

# INSTRUCTION MANUAL

Hot plate,Magnetic Stirrer,Hot Plate & Magnetic Stirrer

MODEL :MS100(HP100),MS200,MS300HS

ver 1.0



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We appreciate you for purchasing MISUNG SCIENTIFIC CO.,Ltd product.

Before using the product you have purchased,check to make sure that it is exactly what you ordered.

Then,please use it following the instructions below.

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## 1. Safety information

Before you use, read safety precautions carefully, and use this product properly.

The precautions described in this manual contain important contents related with safety; therefore, please follow the instructions accordingly.

The precautions are composed of DANGER, WARNING and CAUTION.

	<b>DANGER</b>	Indicates a potentially or imminently hazardous situation which, if not avoided, could result in death or serious injury.
	<b>WARNING</b>	Is used to alert operators to an operating procedure, practice or condition that, if not strictly observed, can result in severe injury or loss of life.
	<b>CAUTION</b>	Indicates a potentially hazardous situation that may result in minor or moderate injury.

	 <b>WARNING</b>	 <b>CAUTION</b>
	Touching the reactor block surfaces and vials while hot can cause serious burns.	
Hot Surface		

	 <b>WARNING</b>	 <b>CAUTION</b>
	This product requires a protective earth connection. If not provided with a plug on a cord, connect positive earth to this terminal.	
Protective Earth Ground		

## 2. Safety information ( Setting up )

Used to alert operators to a specific operating procedure that should be emphasized for operating safety.

Read and follow instructions carefully before performing the required procedure.

	<b>DANGER</b>		<b>WARNING</b>		<b>CAUTION</b>
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1) Do not use this product at any place with possible thermal accumulation due to direct sunlight or heat radiation.

2) Do not use this product at any place with direct vibration or impact.

3) To prevent deflection of this product, apply a proper power voltage in accordance with the rating.

4) Do not use outdoors; Shock hazard may result and life can be shortened.

5) If there is a concern about a serious accident caused by a malfunction or abnormality of this product, please install an external protection circuit and devise a scheme for preventing an accident.

6) Do not use this product at any place with a large inductive difficulty or occurring static electricity or magnetic noise.

7) If there is excessive noise from the power supply, using insulating transformer and noise filter is recommended. The noise filter must be attached to a panel which is already connected to a ground and the wire between the filter output side and power supply

8) Do not use this product at any place with liquid, oil, medical substances, dust, salt or iron contents. (Use at Pollution level 1 or 2)

9) Do not use in the presence of flammable or combustible materials; fire or explosion may result.

10) Do not use this product at any place with occurring corrosive (especially noxious gas or ammonia) or flammable gas.

11) Since this product is not designed with explosion-protective structure, do not use it any place with flammable or explosive gas.

12) Use this product within the range of the operating ambient temperature, 0~40°C and ambient humidity, 35~85%RH (No condensation).

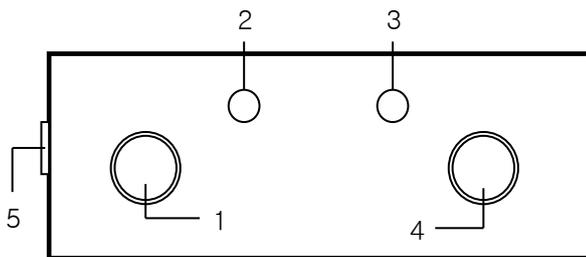
### 3. Features and areas of use

Your Misung hot plate, stirrer or stirring hot plate is a general purpose heating and/or stirring plate designed for laboratory procedures requiring precise control of temperature and/or stirring speed. Your hot plate, stirrer or stirring hot plate may be

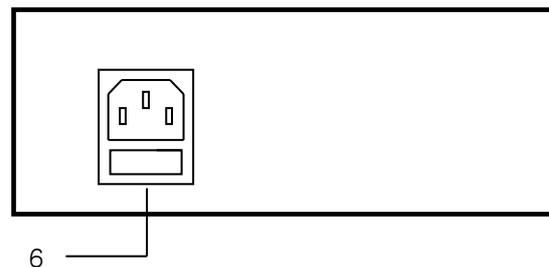
- 1) Ceramic coated stainless top plate : Ceramic coated stainless top plate is corrosion proof, temperature resistant and resists aggressive fluids.
- 2) Coated with pure white plate, easy to observe in use.
- 3) Top plate makes a quick thermal conduction and the surface temperature uniform.
- 4) We use electronic energy regulator to control temperature.
- 5) Misung designed the unit which starts and stops smoothly to prevent fluid spillover from rapid turnover and detaching of stirrer bar.
- 6) Misung hot plate has an electronic feedback control which will accurately maintain temperature.

### 4. Explanation of each part

Front side



Rear side



Model NO	STIRRER	HOT PLATE & STIRRER	HOT PLATE & STIRRER
	MS200	MS300HS	MS100(HP100)
1	X	Heater volume	X
2	X	Heater lamp	X
3	Motor lamp		Heater lamp
4	Motor volume		Heater volume
5	Main power switch		
6	Single fuse holder		
7			
8			

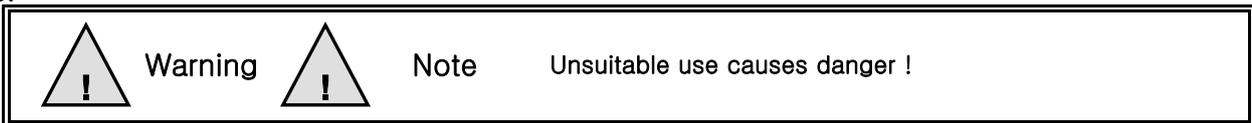
※ 6. Fuse holder : It breaks or stops the current if the flow of electricity is too strong, thereby fuse prevents damage to the unit.

Main power cord : AC 200-230V 50/60Hz

## 5. Safety Precaution (in use)



- 1) Use a properly grounded electrical outlet of correct voltage and current handling capacity. This unit operates only by AC200–230V 50/60Hz without danger. Check supplied voltage and current of AC200–230V, 50/60HZ before use.
  - 2) Do not cover top plate with aluminum foil to prevent overheating, or fatal damage may result.
  - 3) Keep the controller out of fluid.
  - 4) Keep the unit out of particle and fluid. Inflow of particle and fluid into the unit can be a cause of fire. If inflow of particle or liquid, remove them after turn your power switch off and disconnect the plug
  - 5) Do not put a strain on unit, it can be damaged.
  - 6) Hot surface on operation. Avoid contact.
  - 7) Do not drop objects onto your unit and do not drop your unit.
  - 8) Turn your power switch OFF and disconnect the plug whenever you leave the unit.
  - 9) Power cable should not be contacted hot plate.
- etc.



- 1) If you use the product with methods other than specified by the manufacturer, there may be bodily injuries or property damages.
- 2) When the product gets wet, the inspection is essential because there is danger of an electric leakage or fire.
- 3) Some parts of this product have limited life span, and others are changed by their usage.
- 4) Confirm carefully the plug connected correctly. Wrong connection of the plug may cause fire.
- 5) Do not leave the unit whenever the unit is on running. Turn your power switch OFF whenever the item is not used, or before disconnecting the plug.
- 6) Do not use the unit on other purpose.
- 7) Hot surface. Avoid contact. The hot plate will remain hot without any visual indication on power as well after power has been removed for sometime .

## 6. Operation and control

- 1) Turn volume switch OFF and check the voltage (AC200–230V 50/60Hz) before plugging in. And connect the power cord (6) to power supply (AC200–230V 50/60Hz).
- 2) Place your container or heating bath with the magnetic stirrer bar. Stirrer bar should be placed in center of hotplate.
- 3) Turn main power S/W(5) ON.
- 4) Heating : Use heater control (1) to adjust hot plate temperature.  
(LED (2) confirms heating current ON.)  
The below chart shows the surface temperature chart of hot plate on the position of volume scale.
  1. Each data was measured without vessel or container after instrument starts for 30 Min.
  2. Input power : AC200–230V 50/60Hz
  3. Ambient temp. : 40℃
  4. Tolerance : within +/- 5 %
  5. These data can be changed as per the different conditions.
- 5) Stirring: Use motor control volume (4) to adjust motor speed rpm.  
(Analog Type: Turn the speed control(4) ON. A LED (3) confirms the current ON. Set speed to meet your needs by rotation of the speed control (4) on the front panel.
- 6) Do not place anything on top plate when use finishes.
- 7) Turn the main power S/W OFF.
- 8) Turn your power switch OFF and disconnect the plug whenever the unit is not in use.

Keep the unit clean.

Note:

- 1) Range of speed control : 100~1500 rpm  
(Every 10rpm increases by rotation the knob right-handed and every 10rpm decreases by rotation the knob left-handed)
- 2) Speed control knob in extreme left (CCW) position stops operating.
- 3) Set the speed (rpm) with the dial, it arrives at the set value shortly and maintained constant speed by arithmetic logic unit. (Smooth start function)
- 4) If motor does not run on starting, make it run in 3 second by a increasing or output until 10rpm or more.

## 7. Cleaning and store



**Caution** Disconnect the plug before cleaning !!

- 1) Do not polish this product with substances such as alcohol or benzene. (Use neutral detergent.)
- 2) Do not decompose, modify, revise or repair this product. This may be a cause of malfunction, electric or fire.
- 3) Cleaning: wipe housing surfaces clean with a damp cloth (add some sort of mild liquid soap).
- 4) Wipe again with dry cloth
- 5) We recommend to store the item and its components in its original box, or a similar container that offers adequate protection against damage in transit. Tape the box securely.

## 8. Trouble shooting

### 1) Cause of trouble

- Corrosion caused by inflow of fluid into the unit inside.
- Damages occurred by overheat when user covers the top plate with aluminium foil.
- Heavy load

### 2) Power switch dim:

- Check power supply and power cord.
- Check power switch "ON".
- Check fuse.

In case of a malfunction as described above, contact your authorized Misung Dealer.

## 9. SPECIFICATIONS

MODEL		MS100(HP100)	MS300HS	MS200
Type		HOT PLATE	HOT PLATE & STIRRER	MAGNETIC STIRRER
H E A T E R	Temperature range	Up to 380℃		—
	Capacity	680W		—
	Control	Proportion control		—
M O T O R	Speed	—	100 ~ 1500rpm	
	Capacity	—	Up to 5000mL	
	Control	—	Feed back control	
Top plate		Ceramic coated top plate		
DIMEN SIONS	Plate area	180 x 180mm		
	Overall(WxDxH)			
Power		AC 230/220V 50/60Hz		
Weight				
Fuse		250V T5AH		250V T1AH