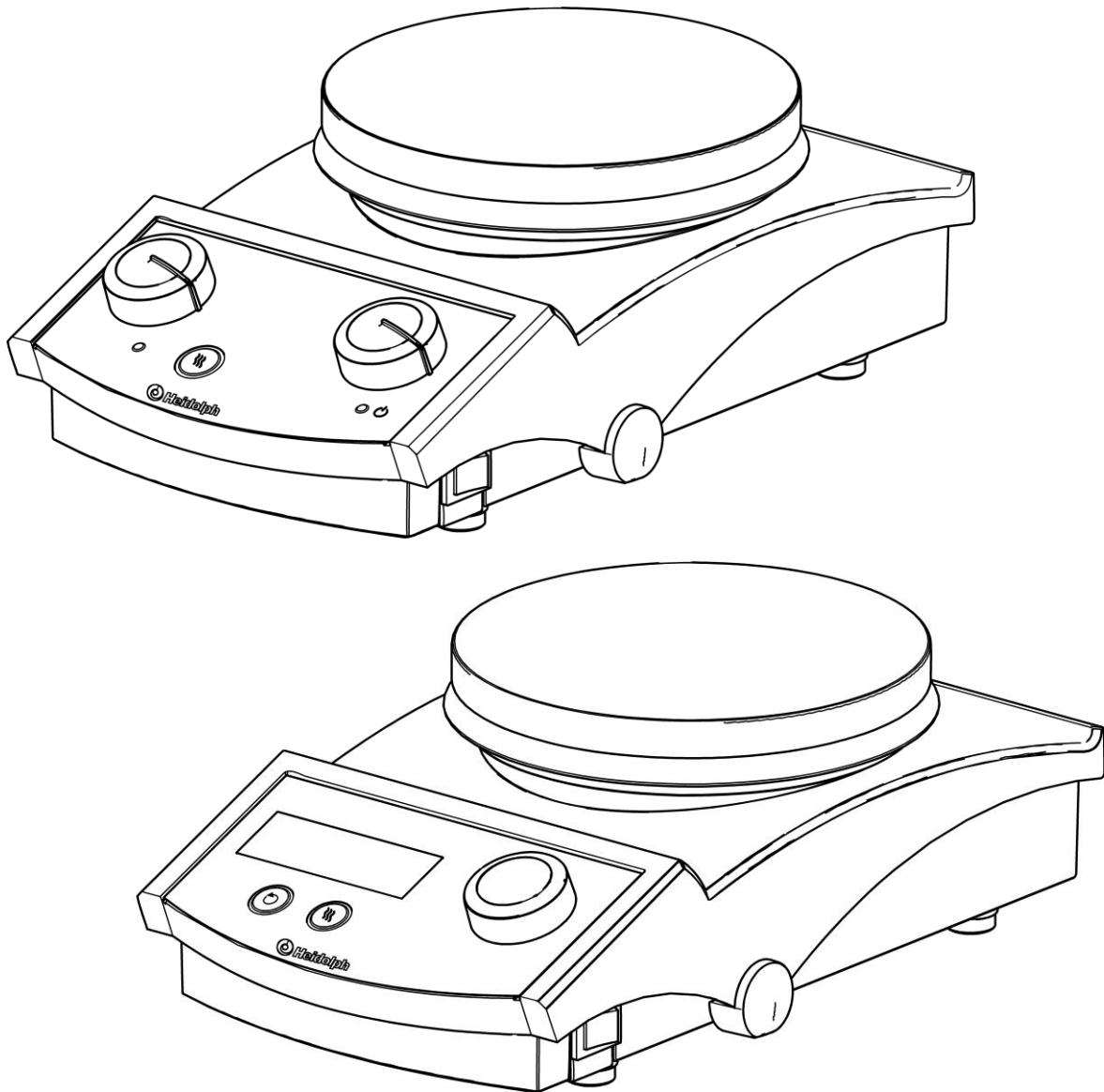


Magnetic stirrer MR Hei-Standard, MR Hei-Tec



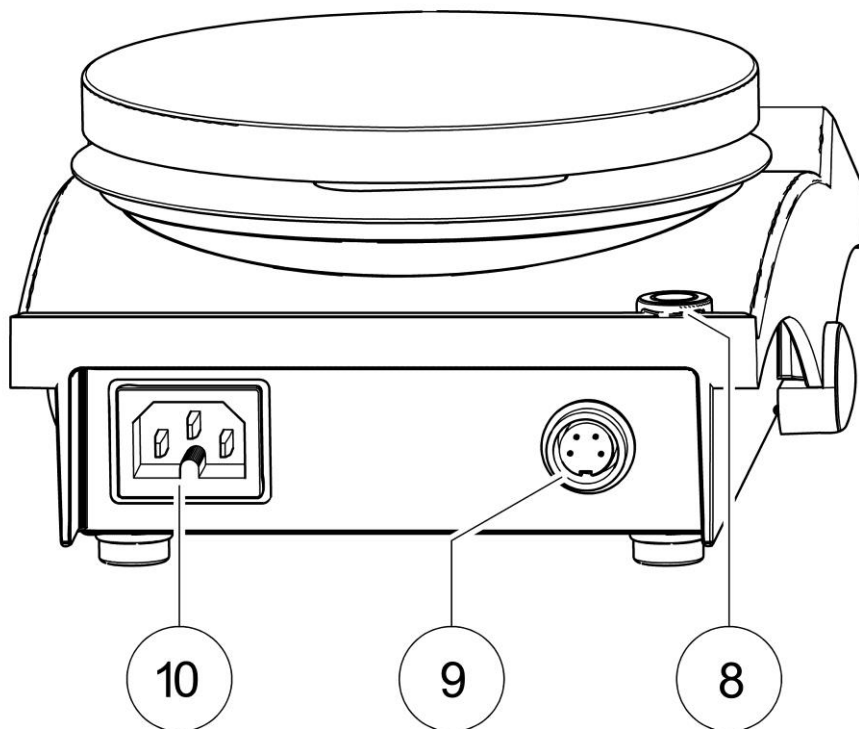
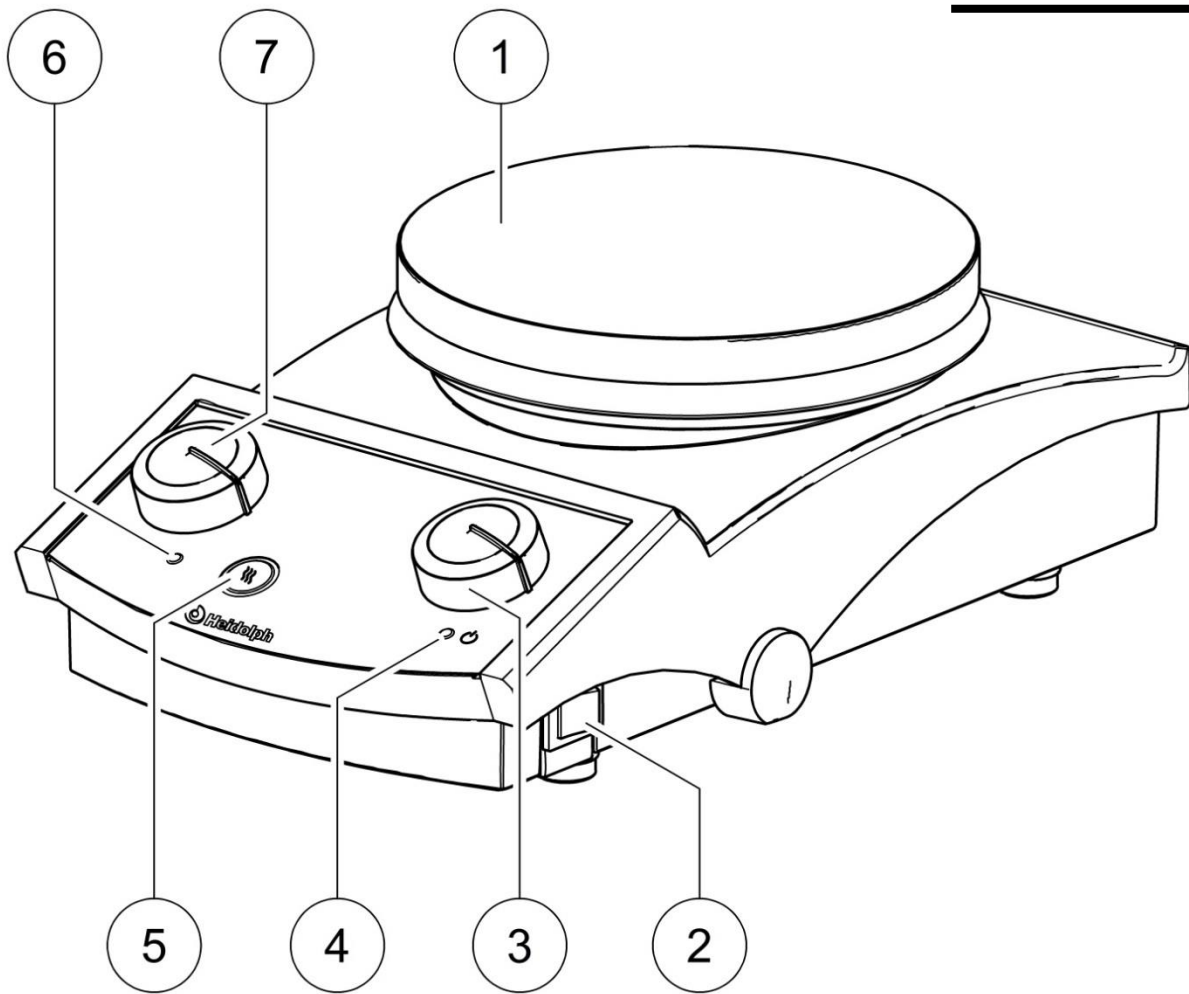
Safe Heating and Mixing

Translation of the original operating instructions
Operating instructions must be read before initial start-up.
Please follow the safety instructions provided.
Please keep for future reference.

CE

Overview

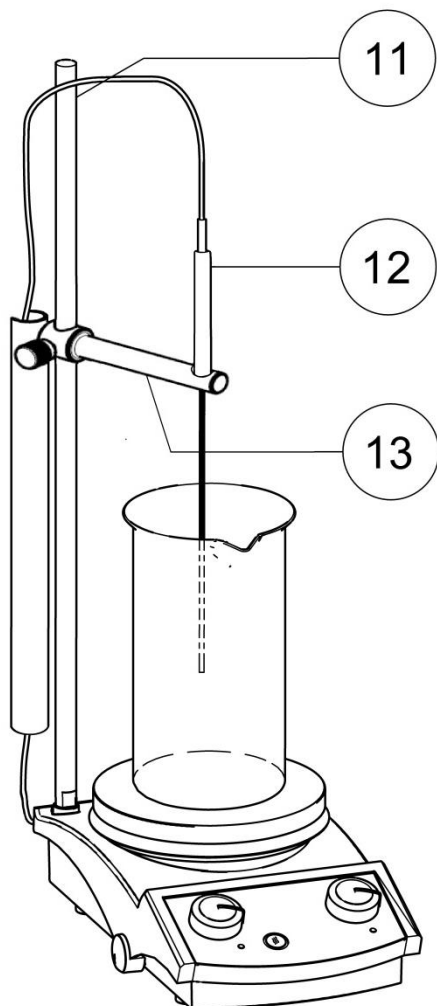
MR Hei-Standard



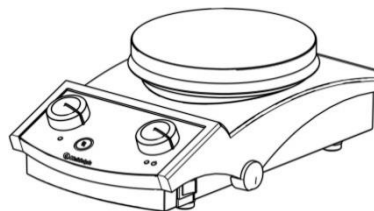
Contents

Overview	B
Scope of supply MR Hei-Standard	D
Scope of supply MR Hei-Tec	E
Key to illustrations	F
Applied standards and guidelines	1
Safety instructions.....	1
Device description	7
Storage & transport	7
Unpacking the device.....	7
Installation	7
Start-up	9
Operation.....	11
Stirring.....	11
Heating	13
Error codes	23
Maintenance	25
Cleaning.....	25
Disassembly	25
Disposal.....	25
Accessories.....	26
Technical data	26
Warranty bond.....	28
Contact/Technical Service	28
Confirmation of condition of unit	29

Accessories (optional)



Scope of supply



MR Hei-Standard

As standard (EU): 505-20000-00 (230 V, 50/60 Hz)
For US: 505-20000-01 (115 V, 50/60 Hz)
For UK: 505-20000-02 (230 V, 50/60 Hz)
For IN: 505-20000-18 (230 V, 50/60 Hz)

+



Power cord

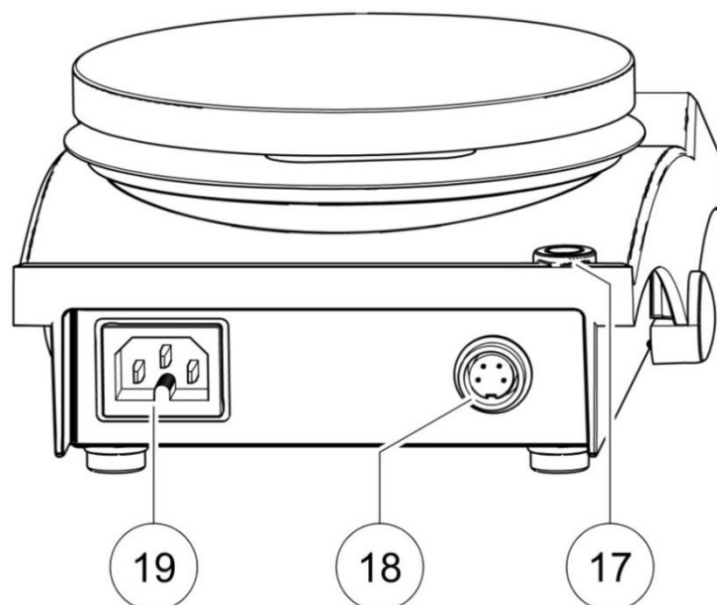
As standard (EU): 14-007-003-81 (230 V, 50/60 Hz)
For US: 14-007-045-10 (115 V, 50/60 Hz)
For UK: 14-007-005-45 (230 V, 50/60 Hz)
For IN: 14-300-009-36 (230 V, 50/60 Hz)

+

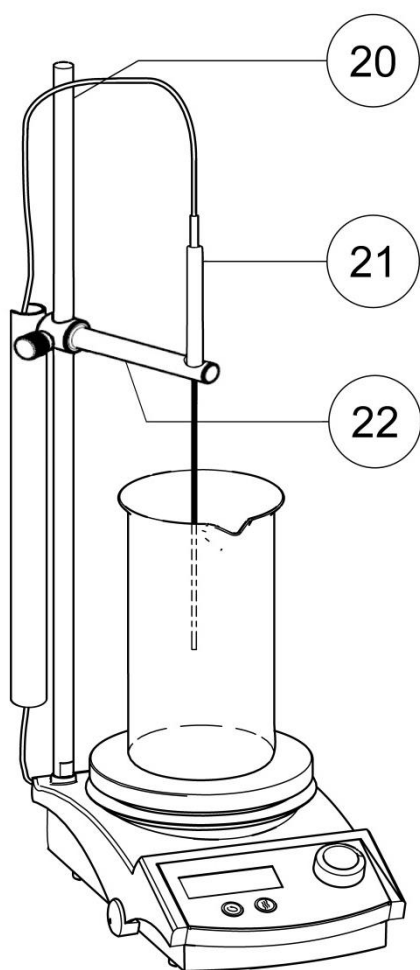


Operating instructions

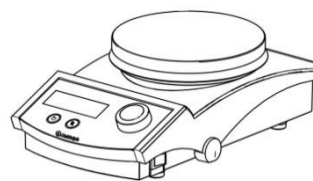
01-005-005-39



Accessories (optional)



Scope of supply



MR Hei-Tec

- As standard (EU): 505-30000-00 (230 V, 50/60 Hz)
- For US: 505-30000-01 (115 V, 50/60 Hz)
- For UK: 505-30000-02 (230 V, 50/60 Hz)
- For IN: 505-30000-06 (230 V, 50/60 Hz)

+



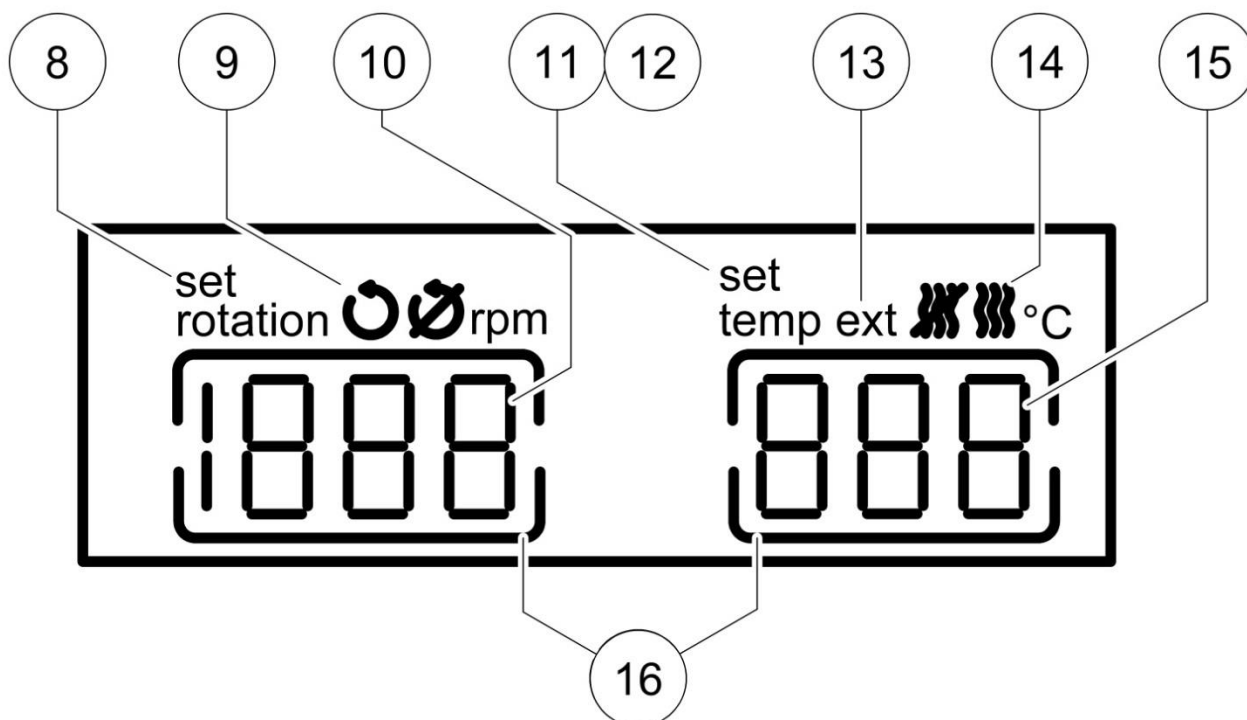
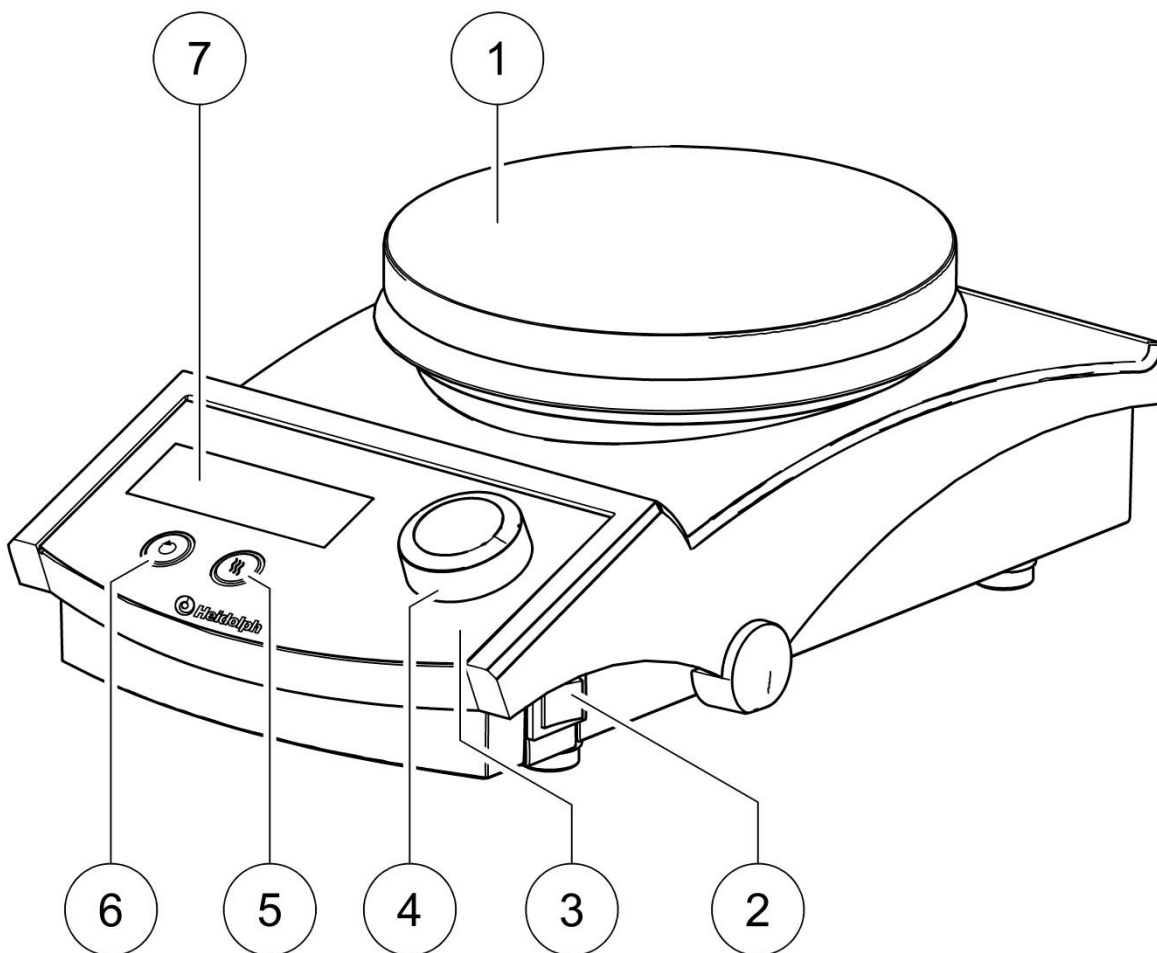
Power cord

- As standard (EU): 14-007-003-81 (230 V, 50/60 Hz)
- For US: 14-007-045-10 (115 V, 50/60 Hz)
- For UK: 14-007-005-45 (230 V, 50/60 Hz)
- For IN: 14-300-009-36 (230 V, 50/60 Hz)

+



Operating instructions
01-005-005-39



Key to illustrations

MR Hei-Standard (page A, C)

- 1 Hotplate
- 2 Mains switch: Switch device on/off
- 3 Speed control knob: Set set speed
- 4 LED I/O: Device on/off
- 5 Heating button: Switch heating function on/off
- 6 LED light for heating function: Device heats up/does not heat up
- 7 Temperature control knob: Set set temperature
- 8 Drill hole for support rod with protective cap
- 9 Temperature sensor socket
- 10 Power plug
- 11 Support rod
- 12 Temperature sensor Pt 1000
- 13 Attachment with cable inlet

MR Hei-Tec (page D, E)

- 1 Hotplate
- 2 Mains switch: Switch device on/off
- 3 Control panel
- 4 Rotary-push button **Hei-GUIDE**: Set and determine the set speed/set temperature
- 5 Heating button: Switch heating function on/off and switch between Fast-/Precise-Mode
- 6 Stirring button: Switch stirring function on/off
- 7 Display
- 8 set rotation: Indicates the set speed
- 9 Stirring symbol: The device is stirring
- 10 Rotation speed and mode: Displays actual speed/set speed and Fast-/Precise-Mode
- 11 set temp: Indicates the set temperature
- 12 set temp ext: Indicates the set temperature and temperature control using the temperature sensor
- 13 ext: Indicates the temperature control using the temperature sensor
- 14 Heating symbol [flashing]: Is shown when heat energy is supplied
- 15 Temperature: Displays actual temperature/set temperature and Fast-/Precise-Mode
- 16 Selection frame: Highlights the pre-selected value
- 17 Drill hole for support rod with protective cap
- 18 Temperature sensor socket
- 19 Power plug
- 20 Support rod
- 21 Temperature sensor Pt 1000
- 22 Attachment with cable inlet

Applied standards and guidelines

NOTICE

EC declaration of conformity

→ See the "EC declaration of conformity" enclosed.

Safety instructions

WARNING

Risk of injury due to failure to observe safety signs and safety instructions!

Dangers emerge when safety signs, located on the device, are not observed or when safety instructions detailed in the operating instructions are not followed.




→ Please note the safety signs.

→ Please carefully read and observe the safety instructions provided.

Warning notices

The design of warning notices is based on a combination of signal words and continuous text.

In this way, the signal word indicates the level of risk. The following table explains the significance of each of the signal words.

Signal word	Meaning
 DANGER	DANGER indicates a hazardous situation which, if not avoided, will result in death or serious injury.
 WARNING	WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury.
 CAUTION	CAUTION indicates a hazardous situation which, if not avoided, may result in minor or moderate injury.
NOTICE	NOTICE indicates a property damage message

The warning notice also provides information on the type and source of the danger, the possible consequences of the danger and measures to prevent any danger arising. The following example warning notice indicates the design of a warning notice.

DANGER

The type and source of the danger are displayed here!

Here, the possible consequences are described when no measures are taken to prevent dangers occurring.

→ Here, the measure for risk prevention is specified.

Other symbols used in these operating instructions provide information on the handling instructions. The following table explains the use of each symbol.

Symbol	Use	Explanation
→	Handling instructions	Here, you are required to take action.
1. 2. 3.	Handling instructions, multi-step	The handling instructions must be carried out in the sequence specified. Deviations from this sequence may lead to damage to the device or accidents.

General safety instructions

The device has been constructed according to state-of-the-art technology and recognized safety regulations. However, risks may still arise during installation, operation and maintenance.

→ Please observe the safety instructions and warning notices.

The safety instructions provided in this chapter are supplemented by specific warning notices in the following chapters. This warning notice explains exactly how you must behave in order to protect yourself, others and objects from damage.

These operating instructions are a component of the device described here.

→ Please ensure the operating instructions are available at all times.

→ Please pass on the operating instructions to the subsequent owner.

The device may only be used under the following circumstances:

- The device is in full working order.
 - The device is used according to its intended purpose.
 - All operators of the device possess the necessary safety and risk awareness.
 - The instructions stipulated in this instruction manual are followed.
- Errors must be eradicated immediately; especially those which jeopardize safety.

Intended use

The device is a magnetic stirrer with a heating function, suitable for continuous operation. The device stirs and/or heats substances in a container. A magnetic stir bar, which is guided by a magnet, moves to administer stirring.

A suitable operating location for the device is one of the following areas:
Chemical and biological laboratories in industry and universities

In order to use the device according to its intended use, please also observe these operating instructions, the safety instructions and the instructions provided for cleaning (see chapter "[Cleaning](#)").

Uses not permitted

Any use which deviates from the device's intended use is considered to be improper. The manufacturer does not accept liability for any damages resulting from non-permitted uses. The risk is carried by the operator alone.

- Do not use the device in potentially explosive areas. The device is not protected against explosion.
- Do not insert any objects into the area between the hotplate, the cover plate and the base of the device.
- Do not cover the ventilation slots.

Use in potentially explosive areas

- Do not use the device in potentially explosive areas. The device is not protected against explosion. There is no explosion or ATEX protection available.

Operating company's obligations

- Only operate the device in full and proper working order.
- Ensure that only qualified personnel operate the device.
- Ensure that the personnel has received safety instructions in order to guarantee responsible and safe work procedures in the laboratory.
- Ensure that the device is positioned in a suitable location.
- Ensure that the device is sufficiently stable.
- Ensure that installation and operation of the device is only carried out in facilities which are fitted with the appropriate laboratory equipment (e.g. with air extraction units).

Operating personnel's obligations

- Ensure that work which uses naked flames is not carried out in the vicinity of the device (risk of explosion).
- Ensure that the flow rate when removing liquids with flammable materials remains at < 1 m/s (electrostatic charge; risk of ignition).
- Ensure that gases classified in explosion group IIC are not produced by materials or during chemical reactions, e.g. hydrogen.
- Ensure that no devices are operated or assembled which are emission or radiation sources (electromagnetic waves) for the frequency range (3×10^{11} Hz bis 3×10^{15} Hz).
- Ensure that no devices are operated or assembled which constitute emission or radiation sources for ionizing radiation or in the ultrasonic range.
- Ensure that no adiabatic compression or shock waves occur (shock wave combustion).
- Please wear the appropriate protective clothing when working on the machine (protective glasses and if necessary, safety gloves).
- Ensure that sufficient heat transfer media are used.
- Ensure that the correct heat and cold protection is used in relation to the media implemented.
- Please avoid putting pressure on the display.

Personnel qualification

The target group for this device is qualified personnel. The device may only be operated by individuals who have been instructed in its proper use by qualified personnel.

NOTICE

Operating instructions

These operating instructions must be followed, read and understood by all persons working on the device (acknowledgment of the safety instructions is particularly important).

Safety-conscious operation

Heidolph Instruments does not accept liability for personal injury or damage to property which may result from improper and unprofessional working procedures.






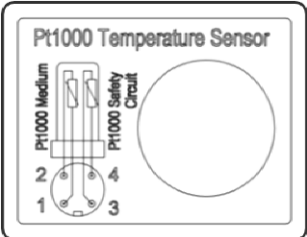
- The following regulations must be observed:
 - laboratory guidelines
 - accident prevention regulations
 - the Ordinance on Hazardous Substances
 - other generally recognized regulations of safety engineering and industrial medicine
 - local regulations

Safety devices on the unit

The safety circuit switches itself off under the following circumstances:

- The preset hotplate temperature (set value) is exceeded by the safety temperature (max. 25 °C) (only for MR Hei-Tec in Precise-Mode).
- The hotplate temperature measured (actual value) is greater than 360 °C.
- Sensor break or sensor shorted in the temperature sensor of the safety circuit.
- Sensor break or sensor shorted in the temperature sensor of the control circuit.
- Sensor break or sensor shorted in the safety circuit of the external temperature sensor.
- Sensor break or sensor shorted in the control circuit of the external temperature sensor.
- The sensor difference is too great.

Information on the device

Note	Meaning
 <p> Heidolph Heidolph Instruments GmbH & Co.KG Walpersdorfer Str. 12' D-91126 Schwabach Magnetrührer Typ: MR Hei-Tec No.: 505-30000-00-2 AC 230/240V 50/60Hz 825W 100-1400 1/min Ser.No: 081210047 CE Made in Germany </p>	<p>Name plate (example: MR Hei-Tec)</p>
 <p> Service Tel.: 0800-5 8897108 3 Jahre Garantie 3 Years Warranty Service Tel.: (+49)-9122 983074 </p>	<p>Warranty seal</p>
 <p> Warning Before opening the box disconnect power plug. Warnung Vor dem Öffnen des Gehäuses Netzstecker ziehen. </p>	<p>Note: please disconnect the connection to the power supply before opening the device.</p>
	<p>Ground symbol</p>
	<p>Hot surface</p>
 <p> Pt1000 Temperature Sensor Pt1000 Medium Pt1000 Safety Circuit 1 2 3 4 </p>	<p>Contact thermometer terminal assignment</p>

Residual dangers

Despite all precautions taken, residual risks can emerge which may not be immediately obvious! Adhering to the safety instructions, the intended use and the operating instructions as a whole can reduce residual risks!



WARNING

Risk of slipping!

Risk of injury.

After operation or in the event of malfunctions, there may be liquid on the floor close to the machine.

→ Watch out for any wet spots and clean the floor if necessary.



WARNING

Errors!

Risk of injury.

Malfunctions or operating states that may jeopardize the safety of operating personnel require the device to be brought to a standstill by disconnecting the power supply.

→ Proper restoration of the machine's intended state is necessary.



WARNING

Hot surfaces!

Risk of scalding and burns.

→ Allow the hotplate and accessories to cool down.

→ Allow liquids and sampling media to cool down.



WARNING

Rotating magnetic field!

Potential health hazard for pacemaker wearers.

There is a risk that the magnetic field can disrupt the functions of the pacemaker.

→ Keep pacemaker wearers away from the device.



DANGER

Danger to life due to dangerous voltage!

Risk of serious injury.

Electrical residual energy remains in lines, equipment and devices after shutting down the device.

→ Point out the power sockets to the operating personnel. Disconnect the power plugs from the energy source in order to establish zero potential.

→ Only allow qualified electricians to perform work on the electrical supply system.

→ Disconnect the device from the power supply. Regularly check the electrical equipment (mains cables) of the device.

→ Replace damaged mains cables. Regularly check all cables for damages during repair and maintenance work.

→ Only set up or disconnect connections when disconnected from the power supply.



DANGER

Risk of injury or danger to life due to failure to observe the safety instructions and safety clearance!

Risk of injury.

Risks arise due to failure to observe the safety instructions and the safety clearance for the device.

→ Follow all safety instructions and signs provided on the device and in these operating instructions. Maintain the appropriate safety clearance distance from the device.



WARNING

Unauthorized access is prohibited!

Risk of injury.

Risks arise if unauthorized persons enter the danger zone of the device.

- The operator is responsible for ensuring that unauthorized persons (e.g. visitors) do not have access to the danger zones (service area, protected areas).
-



DANGER

Failure to observe the danger zone, work area and service area!

Dangers are posed by electrical and mechanical energies, as well as by residual dangers.

- Please ensure a safety clearance distance of 50cm around the test setup.
 - Do not place or store any objects in the work or service area.
 - Deposit accessories, chemicals or tools in such a way that no dangers arise for the personnel.
-



DANGER

Glass breakage!

Risk of injury.

When using glass attachments, there is a risk of glass breakage.

- Monitor pressure conditions in the glass attachment.
 - Avoid negative pressure higher than the permissible pressure level for the glass attachment.
-



DANGER

Risk of fire and explosion!

Serious risk of fire and explosion.

There is a risk of fire and explosions in the vicinity of the device. Smoking, naked flames and fire are strictly forbidden in the vicinity of the device.

- Do not store any flammable liquids in the danger zone of the device. A fire extinguisher must be kept in the vicinity of the device.
 - Avoid potential sources of ignition such as flammable atmospheres, reactions or electrostatic charges.
 - Avoid exothermic reactions or the spontaneous combustion of dust.
 - Avoid adiabatic compression and shock waves.
 - Take special care with reactions of explosion group IIC for which hydrogen can be released.
-



DANGER

Danger when extinguishing fires!

Risk of serious injury as a result of chemical reactions.

Risk of chemical absorption.

Vigorous reactions with the medium can occur if water is used to extinguish the fire.

- Do NOT use water to put out the fire.
 - Use extinguishing agents which do not react with the medium.
 - Please observe the fire protection regulations and the fire extinguishing instructions they provide.
-

Device description

The device is a magnetic stirrer and has the following functions:

- Stirring of substances.
- Heating of substances.

Stir and/or heat the substances in a heat-resistant stirring container, with the underside on the hotplate. Set the stirring speed and heating temperature individually using the operating elements.

Storage & transport

CAUTION **Damages as a result of improper transport!**

Damage can be caused to the device and the device mechanics in the case of improper transport.

- Avoid jolting and impacts.
-

- Do not store equipment in box while hot.
- Store and transport the device in the original packaging.
- Seal the packaging with adhesive tape.
- Store the device in a dry location.
- To carry the device, lift it from below.

Unpacking the device

1. Unpack the device and if necessary, remove any protective films.
2. Check scope of supply.

Has the device been damaged or is delivery incomplete?

- Please inform Heidolph Instruments.

Installation

Device

CAUTION **Toppling of the device with attachment!**

Risk of injury and damage to the enclosure.

- Place the device on a flat, solid, temperature-resistant and dry surface with sufficient space.
 - Use suitable lifting equipment.
-

WARNING **Hazardous materials and solvents!**

When handling hazardous materials and solvents, chemicals can be released into the atmosphere.

- Do not expose operating personnel to harmful vapors or gases. Extract waste air using a vapor outlet.
 - Ensure that the separator for the power supply is easily accessible at all times.
-

- Double-check if components are damaged.
- Double-check setup.

Accessories (optional)

Temperature sensor Pt 1000

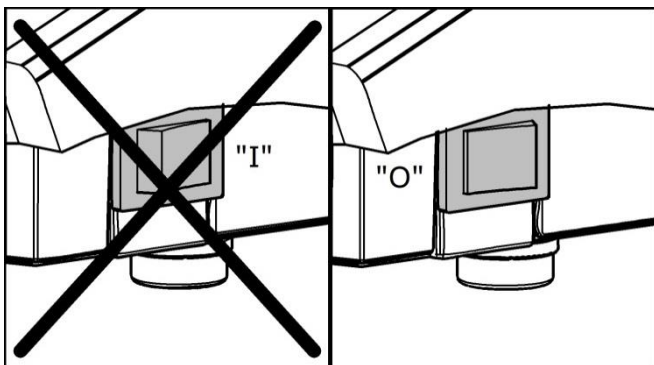
(DIN EN 60751, Class A)

NOTICE **Immersion depth of temperature sensor**

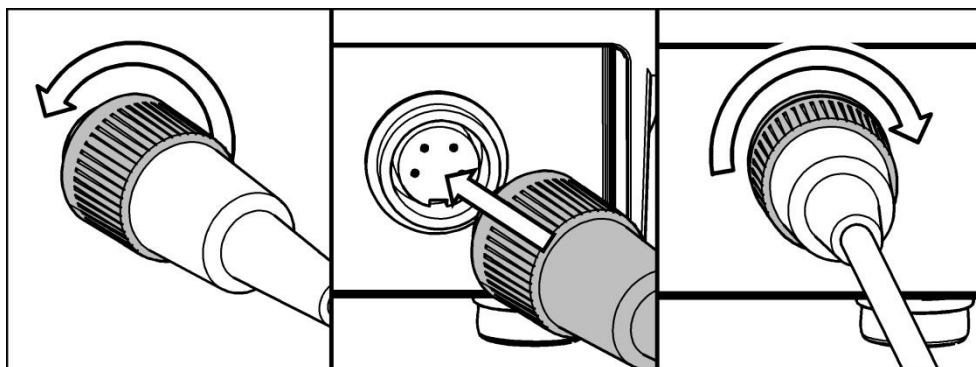
Immerse the temperature sensor in the medium by at least 20 mm. Otherwise inaccurate measurements are possible.

The temperature sensor Pt 1000 measures and regulates the temperature of the heated medium.

1. Switch off the device.

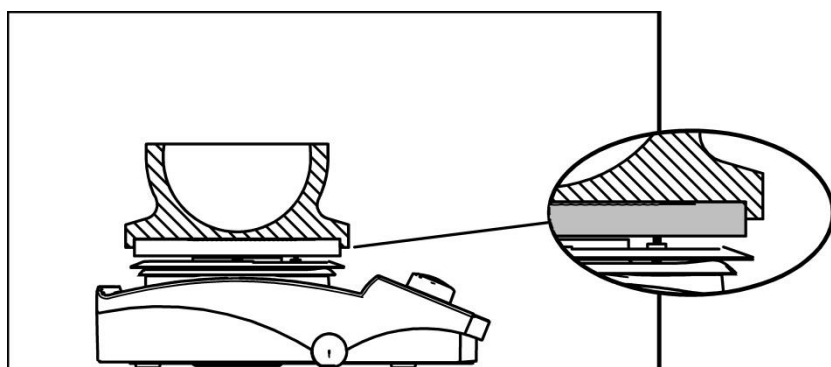


2. Connect temperature sensor.



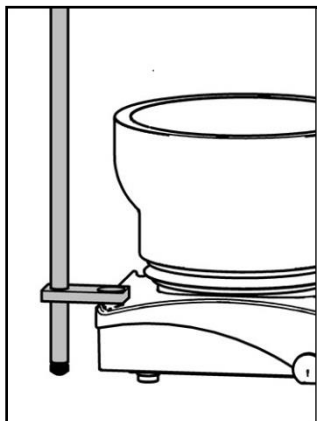
Heat-On block

- Securely position the heat-on block.



Heat-On 5 liter block (when using a support rod)

→ Mount support rod with an extension arm.



Start-up



CAUTION

The mains voltage and specification of the mains voltage on the name plate do not coincide!

Damage to property as a result of overvoltage.

→ Please ensure that the mains voltage coincides with the voltage specified on the name plate.



CAUTION

Unintentional switch-on of the device!

Injury and burns to the hands.

→ Switch off the device.

→ Remove the mains plug after use.

→ Safely lay all mains cables and connecting cables.

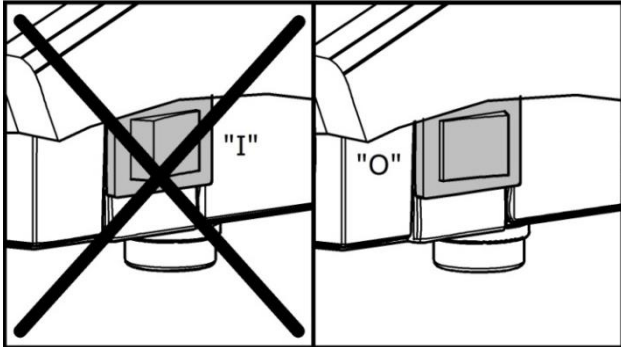


Risk of electric shock or a short circuit!

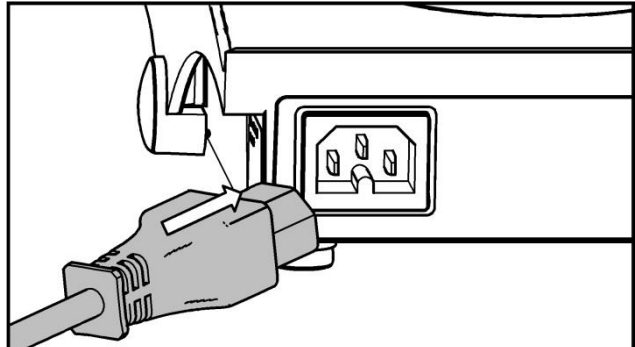
Risk of electric shock or short circuit due to melted insulation

- Ensure that all mains cables, pipes and connecting cables have been laid correctly in the area where heat is generated.

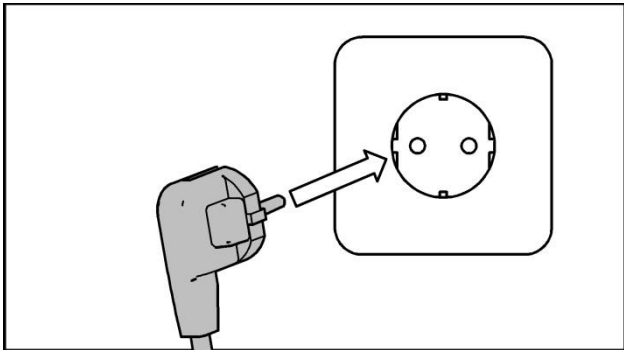
1. Switch off the device.



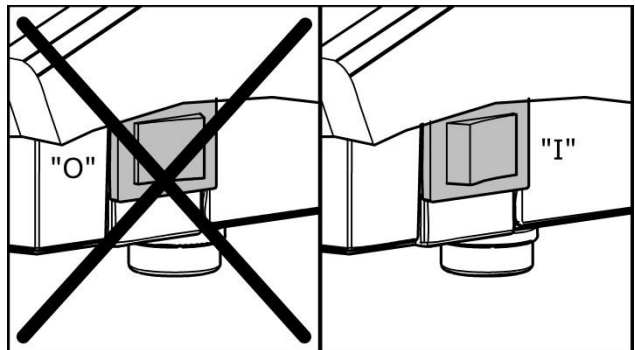
2. Insert device connection cable in the mains power plug.



3. Insert device connection cable in the power supply socket.



4. Switch on the device.



NOTICE

Stirring and heating functions are not active

- The stirring and heating functions are not active after the device has been switched on.

Operation

Stirring

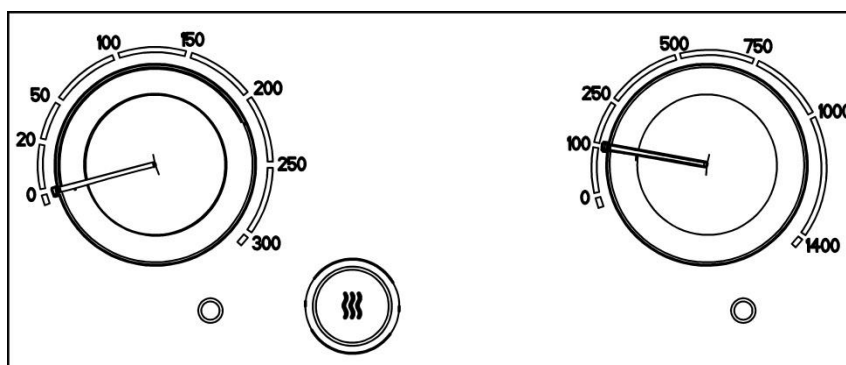
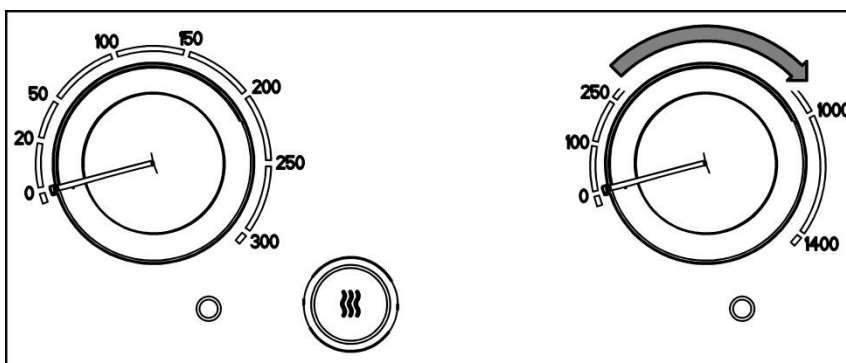
MR Hei-Standard

NOTICE **Start stirring function**

The stirring function starts from a speed of 100 rpm. You can adjust the speed up to a speed of 1400 rpm.

1. Set set speed.

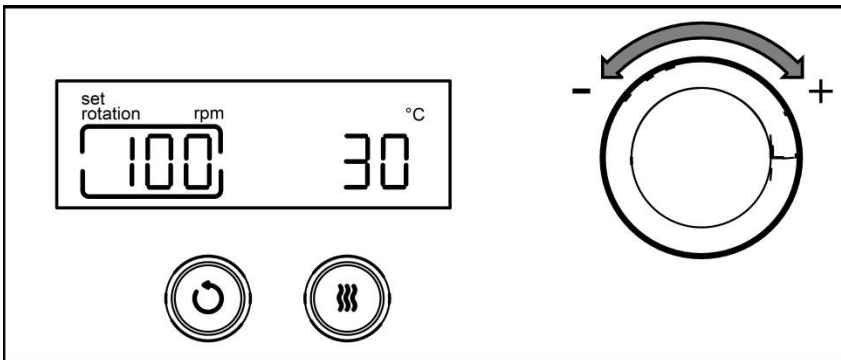
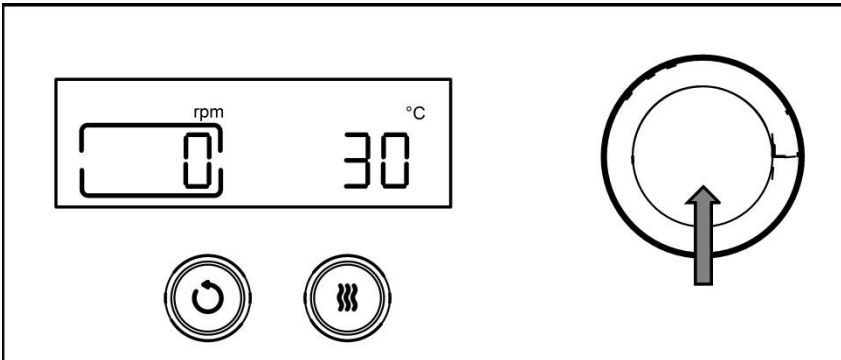
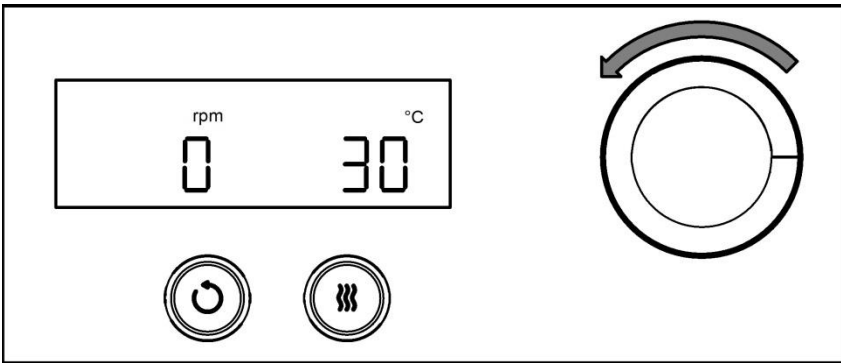
Example: 100 rpm



MR Hei-Tec

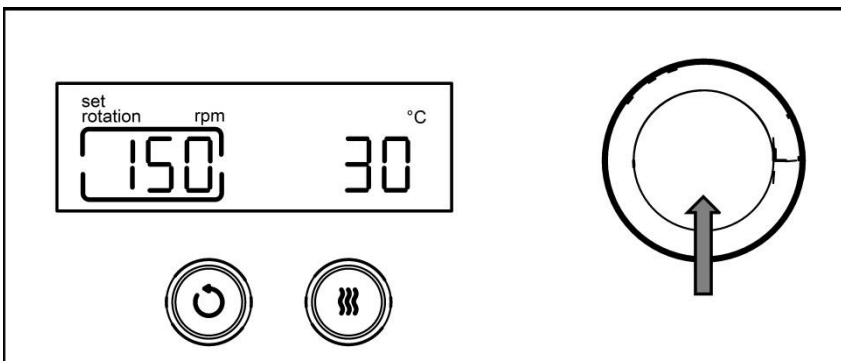
1. Set set speed.

Example: 150 rpm



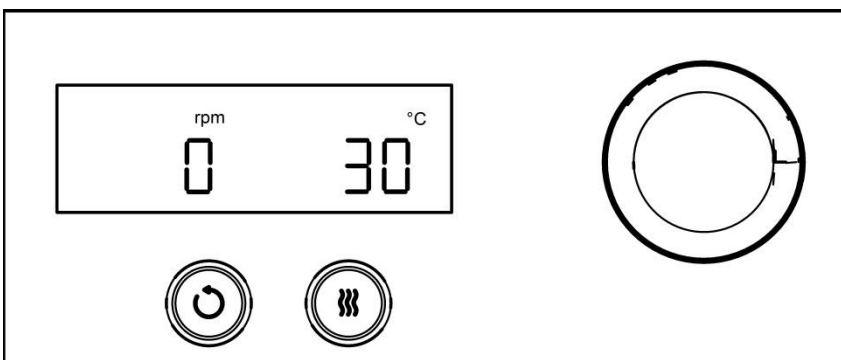
Stirring function switched on?

If you have already switched on the stirring function at this point in time, the appliance adjusts to the set value immediately.



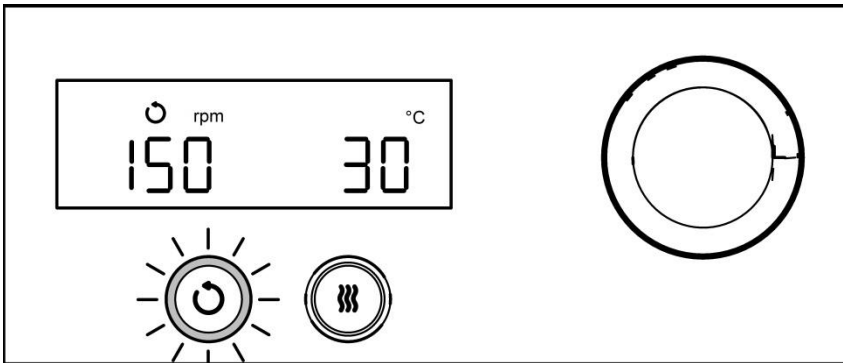
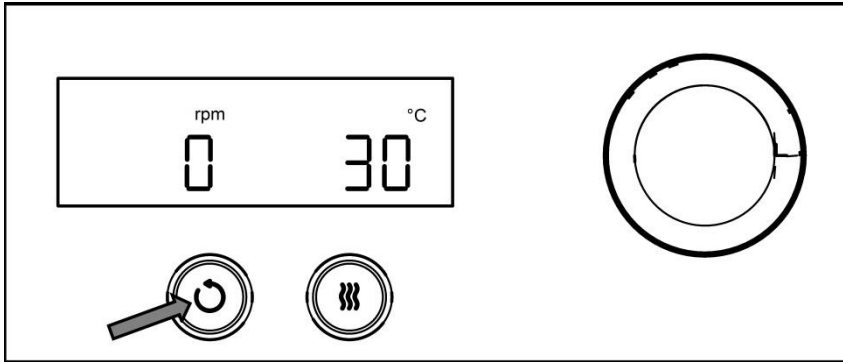
Acceptance of the set value

The set value is accepted automatically after a few seconds or by pressing the rotating push button **Hei Guide**.



2. Switch on stirring function.

Example: 150 rpm

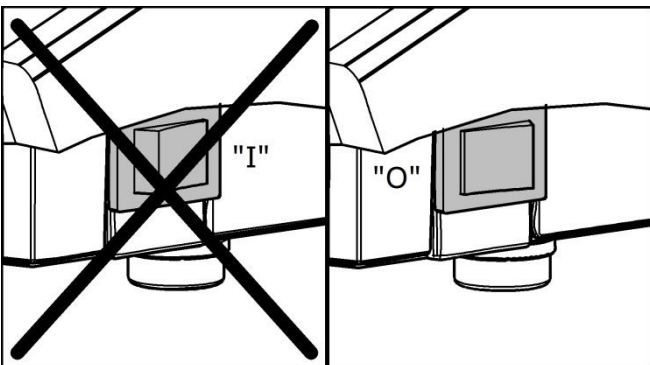


Heating

NOTICE **Set temperature setting value**

You can set the set temperature anywhere between 20 to 300 °C.

1. Switch off the device.



2. Select heating method **a.** or **b.**

MR Hei-Standard

a. Heating *without* temperature sensor

The temperature is measured and regulated exclusively using the hotplate.

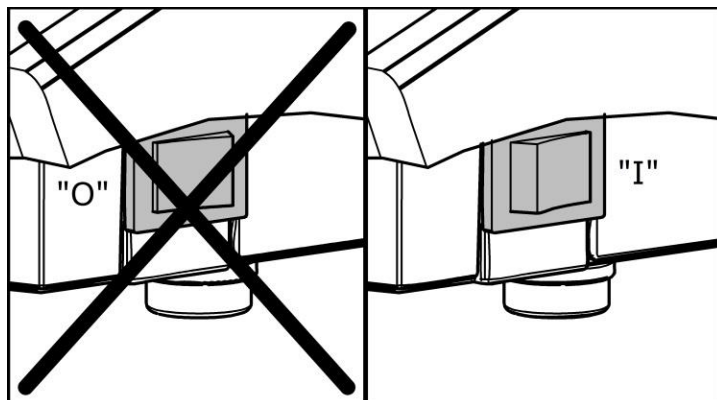
The actual temperature in the stirring container is always lower than the preset set temperature. Factors to consider for temperature differences are the following: heat transfer resistance of the different stirring containers, heat transfer resistance of the quantity to be heated and heat loss due to radiation.

b. Heating *with* temperature sensor

***NOTICE* Connect temperature sensor**

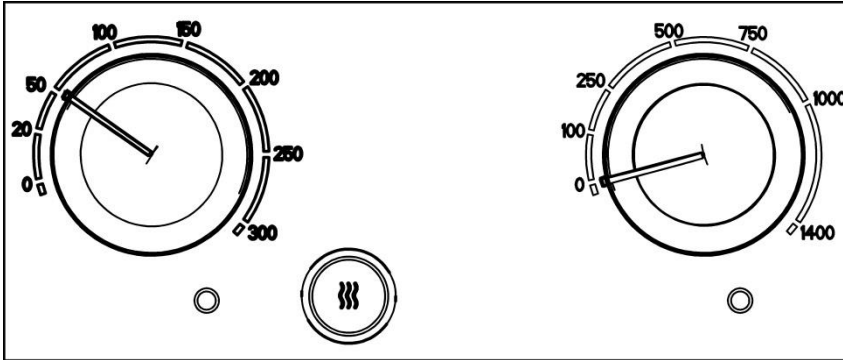
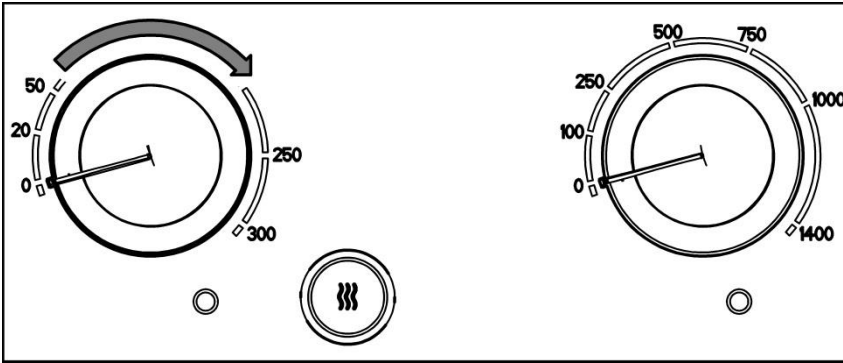
→ Follow the instructions in chapter "Installation" - "Accessories (optional)" - "Temperature sensor Pt 1000".

3. Switch on the device



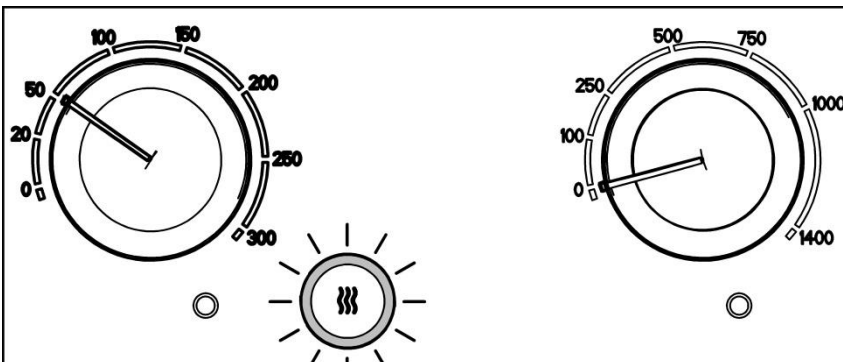
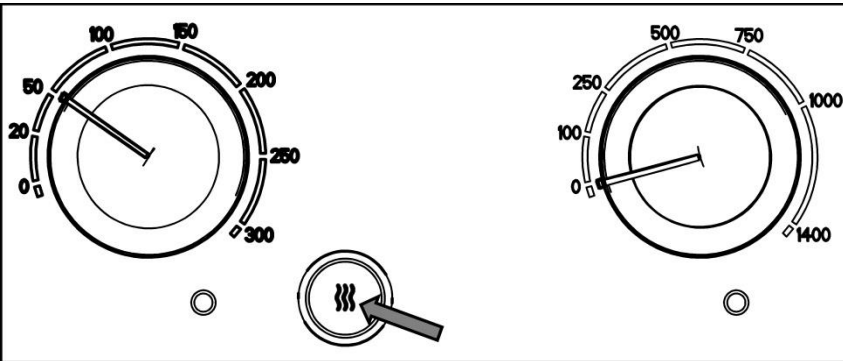
4. Set set temperature.

Example: 50 °C



5. Switch on heating function.

Example: 50 °C



MR Hei-Tec

a. Heating without temperature sensor

The temperature is measured and regulated exclusively using the hotplate.

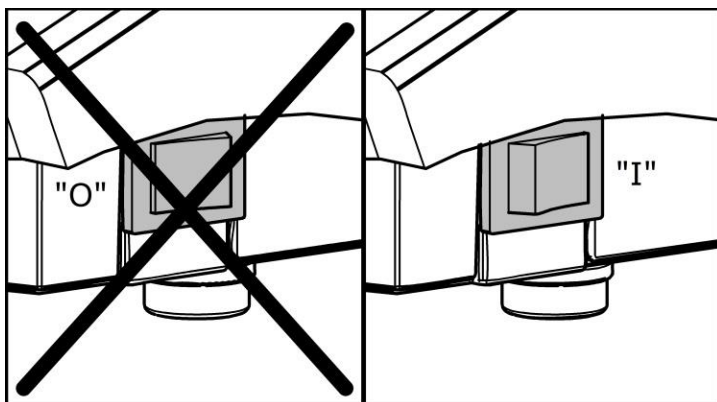
The actual temperature in the stirring container is always lower than the preset set temperature. Factors to consider for temperature differences are the following: heat transfer resistance of the different stirring containers, heat transfer resistance of the quantity to be heated and heat loss due to radiation.

b. Heating *with* temperature sensor

NOTICE**Connect temperature sensor**

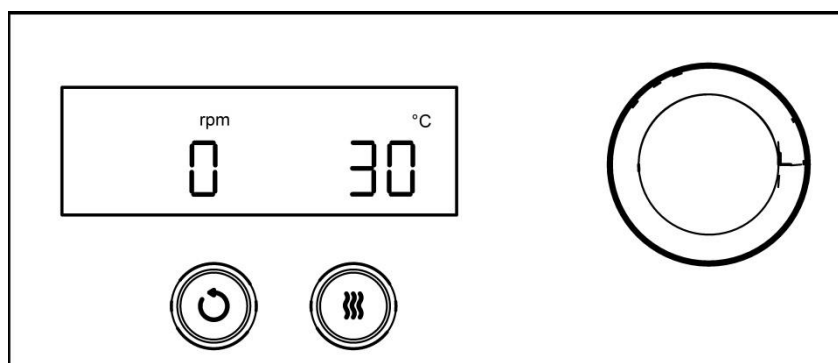
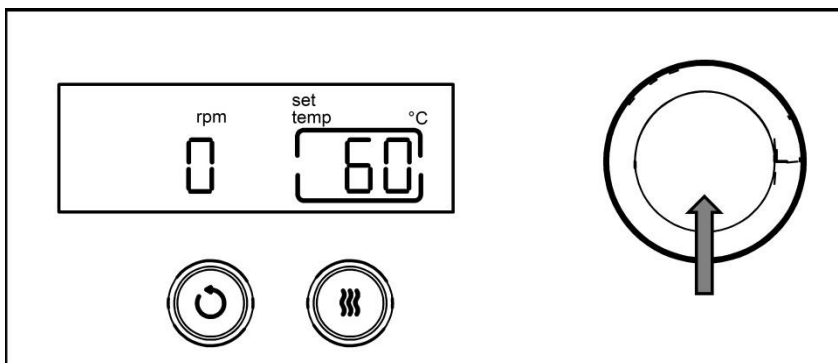
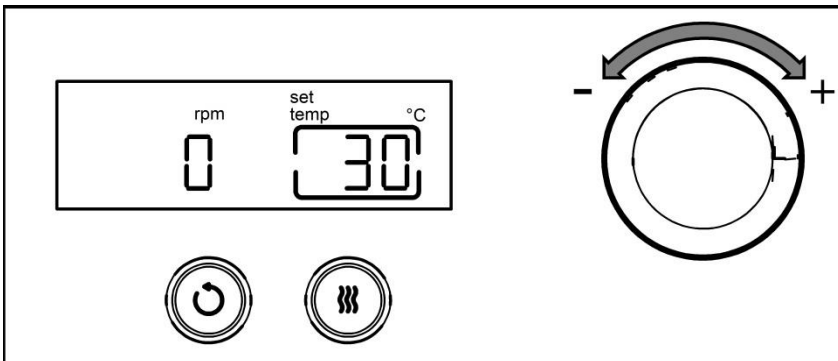
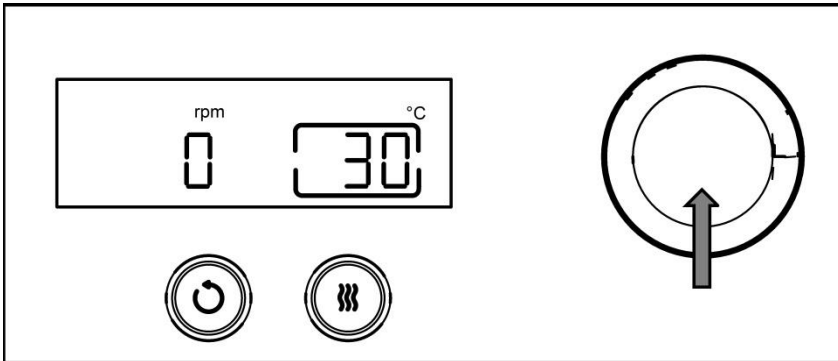
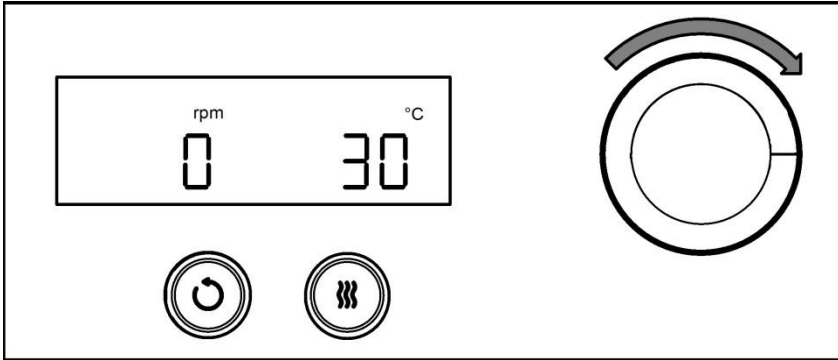
- Follow the instructions in chapter "Installation" - "Accessories (optional)" - "Temperature sensor Pt 1000".
-

3. Switch on the device



4. Set set temperature.

Example: 60 °C



Display element „ext“

If the temperature sensor is connected, the display element "ext" is also shown.



Heating function switched on?

If you have already switched on the heating function at this point in time, the appliance adjusts to the set value immediately.



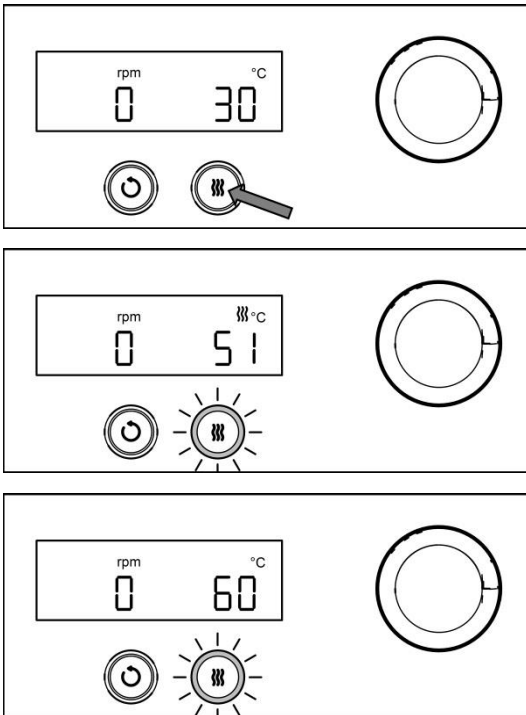
Acceptance of the set value

The set value is accepted automatically after a few seconds or by pressing the rotating push button **Hei Guide**.

5. Switch on heating function.

a. Heating *without* temperature sensor

Example: 60 °C



b. Heating *with* temperature sensor



Fast-Mode and Precise-Mode

You can choose between the following 2 modes as soon as you have switched on the heating function:

- The time saving **Fast-Mode** (factory setting) – allows for shortest heating-up times.
- The **Precise-Mode** - prevents an overtemperature situation categorically.

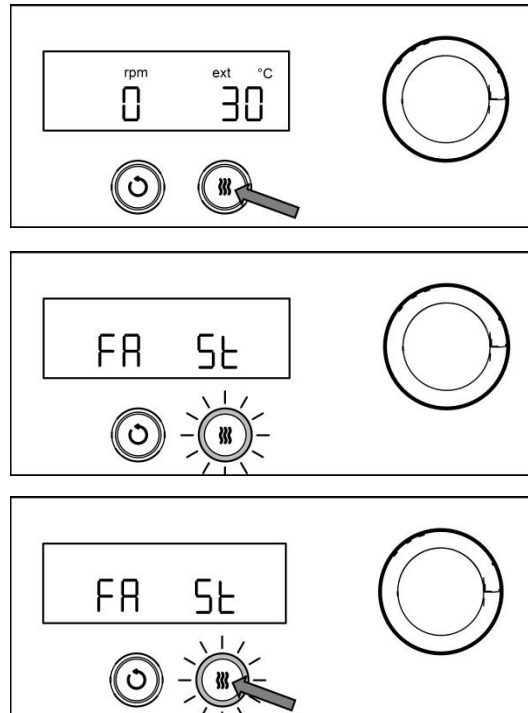
To change between modes:

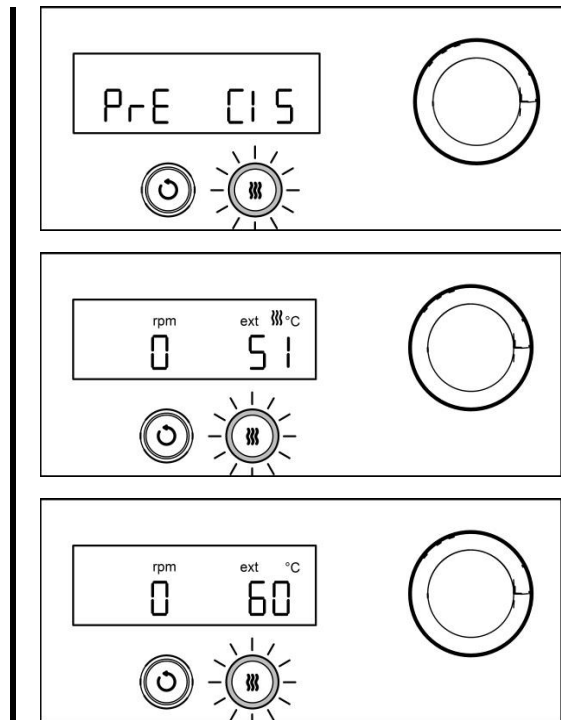
- While the illuminated ring of the Heating button is flashing, you can change from one mode to the other as many times as you wish by pressing the Heating button.
- The unit will heat up with the mode selected last as soon as the illuminated ring is no longer flashing.

To save a mode:

The mode selected last remains saved even if the unit is switched off.

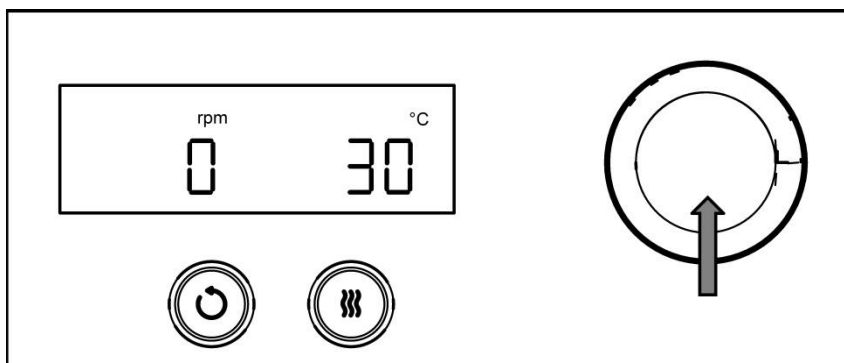
Example: 60 °C, Precise-Mode





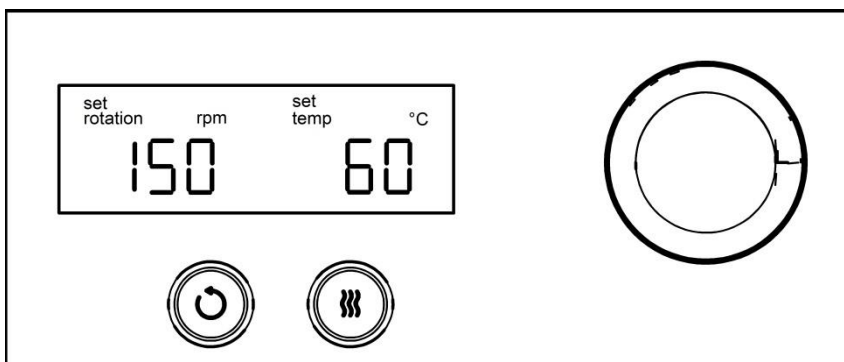
Display of set speed and set temperature (MR Hei-Tec)

→ Readout the set speed and set temperature.



Display element „ext“

If the temperature sensor is connected, the display element "ext" is also shown.



Calibrating (MR Hei-Tec)

With the calibrating function, you can change the temperature of the medium measured using the temperature sensor Pt 1000 by a calibration value of -5 °C to +5 °C.

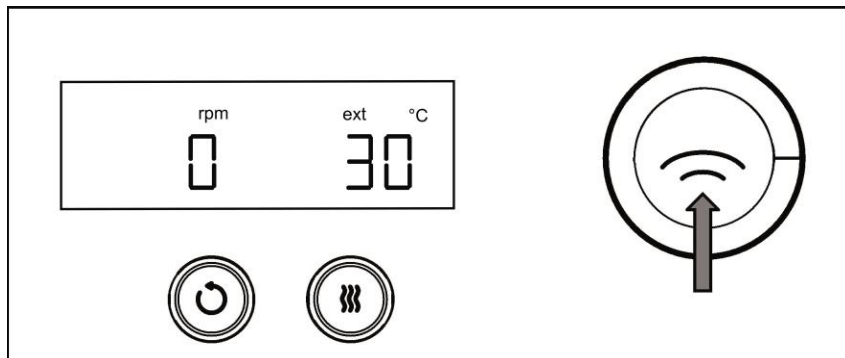


Stirring function and heating function

The stirring function and the heating function may not be active.

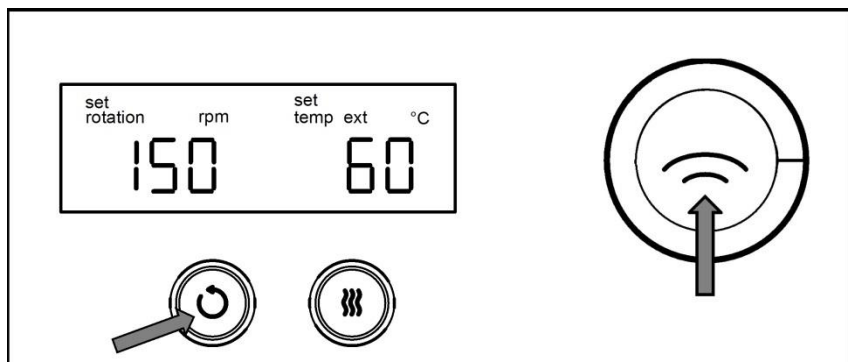
1. Connect temperature sensor (see chapter "Installation" – "Accessories (optional)" - „Temperature sensor Pt 1000").
2. Calibrate temperature.

Example: 31 °C



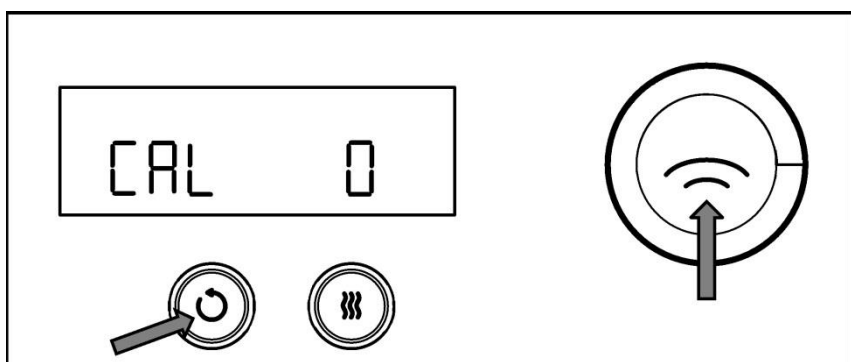
Press and hold Hei Guide

Press the **Hei Guide** rotary-push button and hold button during the entire setting procedure.



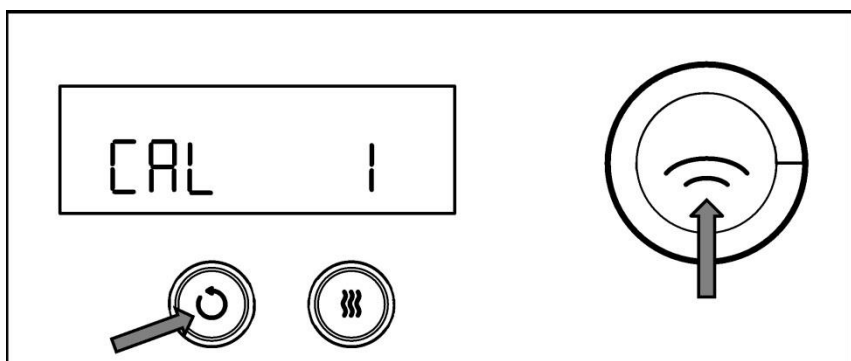
Press Stirring button

Now press the Stirring button as well.

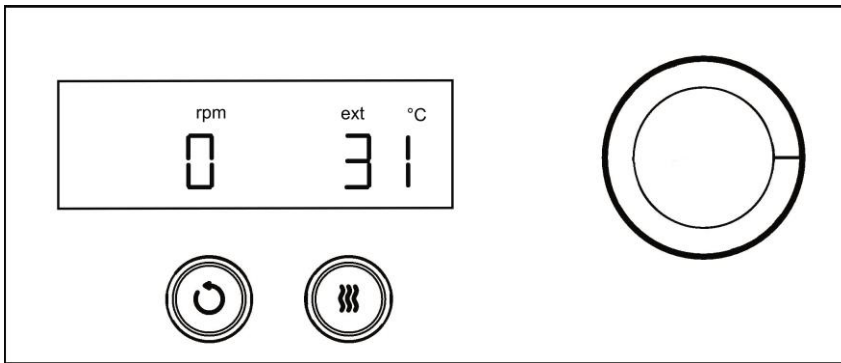


Increase/decrease calibration value

To increase or decrease the calibration value, press the Stirring button repeatedly until you reach the desired calibration value.



3. When you reach the desired setting, release the **Hei Guide** rotary-push button.



Save settings

The last selected settings remain saved following switching off and are offered to you first when setting again the calibrating function.

Safety Plus (MR Hei-Tec)

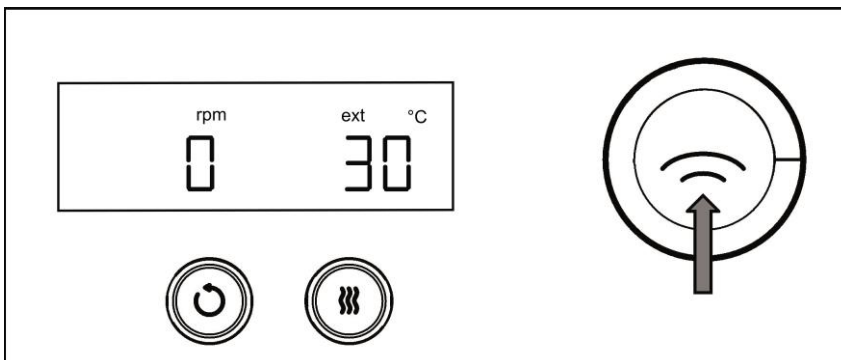
The Safety Plus function allows you to switch off error monitoring of the temperature sensor for errors "E21" and "E22" and back on again if required (default setting: "SAF On").



Stirring function and heating function

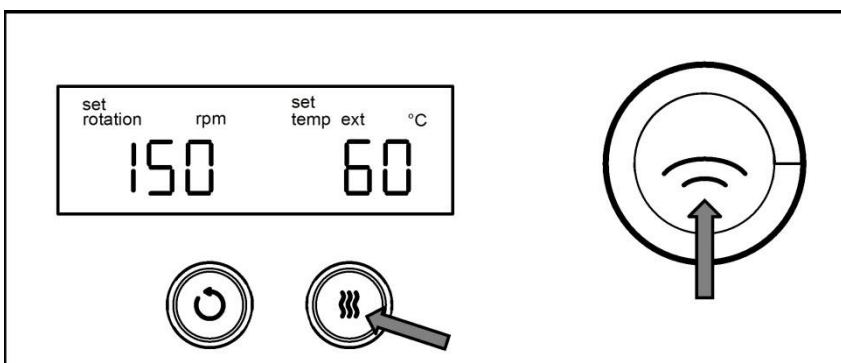
The stirring function and the heating function may not be active.

1. Connect temperature sensor (see chapter "Installation" - "Accessories (optional)" - "Temperature sensor Pt 1000").
2. Turn Safety Plus function off (**a.**) or on (**b.**).



Press and hold Hei Guide

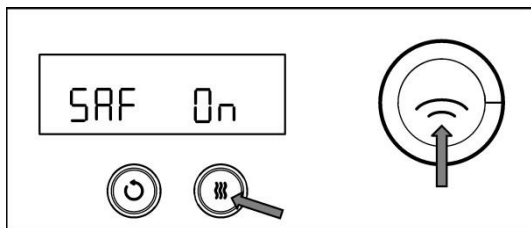
Press the **Hei Guide** rotary-push button and hold button during the entire settings process.



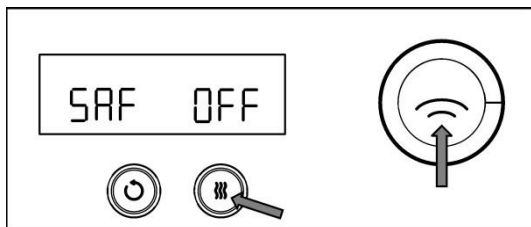
Press Heating button

Now press the Heating button as well.

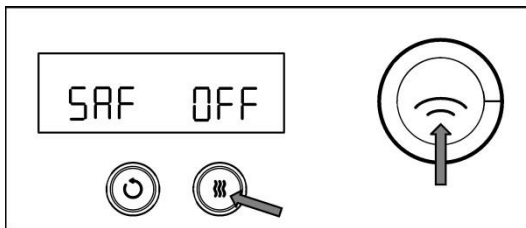
a. Switch off Safety Plus function



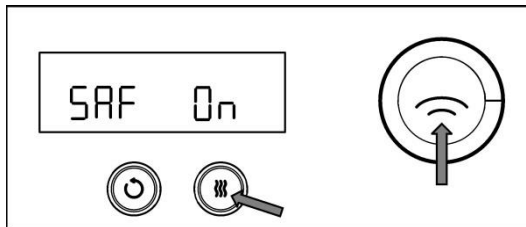
3. Press Heating button again.



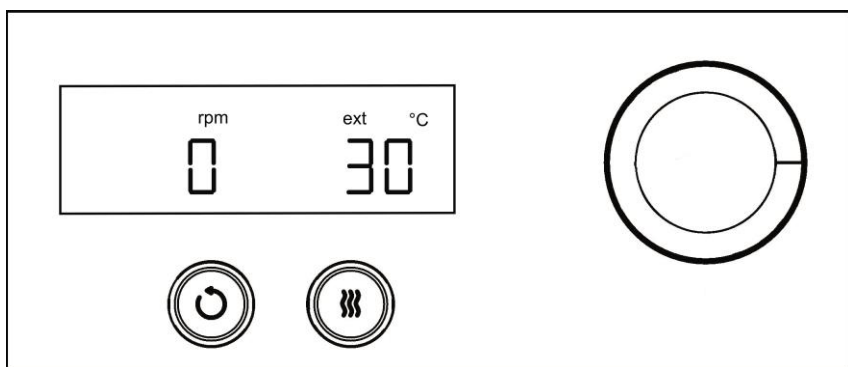
b. Switch on Safety Plus function



3. Press Heating button again.



4. When you reach the desired setting, release the **Hei Guide** rotary-push button.



Save settings

The last selected settings remain saved following switching off and are offered to you first when setting again the Safety Plus function.

Error codes

NOTICE

Error code displayed on the device

1. Perform a reset.
2. Implement the measures suggested in the table below.

MR Hei-Standard

Error code	Cause	Consequence	Measure
LED I/O flashes one time	-	Heating function off.	➔ Please contact our Technical Service.
LED I/O flashes two times	The actual temperature exceeds the set temperature on the sensor of the temperature sensor by more than 25 °C: a. Temperature control defective. b. Exothermic reaction. c. Test setup not optimal.		➔ Check test setup. ➔ Please contact our Technical Service.
LED I/O flashes three times	a. Speed control knob defective. b. Temperature control knob defective. c. Heating button defective.	Heating function off.	➔ Please contact our Technical Service.
LED I/O flashes four times	Motor defective.	Heating function off. Stirring function off.	
LED I/O flashes five times	a. Sensor break. b. Temperature sensor is connected or disconnected whilst the heating function is switched on. (IMPORTANT: The temperature sensor must only be connected or removed when the heating function is switched off)	Heating function off.	➔ Replace temperature sensor (only in case of "a"). ➔ Switch off the device. ➔ Connect temperature sensor (see chapter "Installation"). ➔ Switch on the device.

MR Hei-Tec

Error code	Mode	Cause	Consequence	Measure
„E11“, „E12“, „E13“, „E14“		-	Heating function off.	➔ Please contact our Technical Service.

Error code	Mode	Cause	Consequence	Measure
„E21“ *		a. Temperature sensor dropped from the medium.		→ Position the temperature sensor at the measuring point. → Perform a reset.
		b. Cool medium is refilled when heating function is switched on and temperature sensor is connected. (IMPORTANT: Only refill the cool medium when the heating function is switched off).		→ Perform a reset.
„E22“ *		a. Temperature sensor located outside of the medium when switching on the heating.		→ Position the temperature sensor at the measuring point. → Perform a reset.
		b. The temperature on the sensor of the temperature sensor is too low during the first 10 minutes. c. For physical reasons, a temperature increase is not possible.		→ Reduce the medium quality or optimize heat conduction.
„E23“	(only in Precise-Mode)	The actual temperature exceeds the set temperature on the sensor of the temperature sensor by more than 25°C: a. Temperature control defective. b. Exothermic reaction. c. Test setup not optimal.		→ Check test setup. → Please contact our Technical Service.
„E33“		Heating button defective.		→ Please contact our Technical Service.
„E34“		Stirring button defective.		
„E35“		Hei-Guide rotary-push button defective.		
„E41“		Motor defective.	Heating function off. Stirring function off.	
„E51“, „E52“, „E53“		a. Sensor break. b. Temperature sensor is connected or disconnected whilst the heating function is switched on. (IMPORTANT: The temperature sensor must only be connected or removed when the heating function is switched off)	Heating function off.	→ Replace temperature sensor (only in case of "a"). → Switch off the device. → Connect temperature sensor (see chapter " <u>Installation</u> "). → Switch on the device.

* The monitoring of this safety function can be disabled by switching off the Safety Plus function (see chapter "Operation" - "Heating" - "Safety Plus (MR Hei-Tec)").

Maintenance

The device is maintenance-free.

Is repair work required?

- Please inform Heidolph Instruments. Repair work must be carried out by the specialized personnel authorized by Heidolph Instruments.



Risk posed by electrical voltage!

Risk of damage to health and to the device.

- Remove mains plug before opening the instrument.

Cleaning



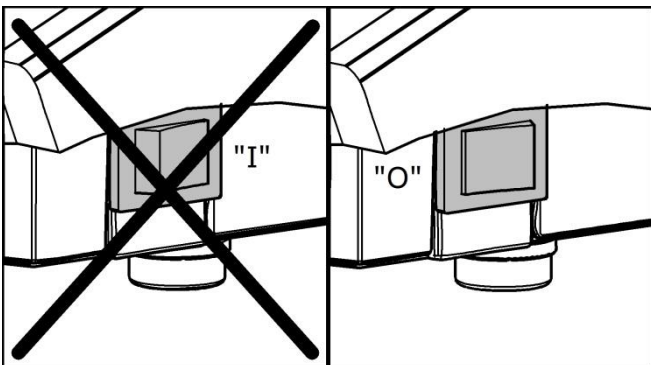
Damage to property as a result of corrosive cleaning agents!

Damage to the surface of the device.

- To clean the enclosure and device surface, use a damp cloth (mild soap solution).
- Do not use cleaning rags, scouring agents, acids, alkaline solutions, chlorine bleach, chlorine-based cleaning products or products which contain metallic components.

Disassembly

1. Switch off the device.



2. Disconnect all plug connections.



Hot surfaces!

Risk of scalding and burns.

- Allow the hotplate and accessories to cool down.
- Allow liquids and sampling media to cool down.

Disposal

- Please ensure that the device is disposed of properly according to the valid national legal regulations.
- Please dispose of the packaging material correctly in accordance with the valid, national legal regulations.

Accessories

Heat-On 250 ml block	505-80067-00
Heat-On 250 ml block with flask sidearm cutouts	505-80067-01
Heat-On 500 ml block	505-80069-00
Heat-On 1 liter block	505-80071-00
Heat-On 2 liter block	505-80073-00
Heat-On 3 liter block	505-80075-00
Heat-On 5 liter block	505-80076-00
Heat-On safety handles	505-80077-00
Heat-On inserts from 10 ml to 150 ml on request	
Concave block adaptor for 1 liter flasks	504-94000-00
Heating bath liquid 5 liter – up to 240°C	515-31000-00
Support rod, stainless steel 1.4305 (V2A)	509-81000-00
Temperature sensor Pt 1000 – glass-coated	509-67920-00
Temperature sensor Pt 1000 – V4A	509-67910-00
Pt 1000 clamping system (includes support rod and attachment with cable inlet)	509-63100-00
Pt 1000 clamping system for bath attachments from 3 to 5 liter (includes support rod and attachment with cable inlet)	509-63200-00
Stirring bars kit (3 pcs.), cylindrical shape and PTFE-coated	509-56000-00
Stirring bars evaluation kit (for flasks, 10 pcs.), cross shape, oval shape, elliptical shape	509-58300-00
Stirring bars for 5 ml to 2000 ml flasks on request	
Silicone protective cover MR Hei-Standard	23-07-06-05-63
Silicone protective cover MR Hei-Tec	23-07-06-05-59
Holding device MR	509-96000-00

Technical data

MR Hei-Standard

Dimensions (W x D x H)	277 × 173 × 94	
Power input	115 V	620 W
	230 V	820 W
Permissible ambient temperature	0 – 40 °C	
Permissible ambient conditions	5 - 31 °C at 80 % relative humidity 32 - 40 °C linear decrease up to 50 % relative humidity 0 - 2000m a.s.l. Contamination level 2 Overvoltage category II	
Weight	2.9 kg	
Protection class	IP32	
Airborne sound level	Significantly lower than 80 dB(A)	
Heating regulation	Electronic	
Hotplate material	Silumin ceramicized	
Hotplate dimensions	Ø 145 mm	
Safety circuit (hotplate)	25K above the hotplate temperature	
Heat output	115 V	600 W
	230 V	800 W
Hotplate temperature range	20 – 300 °C	
Temperature setting accuracy	± 1 K	

Temperature setting accuracy of external sensors	$\pm 0.5 \text{ K}^*$
Temperature setting accuracy of hotplate sensors	$\pm 0.5 \text{ K}^*$
Speed	100 – 1400 rpm
Speed accuracy	< 2 %
Maximum stirring quantity (water)	20 l
Connection	Temperature sensor

* sets the control accuracy for the following values: 800 ml water in a 1 liter glass beaker, form H according to DIN 12 331, set temperature 50 °C, 40 mm stirring bar, 600 rpm, immersion depth of sensor 60 mm.

MR Hei-Tec

Dimensions (W x D x H)	277 x 173 x 94	
Display	Digital	
Power input	115 V	620 W
	230 V	825 W
Permissible ambient temperature	0 – 40 °C	
Permissible ambient conditions	5 - 31 °C at 80 % relative humidity 32 - 40 °C linear decrease up to 50 % relative humidity 0 – 2000m a.s.l. Contamination level 2 Overvoltage category II	
Weight	2.6 kg	
Protection class	IP32	
Airborne sound level	Significantly lower than 80 dB(A)	
Heating regulation	Electronic	
Hotplate material	Silumin ceramicized	
Hotplate dimensions	Ø 145 mm	
Safety circuit (hotplate)	25K above the hotplate temperature	
Heat output	115 V	600 W
	230 V	800 W
Hotplate temperature range	20 – 300 °C	
Temperature setting accuracy	$\pm 1 \text{ K}$	
Temperature setting accuracy of external sensors	$\pm 0.5 \text{ K}^*$	
Temperature setting accuracy of hotplate sensors	$\pm 0.5 \text{ K}^*$	
Speed	100 – 1400 rpm	
Speed accuracy	< 2 %	
Maximum stirring quantity (water)	20 l	
Connection	Temperature sensor Pt 1000	

* sets the control accuracy for the following values: 800 ml water in a 1 liter glass beaker, form H according to DIN 12 331, set temperature 50 °C, 40 mm stirring bar, 600 rpm, immersion depth of sensor 60 mm.

Warranty bond



The Heidolph Instruments company provides a 3-year warranty for the products described here (excluding glass and wearing parts) if you register using the warranty card enclosed or online (www.heidolph.com). The warranty is valid from the point of registration. The serial number is also valid without registering. The warranty covers part and manufacturing defects.

In the case of a part or manufacturing defect, the device shall be repaired or replaced free of charge under the terms of the warranty.

Heidolph Instruments shall not assume liability for any damages incurred as a result of improper handling or transport.

Guarantee claim?

- Please inform Heidolph Instruments should you wish to make a guarantee claim.

Contact/Technical Service

If your device is not working properly:

- Please inform Heidolph Instruments by using our contact information.

You have contacted Heidolph Instruments?

- Copy and complete the Confirmation of condition of unit from these operating instructions.
- Please repack the device appropriately for transport and send to Heidolph Instruments together with the Confirmation of condition of unit.

Our contact details

North America

Phone: 1-866-650-9604
E-mail: service@heidolph.com
www.heidolphNA.com

UK United Kingdom

Phone: 01799-5133-20
E-mail: sandra.mcneill@radleys.co.uk
www.heidolph-instruments.co.uk

All other countries

Heidolph Instruments GmbH & Co. KG
Technical Service
Walpersdorfer Str. 12
91126 Schwabach
Germany
Phone: +49-9122-9920-74
E-mail: service@heidolph.de
www.heidolph.de

Confirmation of condition of unit

→ In the case of repair, copy and complete the Confirmation of condition of unit and send it to Heidolph Instruments (see chapter "[Contact/Technical Service](#)").

1. Details about the unit

Product number _____
Serial number _____
Reason for repair _____

2. Has the device been cleaned, decontaminated/sterilized?

yes _____ no _____

3. Is the unit in a condition which does not represent any health threats for the staff of our service department?

yes _____ no _____

if not, which substances has the unit come into contact with?

4. Legally binding declaration

The customer is aware of being legally liable to Heidolph Instruments for any damages arising from incomplete and incorrect information.

Date _____ **Signature** _____

Company stamp _____

Please note The shipper is responsible for the return of the goods in wellpacked condition, suitable for the mode of transport.

Sender information

Name, first name _____
Company _____
Department, research group _____
Street _____
Zip code, city _____
Country _____
Phone _____
E-mail _____

01-005-005-39-1 21.03.2014
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