CONTINUOUS-WAVE 6 kW MAGNETRON

Packaged, metal-ceramic, water cooled continuous-wave magnetron with integral RF cathode filter intended for use in industrial microwave heating applications. The tube features a quick-heating cathode, high efficiency, and has a typical output power of 6 kW.
A packaged permanent magnet and an integrated electromagnet system allow accurate output power control and stabilization.
Available accessories: probe 55386
circulator 2722 162 10311

QUICK REFERENCE DATA

Frequency, matched load, fixed within the band	f	2.45 to 2.47 GHz
Maximum output power with circulator	Wo	6 kW
Maximum output power without circulator	Wo	5 kW
Output power control and stabilization		by electromagnet
Construction		packaged, metal ceramic
Cathode		quick heating, Th-W
Cooling		water and forced air
RF cathode filter		integral

TYPICAL OPERATION

Magnetron coupled to waveguide section of Fig. 6 or Fig 8.
Load VSWR ≤ 1.2 (measured with probe type 55386) or:
Magnetron coupled to waveguide section of Fig. 7 VSWR = 2.5 in phase of maximum output power.(d = 0.03 λ measured with probe 55386) *

Anode supply: three-phase full-wave rectified voltage.
choke 1 to 3 H.

Conditions, output power	Wo	5	6	kW **
Filament voltage, AC or DC, starting	Vf	5	5	V ±10%
Waiting time	tw	10	10	s
Filament voltage, operating	Vf	see Fig 3	0	V
Anode current, mean	Ia	950	1150	mA
Anode current, peak	Iap	1200	1300	mA
Cooling		see relevant paragraph		

Performance

Filament current at Vf= 5V, starting	If	33	33 A
Electromagnet current at T ambient = 25 °C	Im	-1.7	-2 A
Anode voltage, peak	Vap	7.2	7.2 kV
Output power	Wo	5	6 kW
Frequency	f	2.46	2.46 GHz
Efficiency	η	72	72 %

CATHODE: thoriated tungsten, quick start.

HEATING: direct by AC (50 Hz or 60 Hz) or DC

Filament voltage, starting and stand-by	Vf	5 V ±10%
Filament current at Vf = 5V; Ia = 0	If	33 A
Filament voltage, operating	see Fig. 3	
Cold filament resistance	Rfo	23 mΩ
Waiting time (Time before application of high voltage)	tw	min. 10 s

Immediately after applying the anode voltage the filament voltage must be reduced to the operating value, see Fig. 3.

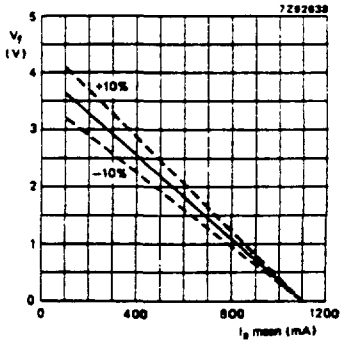
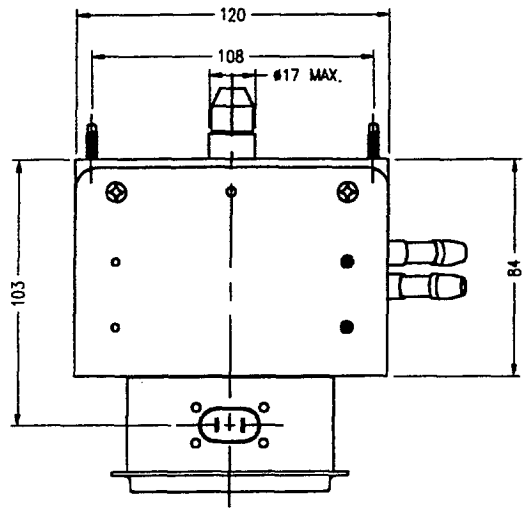
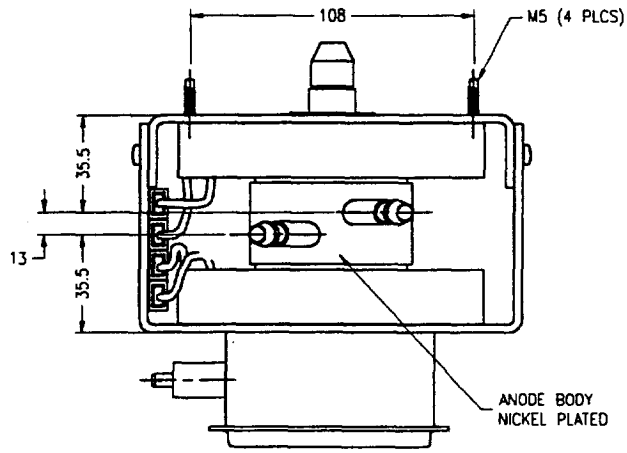


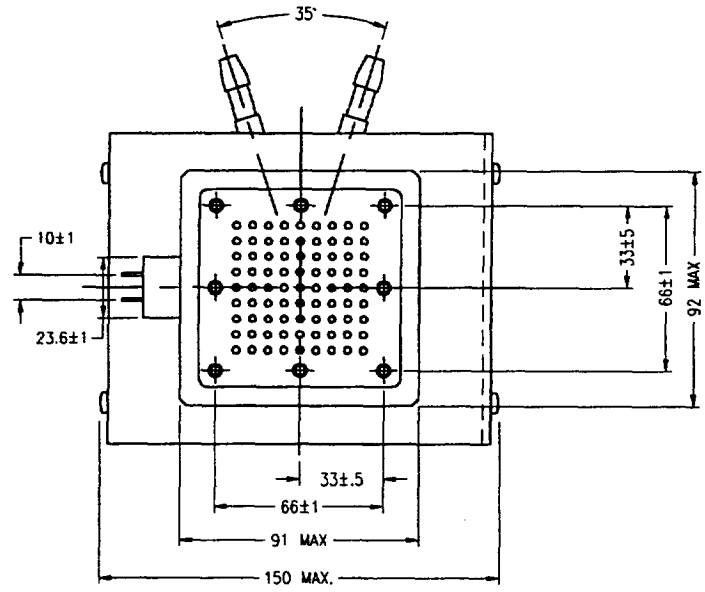
Fig. 3 Filament voltage reduction curve with applied anode voltage. Filament starting voltage without anode voltage is 5,0 V ± 10%.

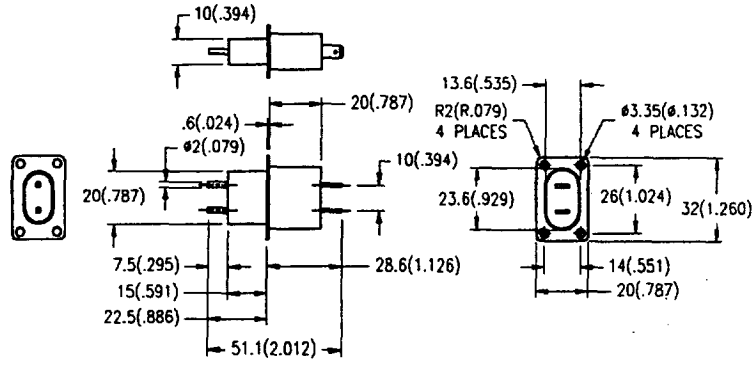
* For launcher sections and for other load impedance and anode current conditions see Figs 6, 7, 8 and 9 and "Design and operating notes."

** For 6 kW output power, the magnetron must be operated with a VSWR of 2.5 ± 0.5 in the sink phase only.









CHARACTERISTICS

RATED VOLTAGE	10kVdc
WITHSTANDING VOLTAGE	10kVac [50Hz rms] FOR 1 MIN.
INSULATION RESISTANCE	10000M min.
RATED CAPACITANCE	500pF ±30%
DISSIPATION FACTOR	2.5% max.
CAPACITANCE TEMP.	E(+20, -55%)
OPERATING TEMP.	-30 to + 120°C [-22 to + 248°F]

Dimensions in mm

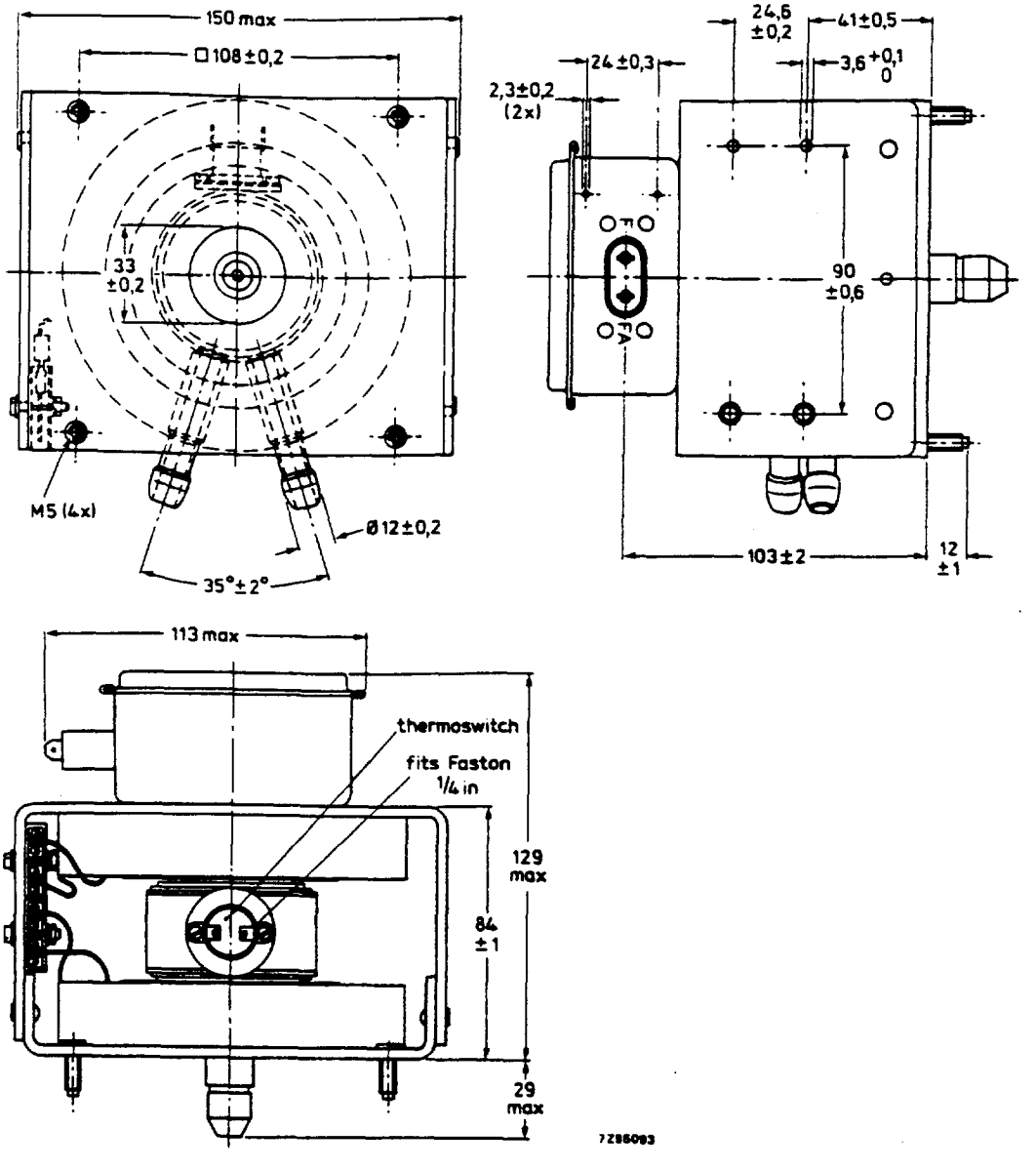


Fig. 4b.

YJ1600 Magnetron

March 1991 Warranty Information

Warranty and factors affecting the life of the YJ1600 magnetron

Warranty

The warranty is:

500 hours full credit
5000 hours prorata at 5 kW without circulator
2000 hours prorata at 6 kW with a circulator

The hours of operation determine the amount of credit, but this is not valid beyond 12 months in the equipment or 18 months from invoice date.

The right to access to equipment installation for the purpose of inspection of operating conditions shall be accorded to a representative of the manufacturer or any agent appointed by him, if so desired.

The liabilities under this warranty are limited optionally to replacement or credit in lieu of replacement. The decision of the manufacturer's engineers on the cause of failure and applicable allowance is final.

Factors Affecting Life of Magnetron

It can be expected that the YJ1600 will have a very long life, if operated according the "typical operating conditions" as indicated in the tube's data. However, the life can be negatively affected by several conditions.

Therefore:

- The tube should not be operated for periods longer than 3 minutes at anode currents of less than 300 mA (1.5 kW output). If operated for an interval (less than 3 minutes) at an anode current of less than 300 mA, the magnetron should be operated for at least an equal time period at an anode current greater than 300 mA.

  If the tube is operated with an average anode current below 300 mA for longer than 3 minutes at a time, the tube may internally arc and be permanently damaged.

  Although every magnetron is aged by the manufacturer, there is a bigger risk of arcing for new magnetrons put in service.

- The life of a YJ1600 magnetron will be reduced, by operating the magnetron for long periods with average anode currents less than 300 mA.

- The number of cycles between low and high power should be kept below 30000 over the total life span of the tube.

- The number of standby hours (only filament voltage applied to the magnetron) should be counted toward the total number of life hours. (The filament temperature at standby is approximately equal to the filament temperature in operating condition. Therefore, the rate of evaporation of thorium from the cathode will also be approximately equal.)