

Operation Manual



BHTL-101

Hotplate

Index

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Preface

Thank you for purchasing our hotplate magnetic stirrer. Please read the entire instruction manual before operating the Hotplate, Stirrer, and be aware of all the cautions while using this instrument.

Service

You can always contact our service department for technical support. Whenever it is necessary in the following ways:

Please provide the customer care representative with the following information :



- Serial number (on the rear panel)
- Certification
- Description of problem (i.e., hardware or software)
- Methods and procedures adopted to resolve the problems
- Your contact information

Unpacking

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

Note: If there is any apparent damage to the system, please do not plug it into the main power line.

| Item | Qty |
|-------------|-----|
| Main unit | 1 |
| Power cable | 1 |
| User Manual | 1 |

| Symbol | Additional Description |
|---|---|
|  | <p>Warning!</p> <p>Please check the instrument working condition before use.</p> <p>Ensure that every user is aware of the instrument operation.</p> <p>Operate the instrument according to the instructions provided in this user manual.</p> |
|  | <p>Caution!</p> <p>Do not touch the work plate or housing parts during operation as the work plate temperature can reach up to 380°C during operation</p> |

| | |
|---|---|
| | Keep the instrument away from explosive and flammable materials. |
|  | Protective ground contact ! Make sure that socket is earthed before use(protective from ground contact) |

01 Safety Instructions

- Please check whether the instrument's working condition as soon as you receive it.
- Ensure that label indicated the correct voltage before connecting the instrument to power supply
- Do not operate the unit with a damaged power cord
- Set-up and install the magnetic stirrer on a stable and temperature resistant surface
- Ensure good working environment free of explosive, hazardous and inflammable substances or water.
- Ensure that the main power supply cable does not touch the hotplate.
- Keep the magnetic Stirrer away from the effects of high magnetic field.
- Do not cover the instrument and do not splash water on the components
- When working wear personal safety guards to avoid the risk of splashing and evaporation of liquids, release of toxic or combustible gases.
- Heating temperature must be set to at least 50 °C lower than the fire point of the chemicals used.
- Pathogenic materials processing must be done in closed vessels only.
- Ensure that the tip of the external temperature sensor is at least 5-10 mm away from the bottom of the vessel.
- Always disconnect the main power supply after use.
- Make sure of the instrument and its accessories working condition every time before it's operation.
- Please use the accessories described in the "Accessories" chapter and running as the user manual to guarantee the safe operation. Accessories must be securely attached to the instrument and cannot come off by themselves.
- The manufacturer does not accept responsibility for any mishandling of the instrument and for any potential risk taken by the user.
- Do not use this instrument in an explosive environment; This instrument has no explosion-proof function.

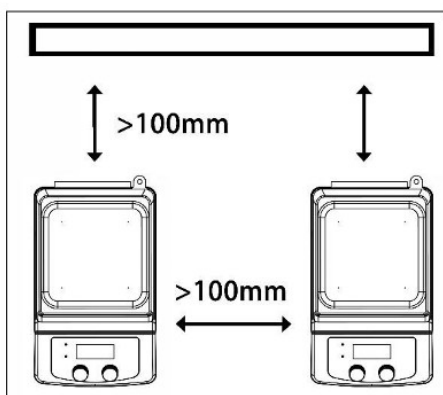
02 Specifications

2.1. Proper use

The instrument is designed for mixing and heating applications.

- The altitude can't exceed 2000 meters.
- Environmental temperature between 10 °C to 40 °C.
- Installation type: the product is to connect the indoor outlet.
- Voltage fluctuation is not more than $\pm 10\%$
- The distance from the other equipment's and the wall should be more than 100 mm.

This instrument is not suitable for using in residential areas or other constraints mentioned in Chapter 1

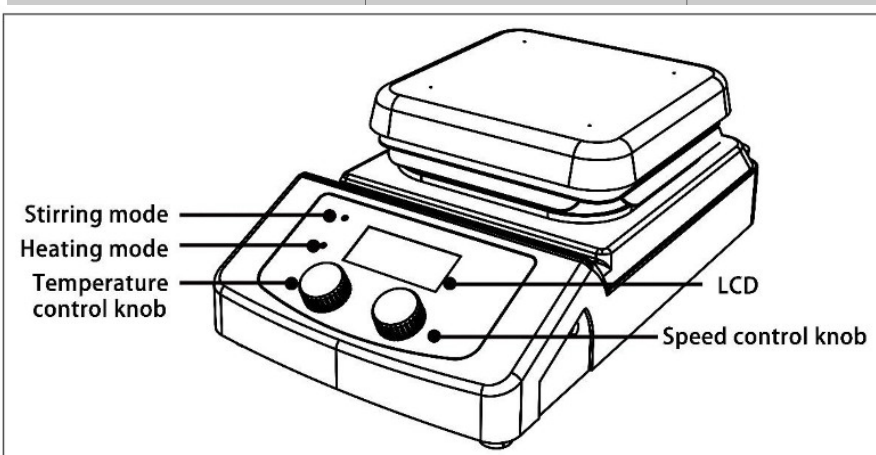


2.2 Technical Parameters

Table 2.2

| | | | |
|---|--|---|----------------------------------|
| Items | LCD Digital Hotplate Magnetic Stirrer | LCD Digital 6' Square Magnetic Stirrer | LCD Digital Hotplate |
| Work plate dimension | 140x140mm | 140x140mm | 140x140mm |
| Plate material | Aluminum with ceramic coating | Aluminum with ceramic coating | Aluminum with Ceramic coating |
| Motor type | Brushless DC motor | Brushless DC motor | \ |
| Motor rating input[W] | 2.4 | 2.4 | \ |
| Motor rating output[W] | 1.8 | 1.8 | \ |
| Power[W] | 510 | 10 | 510 |
| Heating Power[W] | 500 | \ | 500 |
| Voltage | 100-120/60Hz 200-240V/50Hz | 100-240V 50/60Hz | 100-120/60Hz 200-240/50Hz |
| Stirring positions | 1 | 1 | \ |
| Max. stirring quantity(H ₂ O) [L] | 5 | 5 | \ |
| Max. magnetic bar[mm] | 50 | 50 | \ |
| Speed range[rpm] | 200-1500 | 200-1500 | \ |
| Speed display | LCD | LCD | \ |

| | | | |
|----------------------------------|------------------------------|-------------|------------------------------|
| Temperature | LCD | \ | LCD |
| display | | | |
| Control accuracy of sensor[rpm] | ±20rpm | ±20rpm | \ |
| Temperature range[°C] | Room temperature +5 - 380 | \ | Room temperature +5 - 380 |
| Over temperature protection[°C] | 420 | \ | 420 |
| Temperature display accuracy[°C] | ±0.2 | \ | ±0.2 |
| External temp. sensor | PT1000 Accuracy ±0.5°C | \ | PT1000 Accuracy ±0.5°C |
| IP Protection class | IP21 | IP21 | IP21 |
| Dimensions[WxDxH][mm] | 320*180*108 | 320*180*108 | 320*180*108 |
| Weight[kg] | 2.2 | 2.2 | 2.2 |
| Permissible ambient | | | 5-40 |
| | | | 80%RH |



2.3 Structure

Figure 2.3.1 Hotplate magnetic stirrer

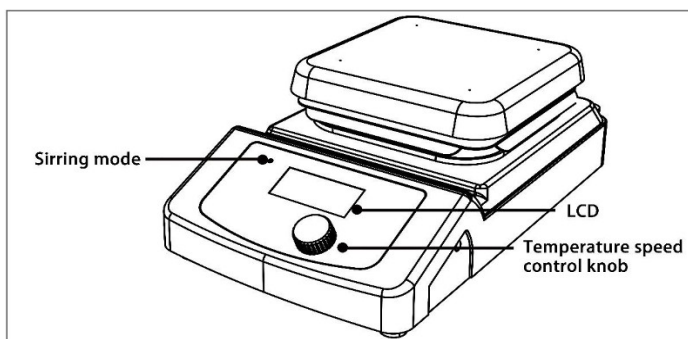


Figure 2.3.2 Magnetic stirrer/hotplate

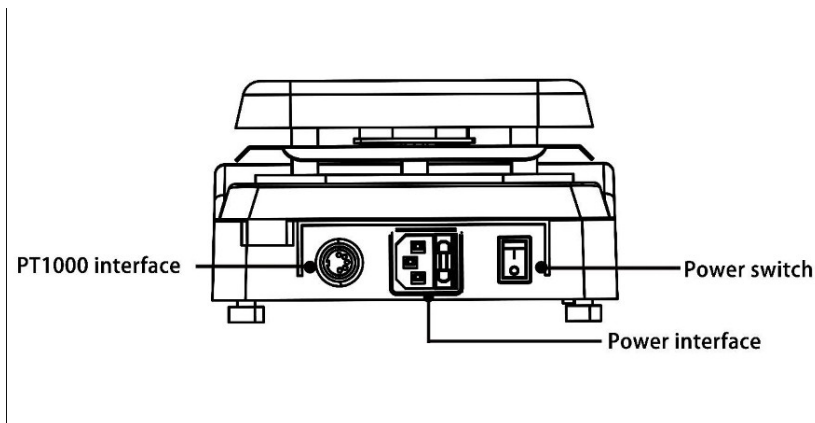


Figure 2.3.3

2.4. Control Display

2.4.1. Control

Table 2.4.1

| | Item | Description |
|----------------------------------|---|---|
| Hotplate magnetic stirrer | Temperature control knob Heat | Set the temperature by rotating the temp. control knob slowly to desired setting and confirm it by pushing the temp. control knob. |
| | Speed control knob Stir | Set the target speed by rotating the speed control knob slowly to desired setting and confirm it by pushing the speed control knob. |
| | LCD | LCD displays the actual and set values of temperature and speed. |
| | PT1000 Indicator | Plug PT1000, display shows " Probe " is on |
| | Power Switch | Switch ON or OFF the instrument. |

| | | |
|-------------------------|-----------------------------------|---|
| Magnetic stirrer | Speed control knob Stir | Set the target speed by rotating the speed control knob slowly to desired setting and confirm it by pushing the speed control knob. |
| | LCD | LCD displays the actual and set values of temperature and speed. |
| | Power Switch | Switch ON or OFF the instrument. |
| | Temperature | Set the temperature by rotating the temp. |

| | | |
|-----------------|-----------------------------|--|
| Hotplate | control knob Heat | control knob slowly to desired setting and confirm it by pushing the temp. control knob. |
| | LCD | LCD displays the actual and set values of temperature and speed. |
| | Power Switch | Switch ON or OFF the instrument. |

2.4.2. Display

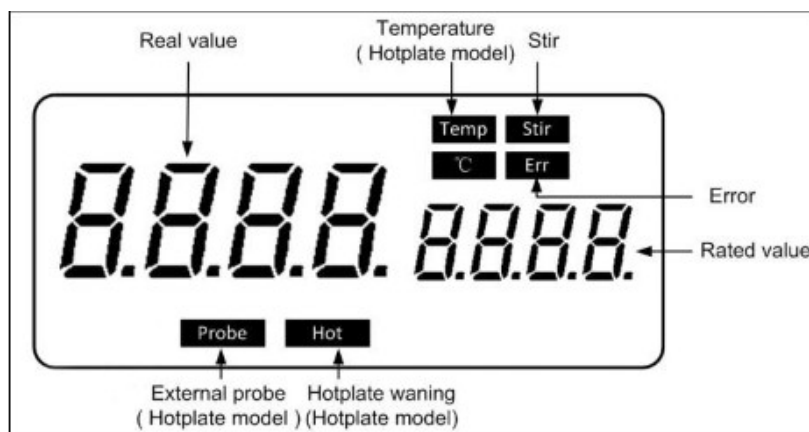


Table 2.4.2

| Display | Descriptions |
|----------------------|--|
| Temp & °C | Displays set/actual 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 heating plate temperature is above 50°C even after switching OFF the heating function. |
| Probe | Displays when external probe is connected. |

| | |
|------------------|---|
| Err | Displayed in case if any error occurs. |
| Set/Actual value | Displays set/actual values in case heating or stirring function is switched ON. |

03 Operation Instructions

- Ensure that the label indicated the correct voltage before connecting the instrument to power supply
- 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(hotplate stirrer/stirrer)
- Place the vessel on the work plate.
- Set the target stirring speed and begin (hotplate stirrer/stirrer).
- Observe the stirring bar and LCD display (hotplate stirrer/stirrer).
- Set the target temperature and start heating (hotplate stirrer/hotplate).
- Observe the actual temperature on LCD display (hotplate stirrer/hotplate).
- Stop heating (hotplate stirrer/hotplate) and stirring functions(hotplate stirrer/stirrer).

If the above operations are normal, the instrument is ready to operate. If there is any problem during above operations, then instrument may be damaged during transportation, please contact manufacturer/supplier for technical support.



Warning!

Forbid to transfer the vessel when the instrument working.

04 Function

4.1. Heating (hotplate stirrer/hotplate)

The instrument 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 monitored from a separate, adjustable safety circuit. The two temperature sensors PT1000 internal builds temperature control into the hotplate and PT1000 external can monitor the temperature of sample.

Set the target temperature and start heating:

- Set the temperature by rotating the temperature control knob slowly to desired setting.
- The set value is confirmed and heating is switched ON by pushing the temp.

Control knob.

- The LED displays the temperature value on the left-hand side during heating.
- The heating function is switched OFF by pushing the same temperature control knob again.
- The last set temperature is displayed once the instrument is shutdown and restarted.

4.1.1 EXTERNAL SENSOR INSTALLATION

- The external temperature sensor PT1000 is the manufacturer's standard accessory
- Install the sensor support on the instrument.
- Connect the external sensor in the port provided at the back of the unit.
- If the sensor is plugged in, "Probe" will be shown on the digital display indicating the sensor operation.
- Fix sensor on the support and adjust its position.
- Put the External sensor probe into the vessel on the hotplate.
- If any abnormal situation is detected, the heating mode will automatically shut down. Then please do the following:
 - Turn off the power supply,
 - Ensure the external temperature controller stay in the heating samples
 - Open the power supply, to set the target temperature and heating function If the instrument cannot work again, please contact the manufacturers/suppliers.

4.2. Stirring (hotplate stirrer/stirrer)

Instrument adopts closed loop control motor, motor drive mechanism to the permanent magnets, and can set the motor speed through speed control knob

- Set the target stirring speed and start stirring:
- Set the target speed by rotating the speed control knob slowly to desired setting.
- The set value is confirmed and stirring is switched ON by pushing the stirring control knob.
- The LED displays the target speed value on the right-hand side during stirring.
- The stirring function is switched OFF by pushing the same stirring control knob again.

When both heating and stirring are switched ON and those above operations are done, the LCD will shift to the speed value and come back to the temperature value in about 5 seconds.

05 Maintenance and Cleaning

Proper maintenance can keep instruments working properly and lengthen its lifetime.

- Please keep the instrument in dry and clean surface.
- Please do not connect the power supply before the surface dry.

- If the instrument is wet then any solid or liquid particles might have got into the instrument, please disconnect the power supply quickly and contact the manufacturer/supplier for more advice.
- Do not spray cleanser into the instrument when cleaning.
- Unplug the power line before cleaning. Please use the recommended cleansers.

| | |
|-------------------------------|---|
| Dyes | Isopropyl alcohol |
| Construction materials | Water containing tenside /Isopropyl alcohol |
| Cosmetics | Water containing tenside /Isopropyl alcohol |
| Foodstuffs | Water containing tenside |
| Fuels | Water containing tenside |

- 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.
- Before sending the instrument for repair, it must be cleaned to avoid the pollution of hazardous substances. Please send back with the original packaging.
- If the product is not in use for long time, please store it in a dry, clean, stable and room temperature environment.
- For machine maintenance details, please refer to “product service manual”.

Warning ! Switch OFF the instrument before maintenance and cleaning.

06 Faults

The instrument adopts the advanced production technology and testing methods. Each unit had been tested thoroughly before dispatch, with good reliability.

The common errors generally occur due to improper operation.

| Errors | Problem | Process |
|--|---|---|
| Not functioning in switch ON mode | The power cord connection is unreliable | Ensure the power cord is connected well |
| | Power supply insurance tube damage or loose | Check if the tube is damaged or loose |

| | | |
|-------------|--|---|
| ERR4 | The sensor circuit error | Check the sensor |
| ERR5 | Temperature exceeds hardware protection | Sensor fault or heating element circuit short |
| ERR6 | The instrument does not work when switched ON or the temperature rises above 30 degrees in 15s | Uncontrolled thyristor short circuit |
| ERR7 | When switched ON temperature rises less than 10 degrees in 15s | Heating circuit breakers or sensor failure |
| ERR8 | When switched on motor speed is not detected | Motor does not run or speed sensor failure |

If the error occurred cannot be handled, please contact the local dealers or can contact us directly.

Spare Parts

| Description | Specification |
|---|---|
| PT1000-A The external temperature probe | Length 230 mm |
| PT1000-B Glass external temperature probe | PT1000-B Glass external temperature probe for LCD hotplate magnetic stirrer, length 230mm |
| Temperature probe support components | Fit for PT1000 |
| Round bottom flask heating | 50 ml |
| | 100 ml |

| | |
|---|--------------------|
| block | 250 ml |
| | 500 ml |
| Magnetic stirrer bar, To be used below 150 °C | 10 mm x 6 mm |
| | 15/20/25 mm x 8 mm |
| | 30 mm x 6 mm |
| | 40/51 mm x 8 mm |
| Stirrer bar remover | 200 mm |

Certificate

This product conforms in accordance to ISO 9001 standards, and other international standards organizations.

EN 61010-1
 UL 61010-1
 CAN/CSA C22.2No.61010-1 EN 61010-2-010
 EN 61326-1

EMC standard : 2014/30/EU
 LVD standard : 2014/35/EU

Warranty policy

- All products are supplied with a warranty of 12 Months for Liquid handling range and 24 Months for instruments range from the date of shipment.
 - This instrument is warranted to be free from defects in material and workmanship and it must be operated in accordance with our operating guidelines, serviced and maintained on a regular basis in accordance with the terms specified in the relevant user manual.
 - Warranty shall not apply to any product or parts which have been damaged due to mishandling or improper installation or abnormal conditions of operation.
 - Although great care is used when packaging items for shipment, the manufacturer cannot accept liability for transportation of goods from the manufacturer and transit damage is not covered by warranty
 - Only approved spare parts should be used in the instrument and these should be changed on a regular basis as specified in the relevant user manual. Details of the approved spare parts and accessories for each system are shown in the user manual or alternatively this information can be obtained from the manufacturer.
- For claims under the warranty please contact your local supplier. You may also send the instrument directly to manufacturer, enclosing the invoice copy and giving reasons for the claim. Manufacturer will not be liable for freight costs.



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