MINISTRY OF TECHNOLOGY - DLRD/RRE

VALVE ELECTRONIC **CV2312**

Specification Mintech/CV 2312 Issue No. 4A, Dated May, 1968. To be read in conjunction with K1001 and BS.448	SECURITY Specification: UNCLASSIFIED Valve: UNCLASSIFIED

→ Indicates a change

TYPE OF VALVE - Twin-primer Broad-Band TR Cell (Improved version)

PROTOTYPE - VX1028

MARKING

See K1001/4

RATING			Note
Operating Frequency range	(MHz)	8500 to 9300	
Max. Peak Power	(kW)	250	A,B
Min. Peak Power	(kW)	4	A
Min. Primer Supply Voltage	(V)	-950	
Max. Main Primer Current	(μA)	185	C
Min. Main Primer Current	(μA)	100	C
Max. Auxiliary Primer Current	(μA)	80	C
Min. Auxiliary Primer Current	(μA)	50	C

DIMENSIONS AND CONNECTIONS

See Drawing on Page 6
See Note E

TOP CAPS

CT1
(See BS.448 : 6/1.1)

NOTES

A. With duty cycle not exceeding 0.001

B. Operation at this power level results in considerably reduced life. For satisfactory operation at power levels above 50 kW it is recommended that the valve be preceded by a pre - TR Cell.

C. The Primer Currents shall be limited by series resistances of which at least 1 megohm must be placed adjacent to each primer

D. If necessary the valve may be used with single primer operation. This must be the MAIN primer.

E. The superstructure of the cell which has no dimensions specified is providing support for the cell and electrodes. Any stress or strain applied to the superstructure may possibly impair the performance or reliability of the cell. Under no circumstances should such superstructure be used wholly or in part as a location reference plane or for the purpose of a support for component parts of ancillary equipment.

To be performed in addition to those applicable in K1001

Test Conditions			Test	Limits		No. Tested	Note
				Min.	Max.		
	Primer Supply Voltage (V)						
a	-900	Test shall be performed at least 7 days after any previous discharge.	Primer Breakdown (secs) The delay between the application of primer voltage simultaneously to each primer and the breakdown shall be measured.	-	5	100%	1
b	-1000		Primer Operating Voltage (V) The voltage of both primers shall be measured after breakdown has occurred.	180	340	100%	1
c	-1000	Line shall be energised with not more than 10 mW rf. terminated in a load matched better than 1.02 vswr.	VSWR Measured at frequencies 8500, 8700, 8900, 9100 and 9300 MHz.	-	1.30	100% or S	1, 2
d	-1000	Valve shall be mounted between impedances matched better than 1.10 vswr. Line shall be energised with not more than 10 mW r.f.. Test Frequency = 8500 MHz	Insertion Loss (db)	-	0.8	100% or S	1, 2
e	-1000	Test Frequency = 8900 MHz ± 75 MHz p.r.f. = 1000 Hz ± 10% Power Output = 200 kW Peak ± 15% Rate of Rise of Magnetron voltage = 100 kV/μsec ± 10%. Pulse lengths measured at 10% of peak amplitude (i) 0.15 μsec ±15%. (ii) 1.0 μsec ±10%.	High Power Leakage (i) Spike Energy (ergs/Pulse) (ii) Total Power (mW Peak)	- 35	0.30 100	100% 100%	1, 3 and 4

Test Conditions			Test	Limits Min.	Limits Max.	No. Tested	Note
f	-1000	The test frequency of the simulated echo pulse shall be within the range 8500 to 9300 MHz , and its Power incident on the cell shall be less than 10 mW peak r.f..Test frequency of the transmitter pulse shall be 8900 ± 75 MHz and power 200 kW ± 15% peak r.f. tp = 1.0µS. ± 10% PRF - 1000 Hz ± 10%	Recovery Time The time shall be measured from the trailing edge of the transmitter pulse for an insertion loss exceeding that immediately before the transmitter pulse by:- (i) 6 db (µS) (ii) 2 db (µS)	 - -	 3 8	 5%(6) 5%(6)	 1
g	-1000	Applied Power varied from 100 mW to 100W. tp = 1.0 µS ± 10%. Other conditions as for Test e(ii)	Low Power Leakage (mW peak) The total leakage power through the cell shall be measured as the applied power is varied from 100 mW to 100W.	-	250	5%(6)	1
h	-1000	Test frequencies 8500, 8900 and 9300 MHz. Line shall be energised at a convenient low power level.	Electrical Length The length of RCSC No.16 Waveguide having the same effective electrical length as the cell shall be determined (i) at 8500 MHz (degrees) (ii) at 8900 MHz (degrees) (iii) at 9300 MHz (degrees)	 137 234 312	 177 274 352	 100% or S	 1 and 2
j	-1000	As for Test e(ii)	Position of Short (ins) The distance of the effective r.f. short behind the front flange of the cell shall be measured.	0.014	0.028	QA	1

Test Conditions			Test	Limits		Tested	Note
				Min.	Max.		
k	-1000	The line shall be energised with not more than 4 kWr.f. measured immediately after the cell. Other conditions as for e(ii)	Arc Loss (db)	-	0.8	Q.A.	1
m	-1000	6 valves to be mounted on E plane T junctions followed by a matched load. Input power not exceeding 60 kW, output power not less than 40 kW. Other conditions as in test e (ii)	Life Test Valves to be run for 500 hours. Test c - g to be performed at 0, 50, 100, 200, 300 and 500 hours. Number of valves which at any one time exceed life test limits in any respect. (Note 5) (No.)	-	1	Q.A.	1, 5
n	-1000	The cell shall be operated for one hour with the air pressure in the waveguide on the input side maintained at 30 lbs/sq. in absolute. Tp = 1.0 µsec ± 10%. Other conditions as for Test e(ii)	High Power	-	-	Q.A.	1

NOTES

1. The primer supply shall be D.C. having a peak-to-peak ripple voltage not exceeding 1% and shall be negative with respect to the body of the cell. The regulation of the supply shall be negligible at load currents up to 0.3 mA. The supply shall be connected to the main primer through resistances totalling 5.5 MΩ ± 5% and to the axiliary primer through resistances totalling 12.5 MΩ ± 5%. At least 1 MΩ shall be placed adjacent to each primer terminal.

2. An approved sampling test may be employed. If a batch fails to meet this, all valves shall be subjected to the specification test.

3. This test is to be performed using Valve Type CV2284 (4J50 magnetron). Measurements are to be made with a thermistor mount having the following characteristics:-

Efficiency E $\frac{\text{(ratio of measured power)}}{\text{incident power}}$ to be greater than 90%

v.s.w.r. to be greater than 0.9 over 8900 ± 100 MHz and greater than 0.75 over 8900 ± 250 MHz.

If the measured leakage powers are P_1 and P_2 in μW at pulse durations of 0.15 μS(t_1) and 1.0 μS(t_2), and the pulse repetition frequency is f then

(i) spike energy = $\frac{10P_1}{Ef}$ ergs/pulse

(ii) total power = $\frac{1000P_2}{Ef\ t_2}$ mW peak

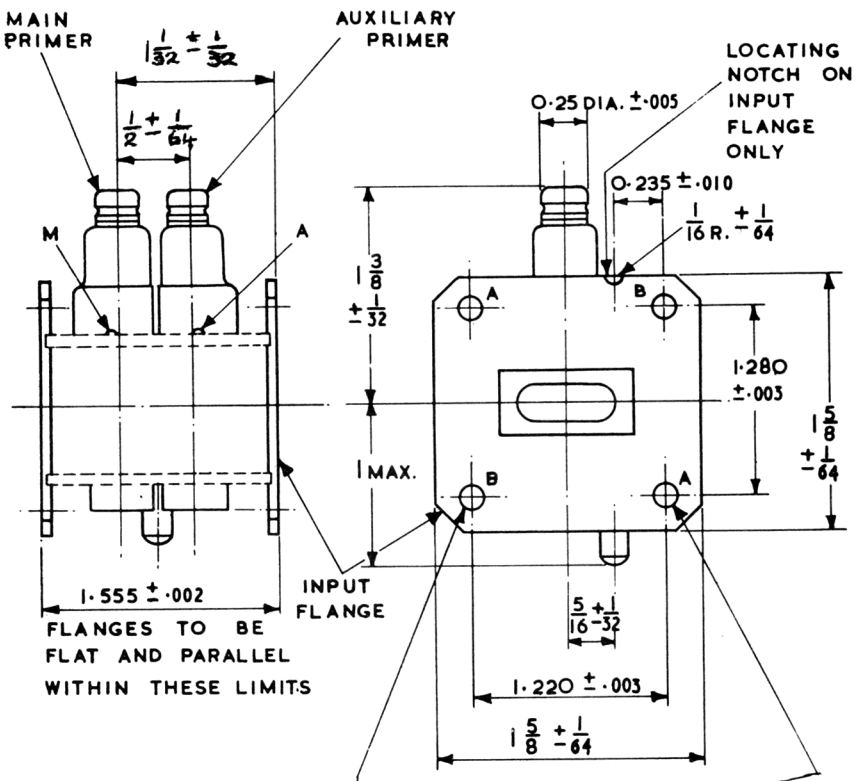
4. The minimum limit for total leakage is a manufacturing test limit applying to new valves only.

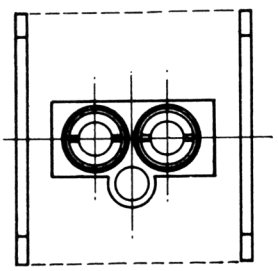
5. Life Test Limits

During life test, the limits applicable to the tests contained in clauses c - g (inclusive) shall be amended to the following:-

V.S.W.R. (All test frequencies)		Max. 1.4
Insertion Loss (db)		Max. 1.0
Breakthrough (i)	spike (ergs/pulse)	Max. 0.3
(ii)	total power (mW peak)	Max. 100
Recovery time (i)	6 db (μS)	Max. 10
(ii)	2 db (μS)	Max. 20
Low Power Leakage (mW)		Max. 250

OUTLINE DRAWING





A - 2 HOLES EACH FLANGE, 4.2 to 4.4 mm or .170 DIA. ± .002 COAXIAL WITH EACH OTHER.

B - 2 HOLES EACH FLANGE, 3.7 to 3.9 mm or .150DIA. ± .002 COAXIAL WITH EACH OTHER.

TO BE POSITIONED AS SHOWN ON 1.768 ±.004 P.C.D.

THIRD ANGLE PROJECTION

ALL DIMENSIONS IN INCHES