

MS-(H)-Pro Digital (Hotplate) Magnetic Stirrer



User Manual

MS-H-Pro Digital Hotplate Magnetic Stirrer

MS-Pro Digital Magnetic Stirrer

Please read the User Manual and the related Video of this instrument on our website carefully before use, and follow all operating and safety instructions!

The website www.sciologex.com

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Contents

Contents	1	8.2 Residual Heat Warning (HOT)	10
Preface	2	8.3 Setting the Safety Temperature	10
Service	2	9 Function: Stirring	11
Warranty	2	9.1 Basic Stirring	11
1 Safety Instructions	3	9.2 Stirring Bar Breakaway Monitoring	11
2 Proper use	4	10 Remote Control	12
3 Inspection	5	11 Faults	12
3.1 Receiving Inspection	5	12 Maintenance and Cleaning	13
3.2 Listing of Items	5	13 Associated Standards and Regulations	14
4 Trial run	5	14 Technical Data	14
5 Control and Display	6	15 Products and Accessories	15
5.1 Control Elements	6	16 Main Spare Parts	Inside back
5.2 Display	7	16.1 Spare Parts Diagram of MS-(H)-Pro	Inside back
6 Initialization	7	16.2 List of Spare Parts of MS-(H)-Pro	Inside back
6.1 Initializing Sequence	7		
6.2 Default Settings	7		
6.3 Resetting Parameters to Factory Settings	8		
7 Operating Modes	8		
7.1 Operation Mode of MS-H-Pro	8		
7.2 Operation Mode of MS-Pro	8		
8 Function: Heating(MS-H-Pro)	9		
8.1 Working with External Temperature Sensor	9		

Preface

Welcome to the “MS-(H)-Pro Digital (Hotplate) Magnetic Stirrer User Manual” . Users should read this Manual carefully, follow the instructions and procedures, and beware of all the cautions when using this instrument.

Service

When help needed, you can always contact the Service Department of manufacturer for technical support in the following ways:

SCIOGEX, LLC

500 Four Rod Road

Suite 122

Berlin, CT 06037

USA

Tel: 1- (860) 828-5614

Fax: 1- (860) 828-5389

E-mail: info@scilogex.com

Website: [Http://www.scilogex.com](http://www.scilogex.com)

Please provide the customer care representative with the following information:




- Serial Number (on the rear panel)
- Description of problem (i.e., hardware or software)
- Methods and procedures adopted to resolve the problems
- Your contact information

Warranty

You have purchased a Scilogex instrument. 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 dealer. You may also send the instrument direct to our works, enclosing the invoice copy and by giving reasons for the claim. You would be solely liable for freight costs.

1 Safety Instructions

	<p>Warning!</p> <ul style="list-style-type: none"> • Read the operating instructions carefully before use the instrument. • Ensure that only trained staff work with the instrument. • Forbid to heat the substances with low-burning point or easy-volatile (MS-H-Pro)
	<p>Risk of burn!</p> <ul style="list-style-type: none"> • Caution when touching the housing parts and the heating plate. The heating plate can reach temperatures of 340 °C. • Pay attention to the residual heat after switching off.
	<p>Protective ground contact!</p> <ul style="list-style-type: none"> • Make sure that socket must be earthed (protective ground contact) before use.

- When work , wear the personal guard 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 an 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 :
 - The stirring bar breakaway because of too high speed
 - The instrument is not running smoothly, or container moves on the base plate.
 - Temperature must always be set to at least 25 °C lower than the fire point of the media used.
 - Beware 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 expansion 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 before hand for damage each time you use them. 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 cannot come off by themselves. Always disconnect the plug before fitting accessories.

- Ensure that the external temperature sensor is inserted in the media to a depth of at least 20 mm.
- When using metal vessels, do not place the temperature sensors on the bottom of the vessel. Placing sensors on the vessel bottom can cause excessively high temperatures to be measured especially in media which have poor conductivity. The tip of the measuring sensor must be at least 5 mm from the vessel bottom; a distance of 10 mm is ideal.
- The instrument can only be disconnected from the main power supply by pulling out the mains plug or the connector plug.
- The voltage stated on the label must correspond to the main power supply.
- Ensure that the mains power supply cable does not touch the heating base plate. Do not cover the device.
- The instrument may only be opened by experts.
- Keep away from high magnetic field.
- Observe the minimum distances between the devices, between the device and the wall and above the assembly

(min. 100 mm).

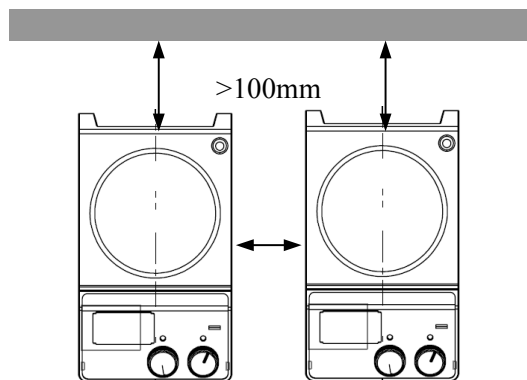


Figure 1

2 Proper use

The instrument is designed for mixing and/or heating liquids in schools, laboratories or factories. This device is not suitable for 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. If it happens, please contact manufacturer 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 packing includes the following items:

Items	Qty
Main unit	1
Power cable	1
Stirrer bar	1
User manual	1

Table 1

4 Trial run

- Make sure the required operating voltage and power supply voltage match.
- Ensure the socket must be earthed reliably.

- Ensure the power be off
- Plug in the power cable, ensure the power be on and begin initializing.
- Add the medium into the vessel with a stirring bar.
- Put the vessel on the workplate.
- Set the rated stirring speed and start stirring.
- Observe the stirring bar and LCD display.
- Set the rated temperature and start heating.
- Observe the real temperature on LCD display.
- 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 for technical support.

5 Control and Display

5.1 Control elements

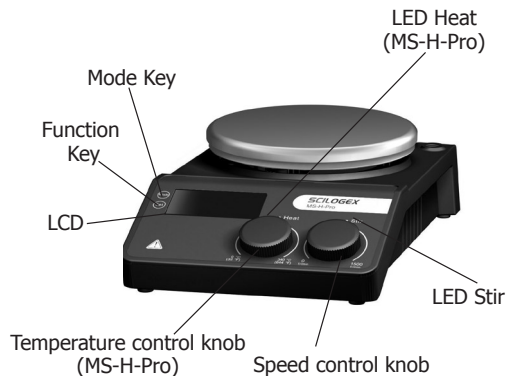
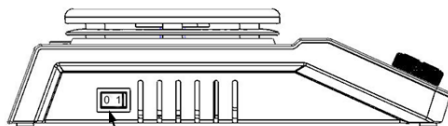


Figure 2



Power Switch

Figure 3

Items	Descriptions
Speed control knob Stir	Set the rated rotary speed. The function “Stirring” is switched ON or OFF via push the knob.
Temperature control knob Heat (MS-H-Pro)	Set the rated temperature. The function “heating” is switched ON or OFF via push the knob.
Mode Key Mode	Shift among the three operating modes: A, B, and C mode.
Set Key Set	Setting all parameters of the device
LCD	LCD displays the real working state and all settings.
LED Heat (MS-H-Pro)	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.

Table 2

5.2 Display

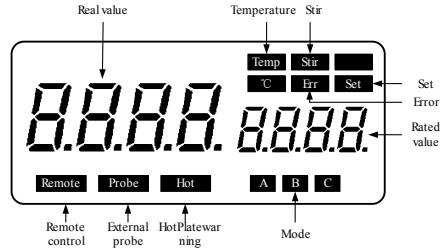


Figure 4

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.
Mode	Display the setting mode in order of A, B and C after pressing mode key.
Set	Press setting key to set function, and display Set characters.
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.
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.

Table 3



Note:

If both heating and stirring functions have been started at the same time, the display of function “heating” always has higher priority. If in this case speed is changed via the stirring knob, it display stirring speed and reverses to temperature in the duration of 5 seconds.

6 Initialization

6.1 Initializing sequence

- Turn on instrument by the power switch.
- The “Heat” and “Stir” LEDs and the LCD display flash about 3 times.
- LCD displays the workplate's safe temperature limit in “SAFE xxx° C” .
- LCD displays residual heat warning “rES On/OFF” .
- LCD displays stirring bar breakaway monitoring “br On/OFF” .
- LCD displays operating modes(A, B, C).
- LCD displays the “Probe” characters in case of connecting with external temperature sensors.

6.2 Default settings

MS-(H)-Pro is supplied with the following default settings

Items	Default settings
Operating mode	A
Setting temperature (° C)	25
SAFE (°C)	350
Setting rotary speed (rpm)	100
Residual heat warning	On
Stirring bar breakaway monitoring	OFF

Table 4

6.3 Resetting parameters to factory settings

Reset the parameters to the default settings, as follows:

- Turn off by the power switch ‘O/I’ to ‘O’
- Have the keys “Set” and “Mode” pressed down at the same time and switch on the main O/I switch. Release buttons after 5 seconds.
- The unit is now set to the factory default settings.

7 Operating modes

7.1 Operation modes of MS-H-Pro:

Operation mode A

- MS-H-Pro has heating and stirring functions.
- Users can control on the front panel or by remote PC.
- Residual temperature warning, safe temperature limit and

stirring bar breakaway monitoring can be set in this mode.

Operation mode B

- MS-H-Pro has heating and stirring functions.
- Users can control on the front panel or by remote PC.
- Residual temperature warning, safe temperature limit and stirring bar breakaway monitoring can be set in this mode.

Operation mode C

- MS-H-Pro maintains the state of the heating and stirring functions before the last switching off (mains OFF), as well as the data set last can be changed.
- Remote control can be used without supporting external temperature sensors.
- Residual temperature warning, safe temperature limit and stirring bar breakaway monitoring can’ t be set in this mode.

7.2 Operation modes of MS-Pro:

Operation mode A

- MS- Pro has heating and stirring functions.
- Users can control on the front panel or by remote PC.
- Stirring bar breakaway monitoring can be set in this mode.

Operation mode B

- MS-Pro maintains the state of the heating and stirring functions before the last switching off (mains OFF), as well as the data set last can be changed.
- Remote control can be used.
- Stirring bar breakaway monitoring can't be set in this mode.



Note:

Mode changing and parameter setting is forbidden when the instrument is running.
Switch OFF “Stir” and “Heat” control knob in advance before change mode.

8 Function: Heating(MS-H-Pro)

The device is controlled by Digital Temperature Control Technology, which has two separate safe circuit. The hotplate is kept at a constant temperature by a digital control circuit. The hotplate temperature can also be monitored 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 monitor the temperature of sample.

If external temperature sensors needed, it must be plugged in

before the device is switched ON.

- Ensure the external temperature sensors connecting firmly before heating.
- Set the temperature via turning the temperature control knob slowly to the ideal scale.
- When the heating function is switched on, the LED “Heat” will light up and the LCD will display the real temperature.
- The rated 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 via pushing the heat knob.

8.1 Working with external temperature sensor

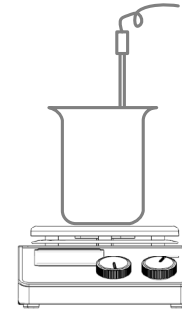


Figure 5

In the B mode, if the external temperature sensor is not plugged in, “Probe” will flash. If plugged in, “Probe” will be shown on the digital display to indicate that the sensor is operating. The external temperature sensors’ value and actual temperature are displayed.

Compared with the temperature control of the hotplate, the external temperature sensor can control the medium’s temperature more precisely.



Warning!

Forbid to Plug in/pull out external temperature sensor in heating.

8.2 Residual heat warning (HOT)

In the A or B mode, users can set the residual heat warning function, as follows:

- Press continuously the function setting key till the LCD displays “rES” .

Press the temperature regulation key to switch on or off the residual heat warning function, and the LCD displays “On” or “OFF” .

- Press continuously the function setting key till “Set” disappear.
- The residual heat warning function has been switched on or off.

In order to prevent the risk of burns from a hotplate, MS-H-Pro has a residual heat warning function. When the heating function is switched off and the hotplate temperature is still above 50°C, “Hot” will flash to warn that there is a hazard of burns from the hotplate. When the heating plate 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 can not be run.

8.3 Setting the safety temperature

In the A or B mode, the safety temperature can be set, as follows:

- Press continuously the function setting key till the LCD displays “SAFE” .
- Adjust the temperature setting key to set the safety temperature from 100 to 350°C .
- Press continuously the function setting key till “Set” disappear.
- The value of the safety temperature has been stored and setting is completed.

9 Function: Stirring

9.1 Basic Stirring

The function “stirring” is switched on or off via the rotary stirring knob. The motor speed is set on the knob (100 to 1500 rpm in steps of 10 rpm).

When both the 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.

9.2 Stirring bar breakaway monitoring

In the A or B mode, the stirring bar breakaway monitoring can be set, as follows:

- Press continuously the function setting key till the LCD displays “br” .
- Press the function setting key to switch on or off the stirring bar breakaway monitoring function, and the LCD displays “On” or “OFF” .
- Press continuously the function setting key till “Set” disappear.
- The stirring bar breakaway monitoring function has been

set.

Breakaway can occur when stirring at high speeds , when large stirring bars are being driven at speeds close to the maximum magnetically torque or sample viscosity changes. Using MS-(H)-Pro, stirring bar breakaway monitoring function can be set at the rotary speed range between 300 and 1500 rpm. When stirring bar breakaway is detected, stirring is stopped immediately to enable the stirring bar to be picked up. After this, stirring starts again and rotary speed increases up to the set speed. If a further stirring bar breakaway occurs within the next 3 minutes of stirring at a constant set speed, the stirring bar will be picked up again and stirring will restart but this time at the set speed reduced by 100 rpm. The speed will be reduced each time in 100 rpm steps until the minimum of 200 rpm is reached. In this case you should select new test conditions.

IMPORTANT:

You must calibrate and test the stirring bar breakaway monitoring function for your particular configuration taking into account the stirring bars, speed, vessel and medium you are using.

10 Remote control

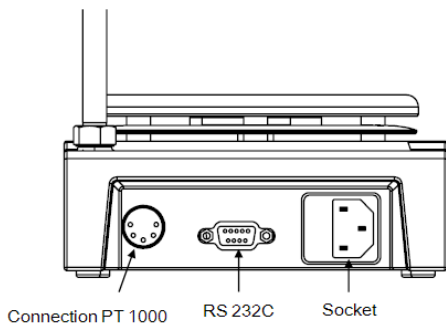


Figure 6

The unit can be controlled from an external PC (using the dedicated software) via the RS232 C 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 RS232 C, corresponding with DIN66020 Part 1. The allotment of the bushing can be taken from illustration.
- For the electrical properties of the interface lines and for the allotment of the signal status, standard RS232 C, corresponding with DIN66259 Part 1 applies.
- 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



NOTE:

Forbid to plug in or plug out the RS 232C communication line!

11 Faults

- Instruments can't be power ON
 - Check whether the power cable is plugged
 - 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.
- Temperature cannot reach set point
 - Check whether the safety temperature value is set too low
- Stir speed cannot reach set point
 - Check whether the stirring bar breakaway monitoring is ON
 - Excessive medium viscosity may cause abnormal speed reduction of the motor

- Heating cannot be started when push the temperature control knob, or stirring cannot be started when push the speed control knob.
 - Check whether the unit is in the mode setting program,
 - Exit from the mode setting and restart the heating/stirring functions.
- 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 still work and “Hot” flash).
 - Turn off residual heat warning function before powered OFF the unit.

If these faults are not resolved, please set the instruments to factory default setting, or take the unit to your technical service center.

12 Maintenance and Cleaning

- Proper maintenance can keep instruments working in a good state and lengthen its lifetime.
- Be careful not spray the cleanser into the instrument when cleaning.
- Unplug the power line when cleaning.
- Only use cleanser that we advised as below:

Dyes	Isopropyl alcohol
Construction materials	Water containing tenside / isopropyl alcohol
Cosmetics	Water containing tenside / isopropyl alcohol
Foodstuffs	Water containing tenside
Fuels	Water containing tenside

Table 5

- Wear the proper protective gloves during cleaning of the instrument.
- Before using other method for cleaning or decontamination, the user must contact the manufacturer ascertain that this method does not destroy the instrument.
- The enamel makes the hotplate easier to care for and more resistant to acids and bases. Because of it, however, the heating plate 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.
- The instrument must be cleaned and put it into the initial packaging carton before sending to service for repair, avoiding the contamination of hazardous.
- Use the instrument in a dry clean room and temperature stable environment.

13 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/EWG

Instrument guidelines: 73/023/EWG

14 Technical data

Voltage [VAC]	200-240 / 100-120
Frequency [Hz]	50/60
Power [W]	550(MS-H-Pro) /50(MS-Pro)

Stirring point position quantity	1
Max. stirring quantity (H ₂ O) [L]	20
Max. magnetic bar [mm]	80
Motor type	External rotor brushless motor
Max. power input of motor [W]	18
Max. power output of motor [W]	10
Speed range [rpm]	100 ~ 1500
Rotary speed display	LCD
Speed display accuracy [rpm]	1
Hotplate material	Stainless steel/porcelain enamel
Ø of the hotplate [mm]	Ø 135
Heating power [W]	500(MS-H-Pro)
Heating rate (1L water) [K/min]	6(MS-H-Pro)
Temperature range [°C]	RT~340(MS-H-Pro)
Temperature display [°C]	LCD(MS-H-Pro)
Temperature display accuracy [°C]	0.1(MS-H-Pro)
Control accuracy of heating temperature [°C]	1(MS-H-Pro)

The safety temperature range of the hotplate [°C]	100~350(MS-H-Pro)
Temperature sensor in medium	PT1000(MS-H-Pro)
Control accuracy of heating temperature with temperature sensor [°C]	0.2(MS-H-Pro)
Dimensions (mm)	280 × 160 × 85
Weight [kg]	2.8
Permitted ambient temperature[°C]	5 ~ 40
Permitted relative humidity	80%
Protection class acc. to DIN 60529	IP42
RS232 interface	Yes

Table 6

15 Products and Accessories

Cat.No.	Description
811123019999	MS-H-Pro Digital Hotplate Magnetic Stirrer , Porcelain enamel, Cn plug, 220V/50Hz/60Hz

811123029999	MS-H-Pro Digital Hotplate Magnetic Stirrer , Porcelain enamel,USA plug, 110V/50Hz/60Hz
811123039999	MS-H-Pro Digital Hotplate Magnetic Stirrer , Stainless Steel, Cn plug, 220/50Hz/60Hz
811123049999	MS-H-Pro Digital Hotplate Magnetic Stirrer , Stainless Steel, USA plug, 110V/50Hz/60Hz
811123059999	MS-H-Pro Digital Hotplate Magnetic Stirrer , Porcelain enamel, Euro plug, 220/50Hz/60Hz
811123069999	MS-H-Pro Digital Hotplate Magnetic Stirrer , Porcelain enamel, UK plug, 220V/50Hz/60Hz
811123109999	MS-H-Pro Digital Hotplate Magnetic Stirrer , Stainless Steel, Euro plug, 220V/50Hz/60Hz
811123119999	MS-H-Pro Digital Hotplate Magnetic Stirrer , Stainless Steel, UK plug, 220V/50Hz/60Hz
811123149999	MS-H-Pro Digital Hotplate Magnetic Stirrer , Porcelain enamel, USA plug, 220V/50Hz/60Hz

811113019999	MS-Pro Digital Magnetic Stirrer , Stainless Steel, Cn plug, 220V/50Hz/60Hz
811113029999	MS-Pro Digital Magnetic Stirrer , Stainless Steel, USA plug, 110V/50Hz/60Hz
811113039999	MS-Pro Digital Magnetic Stirrer , Stainless Steel, Euro plug, 220V/50Hz/60Hz
811113049999	MS-Pro Digital Magnetic Stirrer , Stainless Steel, UK plug, 220V/50Hz/60Hz
811113089999	MS-Pro Digital Magnetic Stirrer , Stainless Steel, USA plug, 220V/50Hz/60Hz
Accessories	
18900001	MS 135.1 Carrier plate, Used with MS135.2--5
18900002	MS 135.2 Quarter, 4 ml reaction vessel
18900003	MS 135.3 Quarter, 20 ml reaction vessel
18900004	MS 135.4 Quarter, 30 ml reaction vessel
18900005	MS 135.5 Quarter, 40 ml reaction vessel
18900048	MS 135.6 Quarter, 8ml reaction vessel
18900049	MS 135.7 Quarter, 16 ml reaction vessel
18900006	Stirring bars (10mm x 6mm) , 1pcs/pk
18900007	Stirring bars (15mm x 8mm) , 1pcs/pk
18900008	Stirring bars (20mm x 8mm) , 1pcs/pk

18900009	Stirring bars (25mm x 8mm) , 1pcs/pk
12500005	Stirring bars (30mm x 6mm) , 1pcs/pk
18900011	Stirring bars (40mm x 8mm) , 1pcs/pk
12500004	Stirring bars (50mm x 8mm) , 1pcs/pk
18900013	Stirring bars (65mm x 8mm) , 1pcs/pk
18900014	Stirring bars (80mm x 13mm) , 1pcs/pk
18900015	Stirring bar mover, 1pc
18900016	PT1000 Temperature probe for MS-H-pro
18900017	Stander kit of PT1000
18900018	F100 unit cover, for none heat plate model MS-Pro,MS-S
18900019	F101 unit cover, for heat plate model MS-H-Pro,MS-H-S
18100319	9-Pin interface line, suitable for StirPC software.

Table 6

Note: The software StirPC can be download free on our website www.scilogex.com

16 Main spare parts

16.1 Spare parts diagram

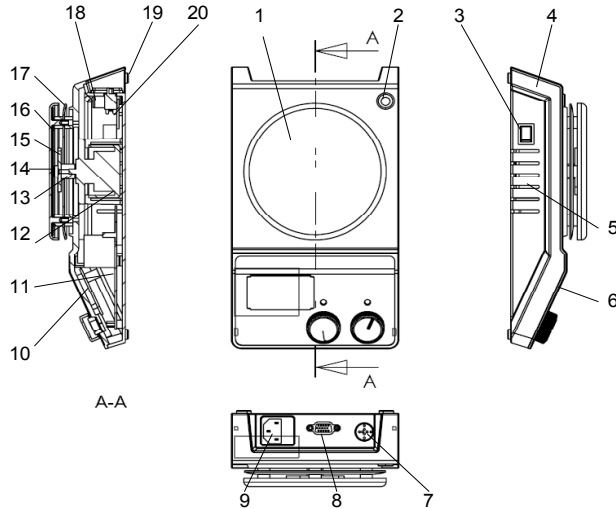


Figure 8

16.2 List of spare parts

No	Name	No.	Name
1	Workplate	11	Driver circuit board
2	Hole for external temperature sensor holder	12	Direct-current Motor without brush
3	Mains switch	13	Turntable
4	Housing	14	Internal temperature sensors
5	Ventilation	15	Permanent magnet
6	Control panel	16	Heating parts
7	External temperature sensors' socket	17	Protective plate
8	Remote control socket	18	Rear board
9	Mains socket	19	Rubber bush
10	Main circuit board	20	Interface circuit board

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