



TH177 TRIODE

The TH 177 is a water cooled transmitting triode used as an oscillator in R.F. industrial generators and especially in dielectric heating. It can operate at full load up to 30 MHz.

The anode equipped with a removable cooler can dissipate 30 kW.



GENERAL CHARACTERISTICS

Electrical

Type of cathode	thoriated tungsten
Heating	direct DC or AC single phase
Filament voltage	7.0 ± 5 % V
Filament current, approx.	200 A
Maximum surge current	600 A
Filament resistance (cold)	0.006 Ω
Interelectrode capacitances :	
- cathode-grid	64 pF
- grid-anode	39 pF
- anode-cathode	1.5 pF
Amplification factor	23
Transconductance (for $I_a = 2A$)	30 mA/V

Mechanical

Operating position	vertical, anode down
Anode cooling	water cooling
Maximum temperature of glass and electrode terminals	150 °C
Cooling of glass and electrode terminals	forced air
Cooling airflow	1 m ³ /mn
Net weight, approx. (without cooler)	18 kg
Dimensions	see drawing

Accessories

Cooler for water circulation	TH 11052
Water tight gasket	TH 32507
Heater transformer (1)	TH 20020
Filament connexion	TH 13052
Grid connexion :	
- up to 10 MHz	TH 13508
- above 10 MHz	TH 13518
Blower for electrode terminals (7.2 V - 30 VA)	TH 14107

(1) This transformer permits to apply the heater voltage in one step.



OPERATING CONDITIONS

OSCILLATOR FOR INDUSTRIAL APPLICATION

Maximum ratings

D.C. anode voltage	14.0	kV
D.C. grid voltage	-1500	V
Peak cathode current	40	A
D.C. anode current	5.5	A
D.C. grid current	700	mA
Input power	60	kW
Anode dissipation (2)	30	kW
Grid dissipation	600	W
Frequency at full load	30	MHz

Typical operations

D.C. anode voltage	8.5	12	12	kV
D.C. grid voltage	-700	-1000	-1000	V
Peak RF grid voltage	1250	1500	1550	V
D.C. anode current	4.8	3.8	5	A
D.C. grid current, approx.	500	400	500	mA
Input power	41	46	60	kW
Anode dissipation	10	10	14	kW
Output power (3)	30	35	45	kW
Efficiency	73	76	75	%

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

(3) Without taking circuit losses into account.

PARTICULAR OPERATING INSTRUCTIONS

These particular instructions are complementary to the general instructions.

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 when alongside the boiler ; great care must be taken in mounting the tube in its cooler.

Heating

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

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 20 020 type.

Security devices

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

This must be checked by short-circuiting the anode supply using a copper fuse of 30/100 mm maximum.

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

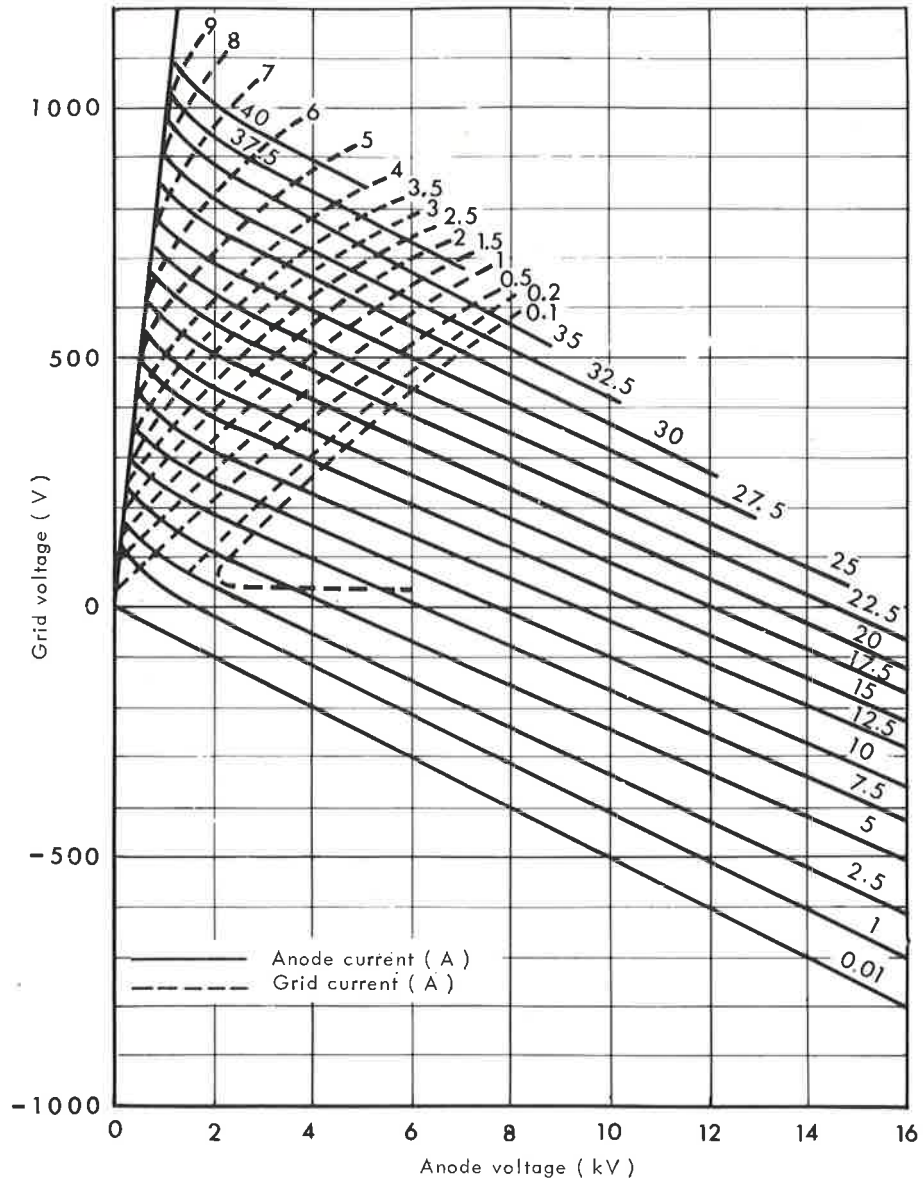
The grid to ground spark gap must be in good condition and correctly adjusted.



THOMSON-CSF

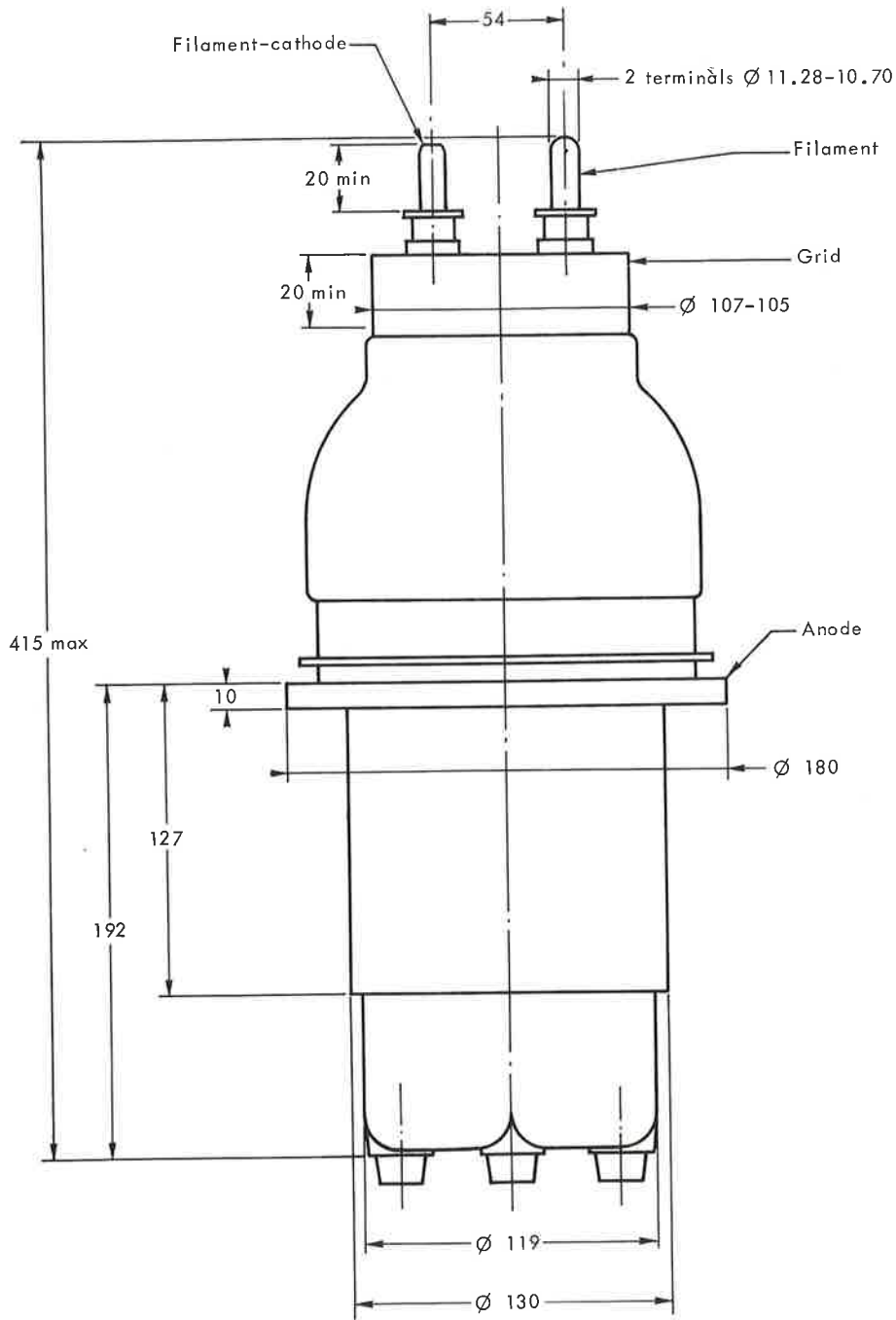
GROUPEMENT TUBES ELECTRONIQUES

CONSTANT CURRENT CHARACTERISTICS





OUTLINE DRAWING



Dimensions in mm.

