Safe
Heating and Mixing

Betriebsanleitung

Operating instructions

Hei-PLATE Mix'n'Heat Core+

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research made easy

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About this document

This operating instructions manual describes the features and operation of Hei-PLATE Mix'n'Heat Core+ magnetic stirrers. The operating instructions manual is an integral part of the delivery!

Typographic conventions

Standardized symbols, highlighting elements, and signal words are used in this document to identify warnings, cautions, important information, and special text contents.

Symbol	Signal word / explanatory note
	Warning symbols in combination with a signal word indicate dangers: **DANGER** Indicates a hazardous situation which, if not avoided,will result in death or serious injury. **WARNING** Indicates a possible hazardous situation which, if not avoided,may result in death or serious injury. **CAUTION** Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury or material/environmental damage.
	Prohibition signs indicate actions or situations that are to be omitted or avoided. Failure to comply may result in personal injury and / or damage to property.
	Mandatory signs are used to indicate important information regarding the product handling. This information is used to ensure operational safety and to maintain the value of the product.
[**GUI**]	**Parameter** designations, **display texts**, and **device labels** are highlighted in text and tables in a typographic manner to facilitate the assignment on the device.
→	The arrow symbol indicates instructions to be followed in order to ensure the operational safety when handling the product.

Copyright protection

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No part of this publication may be transmitted or reproduced in any form, by any means, without the prior written consent of the copyright owner Heidolph Instruments GmbH & Co. KG. Any violation is subject to compensation for damages.

Basic product information

Guidelines applied, product certification

CE	**CE Marking** The device complies with the following standards: • European Machinery Directive, 2006/42/EC • EMC Directive 2014/30/EU

California Residents

Important information for California residents regarding Prop 65. Please visit www.P65Warnings.ca.gov for more information.

Residual risk

The device was designed and manufactured in accordance with the latest technical standards at the time of development and the recognized safety regulations. During installation and use, as well as during maintenance work, repairs and cleaning, there are nevertheless certain residual risks associated with the device described.

These are identified and described at the appropriate points in this document.

Intended use

The device described in this manual is specifically designed for the following tasks:

- Heating
- Mixing
- Stirring
- Titration

The device described in this manual is suitable for use in chemistry, pharmacy, biology, environmental analytics, basic research and research laboratories

Any other use of the device described in this manual is not considered as intended!

Due to its design, the device in its delivery condition may only be used in analytical processes or in laboratory-like conditions in the food, cosmetics, and pharmaceutical industries as well as other comparable industries that manufacture products intended for consumption by humans or animals, or for use on humans or animals.

Reasonably foreseeable misuse

For use under conditions or for purposes deviating from the intended use, additional measures may become necessary, and/or specific guidelines and safety regulations will have to be observed (see section „Special hygiene measures for the use of laboratory equipment in food, cosmetics and pharmaceutical production“, page 41). Corresponding requirements must be evaluated and observed by the operator in each individual case.

Compliance with and implementation of all relevant guidelines and safety measures for the respective field of application is within the sole responsibility of the operator.

All risks resulting from improper use are solely borne by the operator.

The device may exclusively be operated by authorized and instructed personnel. Training and qualification of the operating personnel as well as ensuring that the device is operated with responsibility are the sole responsibility of the operator!

Transportation

During transport, avoid severe shocks and mechanical stresses that can cause damage to the device.

Keep the original packaging in a dry and protected place for later use.

Storage

Always store the device in its original packaging. To protect against damage and unreasonable material aging, store the device in a dry environment that should be as temperature-stable and dust-free as possible.

Recommended ambient conditions for storage:

- 5 °C – 31 °C up to 80 % rel. humidity
- 32 °C – 40 °C up to 50 % rel. humidity (decreasing linearly)

Acclimatization

After each transport and after storage under critical climatic conditions (e.g. high temperature difference between inside and outside), allow the device to acclimatize at room temperature for a minimum of two hours to prevent possible damage from condensation before putting it into operation at the place of use. If necessary, extend the acclimatization phase if the temperature differences are very high.

Make all supply connections (power supply, tubing) only after the device has been acclimatized!

Permissible ambient conditions

The device is designed for indoor use only. Permissible ambient conditions for operation:

- 5 °C – 31 °C up to 80 % rel. humidity
- 32 °C – 40 °C up to 50 % rel. humidity (decreasing linearly)
- Maximum height above sea level: 2,000 m

When used in corrosive atmospheres, the service life of the device may be reduced depending on the concentration, duration and frequency of exposure.

The device **IS NOT** suitable for outdoor use!

The device **IS NOT** suitable for use in hazardous areas!

Processing liquids at extreme cold temperatures

The device is suitable for the processing of liquids at extreme cold temperatures within the stated permissible ambient conditions and observing the regulations for proper use.

Always use a suitable insulating vessel (e.g., a Deware flask) to process liquids above a temperature of < -15 °C to avoid damage to the device due to condensation and frost.

General safety information

- ➜ Before commissioning and using the device, familiarize yourself with all the safety regulations and guidelines for occupational safety applicable at the place of use and observe them at all times.
- ➜ Only operate the device if it is in perfect technical condition. In particular, ensure that there is no visible damage on the device itself and, where necessary, on connected devices or the supply connections.
- ➜ If there is missing or misleading information on the device or on occupational safety, contact the responsible safety specialist or our technical service.
- ➜ Only use the device in accordance with the regulations for intended use („Intended use", page 37).

Electrical safety

- ➜ Ensure that the voltage indicated on the rating plate matches the supply voltage of the country in which the device is being used.
- ➜ Ensure that the power supply circuit provided is protected by means of a residual-current device (RCD).
- ➜ Always use the supplied power supply cord provided with the device.
- ➜ Prior to use, check that the device and the power supply cord are free of visible damage.
- ➜ Have repairs and/or maintenance work on the device carried out exclusively by an authorized and skilled electrician or by the technical service department of Heidolph Instruments.
- ➜ Always switch off and disconnect the device from the power supply, preventing reconnection, before carrying out maintenance work, cleaning, or repairs.

Operational safety

- ➜ Operate the device under a closed ventilated fume hood when working with potentially hazardous substances (see EN 14175 and DIN 12924).
- ➜ Do not make any unauthorized changes or modifications to the device!
- ➜ Only use genuine spare parts and accessories, or those expressly approved by the manufacturer!
- ➜ Rectify malfunctions or faults on the device immediately. Switch off and disconnect the device from the power supply, preventing reconnection, if it is not possible to eliminate the malfunction or rectify the fault immediately.
- ➜ Observe all other applicable regulations such as laboratory and workplace guidelines, recognized safety technology rules and special local regulations.

Work safety

- ➜ Always use the prescribed personal protective equipment (PPE) such as protective clothing, safety goggles, protective gloves, safety shoes, etc.
- ➜ Do not operate any other devices in the immediate vicinity of the device ...
  - which can generate electromagnetic fields in the frequency range between 9×10^3 Hz to 3×10^{11} Hz,
  - which generate emission or radiation sources in the frequency range 3×10^{11} Hz to 3×10^{15} Hz (in the optical spectral range wavelengths from 1,000 µm to 0,1 µm),
  - which generate ultrasonic or ionizing waves.
- ➜ Do not operate the unit when adiabatic compression or shock waves may occur (pressure wave ignition).
- ➜ Do not use substances that could release energy in an uncontrolled way and cause a pressure increase (exothermic reaction, spontaneous ignition of dusts).
- ➜ Only use stirring tools approved and authorized by Heidolph Instruments.
- ➜ Route all cables free of kinks and outside the operating and hazardous area.
- ➜ Avoid excessive pressure on the device display.
- ➜ Avoid fluid accumulation on the device.
- ➜ Keep the base unit dry during operation.
- ➜ Ensure adequate safety distance: Do not store objects in the working and hazardous area of the device during operation.

Personal protective equipment (PPE)

The operator must determine and provide the necessary PPE, depending on the respective application and the media and chemicals used.

The corresponding instruction of the personnel is solely within the operator's responsibility.

Environmental protection

When processing environmentally hazardous substances, take appropriate measures to avoid risks to the environment.

The evaluation of corresponding measures such as the marking of a hazardous area, their implementation, and the training of the responsible personnel is the sole responsibility of the operator!

Biohazard

When processing biohazardous substances, take appropriate measures to prevent hazards to persons and the environment, including:

- ➜ Instruction of the personnel regarding the necessary safety measures.
- ➜ Provision of personal protective equipment (PPE) and instruction of the personnel in its use.
- ➜ Marking of the device with a biohazard warning symbol.

The evaluation of corresponding measures such as the marking of a hazardous area, their implementation, and the training of the responsible personnel is the sole responsibility of the operator!

Special hygiene measures for the use of laboratory equipment in food, cosmetics and pharmaceutical production

When laboratory equipment is used in the production processes of the food, cosmetics or pharmaceutical industry, special hygiene measures must be taken by the user to avoid sample contamination and to minimize any risk to humans and the environment as far as possible.

Please observe the following recommendations:

General Measures

- ➜ Ensure a clean working and storage environment when handling substances and materials.
- ➜ Train all employees in the field of occupational hygiene, document all training measures and check the implementation of all required hygiene measures during operation regularly.
- ➜ Use a hygiene control concept such as HACCP (Hazard Analysis and critical Control points). The HACCP comprises the following criteria:
  - Hazard analysis
  - Identification of critical control points
  - Definition of critical limit values
  - Establishment of a system for monitoring and controlling critical hazard control points (CCP)
  - Corrective actions for uncontrollable CCP
  - Establishment of a system to verify the implementation of all HACCP measures
  - Establishment of a system for documenting all associated procedures and protocols

The evaluation of the applicability of the mentioned rules and regulations is within the sole responsibility of the operator!

Device-specific measures

- ➜ Regularly clean components that come into contact with the product, such as flasks, seals, tubes, etc. in the autoclave (if available or possible) or chemically (e.g. with ethanol) to sterilize all surfaces.
- ➜ Make sure that even products that are intended for single use only are of sufficient purity.
- ➜ Do not use open containers.
- ➜ Avoid contamination by handling contaminated vessels, apparatus or aids with care.

Contact information

For further information, please contact our after sales service at any time.

Phone: +49-9122-9920-0

Mail: sales@heidolph.de

Other regulations

In addition to the notes and instructions in this document, observe all other applicable regulations such as laboratory and workplace guidelines, hazardous substances ordinances, recognized rules of safety engineering and occupational medicine as well as particular local regulations!

Noncompliance will invalidate any warranty against Heidolph Instruments.

The operator is solely liable for all damage resulting from unauthorized changes or modifications to the unit, from the use of unauthorized or non-genuine spare parts and accessories, or from disregarding the safety instructions and hazard warnings or the manufacturer’s instructions!

Mechanical design

Setting up the device

CAUTION

Risk Of Slipping!

The vibration during operation can cause the device to move over the mounting surface and/or fall to the ground.

→ Observe the instructions for the correct positioning of the device!

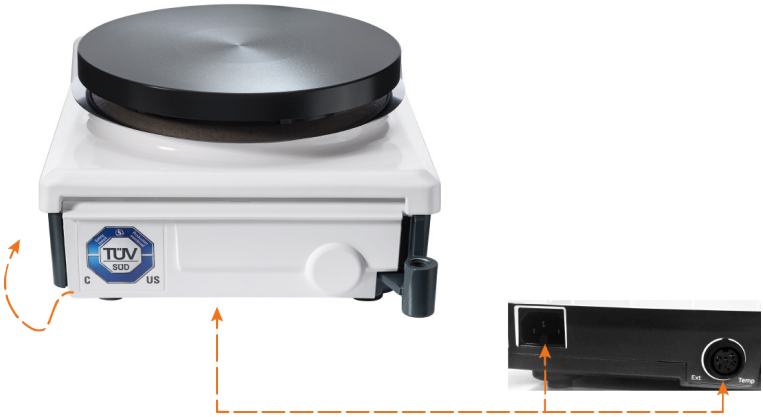
→ Place the device on a solid level and horizontal surface for use.
→ Before switching on, make sure that the device is sufficiently stable.
→ Keep all contact surfaces clean and dry.
→ Keep a minimum distance of 10 cm between magnetic stirrers and other devices and structures (devices with heating function only).

Power Supply

Always use the supplied power supply cord provided with the device! Observe the instructions in section „Electrical safety", page 39.

The device must only be supplied with power from a properly grounded mains socket-outlet.

The appliance inlet is located under the protective cover on the back of the device:



→ Lift the protective cover for connecting the power supply cable by hand. No tools are required to open the protective cover.

As soon as the device is supplied via the power supply cable, the on/off button lights up white.

External temperature sensor

The port used to connect the external temperature sensor (PT1000) is located under the protective cover on the rear of the device (see figure above).

➜ Lift the protective cover for connecting the sensor cable by hand. No tools are required to open the protective cover.

➜ Make sure that the connector of the sensor cable is properly connected to the device and locked.

Switching the device on/off

To turn on the device, press the on/off button. When the device is switched on, the on/off button lights up green.

To turn off the device, press the on/off button again. When the device is turned off, the on/off button lights up white.

Settings

The following adjustments can be made in the device settings:

- Enable/disable auto standby
- Activating/deactivating the [automatic restart] function
- Activating/deactivating the [soft start] function
- Calibration of external temperature sensor (PT1000)
- Activating/deactivating the safety function

Open the settings menu

To open the **settings menu**, proceed as follows:

➜ Turn off the device (on/off button lights up white).

➜ Press simultaneously and hold both the push-and-rotary controls **[temperature]** and **[rotation]**.

➜ Press the on/off button until **AR off** (first setting option) appears on the display.

➜ Release the push-and-rotary controls and the on/off button.

➜ Use the **[temperature]** control to select one after another the following options:

- **AR**: Activate or deactivate automatic restart
- **SoS**: Activate or deactivate soft start
- **ASd**: Activate or deactivate auto standby
- **SAF**: Activate or deactivate the security function
- **CAL**: Calibrate the connected temperature sensor

➜ Use the **[rotation]** control to select the desired mode:

- [**on**] or [**off**] for automatic restart, soft start, auto standby and safety function
- Temperature deviation in **°C** for sensor calibration

If no selection is made within about five seconds, the menu is automatically closed and the device is in the on state!

Automatic restart

If the [automatic restart] function is activated, the device switches on again automatically with the set parameters after a power interruption when the power is restored.

WARNING

Risk of burns, risk of injury, risk of damage to property from falling vessels and leaking chemicals

When the [automatic restart] function is activated, the heating plate automatically heats up to the last set operating temperature when the power is restored and the rotation speed will be augmented to the last set value.

- ➜ Ensure that all vessels are properly positioned on the heating plate before the power is restored.
- ➜ In the event of a power failure, do not place any objects on the heating plate.

By default, the [automatic restart] function is deactivated. The function can be activated or deactivated at any time via the device settings:

- ➜ Open device settings (see section „Open the settings menu", page 45)
- ➜ Set **AR** to **on** to activate the function
- ➜ Set **AR** to **off** to disable the function

Soft start

When the [soft start] function is activated, the speed is gradually increased to the set value after the rotation is switched on.

By default, the [soft start] function is activated. The function can be activated or deactivated at any time via the device settings:

- ➜ Open device settings (see section „Open the settings menu", page 45)
- ➜ Set **SoS** to **off** to disable the function
- ➜ Set **SoS** to **on** to enable the function

Auto standby function

When the [auto standby] function is activated, the device is automatically switched off from idle status (no heating function, no agitation function) if no operation is performed for a period of three minutes.

The device must then be switched on again using the on/off button.

By default, the [auto standby] function is deactivated. The function can be activated or deactivated at any time via the device settings:

- ➜ Open device settings (see section „Open the settings menu", page 45)
- ➜ Set **ASd** to **on** to activate the function
- ➜ Set **ASd** to **off** to disable the function

Safety function

(Only relevant and available operating the device with an external temperature sensor, see also section „Operation with external temperature sensor", page 51.)

If the safety function is activated, the heating function is automatically switched off when the sensor detects a sudden drop in temperature or when the measured temperature rises too slow.

By default, the safety function is activated. The function can be activated or deactivated via the device settings:

➜ Open device settings (see section „Open the settings menu", page 45)

➜ Set **SAF** to **off** to disable the function

➜ Set **SAF** to **on** to activate the function

Sensor calibration

(Only relevant and available operating the device with an external temperature sensor, see also section „Operation with external temperature sensor", page 51.)

The calibration function can be used to set the connected temperature sensor according to the specific ambient conditions in your laboratory.

The sensor calibration function is only available when a compatible temperature sensor is connected. To calibrate the connected temperature sensor, follow these steps:

➜ Immerse the sensor in the reference sample

➜ Open device settings (see section „Open the settings menu", page 45)

➜ Select parameter **CAL**

➜ Adjust the displayed temperature value as desired

!	The value is retained until a new calibration is performed.

General notes

Observe the instructions in this section when operating the device!

CAUTION

Risk of injury, risk of damage to property due to tilting/falling of the device

High shaking frequencies in combination with a large load and/or a tall attachment assembly on the shaking platform may cause the device to swing up and fall!

- ➜ Only gradually increase the shaking frequency to the required level under the above conditions, paying attention to the stability of the structure.
- ➜ Lower the shaking frequency or reduce the total load on the shaking platform when the device starts to move during operation.

An uneven distribution of the load on the shaking platform may cause the device to swing up and fall!

- ➜ Always ensure that the vessels are evenly distributed on the shaking platform.
- ➜ Pay particular attention to an even distribution of the weight load when vessels of different sizes and/or differently filled vessels are placed on the shaking platform at the same time!

Risk of injury, risk of damage to property from falling vessels

At high shaking frequencies, there is a risk that improperly fastened vessels will fall off the shaking platform.

- ➜ Before switching on the device, make sure that all vessels are properly fixed on the shaking platform.
- ➜ Contaminated surfaces should be cleaned immediately.

Always place individual vessels in the center of the heating plate.

Use suitable attachments for processing multiple samples/vessels simultaneously.

Do not switch on the appliance until all the vessels are securely positioned on the heating plate.

Always use the necessary and appropriate personal protective equipment!

Push-and-rotary controls

The device is equipped with two push-and-rotary controls for setting **[temperature]** and **[rotation]**, for adjusting various device parameters, and for switching the heating and mix functions on and off (see section „Mechanical design“, page 43).

The operation of the push-and-rotary controls is described in detail in the following sections:

Adjust values

Quickly turn the two knobs clockwise or counter-clockwise to increase or decrease the displayed value (temperature, speed, setting value).

Switch heating/mix function on/off

Press the **[temperature]** control turn the heating function on and off.

Press the **[rotation]** control to turn the mixing function on and off.

Display set values

During normal operation, move the two controls one detent position clockwise or counter-clockwise to display the set point (temperature, speed).

Lock function

Press and hold the **[temperature]** / **[rotation]** push-and-rotary control for at least two seconds until the displayed value (temperature or speed) is highlighted with a white frame. In this state, the push-and-rotary control is locked to prevent unintended operation.

Press and hold the **[temperature]** / **[rotation]** push-and-rotary control again for at least two seconds until the white marker frame disappears. In this state, the push-and-rotary control is unlocked.

The two push-and-rotary controls **[temperature]** and **[rotation]** can be locked at the same time as described.

Setting the heating temperature

WARNING

Risk of burn

The heating plate is designed for a maximum operating temperature of 300°C. Contact with surfaces above 50 °C can lead to serious injury.

- ➜ Always pay attention to the heating temperature indicator of the device.
- ➜ Avoid direct skin contact with the heating plate during operation and also observe the residual heat indicator after switching off!
- ➜ Do not place heat-sensitive objects on the heating plate.
- ➜ Always use the necessary personal protective equipment (heat-resistant gloves, eye protection, safety clothing) to process samples from a temperature of 50 °C.

➜ Turn on the device as described in section „Switching the device on/off", page 45

– The display shows the current temperature of the heating plate.

➜ Turn the **[temperature]** control clockwise or counter-clockwise to set the desired temperature (setting range: 20 – 300 °C).

– The setpoint can be adjusted at any time during operation.

➜ Press the **[temperature]** control to activate the heating function.

– When the heating function is activated, the LED ring of the **[temperature]** control lights up orange.

➜ Press the **[temperature]** control again to turn off the heating function.

Residual heat indicator

When the device is switched off, the display shows the current temperature of the heating plate. At the same time, the LED ring of the **[temperature]** control flashes.

The optical indicators (display and LED ring) will turn off as soon as the surface temperature of the heating plate reaches a level of 50 °C with a falling tendency.

WARNING

Risk of burn

As long as the device is not switched off, the display shows the current temperature of the heating plate or the measured value from the external temperature sensor.

- ➜ Note that the sensor reading may differ significantly from the current surface temperature of the heating plate!
- ➜ Avoid direct skin contact with the heating plate!
- ➜ Do not place heat-sensitive objects on the heating plate.

Setting the rotation speed

WARNING

Risk of injury, risk of damage to property caused by splashing fluids

When using open vessels, there is a risk that fluid will spray out.

- ➜ Whenever possible, use closed vessels for processing corrosive, toxic or biohazardous substances and seal them safely.
- ➜ Especially using open vessels, increase the rotation speed only gradually and observe the fluid movements.
- ➜ Always use the necessary personal protective equipment (heat-resistant gloves, eye protection, safety clothing) to process samples from a temperature of 50 °C.

- ➜ Turn on the device as described in section „Switching the device on/off", page 45
  - The display shows **rpm 0**.
- ➜ Turn the **[rotation]** control clockwise or counter-clockwise to set the desired nominal speed (setting range: 100 – 1,400 rpm).
- ➜ Press the **[rotation]** control activate the mixing function.
  - When the mixing function is activated, the LED ring of the **[rotation]** control lights up White.
  - The displayed rotation speed value continuously updates until the setpoint is reached.
- ➜ The setpoint can be adjusted at any time:
  - Use the **[rotation]** control to adjust the setpoint as required.
  - The rotation speed is adjusted without any delay (observe the display!).
- ➜ Press the **[rotation]** control again to turn off the mixing function.

Operation with external temperature sensor

Devices of the type Hei-PLATE Mix'n'Heat Core+ can be operated with an external temperature controller (PT1000) (optional accessory).

For detailed instructions on how to set up and connect a temperature controller, refer to the associated operating instructions.

The port for the external temperature sensor is located under the protective cover on the back of the device.

When using an external temperature sensor, the current temperature is not measured on the heating plate, but on the connected sensor. The temperature indicator on the display is marked with the **[ext]** symbol.

Calibrate the external sensor as described in section „Sensor calibration", page 47 to obtain correct readings and work results.

Two heating modes are available when using an external temperature sensor:

- **FASt** mode: In this mode, the heating plate is heated up quickly to the preset temperature (factory setting).
- **PrECIS** mode: In this mode, the heating plate is heated slowly and without overshooting to the preset temperature.

Observe the specific safety instructions for operation with external temperature sensor!

WARNING

Risk of burn

As long as the temperature sensor is not immersed in the sample, the temperature of the ambient air is displayed. The heating plate can therefore heat up to 300 °C unnoticed!

➜ Always immerse the temperature sensor in the sample before switching on the device or before calibrating!

➜ Do not place heat-sensitive objects on the heating plate.

➜ Always use the necessary personal protective equipment (heat-resistant gloves, eye protection, safety clothing) to process samples from a temperature of 50 °C.

Procedure

➜ Ensure that the external temperature sensor is correctly connected.

➜ Switch on the device and set the heating temperature, see section „Setting the heating temperature", page 50.

- The device operates in the last active heating mode (**FASt** or **PrECIS**).

➜ Press the **[temperature]** control to change the heating mode if necessary (LED ring flashes rapidly).

- Activate **FASt** mode: Press the control once and wait until the LED ring lights up continuously.
- Activate **PrECIS** mode: Press the control twice and wait until the LED ring lights up continuously.

➜ Immerse the external temperature sensor at least 20 mm deep in the sample to obtain a stable reading.

- The display shows the measured temperature of the sensor: Symbol **[ext]**.

➜ Press the **[temperature]** control to activate the heating function.

- When the heating function is activated, the LED ring of the **[temperature]** control lights up orange.

➜ Press the **[temperature]** control again to turn off the heating function.

Troubleshooting

The following table includes possible failures and corresponding corrective measures.

Malfunction	Possible cause/ remedy
On/off button illumination remains off	➜ Mains voltage not present: Check the power supply cable for damage, check the connection plug for correct seating, check the fuse of the house installation. ➜ LED defective, contact technical service.
No mixing function	➜ No magnetic stirring bar in the vessel, insert stirring bars. ➜ Rotation speed set to zero, increase rotation speed.
No heating function	➜ Heating temperature setpoint below current temperature, adjust setpoint. ➜ Heating plate defective, contact technical service!
Temperature display not plausible with temperature sensor connected	➜ Check temperature sensor connection. ➜ The immersion depth is too low, note the minimum immersion depth of 20 mm.
Deviation setpoint/ current value of sample	➜ Setpoint too low, take into account heat losses. ➜ Heating plate defective, contact technical service!

If a fault cannot be rectified with the described remedies, please contact an authorized sales representative or our technical service (see section „Contact information Heidolph international“, page 59).

Error codes on the device

Code	Description
E11	Sensor break, internal sensor
E12	Sensor break or short circuit, internal hardware
E13	Internal sensor difference < 15 °C
E14	Internal safety temperature ($T_{hotplate}$ > T_{set} + 25 °C)
E21	External temperature sensor: media contact lost in the current process
E22	External temperature sensor without media contact when switching on
E23	External safety temperature exceeded
E36	IO expander: Loss of communication
E41	Drive failure
E51	External sensor break
E52	External sensor difference > 15 °C
E53	External temperature sensor disconnected or plugged in when the heating is switched on

Technical data

General device data	
Model	Magnetic stirrer **Hei-PLATE Mix'n'Heat Core**+
Dimensions (W × H × D)	168 × 101 × 299 mm
Usable surface heating plate	∅ 135 mm or ∅ 145 mm (depending on model, see ordering data)
Weight	approx. 3 kg
Maximum permissible load	25 kg
Drive	EC motor, left-turning
Speed range	100 – 1,400 rpm
Adjustment accuracy	5 rpm
Heating power	800 W at 230 V (EU) 600 W at 115 V (US)
Heating temperature range	20 – 300 °C
Heating control	PID
Adjustment accuracy	1 K
Measurement accuracy (DIN IEC 751 Class a)	±0.2 K, plus tolerance PT1000
Measurement resolution	1 K
Display	LCD display
Protection class (EN 60529)	IP42
Acoustic pressure	< 50 db(A)

Electrical data	
Rated voltage	230 V, 50/60 Hz (EU) 115 V, 50/60 Hz (US)
Connection	L+N+PE
Protection class	I
Overvoltage category	II
Degree of pollution	2
Power input	Normal operation 230 V: 825 W (EU) Normal operation 115 V: 625 W (US) Standby mode: 1.7 W
EMC class	B, Group 1
Permissible ambient conditions	
Operating temperature	5 °C – 31 °C up to 80 % rel. humidity 32 °C – 40 °C up to 50 % rel. humidity (decreasing linearly)
Maximum height above sea level	2,000 m

Scope of delivery

Item	Quantity	Product no.
Hei-PLATE Mix'n'Heat Core+	1	506-21100-00
Operating instructions	1	01-005-006-76
Guarantee registration / Declaration of no objection	1	01-006-002-78

Accessories

Detailed information on the available accessories for your device variant can be found on our website at www.heidolph-instruments.com.

In case of need, contact an authorized dealer or our technical service, see „Contact information Heidolph international“, page 59.

Device service

When carrying out service work on the device (cleaning, maintenance, repair), observe the general instructions and safety information described in this section.

WARNING: Danger of electric shock

Live components are installed inside the device.

When opening the device, there is a risk of touching live components.

➜ Switch the device's main switch off and disconnect it from the power supply before carrying out maintenance work, cleaning, or repairs.

Penetrating liquid poses the danger of an electric shock.

➜ When cleaning, avoid the penetration of liquids.

General cleaning instructions

Wipe all surfaces and the control panel with a damp cloth if necessary. Persistent contamination can be removed with mild soapy water.

CAUTION: Damage to the device

Improper cleaning can damage the surfaces of the device.

Penetrating liquid can damage the electronic components inside the device.

➜ Clean the device's surfaces with a soft, lint-free and only slightly moistened cloth.

➜ Never use any aggressive or abrasive cleaning agents or aids.

Repairs

Repairs to the device may only be carried out by authorized skilled experts!

Unauthorized repairs during the warranty period will result in the loss of the warranty claim.

The owner is solely liable for damage caused by unauthorized repairs.

In case of repair contact an authorized dealer or our technical service, see „Contact information Heidolph international", page 59.

Include the completed declaration of no objection with every device return, see „Declaration of no objection", page 60.

Maintenance

The device contains no user-serviceable components. If necessary, in the event of abnormal operating behavior such as excessive noise or heat generation, for example, contact our technical service, see „Contact information Heidolph international", page 59.

Disposal

- ➜ When disposing of the device, observe the provisions of the WEEE Directive 2012/19/EU and its transposition into national law in the country of use.
- ➜ When disposing of portable batteries, observe the provisions of the European Battery Directive 2013/56/EU and their transposition into national law in the country of use.
- ➜ Check the device and all components for residues of substances that are hazardous to health, the environment, and biohazardous before disposing.
- ➜ Properly remove and dispose residues of substances that are hazardous to health, the environment and biohazardous!

Contact information Heidolph international

Heidolph Instruments North America

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

Heidolph Instruments United Kingdom

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

Local distributors

To find your local distributor please visit www.heidolph.com

Warranty Statement

Heidolph Instruments assumes a three-year warranty against material and manufacturing defects.

Excluded from the warranty are glass and wear parts, transport damage, and damage resulting from improper handling or non-intended use of the product.

For registered products, the warranty period begins on the date of purchase. Register the product with the enclosed warranty card or on our homepage www.heidolph.com.

For non-registered products, the warranty period begins with the date of the serial production (to be determined by the serial number).

In the event of material or manufacturing defects, the product will either be repaired or replaced free of charge within the warranty period.