

Packaged MAGNETRON for microwave heating applications, operating at a fixed frequency within the range 2425-2475 Mc/s and capable of delivering a continuous wave output power of 200 watts. The tube is designed for coupling to a 50 ohms $1/2''$ coaxial load transmission line and can be operated either at A.C. or at D.C. supply voltages

MAGNETRON avec aimant incorporé, pour applications de chauffage à ondes ultracourtes à une fréquence fixe dans la gamme 2425-2475 MHz et capable de fournir une puissance de sortie continue de 200 watts. Le tube est conçu pour couplage à une ligne de transmission coaxiale de 50 ohms $1/2''$ et peut fonctionner à tension d'alimentation continue ou alternative

MAGNETRON für Mikrowellenheizungszwecke zum Betrieb auf einer festen Frequenz im Bereich 2425-2475 MHz mit einer Dauerleistung von 200 W. Magnetron und Magnet bilden eine Baueinheit. Die Röhre ist geeignet zur Kopplung an eine 50 Ohm $1/2''$ koaxiale Übertragungsleitung und kann von Gleich- oder Wechselspannung betrieben werden

Heating : indirect	V_{fo}	= 5,3 V + 5 %
Chauffage: indirect	I_f ($V_f = 5,3$ V)	= 3,2 A
Heizung : indirekt		= max. 3,4 A
	T_w	= min. 2 min.
	R_f (cold, froid, kalt)	= 0,35 Ω

Remark:

At $I_a > 120$ mA it is necessary to reduce V_f from 5.3 V to 4.5 V immediately after applying high voltage. If then becomes 2.8 A. At $I_a < 120$ mA V_f must not be reduced

Observation:

A $I_a > 120$ mA il faut réduire V_f de 5,3 V jusqu'à 4,5 V immédiatement après l'application de la haute tension. I_f devient alors 2,8 A. A $I_a < 120$ mA V_f ne sera pas réduit

Bemerkung:

Bei $I_a > 120$ mA muss V_f sofort nach dem Einschalten der Hochspannung reduziert werden auf 4,5 V. I_f wird dann 2,8 A. Bei $I_a < 120$ mA muss V_f nicht reduziert werden

Limiting values (absolute values)

Caractéristiques limites (valeurs absolues)

Grenzdaten (absolute Werte)

Each limiting value should be regarded independently of other values, so that under no circumstances it is permitted to exceed a limiting value whichever

Chaque valeur limite doit être considérée indépendamment des autres valeurs, de sorte qu'en aucun cas il est permis de dépasser une valeur limite quelconque

Jeder Grenzwert gilt unabhängig von anderen Werten, sodass er unter keinen Umständen überschritten werden darf

V_{fo}	= max. 5,6 V	W_{ia}	= max. 370 W
I_{fsurge}	= max. 6,0 A	V.S.W.R.	= max. 2
I_a	= max. 220 mA ¹⁾	t_a	= max. 125 °C

¹⁾ See page 2; voir page 2; siehe Seite 2

Packaged MAGNETRON for low-power microwave heating applications, operating at a fixed frequency within the range of 2425 to 2475 Mc/s and capable of delivering a continuous wave output power of approximately 200 watts. The tube has been designed for coupling to a 50 ohms $\frac{1}{2}$ " coaxial line and can be operated at A.C., at unfiltered rectified A.C. or at D.C. anode voltage

CATHODE: oxide coated

→ HEATING:

Indirect by A.C. or D.C.

Heater starting voltage	V_{fo}	$= 5.3 \text{ V} \begin{matrix} + 5\% \\ - 10\% \end{matrix}$
Heater current at 5.3 V	$I_f(V_f=5.3 \text{ V})$	$= 3.5 \text{ A}$
Cold heater resistance	$R_f(\text{cold})$	$= 0.2 \Omega$

Before application of the high voltage, the cathode must be heated for at least 3 minutes

For reduction of the heater voltage as a function of the anode current see page C

→ TYPICAL CHARACTERISTICS

Anode current	I_a	$= 200 \text{ mA}$
Voltage standing wave ratio	V.S.W.R.	< 1.05
Anode voltage (filtered D.C. voltage)	V_a	$= 1.65 \begin{matrix} +0.05 \\ - 0.1 \end{matrix} \text{ kV}$

COOLING

The tube does not require any extra cooling, provided it is effectively mounted on a heat-conducting non-magnetic chassis plate (sink cooling). To obtain an effective natural cooling of the tube, a vertical position of the chassis plate can be advantageous

STORAGE, HANDLING

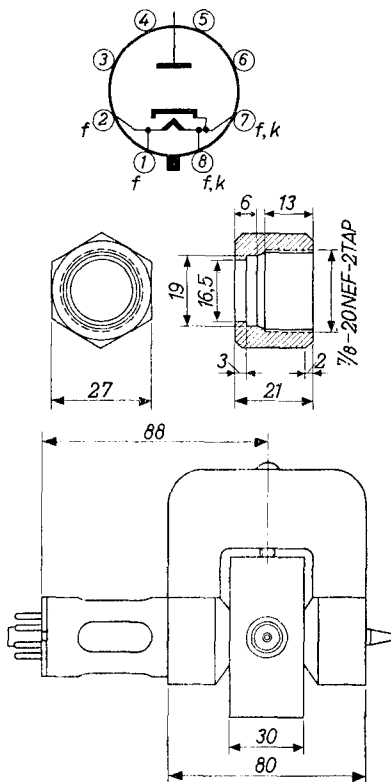
In storage a minimum distance of 15 cm should be maintained between the magnetrons to prevent a decrease of the field strength of the magnet due to interaction with adjacent magnets

Magnetic materials should be kept away from the magnet a distance of at least 5 cm

During installation non-magnetic tools should be used

7090

PHILIPS



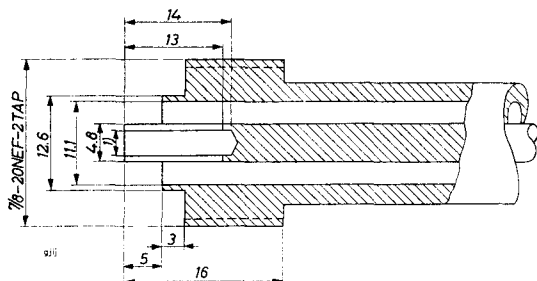
- ¹⁾ With A.C. anode supply or with anode voltage from single-phase full-wave rectifier without filter
 Avec tension d'alimentation alternative ou avec tension anodique dérivée d'un redresseur monophasé à deux alternances sans filtre

Mit Anodenwechselspeisespannung oder mit Anodenspannung von einem Einphasen-Doppelweggleichrichter ohne Filter

7090**PHILIPS****COAXIAL LINE**

Example of 50 ohms 1/2 inch coaxial line

The inner conductor should be sufficiently flexible

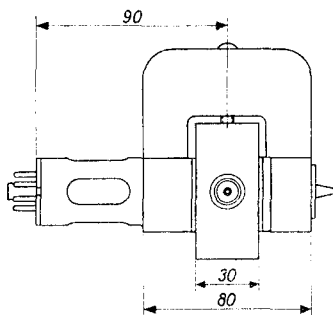


Dimensions in mm

- ¹⁾ Hole 3.85 - 0.05 mm with 2 to 4 slots, wide 0.2 mm
The wall segments should be pressed together

Net weight 2.4 kg

Shipping weight 3.5 kg



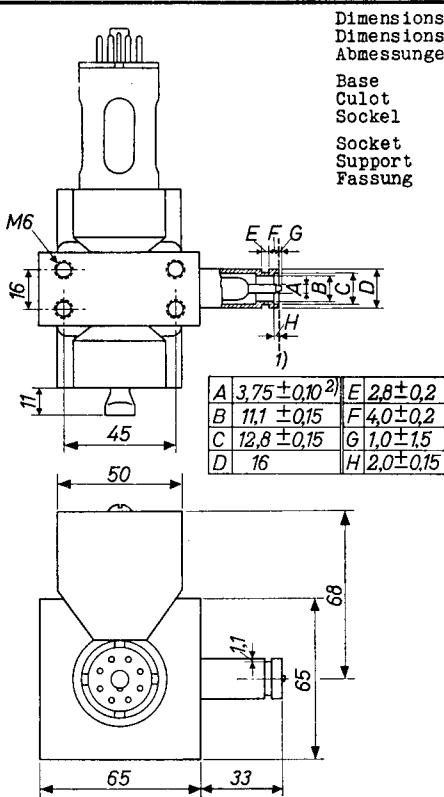
Dimensions in mm

Mounting position: any

Base Octal

Socket 5903/13

The socket should not be rigidly mounted. It should have flexible leads and be allowed to move freely



Dimensions in mm
Dimensions en mm
Abmessungen in mm

Base
Culot
Sockel
Socket
Support
Fassung

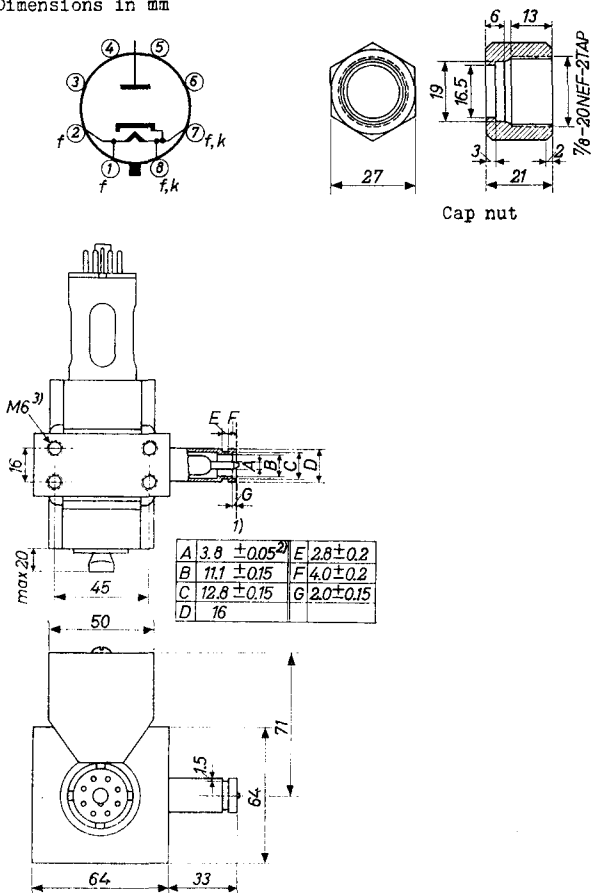
Octal

5903/13

¹⁾ Reference plane
Plan de référence
Bezugsebene

²⁾ The diameter of the eccentricity of the inner conductor is max. 1.6 mm
Le diamètre de la surface de l'excentricité du conducteur est de 1,6 mm au max.
Der Durchmesser der Exzentrizitätsfläche des inneren Leiters ist max. 1,6 mm

Dimensions in mm



1) Reference plane

2) The diameter of the eccentricity of the inner conductor is max. 1.6 mm

3) Deep 10 mm

Mounting position: any
 Montage : arbitrairement -
 Einbau : willkürlich

Net weight		Shipping weight	
Poids net	2,4 kg	Poids brut	3,5 kg
Nettogewicht		Bruttogewicht	

Operating characteristics with A.C. anode supply or with anode voltage from single-phase full-wave rectifier without filter

Caractéristiques d'utilisation avec tension d'alimentation alternative ou avec tension anodique dérivée d'un redresseur monophasé à deux alternances sans filtre

Betriebsdaten mit Anodenwechselspeisespannung oder mit Anodenspannung von einem Einphasen-Doppelweggleichrichter ohne Filter

f	=	2425 - 2475 Mc/s
V_f	=	4,5 V ²⁾
I_a	=	200 mA
V_a	=	1600 ± 100 V ³⁾
W_0	=	200 W

Coupling: standard 1/2" coaxial line of 50 Ω

Couplage: câble standardisé de 1/2" 50 Ω

Kopplung: standardisierte 1/2" 50 Ω Koaxialleitung

Cooling: The tube does not require any extra cooling, provided it is mounted effectively on a heat-conducting chassis plate (sink-cooling). To obtain an effective natural cooling, a vertical position of the chassis plate can be advantageous

Refroidissement: Le tube ne demande pas un refroidissement additionnel, pourvu qu'il soit monté d'une manière effective à une plaque de chassis conduisant la chaleur. Afin d'obtenir un refroidissement naturel efficace, une position verticale de la plaque de chassis peut être avantageuse

Kühlung: Die Röhre erfordert keine zusätzliche Kühlung, wenn sie nur auf einer wärmeleitenden Chassisplatte montiert ist. Zur Erhaltung einer guten natürlichen Kühlung kann eine senkrechte Stellung der Chassisplatte vorteilhaft sein

²⁾ See "Remark" page 1
 Voir "Observation" page 1
 Siehe "Bemerkung" Seite 1

³⁾ R.M.S. value of alternating voltage or D.C. value of pulsating voltage
 Valeur efficace de tension alternative ou composante continue de tension pulsatoire
 Effektivwert der Wechselspannung oder Gleichspannungsanteil der pulsierenden Spannung

→ I. A.C. ANODE SUPPLY (See page A, curves A,B and C)

Limiting values (Absolute limits)

Heater starting voltage	V_{f0}	= max.	5.6 V
Heater surge current	I_f surge	= max.	8.5 A
Anode current	I_a	= max.	230 mA ¹⁾
Anode peak current	I_{ap}	= max.	1.4 A
Voltage standing wave ratio	V.S.W.R.	= max.	2.0
Temperature of any part of envelope	t	= max.	125 °C

Operating characteristics

Fixed frequency	f	= between 2425 and 2475 Mc/s
Heater voltage	V_f	= 4.5 V $\begin{smallmatrix} + 5\% \\ -10\% \end{smallmatrix}$ ²⁾
Anode current	I_a	= 200 mA ¹⁾
Anode peak current	I_{af}	= 1.3 A
Anode voltage	V_a	= 1.65 kV ³⁾ ⁴⁾
Output power	W_o	= 200 W ⁴⁾

→ II. ANODE SUPPLY FROM SINGLE-PHASE FULL-WAVE RECTIFIER WITHOUT FILTER (See page A, curves A,B and C)

Limiting values (Absolute limits)

Heater starting voltage	V_{f0}	= max.	5.6 V
Heater surge current	I_f surge	= max.	8.5 A
Anode current	I_a	= max.	230 mA ¹⁾
Anode peak current	I_{ap}	= max.	0.8 A
Voltage standing wave ratio	V.S.W.R.	= max.	2.0
Temperature of any part of envelope	t	= max.	125 °C

Operating characteristics

Fixed frequency	f	= between 2425 and 2475 Mc/s
Heater voltage	V_f	= 4.5 V $\begin{smallmatrix} + 5\% \\ -10\% \end{smallmatrix}$ ²⁾
Anode current	I_a	= 200 mA ¹⁾
Anode peak current	I_{ap}	= 0.7 A
Anode voltage	V_a	= 1.65 kV ³⁾ ⁴⁾
Output power	W_o	= 200 W ⁴⁾

¹⁾²⁾³⁾⁴⁾ See page 5

Remarks: In storage a minimum distance of 15 cm should be maintained between the magnetrons. Magnetic materials should be kept away from the magnet a distance of at least 5 cm. During installation non-magnetic tools should be used

Observations: Pendant l'emmagasinage il faut maintenir une distance de 15 cm au min. entre les magnétrons. Des matériaux magnétiques doivent être éloignés de l'aimant d'une distance de 5 cm au moins. Pendant l'installation il est nécessaire d'utiliser des outils non-magnétiques

Bemerkungen: Die Magnetrons dürfen nur mit einem gegenseitigen Abstand von mindestens 15 cm gelagert werden. Magnetische Werkstoffe müssen mindestens 5 cm vom Magnet entfernt bleiben. Bei der Montage müssen nicht-magnetische Werkzeuge verwendet werden

III. FILTERED D.C. ANODE SUPPLY (Page A, curves D,E and F)

With fixed reflection element between the magnetron and the load with the following approximate characteristics:

Voltage standing wave ratio = 2.0

Phase position = 0.45λ (phase of sink region)

Limiting values (Absolute limits)

Heater starting voltage	V_{f0}	= max.	5.6 V
Heater surge current	I_f surge	= max.	8.5 A
Anode current	I_a	= max.	125 mA ¹⁾
Voltage standing wave ratio	V.S.W.R.	= max.	3.0
Temperature of any part of envelope	t	= max.	125 °C

Operating characteristics

Fixed frequency	f	= between 2425 and 2475 Mc/s
Heater voltage	V_f	= 4.8 V + 5 % -10 % ²⁾
Anode current	I_a	= 100 mA ¹⁾
Anode voltage	V_a	= 1.65 kV ⁴⁾
Output power	W_0	= 100 W ⁴⁾

¹⁾ Measured with a moving coil instrument

²⁾ The heater voltage must be reduced from 5.3 V to the indicated value immediately after switching on the high voltage when the magnetron starts oscillating

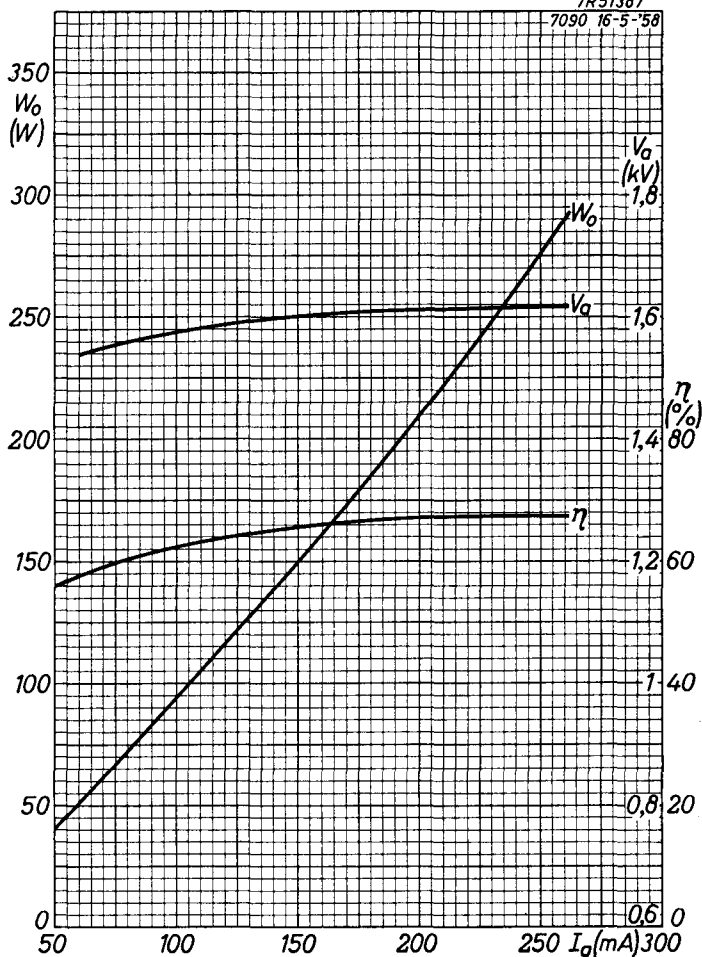
³⁾ Measured with filtered D.C. anode supply

⁴⁾ At matched load

PHILIPS

7090

7R51387
7090 16-5-58

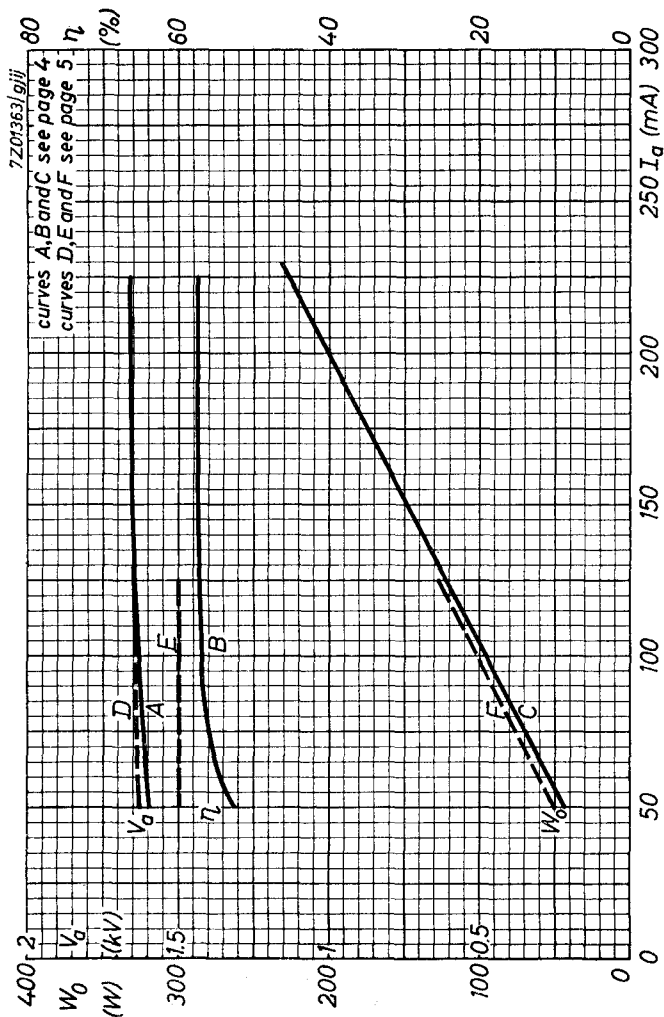


6.6.1958

A

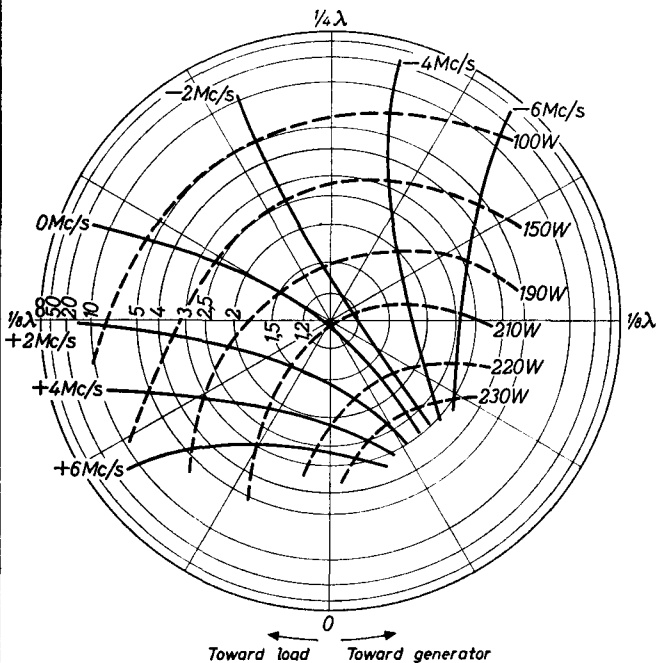
7090

PHILIPS



PHILIPS

7R51388
7090 17-5-'58



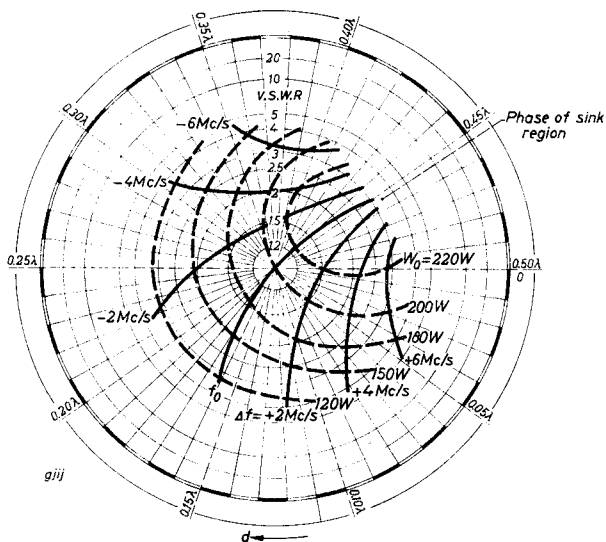
LOAD DIAGRAM

Measured with A.C. anode supply

Anode current $I_a = 0.2 \text{ A}$

Peak anode current $I_{ap} = 1.3 \text{ A}$

Frequency $f_0 = 2450 \text{ Mc/s}$



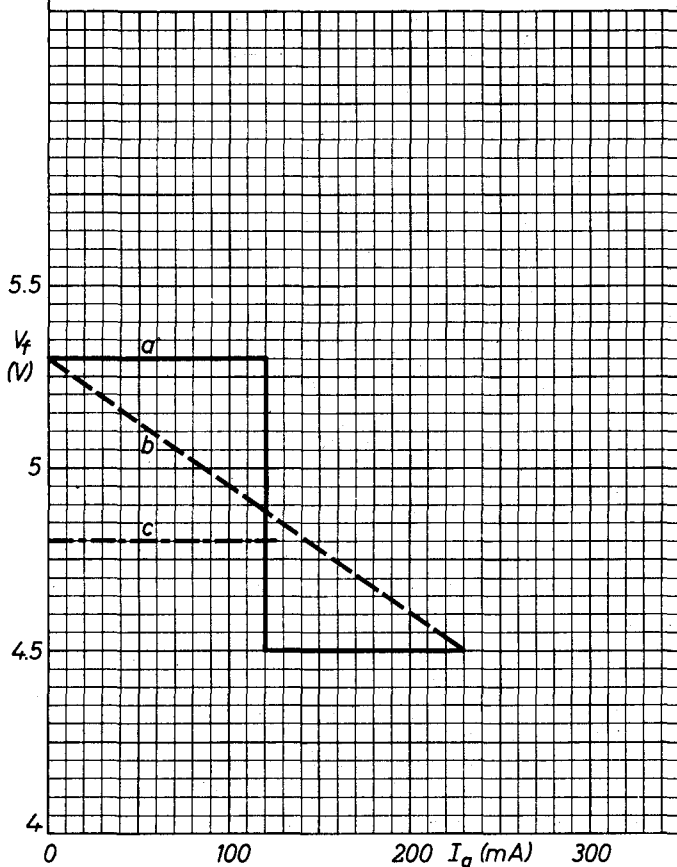
d = distance of standing wave minimum from reference plane toward load.

For reference plane see page 3

7090**PHILIPS**

7Z01364/gijj

The heater voltage should be adjusted according to curve a or b for A.C. anode voltage and for unfiltered single-phase full-wave rectified anode voltage and according to curve c for filtered D.C. anode voltage





	7090	
page	sheet	date
1	1	1958.06.06
2	1	1962.07.07
3	2	1958.06.06
4	2	1962.07.07
5	3	1958.06.06
6	3	1962.07.07
7	4	1958.06.06
8	4	1962.07.07
9	5	1958.06.06
10	5	1962.07.07
11	A	1958.06.06
12	A	1962.07.07
13	B	1958.06.06
14	B	1962.07.07
15	C	1962.07.07
16	FP	1999.12.30