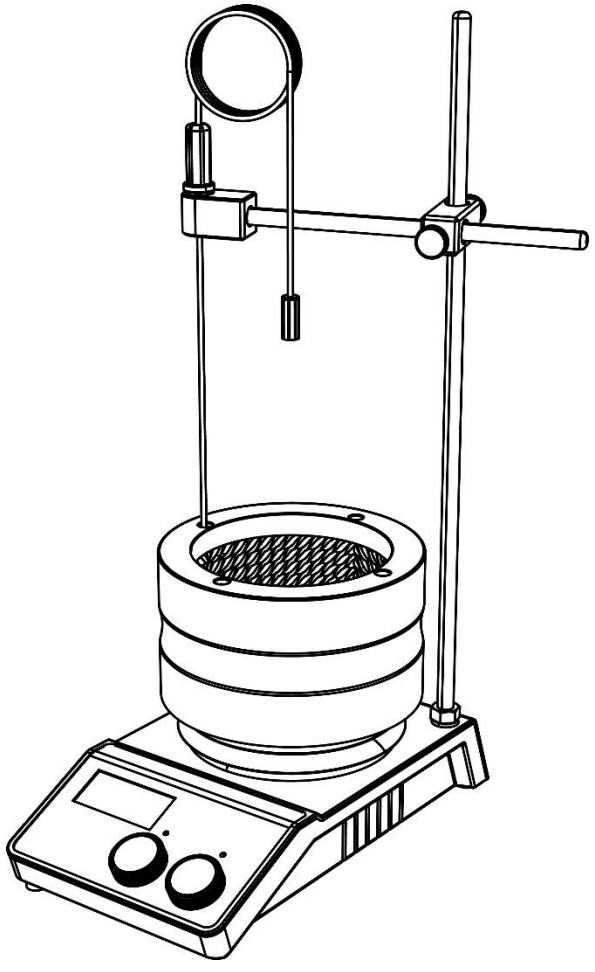
Stirring&Heating

LCD Digital Hotplate Magnetic Stirrer
User Manual



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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 is 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

Quality Assurance

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 supplier. You may also send the instrument directly to manufacturer, enclosing the invoice copy and by giving reasons for the claim.

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 centrifuge is operated in a commercial environment. The equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the user manual, may cause harmful interference to radio communications. Operation of equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference.

1. Safety Instructions

	**Warning!** ● Read the operating instructions carefully before use. ● Ensure that only trained staff works with the instrument.
	**Risk of burn!** ● Caution when touch the housing block and the hotplate which can reach temperature of 280 ℃. ● Pay attention to the residual heat after switching off.
	**Protective ground contact!** ● Make sure thatsocket must be grounded(protective ground contact) before use.
	**Note:** **! Do not remove or insert the serial cable of the heating sleeve when the system is started.**

- 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℃ lower than the flash point of the media used.
- Be aware of hazards due to:
  - Flammable materials or media with a lo 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 ill 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℃ .

- 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 all.
- 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.
- The heating mantle only provides heating function, while the main unit only provides stirring function.

Caution: This equipment is not intended for use in residential environments

and may not provide adequate protection to radio reception in such environments.

2. Proper use

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 all and above the assembly (min. 100 mm).

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

This ISM device complies with Canadian ICES-001.

This ISM device complies with the NMB-001 standard of Canada.

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
Stirrer bar	1
User Manual	1

Table 1

4. Control

4.1. Control elements

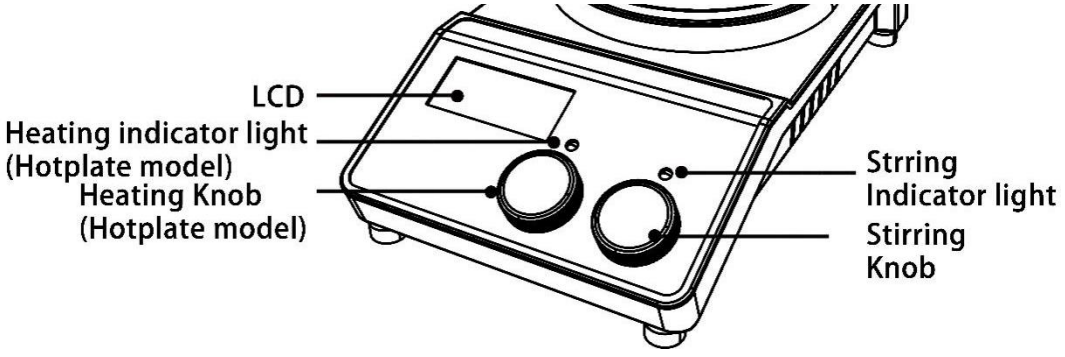

Figure 2 Digital hotplate model

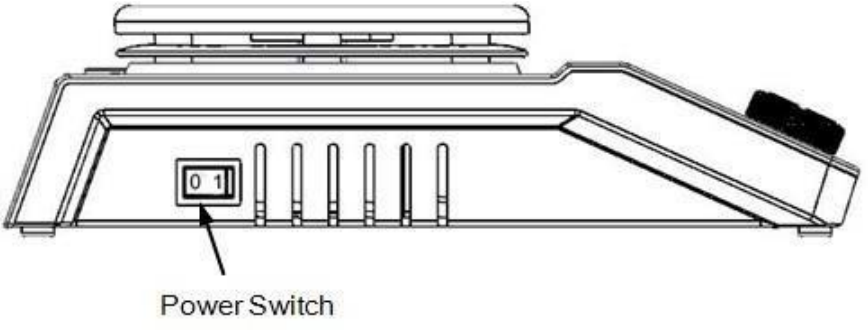

Figure 3

Items	Descriptions
Stirring knob Stir	Set the rated rotary speed. The function “Stirring” is switched ON or OFF via push ON/OFF the knob.
Heating knob Heat (Hotplate model)	Set the rated temperature. The function “heating” is switched ON or OFF via push ON/OFF the knob.
LCD	LCD displays the real working state and all settings.
Heating indicator light (Hotplate model)	When the heating function is switched ON, the heating indicator light is lit.
Stirring indicator light	When the stirring function is switched ON, the stirring indicator light is lit.
Power switch	Switch ON or OFF the instrument.

Table 2

4.2. Display

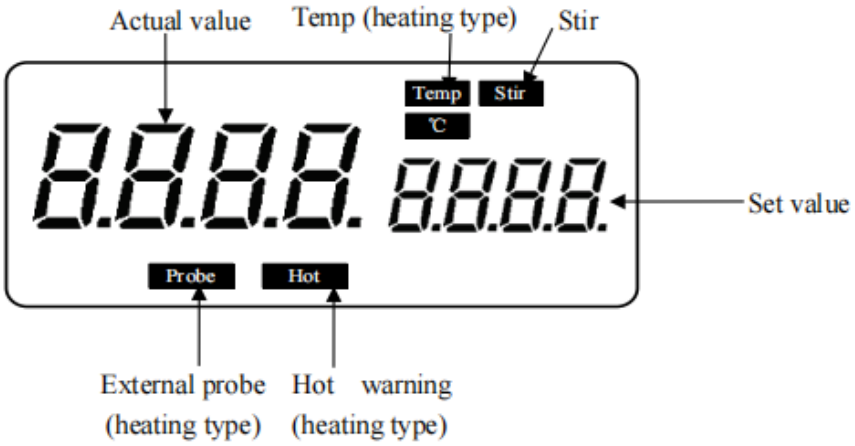

Figure 4

Characters	Descriptions
Temp & ℃	Display temperature when the heating function is switched ON
Stir	Display stirring state 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.
Probe	Display when using external probe.
Remote	Display in case of remote control.
Err	Display in case of error happening.

Rated value /Real value	Display value in case of heating or stirring function switching 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. 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

5. Trial Run

- Make sure the required operated voltage and power supply voltage match.
- Ensure the socket is properly grounded.
- Connect the power supply before, please link electric jacket, avoid "Error2 fault warning.

- 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 hen the instrument working.

6. Function: Heating (LCD Digital Hotplate Model)

The device is controlled by digital temperature control technology, which has to 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:

- Heating module 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

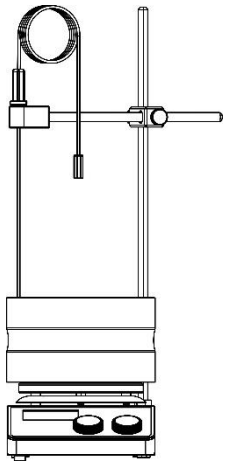

Figure 5

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℃, 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. 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.

8. Automatic calibration function

(1) Start calibration:

1) Long press the speed knob before opening the switch, then open the switch, release the button when the "rES" sign appears, and then shut down, and the parameter recovery is completed.

2) Confirm that the external temperature sensor is inserted, hold down the temperature knob and do not release it, start the machine, release it when the "CAL" sign appears, and start calibration.

3) Adjust the temperature knob, set the temperature to the temperature point that needs to be calibrated, and then press the temperature knob to heat, at this time, the heating indicator will light up, and when the temperature is stable near the set value (±1℃), read the actual temperature value, and then press the temperature button to turn off the heating, and the indicator will turn off.

4) Press the speed knob, then the speed indicator light will turn on, the display will display "CAL", then adjust the speed knob to enter the actual temperature value (the actual measured temperature), after the adjustment is completed, press the speed button, the speed indicator will be off, the display will display "donE", and then turn off the power switch to complete the calibration.

(2)、Restore factory parameters: long press the speed knob before opening the switch, and then open the switch, release the buttonw hen the "rES" sign appears, and then shut down, and restore factory parameters.

Note: The difference between the actual measured temperature and the set temperature should be less than 10℃. If it is greater than 10℃, the calibration will fail.

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 hen switched OFF.
  - Check if the residual heat warning function is still ON and hotplate temperature is above 50 ℃ **(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

Cause	Code	Problem analysis
The sensor detects that the actual temperature exceeds the protection temperature by 420 ° C	ER5	The sensor is faulty or the heater is short-circuited
The heating function is not turned on but the temperature rises	ER6	Thyristor short circuit cannot be controlled
Turn on the heating function, but the temperature does not change	ER7	The heating circuit is disconnected or the sensor is faulty

If the heating module is not connected to the serial port of the host, enable the heating function	ER9	Before connecting the power cord and turning on the machine, connect the serial port of the electric heating sleeve and turn on the heating function
Failed to detect the speed of the startup motor	ER8	Motor failure or speed acquisition sensor failure

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 hen cleaning.
- Unplug the power line hen 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 methods 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 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/EG Instrument

guidelines: 73/023/EG

12. Specifications

Voltage [VAC]	200-220
Frequency [Hz]	50
Stirring position	1
Max. stirring quantity (H2O) [l]	20
Motor type	DC brushless motor
Max. power input of motor []	1.8

Speed range [rpm]	200-1500, increment: 10	
Rotary speed display	LCD	
*Heating power [W]	210/240/380/440	100/170/270/330
power[W]	230/260/400/460	120/190/290/350
Voltage，Frequency	100-120V，60Hz；200-220V,50Hz	
*Temperature range [°C]	25-280℃, 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 [℃]	±0.2	
Residual heat warning	50℃	
Dimensions (mm)	295×160×160	
Weight [kg]	3.7	
Permitted ambient temperature [°C]	5-40	
Permitted relative humidity	80%	
Protection class acc. to DIN 60529	IP21	

Container application scope	100mL 250mL、500mL、1000mLBeaker	100mL、250mL、500mL 、1000mLRound-bottom flask

Table 4