





## HotPlate Magnetic Stirrer

Thank you very much for Choosing Biolab products. Please read the "Operating Instructions" and "Warranty" before operating this unit to assure proper operation.

## Index

1.	Safety Instruction and Installation	.03
2.	User Instruction	.06
3.	Troubleshooting and Maintenance	.13
4.	Warranty	.14



# 01 Safety Instructions and Installation

#### 1.1 Safety Instructions

<ul><li>Warning!</li><li>Read the operating instructions carefully before use.</li><li>Ensure that only trained staff works with the instrument.</li></ul>
<ul> <li>Risk of burn!</li> <li>Caution when touch the housing parts and the hotplate which can reach temperature of 340°C.</li> <li>Pay attention to the residual heat after switching off.</li> </ul>
<ul> <li>Protective ground contact!</li> <li>Make sure that the electrical socket is grounded (protective ground contact) before use.</li> </ul>

a. When operating wear personal safety protection to avoid the risk from:

- Splashing and evaporation of liquids
- Release of toxic or combustible gases

b. Use the instrument in a spacious area on a stable, clean, non-slip, dry and fireproof surface. Do not operate the instrument in explosive atmospheres, with hazardous substances or around water.

- c. Gradually increase the speed, reduce the speed if:
  - Stirring bar breaks away due to high speed
  - The instrument is not running smoothly, or the container is not centered on the plate.
- d. Temperature must always be set to at least 50°C lower than the flash point of the media used.
- e. Be aware of hazards due to:
  - Flammable materials or media with a low boiling temperature
  - Overfilling of media
  - Unsafe container
- f. Process pathogenic materials only in closed vessels.

g. If the case of the stirrer bar is PTFE, please note:

- Elemental fluorine, three fluoride and alkali metals will corrode the PTFE and Halogen alkalies make it expand at room temperature

- Molten alkali, alkaline earth metals or their solution, as well as the powder in second and third ethnic of the Periodic Table of Elements will have chemical reaction with PTFE when temperature reaches 300 ~ 400°C.

h. Check the instrument and accessories prior to each use. Do not use damaged components. Safe operation is only guaranteed with the accessories listed in the "Accessories" section. Accessories must be securely attached to the device and must be removed when not in use. Always disconnect the power before fitting accessories.

i. When using the external temperature sensor, the tip of the measuring sensor must be at least 5-10mm from vessel's bottom and wall.

j. The instrument can only be fully disconnected from the main power supply by turning off the main or disconnecting the plug.

k. The voltage stated on the label must correspond to the main power supply.

I. Ensure that the main power supply cable does not touch the hotplate. Do not cover the device.

m. The instrument must only be operated by adults.

n. Keep away from high magnetic fields.

#### 1.2 Proper Use

The instrument is designed for mixing and/or heating liquids in laboratories:

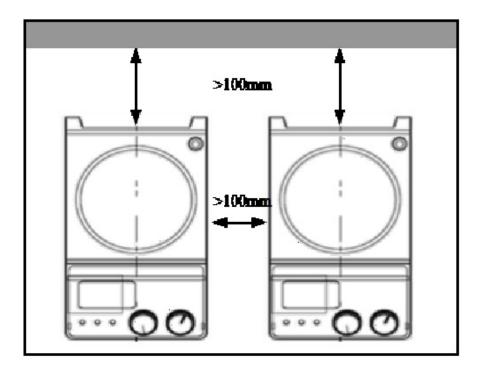
• Do not use more than 2000 meters above sea level

Temperature between 0°C and 40°C

• Installation Type: Product is designed to connect the indoor outlet, where voltage fluctuation is not more than  $\pm 10\%$  compared with normal.

• Observe the minimum distances between multiple units, and distances to the rear wall and above the assembly (min. 100 mm).







This device is not suitable for using in residential areas or other constraints mentioned in 1.1.

#### 1.3 Inspection

1.3.1 Receiving Inspection

Unpack the equipment carefully and check for any damage which may have arisen during transport. Please contact manufacturer/supplier for technical support.

Note: If there is any apparent damage to the unit, do not attempt to operate.

#### 1.3.2 Listing of Items

Item	Quantity
Main unit	1
Power cable	1
Stirrer bar	1
User manual	1

5

# 02 User Instruction

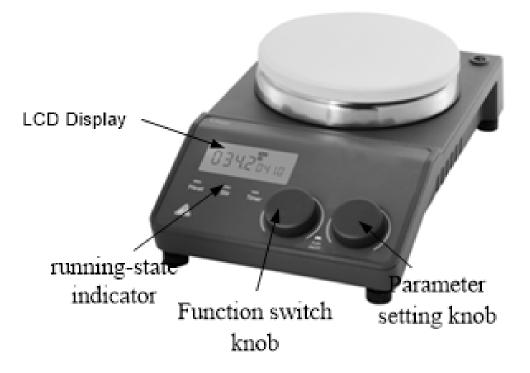
#### 2.1 Functions

2.1.1 Technical Parameters

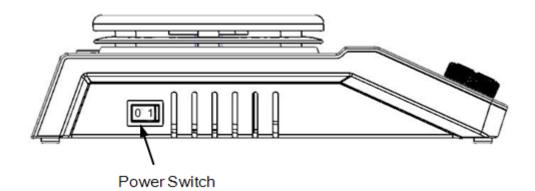
Capacity	20 L
Stirring Positions	1
Speed Range	100-1500 rpm
Temperature	RT-340°C
Permissible Ambient Temperature	5-40°C
Temperature Increment	1°C
Control Accuracy of Work Plate	±1(<100°C), ±1%(>100°C)
Temperature Accuracy	±0.1°C
Safety Temperature	360°C
Control Accuracy with Sensor PT1000	±0.2°C
Permissible Relative Humidity	0.8
Heating Warning	50°C
Timing Range	1 min to 99h 59min
Motor rating Input [W]	18
Motor rating output [W]	10
Heating Output	500 W
Work Plate Size	135 mm
Stirrer Dimension	80 mm
Platform Material	Stainless steel with ceramic coating
Speed Display	LCD
Speed Display Resolution	±1 rpm
Temperature Display	LCD
Remote Control (RS232 interface)	Yes
Motor Type	Brushless DC motor
Protection Class	IP42
Overall Dimension	160Wx280Dx85H mm
Weight	2.8 kg
Power	550 W
Power Supply	100-120V/200-240V, 50/60Hz

6

2.1.2 Control



Picture 2

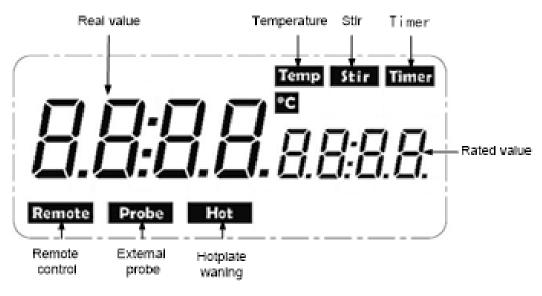


Picture 3



	Items	Descriptions
	Function switch knob	Turning the knob, switches the parameters setting interface, followed by Temperature setting, Speed setting, Timer setting, switching cycle. Pressing the knob turns the three setting options on/off.
LCD digital Hotplate	Parameter setting knob	At the parameter setting interface, set the parameter by turning the knob. Pressing the knob turns on the initializer.
Timer Magnetic Stirrer	LCD display	LCD displays the real-time working state and all settings.
Surrer	Heating knob Heat	When the heating function is switched ON, the LED Heat is lit.
	Stirring knob Stir	When the stirring function is switched ON, the LED Stir is lit.
	Timer knob timer	When the timer function is switched ON, the LED Timer is lit.
	Power switch	Switch ON or OFF.

#### 2.1.3 Display



Picture 4

Characters	Descriptions
Temp & °C	Displays temperature when the heating function is switched ON.
Stir	Displays stirring speed when the stirring function is switched ON.
Hot	Displays HOT warning if the plate temperature is above 50°C after switching OFF the heating function.
Timer	Timer parameter when the timer function is switched ON.
Probe	Display when using external probe.
Remote	Display when using remote control.
Rated value/Real value	Display values in when heating or stirring or timer function is switched ON.

**Note:** If both heating and stirring functions have been started at the same time, heat display always has higher priority. If in this case speed is changed via the stirring knob, it displays stirring speed and reverts to temperature after 5 seconds.

#### 2.2 Trial Running

Make sure the required operated voltage and power supply voltage match.

Ensure the socket is properly grounded.

Plug in the power cable, ensure the power is on and begin initializing.

Add the medium into the vessel with an appropriate stirring bar.

Place vessel on the work plate.

Set the target stirring speed and begin.

Observe the stirring bar and LCD display.

Set the target temperature and start heating.

Observe the real temperature on LCD display.

Set the timer.

Timer ends, the heating function stops.

Stops stirrer function.

If these operations above are normal, the device is ready to operate. If these operations are not normal, the device may be damaged during transportation, please contact manufacturer/supplier for technical support.

### Warning !

#### Do not remove the vessel when the instrument is operating.

#### 2.3 Function

#### 2.3.1 Heating

The device is controlled by digital temperature control technology, which has two separate safety circuits. The hotplate is kept at a constant temperature by a digital control circuit. The hotplate temperature can also be controlled from a separate, adjustable safety circuit. The two temperature sensors (PT1000) internal for temperature control are built into the hotplate. The single external PT1000 can control the temperature of sample.

- Plug in the external PT1000.
- Set the temperature via rotating the temperature control knob slowly to the target value, press parameter set knob and switch on the heating function.
- When the heating function is switched on, the LED "Heat" will light up and the LCD will display the actual temperature.
- The set temperature will be displayed on the right-hand side of the LCD as well as Temp and °C characters.
- The heating function is switched on or off by pushing heating knob.

Instrument is turned on for the setting zone temperature setting when the last shutdown temperature, the common case, set the heating temperature display the actual temperature may have the following differences:

- Hotplate center and outer edge.
- The sample container and the container.

In order to ensure the accuracy of the liquid temperature inside the container, please use the PT1000 external temperature sensor.



1) Working with the PT1000 external temperature sensor



Picture 5

The PT1000 external temperature sensor is the manufacturer's optional accessory. If the sensor is plugged in, "Probe" will be shown on the digital display to indicate the sensor is operating. The setting value of external temperature sensors and actual temperature are displayed. The safety circuit controls hotplate temperature.

Comparing with the temperature control of the hotplate, the external temperature sensor can control the medium's temperature more precisely. The external temperature sensor must be put in sample container, if detect anomalies, heating will automatically shut down. Please do the following at this time:

- Turn off the power
- Ensure the external temperature sensor is positioned sample container correctly
- Turn on the power, set the target temperature and switch on the heating function
- If the unit is still not functioning correctly, please contact manufacturer/supplier

#### 2) Residual heat warning (HOT)

In order to help prevent the risk of burns from the hotplate, this instrument has a residual heat warning function. When the heating function is switched off (and the power cord is still plugged in) and the heating plate temperature is still above 50°C, "Hot" will flash to warn that it is unsafe to touch.. When the hotplate temperature drops to below 50°C, the display will automatically switch off. To completely turn off the unit, pull out the plug. When the plug is pulled out, the residual heat warning function will not function.

#### 2.3.2 Stirring

The "stirring" function is switched on or off via rotating stirring knob. The speed is set on the knob (100 to 1500 rpm in steps of 10 rpm). When both the heating function and stirring are switched on and the above operations are completed, the LCD will shift to the speed value and revert back to the temperature value in about 5 seconds.

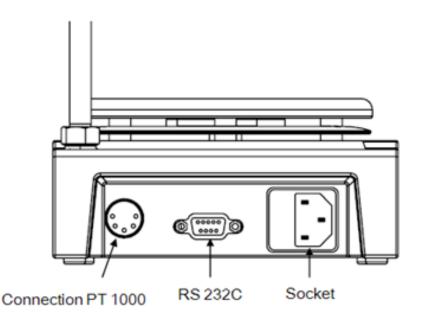
The last speed value set is displayed.

#### 2.3.3 Timer

Turn the Function switch knob to time set interface, turn the parameter set knob to target time, press parameter set knob, to switch on timer function.

Attention: The heating and stirring function can be switched on at the same time only when setting the timer function. Otherwise, only the stirring function can be switched on.

#### 2.3.4 Remote Control



#### Picture 6

The unit can be controlled from an external PC (using the third-party software) via the RS232C serial interface fitted to the unit. Data communication from laboratory instrument to computer is only possible on demand of the computer.

The functions of the interface lines between laboratory instrument and automation system are selected from the specified signals of the EIA-standard RS232C, corresponding with DIN66020 Part 1. The allotment of the bushing can be taken from Picture 6.

Transmission method: Asynchronous signal transmission in start-stop-operation.

Mode of transmission: Fully Duplex. 1 start bit; 7 character bits; 1 parity bit [straight (even)); 1 stop bit.

Transmission speed: 9600 bit/s.

Note: Forbid to insert or remove the RS232C communication line when switch on!

## 03 Troubleshooting and Maintenance

#### 3.1 Faults

1) Instruments can't be powered ON

Check whether the power line is unplugged

Check whether the fuse is broken or loose

2) Fault in power during self-test

Switch OFF the unit, then switch ON and reset the instruments to factory default setting.

3) Stir speed cannot reach set point

Excessive medium viscosity may cause abnormal speed reduction of the motor

4) Unit cannot be powered off when switched off.

Check if the residual heat warning function is still ON and hotplate temperature is above 50<sup>II</sup> (the LCD still work and "Hot" flash).

If these faults are not resolved, please contact us.

#### 3.2 Maintenance and Cleaning

Please keep the instrument dry and clean, quickly remove and overflowing liquid, use non-abrasive cleaner to clean up the outer surface, please do not connect with the power supply if wet. If wet solids or liquid enter into the instrument, please disconnect the power supply and do not use, contact the supplier for more advice.

Do not use a spray cleanser on the instrument when cleaning.

Unplug the power cord when cleaning.

Only use recommended cleansers:

Dyes	Isopropyl alcohol
Construction materials	Water containing surfactant / Isopropyl alcohol
Cosmetics	Water containing surfactant / Isopropyl alcohol
Foodstuffs	Water containing surfactant
Fuels	Water containing surfactant

Before using other method for cleaning or decontamination, the user must ascertain with the manufacturer that this method will not harm the instrument. Wear the proper protective gloves during cleaning of the instrument.

### Note:

a. Electronic equipment cannot cleaned with a detergent cleaner

b. Repairing equipment must be cleaned and avoid the contamination of dangerous substances, put the equipment into original package box and returned.

c. When the equipment hasn't been used for long time, please leave it in power-off condition at dry, clean, room temperature, stable environment.

# 04 Warranty

1) Warranty is 12 months from EX-factory date (excluding consumable accessories).

2) We will take no responsibility for risks caused by improper operation and man-made damages.

3) After the expiration of warranty, our company is also responsible for repairs, but the corresponding maintenance cost should be charged.

4) We can provide equipment drawings and necessary technical data for maintenance companies or personnel trained by our company.







**BIOLAB SCIENTIFIC LIMITED** 3660 Midland Avenue, Suite 300, Toronto, Ontario M1V 0B8, Canada



