MINISTRY OF AIRCRAFT PRODUCTION (DCD)

ELECTRONIC VALVE TYPE C.V.221

Specification DCD WT 2479 Issue 2 date 1.2.45. To be read in conjunction with K1001 ignoring clauses:- 5.8	SECURITY Valve ~~Confidential~~ Unclassified Specification ~~Secret~~ Unclassified

TYPE OF VALVE - Gas-filled resonator spark-gap.

MARKING
CV 221
serial number

RATING		Note
Nominal frequency at which spark-gap will operate (Mc/s)	9375	
Minimum priming voltage D.C. (V)	-1000	A
Continuous priming current (mA)	0.15 ± .05	A B
Maximum mean line power in equipment (W)	100	

BASE
None

DIMENSIONS AND CONNECTIONS

See drawing on page 4.

REQUIREMENTS

Gas-filling - Water vapour with a pressure equivalent to 6 mm of mercury and argon with a pressure equivalent to 6 mm of mercury.

Finish - The inside portions of the waveguide shall be free from oxide scale. All internal parts shall be carefully cleaned.

Protective cap - The protective cap shall withstand a force of 7 lbs. weight in any direction without becoming loose.

NOTE A - The power pack supplying the priming electrode shall have an open circuit voltage of at least 1000 V and be connected through a resistance limiting the current to a maximum value of 0.2 mA. There shall be a resistance of at least 470K adjacent to the electrode.

NOTE B - The value 0.2 mA shall not be exceeded or the life of the spark gap will suffer.

NOTE C - The valve is liable to be damaged if it is tuned frequently over its full range. The number of tuning operations and the range of movement should be restricted.

400

TESTS

CV221 to be carried out in addition to those applicable in K1001.

Clause	Test Conditions	Test	Limits Min.	Limits Max.	No. Tested	Note
a	Frequency Tuning Range (Mc/s)		9901 to 9091		5%	
b	See K1001/5.2. Test voltage 250V approx. but less than the striking potential of the cell.	Insulation (megohms) between priming electrode and resonator.	100	-	100%	
c	(i) Insertion loss (db) at 9375 Mc/s with no priming current. This shall be measured as the decrease in signal strength when the valve under test, correctly tuned, is substituted for a section of waveguide of identical physical length. Measurement to be made in both directions through the valve.		0.8	1.5	5% (5)	1
	(ii) Measurement as in (i) in one direction only through the valve		0.8	1.5	100%	1
	(iii) Test to be repeated with a priming current of 0.2 mA and the increase in loss (db) from (i) or (ii) measured.		-	0.2	5% (5)	1
d	Measurement to be made at 9375 Mc/s by an approved method in an approved apparatus with the valve either way round.	Standing wave ratio	0.5	-	100%	
e	Effective electrical shorting position (mm) at a frequency of 9375 Mc/s from each end of the valve towards the centre when the valve is fully detuned.		17.5	19.5	100%	1
f	After a shelf life of 7 days DC voltage shall be applied between priming electrode and resonator and increased until discharge occurs.	Breakdown voltage (v)	-	-1000	100%	3
g	Test to be applied after a shelf life of 7 days. Pulse length - 1 µsec. Repetition rate - 1000 pps. Peak R.F.power - 40 ± 10 kW Priming current - 0.2 mA The valve shall be tuned to resonance and the leakage power, in the direction of minimum loss, averaged over a pulse. A CV 209 magnetron of frequency between 9348 Mc/s (3.21 cms) and 9404 Mc/s (3.19 cms) shall be used.	Total leakage power (mW)	-	30	100%	1

TESTS (Contd.)

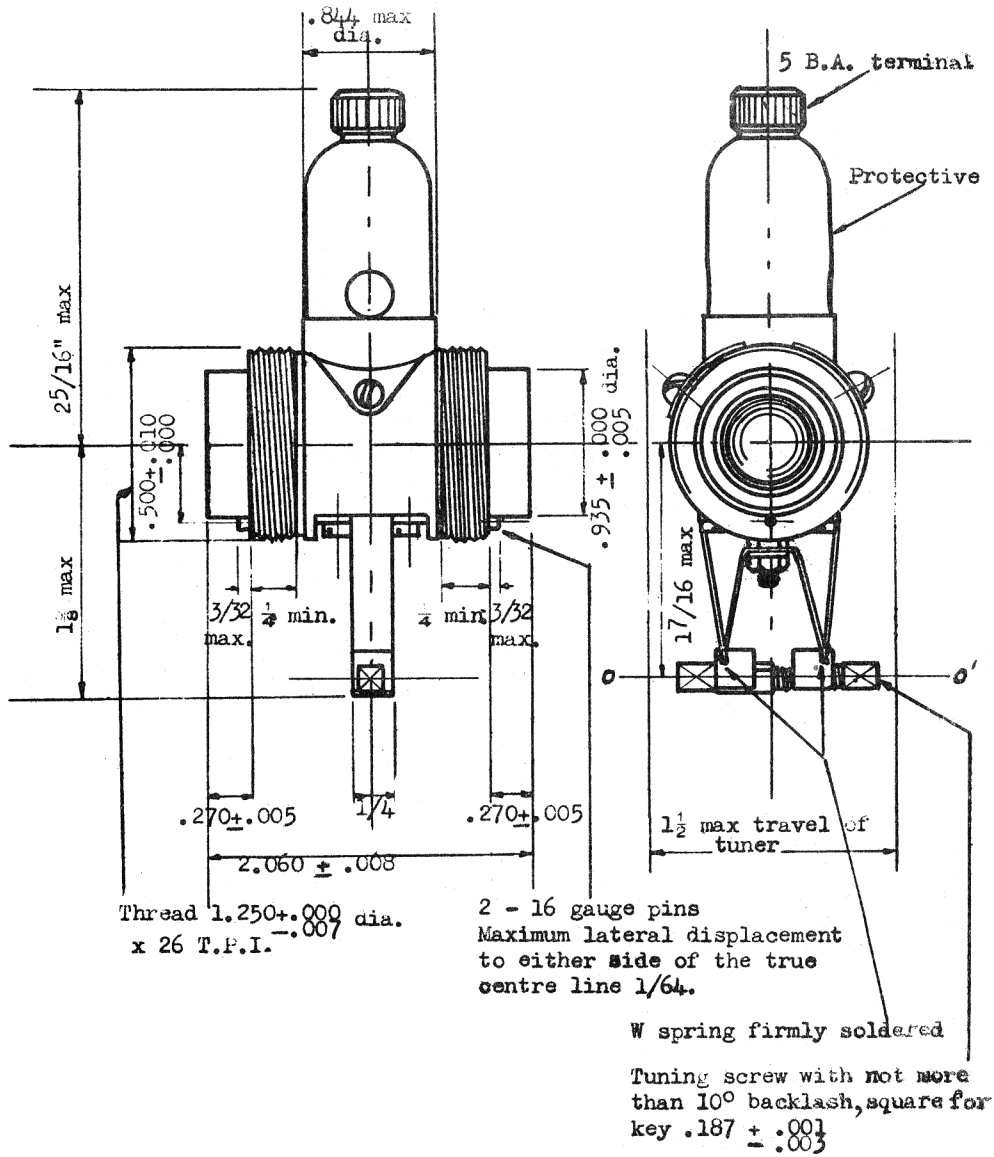
CV221.

Clause	Test Conditions	Test	Limits Min.	Limits Max.	No. Tested	Note
h	With conditions as in test 'g' the loss (db) in excess of value in (ci) shall be measured at a time 4 μsecs after the mid point of the test pulse.		-	6	100%	1
j	The valve tuned to 9375 Mc/s vibrated for half an hour in a direction parallel to the axis of the tuner (axis 0-0^1 on drawing on page 4) under approved conditions.	(i) Change in resonant frequency (Mc/s) (ii) The valve shall remain constructionally satisfactory.	-	5	5% (5)	1 & 2
k	The valve shall be subjected to (i) Pressure range at 15°C to 25°C from atmospheric pressure to 7.5" mercury. (ii) Temperature range at normal atmospheric pressure, of -40°C to 70°C.	(i) Change in resonant frequency (Mc/s) at extremes of the pressure range. (ii) Change in resonant frequency (Mc/s) at extremes of temperature range. (iii) After (i) and (ii) have been carried out the protective cap shall withstand a force of 7 lbs without becoming loose.	- -	6 20	5% (5) 5% (5) 5% (5)	2 2 2
m	A force of 2 lbs weight shall be applied to the centre of the tuner screw in the direction of the arrows on the drawing.	Change in resonant frequency (Mc/s)	-	4	100%	

Note 1 - Test to be done in an approved apparatus.

Note 2 - After tests (j) and (k) have been carried out the valve must still satisfy test (g).

Note 3 - If the valve misfires or fires without the striking voltage being noted, it shall be set aside for 24 hours before the test is again applied.



All dimensions in inches unless otherwise stated.