MAGNETRON

JN2-2·5W

Frequency: *2.45 ± 0.025Gc/s, fixed*
Power output: *2.5kW, c.w.*
Construction: *Unpackaged, water-cooled*
Application: *Microwave heating*

PRELIMINARY DATA

This data should be read in conjunction with GENERAL OPERATIONAL RECOMMENDATIONS—MICROWAVE DEVICES which precede this section of the handbook.

CHARACTERISTICS

Frequency fixed within the band	2.425 to 2.475	Gc/s
Operating voltage range (d.c.), I = 750mA with P2J–1 magnet	4.3 to 4.7	kV

CATHODE

Indirectly heated, dispenser type *

V_h	5.0	V
I_h	32	A
r_h (cold)	0.02	Ω
Minimum heating time	2.0	min

The surge current when switching on must not exceed 100A.

It is necessary to reduce the heater voltage immediately after the application of anode power, to compensate for additional heating of the cathode by back bombardment. The correct value of the nominal heater voltage is given by the curve (full line) on page C5.

Where it is required to design a heating generator for several fixed output power levels, the heater voltage may be reduced in one or two steps depending on the anode current range. The appropriate nominal value of heater voltage is that which falls within the limit curves (dotted lines) for the appropriate operating current. The deviation from the nominal should be kept to a minimum.

Temporary fluctuations not exceeding +5% and –10% of the nominal value are permissible.

MOUNTING POSITION

Any

STORAGE AND HANDLING

During transport and storage a minimum distance of 2 inches should be maintained between magnets. In equipment a minimum radial distance of 4 inches must be maintained between the magnetron and magnetic materials.

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OPERATION FROM THREE PHASE HALF-WAVE RECTIFIER WITHOUT SMOOTHING FILTER

Limiting values (absolute ratings)

V_h (starting) max.	5.25	V
I_{av} max.	900	mA
I_{pk} max.	2.1	A
Mismatch of load to magnetron v.s.w.r. max.		
(a) when distance of v.s.w. minimum from reference line A or A′ lies between 0.4 and 0.47λ (See page C2)	2.5	
(b) in the remaining region	4.0	

Operating conditions

When P_{out} ≧2.5kW it is necessary to insert between the magnetron and the load a fixed reflection element giving a v.s.w.r. of approximately 1.5 and with a phase position of 0.43λ. See diagram on page C2.

V_h (running)	1.5	V
I_h (running)	14.5	A
I_{av}	850	mA
i_{pk}	2.0	A
$V_{tr(r.m.s.)}$ (for equivalent resistive load at $I_{r.m.s.}$ per phase = 420mA)	4.5	kV
Mismatch of load to magnetron v.s.w.r.	2.5	
P_{out} (dependent upon phase of mismatch)	1.9 to 2.9	kW
η (approx.) matched load	65	%

MAGNETRON

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OPERATION FROM SINGLE PHASE FULL-WAVE RECTIFIER WITHOUT SMOOTHING FILTER

Limiting values (absolute ratings)

V_h (starting) max.	5.25	V
I_{av} max.	800	mA
i_{pk} max.	2.1	A
Mismatch of load to magnetron v.s.w.r. max.		
(a) when distance of v.s.w. minimum from reference line A or A′ lies between 0.4 and 0.47λ (See page C3)	4.0	
(b) in the remaining region	5.0	

Operating conditions

V_h (running)	2.0	V
I_h (running)	18	A
I_{av}	750	mA
i_{pk}	2.0	A
$V_{tr(r.m.s.)}$ (for equivalent resistive load at $I_{r.m.s.}$ = 850mA)	4.5	kV
Mismatch of load to magnetron v.s.w.r.	3.0	
P_{out} (dependent upon phase of mismatch)	1.2 to 2.3	kW
η (approx.) matched load	60	%

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COOLING

Water-cooled (See curve on page C4)

Maximum temperature of anode block at a point very close to the output coupling	125	°C
Maximum temperature of cathode terminal at any point on the cathode radiator	180	°C

Cooling clips type 40634 should be attached to the filament terminal and a flow of air of approximately 2 cu. ft./min. should be directed at the cathode radiator and not allowed to cool the supporting glassware.

A plate is provided on the air duct around the anode block for the mounting of a thermally operated circuit breaker to protect the valve in the event of failure of the cooling water. This circuit breaker should come into operation at 100°C approximately.

OPERATING NOTES

1. The valve is designed to feed into a 50Ω, 1⅝ inch coaxial transmission line.
2. The impedance of the h.t. supply should be greater than 500Ω. In addition a limiting resistance of 200Ω minimum should be inserted in series with the magnetron.

PHYSICAL DATA

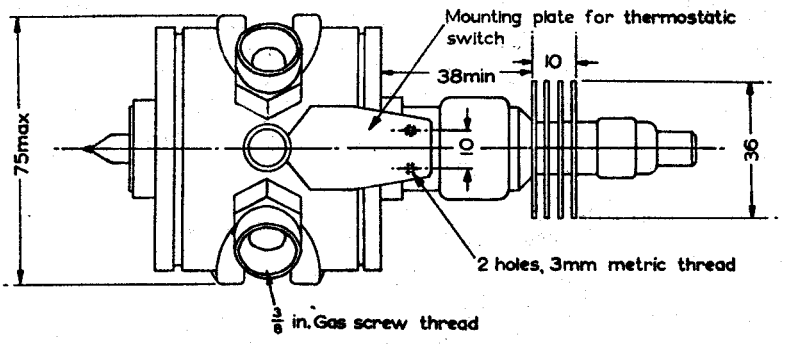
Weight of magnetron	3.5 1.6	lb kg
Weight of magnet	12.3 5.6	lb kg

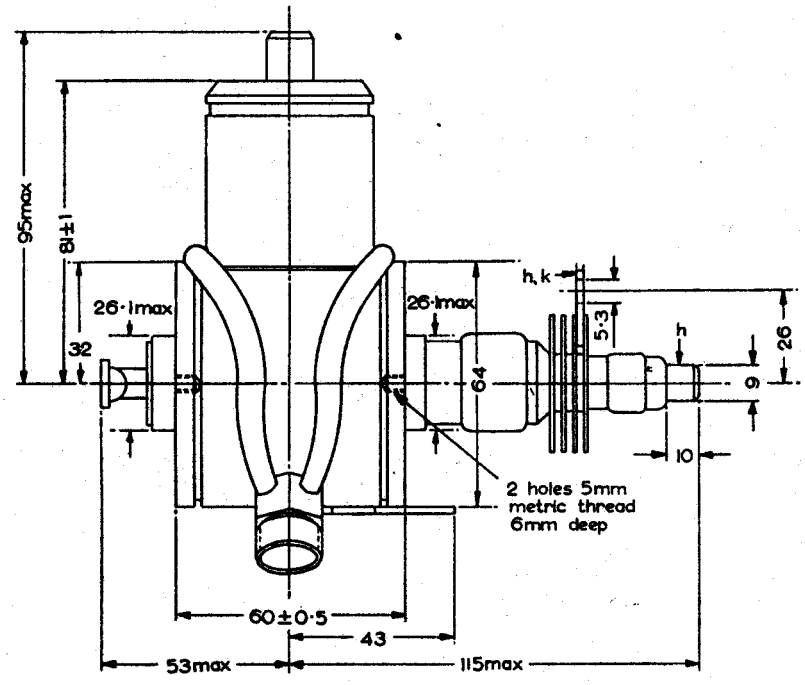
ACCESSORIES

Magnet	P2J–1
Cap nut	55312
Spring ring	55313
Filament terminal cooling clip	40634

MAGNETRON

JN2-2·5W



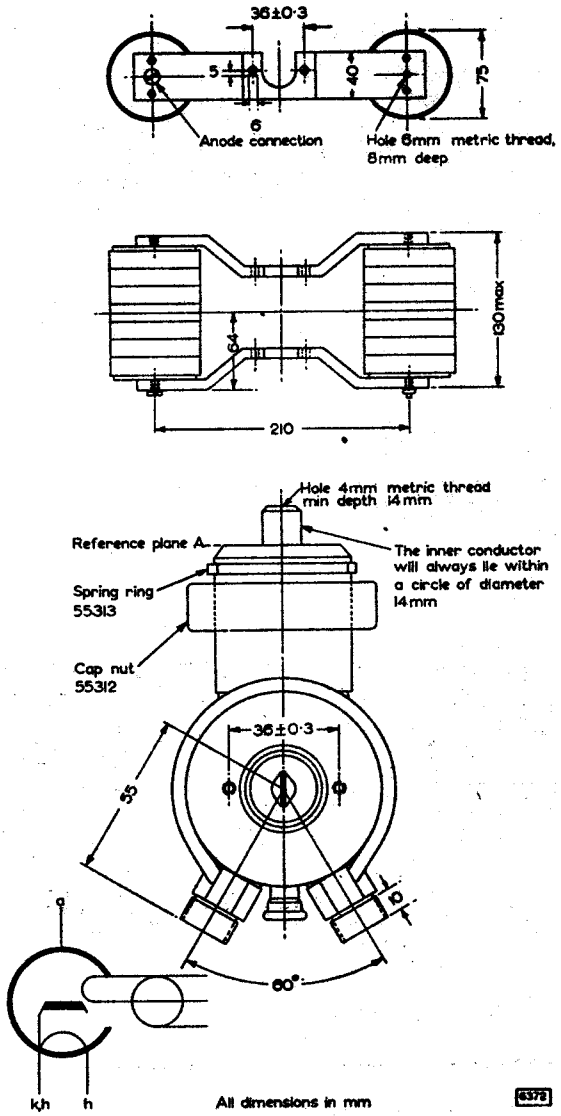


6371

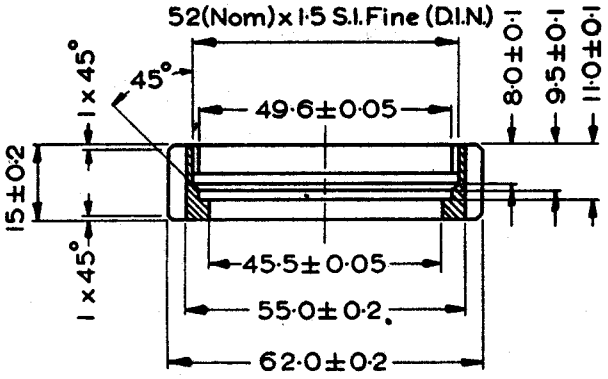
All dimensions in mm

JN2-2·5W

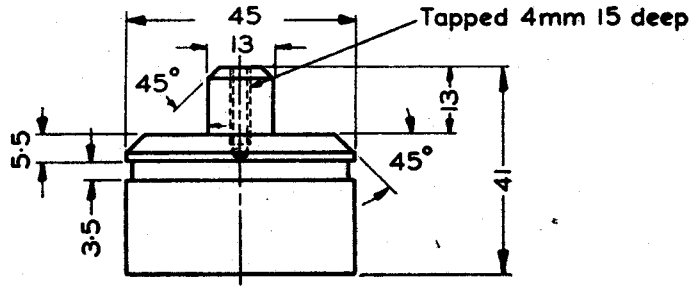
MAGNETRON



JN2-2·5W



Cap Nut 55312.



Output Terminal

6047 All dimensions in mm

MAGNETRON

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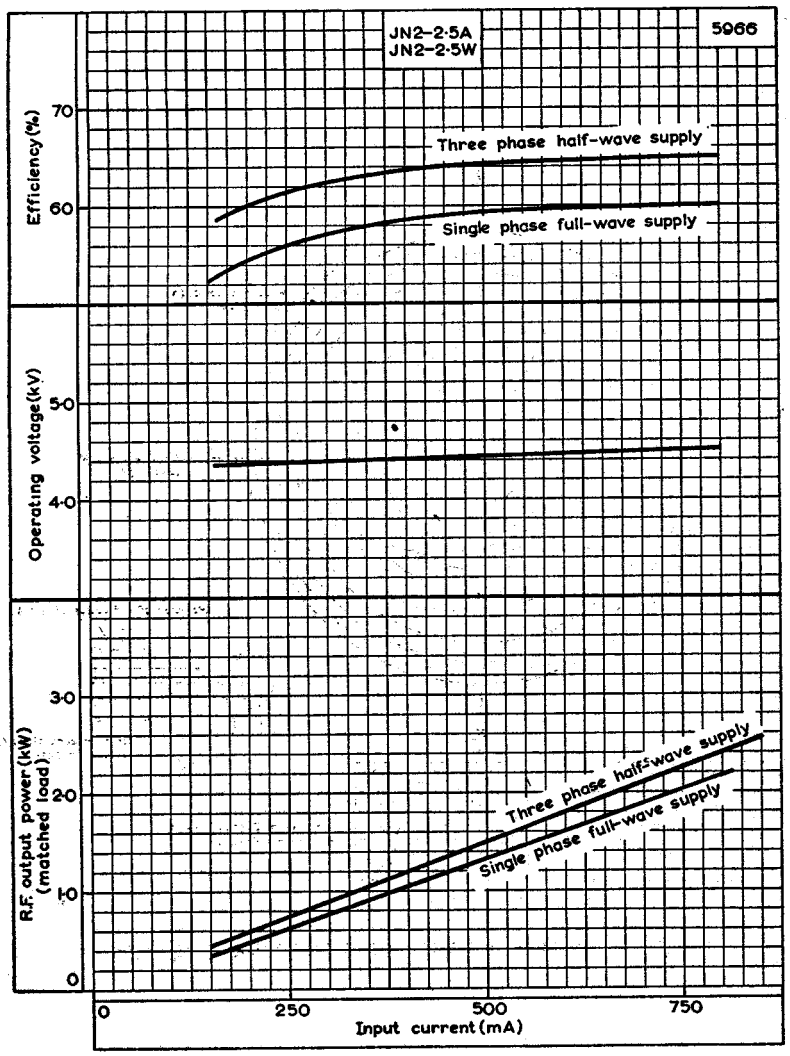
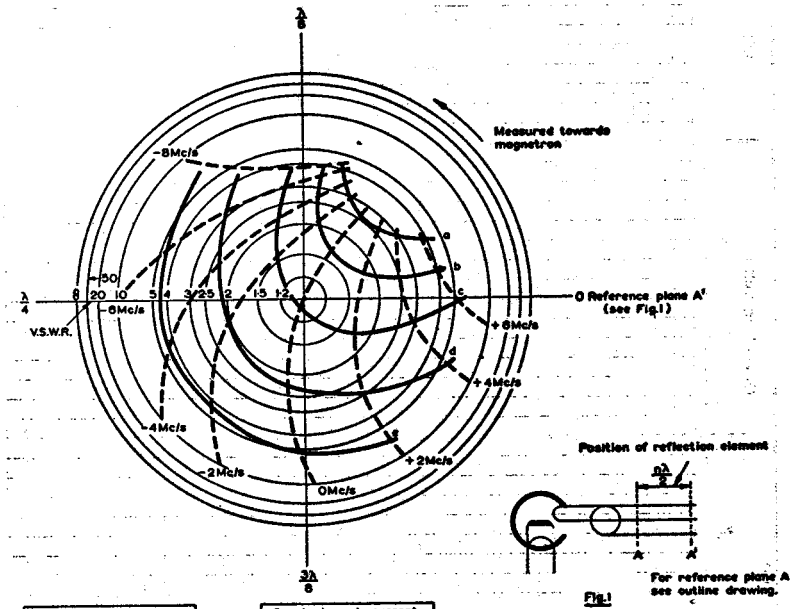


R.F. OUTPUT POWER, OPERATING VOLTAGE AND EFFICIENCY PLOTTED AGAINST INPUT CURRENT

JN2-2·5W

MAGNETRON



Constant anode voltage V_a=4·5kV		
	P_{out} (kW)	I_a(mA)
a	2·7	770
b	2·6	810
c	2·5	850
d	2·2	880
e	1·75	950

Constant anode current I_a=850mA		
	P_{out} (kW)	V_a(kV)
a	2·9	4·7
b	2·7	4·6
c	2·5	4·5
d	2·1	4·4
e	1·6	4·3

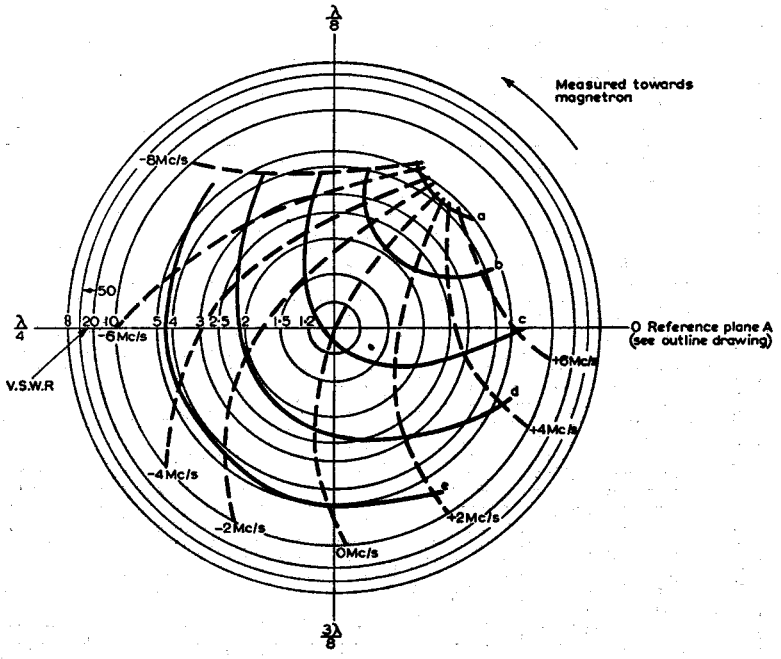
——— Output power
– – – – Frequency pulling

Three phase half-wave supply

580

RIEKE DIAGRAM (THREE PHASE HALF-WAVE SUPPLY)

JN2-2·5W



Constant anode voltage V_a=4·5 kV		
	P_{out} (kW)	I_a (mA)
a	2·1	650
b	2·05	700
c	2·0	750
d	1·7	825
e	1·25	875

Constant anode current I_a=750 mA		
	P_{out} (kW)	V_a (kV)
a	2·5	4·7
b	2·25	4·6
c	2·0	4·5
d	1·5	4·4
e	1·0	4·3

——— Output power
— — — Frequency pulling

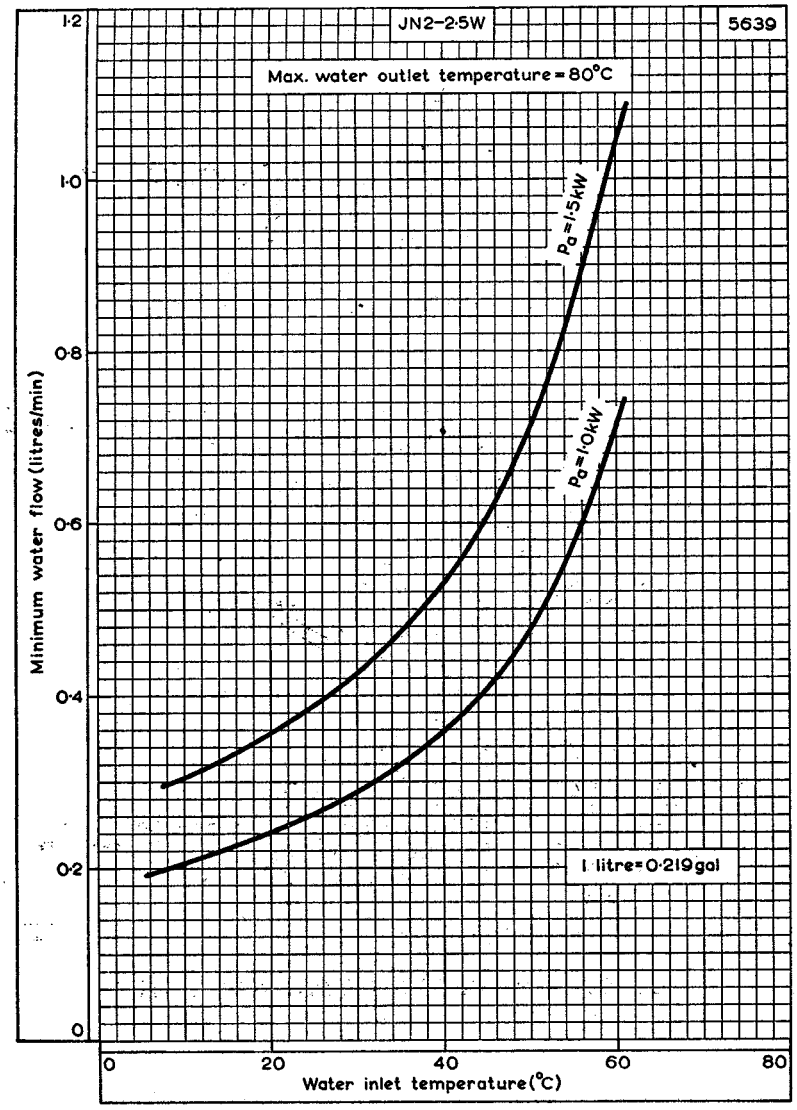
Single phase full-wave supply

5789

RIEKE DIAGRAM (SINGLE PHASE FULL-WAVE SUPPLY)

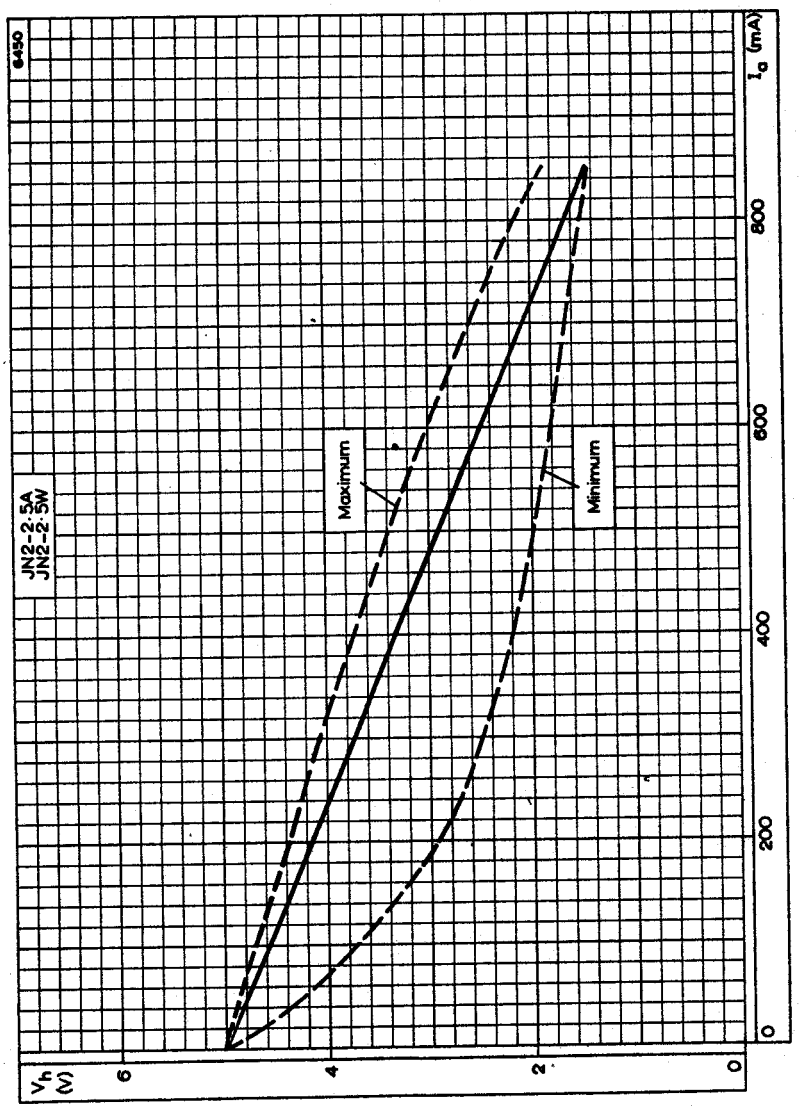
JN2-2·5W

MAGNETRON



COOLING CURVES

JN2-2·5W



REDUCTION OF HEATER VOLTAGE PLOTTED AGAINST ANODE CURRENT