MINISTRY OF ~~AVIATION~~ TECHNOLOGY - DLRD/RRE

VALVE ELECTRONIC CV6129 Amdt 2

Specification Min Tech/CV6129 Issue 1A Dated 8th April 1964 To be read in conjunction with K1001	SECURITY	
	Specification	Valve
	Unclassified	Unclassified

← Indicates a change

TYPE OF VALVE: Microwave Gas Switch (Plug-in type T.R. Cell)

ENVELOPE: Metal and Glass

PROTOTYPE: VX3293

MARKING

See K1001/4

DIMENSIONS

See Drawing, Page 6

MOUNTING POSITION

Any

PACKING

See K1005

RATINGS AND CHARACTERISTICS

(Not for inspection purposes)

All limiting values are absolute			Note
Operating frequency range	(kMc/s)	2.6-3.9	C
Max. peak r.f. power	(kW)	5	A
Min. peak r.f. power	(W)	10	B

NOTES

A. At a duty cycle of 0.002. For use above max power level it should be used in conjunction with power limiter of CV2430 type or equivalent.

B. This power level is the minimum at which the valve will fire consistently when followed by a matched load.

C. Operating Frequency Range

The valve is designed to operate in No. 10 or No. 11 waveguide and the mount must be chosen to suit the desired operating frequency band. Chokes are provided on the valve.

A typical mount for No. 11 Waveguide (Mount A), is shown on page 7 and for No.10 Waveguide (Mount B), on page 8. The iris width will decrease and Q value will increase with increasing frequency. Higher Q values can be obtained using double irises and lower Q values by using a small ridge in the waveguide.

D. Joint Services Catalogue Number 5960-99-037-3518

E. Nominal Radio activity ~~3200~~ 100 micro curies (Tritium)

Amdt 2

Typical Performance (See Note vii)

		MOUNT A	MOUNT B	NOTES
Centre frequency	(Mc/s)	3620	3265	
Loaded Q Value		6.0	4.5	(i)
Insertion Loss	(dB)	0.12	0.15	(ii)
Spike leakage energy	(e/p)	11	45	(ii) (iii) (iv)
Flat break through peak power	(W)	-	2.0	(ii) (iii) (iv)
Total leakage energy at 0.8 usecs pulse	(e/p)	32	-	(ii) (iii) (iv)
Recovery time to 6 dB	(μsecs)	17	15	(ii) (iii) (v)
Firing Power	(W)	1.7	4.0	(ii) (vi)

NOTES

(i) Q value. This is the Q of the cell in its mount when loaded with a matched guide in both directions. To calculate Q the v.s.w.r. of the mount terminated in a matched load is plotted as a function of frequency. The Q is then deduced from the formula:-

$$Q_L = \frac{1 - r}{2\sqrt{r}} \times \frac{f_o}{f_2 - f_1}$$

where r = v.s.w.r. (less than 1) within the range 0.5 to 0.6 at which f1 and f2 are quoted.

(ii) Measured at the nominal centre frequency

(iii) Measured with a peak incident r.f. power of 5 kW.

(iv) Calculated as given in Note 5 on page 4

(v) See Note 6 on page 5.

(vi) See Note 2 on page ~~4.5~~ Amdt 1.

(vii) The valve is intended for use in a conventional duplexer in front of a primed gap or, if leakage power requirements are less stringent, may be used solely with pre TR or other unprimed gap.

TESTS

To be performed in addition to those applicable in K1001

Valves should be held for a period of at least seven days after manufacture before commencing tests.

TEST CONDITIONS:- Unless otherwise stated

Freq (Mc/s) 3620 ± 50

K1001	Test	Test Conditions	AQL %	Insp. Level	Sym-bol	LIMITS Min.	LIMITS Max.	Units
	GROUP A							
	(a)							
5H. 4.1.6	Centre frequency of range within V.S.W.R. of 0.75 ± 0.05.	The line shall be energised with 20 ± 10 mW r.f. power and terminated in an impedance matched better than 0.98 v.s.w.r. Note 1		100%		3600	3645	Mc/s
	(b)							
5H. 4.1.3	V.S.W.R. Determined with the line terminated in a matched load.	As test (a) f = 3620 Mc/s ± 3 Mc/s Note 1		100%		0.89	-	ratio
	(c)							
5H. 4.1.1	Insertion loss	f = 3620 Mc/s ± 3 Mc/s The line shall be energised with 20 ± 10 mW r.f. power and the valve mounted between impedances matched better than 0.91 v.s.w.r. Note 1		100%		-	0.20	dB
	(d)							
5H. 4.2.8	Firing Power	Increase r.f. power input slowly until cell fires. Notes 1, 2 and 3		100%		-	10	W
5H.	(e) High Power leakage	The line shall be energised with 5 ± 1kW peak r.f. power and the valve mounted between impedances matched better than 0.91 v.s.w.r. Pulse length						
1.14.3	Spike leakage	(i) 0.1 µsec. min				-	13.5	e/p
1.14.2	Total leakage	(ii) 0.9 ± 0.1 usec Notes 1, 4 and 5				-	36	e/p

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K1001	Test	Test Conditions	AQL %	Insp. Level	Symbol	LIMITS Min.	LIMITS Max.	Units
5H. 4.2.5.1	(f) Recovery Time	Conditions as in Test (e) Pulse Length = 0.9 ± 0.1 µsecs Frequency of simulated echo 3620 ± 10 Mc/s Notes 1 and 6		100%			24	µsecs
	GROUPS B, C, D and E omitted							
5H. 5.3	GROUP F (g) Life Test	Note 7 The valve shall be mounted on the side-arm of a matched T-junction Incident peak power = 5 ± 1kW. p.r.f. = 500 p.p.s. ± 50 p.p.s. t_p = 2 µSecs ± 0.2µSecs or alternatively:- p.r.f. = 1200 p.p.s. ± 100 p.p.s. t_p = ~~0.4~~ 1.0 µSec ± 0.1 µSecs		See Note 10				
	Life Test end-point 1000 hours	Note 8						
	(i) Centre Frequency					3595	3680	Mc/s
	(ii) v.s.w.r.					0.85		
	(iii) Insertion Loss						0.25	dB
	(iv) Firing Power						20.0	W
	(v) High Power leakage						15	e/p
	Spike energy						44	e/p
	Total energy						50	µsecs
	(vi) Recovery Time							

Amdt 1

NOTES

1. The valve shall be tested in Mount A shown on Page 7.

2. The valve shall be tested in the line between terminations matched better than 0.91 v.s.w.r. The firing power is that power present in the line when the cell breaks down.

3. This test to be carried out before tests (e) and (f).

4. Measured with a thermistor head having a band width not less than 350 Mc/s at a v.s.w.r. of 0.67 and centred at the magnetron frequency.

5. If the measured mean leakage powers are p1 and p2 microwatts respectively then:

$$\text{Spike Leakage} = \frac{10p1}{\text{p.r.f.}} \quad \text{ergs/pulse}$$

$$\text{Total leakage energy} = \frac{10p2}{\text{p.r.f.}} \quad \text{ergs/pulse}$$

6. The time shall be measured from the trailing edge of the transmitter pulse for an insertion loss 6dB greater than that immediately before the transmitter pulse.

7. The Valve shall be tested in Mount B on page 8.

8. The post life tests shall be made under the conditions given in tests a, b, c, d, e and f, and the relaxed limits as stated shall apply.

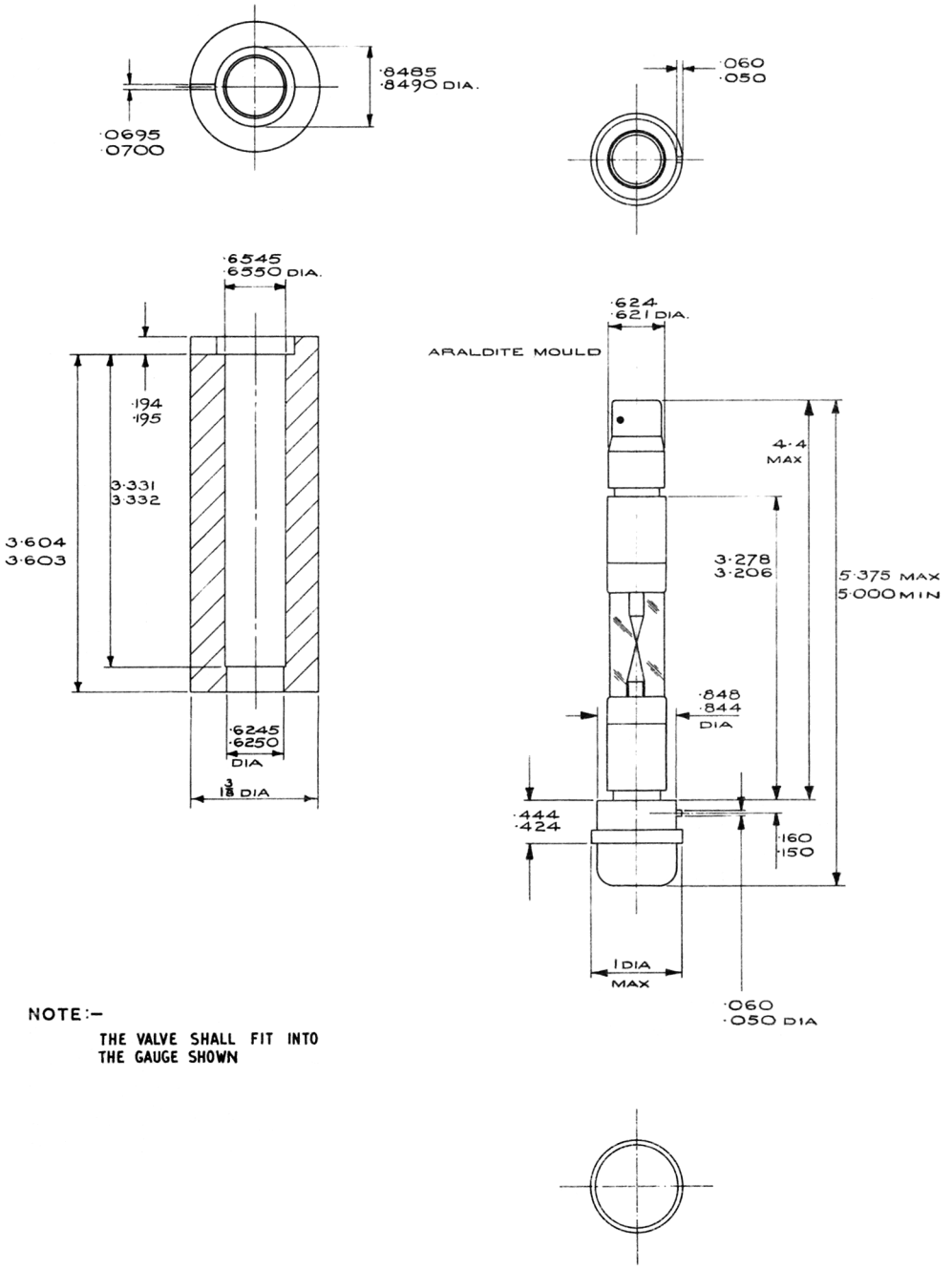
9. These conditions apply to production Life testing.

10. The number of valves to be life tested shall be not less than 4% of the contract quantity. The tests shall be performed at regular intervals during the contract production period. Cells placed on test shall be representative of those produced at the time the test commences.

The criterion for 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 dispatched without awaiting the accumulation of the ten samples provided that the results of tests made do not preclude acceptance under the criterion. Where rejection is incurred, shipment shall cease and the Approval Authority shall be informed.

OUTLINE DRAWING

THIRD ANGLE PROJECTION

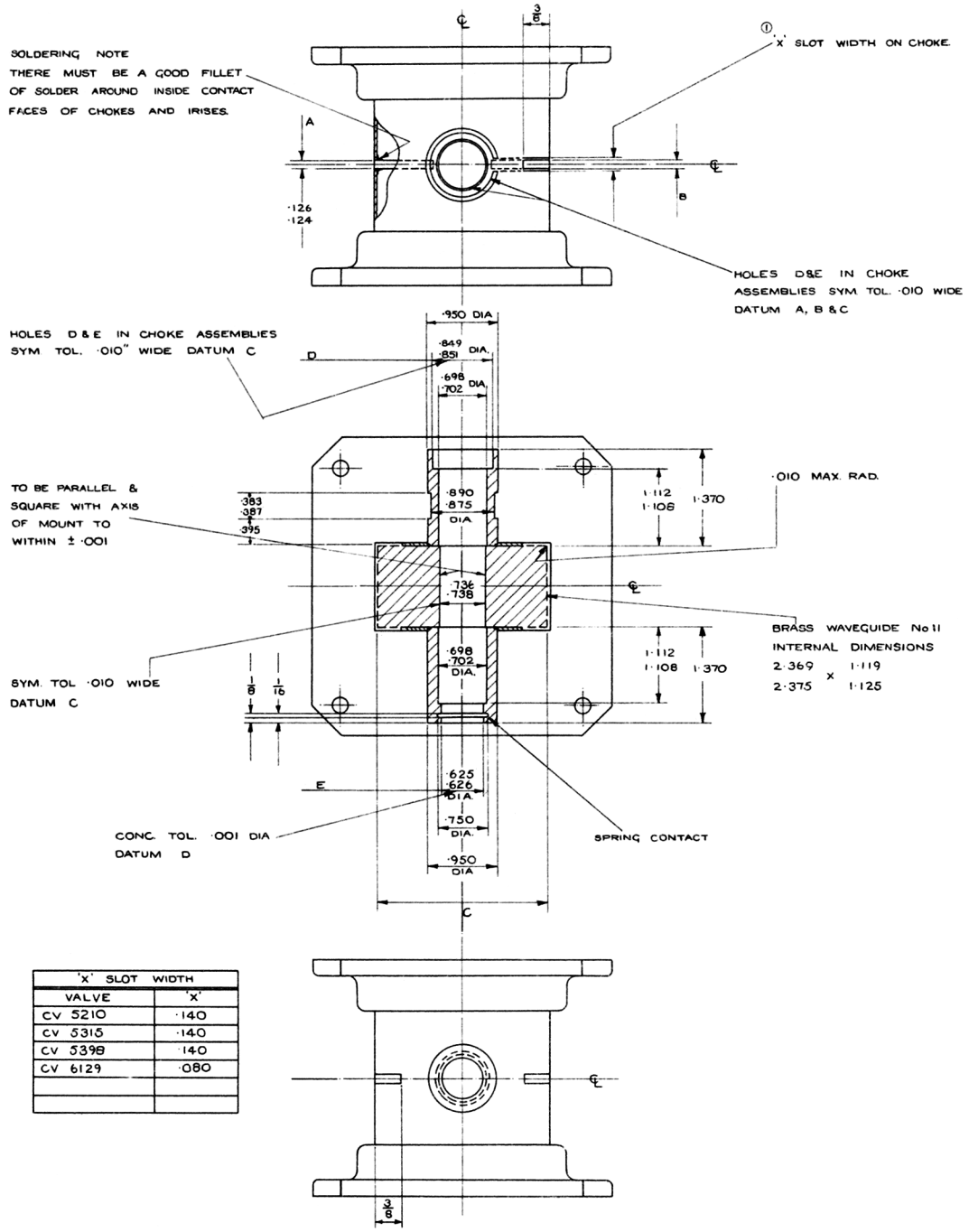


NOTE:–

THE VALVE SHALL FIT INTO
THE GAUGE SHOWN

ALL DIMENSIONS IN INCHES

FIG. 2
TEST MOUNT "A"
(THIRD ANGLE PROJECTION)
DIMENSIONS IN INCHES



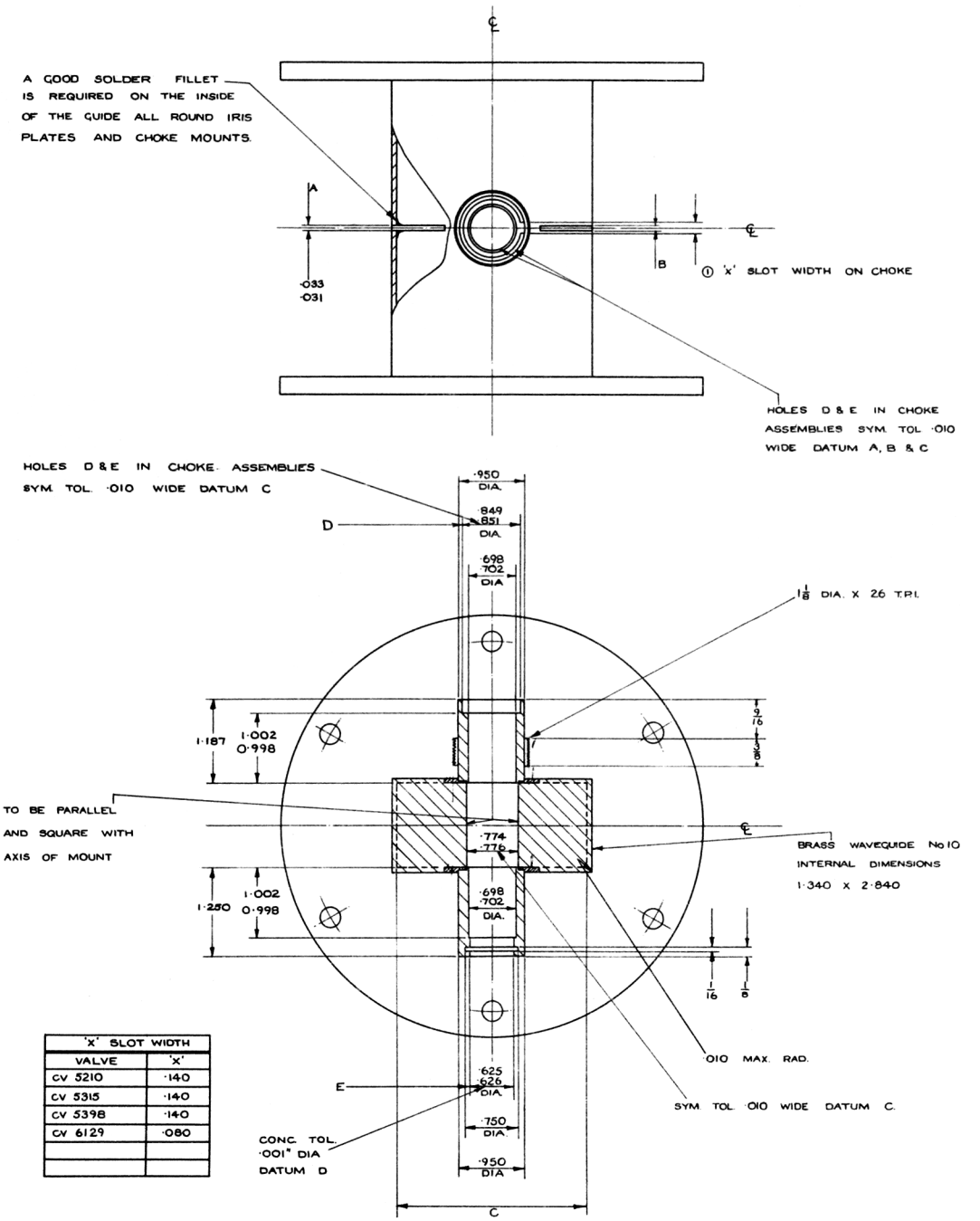
'X' SLOT WIDTH	
VALVE	'X'
CV 5210	·140
CV 5315	·140
CV 5398	·140
CV 6129	·080

FIG. 3

TEST MOUNT B

(THIRD ANGLE PROJECTION)

DIMENSIONS IN INCHES



'X' SLOT WIDTH	
VALVE	'X'
CV 5210	·140
CV 5315	·140
CV 5398	·140
CV 6129	·080

ELECTRONIC VALVE SPECIFICATIONS

SPECIFICATION MOA/CV6129 ISSUE NO. 1A DATED 8 APRIL 1964

AMENDMENT NO. 1

(i) Page 2, Note (vi) Amend reference to "page 4" to read "page 5".

(ii) Page 3, Test Group A(a) Centre Frequency. Insert under heading "Centre frequency" in Test column "of range within V.S.W.R. of 0.75 ± 0.05".

(iii) Page 4 Test Group F(g) Life Test. In the column headed Test Conditions amend "tp = 0.1 μ secs. ± 0.1 μ secs." to read "tp = 1.0 μ secs. ± 0.1 μ secs."

September, 1964

(228856)

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

19/4/64

ELECTRONIC VALVE SPECIFICATIONS

SPECIFICATION MOA/CV6129, ISSUE 1A, DATED 8th April 1967

AMENDMENT No. 2

Page 1. Insert the following amendments:-

(i) Specification Authority (top of page)

Amend "MINISTRY OF AVIATION - DLRD/RRE" to read "MINISTRY OF TECHNOLOGY - DLRD/RRE".

(ii) Specification Title

Amend "Specification MOA/CV6129" to read "Specification Mintech./CV6129".

(iii) Note E

Amend "3200" to read "100".

September 1967 TVC for RRE

N445478