

S.Q. TUBE

Special quality output pentode designed for use as line output tube, power output tube, wide band amplifier and series regulator tube.

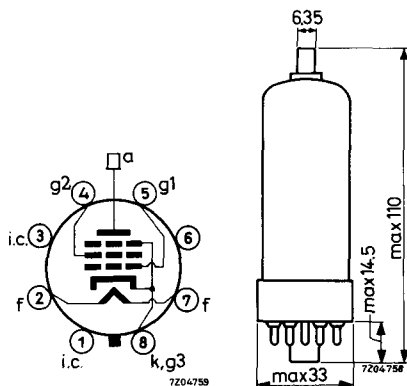
QUICK REFERENCE DATA

Life test	10 000 hours	
Low interface resistance		
Mechanical quality	Shock and vibration resistant	
Base	Octal	
Heating	Indirect A.C. or D.C.; parallel supply	
Heater voltage	V_f	6.3 V
Heater current	I_f	1.2 A
Anode current	I_a	100 mA
Mutual conductance	S	14 mA/V
Output power. Class B (2 tubes)	W_o	30 W

DIMENSIONS AND CONNECTIONS

Dimensions in mm

Base: Octal



CHARACTERISTICS

Column I Nominal value or setting of the tube

II Range values for equipment design: Initial spread

III Range values for equipment design: End of life

		I	II	III	
Heater voltage	V_f	6.3			V
Heater current	I_f	1.2	1.12 - 1.28		A
Anode voltage	V_a	100			V
Grid No.2 voltage	V_{g_2}	100			V
Cathode resistor	R_k	75			Ω
Anode current	I_a	100	85 - 118	min. 65	mA
Grid No.2 current	I_{g_2}	5.2	4.0 - 6.5		mA
Mutual conductance	S	14	11.5 - 16.5	min. 9.5	mA/V
Amplification factor	$\mu_{g_2g_1}$	5.6			
Internal resistance	R_i	5.0			k Ω
<u>Cut-off voltage</u>	$-V_{g_1}$	35			V
Anode current	I_a	0.1			mA
<u>Negative grid No.1 current</u>	$-I_{g_1}$		max. 1	max. 2	μ A
<u>Cut-off voltage</u>	$-V_{g_1}$		max. 120		V
Anode voltage	V_a	7			kV _p
Grid No.2 voltage	V_{g_2}	190			V
Cathode current	I_k	60			μ A
<u>As triode</u> (grid No.2 connected to anode)					
Anode voltage	V_a	100			V
Cathode resistor	R_k	85			Ω
Anode current	I_a	100			mA
Mutual conductance	S	14			mA/V
Amplification factor	μ	5.2			
Internal resistance	R_i	350			Ω

CHARACTERISTICS (continued)Insulation resistance between:

Anode and other electrodes

 R_{ins}

II

min. 100 M Ω

Grid No. 1 and other electrodes

 R_{ins} min. 100 M Ω Leakage current between
cathode and heater I_{kf} max. 20 μ A**CAPACITANCES**Anode to grid No. 2, grid No. 3,
cathode and heater C_{a/g_2g_3kf}

I

II

9 - 11 pF

Grid No. 1 to grid No. 2, grid No. 3,
cathode and heater C_{g_1/g_2g_3kf}

19

17.5 - 20.5 pF

Anode to grid No. 1

 C_{ag_1}

max. 1.1 pF

SHOCK AND VIBRATION RESISTANCE

The following test conditions are applied to assess the mechanical quality of the tube. These conditions are not intended to be used as normal operating conditions.

Shock

The tube is subjected 5 times in each 4 positions to an acceleration of 500 g supplied by an NRL shock machine with the hammer lifted over an angle of 30°.

Vibration

The tube is subjected during 32 hours in each of 3 positions to a vibration frequency of 50 Hz with an acceleration of 2.5 g.

LIFE

Production samples are tested to be within the end of life values (column III) during 10 000 hours.

LIMITING VALUES (Absolute max. rating system)

Anode voltage	V_{a_o}	max.	650 V
	V_a	max.	400 V
Anode peak voltage	$+V_{a_p}$	max.	7 kV
	$-V_{a_p}$	max.	1.5 kV
Pulse duration = max. 18 μ sec			
Duty factor = max. 0.22			
Anode dissipation	W_a	max.	15 W
Anode + grid No. 2 dissipation	W_{a+g_2}	max.	16 W
Grid No. 2 voltage	$V_{g_{2o}}$	max.	650 V
	V_{g_2}	max.	300 V
Grid No. 2 dissipation	W_{g_2}	max.	5.5 W
Grid No. 2 dissipation during heating up of EHT diode	W_{g_2}	max.	7.0 W
Grid No. 1 peak voltage	$-V_{g_{1p}}$	max.	1 kV
Pulse duration = max. 18 μ sec			
Duty factor = max. 0.22			
Grid No. 1 resistor	R_{g_1}	max.	0.5 M Ω
Grid No. 1 resistor in line output circuits	R_{g_1}	max.	2.2 M Ω
Cathode current	I_k	max.	220 mA
Cathode peak current	I_{k_p}	max.	1.2 A
Averaging time = max. 10 msec			
Voltage between cathode and heater			
Cathode positive	V_{kf} (k pos)	max.	250 V
Cathode negative	V_{kf} (k neg)	max.	200 V
Bulb temperature	t_{bulb}	max.	220 $^{\circ}$ C

Heater voltage: The average heater value should be 6.3 V.

Variation of the heater voltage exceeding the range of 6.0 V to 6.6 V will shorten the tube life.

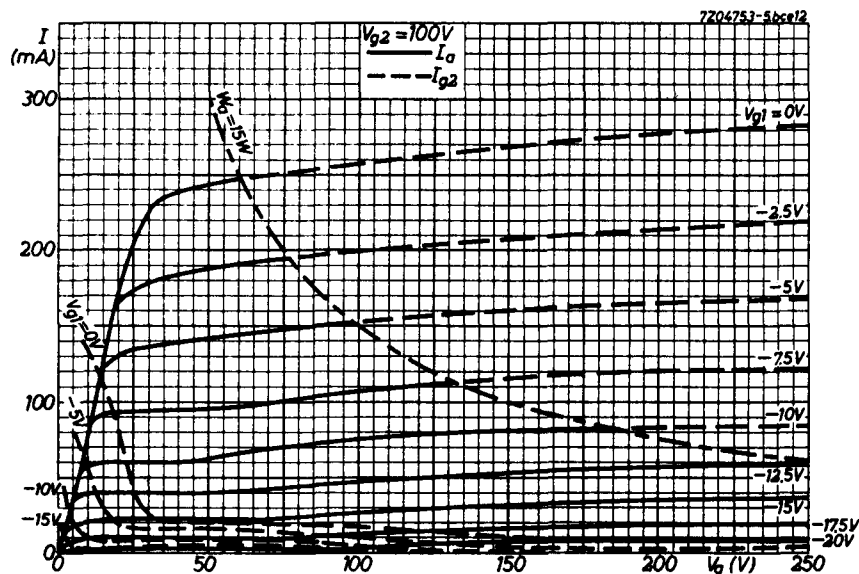
The tolerance of heater current should be taken into account.

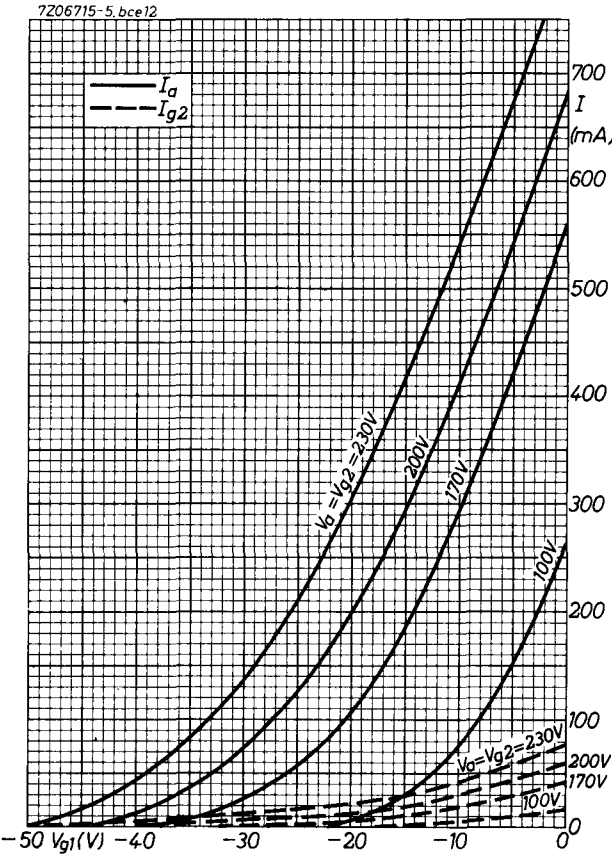
OPERATING CHARACTERISTICS

Output tube class B (2 tubes) Excitation to maximum output is continuously permitted.

Anode voltage	V_a	250	V
Grid No.2 voltage	V_{g2}	170	V
Grid No.1 voltage	$-V_{g1}$	34	V
Load resistance	$R_{aa} \sim$	3	$k\Omega$
Grid No.2 resistor	R_{g2}	2×0.5	$k\Omega$ ¹⁾
Input voltage	V_i	0	22 V_{RMS}
Anode current	I_a	2×12	2×94 mA
Grid No.2 current	I_{g2}	2×1	2×28 mA
Output power	W_o	0	30 W
Total distortion	d_{tot}		6 %

¹⁾ To avoid overloading of grid No.2 this resistor should not be by-passed.





PHILIPS

Data handbook



**Electronic
components
and materials**

E236L

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