# Operation Manual

**BHMS-103**

# HotPlate Magnetic Stirrer

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

# Index

**Preface**

Welcome to the 7' Square Hotplate Magnetic Stirrer". Users should read this Manual carefully, follow the instructions and procedures, and be aware of all the cautions when using this instrument.

**Service**

When help needed, you can always contact the Service Department of manufacturer for technical support.

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

**Warranty**

This instrument is warranted to be free from defects in materials and workmanship under normal use and service, for a period of 24 months from the date of invoice. The warranty is extended only to the original purchaser. It shall not apply to any product or parts which have been damaged on account of improper installation, improper connections, misuse, accident or abnormal conditions of operation.

For claims under the warranty please contact your local supplier. You may also send the instrument directly to manufacturer, enclosing the invoice copy and by giving reasons for the claim.

# 01 Safety Instructions

| | |
|---|---|
|  | Warning!<br>• Read the operating instructions carefully before use.<br>• Ensure that only trained staff works with the instrument. |
|  | Risk of burn!<br>• Caution when touch the housing parts and the hotplate which can reach temperature of 550℃.<br>• Pay attention to the residual heat after switching off. |
|  | Protective ground contact!<br>• Make sure that socket must be grounded (protective ground contact) before use. |

•When working wear personal safety guards to avoidthe risk from:
-Splashing and evaporation of liquids
-Release of toxic or combustible gases
•Set up the instrument in a spacious are on a stable,clean, non-slip, dry and fireproof surface. Do not operate the instrument in explosive atmospheres, with hazardous substances or under water.
•Gradually increase the speed, reduce the speedif:
-Stirring bar breaks away due to high speed
-The instrument is not running smoothly, orcontainer moves on the base plate
•Temperature must always be set to at least 50℃lower
than the fire point of the media used.
•Be aware of hazards dueto:
-Flammable materials or media with a lowboiling temperature
-Overfilling of media
-Unsafe container
•Process pathogenic materials only in closedvessels.
•Check the instrument and accessories prior to eachuse. Do not use damaged components. Safe operationis only guaranteed with the accessories described in the"Accessories" chapter. Accessories must be securelyattached to the device and can not come off bythemselves. Always disconnect the plug before fittingaccessories.

7” Square Hotplate Magnetic Stirrer
•When the external temperature sensor needed, the tip ofthe measuring sensor must be at least 5-10mm from vessel bottom and wall.
•The instrument can only be disconnected from the main power supply by pulling out the main or the connector plug.
•The voltage stated on the label must correspond to the main power supply.
•Ensure that the main power supply cable does not touch the hotplate. Do not cover the device.
•Forbid to put pressure and over heat media on the surfaceof glass ceramic that can be caused surface broken.
•The instrument may only be opened by experts.
•Keep away from high magnetic field.

# 02 Proper Use

The instrument is designed for mixing and/or heating liquids in schools, laboratories or factories.
•Observe the minimum distances between the devices,between the device and the wall and above the assembly (min. 100 mm)

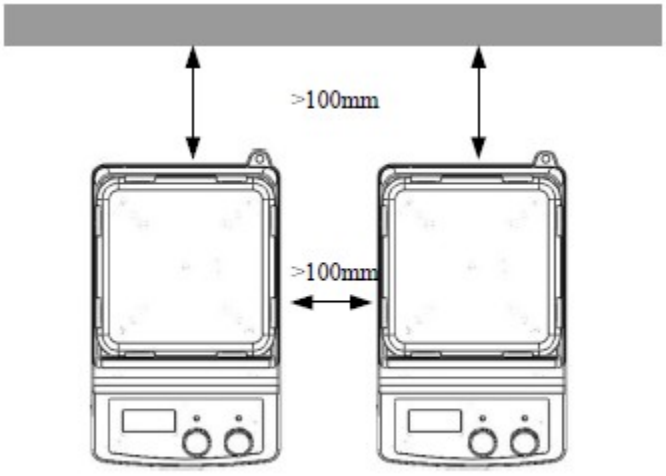



Figure 1

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

# 03 Inspection

3.1 Receiving Inspection

Unpack the equipment 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 power line.

3.2 Listing of Items

The package includes the following items:

| **Items** | **Qty** |
|---|---|
| Main unit | 1 |
| Power cable | 1 |
| User Manual | 1 |

# 04 Control

4.1 Control elements

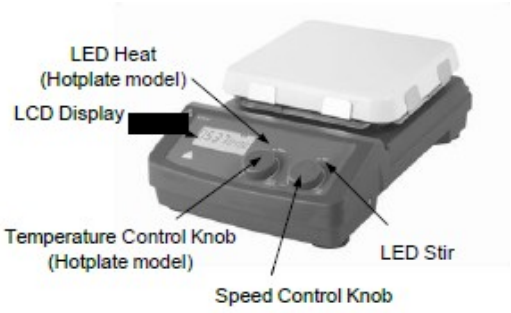



Figure 2 LCD digital model

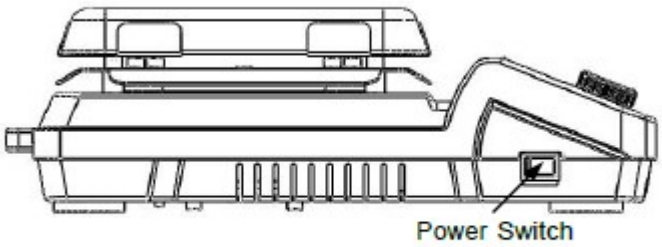



Figure 4

| | Items | Descriptions |
|---|---|---|
| LCD digital model | Speed control knob Stir | Set the rated rotary speed. The stirring function is switched ON or OFF by pushing the knob. |
| | Temperature control knob Heat (Hotplate) | Set the rated temperature. The heating function is switched ON or OFF by pushing the knob. |
| | LCD Display | LCD displays the real working state and all settings. |
| | LED Heat (Hotplate) | When the heating function is switched ON, the LED Heat is lit. |
| | LED Stir | When the stirring function is switched ON, the LED Stir is lit. |
| | Power Switch | Switch ON or OFF the instrument. |
| LED digital model | Speed control knob Stir | The stirring function is switched ON or OFF by rotating the knob. |
| | Temperature control knob Heat (Hotplate) | The heating function is switched ON or OFF by rotating the knob. |
| | LED Display (Hotplate) | If rotate the heating knob, LED displays the temperature setting value and shift to real value in the duration of 5 seconds. |
| | LED Heat (Hotplate) | When the heating function is switched ON, the LED Heat is lit. |
| | LED Stir | When the instrument is switched ON, the LED Stir is lit. |
| | Power Switch | Switch ON or OFF the instrument. |

Table 2

## 4.2 Display

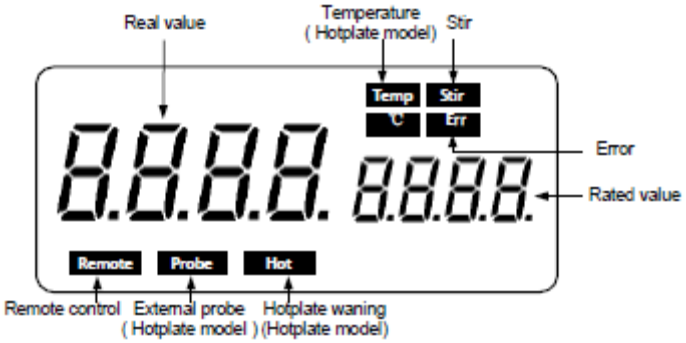



Figure 5 LCD digital model

| Characters | Descriptions |
|---|---|
| Temp and ℃ | Display temperature when the heating function is switched ON. |
| Stir | Display stirring state when the stirring function is switched ON. |
| Hot | Display hot warning if the heating plate temperature is above50℃ after switching OFF the heating function. |
| Probe | Display when using external probe. |

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

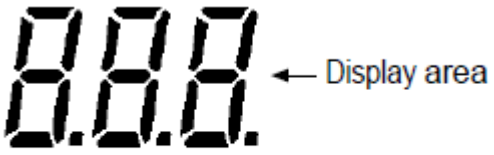


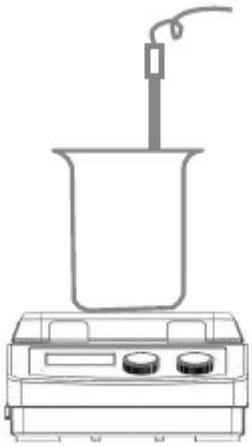

Figure 6 LED digital hotplate model

# 05 Trial Run

Make sure the required operating voltage and power
supply voltage match.
•Ensure the socket must be properly grounded.
•Plug in the power cable · ensure the power is on and begininitializing.
•Add the medium into the vessel with an appropriatestirring bar.
•Place vessel on the work plate.
•Set the target stirring speed and begin.
Display area
to real value in 5 seconds.
When the heating function is switched OFF and the hotplate temperature is still above 50℃,
LED displays HOT, otherwise LED displays 0.
•Set the target temperature and start heating (hotplatemodel).
•Stop the heating and stirring functions.
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 !
Forbid to transfer the vessel when the instrument working

# 06 Working with external temperature sensor



### 6.1 LCD digital hotplate model

The external temperature sensor PT1000 is manufacture's standard accessory. If the sensor is plugged in, "Probe" will be shown on the LCD digital display to indicate the sensor is operating. The setting value of external temperature sensor and actual temperature are displayed. Safe circuit controls hotplate temperature. Comparing with the temperature control of the hotplate, the external temperature sensor can control the medium's temperature more precise. The heating function will be stopped automatically under abnormal conditions. Please operate follow the instructions below:

• Switch OFF the instrument.
• Ensure the external temperature sensor is inserted in the media heated.
• Switch ON the instrument and run heating function.

If the heating function does not work, please contact manufacturer/supplier for technical support.

### 6.2 LED digital hotplate model

The external temperature sensor PT1000 is the manufacture's standard accessory. If the sensor is plugged in and rotate the heating knob, LED displays the temperature setting value and shifts to real value in 5 seconds. Safe circuit controls hotplate temperature. Comparing with the temperature control of the hotplate, the external temperature sensor can control the medium's temperature more precise. The heating function will be stopped automatically under abnormal conditions. Please operate follow the instructions below:

•Switch OFF the instrument.
•Ensure the external temperature sensor is inserted inthe media heated.
•Switch ON the instrument and run heating function.

If the heating function does not work, please contact manufacturer/supplier for technical support.

## 07 Residual heat warning

In order to prevent the risk of burns from the hotplate, digital hotplate model has a residual heat warning function. When the heating function is switched off and the heating plate temperature is still above 50°C, "Hot" will flash to warn that there is a hazard of burns from the hotplate. When the hotplate temperature drops to below 50°C, the unit will automatically switch off. If users want to turn off the LCD or LED screen immediately, just pull out the plug directly. When the power OFF, the residual heat warning function cannot be run.

# 08 Remote Control (LCD Digital model)

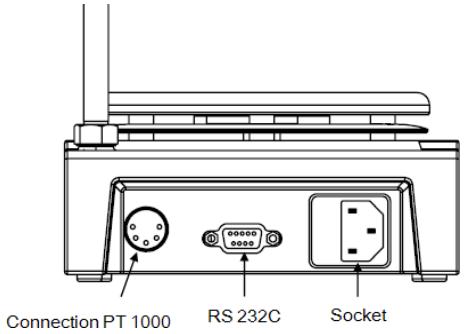



**Figure 8**

The unit can be controlled from an external PC (using the dedicated 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 Figure 8.

- 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
  - Start remote control knob, LCD displays " Remote "

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

# 09 Faults

Instruments can't be power ON
-Check whether the power line is unplugged
-Check whether the fuse is broken or loose

•Fault in power ON self test
-Switch OFF the unit, then switch ON and reset theinstruments to factory default setting.
•Stir speed cannot reach set point
-Excessive medium viscosity may cause abnormalspeed reduction of the motor
•Unit cannot be powered OFF when switched OFF.
-Check if the residual heat warning function is still ON
and hotplate temperature is above 50 ℃ (the
LCD/LED screen still work and “Hot” flash).

# 10 Maintenance and Cleaning

◦ Proper maintenance can keep instruments working properly and lengthen its lifetime.
◦ Do not spray cleanser into the instrument when cleaning.
◦ Unplug the power line when cleaning.
◦ Only use 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 |

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

• Send in the case of service the instrument back in the packaging carton. Storage packing is not sufficient for the back dispatch. Use additionally a suitable transportation packing.
• The enamel makes the hotplate easier to care for and more resistant to acids and bases. Because of it, however, the hotplate is also more susceptible to extreme fluctuations in temperature and the force of impact. This can result in cracks forming or the coating flaking off.

Power OFF when maintenance and cleaning.

# 11 Associated standards and regulations

Construction in accordance with the following safety standards:

EN 61010-1
UL 3101-1
CAN/CSA C22.2(1010-1) EN 61010-2-10

Construction in accordance with the following EMC standards:

EN 61326-1
Associated EU guidelines: EMC-guidelines: 89/336/EWG Instrument guidelines: 73/023/EWG

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

# 12 Specifications

| Items | Specifications | |
|---|---|---|
| | LCD digital model | LED digital model |
| Voltage [VAC] | 100-120/200-240 | |
| Frequency [Hz] | 50/60 | |
| Power [W] | *10<br>50/ | *1030/30 |

| | | |
|---|---|---|
| | 50 | |
| Stirring point position quantity | 1 | 1 |
| Max. stirring quantity ($H_2O$) [l] | 20 | 10 |
| Max. magnetic bar [L×Ø, mm] | 80×10 | |
| Motor type | DC brushless motor | Shaded pole motor |
| Max. power input of motor [W] | 18 | 15 |
| Max. power output of motor [W] | 10 | 1.5 |
| Speed range [rpm] | 100 - 1500 | 0-1500 |
| Rotary speed display | LCD | Scale |
| Plate material | Glass ceramic | |
| Dimensions of workplate (mm) | 184×184 | |
| *Heating power [W] | 1000 | |
| *Temperature range [°C] | RT-550, increment: 1 | RT-550, increment: 5 |

**BIOLAB SCIENTIFIC LTD.**
3660 Midland Avenue, Suite 300, Toronto, Ontario M1V 0B8 Canada
Email: contact@biolabscientific.com  Tel: +1 707 533 1445
Website: www.biolabscientific.com