

Indian Institute of Technology, Delhi

Centre for Energy Studies

August 29, 2014

NOTICE INVITING QUOTATION

Please submit duly signed technical and commercial bids separately in sealed envelopes for a **Remotely Programmable High Voltage Power Supply (-4.5 kV, 400 mA) and operable in constant voltage/ constant current mode**. Your quotations should reach Dr. Ramesh Narayanan, Centre for Energy Studies, Indian Institute of Technology, Delhi, Hauz Khas, New Delhi – 110016 latest by September 19, 2014 by 5:00 p.m. (IST) by post/courier.

The minimum technical specifications desired for the **Remotely Programmable High Voltage Power Supply (-4.5 kV, 400 mA) and operable in constant voltage/ constant current mode** are as follows:

Specification of -4.5kV 400mA HVPS

1. Application Note

The HV power supply is used to power the anode of the magnetron tube. It is an HVDC power supply which should be capable to deliver 400mA of current. The maximum required voltage would be -4.5kV it should be able to work in both constant current mode and constant voltage mode.

2. Topologies and space

- The Power supply should essentially be a SMPS based power supply which should be mounted in a 19" rack.
- Linear Topologies using thyristers are not acceptable
- The power supply should be designed as compact as possible
- The supplier should mention about the topology used, its control philosophy and the approximate size of the power supply while quoting

Core Specifications of Power Supply		
Sr. No	Parameter	Specifications
1	Input	230VAC±10%, 50Hz, Single phase
2	Output Voltage	-4.5kVDC Negative
3	Output Current	400mA (max)
	Maximum Static Output Power	≥1.8 kW
4	Polarity	Negative with respect to ground potential
5	Ripple	< 1%
6	Operating type	Constant current/Constant Voltage
7	Remote operation of power supply	Capable to rise the high voltage with a remote programmable isolated analog input preferably 0-5V or 0-10V DC (linear)
8	Precision of output current setting	± 10mA in the range of 0 to 400mA dc with a setting accuracy of ±10%
9	Voltage Regulation	Load: ≤1% of full output voltage
		Line: ≤1% of full output voltage
10	Current Regulation	Load: ≤1% of full current at any voltage
		Line: ≤±0.5% of full current over specified input
11	Protections to trip the output Voltage	Input Overload (through MCB)
		Output Over Current trip
		Thermal switches
		Arc quenching resistors

		Arc Quench
		Arc Sensing
		External Interlock(through Potential free contact close-Operate and Open-Trip)
		Remote HV Enable disable(FOC and TTL signal, High enable, Low Disable)
		Continuous short circuit protection
12	Controls	Current adjustments in steps of 10mA over entire range via ten-turn potentiometers with lockable counting dials.
		Remote ON/OFF (TTL/Fiber optic)
13	Analog Input	Current 0-10VDC (FSD) Isolated output linear
		Voltage 0-10VDC (FSD) Isolated output linear
14	Monitoring	Front panel Digital voltage and Current meters, 1% accuracy
15	Output Cable	Suitable output termination should be provided for HV return and Ground
16	Analog Output (Remote reading of voltage and current)	Current 0-10VDC (FSD)
		Voltage 0-10VDC (FSD)
17	Long Term Voltage Stability	1% after 30 minutes warm up and 8 hours duration

3. Other important Features and requirements of the Power supplies

1. The Power supply should be suitably designed to withstand the dynamics caused due the fluctuation in the load
2. The power supply should be EMI EMC compatible.
3. The power supply should be short circuit protected
4. The power supply should be programmable with an external voltage source preferably 0-10V.
5. The voltage and the current should be measured and displayed in the front panel in a digital meter
6. The power supply should be able to operate in local and remote modes of operation
7. The power supply and the control cabinet should be placed in suitable powder coated cabinet
8. The components should be placed with proper clearance as per IS standard
9. The output of the power supply should be terminated in a suitable bushing or H.V feed through.

4. Submittals

- 2 sets of the user manual
- Test certificate of the components used in the PS

5. Inspection

- The supplier should intimate one week in advance for Pre dispatch inspection. IIT-DELHI representative will witness all the factory acceptance test given in clause 6.

6. Factory acceptance tests

- No load Test
- Full load test
- Voltage and Rise time test with resistive load
- Controls Test
- Measurement accuracy test

7. Site Acceptance test

- No load Test
- Full load test
- Voltage and Rise time test with resistive load
- Controls Test
- Measurement accuracy test

8. Testing commissioning and Integration

- The supplier should depute their engineer for the testing and commissioning the power supply at IIT-DELHI site.
- In case the final load is not ready during the arrival of the power supply to IIT-DELHI, the power supply will be accepted by testing the power supply with a dummy load. However the supplier should send their engineer during the integration of the power supply with the system as per the request of IIT-DELHI.
- The acceptance of the power supply will be given only after successful completion of the site acceptance test given in clause 7.

Purchase Terms & Conditions

1. Please submit the TECHNICAL and FINANCIAL bids in separate sealed envelopes. Mark the two envelopes clearly as “Technical Bid” and “Financial Bid” respectively. Both the sealed envelopes should be sent in a single sealed envelope, clearly marked as “Quotation for **Remotely Programmable High Voltage Power Supply (-4.5 kV, 400 mA) and operable in constant voltage/ constant current mode**”. The quote should reach the following address on or before September 19, 2014, 5 PM:

Dr. Ramesh Narayanan,
Centre for Energy Studies,
Indian Institute of Technology, Delhi,
Hauz Khas,
New Delhi – 110016

2. Please quote prices for FOB New Delhi, inclusive of all taxes and duties.
3. Quote should be in Indian Rupees for agents of Indian manufacturers, or in foreign currency, for agents of foreign manufacturers, and needs to be valid for at least three months.
4. Attach all the technical literature and a list of similar installations done in India.
5. If the quote is being submitted by a representative of the manufacturer, a valid agency-ship or dealership certificate authorizing the agent to quote to IIT Delhi on behalf of the manufacturers should be enclosed.
6. Either the Indian agent on behalf of the principal/OEM, or the principal/OEM can bid, but both cannot bid simultaneously.
7. Clearly specify the installation requirements - such as space, power, frequency, environment etc.
8. If the item quoted is proprietary in nature, please enclose proprietary certificate from the principals stating “Certified that is a proprietary item of M/s _____ and no other manufacturer makes this item.”
9. Please attach a signed and stamped compliance chart for the specifications.
10. Please specify all of your terms and conditions clearly.
11. Mode of payment for purchases in foreign currency is through irrevocable letter of credit, or through wire transfer after successful testing, commissioning and integration. Only bank charges within India are payable by IIT Delhi, all bank charges outside India are the responsibility of the seller. For others the payment will be made by bank transfer after successful testing, commissioning and integration.
12. The Institute reserves the right to accept or reject any or all quotations without assigning any reasons thereof.