

VALVE ELECTRONIC

CV1297

ADMIRALTY SIGNAL AND RADAR ESTABLISHMENT

Specification AD/CV1297 Issue No. 1 Dated 1st September, 1955 To be read in conjunction with K1001	<u>SECURITY</u>	
	<u>Specification</u> Unclassified	<u>Valve</u> Unclassified

<u>TYPE OF VALVE</u> :- T.R. Cell for use in tunable cavity resonator.			<u>MARKING</u> See K.1001/4.		
<u>PROTOTYPE</u> :- CV2739, tested to improved specification.					
<u>RATINGS</u>			Note	<u>DIMENSIONS &amp; CONNECTIONS</u>	
Operating Frequency	(Mc/s)	2925 to 3075	A	See drawing on Page 5	
Min. Primer Supply Voltage	(V)	-800	B		
Max. Primer Operating Current	( $\mu$ A)	150	B		
Min. Primer Operating Current	( $\mu$ A)	100	B		
Max. Peak Power	(kW)	500	C		
<u>NOTES</u>					
A. When used in Resonator 'B' of Crystal Protection Unit A.P.64870, (See Note 2).					
B. Primer current to be limited by a series resistance of which at least 1 Megohm must be adjacent to the valve.					
C. With duty ratio not exceeding 0.001.					

TESTS

To be performed in addition to those applicable in K1001

	Test Conditions	Test	Limits		No. Tested	Note
			Min.	Max.		
a	Test shall be performed at least 7 days after any previous discharge.	<u>Primer Breakdown</u> (Secs) The delay between the application of the primer voltage and the initial breakdown shall be measured.	-	5	100%	1
b	Test shall be performed at least 7 days after any previous discharge.	<u>Primer Operating Voltage</u> (V) The primer voltage shall be measured after breakdown has occurred.	34.0	45.0	100%	1
c	Valve to be mounted in Resonator "A" (See drawing on Page 6). The transmission line shall be energised with not more than 10 mW RF and terminated in a load matched better than 1.1 V.S.W.R.	<u>V.S.W.R.</u> Measured at 2925 Mc/s. 3075 Mc/s. and 3000 Mc/s.	-	1.4	10%	1, 2
d	Valve to be mounted in Resonator "A" (See drawing on Page 6), between source and terminating impedances matched better than 1.1 V.S.W.R. The transmission line shall be energised with not more than 10 mW RF.	<u>Low Power Level Insertion Loss</u> (dB) Measured at 2925 Mc/s. 3075 Mc/s. and 3000 Mc/s.	-	0.5 1.2	20%	1, 2
e	Valve to be mounted in Resonator "B". (See drawing on Page 6). The transmission line shall be energised by not more than 10 mW RF. The frequency tuning range shall be obtained by adjusting the two tuners.	<u>Frequency Range</u> (Mc/s.)	2925 to 3075		100%	1, 2, 3

TESTS

CV1297

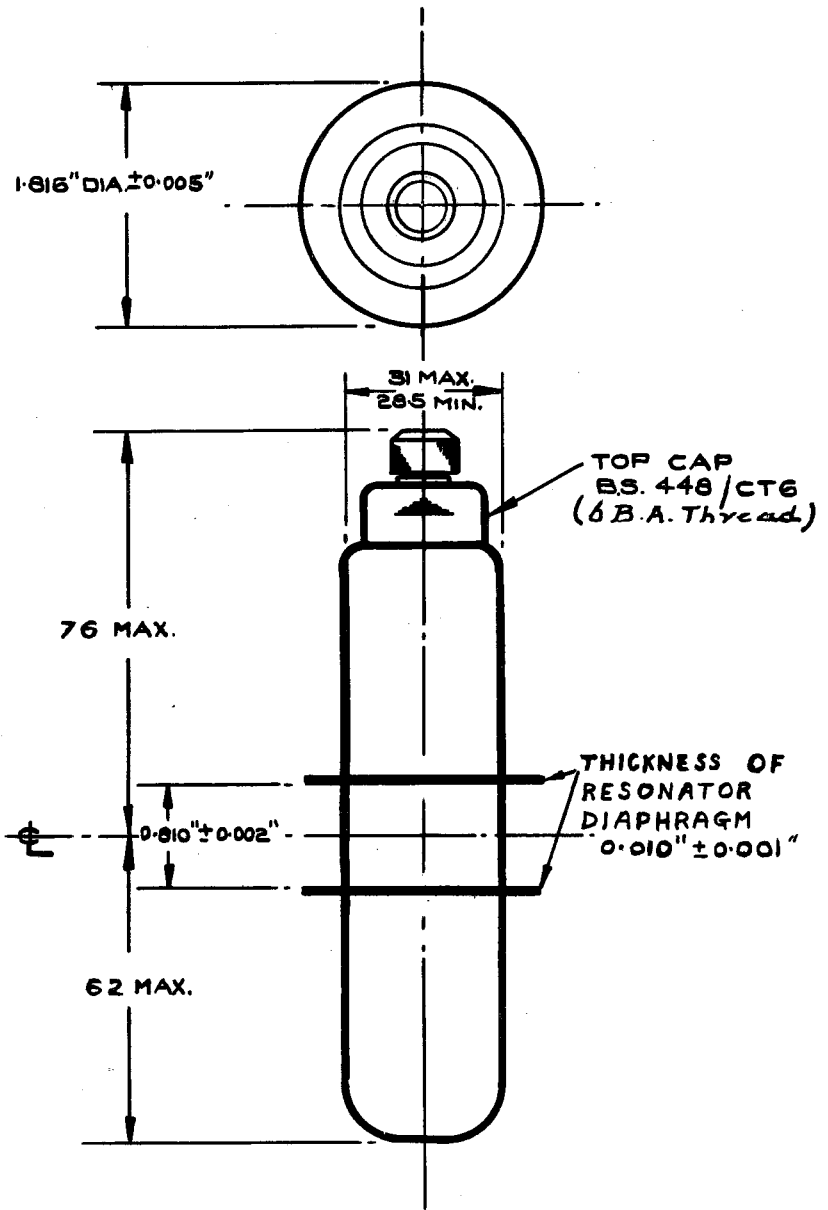
To be performed in addition to those applicable in K1001

	Test Conditions	Test	Limits		No. Tested	Note
			Min.	Max.		
f	Valve to be mounted in Resonator "B", (see drawing on Page 6). The transmission line shall be energised with 450 kW $\pm$ 10% peak RF with P.R.F. 500 p.p.s. $\pm$ 10% and terminated in a matched load. Test carried out at a frequency between 2925 Mc/s and 3075 Mc/s.	<u>High Power Leakage</u> 1. "Spike" energy (ergs/pulse) 2. Peak "Flat" power (mW)	-	1.0 250	100% 100%	1, 2
g	Valve to be mounted in Resonator "B". (See drawing on Page 6). The transmission line shall be energised with 450 kW $\pm$ 10% peak RF with $T_p = 1.9$ $\mu$ secs. $\pm$ 10% and P.R.F. = 500 p.p.s. $\pm$ 10% and terminated in a matched load. Test carried out at a frequency between 2925 Mc/s and 3075 Mc/s.	<u>Recovery Time</u> ( $\mu$ secs.) The time to be measured from the trailing edge of the applied pulse until the insertion loss has fallen to a value 6 dB above the level that existed immediately before the pulse was applied.	-	12	T.A.	1, 2
h	Valve to be mounted in Resonator "B" (See drawing on page 6) and the transmission line shall be terminated in a matched load. The peak power applied to the valve shall be increased gradually from 100 mW to 100 W $T_p = 1.9$ $\mu$ secs. $\pm$ 10% P.R.F. = 500 p.p.s. $\pm$ 10%. Test carried out at a frequency between 2925 Mc/s and 3075 Mc/s.	<u>Low Power Leakage</u> (mW, Peak) The maximum leakage through the cell is to be measured.	-	300	T.A.	1, 2
j	Two valves shall be mounted in the crystal protection unit shown in the drawing on Page 6. The transmission line shall be energised with 450 kW $\pm$ 10% with P.R.F. = 500 p.p.s. and shall be terminated in a matched load. The primer current of the valve in Resonator "A" shall be not more than 150 $\mu$ A d.c. The potential of the primer in Resonator "B" shall be pulsed negatively with respect to the resonator diaphragm. (Further details are given in Note 4).	<u>High Power Leakage in Crystal Protection Unit</u> <u>A.P. 64870.</u> 1. "Spike" energy (ergs/pulse) 2. Peak "Flat" power. (mW).	-	0.04 10	10% (20) 10% (20)	1, 2, 4, 5.

TESTSNOTES

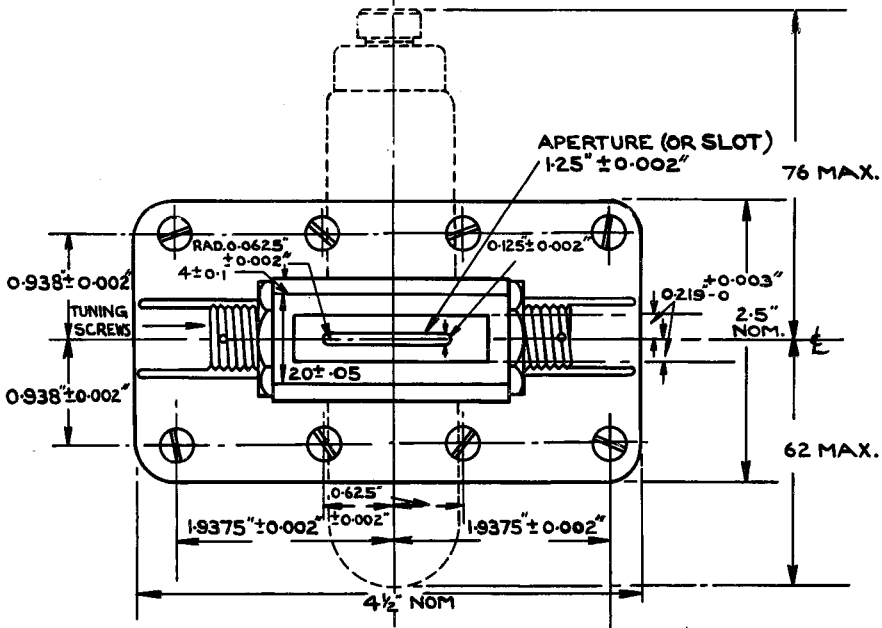
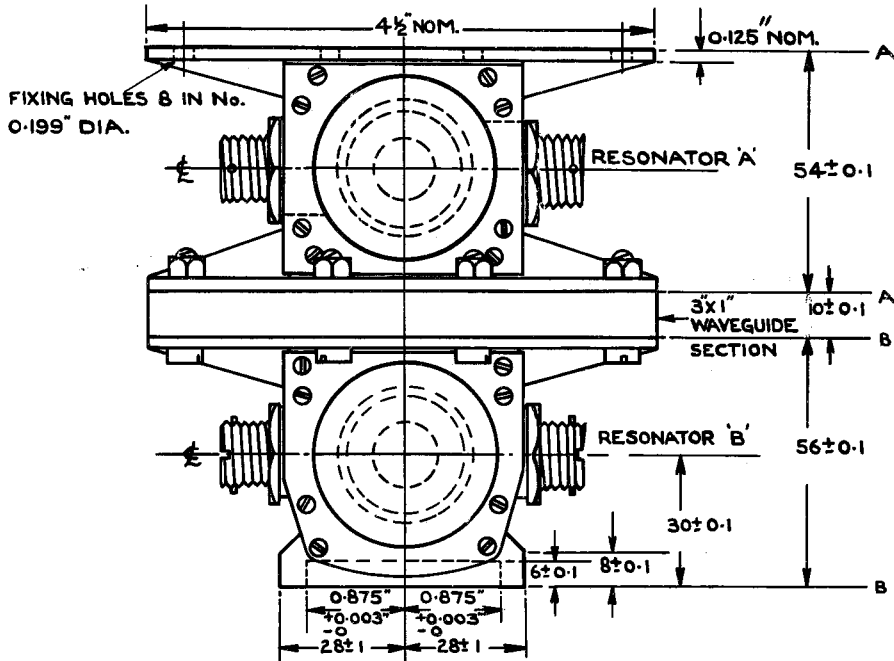
1. The d.c. primer supply voltage shall be 800 V having a peak to peak ripple voltage not exceeding 1%, and the primer shall be negative with respect to the resonator diaphragm. The regulation of the supply shall be negligible up to load currents of 200  $\mu$ A. The supply shall be connected to the primer electrodes through resistances totalling 3.3 Megohm + 10% of which at least 1 Megohm must be placed adjacent to the valve.
2. Resonator "A" is the resonator which lies between lines AA of the drawing on Page 6. Resonator "B" is the resonator which lies between lines BB of the same drawing. Where reference is made to only one resonator, then that resonator is used without the other resonator or the short connecting Waveguide section.
3. The upper limit of the frequency range is found by turning the tuning slugs in as far as possible and then measuring the resonant frequency of the cavity in that state. The lower limit of the frequency range is found by removing the tuning slugs, then screwing them two turns back into the cavity, and measuring the resonant frequency of the cavity in that state.
4. The primer supply to the valve in Resonator "B" shall be taken via a 6 pF condenser from a pulsed 7 kV source having a P.R.F. = 500 p.p.s. + 10%.  $T_p$  shall be equal in duration and in synchronisation with the oscillator pulse of the test apparatus transmitter. The pulse shall cause the primer to breakdown before the transmitted energy in the waveguide reaches the Crystal Protection Unit. This can be achieved by using the primary of the pulse transformer as the source of potential, and keeping the pulse lead shorter than the transmitting waveguide.
5. Each valve is to be tested in Resonator "A" and also in Resonator "B" of the Crystal Protection Unit and must work satisfactorily in both positions. The test procedure shall be as follows:-

Two valves shall be placed in the Unit and the high power leakage shall be measured. The valve in Resonator "B" shall then be removed and the valve in Resonator "A" shall be moved to Resonator "B". A new valve shall then be placed in Resonator "A" and the high power leakage shall again be measured. This procedure shall be repeated until all the valves have been tested in the two positions, the first valve tested in Resonator "B" being tested in Resonator "A" with the last valve of the batch mounted in Resonator "B".



ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE STATED

CRYSTAL PROTECTION UNIT A.P. 64870.



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