

NOTES

Note 8 Delete "Adjust $V_{g1} = 10mA$ " and substitute "Adjust V_{g1} for $I_k = 10mA$."

Note 9 New Note

"With $V_a = V_{g2} = 200v$, $V_{g3} = 0$, adjust V_{g1} to give $I_k = 12mA$. Then apply signal = + 1 volt to g^1 . Reduce V_{g2} to give $I_k = 12mA$. Inner amplification factor = change in V_{g2} ".

December 1960

R.R.E.

ELECTRONIC VALVE SPECIFICATIONS

SPECIFICATION CV.4064

ISSUE NO.1 DATED 14.9.1956.

AMENDMENT NO.3

Page 3, Group D. Inner Amplification Factor.

Amend Limits to read: 30 min. 38 bogie. 46 max.

April 1962
(22649)

Ministry of Aviation/R.R.E.

MINISTRY OF SUPPLY - D.J.L.R.-D.(A)/R.A.E.

Specification MDS(A)/CV.4064 Issue 1 Dated 14.9.56 To be read in conjunction with BS.448, BS.1409 and K.1001	SECURITY	
	<u>Specification</u> UNCLASSIFIED	<u>Valve</u> UNCLASSIFIED

TYPE OF VALVE	- Reliable Miniature H.F. Pentode with a limiting diode connected to g3		<u>MARKING</u> K1001/4		
CATHODE	- Indirectly heated		<u>BASE</u> BS.448/876		
ENVELOPE	- Glass		<u>CONNECTIONS</u>		
PROTOTYPE	- CV2209		Pin	Electrode	
<u>RATINGS</u> (All limiting values are absolute)		Note	1	Grid g1	
Heater Voltage	(V)	6.3	2	Cathode k	
Heater Current	(A)	0.35	3	Heater h	
Max. Heater - Cathode Voltage	(V)	± 150	4	Heater h	
Max. Operating Anode Voltage	(V)	300	5	Anode a	
Max. Anode Voltage ($i_a = 0$)	(V)	550	6	SUP. diode g3 + d	
Max. Operating Screen Voltage	(V)	300	7	Screen g2	
Max. Screen Voltage ($I_{g2} = 0$)	(V)	400	<u>DIMENSIONS</u> See B.S.448/876/2.1 Size Ref. No. 2		
Max. Anode Dissipation	(W)	3.0			
Max. Screen Dissipation	(W)	1.5			
Max. Bulb Temperature	(°C)	200			
Max. Shock (short duration)	(g)	500			
Max. Acceleration (continuous operation)	(g)	2.5			
Inner Amplification Factor (μ g1, g2)		42			
Initial Conductance	(mA/V)	4.0			
Anode Impedance	(Ω)	0.1			
<u>CAPACITANCES</u> (pF)					
C in (nom.)		7.55	A seated height	-	47.5
C out (nom.)		4.55	C diameter	16.0	19.0
Cs, g1 (max.)		0.015	D overall length	-	54.5
			<u>MARKING POSITION</u> ANY		

NOTESA. Measured at $V_a = V_{g2} = 200V$; $V_{g1} = -3.45V$; $V_{g3} = 0$. ($i_a = 7.5$ mA; $I_{g2} = 4.5$ mA).

B. Measured with a close fitting metal screen.

C. **Caution to Electronic Equipment Design Engineers;** Special attention should be given to the temperature of valves to be operated in aircraft. Reliability will be seriously impaired if the maximum bulb temperature is exceeded. The life expectancy may be reduced if conditions other than those specified for life tests are imposed on the valve and will be reduced appreciably if absolute maximum ratings are exceeded. Both reliability and performance will be jeopardised if heater voltage ratings are exceeded; life and reliability performance are directly related to the degree that regulation of the heater voltage is maintained at its centre-rated value.

TESTS

To be performed in addition to those applicable in K1001

To be performed in the specified order unless otherwise agreed with the Inspecting Authority

Test Conditions - unless otherwise specified																																			
<table border="0" style="width:100%; border-collapse: collapse;"> <tr> <td style="text-align: center;">V_a(V)</td> <td style="text-align: center;">V_{g2}(V)</td> <td style="text-align: center;">V_{g3}(V)</td> <td style="text-align: center;">V_{g1}(V)</td> <td style="text-align: center;">V_h(V)</td> <td style="text-align: center;">R_k(Ω)</td> <td colspan="6"></td> </tr> <tr> <td style="text-align: center;">200</td> <td style="text-align: center;">200</td> <td style="text-align: center;">0</td> <td style="text-align: center;">0</td> <td style="text-align: center;">6.3</td> <td style="text-align: center;">287</td> <td colspan="6"></td> </tr> </table>												V _a (V)	V _{g2} (V)	V _{g3} (V)	V _{g1} (V)	V _h (V)	R _k (Ω)							200	200	0	0	6.3	287						
V _a (V)	V _{g2} (V)	V _{g3} (V)	V _{g1} (V)	V _h (V)	R _k (Ω)																														
200	200	0	0	6.3	287																														
K1001 Ref.	Test	Test Conditions	AQL %	Insp. Level	Symbol	Limits						Units																							
						Min.	LAL	Regay	UAL	Max.	ALD																								
7.1	Glass Strain		6.5	I																															
	<u>GROUP A</u>																																		
	Electrode Insulation	V _h = 6.3V. Note 1 V _{g1} to all = -100V V _{g2} to all = -300V V _{g3} to all = -300V V _a to all = -300V		100%	R	100	-	-	-	-	-	H Ω																							
				100%	R	100	-	-	-	-	-	H Ω																							
				100%	R	100	-	-	-	-	-	H Ω																							
				100%	R	100	-	-	-	-	-	H Ω																							
	Reverse Grid Current	R _{g1} = 500k Ω max.		100%	I _{g1}	-	-	-	-	0.5	-	μA																							
	<u>GROUP B</u>																																		
	Combined AQL		1.0																																
5.3	Heater Current		0.65	II	I _h	320	-	350	-	380	-	mA																							
	Ik Leakage Current	V _h k = ±100V; Note 3 V _h k = -100V; (Method Positive)	0.65	II	I _h k	-	-	-	-	20	-	μA																							
				V2	I _h k	-	-	-	5	-	-	μA																							
	Anode Current		0.65	II	I _a	5.6	-	7.1	-	8.6	-	mA																							
				V2	I _a	to be recorded and agreed later						mA																							
	g1 Cut Off Volts	I _a = 0.1 mA	0.65	II	-V _{g1}	-	-	-	-	11	-	V																							
	g3 Cut off Volts	Note 8	0.65	II	-V _{g3}	5	-	-	-	11.5	-	V																							
	Internal Conductance		0.65	II	g _h	3.15	-	4.05	-	5.0	-	mA/V																							
				V2	g _h	to be recorded and agreed later						mA/V																							
	Screen Current		0.65	II	I _{g2}	2.7	-	4.35	-	6.0	-	mA																							
				V2	I _{g2}	to be recorded and agreed later						mA																							
	<u>GROUP C</u>																																		
	Combined AQL		6.5																																
	Biode Current (g3)	V _{g1} = -30V V _{g3} = +30V	2.5	I	I _{g3}	1.0	-	-	-	-	-	mA																							
	Change of Internal Conductance	V _h = 5.7V. Notes 2 and 7	2.5	I	Δg _h	-	-	-	-	15	-	%																							

NOTE

1. Heater and cathode strapped and considered as a single electrode.
2. Change of Mutual Conductance is expressed:-

$$\frac{(\mu \text{ at } 6.3V) - (\mu \text{ at } 5.7V)}{(\mu \text{ at } 6.3V)} \times 100\%$$

3. Heater positive and negative successively.
4. Valves shall be vibrated in each of the three required planes for not less than 30 hours and not less than 100 hours total. Heater switched 1 minute on 3 minutes off. No other voltages applied. Min. peak acceleration = 5g. Frequency = 170 ± 5 c/s.
5. The valves shall be mounted so that the direction of vibration is parallel to the minor axis of the electrode mounting structure. Vibration frequency = any fixed frequency in the range 25 - 100 c/s. Min. peak acceleration = 2g. The test shall be of sufficient duration to obtain a steady reading of noise output.
6. Prior to this test the valve shall be preheated for 5 minutes under the test conditions. I_g shall not be rising or out of limit after a total of 10 minutes.
7. Preheat the valves for 5 minutes under the test conditions before making this test.
8. V_a = 200V; V_{g2} = 100V; adjust V_{g1} = 10mA with V_{g3} = 0. V_{g3}, adjust for I_a = 0.1 mA.