ARGOLAB M2-D PRO MAGNETIC HEATED STIRRER USER MANUAL



1. Safety instructions

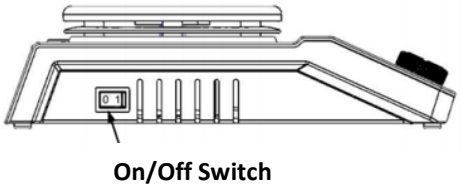
	• Read the instructions carefully before using • Ensure that only qualified personnel use this tool • Do not heat highly flammable or highly volatile substances
	• Be very careful when touching the heating plate. It can reach temperatures of up to 340 °C • Be careful when touching the aluminum parts of the case and the heating plate. Both can reach dangerous temperatures • Be aware of residual heat on the heating plate and case after switching off the stirrer • The device may only be transported/moved once the heating plate has cooled down and the instrument has been disconnected from the power supply
	• Before use, ensure that the instrument is connected to a grounded socket

During use, personnel must prevent risks of:

- Splashes and/or evaporation of liquids and emissions of toxic or combustible gases;
- Place the instrument in a suitable area, on a stable, clean, non-slip, dry and fireproof surface;
- Do not use the instrument in explosive atmospheres, containing hazardous substances or under water;
- Gradually increasing the stirring speed;
- The set heating temperature must always be at least 25 °C lower than the combustion temperature of the heated substance used;
- Pay close attention to risks due to: flammable materials or samples with low boiling points, overfilling of samples, containers that are unsafe and/or unsuitable for stirring or heating;
- Use any pathogenic samples only in closed containers;
- Check that the instrument and accessories are in optimal condition before use. Never use damaged components. Optimal safety and operation are only guaranteed if the instrument and accessories described are in good working order. Any accessories must also be securely connected to the device;
- The instrument can be powered off by disconnecting it from the power supply or by disconnecting the cable from the instrument;
- The supply voltage indicated on the instrument label must correspond to that of the mains to which it is connected;
- Ensure that the power cable does not touch the heating plate;
- The instrument may only be opened by specialized technicians;
- Keep the instrument away from electromagnetic fields;
- Observe the minimum distance between devices and between the device and the wall (minimum 10 cm).

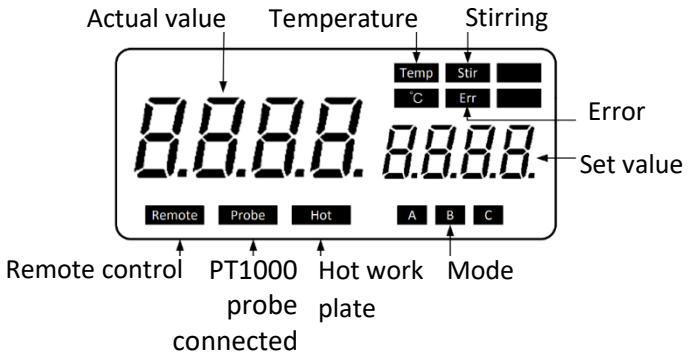
2. Controls and indicators





COMMAND	DESCRIPTION
Stirring knob	Set the required stirring speed between 0 and 1500 rpm by turning the knob. The stirring function is activated/deactivated by turning the same knob.
Stirring LED	When the stirring function is active, the stirring LED is lit.
Heating knob	Set the required temperature between room temperature and 340 °C. The heating function is activated/deactivated by turning the knob itself.
Heating LED	When the heating function is active, the heating LED is lit.
On/Off key	Switches the instrument on and off.
LCD display	The LCD display shows the actual values and the set parameters.

3. Display



COMMAND	DESCRIPTION
Temp and °C	These icons appear when the heating function is active
Stir	This icon appears when the stirring function is active
Mode	View the operating mode (A, B, or C)
Hot	It warns that the plate may still be too hot and therefore potentially dangerous. This function is also active when the heating function is deactivated if the plate temperature is above 50 °C
Probe	The external probe is connected to the instrument
Remote	The instrument is remotely controlled
Err	View an operating error
Actual value and set value	Viewing the current heating and/or stirring parameters

Note: If the heating and stirring functions have been started simultaneously, the “heating” function display always has priority. If the speed is changed, the new value is displayed for 5 seconds.

4. General functioning

- Place the instrument on a stable surface, ensure that the stirring and heating control knobs are set to minimum and connect the power supply;
- Switch on the instrument by pressing the On/Off key on the side;
- Place a container (max. 20 litres) with liquid, inside which a magnetic stir bar (supplied, max. 80 mm long) has already been placed;
- Turn the stirring control knob to set the desired rotation speed;
- Turn the heating adjustment knob to set the desired temperature (the maximum temperature indicated is that which the internal heating element can reach, NOT the plate or the sample on it).

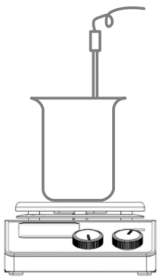
5. Operating modes

Operating mode A
The user can adjust the parameters using the front controls or via a PC connected to the RS232 port. The residual temperature safety function, the safety temperature limit and the automatic braking function for magnetic anchor detachment can be modified.

Operating mode B
This mode is only active when an external probe is connected. The user can adjust the parameters using the front controls or via a PC connected to the RS232 port. The residual temperature safety function, the safety temperature limit and the automatic braking function for magnetic anchor detachment can be modified.

Operating mode C
The instrument stores the last speed and temperature settings set before the last shutdown. Remote control from a PC can be used, but without connecting the external probe. The residual temperature safety function, the safety temperature limit and the automatic braking function for magnetic anchor detachment CANNOT be modified.

6. Heating mode with external temperature probe



The device control system is digital and the temperature control system in particular has two separate safety circuits. The plate is kept at a constant temperature by a digital control circuit. The plate temperature is monitored by two internal temperature probes (PT1000) integrated into the plate itself. The external PT1000 probe is able to monitor the temperature of the heated sample. If the external temperature probe is required, it is advisable to connect it before switching on the instrument. Procedure:

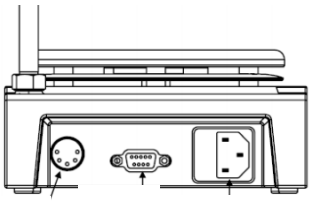
- Ensure that any external probe is properly connected to the instrument.
- Set the temperature using the adjustment knob and bring it to the desired value.
- When the heating function is active, the “Heating” LED lights up and the display shows the actual temperature.
- The set temperature will be displayed on the right side of the screen.
- The heating function is switched On/Off by pressing the temperature adjustment knob.

With the external temperature probe plugged in, the word “Probe” will appear on the display to indicate that the probe is operating.

7. Remote control

The instrument can be controlled from an external PC via the RS232 serial port located on the rear of the instrument. Data transmission to the PC is only possible upon request from the PC itself.

- Transmission method: Asynchronous signal
- Transmission mode: Fully Duplex
- Transmission speed: 9600 bits/s



8. Cleaning and maintenance

- Proper maintenance of the instrument ensures its good condition and prolongs its life;
- Disconnect the power cable during cleaning;
- When cleaning, take care not to spray the detergent inside the instrument;
- Use only non-aggressive detergents that do not contain corrosive substances;
- Before proceeding with cleaning or decontamination, the user must ensure that the method used will not damage the instrument;
- Wear appropriate protective equipment when cleaning with chemicals;
- If the instrument needs to be sent for technical assistance, it must be properly cleaned and decontaminated of any pathogens. It is also advisable to place the instrument in its original packaging before sending it to the repair service.

9. Faulty operation

- In the event of a fault with the instrument, it is advisable to switch it off;
- Switch off the main On/Off switch for a few seconds and then switch the unit back on;
- Possible malfunctions displayed on the instrument:

Error code	Problem description	Cause	Solution
E01	No operational response	No power supply	Check the power supply and then switch the instrument back on
		Fuse failure	Replace fuse
		Connection error	Open the instrument, check all connections and reconnect them
E02	The instrument doesn't heat	The required temperature has not been set	Set the required temperature and turn the heating knob to switch on the indicator
		Driver board failure	Replace the Driver board
		Heating element failure	Replace the heating element
E03	The instrument doesn't stir	The required speed has not been set	Set the speed you want and press the speed knob to turn on the indicator
		Driver board failure	Replace the Driver board
		Motherboard failure	Replace the motherboard
		Motor failure	Replace the motor

If any of the problems mentioned occur, please contact technical support.

10. Related regulations

The instrument has been manufactured in compliance with the following safety standards:
EN 61010-1
UL 3101-1
CAN/CSA C22.2(1010-1) EN 61010-2-10
The instrument has been manufactured in compliance with the following EMC standards:
EN 61326-1
European guidelines:
EMC guidelines: 89/336/EWG
Machine guidelines: 73/023/EWG

11. Technical specifications

Work surface size (Ø)	135 mm
Work surface material	stainless steel cover with ceramic coating
Display	Digital LCD
Motor type	Brushless DC motor
Stirring positions	1
Max. stirring quantity (H_2O)	20 l
Max. magnetic bar (length)	80 mm
Speed range	100 – 1500 rpm
Stirring interface	Knob and digital LCD display
Heating interface	Knob and digital LCD display
Heating temperature range	Room Temp. … 340 °C
Accuracy of heating fluid temperature control	± 1 °C (< 100 °C) / ± 1 % (> 100 °C)
Overheating protection	420 °C
Temperature display accuracy	± 0,1 °C
"HOT" warning	50 °C
External temperature probe	PT1000 (accuracy ± 0,2 °C)
Data Transmission Interface	RS232
Protection class	IP21
Motor output power	10 W
Power	550 W
Voltage, frequency	100 – 240 V, 50 / 60 Hz
Size (W x D x H)	160 x 280 x 100 mm
Weight	2,8 kg
Permissible ambient temperature and humidity	5 – 40 °C, 80% RH

12. Disposal of electronic equipment



Electrical and electronic equipment bearing this symbol cannot be disposed of in public landfills. In accordance with the WEEE Directive 2012/19/EU, European users of electrical and electronic equipment have the option of returning used equipment to the Distributor or Manufacturer when purchasing new equipment. The illegal disposal of electrical and electronic equipment is punishable by a financial penalty.