

Specification Mintech/CV6234 Issue 1, Dated October 1968. To be read in conjunction with K1001.		<u>SECURITY</u> <u>Specification</u> <u>Valve</u> Unclassified Unclassified																																											
<u>TYPE OF VALVE:</u> Packaged Magnetron <u>CATHODE:</u> Unipotential, indirectly heated <u>PROTOTYPE:</u> VX 8544		<u>MARKING</u> See K1001/4 Additional marking:- Serial No.																																											
<u>RATINGS AND CHARACTERISTICS</u> Not for Inspection Purposes. All limiting values are absolute and non-simultaneous.		<u>CONNECTIONS & DIMENSIONS</u> See drawing fig. 1 WG 16 Bolted flange (DEF 5352)																																											
<table border="0" style="width: 100%;"> <tr> <td></td> <td style="text-align: center;"><u>NOTE</u></td> <td></td> </tr> <tr> <td>Heater voltage</td> <td>(V) 6.3\pm7%</td> <td>D</td> </tr> <tr> <td>Heater current at $V_h = 6.3V$.</td> <td>(A) 1.6\pm0.1</td> <td></td> </tr> <tr> <td>Max. peak anode current.</td> <td>(mA) 180</td> <td></td> </tr> <tr> <td>Min. peak anode current.</td> <td>(mA) 110</td> <td></td> </tr> <tr> <td>Max. peak input power.</td> <td>(W) 160</td> <td></td> </tr> <tr> <td>Max. mean anode input power.</td> <td>(W) 60</td> <td></td> </tr> <tr> <td>Max. duty cycle.</td> <td>(Ratio) 0.5</td> <td></td> </tr> <tr> <td>Max. pulsed duration.</td> <td>(μSec) 6</td> <td></td> </tr> <tr> <td>Max. rate of rise of voltage.</td> <td>(kV/μSec) 5</td> <td>C</td> </tr> <tr> <td>Max. anode temperature.</td> <td>($^{\circ}$C) 140</td> <td>A</td> </tr> <tr> <td>Min. tube heating time.</td> <td>(Secs) 150</td> <td>B</td> </tr> <tr> <td>Nominal operating frequency.</td> <td>(MHz) 8800</td> <td></td> </tr> <tr> <td>Nominal pulse voltage.</td> <td>(V) 800</td> <td></td> </tr> </table>			<u>NOTE</u>		Heater voltage	(V) 6.3 \pm 7%	D	Heater current at $V_h = 6.3V$.	(A) 1.6 \pm 0.1		Max. peak anode current.	(mA) 180		Min. peak anode current.	(mA) 110		Max. peak input power.	(W) 160		Max. mean anode input power.	(W) 60		Max. duty cycle.	(Ratio) 0.5		Max. pulsed duration.	(μ Sec) 6		Max. rate of rise of voltage.	(kV/ μ Sec) 5	C	Max. anode temperature.	($^{\circ}$ C) 140	A	Min. tube heating time.	(Secs) 150	B	Nominal operating frequency.	(MHz) 8800		Nominal pulse voltage.	(V) 800		<u>MOUNTING SUPPORT</u> By means of studs in the output flange, see fig. 1	
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		<u>MOUNTING POSITION</u> Any																																											
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		<u>JOINT SERVICE CAT. NO.</u> 5960-99-037- 5825																																											
		<u>PACKAGING</u> To K1005																																											
<u>NOTES</u> A. Measured at the point specified on the outline drawing on page 7. B. The cathode heating time should be greater than 150 seconds for ambient temperatures above $0^{\circ}C$ and greater than 180 seconds for ambient temperatures between $-55^{\circ}C$ and $0^{\circ}C$. C. For rating purposes only, the rate of rise of pulse voltage, is defined as the steepest tangent to the leading edge of the voltage pulse, measured for voltages which are in excess of 80% of the running voltage of the magnetron. D. The heater voltage should be reduced when the valve is running, otherwise life may be impaired. The value may be obtained from the table below. For intermediate anode currents obtain the heater voltage by linear interpolation.																																													
<table border="1" style="margin: auto; border-collapse: collapse;"> <thead> <tr> <th style="padding: 5px;">V_h, volts rms</th> <th style="padding: 5px;">I_a, mA mean</th> </tr> </thead> <tbody> <tr> <td style="padding: 5px;">6.3 \pm 7%</td> <td style="padding: 5px;">0</td> </tr> <tr> <td style="padding: 5px;">5.5 \pm 7%</td> <td style="padding: 5px;">30</td> </tr> <tr> <td style="padding: 5px;">4.5 \pm 7%</td> <td style="padding: 5px;">60</td> </tr> </tbody> </table>				V_h , volts rms	I_a , mA mean	6.3 \pm 7%	0	5.5 \pm 7%	30	4.5 \pm 7%	60																																		
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TESTS

To be performed in addition to those applicable in K1001, and with particular reference to section 5F. See note 1.

General Test Conditions:- Unless otherwise stated for individual tests, these shall be as given below:- Where tolerances are quoted, the actual value is at the discretion of the manufacturer provided it satisfies the tolerances specified.

Vh 6.3 volts Ia 60 mA mean PRF 100,000 pps Pulse width tp 4 μ secs rrv 5 kV/ μ secs min Load VSWR = 1.05 max.
See note 2 See note 4

Duty factor = $0.4 \pm 5\%$

No.	Test	Test Conditions	LIMITS		Units
			Min.	Max.	
1	Dimensions	Valve to be inspected to fig. 1 Valve must pass the gauges defined in figs. 2 and 3.			
2	Soak		48		hrs.
3	Holding period	No voltages	14		days
4	Missing pulses (1)	Ia mean = 72 mA Notes 8, 9.	-	0.25	%
5	Missing pulses (2)	Ia mean = 44 and 72 mA. VSWR = 1.3 min. all phases, note 9.	-	0.25	%
6	Peak anode voltage		750	850	Volts
7	Mean power output		7.5	-	Watts
8	Frequency	$t_{\text{anode}} = 80^{\circ} \pm 5^{\circ}\text{C}$. See outline drawing, fig. 1 (Drg. Note 4).	8785	8830	MHz
9	Pulling factor	Load VSWR = 1.5 min. (all phases)	-	15	MHz
10	Bandwidth (1)	Ia mean = 44 and 72 mA, VSWR = 1.3 min, all phases, note 3.	-	2.5/tp	MHz
11	Sidelobes (1)	Ia mean = 44 and 72 mA, VSWR = 1.3 min, all phases, note 3.	6	-	db.
12	Heater current	No pulse voltages, Vh = 6.3 volts rms for 2 minutes min.	1.5	1.7	Amps
13	Bandwidth (2) (QA)	Duty cycle $0.2 \pm 5\%$ PRF = 50,000 pps, note 3 Ia mean = 30 mA.		2.5/tp	MHz
14	Sidelobes (2) (QA)	Duty cycle $0.2 \pm 5\%$ PRF = 50,000 pps, note 3. Ia mean = 30 mA.	6	-	db.

NOTES

1. The tests shall be carried out on all valves except those designated sample (S) and Qualification Approval (Q.A.). The tests may be carried out in any order except that tests (2) (3) and (4) must be carried out in that order.

Any meters used must be Industrial Grade I as laid down in BS 89.

2. The heater starting voltage shall be 6.3 volts rms and be reduced within five seconds of applying E.H.T. For $I_a = 30$ mA mean, $V_h = 5.5$ volts rms; for $I_a = 60$ mA mean, $V_h = 4.5$ volts rms.

3. To be measured with an RF spectrometer. The main lobe shall be such that the sign of the slope between the 6db levels changes once only.

The ratio of the maximum power in the main lobe to the maximum power in any of the sidelobes shall be greater than 6 db.

4. K1001 5F 2.5.5 is waived, and instead the manufacturer shall comply with the following:-

"The rate of rise of pulse voltage, is the value of dV/dt at the onset of RF oscillations and shall not be less than that specified".
The rrv shall be measured with a suitable differentiator.

5. The pushing factor shall be measured by modulating the mean anode current by $\pm 10\%$ with a 50 c/s waveform. Alternatively, the mean anode current may be varied rapidly between 27 and 33 mA while the total frequency excursion is noted, care being taken to eliminate errors due to thermal effects.

6. The vibration shall be separately applied in each of three mutually perpendicular directions, one of which shall be perpendicular to the plane of the flange. The vibration shall have accelerations of 2g for 25 c/s to 150 c/s, and $\frac{1}{2}g$ for 150 c/s to 2000 c/s. The sampling rate shall be one valve in 50 or one valve per batch whichever is the smaller.

7. To be measured with the anode temperatures controlled at respectively 90°C and 110°C.

8. Immediately following the holding period, test 4 shall be performed. 6.3 volts shall be applied to the heater for 2 minutes maximum, then the EHT shall be applied to give 72 mA mean anode current. The valve shall meet the requirement by the end of the fifth minute of running. After the shelf storage, similar conditions apply except that the valve shall meet the requirement after the 15th minute of running. Running time shall be measured from the moment of application of anode voltage.

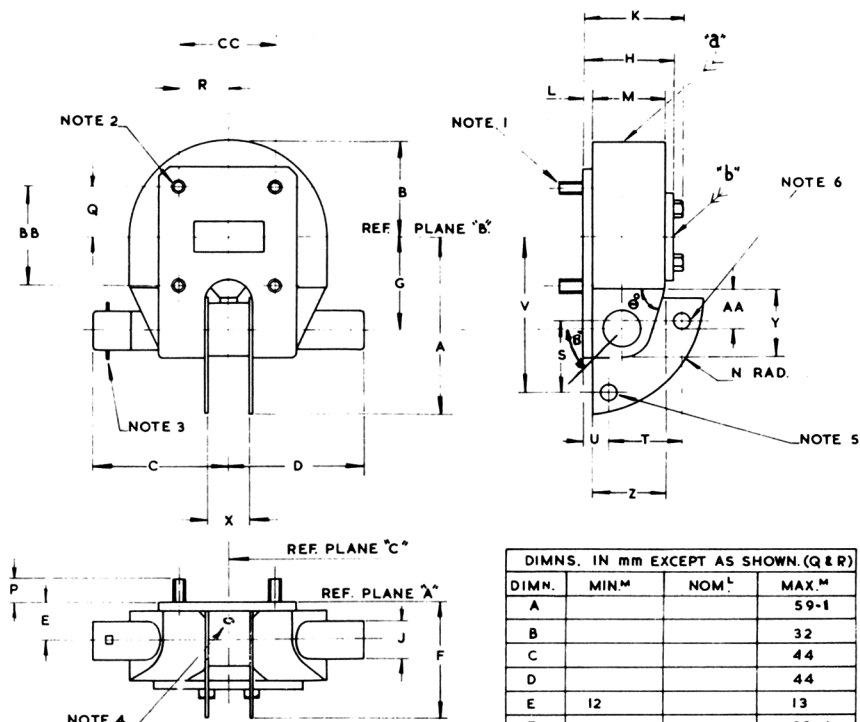
9. A missing pulse is defined as an RF pulse which has less than 70% of the average energy of a normal pulse in the band 8720 - 8880 MHz.

10. The scale of life testing shall be related to the production. For production orders of less than 51, one valve shall be life-tested. For production orders of greater than 50, the production shall be divided into batches of 50 and one valve from each shall be life-tested. The batch corresponding to the valve undergoing the life test shall not be released until the life test has completed 80% of the required life. In the event of any valve failing to meet the life test requirements the manufacturer shall consult the Approving Authority.

NOTES cont'd.

11. Three valves shall be stored for 3 years. The valves shall pass all 100% tests after this period and test 4 shall be the first to be performed. Failures shall be reported to the Approving Authority.
12. Three samples shall be subjected to this test. The average of the total aggregate hours shall be 2000 hours per valve for the three valves. No valve contributing less than 1000 hours to the aggregate total shall be accepted as part of the test.

FIG. 1

**MARKING**

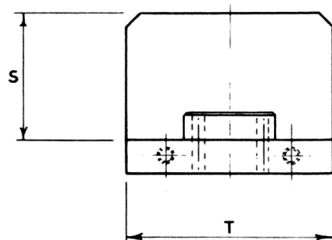
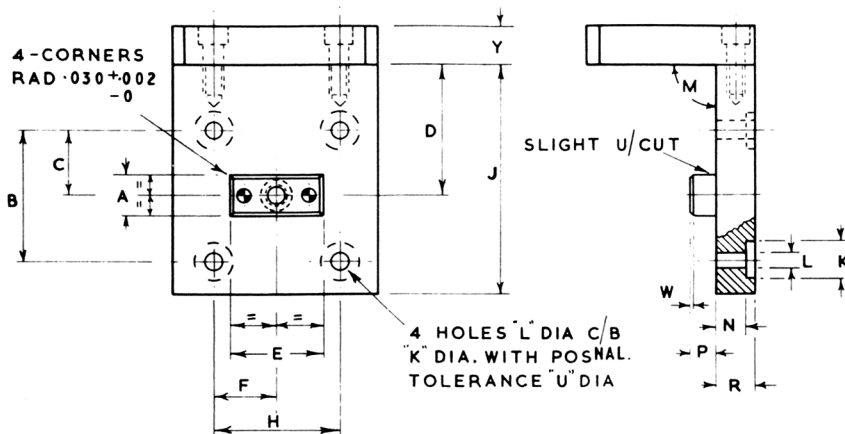
FOR GENERAL MARKING INSTRUCTIONS SEE GWV 5-7-0/202.
TYPE MARKING ACCORDING TO PATTERN SE AND POSITIONED
WHERE INDICATED BY ARROW "a". DATE AND CODE MARK
POSITIONED WHERE INDICATED BY ARROW "b".

NOTES

1. FOUR STUDS No. 8 (0-164") 32 UNC.
2. TOLERANCE ZONE DIAMETER 0.004".
3. CATHODE TERMINAL MARKED K
4. ANODE TEMPERATURE MEASURING POINT.
5. 4 HOLES W DIA. POSITION TOLERANCE 0.2 DIA.
6. THICKNESS OF MATERIAL BETWEEN CIRCUMFERENCE
OF HOLES AND EDGE OF FIN $\frac{1}{32}$ MINIMUM.
7. GAUGE 1 TO CHECK STUD LENGTH P, POSITIONS
OF STUDS Q, R, BB, CC, AND HEIGHT OF MAGNET.
GAUGE 2 TO CHECK N, S, T, X, F, U, V.

DIMNS. IN mm EXCEPT AS SHOWN (Q & R)			
DIMN.	MIN. ^M	NOM. ^L	MAX. ^M
A			59.1
B			32
C			44
D			44
E	12		13
F			39.1
G	29		33
H	29		30.5
J			13
K	32.0		35.5
L	2.9		3.4
M	23.1		24.7
N			35.7
P	7		8
Q		0.640"	NOTE 7
R		0.610"	NOTE 7
S		22.2 TP	
T		25.4 TP	
U		8.0 TP	
V		51.6 TP	
W	4.9		5.1
X	13.36		13.61
Y	24.3		25.0
Z	23.7		24.4
AA	15.8		16.4
BB		32.51	
CC		30.99	
θ°	70° ± 0.5°		
B°	45° ± 5° (NOTE 4)		

FIG. 2

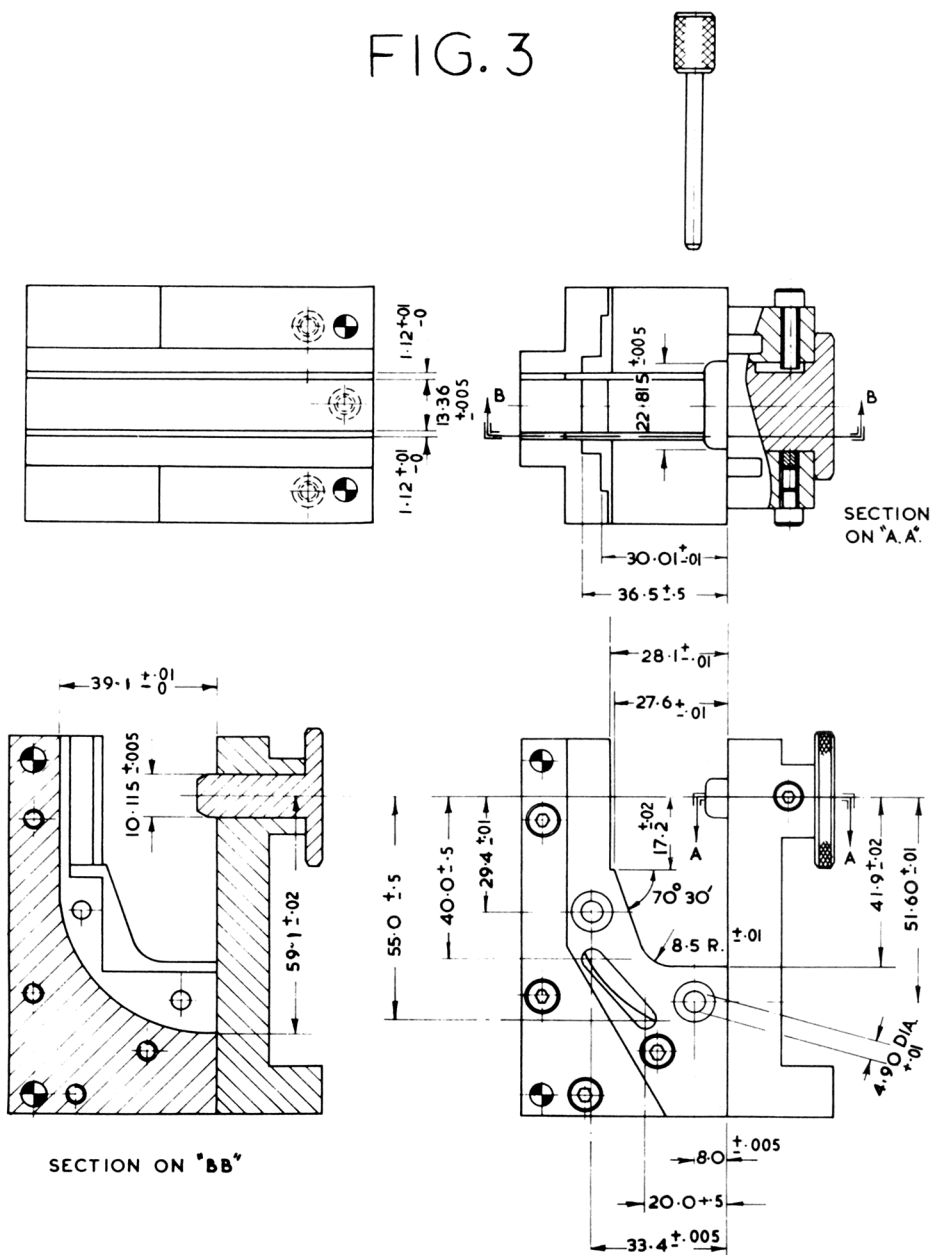


INDEX	INCHES		METRIC	
	MAX	MIN	MAX	MIN
A	0.398	0.397	10.11	10.084
B	1.280	BAS	32.51	BAS
C	0.64	BAS	16.255	BAS
D	1.260	1.256	32.00	31.90
E	0.898	0.897	22.81	22.786
F	0.61	BAS	15.49	BAS
H	1.220	BAS	30.98	BAS
J	2.26	2.24	57.4	56.9
K	0.38	0.36	9.65	9.15
L	0.170	0.1695	4.318	4.305
M	90° ± 5'		—	
N	0.280	0.276	7.1	7.0
P	0.26	0.24	6.6	6.1
R	0.354	0.350	9.0	8.9
S	1.27	1.23	32.25	31.25
T	2.02	1.98	51.3	50.3
U	0.0005	—	0.0127	—
W	0.04	0.03	1.0	0.75
Y	0.38	0.36	9.65	9.15

NOTE.

1. GAUGE TO CHECK STUD LENGTH, POSITION OF STUDS, & HEIGHT OF MAGNET.
2. GAUGING FACES OF RECT. BLOCK TO BE SQUARE & PARELLEL, AND IN CORRECT RELATIONSHIP TO HOLES "L".

FIG. 3



ALL DIMENSIONS IN mm.

ELECTRONIC VALVE SPECIFICATIONS

SPECIFICATION MOA/CV6234, ISSUE 1 DATED OCTOBER 1968
AMENDMENT NO 1

1 Page 1

(a) Specification Authority (top left hand corner)

Delete "Ministry of Technology - DLRD/RRE"

Insert "MOD(PE) - Royal Radar Establishment"

(b) Specification Title

Delete "Specification Mintech/CV6234"

Insert "Specification MOD(PE)/CV6234"

(c) Ratings and characteristics

Between "Max rate of rise of voltage" and "Max anode temperature"

Insert in the appropriate columns:

Min rate of rise of voltage (kV/ μ s)

(d) Note C

Delete the first four words ie "For rating purposes only"

2 Page 2

(a) Test 5 Missing pulses (2)

In the column headed Test Conditions after "note 9" add "13"

3 Page 4

(a) Note 4

Delete entirely

Insert "The rate of rise of pulse voltage shall be the maximum value measured above the 80% level of the magnetron pulse voltage, (as in BS9030).

(b) Note 9

Delete entirely

Insert "A pulse is defined as missing when the rf energy is less than 70% of the average energy of a pulse in the normal spectrum envelope ie between the first spectrum zeros".

4 Page 5

Insert new note 13.

"13 This test shall be performed using a Decca Modulator reference C/SK 14359, over the rate of rise of voltage range 3 kV/ μ s to 5 kV/ μ s. The missing pulse rate at the worst condition shall be recorded:"