

## S.Q. TUBE

Special quality triode, designed for use as amplifier in measuring probes.

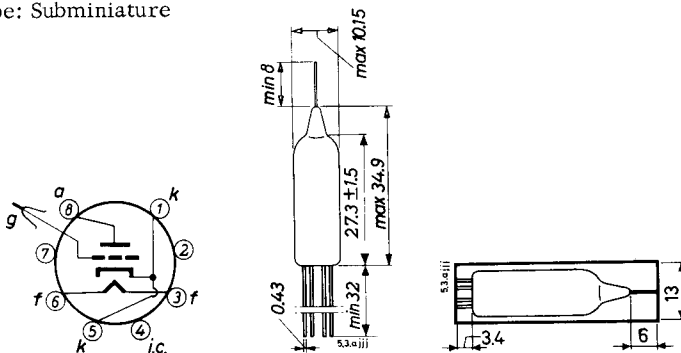
### QUICK REFERENCE DATA

Life test	1000 hours	
Envelope	Subminiature	
Low interface resistance		
Mechanical quality	Shock and vibration resistant	
Heating	Indirect	
	A. C. or D. C. ; parallel supply	
Heater voltage	$V_f$	6.3 V
Heater current	$I_f$	185 mA
Equivalent grid noise voltage	$V_n$	max. 1 mV
Anode current	$I_a$	14 mA
Mutual conductance	$S$	14.5 mA/V

### DIMENSIONS AND CONNECTIONS

Dimensions in mm

Envelope: 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.

Method of shielding. See fig. 1.

**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	$I_f$	185	175- 195		mA
Anode voltage	$V_a$	80			V
Grid voltage	$-V_g$	2			V
Anode current	$I_a$	14			mA
Mutual conductance	S	14.5			mA/V
Amplification factor	$\mu$	27.5			
Input resistance	$r_g$	300			$\Omega$
Frequency = 250 MHz					
Input resonance frequency	f	400			MHz
Anode supply voltage	$V_{ba}$	82			V
Cathode resistor	$R_k$	143			$\Omega$
Anode current	$I_a$	14.0	11.2-16.8	min. 8.2	mA
Mutual conductance	S	14.5			mA/V
Anode supply voltage	$V_{ba}$	90			V
Cathode resistor	$R_k$	680			$\Omega$
Grid supply voltage	$+V_{bg}$	7.5			V
Anode current	$I_a$	14			mA
Mutual conductance	S	14.5	12.9-16.1	min. 9.2	mA/V
<u>Negative grid current</u>	$-I_g$		max. 0.01	max. 0.01	$\mu A$
<u>Leakage current between cathode and heater</u>	$I_{kf}$		max. 5	max. 10	$\mu A$

Voltage between cathode and heater = 55 V. Cath. positive

**CHARACTERISTICS (continued)**

Equivalent grid microphony voltage

Peak acceleration = 4 g  
 Frequency = 50 Hz

	I	II	
$V_g$		max. 1.0	mV <sub>RMS</sub>

Equivalent grid hum voltage

Grid resistor = 0.5 MΩ  
 Cathode resistor = 100 Ω  
 Heater centre grounded

$V_g$		max. 1.0	mV <sub>RMS</sub>
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**CAPACITANCES**

Grid to cathode

$C_{gk}$	3.5	2.9 - 4.1	pF
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Anode to grid

$C_{ag}$	1.7	1.4 - 2.0	pF
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Grid to heater

$C_{gf}$	33	23 - 43	mpF
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Anode to cathode

$C_{ak}$	450	325 - 575	mpF
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Anode to heater

$C_{af}$	270	185 - 355	mpF
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**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 during 1000 hours.

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

Anode voltage	$V_{a_o}$	max.	275 V
	$V_a$	max.	110 V
Anode dissipation	$W_a$	max.	1.5 W
Grid voltage	$-V_g$	max.	55 V
Cathode current	$I_k$	max.	22 mA
Voltage between cathode and heater	$V_{kf}$	max.	55 V
Bulb temperature	$t_{bulb}$	max.	170 °C

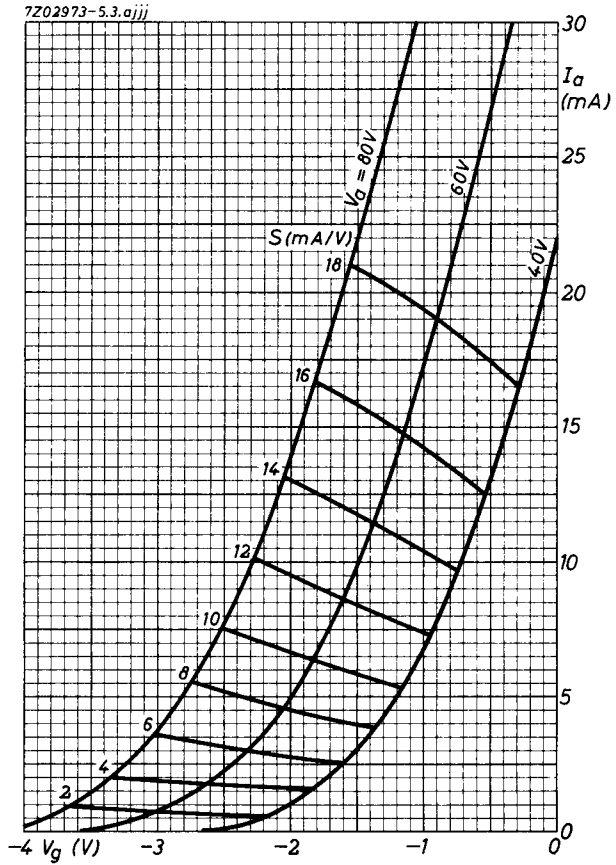
Grid resistor: The grid resistance should be restricted to a value such that no limiting values are exceeded at  $-I_g = 0.01 \mu A$ .

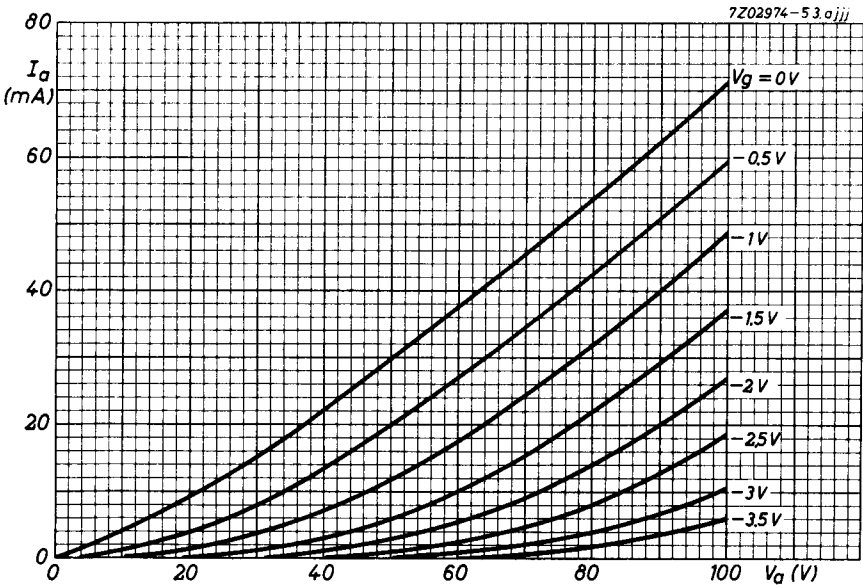
The D.C. feed back factor of the operating circuit may be taken into account.

The  $R_g$  value will also be limited by the required current stability and the permissible hum level.

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.





# PHILIPS

Data handbook



Electronic  
components  
and materials

## EC1000

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