ADMIRALTY SIGNAL AND RADAR ESTABLISHMENT

VALVE ELECTRONIC

# CV4066.

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

→ Indicates a change

| | |
|---|---|
| TYPE OF VALVE: Reliable Sub-miniature Gas-filled Voltage Reference Tube with flexible leads.<br>CATHODE: Cold<br>ENVELOPE: Glass, unmetallised<br>PROTOTYPE: VX8190C | MARKINGS: See K1001/4<br>BASE: Button. Flying Leads 3 in line across a diameter. See drawing on page 5. |

## RATINGS
(all limiting values are absolute)

| | | Notes |
|---|---|---|
| Max. Striking Voltage (V) | 125 | A |
| Nominal Stabilised Voltage (V) | 86 | |
| Recommended Operating Current (mA) | 2.0 | |
| Max. Cathode Current (mA) | 3.5 | |
| Min. Cathode Current (mA) | 0.5 | |
| Max. Incremental Resistance (ohms) | 1,000 | |
| Max. Acceleration (continuous operation) (g) | 2.5 | |
| Shock (short duration) (g) | 750 | |
| Ambient Temperature Range (C°) | -55 to +90 | |
| → Life Expectancy (Min.) (Hours) | 10,000 | |

## CONNECTIONS

| Lead | Electrode | |
|---|---|---|
| 1 | Cathode | k |
| 2 | Omitted | |
| 3 | Anode | a |
| 4 | Omitted | |
| 5 | Cathode | k |

## DIMENSIONS

See drawing on page 5

| Dimension (mm) | Min. | Max. |
|---|---|---|
| A. (Seated height) | | 35 |
| B. (Diameter) | | 10.2 |
| C. (Length of lead) | 38 | - |

## MOUNTING POSITION

Any

## NOTES

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

| $V_a(b)$ V (Note 1) | R.lim. (ohms) 30K~ | $I_a$ (mA) 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 Min. | Limits Max. | Units | Notes |
|---|---|---|---|---|---|---|---|---|---|
| → 7.1 | Glass Strain | No voltages | 6.5 | I | | | | | |
| | GROUP A | | | | | | | | |
| | 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 |
| | GROUP B | | | | | | | | |
| | 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 |

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| K1001 | Test | Test Conditions | AQL % | Insp. Level | Symbol | Limits Min. | Limits Max. | Units | Notes |
|---|---|---|---|---|---|---|---|---|---|
| | 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 |
| | GROUP C | Combined AQL | 6.5 | | | | | | |
| | Striking Voltage (Dark strike) | | 2.5 | I | $V_s$ | - | 125 | V | 1 |
| | Leakage current. | $V_a$ = 50V D.C., $R_a$ = 1 megohm. | 2.5 | I | $I_a$ | - | 15 | µA | |
| | Maintaining Voltage (2) | $I_a$ = 3.5mA | 2.5 | I | $V_m$ | | 89 | V | |
| | Regulation. (2) | $I_a$ change from 0.5mA to 3.5mA. | 2.5 | I | $\Delta V_m$ | | 3 | V | |
| 5.12 | GROUP D Lead fragility | No voltages | 6.5 | IA | | | | | |
| | GROUP E | | | | | | | | |
| 11.2 | Resonance search (1) | $R_a$ = 27,000 ohms. Acceleration 2g. Frequency varied between 25 and 500 c.p.s. | | IC | | | | | |
| | Vibration Noise Output | | 2.5 | | Va(A.C.) | - | 5.0 | mV r.m.s. | |
| | Resonance search (2) | $R_a$ = 27,000 ohms. Acceleration 2g. Frequency varied between 500 and 2,500 c/s. | | IC | | | | | |
| | Vibration Noise Output | | 2.5 | | Va(A.C.) | - | 15.0 | mV r.m.s. | |
| 11.3 | Fatigue test. | No voltages. Acceleration 5g. Frequency 170±5 c.p.s. Duration 30x30x 39 hours | | IA | | | | | |
| | | POST FATIGUE TESTS | | | | | | | |
| | Change in Maintaining Voltage | Combined AQL | 4.0 | | | | | | |
| | | | 2.5 | | $\Delta V_m$ | | ±0.8 | V | 8 |
| | Microphony | | 2.5 | | | | 50 | mV p/p | 7 |
| 11.4 | Shock test. | No voltages Acceleration(750g) Hammer angle 48° | | IA | | | | | |
| | | POST SHOCK TESTS | | | | | | | |
| | Change in Maintaining Voltage | Combined AQL | 4.0 | | | | | | |
| | | | 2.5 | | $\Delta V_m$ | | ±0.8 | V | 8 |
| | Microphony | | 2.5 | | | | 50 | mV p/p. | 7 |

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

NOTES

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

2. There shall be no evidence of discharge between the leads for anode voltages up to the striking voltage of the valve.

3. The tube voltage drop shall be measured in $10^{o}C$ steps over the temperature range specified.

4. This test is to be conducted in normal ambient room lighting, 5 to 50 foot candles.

5. 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.

6. The jump voltages must be within the specified limits.

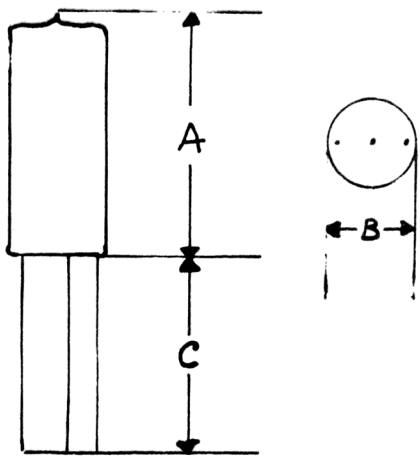
7. The valve shall be tapped and the noise shall not exceed the specified limit.

NOTES contd.

8. Before the test is performed the tube must be run for 3 minutes with Ia 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.