

**PRASAR BHARATI
BROADCASTING CORPORATION OF INDIA
DIRECTORATE GENERAL: ALL INDIA RADIO
(PLANNING & DEVELOPMENT UNIT)**

No.18/1/2009-EI/

Specification for : **Valve Type- BEL- 1000 A**
Ceramic metal tetrode with coaxial structure

Specification No. : Specs./18/1/2009/TM/1015

No. of pages : 4

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Date of approval :

Date of issue :

Para wise compliance report for all the clauses of the specifications must be done without these tender will be rejected.

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Specifications No.: Specs./18/1/2009/TM/1015

Specifications of Ceramic Tetrode Valve Type: BEL- 1000A

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1. Scope:

This Ceramic Tetrode Valve is being used in IPA stage of 100 KW MW HMB-140 make Transmitters in AIR Network.

2. General Characteristic of the valve:

The valves offered should be **New and of first quality.**

- a. Valve: Ceramic metal Tetrode with co-axial structure.
- b. Filament: Thoriated tungsten cathode with direct heating.
- c. Anode: Air cooled.
- d. Operating frequency: Upto 110 MHz.
- e. Operating position: Vertical, Anode up.
- f. Weight: Approx. 700 gm

3. Eligibility of the supplier:

- a. The supplier must possess valid ISO 9001/ 2000 Certificate in production.
- b. Original Equipment Manufacturer or their Authorised agent shall only be eligible to quote.
- c. Authorisation letter must be ink signed by the OEM and submitted along with the tender. Name and address of the OEM and location of its manufacturing facilities is to be given.
- d. The supplier must possess an experience of at least 2 years in manufacturing.
- e. The supplier must provide past record of timely and good quality supply of tendered items to Broadcast Organisations in the preceding two years supported with copies of orders placed by the Broadcast Organisation with the Manufacturing firm, and Broadcaster's satisfaction letters regarding the tendered item.

Any offer which fails to meet the above eligible condition will be summarily rejected.

4. Electrical Specifications:

- 4.1.1 Filament voltage: 7.5 V(AC) \pm 5%
- Filament current: 21.3 A
- Mutual Conductance 10 m A/V
- (Eb=2.5kv, Ec2=500v, Ib=100mA)

4.1.2 Interelectrode Capacitance:

	<u>Typical</u>	<u>Unit</u>
Control grid to plate	0.35	pf.
Input	2.8	pf.
Output	8.0	pf.

4.1.3 Amplification Factor: $\mu_{g_2 g_1}$

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5. Mechanical Specifications:

Max. Length-	240 mm
Max diameter-	134 mm
Net weight	700 gm(Approx)
Mounting position	Vertical Anode up
Socket	SK 500 or M-100
Chimney	SK 506 or M-101
Plate Connector	HR8 or VT 410

6. Operating Data:

6.1 Maximum Rating:

DC Anode voltage	6	KV
Anode Current	700	mA
Anode dissipation	1000	W
Frequency	110	MHz
Output Power(Class C)	2.8	KW

6.2 Class AB, Power Amplifier and Modulator:

Maximum Rating:

Anode voltage	6	KV
Screen grid voltage	1.0	KV
Anode current	700	m A
Screen Grid dissipation	75	W
Anode dissipation	1.0	KW

Typical Operation Ratings for Two Tubes :

DC Anode voltage	4	5	6	KV
DC Screen grid voltage	1000	1000	1000	V
DC control grid voltage	-115	-125	-135	V
Peak AF grid to grid voltage	230	250	270	V
Signal anode current Max	1050	1000	950	mA
Zero Signal anode current	300	240	200	mA
Max signal screen grid current	60	60	64	mA
Output power	2.3	3.1	3.8	KW
Effective load resistance Anode-to-anode	7	10	14	kΩ

6.3 Tube Cooling:

Anode of the valve should be Radiation and forced air cooled.

Air flow at a static pressure of 30mm of water	1.3m ³ /min
Plate seal temperature	180 °C max
Bulb temperature	200 °C max
Stem temperature	150 °C max

7. Certificate of Origin:

- i. In order to verify that each tube supplied by OEM comes from an ISO-9001/2000 certified factory, the vendor should provide country of origin and type of the tube, and Sr. No., if any, must be engraved or inked on the body of each tube and it must be visible easily even while in operation.
- b) In the absence of such a certificate of origin on the tubes, the tubes shall be considered as rebuilt or not manufactured by vendor.
- c) Rebuilt/ Refurbished/Reconditioned tube shell not be accepted

8. Package and Marking

Please refer to the relevant clause in the booklet “Instructions to Bidders”

9. INSURANCE AGAINST WAR AND MARINE RISK:

Please refer to Commercial terms for transportation by air, sea and land up to ultimate consignee.

10. Tube Appearance

The tube (Valve) brazing area, ceramic cleanliness, electrical connections, coolant connection, plating, shining silver plated surface around anode, cathode grid rings should be of high quality.

The shining of silver plated on cathode, grid and anode ring should be as good as new after the run of 100 hours operation of the tube.

11. Delivery

Delivery should complete in nine months after the issue of the AT. The lot of tubes should be duly insured (Insurance as per commercial terms) and be delivered at the destination of ultimate consignee (AIR Stations in India) mentioned in the AT.

12. Guarantee Conditions

The electron tubes shall be free from defects in design, material and workmanship. The tube will be operated within pre designed fixed parameters and dynamic broadcast parameters, by taking all cooling conditions into account.

The tube shall be guaranteed for 2000Hrs. of heater/filament operation or 2 years from the date of receipt which ever occur first. In case of failure of the tube within the first 100 Hrs. full free replacement with a **New and of first quality tube** is to be provided by the OEM/supplier. Prorata credit will be for failure of tube between 100hrs. and 2000hrs. The claim shall be settled by the **Supplier/OEM without any option** as given below :

If the tube fails after 100 hours and within guaranteed 2000 hours, then prorata

$$C = \frac{P(G-H)}{G}$$

C - Credit

G - Guaranteed no. of hours

H - Useful filament hours served by the defective tube.

P - Purchased price of defective tube.

13. Performance Guarantee

As per DGS and D rule

14. Literature

Necessary literature, catalogues concerning to the article in supply and the company profile including the manufacturing procedure etc. must be supplied by the Bidder