Government of India
Bhabha Atomic Research Center
Pulsed Power & Electromagnetics Division

Ref: BARCV/PPEMD/2020-21/R&D-44/WO/RV/23 Date: 23/11/2020

SUB: Inviting quotations for **Fabrication & Supply of programmable fully-controlled AC-DC converter as per provided specifications (attached).**

Dear Sir,

1. Quotations are invited for the fabrication & supply work, as per the enclosed specification
2. Bidder shall quote for fabrication & supply work.
3. Taxes shall be quoted separately.
4. The quotation must reach the Head, Pulsed Power & Electro-Magnetics Division by date 12/12/2020 and must be sent in a sealed, printed envelope superscripted with reference number and the due date given above by 4pm, 12/12/2020.
5. The address of the envelop should read –

   Dr. Rishi Verma
   C/o Dr. Archana Sharma
   PP&EMD, PEB-1, Bhabha Atomic Research Centre
   Gandivanipalem Village,
   Atchutapuram Mandal, Visakhapatnam – 531011

6. Head, PP&EMD reserves the rights to accept/ reject any or all quotations without assigning any reasons.
7. Quotation must also indicate the validity of offer & required delivery time.
8. Quotations are to be in printed letter-head / quotation format only. Quotation received in computer-generated forms will be considered as invalid and rejected.
9. Quotation should consist of Sales Tax registration number (Registered with local ST / CST authority), PAN number of the firm, services tax registration number etc.
10. Claim preferred by the firms are also be in printed INVOICE format consisting of the above registration numbers.
11. No Free issue material will be given
12. Since the goods are to be supplied against the work order meant for research purpose of a research organization under DAE, the necessary GST will be exempted to the party.
13. In case of any query, the party can contact on rishiv9@gmail.com, ph. No 8374512797 between 10am to 5pm.

Approving Authority

(Dr. Archana Sharma)
AD (BTDG) & Head (PP&EMD)
BARC, Visakhapatnam

डॉ. (श्रीमती) अर्चना शर्मा/Archana Sharma
सह निदेशक/Associate Director
किरणपुंज प्रौद्योगिकी विकास वर्ग
Beam Technology Development Group

Annexure-II
General Terms and Conditions

1. Quality surveillance, inspection and inspection report

1.0 All work covered by the inspections shall be subjected to quality surveillance by the purchaser or his authorized representatives for which purpose the fabricator shall allow access at all reasonable times during manufacture to

1.1 The premises in which the work is being carried out.

1.2 The drawings and or tooling involved.

1.3 Gauges, instruments etc. required for inspecting the work.

1.4 Inspection and tests shall be carried out by the fabricator as per the requirements detailed in the drawings and these specifications.

1.5 The fabricator shall submit three copies of inspection reports to the purchaser for approval.

1.6 Components found unsatisfactory as to workmanship or material shall be removed by the fabricator and replaced by the components which is satisfactory.

1.7 The finished components shall not be dispatched prior to approval by our Engineer.

2. Raw Material

2.0 Raw Material for all the components and hardware will be provided by the supplier.

2.1 Material test certificate with sample may need to be submitted if asked.

3. Delivery

3.0 The bidder shall deliver the finished components after approval by our Engineer within4 weeks from the date of receipt of work order.

3.1 In case any extension in delivery is to be granted to the contractor, party's should make request for extension in writing justifying the reason for extension.

3.2 Any delay which is attributable to the contractor is liable for penalty @ ½% per week (max. 5%) to be imposed on the contractor.

4. Sub Contract

4.0 The fabricator shall not sub-contract any or all the work without written consent from the purchaser. The fabricator shall be responsible to the purchaser for all of the sub-contractor of the fabricator, if at all allowed by the purchaser.

5. Taxes

5.0 GST @ 5% against undertaking from the supplier.

6. Payment

6.0 Payment will be made only after satisfactory completion of work and on production of Invoice with details of location of supply, separate tax components, GSTN and PAN, receipt cum issue voucher from stores, advance stamped receipt, and guarantee certificate (4 nos.) and Bank details.

6.1 Advance/ part payment or against delivery cannot be made.

6.2 It may be noted that Income Tax at 2% and surcharge on IT at the rate applicable will be deducted from the bill.

6.3 TDS @ 1% will be deducted on payments made to the supplier of taxable goods and/ or services where the total value of such supply, under an individual contract, exceeds 2.5 lakhs.

7. Confidentiality:

7.0 No party shall disclose any information to third party concerning the matters under this contract generally. In particular, any information identified as "PROPRIETARY" in nature by the disclosing party shall be kept strictly confidential by the receiving party and shall not be disclosed to any third party without the prior written consent of the original disclosing party.

7.1 "RESTRICTED INFORMATION" categories under section 18 of the Atomic Energy Act, 1962 and "OFFICIAL SECRETS" under section 5 of the Official Secrets Act, 1923:-
Any contravention of the above-mentioned provisions by any contractor, sub-contractor, consultant, advisor or the any employees of a contractor will invite penal consequences under the aforesaid legislation.

7.2 Prohibition against use of BARC's name without permission for publicity purpose: -
The contractor or sub-contractor, consultant, advisor or the employees engaged by the contractor shall not use BARC's name for publicity through any public media like press, radio, T.V., or internet without the prior written approval from BARC. (vide circular ref: 2/Misc-9/Lg1/2001/92 dated April 30, 2001)

(Dr. Archana Sharma)
AD (BTDG) & Head (PP&EMD), BARC

डॉ. (श्रीमती) अर्चना शर्मा/Archana Sharma
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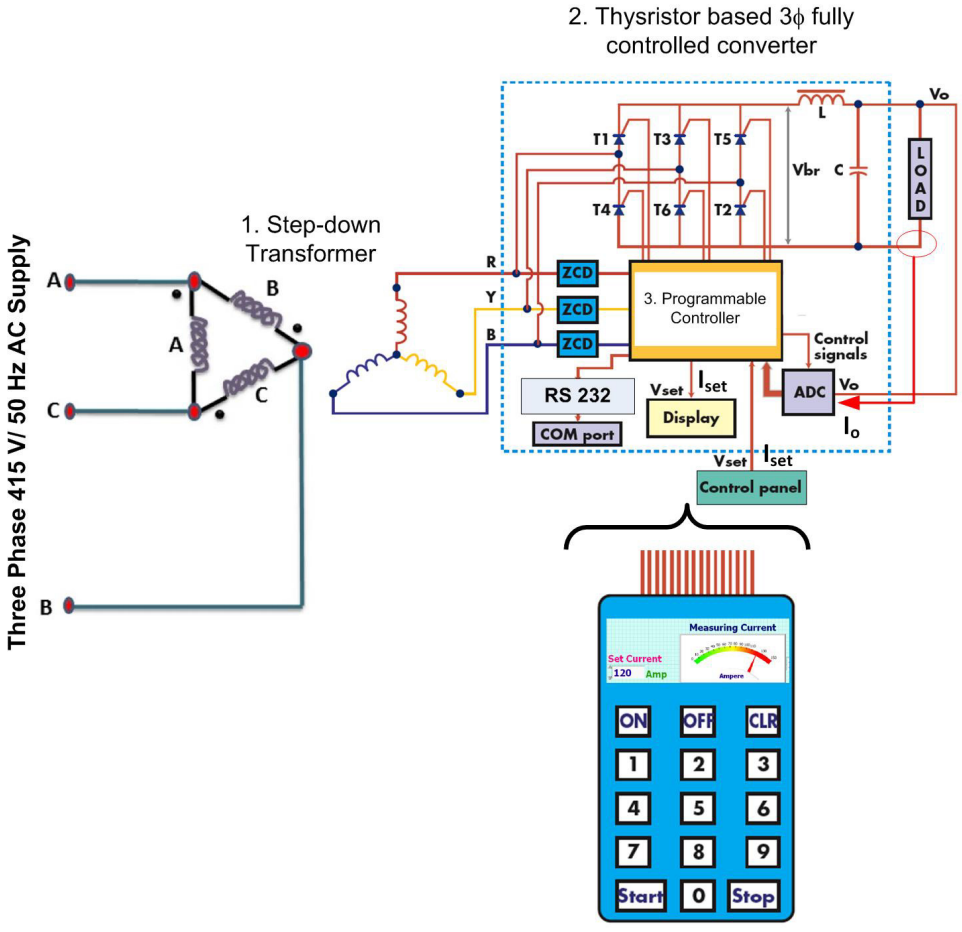
Beam Technology Development Group

Fabrication & Supply of programmable fully-controlled AC-DC converter as per provided specifications:

Scope of this work order includes the fabrication and supply of a Programmable fully-controlled AC-DC converter for feeding current in the range of 50A to 1000A DC in to a solenoid magnet. The three phase mains AC input voltage shall be stepped down suitably by a transformer of appropriate VA rating and fed to the fully controlled full wave rectifier. The maximum voltage and current that this power supply shall be able to feed in the solenoid magnet will be 40V and 1000A, respectively. The remotely operated modular handheld display and control unit must facilitate the presetting of maximum voltage and current that will be fed to the solenoid magnet. When the ON signal is given remotely then current shall start following in to the solenoid magnet and the live value of measured current shall be visible on display screen to the operator. In pulsed mode, the turn-ON duration of this high current power supply must allow presetting in the range of 1 second to 30 seconds (that can be increment/decremented in the step size of 1 second).

The functional and operational requirements of this high current power supply are indicated in the schematic shown below.



4. Handheld Modular Display & Control Unit
(For Setting Voltage & Current & Live Display of Measured Values)

Scope of supply of modular sub-systems and their quantities:

1. **Step down transformer (Qty – 1 No.)**
    a. Input – 415V AC, 50 Hz (three terminal)
    b. Output – 40V AC, 40 Hz (three terminal)

2. **Thyristor based 3Φ fully controlled converter with filter and protection (Qty – 1 No.)**
    a. Input – 40V AC, 40 Hz (three terminal)
    b. Output – shall be adjustable in range of 5V to 40V DC/ 50A to 1000A (two terminal)

3. **Programmable Controller (Qty – 2 Nos.)**
    a. Inputs – (i) from step down transformer to sense zero crossing & (ii) command from control unit (iii) feedback of measured voltage and current on load from ADC.
    b. Output – SCR Gate control pulses (6 Nos.) & display of measured voltage and current on modular handheld unit.

4. **Handheld Modular Display & Control Unit (Qty – 2 Nos.)**
    a. Inputs – Setting of voltage and current to pre-defined values from soft-touch panel
    b. Output – Command signals being carried to programmable controller to ensure preset value current flows through the solenoid magnet.
    c. Communicating Connection Cable (between programmable controller unit and control unit) of 10 meter length must be provided with each control unit.

Technical specifications of high current 40V/1000A DC power supply are detailed as under:

Input Voltage: 415V AC, 50Hz, Three phase

Output Voltage: 5V to 40V DC

Output Current: 50A to 1000A DC

Power supply topology: SCR phase controlled with L/C filter

Maximum Output Power: 40 kW

Polarity: Positive

Maximum output Ripple (RMS) in Voltage/ Current: ≤1%

Load Regulation (Voltage and Current): ≤1%

Mode of operation: Constant voltage-Constant current with auto crossover

Voltage & Current Control: Must be pre-settable from modular display and control unit

Metering: Analog/ Digital (3.5 digit on modular display and control unit)

Turning-ON: Continuous/ Pulsed (1sec to 30sec must be pre-settable from modular control unit)

Overload capacity: 110% Continuous

Protections: Overload & Short-circuit

Remote Control Interface: RS232/ USB

Working environment: 20 to 45°C

Movability: Power Supply Unit must be on platform with heavy duty lockable castors

NOTE: *Fabricators shall submit single quotation taking in to account all sub-systems/ accessories for quantities as mentioned in the scope of supply. Discrete quotations for subsystems will not be considered. Installation and testing at BARC site by fabricator is included in the scope of this Work Order.*