

FRAME AND A.F. OUTPUT PENTODE

Pentode intended for use as frame output tube in television receivers and as A.F. power amplifier.

QUICK REFERENCE DATA

Anode peak voltage	V_{ap}	max.	2 kV
Cathode current	I_k	max.	100 mA
Output power	W_o		5.3 W

HEATING: Indirect by A. C. or D. C.; series supply

Heater current

I_f 300 mA

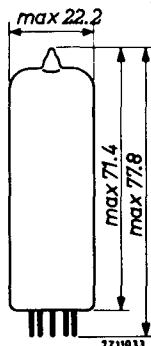
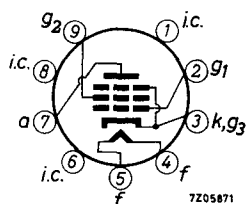
Heater voltage

V_f 15 V

DIMENSIONS AND CONNECTIONS

Base: Noval

Dimensions in mm



CAPACITANCES

Anode to all except grid No. 1

$C_a(g_1)$ 6.8 pF

Grid No. 1 to all except anode

$C_{g1(a)}$ 13 pF

Anode to grid No. 1

C_{ag1} max. 0.6 pF

Grid No. 1 to heater

C_{g1f} max. 0.25 pF

OPTIMUM PEAK ANODE CURRENT IN FRAME OUTPUT APPLICATION

The circuit should be designed so that the peak anode current does not exceed:

145 mA at $V_a = 60$ V, $V_{g2} = 170$ V, $I_f = 300$ mA

190 mA at $V_a = 70$ V, $V_{g2} = 200$ V, $I_f = 300$ mA

220 mA at $V_a = 80$ V, $V_{g2} = 220$ V, $I_f = 300$ mA

The minimum available value of the peak anode current at end of life and $I_f = 285$ mA is:

125 mA at $V_a = 60$ V, $V_{g2} = 170$ V

160 mA at $V_a = 70$ V, $V_{g2} = 200$ V

185 mA at $V_a = 80$ V, $V_{g2} = 220$ V

OPERATING CHARACTERISTICS

A.F. power amplifier, class A (measured with V_k constant)

Supply voltage	V_b	170	200	V
Grid No.2 series resistor (non decoupled)	R_{g2}	0	470	Ω
Cathode resistor	R_k	130	215	Ω
Load resistance	$R_{a\sim}$	2	2.5	k Ω
Grid No.1 driving voltage	V_i	0 0.47 6.1 0 0.52 7.0 V_{RMS}		
Anode current	I_a	75 - 76	65 - 64	mA
Grid No.2 current	I_{g2}	4.0 - 16.5	3.2 - 11.4	mA
Output power	W_o	0 0.05 5.1	0 0.05 5.3	W
Distortion	d_{tot}	- - 10	- - 10	%
Anode supply voltage	V_{ba}		230	V
Grid No.2 supply voltage	V_{bg2}		200	V
Grid No.2 series resistor (non decoupled)	R_{g2}		220	Ω
Cathode resistor	R_k		270	Ω
Load resistance	$R_{a\sim}$		3.25	k Ω
Grid No.1 driving voltage	V_i	0 0.42 5.7 V_{RMS}		
Anode current	I_a		56 - 54	mA
Grid No.2 current	I_{g2}		2.2 - 9.7	mA
Output power	W_o		0 0.05 5.4	W
Distortion	d_{tot}		- - 10	%

OPERATING CHARACTERISTICS
A.F. power amplifier, class AB, two tubes in push-pull

Anode supply voltage	V_{ba}	200	230	V
Grid No.2 voltage	V_{bg2}	200	200	V
Common cathode resistor	R_k	120	130	Ω
Load resistance	$R_{aa\sim}$	3	4	k Ω
Grid No.1 driving voltage	V_i	0 0.47	14.3	0 0.4 14.6 V _{RMS}
Anode current	I_a	2x60 -	2x64.5 2x56 -	2x61 mA
Grid No.2 current	I_{g2}	2x3.0 -	2x18.5 2x2.3 -	2x17.5 mA
Output power	W_o	0 0.05	14.3	0 0.05 17.5 W
Distortion	d_{tot}	- -	3.8 - -	5.4 %

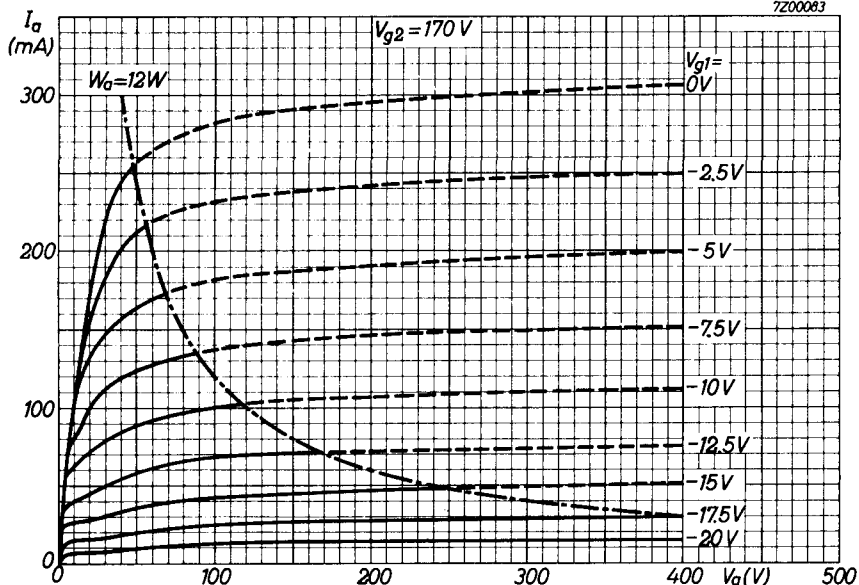
LIMITING VALUES (Design centre rating system)

Anode voltage	V_{a0}	max.	550 V
	V_a	max.	250 V
Anode peak voltage	V_{ap}	max.	2 kV ¹⁾
Grid No.2 voltage	V_{g20}	max.	550 V
	V_{g2}	max.	250 V
Anode dissipation	W_a	max.	12 W ²⁾
Grid No.2 dissipation			
average	W_{g2}	max.	1.75 W
peak	W_{g2p}	max.	6 W
Cathode current	I_k	max.	100 mA
Grid No.1 resistor			
for automatic bias	R_{g1}	max.	1 M Ω
for frame output with automatic bias	R_{g1}	max.	2 M Ω
Cathode to heater voltage	V_{kf}	max.	200 V

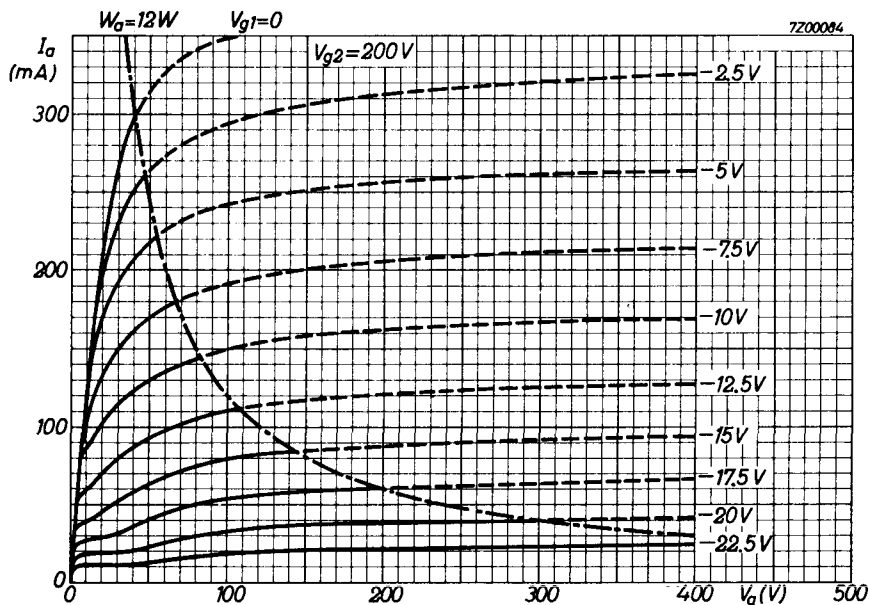
¹⁾ In frame output circuits where the max. pulse duration is 4% of a cycle with a max. of 0.8 ms.

²⁾ For frame output application $W_a = \text{max. } 10 \text{ W}$.

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PHILIPS

Data handbook



**Electronic
components
and materials**

PL84

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