

Special quality double triode having separate cathodes, for use in industrial equipment where stability of characteristics and long life are required.

This data should be read in conjunction with the 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. The heater is centre-tapped and the two sections may be operated in series or in parallel with one another.

Series V_h applied between pins 4 and 5

Parallel V_h applied between pin 9 and pins 4 and 5 connected together

	<i>Series</i>	<i>Parallel</i>	
V_h^1	12.6	6.3	V
I_h	300	600	mA

The maximum variation of heater current at $V_h = 6.3V$ or $12.6V$ is $\pm 5\%$. In order to obtain a useful valve life with the heater fed from a parallel source the absolute maximum variation of heater voltage should be $\pm 5\%$. With the heater in a series connected chain the absolute maximum variation of heater current due to voltage fluctuations and component tolerances should be $< \pm 1.5\%$.

MOUNTING POSITION

Any

CAPACITANCES²

	$\dagger$ Shielded	Unshielded	
$C_{a'-g'}$	3.0 ± 0.6	3.0	pF
$*C_{in}$	2.6 ± 0.7	2.4	pF
$C_{out'}$	3.0 ± 0.7	0.55	pF
$*C_{g-h}$	< 0.23	< 0.23	pF
$C_{a''-g''}$	3.0 ± 0.6	3.1	pF
$C_{out''}$	3.5 ± 0.7	0.45	pF
$C_{a'-a''}$	1.3 ± 0.4	1.45	pF
$C_{g'-g''}$	< 0.013	< 0.013	pF
$C_{a'-g''}$	< 0.065	< 0.065	pF
$*C_{k-h}$	4.8	4.8	pF
$C_{a''-g'}$	< 0.1	< 0.1	pF

*Each section

$\dagger$ Length of screening can 70mm, inner diameter 22mm.



CHARACTERISTICS³ (each section)

V_{a-k}	250	V
* I_a	6.0 ± 0.6	mA
R_k	920	Ω
* g_m	2.7 ± 0.5	mA/V
μ	27	
r_a	10	k Ω
r_a min.	7.0	k Ω
$V_g (I_g = +0.3 \mu A)$	< -1.3	V
* $-I_g$ max. ($R_g = 100k\Omega$)	0.5	μA
Cathode heating time	16	s
Cathode heating time max.	23	s
Cathode cooling time min.	13	s

*To allow for valve deterioration during life, circuits should be designed to function with a valve in which one or more of these characteristics have changed to the following values.

I_a	≥ 4.3	mA
g_m	≥ 1.8	mA/V
$-I_g$	≥ 1.0	μA

OPERATING CONDITIONS AS RESISTANCE COUPLED A.F. AMPLIFIER (each section)

With cathode bias

V_h (V)	R_a (k Ω)	I_a (mA)	R_k (k Ω)	V_{out} $\frac{V_{out}}{V_{in}}$	V_{out}^* ($V_{r.m.s.}$)	D_{tot}^* (%)	$R_{g1}^\dagger$ (k Ω)
400	47	4.4	1.2	18.5	60	4.2	150
350	47	3.8	1.2	18.5	50	4.1	150
300	47	3.15	1.2	18.5	40	4.0	150
250	47	2.45	1.2	18.5	30	3.8	150
200	47	1.86	1.2	18.5	20	3.3	150
400	100	2.3	2.2	20	63	3.7	330
350	100	1.95	2.2	20	52	3.6	330
300	100	1.65	2.2	20	42	3.5	330
250	100	1.3	2.2	20	32	3.4	330
200	100	1.0	2.2	20	22	3.1	330
400	220	1.15	3.9	21	58	3.2	680
350	220	0.99	3.9	21	47	3.1	680
300	220	0.83	3.9	21	38	3.0	680
250	220	0.67	3.9	21	29	2.6	680
200	220	0.52	3.9	21	19	2.3	680

*Output voltage and distortion at start of positive grid current. At lower output voltages the distortion is approximately proportional to the output voltage.

$^\dagger R_{g1}$ = grid resistance of following valve.



BALANCE AND CUT-OFF CHARACTERISTICS

$V_{a(b)}$	250	250	V
V_g	-5.5	<-17	V
I_a	—	15	μA
$I_{a'} \sim I_{a''}$	<3.0	—	mA
R_a	0	1.0	M Ω
R_k	0	920	Ω

INSULATION

Between heater and cathode

V_h	6.3	V
V_{h-k}	120	V
Leakage current	<12	μA

LIMITING VALUES⁴ (each section)

$V_{a(b)}$ max.	600	V
V_a max.	300	V
p_a max.	2.0	W
I_k max.	12	mA
$^*I_{k(pk)}$ max.	150	mA
$^{\dagger}I_{k(pk)}$ max.	30	mA
$-V_g$ max.	200	V
I_g max.	300	μA
$i_{g(pk)}$ max.	30	mA
R_{g-k} max.	1.0	M Ω
V_{h-k} max.	120	V
R_{h-k} max.	100	k Ω
T_{bulb} max.	170	$^{\circ}C$

$^*i_{g(pk)} < 30mA$, max. duty cycle = 0.005, max. averaging time = 0.002s

$^{\dagger}i_{g(pk)} < 2mA$, max. duty cycle = 0.2, max. averaging time = 0.002s

SHOCK AND VIBRATION RATINGS

The E80CC can withstand vibrations of 2.5g and 50c/s for 96 hours and is proof against impact accelerations of approximately 450g.

OPERATING NOTES

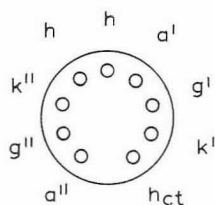
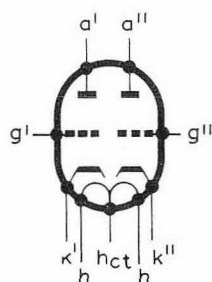
The hum voltage referred to either grid has a maximum value of 75 μA , measured with a grid resistor of 500k Ω , and an anode current of 1.5mA.



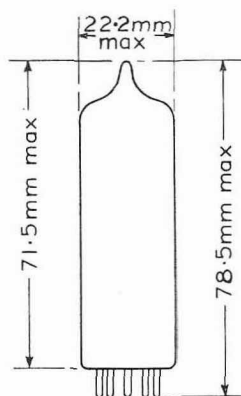
E80CC

SPECIAL QUALITY DOUBLE TRIODE

5110



B9A Base



The bulb and base dimensions of this valve are in accordance with BS448, Section B9A.