

### S.Q. TUBE

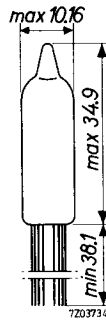
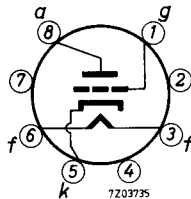
Special quality triode designed for use as A.F. amplifier

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	S	2.3 mA/V
Amplification factor	$\mu$	70

#### DIMENSIONS AND CONNECTIONS

Dimensions in mm

Base: Subminiature



Leads should not be soldered nearer than 5 mm to the seal.  
Leads should not be bent nearer than 2 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 supply voltage	$V_{ba}$	100			V
Cathode resistor	$R_k$	1500			$\Omega$
Anode current	$I_a$	0.73	0.5 - 0.9		mA
Mutual conductance	S	1.7	1.4 - 2.0	min. 1.1	mA/V
Internal resistance	$R_i$	41			k $\Omega$
Amplification factor	$\mu$	70	60 - 80		
<u>Cut-off voltage</u>	$-V_g$	2.5			V
Anode current	$I_a$		max. 50		$\mu A$
Grid voltage	$-V_g$	1.8			V
Anode current	$I_a$		min. 5		$\mu A$
<u>Negative grid current</u>	$-I_g$		max. 0.3	max. 0.6	$\mu A$
Anode supply voltage $V_{ba} = 150$ V					
Cathode resistor $R_k = 2700$ $\Omega$					
Anode supply voltage	$V_{ba}$	150			V
Cathode resistor	$R_k$	680			$\Omega$
Anode current	$I_a$	1.85			mA
Mutual conductance	S	2.3			mA/V
Amplification factor	$\mu$	70			
Internal resistance	$R_i$	30.5			k $\Omega$
<u>Leakage current between cathode and heater</u>	$I_{kf}$		max. 5		$\mu A$

Voltage between cathode  
and heater  $V_{kf} = 100$  V

**CHARACTERISTICS** (continued)Insulation resistance  
between electrodes

	I	II	III	
$R_{ins}$		min. 100	min. 25	M $\Omega$
Voltage between electrodes = 100 V				
<u>Vibrational noise output</u>	$V_o$	max. 25		mV

Anode supply voltage  $V_{ba} = 100$  V

Anode resistor  $R_a = 10$  k $\Omega$

Cathode by-pass capacitor  $C_k = 1000$  pF

Vibration frequency = 40 Hz

Acceleration = 15 g

**CAPACITANCES**

Anode to cathode and heater

	I	II		
$C_{a/kf}$	0.6	0.4 - 0.8	pF	
Grid to cathode and heater	$C_{g/kf}$	1.7	1.2 - 2.2	pF
Anode to grid	$C_{ag}$	0.8	0.6 - 1.0	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 50 Hz with an acceleration of 2.5 g.

**LIFE**

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

Anode supply voltage	$V_{ba}$	150 V
Cathode resistor	$R_k$	680 $\Omega$
Grid resistor	$R_g$	1 $M\Omega$
Voltage between cathode and heater (k pos)	$V_{kf}$	200 V

**LIMITING VALUES** (Absolute max. rating system)

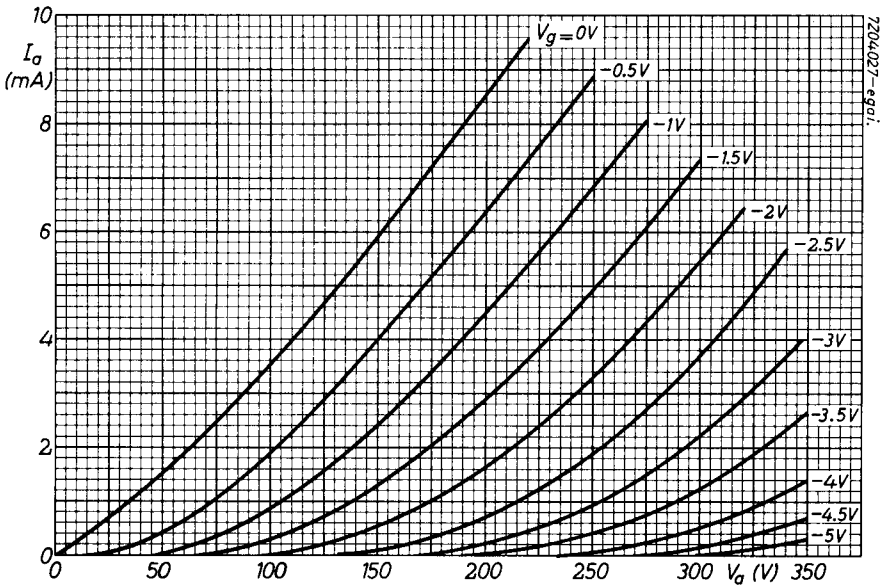
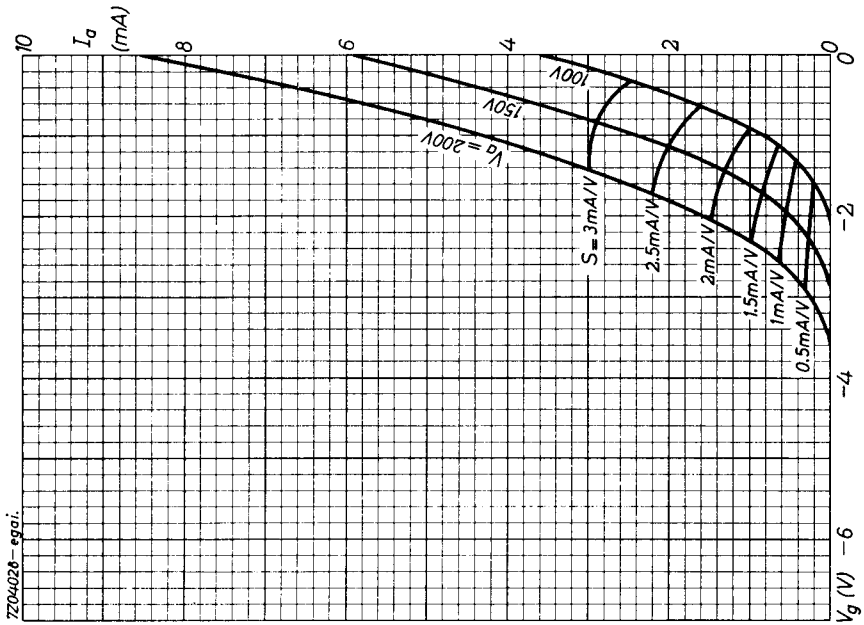
Anode voltage	$V_{a0}$	max. 330 V
	$V_a$	max. 165 V
Grid voltage	$-V_g$	max. 55 V
	$+V_g$	max. 0 V
Anode dissipation	$W_a$	max. 0.55 W
Anode current	$I_a$	max. 3.3 mA
Peak voltage between cathode and heater	$V_{kfp}$	max. 200 V
Bulb temperature	$t_{bulb}$	max. 220 $^{\circ}C$
Heater voltage	$V_f$	min. 6.0 V
		max. 6.6 V

**OPERATING CHARACTERISTICS**

Anode supply voltage	$V_{ba}$	100	100	100	100	100	100	V
Cathode resistor	$R_k$	2.7	2.7	5.6	6.8	10	10	$k\Omega$
Anode resistor	$R_a$	0.1	0.1	0.27	0.27	0.47	0.47	$M\Omega$
Grid resistor	$R_g$	1.0	1.0	1.0	1.0	1.0	1.0	$M\Omega$
Grid resistor next stage	$R_g'$	0.27	0.47	0.47	1.0	0.47	1.0	$M\Omega$
Voltage gain	$V_o/V_i$	37	39	41	42	40	43	
Total distortion	$d_{tot}$	2.4	2.1	2.1	1.8	2.4	1.7	%

## OPERATING CHARACTERISTICS

Anode supply voltage	$V_{ba}$	200	200	200	200	200	200	V
Cathode resistor	$R_k$	1.5	1.8	3.3	3.9	5.6	6.8	$k\Omega$
Anode resistor	$R_a$	0.1	0.1	0.27	0.27	0.47	0.47	$M\Omega$
Grid resistor	$R_g$	1.0	1.0	1.0	1.0	1.0	1.0	$M\Omega$
Grid resistor next stage	$R_{g'}$	0.27	0.47	0.47	1.0	0.47	1.0	$M\Omega$
Voltage gain	$V_o/V_i$	44	46	49	50	48	50	
Total distortion	$d_{tot}$	0.7	0.7	0.9	0.7	0.9	0.7	%



# PHILIPS

Data handbook



Electronic  
components  
and materials

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7	FP	2001.04.22