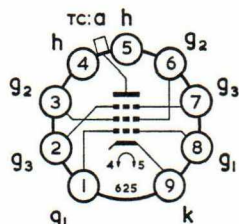


LINE OUTPUT PENTODE



B9D Base, CT1 Cap

GENERAL

This output pentode is for use in the line deflection circuits of colour television receivers having series connected heaters (a.c. or d.c.).

Heater Current	I_h	0.3	A
Heater Voltage	V_h	40	V

RATINGS

		†	*	
Maximum Anode Dissipation	$P_a(\max)$	40	30	W
Maximum Anode and Screen Grid Dissipation (Triode connected)	$P_{(a+g_2)\max}$	42	31	W
Maximum Screen Grid Dissipation	$P_{g_2(\max)}$	9.0	7.0‡	W
Maximum Anode Supply Voltage (Valve cold)	$V_{a(b)\max}$	—	700	V
Maximum Peak Anode Voltage	$V_{a(pk)\max}$	8.0§	7.0§	kV
Maximum Suppressor Grid Voltage	$V_{g_3(\max)}$	—	50	V
Maximum Screen Grid Supply Voltage (Valve cold)	$V_{g_2(b)\max}$	—	700	V
Maximum Screen Grid Voltage	$V_{g_2(\max)}$	—	275	V
Maximum Negative Peak Control Grid Voltage	$-V_{g_1(pk)\max}$	550§	—	V
Maximum Heater to Cathode Voltage	$V_{h-k(\max)}$	—	250	V
Maximum Cathode Current	$I_k(\max)$	—	0.5	A
Maximum Peak Cathode Current	$i_k(pk)\max$	—	1.2	A
Maximum Control Grid Resistance	$R_{g_1(\max)}$	—	—	—
Fixed Bias	—	—	0.5¶	MΩ
Stabilised Line Timebases	—	—	2.2¶	MΩ
Maximum Suppressor Grid Resistance	$R_{g_3(\max)}$	—	10	kΩ
Maximum Bulb Temperature (Absolute)	$T_{bulb(\max)}$	—	300	°C

* Design centre ratings.

† Design maximum ratings. These limits should not be exceeded with a nominal tube under the worst probable operating conditions at a normal picture width.

‡ To prevent an excessive value of p_{g_2} the graph on page 3 should be used to obtain the minimum R_{g_2} values.

§ Maximum pulse duration is 22% of one cycle with a maximum of 18 μ s.

¶ The circuit design has to be such that negative control grid currents up to 5 μ A do not have any detrimental effect upon valve adjustment or circuit performance. Care should be taken that with 5 μ A grid current the limiting values for I_k , p_a and p_{g_2} are not exceeded.

|| With $R_{g_3} \leq 10$ kΩ, capacitive decoupling of g_3 is not required.

INTER-ELECTRODE CAPACITANCES

Anode to Grid 1	C_{a-g1}	2.5	pF
Anode to Grid 1	C_{a-g1}	<3.0	pF
Grid 1 to Heater	C_{g1-h}	<0.2	pF

DYNAMIC CHARACTERISTICS

(Measured under pulse conditions)

Anode Voltage	V_a	160	50	V
Suppressor Grid Voltage	V_{g3}	0	0	V
Screen Grid Voltage	V_{g2}	160	175	V
Control Grid Voltage	V_{g1}	0	-10	V
Anode Current	I_a	1.4	0.8	A
Screen Grid Current	I_{g2}	45	70	mA

TYPICAL OPERATING CONDITIONS

The diagram on page 4 indicates values of $V_{a(min)}$, $-V_{g1}$ and V_{g2} corresponding to $i_{a(pk)}$ at the end of scan. Higher values of V_{g2} may be used provided maximum screen grid dissipation and the minimum screen grid resistor are considered. This will require a larger $-V_{g1}$. The screen grid resistor should be determined by measurement on valves with average characteristics.

V_{g2} and $-V_{g1}$ apply for nominal mains voltage but safety factors have been taken into consideration for component spread, valve spread and decrease of the valve characteristics during life.

To ensure operation above the knee at mains voltage below nominal value, the value of $V_{a(min)}$ shown on the diagram must be increased by the amount the supply voltage may fall.

Typical example using diagram

Peak anode current	$i_{a(pk)}$	800	mA
Screen grid voltage	V_{g2}	175	V
Grid 1 voltage	V_{g1}	-10	V
Minimum anode voltage	$V_{a(min)}$		
for low mains voltage		54	V
Supply Voltage	V_b	240	V
Supply voltage variation			
(due to low limit mains)	ΔV_b	24	V
Hence minimum anode voltage for			
nominal mains voltage (54 + 24)		78	V

Minimum cut-off voltage during flyback

Peak anode voltage	$V_{a(pk)}$	7.0	kV
Grid 1 impedance at line frequency	Z_{g1}	1.0	kΩ
Screen grid voltage	V_{g2}	150 200 250	V
Minimum cut-off voltage during flyback	$V_{g1(min)}$	-175 -195 -215	V

Note

When optimum suppression of Barkhausen oscillations and/or snivets is required g_3 may be connected to a positive voltage of approximately 20V.

Hum. At $Z_{g1} = 200 \text{ k}\Omega$ ($f = 50 \text{ Hz}$), $V_{h-k} = 220 \text{ V}_{r.m.s.}$ and without wiring and socket capacitances, the equivalent grid hum voltage is less than 5 mV.

Mounting. This valve requires additional support at the top.

