

TH 316 TRIODE

The TH 316 is a forced air cooled, ceramic metal, high gain triode of planar structure. This tube is specially designed for highly linear amplifier operating up to 1000 MHz without grid current in T.V. translators handling both sound and vision signals in the same channel with a crossmodulation level better than 52 dB.

The anode can dissipate 270 W.



GENERAL CHARACTERISTICS

Electrical

Type of cathode	oxide coated
Heating	indirect
Heater voltage (1)	5.0 ± 2% V
Heater current, approximate	1.9 A
Minimum preheating time	3 mn
Interelectrode capacitances (2) :	
- grid-anode	3.2 to 4 pF
- grid-cathode (cold)	14.5 to 14.8 pF
- cathode-anode (cold)	0.04 pF max.
Amplification factor, average	230
Transconductance, average ($I_a = 150$ mA)	70 mA/V

Mechanical

Mounting position	any
Anode cooling (3)	forced air (see curves page 4)
Maximum temperature at the top of radiator	see curves page 4
Maximum temperature of electrode terminals (3)	150 °C
Net weight, approximate	170 g
Dimensions	see drawing



OPERATING CONDITIONS

Maximum ratings

Anode D.C. voltage	2 000	V
Grid D.C. voltage	-50	V
Cathode D.C. current	250	mA
Anode dissipation	270	W
Frequency	1 000	MHz

CLASS A - LINEAR AMPLIFIER FOR TELEVISION TRANSLATOR HANDLING BOTH SOUND AND VISION SIGNALS C.C.I.R. STANDARD

Typical operation

Operating frequency	780	780	MHz
Anode D.C. voltage	1 200	1 500	V
Anode D.C. current	100	100	mA
Gain	20	20	dB
Peak video power	25	35	W
Crossmodulation level (3 tones test)	> 52	> 52	dB*

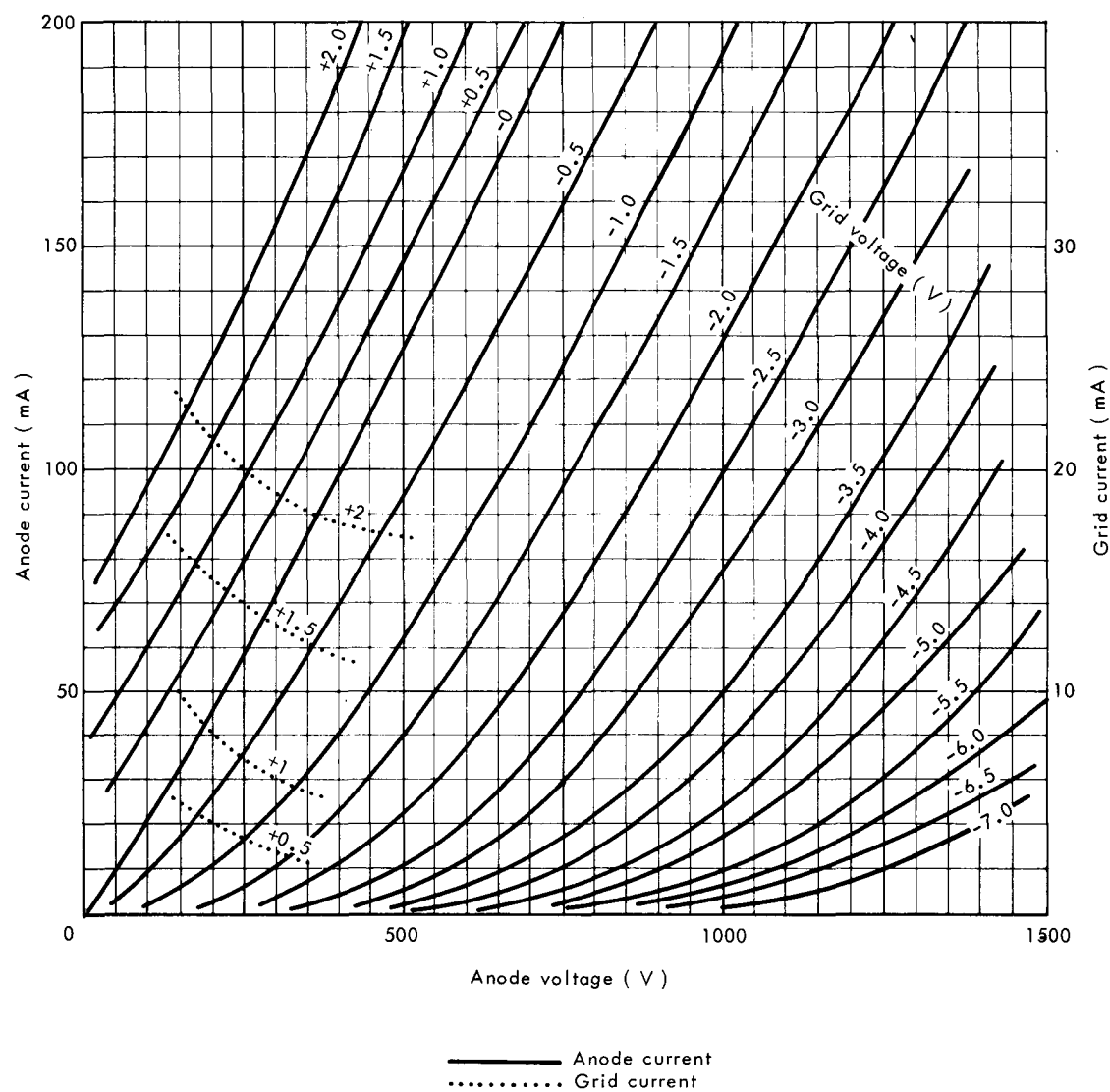
* Under Video level.

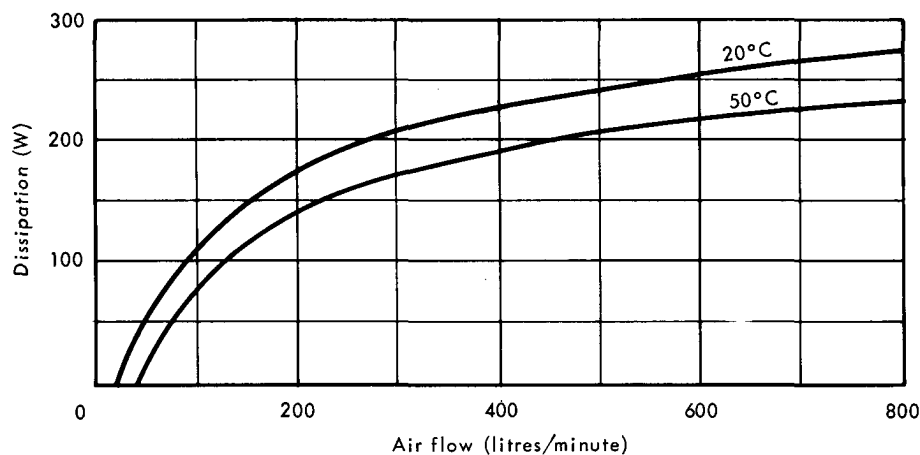
NOTES

- 1 - In high frequency operation, the cathode is subjected to considerable bombardment which raises its temperature. After the circuit has been adjusted for proper tube operation, the heater voltage must be reduced to prevent overheating of the cathode with resulting short life. Ask for information for any special operation.
- 2 - Measurements are made in appropriate mounting with minimum parasitic capacitances.
- 3 - The cooling airflow must be established before any voltage application.

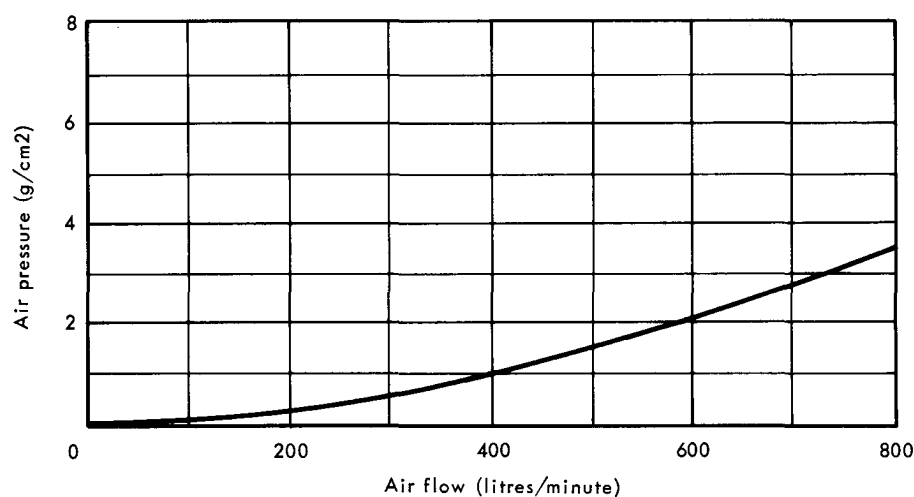


CURRENT CHARACTERISTICS

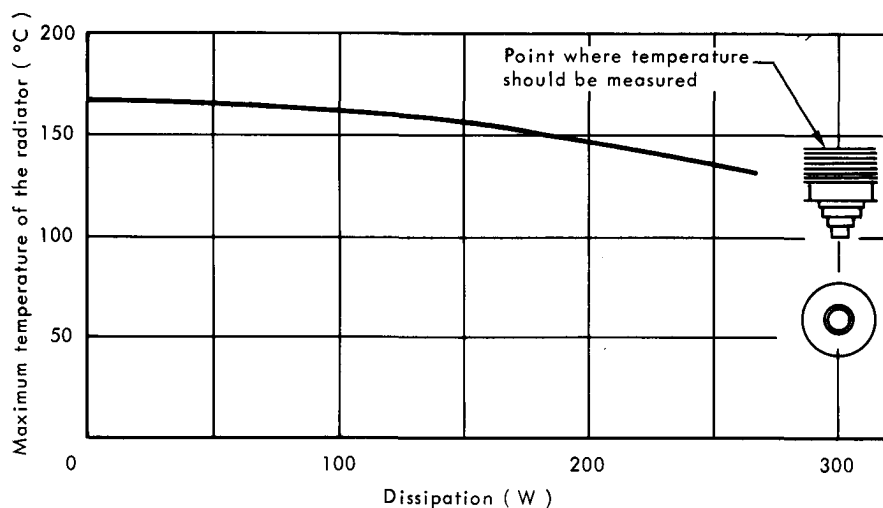


**THOMSON-CSF**
GROUPEMENT TUBES ELECTRONIQUESAIRFLOW VERSUS ANODE DISSIPATION
FOR INLET AIR TEMPERATURE OF 20° C

AIR PRESSURE AT THE ENTRANCE OF THE DUCT

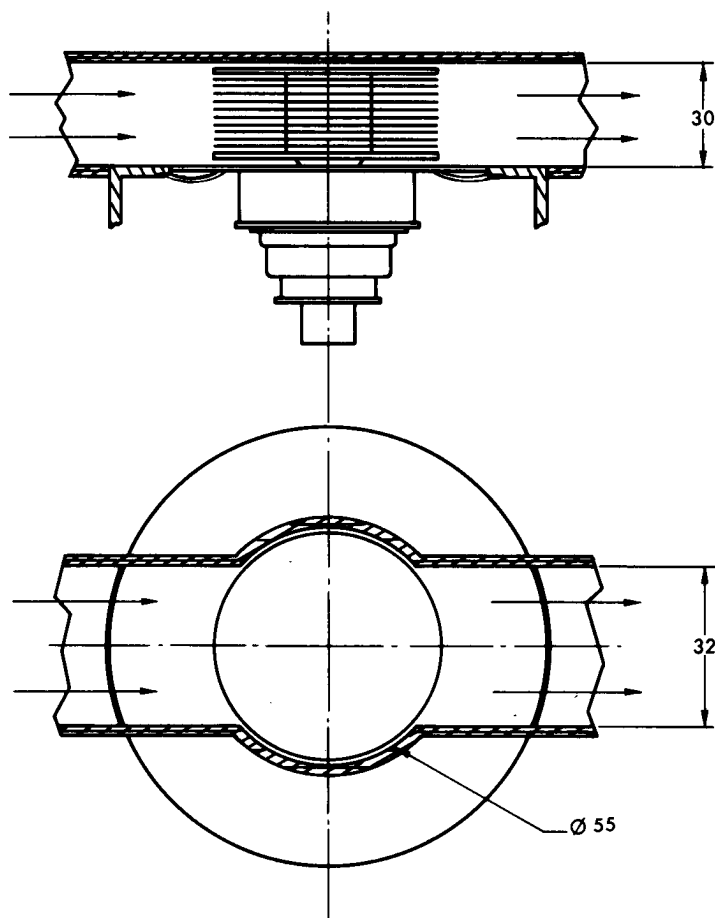


MAXIMUM TEMPERATURE ALLOWED AT THE TOP OF THE RADIATOR

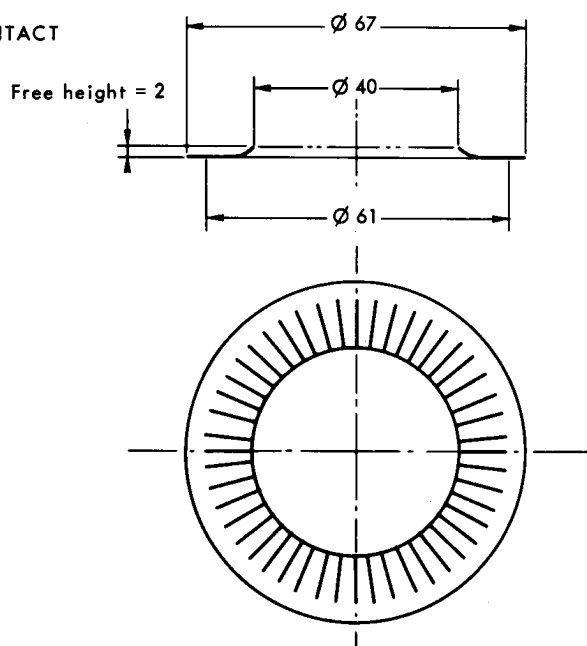




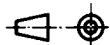
DETAILS OF AIR DUCT



ANODE SPRING CONTACT

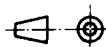
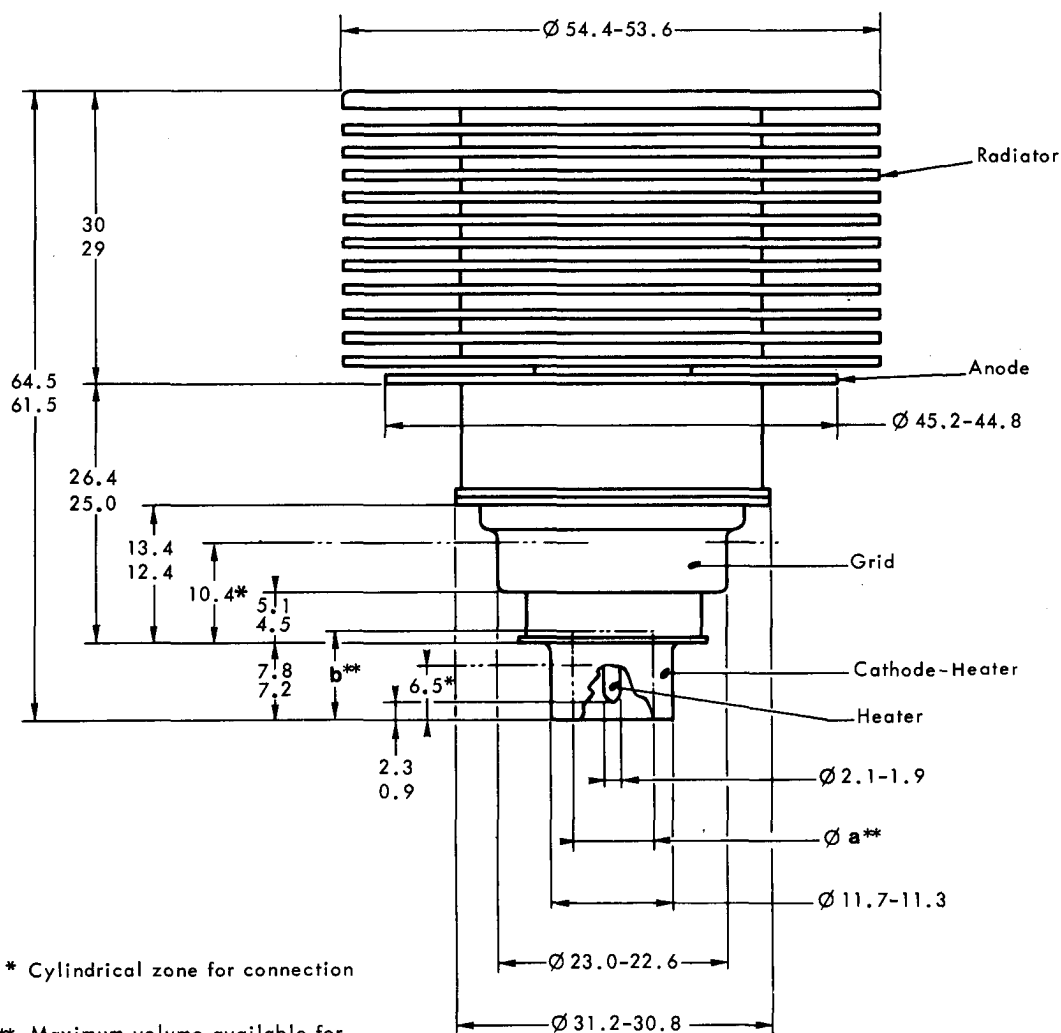


Dimensions in mm.





OUTLINE DRAWING



TRIODE TH 316

Le tube TH 316 est une triode céramique métal, à structure plane, à grand gain, refroidie par air forcé. Il est spécialement destiné aux amplificateurs linéaires fonctionnant sans courant grille jusqu'à une fréquence de 1000 MHz. Ces amplificateurs sont utilisés dans des réémetteurs de Télévision pour l'amplification simultanée dans une seule voie des signaux image et son avec un taux d'intermodulation meilleur que 52 dB.

Son anode peut dissiper 270 W.



CARACTERISTIQUES GENERALES

Electriques

Nature de la cathode		oxydes indirect	V
Mode de chauffage		5, 0 ± 2 %	A
Tension filament (1)		1, 9	mn
Courant filament, env.		3	
Temps minimal de préchauffage		3, 2 à 4	pF
Capacités interélectrodes (2) :		14, 5 à 14, 8	pF
- grille-anode		max. 0, 04	pF
- grille-cathode (à froid)		230	
- cathode-anode (à froid)		70	mA/V
Facteur d'amplification, env.			
Pente (I _a = 150 mA), env.			

Mécaniques

Position de fonctionnement		indifférente	
Refroidissement de l'anode (3)		air forcé (voir courbe page 4)	
Température maximale au sommet du radiateur		voir courbe page 4	
Température maximale des sorties d'électrodes (3)		150	°C
Poids, env.		170	g
Dimensions		voir dessin	



CONDITIONS D'EMPLOI

Valeurs limites

Tension continue d'anode	2000	V
Tension continue de grille	- 50	V
Courant continu de cathode	250	mA
Dissipation d'anode	270	W
Fréquence	1000	MHz

AMPLIFICATEUR LINEAIRE POUR REEMETTEUR DE TELEVISION - CLASSE A

AMPLIFICATION SIMULTANEE DES SIGNAUX IMAGE ET SON

NORMES C.C.I.R.

Exemple de fonctionnement

Fréquence de fonctionnement	780	780	MHz
Tension continue d'anode	1200	1500	V
Courant continu d'anode	100	100	mA
Gain	20	20	dB
Puissance video crête	25	35	W
Taux d'intermodulation (méthode des 3 signaux)	> 52	> 52	dB *

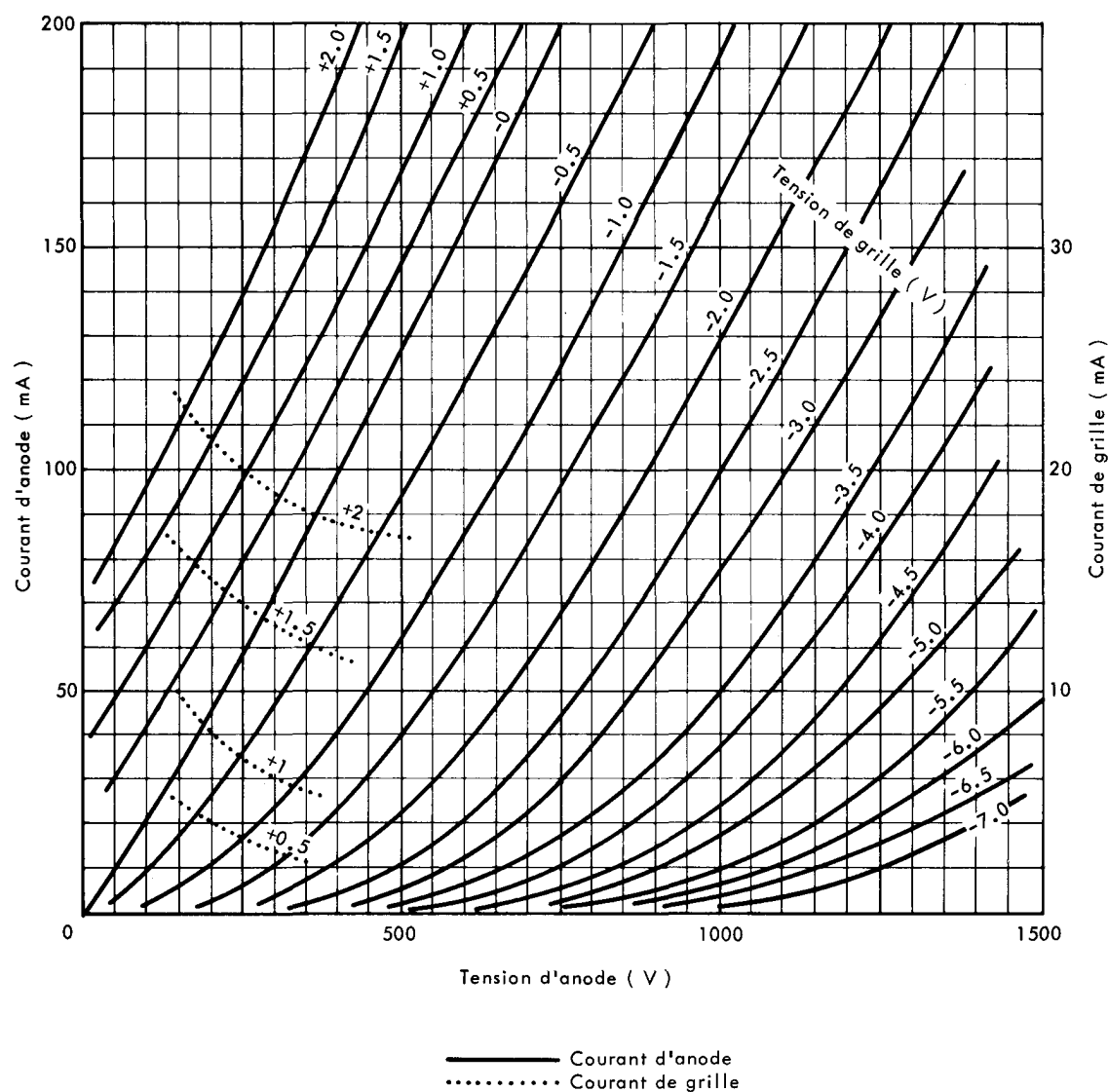
* Au dessous du niveau video.

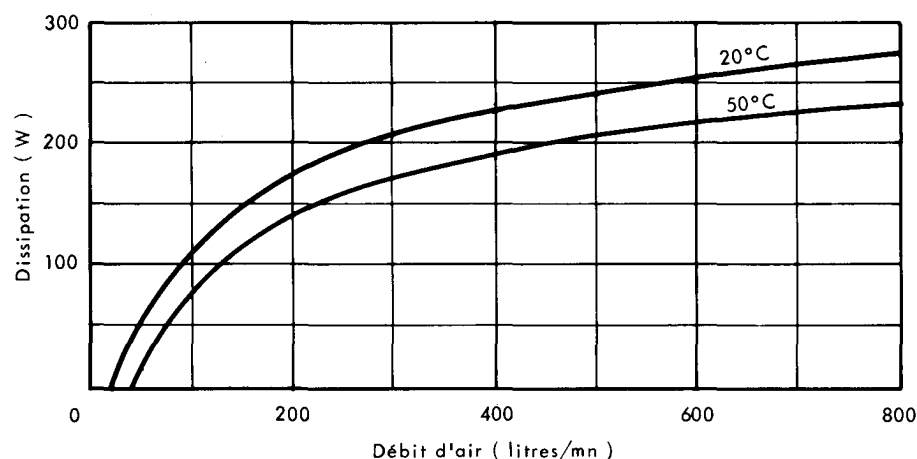
NOTES

- (1) En fonctionnement à haute fréquence la cathode est soumise à un important bombardement, ce qui a pour effet d'élever sa température. Après réglage du circuit pour obtenir un fonctionnement correct, réduire la tension de chauffage afin d'éviter cet échauffement nuisible à la durée de vie du tube. Nous consulter pour toute application spéciale.
- (2) Les mesures sont faites dans un montage approprié avec un minimum de capacités parasites.
- (3) Le débit d'air de refroidissement doit être établi avant l'application des différentes tensions.

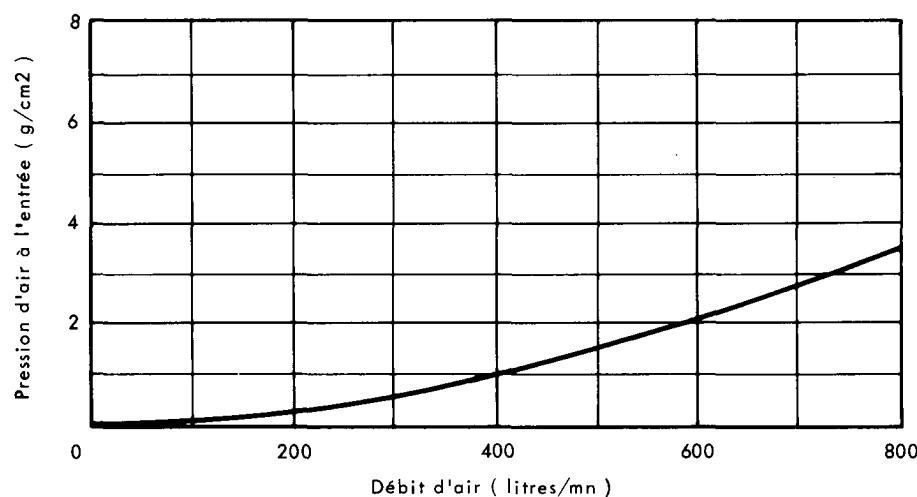


CARACTERISTIQUES DE COURANTS

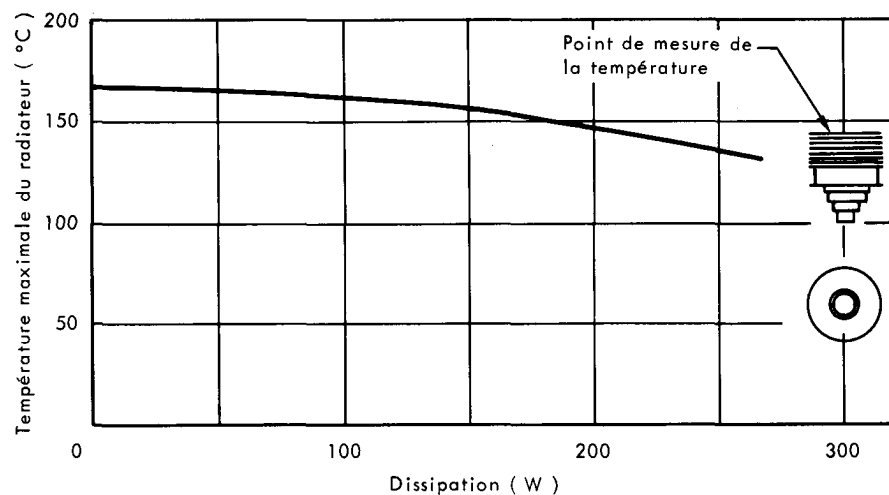



 DEBIT D'AIR EN FONCTION DE LA DISSIPATION D'ANODE
 POUR DES TEMPERATURES DE L'AIR A L'ENTREE DE 20°C ET 50°C


PRESSION D'AIR A L'ENTREE DE LA CANALISATION



TEMPERATURE MAXIMALE ADMISE AU SOMMET DU RADIATEUR





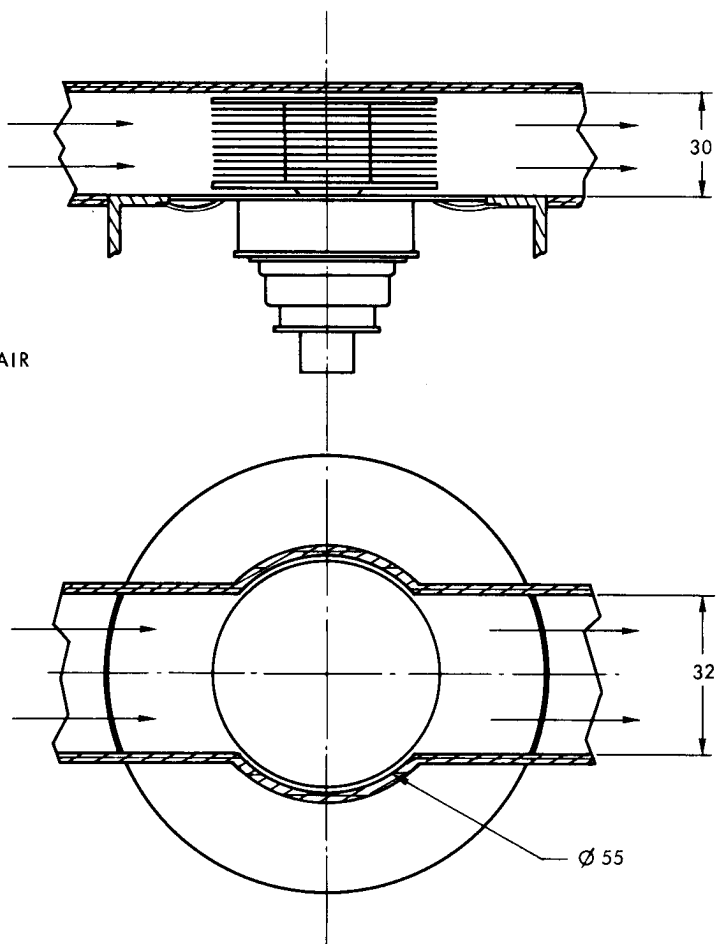
THOMSON-CSF
GROUPEMENT TUBES ELECTRONIQUES

NOTICE TEG 2094

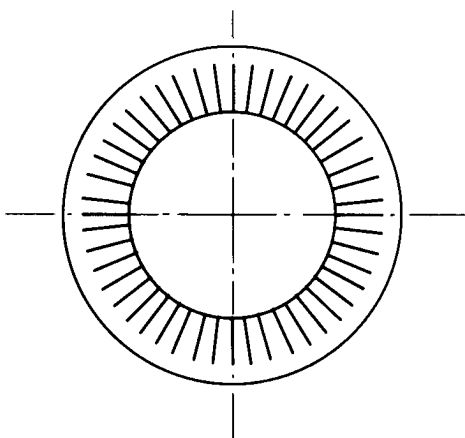
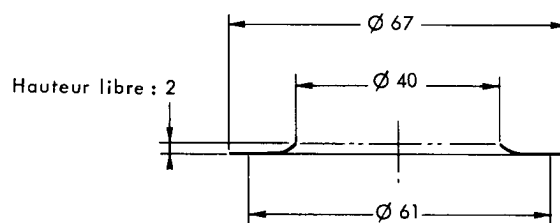
TH 316

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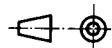
DETAILS DE LA
CANALISATION D'AIR



RESSORT DE
CONTACT D'ANODE



Cotes en mm.





Technical drawing of the 6X4P vacuum tube showing dimensions and components. The drawing includes the following labels and dimensions:

- Dimensions:**
 - Overall diameter: $\varnothing 54.4-53.6$
 - Overall height: 64.5
 - Height from base to top of radiator: 30
 - Height from base to top of anode: 61.5
 - Height from base to top of grille: 26.4
 - Height from base to top of filament-cathode: 25.0
 - Height from base to top of filament: 13.4
 - Height from base to top of filament (alternative): 12.4
 - Height from base to top of filament (alternative): 10.4*
 - Height from base to top of filament (alternative): 5.1
 - Height from base to top of filament (alternative): 4.5
 - Height from base to top of filament (alternative): 7.8
 - Height from base to top of filament (alternative): 7.2
 - Height from base to top of filament (alternative): 6.5*
 - Height from base to top of filament (alternative): 2.3
 - Height from base to top of filament (alternative): 0.9
 - Height from base to top of filament (alternative): b^{**}
 - Height from base to top of filament (alternative): $\varnothing a^{**}$
 - Height from base to top of filament (alternative): $\varnothing 11.7-11.3$
 - Height from base to top of filament (alternative): $\varnothing 23.0-22.6$
 - Height from base to top of filament (alternative): $\varnothing 31.2-30.8$
- Components:**
 - Radiateur
 - Anode
 - Grille
 - Filament-cathode
 - Filament

$$\begin{aligned} a &= 8 \\ b &= 7.5 \end{aligned}$$