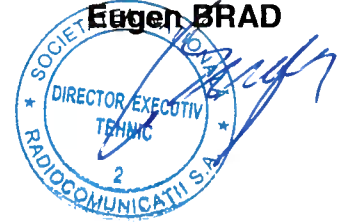




Aprobat
Director Executiv Tehnic
Eugen BRAD



LOT 1

TECHNICAL REQUIREMENTS

ELECTRON TUBE THALES TH558E

- Electron tubes technical specification
- Quotation list for electron tubes
- Delivery location

TECHNICAL FEATURES FOR ELECTRON TUBE

THALES – TH558E



THALES

No.	Customer Specifications	Specification of the offered equipment	Mandatory	Remarks
1.	Scope: This tetrode electron tube (valve) is being used in Class-C amplifier stage of 300 kW SW CEC 419G Continental.		Yes	
2.	General Characteristic of the valve: The electron tube offered should be new a. electron tube: Ceramic metal tetrode with co-axial structure b. Filament: Thoriated tungsten cathode with direct heating. c. Anode: Condensed water vapour cooled. d. Operating frequency: Up to 50 MHz. e. Operating position: Vertical, Anode up. f. Weight: Approx.74 kg.		Yes	
3.	Eligibility of the supplier: a. Original Equipment Manufacturer or their Authorised reseller shall only be eligible to quote. b. The supplier must possess valid ISO 9001 Certificate with latest amendments in production. c. In case O.E.M is not the tenderer, it should submit an authorization letter duly signed and stamped by the OEM and submit it along with the tender. Name and address of the OEM and location of its manufacturing facilities is to be clearly mentioned. d. The supplier must possess an experience of at least 5 years in manufacturing new and first quality tubes. e. The tenderer must be able to provide past records of timely and good quality supply of tendered items to Broadcast Organizations in the preceding two years. Any offer which fails to meet the above eligible conditions will be summarily rejected.		Yes	
4.	Electrical Specifications:			
4.1	Filament voltage: 20.5V-23 V(AC) ±2% Filament current: 450A -550 A Max starting current: 1000 A Mutual Conductance (minimum): 180 m A/V		Yes	

4.2	Interelectrode Capacitance: K – G ₁ 410 pF - 490 pF K – G ₂ 37 pF - 46 pF K – A 0.6 pF - 1.2 pF G ₁ – G ₂ 700 pF - 830 pF G ₁ – A 4.5 pF - 7.5 pF G ₂ – A 92 pF - 112 pF		Yes																															
4.3	Amplification Factor: μ g₂-g₁ 3.7-4.9		Yes																															
5.	Mechanical Specifications: Max. Length: 655 mm Max diameter: 320 mm Weight without packing: 74 kg		Yes																															
6.	Operating Data:																																	
6.1	Maximum Rating, whatever application: DC Anode voltage 15 kV DC Screen grid voltage 1.25 kV Screen Grid dissipation 8.0 kW Anode dissipation 500 kW Control Grid Dissipation 3.0 kW Peak voltage between G ₁ -G ₂ 4.0 kV Peak Cathode Current 600 A Frequency 50 MHz		Yes																															
6.2	Class C, Anode -Screen Modulated, RF Power Amplifier : Output power 550 kW Frequency 26 MHz Heater voltage 20.5 V DC Anode voltage up to 26 MHz 12.5 kV DC Screen grid voltage 1100 V DC Control grid voltage -500 V Anode DC current 54A		Yes																															
6.3	Typical Operation Ratings, 500 kW, without modulation: <table border="0"> <thead> <tr> <th></th> <th>min</th> <th>max</th> </tr> </thead> <tbody> <tr> <td>DC Anode voltage</td> <td>12.5 kV</td> <td>14 kV</td> </tr> <tr> <td>DC Screen grid voltage</td> <td>1000 V</td> <td>1000 V</td> </tr> <tr> <td>DC control grid voltage</td> <td>-550 V</td> <td>-550 V</td> </tr> <tr> <td>DC Anode current</td> <td>54 A</td> <td>47 A</td> </tr> <tr> <td>DC screen grid current</td> <td>5.0 A</td> <td>4.2 A</td> </tr> <tr> <td>DC control grid current</td> <td>5.0 A</td> <td>4.0 A</td> </tr> <tr> <td>Output power</td> <td>550 kW</td> <td>550 kW</td> </tr> <tr> <td>Anode efficiency</td> <td>81.5 %</td> <td>84.0 %</td> </tr> <tr> <td>Frequency Maximum</td> <td>30 MHz</td> <td>30 MHz</td> </tr> </tbody> </table>		min	max	DC Anode voltage	12.5 kV	14 kV	DC Screen grid voltage	1000 V	1000 V	DC control grid voltage	-550 V	-550 V	DC Anode current	54 A	47 A	DC screen grid current	5.0 A	4.2 A	DC control grid current	5.0 A	4.0 A	Output power	550 kW	550 kW	Anode efficiency	81.5 %	84.0 %	Frequency Maximum	30 MHz	30 MHz		Yes	
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6.4	<p>Tube Cooling: Anode of the valve should be condensed water vapor cooled.</p> <p>Min. water flow (no RF) 110 l/min Min. water flow in typical operation 150 l/min Min. air flow at the base of the tube 1.6m³/min Temperature of Ceramic Cylinder & of metal ceramic seals max. 200 °C</p>		Yes	
7.	<p>Certificate of Origin:</p> <p>a) In order to verify that each tube supplied by OEM comes from an ISO9001 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.</p> <p>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.</p> <p>c) Rebuilt/ Refurbished/Reconditioned tube shall not be accepted.</p>		Yes	
8.	<p>Tube Appearance The Electron tubes shall be free from defects in design, material and workmanship. 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 200 hours operation of the tube.</p>		Yes	
9.	<p>Guarantee Conditions</p> <p>The tubes shall be guaranteed for 6000 Hrs. of heater/filament operation or 2 years from the delivery date whichever is earlier. In case of failure of the tube within the first 200 Hrs, full free replacement with a New and of first quality tube is to be provided by the tenderer. In case the tube fails between 200 Hrs. and 6000 Hrs. the tenderer shall make prorata payment as described below:</p> <p>Prorata Payment Computation :</p> <p>If the tube fails after 200 hours and within guaranteed 6000 hours, then prorata payment shall be computed as per following formula.</p> $C = P(G-H)/G$ <p>C -Credit G -Guaranteed no. of hours H -Useful filament hours served by the defective tube. P -Purchased price of defective tube.</p>		Yes	



10.	Document accompanying the electron tube -technical specifications -factory HV test protocol and report; date of testing -factory warranty certificate with date of tube manufacturing -factory warranty claim		Yes	
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Delivery time: 4 months



**QUOTATION LIST FOR ELECTRON TUBES
THALES - TH558E**

No	Item	REQUIREMENTS	Q-ty	PRICE (EURO) CIP Tiganesti site
1	ELECTRON TUBE THALES	Tetrode TH558E	1Pc.	

No	Item	REQUIREMENTS	Q-ty	PRICE (EURO) CIP Galbeni site
1	ELECTRON TUBE THALES	Tetrode TH558E	1Pc.	

TOTAL:



Delivery Locations Lot 1:

No	Site	Tube type	Qty.	Delivery address:
1	Tiganesti site	Thales TH558E	1 pc.	Statia radio Tiganesti , sat Tiganesti, com. Ciolpani, jud Ilfov (km37 DN1 Bucuresti-Ploiesti)
2	Galbeni site	Thales TH558E	1 pc.	Statia radio Tiganesti , sat Galbeni, com. Filipesti, jud Bacau

Manager Departament Broadcasting
Adrian STRĂMBEANU



Şef Serviciu Radiodifuziune
Mina CARCU



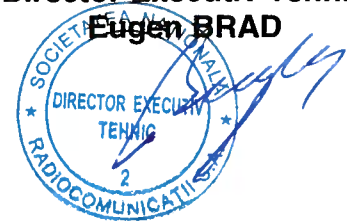
Întocmit: Gabriel STANCIU





Aprobat
Director Executiv Tehnic
Eugen BRAD

LOT 2



TECHNICAL REQUIREMENTS

ELECTRON TUBE EIMAC 3CW20000A7

- Electron tubes technical specification
- Quotation list for electron tubes
- Delivery location

TECHNICAL FEATURES FOR ELECTRON TUBE

EIMAC – 3CW20000A7



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No.	Customer Specifications	Specification of the offered equipment	Mandatory	Remarks
1.	Scope: This triode electron tube (valve) is being used in class B driver amplifier stage of 300 kW SW CEC 419G Continental.		Yes	
2.	General Characteristic of the valve: The electron tube offered should be new a. electron tube: Ceramic metal triode with co-axial structure b. Filament: Thoriated tungsten cathode with direct heating. c. Anode: Condensed water vapour cooled. d. Operating frequency: Up to 110 MHz.		Yes	
3.	Eligibility of the supplier: Original Equipment Manufacturer or their Authorised reseller shall only be eligible to quote.		Yes	
4.	Electrical Specifications:			
4.1	Filament voltage: 7.5V Filament current: 99 A		Yes	
4.2	Interelectrode Capacitance: Grounded cathode Input 59 pF Output 0.2 pF Feedtrough 36 pF Grounded grid Input 59 pF Output 36 pF Feedtrough 0.2 pF		Yes	
4.3	Amplification Factor: 200		Yes	
5.	Mechanical Specifications: Max. Length: 285 mm Max diameter: 118.10 mm Weight without packing: 5.2 kg		Yes	
6.	Operating Data:			
6.1	Maximum Rating, whatever application: Plate dissipation 20 kW DC plate voltage 7 kV Plate current 5 A		Yes	

6.2	Class B, cathode driven , RF linear Amplifier : Output power 5.65 kW Plate voltage 7 kV Plate current 2.4 A		Yes	
7.	Certificate of Origin: a) In order to verify that each tube supplied by OEM comes from an ISO9001 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 shall not be accepted.		Yes	
8.	Tube Appearance The Electron tubes shall be free from defects in design, material and workmanship.		Yes	
9.	Guarantee Conditions The tubes shall be guaranteed for 3000 Hrs. of heater/filament operation or 1 years from the delivery date whichever is earlier.		Yes	
10.	Document acompagnying the electron tube -technical specifications -factory HV test protocol and report; date of testing -factory warranty certificate with date of tube manufacturing -factory warranty claim		Yes	

Delivery time: 4 weeks

**QUOTATION LIST FOR ELECTRON TUBES
EIMAC - 3CW20000A7**

No	Item	REQUIREMENTS	Q-ty	PRICE (EURO) CIP Tiganesti site
1	ELECTRON TUBE EIMAC	Triode 3CW20000A7	1Pc.	

No	Item	REQUIREMENTS	Q-ty	PRICE (EURO) CIP Galbeni site
1	ELECTRON TUBE EIMAC	Triode 3CW20000A7	1Pc.	

TOTAL:

Delivery Locations Lot 2:

No	Site	Tube type	Qty.	Delivery address:
1	Tiganesti site	EIMAC 3CW20000A7	1 pc.	Statia radio Tiganesti , sat Tiganesti, com. Ciolpani, jud Ilfov (km37 DN1 Bucuresti-Ploiesti)
2	Galbeni site	EIMAC 3CW20000A7	1 pc.	Statia radio Tiganesti , sat Galbeni, com. Filipesti, jud Bacau

Manager Department Broadcasting
Adrian STRĂMBEANU

Şef Serviciu Radiodifuziune
Mihai CÂRCU

Întocmit: Gabriel STANCIU

