ADMIRALTY SIGNAL AND RADAR ESTABLISHMENT

VALVE ELECTRONIC **CV2308**
CV2309

Specification AD/CV2308, CV2309 Issue No. 2 Dated 17.8.55. To be read in conjunction with K1001	SECURITY Specification: Unclassified Valve: Unclassified

→ Indicates a change

TYPE OF VALVE: Broad Band T.B. Cell

PROTOTYPES: VX4142 (BS.116)
VX4143 (BS.118)

MARKING
See K1001/4

RATING		Note
Operating frequency:		
CV2308 (Mc/s)	9050 to 9600	
CV2309 (Mc/s)	8500 to 9050	
Max. Transmitter Peak Power at 0.001 duty cycle (kW)	50	A
Min. Transmitter Peak Power (kW)	5	

DIMENSIONS

CV2308 - See drawings, Pages 4 and 6

CV2309 - See drawings, Pages 5 and 6

NOTES

A. Absolute Maximum Value

B. At least one washer of the dimensions given in the drawing on pages 4 and 5 shall be supplied with each valve.

TESTS

To be performed in addition to those applicable in K1001

	Test Conditions	Test	Limits Min.	Limits Max.	No Tested	Note
a	Valve shall be mounted as shown in drawing on page 6 and terminated in a matched load (V.S.W.R. better than 1.03). Test frequency:- CV2308 = 9325 Mc/s ±0.05% CV2309 = 8775 Mc/s ±0.05%	Equivalent Conductance G/Yo	-	0.10	100%	1
b	As for Test (a)	Tuning Susceptance B/Yo	-0.06	+0.06	100%	2
c	Valve shall be mounted as shown in drawing on page 6 and terminated in a matched load (V.S.W.R. better than 1.03) Test at a frequency between 8500 and 9600 Mc/s. Line to be energised with 4kW peak R.F. power with Tp = 1.0 µsecs. ± 10% and p.r.f. 1000 c/s ± 10%. Test to be performed at least 7 days after pumping and at least 24 hours after any previous discharge.	Firing Time (Secs) Time interval between application of power and valve firing (measured at least 24 hours after any previous discharge)	-	10	100%	
d	As for Test (c) ignoring the last sentence.	Arc Loss (dB)	-	0.8	100%	3
e	Valve shall be mounted as shown in drawing on page 6 and terminated in a matched load. Test at a frequency between 8500 and 9600 Mc/s. Line to be energised with 12-15kW peak R.F. power derived from a higher power source through an attenuator of not less than 6 dB with Tp = 1.0 µsec. ± 10% and p.r.f. = 1000 c/s ± 10%.	Recovery Loss (dB) After 2 µsecs. (measured between trailing edge of transmitter pulse and leading edge of a signal pulse of the same frequency as the test frequency).	-	2.0	100%	

TESTS

To be performed in addition to those applicable in K1001

	Test Conditions	Test	Limits		No. Tested	Note
			Min.	Max.		
f	As for Test (a)	Loaded Q	-	6.5	T.A.	4
g	As for Test (e) Load V.S.W.R. to be better than 1.02.	High Level Voltage Standing Wave Ratio	-	1.11	5%	

NOTES

1. The effect of susceptance on the V.S.W.R. is negligible at the test frequency; therefore, the equivalent conductance $\frac{G}{Yo}$ can be taken as equal to $\frac{1}{r-1}$, where r is the V.S.W.R.

2. Susceptance may be measured by comparing the phase of the reflection from the valve with the phase of the reflection from another valve known to be resonant at the test frequency. Then, provided $\Delta\lambda$ is small,

$$\frac{B}{Yo} \doteq (1 + \frac{2G}{Yo}) \frac{2\pi\Delta\lambda}{\lambda g}$$

where λ g is the guide wavelength and $\Delta\lambda$ is the phase difference measured in the same units as λ g.

3. That is, the power loss in the arc shall be less than 680W peak.

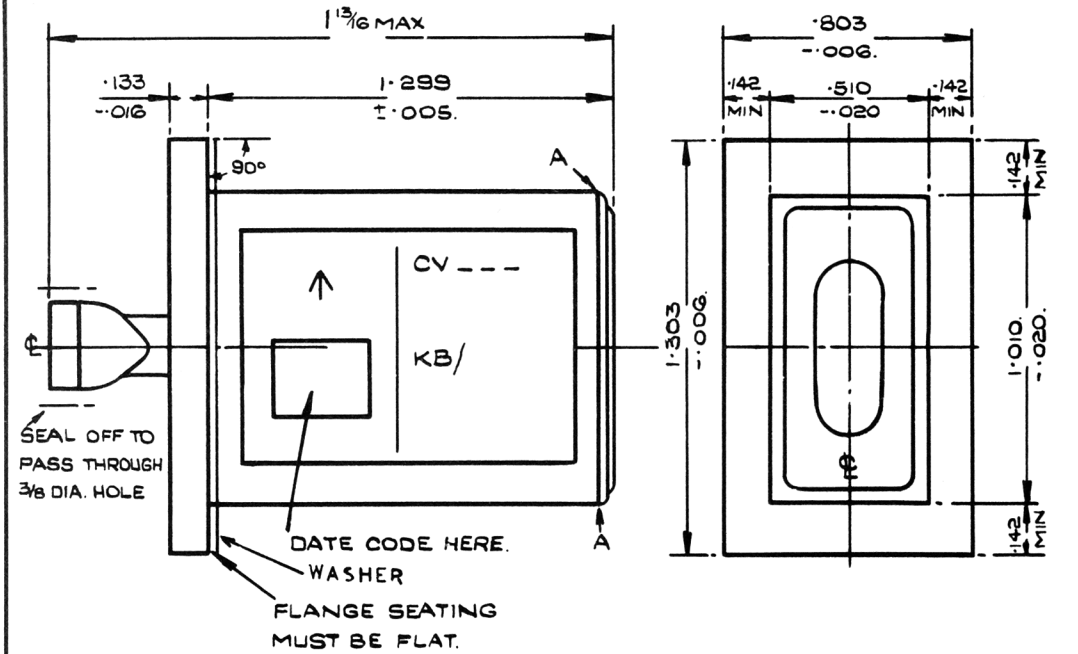
4. Loaded Q is defined as:-

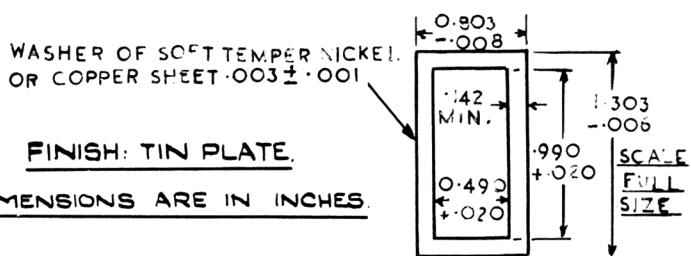
$$\text{Loaded Q} = \frac{Fo \frac{d}{dF} (\frac{B}{Yo})}{2(1 + \frac{G}{Yo})}$$

where Fo = Test Frequency.

SCALE: TWICE FULL SIZE.

ALL ·142 MIN DIMENSIONS TO BE MEASURED AT A-A.





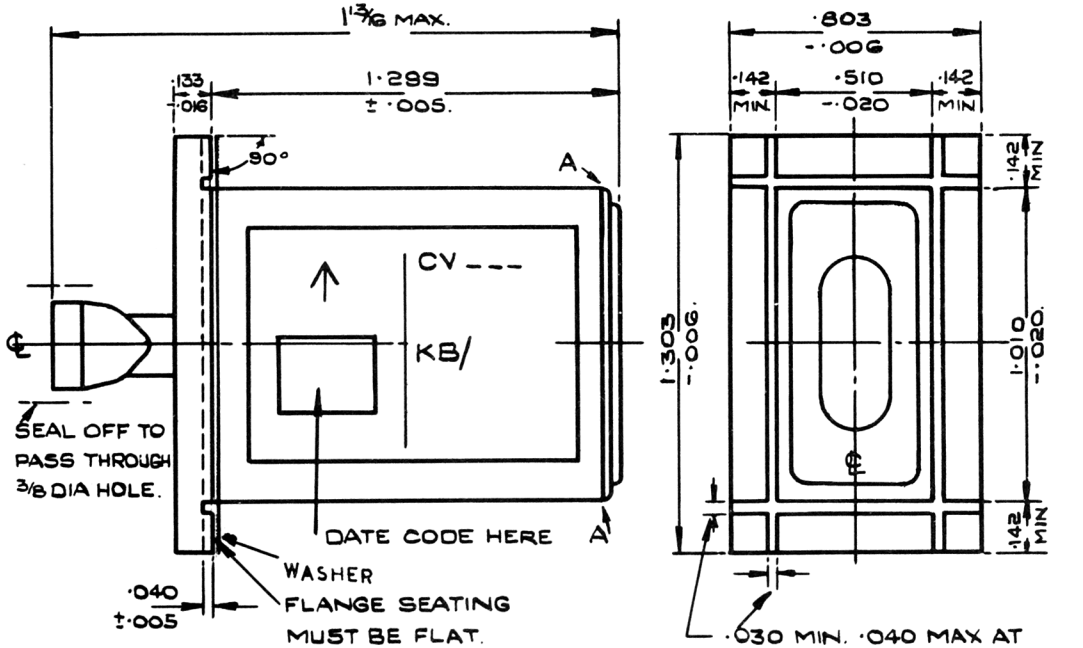
FINISH: TIN PLATE.

ALL DIMENSIONS ARE IN INCHES.

CV2309

SCALE: TWICE FULL SIZE.

ALL ·142 MIN. DIMENSIONS TO BE MEASURED AT A-A.



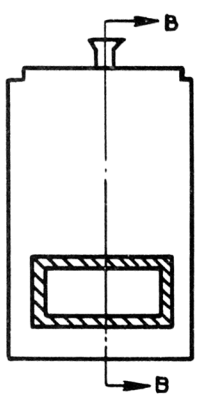
FINISH: TIN PLATE.

ALL DIMENSIONS ARE IN INCHES.

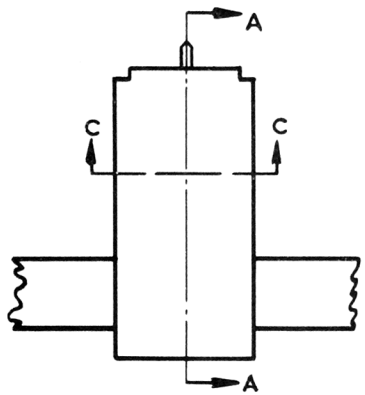
MOUNT FOR TESTING

NOTE 1. 0·015 CUT-AWAY AT SIDE OF WAVEGUIDE MEASURED FROM THE PLANE OF THE INNER SURFACE OF THE TOP OF THE WAVEGUIDE.

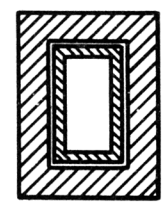
NOTE 2. 0·030 TO 0·040 SPACING ALL ROUND THE VALVE.



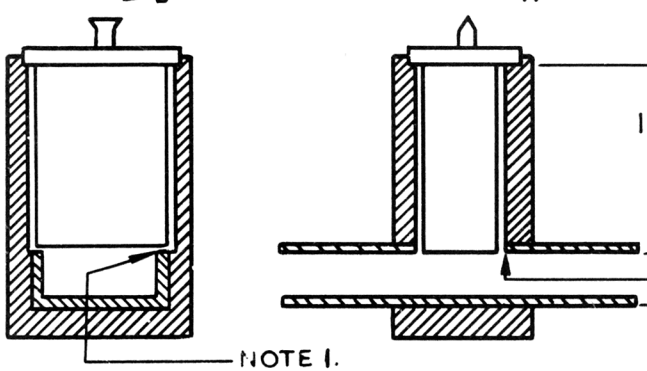
SECTION AA OF MOUNT SHOWING VALVE IN POSITION.



SECTION BB OF MOUNT SHOWING VALVE IN POSITION.



SECTION CC OF MOUNT SHOWING VALVE IN POSITION



PIECE OF STRAIGHT WAVEGUIDE OF INTERNAL DIMENSIONS 0·4 BY 0·9.

ALL DIMENSIONS IN INCHES.