TEST SPECIFICATIONS

Type : H0915

Description : Continuous Wave (C.W.) Magnetron intended for use in industrial microwave heating applications 2450MHz, fixed frequency.

Absolute Maximum Ratings :

Item	Symbol	Min.	Max.	Unit	Note
Filament Surge Current	—	—	200	Aac	
Filament Voltage (Pre-heating)	Ef	5.8	6.2	Vac	2
Filament Voltage (Operation)	Ef	(See Fig. 1)		Vac	1, 2, 3
Pre-heating Time	tk	(See Fig. 2)		sec	1, 3
Anode Voltage	Eb	—	9.5	kVdc	1
Peak Anode Current	ibm	—	2.2	Ap	1
Average Anode Current	Ib	—	1800	mAdc	1
Average Anode Input	Pi	—	16.0	kW	1
Load VSWR	σL	—	1.5	—	1, 7
Anode Core Temperature	Tp	—	130	℃	
Case Temperature	Tcase	—	120	℃	
Storage Temperature	—	-30	60	℃	

Test conditions for electrical characteristics :

Filament Voltage	Ef = 5.0V (Stand-by), Ef = 6.0V (Pre-heating), Ef = 1.5V (Operation)
Average Anode Current	Ib = 1600 mAdc
Load VSWR	σL = 1.1 or less
Cooling Water Flow	Q = 7L/min
Cooling Water Temperature at inlet	22℃

Limits and characteristics :

Item	Conditions	Symbol	Typ.	Min.	Max.	Unit	Note
Filament Current (Pre-heating)	tk=120secMin.	If	33.0	31.0	35.0	Aac	1, 4, 5
Anode Voltage		Eb	8.9	8.6	9.2	kVdc	1, 4, 5, 10
Average Power Output		Po	10,000	9700	—	W	1, 4, 5, 10
Frequency		fo	2460	2445	2475	MHz	1, 4, 5, 10
Stability	σL=1.5 or less	ST	—	1200	—	mAdc	1, 4, 5, 6, 8
Breakdown Voltage		Et	—	10	—	kVdc	9

Notes :

1. Power supply should be DC with the less than 2% of ripple rate.
2. Filament Voltage should be regulated as shown in Fig. 1 for continuous operation.
3. If power supply is different, the figure shall be reviewed.
4. Block diagram of the test equipment is shown in Sheet No. 1609-0015-1.
5. Launcher and tapered waveguides are shown in Sheet No. 1609-0016-1.
6. Any instability such as mode jump, run away, should not be observed at any phase of the specified VSWR.
7. The load impedance should be kept outside the restricted region on the Rieke diagram shown in Fig. 3.
8. Operate momentarily 5 sec maximum to avoid destruction of the tube.
9. No continuous spark at 10 kVdc after gradual voltage up.
   (RL =100 k ohms. Potential of anode shall be plus.)
10. Figures are specified at 20± 1℃ of the magnets' temperature.
    If the magnets' temperature is T ℃, Eb(T), Po(T) and fo shall be :

$$Eb(T) = \{1-0.0013(T-20)\}Eb$$
$$Po(T) = \{1-0.0013(T-20)\}Po$$
$$fo(T) = fo$$

    Measurement shall be done within 15 sec after Eb is supplied.
11. Recommending power supply : DC or 3-phase Fullwave rectifier without filter, and a matched load.
12. Timing chart is shown in Fig. 2.
13. Performance chart is shown in Fig. 4.
14. Cooling characteristics are shown in Fig. 5.

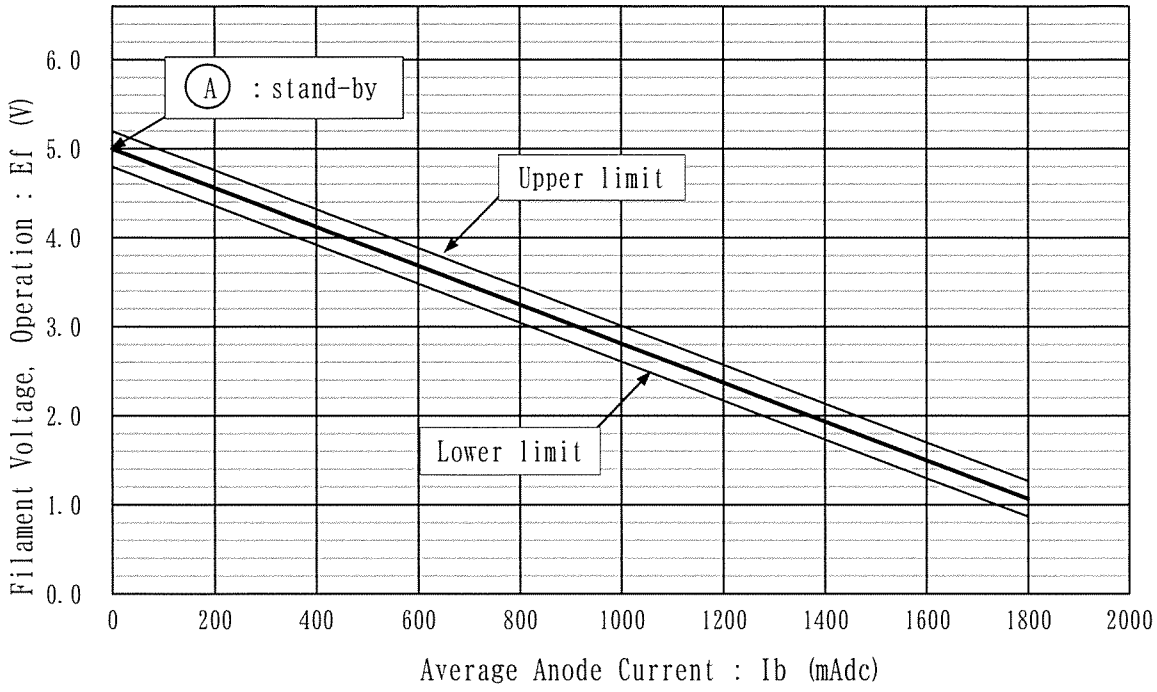

Fig. 1 Reduction Chart of Filament Voltage

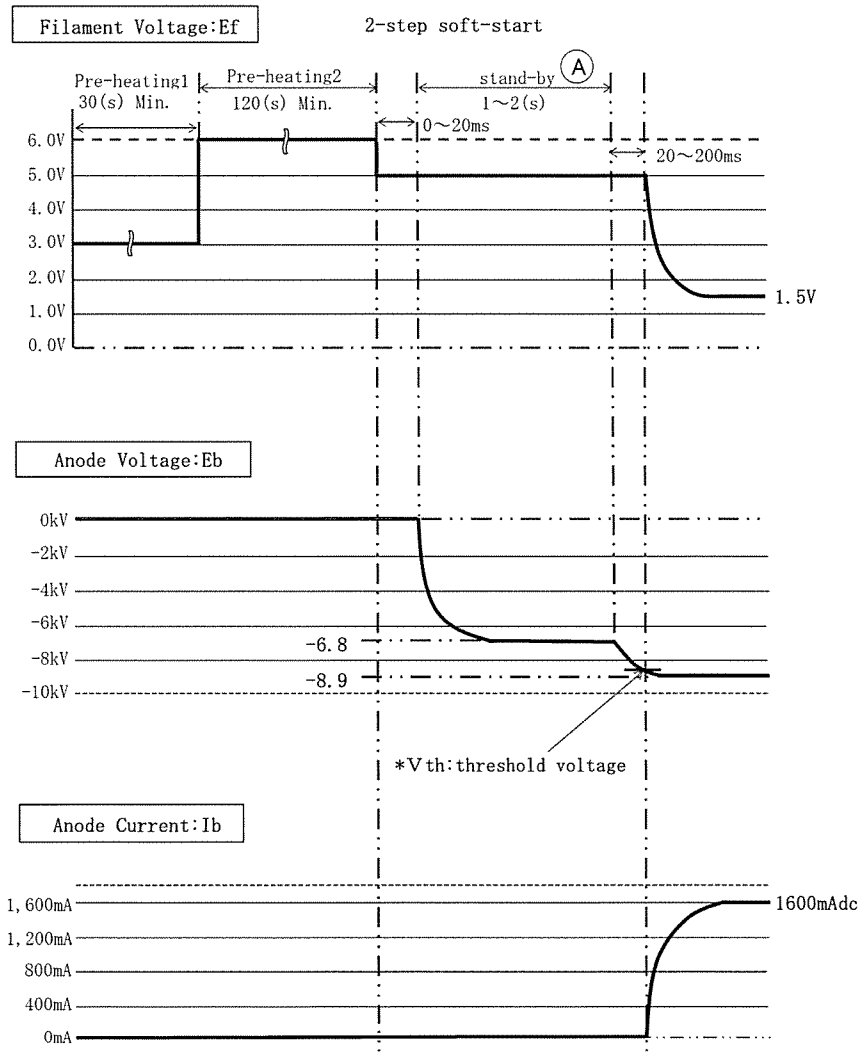

Fig. 2 Timing Chart for Swiching-ON of Both Filament & Anode Power

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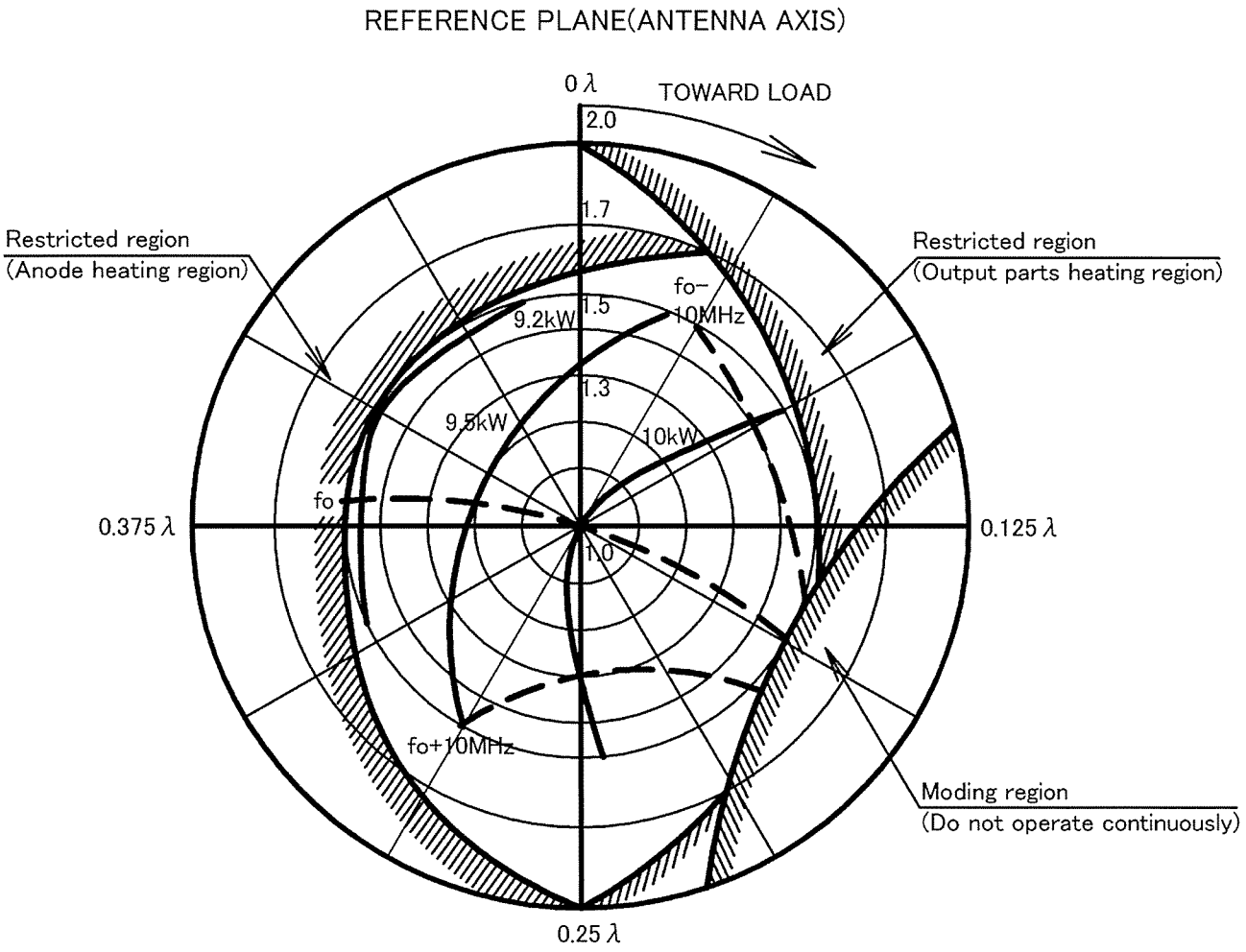
RIEKE DIAGRAM

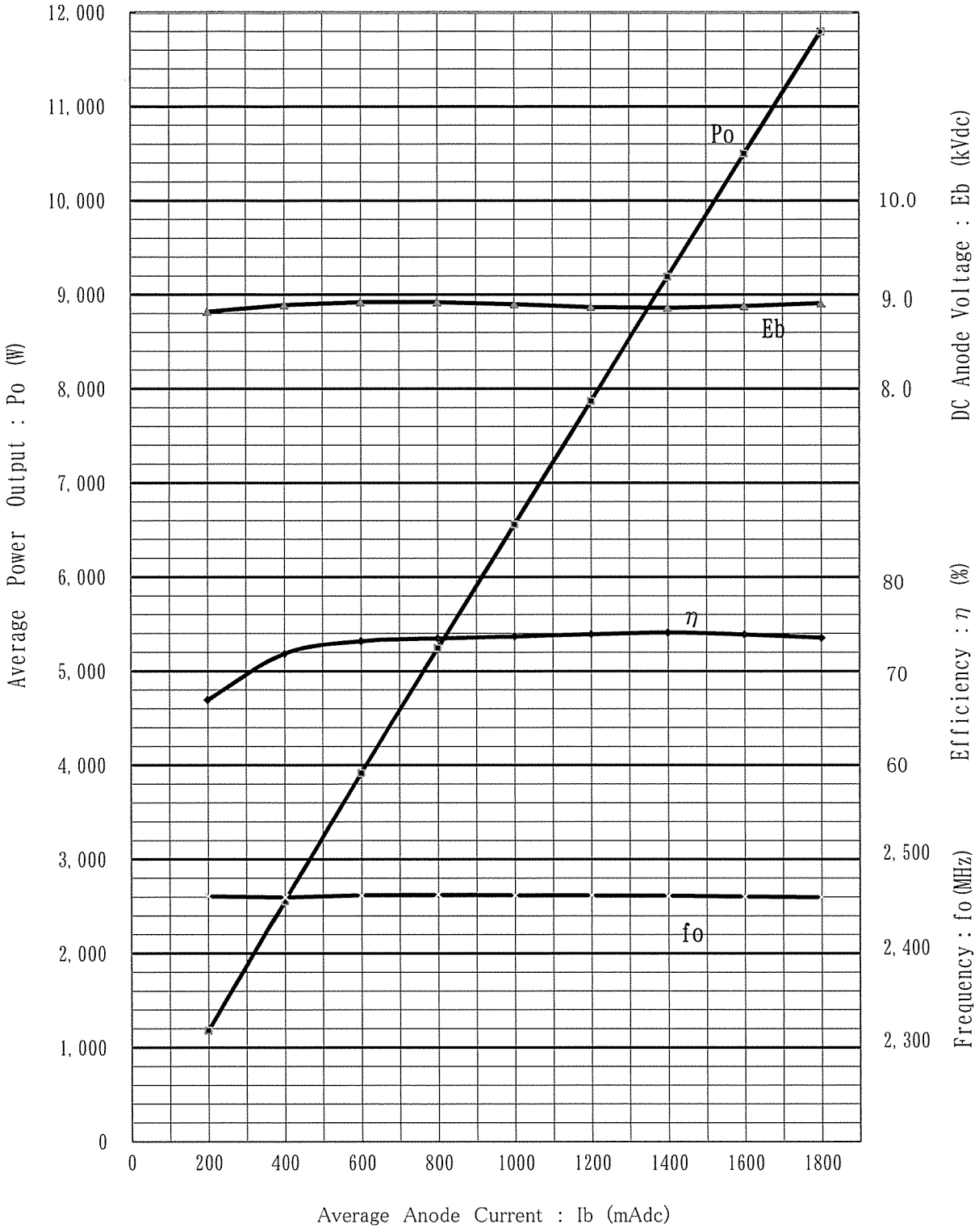
——— Output power (W)
------- Frequency (MHz)
fo=2460 MHz



Test conditions

1. Average anode current : 1600mA
2. Anode supply : DC
3. Filament Voltage : 1.5V

Fig. 3 Rieke Diagram of the H0915



Test conditions

1. Load VSWR : $\sigma L \leqq 1.1$
2. Anode supply : DC

Fig. 4 H0915 Performance chart

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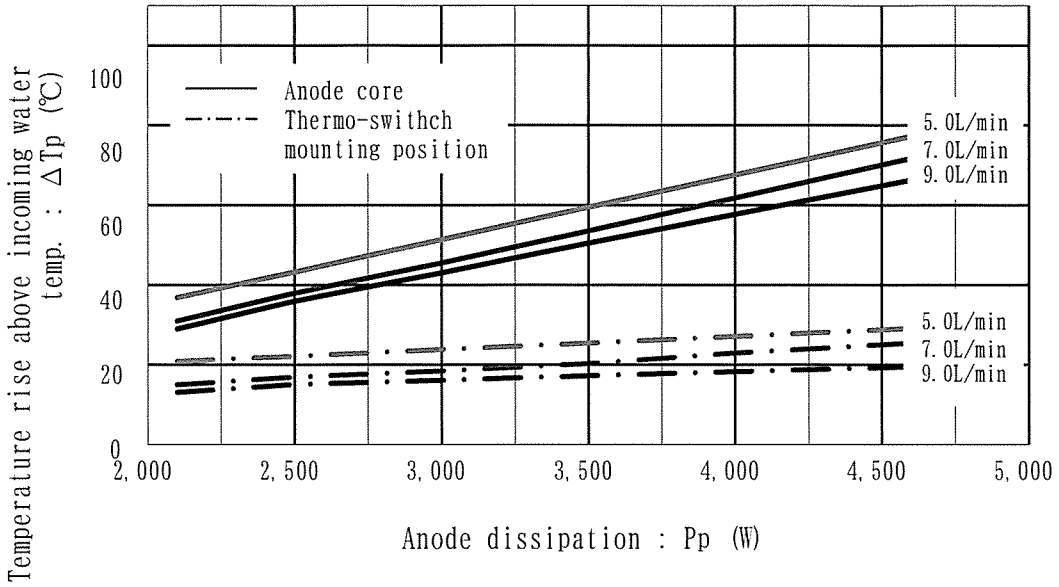
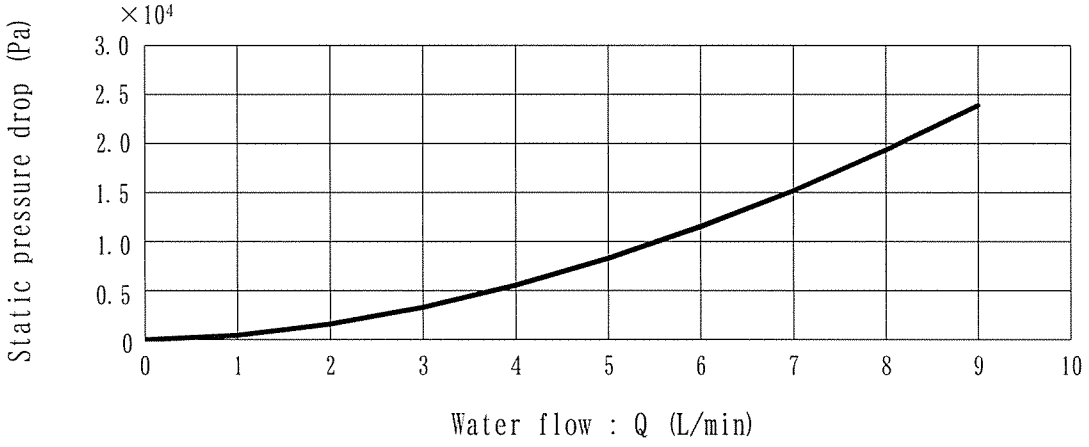
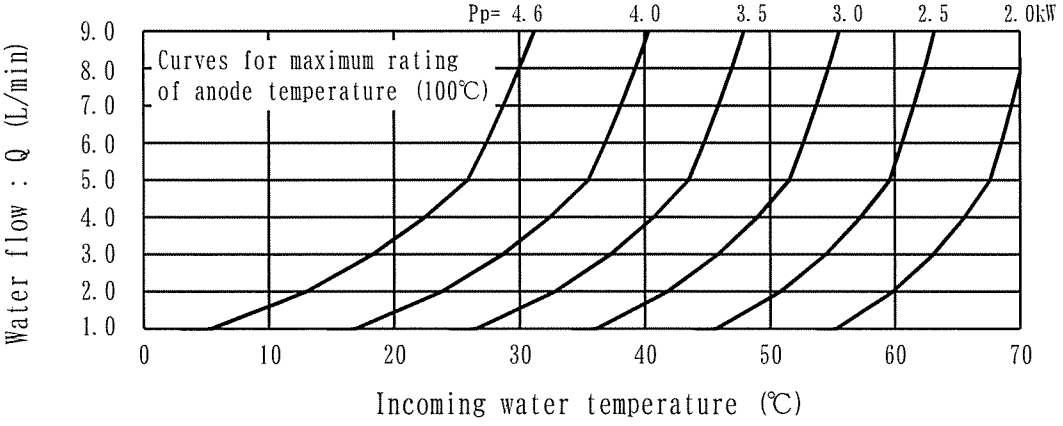


(A) ANODE DISSIPATION VS. CORE TEMPERATURE RISE



(B) WATER FLOW VS. STATIC PRESSURE DROP



(C) WATER TEMPERATURE VS. WATER FLOW (ABSOLUTE MAXIMUM RATING)

Fig. 5 H0915 Cooling Characteristics

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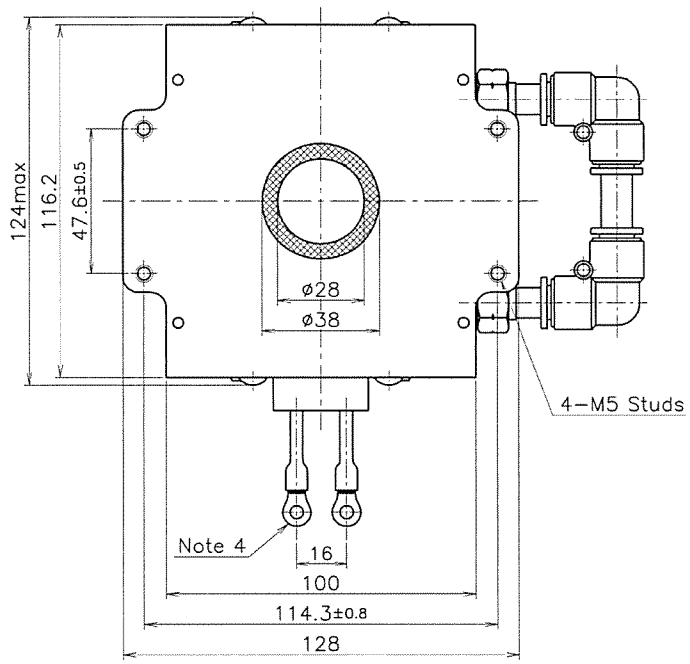
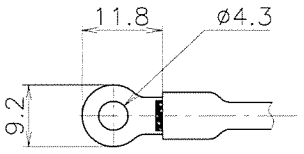
DIMENSIONAL OUTLINE OF H0915

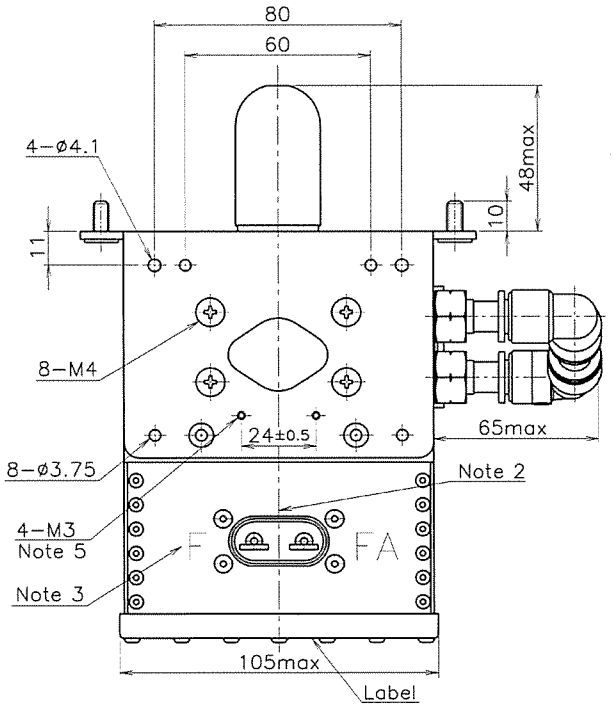
units : mm

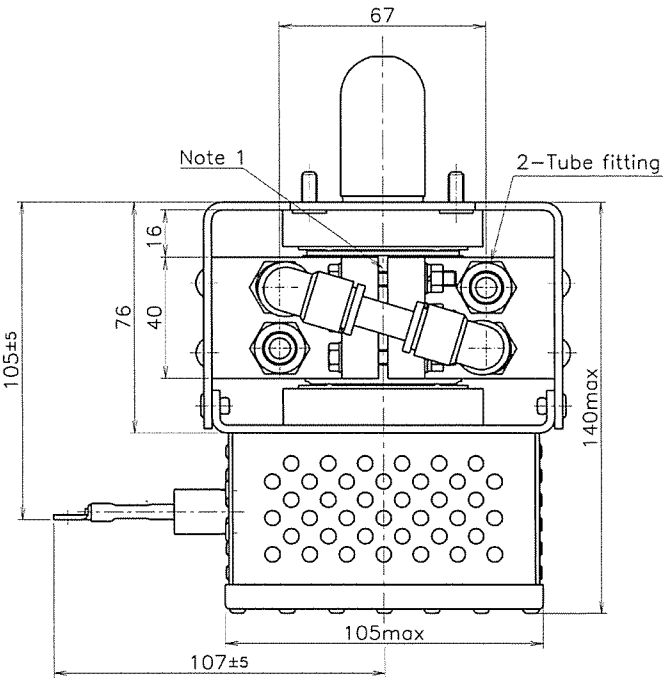


Notes :
(1) Anode core temperature measuring point.
(2) Case temperature measuring point.
(3) Phase mark for connecting with filament transformer.
(4) Detailed drawing of the filament terminals.



(5) Thermal-switch mounting position.
(6) Details of Tube fitting.
Manufacturer :NITTA MOORE COMPANY
Part No. :C4N10×8-Rc1/4-S
Tube : ϕ 10×8 (Outer×Inner)





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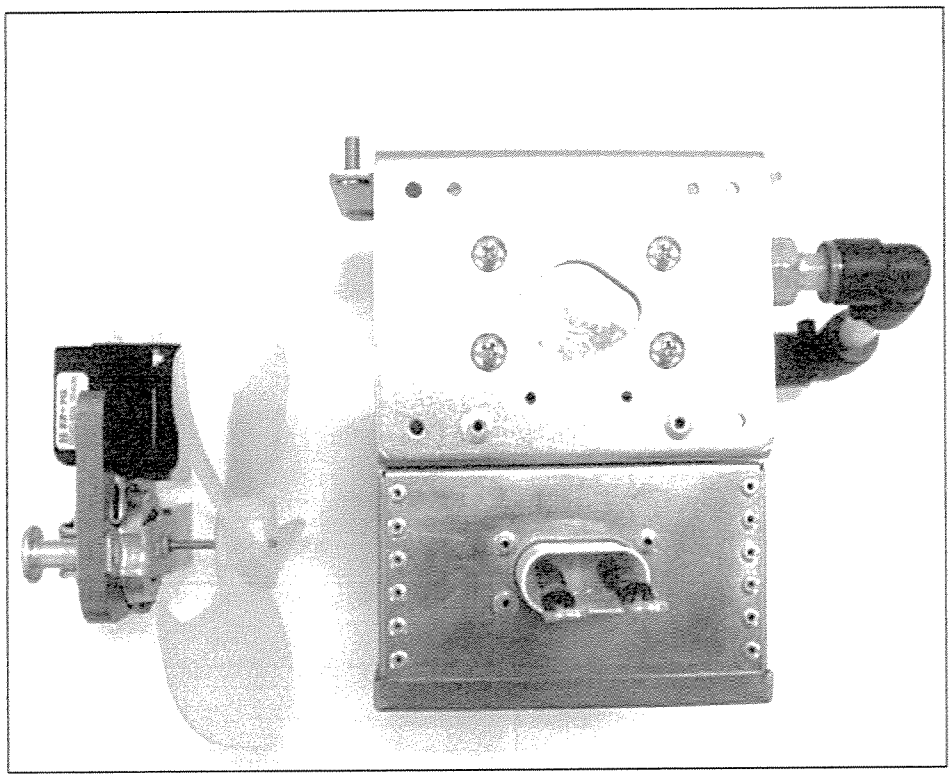
Cooling method to Input Portion of The H0915

Recommended characteristics of the fan:

Air flow is 0.5m^3/minute or larger at 0Pa of static pressure.

Example of the fan position to the magnetron is shown below:



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PRECAUTIONS FOR SAFETY

Carefully take the following precautions for safety in using the magnetrons for microwave ovens or for other applications.

Magnetrons must be handled by individuals possessing adequate backgrounds of electrical, electronic, microwave and mechanical experience.

The filament power supply of the magnetrons, please use a commercial frequency power supply (50Hz/60Hz) or DC power supply. Because you may burn magnetron filter circuit,you should never use of the switching power supply.

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1.Radiation Leakage

Care should be taken for radiation leaked from the magnetron, although the leakage from the input part of magnetron is restricted to a level which human body is not adversely affected.

1-1 Properly install and tightly fasten the magnetron in the oven or in the waveguide launcher.

1-2 Do not deform the gasket or do not operate the magnetron with the gasket removed, to avoid hazardous conditions such as radiation leakage and arcing.

1-3 Never operate the magnetron without installing it in the oven or with the output antenna exposed.

1-4 Do not remove the lid of filter box nor deform the filter box.

1-5 Always keep your eyes apart from the operating magnetron in consideration of the unexpected hazardous conditions.

1-6 Do not use a dropped magnetron because the microwave sealing might be damaged.

2.Temperature

Although the magnetron is subjected to forced air or water cooling during operation, high temperature is observed the enclosure of magnetron, care should be taken as follows:

2-1 Do not touch the magnetron immediately after turning power off.
Allow the magnetron to cool before handling.

2-2 Putting on cotton gloves or the equivalents is recommended for safe handling.

2-3 Install a thermo-protector on the enclosure of magnetron to avoid abnormal temperature rise.

3.High Voltage Shock

Since the magnetron is operated with negative high potential at the filament terminals, a special care must be taken as follows :

3-1 Do not touch nor come close to the filament terminals or their surroundings during operation.

3-2 To avoid shock hazards, never insert metallic wire or line into the filter box, and never operate the magnetron with the lid of filter box open.

3-3 Before removing the magnetron from the oven, carefully check that power is turned off, and discharge the filament terminal or the capacitor in the power supply circuit by using the discharging rod adequately designed safety.

4.High Voltage Break Down

4-1 Contact resistance at connecting point for filament terminals :

Care should be taken for loose connection between filament terminal and receptacle. Because higher contact resistance as connecting point causes both larger ohmic loss and higher temperature, magnetron cannot adequately be operated due to low filament voltage, insulating materials by terminal leads (in a feed through capacitor) can easily be burned, and insulation may be broken down due to burned insulator.

Special care must be taken as follows :

4-1-1 To avoid loose contact, do not use economy type receptacle.
Premier line receptacle is recommended for tight connection.

4-1-2 Properly install receptacle to terminals.

4-1-3 Properly and tightly connect the flying lead to receptacle.

4-2 Surface of insulator of feed through capacitor :

Since the surface of insulator of the feed through capacitor is eventually contaminated by dirty materials which mainly comes from cooked food-stuff and dust in the room, proper care should be taken for the insulator from dirty smudge.

The dirty smudge on the insulator at high humidity conditions may cause the insulator burn due to high voltage.

Special care must be taken as follows :

4-2-1 Do not touch surface of insulator with bare hand or with dirty gloves when you install magnetron in the oven.

4-2-2 Protect the surface of insulator from the polluted air with soot, dust, vaporous oil, moisture, and so on. Do not blow the insulator with polluted cooling air.

4-2-3 Protect the surface of insulator from the contamination by insects, such as cockroach.

4-2-4 Do not place a combustible material near the surface of insulator.
One of solutions is to add an incombustible insulator to cover terminals and capacitor.