

VALVE ELECTRONICADMIRALTY SURFACE WEAPONS ESTABLISHMENT

CVI479-82

Specification AD/CVI479, CVI480, CVI481,
CVI482.SECURITY

Issue 7 dated 24/4/61.

To be read in conjunction with K1006. ←

Specification

Unclassified

Valve

Unclassified

→ Indicates a change

<u>TYPE OF VALVE:</u> Magnetron <u>CATHODE:</u> Indirectly heated, oxide coated. <u>ENVELOPE:</u> Copper and glass <u>PROTOTYPES:</u> CV76A, B, C & D		<u>MARKING</u> See K1001/4 <u>Additional Marking</u> Serial No.	
<u>RATING</u> Heater Voltage (a.c. or d.c.) (V) Heater Current (A) Nominal Frequencies:- CVI479 (Mc/s) 3045 CVI480 (Mc/s) 3018 CVI481 (Mc/s) 2993 CVI482 (Mc/s) 2965 Max. Anode Dissipation (W) 600		Note D A, C.	<u>DIMENSIONS AND CONNECTIONS</u> See drawing on Page 4.
<u>TYPICAL OPERATION CONDITIONS</u> Peak Anode Voltage (kV) 27 B Peak Anode Current (A) 35 B Peak Output power (kW) 450 B			
<u>NOTES</u> A. Absolute Maximum Value. B. These figures apply for pulse operation with:- (i) Pulse Recurrence Frequency : 500 pps (ii) Pulse length : 2 or 0.7 μ secs. (iii) Pulse shape : Sensibly square (iv) Field strength : 2300 oersteds (See Note E) C. 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. D. $V_h = 5.0V$ for starting only. For normal running $V_h = 0$. E. The valve is expected to operate with any field in the range 2300 ± 100 oersteds. This point will be checked at Qualification approval. F. The magnetron shall be processed so as to ensure, as far as possible that only brief aging (of the order of 5 minutes or less) is necessary when it is put into service. G. In use, the cathode lead side of the valve shall be adjacent to the north pole of the magnet.			

CVI479-82

PAGE 1.

SPECIFICATION FOR CV1479-1482

To be read in conjunction with K1006.

<u>Ratings:</u>	<u>Ef</u>	<u>epy</u>	<u>ib</u>	<u>Pi</u>	<u>tk</u>	<u>Du</u>	<u>tp</u>	<u>Anode T</u>	<u>H</u>
<u>Absolute</u>	<u>V</u>	<u>kV</u>	<u>a</u>	<u>W</u>	<u>sec</u>	<u>—</u>	<u>us</u>	<u>°C</u>	<u>oersteds</u>
<u>Maximum:</u>	5.5	30	40	1200	—	.001	2.5	140	2400
<u>Minimum:</u>	4.5	—	—	—	120	—	—	—	2200

Pulsing Service Note 2

~~xxx~~Cathode: Oxide Coated Unipotential

For miscellaneous requirements, see Paragraph 3.3 Inspection Instructions for Electron Tubes for use with K1006.

<u>Ref.</u>	<u>Test</u>	<u>Conditions</u>	<u>Min.</u>	<u>Max.</u>
3.1	Qualification Approval:			
4.5	Holding Period:	t=168 hours		
K1005	Carton Drop:			
4.9.19.1	xxx Vibration:	No voltage		
4.9.19.2	xxx Vibration:	No voltage		
4.9.2	Dimensions:	Per drawing page Note 1		
4.16.1	xxx Cooling:	Note C page A		
4.10.8	Heater Current:	Ef=5.0V	If: 2.3	2.9 A
4.16.3	<u>Oscillation (1):</u>	Note 3		
—	Coupling:	Per drawing; Note 4		
4.16.3.1	Magnetic Field:	H=2300 oersteds Note 5		
4.16.3.2	Heater:	tk=120 (max.) at Ef=5.0V; Ef=0V for test		
4.16.3.3	Pulse Characteristics:	tp=1.8 to 2.2 us; Du=.001; + 10% rrv=110kV/us (min) Note 6		
4.16.3.4	Average Anode Current: Standing Wave Ratio:	Ib=35 mA d.c. o =1.15/1 (max) Note 7		
4.16.3.5	Pulse Voltage:		epy: 24	30 kV
4.16.3.6	Power Output:	t=300 (max)	Po: 400	— W

PAGE 2

4.10.7.3	Frequency:	Temp. of anode block approx. 100°C			
		CV1479:	3030	3060	Mc
		CV1480:	3005	3030	Mc
		CV1481:	2980	3005	Mc
		CV1482:	2950	2980	Mc
4.16.3.7	R.F. Bandwidth:	Note 8	Bandwidth: —	1.5	Mc
---	*Pulling Factor:	Note 9	ΔF : —	35	Mc
4.16.6	*Pushing Factor:	Ib=30 to 40 mA d.c.	ΔF : —	5	Mc
4.16.7	*Stability:	Ib=40 mA d.c. Note 10	MP: —	0.25%	
4.16.3	<u>Oscillation (2):</u>	Note 3			
---	Coupling:	Per drawing; Note 4			
4.16.3.1	Magnetic Field:	H=2300 oersteds Note 5			
4.16.3.2	Heater:	tk=120 (max) at Ef=5.0V; EF=2.0V for test			
4.16.3.3	Pulse Characteristics:	tp=0.75 to 0.65 μ s; Du=.0004; \pm 7.5% rrv=110 kV/ μ S (min) Note 6			
4.16.3.4	Average Anode Current:	Ib=15 mA d.c.			
	Standing Wave Ratio:	$\sigma = 1.15/1$ (max) Note 7			
4.16.7.	*Stability:	Note 10	MP: —	0.25%	
4.9.14	***Temperature Coefficient:		ΔF : —	.07Mc/°C	
4.9.15	***Low Temperature: Operation:	tk=180 (max);			
4.11	Life Test:	Group D; Osc. (1) Note 11	t: 500 —	hrs.	
4.11.4	Life Test End Point:	Osc. (1) Stability Notes 10 and 11	Po: 360 — MP: —	W 0.5%	

Note 1: A cover shall be screwed over the output probe for protection during transit.

Note 2: The heater voltage shall be applied for the specified time before running up the valve. The heater shall be switched off when the specified pulse current has been attained.

- Note 3: The modulator shall be equivalent to Modulator Type 277. Panel 3 BA.
- Note 4: The magnetron connector shall be A.P.W9199 as used in Transmitter 9R. The Magnetron with an anti-corona ball fitted to its output should be fully screwed into the holder within the turnstile. The turnstile will then be unscrewed one half turn.

A load capable of absorbing the R/F power shall be attached to the output flange of the connector. The reflection from the load shall not exceed that specified.

The piston in the output connector shall be adjusted to deliver maximum power into the load and then moved one centimetre towards the valve.

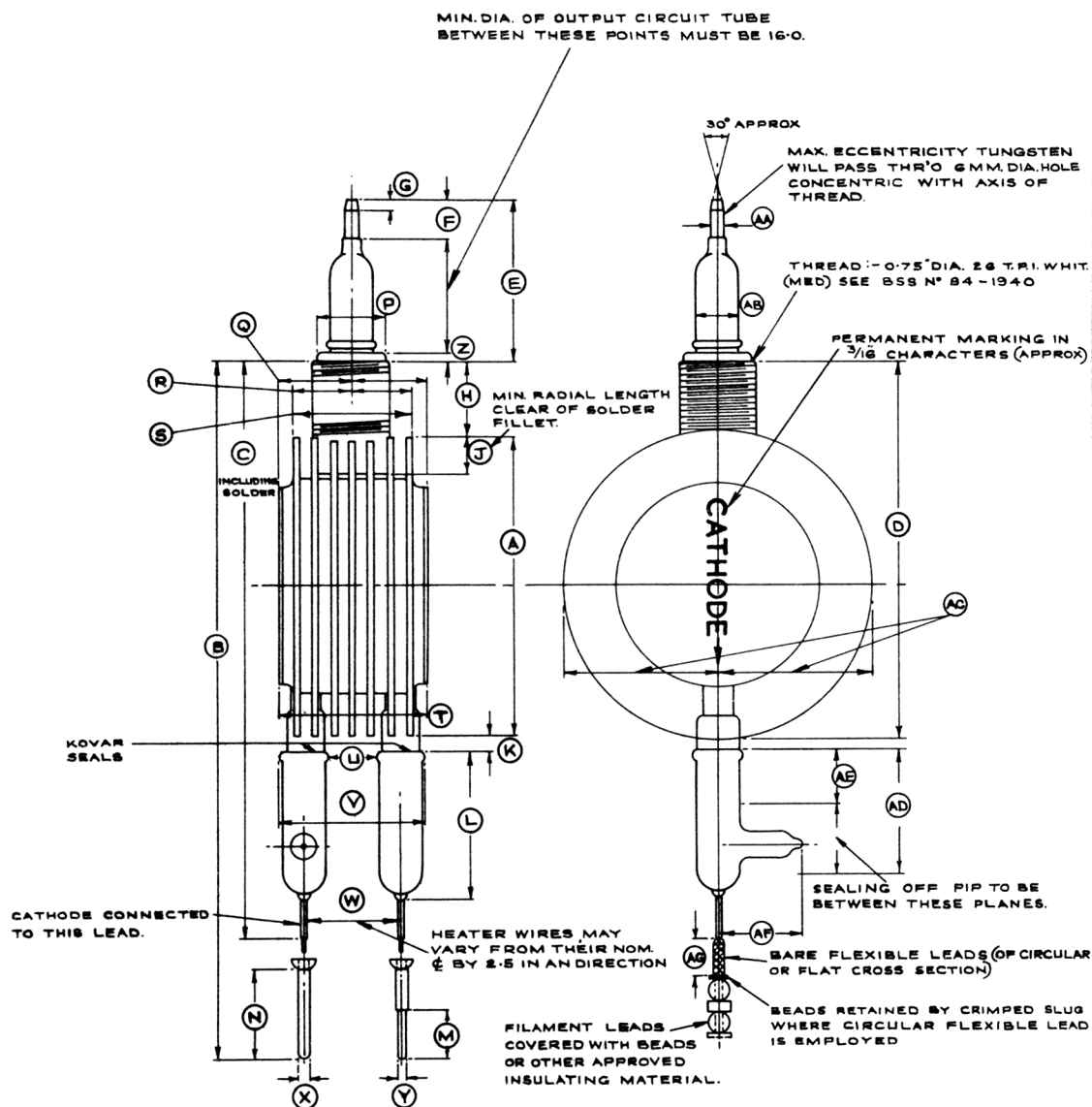
- Note 5: The magnetic field shall be provided by permanent magnet Pattern No. A.P.W57653 or by an approved electro-magnet which shall be considered satisfactory if the field strength is within 20 oersteds of the specified value. That the valve will operate satisfactorily over a range of magnetic field strength of ± 100 oersteds will be confirmed before Qualification Approval is given.
- Note 6: The rate of rise of voltage (r.r.v.) shall be expressed in kilovolts per microsecond defined by the steepest tangent to the leading edge of the voltage pulse above 80 percent amplitude. Any capacitance used in viewing system shall not exceed $10.0 \mu\text{F}$.
- Note 7: This v.s.w.r. applies to any additional equipment added to the connector section referred to in Note 4.
- Note 8: A waveguide mismatch giving a v.s.w.r. of not less than 1.5:1 shall be varied over all phases.
- Note 9: The Waveguide plunger of the Magnetron connector shall be adjusted to produce the maximum possible frequency change.

This test shall be at a rate per month, of (i) 5 valves, or (ii) 2% of the total quantity on order, whichever is the greater. If the average frequency change over one month of production exceeds 28 Mc/s, correcting action shall be taken and the approving authority notified. However, deliveries may continue.

- Note 10: Stability shall be measured in terms of the average number of output pulses missing expressed as a percentage of the number of input pulses applied during the period of observation. The Missing Pulses (M.P.) due to any cause are considered to be "missing" if the r.f. energy is less than 70% of the normal energy. The count shall be made over any 120 sec. period within 5 minutes of switching on the H.T. after the specified holding period.
- Note 11: If the valve(s) selected each month of life test pass this test, the month's production shall be accepted.

If any life test sample fails to pass the life test, another valve from the same month's production shall be life tested. If this valve passes the test together with any other valves undergoing the test, then the month's production shall be accepted. In the event of failure of the one replacement sample, or of another valve continuing on life test the month's production shall be rejected.

A rejected batch may be re-submitted for acceptance following a joint investigation by the Contractor and the purchasing authority.



NOTES TO USER

1. MINIMUM RADIATOR HOUSING WIDTH $1\frac{3}{16} \pm .01$ "
2. NORMAL MAGNET AIR GAP $39.5 \pm .05$ MM
3. THE NUMBER OF COOLING FINS PROVIDED MAY BE 7 OR 9.

DIMENSIONS ON PAGE 5.

OUTLINE DIMENSIONS.

REFERENCE	DIMENSION		NOTE	REFERENCE	DIMENSION		NOTE
	INCHES	m. m.			INCHES	m. m.	
A	3.0 ± 0.02			S	$\frac{3}{16} \pm 0.01$		
B		300 ± 5		T		37.5 MAX.	
C		149 ± 3	INCLUDING SOLDER	U	0.437 MIN.		
D		95 MAX.		V		42 MAX.	
E		41.9 ± 1.0		W		24.5 CRS.	
F		10 MIN.		X	$\frac{1}{8} \pm \frac{1}{64}$ DIA.		
G		3 MAX.		Y	$\frac{5}{64} \pm \frac{1}{64}$ DIA.		
H		16 MIN.		Z	$\frac{3}{32}$ NOM.		
J	$\frac{3}{8}$ MIN.			AA		$\begin{matrix} +0.1 \\ 4-0.2 \end{matrix}$	
K	$\frac{1}{16}$ NOM.			AB		14 MAX.	
L	$\frac{1}{4}$ MIN.		GLASS	AC	1.53 MAX.		EDGE OF RAD. -IATOR TO AXIS OF THREAD
M	$\frac{1}{2}$ NOM.			AD	0.9 MAX.		
N	$\frac{15}{16}$ NOM.			AE	0.4 MIN.		
P	0.69 ± 0.001			AF	0.87 MAX.		
Q		19.5 MAX.	FACE OF BLOCK TO AXIS OF THREAD	AG		10 APPROX.	
R	0.62 MAX.		FACE OF RAD. -IATOR TO AXIS OF THREAD				

ELECTRONIC VALVE SPECIFICATIONS
SPECIFICATION AD/1479-82 INCLUSIVE
ISSUE NO. 7 DATED 24.4.61

AMENDMENT NO. 1

Page 4. Notes to User

In note 2 add "mm" after 39.5 + .05
- 0

December, 1961

Admiralty Surface Weapons Establishment

N 7061

✓ AM