THIS VALVE MAY BE RADIO ACTIVE To CLASS 1 (See K1001 Appendix XA) Amdt-3

MINISTRY OF AVIATION - DLRD/RRE VALVE ELECTRONIC

CV 6110

Specification MOA/CV6110 Issue 1 dated 9th March, 1962. To be read in conjunction with K1001	SECURITY Specification: Unclassified Valve: Unclassified

→ indicates a change

TYPE OF VALVE: Microwave Gas Switch (Pre TR Tube)

ENVELOPE : Silica

PROTOTYPE : VX9230

MARKING

See K1001/4

DIMENSIONS

See drawing on Page 5

MOUNTING POSITION

Any (Note C)

PACKAGING

See K1005

JOINT SERVICES CATALOGUE NUMBER

5960 - 99 - 037 - 3120

RATING

Not to be used for test purposes
All limiting values are absolute

		Note
Operating Frequency Range (kMc/s)	2 - 4	A
Max. Peak Power Input (MW)	6	B
Max. Mean Power Input (kW)	12	B
Max. Pulse width (μs)	10	

NOTES

A. The valve may be used in a suitable waveguide mount at any frequency in this range. The bandwidth and matching are determined by the design of the mount.

B. The quoted power is that which is measured incident on a balanced duplexer where two valves are each operating across both arms of the duplexer.

C. The hole through which the tube is mounted should be 0.5603"/0.5606" dia.

TYPICAL OPERATING CONDITIONS

Primary Switch at 3 kMc/s. Phase Shift Duplexer

Two tubes may be used side by side in a mount having a Q of 2.3 and an insertion loss of less than 0.1 dB (Drawing No.RR/C252285). With a 10 μs pulse and peak and mean powers of 12 MW and 24 kW respectively the recovery time of 3dB is approximately 200 μs and the arc loss 0.05dB. The leakage power will depend on the characteristics of the waveguide circuit and in general will be about 30dB down on the incident power. The life expectation is several thousand hours. The recovery time is less for lower mean powers or shorter pulse widths.

Primary Switch at 3kMc/s. Balanced Duplexer

The tubes may be operated in the same mount in a balanced duplexer. In this case the maximum peak and mean powers are reduced by a factor of 2 and the recovery time and are loss are the same as before. The leakage power is about 50dB down on the incident power.

TEST CONDITIONS

The valves shall be tested in an approved balanced duplexer in WG10. The minimum v.s.w.r. looking outwards from the balanced duplexer shall not be less than 0.83 on any arm.

tp(μsec)	Du	Freq.(kMc/s)
1.9 ± 10%	0.00095	3.000 ± 0.5

K1001	TEST	TEST CONDITIONS	AQL %	Insp. Level	Symbol	Limits Min.	Limits Max.	Units
	GROUP A							
5H.4.2.8	Firing Power	Adjust r.f. input power from a low value until valve strikes. Note 1		100%		-	50	kW
5H.4.2.5.1	Recovery Time to 3 dB	Peak power input = 150kW ± 10% Notes 1, 2, 3 and 4		100%		32	48	μsecs
	GROUPS B AND C OMITTED							
5H.4.1.3.2	GROUP D v.s.w.r.	Notes 5,6 and 10 Frequency (1) 2.800 ± 0.005kMc/s (2) 2.700 ± 0.005kMc/s (3) 2.900 ± 0.005kMc/s	6.5	I		 0.96 0.60 0.60	 - 0.75 0.75	
	GROUP E	Note 7		10%				
7.1	Glass strain	No Voltages						
11.3	Fatigue	No. Voltages Frequency any within range 40-200 c/s Min. peak acceleration = 5g Duration = 64hrs. Note 8						
11.4	Shock	No Voltages Hammer angle = 30°						

K1001	TEST	TEST CONDITIONS	AQL %	Insp. Level	Sym-bol	Limits Min.	Limits Max.	Units
	GROUP E (Contd.)							
5H.5.2.3	Temperature Cycling	No Voltages Three cycles between -40°C and 100°C						
	Post Fatigue Shock and Temperature Cycling Tests Breakdown							
	Breakdown Power	As in Group A				-	50	kW
	GROUP F OMITTED							
	GROUP G							
	Re-test after 28 days Holding period (Note 9)							
	Breakdown Power	As in Group A	1	100%		-	50	kW
	Recovery time	As in Group A	1	100%		32	48	μs

NOTES

1. The power measured or quoted shall be that which is incident on the balanced duplexer.

2. The valve shall be moved up and down in the duplexer through all positions for which the accurately dimensioned section of the valve is completely through both waveguides.

3. Measurements shall be made at various positions following rotation of the valve in the mount.

4. The power shall be applied for at least one minute immediately before this measurement is made.

5. This test shall be performed with the valve fitted into an approved mount ~~constructed to~~ the details given in R.R.E. drawing RR/C252285 ~~or any other mount of approved design~~. for a substitute mount see Amdt 2

6. Valves shall be tested in pairs selected at random.

7. The sample size used for the purpose of the tests contained in Group E shall comprise of 10% of the lot size taken to the nearest whole number above the 10% value. Where the production rate is less than 25 per calendar month, a lot shall be considered as the total production of that month.

   The criterion of acceptance shall be that there shall not be more than one failure in any ten consecutive samples tested. During the initial period of any contract following a non-production period exceeding six months, valves may be despatched without awaiting the cumulation of the ten samples provided that the results of tests made do not preclude acceptance under the criterion.

NOTES (Contd.)

Where rejection is incurred production shall cease and the approval authority informed.

The manufacturer may, at his discretion, test additional valves or apply more than one test to each sample.

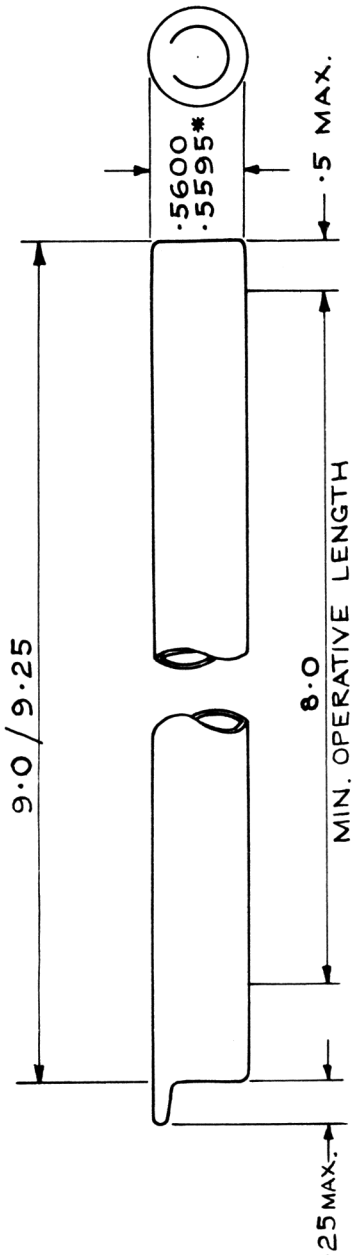
At least half of the samples taken for Group E shall be subjected to the mechanical tests.

8. The valve shall be vibrated in the horizontal plane only.

9. This test shall be performed in place of life tests.

10. R.F. power not to exceed 100mW.

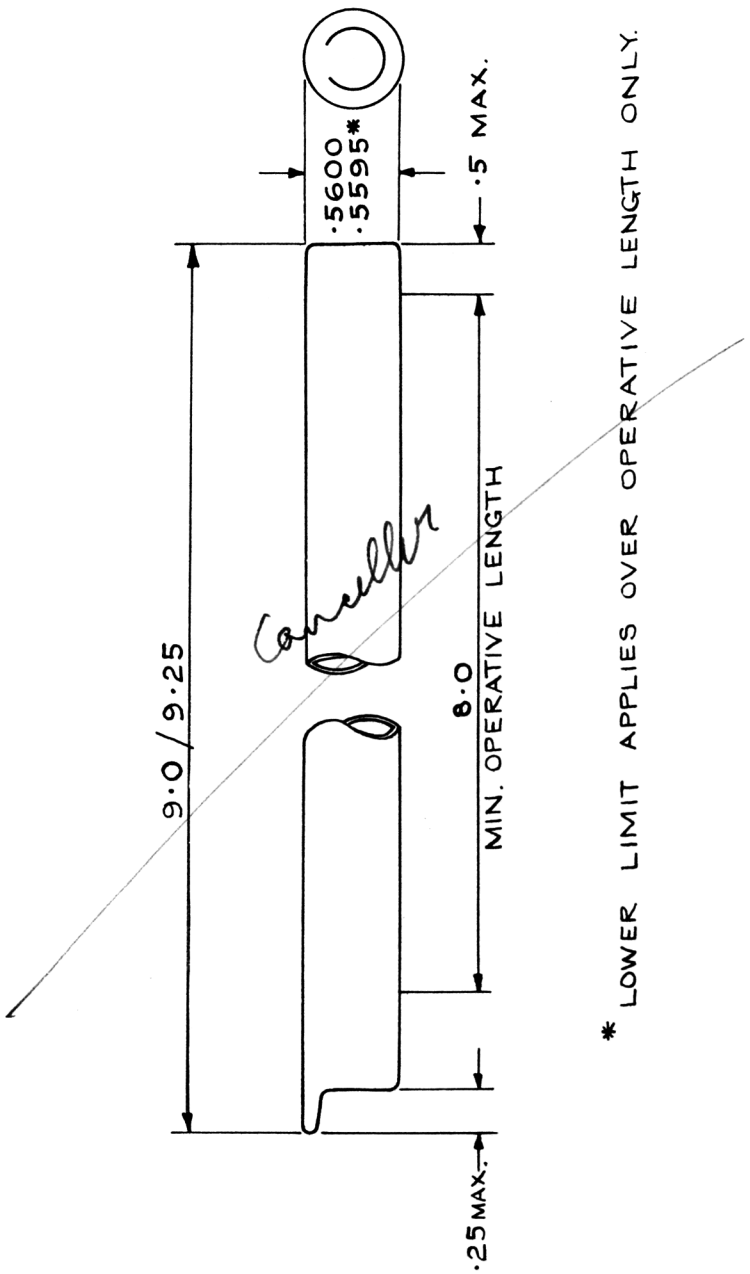
CV 6110



* LOWER LIMIT APPLIES OVER OPERATIVE LENGTH ONLY.

DIMENSIONS IN INCHES.

CV 6110



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DIMENSIONS IN INCHES.

ELECTRONIC VALVE SPECIFICATIONS

SPECIFICATION MOA/CV6110 ISSUE 1

DATED 9TH MARCH 1962

AMENDMENT NO. 1

Page 5. Remove and destroy this page and substitute new Page 5 dated 31st January 1963, attached hereto.

February, 1963
163601

T.V.C. for R.R.E.

ELECTRONIC VALVE SPECIFICATIONS

SPECIFICATION M.O.A./CV6110 ISSUE NO. 1 DATED 9th March, 1962

Amendment No. 2

Page 3 Note 5.

Amend this note to read:-

'This test shall be performed with the valve fitted into an approved mount. The details for a suitable mount are given in R.R.E. drawing RR/C252285'.

T.V.C. for R.R.E.

November, 1963.

(152592)

ELECTRONIC VALVE SPECIFICATIONS

SPECIFICATION MOA/CV6110, ISSUE No.1., DATED 9th March 1962

AMENDMENT No.3

Page 1. Top of Page.

Amend the note to read "THIS VALVE MAY BE RADIOACTIVE TO CLASS I. (See K1001 Appendix XX)."

October 1966 TVC. for RRE

N445218

AHS 22/11