

MAGNETRON

Frequency: 'X' band.
Output power: 180kW, pulsed.
Construction: Packaged, forced-air cooled.

JP9-180

PRELIMINARY DATA

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

CHARACTERISTICS

	Min.	Max.	
Frequency			
Fixed within the band	9.325	to 9.425	Gc/s
Pulse voltage ($I_{\text{pulse}} = 22.5\text{A}$)	18	23	kV
R.F. pulse output power ($I_{\text{pulse}} = 22.5\text{A}$)	150	—	kW
Frequency pulling factor (v.s.w.r. = 1.5)	—	15	Mc/s
Frequency temperature coefficient	—	-250	kc/s per °C

CATHODE

Indirectly heated

V_h	12.6	V
I_h	2.25	A
$I_{h(\text{surge}) \text{ max.}}$	7.5	A
$r_{h(\text{cold})}$	0.67	Ω

Heating time. At ambient temperatures above 0°C the cathode must be heated for at least 3 minutes before the application of full h.t. Below this temperature the heating time must be increased to at least 4 minutes.

It is necessary to reduce the heater voltage immediately after the application of h.t. in accordance with the input power-heater voltage rating chart on page C2.

TYPICAL OPERATION

Duty cycle	0.0004	
Heater voltage (running)	8.0	V
Pulse duration	1.0	μs
Pulse repetition frequency	400	p/s
Pulse current	22.5	A
Pulse voltage	20.5	kV
Pulse input power	460	kW
R.F. pulse output power	180	kW
Mean input current	9.0	mA
Mean input power	184	W
Mean r.f. output power	72	W
Frequency pulling (v.s.w.r. = 1.5)	13	Mc/s
Rate of rise of pulse voltage	100	kV/ μs

COOLING

It is necessary to direct a flow of cooling air between the radiator fins, and on the cathode and heater seals, in order to keep the temperature below the permitted maximum.

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LIMITING VALUES (absolute ratings)

	Min.	Max.	
Pulse current	16	25	A
Pulse voltage	17	24	kV
Pulse duration	—	2.0	μ s
Duty cycle	—	0.0005	
Mean input power	—	250	W
Rate of rise of voltage pulse	—	110	kV/ μ s
Load mismatch (v.s.w.r.)	—	1.5	
Temperature of anode block	—	140	$^{\circ}$ C
Temperature of cathode and heater seals	—	200	$^{\circ}$ C

MOUNTING POSITION

Any

PRESSURISING

The valve can be operated in the pressure range 600 to 2370mm of mercury.

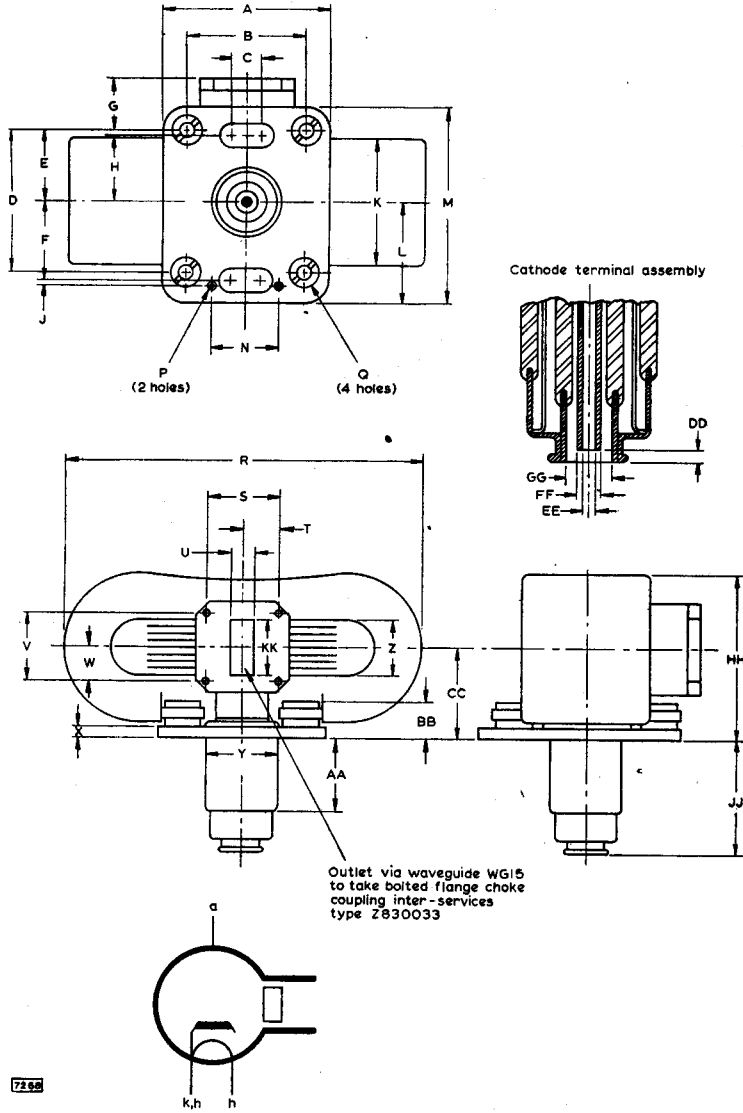
DIMENSIONS

	Inches	Millimetres		Inches	Millimetres
A	3.500	88.9		U	0.4985 \pm 0.0005
B	2.500 \pm 0.010	63.5 \pm 0.25		V	1.352 \pm 0.004
C	0.625 \pm 0.015	15.9 \pm 0.4		W	0.676
D	3.000 \pm 0.010	76.2 \pm 0.25		X	0.125
E	1.500	38.1		Y	1.375
F	1.750	44.5		Z	1.200
G	0.907 \pm 0.025	23.0 \pm 0.6		AA	1.500
H	1.437	36.5		BB	0.625
J	0.125	3.18		CC	1.792 \pm 0.020
K	2.875	73.0	max.	DD	0.156 \pm 0.031
L	2.187 \pm 0.015	55.5 \pm 0.4		EE	0.169 \pm 0.005
M	4.125	104.8		FF	0.250 \pm 0.015
N	1.500 \pm 0.015	38.1 \pm 0.4		GG	0.540 \pm 0.005
P	0.125	3.18			13.7 \pm 0.1
Q	0.281	7.14			-0.008
R	7.687	195.3	max.	HH	3.545
S	1.474 \pm 0.004	37.5 \pm 0.1		JJ	2.548 \pm 0.062
T	0.737	18.7		KK	1.122 \pm 0.003
					28.5 \pm 0.1

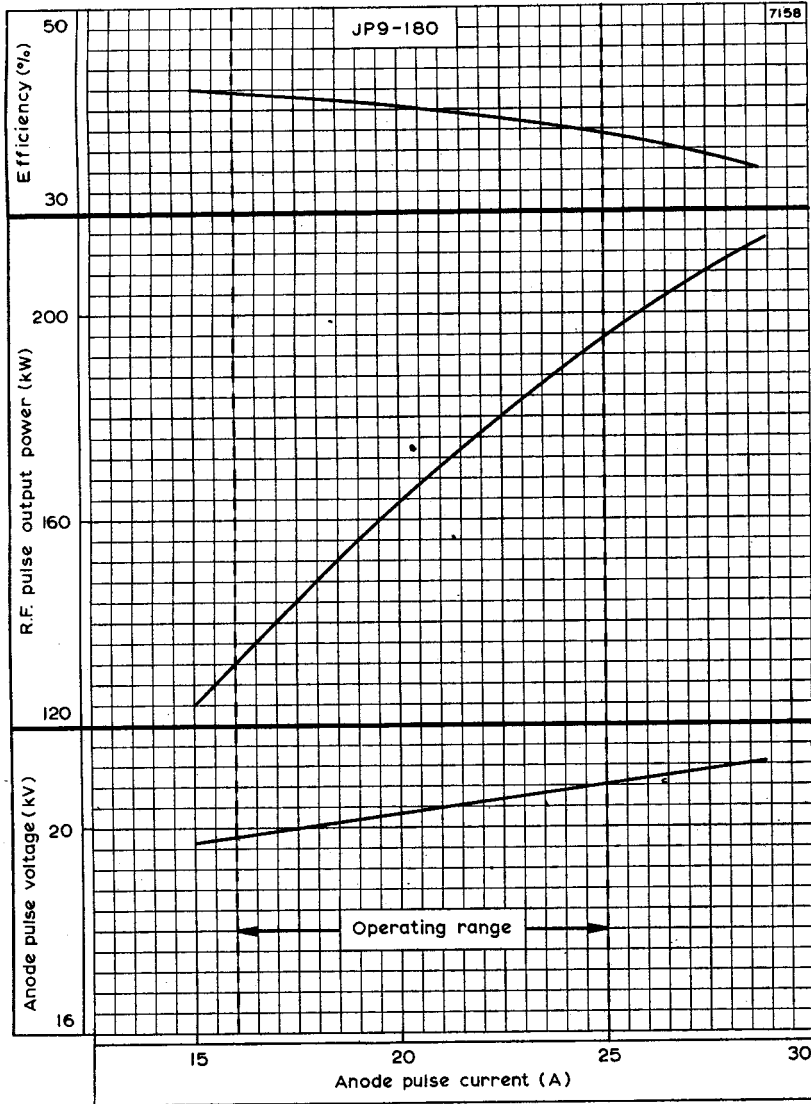


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The anode is terminated at the base plate.

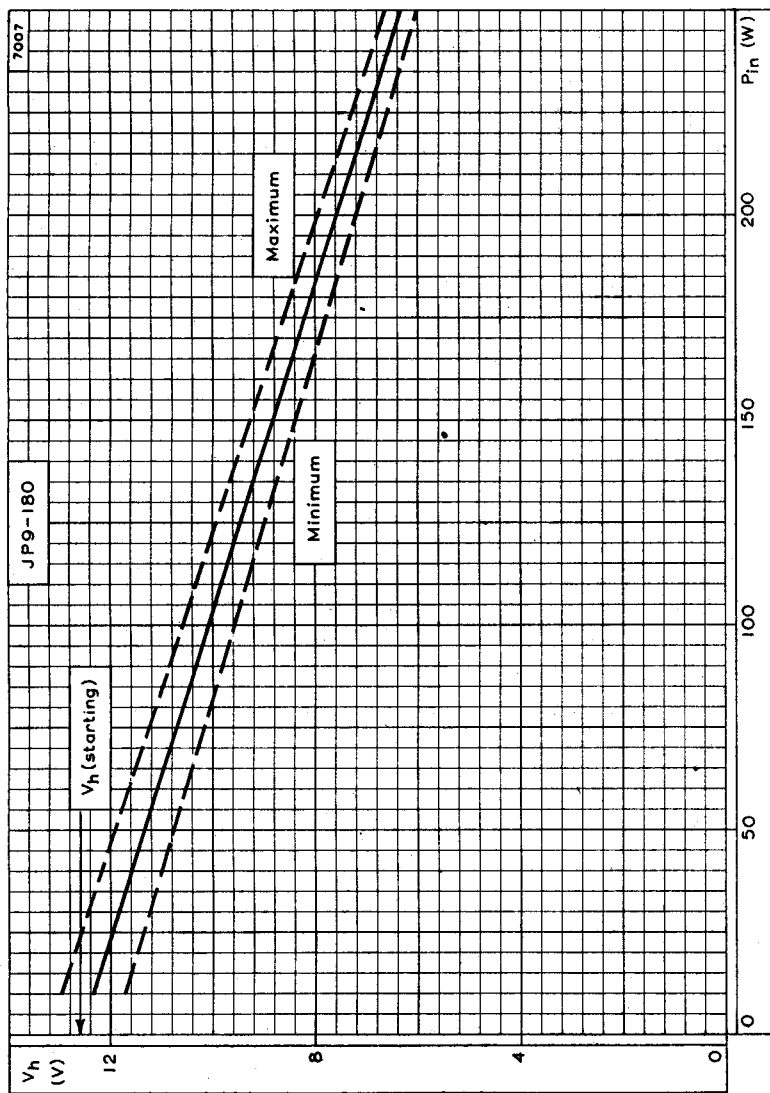


ANODE PULSE VOLTAGE, R.F. PULSE OUTPUT POWER AND EFFICIENCY PLOTTED AGAINST ANODE PULSE CURRENT



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REDUCTION OF HEATER VOLTAGE PLOTTED AGAINST MEAN INPUT POWER

