

ADMIRALTY SIGNAL & RADAR ESTABLISHMENT

Specification AD/CV991/Issue 3. Dated 20.4.48. To be read in conjunction with K1001, ignoring clauses:- 5.2, 5.3, 5.8.	<u>SECURITY</u>	
	<u>Specn.</u> Restricted	<u>Valve</u> Unclassified

→ Indicates a change.

<p><u>TYPE OF VALVE:-</u> Magnetron with pre-plumbed waveguide output.</p> <p><u>CATHODE:-</u> Indirectly heated, oxide coated.</p> <p><u>ENVELOPE:-</u> Copper and Glass.</p> <p><u>PROTOTYPE:-</u> First E1494, then E1542.</p>	<p><u>MARKING</u></p> <p>See K1001/4. Additional Marking:- Serial No. See also Note C.</p>																				
<table border="1" style="width: 100%;"> <thead> <tr> <th style="text-align: center;"><u>RATING</u></th> <th style="text-align: center;">Note</th> </tr> </thead> <tbody> <tr> <td>Heater Voltage (AC or DC) (V) 3.0</td> <td style="text-align: center;">E</td> </tr> <tr> <td>Heater Current (A) 2.5</td> <td style="text-align: center;">C</td> </tr> <tr> <td>Approx. Nominal Wavelength (cm) 3.14</td> <td style="text-align: center;">H</td> </tr> <tr> <td>Max. Frequency Pulling (Mc/s) 15</td> <td style="text-align: center;">B</td> </tr> <tr> <td>Max. Anode Dissipation (W) 150</td> <td style="text-align: center;">A</td> </tr> <tr> <td colspan="2" style="text-align: center;"><u>Typical Operating Conditions</u></td> </tr> <tr> <td>Peak Anode Voltage (kV) 15.5</td> <td style="text-align: center;">A</td> </tr> <tr> <td>Peak Anode Current (A) 10</td> <td style="text-align: center;">A</td> </tr> <tr> <td>Output Peak Power (kW) 27</td> <td style="text-align: center;">A</td> </tr> </tbody> </table>	<u>RATING</u>	Note	Heater Voltage (AC or DC) (V) 3.0	E	Heater Current (A) 2.5	C	Approx. Nominal Wavelength (cm) 3.14	H	Max. Frequency Pulling (Mc/s) 15	B	Max. Anode Dissipation (W) 150	A	<u>Typical Operating Conditions</u>		Peak Anode Voltage (kV) 15.5	A	Peak Anode Current (A) 10	A	Output Peak Power (kW) 27	A	<p style="text-align: center;"><u>DIMENSIONS AND CONNECTIONS</u></p> <p>See Pages 3 and 4.</p> <p style="text-align: center;"><u>PACKAGING</u></p> <p>See K1005.</p>
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NOTES

- A. These figures are for pulse operation with:-
- (i) Recurrence frequency : 1500 pps.
 - (ii) Pulse length : $\frac{1}{2}$ μ Sec.
 - (iii) Pulse shape : Sensibly square.
 - (iv) Field strength : 3250 oersteds. (See Note D).
- B. During operation and testing, air must be blown through a suitable fitting enclosing the cooling fins of the anode so that the block temperature does not rise above 140°C.
- C. No technical information shall appear on the valve or packing.
- D. The valve is expected to operate with any field in the range 3250 \pm 150 oersteds. This point will be checked at Type Approval.
- E. If the input power is sufficiently high, $V_h = 3.0$ V. may be required for starting only, and during operation may be reduced or switched off. V_h must be applied for at least 1.5 mins. before V_a is applied.
- F. The magnetron shall be processed so as to ensure, as far as possible, that only brief ageing (of the order of 5 mins. or less) is necessary when maximum V_a is instantaneously applied, as in service.
- G. In use, the cathode lead side of the valve shall be adjacent to the north pole of the magnet.
- H. See test 'c' (ii).

TESTS

To be performed in addition to those applicable in K1001.

	Test Conditions		Test	Limits		No. Tested	Notes
	Vh (V)	Ia (A) (peak)		Min.	Max.		
a	3.0 (AC or DC)		Ih (A)	2.0	3.0	100%	
b	3.0	10.0	Va peak (kV)	12.5	17.5	100%	1,2
c	3.0	10.0	(i) Frequency (Mc/s)	9820	9900	100%	1,2, C.
	A sliding slug, which in any position in the waveguide introduces a voltage S.W.R. of 1.5:1, followed by a matched termination, shall be used; it shall be used in the output waveguide near the magnetron. The frequency change which occurs as the slug is moved, so as to move the S.W. pattern through at least $\lambda_g/2$ at the magnetron, shall be noted.		(ii) Frequency pulling (Mc/s)	-	15		
d	3.0	10.0	Efficiency (Power out/Power in).	15%	-	100%	1,2, 3.
	Efficiency is to be measured by an approved method.						
e	3.0	Ia peak to be varied from 5	Frequency Continuity	The frequency shall vary smoothly and without discontinuity.		A small %	1,2
	to 12 A. The change of frequency is to be observed.						

NOTES

- The valve is to be pulse tested, according to the above table (tests 'b' to 'e'), in an approved circuit, and with the following test conditions :-

1.1. Recurrence frequency	:	1500 pps.	} or other approved figures.
1.2. Min. Pulse length	:	0.5 μ Sec.	
1.3. Min. mark/space ratio	:	1/1300.	
1.4. Pulse shape	:	Sensibly square.	
1.5. Field strength	:	3250 \pm 30 oersteds.	
- No serious or continued flashing (internal or external) must occur during the tests.
- The apparatus used for the measurement of output power is to be checked after every 500 valves tested, or once a month (whichever is the shorter period) against the calorimetric method of measurement.

FIG. 1



