MAGNETRON

JP9-75

Frequency: *'X' band, fixed.*
Power output: *80kW, pulsed.*
Construction: *Packaged, forced-air cooled.*

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	9.345	to	9.405	Gc/s
Pulse voltage (I_{pulse} = 15A)	14		16	kV
R.F. pulse output power (I_{pulse} = 15A)	65		—	kW
Frequency pulling factor (v.s.w.r. = 1.5)	—		15	Mc/s
Frequency pushing factor	—		750	kc/s per A
Frequency temperature coefficient	—		−250	kc/s per °C
Distance of v.s.w. minimum from face of mounting plate into valve	10.8	to	17.8	mm
Input capacitance	—		12	pF

CATHODE

Indirectly heated

V_h	10	V
I_h	2.85	A
$I_{h(surge)}$ max.	11.5	A
r_h (cold)	0.4	Ω

Heating time. At ambient temperatures above 0°C the cathode must be heated for at least 3 minutes before the application of h.t.

For mean input powers greater than 50 watts, 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	0.0002	0.001	0.001	
Heater voltage (running)	10	7.5	7.5	V
Pulse duration	0.1	1.0	5.0	μs
Pulse repetition frequency	2000	1000	200	p/s
Pulse current	15	15	15	A
Pulse voltage	15	15	15	kV
Pulse input power	225	225	225	kW
R.F. pulse output power	80	80	80	kW
Mean input current	3.0	15	15	mA
Mean input power	45	225	225	W
Mean r.f. output power	16	80	80	W
Frequency pulling (v.s.w.r. = 1.5)	10	10	10	Mc/s
Rate of rise of pulse voltage	140	70	60	kV/μs

JP9-75

MAGNETRON

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.

LIMITING VALUES (absolute ratings) ←

	Min.	*Max.*	
Pulse current	10	18	A
Pulse voltage	13.5	16.5	kV
Pulse duration	—	5.5	μs
Duty cycle	—	0.002	
Mean input power	—	400	W
Rate of rise of voltage pulse			
($t_p \leqq 1\mu s$)	—	150	kV/μs
($t_p > 1\mu s$)	—	80	kV/μs
Load mismatch (v.s.w.r.)	—	1.5	
Temperature of anode block	—	175	°C
Temperature of cathode and heater seals	—	150	°C

MOUNTING POSITION

Any

PRESSURISING ←

The valve must not be operated at a pressure lower than 600mm of mercury. The waveguide output system can be pressurised up to a pressure of 2370mm of mercury.

PHYSICAL DATA

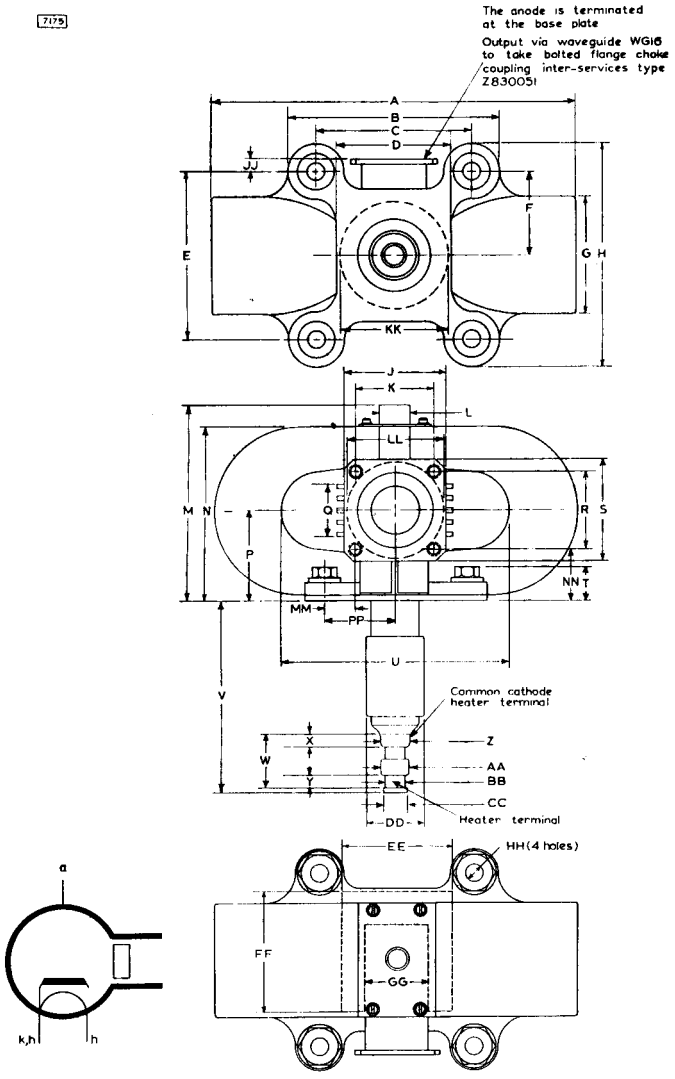
Weight of magnetron	4 lb 12 oz	
	2.2	kg
Weight of magnetron in carton	13	lb
	5.9	kg
Dimensions of storage carton	13.25 × 12 × 9.375	in.
	337 × 305 × 238	mm

For export a smaller pack is available on demand.

Weight of magnetron in carton	7 lb 12 oz	
	3.5	kg
Dimensions of storage carton	11.25 × 9.5 × 6.75	in.
	286 × 241 × 171	mm

JP9-75

7175



All dimensions in mm

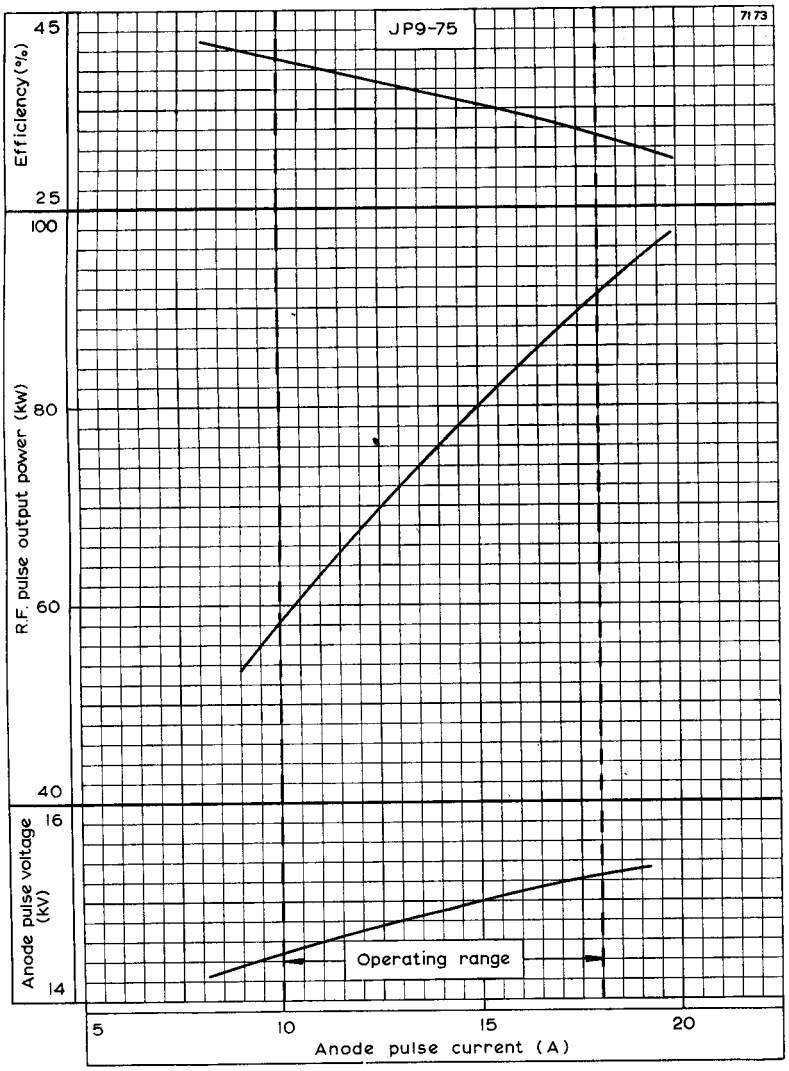
JP9-75

MAGNETRON

DIMENSIONS

	Inches	*Millimetres*	
A	5.933	150.7	max.
B	3.437	87.3	max.
C	2.531 ± 0.010	64.29 ± 0.25	
D	1.874	47.6	min.
E	2.781 ± 0.010	70.64 ± 0.25	
F	1.391	35.32	
G	1.937	49.2	max.
H	3.622	92	max.
J	1.654 ± 0.020	42.0 ± 0.5	
K	1.280 ± 0.004	32.5 ± 0.1	
L	0.512	13	max.
M	3.189	81	max.
N	2.843	72.2	max.
P	1.437 ± 0.024	36.5 ± 0.6	
Q	0.866	22	max.
R	1.221 ± 0.004	31.0 ± 0.1	
S	1.654 ± 0.020	42.0 ± 0.5	
T	0.650 ± 0.059	16.5 ± 1.5	
U	3.819	97	min.
V	3.150	80	max.
W	0.917	23.3	min.
X	0.158	4.0	min.
Y	0.276	7.0	min.
Z	0.471 ± 0.010	11.95 ± 0.25	
AA	0.433	11	max.
BB	0.323 ± 0.008	8.2 ± 0.2	
CC	0.394 ± 0.008	10.0 ± 0.2	
DD	0.984	25	max.
EE	1.969	50	max.
FF	1.969 ± 0.079	50.0 ± 2.0	
GG	1.142	29	max.
HH	0.281 ± 0.005	7.14 ± 0.12	
JJ	0.197 ± 0.118	5.0 ± 3.0	
KK	1.850	47	min.
LL	1.543	39.2	min.
MM	0.626 ± 0.024	15.9 ± 0.6	
NN	0.827 ± 0.024	21.0 ± 0.6	
PP	1.266	32.15	

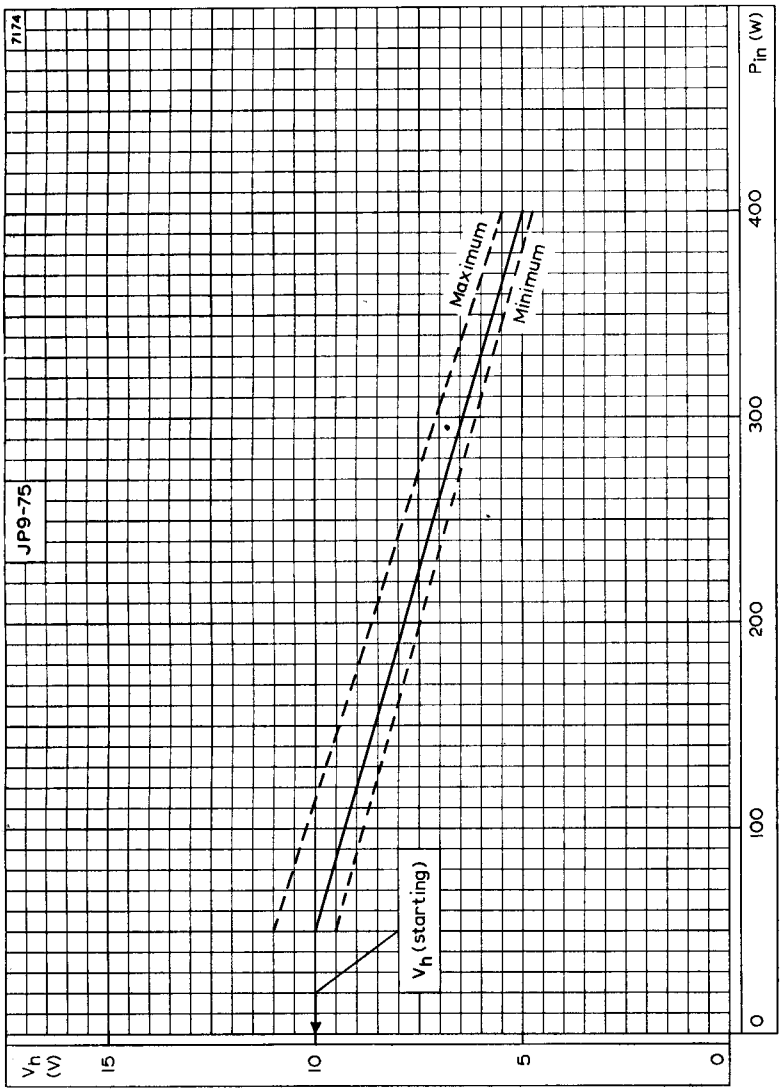
JP9-75



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

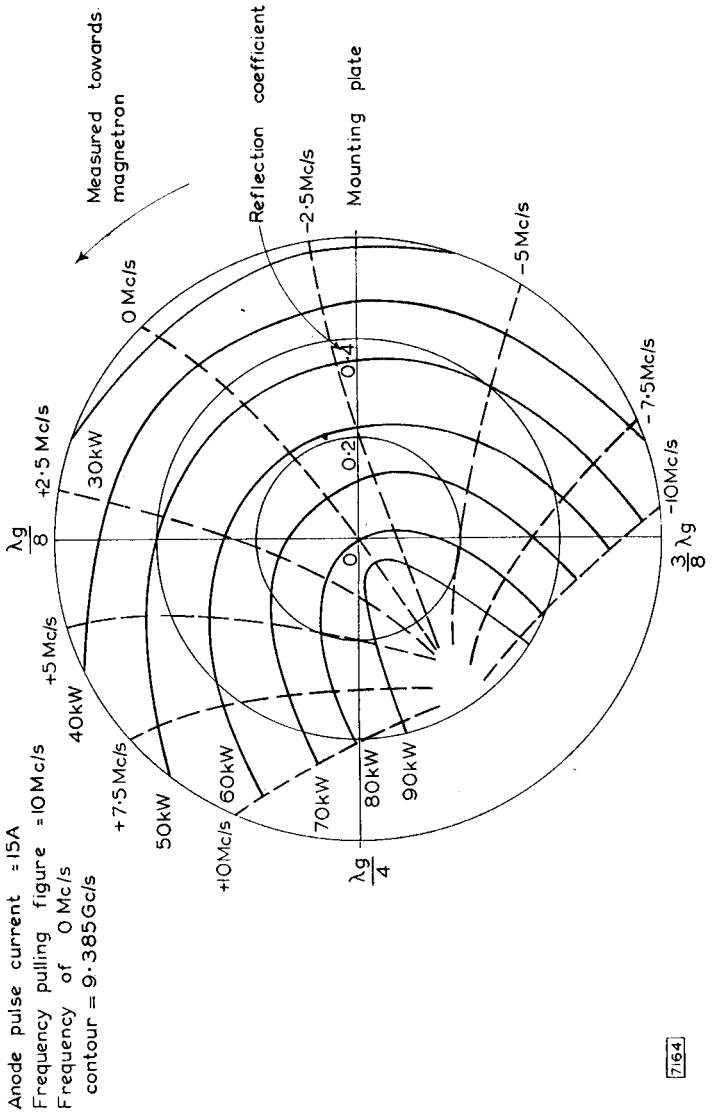
JP9-75

MAGNETRON



REDUCTION OF HEATER VOLTAGE PLOTTED AGAINST MEAN INPUT POWER

JP9-75



RIEKE DIAGRAM