

MINISTRY OF SUPPLY - DLPMVALVE ELECTRONIC

CV5031

Specification MOS/CV 5031 Issue 1. dated 28.3.57 To be read in conjunction with K.1001 ignoring clauses 5.2, 5.3, 5.8.		<u>SECURITY</u> <table border="1"> <tr> <td><u>Specification</u></td> <td><u>Valve</u></td> </tr> <tr> <td>Unclassified</td> <td>Unclassified</td> </tr> </table>		<u>Specification</u>	<u>Valve</u>	Unclassified	Unclassified																																						
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<u>TYPE OF VALVE:</u> Magnetron <u>CATHODE:</u> Indirectly Heated <u>PROTOTYPE:</u> N.548		<u>MARKING</u> See K.1001/4																																											
<table border="1"> <thead> <tr> <th><u>RATING</u></th> <th></th> <th>Note</th> </tr> </thead> <tbody> <tr> <td>Heater Voltage (V)</td> <td>3.0</td> <td>A.B.</td> </tr> <tr> <td>Heater Current (A)</td> <td>3.5</td> <td></td> </tr> <tr> <td>Max.Peak Anode Voltage (kV)</td> <td>15.5</td> <td></td> </tr> <tr> <td>Min.Peak Anode Voltage (kV)</td> <td>10.5</td> <td></td> </tr> <tr> <td>Max.Peak Anode Current (A)</td> <td>12.0</td> <td></td> </tr> <tr> <td>Min.Peak Anode Current (A)</td> <td>8.0</td> <td></td> </tr> <tr> <td>Max.Peak Input Power (kW)</td> <td>150</td> <td></td> </tr> <tr> <td>Max.Anode Input Power (W)</td> <td>150</td> <td>C.</td> </tr> <tr> <td>Max.Duty Cycle for above Rating</td> <td>0.001</td> <td></td> </tr> <tr> <td>Max.Pulse Duration (u.sec)</td> <td>2</td> <td></td> </tr> <tr> <td>Max.Rate of Voltage Rise (kV/u.sec)</td> <td>150</td> <td></td> </tr> <tr> <td>Max.Anode Temperature (C)</td> <td>140</td> <td></td> </tr> <tr> <td>Nominal Frequency</td> <td>9085</td> <td></td> </tr> </tbody> </table>		<u>RATING</u>		Note	Heater Voltage (V)	3.0	A.B.	Heater Current (A)	3.5		Max.Peak Anode Voltage (kV)	15.5		Min.Peak Anode Voltage (kV)	10.5		Max.Peak Anode Current (A)	12.0		Min.Peak Anode Current (A)	8.0		Max.Peak Input Power (kW)	150		Max.Anode Input Power (W)	150	C.	Max.Duty Cycle for above Rating	0.001		Max.Pulse Duration (u.sec)	2		Max.Rate of Voltage Rise (kV/u.sec)	150		Max.Anode Temperature (C)	140		Nominal Frequency	9085		<u>DIMENSIONS AND CONNECTIONS</u> See Drawing, Page 4 and 5	
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<u>Notes</u> A. Full heater voltage shall be applied for at least two minutes before the application of H.T. B. When operating at maximum input the heater voltage should be reduced to 1.5 V. C. The temperature of the anode block shall not at any point exceed 140°C. D. In use the cathode lead side of the valve shall be adjacent to the North pole of the magnet																																													

TESTS

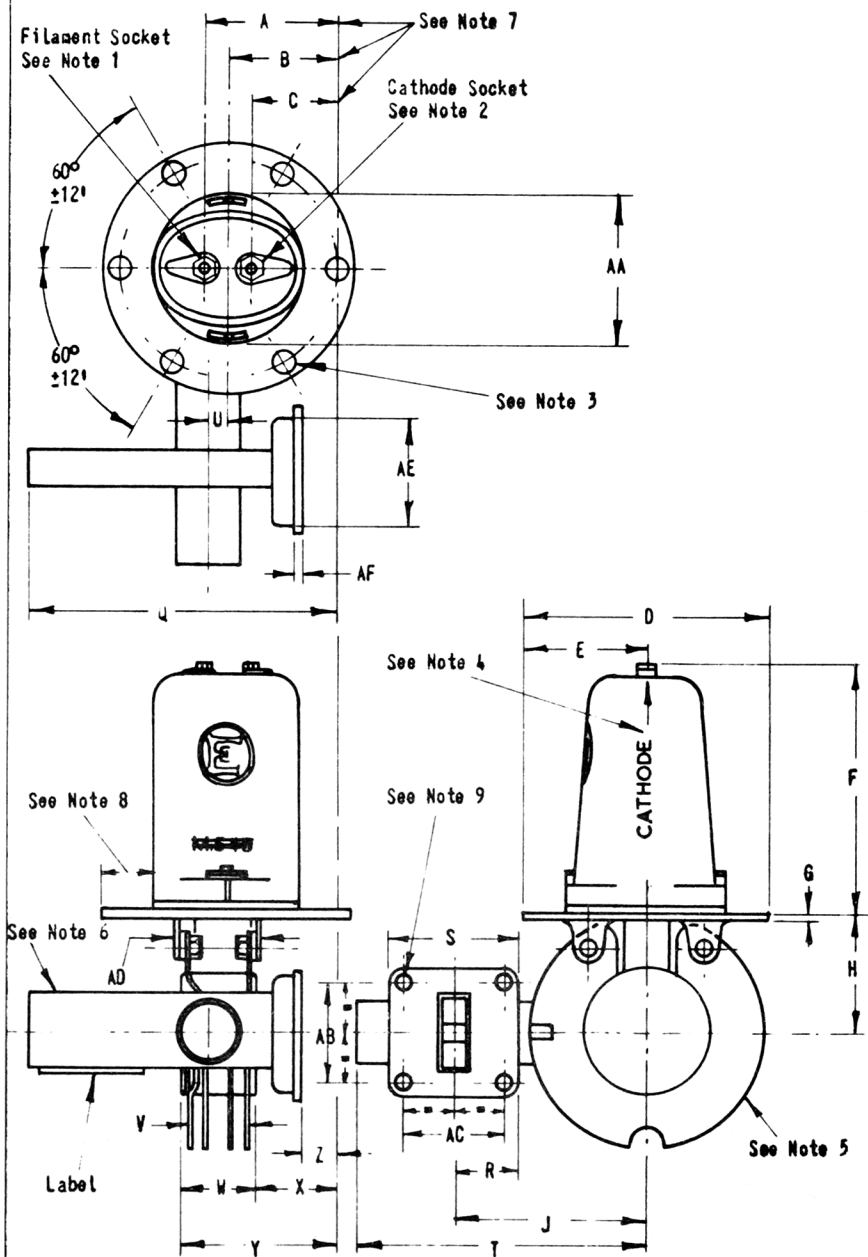
To be performed in addition to those applicable in K.1001

Test Conditions			Test	Limits		No. Tested	Notes
	VH (V)	Mean Ia (mA)		Min.	Max.		
a	3.0	-	Heater Current (A)	3.0	4.0	100 %	1
b	1.5	12.0	Va Peak (kV)	12.5	14.5	100 %	2,3. & 4
c	1.5	12.0	Power Output (W)	35.0	-	100 %	2,3. & 4
d	1.5	12.0	Frequency (Mc/s)	9003	9168	100 %	2,3,4. & 6
e	2.0	10.0	Frequency Pulling (Mc/s)	-	12.0	100 %	2,3,5. & 7
f	2.0	Mean current varied over range 8-12mA	There shall be no mode change.	-	-	100 %	2,3,4. & 7
g	2.0	Mean current varied over range 10-12mA	Frequency Shift (Mc/s)	-	5	100 %	2,3,4,8.
h	1.5	12.0	Stability (%)	-	0.5	100 %	2,3,4.& 12
j	3.0	-	Cold Impedance (mm) Position of Voltage Minimum	-	3.0	100 %	9
k	-	-	Vibration			10 %	10 & 13
l	-	-	Drop			10 %	11 & 13

Notes

1. The heater current shall be measured not less than 360 seconds after the application of heater voltage.
2. Full heater voltage of 3.0 V shall be applied for not more than 120 seconds before the application of H.T. when the heater voltage shall be reduced within 5 seconds.
3. Measured with pulse length 1u.sec \pm 10%, duty cycle 0.001, magnetic field strength 3,800 oersteds \pm 2%. the rate of rise of the voltage pulse shall not be less than 150 kV/u.sec. when the valve is operating at 12 amps peak.
4. The waveguide shall be terminated in a resistive load giving a voltage standing wave ratio better than 1.10.
5. Measured with a voltage standing wave ratio of not less than 1.5 varied through all phases.
6. The spectrum width is not to exceed 3 Mc/s at the $\frac{1}{4}$ power points.
7. There shall be no sign of missing pulses nor serious deterioration of the spectrum when viewed on a spectrum analyser, nor double traces of voltage or current observed on an oscilloscope.
8. The difference between maximum and minimum frequencies in the range 10-12 mA is not to exceed 5.0 Mc/s.
9. The voltage standing wave ratio shall be not less than 6.0 to 1. The distance of the minimum from the reference plane shall be within the specified limits at the frequency recorded in test "d". The reference plane shall be 1mm distant from the magnetron coupling flange into the valve.
10. One valve in ten shall be mounted rigidly on a platform which will be vibrated with simple harmonic motion of 0.040" amplitude (total excursion 0.080") at a frequency of 25 cps. The cathode tube and support arm are to be at right angles to the direction of motion. The duration of vibration shall be 60 seconds.
11. One valve in ten shall be dropped in its normal approved packing 3 feet on to a concrete floor.
12. The valve shall be stored for 168 hours before this test. Stable operation shall be demonstrated over 30 seconds of a test period not to exceed 4 minutes after the application of H.T. Stability is defined as:-

$$\frac{\text{Number of arcs}}{\text{Total number of magnetron pulses in the test interval}} \times 100\%$$
 Arcs shall be recorded by an electronic counter which is adjusted to respond to current pulses more than 10% above the operating peak current.
13. The valve shall then pass the specification. In the event of a failure "the lot" shall be subjected to this test.



For Dimensions & Notes see Page 5

DIMENSIONS AND NOTES

DIMENSION (Note 10)	NOMINAL	MINIMUM	MAXIMUM	REMARKS
A	1.687			See Note 7
B	1.437			See Note 7
C	1.187			See Note 7
D	3.250	3.218	3.281	Diameter
E	1.625			
F	2.984	2.922	3.046	
G	0.125			
H	1.562	1.542	1.582	
J	2.437	2.417	2.457	
K				
L				
M				
N				
P				
Q			4.062	
R	0.812	0.810	0.814	
S	1.625	1.610	1.640	
T			4.750	
U	0.219			
V	0.807	0.8025	0.812	
W			0.974	
X		0.812		
Y			1.938	
Z	0.122	0.102	0.142	
AA			2.218	Diameter
AB	1.220			
AC	1.280			
AD			1.107	
AE	1.422	1.407	1.437	Diameter
AF	0.110	0.105	0.115	
<p>NOTES:- 1. Filament hole in Pin Jack is 0.164 - 0.174 Diameter</p> <p>2. Cathode Hole in Pin Jack is 0.164 - 0.174 Diameter</p> <p>3. 6 Holes $0.193 \pm .003$ Diameter equally spaced on a $2.875 \pm .006$ P.C. Dia.</p> <p>4. Common Cathode Connection indicated by "CATHODE" marking.</p> <p>5. Radiator, Diameter is 3.062 Maximum.</p> <p>6. Waveguide $1" \times \frac{1}{2}"$ Outside $\times 0.050"$ wall.</p> <p>7. Centre-line to be within 0.023" of nominal position and spacing between pin-jacks to be $0.500" \pm 0.010"$.</p> <p>8. With the flange resting on a plane surface the flatness of the mounting plate 0.500" from the edge shall be such that a 0.010" thickness gauge 0.125" wide shall not enter for a distance of more than 0.250".</p> <p>9. 4 Holes $0.170" \pm .003"$.</p> <p>10. All dimensions in inches.</p>				