

**F.No. 1/1/(08)/2011-SEC**  
**Government of India**  
**Ministry of New and Renewable Energy**  
**Solar Energy Centre**  
**19<sup>th</sup> Mile Stone, Gurgaon-Faridabad Road,**  
**Village & P.O. GwalPahari, Distt. Gurgaon (HR).**  
**Phone: 091-124-2579213**  
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**Date: 30.12.2013**

**Tender Document**

**Sub: Tender for design, fabrication and supply of Programmable AC/DC Power Source at Solar Energy Centre, MNRE, Govt. of India – reg.**

On behalf of President of India, Adviser & Head, Solar Energy Centre (SEC), Ministry of New and Renewable Energy (MNRE), Government of India invites sealed tenders in two parts (Technical and Commercial offers separately) from original manufacturers or their Authorized Indian representatives, for Design, Fabrication and Supply of the following test Equipment Programmable AC/DC Power Source along with suitable power analyzer optional at Solar Energy Centre, Gwalpahari, Gurgaon, Haryana, India. The original manufacturer should be a globally reputed company and should have sufficient experience in Design & Fabrication of Programmable AC/DC Power Source. Preference may be given to the manufacturers having their authorized repair & service center(s) in India and a list of the same should be supplied along with the bid document. **A list of actual users/customers should also be furnished along with the Technical Bid.**

1	Tender No.	F. No. 1/1/ (08)/2011-SEC dated 20.11.2013
2	Details of equipment	Programmable AC/DC Power Source
3	Quantity	1 Nos . of 6-KVA Power source with 15- 1KHz Frequency, 0-300Vper phase, 0-500V phase to Phase /both 3Ø & 1Ø operation, along with accessories for Rack mounting and an option of 4-Channels Precision Power Analyzer for both AC & DC Measurements and consumables for five years system
4	Description of AC/DC AC Source	A 6-KVA Power source with 15- 1KHz Frequency, 0-300Vper phase and 0-500V phase to Phase /both 3Ø & 1Ø operation, along with accessories for Rack mounting and an option of 4-Channels Precision Power Analyzer for both AC Measurements and consumables. Programmable AC Power Source is required for testing UPS, Off-Grid Inverters & Programmable AC/DC Power Source. It can simulate AC & DC Source in all configuration & all types of Power Line Disturbance Simulation, Harmonics, and Interharmonics Synthesis for 0-300V / 15-1KHz frequency / 3Ø / 6-KVA of total Power.

## 2. SCOPE OF CONTRACT:

The supply should cover the Design, Fabrication, Supply, Installation and Commissioning of 1 number of 6-KVA programmable AC Power source with 15- 1KHz Frequency, 0-300V per phase, 0-500V phase to Phase /both 3Ø & 1Ø operation, along with accessories for Rack mounting and an option of 4-Channels Precision Power Analyzer for both AC & DC Measurements, along with consumables for five years system, at Solar Energy Centre, Ministry of New and Renewable Energy, 19th Mile Stone, Gurgaon-Faridabad Road, Village & P.O. GwalPahari, District Gurgaon (Pin 122001), Haryana, India.

## 3. SPECIFICATIONS OF PROGRAMMABLE AC/DC POWER SOURCE:

### 3.1 TECHNICAL SPECIFICATIONS:

Programmable AC/DC Power Source is required for testing Off/ON-grid tied Inverters, AC/DC Load Testing and other power devices testing. It can simulate AC + DC, AC Only & DC Only mode for Programmable Voltage output in all configurations & all types of loads. Under the present tender, SEC looking for 1 No. of AC Sources with Power rating of 6-KVA. An option for a 4- Channel Precision Power analyzer with specification given below should be offered with the system. It should be possible Programmable AC/DC Source can be used for both parallel and series configuration for either a three phase grid inverter up to 6-KVA and a single phase inverter up to 2-KVA per phase. The broad specifications of each of the system are as follows:

### 3.2 CHARACTERISTICS OF PROGRAMMABLE AC/DC POWER SOURCE :

**3.2.1.** Programmable AC/DC Power Source should be able to simulate the Power Line Disturbance Simulation, Harmonics, and Interharmonics Synthesis for 0-300V/15Hz- 1.2 KHz frequency/3Ø/6-KVA of total Power and 2-KVA per Phase output.

1. **Circuit Type:** Advanced PWM Technology & Built in PFC, which provides input power factor up to 0.97
2. **Output Mode:** AC + DC, AC Only & DC Only mode for Programmable Voltage output capability.
3. **Slew Rate Setting:** Programmable slew rate setting for changing voltage and frequency.
4. It is necessary for Programmable AC Source to generate harmonics, inter harmonics synthesis, voltage dips, short and variation simulation, Power Line Disturbance simulation, Programmable output impedance conditions & settings, High output current crest factor and turn On / Off phase angle control, Arbitrary Waveform Simulation.
5. **AC Output Rating (for Power) :** Max. Power: 6000VA when 3-Phase & 2000VA when 1-phase is in use.
6. **Output Rating AC (For Voltage Range/phase):** 150V/300V/Auto with Accuracy of 0.2%+0.2%F.S. Distortion will not more than 0.3% @ 50/60Hz, 1.5% @ 15 to 1.2 KHz.
7. Line Regulation                      0.1%
8. Load Regulation                    0.2%
9. Phase angle (Resolution/Accuracy) : 0-360°(0.3degree/<0.8degree at 50/60Hz)
10. Voltage resolution: 0.1V

11. **Output Current (per Phase):** Rms Current will be 15A/7.5A (150V/300V), Peak Current will be 90A/45A (150V/300V)
12. **Output Frequency:** Range DC, 15Hz - 1.2KHz, Accuracy: 0.1%
13. **Harmonics & Inter-harmonics Simulation:** Harmonic simulation up to 40<sup>th</sup> Harmonic Order, Inter harmonic simulation bandwidth from 0.01Hz to 2400Hz.
14. **DC Voltage:** Max. DC Voltage should go up to 420Volts
15. Input power- 3-phase & input frequency- 50Hz
16. **Measurement Parameters:** RMS voltage, RMS current, true power, power factor, and current crest factor, VA (apparent power) and VAR (reactive power)
17. Programmable AC Source must be CE certified.
18. **Protection:** Under voltage protection, over current Protection, over power protection, over temperature protection, short circuit protection, cooling through fan.
19. **Precision Power Analyzer features :**
  - a) 4-Input Channels for both voltage and current.
  - b) Should be able to measure AC, AC+DC and DC measurements.
  - c) Should be battery and mains operated.
  - d) Voltage range up to 600V<sub>rms</sub> for nominal voltage and 1000V<sub>rms</sub> for peak voltage measurement.
  - e) AC & DC currents should be supported with Low current (minimum) and High current rated (Maximum) optional clamps.
  - f) Inbuilt supported configuration for Single-phase photovoltaic system and Three-phase photovoltaic system should be Three phase system 4-wire WYE (three phase + neutral + ground) or Three phase system 3-wire DELTA (three phase + ground). Three phase system 3-wire (three phase + neutral + ground) and Single phase system (phase + neutral + ground).
  - g) Able to measure the performance of 3-phase PV-Inverter or single phase Photovoltaic inverter or PV array performance, with the combination inputs for temperature and irradiance via reference cell measurement method.
  - h) PC software for report and data analysis. Flash drive and Compact Flash card for extended memory & data transfer to PC must be supported.
  - i) All the quality power parameters required for Photovoltaic Inverter testing such as Frequency, DC Voltage, DC Current, AC Voltage, AC Current, Harmonics, PF, Power & Energy measurements, Temperature and Irradiance, Unbalance voltage, Inrush Current, Transients measurements etc. should be possible.

3.2.2. The original manufacturers who have past experience of fabricating such systems, or at least. similar systems for PV modules testing are preferred. A list of clients whose sites are open to visit by SEC officers for demonstration should be enclosed.

#### 4. EARNEST MONEY DEPOSIT (EMD):

A sum of Rs. 56,000 should be submitted as Earnest Money Deposit (EMD) **along with the technical bid** in the form of nationalized bank's demand draft drawn in favor of "*Drawing & Disbursing Officer, Solar Energy Centre and payable at New Delhi, India.*" The EMD of the

accepted tender will be retained as Security Deposit and the EMD of other unsuccessful bidders would be refunded.

#### **5. RATES:**

The rates should be quoted specifically on the following lines: Firm and final cost of Programmable AC/DC Power Source with the above specifications and features. Duties, taxes and freight etc. if any applicable, should be indicated separately and clearly. However, certificate towards Customs Duty exemption in terms of Govt. Notification No. 51/96-Customs dated 23 July 1996 and Central Excise exemption in terms of Govt. Notification No. 10/97-Central Excise dated 1 march, 1997, if necessary will be issued to the supplier, provided the import is direct on the name of consignee and also the payment is in foreign exchange. Cost involved towards installation and commissioning at site, and Cost towards the training of customer's personnel should be indicated separately. Cost involved towards options, accessories, spares and consumables for operating the system at least for five years should be mentioned separately. A list of spares needed for five years trouble free operation should be attached along with its cost/prices.

#### **6. DELIVERY PERIOD:**

The system, Programmable AC/DC Power Source complete in all respects as per specifications above, in a single consignment should be delivered at the site/consignee within 2 months from the date of issue of confirmed supply order OR date of opening of Letter of Credit.

#### **7. INSPECTION:**

The supplier should satisfy himself/herself that the Programmable AC/DC Power Source and its spares if any are fully conforms to the specifications by carrying out complete pre-inspection of each component before dispatch. Final inspection will be carried out in the presence of firms Representative / Indian agent when the consignment arrives at Solar Energy Centre, Ministry of New and Renewable Energy, Village & P.O. Gwal Pahari, Distt. Gurgaon, (Pin-122001), Haryana, India.

#### **8. CONSIGNEE:**

Director (SPV-Testing)/ Store Keeper, Solar Energy Centre, Ministry of New and Renewable Energy, Village & P.O. GwalPahari, Distt.Gurgaon(Pin-122001), Haryana, India. The port of destination is Indira Gandhi International Airport, New Delhi, India and addressed to the consignee.

#### **9. GUARANTEE/WARRANTY:**

Systems/Spares supplied should be covered by standard terms of warranty for a period of 12 months from the date of installation or 18 months from the date of delivery, whichever is earlier for manufacturing defects/performance. During this period, the company should replace/repair the defective parts. The entire expenditure including freight if any for such replacement shall be borne by the firm.

#### **10. PAYMENT TERMS:**

Payment will be considered against irrevocable Letter of Credit on presentation of the following documents without discrepancies:

- Clean Master Airway Bill/House Airway Bill in original.

- Commercial invoice in quadruplicate.
- Packing list in duplicate.
- Manufacturer's certificate of warranty/guarantee and the inspection and calibration report.
- Certificate of origin.
- - Address/Tel/Fax number of your banker.

#### **11. PENALTY:**

The supplier shall supply the stores in accordance with the particulars as explicitly specified in the tender document at the place only. The time for and the date of the stores stipulated shall be deemed to be the essence of the supply/work order. If the supplies are not completed within the period prescribed, the supply order will be liable to be cancelled at the risk and cost of the contract besides forfeiting the Earnest Money Deposit. Should the supplier fail to deliver the systems within the period prescribed for such delivery/completion or at any time repudiates the contract before the expiry of such period, the competent authority or the purchaser may without prejudice to his right to recover the damages for breach of the contract/order. If for any reasons the contractor is unable to adhere to the contract delivery dates, he may seek extension in delivery/completion dates well in time by sending a request in writing in this regard to the office issuing the contract/supply order. The purchaser reserves the right to allow the extension of delivery period subject to such conditions as he may think fit. However, the decision of the purchaser shall be final and binding.

#### **12. DOCUMENTATION:**

The supplier will provide drawings, manuals, installation, operation and maintenance, trouble-shooting, circuit diagram etc. of Programmable AC/DC Power Source to be supplied under the order. The supplier will also supply detailed circuit diagram and installation configuration of the Programmable AC/DC Power Source including Do's and Don'ts and training material in English.

#### **13. DISPUTES:**

In case of any dispute the decision of Secretary, Ministry of New and Renewable Energy, Government of India will be final and binding on both parties. Further dispute, if any will be settled in the Court of Law at New Delhi jurisdiction only.

#### **14. IMPORT LICENSE:**

No import license is required for this import as it is being made under [OGL](#) for research and development purposes. However, the supplier will be fully responsible for obtaining the required authorization of export from country of origin, if necessary.

#### **15. COMPETENCE:**

The supplier should have sufficient experience in manufacturing of solar photovoltaic test/measurement equipments. Catalogues and company profiles should be enclosed along with the Technical bid.

#### **16. VALIDITY:**

Tenders should be valid for 180 days from the date of opening.

#### **17. SUBMISSION OF TENDERS:**

Sealed tenders are to be submitted in two parts i.e. **Part-I containing Technical competence / literature along with Demand Draft for EMD**, and **Part-II containing only commercial invoice in a separate sealed envelope, super-scribed as commercial bid**. Both the technical and commercial envelopes should be kept in a large size sealed envelope super-scribed as

tender for “**Programmable AC/DC Power Source due for opening on 23<sup>rd</sup>.1.2014** and addressed to:

Adviser & Head (SEC),  
Solar Energy Centre,  
Ministry of New and Renewable Energy,  
19<sup>th</sup> Mile Stone, Gurgaon – Faridabad Road,  
Village & P.O. GwalPahari,  
Distt.Gurgaon (Pin-122001), Haryana, India.

OR

Adviser & Head (SEC),  
Solar Energy Centre,  
Ministry of New and Renewable Energy  
Block-14, CGO Complex, Lodhi Road,  
New Delhi – 110003.

The bids sent by speed post of Indian Postal Department or through private courier Service providers may not get delivered at GwalPahari district Gurgaon, Haryana in time. Therefore an alternate address of New Delhi is also provided above. It is suggested that the bid should be sent sufficiently advanced so as to reach SEC on or before stipulated date and time. Solar energy center will not be held responsible for any postal delay and no claim / objections / correspondence will be entertained regarding this.

**18. IMPORTANT DATES:**

- a. Closing time and date of receipt of tenders at **12.00 noon on 23<sup>rd</sup>.1.2014**
- b. Opening of Technical Bids at **03.00 PM on 23<sup>rd</sup>.1.2014**
- c. Opening of Financial Bids of technically qualified tenders will be (tentatively) after one week of opening the technical bids of the tender. In case of any delay the same will be informed to the bidders.

**19.** It may please be ensured that the main tender envelope should be clearly super-scribed – “**Tender for Programmable AC/DC Power Source, Due for Opening ON 23<sup>rd</sup>.1.2014**”.

**(O.S. Sastry)**  
**Director (SPV Testing)**