

Safe
Heating and Mixing



Betriebsanleitung

Operating instructions
Notice d'instructions

Hei-PLATE Mix 20 l
Hei-PLATE Mix'n'Heat Core

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About this document

These operating instructions describe all the functions and the operation of the magnetic stirrers, type Hei-PLATE Mix 20 l and Hei-PLATE Mix'n'Heat Core. The operating instructions are an integral part of the described device!

Typographic conventions

Standardized symbols, signal words and highlighting elements are used in this document to warn of hazards and to identify important information or rather special text contents.

Symbol	Signal word / explanation
	<p>Warning symbols in combination with a signal word indicate dangers:</p> <p>DANGER Indicates an immediate dangerous situation. Failure to respect the indications will result in death or serious injury.</p> <p>WARNING Indicates a potential danger. Failure to respect the indications will result in serious injuries.</p> <p>CAUTION Indicates a potential hazard which, if not avoided, damage to property and minor to moderate injuries can occur.</p>
	<p>Mandatory signs are used to indicate important and useful information on handling a product.</p> <p>This information is used to ensure operational safety and to maintain the value of the product.</p>
[GUI]	Parameter designations, display texts , and device labels are typographically highlighted in the text and in tables to facilitate their assignment on the device.
→	The arrow indicates specific instructions to be followed to ensure operational safety when handling the product.

Copyright protection

This document is protected by copyright and is intended for use by the purchaser of the product only.

No transfer to third parties, reproduction in any form, including excerpts, and by any means, as well as utilization and/or disclosure of the contents is permitted without the prior written consent of Heidolph Instruments GmbH & Co. KG. Any violation is subject to compensation for damage.

Safety instructions in the official languages of the European Union

A summary of all safety instructions in the official languages of the European Union can be found in our Safety Guide for the product group shakers & mixers (Ref. 01-005-006-99). This document is available for download on our homepage in the most up-to-date version.

Notes on the product

Directives applied, product certification



CE marking

The device meets all requirements of the following directives:

- European Machinery Directive, 2006/42/EC
- EMC Directive, 2004/108/EC

California Residents

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

Residual risk

The device has been designed and manufactured in accordance with the state-of-the-art standards at the time of development and the recognized safety regulations. During mounting and use, as well as during maintenance, repair and cleaning work, there are nevertheless certain residual risks associated with the described device.

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

Intended use

The described devices have been developed and designed by the manufacturer for the following laboratory activities:

- Heating (only Hei-PLATE Mix'n'Heat Core)
- Mixing
- Stirring
- Titrating

Any other use of this device 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

Additional measures may be necessary, and/or specific directives and safety regulations may have to be observed for use under conditions or for purposes deviating from the intended use (see, for example, section „Other regulations“ on page 28). Corresponding requirements must be evaluated and implemented by the operator in each individual case.

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

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

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

Transportation

During transportation, 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. For protection against damage and excessive material aging, store the device in an environment that is as dry, temperature-stable and dust-free as possible.

Recommended storage conditions:

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

Acclimatization

After each transportation 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 at least two hours to prevent possible damage due to condensation before commissioning it in the place of use. If necessary, extend the acclimatization phase if the temperature differences are very high.

Permissible ambient conditions

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

- 5 °C – 31 °C at up to 80 % rel. humidity
- 32 °C – 40 °C at up to 50 % rel. humidity (decreasing linearly)
- Installation altitude: 2,000 m asl

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 potentially explosive 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 damages to the device due to condensation and frost.

General safety instructions

- Before commissioning and using the device, familiarize yourself with all the safety regulations and occupational safety guidelines applicable at the place of use and observe them at all times.
- Only operate the device if it is in faultless technical condition. In particular, ensure that there is no visible damage on the device itself and, where applicable, on connected devices or the supply connections.
- If there is missing or misleading information on the device or regarding occupational safety, contact the responsible safety specialist or our technical service.
- Only use the device in accordance with the regulations on intended use („Intended use“ on page 25).

Electrical safety

- Before connecting the device to the power supply, ensure that the voltage indicated on the rating plate matches the specifications of the local power utility company.
- Ensure that the power supply circuit provided is protected by means of a residual-current device (RCD).
- Always use the 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 electrician or by the technical service department of Heidolph Instruments.
- Always disconnect the device from the power supply system before carrying out any maintenance, cleaning or repair work.

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.

Occupational safety

- Always use the prescribed personal protective equipment (PPE) such as protective clothing, safety goggles, protective gloves, safety shoes, etc.
- Persons with pacemakers must maintain a minimum distance of ten cm from the device to prevent possible interferences.
- Do not operate any other devices in the immediate vicinity of the device
 - which generate emission or radiation sources in the frequency range 3×10^4 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 process substances that could release energy in an uncontrolled manner (e.g. self-ignition).
- Do not process substances in which the energy input through mixing poses a danger.
- Do not work with an open flame in the immediate vicinity of the device (risk of explosion).

- Wipe off any liquid that may have spilled on the device immediately.
- Always switch off the device when it is not in use.

Personal protective equipment (PPE)

The operating company 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 operating company's responsibility.

Environmental protection

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

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

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 claims against Heidolph Instruments.

The operator is solely liable for all damage resulting from unauthorized changes or modifications to the device, 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

Hei-PLATE Mix 20 l



Hei-PLATE Mix'n'Heat Core



Set up the device



CAUTION

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

- 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 to ensure the stability of the device during operation.
- During operation, make sure that the required minimum distance of 10 cm between the magnetic stirrer and other devices and structures is maintained (only devices with heating function).

Power supply



Always use the supplied power supply cord provided with the device! Observe the instructions in section „Electrical safety“ on page 27.

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 (figure: Hei-PLATE Core. Hei-PLATE Mix 20 l without connection socket for external temperature controller!)

- 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 controller (Hei-PLATE Core only)

The six-pole connection socket for the external temperature controller EKT-HEI CON is located under the protective cover on the rear of the device.

- Lift the protective cover for connecting temperature controller cable by hand. No tools are required to open the protective cover!

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.

General notes

CAUTION

High speeds in combination with a large load and/or a tall setup as well as an uneven distribution of the load on the top plate/heating plate carry the risk of the device swinging up and falling.



- Always place individual vessels in the center of the top plate/heating plate.
- Use suitable attachments for processing multiple samples/vessels simultaneously.
- Do not switch on the device until all vessels are securely positioned on the top plate/heating plate.
- Only increase the speed to the required level gradually and pay attention to the stability of the setup.
- Lower the speed or reduce the total load on the top plate/heating plate if the device starts to move independently during operation.
- Always ensure that the vessels are evenly distributed on the top plate/heating plate.
- 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 top plate/heating plate at the same time!

High speeds carry the risk of improperly fastened vessels falling off the top plate/heating plate and contaminating the environment by leaking chemicals.

- Before switching on the device, make sure that all vessels are properly fixed on the top plate/heating plate.
- Clean contaminated surfaces immediately.

Setting the rotation speed

WARNING

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.
- **Hei-PLATE Core:** 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“ on page 30
- Turn the **[rotation]** control clockwise or counter-clockwise to set the desired speed (setting range: 100 – 1,400 rpm)
- The rotation speed can be adjusted at any time.

Heating function (Hei-PLATE Core only)

Set the heating temperature



WARNING

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

- 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“ on page 30
- Turn the **[temperature]** control clockwise or counter-clockwise to set the heating temperature (setting range: 20 – 300 °C).

Switching the heating function on/off

- Make sure the device is switched on and the heating temperature is set.
- Press the **[heating on/off]** button to activate the heating function.
 - When the heating function is activated, the LED ring of the **[heating on/off]** button and the corresponding **[heating]** indicator LED will light orange.
- The heating temperature can be adjusted at any time during operation by turning the **[temperature]** control.
- Press the **[heating on/off]** button again to switch off the heating function.

Operation with external temperature controller



WARNING

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

- Before switching on the device and for calibration, immerse the temperature controller in the sample!
- 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.

- Make sure the device is switched on and the heating temperature is preselected (see section „Set the heating temperature“ on page 32).
- Immerse the temperature controller at least 20 mm deep in the sample to obtain a stable reading.

→ When making measurements, follow the instructions in the EKT Hei-con manual!



For detailed instructions on setting up, connecting and operating with a temperature controller, refer to the operating instructions for the EKT Hei-Con (article number 01-005-004-61-61).

Troubleshooting

The following table includes possible failures and corresponding corrective measures:

Malfunction	Possible cause/ remedy
On/off button illumination remains off	<ul style="list-style-type: none"> → 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.
LED heating on/off does not light up	<ul style="list-style-type: none"> → Heating plate does not heat: Device switched off or mains voltage not present: Switch on device, 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	<ul style="list-style-type: none"> → No magnetic stirring bar in the vessel, insert stirring bars. → Rotation speed set to zero, increase rotation speed.
No heating function	<ul style="list-style-type: none"> → Heating plate defective, contact technical service!
Deviation setpoint/ current value of sample	<ul style="list-style-type: none"> → Setpoint too low, take into account heat losses. → Heating plate defective, contact technical service!

If a fault cannot be rectified with the described suggestions, please contact an authorized sales representative or our technical service (see section „Heidolph International contact information“ on page 38).

Technical specifications

General device data		
Hei-PLATE model	Mix 20 l	Mix'n'Heat Core
Dimensions (W × H × D)	168 × 101 × 299 mm	
Usable surface heating plate	Ø 145 mm	Ø 135 mm Ø 145 mm
Weight	approx. 3 kg	
Maximum permissible load	25 kg	
Drive	EC motor, left-turning	
Speed range	100 – 1,400 rpm	
Protection class (EN 60529)	IP42	
Acoustic pressure	< 50 db(A)	
Heating		
Heating power	n.a.	800 W at 230 V (EU) 600 W at 115 V (US)
Heating temperature range	n.a.	20 – 300 °C
Heating control	n.a.	PID
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 at up to 80 % rel. humidity 32 °C – 40 °C at up to 50 % rel. humidity (decreasing linearly)	
Installation altitude	up to 2,000 m asl	

Scope of delivery

Item	Quantity	Product no.
Hei-PLATE Mix'n'Heat Core	1	506-11100-00
OR		
Hei-PLATE Mix 20 l	1	506-54100-00
Operating instructions	1	01-005-006-54
Warranty registration	1	01-006-002-78

Accessories



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

If required, contact an authorized dealer or our technical service, see „Heidolph International contact information“ on page 38.

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

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 risk of an electric shock.
- When cleaning, avoid the penetration of liquids.

General cleaning instructions

Wipe all surfaces of the device with a damp cloth if necessary. Persistent contamination can be removed with mild soapy water.



CAUTION

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 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.

If repairs are required, contact an authorized dealer or our technical service, see „Heidolph International contact information“ on page 38.

Include the completed certificate of decontamination with every device return, see „Certificate of decontamination“ on page 39.

Maintenance

There are no user-serviceable components in the unit housing. If necessary (in the event of abnormal operating behavior such as excessive noise or heat generation, for example), contact our technical service, see „Heidolph International contact information“ on page 38.

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 implementation in 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 disposal.
- Properly remove and dispose of residues of substances that are hazardous to health, the environment and are biohazardous!

Heidolph International contact information



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 provides a three-year warranty against material and manufacturing defects.

Glass and wear parts, transportation damage, and damage resulting from improper handling or non-intended use of the product are excluded from the warranty.

The warranty period for registered products begins on the date of purchase. Register the product with the enclosed warranty card or on our website - www.heidolph.com.

The warranty period for unregistered products begins on the date of serial production (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.