

Technical specifications for DC power source

Required mandatory specifications

(All the conditions should be met)

1. Technology requirement

- 1.1. Power source should be capable of delivering direct current in (i) pulsing mode and constant current amplitude mode at short circuiting voltage.
- 1.2. Power source should be capable of supplying a maximum peak current of 900 A or more with a single or multiple power sources connected suitably.
- 1.3. System should provide short circuit direct current from 10 A to 900 A or more.
- 1.4. System should be capable of generating varying current waveforms (pulsing, constant current amplitude waveforms) and applying sequentially to a workpiece using a suitable PLC communication unit.
- 1.5. Power source should be fully programmable with microprocessor & memory facility.
- 1.6. A programmable logic controller (PLC) should be provided with power source to program the waveform which can be fed to power source.
- 1.7. Communication interfaces should be provided between the PLC and power source such as ethernet, field bus or other compatible standard interfaces.
- 1.8. Power engine should be fully digital controllable with a regulating unit.
- 1.9. Standard remote control connection (Local Net) should be available for uploading the customised waveform as per the end user requirement.
- 1.10. Latest international standards should be satisfied (EN 60974-10).
- 1.11. Power source should be in fully solid state without any moving components.
- 1.12. Code locking facility should be available for protection against misuse and theft.
- 1.13. A minimum power factor of 0.99 is required.
- 1.14. Digital Ammeter & Voltmeter should be provided with Command & Actual value display.
- 1.15. Power source should be operational to provide the programmed current waveform when the output is short-circuited.
- 1.16. A proper thermal stabilizer should be provided with a cooling system.
- 1.17. System should indicate voltage fluctuations (under and over voltage).
- 1.18. Error signals should be displayed in the system to facilitate servicing.

- 1.19. Provision is to be provided for accurate control of Main current, Pulse current and Pulse current frequency.
- 1.20. System should have the capability to increase the short circuit current up to 1600 A with additional accessories in future.
- 1.21. If multiple power sources are used to achieve the current amplitudes specified in items 1.2, 1.3 and 1.20, necessary numbers of choke/connectors to be provided for individual setup and combined setup.
- 1.22. A minimum duty cycle of 45 % is needed at 900 A (duty cycle at 10 min/40° C).
- 1.23. Maximum weight of the system should not be more than 85 Kgs. System should be in modular for easy mobilisation.
- 1.24. Digital indication should be provided for
 - 1.24.1. Run-status.
 - 1.24.2. Operating mode.
 - 1.24.3. Short circuiting voltage, Short circuiting amperage (actual value).
 - 1.24.4. "Hold" function.
 - 1.24.5. Over temperature.
 - 1.24.6. Service code.
 - 1.24.7. Mains voltage monitoring.
 - 1.24.8. Storage number.

2. Safety features required

- 2.1. Full protection should be provided against electric shock.
- 2.2. Power source should be properly insulated.
- 2.3. Earth leakage should be monitored.

3. Documentation required

The following documentations should be provided (one set of each in English)

- 3.1. Operation manual.
- 3.2. Maintenance, troubleshooting and safety guidelines manuals.
- 3.3. Manuals to handle accessories and guidelines.
- 3.4. Occupational Health and Safety (OHS) guidelines and warnings.

4. Warranty and Annual Maintenance Contract requirements

- 4.1. A 2-year complete system warranty should be provided from the date of installation.
- 4.2. Possibility of extending the warranty beyond the mandatory period should be clearly mentioned with the appropriate cost.

4.3. Bidder should have provision for a continuous Annual Maintenance Contract upon the completion of warranty period.

5. Inspection, installation, commissioning and training

5.1. All the essential requirements ensuring a ready-to-use set up at IIT Madras should be supplied.

5.2. Comprehensive training for five research fellows/students should be imparted upon installation.

6. Spares and mandatory accessories.

6.1. Bidder should offer a list of essential spare parts and accessories with their part numbers for a continuous operation for three years. Bidder should also ensure that the spare parts and accessories should be made available to procure for a smooth operation over at least 15 years from the date of installation.

6.2. However, the consumables and parts required for the installation and standardisation of the system should be given at free of cost.

7. Additional mandatory conditions

7.1. A continuous operational support to IIT Madras should be provided without any additional cost during the warranty period (at least three years from the date of installation).

7.2. There should be a minimum of two visits per year by the service engineer and application engineer of the equipment supplier (preferably from OEM).

7.3. The total cost of the system should be inclusive of these visits.

7.4. The bidder must either be OEM or legal representatives of the OEM in India. The bidder and the legal representatives should have ISO certification for quality standards (a copy of ISO certification should be attached with the technical bid).

7.5. Bidder and their OEM should have installed at least 5 systems in any of the government organisations/research labs/IITs/NITs/other CFTIs in last five years.

7.6. A global reference list as well as user list in India should be enclosed.

7.7. The operational status of all the equipment in India should be provided.

7.8. Special design/provision should be made to prevent accidents while in operation.

7.9. "Emergency Stop" button(s) should be provided at convenient and easily accessible location.

7.10. Safety manuals and charts should be provided.

7.11. Supplier should provide safety training at the time of installation.

- 8. A detailed compliance statement, clearly indicating the compliance (or deviation) against each technical specification to above mentioned specifications should be provided along with technical and financial quotes.**
- 9. Financial bids should be provided as a modular bid with a list price for each and individual item.**