



Government of India  
Bhabha Atomic Research Centre  
Electromagnetic Applications and Instrumentation Division



Tender No. : EmA&ID/JI/2022/09M22A

Date: 09<sup>th</sup> March, 2022

Sub: Fabrication, Supply and testing of cryogenic protection circuits as per specification sheet - TSP/2022/3

Dear Sir/Madam,

1. Quotations are invited for the *execution of subject work*.
2. Taxes and Excise Duties shall be quoted separately. Form AF / H whichever is applicable shall be provided, if required.
3. The suppliers are shall submit the cost for Design, fabrication, assembly and testing. All necessary tools, instruments have to be arranged by the supplier.
4. The quotation must reach the undersigned on or before **24<sup>th</sup> March, 2022** and must be sent in a sealed envelope super-scribed with the *reference number & the due date* given above.
5. The quotations must reach us on or before the aforesaid date by India post (by speed post or ordinary post) only.
6. The address on the envelop should read:  
The Head,  
Electromagnetic Applications Section,  
Electromagnetic Applications & Instrumentation Division  
RCnD Bldg., North Site,  
B.A.R.C, Trombay,  
Mumbai - 400 085.  
(Attn: Shri. Janvin Itteera)
7. The finished components with the test certificates as mentioned in the enclosures shall be delivered by the manufacturer after the award of the contract at BARC, Trombay, Mumbai - 400 085.
8. Delivery, packing & forwarding charges, if any, must be clearly mentioned in the offer.
9. Drawings / Sketches (if any) must be returned along with the offer
10. Quotation must indicate the PAN and GSTIN no of the vendor. Minimum validity of 60 days is preferred.
11. The quotation has to be duly signed by *authorized person with company seal*. *Unsigned offers shall be treated as invalid*.
12. For any technical clarifications, Please contact the undersigned vide email: [janvin@barc.gov.in](mailto:janvin@barc.gov.in); Tel: +912225591492
13. All items delivered under this work order are developed solely for R&D purpose for use at EmA&ID, BARC, Trombay, hence, requisite exemptions shall be granted to successful contractor

Encl.: TSP/2022/03

(Janvin Itteera)  
Scientific Officer(E), B.A.R.C  
For & on Behalf of the President of India  
(The Purchaser)

# Technical Specifications

## Power Diode

### 1) Scope:

The tender is invited for the “**diode based cryogenic protection circuits**” as per the following technical specification.

- Para 2 gives scope of supply and deliverables.
- Para 3 gives technical requirements of the product. Supplier has to offer their product equivalent to this specification along with complete product sheet for technical evaluation. In absence of product brochure, the offer will be rejected.
- Para 4 gives general instructions.

### 2) Scope of supply and deliverable:

2.1) The successful bidder shall deliver following items and shall quote for the full quantity as mentioned in the table given below:

| S. No. | Description of items                      | Quantity |
|--------|---|----------|
| 1)     | Interconnected cryogenic protection racks | 1 Set    |

*Table-1: List of deliverables*

### 3) Technical requirements:

3.1) The power diodes are required to have following features:

| S. No. | Specifications                       | Value   |
|--------|--------------------------------------|---|
| 1      | $I_{Fav}$                            | 300 A   |
| 2      | $I_{Frms}$                           | 470 A   |
| 3      | $V_{RRM}$                            | 600 V   |
| 4      | Recovery time $t_{rr}$               | 6 $\mu$ sec @ $I_{FM} = 785$ A and $T_j = 25$ C |
| 5      | One half cycle surge current         | 5500 A  |
| 6      | Three cycle surge current            | 4300 A  |
| 7      | $I^2t$ for fusing                    | 125000 $A^2sec$                                 |
| 8      | Max $I^2t$ of the package            | $20 \times 10^6$ $A^2sec$                       |
| 9      | Storage temperature $T_{stg}$        | -65 to 190 C                                    |
| 10     | Junction temperature $T_j$           | -65 to 190 C                                    |
| 11     | Forward voltage drop $V_{FM}$        | 1.7 V @ $T_j = 25$ C and $I_{FM} = 800$ A       |
| 12     | $I_{RRM}$                            | 50 mA   |
| 13     | Thermal resistance, junction to case | 0.095 C/Watt                                    |
| 14     | Thermal resistance, case to sink     | 0.02 C/Watt                                     |

*Table 2. Technical requirements for the cryogenic grade diodes.*

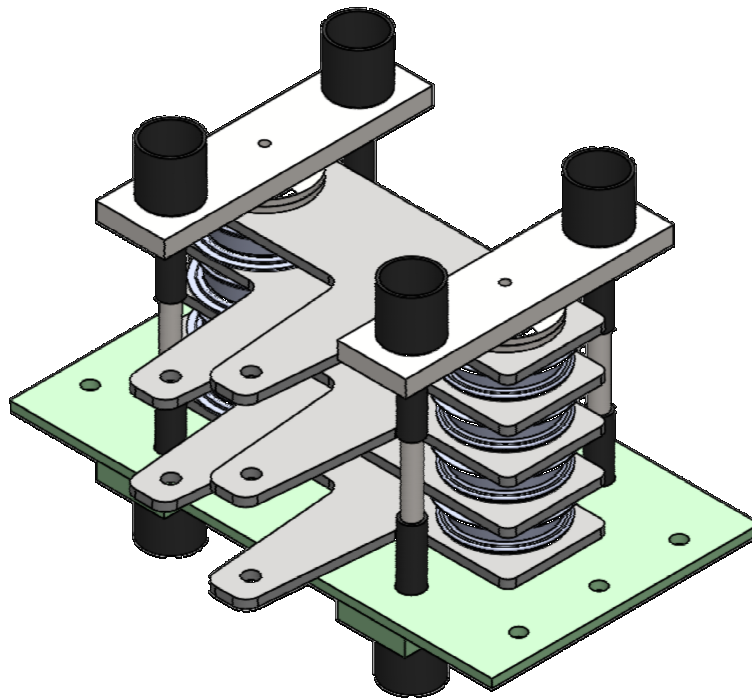


Fig-1.0: Connection layout

**4) General Instructions:**

- a) Mandatory information: Suppliers shall give complete details of their product, country of origin and compliance certificates from users for technical evaluation (Purchase order reference shall be attached if same equipment or equivalent has been supplied to any Government or defence Laboratory). Quotations submitted with incomplete details are viable for rejection.
- b) Test Certificates shall be provided along with the power diodes.
- c) Warranty: Warranty shall be 12 months from the date of acceptance at purchaser premises.
- d) No post supply inspection will be permitted at purchaser's premises.
- e) Operating and installation manual to be supplied with the instrument

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