

S.Q. TUBE

Pentode designed for use in telephone equipment.

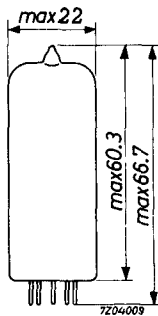
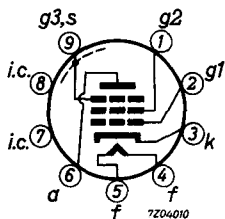
QUICK REFERENCE DATA

Life test	10 000 hours	
Low interface resistance		
Base	Noval	
Heating	Indirect A.C. or D.C. Series or parallel supply	
Heater voltage	V_f	18 V
Heater current	I_f	100 mA
Anode current	I_a	10 mA
Mutual conductance	S	9 mA/V

DIMENSIONS AND CONNECTIONS

Dimensions in mm

Base: Noval



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	18			V
Heater current	I_f	100	95 - 105		mA
Anode voltage	V_a	210			V
Grid No.3 voltage	V_{g3}	0			V
Grid No.2 voltage	V_{g2}	120			V
Cathode resistor	R_k	165			Ω
Anode current	I_a	10	8.7 - 11.3	min. 7	mA
Grid No.2 current	I_{g2}	2.1	1.7 - 2.5	min. 1.25	mA
Mutual conductance	S	9	7.8 - 10.2	min. 6.4	mA/V
Internal resistance	R_i	0.5	min. 0.3		M Ω
Amplification factor	μ_{g2g1}	38			
Equivalent noise resistance					
R.F.	R_{eq}	750	max. 1000		Ω
A.F. (0 - 10 kHz)	R_{eq}		max. 36		k Ω
Negative grid current	$-I_{g1}$		max. 0.5	max. 1.0	μA
<u>Cut-off voltage</u>	$-V_g$		max. 5.25		V
Anode voltage	V_a	210			V
Grid No.3 voltage	V_{g3}	0			V
Grid No.2 voltage	V_{g2}	120			V
Anode current	I_a	0.5			mA
<u>Hum voltage</u>	V_{g1}		max. 0.5		mV _{RMS}
Grid No.1 resistor $R_{g1} = 0.5$ M Ω					
<u>Leakage current between cathode and heater</u>	I_{kf}		max. 20		μA
Voltage between cathode and heater $V_{kf} = 100$ V					

CAPACITANCES

		I	II	
Anode to grid No.2, grid No.3, cathode and heater	C_{a/g_2g_3kfs}	3.5	max. 4.1	pF
Grid No.1 to grid No.2, grid No.3, cathode, heater and screen	C_{g_1/g_2g_3kfs}	8.0	max. 8.7	pF
Anode to grid No.1	C_{ag_1}		max. 0.015	pF
Grid No.1 to heater	C_{g_1f}		max. 0.15	pF
Cathode to heater	C_{kf}	4		pF
Grid No.1 to grid No.2, grid No.3, cathode, heater and screen	C_{g_1/g_2g_3kfs}	11.3		pF
Cathode current = 12.1 mA				
Radiation capacitance:				
Anode to surrounding box, inner diam. 52 mm, height 98 mm	C_{ra}		max. 0.025	pF
Grid No.1 to surrounding box, inner diam. 52 mm, height 98 mm	C_{rg_1}		max. 0.025	pF

LIFE

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

LIMITING VALUES Design centre rating system

Anode voltage	V_{a_o}	max. 550	V
	V_a	max. 210	V
Anode dissipation	W_a	max. 2.1	W
Grid No.2 voltage	$V_{g_{2o}}$	max. 550	V
	V_{g_2}	max. 210	V
Grid No.2 dissipation	W_{g_2}	max. 0.35	W
Cathode current	I_k	max. 16	mA
Grid No.1 resistor (automatic bias)	R_{g_1}	max. 1	MΩ
Voltage between cathode and heater	V_{kf}	max. 100	V
Bulb temperature	t_{bulb}	max. 170	°C

LIMITING VALUES (continued)

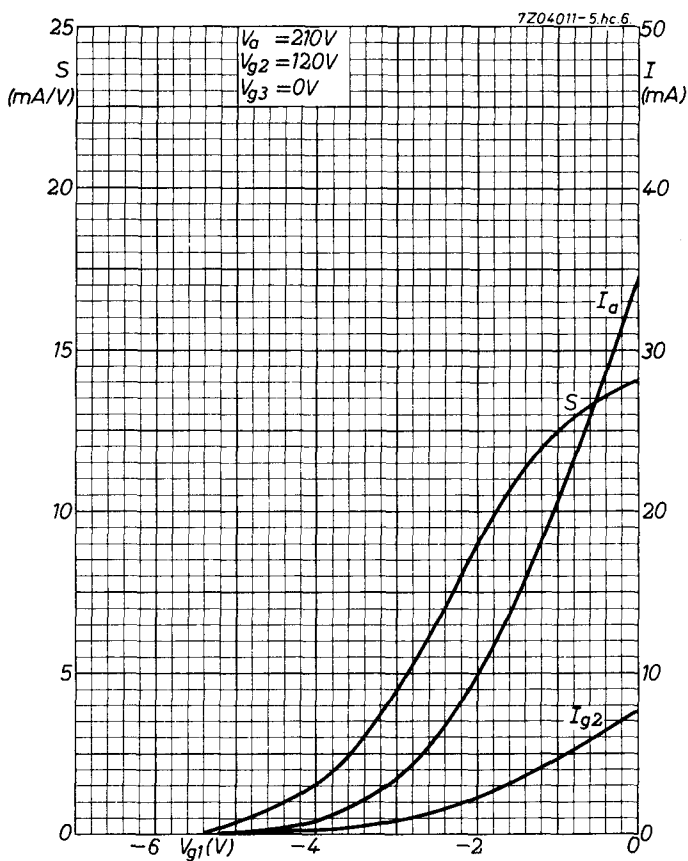
Heater voltage: The average heater voltage should be 18 V.

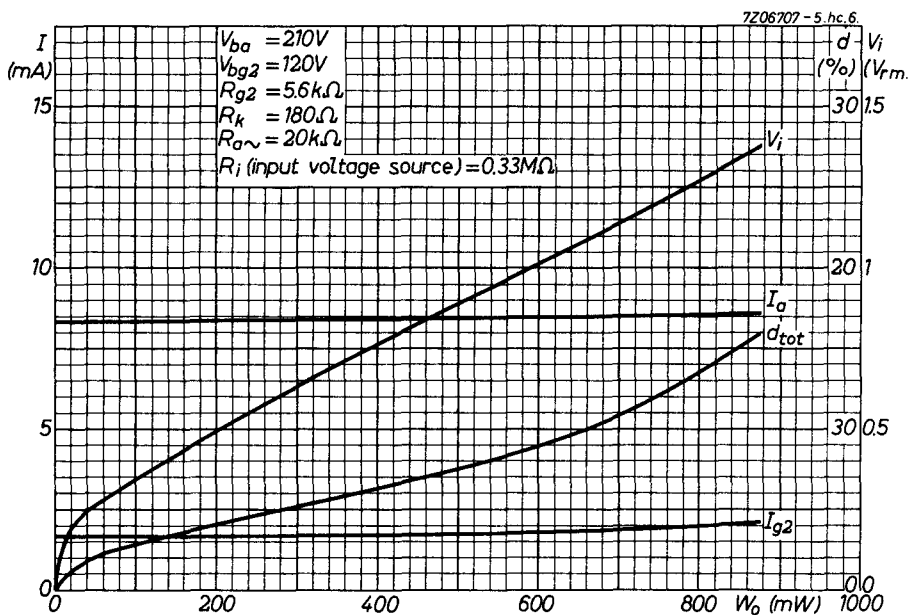
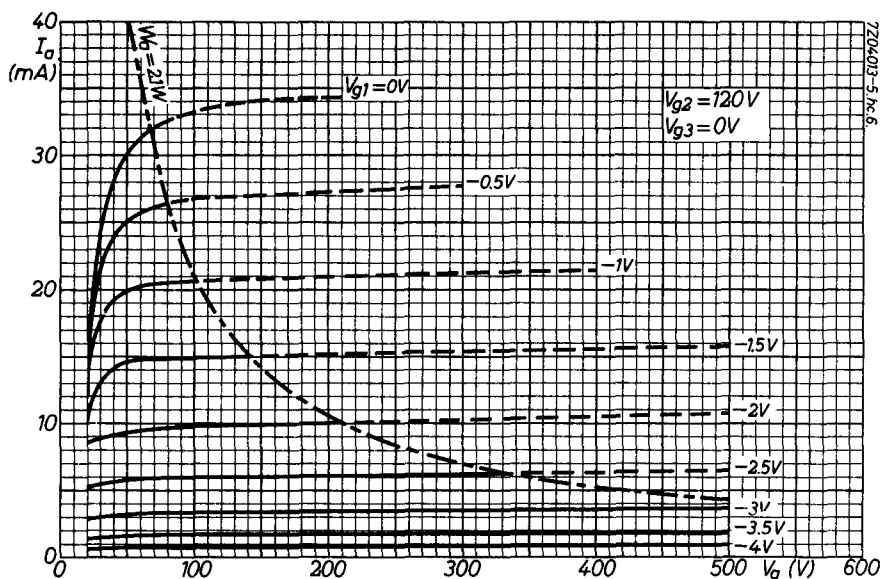
Variations of the heater voltage exceeding the range of 17.1 to 18.9 V will shorten the tube life.

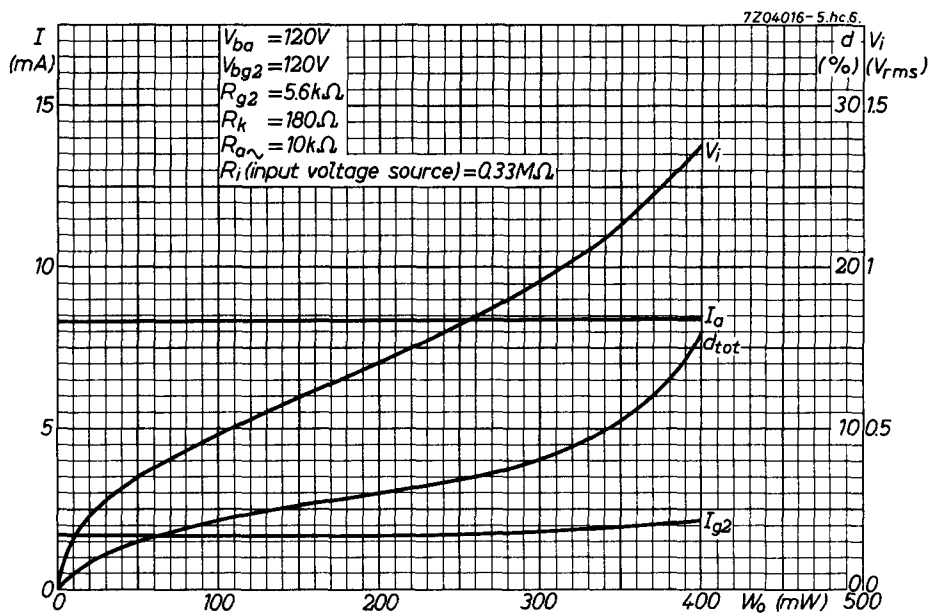
The tolerance of heater current (column II) should be taken into account.

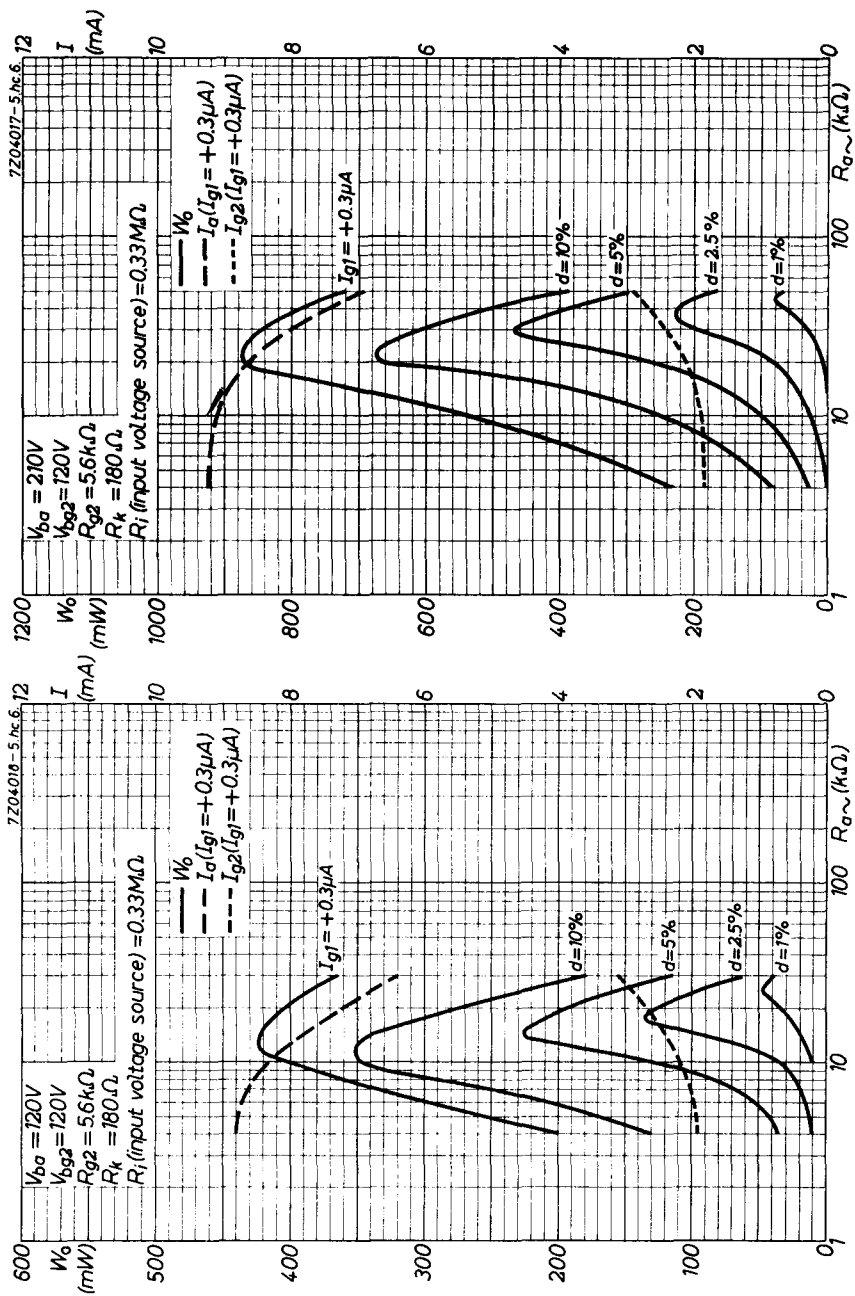
OPERATING CHARACTERISTICSOutput tube class A

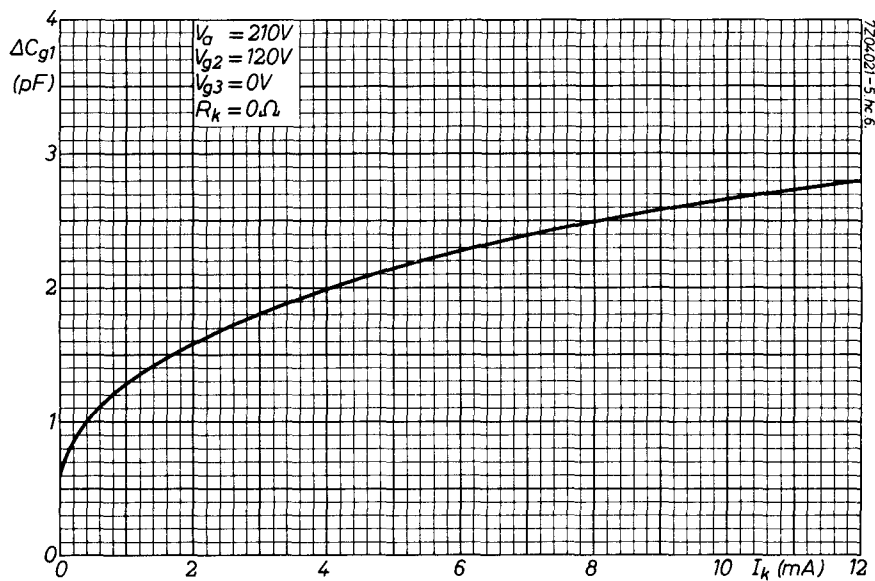
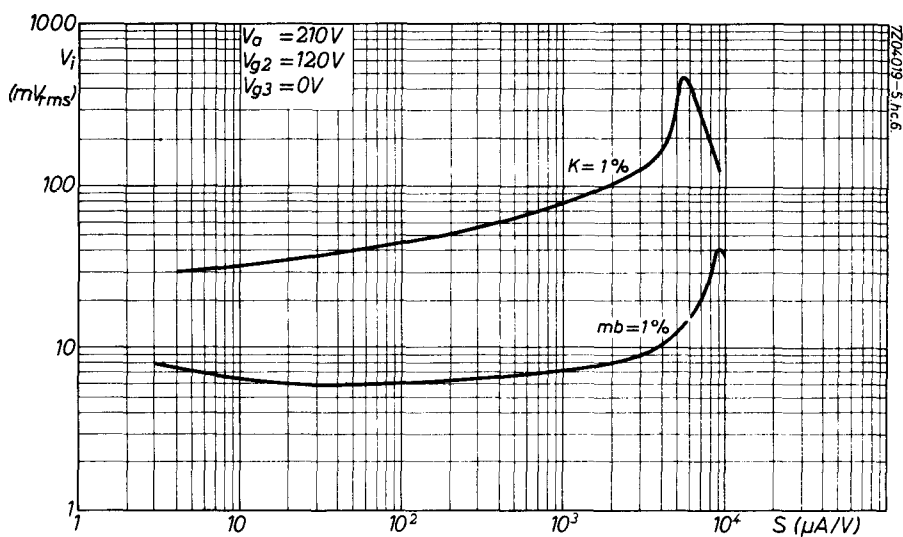
Anode voltage	V_a	120			210		V	
Grid No.3 voltage	V_{g_3}	0			0		V	
Grid No.2 supply voltage	V_{bg_2}	120			120		V	
Grid No.2 resistor	R_{g_2}	5.6			5.6		k Ω	
Cathode resistor	R_k	180			180		Ω	
Anode current	I_a	8.3			8.3		mA	
Grid No.2 current	I_{g_2}	1.7			1.7		mA	
Mutual conductance	S	8.2			8.2		mA/V	
Internal resistance	R_i	0.42			0.44		M Ω	
Load resistance	$R_{a\sim}$	10			20			k Ω
Output power	W_o	340	400	50	660	870	50	mW
Input voltage	V_i	1.1	-	0.35	1.1	-	0.25	V _{RMS}
Total distortion	d_{tot}	10	-	-	10	-	-	%
Grid No.1 current	$+I_g$	-	0.3	-	-	0.3	-	μA
Grid No.1 resistor	R_{g_1}	-	0.33	-	-	0.33	-	M Ω

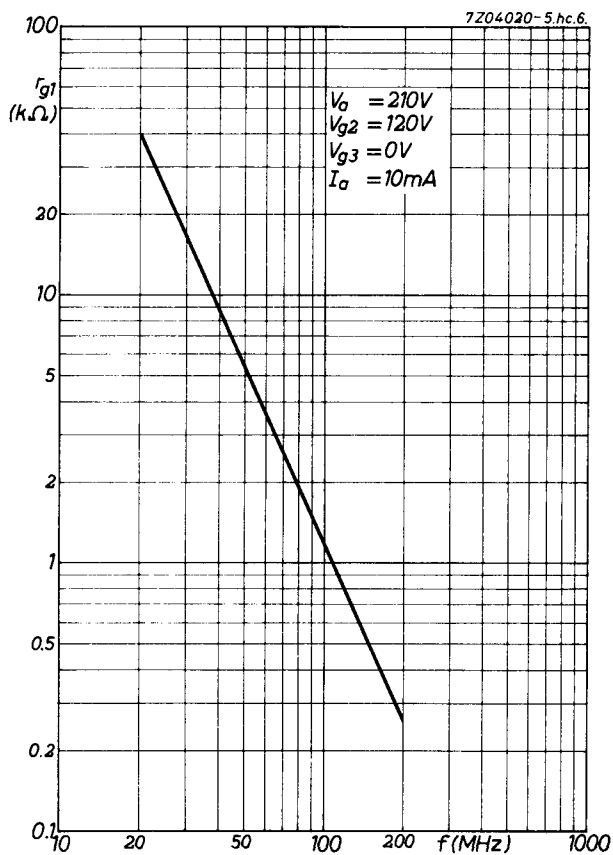












PHILIPS

Data handbook



**Electronic
components
and materials**

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