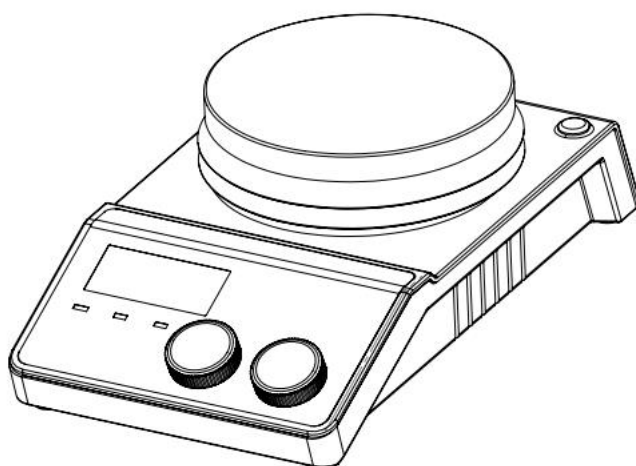


**Digital Hotplate Magnetic Stirrer**  
**Model RSLAB-2C**  
**Code LBD002**  
**User Manual**



July 2024

# CONTENTS

<b>PREFACE .....</b>	<b>3</b>
<b>SERVICE.....</b>	<b>3</b>
<b>WARRANTY .....</b>	<b>3</b>
<b>1. SAFETY INSTRUCTIONS .....</b>	<b>4</b>
<b>2. PROPER USE.....</b>	<b>6</b>
<b>3. INSPECTION.....</b>	<b>6</b>
3.1. RECEIVING INSPECTION.....	6
3.2. LISTING OF ITEMS .....	6
<b>4. CONTROL.....</b>	<b>7</b>
4.1. CONTROL ELEMENTS.....	7
4.2. DISPLAY.....	7
<b>5. TRIAL RUN.....</b>	<b>9</b>
<b>6. FUNCTION: HEATING (LCD DIGITAL HOTPLATE MODEL) .....</b>	<b>9</b>
6.1. WORKING WITH THE EXTERNAL TEMPERATURE SENSOR .....	11
6.2. RESIDUAL HEAT WARNING (HOT) .....	11
<b>7. OTHER .....</b>	<b>11</b>
7.1 STIRRING (LCD DIGITAL MODEL) .....	11
7.2 TIMER FUNCTION .....	11
<b>8. REMOTE CONTROL (LCD DIGITAL MODEL).....</b>	<b>12</b>
<b>9. FAULTS .....</b>	<b>12</b>
<b>10. MAINTENANCE AND CLEANING.....</b>	<b>14</b>
<b>11. ASSOCIATED STANDARDS AND REGULATIONS.....</b>	<b>15</b>
<b>12. SPECIFICATIONS.....</b>	<b>16</b>

## **Preface**

Welcome to choose our products. 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, please contact your distributor.

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 warranty claims please contact your local distributor.

## 1. Safety Instructions

	<b>Warning!</b> <ul style="list-style-type: none"><li>● Read the operating instructions carefully before use.</li><li>● Ensure that only trained staff works with the instrument.</li></ul>
	<b>Risk of burn!</b> <ul style="list-style-type: none"><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>
	<b>Protective ground contact!</b> <ul style="list-style-type: none"><li>● Make sure that socket must be grounded (protective ground contact) before use.</li></ul>

- When operating wear personal safety protection to avoid the risk from:
  - Splashing and evaporation of liquids
  - Release of toxic or combustible gases
- Set up 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.
- 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
- Temperature must always be set to at least 50°C lower than the flash point of the media used.
- Be aware of hazards due to:
  - Flammable materials or media with a low boiling temperature
  - Overfilling of media
  - Unsafe container
- Process pathogenic materials only in closed vessels.
  - If the case of the stirrer bar is PTFE, please note:
    - Elemental fluorine, three fluoride and alkali metals will corrode the PTFE and Halogen alkanes 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.

- 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.
- When the external temperature sensor needed, the tip of the measuring sensor must be at least 5-10 mm from vessel bottom and wall.
- The instrument can only be fully disconnected from the main power supply by turning off the main or disconnecting the 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.
- The instrument must only be operated by adults.
- Keep away from high magnetic fields.
- Do not use this instrument in an explosive environment; This instrument has no explosion-proof function.

## 2. Proper use

The equipment is used in a BASIC ELECTROMAGNETIC ENVIRONMENT.

The instrument is designed for mixing and/or heating liquids in schools, laboratories or factories

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

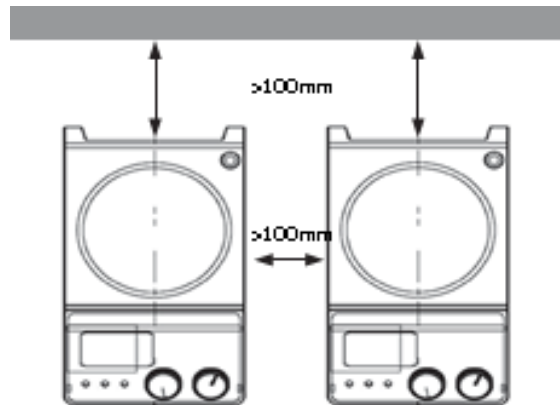


Figure 1

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

## 3. Inspection

### 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 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
Stirring bar	1
User Manual	1

Table 1

This ISM device complies with Canadian ICES-001.

Cet appareil ISM est conforme à la norme NMB-001 du Canada.

Caution: This equipment is not intended for use in residential environments and may not provide adequate protection to radio reception in such environments.

RS232 communication cable length  $\leq 3\text{m}$ .

## 4. Control

### 4.1. Control elements

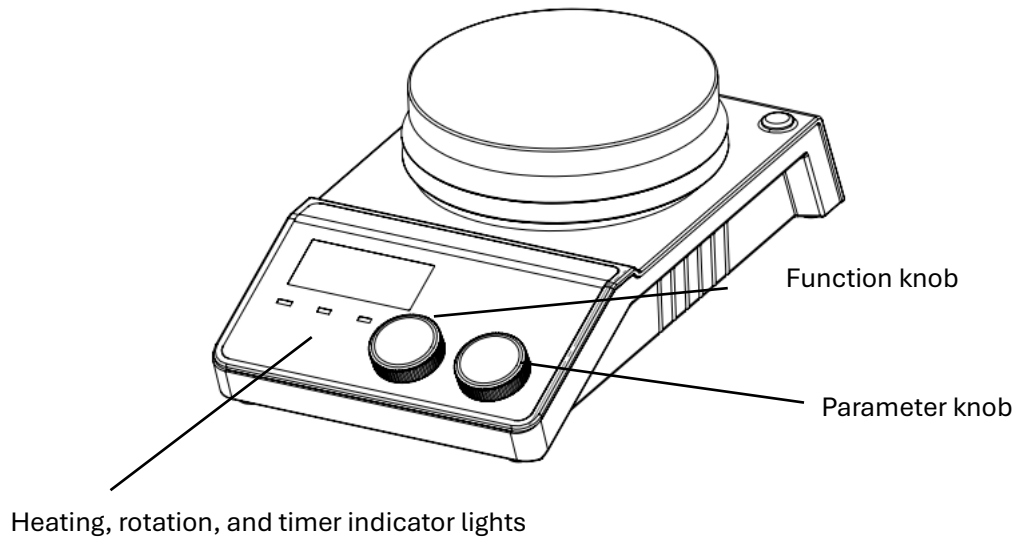


Figure 2 Digital hotplate model

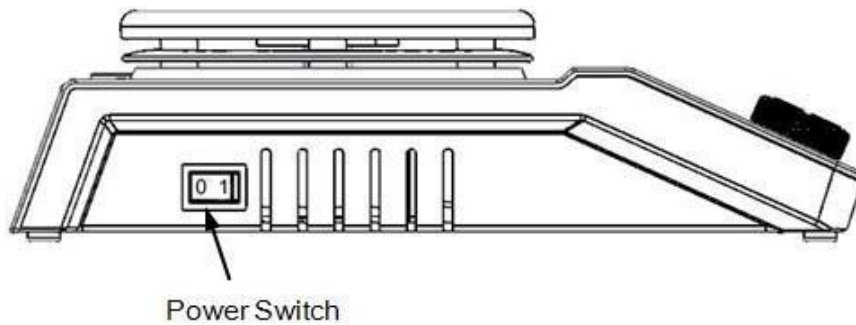


Figure 3

### 4.2. Display

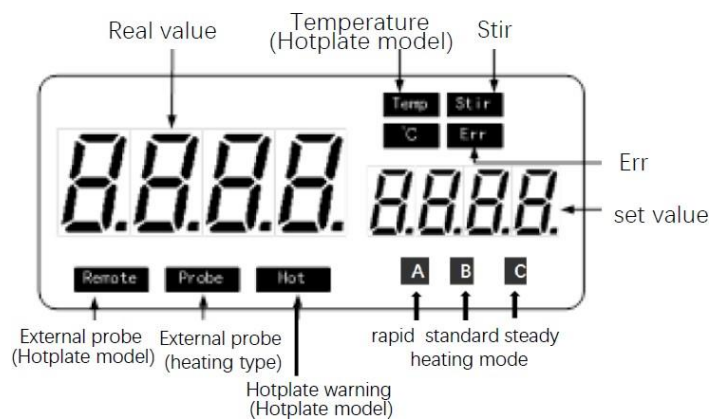


Figure 4

Characters	Descriptions
<b>Temp &amp; °C</b>	Display temperature when the heating function is switched ON
<b>Stir</b>	Display stirring state when the stirring function is switched ON
<b>Hot</b>	Displays HOT warning if the plate temperature is above 50°C after switching OFF the heating function.
<b>Probe</b>	Display when using external probe.
<b>Remote</b>	Display in case of remote control.
<b>Err</b>	Display in case of error happening.
Rated value /Real value	Display value in case of heating or stirring function switching ON.
<b>A</b>	rapid heating mode, under which the heating speed is the fastest but there may be some overshoot
<b>B</b>	standard heating mode, under which the heating speed is faster and the overshoot is smaller
<b>C</b>	steady heating mode, under which the heating speed is slower, but the overshoot is small or no overshoot

	<p><b>Note:</b></p> <p>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.</p> <p>Heating mode Setting method: startup and during the initialization, rotate the Heat knob, select among the mode A/B/C. The mode will be automatically locked after 3 seconds. If you need to adjust again, please repeat the same setting operation after restarting the machine</p>
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## 5. Trial Run

- 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 (digital model).
- Set the target temperature and start heating.
- Observe the real temperature on LCD display (digital model).
- Stop the heating and stirring functions.

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



### **Warning!**

Forbid to transfer the vessel when the instrument working.

## 6. Function: Heating (LCD Digital Hotplate Model)

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
- The instrument automatically displays the last running speed and temperature parameters once turned on. Generally, the LCD screen cannot display the actual temperature of sample in the vessel or

hotplate surface. The temperature differences may exist between:

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

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

## 6.1. Working with the External Temperature Sensor

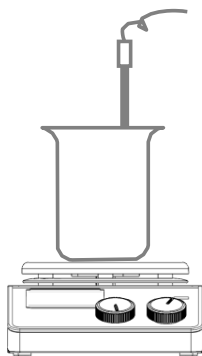


Figure 5

The external temperature sensor PT1000 is the manufacture's standard 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. Safe circuit controls hotplate temperature.

Comparing with the temperature control of the hotplate, the external temperature sensor can control the medium's temperature more precisely.

## 6.2. Residual heat warning (HOT)

In order to prevent the risk of burns from a hotplate, digital hotplate 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 immediately, just pull out the plug directly. When the plug is pulled out, the residual heat warning function cannot be run.

## 7. Other

### 7.1 Stirring (LCD Digital Model)

The function "stirring" 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 of function 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.

### 7.2 Timer function

Turn the function switch knob to the time setting interface, rotate the parameter setting knob to the desired time, press the parameter setting knob to activate the timer function.

Note: The timer function only controls the heating function and does

not control the stirring function.

## 8. Remote Control (LCD Digital Model)

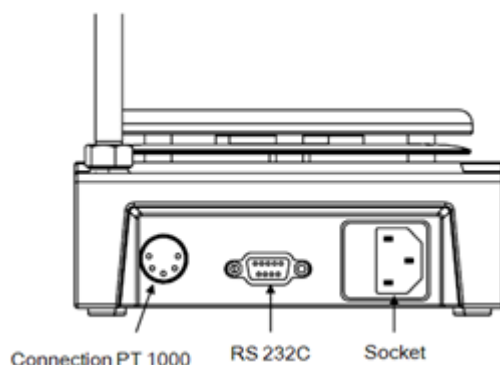


Figure 6

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 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
- Start remote control knob LCD display “Remote”.



**Note:**

DO NOT insert or remove the RS232C communication line when the instrument is power on!

## 9. 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 the instruments to factory default setting.
- Stir speed cannot reach set point
  - Excessive medium viscosity may cause abnormal speed

- 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 °C **(the LCD screen still work and “Hot” flash)**.
- • Display temperature changed after installing external temperature sensor
  - The external temperature sensor interface is not connected well, quickly unplug and plug the external temperature sensor again.
- Fault error

Describe& conditions	Code	Conditions
The temperature sensor is incorrectly placed or not put into the container during heating. The temperature rises less than 2 °C after 7 minutes of heating	ER9	1. The setting temperature shall be more than the initial temperature displayed on the screen +10°C 2. The initial temperature displayed on the screen shall be less than 35°C. 3. The temperature shall rise within 2°C after heating for 7min.
When the temperature sensor is taken out of the container during heating, the temperature measured value drops by more than 1°C every 3 seconds	ER3	The time of PT1000 sensor in liquid is greater than 1min
During the heating process, PT1000 detection temperature exceeds the target temperature by 40°C.	ER4	Set the target temperature to be higher than the initial temperature

***If these faults are not resolved, please contact dealer/ supplier.***

## 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

- 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:**

Electronic device cannot clean with cleanser. If you require maintenance service, must be cleaned the instrument in advance to avoid pollution of hazardous substances, and to send back into original packing.

If the instrument will not use for a long time, please switch off and place in a dry, clean, room temperature and stable location.

## 11. Associated standards and regulations

Construction in accordance with the following safety standards:

EN 61010-1

UL 61010-1

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

Item	Specifications
Model / Reference	RSLAB-2C / LBD002
Voltage [VAC]	100-120/200-240
Frequency [Hz]	50/60
Power [W]	650
Stirring position	1
Max. stirring quantity (H <sub>2</sub> O) [L]	20
Max. magnetic bar [L×Ø, mm]	80×10
Motor type	DC brushless motor
Max. power input of motor [W]	18
Max. power output of motor [W]	10
Speed range [rpm]	100-1500, increment: 10
Speed display	LCD
Plate material	Aluminum with ceramic coating
Dimensions of work plate (mm)	Ø 135
Heating power [W]	600
Temperature range [°C]	RT-340, increment: 1
Temperature display [°C]	LCD
Temperature display accuracy [°C]	±0.1
Temperature sensor in medium	PT1000
Control accuracy of heating temp. with temp. sensor [°C]	±0.2
Residual heat warning	50°C

Dimensions (mm)	280×160×100
Weight [kg]	2.8
Permitted ambient temperature [°C]	5-40
Permitted relative humidity [%]	80
Protection class acc. to DIN 60529	IP21
RS232 interface	Yes

Table 4