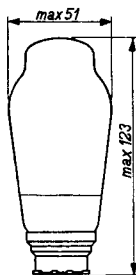
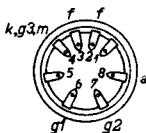
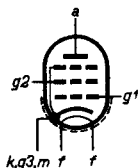


OUTPUT PENTODE  
 PENTHODE DE SORTIE  
 ENDPENTHODE

Heating : indirect by A.C.;  
 parallel supply  
 Chauffage : indirect par C.A.; Vf = 6,3 V  
 alimentation en parallèle If = 1,0 A  
 Heizung : indirekt durch Wechselstrom;  
 Parallelspeisung



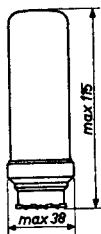
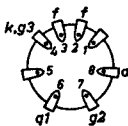
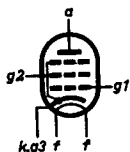
Capacities  
 Capacités  
 Kapazitäten

Ca = 13,5 pF  
 Cg1 = 18,5 pF  
 Cagl < 0,7 pF  
 Cglf = 1,5 pF  
 Ckf = 8,5 pF

OUTPUT PENTODE  
PENTHODE DE SORTIE  
ENDPENTODE

Heating : indirect; parallel supply  $V_f = 6,3 \text{ V}$   
 Chauffage: indirect; alimentation- parallèle  $I_f = 1,5 \text{ A}$   
 Heizung : indirect; Parallelspeisung

Dimensions in mm  
 Dimensions en mm  
 Abmessungen in mm



Base, culot, Sockel: P

Capacitances	$C_a = 13,5 \text{ pF}$	$C_{ag1} < 0,7 \text{ pF}$
Capacités	$C_{g1} = 18,5 \text{ pF}$	$C_{g1f} = 1,5 \text{ pF}$
Kapazitäten		$C_{kf} = 8,5 \text{ pF}$

Operating characteristics class A  
 Caractéristiques d'utilisation classe A  
 Betriebsdaten Klasse A

$V_a$	=	250 V
$V_{g2}$	=	250 V
$R_k$	=	90 $\Omega$
$I_a$	=	72 mA
$I_{g2}$	=	8 mA
S	=	14,5 mA/V
$\mu_{g2g1}$	=	20 -
$R_i$	=	20 k $\Omega$
$R_{a\sim}$	=	3,5 k $\Omega$
$V_1(I_{g1}=+0,3\mu\text{A})$	=	5,3 V <sub>eff</sub>
$W_o(I_{g1}=+0,3\mu\text{A})$	=	8 W
$dt_{tot}(I_{g1}=+0,3\mu\text{A})$	=	10 %
$V_1(W_o = 50 \text{ mW})$	=	0,3 V <sub>eff</sub>

Operating conditions class A  
 Caractéristiques d'utilisation classe A  
 Betriebsdaten Klasse A

Va	=	250	V
Vg2	=	250	V
Rk	=	90	$\Omega$
Ia	=	72	mA
Ig2	=	8	mA
S	=	14,5	mA/V
$\mu g2g1$	=	20	-
Ri	=	20	k $\Omega$
Ra	=	3,5	k $\Omega$
Vi (Igl=+0,3 $\mu$ A)	=	5,3	V <sub>eff</sub>
Wo (Igl=+0,3 $\mu$ A)	=	8	W
d (Igl=+0,3 $\mu$ A)	=	10	%
Vi (Wo = 50 mW)	=	0,3	V <sub>eff</sub>

Operating conditions class AB  
 Caractéristiques d'utilisation classe AB  
 Betriebsdaten Klasse AB

Raa'	=	8	6	k $\Omega$
Rg2	=	2,2	0,7	k $\Omega$
Rk	=	170	125	$\Omega$
Vi	=	0 17	0 14	V <sub>eff</sub>
Vb <sub>a</sub>	=	425 425	375 375	V
Va+V <sub>Rk</sub>	=	405 400	355 350	V
Vb <sub>g2</sub>	=	425 425	375 375	V
Ia	=	2x46 2x58	2x52 2x64	mA
Ig2	=	2x5 2x14,5	2x6,5 2x16,5	mA
Wo	=	0 29	0 27,5	W
d	=	- 5	- 4	%

Operating characteristics class AB  
 Caractéristiques d'utilisation classe AB  
 Betriebsdaten Klasse AB

$R_{aa\sim}$	=	8		6		k $\Omega$
$R_{g2}$	=	2,2		0,7		k $\Omega$
$R_k$	=	170		125		$\Omega$
$V_i$	=	0	17	0	14	$V_{eff}$
$V_{ba}$	=	425	425	375	375	V
$V_a + V_{Rk}$	=	405	400	355	350	V
$V_{bg2}$	=	425	425	375	375	V
$I_a$	=	2x46	2x58	2x52	2x64	mA
$I_{g2}$	=	2x5	2x14,5	2x6,5	2x16,5	mA
$W_o$	=	0	29	0	27,5	W
$dt_{tot}$	=	-	5	-	4	%

Operating characteristics class AB in triode connection ( $g_2$  connected to anode)  
 Caractéristiques d'utilisation classe AB en connexion triode ( $g_2$  reliée à l'anode)  
 Betriebsdaten Klasse AB in Triodenschaltung ( $g_2$  verbunden mit Anode)

$V_b$	=	400		V
$R_k$	=	175		$\Omega$
$R_{aa\sim}$	=	5,5		k $\Omega$
$V_i$	=	0	13,5	$V_{eff}$
$I_a$	=	2x48	2x54	mA
$W_o$	=	0	13	W
$dt_{tot}$	=	-	1,5	%

Limiting values  
 Caractéristiques limites  
 Grenzdaten

$V_{a0}$	= max. 800 V	$W_{g2}(V_1=0)$	= max. 2 W
$V_a$	= max. 425 V	$W_{g2}(W_o=\max.)$	= max. 5 W
$W_a$	= max. 18 W	$V_{g1}(I_{g1}=+0,3\mu A)$	= max. -1,3 V
$V_{g20}$	= max. 650 V	$R_{g1}(A, AB)$	= max. 0,7 M $\Omega$
$V_{g2}$	= max. 425 V	$R_{g1}(B)$	= max. 0,5 M $\Omega$
$I_k$	= max. 90 mA	$V_{kf}$	= max. 50 V
		$R_{kf}$	= max. 20 k $\Omega$

Operating conditions class A in triode connection  
(g2 connected to anode)

Caractéristiques d'utilisation classe A en  
connexion triode (g2 reliée à l'anode)

Betriebsdaten Klasse A in Triodenschaltung  
(g2 verbunden mit Anode)

Vb =	375	V
Rk =	300	$\Omega$
Ra =	4	k $\Omega$
Ia =	50	mA
Vi =	11	V <sub>eff</sub>
Wo =	4,5	W
d =	9	%

Operating conditions class AB in triode connection  
(g2 connected to anode)

Caractéristiques d'utilisation classe AB en  
connexion triode (g2 reliée à l'anode)

Betriebsdaten Klasse AB in Triodenschaltung  
(g2 verbunden mit Anode)

Vb =	400	V		
Rk =	175	$\Omega$		
Raa' =	5,5	k $\Omega$		
Vi =	<table style="display: inline-table; border-collapse: collapse;"> <tr> <td style="border-top: 1px solid black; border-bottom: 1px solid black; padding: 0 10px;">0</td> <td style="border-top: 1px solid black; border-bottom: 1px solid black; padding: 0 10px;">13,5</td> </tr> </table>	0	13,5	V <sub>eff</sub>
0	13,5			
Ia =	<table style="display: inline-table; border-collapse: collapse;"> <tr> <td style="border-top: 1px solid black; border-bottom: 1px solid black; padding: 0 10px;">2x48</td> <td style="border-top: 1px solid black; border-bottom: 1px solid black; padding: 0 10px;">2x54</td> </tr> </table>	2x48	2x54	mA
2x48	2x54			
Wo =	<table style="display: inline-table; border-collapse: collapse;"> <tr> <td style="border-top: 1px solid black; border-bottom: 1px solid black; padding: 0 10px;">0</td> <td style="border-top: 1px solid black; border-bottom: 1px solid black; padding: 0 10px;">13</td> </tr> </table>	0	13	W
0	13			
d =	<table style="display: inline-table; border-collapse: collapse;"> <tr> <td style="border-top: 1px solid black; border-bottom: 1px solid black; padding: 0 10px;">-</td> <td style="border-top: 1px solid black; border-bottom: 1px solid black; padding: 0 10px;">1,5</td> </tr> </table>	-	1,5	%
-	1,5			

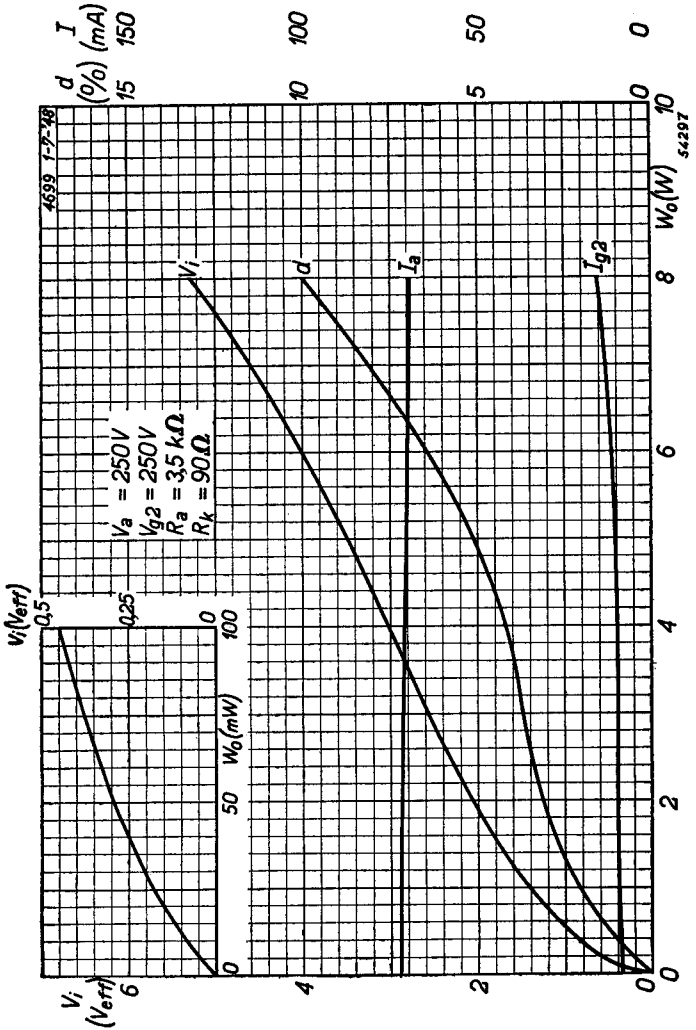
**4699***"Miniwatt"*

Limiting values  
Caractéristiques limites  
Grenzdaten

$V_{a_0}$	= max.	800 V
$V_a$	= max.	425 V
$W_a$	= max.	18 W
$V_{g2_0}$	= max.	650 V
$V_{g2}$	= max.	425 V
$W_{g2} (V_i = 0)$	= max.	2 W
$W_{g2} (W_o = \text{max.})$	= max.	5 W
$I_k$	= max.	90 mA
$V_{g1} (I_{g1} = +0,3\mu A)$	= max.	-1,3 V
$R_{g1} (A, AB)$	= max.	0,7 M $\Omega$
$R_{g1} (B)$	= max.	0,5 M $\Omega$
$V_{fk}$	= max.	50 V
$R_{fk}$	= max.	20 k $\Omega$

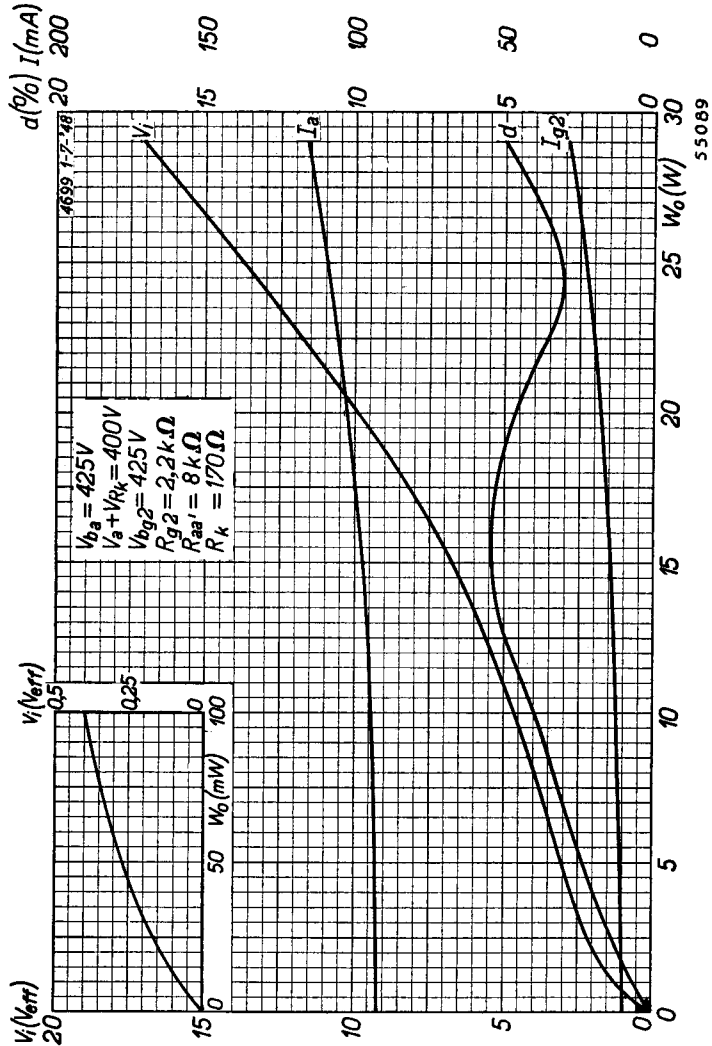
# Miniwatt

4699



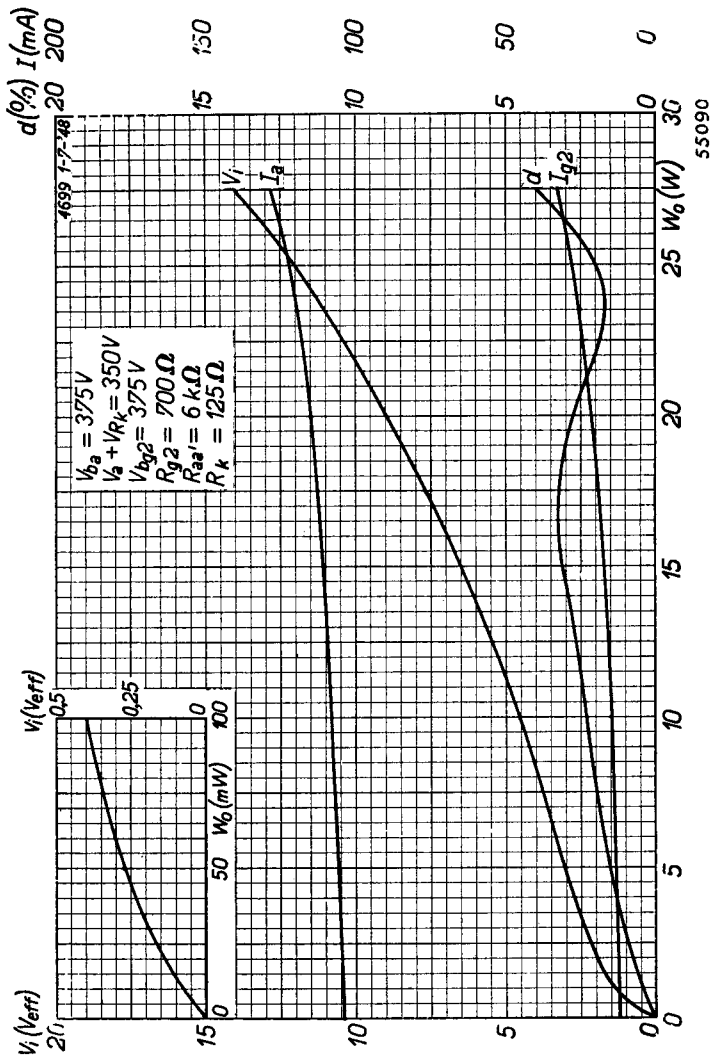
4699

# "Miniwatt"



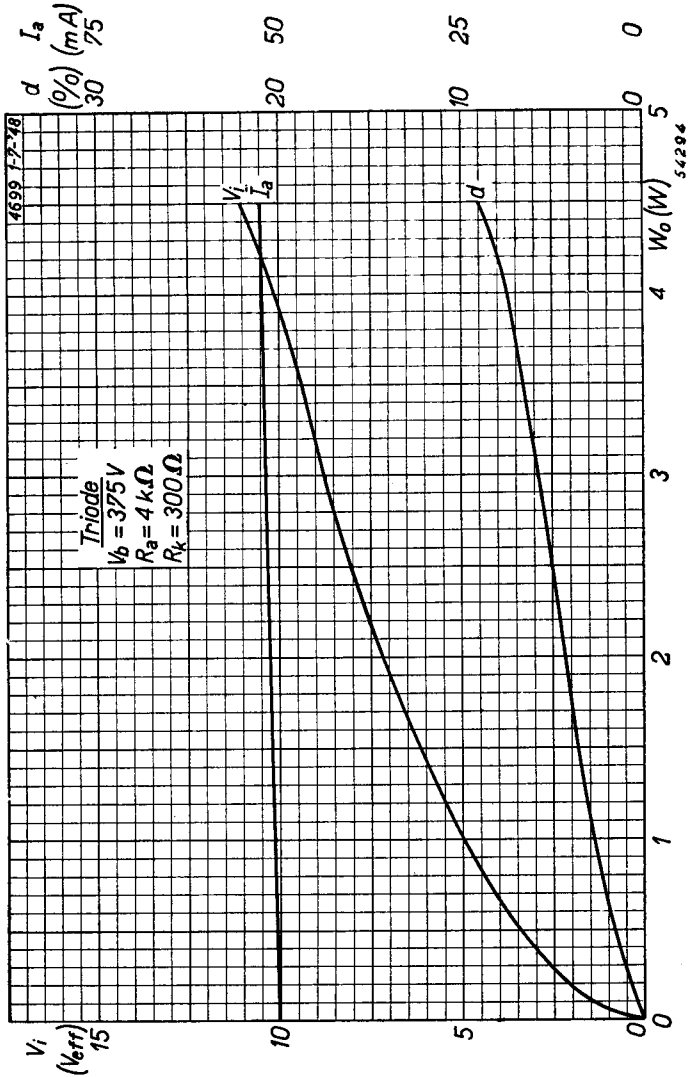
55089





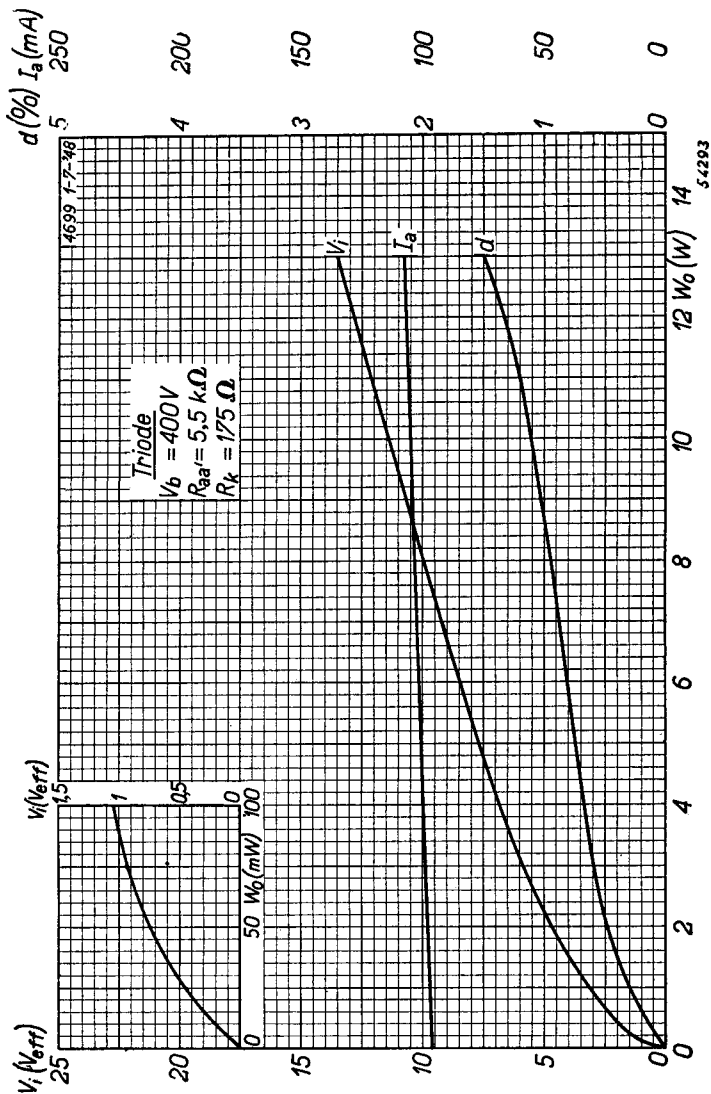
4699

"Miniwatt"



24.8.1948

10



**PHILIPS**

*Electronic  
Tube*

**HANDBOOK**

	<b>4699</b>	
<b>page</b>	<b>sheet</b>	<b>date</b>
1	1	1948.08.24
2	1	1953.12.12
3	2	1948.08.24
4	2	1953.12.12
5	3	1948.08.24
6	4	1948.08.24
7	7	1948.08.24
8	8	1948.08.24
9	9	1948.08.24
10	10	1948.08.24
11	11	1948.08.24
12	FP	1999.02.25