

VALVE ELECTRONIC

ADMIRALTY SIGNAL AND RADAR ESTABLISHMENT

**CV4066.**

Specification AD/CV4066 Issue No. 2 dated 21st March, 1957. To be read in conjunction with K1001 and BS1409	<u>SECURITY</u>	
	<u>Specification</u> Unclassified	<u>Valve</u> Unclassified

—————> Indicates a change

<u>TYPE OF VALVE</u>		Reliable Sub-miniature Gas-filled Voltage Reference Tube with flexible leads.		<u>MARKINGS</u> See K1001/4		
<u>CATHODE</u>	Cold	<u>BASE</u> Button. Flying Leads 3 in line across a diameter. See drawing on page 5.				
<u>ENVELOPE</u>	Glass, unmetallised					
<u>PROTOTYPE</u>	VX8190C					
<u>RATINGS</u> (all limiting values are absolute)			<u>CONNECTIONS</u>			
			Notes			
Max. Striking Voltage (V)	125	A	<u>Lead</u>	<u>Electrode</u>		
Nominal Stabilised Voltage (V)	86		1	Cathode	k	
Recommended Operating Current (mA)	2.0		2	Omitted		
Max. Cathode Current (mA)	3.5		3	Anode	a	
Min. Cathode Current (mA)	0.5		4	Omitted		
Max. Incremental Resistance (ohms)	1,000		5	Cathode	k	
Max. Acceleration (continuous operation) (g)	2.5		<u>DIMENSIONS</u> See drawing on page 5			
Shock (short duration) (g)	750		<u>Dimension (mm)</u>		Min.	Max.
Ambient Temperature Range (°C)	-55 to +90		A. (Seated height)			35
Life Expectancy (Min.) (Hours)	10,000		B. (Diameter)			10.2
		C. (Length of lead)		38	-	
			<u>MOUNTING POSITION</u> Any			
<u>NOTES</u>						
A. Measured either in total darkness or in normal ambient light.						

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TESTS

To be performed in addition to those applicable in K1001

## Test Conditions - Unless otherwise specified

$V_a(b)$	R.lim.	$I_a$
V	(ohms)	(mA)
(Note 1)	30K $\Omega$	2.0 (Note 2)

A D.C. voltage not exceeding 100 volts shall be applied between Anode and Cathode and shall be increased steadily at a rate not exceeding 25 volts/second until the valve strikes. The ripple content of the supply shall not exceed 0.25%.

After the valve has struck, the supply voltage shall be further increased until the anode current is 2.0 mA. It shall be maintained constant for 3 minutes before any characteristic other than striking voltage is measured.

K1001	Test	Test Conditions	AQL %	Insp. Level	Symbol	Limits		Units	Notes
						Min.	Max.		
→ 7.1	Glass Strain	No voltages	6.5	I					
	<u>GROUP A</u>								
	Striking voltage			100%	$V_s$	-	125	V	4
	Maintaining voltage (1)	$I_a = 2.0$ mA		100%	$V_m$	84	88	V	
	Regulation	$I_a$ change from 1.9 to 2.1 mA		100%	$\Delta V_m$		0.2	V	
	Voltage jumps	Vary $I_a$ from 1.2 to 3.5 mA		100%			25	mV P/P	5, 6
	Oscillation	Vary $I_a$ from 1.2 to 3.5 mA		100%			15	mV P/P	5
	Microphony			100%			25	mV P/P	7
	<u>GROUP B</u>								
	Temperature Co-efficient (1)	Temperature varied from -55°C to +25°C		T.A.			-6	mV/°C	3
	Temperature Co-efficient (2)	Temperature varied from +25°C to +90°C		T.A.			-3	mV/°C	3

K1001	Test	Test Conditions	AGL %	Insp. Level	Symbol	Limits		Units	Notes
						Min.	Max.		
	Low pressure Voltage breakdown.	Pressure equivalent to 60,000ft. Increase the voltage applied to the valve until the current flows.			T.A.	-	125	V	2
	<u>GROUP C</u> Striking Voltage (Dark strike) Leakage current.  Maintaining Voltage(2) Regulation. (2)	<u>Combined AGL</u>  $V_a = 50V$ D.C., $R_a = 1$ megohm. $I_a = 3.5mA$ $I_a$ change from 0.5mA to 3.5mA.	6.5 2.5 2.5 2.5		$V_a$ $I_a$ $V_m$ $\Delta V_m$	-	125 15 89 3	V $\mu A$ V V	1
5.12	<u>GROUP D</u> Lead fragility	No voltages	6.5	IA					
11.2	<u>GROUP E</u> Resonance search (1)  Vibration Noise Output  Resonance search (2)	$R_a = 27,000$ ohms. Acceleration 2g. Frequency varied between 25 and 500 c.p.s.	2.5	IC	$V_a(A.C.)$	-	5.0	mV r.m.s.	
11.3	Vibration Noise Output  Fatigue test.	$R_a = 27,000$ ohms. Acceleration 2g. Frequency varied between 500 and 2,500 c/s.	2.5	IC	$V_a(A.C.)$	-	15.0	mV r.m.s.	
		No voltages. Acceleration 5g. Frequency 170 $\pm$ 5 c.p.s. Duration 30x30x 39 hours		IA					
		<u>POST FATIGUE TESTS</u>							
	Change in Maintaining Voltage Microphony	<u>Combined AGL</u>	4.0 2.5 2.5		$\Delta V_m$		$\pm 0.8$ 50	V mV P/P.	8 7
11.4	Shock test.	No voltages Acceleration(750g) Hammer angle 45 $^\circ$		IA					
		<u>POST SHOCK TESTS</u>							
	Change in Maintaining Voltage Microphony	<u>Combined AGL</u>	4.0 2.5 2.5		$\Delta V_m$		$\pm 0.8$ 50	V mV P/P.	8 7

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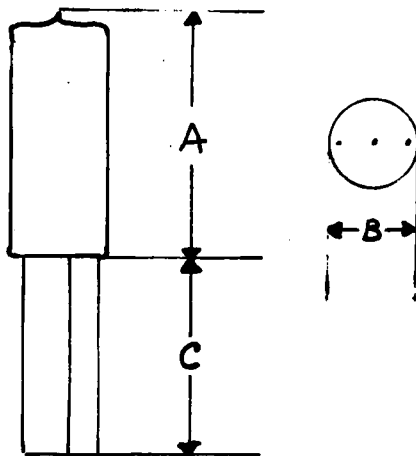
K1001	Test	Test Conditions	AQL %	Insp. Level	Symbol	Limits		Units	Notes
						Min.	Max.		
A VI/ 5	<u>GROUP F</u> Life test	<u>Combined AQL</u> Ia = 2.0 mA	6.5						9
	<u>End Point 1,000 hours</u>								
	<u>Tests to be performed during and at END of LIFE</u>								10
	Striking Voltage (1)		2.5		V <sub>s</sub>	125	V		4
	Change in maintaining voltage	0-300 hours	2.5		ΔV <sub>m</sub>	+0.4	V		
Change in maintaining voltage	0-1,000 hours	2.5		ΔV <sub>m</sub>	+0.8	V			
Regulation	Ia change from 1.9 to 2.1mA	2.5		ΔV <sub>m</sub>	+0.20 -0.0	V			
A IX 2.5	<u>GROUP G</u> Re test after holding period (28 days)								
	Inoperatives		0.5	100%					
	Striking voltages		0.5	100%	V <sub>s</sub>	125	V		4
	Maintaining voltage		0.5	100%	V <sub>m</sub>	84 88	V		

NOTES

- This test is to be conducted in total darkness after the valves have been held in darkness for 24 hours.
- There shall be no evidence of discharge between the leads for anode voltages up to the striking voltage of the valve.
- The tube voltage drop shall be measured in 10°C steps over the temperature range specified.
- This test is to be conducted in normal ambient room lighting, 5 to 50 foot candles.
- A calibrated amplifier detector with C.R.T. indicator, having a substantially linear response over the range 50 to 5,000 c.p.s. is to be connected between the anode and cathode. The anode current is to be varied over the specified range and back at least three times.
- The jump voltages must be within the specified limits.
- The valve shall be tapped and the noise shall not exceed the specified limit.

NOTES contd.

8. Before the test is performed the tube must be run for 3 minutes with  $I_a$  adjusted to 2.0 mA.
9. Valves used for this test are acceptable for delivery.
10. Readings are to be made at 0 hours, 300 (+48, -24) hours and 1,000 (+48, -24) hours.



Leads:-

0.45 mm tinned  
flexible  
wire.2.44 mm centre to  
centre.