VALVE ELECTRONIC **C.V.4054**

ADMIRALTY SIGNAL AND RADAR ESTABLISHMENT

Specification AD/CV4054
Issue No. 2 dated 20.8.56
To be read in conjunction with K1001 and B.S.1409

SECURITY	
Specification	Valve
Unclassified	Unclassified

→ Indicates a change

TYPE OF VALVE: Reliable Gas-filled Voltage Reference Tube, with flexible leads

CATHODE: Cold

ENVELOPE: Glass

PROTOTYPE: VX8142

MARKING
See K1001/4

BASE
B7G/F

RATINGS
(All limiting values are absolute).

		Note
Max. Striking Voltage (V)	115	
Nominal Stabilised Voltage (V)	85	
Recommended Operating Current (mA)	6	
Max. Cathode Current (mA)	10	
Min. Cathode Current (mA)	1	
Max. Incremental Resistance (Ohm)	450	A
Max. Acceleration (continuous operation) (g)	2.5	
Shock (short duration) (g)	500	
Ambient Temperature Range (°C)	-55 to +90	
Life Expectancy (Min) (Hours)	10,000	
Max. percentage variation of burning voltage -		B
During first 300 hours of life %	0.3	
During subsequent 1000 hours %	0.2	
Typical percentage drift of burning voltage per 1000 hours after 1300 hours %	0.1	
Max. Temperature Coefficient between -55°C and +25°C (mV/°C)	-10	
Max. Temperature Coefficient between +25°C and 90°C (mV/°C)	- 5	

CONNECTIONS

Lead	Electrode
1	Anode a
2	Cathode k
3	Internally Connected
4	Cathode k
5	Anode a
6	Internally Connected
7	Cathode k

DIMENSIONS
See K1001/A1/D11

Dimension (mm)	Min.	Max.
A (Seated Height)	-	47
B (Diameter)	16	19
D (Length of leads)	38	-

MOUNTING POSITION
Any

NOTES

A. Measured at an anode current of 6 mA.
B. After the initial warming up period of 3 minutes.

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TESTS

To be performed in addition to those applicable in K1001.

Tests are to be performed in the specified order unless otherwise agreed with the Inspecting Authority.

Test Conditions - Unless otherwise specified

Va (b) (V) (Note 1)	R lim (ohms)	Ia (mA)
	5K	6.0 (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 6.0 mA. It shall be maintained constant for 3 minutes before any characteristic, other than striking voltage, is measured.

K1001	Test	Test Condition	AQL %	Insp. Level	Symbol	Limits Min.	Limits Max	Units	Notes
→ 7.1	Glass Strain	No voltages	6.5	I					
	GROUP A								
	Striking voltage			100%	Va	-	115	V	1
	Maintaining voltage			100%	Vb	83	87	V	
	Regulation (1)	δ Va for change of Ia from 5.8 to 6.2 mA		100%			0.18	V	
	Voltage jumps	Ia varied from 1.0 to 10.0 mA Ra = 500 ohms		100%			100	mV p/p	2
	Oscillation	Ia varied from 1.0 to 10.0 mA Ra = 500 ohms		100%			5	mV p/p	
	Microphonic noise	Ra = 500 ohms		100%			15	mV p/p	4
	Leakage Current	Supply voltage = 55V D.C. Ra = 1 megohm		100%			5	uA D.C.	

TESTS (CONT'D

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K1001	Test	Test Conditions	AQL %	Insp. Level	Symbol	Limits Min	Limits Max.	Units	Notes
	GROUP B								
	Temperature Coefficient (1)	Temperature varied from -55°C to +25°C		TA					6
	Temperature Coefficient (2)	Temperature varied from +25°C to +90°C		TA					6
	Striking Voltage	Measure at Temperature = -50°C		TA			115	V	1
	Regulation	δ Va for change of Ia from 1.0 to 10.0 mA Temperature = +90°C							6
	GROUP C								
	Striking Voltage (Dark Strike)		2.5	I	Vs		115	V	5
	Regulation (2)	δ Va for change of Ia from 1.0 to 10.0 mA	2.5	I			4.0	V	
	GROUP D								
5.12	Lead fragility	No voltages	6.5	IA					
11.2	Resonance Search (1)	Ra = 27k Frequency = 25 to 500 c/s		IC					
11.1	Vibration Noise Output		2.5		Va (AC)		5	mV RMS	
	Resonance Search (2)	Ra = 27K Frequency = 500 to 2500 c/s		IC					
11.1	Vibration Noise Output		2.5		Va (AC)		15	mV RMS	

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K1001	Test	Test Conditions	AQL %	Insp. Level	Symbol	Limits Min.	Limits Max.	Units	Notes
11.3	Fatigue Test	Ia = 0 Duration 30 + 30 + 39 hrs. Acceleration = 5 g. Frequency = 170 c/s		IA					
	Post Fatigue Test	Combined AQL	4.0						
	Anode Voltage Change		2.5		δVa		±0.7	V	
11.1	Vibration Noise		2.5				30	mV p/p	
11.4	Shock Test	Ia = 0 Acceleration = 500 g.		IA					
	Post Shock Test	Combined AQL	4.0						
	Anode Voltage Change		2.5	IA	δVa		±0.7	V	
11.1	Vibration Noise		2.5				30	mV p/p	
	GROUP E								
AVI/5	Life Test End Point 1000 hours								
	Inoperatives		2.5	IA					
	Striking voltage.		2.5		Va		115	V	
	Change of maintaining voltage during life.		2.5				0.4	V	
	Regulation		2.5				0.19	V	

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TESTS (CONT'D)

K1001	Test	Test Conditions	AQL %	Insp. Level	Symbol	Limits Min.	Limits Max.	Units	Notes
	GROUP F								
A D4/25	Electrical Re-test after 28 days holding period.			100%					
	Inoperatives		0.5						
	Striking Voltage.		0.5	100%			116	V	
	Maintaining Voltage.		0.5	100%		82	88	V	
	Regulation (1)	δ Va for change of Ia from 5.8 to 6.2 mA	0.5	100%			0.19	V	

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N O T E S

1. Test to be conducted in normal ambient room lighting (5-50 ft. candles)

2. A calibrated amplifier detector with C.R.T. indicator having a substantially linear response over the range 50-5000 c/s is to be connected between the anode and cathode. The anode current is to be varied slowly from 1.0-10.0 mA and back to 1.0 mA at least three times.

3. The tube voltage drop shall be measured at 10°C steps over the temperature range specified.

4. The valve shall be tapped and the noise shall not exceed the limit specified.

5. This test is to be conducted in total darkness after the valves have been held in total darkness for 24 hours. ←

6. In group B on page 3, the first two tests and the last test are under review. Limit figures for these tests will be supplied when known. ←