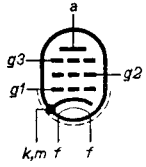
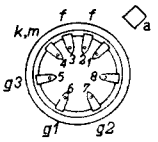
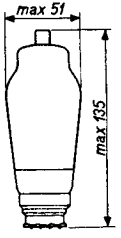
OUTPUT PENTODE
PENTHODE DE SORTIE
ENDPENTHODE

Heating : indirect by A.C.; parallel supply
Chauffage : indirect par C.A.; alimentation en parallèle Vf = 6,3 V If = 1,35 A
Heizung : indirekt durch Wechselstrom; Parallelspeisung







Capacities
Capacités
Kapazitäten

Ca = 10 pF
Cg1 = 14,5 pF
Cag1< 0,8 pF
Cg1f= 1,3 pF
Ckf = 8,5 pF

PHILIPS

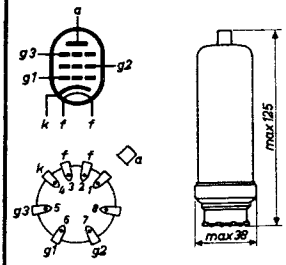
4654
4654K

OUTPUT PENTODE
PENTHODE DE SORTIE
ENDPENTODE

Heating :indirect; parallel supply — V_f= 6,3 V
Chauffage:indirect; alimentation- parallèle — I_f=1,35 A
Heizung :indirekt; Parallelspeisung

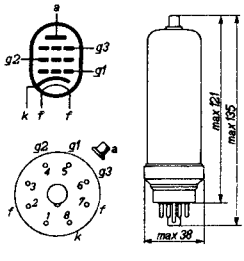
Dimensions in mm
Dimensions en mm
Abmessungen in mm

4654



Base
Culot P
Sockel

4654K



Base
Culot Octal
Sockel

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

V_a	=	250	V
V_{g2}	=	275	V
V_{g3}	=	0	V
R_k	=	175	Ω
I_a	=	72	mA
I_{g2}	=	8	mA
S	=	8,5	mA/V
μ_{g2g1}	=	11	-
R_i	=	22	kΩ
R_a	=	3,5	kΩ
$V_i(I_{g1}=+0,3\mu A)$	=	11,5	Veff
$W_o(I_{g1}=+0,3\mu A)$	=	9,2	W
$d_{tot}(I_{g1}=+0,3\mu A)$	=	11,4	%
$V_i(W_o = 50$ mW)	=	0,5	Veff

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

Va	=	250	V
Vg2	=	275	V
Vg3	=	0	V
Rk	=	175	Ω
Ia	=	72	mA
Ig2	=	8	mA
S	=	8,5	mA/V
μg2g1	=	11	-
Ri	=	22	kΩ
Ra	=	3,5	kΩ
Vi (Ig1=+0,3 μA)	=	11,5	V_{eff}
Wo (Ig1=+0,3 μA)	=	9,2	W
d (Ig1=+0,3 μA)	=	11,4	%
Vi (Wo= 50 mW)	=	0,5	V_{eff}

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

Raa'	=	5			5		kΩ
Rg2	=	500			500		Ω
Vg1	=	-38			-32		V
Vg3	=	0			0		V
Vi	=	0	26,5	26,5	0	22,4	22,4 V_{eff}
Vb_a	=	425	425	400	375	375	350 V
Va	=	420	400	375	370	350	325 V
Vb_{g2}	=	425	425	400	375	375	350 V
Ia	=	2x20	2x93	2x81,5	2x20	2x79	2x70 mA
Ig2	=	2x2,2	2x21	2x18	2x2,2	2x17	2x15 mA
Wo	=	0	48	39	0	35	29 W
d	=	-	2,5	4,2	-	2,5	4,0 %

PHILIPS

Operating characteristics class B and AB
Caractéristiques d'utilisation classe B et AB
Betriebsdaten Klasse B und AB

		B		B		AB		
$R_{aa\sim}$	=	5		5		6,5		kΩ
R_{g2}	=	500		500		2000		Ω
V_{g1}	=	-38		-32		-		V
R_k	=	-		-		265		Ω
V_{g3}	=	0		0		0		V
V_i	=	0	26,5	0	22,4	0	27	V_{eff}
V_{b_a}	=	425	425	375	375	425	425	V
V_a	=	420	400	370	350	-	-	V
$V_{a+V_{Rk}}$	=	-	-	-	-	405	400	V
V_{bg2}	=	425	425	375	375	425	425	V
I_a	=	2x20	2x93	2x20	2x79	2x46,5	2x60	mA
I_{g2}	=	2x2,2	2x21	2x2,2	2x17	2x5,4	2x13	mA
W_o	=	0	48	0	35	0	27,5	W
d_{tot}	=	-	2,5	-	2,5	-	5	%

Limiting values
Caractéristiques limites
Grenzdaten

V_{a_o}	= max.	1200	V
V_a	= max.	600	V
W_a	= max.	18	W
V_{g2_o}	= max.	1000	V
V_{g2}	= max.	425	V
$W_{g2}(V_1=0)$	= max.	3	W
$W_{g2}(W_o$ = max.)	= max.	10	W
I_k	= max.	120	mA
$V_{g1}(I_{g1}=+0,3\mu A)$	= max.	-1,3	V
R_{g1}(A, AB)	= max.	0,7	MΩ
R_{g1}(B)	= max.	0,5	MΩ
V_{kf}	= max.	50	V
R_{kf}	= max.	20	kΩ

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

Raa'	=	6,5		5		kΩ
Rg2	=	2		0,5		kΩ
Rk	=	265		195		Ω
Vg3	=	0		0		V
Vi	=	0	27	0	22,5	V_{eff}
Vb_a	=	425	425	375	375	V
$Va+V_{Rk}$	=	405	400	355	350	V
Vb_{g2}	=	425	425	375	375	V
Ia	=	2x46,5	2x60	2x53	2x66,5	mA
Ig2	=	2x5,4	2x13	2x6,5	2x15,5	mA
Wo	=	0	27,5	0	26	W
d	=	-	5	-	3,5	%

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)

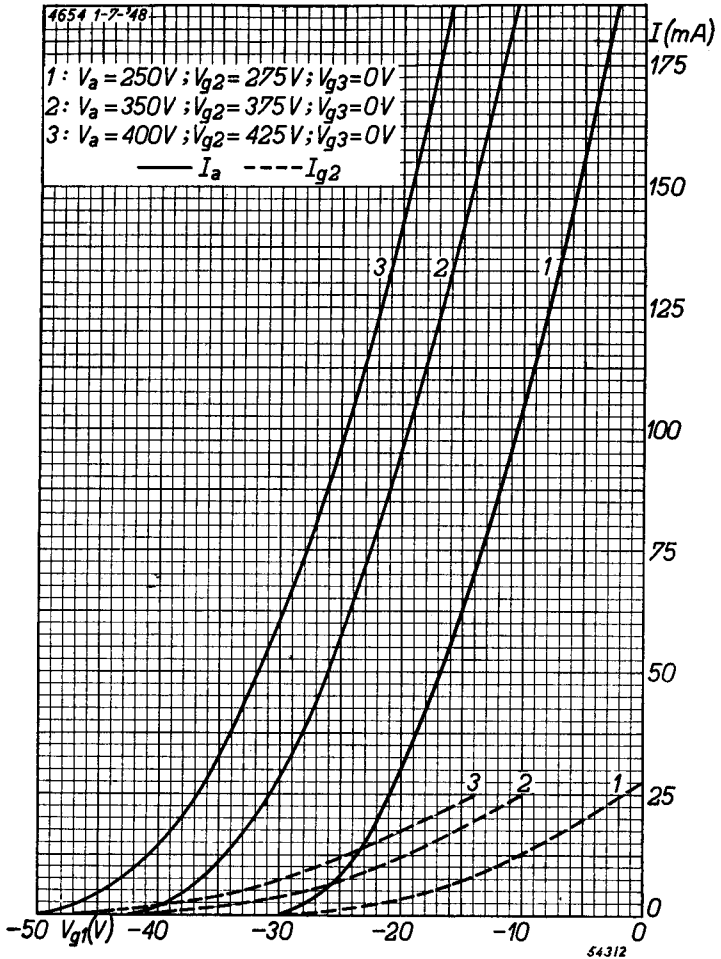
Vb	=	375	V
Vg3	=	0	V
Rk	=	470	Ω
Ra	=	3	kΩ
Ia	=	50	mA
Vi	=	17,5	V_{eff}
Wo	=	4,5	W
d	=	9	%

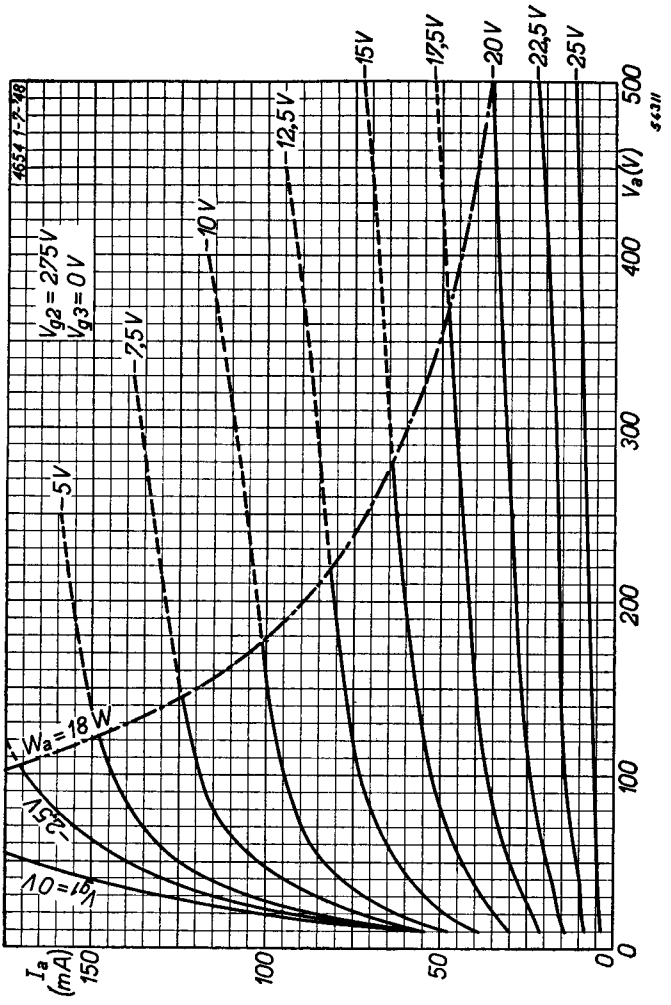
Operating conditions class AB in triode connection
(g2 connected to anode)
Caractéristiques d'utilisation classe AB en connexion triode(g2 reliée à l'anode)
Betriebsdaten Klasse AB in Triodenschaltung
(g2 verbunden mit Anode)

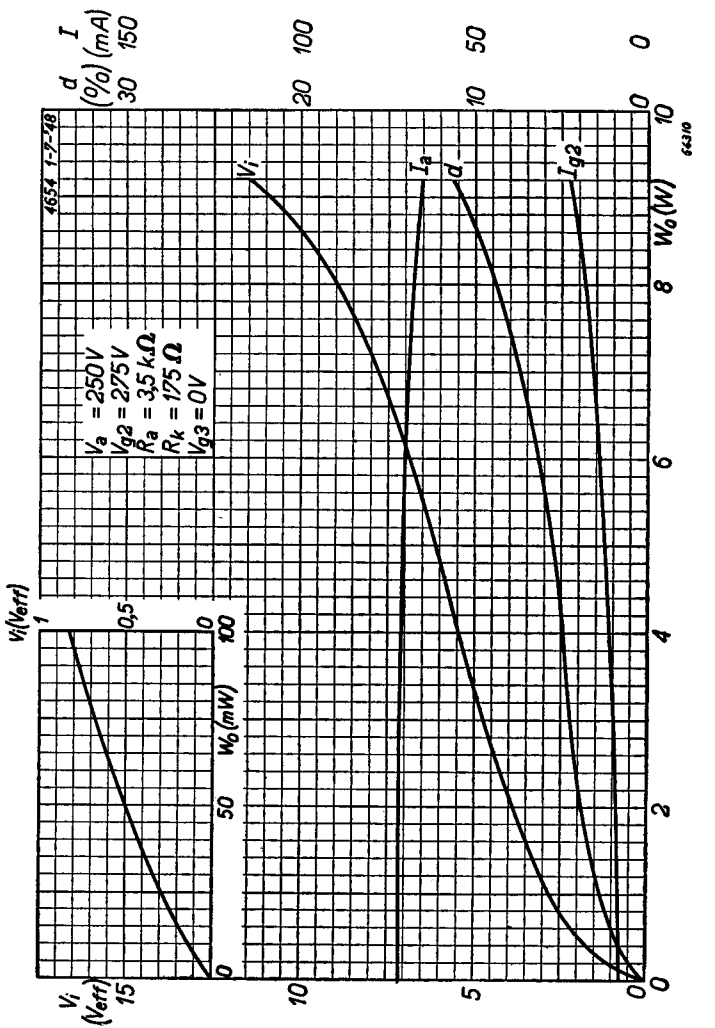
Vb	=	400		V
Vg3	=	0		V
Rk	=	280		Ω
Raa'	=	5,5		kΩ
Vi	=	0	21	V_{eff}
Ia	=	2x50	2x56	mA
Wo	=	0	13	W
d	=	-	1	%

Limiting values
Caractéristiques limites
Grenzdaten

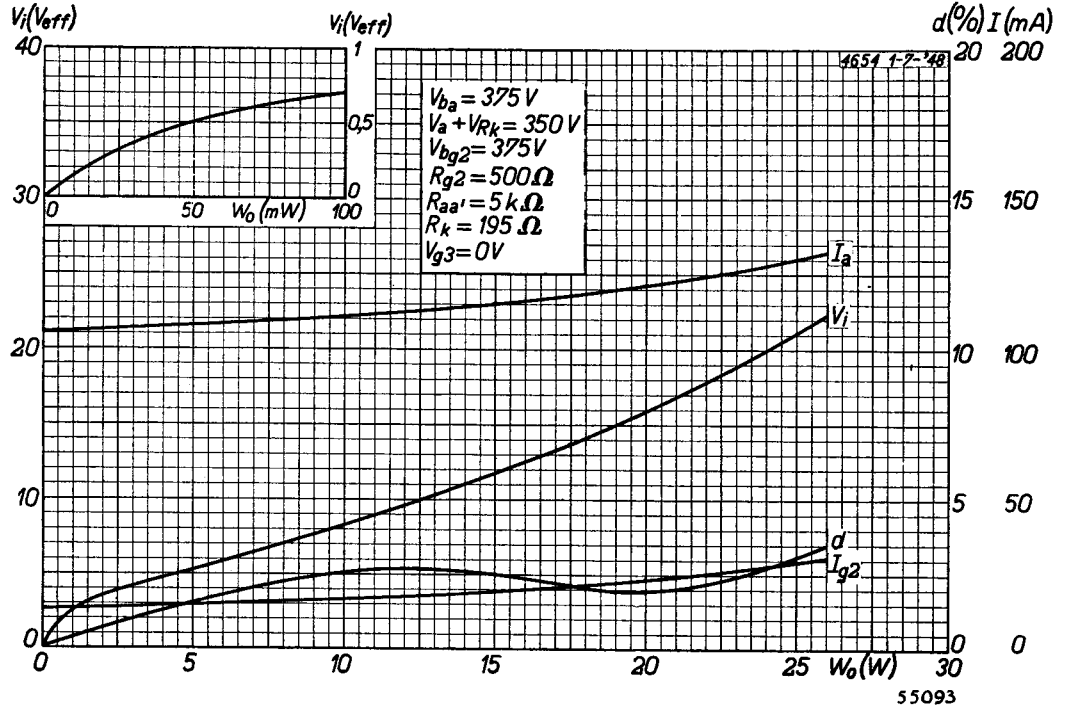
Va_o	= max.	1200	V
Va	= max.	600	V
Wa	= max.	18	W
$Vg2_o$	= max.	1000	V
Vg2	= max.	425	V
Wg2 (Vi = 0)	= max.	3	W
Wg2 (Wo = max.)	= max.	10	W
Ik	= max.	120	mA
Vgl (Igl=+0,3µA)	= max.	-1,3	V
Rgl (A, AB)	= max.	0,7	MΩ
Rgl (B)	= max.	0,5	MΩ
Vfk	= max.	50	V
Rfk	= max.	20	kΩ


4654 1-7-48
1: V_a = 250V ; V_{g2} = 275V ; V_{g3} = 0V
2: V_a = 350V ; V_{g2} = 375V ; V_{g3} = 0V
3: V_a = 400V ; V_{g2} = 425V ; V_{g3} = 0V
—— I_a ---- I_{g2}
I(mA)
175
150
125
100
75
50
25
0
3
2
1
−50 V_{g1}(V) −40 −30 −20 −10 0
54312


4654 1-2-48
V_{g2} = 275 V
V_{g3} = 0 V
-15 V
-17,5 V
-20 V
-22,5 V
-25 V
-12,5 V
-10 V
-7,5 V
-5 V
W_a = 18 W
15
10 = I_{b1}
I_a (mA)
150
100
50
0
0
100
200
300
400
500
V_a(V)

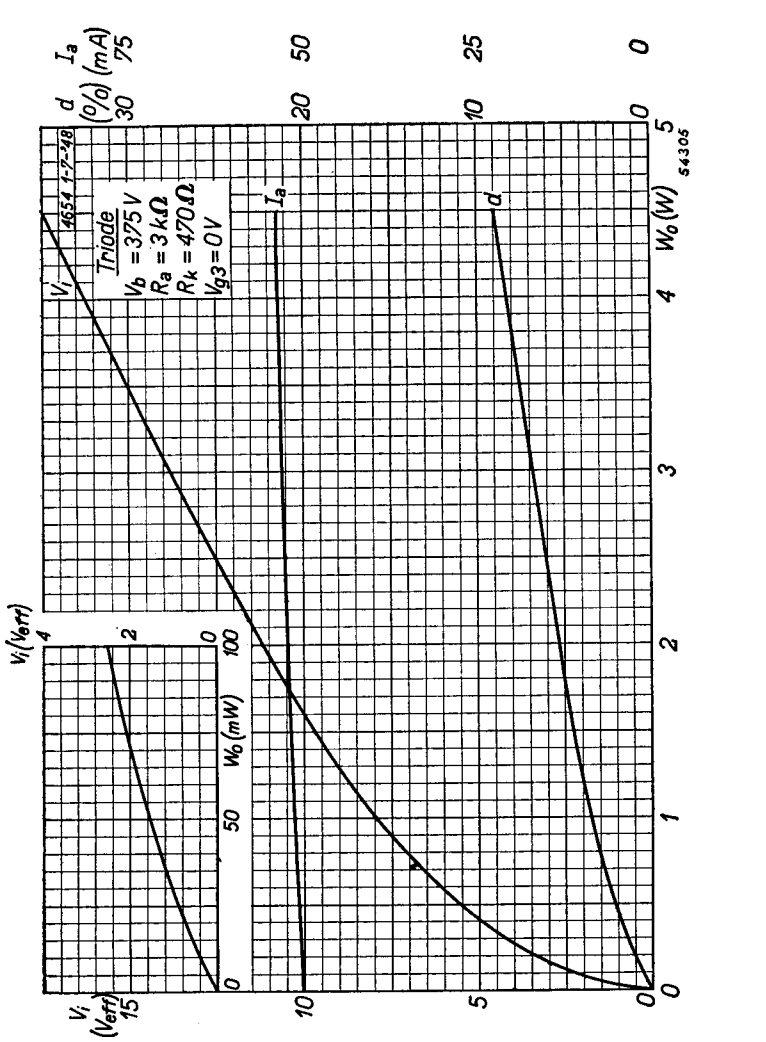

4654 1-7-48
V_a = 250 V
V_{g2} = 275 V
R_a = 3,5 kΩ
R_k = 175 Ω
V_{g3} = 0 V
V_i
I_a
d
I_{g2}
d (%)
I (mA)
W_o (W)
V_i (Veff)
W_o (mW)
6430

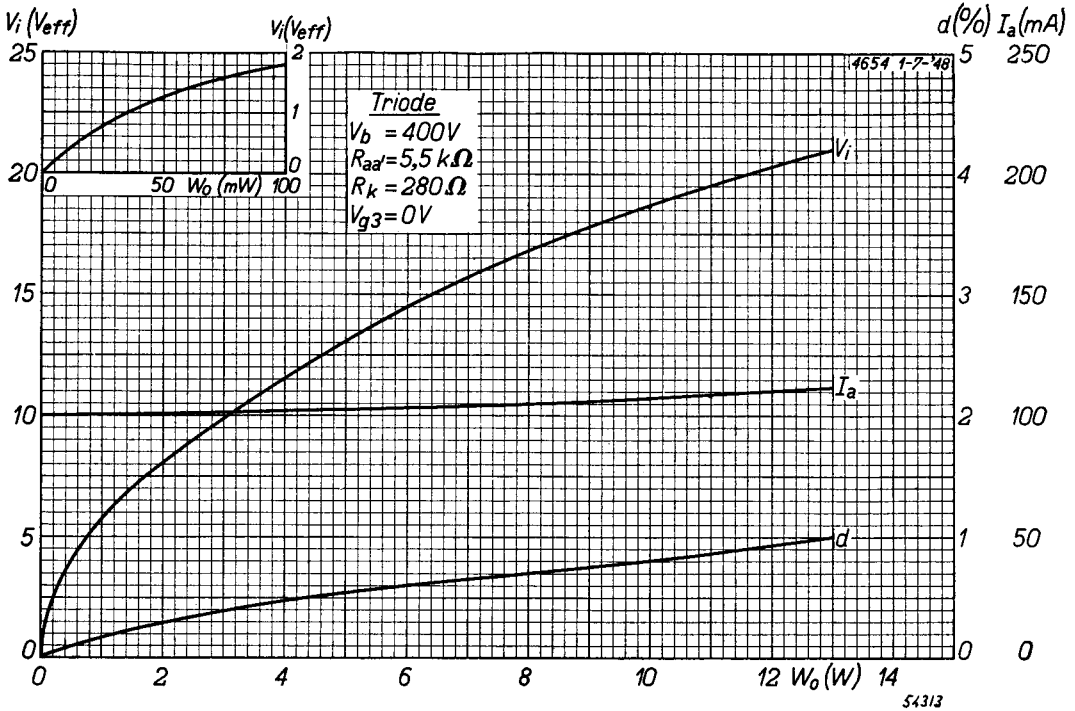
4654 "Miniwatt"



"Miniwatt"

4654


4654 1-2-48
Triode
V_b = 375 V
R_a = 3 kΩ
R_k = 470 Ω
V_{g3} = 0 V
V_i
I_a
d
W_o (W)
I_a (mA)
d (%)
V_i (Veff)
W_o (mW)
54305



"Miniwatt"

4654

PHILIPS

Electronic Tube

HANDBOOK

4654

page	sheet	date
1	1	1948.08.24
2	1	1953.12.12
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12	12	1948.08.24
13	13	1948.08.24
14	FP	1999.05.28