

ADMIRALTY SIGNAL AND RADAR ESTABLISHMENT

Specification AD/CV2308, CV2309 Issue No. 2 Dated 17.8.55. To be read in conjunction with K1001		<u>SECURITY</u>	
		<u>Specification</u> Unclassified	<u>Valve</u> Unclassified
→ Indicates a change			
<u>TYPE OF VALVE:</u> Broad Band T.B. Cell		<u>MARKING</u> See K1001/4	
<u>PROTOTYPES:</u> VX4142 (BS.116) VX4143 (BS.118)			
<u>RATING</u>		<u>NOTE</u>	<u>DIMENSIONS</u>
Operating frequency: CV2308 (Mc/s)	9050 to 9600		CV2308 - See drawings, Pages 4 and 6
CV2309 (Mc/s)	8500 to 9050		CV2309 - See drawings, Pages 5 and 6
Max. Transmitter Peak Power at 0.001 duty cycle (kW)	50	A	
Min. Transmitter Peak Power (kW)	5		
<u>NOTES</u>			
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		No Tested	Note
			Min.	Max.		
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 $\pm 0.05\%$ CV2309 = 8775 Mc/s $\pm 0.05\%$	<u>Equivalent Conductance</u> G/Yo	-	0.10	100%	1
b	As for Test (a)	<u>Tuning Susceptance</u> 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 $T_p = 1.0$ usecs. $\pm 10\%$ and p.r.f. 1000 c/s $\pm 10\%$. Test to be performed at least 7 days after pumping and at least 24 hours after any previous discharge.	<u>Firing Time</u> (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.	<u>Arc Loss</u> (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 $T_p = 1.0$ usec. $\pm 10\%$ and p.r.f. = 1000 c/s $\pm 10\%$.	<u>Recovery Loss</u> (dB) After 2 usecs. (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)	<u>Loaded Q</u>	-	6.5	T.A.	4
g	As for Test (e) Load V.S.W.R. to be better than 1.02.	<u>High Level Voltage Standing Wave Ratio</u>	-	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 $\frac{G}{Y_0}$ 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,

$$\frac{B}{Y_0} \approx (1 + \frac{2G}{Y_0}) \frac{2\pi \Delta \lambda}{\lambda_g}$$

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

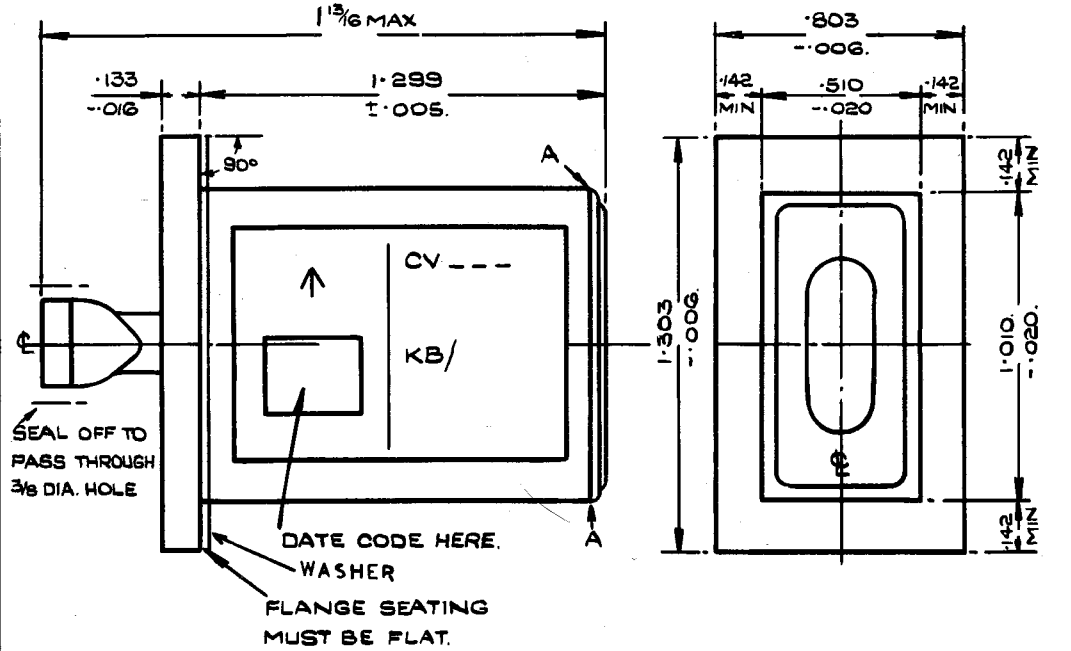
3. That is, the power loss in the arc shall be less than 680W peak.
4. Loaded Q is defined as:-

$$\text{Loaded Q} = F_0 \frac{d}{dF} \left(\frac{B}{Y_0} \right) \frac{1}{2(1 + \frac{G}{Y_0})}$$

where F_0 = Test Frequency.

SCALE: TWICE FULL SIZE.

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



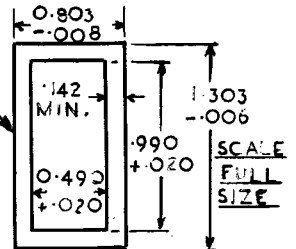
SEAL OFF TO PASS THROUGH 3/8 DIA. HOLE

DATE CODE HERE.
WASHER
FLANGE SEATING MUST BE FLAT.

WASHER OF SOFT TEMPER NICKEL OR COPPER SHEET $.003 \pm .001$

FINISH: TIN PLATE.

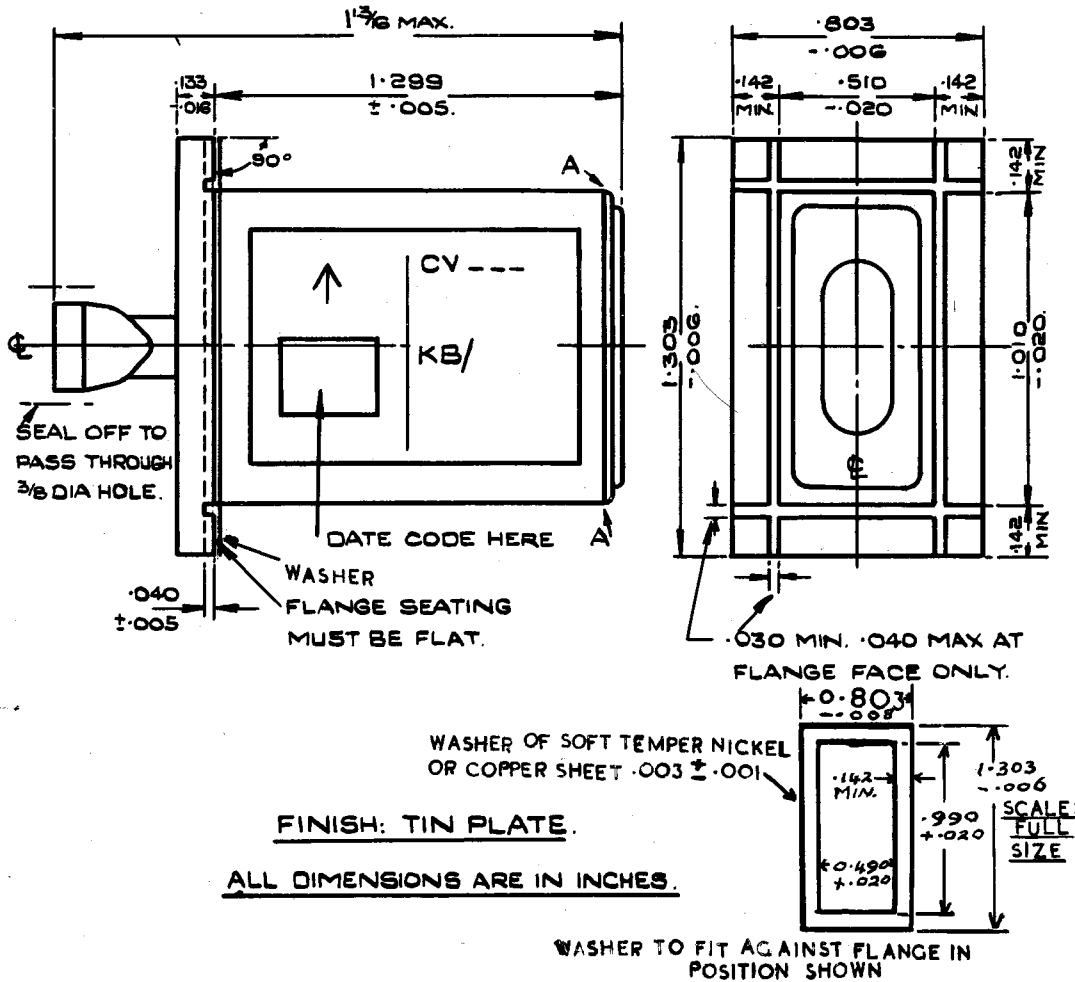
ALL DIMENSIONS ARE IN INCHES.



WASHER TO FIT AGAINST FLANGE IN POSITION SHOWN

SCALE: TWICE FULL SIZE.

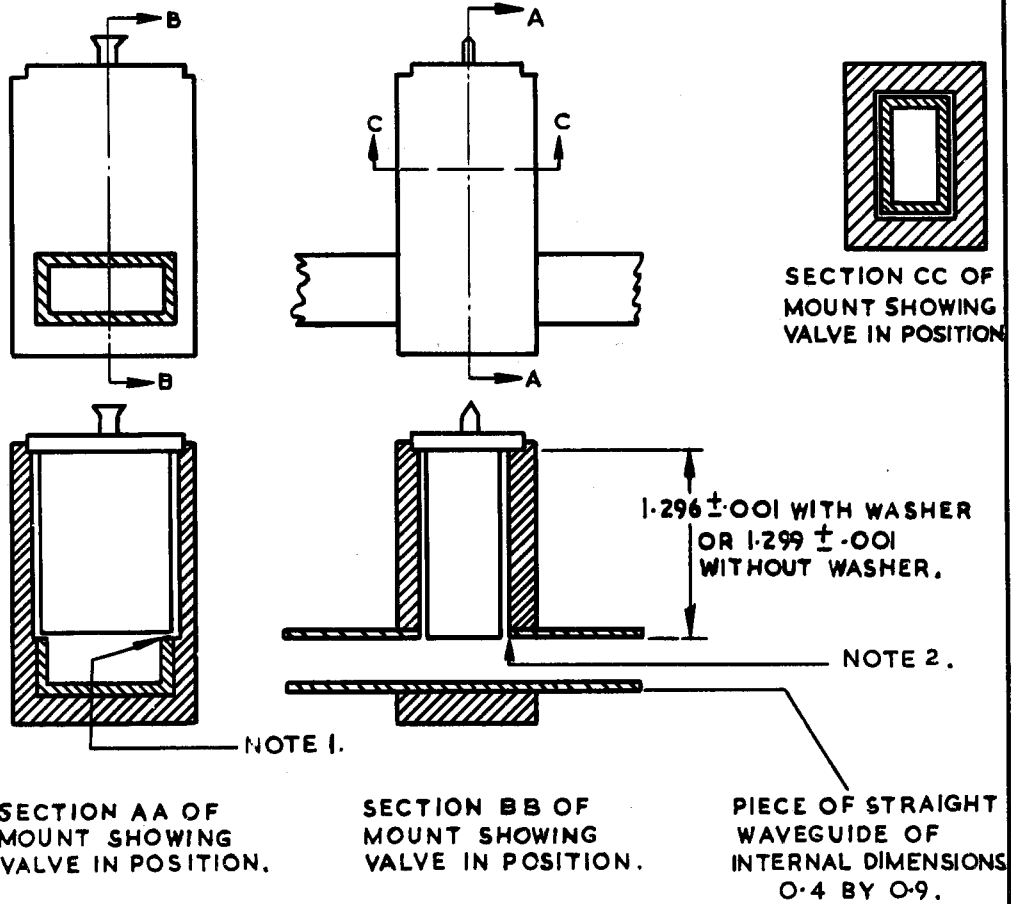
ALL .142 MIN. DIMENSIONS TO BE MEASURED AT A-A.



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.



ALL DIMENSIONS IN INCHES.

CV2308, CV2309/2/6