

# SPECIAL QUALITY DOUBLE TRIODE

# 6211

Special quality double triode, with separate cathodes designed for use in industrial equipment where stability of characteristics and long life are required. This valve will maintain its emission capabilities after long periods of operation under cut-off conditions.

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.

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		
	Series	Parallel	
$V_h^1$	12.6	6.3	V
$I_h$	150	300	mA

The maximum variation of heater current at  $V_h = 6.3V$  is  $\pm 15mA$ .

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 tolerances should be  $< \pm 1.5\%$ .

## CAPACITANCES<sup>2</sup> (measured without an external shield)

	Min.	Av.	Max.	
* $C_{a-g}$	2.0	2.5	3.0	pF
* $C_{in}$	2.1	2.6	3.1	pF
$C_{out'}$	250	400	550	mpF
$C_{out''}$	230	350	470	mpF
$C_{a'-a''}$	—	0.9	1.1	pF
$C_{g'-g''}$	—	—	60	mpF
* $C_{h-k}$	—	2.8	—	pF

\*Each section

## CHARACTERISTICS<sup>3</sup> (each section)

$V_{a-k}$	100	V
$R_k$	470	$\Omega$
$I_a$	4.6	mA
$g_m$	3.6	mA/V
$r_a$	7.8	k $\Omega$
$\mu$	28	

## CHARACTERISTIC RANGE VALUES FOR EQUIPMENT DESIGN

	Average	Initial range	End of life*	
Anode Current				
at $V_{a-k} = 100V$ , $R_k = 470\Omega$	4.6	3.6 to 5.6	—	mA
at $V_a = 150V$ , $V_g = -10V$	—	<100	100	$\mu A$
at $V_a = 85V$ , $V_{g(b)} = 85V$ $R_g = 425k\Omega$	16	12 to 20	7.2	mA
Grid current at $V_a = 100V$ , $V_g = -2V$ , $R_g = 100k\Omega$	—	<0.2	1.0	$\mu A$
Mutual conductance at $V_{a-c} = 100V$ , $R_k = 470\Omega$	3.6	2.7 to 4.5	1.6	mA/V

## INSULATION

	Initial range	End of life*	
Between heater and cathode measured at $V_{h-k} = 180V$ (cathode positive) $R_{lim} = 1.0M\Omega$			
Leakage current	<15	30	$\mu A$
Between any two electrodes measured at 300V	>100	20	M $\Omega$

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

LIMITING VALUES<sup>†</sup> (absolute ratings) each section

$V_{a(b)}$ max.	600	V
$V_a$ max.	200	V
$p_a$ max.	1.5	W
+ $V_g$ max.	1.0	V
- $V_g$ max.	100	V
† $-V_{g(pk)}$ max.	200	V
$I_g$ max.	2.0	mA
† $i_{g(pk)}$ max.	50	mA
$I_k$ max.	14	mA
† $i_{k(pk)}$ max.	75	mA
$R_{g-k}$ max. (fixed bias)	200	k $\Omega$
$V_{h-k}$ max. (cathode positive)	180	V
$V_{h-k}$ max. (cathode negative)	90	V
$V_{h-k(pk)}$ max. (cathode negative)	180	V
$T_{bulb}$ max.	120	°C

†Maximum duration = 10 $\mu s$ . Duty cycle = 1%.



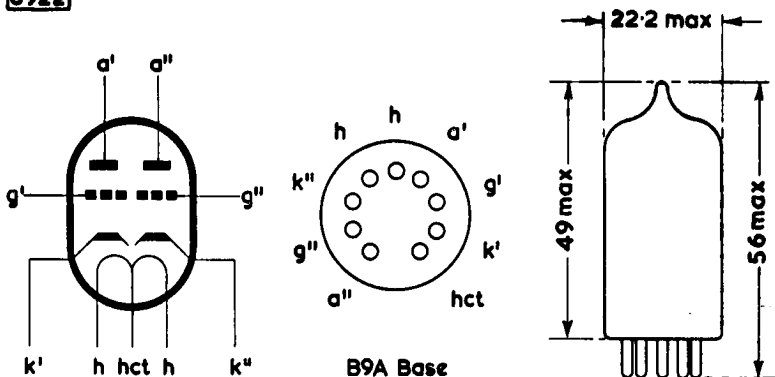
## SHOCK AND VIBRATION

The 6211 can withstand vibrations of 2.5g and 50c/s for 96 hours and is proof against impact accelerations of approximately 300g.

## OPERATING NOTE

The 6211 will maintain its emission capabilities after long periods of operation under cut-off conditions but it is not intended to be used in circuits critical with regard to hum, microphony or noise.

6922



All dimensions in mm

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