

**GOVERNMENT OF INDIA**  
**BHABHA ATOMIC RESEARCH CENTRE**  
**Technical Physics Division**

**Ref: TPD/NSRPS/MF/2021/35**

Date:12-11-2021

**Due Date: 21-11-2021**

Sub: Minor Fabrication - invitation of quotations.

1. Quotations are invited for the minor fabrication job, as per the enclosed specifications.
2. Bidder shall quote for fabrication of the items as per specifications.
3. Taxes shall be quoted separately.
4. The quotations must reach to the Head, TPD within 10 days of the date of this letter and must be sent by **Indian Speed post / Indian Post** only in a sealed envelope superscripted with the above reference number and due date given above
5. The address on the envelope should read:

**Head,**  
**Technical Physics Division**  
**Bhabha Atomic Research Centre**  
**PURNIMA Labs, Trombay, Mumbai 400085.**

6. The bidder shall have to take an insurance policy against any material issued to him by the purchaser
7. The fabrication work shall be subject to inspection by our representative. The finished components shall not be dispatched prior to approval by our representative at the bidder's works. Necessary inspection facilities should be provided to our engineers during fabrication at bidder's premises.
8. The bidder shall deliver the finished item and install it after approval by our representative, within **90** days from the date the firm purchase order issued to the bidder. The finished item shall be delivered to Technical Physics Division, Purnima Labs, BARC, Mumbai- 400085.
9. Head, TPD, BARC, reserves the right to accept/reject any or all quotations without assigning any reason.
10. The bidder should furnish the GST, PAN and TIN numbers in their quotations without which the quotations will be rejected.
11. Quote for each part separately.
12. Detailed drawing will be made available after issue of order.
13. Clarifications for executing the order can be sought after issue of order.

Head,  
TPD

**Design development and supply of customised Gas Discharge System and accessories:**  
**(Quantity 02nos.)**

**Scope of Work**

**Design development and supply of customised Gas Discharge System and accessories**

Brief description: The above work consists of the following:

1. Design and fabrication of Gas-Discharge system with components necessary to deliver required power.
2. Fabrication of housing with required EMI shielding and dissipate heat losses.
3. Integrating the above system, along with assembly of all electronic components and development of necessary circuitry.
4. Supply all the necessary accessories such as interfacing cable and power cable.

**Important:** The vendor should have technically competent team of engineers. All technical training and know-how related to usage of high frequency power source including their settings, connections etc will be imparted by the vendor and lies within the scope of work. Preference will be given to vendors who have already done similar work in other DAE units.

**1. Development of Gas-Discharge System:**

- a) Input supply: 230 VAC, 50 Hz
- b) Output power: 300W into 50 Ohms Load
- c) Mode of operation:
  - **Continuous mode:** Maximum continuous output power of 300 W at frequency 13.56 MHz into a 50 Ohms Load, with provision to increase it from 0 to 300 W.
  - **Pulsed mode:** Frequency range should include 1 Hz to 10 KHz with variable duty-cycle.
- d) Maximum reflected power withstand capability: 100 W with provision to set maximum reflected power allowed.
- e) Suitable interface: Serial or USB with Remote and Local control.
- f) Cooling: Air- cooling system.
- g) Efficiency:  $\geq 55\%$  at full rated power.
- h) Power regulation and stability (during specified load mismatch, temperature change and line voltage change) should be 2% of set point (or better).
- i) Harmonic/spurious frequencies should be limited to -40 dBc below fundamental.
- j) For detailed internal circuitry refer to fig.1.
- k) The front panel should display the following
  - Forward power and reflected power
  - Power ON/OFF
  - C-Tune position and C-Load position
  - Auto/Manual mode for impedance matching unit
  - Interlock status
  - Output voltage

**2. Fabrication of housing:**

- a) Size: all the components should fit in 9.5"W x 19"D x 5.25"H chassis.
- b) The housing should limit harmonics to -40 dBc.
- c) Spurious emissions should be better than -60 dBc.
- d) Provision for forced air cooling should be incorporated in the housing.

**3. Accessories:**

- a) Power transfer cable.
- b) Mains 230V cable.

**4. Certificates to be provided:**

- a) Operating and service manual.
- b) Factory test certificate.
- c) Warranty certificate.

**5. General requirement:**

- a) The entire assembly of the functional unit is within the scope of work of the vendor.
- b) In case of any clarifications regarding internal circuit/ other queries, please contact the undersigned.
- c) One-year (or more) standard warranty has to be provided.
- d) The vendors are encouraged to hold prior discussions with the indenter for any clarifications and suggestions.

**Drawings for Gas Discharge System**

**The Circuit:**

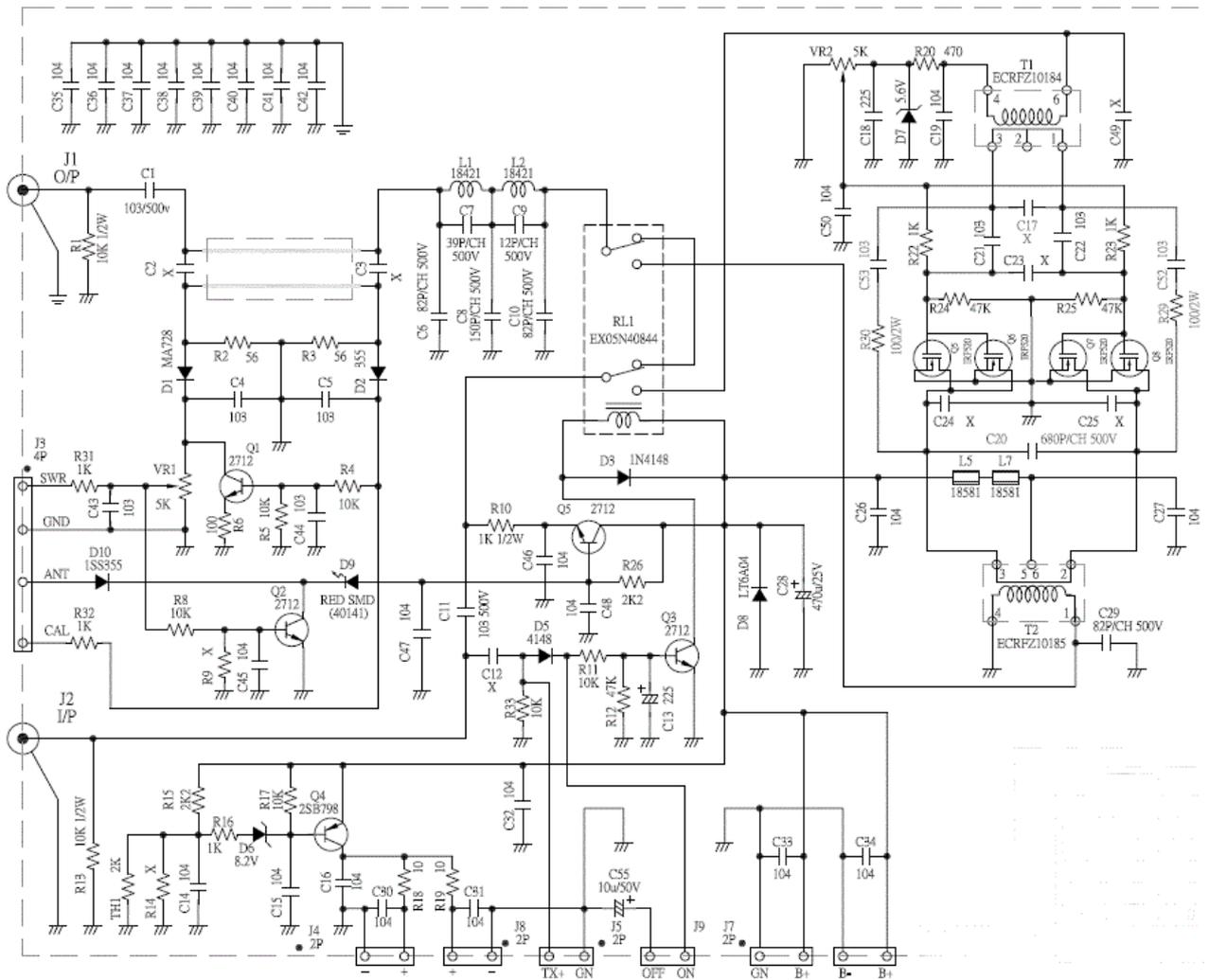
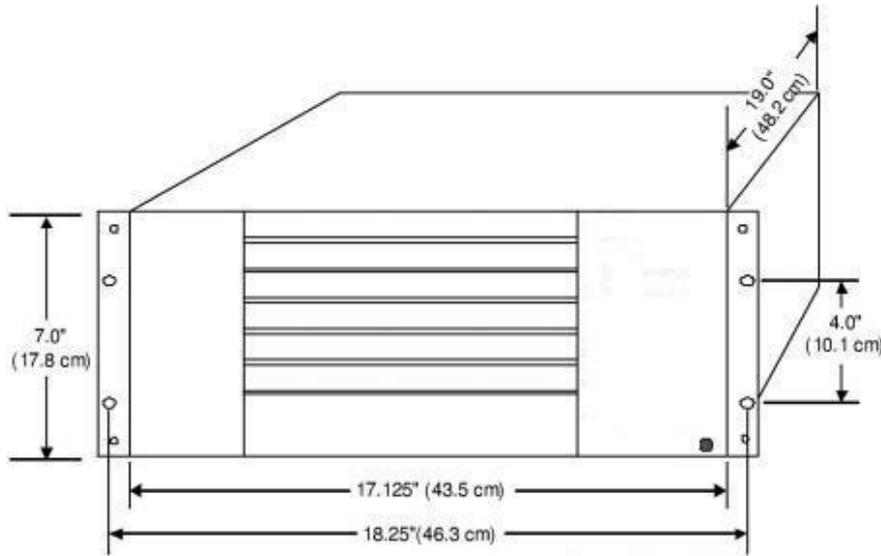


Fig.1 Internal circuit diagram

**The Housing:** (Dimensions are indicative only)



**Note:**

1. All the items have to be quoted simultaneously in view of the compatibility of the system components otherwise offer will be rejected.
2. Post supply inspection in respect of supplies made is not permitted. Any offer containing the condition of post supply inspection will be out-rightly rejected. It is therefore, mandatory for the bidders, while quoting, to indicate in clear terms the requirement of post supply inspection by any outside agency.
3. The item should be installed by the supplier at user's site.

**Bidder Qualification:**

- A. The bidder shall be the original manufacturer or authorized dealer/ representative of original manufacturer. The authorized representative shall provide a certificate of authorization from the manufacturer. It is mandatory to declare the name of the manufacturer and manufacturer's complete contact details like address, contact person, email address, fax and phone numbers. The purchaser reserves the right to communicate with the original manufacturer regarding the offered products to ascertain their quality and genuineness. A list of similar system supplied to other institute /laboratory should be provided to ascertain bidder's adequate expertise in the field of similar instrumentation.  
All the items shall be brand new from reputed manufacturers procured from their authorized agents/principals. Used materials/ recycled items/damaged items **will not be acceptable and will be rejected.**
- B. **INSTALLATION & TRAINING at the user site:** The supplier or their official agent shall install the system and demonstrate the operation of the system as per specifications. On-site training for the operation and maintenance of the system shall be provided after the commissioning of the system by the supplier or their official agent. Technical documents, user manual, drawings of assemblies should be supplied.
- C. **WARRANTY:** Warranty against equipment failure for a minimum period of one year after installation and final acceptance shall be provided. The warranty period shall automatically be extended for down time period. The vendor shall guarantee the spares and services to the supplied equipment at least for a period of five years from the date of supply.
- D. **Testing and acceptance criteria**
  - On site measurement of system main specifications such rated output power, continuous and pulsed operation and remote control with PC will be checked before acceptance.
  - Training of control software with test reports for all operational functions
  - Without satisfactory testing of parameters & certification the product will not be accepted.