



**Instruction Manual
for
Mag-Mixer**

Model: MH800

First Edition

Yamato Scientific Co., Ltd.

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EXPLANATION OF SYMBOLS

Symbols

Various symbols are used in this instruction manual and on the unit in order to use the unit safely. Contents caused by ignoring the symbols and performing improper handling are shown below. Understand the contents of the symbols well before reading the instruction manual.



DANGER: Ignoring this symbol and mishandling the item it corresponds to could result in the death or serious injury ^{*Note 1} of the person operating the unit.



CAUTION: Ignoring this symbol and mishandling the item it corresponds to could result in personal injury ^{*Note 2} to the operator or property damage ^{*Note 3}.

Meaning of Symbols



This symbol indicates warning (including caution). Detailed warning content is described near the symbol.



This symbol indicates prohibition. Detailed prohibition content is described near the symbol.



This symbol indicates essential operations. Detailed instruction is described near the symbol.

Note 1: Serious injury means injury such as wound, electric shock, fracture of bone, poisoning, etc. which have aftereffect as well as injury which needs to be stay in hospital or to go to hospital for a long time for treatment.

Note 2: Injury means wound, electric shock, etc. which do not need to be stay in hospital or to go to hospital for treatment.

Note 3: Property damage means damage related on property such as equipments, building, etc.

CAUTIONS ON SAFE OPERATION



WARNING

⊘ **Do not use the unit in the atmosphere of inflammable or explosive gas.**

- Never use the unit in the atmosphere of inflammable or explosive gas. This unit is not explosion proof, therefore, fire or explosion may be caused.

❗ **Pay attention to high temperature.**

- Agitating table of the unit gets high in temperature, therefore, pay well attention in handling the unit. Fire or burning may be caused if the unit is handled improperly.

❗ **Always ground the unit.**

- Always ground the unit properly in order to avoid electric shock and fire due to short circuit.

❗ **Do not use the unit at the time of abnormality.**

- Turn off the power immediately if smoke or abnormal smell should come out from the unit in order to avoid fire and electric shock.

⊘ **Do not bundle the power cord.**

- Using the unit with the power cord in a bundle may cause overheating and fire.

⊘ **Do not damage the power cord.**

- Do not damage the power cord by forcibly bending, pulling, or twisting in order to avoid fire and electric shock.

⊘ **Do not use explosive or inflammable material.**

- Never use explosive or inflammable material as well as material which includes them in order to avoid explosion and fire.

⊘ **Do not disassemble nor remodel the unit.**

- Never disassemble the unit in order to avoid electric shock and injury since there is a high voltage part (or rotary part) in the unit.
- Do not remodel the unit in order to avoid fire and electric shock.



CAUTION

When it starts thundering.

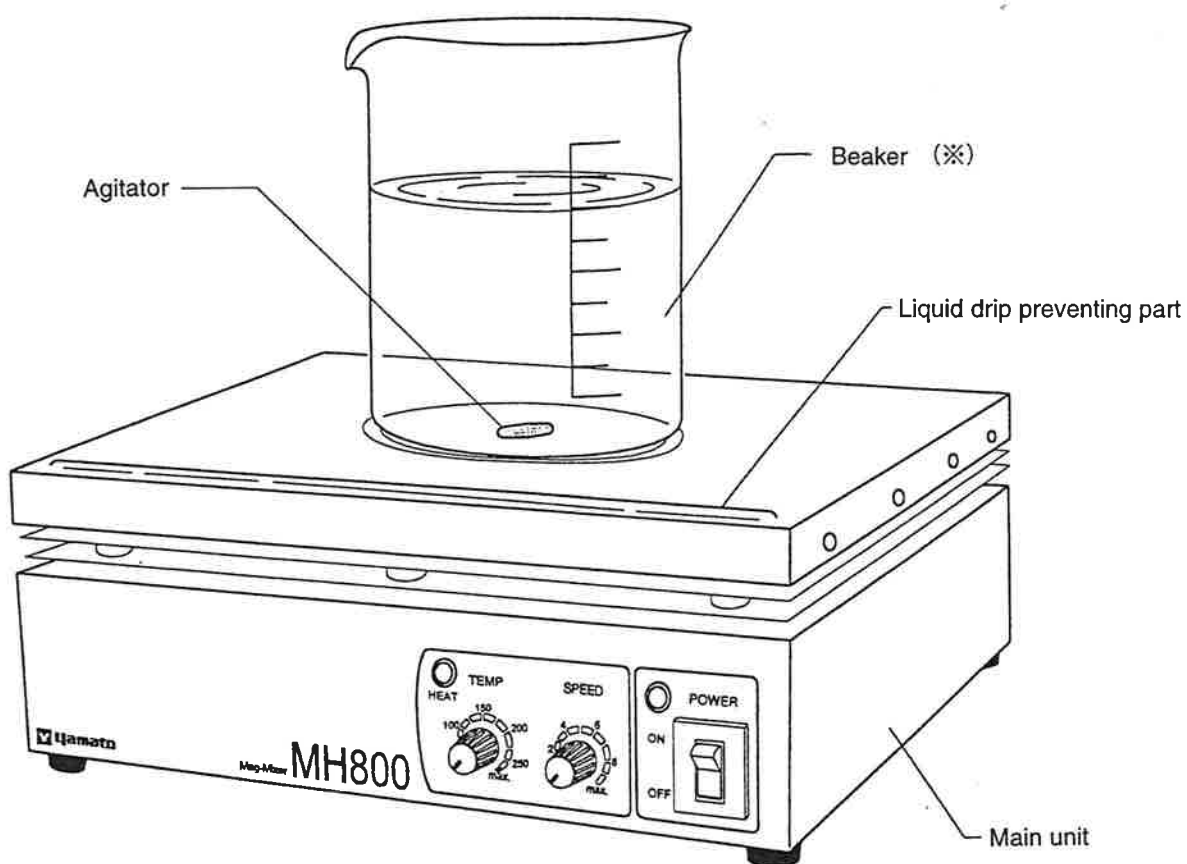
- Turn off the power switch and the main power as soon as it starts thundering.

BEFORE OPERATION

Name and Function of Each Part

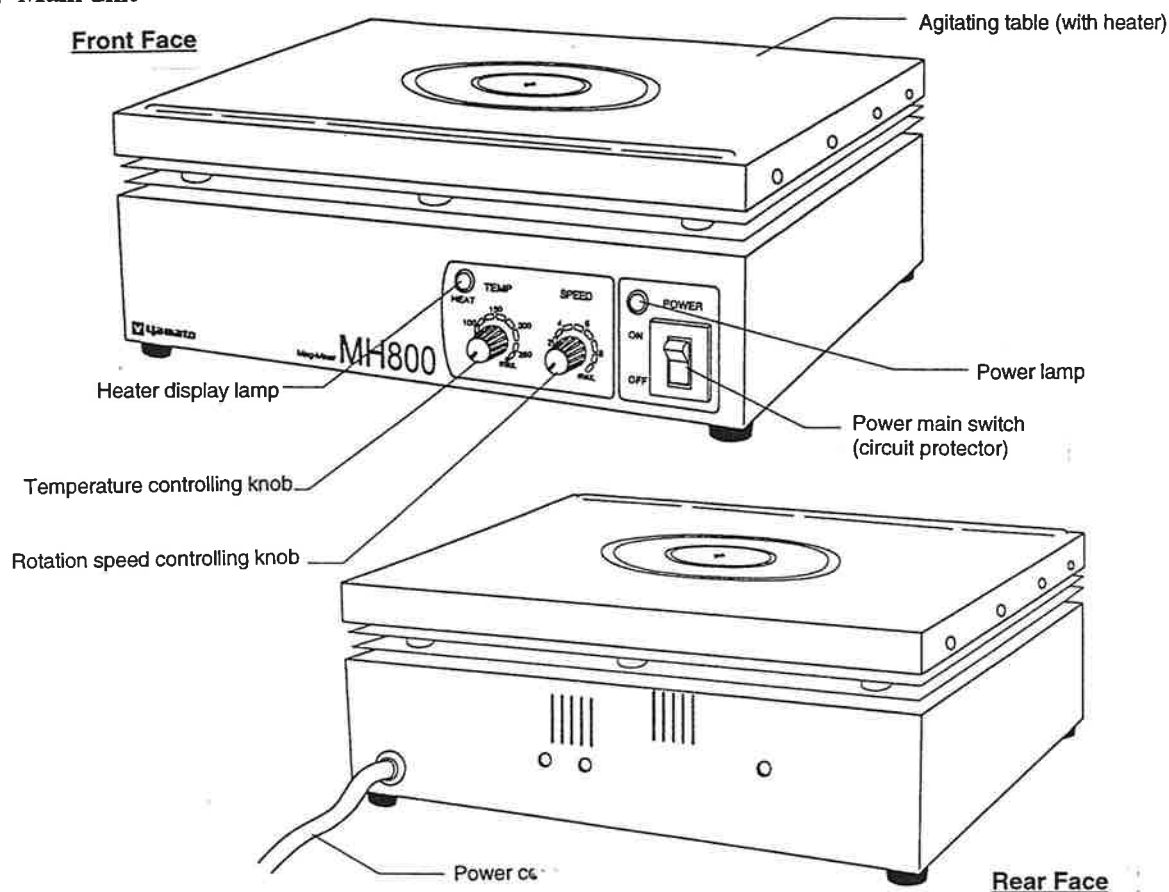
This is the unit to agitate solution by an agitator in which magnet is used. The unit has a heater so it can agitate solution while heating it.

■ Beaker Setting Example



※ Beaker is not attached to the unit.

■ Main unit



Power main switch (circuit protector):

Main switch of the main unit. It is turned ON when it is pressed on the upper side and turned OFF when it is pressed on the lower side. It is automatically turned OFF when current is flown excessively.

Power lamp: Green lamp is lit up when the power main switch is ON.

Rotation speed controlling knob:

Rotation speed is increased when it is turned clockwise.

Agitating table: Put a container (beaker, etc.) in which there is sample on this table. The position marked with + is the center of the agitation.

Temperature controlling knob:

The heater is OFF when the knob is at the position of OFF. Temperature can be controlled by turning the knob. Temperature is increased as the knob is turned clockwise.

Heater display lamp:

Red lamp is lit up when the heater is ON. When the lamp is ON continuously, temperature of the agitating table is in a rising condition. When the lamp is ON intermittently, temperature of the agitating table is in a stable condition.

Power cord: Connect it to AC 100V power source at the time of using the unit.

Installation Method and Preparation Before Operation

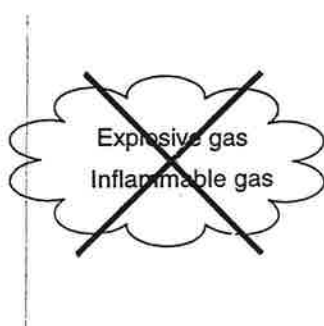


WARNING

Do not use the unit in the atmosphere of inflammable or explosive gas.



- Never use the unit in the atmosphere of inflammable or explosive gas. This unit is not explosion proof, therefore, arc may be generated at the time of switch ON and OFF and may cause fire and explosion.



Always ground the unit.

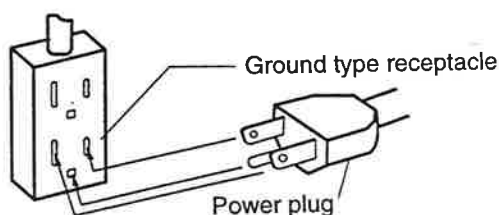


- Always ground the unit in order to avoid electric shock accident due to short circuit.



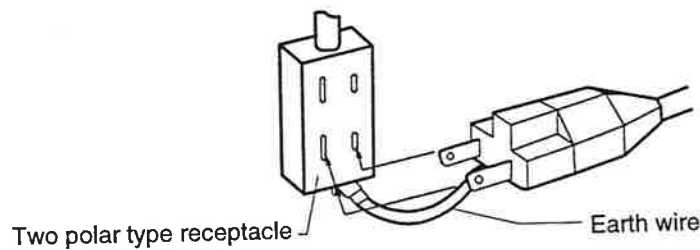
- Never connect the earth wire to a gas pipe since fire may be caused.
- Never connect the earth wire to the earth wire of the telephone line nor to a lightning rod since fire and electric shock may be caused.

■ As to a receptacle, it is recommended to use a ground type receptacle.



When there is no ground terminal on the power facility, grounding work (the 3rd class grounding work 100Ω and less) is necessary. Qualification of the electric work is necessary to perform the grounding work, therefore, ask the sales agent from which you have purchased this unit, the sales office of Yamato Scientific, or a electric work agent for the grounding work.

■ When two polar type receptacle is used



Insert the grounding adapter which is non-standard accessory into the power plug and confirm the polarity of the receptacle side, then connect it. Connect the earth wire of the grounding adapter (green) to the grounding terminal on the power facility side.

Handling of power cord.

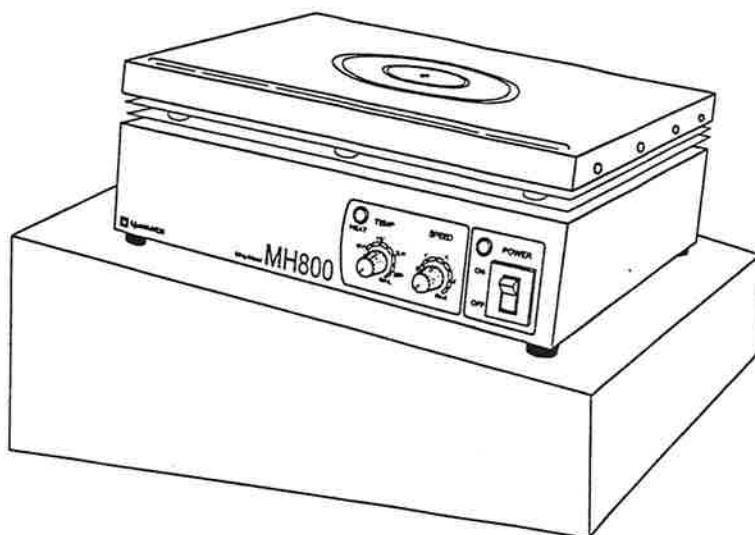


- Use the receptacle suitable for the electric capacity.
Electric capacity of Model MH 800: AC 100V, 11A
- Do not use a branch receptacle since it may cause over heating.

Install the unit at a stable place.



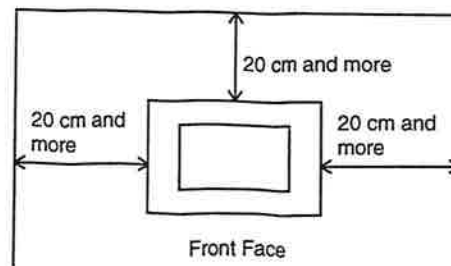
- Install the unit at a flat place. If it is not installed horizontally, a container on the unit may be moved or dropped during operation. Unexpected trouble may be caused as well.



Pay attention to the installation place.



- Do not install the unit in the following places.
 - Place where there is inflammable gas or corrosive gas.
 - Place where ambient temperature gets over 35°C
 - Place where temperature difference is severe.
 - Place where there is much humid and dust.
 - Place where the unit is exposed to direct sun shine.
 - Place where there is much vibration.



- Install the unit with spaces of 20 cm and more on the side faces and 20 cm and more on the rear face.



CAUTION

Handling of power cord.



- Do not bundle the power cord. Using the unit with the power cord in a bundle may cause overheating and fire.
- Do not process, bend forcibly, twist, or pull the power cord. Fire and electric shock may be caused.
- Do not put the power cord under a desk or a chair. Do not damage the power cord by putting it between things. Otherwise, fire and electric shock may be caused.
- Do not put the power cord near a heating equipment such as a heater. Cover of the cord may be melted and fire and electric shock may be caused.
- Do not put the power cord near the agitating table of the unit. Cover of the cord may be melted and fire and electric shock may be caused since the agitating table gets high in temperature.



- If the power cord is damaged (exposure of the core wire, disconnection, etc.), turn off the power switch immediately and ask the sale agent to replace the power cord. If it is left as it is, fire and electric shock may be caused.
- Insert the power plug into the receptacle surely.



WARNING

Prohibition of usage and treatment at the time of abnormality.



- Turn off the power immediately and ask the sales agent or sales office of Yamato Scientific for check if smoke or abnormal smell should come out from the unit by some reason. If it is left as it is, fire and electric shock may be caused. Never repair it by your self since it is very dangerous.



CAUTION

Start the operation from low speed.



- Always start the operation from the low speed. If the power switch is turned ON with the rotation speed controlling knob set to Max. or to the position near to Max., the motor rotates abruptly and the agitator and the sample may be splashed.

Increase the rotation speed slowly.



- Increase the rotation speed slowly by checking the condition of the sample. If the rotation speed is increased abruptly, the sample container (a beaker, etc.) may be damaged by the agitator or the sample may be splashed.

Caution at the time of heating



- Check the condition of the sample some times during heating. It takes some time for temperature of the whole sample gets stable although temperature is set once, therefore, temperature gets higher than the initial one and the sample container may be damaged

When it starts thundering.



- When it starts thundering, turn off the power switch immediately and turn off the main power. If it is left as it is, fire and electric shock may be caused by lightening.

At the time of power failure



- The unit is automatically recovered and the operation is resumed if the operation of the unit is stopped due to power failure and then power is supplied again. If the operation is resumed with the high rotation speed, the sample may be splashed, therefore, lower the rotation speed controlling knob up to Min. and always turn OFF the power switch at the time the unit is stopped due to power failure.

OPERATION

Model MH 800 is a compact desk top type agitating device. It can agitate various solution by using a agitator in which magnet is enclosed. It can heat solution with the attached heater so sample is dissolved easily.

1. Installation of sample container (Refer to the drawing on page 3.)

- (1) Always confirm that the power main switch is OFF before installing the sample container.
- (2) Install the container in which there is sample on the agitating table. At this time, if there is too much sample in the container, sample may be splashed during agitation. Adjust the amount of sample according to the rotation speed.
- (3) At the time of heating sample, volume of sample is increased as temperature rises and sample may be splashed. Adjust the amount of sample according to heating temperature.
- (4) At the time of heating sample, viscosity of sample is lowered as temperature rises and sample may be splashed. At that time, lower the rotation speed or adjust the amount of sample.

2. Operation (Refer to the drawing on page 4.)

Always confirm that the power main switch is OFF, the rotation speed controlling knob is at Min. and the temperature controlling knob is at OFF before starting operation.

<How to Operate>

- ① Turn the power main switch ON by pressing the upper side of the switch lever.
- ② Turn the rotation speed controlling knob slowly while checking the agitation condition up to the desired rotation speed. At this time, if the rotation speed is increased abruptly, the agitator may be dislocated and sample may be splashed. Therefore, always increase the rotation speed slowly.
- ③ At the time of heating sample, turn the temperature controlling knob up to the desired temperature. If the knob is set to Max., temperature of the agitating table gets approx. 250°C (when room temperature is 20°C). It takes some time for temperature of the whole sample gets stable, so confirm the temperature of sample by a thermometer some times until it gets stable.
- ④ When sample is heated and operation is performed for a long time, volume of sample is reduced slowly by evaporation, therefore, confirm the volume some times.

MAINTENANCE

Daily Inspections and Maintenance

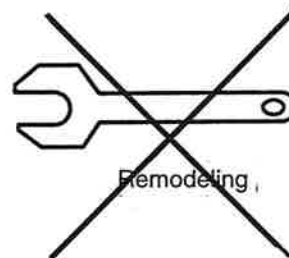


WARNING

Do not disassemble the unit.



- Never disassemble the unit in order to avoid electric shock since there is a high voltage part in the unit. Contact the sales agent or the sales office of Yamato Scientific for inspection, adjustment and repair of the inside.
- Do not remodel the unit in order to avoid fire and electric shock.



CAUTION

At the time of maintenance



- Always turn off the power switch and the main power before starting maintenance for safety.
- It is dangerous to perform maintenance when temperature of the agitating table is high. Always wait until temperature of the agitating table gets low before performing maintenance.
- Wipe off dirt on the agitating table and the operation panel with well squeezed soft cloth. Do not use benzene, thinner, and cleanser. Do not rub with a brush in order to avoid deformation, change of quality, change of color, etc.

Contact the sales agent where you have purchased this unit or our sales office right away if you have any questions.

When the unit is not used for a long time or disposed.



CAUTION

When the unit is not used for a long time



- When the unit is not used for a long time, always turn off the power switch and the main power for safety.

When the unit is disposed.



- At the time of disposing the unit, do not dispose the unit at the place where children play around.

AFTER SALES SERVICE AND GUARANTEE

At the time of requesting repair

At the time of requesting repair

If abnormality should occur, stop the operation, turn off the power switch, and pull out the power plug right away, then contact the sales agent where you have purchased this unit or our sales office.

(Please inform us of the following contents)

- Model of the unit.
- Serial No.
- Date of purchase.
- ※ Refer to the warranty or the name plate on the unit.
- Situation of trouble (as detailed as possible).

When our maintenance staff visits you, always show the warranty to our maintenance staff.

Warranty (attached separately)

- Warranty is given to you by the sales agent where you have purchased this unit or our sales office. Confirm the contents such as “Name of Sales Agent, Date of Purchase” etc. Read the warranty well and keep it carefully.
- Warranty period is a year from the day of purchase. Repair may be performed for free of charge according to the described contents of the warranty.
- As to repair after passing the warranty period, consult the sales agent where you have purchased this unit or our sales office. When the function can be maintained by performing repair, we will perform repair with charge according to customer’s request.

Minimum Stock Period of Functional Parts for Repair

- Minimum stock period of functional parts for repair of MH series is approx. 7 years after stopping manufacturing. Functional parts for repair are the parts which are necessary to maintain the functions of the unit.

Troubleshooting

Trouble	Confirm
The unit is not operated although the power switch is turned on.	● Is the power cord surely connected to the receptacle or to the distribution panel? ● Is power failure caused?
Agitation is not performed well during operation.	● Is the installation place stable? ● Is the installation place flat? ● Is the container at the center of the agitating table?
Temperature does not rise although the temperature controlling knob is turned.	● Is the power main switch on? ● Is power failure caused?
The power switch is turned OFF right away although it is turned ON.	● Ask for repair.

SPECIFICATIONS

Agitating table (heating plate) material	Aluminum with ceramic coating
Agitating table dimensions (width×depth) ^{*1}	299×285 mm (effective part)
Agitating capacity	200 to 10,000 ml
Rotation speed	Approx. 100 to 1,400 rpm ^{*3}
Heater	1,000 W
Temperature control	Triac input control type with set temperature scale
Agitating table temperature	Max. 250℃ (set by volume)
Motor	AC motor, capacitor type electronic control, 3 W
Power	AC 100 V, 50/60 Hz, 11 A
External dimensions (width×depth×height) ^{*2}	309×315×151 mm
Weight	Approx. 6.7 kg
Accessory	1 piece of 40 mm agitator

*1: Agitating table dimensions are top plate effective dimensions. (Liquid drip preventing part is not included.)

*2: Protruding parts are included in the external dimensions.

Width: Including screws

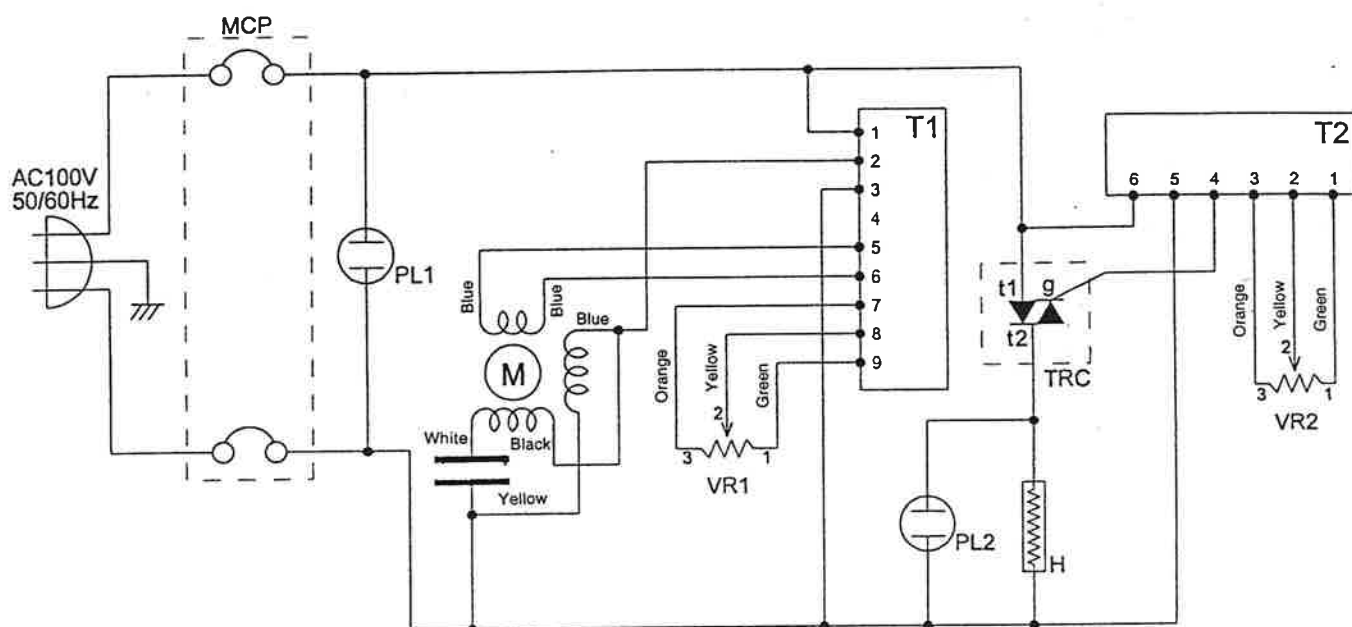
Height: Including rubber leg and liquid drip preventing part.

Depth: Including knobs on the front face, the fuse holder and the cord bush on the rear face.

*3: At the time of no load.

WIRING DIAGRAM AND REPLACING PARTS

Wiring Diagram



Replacing Parts List

Symbol	Part Name	Specifications	
M	Motor	2IJ3RA-A	Yamato Scientific
H	Heater	Myca 1 kW	Yamato Scientific
PL1	Lamp for power	BN-9EG	Sato Parts
PL2	Lamp for heater	BN-9ER	Sato Parts
MCP	Circuit protector	CP22H S/20-B5	Fuji Denki
T1	Board for speed control	T-32	Yamato Scientific
VR1	Variable resistor for speed control	10 kΩ	Yamato Scientific
T2	Board for heater control	C-39	Yamato Scientific
VR2	Variable resistor for heat control	10 kΩ	Yamato Scientific
TRC	Triac	TG16C60	Yamato Scientific