ELITEX

DIGITAL MAGNETIC STIRRER WITH HEATING

read the User Manual carefully before use, and follow all operating and safety instructions

User Manual

English

User Manual

EN

Digital Magnetic Stirrer with Heating

Preface

Thank you for purchasing our product. Users should read this manual carefully, follow the instructions and procedures, and be aware of all preventive measures when using this instrument.

Service

If help is needed, you can always contact your dealer or Labbox via **www.labbox.com**.

Please provide the customer service representative with the following information:

- Serial number
- Description of the problem
- Your contact information

Warranty

This instrument is guaranteed 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 and shall not apply to any product or parts that have been damaged due to improper installation, improper connections, misuse, accidents, or abnormal conditions of operation.

For claims under the warranty, please contact your supplier.

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Preface

Welcome to the "LCD Digital Timer Heated Magnetic Stirrer Instruction Manual". Users should read this manual carefully before using this instrument to understand the relevant precautions and operate according to the instructions and specifications in the manual.

How to get help

If you have any questions or need assistance during installation and use, please do not hesitate to contact the manufacturer/supplier.

Please prepare the following information:

- Product serial number (on instrument nameplate)
- warranty card
- Description of the problematic phenomenon
- The method and procedure you used to solve the problem.
- Your contact information such as phone number, fax number and Email address.

Quality Assurance

According to the terms of the manufacturer's warranty, the instrument is warranted for 24 months under normal use, in case of problems related to the terms of the warranty, please contact your local supplier. You can also send the instrument directly to the manufacturer by post, please include the packing list and a description of the problem, and you will be responsible for any transportation costs incurred.

1. Security matters

	**Warning!** ● Before operating the instrument, please read this manual carefully and observe the safety operation regulations. ● Professionally trained personnel should only operate this instrument. ● Please observe the norms related to safety norms, personal safety and accident prevention. ● Consider the effect of magnetic fields on the surrounding environment, e.g. data storage, cardiac pacemakers.

	**Watch out for burns!** ● When touching the base of the instrument and the heating plate, please note that the maximum temperature of the heating plate of this instrument is 340/550°C. ● There will be residual warmth in the heating plate after the instrument is turned off, so please avoid burns. ● Ensure the instrument is handled exclusively after the disc has completely cooled to a safe operating temperature.
	**Safety grounding protection!** ● For safety, make sure the power outlet is well grounded before using the instrument.

- Wear appropriate protective equipment when working, otherwise danger may be caused by the following:
  - Stirring liquid spills and vapors
  - Toxic, flammable gases released
- Use the instrument in a large well-ventilated area with a smooth, clean, non-slip, dry and fire-resistant work surface. Do not operate the instrument outdoors, in a hazardous environment, or under water.
- Adjust the speed slowly and turn down the speed when the following conditions occur:
  - The instrument runs erratically and the container moves on the heating plate.
- The setup temperature must be 50°C below the ignition point of the sample.
- Take care to avoid the following dangerous operations:
  - Stirring flammable samples with low boiling points
  - Mixing sample overfill
  - Use of unsafe containers
- An airtight container must be used when mixing pathogenic samples.
- When using a stirrer with a polytetrafluoroethylene (PTFE) housing:
  - At room temperature, monofluoride, trifluoride and alkali metals corrode PTFE and haloalkanes swell it.
  - Alkali or alkaline earth metals in molten state or in solution thereof, as well as

powders of the second and third groups of the periodic table, react chemically with PTFE at temperatures of between 300 and 400 °C.

- Make sure that the instrument and its accessories are undamaged before turning it on each time. Use the standard accessories listed in the "Accessories" section and follow the instructions to ensure safety. Make sure that the accessories are securely attached to the instrument so that they do not become detached. Turn off the power before loading or unloading the accessories.
- The tip of the external temperature sensor is at least 5-10 mm from the bottom of the container and 5-10 mm from the wall of the container.
- The instrument can only be completely de-energized by unplugging it.
- Make sure that the power supply voltage is the same as the nameplate.
- Ensure that the power cord is kept away from the heating plate and that the instrument is not covered while in use.
- Only professionally trained personnel should open this instrument.
- Do not use this instrument in areas with strong magnetic fields.
- Use of this instrument in explosive environments is prohibited; this instrument is not explosion-proof.
- To avoid personal injury and property damage, observe relevant safety and accident precautions when handling hazardous materials.

2. Scope of use

- This instrument is designed for use in applications such as schools, laboratories and factories for heating liquids for use in the following environments:
- Altitude not exceeding 2000 meters.
- Temperatures from 5°C to 40°C
- Installation type: the product is designed to be connected to an indoor socket with voltage fluctuations not exceeding ±10% of the normal value.
- The minimum distance between instruments and between instruments and walls is 100mm.

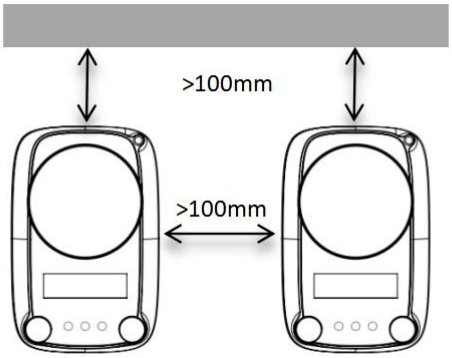

Figure 1

This instrument is not suitable for application in residential areas and under some of the limitations specified in Chapter 1.

3. Inspection

Users are advised to note any damage to the packaging on the receipt. If any internal damage is found after unpacking, please also contact the local supplier or manufacturer.

	**Attention:** Do not connect the instrument to the power supply if you notice any visible damage on the instrument.

4. Control and display

4.1 Control

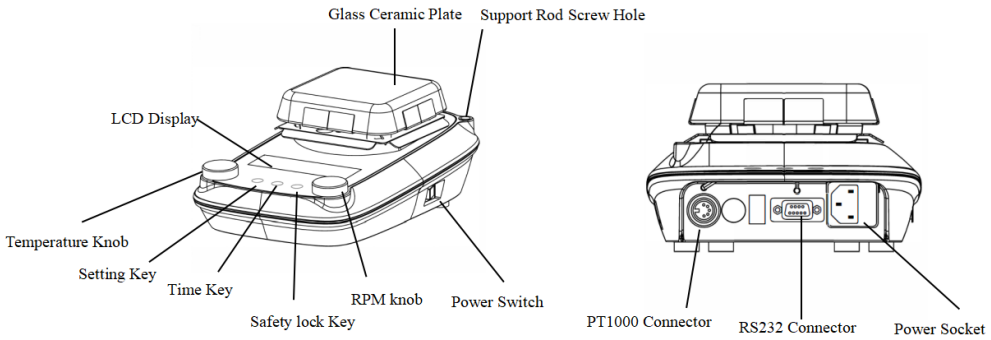

Figure 2: 4-inch Heating & Stirring Model

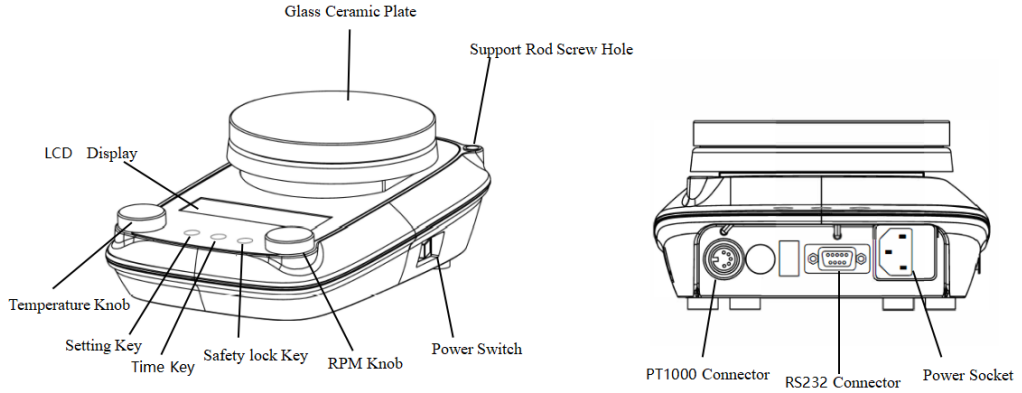

Figure 3: 5-inch strong magnetic heating and stirring Model

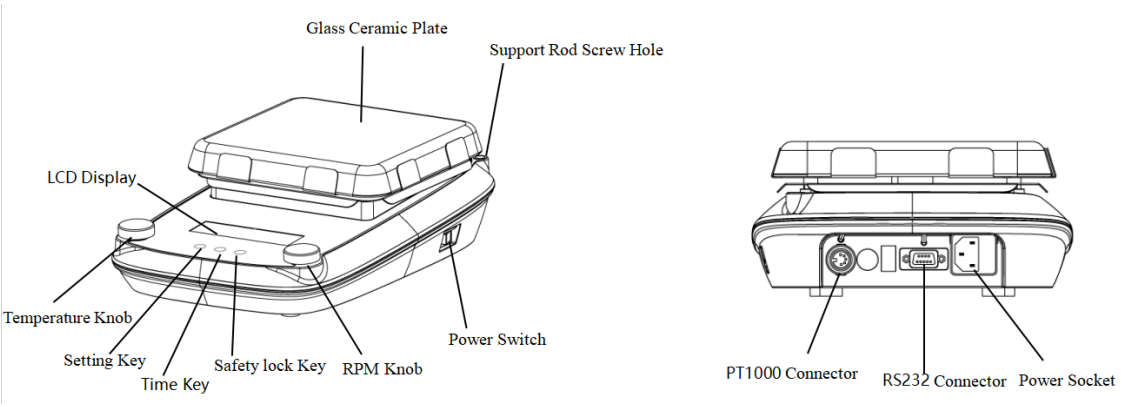

Figura 4: 7-inch Heating & Stirring Model

4.2 Display

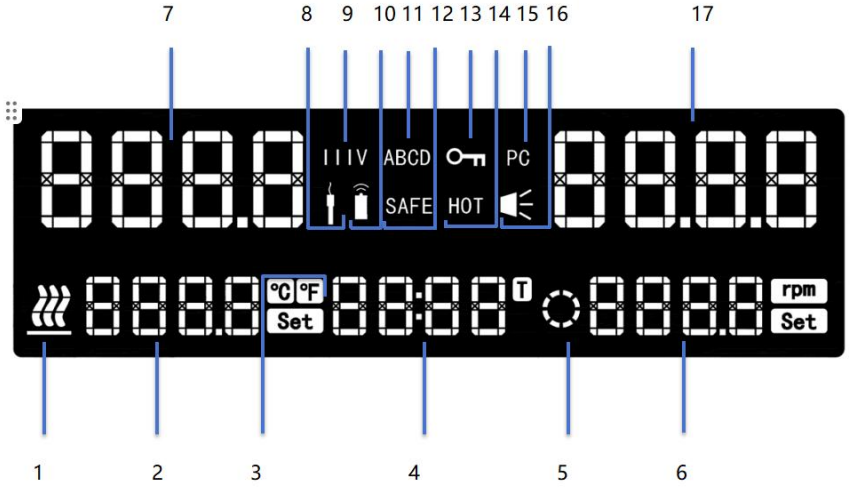

Figure 5: Full-Featured Model

1	Activate Heating Function	10	Connecting The Remote Control
2	Setting The Temperature Value	11	Temperature Control Mode
3	Temperature Unit	12	Safety Temperature
4	Timing	13	Safety Lock
5	Activate Stirring Function	14	Occurs when the disc temperature is above 50°C
6	Setting The Speed Value	15	Connect Computer
7	Setting The Temperature Value	16	Buzzer
8	Connect PT1000 Interface	17	Actual Speed Value
9	Operating Mode		

5. Power on, Power off, Hibernate

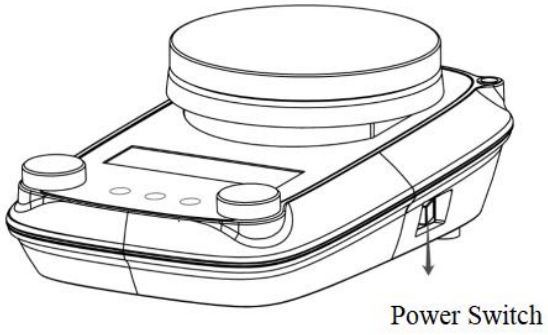

Figure 6

1. Turn on the power switch and switch on the instrument to enter the main interface.
2. Press and hold the temperature knob and speed knob at the same time for 3s, the instrument enters the hibernation state, and the display screen goes out of hibernation. Press and hold the temperature knob and rotational speed knob simultaneously for 3s again to lift the hibernation state and enter the main interface.
3. Turn off the power switch, the machine shut down.

6.Operation

- Check that the operating voltage specified on the nameplate matches the grid voltage.
- Power outlets require good grounding.
- Turn on the power and perform a power-on self-test.
- Select the appropriate stirrer into the container and fill with the sample to be stirred.
- Place the container on the instrument tray.
- Setting the mixing speed and starting the mixing
- Observe the work of the stirrer.
- Sets the heating temperature and starts the heating.
- Observe the actual temperature displayed on the LCD screen.
- Setting the mixing time
- Switching off the heating function and stirring function

If the above operation works correctly, the instrument is ready for official use. If it does not work correctly, the instrument may have been damaged during transport, please contact the manufacturer/supplier's after-sales service center.

	**Attention：** Please do not remove the container during the operation of the instrument. Once the container is detached from the surface of the working disc of the instrument, stop the stirring function before placing the container again, and start the stirring again after the container is placed.

7. Heating function

1) Rotate the temperature knob to adjust the temperature to the desired parameter, click on the temperature knob, The "  " animation is displayed on the

interface. This indicates that the heating function is switched on. The set and actual temperatures are always shown on the display.

For single-function models, the desired temperature can be adjusted with the temperature adjustment knob. When the heating function is switched on, the left side of the LCD screen displays the real-time temperature value and the right side displays the set temperature value.

2) If no external temperature sensor is connected, the display shows the disc temperature. This machine uses an external temperature sensor PT1000, after the external temperature sensor, the screen displays "  ", indicating that the external temperature sensor starts to work. The LCD screen displays the real-time temperature of the external temperature sensor.

3) Display temperature unit： Press and hold the temperature knob and the setting "  " button at the same time. The instrument setup temperature and actual temperature units are switched from degrees Celsius (°C) to degrees Fahrenheit (°F).

4) An external temperature sensor allows for more precise and faster control of the temperature of the sample than the built-in temperature control. The external temperature sensor must be placed in the ambient liquid, not in the heated sample. If an abnormality is detected, the heating module will automatically shut down, in which case do the following:

- Power off
- Ensure that the external thermostat is immersed in the heated sample.
- Turn on the power, set the target temperature and turn on the heating function
- If the instrument does not return to normal operation, contact the manufacturer/supplier.

5) The temperature in the setup area when the instrument is turned on is the setup temperature when the instrument was last turned off. In common use, there may be a difference between the setup heating temperature display value and the following actual temperature:

- Heating plate center and outer edge

- Containers and samples in containers

These differences exist due to thermal conduction properties. To ensure accurate temperatures in the vessel, use an external temperature sensor PT1000.

7.1 Residual temperature warning (HOT)

To prevent burns, the instrument has a residual heat warning function (Hot):

- If the temperature of the heating disc remains above 50°C after the heating function has been switched off, the character "Hot" appears on the LCD to warn that the temperature of the heating disc is too high and that there is a risk of scalding.

After switching off the main switch of the instrument, if the temperature of the disc is higher than 50 °C, the display will show "Hot" and the actual temperature value, and when the temperature of the heated disc drops below 50 °C, the instrument will automatically power off. If the user needs to switch off the LCD screen immediately, they can simply unplug the power supply. The residual heat warning function cannot be operated in the event of a mains failure or with the mains plug unplugged.

7.2 Safety temperature

Setting the safety temperature limit: Click the setup button to enter the safety temperature setting interface, rotate the temperature knob to adjust the safety temperature, after the setting is completed, click the setup button again to return to the main interface, the safety temperature setting is completed. Once the temperature limit is reached, the instrument will turn off the heating function.

	**Attention**： The safety temperature must always be set to at least 25 ^{O}C below the ignition point of the processing medium. The maximum temperature setting for the heating plate must be at least 15 ^{O}C below the safe temperature limit. Safety temperature setting range: 50 ^{O}C - overheating protection temperature. The control of the heating temperature is always referenced to the center temperature of the heating plate.

8.Stirring function

Select the appropriate stirrer into the container, rotate the speed knob, adjust the speed to the desired parameters, click the speed knob, the interface shows"  ", animation. Indicating that the RPM function is switched on. The set RPM and the actual RPM are always shown on the display.

For the single-function model: The stirring speed can be adjusted using the stirring knob. When the stirring function is activated, the actual speed is displayed on the left side of the LCD screen, while the set speed is displayed on the right side.

Forward and Reverse Rotation Function:

For the four multifunctional models – 5-inch heating stirrer, 5-inch high-power magnetic heating stirrer, 7-inch high-power magnetic heating stirrer, and 4-inch heating stirrer – the forward/reverse rotation setting is as follows:

After turning on the power, press and hold the left temperature setting knob. The display will show a clockwise or counterclockwise animation with a corresponding number.

- 0 indicates counterclockwise rotation.
- 1 indicates clockwise rotation.

Press the SET key to switch between the two directions. Once the setting is complete, if no further operation is performed within 5 seconds, the instrument will automatically return to the operation interface. During operation, stirring will proceed in the previously selected rotation direction.

9.Timing function

Long press time button "  " about 3 seconds. The screen will pop up  . At this time, the hour digit on the left side flashes, rotate the RPM knob to adjust to the desired time, press the RPM knob briefly to confirm, at this time, the minute digit on the right side flashes, rotate the RPM knob to adjust to the desired time, press the RPM knob briefly to confirm. Click the time button, ":" flashes, timing

starts. The buzzer emits three beeps after the timer ends. The instrument counts down to the end, the heating function stops, the stirring function does not stop, to prevent residual heat damage to the experimental samples.

10.Safety Lock Function

Press and hold the operator's “  ” keys. The Screen will display”  “, At this time, the instrument enters into the lock state, the keys and knobs cannot be operated and modified. Press the operator's “  ” keys again Screen”  “ will disappear. Exit the safety protection mode and the keys and knobs return to modifiable mode.

11.Menu Settings

After turning on the power switch of the instrument, long press the setup "  " button to carry out: heating mode setting (5-inch model) - operation mode setting - buzzer setting - calibration setting - safety temperature setting (under Ⅲ mode), the specific steps are as follows:

11.1 Operation Mode Setting

- Rotate the temperature knob to adjust the instrument operating mode, press the Setting "  " button briefly to confirm.
- Ⅰ Mode：All settings are stored when the instrument is switched off or the power is disconnected. The heating and stirring functions are switched off after switching on. The safety circuit can be set or changed. After switching on, the display shows operation mode Ⅰ.
- Ⅱ Mode：All settings are stored when the instrument is switched off or the power is disconnected. The heating and stirring functions are the same after switching on as they were before the last switch-off and may be off or on. The safety circuit can be set or changed. After switching on, the display shows

operation mode Ⅱ.

Attention： If the heating is on when the instrument is in Ⅱ mode, when the instrument is switched on for menu setting to calibration setting, you need to turn off the heating function first, and then click the setting button to enter the main interface.

- Ⅲ Mode：The operation of the instrument is the same as in Ⅰ mode (except that the safety temperature needs to be confirmed), when the safety temperature value is flashing, the safety temperature value can be adjusted by the temperature knob, if no adjustment is needed, after the safety temperature value is flashing for 5S, it will automatically enter the main interface.

11.2 Heating Model Setting

This function in only suit for 5-inch instrument.

Short press the Setting "  " button, the screen switches to the heating mode adjustment interface. Rotate the temperature knob to select the heating mode, short press the setting button to confirm.

A Model：Rapid heat-up mode, in which the heating rate is fast with some overshoot.

B Model：Standard heat-up mode, in which the heating rate is faster with less overshoot.

C Model：Stable heating mode, in which the heating rate is slower with little or no overshoot.

11.3 Buzzer Setting

Short press the"  "button, the screen switches to the buzzer setting interface. Turn the temperature knob to adjust the buzzer on or off, short press the setting button to confirm.

11.4 Calibration settings

1) The instrument calibration mode is for external temperature only, and an external temperature sensor must be connected if calibration is required.

2) Calibration operation: Click the Set "  " button to enter the calibration

interface. At this time, the actual temperature is displayed at the actual temperature, the set temperature is displayed at the set temperature, and the character "CAL" is displayed at the actual speed. Rotate the temperature knob to set the desired temperature, click the temperature knob, the heating animation will be on and the instrument will start heating. After the temperature stabilizes, press the speed knob briefly to calibrate the temperature, after the temperature setting is completed, press the speed knob briefly again, the actual rotational speed displays the character "DONE", at this time, the calibration is completed. Switch off the machine and enter the main interface after restarting.

3) If you don't calibrate, click the setup button to skip the calibration interface and enter the main interface of instrument operation.

12. Data Interface

The instrument can be connected to a computer via RS232 interface and controlled by software, and the software of the instrument can also be updated by connecting to a computer via RS232.

Configure ：

- Transmission process: Asynchronous start-stop mode.
- Transmission type: full-duplex communication system.
- ' Characteristics: 8 data bits, 1 start bit, 1 stop bit, no parity bit.
- ' Transmission rate: 9600 bit/s.
- ' Data flow control: none.
- ' Access procedure: The instrument transfers data to the computer only when the computer issues a demand command.

Attention：

Please note the trial conditions, instructions and help system required for the laboratory software system.

13. Restore Factory Setting

Turn on the power switch, when the screen flashes, long press the speed knob, when

the screen appears "rE" characters, shut down and restart, the machine to restore the factory settings. (In Ⅲ mode, the safety temperature confirmation appears first, and then the "rE" character is displayed).

14. Fault Diagnosis

1) Turn on the power supply instrument does not start.

- Please check whether the power cord is connected securely.
- Please check if the power fuse is damaged or loose.

2) Instrument power-on self-test is not normal.

- Please switch off the instrument and restart it.

3) Rotation speed cannot reach the set value.

- This function may cause abnormal deceleration when the viscosity of the medium fluid is too high.

4) The instrument does not power up when the instrument is switched off.

- Heating disc temperature higher than 50^{O}C, residual heat warning function on

5) Fault Reporting

Description & Conditions	Coding	Troubleshooting
The temperature sensor is removed from the container during heating.	ER3	After checking the external sensor, reposition the sensor to the liquid and press any button.
Error when the external temperature sensor exceeds the target temperature by 40^{O}C during the heating process	ER4	Reboot, cool down and re-operate the machine.
Hardware protection temperature detection, the built-in temperature exceeds the overheating protection temperature and reports an error.	ER5	Switch off the power, cool down and re-operate the machine.

When heating is not switched on, the temperature automatically rises by 20°C reporting an error.	ER6	Just press any button.
No RPM detected an error when mixing is switched on.	ER8	Switch off the power and restart the machine.
The temperature sensor is not placed correctly or not put into the container when heating, and the temperature rise is less than 5℃ when heating is turned on for 7min.	ER9	Check that the external sensor is not placed inside the heated liquid.

If the problem is not solved, contact the manufacturer/supplier.

15.Maintenance and Cleaning

- **Maintenance** ：

This instrument requires no special maintenance. The instrument will only experience natural wear and tear of spare parts and wear and tear that may cause occasional failure. Proper use and keeping it in good working condition will extend the life of the instrument.

- **Cleaning：**

1. Disconnect the power supply when cleaning the instrument!
2. Please wear protective gloves when cleaning the instrument.
3. Keep the instrument dry and clean during routine work, quickly remove spilt liquids, use a non-abrasive cleaner to clean the external surfaces and do not connect the power supply until all surfaces are dry. If liquid or wet solids get inside the instrument, quickly disconnect it from the power supply and do not use it again, contact the manufacturer/supplier for further advice.
4. Keep the instrument tidy and do not allow cleaning solutions to flow into the machine.
5. Power must be disconnected before maintenance and cleaning, please use our recommended method to clean the instrument. Removal method:

Dye	Isopropanol
Building material	Aqueous solution containing active agent/isopropyl alcohol
Cosmetic products	Aqueous solution containing active agent/isopropyl alcohol
Foods	Aqueous solutions containing active agents
Fuel oil	Aqueous solutions containing active agents

- Consult the manufacturer regarding any materials not specified in the table above. Prior to employing any alternative cleaning method, the user must obtain confirmation from the manufacturer that the procedure will not compromise the integrity of the instrument. Appropriate protective gloves shall be worn at all times when cleaning the instrument.

16. Relevant standards

The structure of the instrument complies with the following safety standards
EN61010-1 UL61010-1 CAN/CSAC22.2(1010-1) EN61010-2-10
The instrument structure complies with the following EMC standards
EN61326-1
Complies with the following EU standards
EMC standard：89/336/EWG Mechanical design standard：73/023/EWG

Attention：

- Electronic equipment must not be cleaned with cleaning agents.
- Sending instruments for repair must be cleaned up while avoiding contamination with hazardous substances and returned to the original box in which it was sent.
- When the product is not used for a long time, please store the instrument without power and place it in a dry, clean, room temperature and smooth place.

17.Technical parameters

Model number	4" Heated Stirring Model	5" High-Power Heated Stirring Model	7" Heated Stirring Model
Working plate size	100x100mm（4 inch）	Ø135mm（5 inch）	184x184mm（7 inch）
Plate Material	Glass Ceramic	Aluminum with ceramic coating	Glass Ceramic
Motor type	Brushless DC motor	Brushless DC motor	Brushless DC motor
Stirring positions	1	1	1
Maximum stirring volume [H2O]	10L	20L	20L
Maximum stirrer size [length]	40mm	80mm	80mm
Speed range and step	50~1500rpm，step 1rpm	50-1500rpm，increment 1rpm	50~1500rpm，increment 1rpm
Speed Display	LCD	LCD	LCD
Temperature display	LCD	LCD	LCD
Heating temperature range	Room temp-550℃ increment 1℃	Room temp-340℃，increment 1℃	Room temp-550℃，increment 1℃
Temperature control accuracy of heating liquid	±1℃(<100℃)±1%(>100℃)	±1℃(<100℃)±1%(>100℃)	±1℃(<100℃)±1%(>100℃)
overheating protection	580℃	420℃	580℃
Temperature display accuracy	0.1℃	±0.1℃	0.1℃
External temperature sensor	PT1000 (accuracy±0.2℃)	PT1000 (accuracy±0.2℃)	PT1000 (accuracy±0.2℃)
Waste heat warning function	50℃	50℃	50℃
Data connection	RS232	RS232	RS232

Protection class	IP21	IP42	IP21
Timer function	1min-99h59min	1min-99h59min	1min-99h59min
Motor output power	10W	10W	50W
Power	460W	650W	1200W
Heating output power	410W	600W	1150W
Voltage, Frequency	100-120/200-240V, 50/60Hz	100-120/200-240V, 50/60Hz	100-120/200-240V, 50/60Hz
Dimensions [L x W x H]	270x175x108mm	270x175x98mm	360x230x110mm
Weight	2.2kg	2.2kg	4.3kg
Permissible ambient temperature and humidity	5-40℃, 80%RH	5-40℃,80%RH	5-40℃, 80%RH

Nota importante para los aparatos electrónicos vendidos en España

Instrucciones sobre la protección del medio ambiente y la eliminación de aparatos electrónicos:

Los aparatos eléctricos y electrónicos marcados con este símbolo no pueden ser eliminados en forma de residuos urbanos.

De conformidad con la Directiva 2012/19/UE, los usuarios de la Unión Europea de aparatos eléctricos y electrónicos, tienen la posibilidad de devolver sus RAEE para su eliminación al distribuidor o fabricante del equipo después de la compra de uno nuevo. La eliminación ilegal de aparatos eléctricos y electrónicos es castigada con multa administrativa.

Remarque importante pour les appareils électroniques vendus en France

Informations sur la protection du milieu environnemental et élimination des déchets électroniques :

Les appareils électriques et électroniques portant ce symbole ne peuvent pas être jetés dans les décharges.
En réponse à la règlementation, Labbox remplit ses obligations relatives à la fin de vie des équipements électriques de laboratoire qu'il met sur le marché en finançant la filière de recyclage de ecosystem dédiée aux DEEE Pro qui les reprend gratuitement (plus d'informations sur www.ecosystem.eco).
L'élimination illégale d'appareils électriques et électroniques est punie d'amende administrative.

Nota importante per le apparecchiature elettroniche vendute in Italia

Istruzioni sulla protezione ambientale e sullo smaltimento dei dispositivi elettronici:

Le apparecchiature elettriche ed elettroniche contrassegnate con questo simbolo non possono essere smaltite come rifiuti urbani.
In conformità con la Direttiva 2012/19 / UE, gli utenti dell'Unione Europea di apparecchiature elettriche ed elettroniche hanno la possibilità di restituire i propri RAEE per lo smaltimento al distributore o al produttore di apparecchiature dopo averne acquistato uno nuovo. La rimozione illegale di apparecchiature elettriche ed elettroniche è punibile con una sanzione amministrativa.