CV2166

VALVE ELECTRONIC

ADMIRALTY SIGNAL & RADAR ESTABLISHMENT

Specification AD/CV2166 Issue 2. Dated 7.3.51. To be read in conjunction with K1001, ignoring clauses:- 5.2, 5.3.	SECURITY	
	Specn.	Valve
	Unclassified	Unclassified

TYPE OF VALVE:- Package Magnetron.
CATHODE:- Indirectly heated, oxide coated.
ENVELOPE:- Metal and glass.
PROTOTYPE:- VX368 (See Note A.)

MARKING

See K1001/4, also Note 'F'.
Additional Marking:
Serial No.....

RATING			Note
Heater Voltage (AC or DC)	(V)	14	B
Heater Current	(A)	3	
Max. mean input power	(kW)	.500	
Max. mean anode dissipation	(kW)	.300	C
Nominal wavelength range	(cm)	3.2 ±0.04	
Max. frequency pulling	(Mc/s)	15	D
Typical Operating Conditions			
Peak Anode Voltage	(kV)	24	E
Peak Anode Current	(A)	20	E
Peak Output Power	(kW)	200	E

DIMENSIONS AND CONNECTIONS

See drawing page 3.

PACKAGING

See K1005.

NOTES

A. This magnetron CV2166 is interchangeable with the U.S. type 4J50, but it is rated and tested to a less stringent specification in respect of mean power, peak power and frequency range.

B. The heater supply should be switched on for at least 3 mins. before H.T. is applied. Full heater power is required for starting only; during operation it must be reduced to $V_h = 14V\ (1-P_m)$, where P_m is mean input power in kW.

C. During operation and testing air must be blown into the cooling space round the anode so that the block temperature does not rise above 140°C.

D. See test d (i).

E. These figures are for pulsed operation with:

i.	Recurrence frequency	:	500 pps. or 1000 pps.
ii.	Pulse length	:	2 µS. 1 µS.
iii.	Pulse shape (voltage)	:	Nearly square 1 µS wave
iv.	Rate of rise of pulse voltage	:	110 kV/µS approx.

At shorter pulse length somewhat higher RF peak powers can be obtained and on selected valves the rate of rise of pulse voltage may approach 250 kV/µS.

F. No technical information shall appear on the valve or packing.

G. 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 full anode voltage is instantaneously applied.

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TESTS

To be performed in addition to those applicable in K1001.

	Test Conditions		Test	Limits		No. Tested	Note
	Vh (V)	Ia peak (A)		Min.	Max.		
a	14		Ih (A)	2.0	3.5	100%	
b	8	20	Va (kV)	18	24	100%	1
c	8	The anode input adjusted for satisfactory operation with an RF output of between 170 kW and 200 kW.	i. Va (kV) ii. Note Ia = Ia1 iii. Efficiency (%) iv. Frequency (Mc/s)	 35 9275	24 9475	100%	1,2
d	8	Ia1 as in clause 'c'.	i. Frequency pulling (Mc/s) ii. Spectrum width for 90% of power expressed in units of ($\frac{\text{cycles}}{\text{pulse duration}}$)	10	15 3	100% T.A.	1,3
e	8	Ia varied by + 10% and -20% against Ia1.	i. Frequency pushing (Mc/s) There shall be no mode change.		15	100%	1

NOTES

1. Tests to clauses 'b', 'c', 'd' and 'e' shall be done in an approved circuit producing one of the conditions detailed in Note E. A naval type 3BA modulator may be used. The cooling of the magnetron must be such as to keep its block temperature within the range of 50 to 80°C.

2. The apparatus used for measurement of output power is to be checked after every 500 valves tested or once a month, which ever is the shorter period, against a calorimetric method of measurement.
The efficiency is to be calculated as ratio of mean RF power output to mean anode power input. The frequency is to be measured under matched load conditions.

3. A sliding slug which in any position in the waveguide (1" - 1¼" I.D.) introduces a VSWR of 1.5:1 followed by a matched load termination, shall be used (as close to the magnetron as practicable). The freq. pulling which occurs as the slug is moved so as to move the S.W. pattern through at least $\lambda g/2$ shall be noted. The spectrum should be satisfactory at any position of the S.W. pattern.

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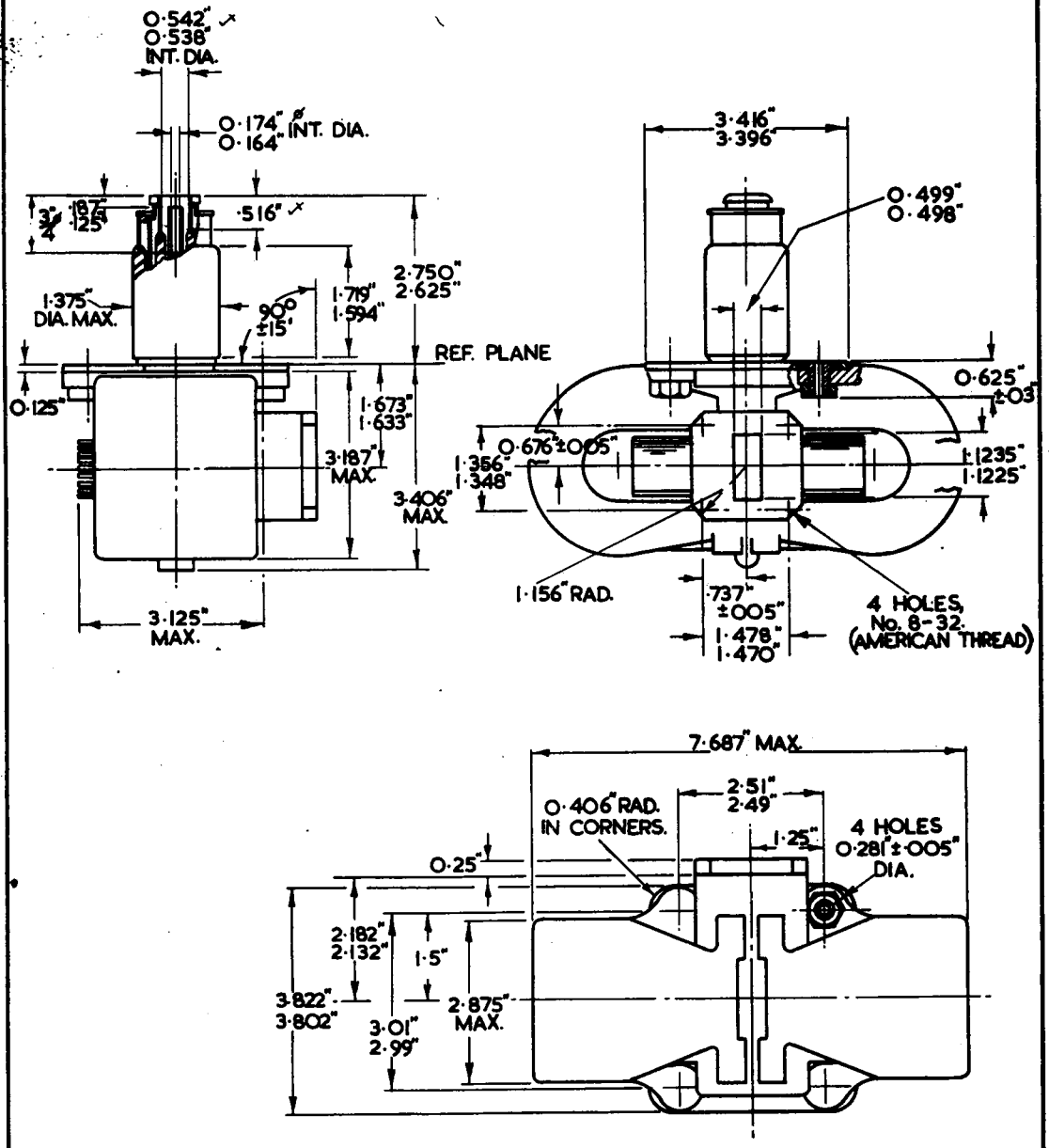

NOTE :-
DEPTHS OF CYLINDERS MARKED ↗ AND ø REFER TO DIAMS. ↗ AND ø RESPECTIVELY.