

Intelligent
evaporation



Betriebsanleitung
Operating instructions
Notice d'instructions

Hei-VAP Expert/Expert Control
Hei-VAP Ultimate/Ultime Control

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About this document

These operating instructions describe all the functions and operation of the Hei-VAP Expert, Hei-VAP Expert Control, Hei-VAP Ultimate and Hei-VAP Ultimate Control type rotary evaporators. The operating instructions are an integral part of the described device!

Typographic conventions

The following symbols, signal words and highlighting elements are used in this document:

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. This information is used to ensure operational safety and to maintain the value of the product.</p>
→	<p>The arrow indicates specific instructions to be followed to ensure operational safety when handling the product.</p>

Copyright protection

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

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 rotary evaporators (Ref. 01-005-006-67). This document is available for download on our homepage in the most up-to-date version.

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



NRTL Certification

The device has been tested in accordance with the following standards:

- UL 61010-1 :2012/R:2016-04
- CAN/CSA-C22.2 No. 61010-1:2012/U2:2016-04
- UL 61010-2-010:2015
- CAN/CSA-C22.2 NO. 61010-2-010:2015

California Residents

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

Customs declaration

Rotary evaporators, as combustion and cleaning equipment, may be subject to notification to a competent customs authority in the country of destination.

The evaluation of a customer obligation to notify and, if applicable, the notification to a competent customs authority in the country of destination is generally the responsibility of the user!

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 device was designed by the manufacturer for the separation of substances, powder drying, concentration, crystallization of substances, and recycling of solvents under vacuum.

Due to its design, the device in its delivery condition may generally 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.

Any other use of this device is not considered as intended!

Compliant use

The user is generally responsible for evaluating the conformity of his application and, if necessary, for taking additional measures.

Reasonably foreseeable misuse

Additional measures may be necessary for use under conditions or for purposes deviating from the intended use, and/or specific guidelines and safety regulations must be observed. 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 generally the responsibility of the operator.

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

The device may generally 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 general 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. To protect against damage and excessive material aging, store the device in an environment that is as dry, temperature-stable and dust-free as possible.

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.

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. The device is **NOT** suitable for outdoor use! The device is **NOT** suitable for use in potentially explosive areas!

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

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 (see section „Intended use“ on page 67).

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 three-pole power supply cord supplied with the device.

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

Prior to use, check that the device and the power supply cord are free of visible damage.

Always have repairs and/or maintenance work on the device carried out by an authorized 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.

Data security

The user is responsible for ensuring data security when transferring data between the described device and other devices.

Always use secure networks for the data transfer and avoid use of critical infrastructure.

Always use high-quality shielded data cables for the data transfer.

For data transfer via a USB B connection, an industrial standard USB hub should be preferably used to ensure the most stable connection possible.

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!

Always 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 relevant general and safety instructions for the connected peripheral devices (observe the supplied documentation!).

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.

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).

Do not process hard, brittle materials such as stones, soil samples, etc., that could destroy the evaporation flask.

Only use heating bath media that guarantee sufficient heat transfer.

Do not operate the device with overpressure.

Do not expose the glass components to a pressure difference of more than 2 bar.

Ensure that the coolant overpressure does not exceed a level of 2 bar.

Ensure that the flow velocity does not exceed 1 m/s when aspirating liquids with flammable components (electrostatic charge, danger of ignition!).

Avoid the formation of explosion group IIC gases and potentially explosive distillation residues.

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 generally 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 general 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 general 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 generally liable for all damage resulting from unauthorized changes or modifications to the device, from the use of unapproved or non-genuine spare parts and accessories, or from disregarding the safety instructions and hazard warnings or the manufacturer's instructions!

Mechanical design



Front view

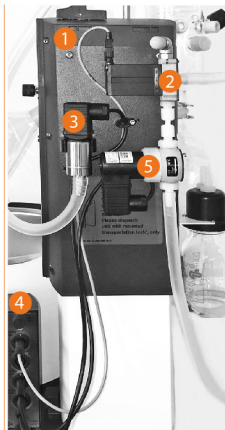
The Hei-VAP Expert and Hei-VAP Ultimate variants have an identical design, but are equipped with different control panels.

The illustration shows an example of the Hei-VAP Ultimate model with glassware G3:

- | | |
|---|---|
| 1 | Condenser (example G3) with receiving flask |
| 2 | Tilt angle adjustment (evaporation flask) |
| 3 | Drive (evaporation flask) |
| 4 | EasyClip (evaporation flask) |
| 5 | Control panel |
| 6 | Evaporation flask |
| 7 | On/Off switch (on the side of the device) |
| 8 | Heating bath |



Hei-VAP Expert/Ultimate



Hei-VAP Expert/Ultimate Control

Device connections

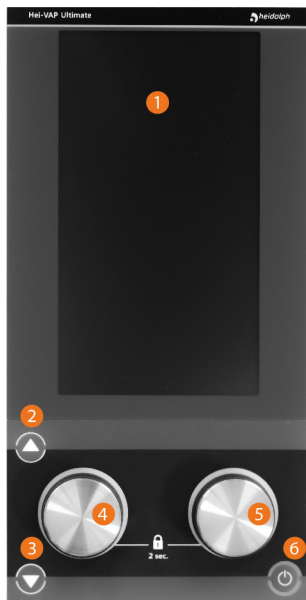
Left: Hei-VAP Expert/Ultimate Control for the use with a speed-controlled vacuum pump

Right: Hei-VAP Expert/Ultimate Control with vacuum valve for the use with a diaphragm vacuum pump.

The variants Hei-VAP Expert/Ultimate without control box function do not have the control Box (4)

- | | |
|---|--|
| 1 | Vacuum unit with components for vacuum control |
| 2 | Venting valve |
| 3 | Vacuum sensor |
| 4 | Control Box (only device variants [Control]) |
| 5 | Vacuum valve |

Control panel



The control panels of the Hei-VAP Ultimate and Hei-VAP Expert variants differ in terms of the dimensions and arrangement of the controls. The functionality of the controls described is identical for all variants.

The control elements of the central display are touch-sensitive (touch panel) and can be operated by finger or with a suitable stylus.

CAUTION



Pointed or sharp objects can damage the surface of the display!

To operate the device functions, touch the display only with your fingertips or a special stylus with a soft-touch tip.

-
- 1 Device display
 - 2 Lift button UP (variant with motor-driven lift)
 - 3 Lift button DOWN (variant with motor-driven lift)
 - 4 Speed controller
 - 5 Controller for heating bath temperature / vacuum pressure
 - 6 Standby button
-

Interfaces



The device interfaces are located on the side (1+2) and on the back (4 - 7) of the control panel.

CAUTION

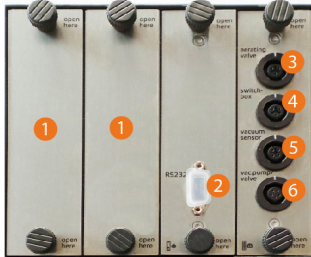


Penetrating liquid can cause malfunctions and short-circuiting.

Open the cap for the lateral interfaces only if needed and make sure that it is always connected in normal operation.

-
- 1 1x Micro SD (interface for service purposes)
 - 2 1x USB 2.0, max. 500 mA (USB type interface: software and firmware updates, data backup)
 - 3 Cap
 - 4 Port for COM connection rotary evaporator / control panel (4-pin)
 - 5 Mini USB interface, type AB, not working in the current software version!
 - 6 RS 232 interface for connecting an automatic module Distimatic Pro or a recirculation chiller
 - 7 Ethernet interface for a control via Hei-CONTROL Pro
-

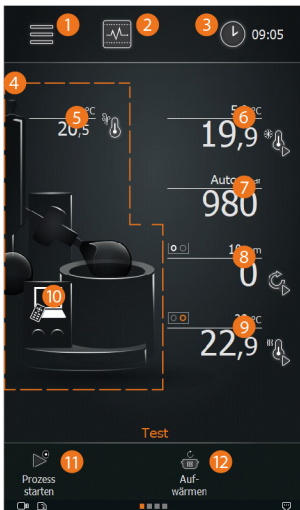
Control-Box



The Control Box is an integral part of the delivery of the Hei-VAP Expert Control and Hei-VAP Ultimate Control variants and serves to control the peripheral devices.

- 1 Free slots for expansion cards, e.g. intermediate valve (option)
- 2 RS 232 interface for the connection of a recirculation chiller
- 3 Connection of a venting valve
- 4 Connection of a Switchbox
- 5 Connection of a vacuum sensor
- 6 Connection of vacuum valve

Structure of the user interface



All device functions are controlled via the integrated control panel and the graphical user interface. For clarity, the detailed description in the following sections will only be done by example of the Hei-VAP Ultimate variant.

After switching on the device and initializing the device control, the start window of the last active operating mode appears on the display (in the example, DAA automatic mode):












- 1 Button [Main menu]
- 2 Button [Mode], in the example, DAA mode
- 3 Function button [System time]
- 4 Display area [Process visualization]
- 5 Boiling or AUTOaccurate temperature (only automatic mode)
- 6 Coolant temperature display Set value / actual value
- 7 Process parameter [Vacuum], set value / actual value
- 8 Process parameter [Rotation], set value / actual value
- 9 Process parameter [Heating bath temperature], set value / actual value
- 10 Button [Activate / deactivate remote control]
- 11 Button [Start / stop process]
- 12 Button [Start / stop warm-up]

Control and display elements

Control element	Function
Button [Main menu]	<p>Touch this button to open the main menu with the following options:</p> <ul style="list-style-type: none"> ▪ Applications → operating mode ▪ Settings → system parameters ▪ Languages → menu language ▪ Formats → system configuration and display formats ▪ Datalogging → data recording ▪ System check → complete system check ▪ Error list → open error list ▪ Info → open system info window
Button [Mode]	<p>Touch this button to activate the required operating mode:</p> <ul style="list-style-type: none"> ▪ Automatic mode ▪ Ramp profile mode ▪ Favorites mode
Function button [System time]	<p>Touch this function button to toggle between the following functions:</p> <ul style="list-style-type: none"> ▪ System time display ▪ Timer ▪ Stopwatch <p>See the following section „System time/timer/stopwatch selection“ on page 84 for detailed information.</p>
Function button [Remote control]	<p>Touch this function button to apply the required setting:</p> <ul style="list-style-type: none"> ▪ Deactivate remote control: confirm the security prompt. When remote control is deactivated, the icon is displayed in strikethrough. ▪ Activate remote control: when tapping on the strike-through icon, the remote control is reactivated without further prompt.
Button [Start process]	Touch this button to start the selected process.
Button [Warm-up]	Touch this button to warm up the heating bath.
Button [Stop process]	Touch this button to stop the running process.
Set value/actual value indicator process parameters	<p>The following process parameters are displayed:</p> <ul style="list-style-type: none"> ▪ Boiling temperature/AUTOaccurate temperature ▪ Coolant temperature ▪ Vacuum pressure ▪ Rotation speed ▪ Heating bath temperature
Process visualization main display	The current process step is visualized in the main display.

Buttons and symbols

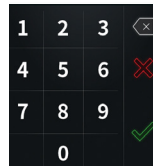
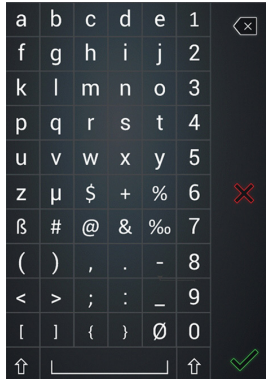
The following table provides an overview of the most important HMI buttons and icons on the control panel and in the menu navigation:

Symbol	Function
	Menu button
	Home button
	Automatic mode DAA button
	Ramp profile mode button
	Activate favorites mode button
	Start / start all button
	Stop / stop all button
	Confirm/OK button
	Cancel/Discard/NOK button
	Delete button
	Screen lock icon

On-screen keyboard

The numeric on-screen keyboard appears automatically when you touch a numeric entry field within a mask.

The alphanumeric on-screen keyboard appears automatically when you touch an input field for alphanumeric values within a mask.



- Use the keyboard to enter the desired designation or value within the permitted range of values.
- Touch the [Cancel] button to return to the parent dialog without making any changes.
- Touch the Delete button to cancel the last entry.
- Confirm your entry with [OK] to accept the new value or the new name. The on-screen keyboard closes.

Set up the device

Ensuring proper system and/or device mounting, including all accessory parts, is the general responsibility of the operating company.

If required, Heidolph offers a professional system and/or device mounting service, including all supplied components and including commissioning. The associated mounting instructions (Ref. 01-001-009-12) describe all steps for proper system and/or device mounting in detail, including wiring and tubing.

CAUTION



Due to improper mounting and/or installation of the system/device, as well as unauthorized changes to the mounting, there is a risk of direct and indirect damage to property!

If necessary (system mounting and installation carried out by the operator or third parties, necessary changes to the existing mounting), contact the manufacturer's technical service (see section „Warranty statement“ on page 119).

To use the device, place it on a clean, stable, level and horizontal surface.

The operator is generally liable for all damage resulting from unauthorized changes or modifications to the device, from the use of unapproved or non-genuine spare parts and accessories, or from disregarding the safety instructions and hazard warnings or the manufacturer's instructions! At the same time, in this case, any warranty claims against Heidolph Instruments will invalidate.

Connecting the control panel

Connect the removable control panel via the associated 4-pin connection cable to the device base (back side).

Power supply



DANGER

Observe the information and instructions in section „Electrical safety“ on page 69

Connect the power supply cord to the appliance inlet on the back of the base unit. Make sure that the device is switched off: Main switch [off]. Connect the power supply cord to a properly secured mains socket-outlet.

Switching the device on/off



CAUTION

Before each operation of the device, check the caps and connecting elements of all glass components for correct and tight fit!

At loose/leaky connections, ambient air is sucked in during the vacuum build-up and the required vacuum pressure cannot be reached in a stable manner!

In the event of excess pressure, there is a risk that liquid will escape from the system! The device and surrounding areas can be severely contaminated by leaking media!

To switch on and off, use the main switch of the device (on the side of the housing).

Transportation lock

All variants with motor driven lift are provided with a mechanical transportation lock to prevent damage during the transport of the device. This transportation lock must be removed from the device within its start-up! Keep the transportation lock with the original packaging for future use.

The transportation lock consists of a profiled plate, which is fixed to the housing with three screws M5×8. The profiled plate is marked with a red flag.



Procedure

- Make sure that the control panel is correctly connected and switch on the device.
- Using the supplied hex wrench, loosen the three fixing screws and remove the profiled plate.
- Move the flask lift to the upper end position (see section „Flask lift“ on page 81).

- Switch off the device: Switching off the device with the flask lift in the upper end position, the additional electronic safety function will be disabled.
- Switch on the device again: The device is ready for use.

Evaporation flask



CAUTION

In the event of improper handling, the evaporation flask that is to be used may fall to the ground.

- Glass breakage!
- Risk of injury/contamination by leaking medium!

Observe the instructions in section „Mount/remove evaporation flasks“ on page 79.

Use only the evaporation flasks approved by the manufacturer.

WARNING

The smallest damage to the evaporation flask can lead to glass breakage when pressurized.

- Glass breakage!
- Risk of injury/contamination by leaking medium!

Before each operation of the device, check the evaporation flask for visible damage.

Mount/remove evaporation flasks



CAUTION

The heating bath is designed for a maximum operating temperature of 210°C (using silicone oil). From a liquid temperature of 50 °C, there is a risk of injury in the event of contact.

Allow heated liquid to cool below 50 °C before removing the flask.

Use appropriate personal protective equipment (heat-resistant gloves, eye protection, safety clothing) to remove the flask.

The evaporation flask is fixed to the vapor tube of the rotary evaporator using a special retort clamp (EASY CLIP):



EASY CLIP open,
Flask unsecured



EASY CLIP closed,
Flask secured

Procedure

- Stop all running processes and the rotation of the flask and move the flask lift to the upper end position (see section „Flask lift“ on page 81).
- Loosen the screw connection of the EASY CLIP at the vapor tube and push the clamping bracket outward (see figure above).
- When mounting the flask, make sure that the glass cones and sockets of the flask and the vapor tube do have full contact and form a straight line and clamp the flask by closing the bracket of the EASY CLIP until it arrests with an audible click (clean the glass cones/sockets before mounting the flask!).
- Screw the EASY CLIP back onto the vapor tube and move the flask lift to the lower end position. Take into consideration the flask size and the filling quantity of the heating bath (see section)! „Fill the heating bath“ on page 82

Adjust the evaporation flask inclination

Procedure

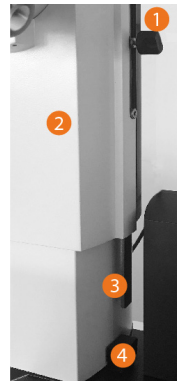
- Stop all running processes and the rotation of the flask and move the flask lift to the upper end position (see section „Flask lift“ on page 81).
- Loosen the locking [1] on the lift base and hold it against the spring force.
- Swing the condenser until the evaporation flask is at the desired angle. Make sure that the flask can turn freely!
- Release the locking [1] and if necessary, slightly move the unit condenser-evaporator flask until the drive unit clicks into place.



Adjust the immersion depth

Procedure

- Stop all running processes and the rotation of the flask and move the flask lift with the evaporation flask mounted to the desired height (see section „Flask lift“ on page 81).
- Loosen the fixing screw [1] on the lift base [2] of the device and push the stop adjustment bar [3] down to the lift stop [4].
- Tighten the fixing screw [1] again.
- If necessary, position the base plate with the heating bath according to the flask size.



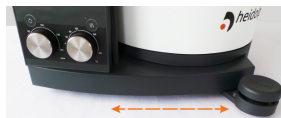
The lift can only be moved downwards up to the set immersion depth. Before the evaporation flask is immersed, check that the fixing screw is firmly seated!

Flask lift

Devices with manual lift

Devices with a manual lift are equipped with a lever for moving the lift up and down:

- Push and move the lever to the left to move the lift up.
- Push and move the lever to the right to move the lift down.



Devices with motor driven lift

For devices with motor driven lift, the lift is moved using the two lift buttons on the control panel, see also section „Control panel“ on page 73:

- Touch the [UP] arrow button to move the lift upwards.
- Touch the [DOWN] arrow button to move the lift downwards.

The movement stops as soon as you release the button!

Receiving flask

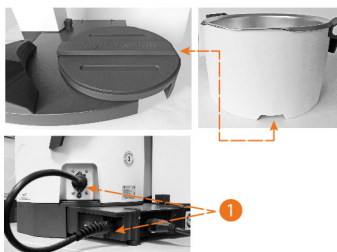
- Stop all running processes and the rotation of the flask.
- Move the flask lift to the upper end position (see section „Flask lift“ on page 81).
- When mounting the receiving flask, make sure that the glass cones and sockets of the flask and the condenser do have full contact and form a straight line (clean the glass cones/sockets before mounting the flask!).
- Mount the ground clamp over the joint and tighten the ground clamp by hand.



Heating bath

The heating bath is placed on the flexible base plate of the base unit and connected to the unit by means of a 7-pin connecting cable. The recess provided on the bottom side ensures that the heating bath can only be placed in the right position on the base plate.

- Stop all running processes and the rotation of the flask.
- Move the flask lift to the upper end position (see „Flask lift“ on page 81).
- Place the heating bath on the base plate of the basic unit: The base plate is equipped with a guide suitable for the bottom-side recess of the heating bath.
- Make sure that the heating bath is securely fixed to the base plate and in position.
- Connect the supplied 7-pin connection cable [1] between the socket of the heating bath and the base unit.
- Before removing the heating bath, disconnect the 7-pin connecting cable between the heating bath socket and the base unit!



Fill the heating bath



CAUTION

If the level in the bath is too high, there is a risk that the heating bath liquid will overflow when the flask is immersed.

- Property damages
- Loss of production

The device and surrounding areas can be severely contaminated by escaping heating bath liquid!

Take the imprinted MIN/MAX markings on the inside of the heating bath as a reference.

- Ensure that the evaporation flask is correctly mounted („Mount/remove evaporation flasks“ on page 79).
- Move the flask lift to the lower end position (see „Flask lift“ on page 81).
- With the flask in the lower end position, fill the heating bath until the fluid reaches a level between the MIN/MAX marks on the inside.
 - The maximum filling volume is 6 liters. Recommended filling volume: depending on the flask size and the immersion angle: 2.2 l to 4.5 l.

Emptying the heating bath



CAUTION

The heating bath is designed for a maximum operating temperature of 210°C (using silicone oil). From a liquid temperature of 50 °C, there is a risk of injury in the event of contact.

Always grip and hold the heating bath by the ergonomic safety handles on the side!

Before emptying the heating bath, allow heated liquid to cool down to below 50 °C.

Use suitable personal protective equipment (heat-resistant gloves, eye protection, safety clothing) to empty the heating bath.

- Move the flask lift to the upper end position (see „Flask lift“ on page 81).
- Disconnect the 7-pin connecting cable between the heating bath and the base unit.
- Remove the heating bath from the base plate of the base unit.



When changing the bath liquid, the heating bath must be thoroughly cleaned and dried.

In particular, when changing from water to oil, make sure that the heating bath temperature is only slowly and gradually augmented during restart (recommendation: 10 °C), so that remaining water in the system can evaporate until the process temperature is reached.

Heating bath overheat protection

The device is equipped with an autonomous overheat protection function that prevents the heating bath from overheating. When reaching the maximum heating bath temperature, the heating function is switched off by a mechanical switch. To reset the safety function, follow these steps:

- Remove the heating bath from the base unit.
- Empty and let cool down the heating bath.
- Press the reset button [1] on the bottom of the heating bath with a suitable tool (blunt tip, insulated or non-conductive material).
- Put the heating bath back on the base unit.



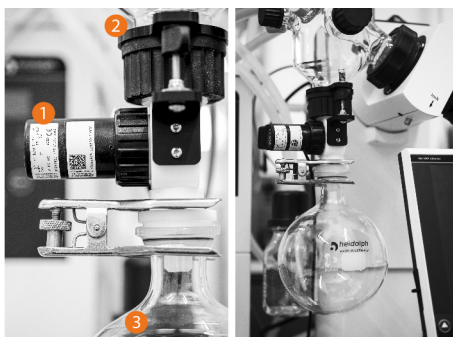
Residual heat indicator

As long as the heating bath temperature is above 50° C, the LED ring of the temperature/ vacuum control knob flashes after the end of the process. If the temperature/vacuum control knob is assigned the vacuum control function, a temperature warning message will appear on the display instead.

The residual heat indicator goes out when the device is switched off!

Intermediate valve (option)

Mount the optional intermediate valve [1] between the condenser [2] and the receiving flask [3]:



- Disconnect the rotary evaporator from the power supply.
- Mount the supplied condenser on the rotary evaporator.
- Mount the supplied [Plug-in card (intermediate valve)] in an available slot of the control Box. Safely store the dismantled cover for later use.
- Mount the intermediate valve on the condenser.
- Mount a receiving flask on the intermediate valve.
- Connect the connection plug of the intermediate valve to the [Plug-in card (intermediate valve)] in the control Box.

Connection recirculation chiller or Distimatic Pro

For connecting an external recirculation chiller or an optional automatic module Hei-VOLUME Distimatic Pro, use the RS 232 interface on the back of the control panel, see section „Interfaces“ on page 73.

For the operation of the respective unit, different settings have to be applied that are described in detail in sections „Connectivity“ on page 94 and „Remote mode“ on page 108. For more detailed information, please refer to the operating instructions supplied with the device.

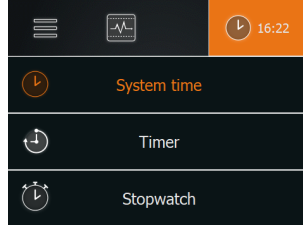
Device configuration

The basic settings for operation are made in the main menu. After switching on the device and initializing the software, the start page of the last active operating mode appears (in the example: Advanced mode, DAA mode (2)).



System time/timer/stopwatch selection

- Tap on the function button [System time/3] to open the selection window time/timer/stopwatch.
- Tap on the required option to switch to the display mode:
 - System time: Time in 12-/24-h format.
 - Timer: Display of the time remaining until the scheduled end of the process.
 - Stopwatch: Display of the actual elapsed time from the start of the process.

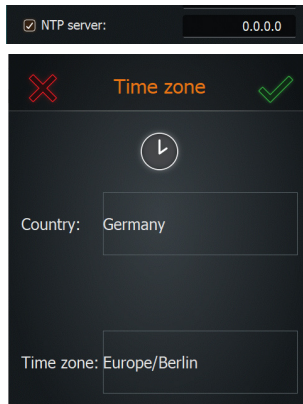


System time

The system time can be set manually by the user or can be synchronized with a time server. The corresponding preselection is made via the main menu, menu item [Hei-CONTROL Pro].

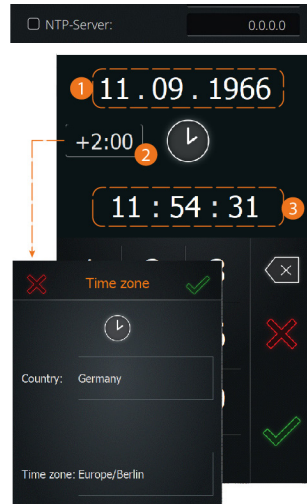
Synchronize system time with NTP server

- For the automatic synchronization, select the option [NTP-Server] in the menu [Hei-CONTROL Pro].
- Confirm with [OK] to exit the menu [Hei-CONTROL Pro].
- If necessary, switch to the display mode [System time] in the start window, see previous section „System time/timer/stopwatch selection“ on page 84.
- Touch the function button [System time] for about two seconds to open the dialog box and select your time zone.
 - In a first step, touch the [Country] field and select the country of use from the following list.
 - Then, touch the [Time zone] field to define a specific time zone within the country of use, if necessary.
- Confirm the new setting with [OK]: the system time will be updated automatically via the display NTP server.



Set system time manually

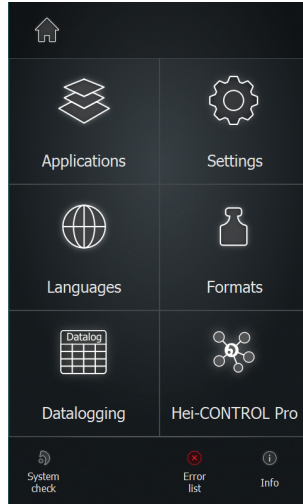
- Deselect the option [NTP server] in the [Hei-CONTROL Pro] menu to set the system time manually.
- Confirm with [OK] to exit the menu [Hei-CONTROL Pro] and open the start window using the Home button.
- If necessary, switch to the display mode [System time] for about two seconds to open the dialog box and set the system time manually.
- Touch the function button [System time] for about two seconds to open the dialog box and set the system time manually.
- Touch the function button [Date/1] and use the keyboard to enter the current date.
- Touch the function button [Time zone/2] and select your time zone:
 - In a first step, touch the [Country] field and select the country of use from the following list.
 - Then, touch the [Time zone] field to define a specific time zone within the country of use, if necessary.
 - Confirm the new setting with [OK].
- Touch the function button [Time/3] and use the keyboard to enter the current time.
- Confirm the new setting with [OK].




Program timer

- Switch to the display mode [Timer], see „System time/timer/stopwatch selection“ on page 84.
- Touch the function button [System time] for approx. two seconds to open the keyboard and to program the timer.
 - Adjustment range: 00:00:01 to 99:9:9 in [hh:mm:ss], respectively one second to four days, three hours, nine minutes and nine seconds

Menu structure



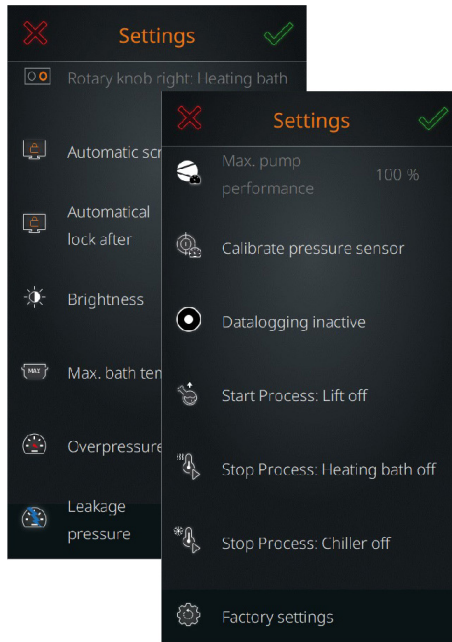
The following buttons and function buttons are available in the main menu:

Button	Function/Meaning
	[Home] button. Touch this function button to return to the previously opened view (start window).
Operating modes	Touch this function button to open the [Applications] menu and select an operating mode.
Settings	Touch this function button to open the [Settings] menu. In this menu, various basic settings can be adjusted and the device can be reset to the factory settings.
Languages	Touch this function button to open the [Languages] menu and load a required user language.
Formats	Touch this function button to open the [Formats] menu. Here you can select the desired format for the display of numerical values, time, date and temperature. At the same time, the connected rotary evaporator / glassware is assigned and the operation with or without residue drainage is selected.
Data logging	Touch this function button to start the [Data logging] function.

Button	Function/Meaning
Hei-CONTROL Pro	Touch this function button to open the screen form for definition of the network parameters.
System check	Touch this function button to perform a full system check.
Error list	Touch this function button to open the list of all error messages.
Info	Touch this function button to open the information window of the system, including firmware and hardware data .

Settings

In the [Settings] menu, the device settings can be adjusted. The menu includes several screens! Touch the display and swipe up or down to scroll through the menu:



Confirm each entry with [OK] to accept changes and to return to the previous menu or the start window of the operating mode; touch the [Cancel] button to return to the previous menu/ start window without making any changes. The various options are described in detail in the following sections:

Rotary knob right: ...

Use this menu item to define the function of the temperature/vacuum control knob on the control panel.

- Touch the function button to switch between the two options:
 - Selection [Vacuum]: The rotary knob is used to regulate the vacuum pressure.
 - Selection [Heating bath]: Knob is used to regulate the heating bath temperature.

Automatic screen lock ...

This menu item allows you to activate/deactivate the automatic screen lock. Touch the function button to switch between the two options:

- Selection [Automatic screen lock active]: The screen will be locked after a specified time. The required wait time can be defined under the following parameter [Automatically lock screen after].
- Selection [Automatic screen lock inactive]: The screen will not be locked. In this mode, the following parameter [Automatically lock screen after] is grayed out and cannot be modified.

Automatically lock after

You can use this menu item to specify the time after which the display is automatically locked from the last operation. Condition: the preceding parameter [Automatic screen lock ...] must be set to [... active]:

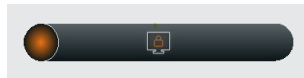
- Touch the function button to open the on-screen numeric keyboard.
- Use the keyboard to enter the desired wait time in a range of at least one (1) to a maximum of sixty (60) minutes. Entries outside this value range are not accepted!



From a continuous on-time of approx. 60 minutes, there is a risk of the display becoming burnt in and static display elements remaining visible as a visible pattern temporarily, even after switching off. It is therefore advisable to set a maximum time of 60 minutes before the screen lock is activated.

When the screen is locked, the lock icon appears on the display.

- Touch anywhere on the screen to display the screen unlock slider:
- To unlock the screen, drag the slider to the right.



Brightness

You can use this menu item to adjust the brightness of the display.

- Touch the function button to open the on-screen numeric keyboard.
- Define the required brightness in percent.
- Confirm your entry with [OK] to accept the modification.

Max. bath temperature

This menu item allows you to define the maximum heating bath temperature (e.g. for the processing of thermosensitive media).

- Touch the function button to open the on-screen numeric keyboard.
- Set the maximum heating bath temperature in the range between 20° C and 90° C. Entries outside this value range are not accepted!



When loading favorites and ramp profiles, it is automatically checked whether the set maximum bath temperature could affect the process. In this case, a warning message appears on the display.

- Confirm your entry with [OK] to accept the modification.

Overpressure

This menu item allows you to set the value for the safety shutdown of the system when an impermissible high vacuum pressure is reached. As soon as the vacuum pressure reaches this limit, all functions are switched off (vacuum, flask rotation, heating bath) and the flask lift is moved to the upper end position (only variants with motor lift!). In addition, a warning message appears on the display.

- Touch the function button to open the on-screen numeric keyboard.
- Define a limit value in the range between 900 mbar and 1,400 mbar (factory setting: 1,400 mbar). Entries outside this value range are not accepted!



When loading favorites and ramp profiles, it is automatically checked whether the set limit value could affect the process. In this case, a warning message appears on the display.

- Confirm your entry with [OK] to accept the modification.

Leakage pressure

This menu item allows you to set the limit value for the safety shutdown of the system in case of failure to reach the leakage pressure. This safety function is activated when the leak pressure falls below the specified minimum during the evacuation process. If the leak pressure is not reached during evacuation (e.g. due to glass breakage or leaks), all functions are switched off (vacuum, flask rotation, heating bath) and the flask lift is moved to the upper end position (only variants with motor lift!). In addition, a warning message appears on the display.

- Touch the function button to open the on-screen numeric keyboard.
- Define a limit value in the range between 1 mbar and 1,399 mbar (factory setting: 1,399 mbar). Entries outside this value range are not accepted!
- Confirm your entry with [OK] to accept the modification.

Max. pump performance

This menu item allows you to define the maximum pump performance in percent of one hundred. By reducing the intake capacity of the pump, a higher solvent recovery rate can be achieved. When using a speed-controlled vacuum pump, the maximum pump performance can be reduced to a maximum of 20% in 10% increments to avoid foaming or boiling delay. When using a diaphragm vacuum pump, this menu item is grayed out!

- Touch the function button to open the on-screen numeric keyboard.
- Set the maximum pump performance in the range between 20 % and 90 %. Entries outside this value range are not accepted!
- Confirm your entry with [OK] to accept the modification.

Calibrate pressure sensor



The vacuum sensor is properly calibrated by the manufacturer before delivery. Normally, recalibration is not required.

During a user recalibration, the evaporation flask should rotate to ensure that system does not have any leaks. All other processes must be stopped!

- Make sure that the pressure sensor is properly connected to the device.
- Ventilate the system.
- Touch the function button to open the [Calibrate pressure sensor] mask and follow the instructions on the display:
- Use the on-screen keyboard to enter the actual atmospheric pressure.
- Close all openings on the evaporator system.
- Confirm the entry. The vacuum control starts automatically.
- Once the system is evacuated to a low level, the second calibration value can be entered: Wait until the vacuum pump does not reduce the pressure further, i.e. until the minimum possible vacuum pressure is reached.
- Enter this value and confirm the values.
- The calibration is then corrected based on the input values.

Calibrate pressure sensor



An external calibrated pressure gauge is required.

Please enter the atmospheric pressure displayed at the external pressure gauge and confirm value with OK!



When the calibration process is canceled and the device is reset to the factory settings, the default values are loaded!

Data logging

This menu item allows you to activate/deactivate the data recording function.

- Data logging display inactive: Touch the function button to activate the function.
- Data logging display active: Touch the function button to deactivate the function.
- Confirm your entry with [OK] to accept the modification.



See „Data logging“ on page 93 for detailed information

Start process: Lift ...

Only devices with motor lift: In this menu, define the behavior of the flask lift at the start of the process.

- Touch the function button to switch between the two options:
 - [Start process: Lift on]: With this selection, the flask lift automatically moves to the lower end position when starting the process and the evaporation flask is thus automatically immersed in the heating bath.
 - [Start process: Lift off]: With this selection, the flask lift remains in the upper end position on starting the process; the evaporation flask must be immersed in the heating bath manually.
- Confirm your entry with [OK] to accept the selection.



Deactivate this function when using a foam brake and on devices using a large evaporation flask to prevent damage to the flask!

Stop process: Heating bath ...

In this menu, define the behavior of the heating bath heating at the end of the process.

- Touch the function button to switch between the two options:
 - [Stop process: Heating bath on]: With this selection, the heating bath remains switched on after the end of the process.
 - [Stop process: Heating bath off]: With this selection, the heating bath is automatically switched off at the end of the process.
- Confirm your entry with [OK] to accept the selection.

Stop process: Chiller ...

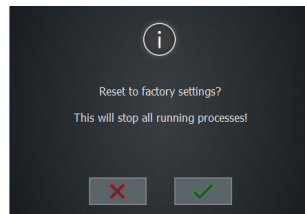
In this menu, define the behavior of the chiller at the end of the process.

- Touch the function button to switch between the two options:
 - [Stop process: Chiller on]: With this selection, the chiller remains switched on at the end of the process.
 - [Stop process: Chiller off]: With this selection, the chiller is automatically switched off at the end of the process.
- Confirm your entry with [OK] to accept the selection.

Factory settings

In this menu, reset the device to the factory settings. All user data (parameter adjustments, favorites, ramp profiles) will be deleted!

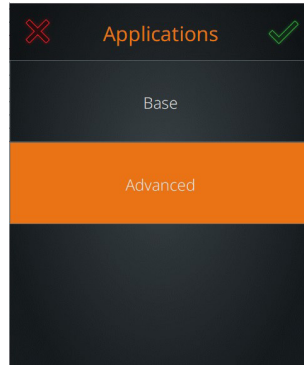
- Touch the function button [Factory settings]. The following prompt appears on the display:
- Confirm the confirmation prompt with [OK] to reset the device to the factory settings. The device must be restarted!
- To cancel the reset and return to the previous menu without making any changes, touch the [Cancel] button.



Applications

In the Applications menu, you can switch between the manual mode [Basic] and the automatic mode [Advanced] (see section „Operating modes“ on page 97 for a detailed description of the operating modes).

- Complete all running processes before changing the operating mode.
- Touch the entry of the desired operating mode. The background color of the selected entry switches to yellow, as shown.
- Confirm the selection with [OK] to activate the selected mode; press [Cancel] to discard the selection and to return to the previous view.
- The start window of the activated mode appears on the display.



User language

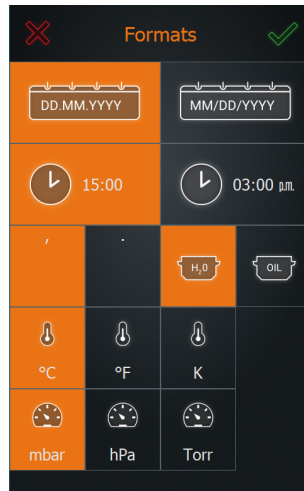
In the [Languages] menu, the user language can be modified at any time. Available languages are English, German, Mandarin, French, Spanish, Portuguese, Italian, Russian and Polish.

- Touch the function button [Languages].
 - The list of all available menu languages opens.
- Touch the entry for the required language.
 - The background color of the selected entry switches to yellow.
- Press [OK] to confirm the selection and to return to the start window of the active mode.

Formats

The following system settings can be applied in the [Formats] menu:

- Set date format (US or EU)
- Set time format (12/24-hour)
- Select heating bath liquid (water, oil)
- Set number separator (US or EU)
- Set temperature unit (degrees Celsius, Fahrenheit, Kelvin)
- Set unit for pressure display (mbar, hPa, torr)
- The active selection is highlighted in yellow. Touch the desired function button to switch between options. Several changes can be made at the same time!
- Confirm the new settings with [OK]. All changes are immediately accepted without a confirmation prompt!
- To discard changes and to return to the previous menu, touch the [Cancel] button.



Data logging

The [Data logging] function can be used to record the individual steps of a process. The function records each individual step with start and end time and stores this information in the Data logging memory.

The internal database offers a total of 30 slots with a capacity of 550,000 entries per measurement series for this.

The data is recorded at fixed intervals (ten seconds) with a fixed recording rate of 1 entry/10 seconds, i.e. the maximum recording time is approx. 152 hours.



If the remaining capacity is 10%, a first warning message appears on the display.

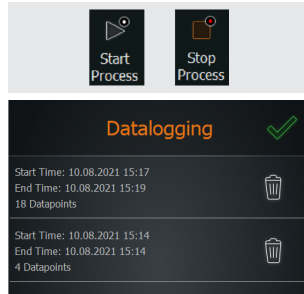
If the remaining capacity is 0%, a second warning message appears on the display and data recording is stopped. In this case, export and/or delete existing data from the system memory to record additional data.

No running processes will be affected by the stop of the data recording!

Activate/deactivate data logging

The data logging function is manually activated/deactivated.

- To enable data recording, open the [Settings] menu and activate the function [Data logging].
 - When the data recording function is activated, the [Start process] and [Stop process] buttons are marked with an additional icon in the footer of the start window:



Via the option Data logging, the recorded data can be exported to a USB stick and read out on a PC or deleted from the system.

- Open the main menu and touch the function button [Data logging].
- The data logging list opens:
- The recorded values show when a process was started and stopped again.



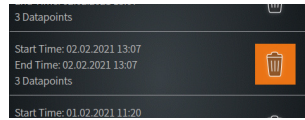
In the event of a power interruption or when the device is switched off during the current data recording, the recording process is aborted and the corresponding entry marked with "(!)". The displayed data set contains the recorded process data that was recorded up to the power interruption:

```
Start time: 28.09.2021 07:17
End Time: 28.09.2021 07:17 (!)
2 Datapoints
```

In the Datalog export file, the corresponding file names are also given the addition "(!)" before the file extension: "(!).csv", or "(!).json".

Delete entries

- To delete an entry from the list, touch the associated Delete button. During the deletion, the assigned Delete button is highlighted in yellow:

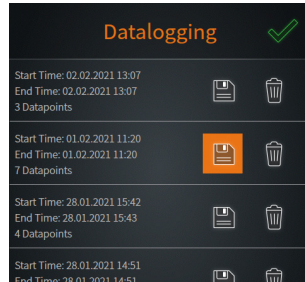


Save entries on USB stick

Recorded entries can be saved on an USB-stick. To do this, connect a VFAT-formatted USB stick to the USB port of the display and open the data list as described.

As soon as a USB stick is connected, a **Save** button (diskette symbol) is assigned to each list entry.

- To save an entry from the list, touch the associated **Save** button. During the saving, the assigned **Save** button has a yellow background:



PRACTICAL TIP

Large amounts of data are generated during the long-term recording of process data (several days).

It is therefore recommended to save the current data recording memory on a USB stick and to remove the existing entries from the internal memory before starting the process.

Connectivity

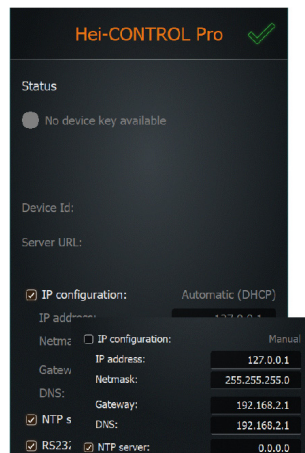
All necessary network parameters and settings for time synchronization can be defined in the [Hei-CONTROL Pro] menu:

All associated parameters can be defined manually in the [static IP configuration] mode (checkbox deselected). Select the checkbox to obtain the IP address of the device automatically.

Select the [NTP server] checkbox to synchronize the system time of the device with a time server. This function requires a valid IP configuration! Place the cursor in the corresponding input field and use the on-screen keyboard to enter the required server address.

Select the [RS 232 Distimatic Pro] checkbox if the device is to be connected directly to an automatic Hei-VOLUME Distimatic Pro module and will be controlled by it.

Deselect the [RS 232 Distimatic Pro] checkbox if the device is to be activated via the RS 232 interface of the control panel and thus via a compatible external control (for further information, see sections „Remote mode“ on page 108 and „RS 232 interface commands“ on page 113).





If the time is synchronized via a time server, the function button [System time] in the display header can only be used to select a time zone.

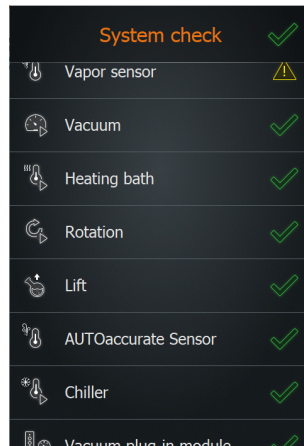
If an ethernet connection exists, the system time is updated automatically via the defined time server. To define the system time manually, the [NTP server] option must be deselected!

The full functionality of the Hei-CONTROL Pro application also requires the Hei-CONTROL Pro server. For more information, refer to the Hei-CONTROL Pro User Manual. The connection status of the Hei-CONTROL Pro application is displayed in the [Status] field.

System check

All connected sensors and actuators or peripherals are displayed in the [System check] menu. Various tests can be carried out via the [System check] sub-menu to ensure the functional and operational safety of the system:

- Open the [Main menu] and touch the [System check] function button in the footer. The [System check] menu appears:
 - Fault-free components are marked with the [OK] status indicator.
 - Faulty components are marked with [NOK]. Please note the corresponding error messages.
- Swipe up or down on the touch panel to scroll through the list.
- Touch the [TEST] function button in the header of the [System check] menu to open the [System check] sub-menu.



CAUTION



Faulty connections or signaling can lead to malfunctions or uncontrolled switching operations!

Leaks reduce the performance of the entire system.

Correct any indicated faults and/or detected malfunctions immediately.

In the event of a continued fault indication/malfunction, contact your local sales representative or our technical service department, see „Warranty statement“ on page 119.

PTFE seal

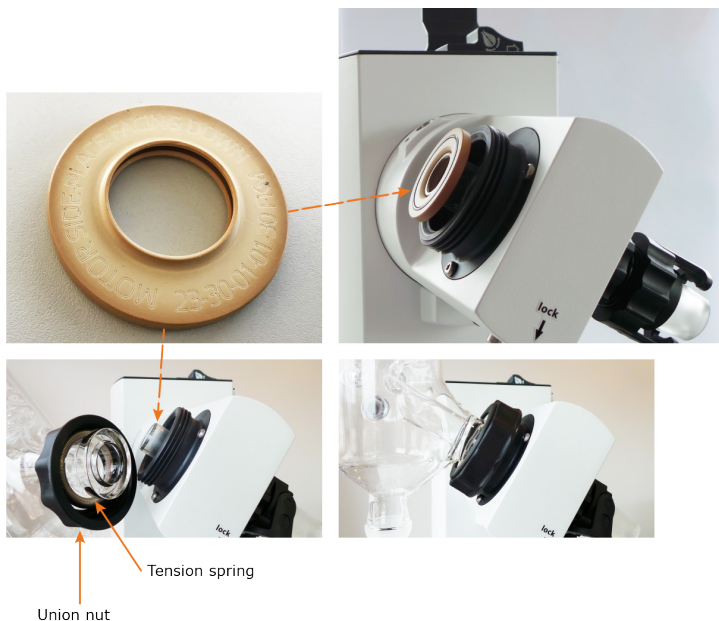
The PTFE seal of the device must be cleaned after a 100-hour break-in period. To do this, follow the steps in this section.



CAUTION

Improper cleaning can damage the surfaces of the PTFE seal.
Clean the seal surfaces with a soft, lint-free and only slightly moistened cloth.
Never use any aggressive or abrasive cleaning agents or aids.

- Loosen the union nut and remove the condenser of the device.
- Remove the PTFE seal from the vapor tube.
- Clean the PTFE seal with a soft cloth, paying particular attention to any residue under the sealing lips.
- Put the PTFE seal back in the correct position and against the stop on the vapor tube (note the "Motor side" embossing!).
- Mount the condenser on the vapor tube again, make sure to insert the tension spring flat and do not tilt the union nut!



Operating modes

WARNING

Due to incorrect/insufficient process settings, there is a risk that impermissible operating values are reached and, as a result, device components will be damaged and heating bath liquid and/or distillation material will escape.

In general, qualified personnel is allowed to adjust the process settings of the device.

When determining the pressure values, observe the chemical-physical properties of the respective material to be distilled.

Pay particular attention to the specific safety instructions for the processing of toxic substances!



When operating the device, there is a risk of contact with rotating parts. Loose clothing, jewelry and open hair can be pulled in!

If possible, operate the device with a guard hood (accessory) or under a closed laboratory fume hood.

Never touch rotating parts with your hands. Do not bend over rotating parts.

Wear tight-fitting work clothes, remove jewelry before starting work, tie long hair under a hair net or under a suitable head covering.

Use appropriate personal protective equipment (PPE).

At high rotation speeds, the heating bath liquid can spray away from the evaporation flask by forming film and/or slop out of the heating bath. There is a risk of scalding and/or contamination.

If possible, operate the device with the guard hood closed.

Adjust the rotation speed of the evaporation flask according to the recommendations in this section.

Use appropriate personal protective equipment (PPE).

Clean dirty surfaces immediately!

After switching on the device and initializing the software, the start page of the last active operating mode appears.



Before the process start, check and correct the essential device parameters such as [Behavior of the motor lift on starting the process], [Behavior of the heating bath heater on stopping the process], [Behavior of the condenser on stopping the process] etc., see section „Device configuration“ on page 84

Open the [Main menu], touch the [Applications] function button and activate the required operating mode: [Basic] or [Advanced]. You will find a detailed description of the operating modes in the following sections.

Base mode

After switching on the device and initializing the software, the start page of the last active operating mode appears. Open the [Main menu] (1), touch the [Applications] function button and activate the operating mode [Basic].

In the [Basic] mode, the operating parameters vacuum pressure, rotational speed and heating bath temperature are entered manually by the operator.

- Touch a parameter's field to open the on-screen keyboard and set a desired value. The input values are accepted without a security prompt:
 - Coolant temperature (2), -10 – 20 °C
 - Vacuum pressure (3), 1 – 1,400 mbar
 - Rotation speed (4), 10 – 280 rpm
 - Heating bath temperature (5), 20 – 80 °C
- Touch the icons of the parameter displays [Coolant temperature] (2), [Vacuum pressure] (3), [Rotation] (4) and [Heating bath temperature] (5) to activate (icon changes from white to yellow) or to deactivate (icon changes from yellow to white) the assigned process independently of the other processes.
- Touch the [Start process] button in the footer to start all processes with the displayed setpoints at the same time.
 - The function button switches to [Stop process].
- Touch the [Stop Process] button in the footer to stop all ongoing processes at the same time.
 - The function button switches to [Start process]



Operating mode Advanced

After switching on the device and initializing the software, the start page of the last active operating mode appears. Open the [Main menu] (1), touch the [Applications] function button and activate the operating mode [Advanced].

In the operating mode [Advanced], the following modes can be selected via the function button [Operating mode] (7) (in the example, Dynamic AUTOaccurate): Favourites (8), ramp profiles (9) and Dynamic AUTOaccurate (10).

Here, the last active profile or the last active favorite will be loaded by default!



Dynamic AUTOaccurate (DAA) mode

In Dynamic AUTOaccurate (DAA) mode, the vacuum pressure is controlled depending on the temperature.



System requirements

For operation in Dynamic AUTOaccurate (DAA) mode, the device has to be equipped with an optional AUTOaccurate sensor.

The AUTOaccurate sensor can only be used in combination with glassware G3 or G6!

The temperature-dependent vacuum control in DAA mode is based on two values:

- [Condenser temperature]: Temperature reading on the AUTOaccurate sensor in the condenser
- [Intensity]: Relative temperature rise to the closing of the vacuum valve, based on the measured condenser temperature T(AA)

At the start of the process, the condenser temperature T(AA) is measured using the AUTOaccurate sensor. When reaching a stable level, the actual evaporation process starts. This "pre-process" can be manually canceled at any time. In this case, the evaporation process is started immediately with the currently measured condenser temperature value.

During the evaporation process, the temperature at the AUTOaccurate sensor increases relative to the initial condenser temperature T(AA). If this temperature rise reaches the defined intensity (parameter [Intensity]), the evaporation process is stopped.

As soon as the temperature at the AUTOaccurate sensor has dropped by a defined value, the system is evacuated and the evaporation process starts again. If the temperature rise at the AUTOaccurate sensor reaches the defined intensity again (at relatively higher vacuum pressure), the vacuum pump is switched off again, etc.

In this way, a consistent performance is achieved in the processing of solvents or mixtures throughout the distillation process.

During multiple solvent distillation, the described process steps are repeated until a defined maximum vacuum pressure is reached (input value [End pressure]). The distillation process is then switched off.

Activate DAA mode

Touch the function button [Operating mode] (2), then touch the [Dynamic AUTOaccurate] icon in the following selection.

Adjust parameters

Touch the keypad of a parameter to open the keyboard. Options:

- Coolant temperature (3), -10 – 20 °C
- Rotation speed (4), 10 – 280 rpm
- Heating bath temperature (5), 20 – 80 °C

Existing profiles with identical input values are detected and loaded automatically!

Tap on the arrow buttons next to the actual value indicator of a function to start/stop the respective process (recirculation chiller, rotation, heating bath) individually.

Touch the [Start process] button in the footer to start all processes at the same time: The button switches to [Stop process]. Tap the button again to stop all processes: The button switches to [Start process].

Touch the [Warm Up] button in the footer to activate the heating function for the heating bath process-independently.



DAA profile

You can find the list of the available DAA profiles on screen 2 of the DAA operating mode (to open, swipe left once on the display).

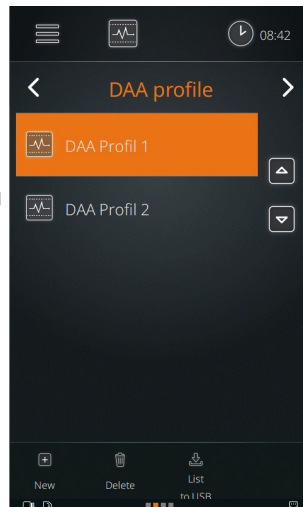
If necessary, use the arrow buttons on the right side to scroll through the list.

Load DAA profile and start process

Mark the required list entry and confirm with [Load] to load the profile. The view switches back to the start window with the operating parameters of the profile.

If necessary, you can delete profiles with [Delete].

All profile settings can be adjusted during the ongoing process. To accept these modifications permanently in the system, the profile has to be overwritten with the new values after the end of the process or has to be stored as new profile in the system. Follow the instructions on the display.



If you adjust the intensity during the running process, the modification must be at least 0,5 °C. Modifications <math>< \pm 0,5 \text{ }^\circ\text{C}</math> will not be considered.

Create DAA profile

A new DAA profile can be defined during the ongoing process on basis of the current operating parameters or in advance using specified parameters.

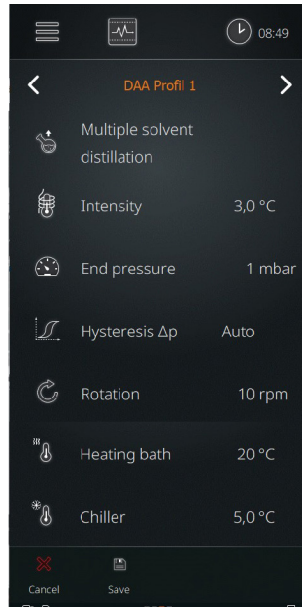
Switch to screen 2 of the operating mode. Touch the [New] button to create a new profile.

The view switches to screen 3. Here, you can define the following parameters (tap on the value to switch between the options or to open the keyboard):

- [Mixture distillation]: Selection between mixture distillation and simple distillation
- [Intensity]: relative temperature rise (1 – 10 °C)
- [End pressure]: only when selecting [Mixture distillation], required end pressure (1 – 1,000 mbar)
- [Hysteresis Δp]: Hysteresis for the opening pressure of the vacuum valve, see section „Hysteresis opening pressure of the vacuum valve“ on page 102
- [Rotation]: Rotation speed (10 – 280 rpm)
- [Heating bath]: Heating bath temperature (20 – 210 °C)
- [Recirculation chiller]: Recirculation chiller temperature (-10 – 20 °C)

After having entered all values and pressed [Save], open the keyboard and assign a unique name to the profile.

The new profile can be loaded directly by pressing [Load]. The view switches back to the start window with the operating parameters of the profile.

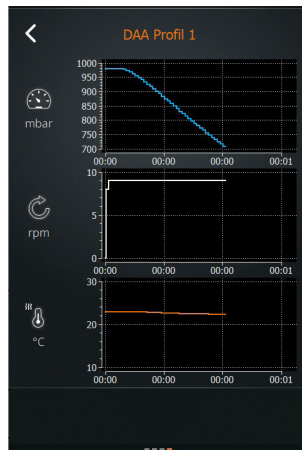


Graphics (curves)

On screen 4 of the operating mode, the process-specific graphics (curves) for vacuum pressure, rotation speed and condenser temperature are displayed in real time.

The boiling points are marked in the temperature curve.

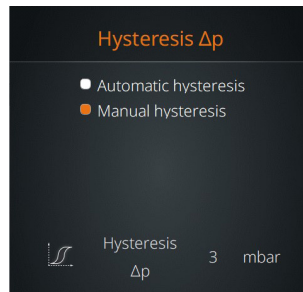
All diagrams are touch-sensitive: tap on a diagram to zoom the display in and out.



Hysteresis opening pressure of the vacuum valve

Open the selection manual/automatic hysteresis via the function button [Hysteresis Δp] in the parameter view:

- When selecting [Automatic hysteresis], predefined hysteresis values are applied for different pressure ranges, see illustration on the right.
- These values cannot be modified.
- Select [Manual hysteresis] to define a uniform hysteresis value for the whole vacuum pressure range. Tap on the displayed value to open the keyboard.
- Define a hysteresis value in a range of 1 – 50 mbar and confirm your entry with [OK] to accept the value. The set value replaces the value [Auto] on the overview page.



Ramp profiles mode

In Ramp profiles mode, user-specific process sequences can be stored as a ramp profile.

Activate Ramp profiles mode

Touch the function button [Operating mode] (2), then touch the [Ramp profiles] icon in the following selection.

Adjust parameters

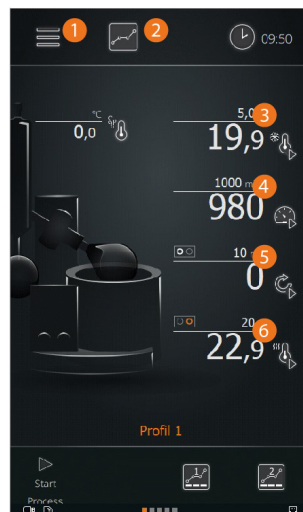
Touch the keypad of a parameter to open the keyboard. Options:

- Coolant temperature (3), -10 – 20 °C
- Vacuum pressure (4), 1 – 1,400 mbar
- Rotation speed (5), 10 – 280 rpm
- Heating bath temperature (6), 20 – 80 °C

Existing profiles with identical input values are detected and loaded automatically!

Tap on the arrow buttons next to the actual value indicator of a function to start/stop the respective process (recirculation chiller, vacuum, rotation, heating bath) individually.

Touch the [Start process] button in the footer to start all processes at the same time: The button switches to [Stop process]. Tap the button again to stop all processes: The button switches to [Start process].



Ramp profiles

You can find the list of the available ramp profiles on screen 2 of the operating mode (to open, swipe left once on the display).

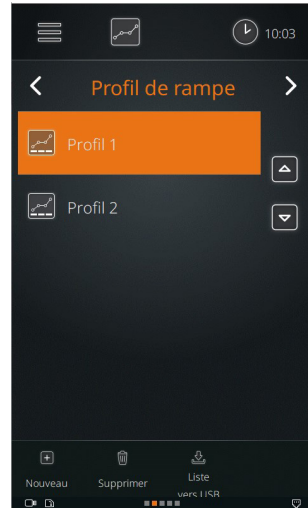
If necessary, use the arrow buttons on the right side to scroll through the list.

Load Ramp profiles and start process

Mark the required list entry and confirm with [Load] to load the profile. The view switches back to the start window with the operating parameters of the profile.

- If necessary, you can delete profiles with [Delete].
- With [List on USB] being available as soon as a USB stick has been plugged on the control panel, you can save ramp profiles on a USB stick.



All profile settings can be adjusted during the ongoing process. To accept these modifications permanently in the system, the profile has to be overwritten with the new values after the end of the process or has to be stored as new profile in the system. Follow the instructions on the display.

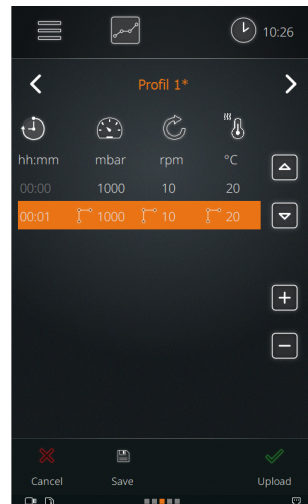


Create ramp profile

A new ramp profile can be defined during the ongoing process on basis of the current operating parameters or in advance using specified parameters.

On screen 2 of the operating mode, touch the [New] button to create a new ramp profile:

- Use the [+] key to add a new line.
- Touch the [hh:mm] value in the new line and use the keyboard to define the duration of the process step (setting range 00:01 to 99:9).
- Touch the value [mbar] and define the vacuum pressure (1 – 1,400 mbar).
- Touch the value [rpm] and define the rotation speed (10 – 280 rpm).
- Touch the value [°C] and define the heating bath temperature (20 – 210 °C).
- Use the [+] key to add additional lines if necessary and set the parameters for each process step as described.
- To delete a line, highlight it and touch the [-] button.
- For each value (vacuum pressure, rotation speed and heating bath temperature), it can be individually determined whether the setpoint should be reached abruptly or gradually linearly. Touch the assigned symbol to switch between the two options:
 - Option abruptly:  / Option gradually linear: 
- After having entered all necessary lines and values and pressed [Save], open the keyboard and assign a unique name to the ramp profile. Afterwards, confirm with [OK].



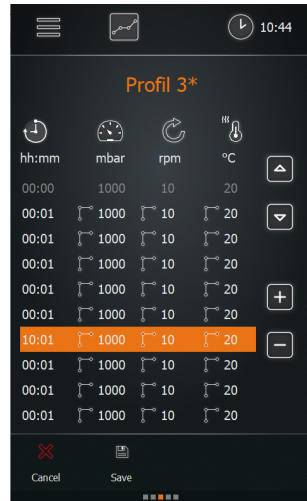


It is not possible to assign designations for ramp profiles twice in the system. If a desired designation already exists, a warning message appears on the display.

In this case, change the designation or overwrite the existing ramp profile. This operation cannot be undone!

Edit ramp profiles

- Switch to screen 3 of the operating mode and open the desired profile.
- From the list of all process steps of the ramp profile, select all the affected lines one after the other (highlighted in yellow) and edit the values as described above.
 - Several process steps can be modified at the same time.
 - Modified ramp profile are marked with an asterisk (*).
- Finally, confirm all changes with [Save]. The on-screen keyboard opens.
- Confirm the designation to store the ramp profile with the changed values in the system or assign a new designation to save a new profile.
- Touch the [Cancel] button to cancel the operation at any time and at any level. All changes made to the ramp profile before are discarded.
- Confirm the additional confirmation prompt with [OK] to accept all changes definitely.

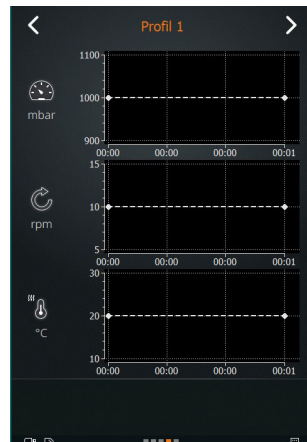


Graphics (curves)

On screen 4 of the operating mode, the process-specific graphics (curves) for vacuum pressure, rotation speed and condenser temperature are displayed in real time.

Color coding: the designed ramp is displayed in gray, real-time data are displayed in white.

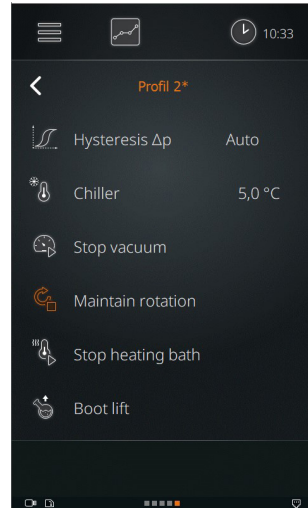
All diagrams are touch-sensitive: tap on a diagram to zoom the display in and out.



Process parameters

Switch to screen 5 of the operating mode. Here, you can define the following parameters (tap on the value to switch between the options or to open the keyboard):

- [Hysteresis Δp]: Hysteresis for the opening pressure of the vacuum valve, see section „Hysteresis opening pressure of the vacuum valve“ on page 102
- [Recirculation chiller]: Recirculation chiller temperature (-10 – 20 °C)
- [Stop/maintain vacuum]: Maintain vacuum pressure after the end of a process or vent.
- [Stop/maintain rotation]: Maintain speed after the end of a process or stop rotation.
- [Stop/maintain heating bath]: Maintain heating bath temperature after the end of a process or deactivate heating bath heater.
- [Move up lift/hold lift]: Hold lift in position after the end of a process or move lift upwards.
- [Stop chiller]: Deactivate chiller after the end of a process.



The settings made here are prioritized and suppress the general parameter settings in the [Settings] menu!

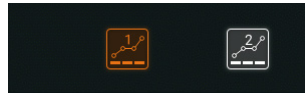
Assign quick access buttons

Load a desired profile (see „Load Ramp profiles and start process“ on page 103).

In the footer of the home page, touch one of the two quick access buttons for about two seconds:

As soon as the icon color changes from white to orange, the quick access button is assigned to the previously loaded ramp (in the example, quick access button 1).

The assignment can be realized during operation without affecting the process.



Import ramp profiles

As soon as a USB stick with stored ramp profiles is inserted into the control panel, a dialog box appears prompting you to import the existing data.

To import the existing data, confirm with [OK]. Alternatively, close the dialog box without importing by touching the [Cancel] button.



Only ramp profiles can be imported in the [Ramp profiles] mode. Unrecognized formats (e.g. favorites) are not displayed.

Files with file names that already exist in system memory cannot be imported. In such a case, you can rename the file stored in the system before the import or overwrite this file with the import file.

Favorites mode

In [Favorites] mode, user-specific parameter settings for the distillation of certain substances can be stored as favorites.



When in [Favorites] mode, processes have to be stopped manually or via a timer. There is no automatic switch-off!

Activate Favorites mode

Touch the function button [Operating mode] (2), then touch the [Favorites] icon in the following selection.

Adjust parameters

Touch the keypad of a parameter to open the keyboard. Options:

- Coolant temperature (3), -10 – 20 °C
- Vacuum pressure (4), 1 – 1,400 mbar
- Rotation speed (5), 10 – 280 rpm
- Heating bath temperature (6), 20 – 80 °C

Existing profiles with identical input values are detected and loaded automatically!

Tap on the arrow buttons next to the actual value indicator of a function to start/stop the respective process (recirculation chiller, vacuum, rotation, heating bath) individually.

Touch the [Start process] button in the footer to start all processes at the same time: The button switches to [Stop process]. Tap the button again to stop all processes: The button switches to [Start process].



Favorites mode

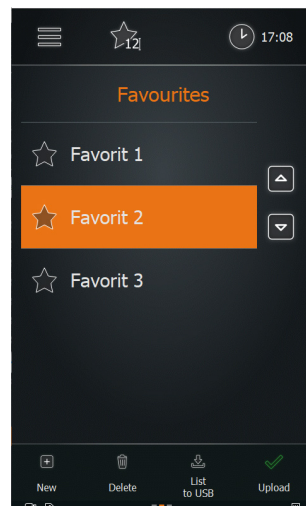
You can find the list of the available favorites on screen 2 of the operating mode (to open, swipe left once on the display).

If necessary, use the arrow buttons on the right side to scroll through the list.

Load favorites and start process

Mark the required list entry and confirm with [Load] to load the favorite. The view switches back to the start window with the operating parameters of the favorite.

- If necessary, you can delete favorites with [Delete].
- With [List on USB] being available as soon as a USB stick has been plugged on the control panel, you can save favorites on a USB stick.



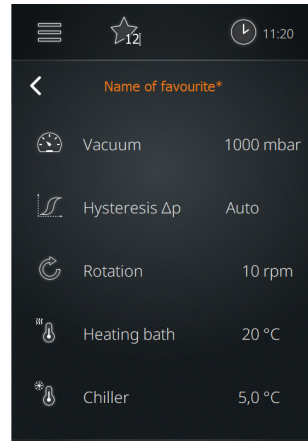
Process parameters

Switch to screen 3 of the operating mode. Here, you can define the following parameters (tap on value):

- [Vacuum]: Vacuum pressure (1 – 1,400 mbar)
- [Hysteresis Δp]: Hysteresis for the opening pressure of the vacuum valve, see section „Hysteresis opening pressure of the vacuum valve“ on page 102
- [Rotation]: Speed (10 – 280 rpm).
- [Heating bath]: Heating bath temperature (20 – 80 °C)
- [Recirculation chiller]: Recirculation chiller temperature (-10 – 20 °C)

All settings can be adjusted during the ongoing process. To accept these modifications permanently in the system, the favorite has to be overwritten with the new values after the end of the process or has to be stored as new favorite in the system.

After having entered all values and pressed [Save], open the keyboard and assign a unique name to the favorite.



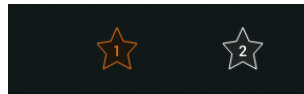
It is not possible to assign designations for favorites twice in the system. If a desired designation already exists, a warning message appears on the display.

In this case, change the designation or overwrite the existing favorite. This operation cannot be undone!

Assign quick access buttons

Load a desired favorite (see section „Load favorites and start process“ on page 106).

In the footer of the home page, touch one of the two quick access buttons for about two seconds.



As soon as the icon color changes from white to yellow, the quick access button is assigned to the previously loaded favorite (in the example, quick access button 1).

The assignment can be realized during operation without affecting the process.

Import favorites

As soon as a USB stick with stored favorites is inserted into the control panel, a dialog box appears prompting you to import the existing data.

To import the existing data, confirm with [OK]. Alternatively, close the dialog box without importing by touching the [Cancel] button.



Only favorites can be imported in the [Favorites] mode. Unrecognized formats (e.g. ramp profiles) are not displayed.

Files with file names that already exist in system memory cannot be imported. In such a case, you can rename the file stored in the system before the import or overwrite this file with the import file.

Remote mode

The RS 232 interface on the control panel of the device allows to control the device as well as to record the process data in remote mode via an external control. This requires a suitable software which supports the set of commands stored in the device (see „RS 232 interface commands“ on page 113).

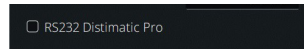


WARNING

Secure the device in remote mode with a clearly visible warning sign and, if necessary, take further ambient-specific protective measures that protect against damage to property and injuries in the event of unexpected/unmonitored starting of the device.

Conditions

In order to activate the device via the RS 232 interface of the control panel, thus via an external control, the option [RS 232 Distimatic Pro] has to be deselected in the [Hei-CONTROL Pro] menu.



In addition, the [Remote control] function has to be activated if necessary (if deactivated, the icon is crossed out). To do so, tap on the function button [Remote control] in the process view, see also section „Control and display elements“ on page 75.



Confirm the security prompt with [OK].

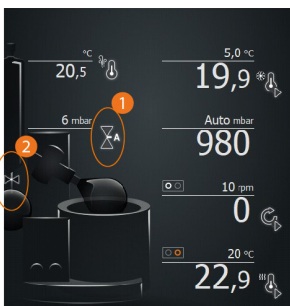
- Function ready: Icon white, not crossed out
- External control active: Icon changes color (yellow)



Operation with intermediate valve (option)

The system extension with intermediate valve (option) was developed especially for applications to dry substances. It assists the user when separating fractions (liquid/liquid or liquid/solid) without a repeated boiling of the distillate. In this way, processes can be finished in a controlled manner (position/mounting see section „Mechanical design“ on page 72).

Representation of the intermediate valve on the user interface



As soon as the intermediate valve is detected in the system after switching on the device, the following symbols appear in the process view:

- Symbol [1]: Operating mode of the intermediate valve.
 - M = manual
 - A = automatic.
- This symbol is stored with a function button (Button [Intermediate valve]). You can switch the valve by tapping on this button.
- Symbol [2]: Operating mode of the intermediate valve (open/closed, in the example: closed).

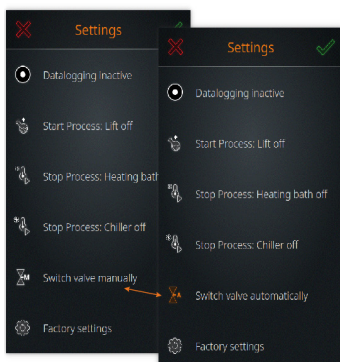
Switched states

When switching on the device, the intermediate valve is closed by default. When switching the intermediate valve, the display changes as follows:

- In the closed state, the symbols [1] and [2] are shown in white.
- When the intermediate valve is open, the symbols [1] and [2] are shown in yellow.



Operating modes



The intermediate valve can be operated in the manual and the automatic mode. The selection of the operating mode is made in the [Settings] menu:

- Touch the button [Switch valve automatically] in the list of the parameters to switch from the manual mode to the automatic mode.
- Touch the button [Switch valve manually] in the list of the parameters out of the automatic mode to switch to the manual mode.

The list entry is only available if the intermediate valve has been detected correctly!

Manual mode

In the manual mode, the intermediate valve can be opened and closed as necessary during the ongoing process. If the pressure increases at the end of the process, the closed intermediate valve will be reopened again automatically when achieving the previously and manually defined switch point!

Automatic mode

In the automatic mode and during the ongoing process, the operator can set a switch point (= vacuum pressure) by tapping the button [Intermediate valve] on the control panel whereby the valve will be closed. As a result, the valve closes when the pressure falls below the defined vacuum pressure and no further distillate will get into the receiving flask.

When the valve is open, the switch point can be newly set any number of times. As soon as the valve is closed, a new switch point cannot be set anymore!

When venting the evaporator, the intermediate valve opens automatically and regardless of the active operating mode as soon as the switch value is exceeded. The distillate flask can thus be removed without pressure difference.

Initial switch point

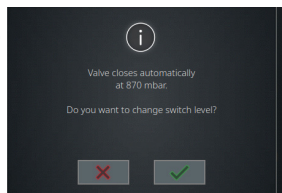
- Switch on the device and make sure that the intermediate valve has been detected and displayed as described above.
- In the [Settings] menu, select the option [Switch valve automatically].
- Switch to the operating mode [Advanced] via the home page.
- Activate the required operating mode.

- Define an initial switch point in the respective sub-menu [Parameters]: Tap on the value, define a new value in the following input field and confirm (in the example: [Favorites] mode).

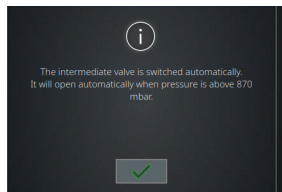


In general, the switch value of the intermediate valve has to be lower than the process pressure during which the solvent will be evaporated.

- Start the process: the intermediate valve will be switched (closed) when achieving the vacuum pressure defined in [Intermediate valve].
- Set any new switch point in the further process cycle: Tap on the button [Intermediate valve] when achieving the required level to set the actual vacuum pressure as switch point. The following prompt appears on the display (example value):



- Confirm your entry with [OK] to accept the value. The following message appears:



Troubleshooting

Failure	Possible cause – remedy
Device does not turn on Display remains dark after switching on	No power supply, check power supply cord.
	Fuse defective, replace.
	On/off switch to OFF, switch on.
Device does not heat up	On/off switch defective, contact technical service.
	Connection cable heating bath is not connected, connect.
	Heating bath defective, contact technical service.
Drive does not turn	Overheat protection has tripped: Let the heating bath cool down and empty, reset the overheating protection.
	No rotation movement, press speed controller.
Engine lift not running	Drive defective, contact technical service.
	Lift in end position, move in opposite direction.
	Lift at height stop, adjust height stop.
No vacuum	Mechanical defect/motor defective, contact technical service.
	Vacuum pump on/off switch OFF, switch on
Vacuum insufficient	Vacuum valve defective, replace
	System leaking, check seals and connections, check joints, grease if necessary.
Device shuts down unexpectedly	Vacuum pump defective, observe manufacturer's instructions for vacuum pump.
	Fuses defective, replace.
Boiling temperature is not displayed	Emergency stop when detecting pressure (see settings, overpressure and leakage pressure), check system and switch on the device again, calibrate the vacuum sensor.
	Boiling temperature sensor not connected, connect or check connection, switch device off and on again if necessary.
Boiling temperature is not displayed	Boiling temperature sensor defective, visual inspection for defect, contact technical service, replace sensor if necessary.
	Temperature outside the measuring range, heat the sensor or let it cool down.

	AUTOaccurate sensor not connected, connect or check the connection, switch off and on the device if necessary.
Automatic mode (DAA) cannot be selected	AUTOaccurate sensor defective, visual inspection for defect, contact technical service, replace sensor if necessary.
	Temperature outside the measuring range, heat the sensor or let it cool down.
Control box not connected or defective	Check connection between control box and evaporator, contact technical service.
Ventilation valve defective	Short circuit in the ventilation valve, contact technical service.
Vacuum valve not connected or defective	Vacuum valve not connected or connection between control box and vacuum valve interrupted, connect vacuum valve, check connection between control box and vacuum valve, contact technical service.
	Short circuit in the vacuum valve, contact technical service.
Vacuum pump not connected or defective	Vacuum pump not connected or connection between Control Box and vacuum pump interrupted, connect vacuum pump, check connection between Control Box and vacuum pump.
Process discontinuation by chiller monitoring (error message)	Chiller failure or repeated fault within 30 s, check connection line to chiller.



All system messages (error messages, warnings, information) are shown in plain text on the display.

Follow the instructions on the display.

In case of recurring errors, please contact the responsible sales department or our technical service. Contact address see „Warranty statement“ on page 119.

RS 232 interface commands

Command	Response	Description
r\r\n	RPM:xxxx\r\n	Actual value (display rotation speed in rpm).
Rxxx\r\n	RPM_SET:xxx\r\n	Set value (set rotation speed in rpm): xxx=10-280. If the command does not contain a numeric value, the actual value will be reported.
RMx\r\n	R_MODE:x\r\n	Rotation off (x=0) or on (x=1). If the command does not contain a numeric value, the actual value will be reported.
h\r\n	HEAT:xxx.x\r\n	Actual value: display heating bath temperature (resolution in 0,1°C)
Hxxx\r\n	HEAT_SET:xxx\r\n	Set value: set heating bath temperature: xxx=20-210 (degrees Celsius or Fahrenheit). If the command does not contain a numeric value, the actual value will be reported.
HMx\r\n	H_MODE:x\r\n	Heating off (x=0) or on (x=1). If the command does not contain a numeric value, the actual value will be reported.
v\r\n	V:xxxx\r\n	Actual value: display vacuum pressure (mbar)
Vxxx\r\n	V_SET:xxx\r\n	Set value: set vacuum pressure: xxx=1-1400. If the command does not contain a numeric value, the actual value will be reported.
VMx\r\n	V_MODE:x\r\n	Vacuum off (x=0) or on (x=1). If the command does not contain a numeric value, the actual value will be reported.
c\r\n	C:xxxx\r\n	Actual value: display chiller temperature (resolution in 0,1°C).
C-xx.x\r\n	C_SET:-xx.x\r\n	Set value: set chiller temperature: xxx=-10.0-+20.0. If the command does not contain a numeric value, the actual value will be reported.
CMx\r\n	C_MODE:x\r\n	Chiller off (x=0) or on (x=1). If the command does not contain a numeric value, the actual value will be reported.
i\r\n	I:x\r\n	Status: set intermediate valve: x=0 / closed, x=1 / open. If the command does not contain a numeric value, the actual status will be reported. Only permissible if the intermediate valve is switched manually, see command [IMx].
Ixxx\r\n	I_SET:xxxx\r\n	Set switch value: set vacuum valve (mbar): if the pressure in the automatic mode falls below the set value, the intermediate valve closes automatically. If the command does not contain a numeric value, the actual value will be reported.
IMx\r\n	I_MODE:x\r\n	Close intermediate valve manually (x=0) or automatically (x=1). If the command does not contain a numeric value, the actual value will be reported.

s\r\n	R(120;1;119), H(55;1;34.9), V(899;0;1015), C(-1.0;1;0.9), I(700;1;0), T(AA;20.5)\r\n	<p>Display status of all actuators: Set value;operating mode;actual value. Example: R(120;1;119) corresponds to: set value (rotation speed: 120 rpm), rotation ON, actual value (rotation speed: 119 rpm).</p> <p>Sensors (type;status): Example: AA=AutoAccurate, V=Steam.</p> <p>Valves (switch states;operating mode;current switch state): Example: Mode 0=manual, mode 1=auto and status 0=closed, status 1=open. Not available values are left blank (example: <V(;;)>)</p>
e\r\n	E_CODES:x\r\n	Query error status <0> = no error, <1> = at least one error existing.
Sx\r\n	S_MODE:x\r\n	Start all: <x=0> = off, <x=1> = on. When entries are missing or incorrect, <NAK> („Negative Acknowledgement“ or „Not Acknowledged“) will be reported.
CCx\r\n	CC_MODE:x\r\n	<p>SET commands have to be activated with a CCx command. The activation can be unlimited in time or be limited in time (example: <CC10>): in the latter case, the commands (GET or SET) have to come within this defined period (here: 10 s). If no command comes within the defined validity period, the device switches to the safe operating state.</p> <p>In order to reactivate the remote SET commands, a new CCx command has to be sent.</p> <p>(x = 0: inactive; x ≥ 1: validity period in seconds; reply <-1> = Timeout)</p>
IDENT\r\n	Hei-VAP, sw(<internal SW ID>), hw(<product variant>;<hardware>;<microcontroller serial N°>)\r\n	Display device ID: product, software ID, hardware ID



- Do not send commands as package, minimum pause time between commands: 0.1 seconds
- <xxxx> = one to four digit numeric value
- <-xx.x> = positive or negative numeric value with decimal place, example: <-8.7> oder <+11.8>

RS-232 interface parameters


- 115200 Baud
- No Parity
- Data: 8 Bit
- Stop: 1 Bit

Command termination

- ... \r\n

Technical specifications

General device data

Model	Rotary evaporator Hei-VAP Expert/Ulimate	
Dimensions (W × H × D)	Variant with motor driven lift & glassware G3: 739 × 887 × 477 mm	
	Variant with manual lift & glassware G3: 739 × 887 × 532 mm	
Weight	approx. 15 kg, without glassware	
Acoustic pressure	< 85 (dB(A)) (in accordance with IEC 61010)	
Flask drive	EC motor	
Speed range	10 – 280 rpm	
Stroke flask lift	155 mm	
Lifting speed flask lift	55 mm/s	
Evaporation rates (L/h) ΔT^* 40 °C (for continuous operation)	Toluene	8,5
	Acetone	5,8
	Ethanol	3,5
	Water	1,2
Maximum cooling surface	1.4 m ²	
Protection class	Device	IP20
	Control panel	IP42
	Control-Box	IP42
	Connection cable heating bath	IP67
Electrical data		
Rated voltage	230 V (50/60 Hz) or 115 V (50/60 Hz)	
Connection	L+N+PE	
Protection class	I  (IEC 61140)	
Overvoltage category	II	
Degree of pollution	2	
Power input	1,400 W max.	

Heating bath, cooling

Heating bath	Inner Ø: 253 mm, outer Ø: 291 mm Material: V4A steel (1.4404) X2CrNiMo 17-12-2 Volume: 6 l
Heating power	1300 W
Temperature range heating bath	20 – 100 C° H ₂ O / 20 – 210 C° oil
Overtemperature protection	Cut-off at 5 °C deviation from the set temperature
Overheat protection	Threshold value 250 °C
Control	electronic
Control accuracy	±1 °C
Permissible ambient conditions	
Storage conditions (recommendation)	5 °C – 31 °C at up to 80 % rel. humidity 32 °C – 40 °C at up to 50 % rel. humidity (linearly reducing)
Operating temperature	5 °C – 31 °C at up to 80 % rel. humidity 32 °C – 40 °C at up to 50 % rel. humidity (linearly reducing)
Installation altitude	up to 2,000 m asl

Scope of delivery

Item	Quantity	Product no.
Rotary evaporator Hei-VAP Expert, complete	1	see package list
Rotary evaporator Hei-VAP Ultimate, complete	1	see package list
Operating instructions	1	01-005-005-86
Warranty registration	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.

Device service



DANGER

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

When cleaning, avoid the penetration of liquids.

Before replacing the fuses, switch off the device and disconnect the power supply.

Always replace the two device fuses in pairs with original manufacturer fuses. Further information on available accessories can be found on our website at www.heidolph.com!

After fuse replacement, check the device for a safe condition according to IEC 61010-1.

General cleaning instructions



CAUTION

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 always be carried out by authorized experts! Unauthorized repairs during the warranty period will result in the loss of the warranty claim.

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

If repairs are required, contact an authorized dealer or our technical service, see „Warranty statement“ on page 119.

Include the completed certificate of decontamination with every device return, see „Certificate of decontamination“ on page 120.

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 „Warranty statement“ on page 119.

- Check for tight fit the caps and fasteners of all glass components at regular intervals and especially before each start-up of the device.
- Check the level sensor in the heating bath regularly for proper operation, contamination, and limescale build-up to prevent malfunctions.



CAUTION

At loose/leaky connections, ambient air is sucked in during the vacuum build-up and the required vacuum pressure cannot be reached in a stable manner!

In the event of excess pressure, there is a risk that liquid will escape from the system! The device and surrounding areas can be severely contaminated by leaking media!

Tighten loose caps/fasteners by hand or correct the seating of the retaining clips.

Dismantling

Observe the instructions given in the associated assembly instructions when dismantling the device.

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 biohazardous!
-

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 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.

Contact details



Heidolph Instruments GmbH & Co. KG

Technischer Service

Walpersdorfer Straße 12

D-91126 Schwabach/Germany

Email: service@heidolph.de

Representations

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

Certificate of decontamination

Enclose the certificate of decontamination, duly completed, with your device return.
Submissions without a certificate of decontamination cannot be processed!

CERTIFICATE OF DECONTAMINATION

IN CASE OF RETURNS



Please fill in the required fields.

Note: The sender must package the goods properly and appropriately for transport.

Heidolph Instruments GmbH & Co. KG
Walpersdorfer Straße 12
91126 Schwabach, Germany
Phone: +49 (0) 9122 9920-380
Fax: +49 (0) 9122 9920-19
Email: service@heidolph.de

SENDER

Name _____ First name _____
Company/institution _____ Department _____
_____ Workgroup _____
Address _____
ZC/City _____
Country _____ Phone _____
Email _____

DEVICE DETAILS

Article number _____ Serial no. _____

Ticket number _____

Reason for sending in _____

Has the device been cleaned, decontaminated/disinfected? Yes No (Please mark as applicable)

If yes, which measures were carried out?

Does this device pose a risk to people and/or the environment due to the processing of substances that are hazardous to health, the environment and/or are biohazardous? Yes No (Please mark as applicable)

If yes, with which substances did the device come into contact?

LEGALLY BINDING DECLARATION

The principal/consignor is aware that they are liable to the agent/consignee for losses or damage incurred due to incomplete and incorrect information.

_____ Date _____ Signature _____ Company stamp _____