



ELECTRONIC TUBE REFERENCE

E186F

Voltage - Pentode electronic tube

CONSOLIDATED TECHNICAL DATA

1 SECTION

CONSTRUCTION

PENTODE

Special-quality high-slope pentode designed for wide-band amplifier service requiring stable characteristics and long life. Its professional construction combines substantial transconductance with extended dependable operation.

GENERAL CHARACTERISTICS

BASE DESIGNATION	Noval	BASE PINS	9
NOMINAL HEATER	6.3 V / 320 mA	PARALLEL HEATER	– / –
HEATING	Indirect	SERIES OPERATION	Not specified
CATHODE ARRANGEMENT	Separate cathodes	SECTION CONSTRUCTION	Similar

SECTION RATINGS

SECTION 1 Pentode	
PLATE RESISTANCE	100000 Ω
TRANSCONDUCTANCE	0.0165 S
MAXIMUM PLATE VOLTAGE	210 V
MAXIMUM SCREEN VOLTAGE	175 V
MAXIMUM PLATE DISSIPATION	3 W
MAXIMUM SCREEN DISSIPATION	0.7 W
MAXIMUM CATHODE CURRENT	25 mA
Special-quality long-life shock- and vibration-resistant low-microphonic broad-band amplifier pentode.	

Special-quality high-slope pentode for wide-band amplifier service where long life and stable characteristics are required.



SOURCE OPERATING CONDITIONS

[SOURCE PDF](#)

1963 Philips Electron Tubes Handbook V1a

Published test conditions and operating points. Values on this page are preserved as reported by this source.

1963 PHILIPS ELECTRON TUBES HANDBOOK V1A

Section 1 · Pentode

CHARACTERISTIC		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Plate current	12.2–13.8 mA	—
Screen current	2.9–3.7 mA	—
Transconductance	14200–18800 uS	—
Plate resistance	100 kOhm	—
Equivalent noise resistance	330 ohm	—

CAPACITANCE		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Plate capacitance	3.3 pF	—
Grid capacitance	7.6 pF	—



SOURCE OPERATING CONDITIONS

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1963 Philips Electron Tubes Handbook V3

Published test conditions and operating points. Values on this page are preserved as reported by this source.

1963 PHILIPS ELECTRON TUBES HANDBOOK V3

Section 1 · Pentode

CHARACTERISTIC		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Heater voltage	6.3 V	Heating indirect. parallel supply Vf = 6.3 V
Heater current	320 mA	Heizung: : indirekt. Parallelspeisung If = 320 mA
Heater voltage	6.3 V	Vf = 6.3
Heater current	320 mA	If = 320 1 300-340 1 300-340 mA
Heater voltage	6.3 V	Vf = 6.3 Y
Cathode-heater voltage	100 V	Vkf = 100 V
Heater voltage	6.3 V	Vf = 6.3 V
Plate voltage	2 V	Va 2) _ -300 V
Plate supply voltage	207 V	Vba = 207
Screen-grid supply voltage	150 V	Vbg2 = 150
Load resistance	2 kohm	Ra = 2
Grid resistor	0.5 kohm	Rg1 = 0.5
Cathode resistor	78 ohm	Rk = 78
Plate supply voltage	216 V	Vba = 216 I
Grid-3 voltage	0 V	Vibrations-Ausgangsspannung Vg3 = 0 1 V
Load resistance	2 kohm	Ra = 2 1 kQ
Cathode resistor	0 ohm	Rk = 0
Heater voltage	6.3 V	Vf = 6.3V Vb81 = +9V
Plate supply voltage	190 V	Vba = 190V Rk = 6300
Cathode resistor	6300 ohm	Vba = 190V Rk = 6300

CAPACITANCE		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Plate capacitance	3.3 pF	Ca = 3.3 1 pF
Grid capacitance	1 pF	Cg1 = 7.6 1 pF
Grid-to-plate capacitance	1 pF	Cag1 = ~< 0.03 pF

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Plate supply voltage	1 V	Vba 1) = 190 V Vba = 180 V
Grid-3 voltage	0 V	Vg3 = 0 V Vg3 = 0 V

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Screen-grid supply voltage	160 V	Vbg2 = 160 V Vbg2 = 150 V
Cathode resistor	100 ohm	Vbg1 = +9 V Rk = 100 O
Plate current	11.5 mA	Rg = 630 O Ia = 11.5 mA
Plate current	13 mA	Ia = 13 12.2-13.8 11.5 mA IB2 = 2.9 mA
Screen-grid current	3.3 mA	Ig2 = 3.3 2.9- 3.7 mA S = 15.9 mA/V
Transconductance	15.9 mA/V	Ig2 = 3.3 2.9- 3.7 mA S = 15.9 mA/V
Transconductance	16.5 mA/V	S = 16.5 14.2-18.8 11 mA/V
Grid-3 voltage	0 V	RI = 100 kO Vg3 0 V
Control-grid current	3 mA	-Ig1 3) = < 0.2 0.5 µA V81 -4.5 V
Plate current	0.8 mA	Ia <0.8 mA
Grid resistor	0.1 kohm	f = 45 Mc/s 3) Measured with Rg1 = 0.1 MO
Grid resistor	0.1 kohm	Gemessen mit Rg1 = 0.1 MO



SOURCE OPERATING CONDITIONS

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1967 Mullard Receiving Tubes for Maintenance

Published test conditions and operating points. Values on this page are preserved as reported by this source.

1967 MULLARD RECEIVING TUBES FOR MAINTENANCE

Section 1 · Pentode

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
hi	320 mA	Published in approved E186F.pdf target datasheet; Section1
The maximum variation of heater current at Vll = 6.3V is	20 mA	Published in approved E186F.pdf target datasheet; Section1
I. 11.5	13 mA	Published in approved E186F.pdf target datasheet; Section1
Ig2 2.9	3.3 mA	Published in approved E186F.pdf target datasheet; Section1

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
gm 15.9	16.5 mA	Published in approved E186F.pdf target datasheet; Section1
Heater current 320 300 to 340 300 t o	340 mA	Published in approved E186F.pdf target datasheet; Section1
P g2 max	700 mW	Published in approved E186F.pdf target datasheet; Section1
II< max	25 mA	Published in approved E186F.pdf target datasheet; Section1
value of	500 mV	Published in approved E186F.pdf target datasheet; Section1
value of	200 mV	Published in approved E186F.pdf target datasheet; Section1

CAPACITANCE		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Ca - gl max	0.03 pF	Published in approved E186F.pdf target datasheet; Section1
Cill	76 pF	Published in approved E186F.pdf target datasheet; Section1
Coll i 3	-45 pF	Published in approved E186F.pdf target datasheet; Section1

CHARACTERISTIC		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
I	13 mA	Published in approved E186F.pdf target datasheet; Section1
Ig2	3.3 mA	Published in approved E186F.pdf target datasheet; Section1
gm	16.5 mA	Published in approved E186F.pdf target datasheet; Section1
Anode current 13 12.2 t o 13.8 >	11.5 mA	Published in approved E186F.pdf target datasheet; Section1
Anode Current <	0.8 mA	Published in approved E186F.pdf target datasheet; Section1
Screen-grid current 3.3 2.9 to	3.7 mA	Published in approved E186F.pdf target datasheet; Section1
Mutual conductance 16.5 14.2 to 18.8 >	11 mA	Published in approved E186F.pdf target datasheet; Section1

SOURCE OPERATING CONDITIONS

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1999 Philips E-Z

Published test conditions and operating points. Values on this page are preserved as reported by this source.

1999 PHILIPS E-Z

Section 1 · Pentode

OTHER		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Heater voltage V_e	6.3 V	Heating
Heater current I_f	320 mA	Heating
Anode current L	13 mA	Heating
Mutual conductance S	16.5 mA	Heating
Heater current I	300–340 mA	Characteristics
cathode and heater T_{ks} max	10 μ A	Characteristics
heater $V_{ir} =$	100 V	Characteristics
Grid No.2 voltage V_{gz}	2 V	Life
heater (cathode negative) V_{kf}	70 V	Life
Anode voltage V_{ao} max	400 V	Limiting Values

CHARACTERISTIC		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Anode supply voltage V_{ba}	190 v	Characteristics
Grid No.3 voltage V_{gs}	3 v	Characteristics
Grid No.2 supply voltage V_{bg2}	2 A	Characteristics
Grid No.1 supply voltage $+V_{bg1}$	9 v	Characteristics
Cathode resistor R_g	630 Ω	Characteristics
Anode current I_a ,	13112.2–13.8 mA	Characteristics
Grid No.2 current I_{g2}	2.9–3.7 mA	Characteristics
Mutual conductance S	14.2–18.6 mA	Characteristics

PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
Internal resistance R_i ;	100 kΩ	Characteristics
Equivalent noise resistance R_{eq}	330 Ω	Characteristics
frequency	45 MHz	Characteristics
Negative grid No.1 current – $I_{g1 \max}$	0.2 μA	Characteristics
Anode supply voltage V_{ba}	180 V	Characteristics
Grid No.3 voltage V_{g3}	3 V	Characteristics
Grid No.2 supply voltage V_{bg2}	2 V	Characteristics
Cathode resistor R_k	100 Ω	Characteristics
Anode current I	11.5 mA	Characteristics
Grid No.2 current I_{g2}	2 mA	Characteristics
Mutual conductance S	15.5 mA	Characteristics
Hum voltage $V_{gl \max.100 \mu V}$	100 μV	Characteristics
With vibration frequency =	50–2000 Hz	Characteristics
Anode resistor R_z =	2 kΩ	Characteristics
Grid No.2 supply voltage $V_{bg2} = 160 V$	2 V	Characteristics

CAPACITANCE		
PARAMETER	PUBLISHED VALUE	CONDITION / NOTE
cathode, heater and screen $C_{a/g3g2kfs}$	3 pF	Capacitances
cathode, heater and screen $C_{gl/g3g2kfs}$	3 pF	Capacitances
Anode to grid No.1 $C_{ag1 \max.0.03 \text{ pF}}$	1 pF	Capacitances

TUBE TINKER

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