

SPECIAL QUALITY DOUBLE TRIODE

E90CC

Special quality double triode with common cathode for use in computers where stability of characteristics and long life are required.

This data should be read in conjunction with GENERAL NOTES - SPECIAL QUALITY VALVES, which precede this section of the handbook, and the index numbers are used to indicate where reference should be made to a specific note.

HEATER

Suitable for series or parallel operation, a.c. or d.c.

V_h^1	6.3	V
I_h	400	mA

The maximum variation of heater current at $V_h = 6.3V$ is $\pm 20mA$. In order to achieve a useful valve life with the heater in a series connected chain the absolute maximum variation of heater current due to voltage fluctuations and component tolerances should be $< \pm 1.5\%$.

CAPACITANCES² (measured without an external shield)

	Minimum	Average	Maximum	
* C_{a-g}	2.0	2.5	3.0	pF
* C_{in}	2.9	3.4	3.9	pF
$C_{out'}$	300	400	500	mF
$C_{out''}$	250	350	450	mF
$C_{g'-h}$	—	—	300	mpF
$C_{g''-h}$	—	—	150	mpF
$C_{a'-a''}$	—	—	1.4	pF
$C_{g'-g''}$	—	—	220	mpF
$C_{a'-g''}$	—	—	150	mpF
$C_{a''-g'}$	—	—	350	mpF
C_{k-h}	—	6.5	—	pF

*Each section

CHARACTERISTICS³ (each section)

V_a	100	V
I_a	8.5	mA
V_g	-2.1	V
g_m	6.0	mA/V
μ	27	
R_k	0	Ω

CHARACTERISTIC RANGE VALUES FOR EQUIPMENT DESIGN

	<i>Average</i>	<i>Initial range</i>	<i>End of life*</i>	
Anode current (each section)				
at $V_a = 100V$, $V_g = -2.1V$	8.5	4.5 to 12.5	—	mA
at $V_b = 150V$, $R_a = 20k\Omega$ $V_g = 0V$, $R_g = 47k\Omega$	—	5.0 to 6.2	4.5	mA
at $V_b = 150V$, $R_a = 20k\Omega$ $V_g = -10V$, $R_g = 47k\Omega$	—	<100	100	μA
Mutual conductance (each section)				
at $V_{a-k} = 100V$, $V_{g-e} = 0V$ $R_k = 250\Omega$ (decoupled)	6.0	4.5 to 7.5	3.0	mA/V
Balance ($V_g' \sim V_g''$)				
at $V_b = 150V$, $R_a = 20k\Omega$ $R_g = 47k\Omega$, $I_a = 100\mu A$	—	<2.0	2.0	V
Negative control-grid current (each section)				
at $V_{a-k} = 100V$, $V_{g-e} = 0V$ $R_k = 250\Omega$	—	<0.2	1.0	μA

INSULATION

	<i>Initial range</i>	<i>End of life*</i>	
Between heater and cathode measured at $V_{h-k} = 100V$ (cathode positive), $R_{lim} = 1M\Omega$ Leakage current			
	<15	30	μA
Between any two electrodes measured at 300V	>100	20	M Ω

*To allow for valve deterioration during life, circuits should be designed to function with a valve, any characteristic of which has reached the stated end of life value.

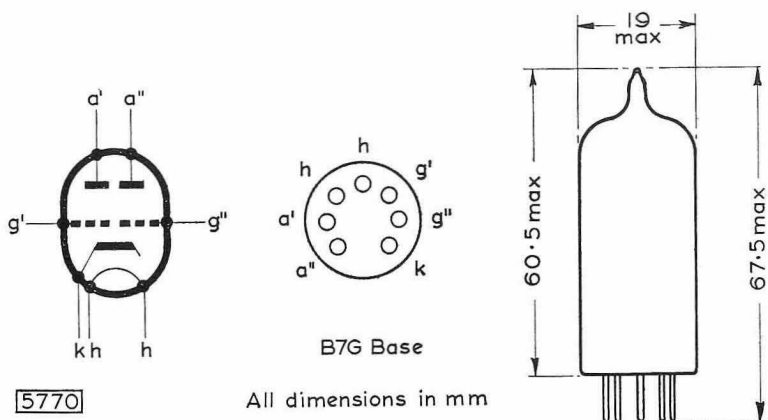
LIMITING VALUES¹ (absolute ratings) each section

$V_{a(b)}$ max.	600	V
V_a max.	300	V
P_a max.	2.0	W
I_k max.	15	mA
$*I_{k(pk)}$ max.	75	mA
$-V_g$ max.	100	V
$*-V_{g(pk)}$ max.	200	V
$+V_g$ max.	0	V
I_g max.	250	μ A
$*I_{g(pk)}$ max.	1.0	mA
R_{g-k} max. (cathode bias)	1.0	M Ω
R_{g-k} max. (fixed bias)	500	k Ω
V_{h-k} max.	100	V
T_{bulb} max.	170	$^{\circ}$ C

*Max. averaging time = 10ms.

OPERATING NOTES

For stable operation it is advisable to restrict the cathode to heater resistor to values less than 20k Ω . The E90CC is not intended for applications which are critical with regard to microphony or hum.



The bulb and base dimensions of this valve are in accordance with BS448, section B7G.

