



H20D+ LCD Digital magnetic stirrer with heating
S20 Magnetic stirrer without heating
H20 Magnetic stirrer with heating

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



user manual

english

User Manual



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Preface

Users should read this Manual carefully, follow the instructions and procedures, and beware of all the cautions 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 (on the back side)
- 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. 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 claim under the warranty, please contact your supplier.

1. Safety Instructions

	Warning! <ul style="list-style-type: none">• Read the operating instructions carefully before use.• Make sure only trained staff works with the equipment.
	Risk of burns! <ul style="list-style-type: none">• Caution when touching the housing parts and the hotplate, which can reach temperature of 350°C.• Pay attention to the residual heat after switching off the equipment.
	Protective ground contact! <ul style="list-style-type: none">• Make sure that the socket is earthed (with protective ground contact) before use.

- When working, wear personal protective equipment to avoid risks from:
 - Splashing and evaporation of liquids
 - Release of toxic or combustible gases
- Set up the instrument on a spacious, stable, clean, non-slip, dry, and fireproof surface. Do not operate the equipment in explosive atmospheres, with hazardous substances, or under water.
- Increase the speed gradually. Reduce the speed if:
 - The stirring bar c due to high speed
 - The equipment is not running smoothly or the container moves on the base plate.
- Temperature must always be set at least 50 °C below the flash point of the media used.
- Beware of hazards due to:
 - Flammable materials or media with a low boiling temperature
 - Overfilling of the container
 - Unsafe container
- Process pathogenic materials only in closed vessels.
- If the stirring bar contains PTFE, please note:
 - Elemental fluorine, three fluoride and alkali metals will corrode the PTFE and Halogen alkanes expand at room temperature.
 - Molten alkali, alkaline earth metals or their solution, as well as the powder in second and third columns of the Periodic Table of Elements will react with PTFE if the temperature reaches 300 ~ 400 °C .
- Check the instrument and the accessories for damage prior to every use. Do not use damaged components. A safe operation is only guaranteed with the accessories described in the “Accessories” chapter. Accessories must be securely attached to the device and cannot come off by themselves. Always disconnect the plug before the assembly or disassembly of accessories.
- When the external temperature sensor is needed, the tip of the measuring sensor must be at least 5-10 mm away from the vessel bottom and wall.
- The equipment can only be disconnected from the main power supply by pulling out the mains plug.
- The voltage stated on the label must correspond to the main power supply.
- Make sure that the cable does not touch the hotplate. Do not cover the device.
- The instrument may only be opened by experts.

- Keep away from high magnetic fields.
- Observe the minimum distances between devices, between the device and the wall, and above the device (min. 100 mm.)

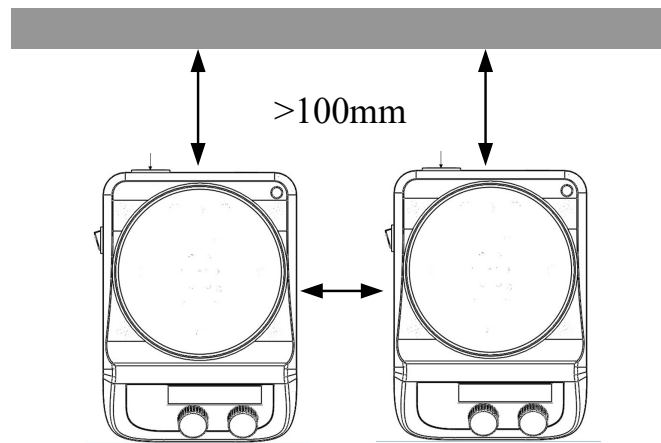


Figure 1

2. Proper Use

The instrument is designed for mixing and/or heating liquids in schools, laboratories, or factories. This device is not suitable for use in residential areas or other restrictions mentioned in Chapter 1.

3. Inspection

3.1 Unpacking

Unpack the equipment carefully and check for any damages that may have arisen during transportation. Please contact the manufacturer/supplier for technical support.



Note:

If there is any apparent damage to the system, 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: H20D+ series



Figure 3: H20 series



Figure 4: S20 series

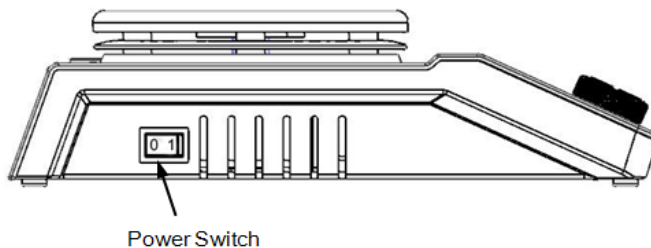


Figure 5: H20D+, H20 and S20 series

	Items	Descriptions
H20D+ series	Stirring knob "Stir"	Set the rated rotary speed. The function "Stirring" is switched ON or OFF by pushing the knob. To increase the value turn the knob clockwise.
	Heating knob "Heat"	Set the temperature parameters. The function "heating" is switched ON or OFF by pressing the knob. To increase the value turn the knob clockwise.
	LCD screen	The LCD screen displays the real working state and all the settings.
	LED Heat	When the heating function is ON, the LED Heat is lit.
	LED Stir	When the stirring function is ON, the LED Stir is lit.
	Power Switch	Switch the system ON or OFF.
H20 series	Stirring knob "Stir"	Set the rotary speed in a safe stirring range (between 0 and 1500 rpm). The function "Stirring" is switched ON or OFF by pressing the knob. To increase the value turn the knob clockwise.
	Heating knob "Heat"	Set the temperature parameters in a safe temperature range (between room temperature and 340°C). The function "heating" is switched ON or OFF by pushing the knob. To increase the value turn the knob clockwise.
	LED Heat	While the heating function is ON, the LED Heat is lit.
	LED Stir	While the device is ON, the LED Stir is lit.
	Power switch	Switch ON or OFF.
S20 series	Stirring knob "Stir"	Set the rotary speed in a safe stirring range between 0 and 1500 rpm. The function "Stirring" is switched ON or OFF by pushing the knob. To increase the value turn the knob clockwise.
	LED Stir	While the device is ON, the LED Stir is lit.
	Power switch	Switch ON or OFF.

Table 2

4.2 Display (H20D+ series)

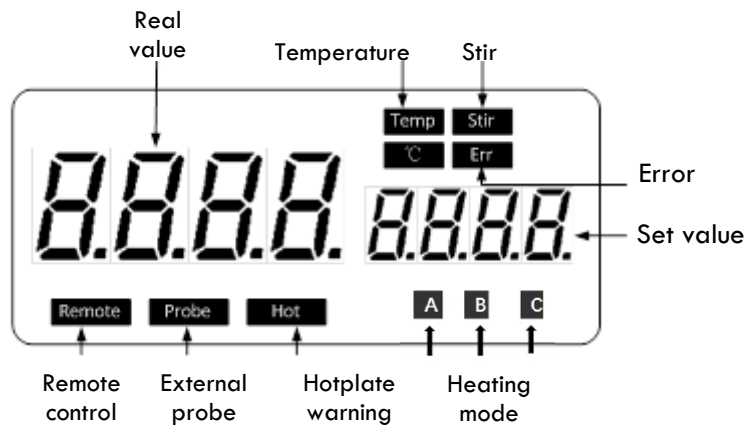



Figure 6

Characters	Descriptions
“Temp” and “°C”	Displays the temperature when the heating function is ON.
“Stir”	Displays the stirring speed when the stirring function is ON.
“Hot”	Displays a “Hot” warning if the heating plate’s temperature is above 50°C after switching OFF the heating function.
“Probe”	Displayed when using the external temperature sensor.
“Remote”	Displayed when using the remote control.
“Err”	Displayed in case of an error.
Set value/ Real value	Displays the real and set temperature or stirring speed value when the function is ON.
A	Rapid heating mode, under which the heating speed is the fastest but there may be some overshoot
B	Standard heating mode, under which the heating speed is faster and the overshoot is smaller
C	Steady heating mode, under which the heating speed is slower but the overshoot is small or no overshoot

Table 3



Note :

If both the heating and stirring functions are started at the same time, the heating function is always the priority. In that case, if the speed is changed by turning the stirring knob, the display will show the stirring speed for 5 seconds and then goes back to the temperature.

Heating mode setup: 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 operating voltage and the power supply voltage match.
- Ensure that the socket is properly grounded.
- Plug in the power cable to the system, then to the outlet. Make sure the power is on and begin the initiation.
- Add the medium into the vessel with a magnetic stirring bar; make sure the magnetic stirring bar has an appropriate size.
- Place the vessel on the work plate.
- Set the target stirring speed and start stirring.
- Observe the stirring bar (all series).
- Set the target temperature and start heating.
- Observe the LCD display (H20D+ series).
- Stop the heating and stirring functions.

If the operations above cause no abnormalities, the device is ready to operate. Otherwise, the device may have been damaged during transportation, please contact the manufacturer/supplier for technical support.



Warning!

Transfer of the vessel when the instrument is working is forbidden.

6. Function: Heating (H20D+ series)

6.1 H20D+ series

The device is controlled by a digital temperature control technology, which has two separate safe circuits. The hotplate is kept at a constant temperature by a digital control circuit. The hotplate temperature can also be monitored from a separate, adjustable safe circuit. The two internal temperature sensors (PT1000) for temperature control are built into the hotplate. The single external PT1000 can monitor the temperature of the sample.

- If using an external sensor PT1000: Always connect to the device BEFORE turning the power on and insert it into the sample BEFORE heating (see section 6.1.1).
- Turn the equipment on by pressing the ON/OFF switch.
- Set the temperature by rotating the temperature control knob slowly towards the target value.
- While the heating function is on, the LED “Heat” lights up and the LCD screen displays the real temperature.
- The temperature is displayed on the right side of the LCD screen as well as the “Temp” and “°C” characters.
- The heating function is switched on or off by pushing the heating knob.

The heating function will stop automatically under abnormal conditions.

In that case, please follow the instructions below:

- Switch OFF the instrument.
- If using external temperature sensors, ensure they are connected and inserted into the media to be heated.
- Switch ON the instrument and run the heating function.

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

When the equipment is switched ON, it displays the speed and temperature parameters used on the last use.

Generally, the LCD screen cannot show the real temperature of the medium in the vessel or on the plate. Temperature differences exist in the following cases:

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

In order to ensure that the temperature inside the container is measured accurately, please use the external temperature sensor PT1000.

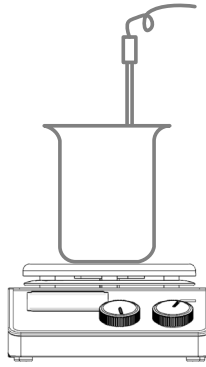


Figure 7

The external temperature sensor PT1000 is the manufacturer's standard accessory that, compared to the temperature control of the hotplate, can measure the sample's temperature in a more precise way.

- **If the external temperature sensor is needed, it must be plugged in before the device is switched ON.**
- Ensure the external temperature sensors are firmly connected and submerged into the media before heating (fig. 8).
- If the sensor is plugged in, "Probe" will be displayed on the digital display to indicate that the sensor is operating. The set value of external temperature sensors and the actual temperature are also displayed.



Warning!

Plugging in / Pulling out external temperature sensors while the system is functioning is forbidden.

6.1.2 Residual heat warning (HOT)

In order to prevent the risk of burns from a hotplate, the 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 on the screen to warn that there is a risk of burns from the hotplate. When the hotplate temperature drops to below 50°C, the system will be automatically switched off. If users want to turn off the LCD screen immediately, just pull out the plug directly. Once the plug is pulled out, the residual heat warning function will stop running.

6.2 H20 series

The function "heating" is switched ON or OFF by rotating the knob. While the heating function is ON, the LED Heat is lit.

7. Stirring

H20D+ series: The stirring function is switched ON/OFF by rotating the stirring knob. The speed is adjusted with the knob, too. When both the heating and the stirring functions are on, the LCD will display the set speed value for 5 seconds and then shift to the real temperature value.

H20 and S20 series: The stirring function is switched ON/OFF by rotating stirring knob. The stirring speed is adjusted with the "Stir" knob.

8. Remote Control (H20D+ series)

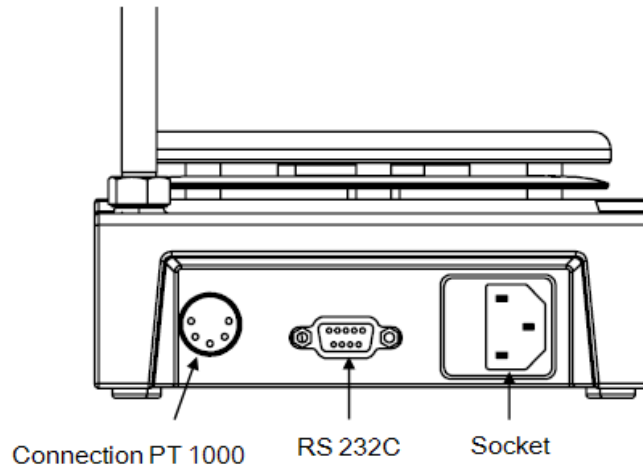


Figure 8

The unit can be controlled from an external PC (using the necessary software) via the RS232C serial interface integrated in the system. Data communication between the laboratory equipment and the computer is only possible on demand of the computer.

- The interface line's functions between the laboratory equipment and the PC are selected from the specified signals according to the EIA- RS232C, corresponding with DIN66020 Part 1. The location of the connector can be seen in 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
 - When this function is being used, the LCD screen displays "Remote".



Note:

Forbidden to insert or remove the RS232C communication line when the equipment is on!

9. Faults

- Instruments cannot be switched ON
 - Check whether the power line is unplugged
 - Check whether the fuse is broken or loose
- Fault during self test
 - Switch OFF the unit, then switch back ON.
- Stir speed cannot reach set point
 - Excessive medium viscosity may cause an abnormal motor's speed reduction.
- Unit does not turn off when pushing the ON/OFF switch.
 - Check if the residual heat warning function is still ON and the hotplate's temperature is above 50°C (the LCD still work and "Hot" flash).

If these faults are not resolved, please contact the manufacturer/supplier.


10. Maintenance and Cleaning

- Proper maintenance can keep instruments working properly and lengthen their lifetime.
- Do not spray cleanser onto the instrument when cleaning.
- Unplug the power line when cleaning.
- Only use recommended cleansers:

Dyes	Isopropyl alcohol
Construction materials	Water containing surfactants / Isopropyl alcohol
Cosmetics	Water containing surfactants / Isopropyl alcohol
Foodstuffs	Water containing surfactants
Fuels	Water containing surfactants

Table 4

- Before using any other cleaning or decontamination methods, the user must verify with the manufacturer that the method will not harm the equipment. Wear the proper protective gloves during cleaning of the instrument.

	<p>Note:</p> <ul style="list-style-type: none"> • The electronic device cannot be cleaned with cleanser. • If maintenance service is needed, the equipment must be cleaned to avoid contamination from hazardous substances and shipped in its original packing carton. • If the instrument will not be used in a long time, please power OFF and place in a dry, clean, and stable location at room temperature.
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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: 2004/108/CE
 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 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	
	H20D+ series	H20 series S20 series
Voltage [VAC]	200-240	200-240 100-240
Frequency [Hz]	50/60	50/60
Power [W]	550	530 30
Stirring point position quantity	1	1
Max. stirring quantity (H ₂ O) [l]	20	20
Max. magnetic bar [L×Ø, mm]	80×10	80×10
Motor type	DC brushless motor	
Max. power input of motor [W]	18	18
Max. power output of motor [W]	10	10
Speed range [rpm]	100-1500, increment: 10	0-1500
Rotary speed display	LCD	Scale
Plate material	Aluminum	Ceramic coated
Dimensions of workplate (mm)	Ø 135	Ø 135
Heating power [W]	500	500
Temperature range [°C]	RT-340, increment: 1	RT-340
Temperature display [°C]	LCD	Scale
Temperature display accuracy [°C]	±0.1	-
The safe temperature of hotplate [°C]	360	350
Temperature sensor in medium	PT1000	-
Control accuracy of heating temp with temp sensor [°C]	±0.2	-
Residual heat warning	50°C	-
Dimensions (mm)	280×160×85	
Weight [kg]	2.8	2.8
Permitted ambient temperature [°C]	5-40	
Permitted relative humidity	80%	
Protection class acc. to DIN 60529	IP42	
RS232 interface	Yes	No / No

Table 5

13.Accessories

Please contact our company to order the following accessories available for these devices: magnetic stirring bars, PT1000 temperature sensor with glass coated and support clamp for temperature sensor.

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 réglementation, 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.

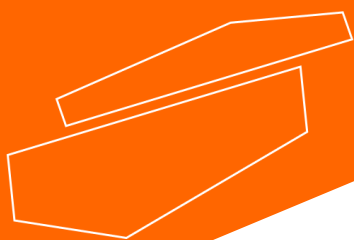
Nota importante per le apparecchiature elettroniche vendute in Italia

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.



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