

# 7" Square (Hotplate) Magnetic Stirrer

## User Manual



MS7-H550-Pro	LCD Digital 7" Square Hotplate Magnetic Stirrer
MS7-H550-S	LED Digital 7" Square Hotplate Magnetic Stirrer
MS7-Pro	LCD Digital 7" Square Plate Magnetic Stirrer
MS7-S	Classic 7" Square Plate Magnetic Stirrer

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

*Technical specifications and outline are subject to change without prior notice.*

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## 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.

### **Dragon Laboratory Instruments Limited**

No.31, Yu An Road, Zone B of TianZhu Airport Industrial Park, Shunyi District, Beijing, 101318 P. R. China

Tel: 86-10-85653451/52/53

Fax: 86-10-85653383

E-mail: [info@dragon-lab.com](mailto:info@dragon-lab.com)

Service Hotline: 400-1100-556

[Http://www.dragon-lab.com](http://www.dragon-lab.com)

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.

## 1. Safety Instructions

	<p>Warning!</p> <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>
	<p>Risk of burn!</p> <ul style="list-style-type: none"> <li>• Caution when touch the housing parts and the hotplate which can reach temperature of 550 °C.</li> <li>• Pay attention to the residual heat after switching off.</li> </ul>
	<p>Protective ground contact!</p> <ul style="list-style-type: none"> <li>• Make sure that socket must be grounded (protective ground contact) before use.</li> </ul>

- When working wear personal safety guards 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 under water.

- Gradually increase the speed, reduce the speed if:
  - Stirring bar breaks away due to high speed
  - The instrument is not running smoothly, or container moves on the base plate
- Temperature must always be set to at least 50°C lower than the fire 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.
- Check the instrument and accessories prior to each use. Do not use damaged components. Safe operation is only guaranteed with the accessories described in the "Accessories" chapter. Accessories must be securely attached to the device and can not come off by themselves. Always disconnect the plug before fitting accessories.
- When the external temperature sensor needed, the tip of the 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 surface of glass ceramic that can be caused surface broken.
- The instrument may only be opened by experts.
- Keep away from high magnetic field.

## 2. 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)

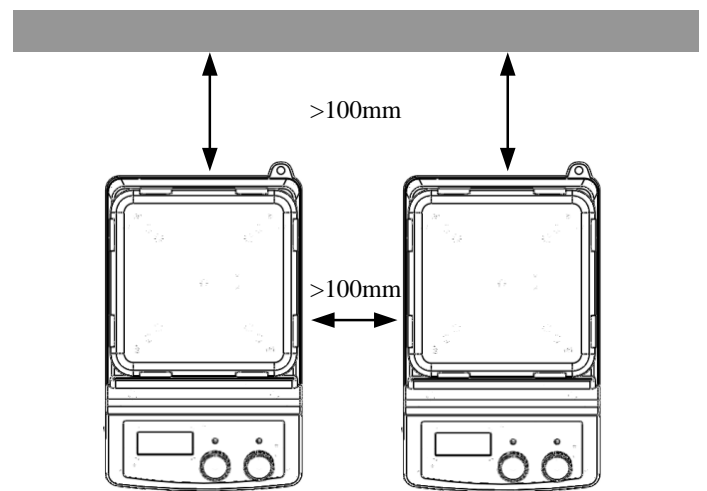


Figure 1

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

## 3. 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

Table 1

## 4. Control

### 4.1 Control elements

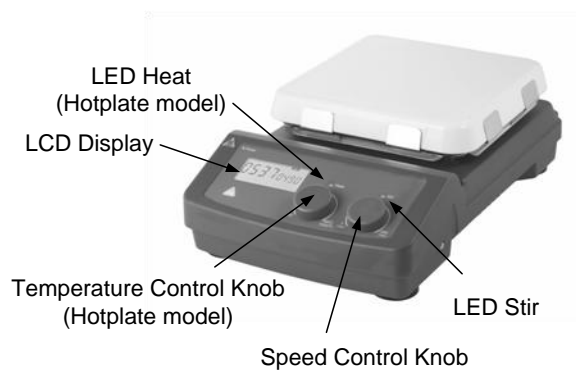


Figure 2 LCD digital model

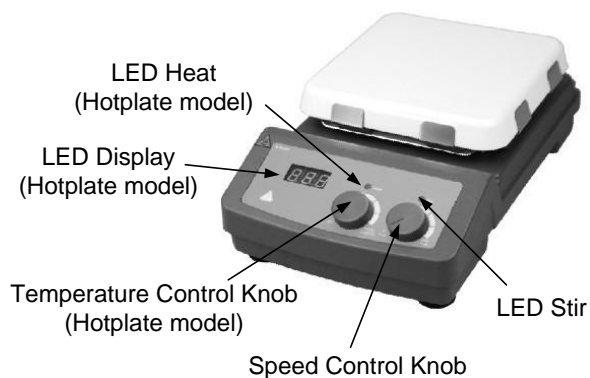


Figure 3 LED digital model

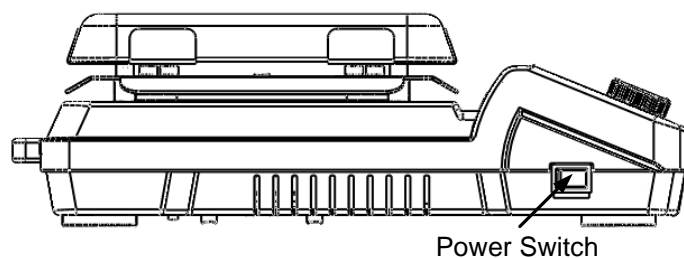


Figure 4

	Items	Descriptions
LCD digital model	Speed control knob <b>Stir</b>	Set the rated rotary speed. The stirring function is switched ON or OFF by pushing the knob.
	Temperature control knob <b>Heat</b> (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 <b>Stir</b>	The stirring function is switched ON or OFF by rotating the knob.
	Temperature control knob <b>Heat</b> (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

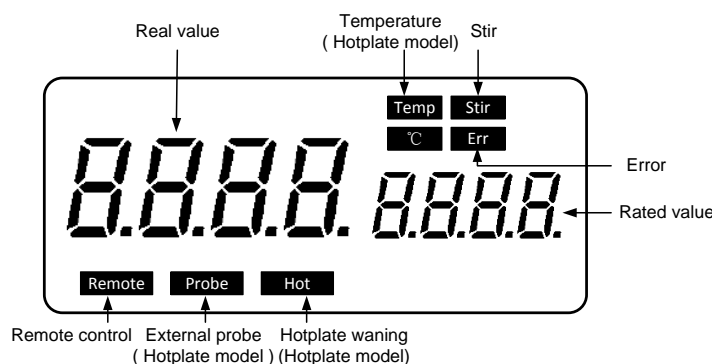


Figure 5 LCD digital model

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.

	<b>Note:</b> 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.
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Characters	Descriptions
Temp and °C	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 above 50 °C after switching OFF the heating function.
Probe	Display when using external probe.

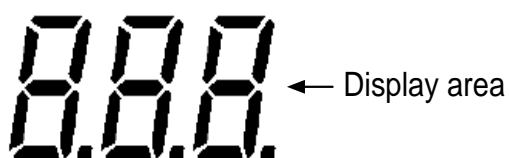


Figure 6 LED digital hotplate model

Display	Descriptions
Display area	When heating function was switched ON, LED displays the temperature setting value and shifts to real value in 5 seconds.
	When the heating function is switched OFF and the hotplate temperature is still above 50°C, LED displays HOT, otherwise LED displays 0.

## 5. 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 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.
- Set the target temperature and start heating (hotplate model).
- 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.

## 6. Working with external temperature sensor (Hotplate Model)

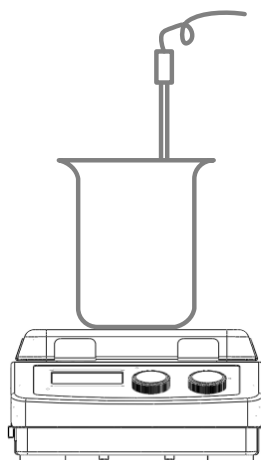


Figure 7

### 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 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.

## 7. Residual heat warning (HOT)

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.

## 8. Remote Control (LCD Digital model)

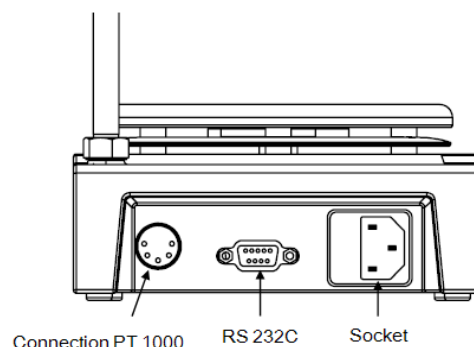


Figure 8

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!

## 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/LED screen still work and "Hot" flash).

*If these faults are not resolved, please contact manufacturer/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

- 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.

**Warning!**

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/EEG

Instrument guidelines: 73/023/EEG

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]	*1050/50	*1030/30
Stirring point position quantity	1	1
Max. stirring quantity (H <sub>2</sub> O) [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

7" Square Hotplate Magnetic Stirrer

*Temperature display [ °C]	LCD	LED
*Temperature display accuracy [ °C]	±0.1	± 1
*Control accuracy of heating temperature [ °C]	±1(100°C below) ±1%(100°C above)	± 10
*The safety temperature of the hotplate [ °C]	580	
*Temperature sensor in medium	PT1000	
*Control accuracy of heating temperature with temperature sensor [ °C]	±0.2	±0.5
*Residual heat warning	50°C	
Dimensions (mm)	215×360×112	
Weight [kg]	*5.3 4.6	*4.5 3.8
Permitted ambient temperature [ °C]	5-40	
Permitted relative humidity	80%	
Protection class acc. to DIN 60529	IP21	
RS232 interface	Yes	No
*Hotplate model		

Table 3



## 13. Ordering information

Cat No.	Descriptions		
813223007777	MS7-H550-Pro LCD Digital 7" Square Hotplate Magnetic Stirrer, glass ceramic hotplate, USA plug, 110V/50Hz/60Hz	813213037777	Euro plug, 220V/50Hz/60Hz MS7-Pro LCD Digital 7" Square Plate Magnetic Stirrer, glass ceramic plate, UK plug, 220V/50Hz/60Hz
813223017777	MS7-H550-Pro LCD Digital 7" Square Hotplate Magnetic Stirrer, glass ceramic hotplate, Cn plug, 220V/50Hz/60Hz	813221007777	MS7-H550-S LED Digital 7" Square Hotplate Magnetic Stirrer, glass ceramic hotplate, USA plug, 110V/50Hz/60Hz
813223027777	MS7-H550-Pro LCD Digital 7" Square Hotplate Magnetic Stirrer, glass ceramic hotplate, Euro plug, 220V/50Hz/60Hz	813221017777	MS7-H550-S LED Digital 7" Square Hotplate Magnetic Stirrer, glass ceramic hotplate, Cn plug, 220V/50Hz/60Hz
813223037777	MS7-H550-Pro LCD Digital 7" Square Hotplate Magnetic Stirrer, glass ceramic hotplate, UK plug, 220V/50Hz/60Hz	813221027777	MS7-H550-S LED Digital 7" Square Hotplate Magnetic Stirrer, glass ceramic hotplate, Euro plug, 220V/50Hz/60Hz
813213007777	MS7-Pro LCD Digital 7" Square Plate Magnetic Stirrer, glass ceramic plate, USA plug, 110V/50Hz/60Hz	813221037777	MS7-H550-S LED Digital 7" Square Hotplate Magnetic Stirrer, glass ceramic hotplate, UK plug, 220V/50Hz/60Hz
813213017777	MS7-Pro LCD Digital 7" Square Plate Magnetic Stirrer, glass ceramic plate, Cn plug, 220V/50Hz/60Hz	813211007777	MS7-S Classic 7" Square Plate Magnetic Stirrer, glass ceramic plate, USA plug, 110V/50Hz/60Hz
813213027777	MS7-Pro LCD Digital 7" Square Plate Magnetic Stirrer, glass ceramic plate,	813211017777	MS7-S Classic 7" Square Plate Magnetic Stirrer, glass ceramic plate, Cn plug, 220V/50Hz/60Hz
		813211027777	MS7-S Classic 7" Square Plate Magnetic

## 7" Square Hotplate Magnetic Stirrer

	Stirrer, glass ceramic plate, Euro plug, 220V/50Hz/60Hz
813211037777	MS7-S Classic 7" Square Plate Magnetic Stirrer, glass ceramic plate, UK plug, 220V/50Hz/60Hz

## Accessories

18900016	PT1000-A Temperature sensor for digital hotplate model, length of 230mm
18900136	PT1000-B Glass coated temperature sensor for digital hotplate model, length of 230mm
18900017	Support clamp of PT1000
18900002	MS135.2 Red quarter pie, 11 holes, 4 ml reaction vessel, Ø15.2mm, 20mm depth
18900003	MS135.3 Purple quarter pie, 4 holes, 20 ml reaction vessel, Ø28mm, 24mm depth
18900004	MS135.4 Blue quarter pie, 4 holes, 30 ml reaction vessel, Ø28mm, 30mm depth
18900005	MS135.5 Black quarter pie, 4 holes, 40 ml reaction vessel, Ø28mm, 43mm depth
18900048	MS135.6 Green quarter pie, 6 holes, 8ml reaction vessel, Ø17.75mm, 26mm

	depth
18900049	MS135.7 Golden quarter pie, 4 holes, 16ml reaction vessel, Ø21.6mm, 31.7mm depth

Table 4



**DLAB Scientific Instrument Inc.**

2311 E. Locust Court, Ontario, CA 91761 United States.

Office: +1-747-230-5179

Fax: +1-909-230-5275

Sales contact: [info@dlabsci.com](mailto:info@dlabsci.com)

Service contact: [service@dlabsci.com](mailto:service@dlabsci.com)

[www.dlabsci.com](http://www.dlabsci.com)