th April (10 days notice) & period from 1st April to 9th April shall be under penalty clause.

- (ii) The installation work shall be carried out under the close supervision of the Project Officer/ Asstt. Project Officer of the district & the user. **The final inspection after installation and commissioning shall be carried out by district office and user.** The supplier shall provide without any extra charge, all materials, tools, testing equipments, labour and assistance of every kind which the inspecting officer may consider necessary for any test or examination. HAREDA can also get the systems tested from any Govt. approved test centre/ laboratory and the expenses shall be borne by the supplier. Rejected material (if any) will have to be replaced by the supplier at its cost within a week time.

- (iii) In case the material offered for inspection fails to meet the specifications stipulated in DNIT /Order /Contract and the material is rejected by the Inspecting Committee or complete material is not available for inspection, HAREDA will levy a penalty at 0.1% of the order value. In case the material offered for inspection fails during the 2nd inspection also, the Indenting Department will have the right to increase the penalty to 0.25% of the order value. In case, the material offered fails during the 3rd and final inspection also, the firm will be liable for penal action including forfeiture of EMD/PSD, risk purchase, debarring/blacklisting in future, and no further opportunity for inspection will be provided to the supplier firm.



- (iv) The inspection report should be submitted to HAREDA within three days from the date of inspection either by hand or by e-mail/fax. Similarly, the commissioning report should be submitted to the concerned district office and an advance copy to HAREDA within **seven days** from the date of commissioning either by hand and by e-mail/fax failing which the commissioning date shall be considered three days prior to the date of submission of the report in HAREDA and the period of late submission of JCR shall be counted towards delay. The district office after verification will issue the JCR or shall report any discrepancy to the supplier with a copy to HAREDA within three days. In case of discrepancy in the system commissioned, the commissioning date shall be counted from the date when the discrepancy has been removed to the entire satisfaction of HAREDA/District Office/User.
- (v) The firm will print the words '**PROMOTED BY HAREDA & YEAR-2016-17.**' on the body of the Systems in permanent manner so as to minimize any possible malpractices.

7. PRICE FALL CLAUSE:

- (i) The prices charged for the stores supplied under the Contract by the Contractor shall in no event exceed the lowest price at which the Contractor sells the Stores or offer to sell stores of identical description to any Department of the Central Government or any Department of a State Government or any statutory undertaking of the Central or a State Government, as the case may be, during the period till all Orders placed during the currency of Contract is completed.
- (ii) If at any time during the said period, the Contractor reduces the Sale price, sells or offers to sell such stores irrespective of quantity to any person(s)/organization(s) including the Purchaser or any Statutory Undertaking of the Central or a State Government, as the case may be, at a price lower than the price chargeable under this Contract, he shall forthwith notify such reduction or Sale or offer of Sale to the Director, Renewable Energy Department, Haryana/HAREDA and the price payable under the Contract for the stores supplied after the date of coming into force of such reduction or sale or offer of sale stand correspondingly reduced. The above stipulation will, however, not apply to :
- (a) Export/deemed Export by the Contractor
- (b) Sale/ normal replacement.
- (iii) The Contractor shall furnish the following certificate to the Paying Authority along with each bill for payment for supplies made against the Contract.

“I/We certify that there has been no reduction in sale price of the Stores of Description identical to the Stores supplied to the Government under the contract herein and such Stores have not been offered/sold by me/us to any person(s)/organization(s) including the purchaser or any Department of Central Government or any Department of a State Government or any statutory Undertaking of the Central or State Government as the case may be up to the date of the bill/the date of completion of supplies against all orders placed during the currency of the Contract at a price lower than the price charged to the Government under the Contract except for quantity of Stores as mentioned at para (ii) above.

8. OPERATION AND MAINTENANCE MANUAL:

The supplier shall provide the guidelines containing DO's & DO NOT's in Hindi and English for Operation and Maintenance of the complete system to the user for proper maintenance of the system.



9. **FORCE MAJEURE**

- (i) Notwithstanding the provisions of clauses contained in this deed; the contractor shall not be liable for forfeiture of its performance security, liquidated damages, termination for default, if he is unable to fulfill his obligation under this deed due to event of force majeure circumstances.
- (ii) 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. Such events may include, but are not restricted to, acts of Govt. either in its sovereign or contractual capacity, wars or revolutions, fires, floods, epidemics, quarantine restrictions and fright embargoes.
- (iii) Obstruction in procurement of components /raw material by the firm from the manufacturers with whom they have tied up for execution of the projects under this tender shall not be covered under force majeure condition. The bidders are advised to make suitable arrangements for supply of parts and components for implementation of the tendered projects within allowed timeframe.
- (iv) However, if a force majeure situation arises, the contractor shall immediately notify the "HAREDA" in writing. The decision of the Director, HAREDA in above conditions shall be final.

10. **ARBITRATION:**

If any question, dispute or difference arises between HAREDA and the contractor, in the connection with this agreement except as to matters, the decisions for which have been specifically provided, either party may forthwith give to the other notice in writing of existence of such question, dispute or difference and the same shall be referred to the sole arbitration of the Principal Secretary/Secretary/Chairman, HAREDA or a person nominated by him. This reference shall be governed by the Indian Arbitration Act, and the rules made there under. The award in such arbitration shall be final and binding on both the parties. Work under the agreement shall be continuing during the arbitration proceedings unless the HAREDA or the arbitrator directs otherwise.

11. **JURISDICTION FOR SETTLING DISPUTES**

Where a contractor has not agreed to Sole Arbitration Clause of the Conditions of the Contract, Governing contracts the dispute/claims arising out of the contract entered into with him will be subject to the jurisdiction of Civil Court Panchkula.

12. **OTHER TERMS AND CONDITIONS**

- (i) Material shall be strictly as per DNIT specifications.
- (ii) The remaining terms and conditions shall be as per the DNIT.

Note:

Placing of any work order under this rate contract will require prior approval/sanction of the Director, DRE/HAREDA. Any work order, referring to this rate contract, placed without the prior approval/ sanction of the Director, DRE/ HAREDA, will not be accepted by the contractor.



Schedule-C

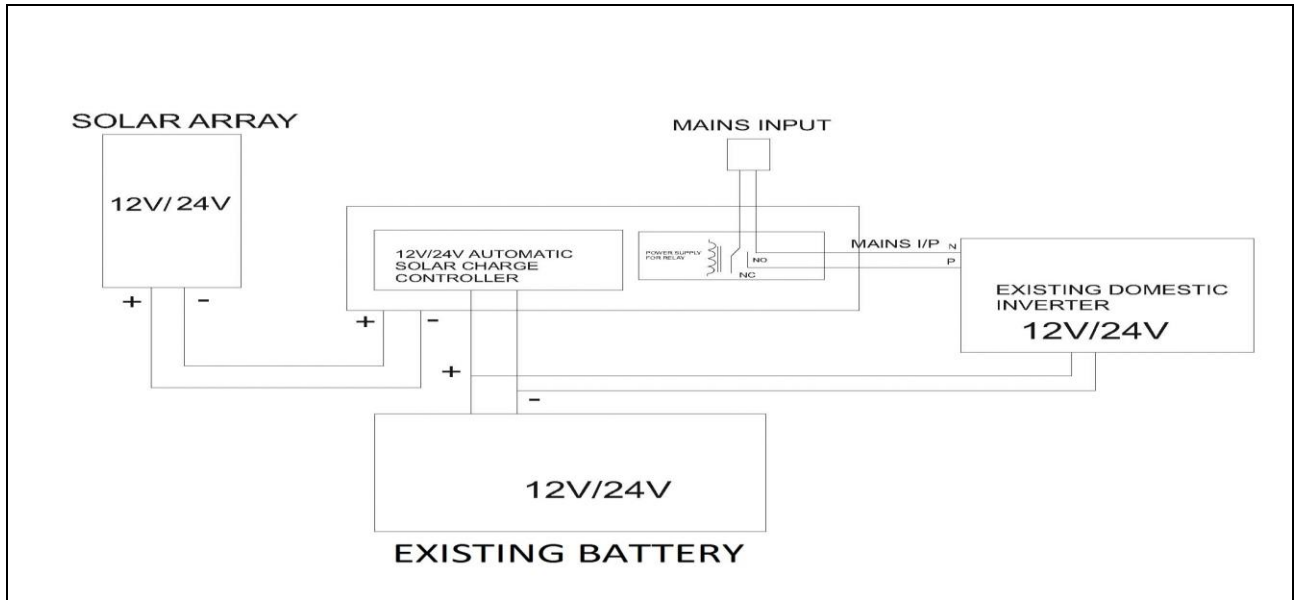
TECHNICAL SPECIFICATIONS OF 300 WATT AND 500 WATT SOLAR CHARGERS WITH INTERFACE CHARGE CONTROLLER TO CHARGE THE BATTERIES OF EXISTING DOMESTIC INVERTORS

SPV MODULES

Item	Description
SPV Module	<ul style="list-style-type: none"> • The Photovoltaic module should be Mono/ Poly Crystalline. • The Total Capacity of 300 Watt with (System -1) for inverter between 600VA to 850 VA using one 12V battery and 500 Watts for (System – 2) for inverter between 1000 VA to 1500 VA using 02 Nos. of 12 V Batteries. • The Photovoltaic modules must be qualified as per IEC 61215 (revised) / IS 14286 standards and in addition, the modules must conform to IEC 61730-1 requirements for construction & Part-2 requirements for testing, for safety qualification. • The PV modules must be tested and approved from any of the IEC/ NABL/ MNRE Accredited Testing Calibration Laboratories. • The supplier shall provide performance guarantee for the PV modules used in the power plant 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. • The efficiency of the PV modules should be minimum 14% and fill factor should be more than 70%.
Nos. of Modules	03 No. of 100 Watt or 02 No. of 150 Watt Modules for System – 1 & 04 No. of 125 Watt or 02 No. of 250 Watt Modules for System – 2
Open Circuit Voltage	The open circuit voltage of the PV modules under STC should be 21.0 Volts for 36 Cells modules and 42.0 Volts for 72 Cells modules.
Power out put	The power output of the PV module should be at standard test conditions (STC) at 16.4 Volts for 36 cells modules & 32.8 Volts for 72 Cells modules.
Junction Box	Junction boxes shall be dust, vermin and waterproof and made of FRP.
Orientation and Tilt of PV Module	Modules alignment and tilt angle shall be calculated to provide max. Annual energy output. This shall be decided based on the location of array installation.
Others	The terminal box on the module should have a provision for opening for replacing the cable; Array Junction Box should be IP – 65.
-do-	Each module should have a) Name of the Manufacturer or distinctive Logo b) Model or Type No. c) Serial No. d) Year of make



INTERFACE SOLAR CHARGE CONTROLLER:-



Type	The controller should be of pulse width modulation (PWM) type.
Voltage	<u>System – 1</u> Constant voltage should be set at 14.5 +/-0.5 volts or suitable DC voltage for charging the battery for 12 volt, One battery of 150 AH / 180 AH at C/10 rating. <u>System - 2</u> Constant voltage should be set at 28 +/-0.5 volts or suitable of DC voltage Charging the battery at 24 volt, two batteries of 150 AH / 180 AH at C/10 rating each.
Nominal SPV input voltage	12 V (system-1) & 24V (System-2).
Product Rating	12/24V,20A(12/24V Auto Detection)
Current rating	Current rating should be minimum 20 Amps
Operating Environment	-20oC to +60oC
Efficiency	>95% @25oC



Working	<p>i. The same controller should be suitable for single battery 12 V and Double battery 12V battery systems already installed in domestic inverters. The capacity of the battery will be between 100 Ah to 180 Ah.</p> <p>ii. The controllers should be microprocessor based used PWM technology.</p> <p>iii. The system should provide the facility to charge battery through solar or using AC grid when battery voltage falls below preset level. The interfacing unit connects the load automatically to the grid power and also charges the battery using AC Grid as well as by solar panels.</p> <p>iv. When batteries are charged to the pre-set level during day time, the interface unit shall automatically cut off AC grid power from the system and load will run through the inverter(using stored battery charge)</p> <p>v. The system should designed to give priority to solar power and use grid power only when solar power is insufficient to charge the batteries and battery charge is insufficient to meet the load requirement.</p> <p>vi. The inverters becomes normal domestic inverters during night time when solar is not available. This is required because if it is continues to function as a solar inverter, AC load will run on battery (through inverter) till the battery becomes low.</p> <p>vii. The interface unit should be easy to install on existing inverters and there should not be any tampering with the existing domestic inverter.</p>
Operation	<p>The above is to accomplished the following operations-</p> <p>1. In Morning condition- When Solar of low intensity is available and Grid is on and the battery is fully charged in this case the system should shift to solar only. During use if battery goes down and solar is not able to sustain load, the charging will be both by Grid and Solar and the load will be on mains till the battery is fully charged.</p> <p>2. In Day time condition- The system should be designed to give priority to solar power and use grid power only when solar power is insufficient to charge the batteries and battery charge is insufficient to meet the load requirement. When batteries are fully charged during day time, the interface unit shall automatically cut off AC grid power from the system and load should run through the inverter(using stored battery charge)</p> <p>3. In evening condition- When solar power drop the systems should be shift to Grid and becomes normal domestic inverters during night time other automatically or manually through a switch.</p>
Indicators	The controller should have indicators for showing solar charge and AC charging and mains on
Protection	<p>Fuses should be provided to protect against short circuit conditions. The following protections should be made in the charger:</p> <ul style="list-style-type: none"> • Reverse polarity • Short Circuit • Over Current • Reverse Current • Over Voltage • Under Voltage • Over Temperature
To prevent reverse flow of current	Blocking diodes should be provided as part of the electronics, to prevent reverse flow of current through the PV module(s)
Warrantee	The system must be warranted for five years from the date of commissioned and PV modules used in the power plant 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.
Structure for module frame	Module frame structure to be made from 35mmx35mmx5 mm MS angle duly painted with corrosion resistant paint and primer suitable for mounting on roof of user. The module frame should be grouted with 1:2:4 cement concrete. All nuts & bolts shall be made of very good quality stainless steel. The array structure shall be so designed that it will occupy minimum space without sacrificing the output from SPV panels at the same time it will withstand wind speed as per IS 875.
Wires/Cables for SPV Modules and Battery	<ul style="list-style-type: none"> • 4.0 mm sq single cables suitable for DC supply for modules interconnection as per site requirement (BOTH SYSTEM -1 &2). • 10 mtr lengths suitable for DC supply from modules to charge controller. • 1.5 mtr lengths with thimble on one side for connecting in battery terminals should be provided. • The cable shall be PVC insulated. • The cables used should be of copper conductor of multi strand wires.
Self consumption	Should not be >20 mA

Codes and Standards

- a. The BOS items / components of the solar power pack must conform to the latest edition of IEC/ equivalent BIS Standards as specified below:

BoS item / component	Standard Description	Standard Number
Solar Modules	Crystalline silicon PV modules Conform to the latest edition	IEC 61215 (revised) / IS 14286 standards and in addition must conform to IEC 61730 Part-I&II
Interface Smart Charge controller	Electronically performance test report for;- Over charging, short circuit, battery reverse polarity, Reverse flow protection and temp compensation. PWM method.	As per specification of DNIT
Cables	General Test and Measuring Methods PVC insulated cables for working voltages upto and including 1100 V-Do-, UV resistant for outdoor installation	IEC 60227/IS 694 IEC 60502/IS1554 (Pt.I &II)

Note: - Please note that the NABL accredited lab must be accredited for Solar Charge Controllers.

2. IDENTIFICATION AND TRACEABILITY

Each PV module must use a RF identification tag (RFID), which must generally contain the following information:

- Name of the manufacturer of PV Module
- Name of the Manufacturer of Solar cells
- Month and year of the manufacture (separately for solar cells and module)
- Country of origin (separately for solar cells and module)
- I-V curve for the module



- (vi) Peak Wattage, I_m , V_m and FF for the module
- Vii) Unique Serial No and Model No of the module
- (viii) Date and year of obtaining IEC PV module qualification certificate
- (ix) Name of the test lab issuing IEC certificate
- (x) Other relevant information on traceability of solar cells and module as per ISO 9000 series.

The RFID can be inside or outside the module laminate, but must be able to withstand harsh environmental conditions.

3. AUTHORISED TESTING LABORATORIES/CENTERS

- 3.1. The PV modules must qualify as per relevant IEC standards. Test certificates can be from any of the IEC/NABL / MNRE Accredited Testing/Calibration Laboratories.
- 3.2 Test certificates for the BOS items/components can be from any of the IEC/ NABL Accredited Testing-Calibration Laboratories or MNRE approved test centers.
- 3.3 NABL centers test be accredited for the item.