

RFP for
Supply, Installation and commissioning of 20 KVA Solar Power Conditioning
Unit For IAO-HANLE

INTRODUCTION:

We have 2 units of 31.5 KWp Solar Power Plant installed at IAO-Hanle Observatory to supply power to the Telescopes and the supporting Instruments. At present, an Inverter (PCU) of 12.5KVA nominal rating is being used to convert the solar energy to 3 phase AC power from the array. Now due to installation of new Telescopes and Instruments the load requirements have increased and need replacement with higher capacity PCU. The specifications of the existing PCU are as follows:

1. Inverter DC input voltage(nominal) : 120V DC
2. Inverter rating(nominal) :12.5 KVA
3. Inverter type : Bi-directional Inverter
4. Inverter AC output(nominal) : 415V AC, 50Hz, 3 phase, 4 wire
5. Solar Charge Controller type : MPPT
6. Solar Charge Controller rating : 32KW
7. DG Input (Nominal) : 3 Phase, 415 V AC, 50 Hz, 4 Wire.

It is proposed to replace the existing 2 numbers of 12.5 KVA Inverter with a 2 numbers of 20 KVA PCU.

2. SCOPE:

2.1. The scope of the work includes supply, installation and commissioning of 2 numbers of **20 KVA Power Conditioning Unit** for IAO-Hanle.

2.2. Service the facility as and when required under warranty and provide guaranteed service for the Power conditioning Unit including subsystems for at least 10 years

2.3. Provide operational support as and when required.

3. SYSTEM DESCRIPTION:

3.1. 20 KVA Solar Power Conditioning Unit Specifications:

- a) Nominal 20 KVA Continuous rating-Bidirectional Inverter
- b) In built Minimum 32KW Integral Solar Regulator-MPPT type
- c) 120Volt DC Input-nominal
- d) 415 V AC, 3 phase, 50 Hz, 4 wire output, pure sine wave with less than 3% total harmonic distortion
- e) 200% Surge Rating
- f) The output regulation should be under $\pm 2\%$ AC voltage and $\pm 0.5\%$ Frequency.
- g) Minimum Efficiency should be above 90%.
- h) The PCU supervisory control shall supervise the DC voltage and current and shall disconnect AC and DC side in case of fault.
- i) The Charge controller should be MPPT charge controller with state of the art device. It must maximize the battery charging and must enhance the life of the batteries by accurately controlling the PV charge current.
- j) The charge controller should have an option of Boost Charging of the Battery bank.
- k) The PCU shall be capable of operating in parallel with the grid utility/DG service as well as reverse charge the batteries when 415V, 3phase, 50Hz is made available to it.

3.2 LCD Interface and Key Pad

- a) Instantaneous Grid or Diesel and Inverter per phase KW, voltage, pf and Frequency.
- b) Grid or Diesel on line status
- c) Battery voltage, current, temperature.
- d) Solar charge current
- e) Solar radiation
- f) Inverter KWh summation
- g) The PCU should have the facility to change the various set points regarding the Batteries, DG, Inverter etc. to give more flexibility to the user as per site conditions.

3.3. Data Logging

- a) Instantaneous feedback of power, voltage, power factor and frequency of the grid, diesel and the inverter system.
- b) Periodic logging of power, voltage, power factor and frequency of the grid, diesel and the inverter system.
- c) Periodic logging of battery statistics including battery voltage, current, temperature etc.
- d) Adjustable logging period from 60 second averages to 24 hour daily logs.
- e) Time and date stamped log entries
- f) Time and date annotated fault log, holding the fault description, operating statistics and fault source.
- g) Bulk log download for immediate data importation into a spreadsheet.

3.4. Download Log Capabilities:

Date and time stamped with selectable log periods one minute to 24 Hours

- a) Solar charge current
- b) Battery current
- c) Battery voltage
- d) Battery temperature
- e) Grid or diesel KW, voltage, pf, frequency
- f) Inverter KW, voltage, pf, frequency
- g) Engine operating status
- i) System faults

3.5. Operating Temperature Range :-10 to 50 deg Celsius

3.5.Humidity: 0-95 % non condensing.

3.6.PROTECTION: The PCU should have the following protection in it:

- a) Over voltage protection both at Input and Output
- b) under voltage protection both at Input and Output
- c) Battery reverse protection.
- d) out put short circuit protection
- e) Over heat protection.
- f) Over/Under battery voltage protection

- g) Over/Under frequency protection
- h) Protection against surge voltage induced at output due to external source
- i) Protection against lightning induced surges class II, 10KA as per IEC 61643-1.
- j) Reverse polarity protection.
- k) Array ground fault protection..

4. SPARE PARTS:

The contractor shall make arrangement to maintain a sufficient stock of essential spares and consumable spare parts to ensure proper maintenance of the PCU promptly.

5. LOCAL CONDITIONS:

It will be imperative on the contractor to have full information of all local conditions and factors which may have any effect on the execution of the works. The contractor shall be deemed to have collected all relevant data regarding the proposed place of work/site, its local environment, approach road and connectivity, actual prevailing working conditions, availability of required materials and labour and all other information/ data required for proper completion of the proposed work.

If required, the contractor must pre-visit the site before starting the work. IIA shall not entertain any request of contractor for clarifications related to such local conditions and shall bear no responsibility in this regard.

6. TOOLS & TACKLES:

The contractor shall arrange all necessary tools & tackles for proper execution of work and operation/ maintenance of the PCU after supply. IIA shall in no way, responsible for supply of any tools & tackles.

7. INSTALLATION AND COMMISSIONING:

The installation and commissioning shall be done by the supplier/manufacturer who is responsible for system performance, direction of installation and structural stability. The supplier shall conduct a detailed site assessment.

8. DOCUMENTATION:

The supplier shall provide easy to use illustrated installation and operation manual in English for easy to installation and trouble free usage. Manual shall contain complete system details such as schematic of the system, working principle, clear

instructions on regular maintenance, trouble shooting of the PCU, emergency shut down procedure, soft start etc.

9. AFTER SALE SERVICE:

The complete details of the service centers in India shall be provided along with the offer. All essential materials and manpower shall be placed at the service centers to ensure quick and efficient after sales service. Any spares to be procured may be specified by the vendor.

10. PERIOD OF COMPLETION:

The work of supplying, installation, testing and commissioning of the 20 KVA PCU at IAO-Hanle is 6 months from the date of getting the work order.