



TH480 TRIODE VAPOTRON

The TH 480 is a transmitting vapor cooled triode used as an oscillator or AF or RF amplifier.

The anode cooler of special design (Thomson patents) can dissipate 70 kW. The corresponding energy can be transferred to a secondary circuit at a temperature of about 100 °C.



GENERAL CHARACTERISTICS

Electrical

Type of cathode	thoriated tungsten	
Heating	direct ; DC or AC single phase	
Filament voltage (1)	12,6	V
Filament current, approx.	200	A
Maximum surge current	600	A
Filament resistance (cold)	0.008	Ω
Interelectrode capacitances, approx. :		
- cathode - grid	100	pF
- grid - anode	73	pF
- anode - cathode	2.5	pF
Amplification factor	25	
Transconductance (I _a = 8 A)	65	mA/V

Mechanical

Operating position	vertical, anode down	
Anode cooling	vaporization of water	
Maximum temperature of glass bulb and electrode terminals	150	°C
Cooling of glass bulb and electrode terminals	forced air	
Cooling airflow	1	m ³ /mn
Net weight, approx.	24	kg
Dimensions	see drawing	

(1) Tolerances are given in operating conditions.



Accessories (2)

Boiler for 80 kW maximum dissipation	TH 17004
- anode connexion ensured by 3 flexible contacts included	
Boiler condenser for 50 kW maximum dissipation	TH 17014
Anode connexion ensured by a removable toroidal gasket	TH 17151
Water-tight gasket on the tube (3)	TH 17801
Filament transformer (4)	TH 20030
Filament connexion	TH 13052
Grid connexion :	
- up to 10 MHz	TH 13520
- above 10 MHz	TH 13521
Blower for electrode terminals cooling	TH 14107
Lifting device	TH 14212

OPERATING CONDITIONS

RF POWER AMPLIFIER – TELEGRAPHY CLASS C

Maximum ratings

Filament voltage	12, 6 ± 2 %	V
D.C. anode voltage	15, 0	kV
D.C. grid voltage	- 2000	V
Peak cathode current	75	A
D.C. anode current	15	A
D.C. grid current	2, 0	A
Input power	180	kW
Anode dissipation (5)	70	kW
Grid dissipation	1800	W
Frequency at full load	10	MHz

Typical operation

D.C. anode voltage	12	13	kV
D.C. grid voltage	- 1000	- 1200	V
Peak RF grid voltage	1600	1900	V
D.C. anode current	10. 7	13. 5	A
D.C. grid current, approx.	1. 1	1. 8	A
Input power	128	175	kW
Anode dissipation	28	35	kW
Output power, approx. (6)	100	140	kW

- (2) Accessories required for the cooling system (boilers, level monitor tanks, condensers ...) are described in particular Data sheets available upon request.
- (3) A groove is provided in the lower part of the collar to this end.
- (4) This transformer permits to apply the filament voltage in one step.
- (5) The indicated power corresponds to the maximum dissipation in the case of permanent anode overloading it must not be used for the calculation of input and output powers.
- (6) Without taking circuit losses into account.



OSCILLATOR FOR INDUSTRIAL APPLICATION

Maximum ratings

Filament voltage	.....	12 ± 5 %	V
D.C. anode voltage	.....	15,0	kV
D.C. grid voltage	.....	- 2000	V
Peak cathode current	.....	60	A
D.C. anode current	.....	10	A
D.C. grid current	.....	1.6	A
Input power	.....	135	kW
Anode dissipation (7)	.....	70	W
Grid dissipation	.....	1600	W
Frequency at full load	.....	30	MHz

Typical operations

D.C. anode voltage	.....	10	12	12	14	kV
D.C. grid voltage	.....	- 900	- 1000	- 1000	- 1200	V
Peak RF grid voltage	.....	1450	1450	1550	1750	V
D.C. anode current	.....	8.9	7.2	9	9.6	A
D.C. grid current, approx.	.....	1.1	0.9	1	1.1	A
Input power	.....	89	86	108	135	kW
Anode dissipation	.....	22	19	25	28	kW
Output power, approx. (8)	.....	65	65	80	105	kW
Efficiency	.....	73	75	74	78	%

(7) The indicated power corresponds to the maximum dissipation in the case of permanent anode overloading this value must not be used for the calculation of input and output powers.

(8) Without taking circuit losses into account.



PARTICULAR OPERATING INSTRUCTIONS

These particular instructions are complementary to those given in data sheet related to the "general instructions for Vapotron operation" which the user must refer to.

MOUNTING

Since shocks and vibrations are harmful, maximum tube life will be obtained if one avoids too much handling. In particular the tube must only be taken out of its packing case when alongside the boiler and only be changed around when absolutely necessary. All handling must be done with the lifting device. It is necessary to use a hoist which may be fixed on a pivoting arm or on a carriage mobile on two rails.

VAPODYNE PLANT

The TH 480 Vapotron must be used in a properly adapted Vapodyne installation. In the case of TH 17004 boiler, the water level must be kept at the level indicated on the tube outline drawing through the use of a level monitoring tank TH 17501.

When the boiler-condenser TH 17014 is used, a high water level is maintained by a security device.

For any other operating modes where standard components are not used, it is necessary to consult us.

HEATING

Before putting a tube into service, check with an ohmmeter that the filament is undamaged ; also check the mounting and the security devices.

The filament voltage measured directly at the tube terminals must be kept within the specified range unless authorized by us.

Any variation outside these limits will shorten the tube life. Thus a voltage regulator must be used.

During the filament voltage surge, the current must not exceed the indicated maximum value. This requirement is fulfilled either by a system enabling to increase the filament voltage in several steps or by using a leakage transformer for instance the TH 20030.

SECURITY DEVICES

The anode power supply must be provided with a very high speed cut-off system and its peak short circuit current must be limited.

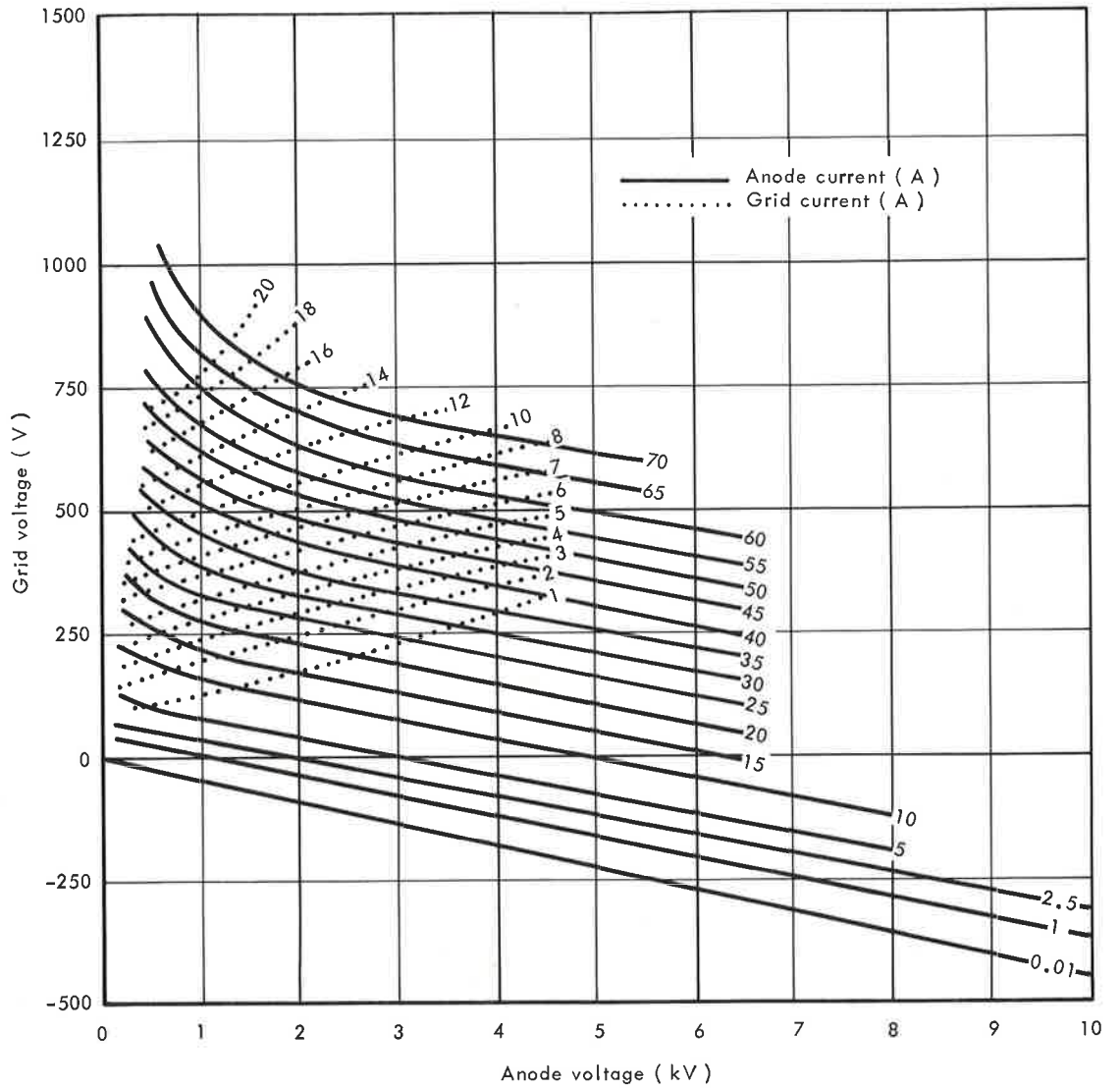
This must be checked by short circuiting the anode supply using a copper fuse of 40/100 mm diameter maximum (see "Instructions for Vapotron operation").

On the other hand, this tube exhibiting high power and high transconductance must be protected against stray oscillations before any voltage applications by means of an efficient damping circuit.

The grid to ground spark gap must be in good condition and correctly adjusted.

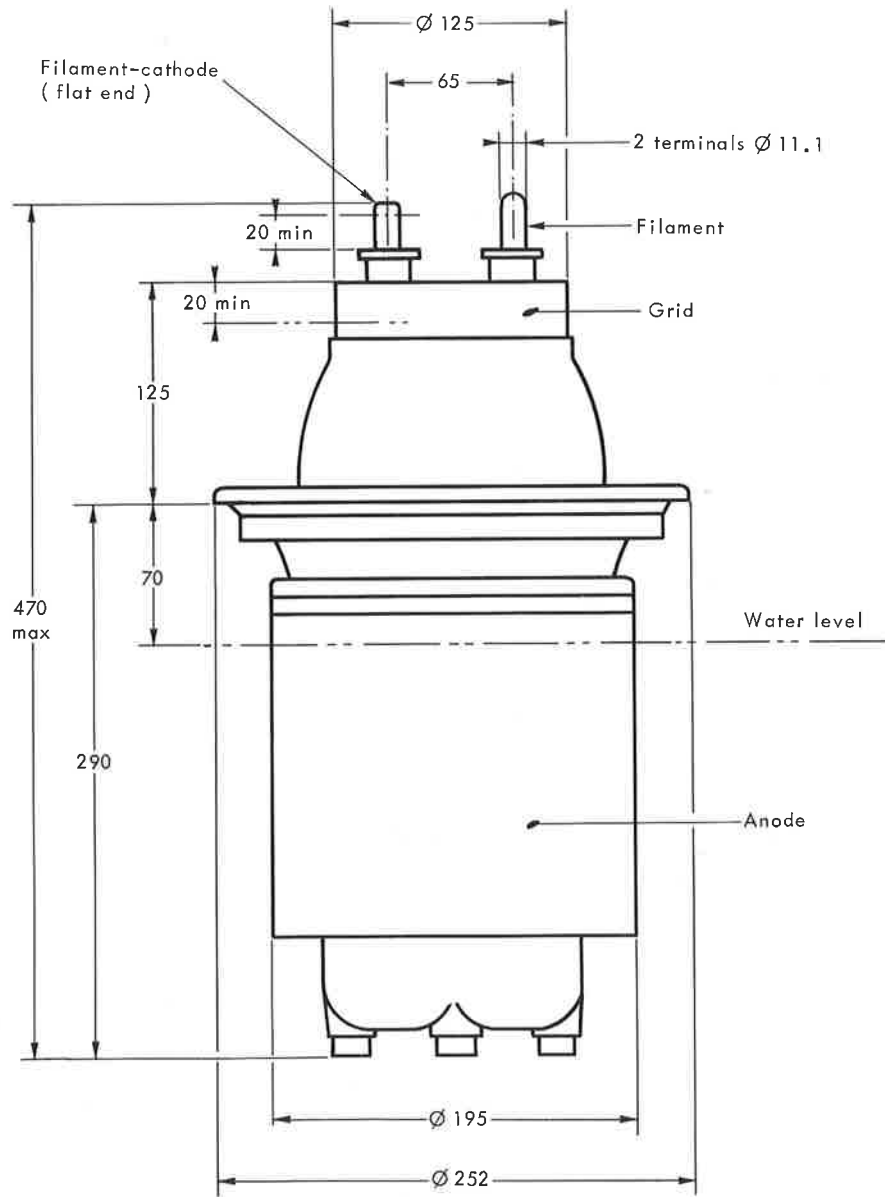


CONSTANT CURRENT CHARACTERISTICS





OUTLINE DRAWING



Dimensions in mm.

