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

VALVE ELECTRONIC **CV2354**

| Specification MOS(A)/CV.2354<br>Issue 2 Dated 14.9.55<br>To be read in conjunction with BS448 and K1001<br>ignoring clauses: 5.2, 5.3 and 5.8 | SECURITY<br>Specification: UNCLASSIFIED<br>Valve: UNCLASSIFIED |
|---|---|

TYPE OF VALVE - Velocity Modulated Local Oscillator with Tunable Internal Cavity Resonator having coaxial line output.

CATHODE - Indirectly Heated

ENVELOPE - Metal/Glass

PROTOTYPE - R.6015

**MARKING**

See K.1001/4

**TOP CAP**

B.S.448/CT2

**BASE**

B.S.448/B8G

| RATING | | | Note |
|---|---|---|---|
| Heater Voltage | (V) | 6.3 | |
| Heater Current | (A) | 0.9 | C |
| Max. Resonator Voltage | (V) | 300 | A,B,D |
| Normal Resonator Voltage | (V) | 275 | B,C |
| Reflector Voltage Range | (V) | -50 to -250 | B,G,F |
| Grid Voltage Range | (V) | 0 to -100 | B |
| Max. Resonator Current | (mA) | 70 | A,D |
| Min. R.F. Power output | (mW) | 40 | |
| Mechanical Tuning Range | (Mc/s) | 4270 to 4760 | |
| Min. Electronic Tuning Range | (Mc/s) | 10 | E |
| Max. Reflector Voltage Change over 10 Mc/s range | (V) | 50 | |
| Mean Reflector Voltage Change over 10 Mc/s range | (V) | 30 | |
| Max. total impedance in reflector to cathode circuit | (MΩ) | 0.25 | |

There shall be no appreciable potential difference between heater and cathode.

**CONNECTIONS**

| | |
|---|---|
| 1 | Cathode |
| 2 | Internally Connected |
| 3 | Grid |
| 4 | Heater |
| 5 | Grid |
| 6 | Heater |
| 7 | Internally Connected |
| 8 | Grid |
| TC | Reflector |
| Metal Envelope | Resonator |

**DIMENSIONS**

See Drawings on pages 4 and 5

**MOUNTING POSITION**

Any
Note H

**NOTES**

See page 2

NOTES

A. Absolute Value.

B. The voltages quoted in this specification are relative to cathode. The valve is normally operated with the resonator at earth potential.

C. It is preferable that the resonator voltage is not switched on until at least 60 seconds after the heater.

D. The temperature of the valve envelope should not at any point exceed 200°C, nor should that of the external metal parts exceed 150°C. Forced air cooling is not normally necessary.

E. Measured at half-power points.

F. If a high impedance reflector supply is used, the circuit must include a diode to prevent the reflector reaching a potential more positive than the cathode.

G. The reflector voltage required depends on the frequency and mode of oscillation. Over the specified frequency range the specified power is obtained at a voltage within the limits stated.

H. The valve is mounted on a waveguide of internal dimensions 2" x 1", terminated by a matched load. A reflecting plunger at the valve end of the waveguide is fixed at a distance from the output probe corresponding to a quarter wavelength at midband (4515 Mc/s).

# TESTS

# CV2354

To be performed in addition to those applicable in K.1001

| | Test Conditions | | | | | Tests | Limits Min. | Limits Max. | No. Tested | Note |
|---|---|---|---|---|---|---|---|---|---|---|
| | Vh (V) | Vg (V) | Vres. (V) | Vref. (V) | Freq. (Mc/s) | | | | | |
| a | 6.3 | 0 | 0 | 0 | 0 | Ih (A) | 0.8 | 1.0 | 100% | 1 |
| b | 6.3 | 0 | 275 | Adjust for max. power | 4270 | (1)Ia (mA)<br>(2)Vr (V)<br>(3)Ir (μA)<br>(4)Power output (mW) | -<br>-50<br>-10<br>40 | 70<br>-250<br>10<br>300 | 100%<br>100%<br>100%<br>100% | 1,4 |
| c | 6.3 | 0 | 275 | Adjust Vr less -ve for half power; Note value (Vr1)<br>Adjust Vr more -ve for half power; Note value (Vr2) | f = 4270 Note value (f1)<br>Note value (f2) | (1)f1-f (Mc/s)<br>(2)f-f2 (Mc/s)<br>(3)$\frac{f1-f2}{Vr2-Vr1}$ (Mc/s/V) | 5<br>5<br>0.2 | -<br>-<br>2.2 | 100%<br>100%<br>100% | 1,2,3 |
| d | As test b | | | | 4760 | As test b | | | | |
| e | As test c | | | | 4760 | As test c | | | | |
| f | As test b | | | | 4515 | As test b | | | | |
| g | As test c | | | | 4515 | As test c | | | | |
| h | 5.8 | 0 | 275 | Adjust for max. power | Any value | Ia | observe value | | 100% | 1 |
| j | 6.8 | 0 | 275 | Re-adjust for max. power | - | Change in Ia from value in test (h) (%) | - | 15 | 100% | 1,2 |
| k | Electrical Re-test after 28 days holding period<br>As test b | | | | 4515 | As test b | | | | 5 |

## NOTES

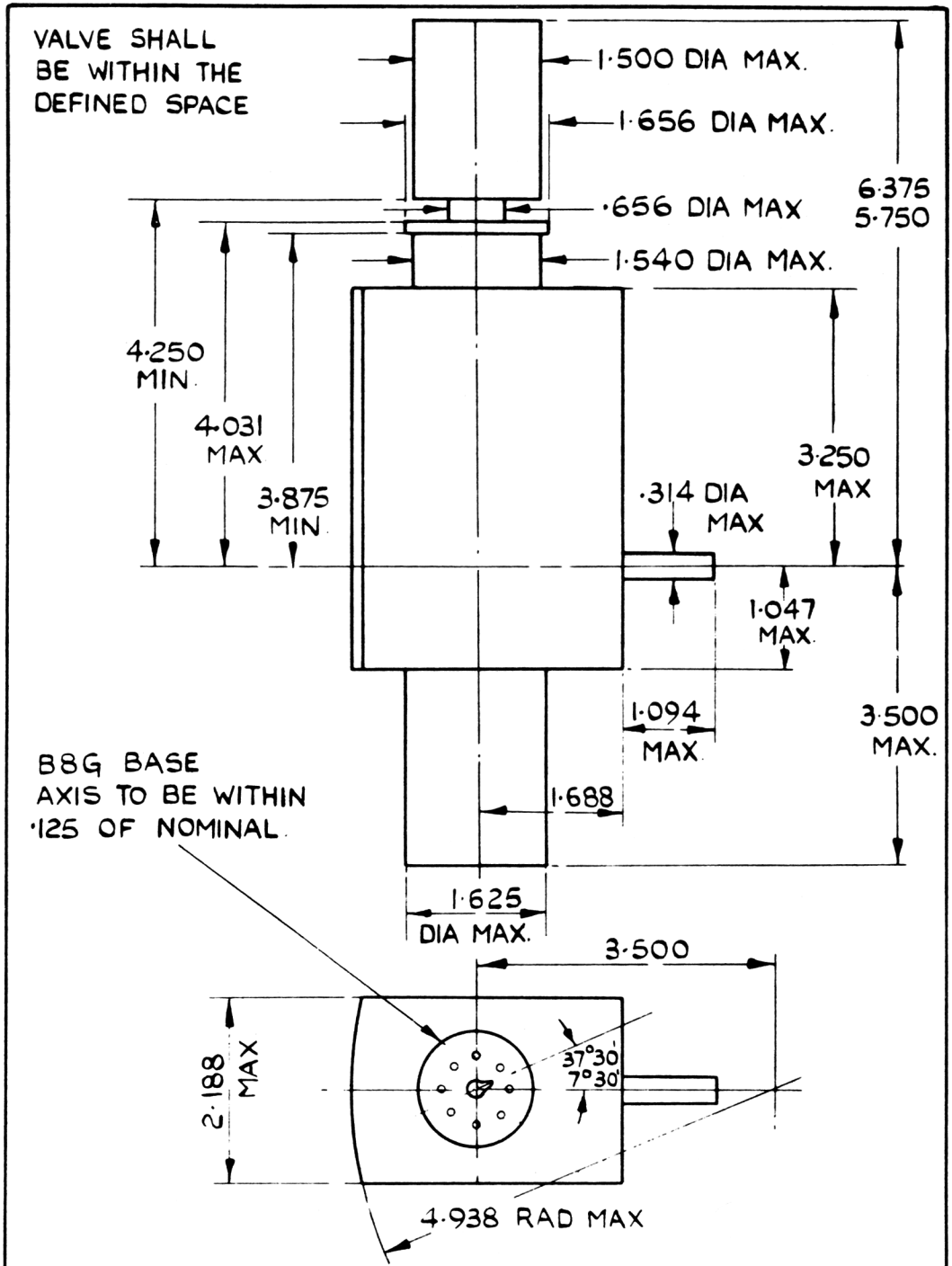
1. The valve shall be run under normal operating conditions for a minimum period of 10 minutes before carrying out tests (a) to (k).

2. Tests (c), (e), (g) and (j) are to be done with mechanical tuning set as in tests (b), (d), (f) and (h) respectively.

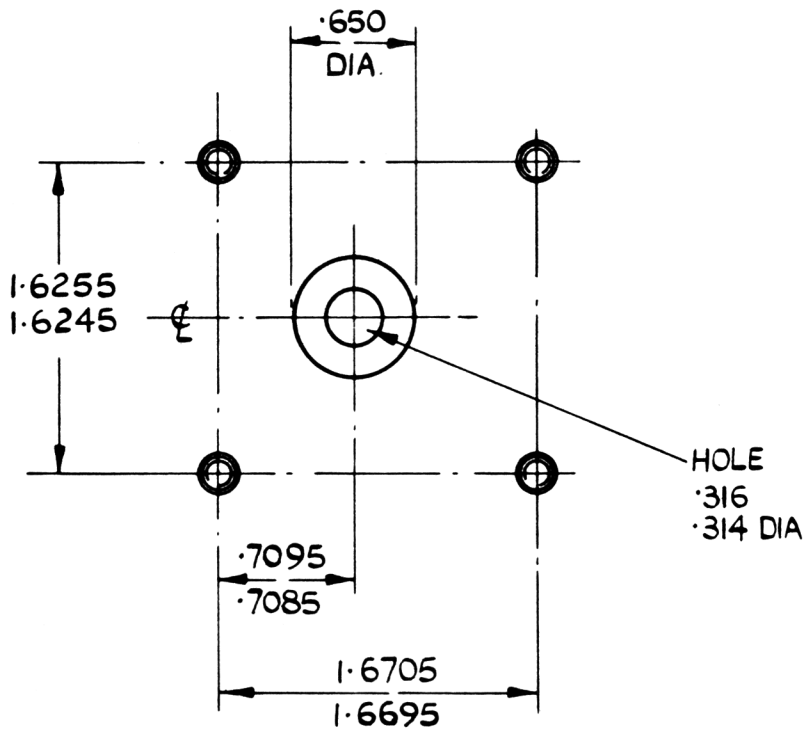
3. There shall be no discontinuity in the rate of change of power with reflector voltage between the half power points.

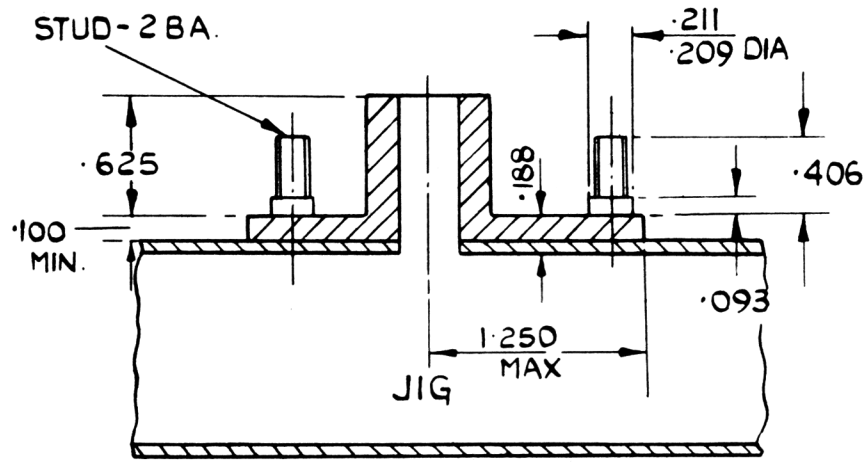
4. The frequency shall be adjusted by means of the mechanical tuning with the reflector voltage adjusted simultaneously for maximum power.

5. That part of Ir due to the ion current shall not have increased over the original value by more than the expected error of measurement.


VALVE SHALL BE WITHIN THE DEFINED SPACE
1·500 DIA MAX.
1·656 DIA MAX.
·656 DIA MAX
1·540 DIA MAX.
6·375
5·750
4·250 MIN.
4·031 MAX
3·875 MIN.
3·250 MAX
·314 DIA MAX
1·047 MAX.
1·094 MAX.
3·500 MAX.
1·688
B8G BASE AXIS TO BE WITHIN ·125 OF NOMINAL.
1·625 DIA MAX.
3·500
2·188 MAX
37°30'
7°30'
4·938 RAD MAX
DIMENSIONS IN INCHES.

# CV2354




VALVE SHALL FIT ONTO JIG BY MEANS OF 4 CAPTIVE SCREWS

DIMENSIONS IN INCHES.
LIMITS UNLESS OTHERWISE STATED TO BE ±·005