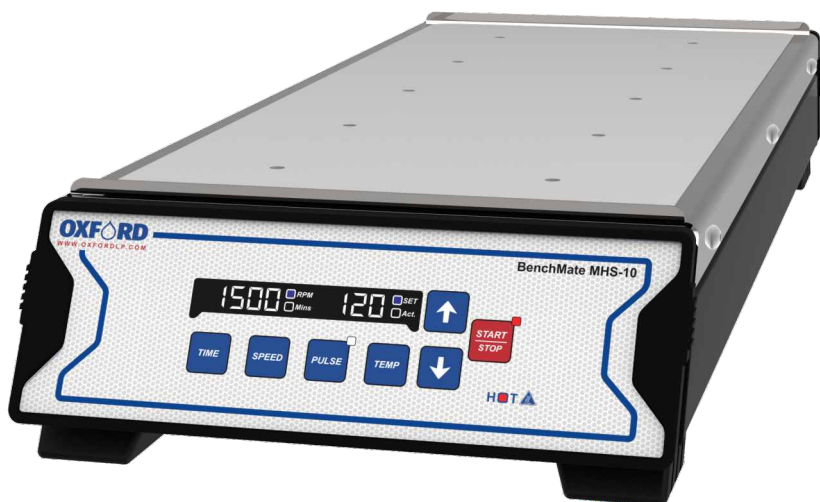


OXFORD

LAB PRODUCTS

Benchmate MHS-5 & MHS-10 Hot Plate Stirrer



Visit www.oxfordlp.com to see the complete product offering and learn more about our products.

Call us at 800-554-4920 to schedule a product demonstration or to learn about the best consumables for your equipment.

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1. INTRODUCTION

The Oxford MHS-5 and MHS-10 multi-position magnetic heated stirrers offers efficient, simple and safe stirring and/or heating of multiple solutions at once. This product enables precise and independent control of temperature, stirring speed and time for maximum versatility. This unit also comes with a programmable pulse mode for optimal mixing of difficult-to-dissolve solutions. The space saving stirrer is designed to safely maximize the use of precious bench-top space.

2. INTENDED USE

This stirrer is designed for use in any laboratory environment where it is necessary to dissolve or mix solution or heat liquids or solutions.

This heated stirrer is suitable for simultaneously or separately heating and stirring multiple solutions at once. It is ideal for mixing solutions, dissolving solutes in solvents (the pulse function aids in dissolving particularly difficult-to-dissolve compounds), heating solutions, maintaining suspensions in liquids, keeping multiple solutions at a fixed temperature.




Note: *This user guide is intended to assist with the operation and care of the unit only and not for its repair. The customer should not attempt to service or repair the unit. If repairs are required, please contact the supplier.*

3. SAFETY PRECAUTIONS

For safe and proper use of this equipment, each user must read the user manual & observe proper safety precautions.

- Do NOT place any steel or magnetic material on the heating plate of the instrument. Doing so can affect the magnetism of the device. Only the use of glass beaker and flasks with laboratory standard magnetic stirring bars is recommended.
- Only use the device on clean, stable, and flat fire-proof surfaces.
- The heating plate must be kept clean and intact. Clean with a soft cloth and mild detergent.
- Do not use to stir liquids of volumes greater than 400 mL per stirring position with a 25 mm stirring bar as this may lead to improper mixing.
- Wear all necessary protective equipment in accordance with the hazardous category of the substance(s) to be stirred / heated to protect the user against:
 - Splashing and evaporation of substance(s).
 - Ejection of parts.
 - Release of toxic or combustible gases.
- If moving the device to a new location, ensure to lift it with both hands supporting the sides and base at the front and back.
- Do not use damaged beakers, flasks, stirring bars or any other component when using this device.
- Reduce the stirring speed if:
 - The substance(s) is/are splashing out of the vessel.
 - The container moves on the heating plate.
 - The appliance is not running smoothly.
- Wear protective gloves when cleaning the device.

3. SAFETY PRECAUTIONS

- The heating plate will be hot after any heating operation. Do not touch the top surface of the device until the “HOT” LED indication goes out. 
- Only stir pathogenic material in closed vessels under a suitable extractor hood. Do not operate the appliance in an explosive atmosphere, with hazardous substances or submerged under water.
- Only use this device to mix substances which will not react dangerously to being heated and/or mixed together, or to other external energy sources such as light irradiation, ambient temperature etc. 
- The user should be aware that any abrasion of the stirring bar or other accessories used can cause contamination of the substance to be stirred with particles or pieces of that accessory.
- PTFE can chemically react with molten or dissolved alkaline earth metals or fine powders of metals from groups two and three of the periodic table at temperatures above 300-400°C. Only elementary fluorine, chlorine trifluoride and alkaline metals attack PTFE, and halogen hydrocarbons have a reversible swelling effect on PTFE.
- In case of power failure/removal, the stirring mechanism will not start automatically following restoration of power to the unit. 
- Only heat substances which have a flash point greater than 150°C.

4. FEATURES

- High Performance multi-position stirrer with 5 and 10 stirring positions.
- Designed for optimal use of benchtop space (small footprint).
- Variable speed, temperature and time setting, and a digital display.
- Homogeneous temperature distribution across the heating plate using multiple sensor technology.
- Brushless DC motor for long life and maintenance free operation.
- Simultaneous display of actual and set temperature through digital display.
- Quiet and consistent stirring at all positions.
- Dedicated LED indicating “HOT” heating plate.
- Pulse mode for vigorous mixing needs.
- Water-proof heater with inbuilt safety cut-off.

5. TECHNICAL SPECIFICATIONS

| Product | MHS-5 | MHS-10 |
|--------------------------------------|-----------------------------|-----------------------------|
| Motor Type | BLDC | BLDC |
| Number of stirring positions | 5 | 10 |
| Max stirring volume per position | 400mL | 400mL |
| Max stirring volume (total) | 2 L | 4 L |
| Speed range | 300 to 1500 rpm | 300 to 1500 rpm |
| Time range | 1 to 999 minutes & Infinite | 1 to 999 minutes & Infinite |
| Temp. range | Ambient to 120°C | Ambient to 120°C |
| Speed control increments | 10 rpm / Step | 10 rpm / Step |
| Time control increments | 1 min / Step | 1 min / Step |
| Temp. control increments | 1°C / Step | 1°C / Step |
| Recommended stirring bar length | 25 mm | 25 mm |
| Heat output | 375 W | 375 W |
| Set-up plate dimensions | 456 x 118 mm | 460 x 178 mm |
| Dimensions (L x W x H) | 136 x 562 x 75 mm | 196 x 565 x 75 mm |
| Weight | 3 Kg | 5 Kg |
| Permissible ambient temp. | 5 - 40°C | 5 - 40°C |
| Permissible relative humidity | 80% | 80% |
| Protection class according to DIN EN | IP 42 | IP 42 |
| RS 232 Interface | Optional | Optional |
| Input Voltage | 230/110VAC, 50/60Hz | 230/110VAC, 50/60Hz |
| Equipment Operating Voltage | 9VDC | 9VDC |
| Power Consumption | 400 W | 400 W |

6. STANDARD ACCESSORIES

- Power Cord
- User Manual
- Warranty Card
- Reference Stir Bar

7. INSTALLATION

The multi-position stirrer is provided in a stiff packed box. Open the box and remove the packaging. Take care while unpacking the device and gently remove all accessories. Gently place the device on a firm and level surface. The user manual should be kept with the device for easy access and reference for new users. Please keep all packaging in safe storage for at least two years for warranty purposes.

7.1 POSITIONING

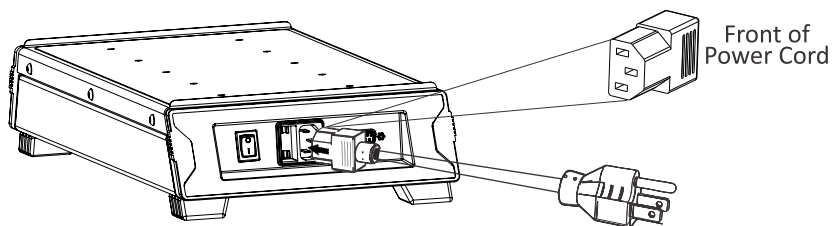
Place the stirrer on a flat and level surface; ensure that the four feet of the stirrer stands on the surface firmly. Avoid installing on a slippery or uneven surface, or a surface prone to vibration.

- The ideal ambient temperature is $20^{\circ}\text{C} \pm 5^{\circ}\text{C}$; avoid placing the unit in direct sunlight.
- Maintain a clearance of at least 20 cm from all side to allow for cooling efficiency.
- Keep away from heat or water to avoid temperature control issues.
- Do not place the stirrer in a place where it may be difficult to operate the device.

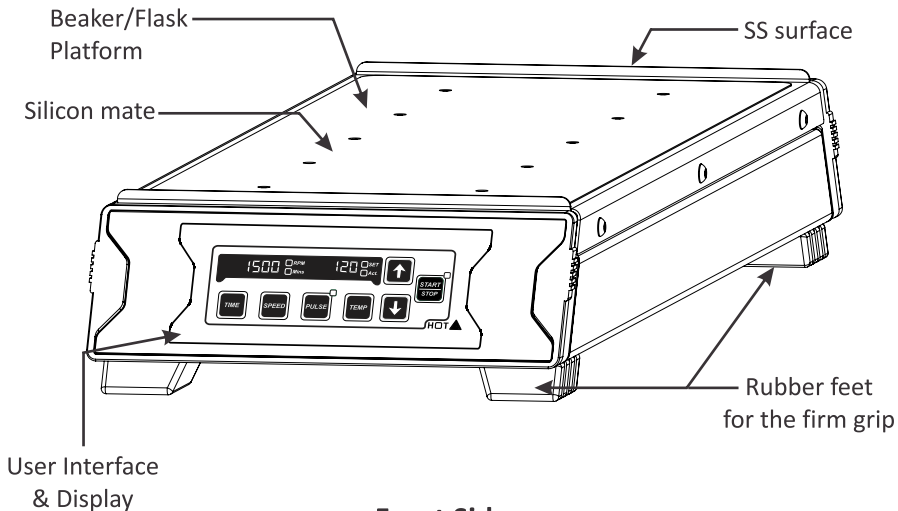
7. INSTALLATION

7.2 CONNECTING POWER CORD

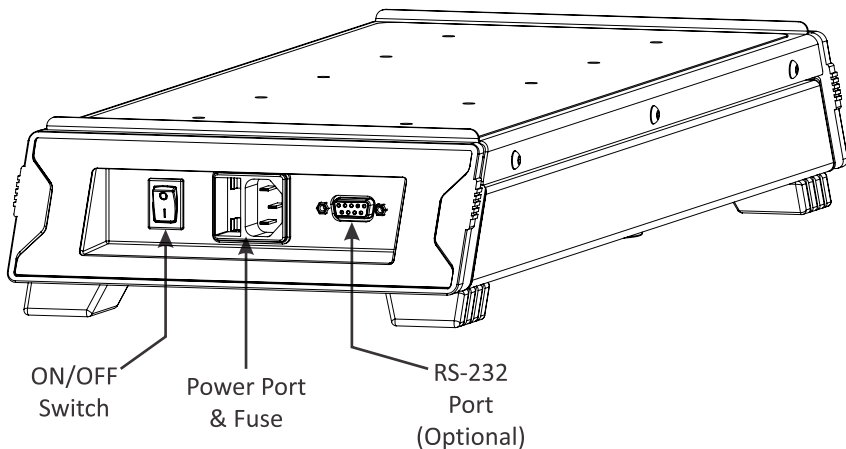
Connect one end of the power cord to the rear side of the unit and other end to the preferred power supply socket, as shown in the figure below. Ensure that you push the power cord firmly for a proper connection.



8. STANDARD COMPONENTS LISTING

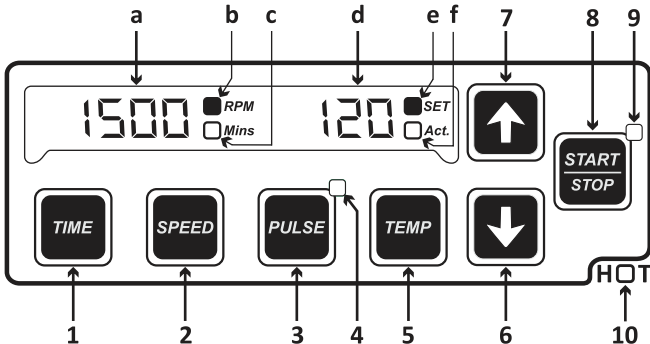


Front Side



Rear Side

9. USER INTERFACE AND DISPLAY



Display

| | | | |
|--|---|--|---|
| a) 1500 | b) <input type="checkbox"/> RPM c) <input type="checkbox"/> Mins | d) 120 | e) <input type="checkbox"/> SET f) <input type="checkbox"/> Act. |
| Display shows current speed & time values | LEDs indicates which parameter is selected - Speed or time | Display shows Set or Actual Temperature value in °C | LEDs indicates which temp. value is displayed - SET or ACTUAL |

User Interface

| | |
|-------------------|--|
| 1) Time | : Press "Time " to select time value. Then press "+/-" to set Time value in minutes. |
| 2) Speed | : Press "Speed " to select Speed value. Then press "+/-" to set Speed value in RPM. |
| 3) Pulse | : Press "Pulse " to start pulse mode operation. |
| 4) Pulse LED | Pulse LED glow to indicate Pulse mode activation. |
| 5) Temp | : Press "Temp " to select Temperature value. Then press "+/-" to set Temp value in °C. |
| 6) ↑ Increment | : Press "+/-" " to increase values. |
| 7) ↓ Decrement | : Press ""+/-" " to decrease values |
| 8) Start/Stop | : Press "Start/Stop " to start and stop operation. |
| 9) Start/Stop LED | Glowing LED indicates Start of Operation. Off LED indicates Stop of Operation. |
| 10) HOT LED | : Glow when platform of the stirrer is HOT above 50°C |

10. OPERATION

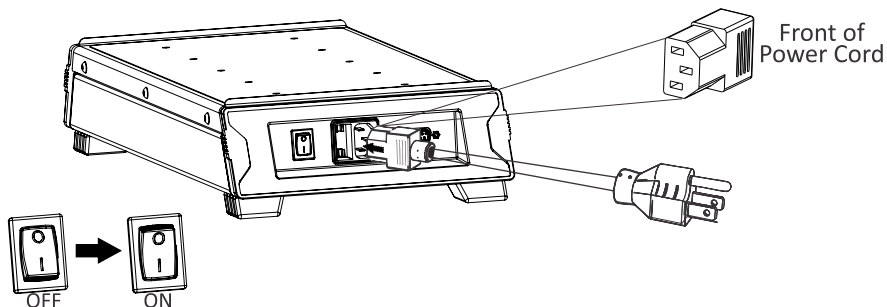
10.1 VESSELS AND POSITIONING

Use flat-bottomed, chemical resistant and heat-resistant glass vessels. Vessels should have a thin and even wall thickness and smooth surfaces, as this will improve the efficiency of the magnetic stirring bar – uneven surfaces will reduce the stirring power and reduce the efficiency of stirring.

Place one magnetic stirrer bar in each flask. Place the flasks, containing the stirrer bar and solution to be stirred, in the center of the stirring point of the selected placement spot on the stirring/heating platform. This will ensure the optimum stirring effect.

If the magnetic stirrer bar is not in the center of the flask during stirring, check that the flask is positioned centrally over the desired stirring spot, and re-position the flask as necessary around the stirring spot until the magnetic stirrer bar enters a normal stirring motion in the center of the flask. If this does not resolve the issue, reduce the stirring speed, or the amount of liquid in the flask.

10.2 SWITCHING ON THE STIRRER



10. OPERATION

After connecting the power cord, switch ON the mains and switch ON the stirrer from rear side as shown in above image.

10.3 SETTING THE TIME AND SPEED

The time is displayed in minutes. The stirrer timer can be set to any time within the range of 1 min to 999 mins (in one minute increments), or to infinite time mode. Infinite time is seen as “∞” on the display. Press “TIME” to select time value and press the increment or decrement arrow buttons to set the time. When the Time button is pressed, the “Mins” display will blink indicating the time value is selected. Once the time value is selected, a single press of the increment or decrement arrow buttons will increase or decrease time value by 1 min, respectively. A long press of the increment or decrement button will quickly increase or decrease the time value. The time value is saved after five blinks. The timer is a countdown timer showing the time remaining before the heating /stirring program ends. Once the selected duration of time runs its course, the stirrer/heater stops.

Speed is displayed as “RPM”. The minimum and maximum speed of the stirrer is 300 rpm and 1500 rpm, respectively. When the device is used for the 1st time, the speed will be set to zero and shown as “0000” on the display. Once a speed value is selected, a single press of either the increment or decrement buttons will increase or decrease the speed value by 10 rpm, respectively. While a long press of the increment or decrement button will quickly increase or decrease the speed value. The speed value is saved after five blinks.

10. OPERATION

10.4 SETTING THE TEMPERATURE

On every startup the temperature function will be in an “OFF” state. To set Temperature, single press the “TEMP” button to select Temperature settings and then press the increment or decrement button to set the desired temperature value. Once the temperature is set, the display will indicate the “SET” Temperature.

The temperature value can be set at any value between ambient temperature and 120°C. Pressing the increment or decrement button while setting the temperature will increase or decrease the temperature value by 1°C. A long press of the increment or decrement button will quickly increase or decrease the temperature value. The temperature value will be saved after five blinks.

To see the actual temperature value, single press the Temp button again and the “Act.” LED will glow indicating that the value displayed is the actual current temperature. By default, the actual temperature value will be room temperature. The Act. temperature is useful to determine how close the actual temperature is to the SET temperature, particularly while the heating plate is heating up.

***Notes:** Exercise cautions when touching the device casing or heating plate during and after it has been in use by yourself or others. The heating plate can reach upto 125.*

10.5 SETTING PULSE MODE

Press “PULSE” to activate pulse mode. In pulse mode, the stirring direction will change between clockwise and counter-clockwise

10. OPERATION

direction for every 30 seconds. However, this interval time can be set from 30 to 99 seconds. Upon selecting pulse mode, the “PULSE” button will glow. Press the “PULSE” button again to STOP pulse mode.

10.6 PROGRAMMABLE PULSE MODE

By default, the pulse mode cycle time is 30 seconds (i.e. 30 seconds clockwise followed by 30 seconds anti-clockwise). With programmable pulse mode, the user can modify the cycle time to their desired duration within the range of 30 secs to 99 secs. Long press the pulse button to select pulse mode cycle time. The time display will change to “s 30” where “30” means pulse cycle time in seconds (s is seconds). The user can now modify pulse cycle time using the increment and decrement buttons.

10.7 START AND STOP OPERATION

Once all desired parameters like Speed, Time & Temperature are set, press the “START/STOP” button once to START operation. Once operation starts, the LED adjacent to “START/STOP” will glow.

To STOP operation, press the “START/STOP” button again. The LED adjacent to button will go off indicating that the operation is stopped.

Make sure that stirring operation is started only after the flask/beaker is placed on the surface. Placing the beaker/flask on the surface during any operation can lead to improper stirring or no stirring at all.

Note: Proper stirring is achieved only if the beaker/flask is placed on the surface

10. OPERATION

before any run operation and only if the speed is increased gradually for stirring.

10.8 HOT INDICATION



Do not touch the heating surface if the “HOT” LED is Glowing. The “HOT” LED indicates that the temperature of the heating surface is above 50°C.

11. TROUBLE SHOOTING

Any type of malfunction during operation can be identified by the error message on display. Proceed as follows in such cases.

1. Problem : No Display

- Solution :
- 1) Check main power is available
 - 2) Check that power adaptor is working properly and it is properly connected at both ends.
 - 3) If the problem still persists then call authorized service person

2. Problem : Err 1

Root Cause : Motor Struck

- Solution :
- 1) First switch off the equipment, plug out the power adaptor and Plug it in again
 - 2) If the problem still persists then call authorized service person

3. Problem : Err 3

Root Cause : If the temperature of heating plate is higher than set value of temperature

- Solution :
- 1) Switch off & let it cool down then Restart the device
 - 2) If the problem still persists then call authorized service person

4. Problem : Err 4

Root Cause : Failure of safety circuit

- Solution :
- 1) Switch off & let it cool down then Restart the device
 - 2) If the problem still persists then call authorized service person

11. TROUBLE SHOOTING

5. Problem : Err 6

Root Cause : Internal Temperature of device exceeds 80°C

Solution : 1) Switch off & let it cool down then Restart the device

2) Change the parameters and observe the max ambient temperature

3) If the problem still persists then call authorized service

6. Problem : Err 7

Root Cause : Thermocouple not connected / damage

Solution : 1) Switch off the device and allow it to cool down then Switch On

2) If the problem still persists then call authorized service person

7. Problem : Err 8

Root Cause : Thermocouple response poor

Solution : 1) Switch Off the device and call authorized service person

12. WARRANTY STATEMENT

This product is warranted to be free from defects in material and workmanship for a period of two (2) years from date of purchase. Your product will be duly repaired upon prompt notification in compliance with the following conditions:

- This warranty is valid only if the product is used for its intended purpose and within the guidelines specified in this instruction manual. This warranty does not cover damage caused by accident, neglect, misuse, improper service, natural forces or other causes not arising from defects in original material or workmanship. This warranty does not cover any incidental or consequential damages, commercial loss or any other damages from the use of this product.
- The warranty is invalidated by any non-factory modification, which will immediately terminate all liabilities on us for the products or damages caused by its use. The customer shall be responsible for the product or use of products as well as any supervision required for safety. If requested the products must be returned to the distributor in well packed and insured manner and all shipping charges must be paid.

***Note:** Some states do not allow limitation on the length of implied warranties or the exclusion or limitation of incidental or consequential damages. This warranty gives you specific legal rights. This warranty is given expressly in lieu of all other warranties, expressed or implied.*

- The purchaser agrees that there is no warranty of merchantability or of fitness for any intended purpose and that there are no other

12. WARRANTY STATEMENT

remedies or warranties, expressed or implied, which extend beyond the description on the face of the agreement. This warranty is only applicable to the original purchaser.

Products received without proper authorization will not be processed for warranty or service. All items returned for service should be sent with postage prepaid in the original packaging or other suitable packaging, padded to avoid damage. We will not be responsible for damage incurred by improper packaging.

Note: *This warranty is valid only if the warranty is registered with the supplier within 30 days from the date of purchase*

| | |
|---|----------------|
| For your reference, make a note of the serial number, date of purchase and supplier here. | |
| Serial No.: | Purchase Date: |
| Supplier: | |

13. PRODUCT DISPOSAL

By observing proper disposal of the equipment, you will help conserve natural and environmental resources along with protecting human health. This equipment is marked with the crossed out wheeled bin symbol to indicate that this equipment must not be disposed of with unsorted waste. The user is responsible for correctly disposing of the equipment by handing it over to an authorized facility for separate collection and recycling. It is also your responsibility to decontaminate the equipment in case of biological, chemical and/or radiological contamination, to protect from health hazards the persons involved in the disposal and recycling of the equipment.



Please contact your local dealer from whom you originally purchased this equipment to get more information about where you can drop off your waste equipment

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Call us at 800-554-4920 to schedule a product demonstration or to learn about the best consumables for your equipment.

Send warranty card information to:

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San Diego, CA 92121

Thank You for choosing Oxford Lab Products for your research.