

S.Q. DUAL CONTROL PENTODE

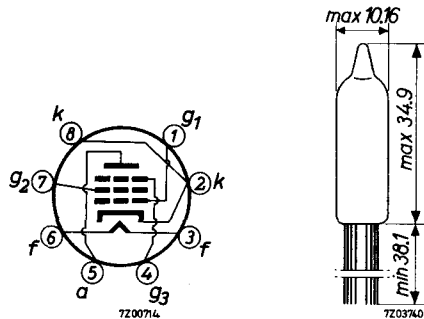
Special quality dual control pentode designed for use as amplifier and mixer.

QUICK REFERENCE DATA		
Life test	1000 hours	
Mechanical quality	Shock and vibration resistant	
Base	Subminiature	
Heating	Indirect	
	A. C. or D. C.; Parallel supply	
Heater voltage	V_f	6.3 V
Heater current	I_f	150 mA
Mutual conductance anode to grid No.1	S_{ag_1}	3.2 mA/V
Mutual conductance anode to grid No.3	S_{ag_3}	0.5 mA/V

DIMENSIONS AND CONNECTIONS

Base: Subminiature

Dimensions in mm



Connections should not be soldered nearer than 5 mm to the seal.

Leads should not be bent nearer than 1.5 mm to the seal.

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	150	140 - 160		mA
Anode voltage	V_a	100			V
Grid No.2 voltage	V_{g2}	100			V
Grid No.3 voltage	V_{g3}	0			V
Cathode resistor	R_k	150			Ω
Anode current	I_a	5.3	3.7 - 6.9		mA
Grid No.2 current	I_{g2}	4.0	2.8 - 5.4		mA
Mutual conductance;					
anode to grid No.1	S_{ag1}	3.2	2.7 - 4.0	ΔS : max. 20 %	mA/V
anode to grid No.3	S_{ag3}	0.5			mA/V
Internal resistance	R_i	110			k Ω
<u>Negative grid No.1 current</u>	$-I_{g1}$		max. 0.3	max. 1.0	μA
Grid No.1 resistor $R_{g1} = 1 M\Omega$					
Anode voltage	V_a	100			V
Grid No.2 voltage	V_{g2}	100			V
Grid No.3 voltage	V_{g3}	-1			V
Cathode resistor	R_k	150			Ω
Anode current	I_a	4.0			mA
Grid No.2 current	I_{g2}	5.8			mA
Mutual conductance;					
anode to grid No.1	S_{ag1}	1.95			mA/V
anode to grid No.3	S_{ag3}		0.5 - 1.8		mA/V
Internal resistance	R_i	50			k Ω

CHARACTERISTICS (continued)

		I	II	III	
<u>Grid No. 1 cut-off voltage</u>	$-V_{g1}$		max. 7.5		V
Anode voltage	V_a	100			V
Grid No. 2 voltage	V_{g2}	100			V
Anode current	I_a	100			μA
<u>Grid No. 3 cut-off voltage</u>	$-V_{g3}$		max. 8.0		V
Anode voltage	V_a	100			V
Grid No. 2 voltage	V_{g2}	100			V
Anode current	I_a	100			μA
<u>Leakage current between cathode and heater</u>	I_{kf}		max. 5	max. 10	μA
Voltage between cathode and heater $V_{kf} = 100$ V					
<u>Insulation resistance between two electrodes</u>	R_{ins}		min. 100	min. 50	M Ω
Voltage between electrodes = 100 V					
<u>Vibrational noise output</u>	V_o		max. 40		mV
Anode supply voltage	V_{ba}	100			V
Anode resistor	R_a	10			k Ω
Grid No. 2 voltage	V_{g2}	100			V
Grid No. 3 voltage	V_{g3}	0			V
Cathode by pass capacitor $C = 1000 \mu F$					
Cathode resistor $R_k = 150 \Omega$					
Vibration frequency 40 Hz					
Acceleration 15 g					

CAPACITANCES; With external shield

		I	II	
Grid No.1 to grid No.2, grid No.3, cathode and heater	$C_{g1/g2g3}$ kf	4.0	3.5 - 4.5	pF
Grid No.3 to grid No.1, grid No.2, cathode and heater	$C_{g3/g2g1}$ kf	4.0	3.5 - 4.5	pF
Anode to grid No.2, grid No.3, cathode and heater	$C_{a/g2g3}$ kf	3.4	2.9 - 3.9	pF
Anode to grid No.1	C_{ag1}		max.0.02	pF
Anode to grid No.3	C_{ag3}		max. 1.1	pF
Grid No.1 to grid No.3	C_{g1g3}		max.0.15	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 of 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 25 Hz with an acceleration of 2.5 g.

LIFE

Production samples are tested to be within the end of life values (column III) during 1000 hours.

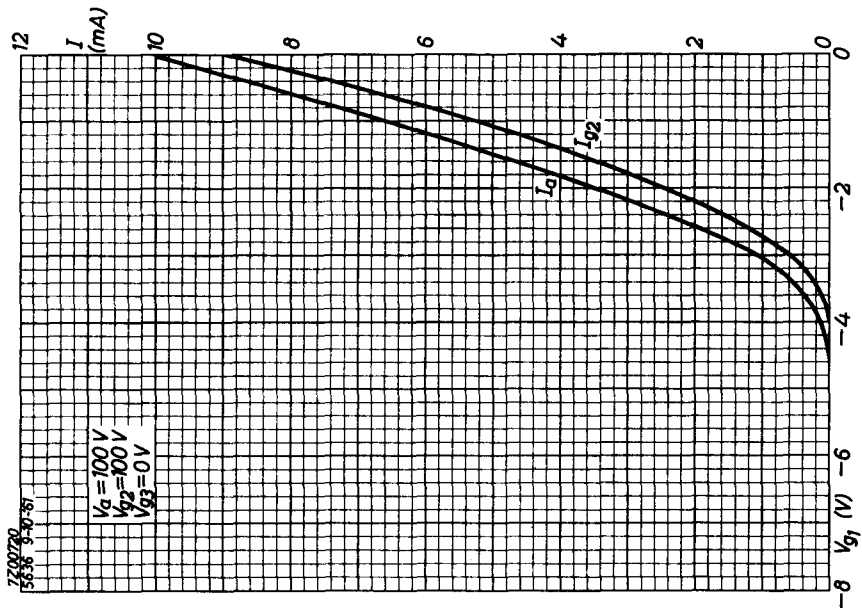
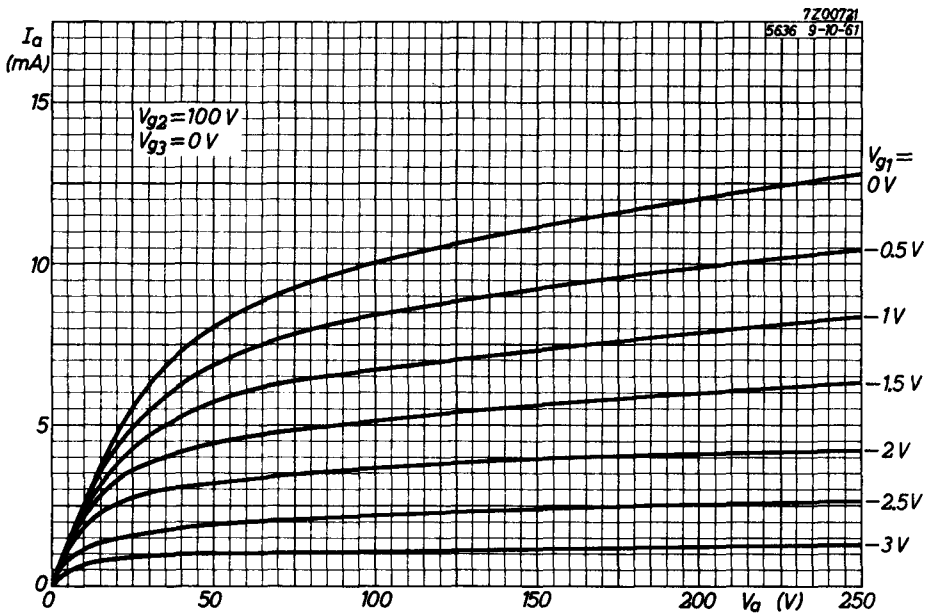
LIMITING VALUES (Absolute max. rating system)

Anode voltage	V_{a_0}	max.	330 V
Anode voltage	V_a	max.	165 V
Anode dissipation	W_a	max.	1.1 W
Grid No.3 voltage	V_{g_3}	max.	30 V
Grid No.3 negative voltage	$-V_{g_3}$	max.	55 V
Grid No.2 voltage	V_{g_2}	max.	155 V
Grid No.2 dissipation	W_{g_2}	max.	0.7 W
Grid No.1 voltage	V_{g_1}	max.	0 V
Grid No.1 negative voltage	$-V_{g_1}$	max.	55 V
Grid No.1 resistor	R_{g_1}	max.	1.2 $M\Omega$
Cathode current	I_k	max.	16 mA
Voltage between cathode and heater;			
D.C. component	V_{kf}	max.	200 V
peak value	V_{kfp}	max.	200 V
Bulb temperature	t_{bulb}	max.	220 °C

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

Variations 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 (column II) should be taken into account.



PHILIPS

Data handbook



**Electronic
components
and materials**

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