



**SIDBI INNOVATION AND INCUBATION CENTRE**  
**INDIAN INSTITUTE OF TECHNOLOGY KANPUR**



To,

**Ref No: IIT/ SIIC/Mole/AC Power/BV/19-11-2014**

**INVITATION FOR QUOTATIONS FOR SUPPLY OF AC POWER SOURCE**

Brief Description of the Goods	Specifications*	Qty.	Delivery Period	Place of Delivery	Installation Requirement if any
<b>AC POWER SOURCE</b>	Mentioned below	01	20 Days	Central Store, IIT Kanpur	Yes

**AC Power Source**

**Input**

Voltage Ranges	Factory configured 187 to 264 Vrms, 3 $\phi$ L-L (3 wire), or 342 to 457 Vrms, 3 $\phi$ L-L (4 wire). A chassis ground is also required.
Power Factor	PFC Input, 0.99PF
Frequency Range	47 to 440 Hz
Efficiency	70% min, at full load
Ride Through	10 ms minimum

**Output**

Power	5550 VA: 1 $\phi$ or 3 $\phi$ (systems up to 33,000 VA)
AC or DC Output Voltage	0 to 156 Vrms L-N, low range; 0 to 312 Vrms L-N, high range
Current Per Phase	16A to 115V in 156V range; 8A to 230V in 312V range per, 1850 VA module. Option current in either AC, DC or AC+DC mode.
Power Factor of Load	0 lagging to 0 leading (0-unity)
Crest Factor	3.25:1 (peak output current to rms output current)
Frequency Range	Specifications apply DC, 40Hz to 5kHz. For output frequencies greater than 1 kHz, the max slew rate allowed is 1 kHz per second.
Max Total Harmonic Distortion	(Full Linear Load or No Load): 0.25% max, 40 to 100 Hz; 0.5% max to 500 Hz; and 1% max to 1 kHz plus 1%/kHz to 5 kHz
AC Noise Level	>60 dB rms below full output voltage
Amplitude Stability With Remote Sense	$\pm 0.1\%$ of full scale over 24 hours at constant line, load and temperature
Line Regulation	(DC, or 40 Hz to 5 kHz): $\pm 0.015\%$ of full scale for a $\pm 10\%$ input line change
Load Regulation	$\pm 0.025\%$ of full scale voltage for a full resistive load to no load; above 1 kHz, add $\pm 0\%/kHz$
Voltage Accuracy	$\pm 0.1\%$ of range. Above 1 kHz, add 0.2%/kHz. Add $\pm 0.1\%$ of full scale for "AC PLUS DC" mode. Valid for 5 to 156 Vrms and 10 to 312 Vrms at 25°C
Voltage Resolution	1mV (0.1V) Full Scale
Frequency Accuracy	$\pm 0.01\%$ at 25°C $\pm 0.001\%/^{\circ}C$

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Frequency Resolution	40 Hz to 81.91 Hz (0.01 Hz) 81.90 Hz to 819 Hz (0.01 Hz) 820 Hz to 5000 Hz (1 Hz)
Phase Accuracy, Phase-to-Phase Balanced	±1% of Programmed value
Linear Resistive Load	
Phase Angle Resolution	0.1°
Remote Output Voltage Sense	5 Vrms total lead drop, max
Common Input and Outputs	
Remote Inhibit	A logic Low or High contact closure input to inhibit the outputs
External Amplitude Modulation	0 to 5 VRMS provides 0 to 20% output amplitude modulation (±2% of full scale output).
External Drive Input	Acts as Amplifier, 0 to 5 VRMS (DC to 5 kHz) or ±5 VDC input for zero to full scale programmed voltage output (±2% of full scale output). Individual inputs for an external signal for each of the three phases.
Remote Programming Voltage	0 to ±7.07 VDC provides zero to full scale programmed voltage output (±2% of full scale output).
External Input Impedance	40K (ohm symbol) for each of the three inputs.
Externally Sync	External Sync allows the output frequency of the AC source to be synchronized to an external TTL level clock signal.
Front Panel Trigger, BNC Connector	Output available at the front panel BNC connector that provides a negative going pulse for any programmed voltage or frequency change. The trigger can be reassigned as an output when running list transients.
Front Panel Phase A, B and C, BNC connectors	These three outputs are representative of the programmed output waveform, magnitude and frequency. 0 to 4.86 Vrms represents 0 to a full-scale output voltage.
Environmental	
Operating Temperature	0°C to 45°C (32°F to 113°F)
Storage Temperature	-40°C to 70°C (-40°F to 158°F)
Cooling	Air is drawn in from the top, bottom, and sides and exhausted through the rear

**Measurements - Standard (AC Measurements)**

Parameter	Frequency	Phase	Voltage (AC rms)	Current (AC rms)
Range	40-81.91 Hz 82.0-819.1 Hz > 819 Hz	40-100 Hz 100-1000 Hz	0-300 V	0-50 A
Accuracy* (±) 1 ø mode (-1)	0.1% + 1 digit	0.5°	0.5% + 250 mV	0.1% + 150 mA
Accuracy* (±) 3 ø mode (-3)	.01 Hz / 0.1 Hz / 1 Hz	2°	0.5% + 250 mV	0.1% + 50 mA
Resolution*	.01 Hz / 0.1 Hz / 1 Hz	0.1° / 1°	10 mV	1 mA
Parameter		Real Power	Apparent Power	Power Factor
Range		0-6 kW	0-6 kVA	0.00-1.00
Accuracy* (±) 1 ø mode (-1)		0.15% + 9 W	0.15% + 9 VA	0.03
Accuracy* (±) 3 ø mode (-3)		0.15% + 3 W	0.15% + 3 VA	0.01
Resolution*		1 W	1 VA	0.01

\* Accuracy specifications are in % of reading and apply above 100 counts. For multi-chassis configurations

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current, power range and accuracy specifications are times three. Power factor accuracy applies for PF > 0. and VA > 50% of max. Frequency measurement specification valid for output > 30 Vrms.

**Constant Power AC Mode**

**Harmonic Measurements**

Parameter	Range	Accuracy ( ± )	Resolution
Frequency fundamental	40.00 - 1000 Hz	2 counts	0.01 Hz to 1 Hz
Frequency harmonics	32.00 Hz - 16 kHz	2° typ.	0.5°
Voltage	Fundamental	0.25V	0.01V
	Harmonic 2 - 50	0.25V + 0.1% + 0.1%/kHz	0.01V
Current	Fundamental	0.05A	0.01A
	Harmonic 2 - 50	0.05A + 0.1% + 0.1%/kHz	0.01A

Harmonics frequency range in three-phase mode is 32 Hz - 16 kHz. Accuracy specifications are multiplied by the number of power sources in multi-source systems with the 3-phase (3Ø) or the number of sources times 3 in the 1-phase (1Ø) mode . Measurement bandwidth is limited to 16 KHz.

**Protection And Safety**

Overvoltage Shutdown	Programmable for 15V to 255V peak, 156V range; 30V to 510V peak, 312V range
Programmable Current Limit Shutdown	Settable to 0.01 ARMS Resolution
Programmable Current Limit with Timed Shutdown	Settable to 1% of range: the timeout is settable from 100 ms to 10s.
Over temperature Shutdown	Automatic,

**Renowned Manufacturers like: Chroma, Ametek**

**Terms & Condition**

1. **The scope includes:**
  - a. Setting up machine in IIT Kanpur.
  - b. Initial Installation and configuration.
  - c. Training.
  
2. **Bid Price**
  - a) The contract shall be for the full quantity as described above. Corrections, if any, shall be made by crossing out, initialing, dating and re writing.
  - b) All duties, taxes and other levies payable on the raw materials and components shall be included in the total price. **Except Central Excise Duty & CDEC** (custom duty), as IIT Kanpur is exempted from these duty.
  - c) Sales tax in connection with the sale shall be shown separately.
  - d) The rates quoted by the bidder shall be fixed for the duration of the contract and shall not be subject to adjustment on any account.
  - e) The Prices shall be quoted in Indian Rupees only.



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3. Each bidder shall submit only one quotation.

4. **Validity of Quotation**

Quotation shall remain valid for a period not less than 60 days after the deadline date specified for submission.

5. **Evaluation of Quotations**

The Purchaser will evaluate and compare the quotations determined to be substantially responsive i.e. which

- (a) are properly signed ; and
- (b) Conform to the terms and conditions, and specification

**The Quotations would be evaluated separately for each item**

Sales tax in connection with sale of goods shall not be taken into account in evaluation.

6. **Award of contract**

The Purchaser will award the contract to the bidder whose quotation has been determined to be substantially responsive (includes technically suitable) and who has offered the lowest evaluated quotation price.

6.1 Notwithstanding the above, **the Purchaser reserves the right to accept or reject any quotations and to cancel the bidding process and reject all quotations at any time prior to the award of contract.**

6.2 The bidder whose bid is accepted will be notified of the award of contract by the Purchaser prior to expiration of the quotation validity period. The terms of the accepted offer shall be incorporated in the purchase order.

7. Payment shall be 90% against the delivery and 10% after satisfactory installation & configuration.

8. Warranty/ guarantee shall be 60 months to the supplied goods.

9. You are requested to provide your offer latest by 2.30 p.m. hours on 29/11/2014



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10. We look forward to receiving your quotations and thank you for your interest in this project.

**FORMAT OF QUOTATION \***

Sl. No.	Description Goods	Specifications	Qty.	Unit	Quoted Unit Rate in Rs.	Total Amount	
						In Figures	In Words
	<b>TOTAL</b>						
	<b>Sales Tax</b>						

**Gross Total Cost : Rs. ....**

We agree to supply the above goods in accordance with the technical specifications for a total contract price of Rs. ....(amount in figures ) (Rs. .... amount in words) within the period specified in the Invitation for Quotations.

We also confirm that the normal commercial warrantee/guarantee of 60 months shall apply to the offered goods.

**Signature of Supplier**

**SPECIAL CONDITION**

**1) Authorization from Manufacturer**

In the case of a Bidder offering to supply goods under the contract which the Bidder did not manufacture or otherwise produce, the Bidder has been duly authorized by the goods' Manufacturer or producer to supply the goods in India.

**2) Proof of Manufacturing and past performance.**

Details of experience and past performance of the bidder on equipment offered and on those of similar nature within the past one years and details of



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current contracts in hand and other commitments.

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