

# PS-3401 Heater / Stirrer

Model PS-3401



## Operating Instructions

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## Safety instructions

### For your protection



- **Read the operating instructions in full before starting up and follow the safety instructions when in use.**
- Ensure that only trained staff works with the device.
- Socket must be earthed (protective ground contact).
- **Caution-Magnetism!** Effects of the magnetic field have to be taken in to account (e.g. data storage media, cardiac pacemakers...).
- The heating plate can reach temperatures of 310°C and pay attention to the residual heat after switching off.
- The main power supply cable should not touch the heating plate.
- Wear your personal protective equipment in accordance with the hazard category of the media to be processed.  
Otherwise there is a risk from:
  - Splashing and evaporation of liquids
  - Ejection of parts
  - Release of toxic or combustible gases
- Set up the device in a spacious area on an even, stable, clean, nonslip, dry and fireproof surface.
- Don't use damaged components.
- Gradually increase the speed and reduce the speed if
  - the medium splashes out of the container because the speed is too high
  - the machine is not running smoothly
  - the container moves on the heating plate
- **Caution!** Only process and heat up any media that has a flash point higher than the adjusted safe temperature limit that has been set.
- The safe temperature limit must always be set to at least 50°C lower than the fire point of the media used.
- Beware of hazards due to:
  - flammable materials
  - combustible media with a low boiling temperature
  - glass breakage
  - incorrect container use
  - overfilling of media
  - unsafe condition of container
- The machine may heat up when in use. Don't use the machine in explosive atmospheres with hazardous substances.
- Process pathogenic materials only in closed containers under a suitable extractor hood.
- Only process media that will not react dangerously to the extra energy produced in other ways, e.g. through light irradiation.
- Accessories must be securely attached to the machine and can't come off by themselves.
- Always disconnect the plug before fitting accessories.
- The machine can only be disconnected from the mains supply by pulling out the mains plug or the connector plug.

- When using PTFE-coated magnetic bars, the following has to be noted:  
Chemical reactions of PTFE occur in contact with molten or solute alkali metals and alkaline earth metals, as well as with fine powders of metals in groups 2 and 3 of the periodic system at temperatures above 300°C-400°C. Only elementary fluorine, chlorotrifluoride and alkali metals attack it; halogenated hydrocarbons have a reversible swelling effect.
- The voltage stated on the type plate must correspond to the mains voltage.
- Don't cover the machine, even partially e.g. with metallic plates or film, which will result in overheating.
- Ensure the heating plate is kept clean.
- Protect the machine and accessories from bumps and impacts.
- The minimum distance between the machines: the minimum distance between the machine and the wall is 100 mm.

### Inspection

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



**Note:**

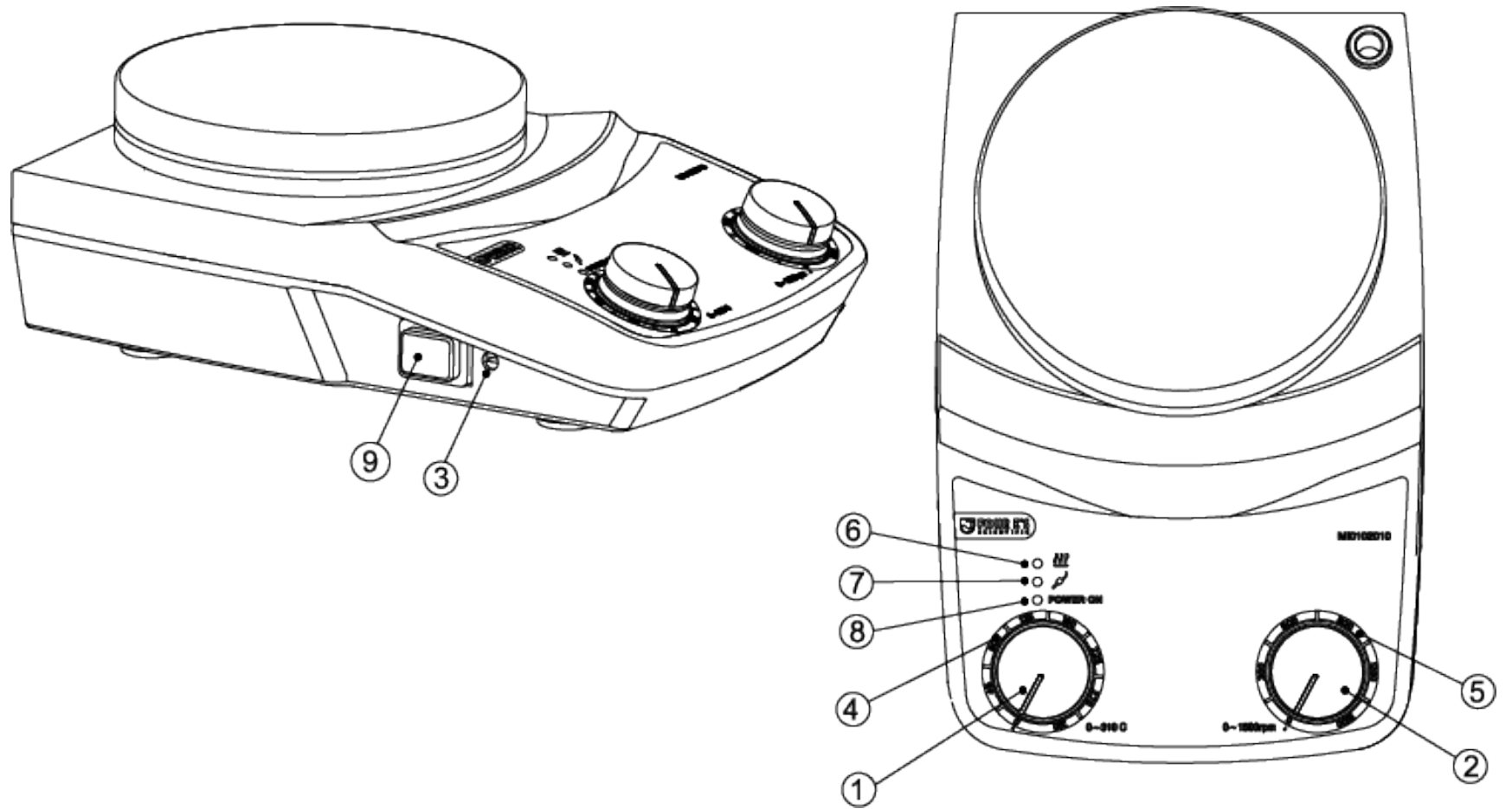
If there is any apparent damage to the device, please do not connect the power line.

- Contents of package

Items	Qty
Main unit	1
Power cable	1
Screwdriver	1
Magnetic stirring bar	1
User Manual	1
Stainless Steel Rod (about 25 cm)	1

Table 1

### Control (Next page)



Item	Description
① Knob for temperature setting	Set the temperature by rotating the knob
② Knob for speed setting	Set the speed by rotating the knob
③ Knob for safety temperature setting	Set the safety temperature by rotating the knob. When the heating temperature is higher than the safety temperature, the machine stops heating. It's the max. temperature of 320°C by rotating the knob to the limit in the clockwise direction; it'll be the min. temperature of 50°C by rotating the knob to the limit in the anti-clockwise direction.
④ Temperature setting scale	Reading the temperature setting value.
⑤ Speed setting scale	Read the speed setting value.
⑥ Heating indicator	It's lit when heating.
⑦ Not applicable	Not applicable
⑧ Setting indicator	The light will flash when setting the temperature or speed.
⑨ Power switch	Switch on/off

Table 2

### **Trial run**

- Make sure the required voltage corresponds to the mains voltage.
  - Ensure the socket must be properly grounded.
  - Switch on and start initializing.
  - Add sample into the container with an appropriate stirring bar.
  - Place the container on the heating plate.
  - Set the target speed and start stirring.
  - Observe the stirring bar operation.
  - Set the temperature and start heating.
  - Connect the external temperature sensor.
- Set temperature by the temperature setting knob.
  - Heating is switched on/off by pressing the temperature setting.
  - The set temperature of last operation will be displayed when the machine is switched on. Normally, the set temperature and the actual temperature may probably have some differences:
    - Hotplate center and outer edge
    - The sample inside the container and the container

If the above operations are normal, the device is good to run. If these operations are abnormal, the device may probably be damaged during transit, please contact manufacturer/supplier for technical support.



#### **Warning!**

DO NOT move the container when the device is working.

### **Heating**

With the digital temperature control, the machine 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 by another adjustable safe circuit. The two temperature sensors (PT1000) internal for temperature control are built into the hotplate.

### Residual heat warning (HOT)

To prevent the risk of burns from the hotplate, this instrument has residual heat warning function. When heating is stopped, and the heating plate temperature is still above 50°C, the setting indicator will light up to warn that there's potential risk of burns. When the hotplate temperature drops to below 50°C, the instrument will be automatically powered off. To turn off the instrument immediately, pull out the plug. In case of main power failure or disconnection, the residual heat warning will not work.

### Stirring

Stirring is switched on / off by pressing the speed setting knob. The speed is set by rotating the knob in the range of 50-1500rpm.

### Faults

- The device can't work when powered on
  - Check if the power line is connected properly
  - Check if the fuse is broken or loose
- Fault in power on self test
  - Power off the device and then restart
- Actual speed can't reach the set value
  - Media in high viscosity may probably cause abnormal speed reduction of the motor
- The device can't be powered off when switched off

- Check if the residual heat warning function is still on and the hotplate temperature is above 50°C (the setting indicator is lit)

Fault	Fault description	Solutions
D2 light, D3 flash	Internal temperature sensor PT1000 failure	Re-start the device
D1, D2 light, D3 flash	Motor failure	Reduce the sample

Table 3

D1 for "Heating" indicator light, D2 for "External temperature sensor" indicator light; D3 for "Power on" indicator light

If the instrument still can't work properly, please contact manufacturer/supplier for technical support.

### Maintenance

Proper maintenance can make the device work well and extend its life.

- Do not allow moisture to get into the device when cleaning.
- Disconnect the main plug when cleaning.
- Wear protective gloves when cleaning.
- Only use the recommended cleansing agents.

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

Table 4

## Standards and Regulations

**USA/Canada:** cTUVus (NRTL: Nationally Recognized Testing Laboratory)  
NRTL Symbol:



## International



## Product End of Life Disposal Instructions:

This electronic product is subject to disposal and recycling regulations that vary by country and region. It is your responsibility to recycle your electronic equipment per your local environmental laws and regulations to ensure that it will be recycled in a manner that protects human health and the environment. To find out where you can drop off your waste equipment for recycling, please contact your local waste recycle/disposal service or the product representative.



The European Union WEEE (Waste Electrical and Electronic Equipment) symbol (above) and on the product or on its packaging indicates that this product **must not** be disposed of in a standard waste container.



**Specifications**

Items	MI0102010
Voltage [VAC]	200-240/100-120
Frequency [Hz]	50/60
Power [W]	650
Stirring point position quantity	1
Max. stirring quantity (H <sub>2</sub> O) [L]	5
Max. magnetic bar [L x Φ, mm ]	55 x 10
Motor Type	Brushless DC motor
Max. power input of motor [W]	30
Max. power output of motor [W]	20
Speed range [rpm]	50-1500
Speed display	Scale reading
Temperature display	Scale reading
Working plate material	Aluminum alloy with ceramic coated
Dimension of working plate (mm)	Φ135
Heating power [W]	600
Temperature range [°C]	50-310
Safety temperature [°C]	50-320
Residual heat warning	50°C
Dimensions [W x D x H, mm]	250x148x85
Weight [kg]	1.9
Permissible ambient temperature [°C]	5-40
Permissible relative humidity	80%

Protection class acc. to DIN EN60529	IP42
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Table 5

**Warranty**

The instrument is warranted to be free from defects in materials and workmanship under normal use and service for a period of **five years** from the date of invoice. The warranty is extended only to the original purchaser. It doesn't cover any worn out parts, nor apply to any damage by improper use, insufficient care or maintenance not carried out in accordance with the instructions in this operating manual.

For claims under the warranty please contact your local supplier. You may also send the instrument directly to manufacturer, enclosing the invoice copy and giving reasons for the claim.

**Technical Support**

Address	PASCO scientific 10101 Foothills Blvd. Roseville, CA 95747-7100
Phone	916-462-8384 (worldwide) 800-772-8700 (US)
Email	<a href="mailto:techsupp@pasco.com">techsupp@pasco.com</a>
Web	<a href="http://www.pasco.com/support">www.pasco.com/support</a>