

PRASAR BHARATI  
(Broadcasting Corporation of India)  
O / O ADDITIONAL DIRECTOR GENERAL (E) (SZ),  
ALL INDIA RADIO & DOORDARSHAN  
Swamy Sivananda Salai, Chennai - 600 005

No. CE (SZ)/PUR/IEBR-AIR/03/SPMW/2011-12

Date: 19.08.2011

Sub.: Enquiry for Supply of **Modulator Valve CQK-25-2/BEL 40000-CX** - Reg.

Dear Sir,

This office is interested in the purchase of the following **Stores/Works** as specification given below/attached and invites your quotation.

1.

Sl. No.	Description	Quantity.	Consignee:
1	<b>Modulator Valve BEL 40000-CX for 100KW BEL HMB-140 MW Transmitter</b> as per DG: AIR Specification No: Specs/18/1/2007/TM/1013; Specifications for Ceramic Tetrode Valve Type:CQK-25-2/BEL-40000CX, enclosed.	<b>2 Nos.</b>	Delivery at: DDG(E), All India Radio, Dharwad, Karnataka.

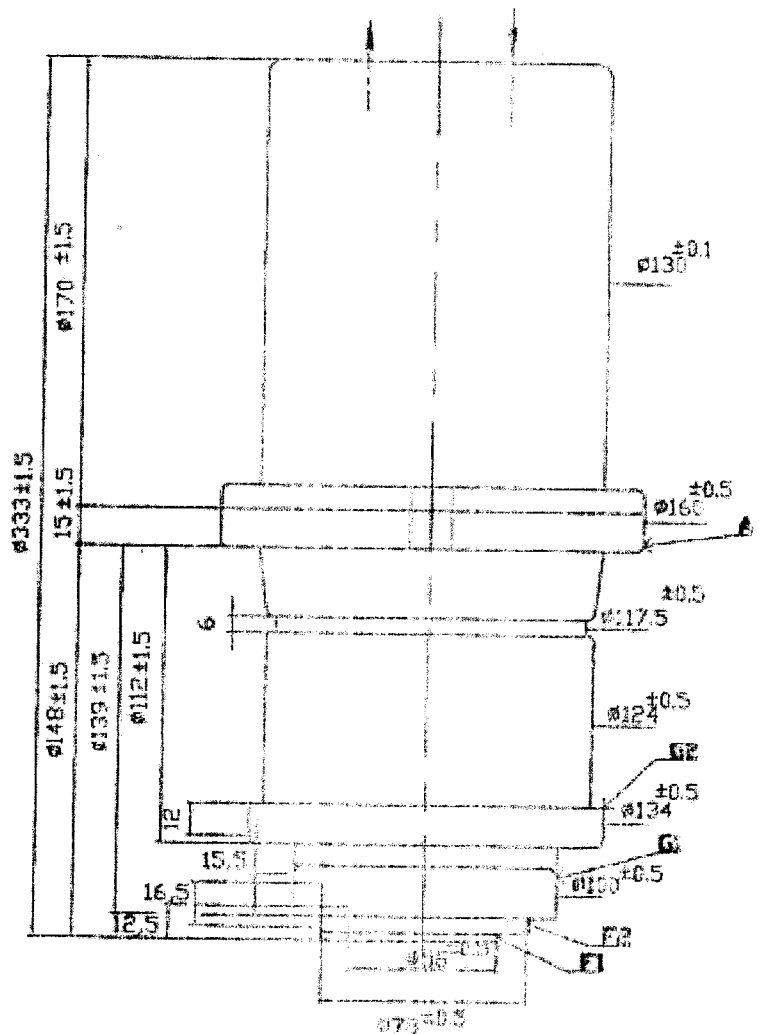
- The quotation should specifically mention **Make & Type of the items**, delivery date, terms and condition of supply. The prices should be firm and given as under.
  - The 'Unit' Price should be for the Unit as indicated in the tender enquiry.
  - Prices quoted should be for F.O.R. Station of destination in India and Inclusive of charges as packing customs, etc., wherever applicable.
- In case of Quotation of F.O.R Station of dispatch basis, the purchaser will not pay separately transit insurance and the supplier will be responsible until the stores arrive in good condition at the destination. Tender/quotation in which transit insurance has been specified as an additional item of expenditure is liable to be ignored.
- EMD:** Earnest Money amounting to **Rs.20,000/-** [Rupees Twenty Thousand Only] in the form of Demand Draft on Nationalized Bank / Commercial Bank drawn in favour of **The ADG (E) (SZ), AIR & DD, Chennai-5** should accompany the tender. EMD by means of Bank guarantee or any other mode of payment other than DD shall not be accepted. Tenders without EMD shall be summarily rejected and their bid will not be opened at the time of tender opening (No exemption for payment of EMD is accepted by this office).  
**SECURITY DEPOSIT:** the successful Tenderer shall furnish the Security Deposit within 2 weeks after placement of order at the rate of **10% of the Order Value**. The security deposit shall be furnished in the form of Demand Draft / Bank Guarantee drawn in favour of **The ADG (E) (SZ), AIR & DD, Chennai-5**. The Security Deposit will be returned in full on completion of successful Guarantee/Warranty Period.
- Printed terms and conditions of tendering firms will not be considered as forming parts of their tender.
- GUARANTEE PERIOD:** One year from the date of delivery of Equipments.
- DELIVERY OF EQUIPMENTS:** The delivery of the entire Equipment at AIR's site shall be completed within **Three months** from the date of placement of order. Delivery period may also be quoted separately.

8. **SALES TAX:** - Sales Tax leviable and intended to be claimed from the purchaser should be distinctly shown along with prices quoted. Where this is not done no claim for Sales Tax will be admitted at any later stage and on any ground whatsoever.
9. **TERMS OF PAYMENT:** - 100 % Payment on receipt of stores in **Good working condition at the destination & Testing in circuit for satisfactory operation.**
10. The quotation should be sent in a sealed cover addressed to the undersigned, by name, so as to reach on or before **12.09.11** 12.30 P.M.  
**THE COVER SHOULD BE SUPERSCRIBED WITH THE FOLLOWING:**
  - a. **Material for which quotations are enclosed.**
  - b. **Reference to letter of enquiry.**
  - c. **Due date of opening quotation.**
11. The Quotations will be opened in this office at 3.00 P.M. on **12.09.11** in the presence of tenderers or their agents such as they may choose to attend.
12. **QUOTATIONS NOT PROPERLY SUPERSCRIBED WILL NOT BE CONSIDERED.**
13. The quotations submitted shall remain open for acceptance for a period of **90 (Ninety) days** from the date of opening of the Tender. If any Tenderer/ Suppliers withdraws his Tender/Quotation before the said period or makes any modifications in the Terms & Conditions on the Tender/Quotation which are not acceptable to the Department, then the Government shall, without prejudice to any other right or remedy, be at the liberty to forfeit 50% of the Earnest Money as aforesaid.
14. Both your **PAN - Permanent Income Tax Account Number** and Income Tax Circle & your **TIN - Tax Identification Number** and the Tax circle should be definitely indicated in your quotation.
15. In case of supply of any Specific or Manufacturer item, the Manufacturer's Test Certificate should be enclosed with the supply.
16. **RIGHT OF ACCEPTANCE:** The undersigned reserves the right to reject the lowest tender or all the tenders without assigning any reasons whatsoever. Further, the undersigned reserves him self the right for decreasing the quantity of material tendered depending upon the actual requirements. The unit rate quoted on the tender shall be applicable for the quantity for which order is placed. All Quotations/Tenders in which any of the prescribed conditions are not fulfilled or are incomplete in any respect are liable to be rejected. The competent authority on behalf of President of India reserve himself the right of accepting the whole or any part of the Tender shall be bound to perform the same at the rate quoted.
17. Canvassing whether directly or indirectly, in connection with Tender/quotation is strictly prohibited and the Tender/quotation submitted by the Contractors / suppliers who resort to canvassing will be liable to rejection.
18. The undersigned also reserves the right to place **Repeat Order** for 100% or less quantity for which the quotation has been originally invited/order placed.
19. **LANGUAGE / UNITS:** All information supplied by the Tenderer & all markings, notes, designation on the drawings & associated write-ups shall be in "**English language**" only. All dimensions, units on drawings, all references to weights, measures & quantities shall be in MKS.
20. In case this is second enquiry, your Quotation in response to the first enquiry should be presumed to be valid up to 120 days from the last date mentioned in para 11 above unless we hear from you.

Web Site: <http://www.cesairdd.org.in/tenders.html/>  
<http://www.allindiaradio.org/tender.html>  
<http://tenders.gov.in>

Encl: DG: AIR Specification No: Specs/18/1/2007/TM/1013  
Specifications for Ceramic Tetrode Valve  
Type:CQK-25-2/BEL-4000CX

(R.VASUMATHI)  
ASSISTANT ENGINEER  
FOR THE ADG (E) (SZ)



TETRODE CQK-25-2/BEL-40000 CX.

*Cart...*



# All India Radio

Internet  Services

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

**Specifications No.:** Specs./18/1/2007/TM/1013

**Specifications of Ceramic Tetrode Valve Type:** CQK- 25-2/ BEL- 40,000 CX

## 1. Scope:

This Ceramic Tetrode Valve is being used in Class-B modulator stage of 100 KW MW IIMB-140 BEL , 50/100 KW SW BBC/BEL make Transmitters and in PA stage of 50 KW SW BBC/BEL 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:               | Condensed water vapour cooled.                  |
| d. Operating frequency: | Upto 30 MHz.                                    |
| e. Operating position:  | Vertical, Anode up.                             |
| f. Weight:              | Approx.32kg.                                    |

## 3. Eligibility of the supplier:

- The supplier must possess valid ISO 9001/ 2000 Certificate in production.
- Original Equipment Manufacturer or their Authorised agent shall only be eligible to quote.
- 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.
- The supplier must possess an experience of at least 2years in manufacturing.
- 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:	10 V(AC) ±5%
Filament current:	210 A
Max starting current:	1800 A
Cold Resistance:	0.005 Ω
Mutual Conductance	65 m A/V

#### 4.1.2 Interelectrode Capacitance:

	<u>Typical</u>	<u>Unit</u>
K - G <sub>1</sub>	135	pf.
K - G <sub>2</sub>	11	pf.
K - A	0.35	pf.
G <sub>1</sub> - G <sub>2</sub>	170	pf.
G <sub>1</sub> - A	3.0	pf.
G <sub>2</sub> - A	55	pf.

4.1.3 Amplification Factor:  $\mu_{g_2 g_1}$  **6.5**

#### 5. Mechanical Specifications:

Max. Length-	<b>338 mm</b>
Max diameter-	<b>160 mm</b>
Weight with packing-	<b>32 Kg</b>
Weight without packing-	<b>11.6 Kg</b>

(Please also see the attached diagram of the valve)

#### 6. Operating Data:

##### 6.1 Maximum Rating:

DC Anode voltage	12	KV
DC Screen grid voltage	1.5	KV
Screen Grid dissipation	750	W
Anode dissipation	40	KW
Control Grid Dissipation	400	W
Dc Control Grid Voltage	- 600	V
Peak Cathode Current	80	A
Frequency	200	MHz

##### 6.2 Class B, AF Power Amplifier and Modulator:

###### Maximum Rating:

DC Anode voltage	12	KV
DC Screen grid voltage	1.5	KV
Signal DC anode current	10	A
Power input	80	kW
Screen Grid dissipation	750	W
Anode dissipation	40	KW

**Typical Operation Ratings for Two Tubes in Push-Pull:**

DC Anode voltage	12	10	KV
DC Screen grid voltage	1500	1500	V
DC control grid voltage	-280	-270	V
Peak AC control grid voltage(G-G)	530	520	V
Signal DC anode current Max	17	18	A
Zero Signal DC anode current	2.0	2.0	A
DC screen grid current	0.75	0.8	A
DC control grid current	0	0	
Driving Power	0	0	
Output power	140	120	KW
Load resistance Anode-to-anode	3150	2410	$\Omega$

**6.3 Class- C, HF Power Amplifier without modulation:**

**Maximum Rating:**

DC Anode voltage up to 30MHz	10	KV
DC Screen grid voltage	1200	V
DC Control grid voltage	-600	V
DC Control grid current	1	A
DC Anode current	10	A
Screen Grid dissipation up to 30MHz	750	W
Power input	100	KW
Anode dissipation	40	KW
Control grid dissipation	400	W
Grid resistor (Tube not conductive)	10	K $\Omega$

**Typical Operation Ratings:**

DC Anode voltage	12	10	KV
DC Screen grid voltage	1200	1200	V
DC control grid voltage	-520	-510	V
Peak AC control grid voltage	605	595	V
DC Anode current	8.3	8.2	A
DC screen grid current	0.5	0.5	A
DC control grid current	0.3	0.3	A
Driving Power	170	170	W
Output power	79	64	KW
Power output at $f \leq 3\text{MHz}$	80	65	KW
Frequency Maximum	30	30	MHz

### Class C, Anode - Screen Modulated, RF Power Amplifier:

#### Maximum Rating:

DC Anode voltage up to 50MHz	10	KV
DC Screen grid voltage	890	V
AC Screen grid voltage	700	V (Modulation factor 1)
DC Control grid voltage	-600	V
DC Control grid current	1	A
DC Anode current	8.5	A
Screen Grid dissipation	500	W
Anode dissipation	27	KW
Power input	85	KW
Control grid dissipation	400	W
Grid resistor (Tube non conductive)	10	K $\Omega$

#### Typical Operation Ratings: (Modulation factor 1)

DC Anode voltage	10	8	KV
DC Screen grid voltage	890	800	V
Peak AC screen grid voltage	700	700	V
DC control grid voltage	-400	-405	V
Peak AC control grid voltage	500	520	V
DC anode current	6.8	6.8	A
DC screen grid current	0.5	0.7	A
DC control grid current	0.6	0.54	A
Driving Power	200	270	KW
Output power	54	43	KW
Power output at $f \leq 3\text{MHz}$	55	44	KW
Frequency maximum	30	30	MHz

### 6.4 Class- C, HF Power Amplifier without modulation:

#### Maximum Rating:

DC Anode voltage up to 30MHz	10	KV
DC Screen grid voltage	1200	V
DC Control grid voltage	-600	V
DC Control grid current	1	A
DC Anode current	10	A
Screen Grid dissipation up to 30MHz	750	W
Power input	100	KW
Anode dissipation	40	KW
Control grid dissipation	400	W
Grid resistor (Tube non conductive)	10	K $\Omega$

### Typical Operation Ratings:

DC Anode voltage	12	10	KV
DC Screen grid voltage	1200	1200	V
DC control grid voltage	-520	-510	V
Peak AC control grid voltage	605	595	V
DC Anode current	8.3	8.2	A
DC screen grid current	0.5	0.5	A
DC control grid current	0.3	0.3	A
Driving Power	170W	170	W
Output power	79	64	KW
Power output at $F \leq 3\text{MHz}$	80	65	KW
Frequency Maximum	30	30	MHz

### 6.5 Tube Cooling:

Anode of the valve should be condensed water vapor cooled.	
Minimum water flow	10 l/min
At $P_a > 20\text{ KW} \rightarrow$ water flow	0.5 l/min kW
Water flow on filament header	min. 0.6 m <sup>3</sup> /min
Water flow on anode cooling ring	min. 0.3 m <sup>3</sup> /min
Minimum air flow at the base of the tube	3 m <sup>3</sup> /min
Temperature of Ceramic Cylinder & of metal ceramic seals	max. 220 °C

### 7. Certificate of Origin

- 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.
- In the absence of such a certificate of origin on the tubes, the tubes shall be considered as rebuilt or not manufactured by vendor.
- Rebuilt/ Refurbished/Reconditioned tube shall 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, curvatures, cleanliness, electrical connections, coolant connection, plating, shiny 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 500 hours operation of the tube.

## 11. Delivery

Delivery should complete in nine months after the issue of 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 working conditions into account.

The tube shall be guaranteed for 5000 Hrs. of heater/filament operation or 2 years from the date of receipt whichever ever occur first. In case of failure of the tube within the first 500 Hrs. full free replacement with a **New and of first quality tube** is to be provided by the OEM/ supplier. Filament credit will be for failure of tube between 500hrs. and 5000hrs. The claim must be settled by the **Supplier/OEM without any option** as given below :

If the tube fails after 500 hours and within guaranteed 5000 hours, then prorata

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

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.

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