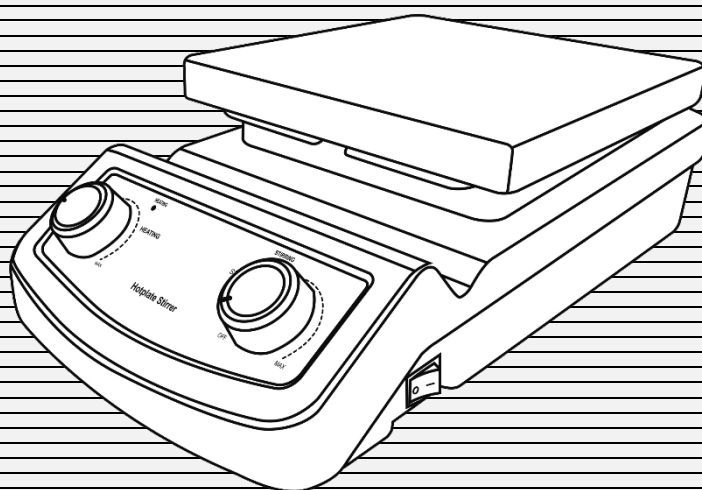


Laboratory Hotplate Stirrer **HS-10**

OPERATING MANUAL



- We greatly appreciate your purchase of the HS-10 Hotplate Stirrer.
- To be sure you take maximum advantage of all the features they have to offer, read these instructions carefully and use the set properly. Be sure to keep this manual for future reference, should any questions or problems arise.

SERIAL NO. _____

PLEASE RECORD UNIT SERIAL NUMBER ATTACHED TO THE
REAR OF THE UNIT FOR FUTURE REFERENCE.

English : 1 ~ 18 Page

Korean : 19 ~ 36 Page

■ SAFETY PRECAUTIONS

◆ Safety symbol used in the manual

Danger  The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance instructions in the literature accompanying the appliance.	Dangerous voltage  The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage"
Explosion hazard  If volatile and explosive chemical materials are used, the explosion may occur.	High temperature  Be careful not to use at high temperature.
Notice  If the user arbitrarily dismantles or transforms the product, the fatal damage of the product may be induced.	Approach prohibition  Prohibit the user from approaching to this area.
warning  If the product is mishandled while ignoring this symbol, the danger by which human beings are dead or severely injured may occur.	Contact prohibition  Prohibit the contact at the moment that leads to the accident.
Caution  If the product is mishandled while ignoring this symbol, the possibility in which human beings are injured or property damage occurs exists.	 Observe the safety rules.
 Be careful to maintain the horizontality of the product and not to fall to the ground.	 Earth
 Keep the product out of the direct rays of the sun.	 OFF position of power switch  ON position of power switch  Connection point of the neutral wire of installation  AC voltage

WARNING :

TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE.



CAUTION
RISK OF ELECTRIC SHOCK
DO NOT OPEN



CAUTION : TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT REMOVE COVER. NO USER SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.

● **Precautions at transportation and installation**



- Please never tilt or lay the product down during transportation.
- Be careful not to drop when transporting the product.
- This product was manufactured to move normally at the rated voltage. Confirm the voltage state before the installation of product.



- Install the product in a place where the floor is hard and flat.
- Keep the set free from moisture, water and dust. It may cause overheating or short circuit. (Pollution Degree 2)
- Do not install the product in a location at an altitude of over 2,000 meters. (6,562 feet).



- Avoid high temperatures : Install the product out of the direct rays of the sun.
- When the product is moved, separate the power plug from a wall outlet, and then move not to damage the product. The cord damage becomes the root cause for an electric shock or an ignition.



- If the product was moved or stored in high humidity state, identify the packaging state of the product before use.
In case that the carton box or wooden box is soaked in water, consult with an engineer about the matter. Do not operate the equipment before the safety is confirmed. This wetting state may be the cause of an electric shock or a fire.
- When installing and using the product, please certainly use the power cord provided with the products.

● Precaution in use



- Please be familiar with the user manual before using this product, and operation should be performed only by qualified personnel.
- This product must be used within the permitted standard load resistance.
- This product should be operated in a room with temperature maintain between 5°C and 40°C. Long-term use in an environment that exceeds the allowable range may cause a malfunction.



- Do not cut or process the power cord or do not bend it by force or pull or tie up it. In addition, if heavy things are placed on the power cord, it may cause damage and it may become the root cause of a fire or an electric shock.



- Please do not touch or manipulate the electrical parts such as the power plug with wet hands electric shock.
- Please do not operate the product by manipulation of the plug to avoid electric shock or short circuits.



- Do not operate the product in the outdoors. It is not allowed to use it at the place that is exposed to the sun or at the place that is gotten in the rain. This leads the product to overheating or electric malfunction.



- Do not use the product on a high place or at high temperature. Do not use the product near the heater or the wind of air conditioner.
The accident by the overheating of the equipment can occur.



- Do not operate the equipment at the place of an inflammable danger or a fire danger. This triggers the severe accident such as an explosion or a fire.



- Please do not use the flammable spray such as lacquers and paint, or volatile, flammable chemicals and its similar product, in the proximity of the product. They may cause the ignition due to the spark of switch.
- If you detect any noise, which is unlike any other time, or it exhibits wrong movement symptom, immediately turn off the power of the product and separate the power cable from the body.
- Please regularly check whether dust or dirt are on the power plug and completely connect the plug. If the plug is covered with dust, or the connection is not complete, it will cause an electrical shock or fire.
- Please separate the power plug from the outlet for safety when the product is unused for long periods of time to avoid overheating or ignition due to dust.
- Please handle the power cord carefully. Hold the plug when unplugging the cord
- The fluctuation of main power voltage should be lower than +/-10% of the nominal voltage.
- The maximum relative humidity is 80% at 31°C and 50% at 40°C.

- Please maintain the clean condition of this product by removing the foreign matter while gently wiping with the neutral detergent and a dry cloth after checking whether the foreign matter present or not, before and after using this product.



- If unexpected sound, smell or smog is generated, pull the main plug out from the wall socket and contact the technical service center.



- Only operate unit after checking the safety of the unit.
- The Sound Level of the buzzer is maximum 60dB in 1 meter distance
- Please keep a human body away from this product when this product is operating at high temperature. Please use this product after wearing the protective equipment at high temperature.
- Be sure to separate the product from power supply cord and cooled down it sufficiently before the transfer of the product to other place.
- Please wear the protective equipment because the heating temperature can be overheated above the setting temperature.
- Please always use the safety equipment (working clothes, gloves and safety glasses) when using this product.
- Please never cover with aluminum foil, etc. over the plate during the heating operation. It can result in the serious damage of the equipment due to overheating.
- Please do not install this product around the product having strong magnetic force.
- Please do not use this product in conjunction with a metal container.
- Do not put the product in places exposing to direct heat sources.
- Please be careful for burns because the residual heat may be remained even if the product is operating or the power was disconnected.

■ INTRODUCTION

Thank you for purchasing Hotplate Stirrer of LK LAB KOREA Co., Ltd.

We, LK LAB KOREA Co., Ltd., started to manufacture and supply highly reproducible and reliable products

in the basic equipment for basic science research such as biotechnology, medicine, environment, and chemistry. Especially, in various experimental equipment for various purposes, the accumulated know-how of LK LAB KOREA Co., Ltd. has achieved high convenience and reliability by achieving commonization and systematization of the methods of use.

This product is manufactured as subminiature size for the effective use in customer's laboratory, and it guarantees low noise and low vibration to maintain the comfortable environment of laboratory. In addition, it was designed by adopting electrical and instrumental safety devices to realize the use safety. We, LK LAB KOREA Co., Ltd. pursues customer satisfaction as the best value, We will do our best to implement steadily. Thank you.

TABLE OF CONTENTS

① Before Using	7
② Features	7
③ Product Installation	8
• Composition identification	8
• How to install	9
• Product specification	10
④ Check before operation	12
• Product Structure	12
• Control Panel	13
⑤ Operation	14
• Stirring Operation	14
• Heating Operation	14
⑥ Product management	15
• Regular inspection	15
• Cleaning and storage	16
⑦ Troubleshooting	17
• Error identification	17
⑧ Accessory	18

① BEFORE USING

Pay attention to the following before using this unit:

- **Moving the set**

To prevent short circuits or damaged wires in the connection cords, always unplug the power cord safely.

- **Before turning the power switch on**

Check once again that all connections are proper and that there are not problems with the connection cords.

- **About operating manual**

Read and understand all the instructions in the user manual before using the products.

In any case, we don't bear responsibility for the damage of product which occurs by no observance for the requirements of user manual. The contents of user manual may be changed or improved. Use only for the intended purpose which is described in the user manual. After reading, store this manual along with the warranty in a safe place.

- **Note that illustrations in this manual may differ from the actual set for explanation purposes.**

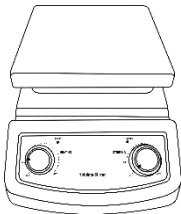
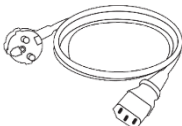
② FEATURES

The high-temperature Hotplate Stirrer of LK LAB KOREA Co., Ltd. is capable of heating up to the high-temperature of 400°C and powerful agitation based on strong magnetism(HS1-A & MS1-A). It also exhibits excellent thermal conductivity and chemical resistance and is applicable to various laboratories. Features of the product are as in the following.

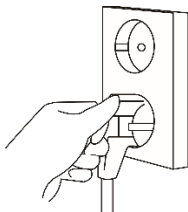
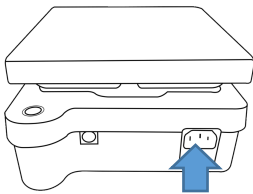
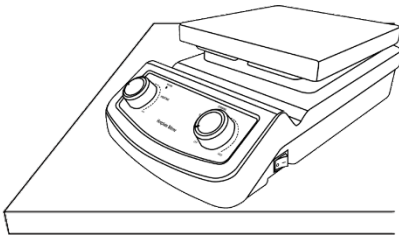
- It can be safely used also in high temperature by applying the heat-resisting ceramic coated top plate.
- The upper plate has specially designed heat line and can offer proper temperature uniformity.
- The upper plate has a high chemical resistance and thus the maintenance thereof is easy.
- The special insulation applied to the product will suppress the overheating thereof and will minimize the surface heat of main unit of the product.
- The motor of strong torque and excellent durability applied to the product ensures the high performance, minimized noise, and extended lifetime of the product.
- The magnet of strong magnetism embedded in the product can prevent the springing of Stirring Bar and can support the agitation of specimens of high viscosity.
- The product is furnished with functions capable of protecting the overheating, overcurrent, and sensor errors of the product to secure the safety of users.

③ PRODUCT INSTALLATION

Composition identification

Basic Components		Qty
1	 Analog Hotplate Stirrer Unit HS-10	1
4	 Power Cable	1
5	 Operating Manual	1

How to install



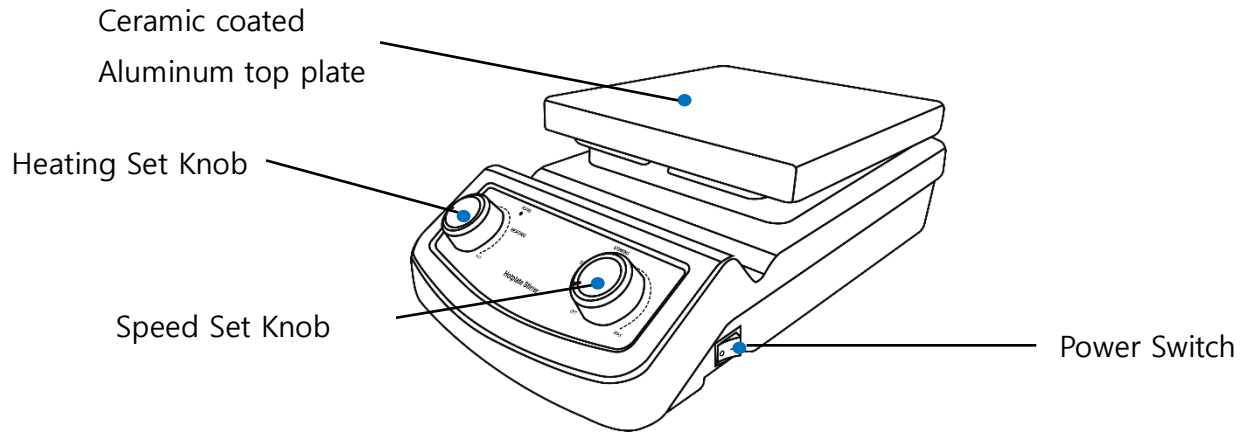
1. Remove the packaging of the product at the place in which the floor of the interior is flat and the horizontality is maintained, and place it on the designated place.
2. Recommend that the product keeps a certain distance with other products. As the heat is generated by operating the product for long time, do not arrange the wall or other products near the product.
3. Confirm whether or not the power cable which is supplied together with the product is damaged, and connect it with the product.
4. Insert the socket in the other side into the wall plug. In case of using a power strip, be careful not to exceed the electrical energy of maximum sum.
5. The ambient temperature may rise by the continuous high-temperature operation of the product thus users should put things vulnerable to heat away from the product.

Product specification

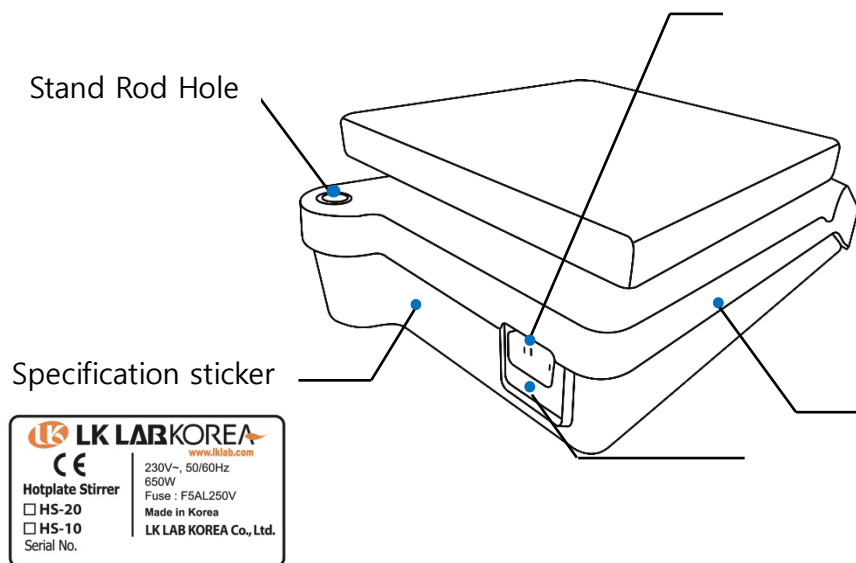
Model		HS-10
Stirrer Speed Range		Max. 1,500rpm
Maximum Stirring Volume (H ₂ O)		20Lit.
Plate Dimension		180 x 180mm
Heating Temperature		Max. 400°C
Heat Control		Fine PWM Controller
Speed Control		Stepless
Heating Output		600 W
Motor Type		Brushless Shade Motor
Permissible Temp. & Humidity		5°C~40°C, <80%
Maximum Magnetic Stirrer Bar		50mm
Power Consumption		650W
Material	Plate	Ceramic Coated Aluminum
	Body	Powder Coated Aluminum
Dimensions (w x d x h) & Weight		180 x 325 x 110mm, 2.9kg
Packing Size (w x d x h) & Gross Weight		285 x 400 x 170mm, 3.6kg
Power Supply		1 Phase, AC 120V, 60Hz or AC 230V, 50/60 HZ

④ Check before operation

Product structure

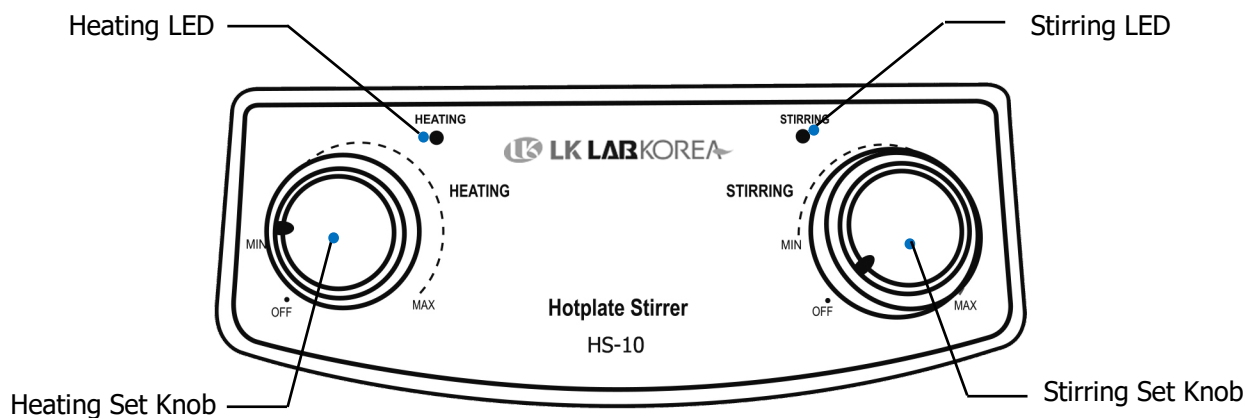


- Power Switch : Equipment power ON/OFF
- Controller : Controlling and checking of the operation.
- Ceramic coated Aluminum top plate : Heating and stirring operation.



- Power Connection : Connection piece of Power cord.
- Specification sticker : Recording the specification and serial number of product.
- Fuse Holder : Fixing the fuse and protection not to expose.

Control panel



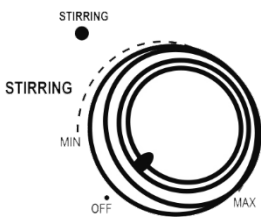
< HS-10 Analog Hotplate Stirrer >

- Heating Set Knob : Control the temperature, on off switching and max. 400°C.
- Heating LED : Lights up when the heating operation.
- Stirring LED : Lights up when the stirring operation.
- Stirring Set Knob : Control the temperature, on off switching and max. about 1500rpm

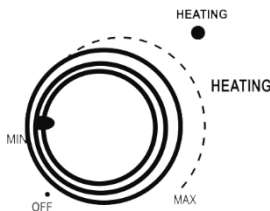
⑤ OPERATION

- Confirm whether the power cable is normally connected or not.
- Press the power switch which is positioned at the right side of the product

Stirring Operation

Controller	How to operate
	1. Turning the Stirring speed control knob to clockwise, STIRRING Lamp is lighting during the stirring operation starts. 2. The more turning the stirring speed control knob to "MAX" direction, the stirring speed is rise and the maximum stirring is 1,500rpm. 3. Turning the stirring speed control knob to "OFF" direction, Stop the stirring operation and STIRRING Lamp is turn off.

Heating Operation

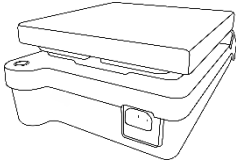
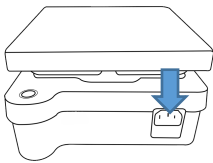
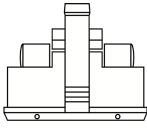
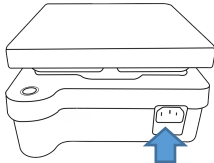
Controller	How to operate
	1. Turning the temperature control knob to clockwise, HEATING Lamp is lighting during the heating operation starts. 2. The more turning the temperature control knob to "MAX" direction, the temperature is rise and the maximum heating temperature is 400 °C. 3. Turning the temperature control knob to "OFF" direction, Stop the heating operation and HEATING Lamp is turn off.

⑥ Product management

Regular inspection

Classifications	A period of checking time		
	Day	Week	Month
Connection state of the source of electric power	√		
Damage of power cable	√		
Cleaning state of power cable	√		
Accessory assembly status	√		
Cleaning state of the Controller	√		
Cleaning state of the body		√	
Shape preservation of rubber foot		√	
Cleaning state in top plate		√	
Normal Control of Operation Mode		√	
Normal Control of Adjusting Knob		√	
Damage state of fuse			√

How to replace the fuse

			
Separate the power cable in the back side of the product, and identify the fuse holder.	Separate the holder from the body using “—” driver.	Identify the fuse and replace it.	Separate the power cable in the back side of the product, and identify the fuse holder.

Cleaning and storage

● Cleaning of the product

Maintain the cleaning state of the product by regular cleaning. The regular maintenance of the product extends the use period of the product and minimizes the contamination of specimen.

1. Confirm whether or not any foreign matters exist, and if yes, immediately wipe off them.
2. Do not use abrasive or detergent based on solvent.
3. If a chemical substance stains the product, wear gloves and a mask which are composed of chemical resistance material and wipe off them with a piece of dry cloth.
4. When cleaning the product, you must separate the power cord from the body.
5. For the part from which the contaminant is not easily erased, wipe off only the part with the towel wetting with the solvent that has low freezing point.
6. Keep the ceramic upper plate clean. And clean the ceramic upper plate by using non-abrasive cleaner.
7. If the materials wetted by liquid or water are entered into this product, please immediately disconnect the power of the product and stop its using.
8. Please use the stirring bar with the suitable size and shape in order to provide optimum performance.
9. Do not use the container made of metal. Metals may or potentially trigger abnormal heating of the product. Metals may also damage the ceramic upper plate.

● Disposal of the product



- When the warranty period of the product is terminated, it should be disposed in accordance with the management regulation of wastes of the corresponding territory.

● Storage of the product

1. If the product is not used for long time, separate the power socket from the body, wrap and store it.
2. Store them in the same place not to lose the components.

⑦ Troubleshooting

Error identification

Problem	Corrective Action
If the agitation does not operate.	Check the current setting value of RPM. 1. Check the power switch.
If the temperature does not rise at room temperature.	Check the temperature currently set. 1. Make sure that the power switch is in ON position.

⑧ Accessory

Component	Information
	Stainless steel Stand Rod, Ø10 x L450mm
	Holder + Clamp + Clip

■ Free warranty service

If any malfunction due to the flaw of the product occurs within 2 years from the purchasing date, the product is free repaired or replaced it with the same kind product after inquiring our head office

■ Onerous service

- In case after a lapse of warranty service period of 2 years. In case the product is arbitrarily remodeled or repaired.
- In case the malfunction by natural disaster. (fire, damage of sea water, gas disaster, flood damage and so on).
- In case the malfunction occurs by not observing the safety caution and warning described in the user manual.
- In case the malfunction occurs by the handling carelessness of the user.

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