

## R.F. PENTODE

Pentode with variable transconductance intended for use as R.F. or I.F. amplifier.

QUICK REFERENCE DATA		
Anode current	$I_a$	9 mA
Transconductance	$S$	4.0 mA/V
Amplification factor	$\mu_{g_2g_1}$	21 -
Internal resistance	$R_i$	750 $k\Omega$

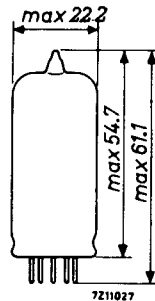
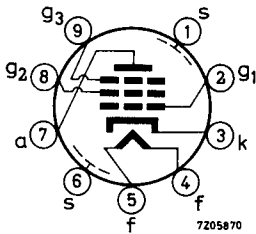
**HEATING :** Indirect by A. C. or D. C. ; parallel supply

Heater voltage	$V_f$	6.3 V
Heater current	$I_f$	200 mA

### DIMENSIONS AND CONNECTIONS

Dimensions in mm

Base: Noval



### CAPACITANCES

Anode to all except grid No. 1	$C_a(g_1)$	5.1 pF
Grid No. 1 to all except anode	$C_{g_1(a)}$	5.5 pF
Anode to grid No. 1	$C_{ag_1}$	max. 0.002 pF
Grid No. 1 to heater	$C_{g_1f}$	0.05 pF

**TYPICAL CHARACTERISTICS**

Anode voltage	$V_a$	250	250	170	V
Grid No.2 voltage	$V_{g2}$	100	85	100	V
Grid No.3 voltage	$V_{g3}$	0	0	0	V
Anode current	$I_a$	9	9	12	mA
Grid No.1 voltage	$V_{g1}$	-2	-1.2 <sup>1)</sup>	-1.2 <sup>1)</sup>	V
Grid No.2 current	$I_{g2}$	3	3.2	4.4	mA
Transconductance	S	3.6	4.0	4.4	mA/V
Internal resistance	$R_i$	0.9	0.75	0.4	MΩ
Amplification factor	$\mu_{g2g1}$	-	21	-	-

**OPERATING CHARACTERISTICS**

Anode voltage, supply voltage	$V_a = V_b$	250		200	V	
Grid No.3 voltage	$V_{g3}$	0		0	V	
Grid No.2 resistor	$R_{g2}$	51		24	kΩ	
Cathode resistor	$R_k$	160		130	Ω	
Grid No.1 voltage	$V_{g1}$	-1.95	-20	-1.95	-20	V
Anode current	$I_a$	9	-	11.1	-	mA
Grid No.2 current	$I_{g2}$	3	-	3.8	-	mA
Transconductance	S	3.5	0.24	3.85	0.16	mA/V
Internal resistance	$R_i$	0.9	-	0.55	-	MΩ
Equivalent noise resistance	$R_{eq}$	4.2	-	4.2	-	kΩ
Input conductance ( $f = 50$ MHz)	g	95	-	102	-	μA/V

<sup>1)</sup> In this case control grid current may occur. If this is not permissible, the negative grid bias should be increased to a value of 1.5 V at least.

**OPERATING CHARACTERISTICS** (continued)

Anode voltage, supply voltage	$V_a = V_b$	250 <sup>1)</sup>	200 <sup>1)</sup>	V
Grid No.3 voltage	$V_{g3}$	0	0	V
Grid No.2 resistor	$R_{g2}$	62	33	k $\Omega$
Cathode resistor	$R_k$	0	0	$\Omega$
Grid No.1 resistor	$R_{g1}$	10	10	M $\Omega$
Control voltage	$V_{R(g1)}$	0 -20	0 -20	V
Anode current	$I_a$	9 -	11.25 -	mA
Grid No.2 current	$I_{g2}$	2.9 -	3.9 -	mA
Transconductance	S	4.7 0.22	5.15 0.15	mA/V
Internal resistance	$R_i$	825 -	550 -	k $\Omega$
Equivalent noise resistance	$R_{eq}$	2.4 -	2.5 -	k $\Omega$

**LIMITING VALUES** (Design centre rating system)

Anode voltage	$V_{a0}$	max. 550	V
	$V_a$	max. 300	V
Anode dissipation	$W_a$	max. 2.25	W
	$V_{g20}$	max. 550	V
Grid No.2 voltage	$V_{g2}$	max. 300	V
	$W_{g2}$	max. 0.45	W
Grid No.2 dissipation	$I_k$	max. 16.5	mA
Cathode current	$R_{g1}$	max. 3	M $\Omega$
Grid No.1 resistor	$R_{g3}$	max. 10	k $\Omega$
Grid No.3 resistor	$V_{kf}$	max. 100	V
Cathode to heater voltage			

<sup>1)</sup> In this case control grid current may occur. If this is not permissible, the negative grid bias should be increased to a value of 1.5 V at least.

# PHILIPS

Data handbook



Electronic  
components  
and materials

**EF89**

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