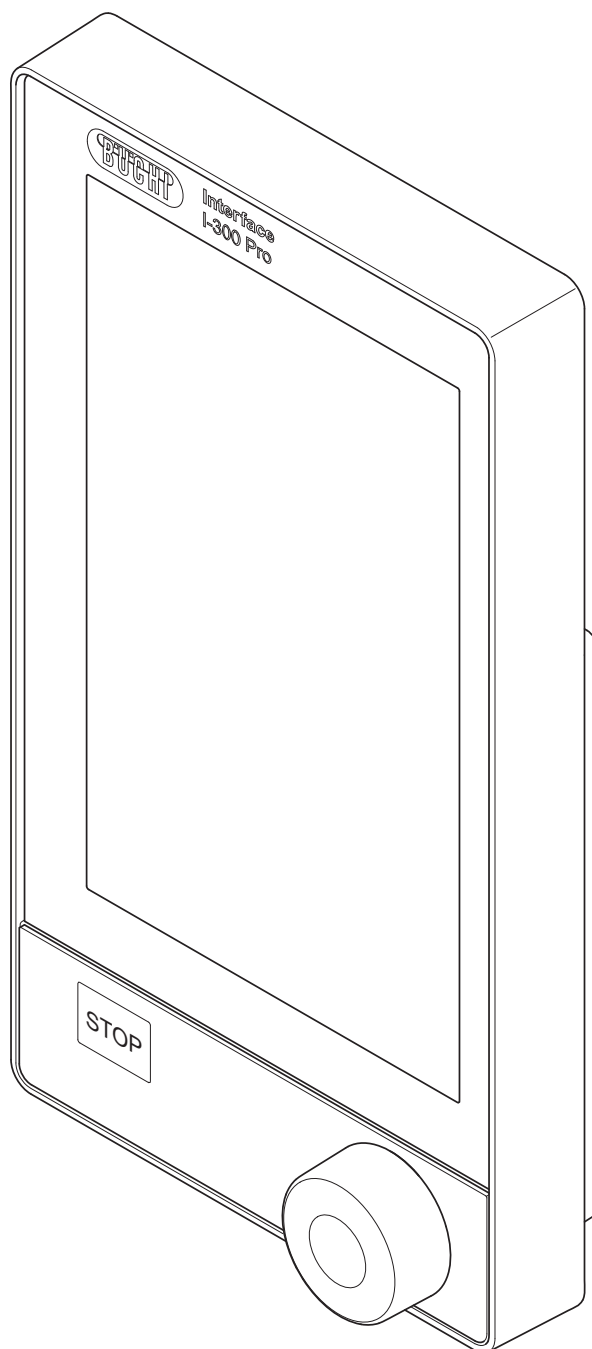




Interface I-300 Pro

Operation Manual



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1 About this document

This operation manual is applicable for all variants of the instrument.

Read this operation manual before operating the instrument and follow the instructions to ensure safe and trouble-free operation.

Keep this operation manual for later use and pass it on to any subsequent user or owner.

BÜCHI Labortechnik AG accepts no liability for damage, faults and malfunctions resulting from not following this operation manual.

If you have any questions after reading this operation manual:

► Contact BÜCHI Labortechnik AG Customer Service.

<https://www.buchi.com/contact>

1.1 Warning notices in this document

Warning notices warn you of dangers that can occur when handling the instrument. There are four danger levels, each identifiable by the signal word used.

Signal word	Meaning
DANGER	Indicates a danger with a high level of risk which could result in death or serious injury if not prevented.
WARNING	Indicates a danger with a medium level of risk which could result in death or serious injury if not prevented.
CAUTION	Indicates a danger with a low level of risk which could result in minor or medium-severity injury if not prevented.
NOTICE	Indicates a danger that could result in damage to property.

1.2 Symbols

The following symbols are displayed in this operation manual or on the device:

1.2.1 Warning symbols

Symbol	Meaning
	General warning

1.2.2 Mark-ups and symbols



NOTE

This symbol draws attention to useful and important information.

☑ This character draws attention to a requirement that must be met before the instructions below are carried out.

► This character indicates an instruction that must be carried out by the user.

⇒ This character indicates the result of a correctly carried out instruction.

Mark-up	Explanation
<i>Window</i>	Software Windows are marked-up like this.

Mark-up	Explanation
<i>Tab</i>	Tabs are marked-up like this.
<i>Dialog</i>	Dialogs are marked-up like this.
<i>[Button]</i>	Buttons are marked-up like this.
<i>[Field names]</i>	Field names are marked-up like this.
<i>[Menu / Menu item]</i>	Menus or menu items are marked-up like this.
Status	Status is marked-up like this.
Signal	Signals are marked-up like this.

1.3 Trademarks

Product names and registered or unregistered trademarks that are used in this document are used only for identification and remain the property of the owner in each case.

2 Safety

2.1 Intended use

The *[Interface I-300 Pro]* is intended for indicating vacuum within an operating range of 0 mbar to ambient atmospheric pressure. The measurement and regulation of the vacuum is performed by means of a VacuBox. The *[Interface I-300 Pro]* has been designed and built as an item of laboratory equipment and can be used in conjunction with the following devices:

- Distillation apparatus, especially rotary evaporators
- Vacuum-drying cabinets
- Vacuum pumps
- Recirculating chiller

2.2 Use other than that intended

Use of any kind other than that described in the section Intended use and any application that does not comply with the technical specifications (see Chapter 3.8 "Technical data", page 26) constitutes use other than that intended.

In particular, the following applications are not permissible:

- Use of the device in areas that require apparatus that is safe to use in potentially explosive atmospheres.
- Use as a calibration device for other equipment.
- Operation at pressures above atmospheric

Damage or hazards attributable to use of the product other than as intended are entirely at the risk of the user alone.

2.3 Staff qualification

Unqualified persons are unable to identify risks and are therefore exposed to greater dangers.

The instrument may only be operated by suitably qualified laboratory staff.

These operating instructions are aimed at the following target groups:

Users

Users are persons that meet the following criteria:

- They have been instructed in the use of the instrument.
- They are familiar with the contents of these operating instructions and the applicable safety regulations and apply them.
- They are able on the basis of their training or professional experience to assess the risks associated with the use of the instrument.

Operator

The operator (generally the laboratory manager) is responsible for the following aspects:

- The instrument must be correctly installed, commissioned, operated and serviced.
- Only suitably qualified staff may be assigned the task of performing the operations described in these operating instructions.
- The staff must comply with the local applicable requirements and regulations for safe and hazard-conscious working practices.
- Safety-related incidents that occur while using the instrument should be reported to the manufacturer (quality@buchi.com).

BUCHI service technicians

Service technicians authorized by BUCHI have attended special training courses and are authorized by BÜCHI Labortechnik AG to carry out special servicing and repair measures.

2.4 Residual risks

The instrument has been developed and manufactured using the latest technological advances. Nevertheless, risks to persons, property or the environment can arise if the instrument is used incorrectly.

Appropriate warnings in this manual serve to alert the user to these residual dangers.

2.4.1 Faults during operation

If an instrument is damaged, sharp edges, glass splinters, moving parts or exposed electrical wires can cause injuries.

- ▶ Regularly check instruments for visible damage.
- ▶ If faults occur, switch off the instrument immediately, unplug the power cord and inform the operator.
- ▶ Do not continue to use instruments that are damaged.

2.5 Personal protective equipment

Depending on the application, hazards due to heat and/or corrosive chemicals may arise.

- ▶ Always wear appropriate personal protective equipment such as safety goggles, protective clothing and gloves.
- ▶ Make sure that the personal protective equipment meets the requirements of the safety data sheets for all chemicals used.

2.6 Modifications

Unauthorized modifications can affect safety and lead to accidents.

- ▶ Use only genuine BUCHI accessories, spare parts and consumables.
- ▶ Carry out technical changes only with prior written approval from BUCHI.
- ▶ Only allow changes to be made by BUCHI service technicians.

BUCHI accepts no liability for damage, faults and malfunctions resulting from unauthorized modifications.

3 Product description






3.1 Description of function

The [Interface I-300 Pro] is designed for indicating, adjusting and controlling the complete distillation system. The [Interface I-300 Pro] settings enable precise specification of the individual process parameters. For example:

- Rotation speed of the evaporating flask
- Specified temperature of the heating bath
- Specified temperature of the coolant
- Specified vacuum pressure
- Duration of the distillation process

The pressure is measured and regulated by the associated VacuBox. Measurement is independent of the solvent used.

3.2 Description of function Cloud Services (Option)

	Dongle	LAN	App	System owner
 Update	X		X	
 MonitorApp		X	X	
 SmartMonitor	X	x*	X	X
 eSupport	X	x*	X	X
 OpenInterface		X		

* Option



NOTE

- For update details, see "Firmware Update Quick Guide"
- For details of Monitor app, see "BUCHI Monitor App Quick Guide"
- For details of eSupport, see Chapter 8.4 "eSupport", page 100
- For details of OpenInterface see Chapter 7.9 "Setting up Rotavapor® Open Interface", page 97

3.3 Description of function of Rotavapor R-300 and Rotavapor R-220 Pro controller

3.3.1 Control of R-300 and R-220 Pro

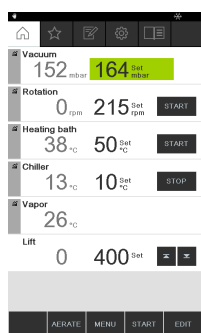
The Rotavapor R-300 and R-220 Pro can both be controlled by the Interface I-300 Pro.

The following table details the common features and the differences in the control of the Rotavapor R-300 and Rotavapor R-220 Pro

	Rotavapor R-300	Rotavapor R-220 Pro
Interface unit mounting	Option: I-300 or I-300 Pro mounted on Rotavapor arm, see Chapter 5.1.1 "Mounting interface on Rotavapor R-300", page 30.	Ready mounted: I-300 Pro mounted on device directly adjacent to internal display, see Chapter 5.1.3 "Mounting interface unit on Rotavapor R-220 Pro", page 33.
Information on display	Full display of figures and graphs on display of I-300 Pro.	Display of figures and graphs split between I-300 and R-220 Pro.
Lift control	Manual and programmed control of lift position possible, see Chapter 6.10 "Controlling lift position via the interface unit", page 87.	Manual adjustment of lift position possible, see Chapter 6.10 "Controlling lift position via the interface unit", page 87.
Communication cable connection	See operating instructions for the Rotavapor R-300.	See operating instructions for the Rotavapor R-220 Pro.
Connections	External valves connected to VacuBox, Chapter 5.5 "Connecting valve unit for external vacuum", page 44.	External valves connected directly to R-220 Pro.
<i>[Manual]</i> operating mode	Distillation carried out with manually set parameters. See Chapter 6.2.3 "Executing Manual mode", page 54	Distillation carried out with manually set parameters. See Chapter 6.2.3 "Executing Manual mode", page 54
<i>[Timer]</i> mode	Distillation carried out with manually set parameters. See Chapter 6.2.4 "Executing Timer mode", page 58	Distillation carried out with manually set parameters. See Chapter 6.2.4 "Executing Timer mode", page 58
<i>[Continuous pumping]</i>	For drying the system after distillation. See Chapter 6.2.5 "Executing Continuous Pumping mode", page 63	For drying the system after distillation. See Chapter 6.2.5 "Executing Continuous Pumping mode", page 63
<i>[AutoDest]</i> mode	For carrying out automatic single or multi-stage distillation. See Chapter 6.2.6 "Executing AutoDest mode", page 66	For carrying out automatic single or multi-stage distillation. See Chapter 6.2.6 "Executing AutoDest mode", page 66
<i>[Drying]</i> mode	Drying of the sample after distillation possible. See Chapter 6.2.7 "Executing Drying mode", page 69.	<i>[Drying]</i> mode is not available for the R-220 Pro.

	Rotavapor R-300	Rotavapor R-220 Pro
<i>[Methods]</i> mode	Distillation carried out according to a sequence of programmed steps. See Chapter 6.2.8 "Executing Methods mode", page 70	Distillation carried out according to a sequence of programmed steps. See Chapter 6.2.8 "Executing Methods mode", page 70
<i>[eSupport]</i>	For details of sending a ticket to the local BUCHI technical engineer, see Chapter 8.4 "eSupport", page 100	The submenu <i>[eSupport]</i> is not available for the R-220 Pro.
<i>[Rotavapor Open Interface]</i>	Rotavapor® Open Interface provides the facility for an overall view of the status of various instruments and communication between them. See Chapter 7.9 "Setting up Rotavapor® Open Interface", page 97	The submenu <i>[Rotavapor Open Interface]</i> is not available for the R-220 Pro.

3.3.2 Parameter display with R-300 and R-220 Pro



The parameters for the current distillation process are shown on the home screen of the Interface I-300 Pro. Depending on which Rotavapor the interface unit is connected to, different parameters may be shown. Below is a comparison of the R-300 and R-220 Pro Rotavapors:

Parameter	Information	R-300	R-220 Pro
Vacuum	<ul style="list-style-type: none"> Current system pressure Desired system pressure 	✓	✓
Rotation	<ul style="list-style-type: none"> Current rotation speed Desired rotation speed 	✓	(✓)*
Heating bath	<ul style="list-style-type: none"> Current heating bath temperature Desired heating bath temperature 	✓	(✓)*
Recirculating chiller	<ul style="list-style-type: none"> Current system temperature Desired system temperature 	✓	✓
Vapor	<ul style="list-style-type: none"> Current vapor temperature 	✓	(✓)*
Lift	<ul style="list-style-type: none"> Raise lift Lower lift 	✓	(✓)**

* With the Rotavapor R-220 Pro these parameters are not shown if the reduced display option (display split between internal Rotavapor display and interface unit) is activated.

** Lift position not displayed with R-220 Pro.

3.4 Description of function for control of the R-300 with and without interface unit/VacuBox

The Rotavapor R-300 can be operated with or without an Interface I-300 Pro.

	Without interface unit/VacuBox	With interface unit/VacuBox
Vacuum pump delivery	<ul style="list-style-type: none"> No vacuum control 	<ul style="list-style-type: none"> Current system pressure shown on display (home screen) Setting and display of specified vacuum
Evaporating flask rotation speed	<ul style="list-style-type: none"> Rotation speed set using control knob Current rotation speed not shown on heating bath base 	<ul style="list-style-type: none"> Rotation speed set using control knob Current rotation speed shown on display (home screen) and on heating bath base
Heating bath temperature	<ul style="list-style-type: none"> Current temperature shown on display on heating bath base Required temperature set using control knob on heating bath base 	<ul style="list-style-type: none"> Current and set temperature shown on display (home screen) of interface unit and on heating bath base Required temperature set using control knob on heating bath base
Recirculating chiller temperature	<ul style="list-style-type: none"> Current coolant temperature shown on display on device Required temperature set using control knob on device 	<ul style="list-style-type: none"> Current system temperature shown on display (home screen) and on device Required temperature set using control knob on device
Vapor temperature	<ul style="list-style-type: none"> No display of vapor temperature possible 	<ul style="list-style-type: none"> Vapor temperature shown on display (home screen)
Lift position	<ul style="list-style-type: none"> Lift position set by means of "vertical adjustment handle" 	<ul style="list-style-type: none"> Lift position set by means of "vertical adjustment handle" Lift position set by means of "Up" and "Down" buttons on home screen

3.5 Configuration

3.5.1 Front view

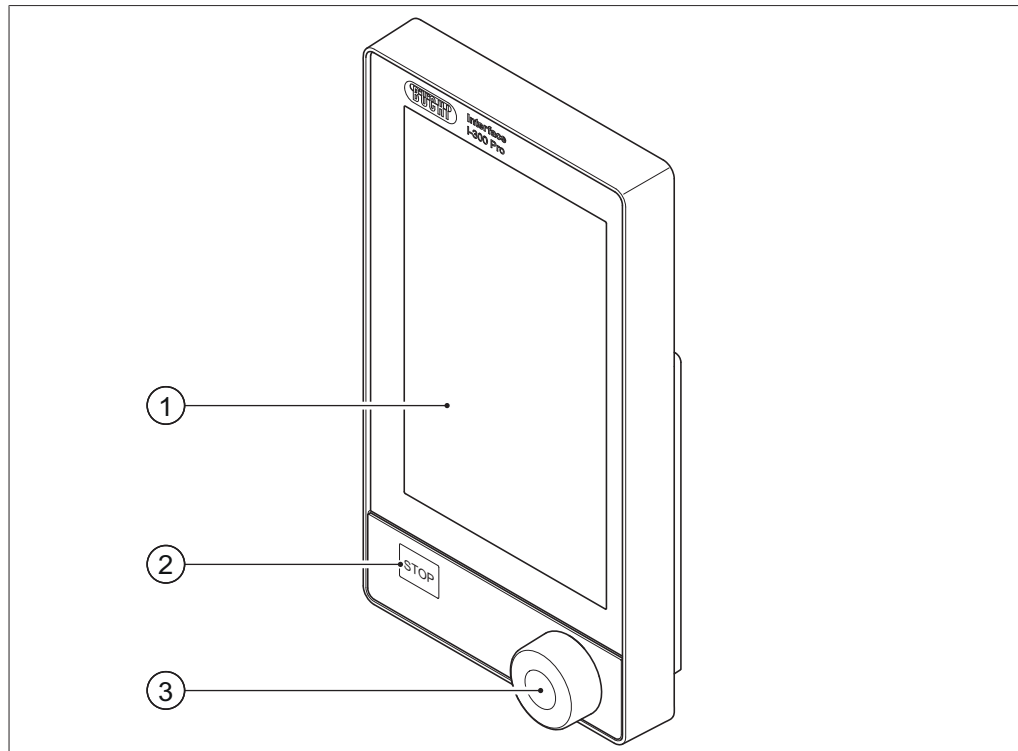


Fig. 1: Front view of Interface I-300 Pro

- | | |
|--------------------------------|----------------------|
| 1 Touch-screen display | 3 Navigation control |
| 2 STOP button (emergency stop) | |

3.5.2 Rear view

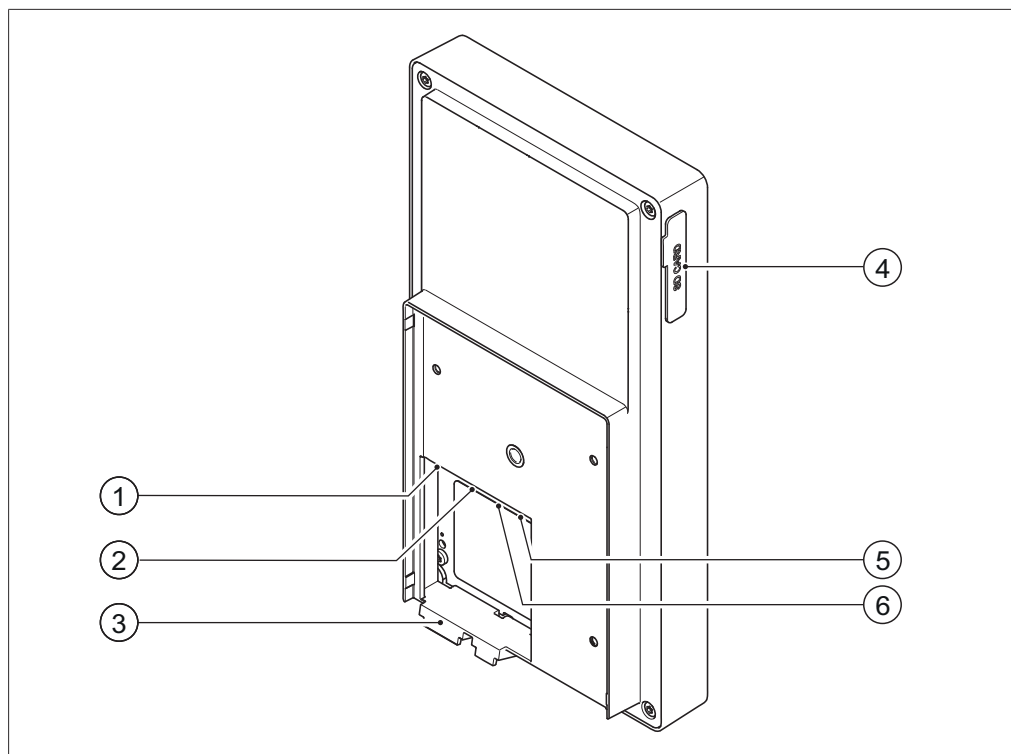


Fig. 2: Rear view of Interface I-300 Pro

- | | |
|---|-----------------------------|
| 1 LAN port | 4 Slot for BUCHI SD card |
| 2 BUCHI standard communication port (COM) | 5 USB connection (not used) |
| 3 Locating lug for bracket | 6 MicroSD card (not used) |

3.5.3 VacuBox (connections)

Other BUCHI laboratory equipment is connected to the *[Interface I-300 Pro]* in series together with the VacuBox. The individual devices are connected to one another via the standard BUCHI communication port (7). See Chapter 5.2.3 "Overview: Setting up communication connections (COM)", page 37.

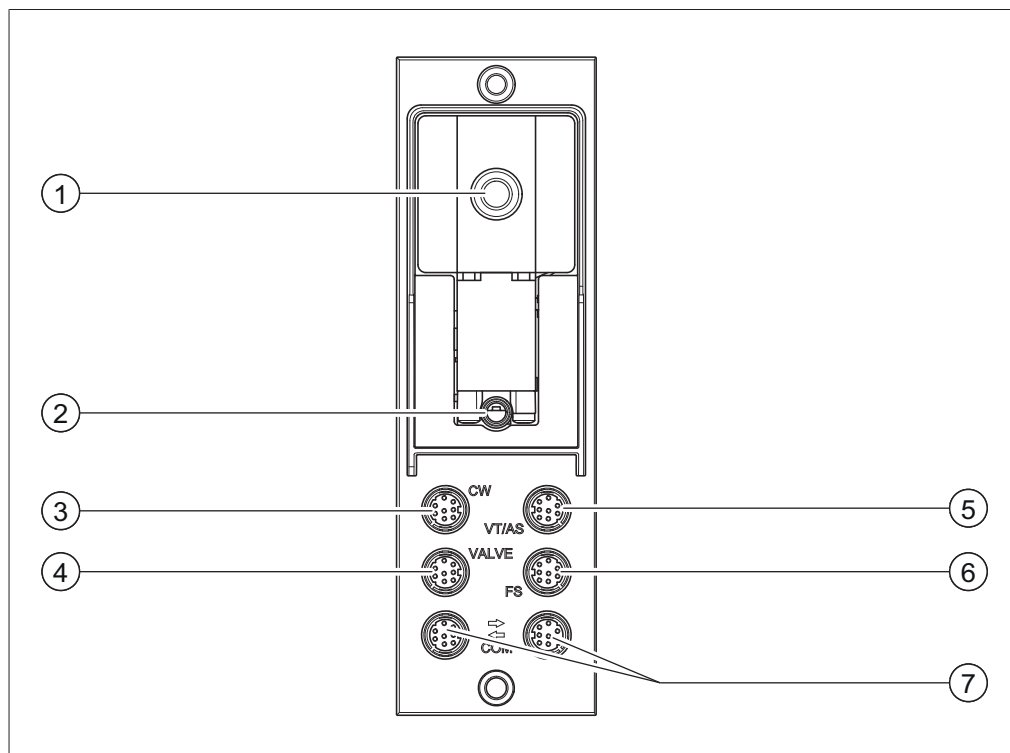


Fig. 3: Connections on the VacuBox

- | | |
|---|--|
| 1 Vacuum connection | 5 Connection for vapor temperature/
AutoDest sensor (VT/AS) |
| 2 Venting valve/inert gas connection
(optional) | 6 Foam sensor connection (FS) |
| 3 Water coolant valve connection (CW) | 7 Standard BUCHI communication port
(COM) |
| 4 Connection for valve unit or straight-
way valve (VALVE) | |



NOTE

Connecting VacuBox with R-220 Pro:

If the Interface I-300 Pro and the VacuBox are operated in the Rotavapor R-220 Pro system, the following points should be noted: The external valves must always be connected to the Rotavapor R-220 Pro even if there is an alternative connection on the VacuBox.

3.5.4 LegacyBox (connections)

Connection of a LegacyBox is required whenever legacy BUCHI laboratory equipment is to be controlled via the [Interface I-300 Pro]. The LegacyBox is connected to the distillation system using a standard BUCHI communication cable and has other connection options such as an RS-485 communication port. There is also the option of incorporating pumps of other makes in the Rotavapor system and controlling them via the interface. In that case, the pump requires a 0 – 10 V input. The LegacyBox is fixed to a Rotavapor R-300 or a laboratory stand clamp.

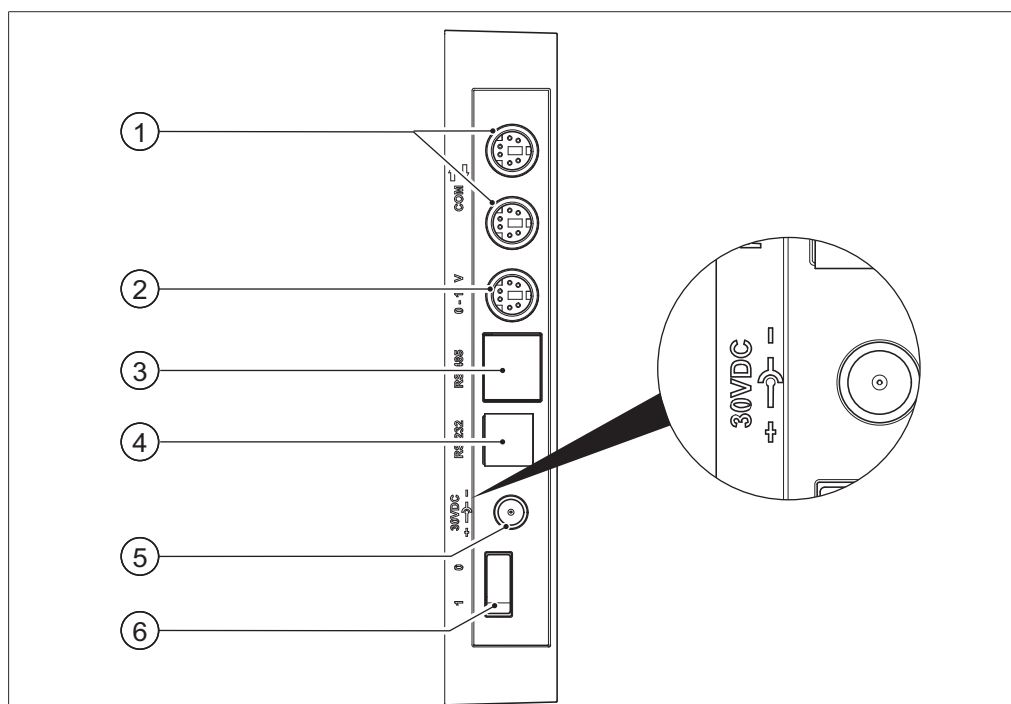


Fig. 4: Connections on the LegacyBox

- | | |
|---|---|
| 1 Standard BUCHI communication port (COM) | 4 RS-232 (not used) |
| 2 0 – 10 V communication port – for connecting pumps of other makes | 5 External power supply – for genuine BUCHI mains adaptor, 30 V, 30 W (see Accessories) |
| 3 RS-485 communication port – for connecting legacy BUCHI laboratory equipment (Vacuum Pumps V-700 / V-710, Rotavapors: R-210 / R-215, Recirculating Chiller F-1xx) | 6 On/Off switch |



NOTE

The external power supply is only necessary if the LegacyBox is not connected to a Rotavapor or a vacuum pump and is used for other vacuum control applications instead. Otherwise the vacuum pump or the Rotavapor supplies the LegacyBox with power.

0 – 10 V communication port

This connection comprises a 0 – 10 V output for connecting pumps of other makes and electrically isolated relay contacts. There is also a valve control contact.

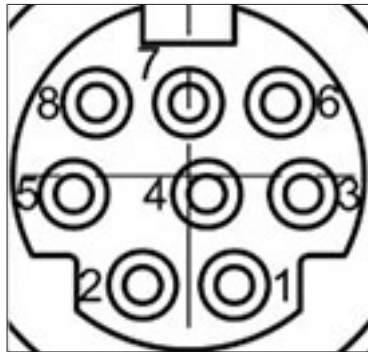
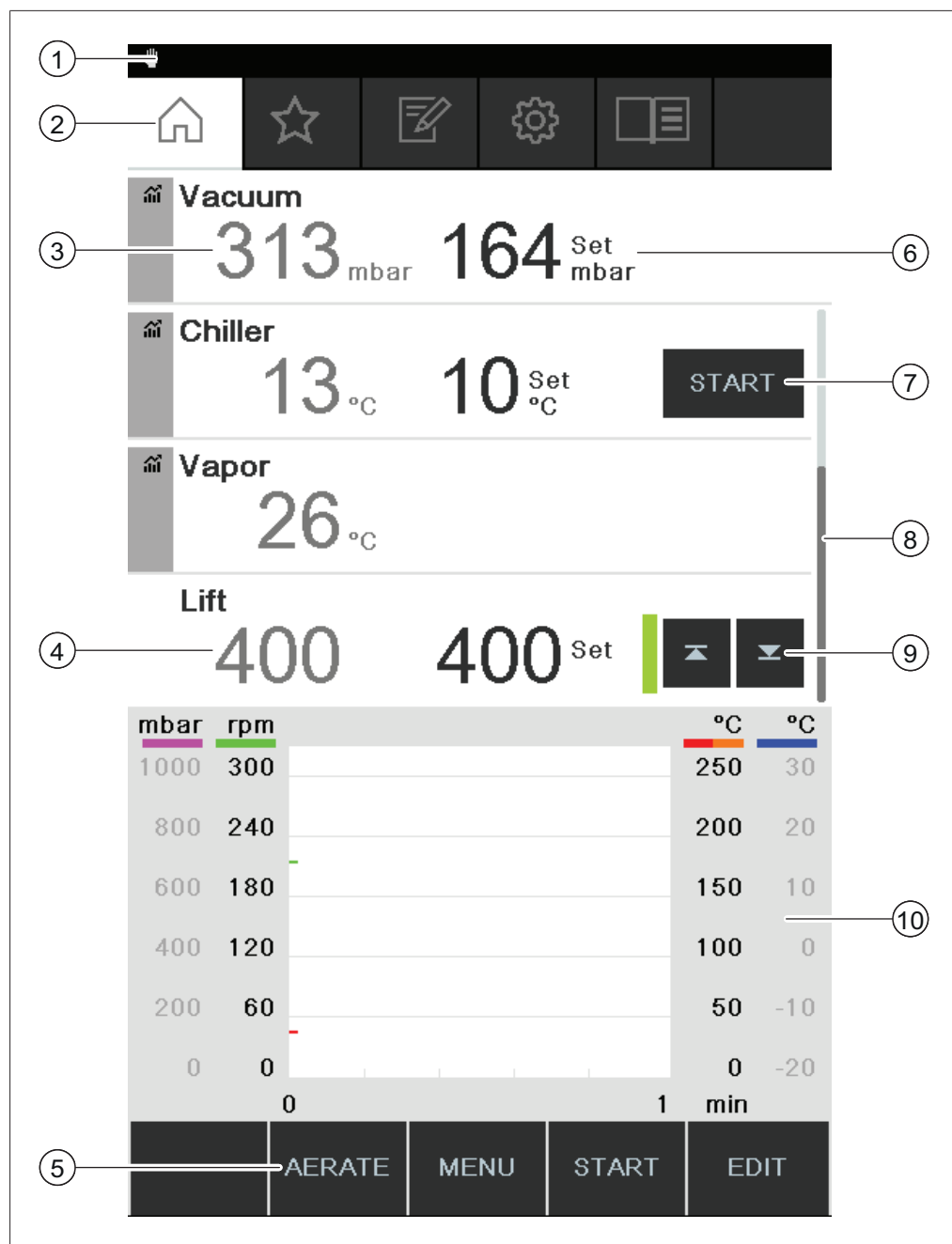


Fig. 5: 8-pin MiniDin pin assignment, view of socket

Pin 8-pin notation	Symbol	Description
1	Ground	Ground connection for valve and 10 V output
2	Valve	Vacuum valve connection
3		Spare
4	10 V output	0 – 10 V (max. 20 mA, min. 500 Ohm)
5	Relay In	Max. 30 V 2 A, electrically isolated
6		Spare
7		Spare
8	Relay Out	Max. 30 V 2 A, electrically isolated
S	Shield	Shield, connected to ground

3.5.5 Display



- | | | | |
|---|--------------------------------------|----|-------------------------------|
| 1 | Status bar | 6 | Current setting (e.g. vacuum) |
| 2 | Menu bar | 7 | Direct intervention buttons |
| 3 | Current reading (e.g. vacuum) | 8 | Scroll bar |
| 4 | Lift position | 9 | Lift control |
| 5 | Function buttons (context-dependent) | 10 | Graph display area |



NOTE

While distillation is in progress, the display is shown in inverse type. A progress bar for each process parameter shows the status on reaching the specified setting concerned.

3.5.6 Type plate

The type plate is on the rear of the *[Interface I-300 Pro]*.

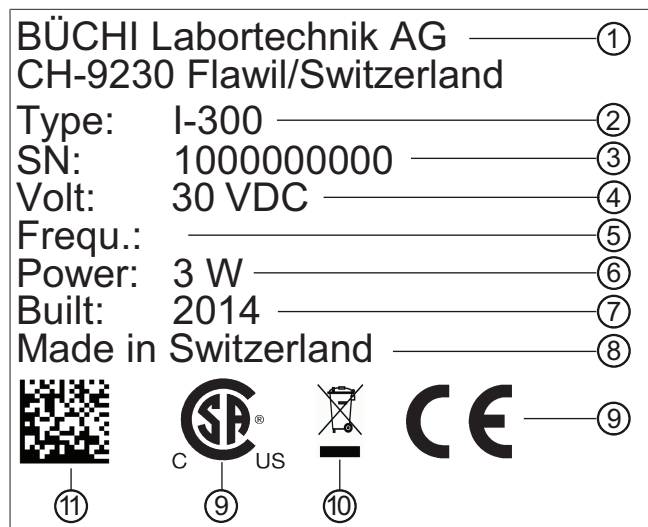


Fig. 6: Type plate (example)

- | | |
|----------------------------|--|
| 1 Company name and address | 7 Year of manufacture |
| 2 Device name | 8 Country of manufacture |
| 3 Serial number | 9 Approvals |
| 4 Input voltage | 10 Symbol for "Do not dispose of as household waste" |
| 5 Frequency | 11 Product code |
| 6 Maximum power rating | |



NOTE



The VacuBox and the LegacyBox each have their own type plate on the rear.




3.6 Navigating through the menu system

3.6.1 Menu bar

The menus are represented by symbols on the menu bar.

The following menus are available:

Symbol	Meaning	Sub-items
	Home screen	<ul style="list-style-type: none"> • Process control parameters • Graphs
	Favorites	<ul style="list-style-type: none"> • Bookmarks for frequently used individual starting points

Symbol	Meaning	Sub-items
	Operating modes	<ul style="list-style-type: none"> • <i>[Manual]</i> • <i>[Timer]</i> • <i>[Continuous pumping]</i> • <i>[AutoDest]</i> • <i>[Drying]</i> • <i>[Methods]</i>
	Configuration	<ul style="list-style-type: none"> • <i>[Maintenance]</i> • <i>[Settings]</i> • <i>[BUCHI Cloud Services]</i> • <i>[Service]</i> • <i>[System information]</i>
	Libraries	<ul style="list-style-type: none"> • <i>[Solvent library]</i> • <i>[Own solvent library]</i> • <i>[Wearing parts]</i> • <i>[Startup info]</i>

3.6.2 Favorites menu

For creating favorites. See Chapter 6.8 "Creating favorites", page 85

3.6.3 Operating modes menu

The Interface I-300 Pro distinguishes between the following operating modes for a distillation system:

Operating mode	Purpose	Content
<i>[Manual]</i>	Carrying out distillation with manually set parameters	See Chapter 6.2.3 "Executing Manual mode", page 54
<i>[Timer]</i>	Carrying out a distillation process with manually set parameters which is to be stopped after a set time has elapsed	See Chapter 6.2.4 "Executing Timer mode", page 58
<i>[Continuous pumping]</i>	Drying the system after distillation	See Chapter 6.2.5 "Executing Continuous Pumping mode", page 63
<i>[AutoDest]</i>	Carrying out automatic single or multi-stage distillation with specified settings for the vacuum continuously adjusted by the system	See Chapter 6.2.6 "Executing AutoDest mode", page 66
<i>[Drying]</i>	Post-drying of contents of evaporating flask. (This feature is only available in conjunction with the Rotavapor R-300.)	See Chapter 6.2.7 "Executing Drying mode", page 69

Operating mode	Purpose	Content
[Methods]	Carrying out distillation according to a sequence of programmed steps with defined times and parameters.	See Chapter 6.2.8 "Executing Methods mode", page 70

3.6.4 Configuration menu

The [Configuration] menu contains the following submenus:

- Maintenance see Chapter "Maintenance submenu", page 22
- Settings see Chapter "Settings submenu", page 22
- BUCHI Cloud Services see Chapter "BUCHI Cloud Services submenu", page 24
- System information see Chapter "System Information submenu", page 25

Maintenance submenu

The submenu [Maintenance] contains the following actions:

Action	Option	Explanation
[Test Results]	Info	Shows the leak tests carried out. See Chapter 7.3 "Opening leak test history", page 90
[Leak test]	START/Information	For carrying out a leak test on the distillation system. See Chapter 7.2 "Performing a leak test", page 89
[Reset duty hours]	Info	Hours of rotation since last service. Resets the hours of rotation recorded.

Settings submenu

The submenu [Settings] contains options for settings that can be made on the distillation system.

Action	Option	Explanation
[Mobile connection QR code]	View	Interface unit shows QR code for the connected distillation system.
[Mobile connection password]	View	For viewing password and entering on mobile device (alternative to QR code)
[On finish: Aerate system]	On/Off	System is vented after automatic or manual termination of distillation.
[On start: start rotation]	On/Off	Evaporating flask starts rotating when distillation is started.
[On finish: Stop rotation]	On/Off	Evaporating flask stops rotating after automatic or manual termination of distillation.
[On start: immerse flask]	On/Off	Evaporating flask is automatically immersed in the heating bath when distillation is started.

Action	Option	Explanation
<i>[On finish: lift out flask]</i>	On/Off	Evaporating flask is automatically lifted out of the heating bath after automatic or manual termination of distillation.
<i>[On finish: stop heating]</i>	On/Off	Heating of heating bath stops after automatic or manual termination of distillation.
<i>[On finish: stop cooling]</i>	On/Off	The Recirculating Chiller F-3xx automatically switches off after automatic or manual termination of distillation.
<i>[On finish: play sound]</i>	On/Off	An audible signal is sounded after automatic or manual termination of distillation.
<i>[Pressure hysteresis]</i>	Entry of pressure	Entry of figure for the maximum allowable difference between the actual vacuum and the specified figure before the vacuum pump switches on again.
<i>[Record data]</i>	On/Off	The following process data is recorded on an SD card: specified setting and actual readings for pressure, rotation, heating bath, recirculating chiller. Actual vapor temperature. Events such as AERATE and defoaming. Difference between inlet and outlet temperature at AutoDest sensor.
<i>[Language]</i>	Choice of language used for control unit display	English, Deutsch, Francais, Italiano, Es-panol, Russian, Portugues, Japanese, Chinese, Indonesian, Korean
<i>[Button tone]</i>	On/Off	A beep sounds when a function button or the navigation control is pressed.
<i>[Seal servicing information]</i>	On/Off	The interface shows information about regular servicing of the system seals. The message appears periodically after every 500 hours of rotation.
<i>[Temperature unit]</i>	Choice of unit for indication of temperatures	°C (Celsius), °F (Fahrenheit) or K (Kelvin)
<i>[Pressure Unit]</i>	Choice of unit for indication of (negative) pressure	hPa (hectopascals), mbar (millibars), torr (= mmHg), mmHg (millimeters of mercury)

Action	Option	Explanation
[Height above sea level]	Enter value	Altitude of location above mean sea level: Max. 4000 m. For determination of max. allowable pressure when working with the solvent library.
[Max. permissible pressure]	Enter value	Max. pressure level present in the system: max. 1300 mbar.
[Max. pump delivery]	Enter value	Max. pump speed in %: 10 –100 %.
[Display brightness]	Enter value	Display illumination level in %: 0 – 100 %.
[UTC offset]	Enter value	Manual entry of time difference between local time and coordinated universal time (UTC).
[Current date]	Enter value	Manual entry of date. Necessary for identification of recorded data.
[Current time]	View	Display of local time. Can be changed by means of the action [UTC offset]. Necessary for identification of recorded data.
[eco mode]	On/Off and entry of figures	See Chapter 6.6 "Activating eco mode", page 83
[Reduced view]	On/Off and reduced display in the "Action" column (only if Rotavapor R-220 Pro connected)	Reduced number of parameters on the home screen to avoid duplication with local display on the Rotavapor R-220 Pro.
[Rotavapor Open Interface]	On/Off	Rotavapor® Open Interface provides the facility for an overall view of the status of various instruments and communication between them. See Chapter 7.9 "Setting up Rotavapor® Open Interface", page 97
[Network]	Entry of details	System name [DHCP]: Yes/No Network addresses for [System IP address], [Gateway], [Subnet mask], [Server IP address], [BUCHI Cloud]: Yes/No
[Delete APP connection]	Confirmation question	All connections settings entered for the instrument are reset.

BUCHI Cloud Services submenu

The submenu [BUCHI Cloud Services] contains functions and views relating to cloud solutions.

Action	Option	Explanation
<i>[System owner]</i>	Info	Shows the details of the registered system owner. The details of the system owner are transferred from the connected app and can be edited there. See <i>"BUCHI Cloud and Monitoring Services Quick Guide"</i>
<i>[eSupport]</i>	Status	Shows the status of an eSupport request. See Chapter 8.4 "eSupport", page 100

submenu Service

The submenu *[Service]* contains settings and calibration functions for connected instruments.

Action	Option	Explanation
<i>[Calibrate AutoDest sensor]</i>	Perform calibration	Calibration sequence between the two condenser sensors. Precondition: the two condenser sensors are at the same temperature. See Chapter 7.7 "Calibrating AutoDest sensor", page 93.
<i>[Pressure offset]</i>	Entry of reference figure for measuring system pressure	The pressure inside the distillation system is measured by a reference sensor. That reading is entered as the reference figure for the system's internal pressure sensor. See Chapter 7.8.1 "Offset calibration", page 95.
<i>[Pressure calibration]</i>	Calibration of pressure sensor and entry of reference pressure	The pressure sensor is calibrated in five stages for the following set pressures: - Approx. 950 mbar (ambient pressure) - 800mbar - 600mbar - 400mbar - 200mbar - 10mbar See Chapter 7.8.2 "Simple calibration", page 96.
<i>[Load factory calibration]</i>	Calibration reset	The current pressure sensor calibration data is overwritten by the factory calibration settings. See Chapter 7.8.3 "Loading factory calibration", page 97.











System Information submenu

The submenu *[System information]* contains details of the currently connected laboratory equipment and information on network connection diagnosis.

3.6.5 Libraries menu

Action	Option	Explanation
[Solvent library]	Select	The solvent library itemizes the commonly used solvents in alphabetical order.
[Own solvent library]	For creating your own solvent library	See Chapter 6.5.2 "Creating your own solvent library", page 82
[Startup info]	View	Shows the home screen.

3.6.6 Symbols on the status bar

Symbol	Status
	Manual distillation
	Distillation using a method
	Drying
	AutoDest distillation
	Distillation running
	The memory card has been inserted.
	Continuous pumping
	The instrument is connected to the BUCHI Cloud.
	Timed distillation
	For checking vacuum seal See Chapter 7.6 "Checking vacuum seal", page 93

3.7 Scope of delivery



NOTE

The scope of delivery depends on the configuration of the purchase order.

Accessories are delivered as per the purchase order, order confirmation, and delivery note.

3.8 Technical data

3.8.1 Interface

Specification	Interface I-300 Pro
Dimensions (W x D x H)	122 x 50 x 221 mm
Interface	

Specification	Interface I-300 Pro
Dimensions (W x D x H)	300 x 85 x 340 mm
Shipping box	
Weight	600 g
Power consumption	10 W
Power supply voltage	30 VDC \pm 5 %
Display	
Protection class	IP21
Approvals	CE / CSA

3.8.2 Junction boxes

	VacuBox	LegacyBox
Dimension (W x D x H)	50 x 57 x 167 mm	50 x 28 x 167 mm
Weight	400 g	200 g
Measurement range	1300 - 0 mbar	
Regulating range	Ambient pressure - 0 mbar	
Measuring accuracy	\pm 2 mbar (after calibration at constant temperature)	
Temperature compensation	0.07 mbar/K	0.07 mbar/K
Vacuum connection	GL14	
Magnetic valve supply	24 V	
Power consumption	8 W	8 W
Power connections / output voltage	30 VDC \pm 5 %	30 VDC \pm 5 %
Hysteresis	Automatic or 1 - 200 mbar	Automatic or 1 - 200 mbar
Protection class	IP 21	IP 21
Approvals	CE / CSA	CE / CSA

3.8.3 Ambient conditions

Max. altitude above sea level	2000 m
Ambient temperature	5 - 40°C
Maximum relative humidity	80% for temperatures up to 31°C decreasing linearly to 50% at 40°C

The laboratory equipment described in this document may only be used in indoor areas.

3.8.4 Materials

Component	Material
Pressure foil	Polyester
Casing	PBT
Vent tube connection	PPS
Pressure sensor	Al ₂ O ₃ 96%

4 Transport and storage

4.1 Transport



NOTICE

Risk of breakage due to incorrect transportation

- ▶ Make sure that all parts of the instrument are safely packed in such a way as to prevent breakage, ideally in the original box.
 - ▶ Avoid sharp movements during transit.
-
- ▶ After transportation, check the instrument for damage.
 - ▶ Damage that has occurred in transit should be reported to the carrier.
 - ▶ Keep packing for future transportation.

4.2 Storage

- ▶ Make sure that the ambient conditions are complied with (see Chapter 3.8 "Technical data", page 26).
- ▶ Wherever possible, store the device in its original packaging.
- ▶ After storage, check the device for damage and replace if necessary.

5 Installation

5.1 Fitting the Interface I-300/I-300 Pro

The Interface I-300/I-300 Pro can be mounted on one of the following BUCHI laboratory devices:

- Rotavapor R-300
- Vacuum Pump V-300
- Rotavapor R-220 Pro

Alternatively, the Interface I-300/I-300 Pro can be mounted separately on a laboratory stand, see Chapter 5.1.4 "Mounting interface unit on laboratory stand (optional accessory)", page 34.

5.1.1 Mounting interface on Rotavapor R-300

The [Interface I-300 Pro] can be mounted and connected up on the vertically adjustable arm of the Rotavapor R-300.

Tools required: Torx keys Tx20 and Tx30

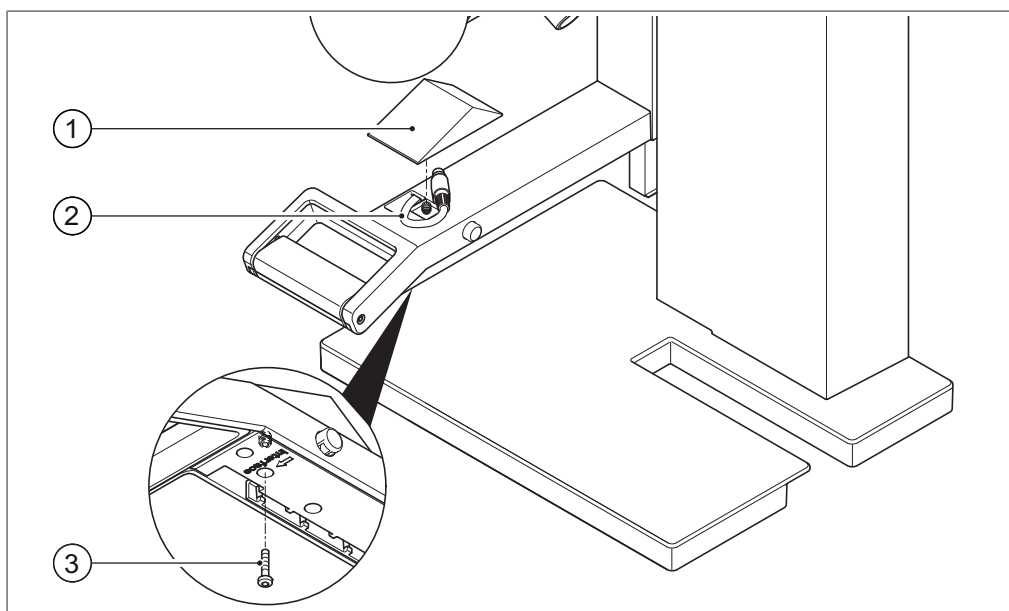


Fig. 7: Handle of Rotavapor R-300

- | | | | |
|---|----------------------|---|------------------------|
| 1 | Cover | 3 | Fixing screw for cover |
| 2 | Communication cables | | |

- Remove the screw on the underside of the vertically adjustable arm (3) using a Torx key and remove the cover (1) from the top of the arm.
- Remove the pre-fitted communication cable (2) from the cover.

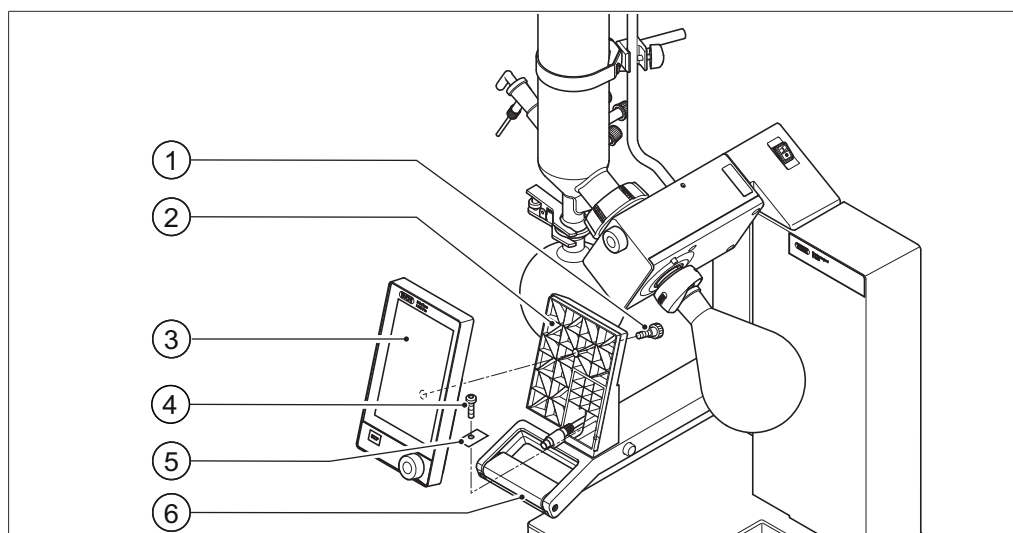


Fig. 8: Fitting the holder and interface unit on the handle

- | | | | |
|---|---------------------------|---|--------------------------|
| 1 | Knurled-head screw | 4 | Fixing screw for holder |
| 2 | Holder for interface unit | 5 | Metal plate |
| 3 | Interface unit | 6 | Rotavapor arm and handle |

- Position the holder (2) for the interface unit on the Rotavapor arm (6). At the same time, feed the communication cable through the bottom hole in the holder.
- Fix the holder to the Rotavapor arm with a screw (4). When doing so, pass the screw through the hole in the metal plate (5).
- Connect the communication cable to the COM port on the rear of the interface unit.
- Position the interface unit (3) on the holder and fix it in place using the knurled-head screw (1) supplied. When doing so, make sure that the communication cable is not trapped.

5.1.2 Fitting interface unit on Vacuum Pump V-300

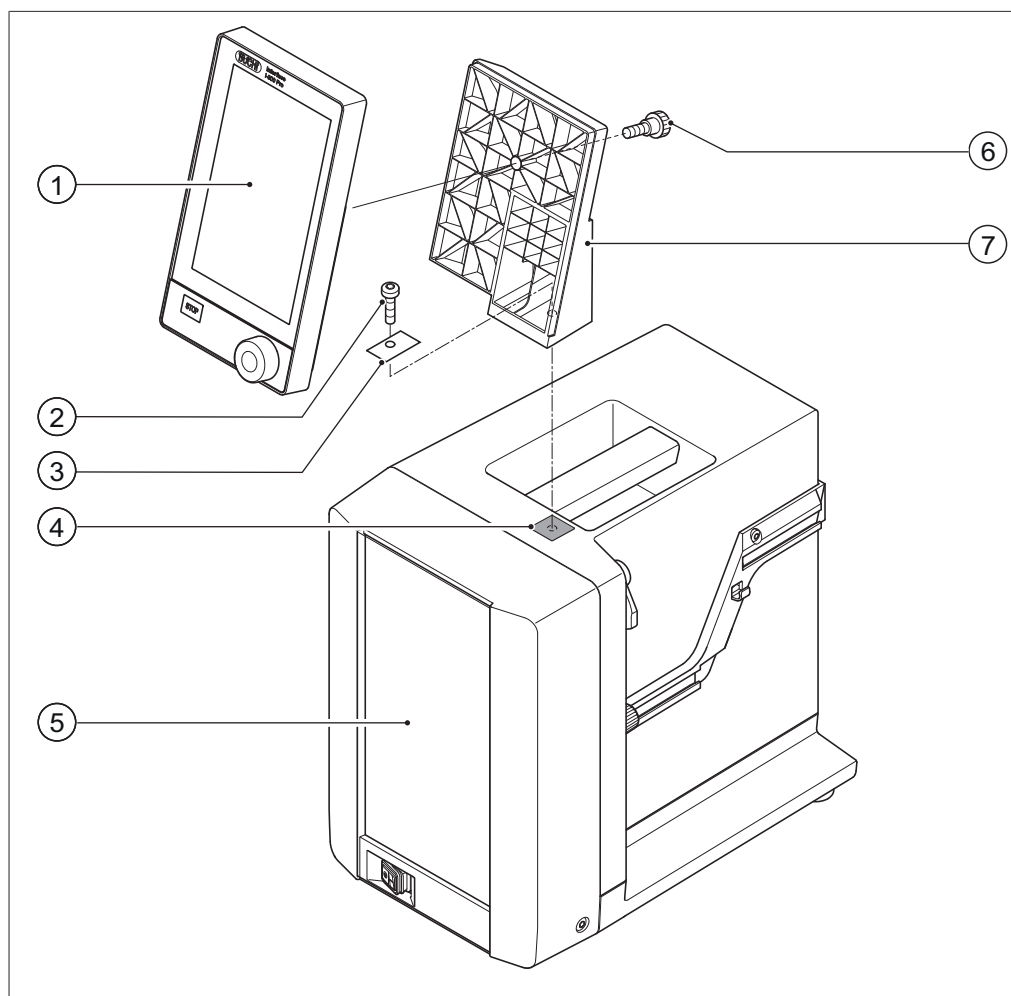


Fig. 9: Fitting interface unit on Vacuum Pump V-300

- | | | | |
|---|-------------------------------|---|--------------------|
| 1 | Interface unit | 5 | Casing front |
| 2 | Fixing screw for holder | 6 | Knurled-head screw |
| 3 | Metal plate | 7 | Holder |
| 4 | Rubber plug and threaded hole | | |

Tools required:

- Torx key Tx30

The *[Interface I-300 Pro]* can be mounted on the top of the Vacuum Pump V-300 using a holder.

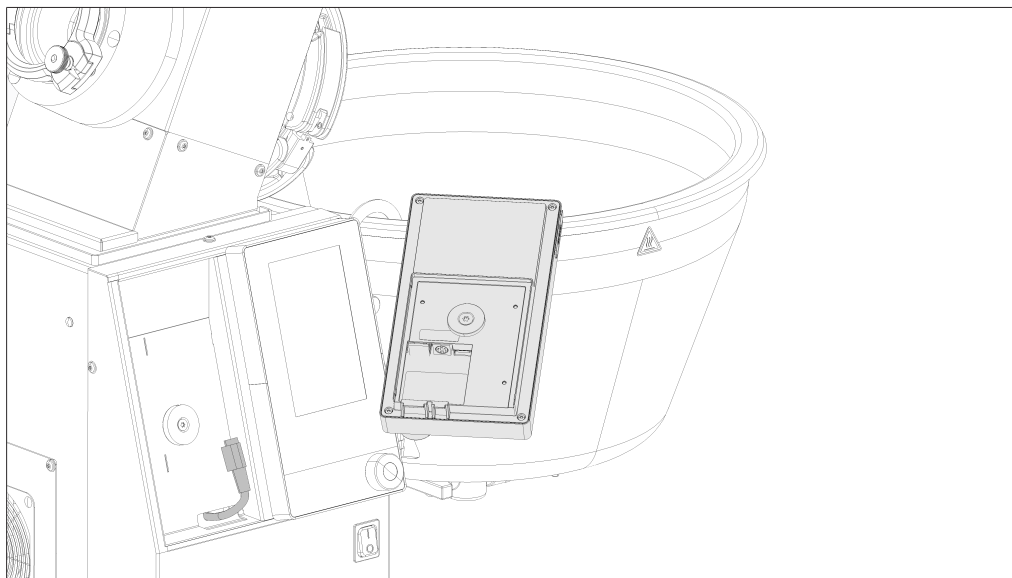
- Remove the rubber plug (4) from the top panel of the vacuum pump. Use a screwdriver if necessary.
 - ⇒ Underneath the rubber plug is a threaded hole for a screw.
- Position the holder (7) over the threaded hole (4) and fix it in place using the screw (2) supplied. When doing so, pass the screw through the hole in the metal plate (3).
- Feed the communication cable through the holder from the rear and connect it to the COM port on the back of the interface unit.

- Position the interface unit (1) on the holder and fix it in place using a knurled-head screw (6) inserted from the back.

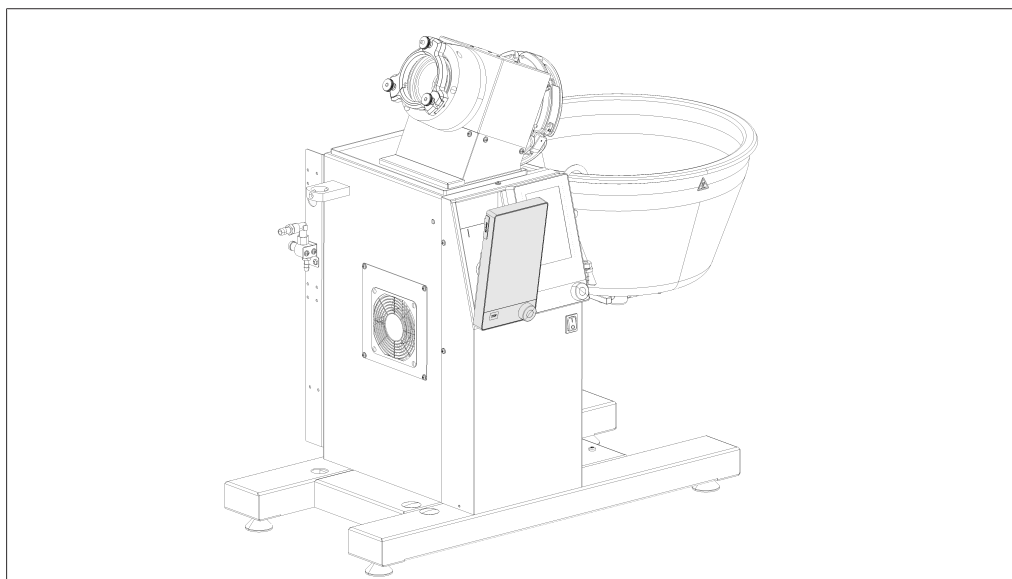
5.1.3 Mounting interface unit on Rotavapor R-220 Pro

The [Interface I-300 Pro] is fitted directly adjacent to the display of the Rotavapor R-220 Pro.

- Remove the cover to the left of the Rotavapor display. (Behind the cover you will see a communication cable with a standard BUCHI communication connection and a LAN cable.)



- Position metal plate on back of Interface I-300 Pro and screw in place.
- Connect Rotavapor communication cable to the interface unit.
- Connect Rotavapor LAN cable to the interface unit. (For a network connection, there must be a connection from the rear panel of the Rotavapor to a network.)



- Insert the interface unit into the recess next to the Rotavapor display. The interface unit is held in place by means of the attached metal plate and a magnet in the Rotavapor casing.

5.1.4 Mounting interface unit on laboratory stand (optional accessory)

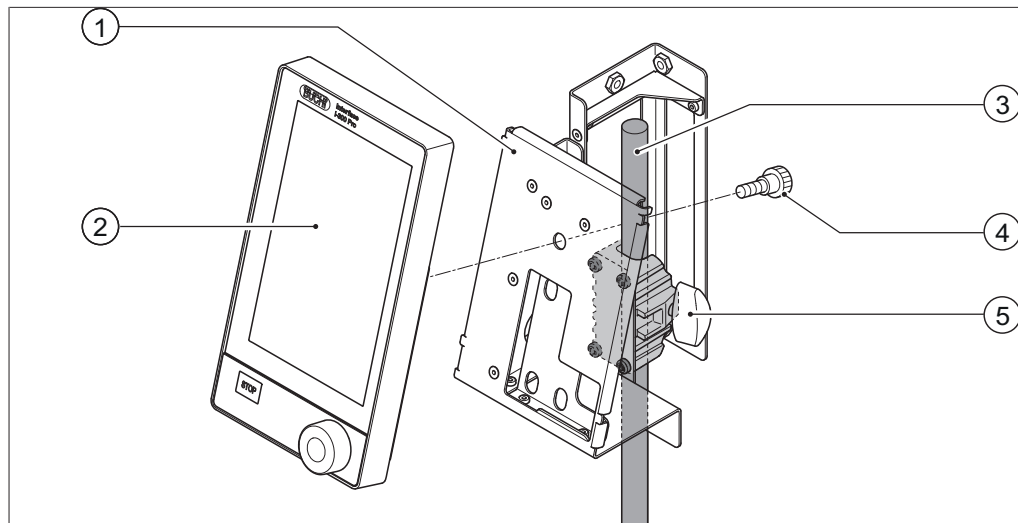


Fig. 10: Mounting interface unit on laboratory stand

- | | |
|-----------------------------|----------------------|
| 1 Holder for interface unit | 4 Knurled-head screw |
| 2 Interface unit | 5 T-screw |
| 3 Laboratory stand | |

The [Interface I-300 Pro] can also be mounted on a laboratory stand using a holder.

- Position the holder (1) on the laboratory stand (3) and fix it in place using the T-screw (5).
- Position the interface unit (2) on the flat face (1) of the holder and fix it in place using a knurled-head screw (4).

5.1.5 Mounting interface unit on a wall bracket (optional accessory)

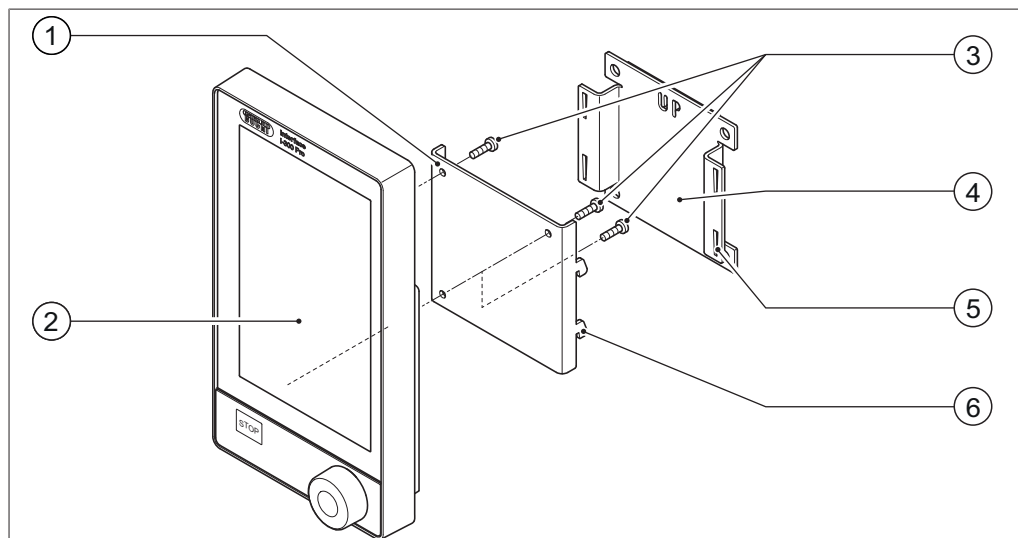


Fig. 11: Two-piece wall bracket for interface unit

- | | |
|------------------------------------|------------------------------|
| 1 Front plate of wall bracket | 4 Rear plate of wall bracket |
| 2 Interface unit | 5 Slot in rear plate |
| 3 Fixing screws for interface unit | 6 Lug on front plate |

The [Interface I-300 Pro] can also be mounted directly onto a plastered or tiled wall or a laboratory fume hood with the aid of a wall bracket.

- ▶ Position the rear plate (4) of the two-part wall bracket on the wall. Note: the word "UP" stamped in the rear plate must be at the top.
- ▶ Option 1: peel protective foil off the back of the plate and press the plate firmly against the wall/glass panel in the desired position so it is held in place by the self-adhesive pad.
- ▶ Option 2: mark the positions of the four holes in the rear plate, drill four holes in the wall in those positions and fix the plate to the wall using screws.
- ▶ Position the interface unit (2) on the outer face of the front plate (1) and fix it in place using three screws (3).
- ▶ Fit the front plate together with interface unit onto the rear plate. As you do so, locate the lugs (6) on the front plate in the slots (5) on the rear plate and then press the front plate down.

5.2 Connecting the Interface I-300/I-300 Pro

The Interface I-300/I-300 Pro can be connected either to an individual BUCHI laboratory device or to a complete distillation system.

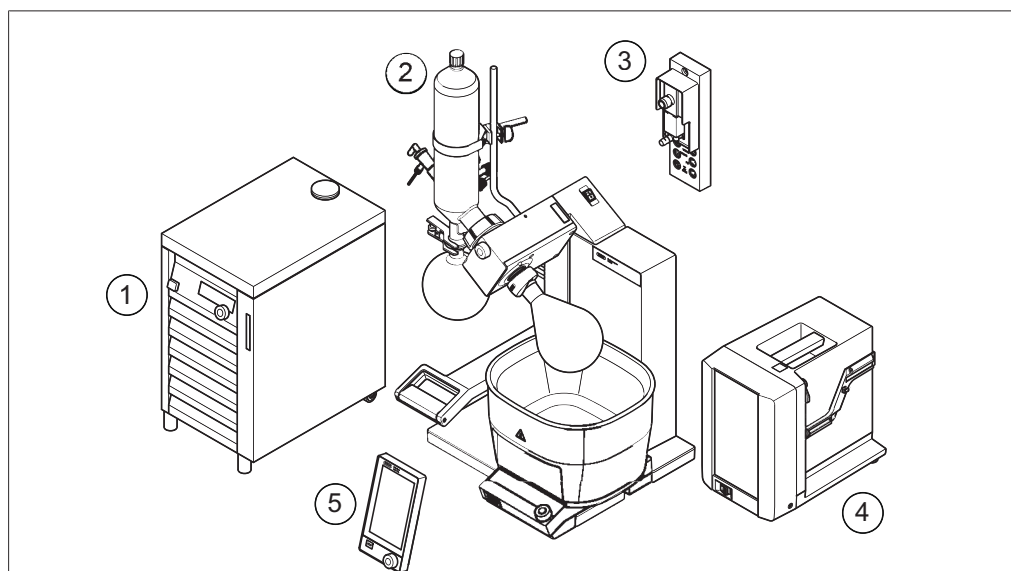


Fig. 12: Interface unit, VacuBox, Rotavapor, vacuum pump and recirculating chiller

- | | |
|---|-----------------------------|
| 1 Recirculating Chiller F-3xx | 4 Vacuum Pump V-300 |
| 2 Rotavapor R-300 with Heating Bath B-300 | 5 Interface I-300/I-300 Pro |
| 3 VacuBox | |

A complete BUCHI distillation system typically consists of the following components:

- Rotavapor R-300 with heating bath
- Vacuum Pump V-300
- Recirculating Chiller F-3xx
- VacuBox
- Interface I-300/I-300 Pro

Data communication between the BUCHI laboratory equipment takes place via the standard BUCHI communication ports. See Chapter 5.2.3 "Overview: Setting up communication connections (COM)", page 37.

The refrigerant circulates around the distillation system through a separate tubing system. See Chapter 5.2.4 "Overview: setting up coolant tubing connections", page 38.

The laboratory equipment to be evacuated is connected to the vacuum pump and the VacuBox by means of vacuum tubing. See Chapter 5.2.5 "Overview: setting up vacuum tubing connections", page 39.

5.2.1 Connecting communication cables to interface unit

The communication connections between the Interface I-300 Pro, the VacuBox and the other BUCHI laboratory equipment are established using the standard BUCHI communication cable (green cable). The corresponding connection sockets are on the rear panels of the devices and are marked "COM" for identification. Details of the precise positions of the connection sockets are provided in the operating instructions for the devices.

- For connection options on the Interface I-300 Pro see Chapter 3.5.2 "Rear view", page 15.
- For connection options on the VacuBox see Chapter 3.5.3 "VacuBox (connections)", page 16.

5.2.2 Establishing LAN connection

Requirements for local network settings

- The following port has to be enabled in the firewall settings on the internet gateway:
 - TCP (HTTPS) traffics through remote port 443
- In order to use the BUCHI Cloud a DNS server must be configured on the instrument.



NOTE

If there is no DNS server available enter the IP address for the BUCHI Cloud connection manually.



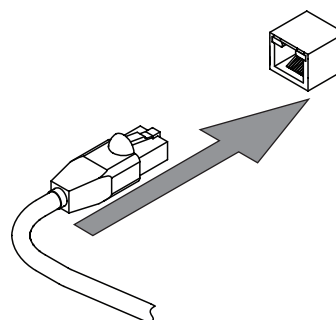
NOTE

If there is no DHCP server available enter the IP address, gateway subnet mask and DNS server manually.


Preparing the instrument for app using

NOTICE! Do not unplug the LAN cable while the unit is connected to the BUCHI Cloud Services.

- ▶ Connect the unit to the LAN (local area network).
- ▶ Restart the unit.



Navigation path


→  → [Settings] → [Network]

-
- ▶ Navigate to [Network].
 - ▶ Activate the function [DHCP].
- ⇒ The unit is now ready.

Enabling BUCHI Cloud access

Enable access to BUCHI Cloud in order to use the BUCHI Monitor App and BUCHI Lyovapor software.

Navigation path

→  → Settings → Network → BUCHI Cloud

-
- ▶ Navigate to the action [BUCHI Cloud] via the navigation path.
 - ▶ Select the option [Yes].
- ⇒ The instrument is connected to the BUCHI Cloud.

5.2.3 Overview: Setting up communication connections (COM)

The laboratory apparatus can be connected in any order.

As well as the interface unit, a VacuBox also has to be connected.

Below is an example of the connections between the laboratory apparatus.

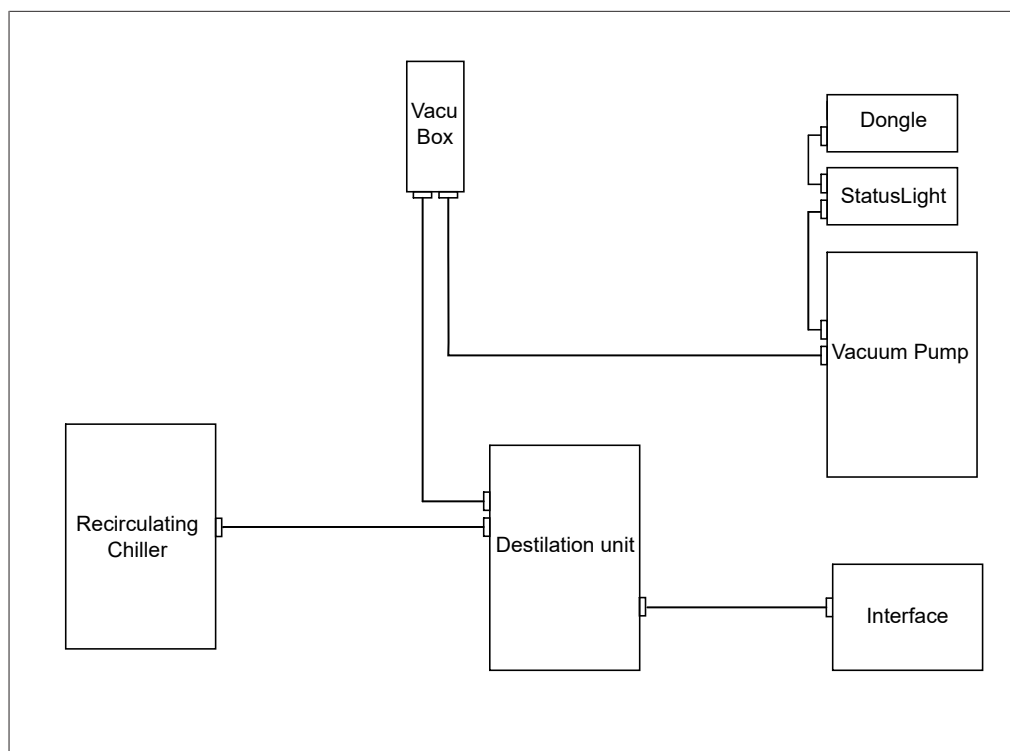


Fig. 13: Schematic diagram of communication connections between the BUCHI laboratory equipment (example)



NOTE

Connections on R-220 Pro:

Information on the connection of communication cables, coolant and vacuum tubing with the Rotavapor R-220 Pro can be found in the operating instructions for the Rotavapor R-220 Pro.

5.2.4 Overview: setting up coolant tubing connections

The tubing connections between the various items of BUCHI laboratory equipment form a sealed circulation system. The starting and finishing point is always the recirculating chiller (F-3xx).

Below is an example of the tubing connections between the laboratory apparatus.

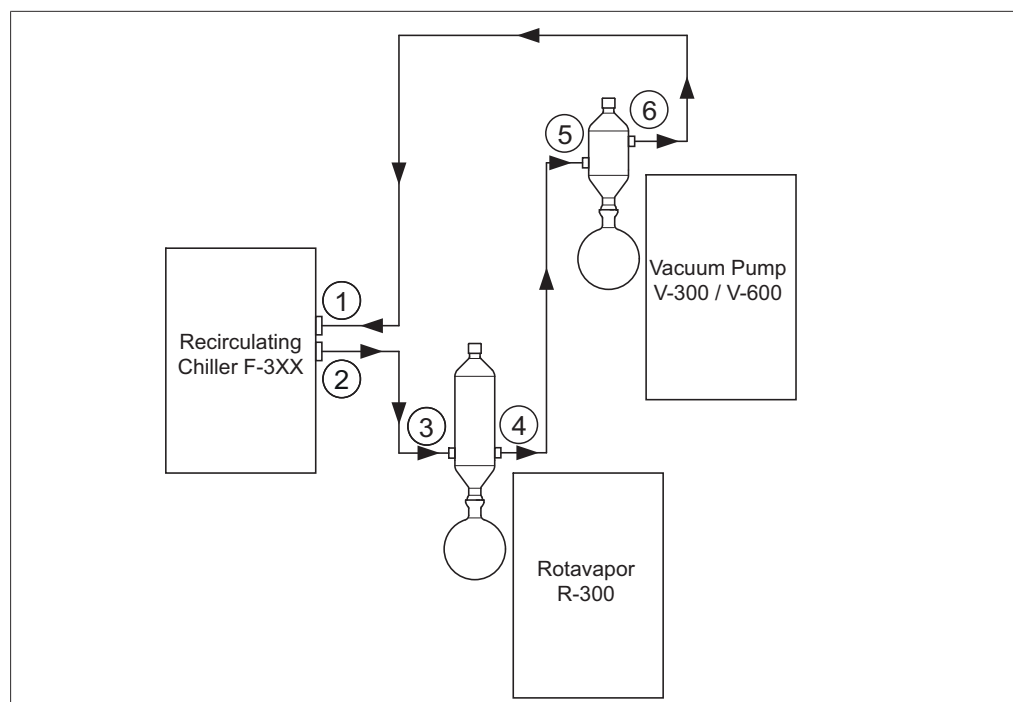


Fig. 14: Coolant tubing connections in a BUCHI distillation system (example)

- | | |
|---|---|
| 1 Inlet on Recirculating Chiller F-3xx | 4 Condenser outlet on Rotavapor R-300 |
| 2 Outlet on Recirculating Chiller F-3xx | 5 Secondary condenser inlet on Vacuum Pump V-300 |
| 3 Condenser inlet on Rotavapor R-300 | 6 Secondary condenser outlet on Vacuum Pump V-300 |

- ▶ Connect a tube between the outlet of the recirculating chiller (2) and the inlet of the condenser on the Rotavapor R-300 (3).
- ▶ Connect a tube between the outlet of the condenser on the Rotavapor R-300 (4) and the inlet of the secondary condenser on the Vacuum Pump V-300 (5).
- ▶ Connect a tube between the outlet of the secondary condenser on the Vacuum Pump V-300 (6) and the inlet of the recirculating chiller (1).



NOTE

Connections on R-220 Pro:

Information on the connection of communication cables, coolant and vacuum tubing with the Rotavapor R-220 Pro can be found in the operating instructions for the Rotavapor R-220 Pro.

5.2.5 Overview: setting up vacuum tubing connections

The vacuum tubing connections in a typical BUCHI distillation system lead from the Rotavapor R-300 via a Woulff bottle to the Vacuum Pump V-300/V-600. The vacuum is measured by means of the VacuBox, which is also connected to the Woulff bottle.

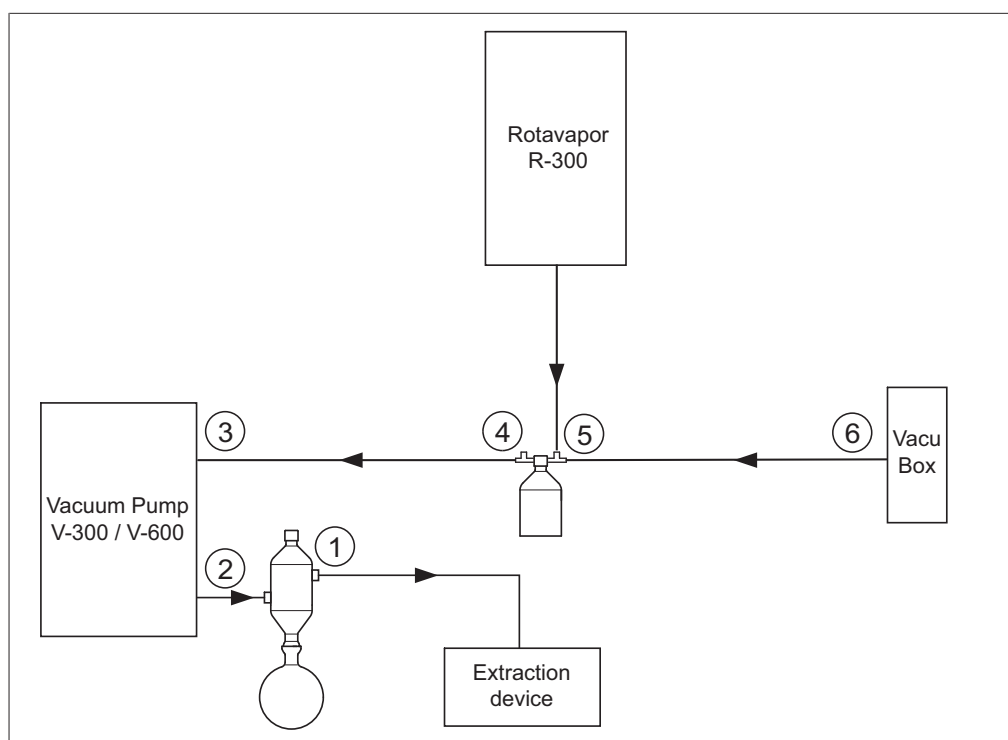


Fig. 15: Coolant tubing connections in a BUCHI distillation system

- | | |
|----------------------------------|-------------------------------|
| 1 Secondary condenser outlet | 4 Woulff bottle outlet (PUMP) |
| 2 Vacuum Pump V-300/V-600 outlet | 5 Woulff bottle inlet (CONTR) |
| 3 Vacuum Pump V-300/V-600 inlet | 6 VacuBox vacuum connection |

- Connect a tube between the Rotavapor R-300 and the top inlet of the Woulff bottle.
- Connect a tube between the outlet of the Woulff bottle marked PUMP (4) and the pump inlet (3).
- Connect the secondary condenser to the pump outlet (2).
- For measuring and controlling the vacuum, connect a tube between the inlet of the Woulff bottle marked CONTR (5) and the VacuBox (6).

The pressure is measured in the VacuBox. The current working pressure can be indicated and controlled by means of the Interface I-300/I-300 Pro.



NOTE

The VacuBox and Woulff bottle can be mounted either on the Rotavapor R-300 or the Vacuum Pump V-300/V-600. What is important is that the VacuBox and Woulff bottle are as close as possible to each other (on the same device) as otherwise there is a vacuum control lag.



NOTE

Connections on R-220 Pro:

Information on the connection of communication cables, coolant and vacuum tubing with the Rotavapor R-220 Pro can be found in the operating instructions for the Rotavapor R-220 Pro.

5.3 Connecting AutoDest sensor to vapor temperature sensor (optional accessory)

The control unit offers programs for performing automatic distillation processes. The programs require the connection of an AutoDest sensor. The AutoDest sensor is connected to the inlet and outlet of the cooling condenser and continuously measures the following temperatures:

- Temperature of the incoming coolant
- Temperature of the outgoing coolant
- Temperature of the vapor exiting the evaporating flask

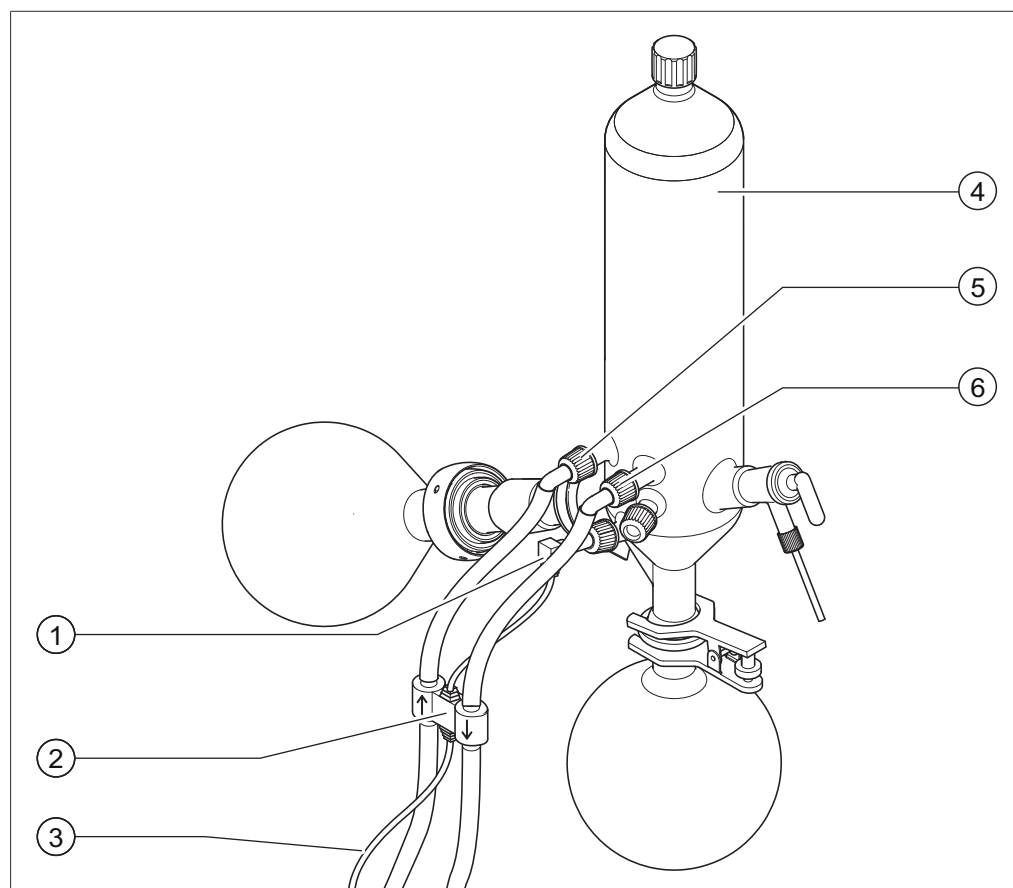


Fig. 16: AutoDest sensor, vapor temperature sensor and cooling condenser with evaporating flask and receiving flask of a Rotavapor R-300

- | | | | |
|---|--|---|-----------------------------|
| 1 | Vapor temperature sensor | 4 | Cooling condenser |
| 2 | AutoDest sensor | 5 | Coolant inlet on condenser |
| 3 | Communication connection between AutoDest sensor and VacuBox | 6 | Coolant outlet on condenser |



NOTE

There are two arrows stamped on the AutoDest sensor indicating the direction of flow for the coolant. The coolant tubing should be connected accordingly.

- ▶ Connect two tubes between the AutoDest sensor (2) and the cooling condenser (4). When doing so pay attention to the direction of flow of the coolant. The arrows on the AutoDest sensor indicate the direction of flow.

**NOTE**

The distance between the AutoDest sensor and the cooling condenser should not be more than 10 cm so as not to falsify the readings for the incoming and outgoing coolant temperatures in the distillation system.

- ▶ Connect a tube between the coolant inlet (5) on the AutoDest sensor and the outlet of the recirculating chiller.
- ▶ Connect a tube between the coolant outlet (6) on the AutoDest sensor and either the inlet of the recirculating chiller or another cooling condenser.
- ▶ Insert a vapor temperature sensor (1) in the cooling condenser and fix it in place.
- ▶ Connect the outgoing cable (3) from the AutoDest sensor to the VacuBox. Use the connection marked "VT/AS" for this lead.

**NOTE**

There should be no air bubbles in the coolant as otherwise correct functioning of the AutoDest sensor is not guaranteed.


**NOTE**

Installing automatic mode sensor on R-220 Pro:

The installation of the automatic mode sensor on the Rotavapor R-220 Pro is described in the operating instructions of the Rotavapor R-220 Pro.

5.4 Connecting foam sensor (optional accessory)

The foam sensor uses infra-red to measure the level of foam formation inside the evaporating flask and initiates one or more short venting bursts to combat the foam.

When de-foaming is active, it is indicated by the symbol  on the status bar of the Interface I-300/I-300 Pro.

The foam sensor passes through the cooling condenser of the R-300 into the evaporating flask. The communication cable from the foam sensor is connected to the VacuBox, see Chapter 3.5.3 "VacuBox (connections)", page 16.

**NOTICE****Risk of heat damage to electronic components**

- ▶ Only use the foam sensor at vapor temperatures up to 85 °C.

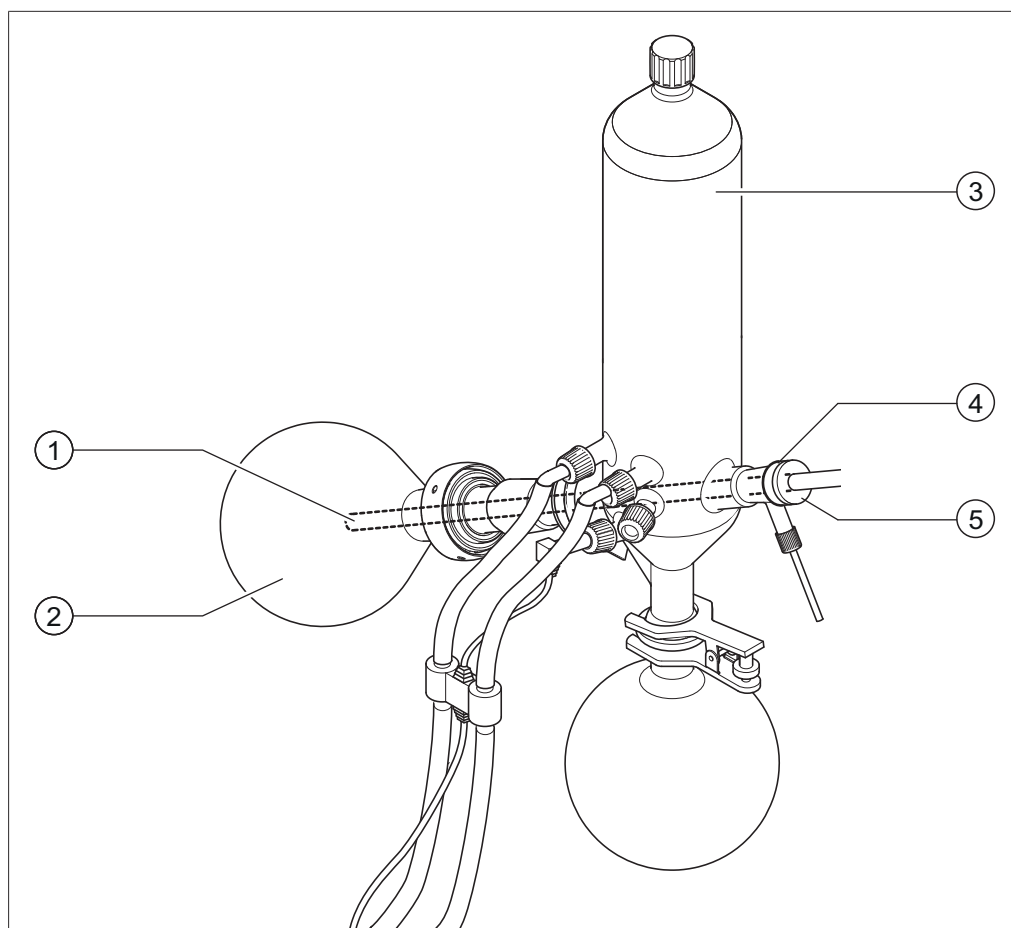


Fig. 17: Foam sensor in the evaporation unit of a Rotavapor R-300

- | | | | |
|---|-------------------|---|------------------------|
| 1 | Foam sensor | 3 | Cooling condenser |
| 2 | Evaporating flask | 4 | Holder for foam sensor |
| | | 5 | Clamp nut |

- Fit the tapered holder (4) over the upper end of the foam sensor (1).
- Feed the foam sensor together with holder through the cooling condenser and the vapor duct into the evaporating flask of the Rotavapor R-300 and fix in place with the clamp nut. When inserting the foam sensor, make sure that the sensor rod passes centrally through the components.

The tip of the foam sensor should be positioned approx. 4 to 5 cm below the ground neck of the evaporating flask.

- Connect the communication cable from the foam sensor to the VacuBox. Plug the connector into the socket marked "FS". For details, see Chapter 3.5.3 "VacuBox (connections)", page 16.

**NOTE**

Immersion angle > 30°:

If the immersion angle of the Rotavapor is to be more than 30°, the small washer supplied must be fitted on the foam sensor in order to prevent the condensate running back into the evaporating flask. The washer is slid over the glass tube of the foam sensor so that it comes to rest in the area below the condensate trap of the cooling condenser. The tip of the washer should point downwards.

**NOTE**

Installing foam sensor on the R-220 Pro:

The installation of the foam sensor on the Rotavapor R-220 Pro is described in the operating instructions of the Rotavapor R-220 Pro.

5.5 Connecting valve unit for external vacuum

The *[Interface I-300 Pro]* can be used together with the VacuBox to control an external vacuum. For precise control of the vacuum, the use of a Woulff bottle is also recommended.

The apparatus can be mounted on a laboratory stand, see Chapter 5.1.4 "Mounting interface unit on laboratory stand (optional accessory)", page 34.

- Connect the vacuum valve to the VacuBox using a communication cable plugged into the connection marked VALVE.
- Connect vacuum tubing between the laboratory apparatus to be evacuated, the VacuBox and the external vacuum unit.
- If a Rotavapor is not connected, connect the VacuBox to the mains adaptor using an adaptor cable and plug the mains adaptor into the external power supply.

**NOTE**

Changing the hysteresis:

To adjust the regulation accuracy, the hysteresis can be altered on the interface unit, see Chapter 3.6.4 "Configuration menu", page 22.

**NOTE**

Connecting VacuBox with R-220 Pro:

If the Interface I-300 Pro and the VacuBox are operated in the Rotavapor R-220 Pro system, the following points should be noted: The external valves must always be connected to the Rotavapor R-220 Pro even if there is an alternative connection on the VacuBox.

5.6 Operating I-300 and I-300 Pro in parallel

**NOTE**

BUCHI Cloud Services are not supported in parallel mode.

If the Rotavapor is to be controlled from outside a fume hood, there is the option of connecting two separate interface units in parallel. In that case, distillation can be controlled from either interface unit. The readings displayed are continuously synchronized. The servicing functions (e.g. leak test) are controlled by the interface unit that is currently being used.

If a mobile connection (see Chapter 5.2.2 "Establishing LAN connection", page 36) is desired when the I-300 and I-300 Pro are operating in parallel, the LAN cable must only be connected to one of the interface units, preferably the I-300 Pro.

- Connect the remote interface unit to the interface unit on the Rotavapor using the standard BUCHI communication port (COM). Use a standard BUCHI communication cable to do so.

6 Operation

6.1 Navigating the menu

The I-300 Pro offers the fundamental option of navigating the menu either by using the function buttons and the navigation control or by means of the touch-screen functionality of the display.

The touch-screen functions can be operated using laboratory gloves. Liquids on the screen do not pose a problem either and do not impair functionality in any way.

6.1.1 Selecting menu items

Selecting menu items on the touch-screen

All menu items can be selected directly on the touch-screen display.

- ▶ To open the main menu and select a menu item from the main menu, simply tap the desired symbol.
- ⇒ The selected menu icon is highlighted in green.
- ▶ To select a menu item from the submenu, tap the desired menu item.

On some submenus, the list of menu items is too long to be shown on the display all at once. In that case, a scroll bar appears on the right.

- ▶ To scroll down to a menu item on a submenu, slowly swipe the screen upwards with your finger.

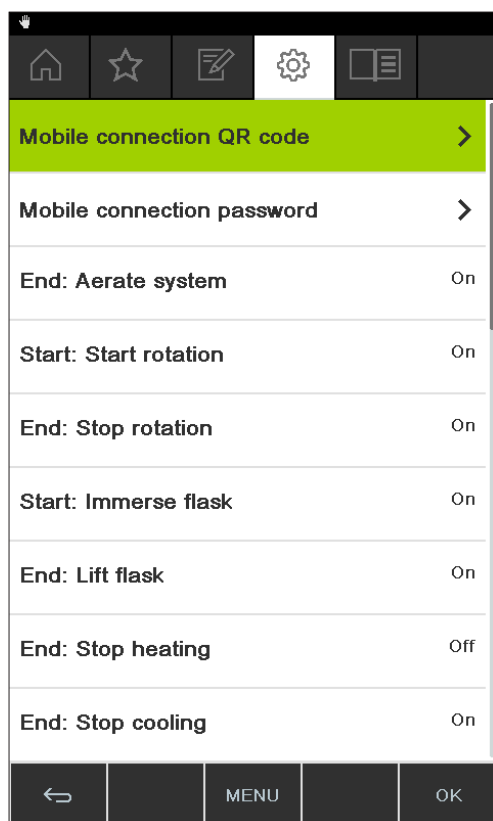


Fig. 18: submenu with large number of items and scroll bar

Selecting menu items using the navigation control and function buttons

As an alternative to tapping the touch-screen display, menu items can also be selected using the navigation control and the function buttons. The home screen is the starting point. Rotating the navigation control selects each symbol in turn. The currently selected menu icon is highlighted in green.

- To open the main menu, press the MENU function button.




Fig. 19: Opening the menu on the Interface I-300 Pro

- To select a menu item from the main menu, turn the navigation control until the desired icon is highlighted in green.
 - Press the navigation control to choose OK and confirm the selection.
- ⇒ The display shows the desired submenu.



Fig. 20: submenu

- To select a menu item from the submenu, turn the navigation control until the desired item is highlighted in green.
 - Press the navigation control to choose OK and confirm the selection.
- ⇒ The display shows the desired submenu on the next menu level down.
- To return to the previous menu level, press the function button .
 - To return to the main menu, press the MENU function button.

6.1.2 Entering parameter settings

The Interface I-300 Pro offers the facility for manually setting various parameters. The parameters are shown on the home screen of the Interface I-300 Pro. The individual parameters are selected by rotating the navigation control or tapping the item directly on the screen. The currently selected parameter is highlighted in green.

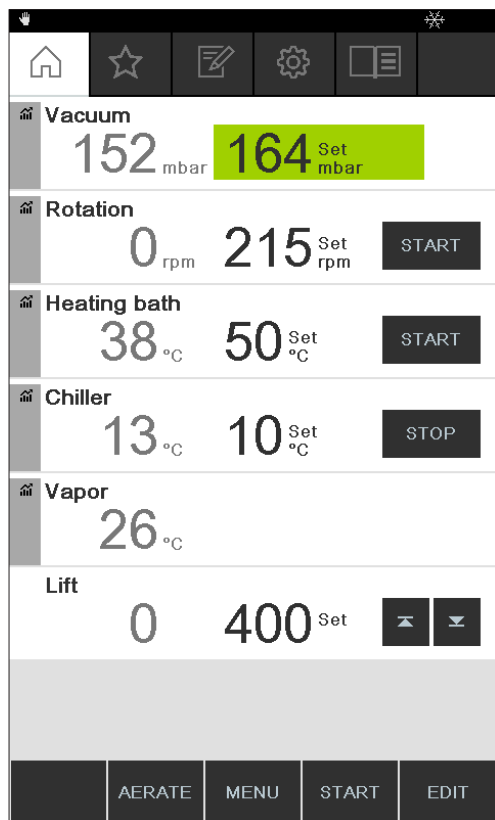


Fig. 21: Entering the settings

- Turn the navigation control to select the desired parameter, then press the navigation control to confirm the selection and choose EDIT. Alternatively, tap the parameter directly on the screen.
- ⇒ The selected figure is shown in inverse type and the word "Set" flashes.

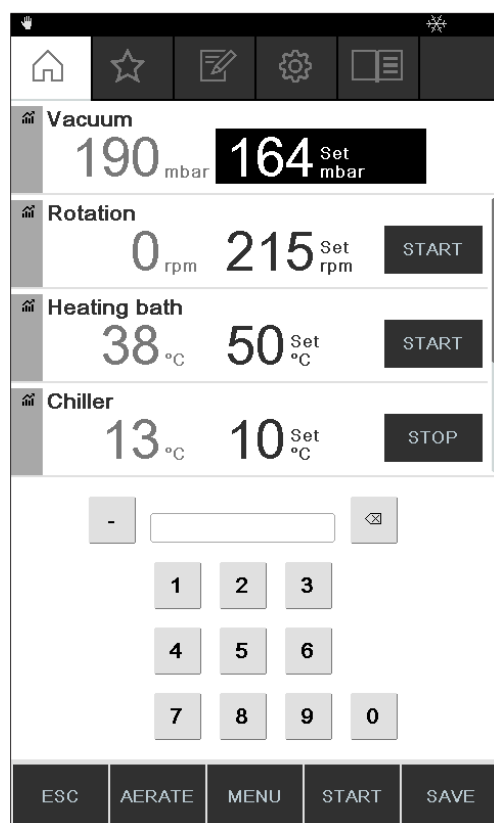


Fig. 22: Changing the setting

- ▶ To increase or decrease the figure, turn the navigation control clockwise or counter-clockwise. Alternatively, enter the figure using the keyboard.
- ▶ To save the new setting, press the navigation control to choose SAVE or tap SAVE directly on the screen.

⇒ The new parameter setting is shown highlighted in green again.

If a reading graph is displayed (see Chapter 6.3 "Displaying reading graphs", page 75), not all parameters can be shown on the screen at once. In that case, a scroll bar appears on the screen.

- ▶ To scroll down to a parameter, turn the navigation control or slowly swipe the screen upwards with your finger.

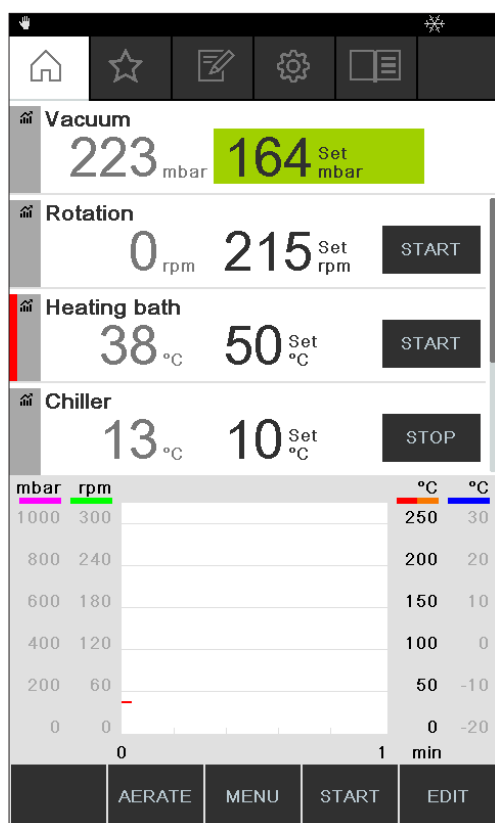


Fig. 23: Scrolling on home screen

6.1.3 Changing settings

The Interface I-300 Pro offers the facility for manually entering various settings.

- Use the navigation control or tap the screen to select the desired setting, see Selecting menu items.
- To edit the setting, press the navigation control to choose EDIT or directly tap EDIT on the screen.
- ⇒ The options for the setting are shown.
- To select an option, turn the navigation control or tap the option directly on the screen. A green bar appears next to the selected option.

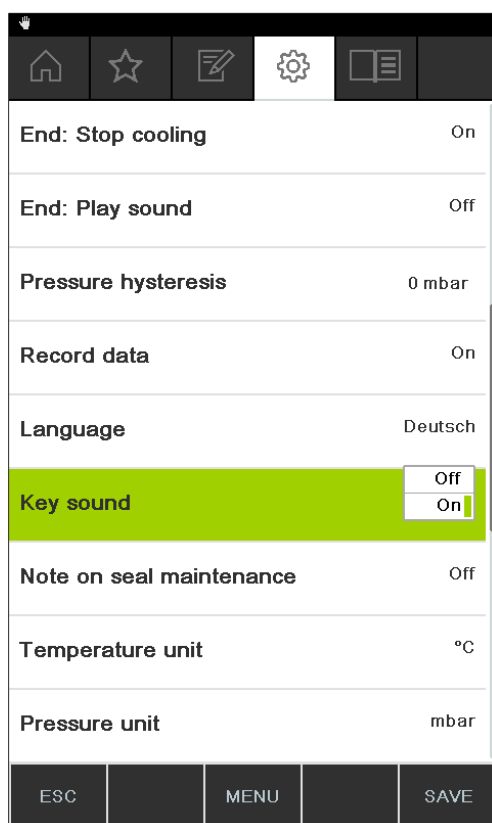


Fig. 24: Options for a setting

- To save the new option for the setting, press the navigation control to choose SAVE or tap SAVE directly on the screen.

6.2 Performing distillation

The Interface I-300 Pro offers the following operating modes for carrying out distillation:

Operating mode

<i>[Manual]</i>	See Chapter 6.2.3 "Executing Manual mode", page 54
<i>[Timer]</i>	See Chapter 6.2.4 "Executing Timer mode", page 58
<i>[Continuous pumping]</i>	See Chapter 6.2.5 "Executing Continuous Pumping mode", page 63
<i>[AutoDest]</i>	See Chapter 6.2.6 "Executing AutoDest mode", page 66
<i>[Drying]</i>	See Chapter 6.2.7 "Executing Drying mode", page 69
<i>[Methods]</i>	See Chapter 6.2.8 "Executing Methods mode", page 70

6.2.1 Overview: typical distillation sequence

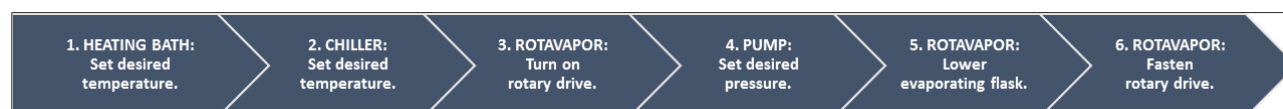
Proper performance of a distillation process typically requires the following steps in the order indicated.



NOTE

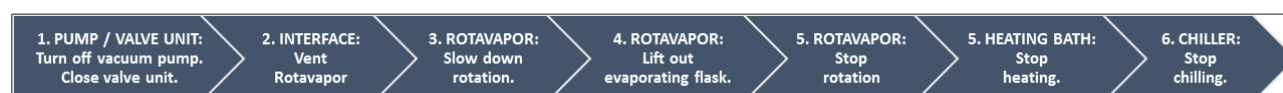
The steps listed below in "Starting distillation" and "Stopping distillation" can also be pre-programmed via the interface unit, see Configuration.


Starting distillation



Step	Component	Action
1	Heating bath	Set the required temperature and start the heating bath.
2	Recirculating chiller	Set the required temperature and start the recirculating chiller.
3	Rotavapor	Start rotation at a slow speed.
4	Vacuum pump	Set the required pressure and start the vacuum pump.
5	Rotavapor	Immerse the evaporating flask in the heating bath.
6	Rotavapor	Increase rotation to the desired speed.

Stopping distillation



Step	Component	Action
1	Vacuum pump/Valve unit	Stop pressure regulation.
2	Interface unit Rotavapor	Vent the system (AERATE). Vent the system (open glass stopcock, open cooling condenser).
3	Rotavapor	Reduce rotation speed.
4	Rotavapor	Lift evaporating flask out of heating bath.
5	Rotavapor	Stop rotation.
6	Heating bath	Stop heating.
7	Interface unit Recirculating chiller	Stop cooling (). Stop cooling.

6.2.2 Basic functions

Venting during distillation

There is the possibility to briefly venting the system while distillation is in progress.

- To briefly vent the system while distillation is in progress, press and hold the AERATE function button until the desired pressure is reached.

⇒ While venting is active, the status bar is shown in yellow on the display.

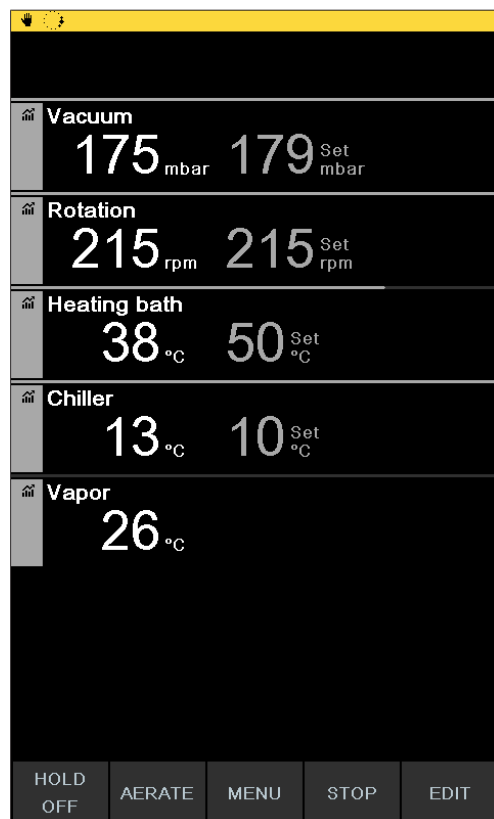


Fig. 25: Home screen during venting

- To evacuate the system to the specified vacuum again after venting, press the function button HOLD OFF.

Venting after completion of distillation

If venting has not been pre-programmed on the interface unit, the system can be fully vented manually after completion of the distillation process.

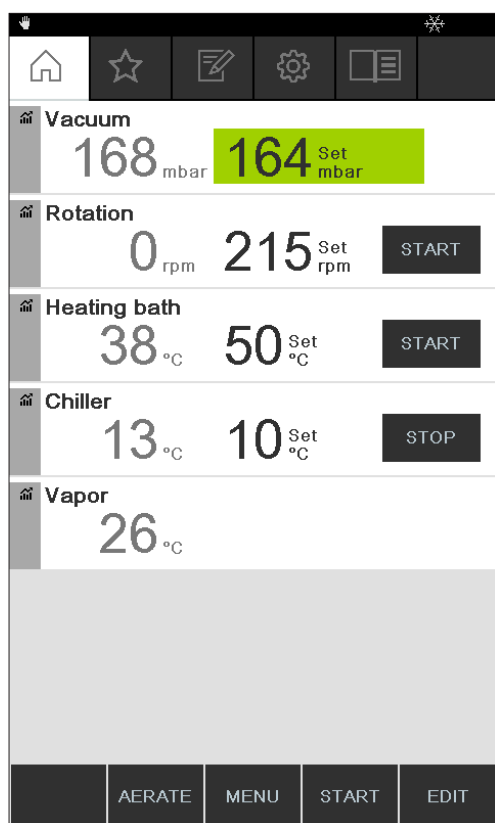



Fig. 26: Home screen after completion of distillation

► After completion of distillation, press the AERATE function button.

⇒ The system is vented until it reaches ambient pressure.

Manually stopping the cooling process

The cooling function continues after completion of a distillation process. If the system has been pre-programmed accordingly, the cooling process stops after 5 minutes. While cooling is active, the status bar shows the symbol . The cooling process can be stopped manually at any time regardless of how the system has been pre-programmed.

Precondition:

☒ After completion of distillation, the system has been fully vented by pressing the AERATE function button.

► To manually stop the cooling process, press the function button .

⇒ The cooling process is stopped and the cooling symbol disappears from the status bar.

Stopping everything

There is the possibility to immediately stopping all apparatus connected to the system while distillation is in progress.

► To stop all apparatus immediately, press the red STOP button (emergency stop).

6.2.3 Executing Manual mode

In *[Manual]* operating mode (manual distillation), the distillation process can be controlled by manually setting the individual process parameters.



CAUTION

Risk of personal injury and property damage from unexpected equipment behavior

- Always carefully check the pre-programmed settings before every distillation process.

Navigation path

→ Operating modes → Manual

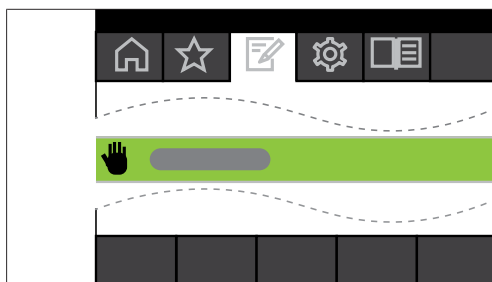


Fig. 27: Selecting the option [Manual] on the *Operating modes* menu

- Navigate to the *Operating modes* menu and select the menu item [Manual], see Chapter 6.1 "Navigating the menu", page 46.
- ⇒ The display shows the home screen with the symbol for manual distillation in the status bar.

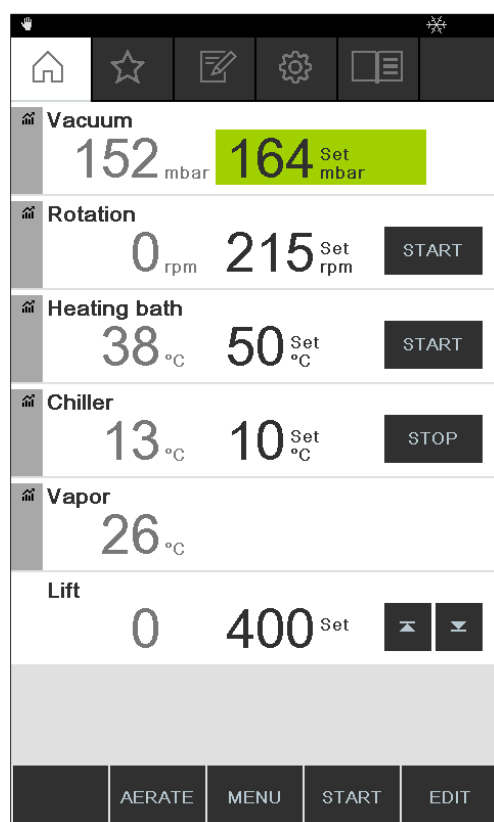


Fig. 28: Home screen showing [Manual] symbol

- Enter the required settings for the process parameters.

In this operating mode, the following parameters and readings are available:

Parameters and readings	Equipment possibly required
<ul style="list-style-type: none"> Specified setting for vacuum Actual reading for current pressure in distillation system 	VacuBox (e.g. with Vacuum Pump V-300/V-600)
<ul style="list-style-type: none"> Actual reading and specified setting for rotation speed (evaporating flask) 	Rotavapor R-300
<ul style="list-style-type: none"> Actual reading and specified setting for heating bath temperature 	Heating Bath B-301/B-305
<ul style="list-style-type: none"> Actual reading and specified setting for cooling temperature 	Recirculating Chiller F-3xx
<ul style="list-style-type: none"> Actual reading for vapor temperature 	AutoDest sensor or vapor temperature sensor
<ul style="list-style-type: none"> Actual reading for lift 	

Starting manual distillation

Precondition:


- ☒ Process parameters have been set.
- Press the function button START.
- ⇒ The display shows the home screen in inverse type.
- ⇒ The status bar shows the symbol  for distillation in progress.



Fig. 29: Distillation process started

- ⇒ The actual readings are shown more brightly in the left-hand column of the display. The right-hand column shows the specified settings.
- To abort the cooling process prematurely, press the function button STOP.

Editing parameters during manual distillation


There is the facility for changing individual parameter settings while distillation is in progress.

Precondition:

- ☒ Distillation process has been started.
- Select the parameter that is to be adjusted while distillation is in progress, see Chapter 6.1 "Navigating the menu", page 46.
- ⇒ The display shows the selected parameter setting highlighted in inverse type.



Fig. 30: Editing parameters while distillation is in progress

- Raise or lower the selected parameter setting.
 - ⇒ While the parameters are being edited, the distillation process continues running in the background (identifiable by the  symbol on the status bar).
 - ⇒ After the parameter setting has been altered, the display shows the home screen in inverse type with the current readings displayed more brightly.

Stopping manual distillation

- To stop the distillation process, press the function button STOP.
 - ⇒ The display shows the home screen with the current readings and specified settings. The status bar shows the cooling symbol, if applicable, together with a timer that is counting down.

6.2.4 Executing Timer mode

In [Timer] mode, a distillation process with a predefined duration is started.



CAUTION

Risk of personal injury and property damage from unexpected equipment behavior

- Always carefully check the pre-programmed settings before every distillation process.

Navigation path

→ Operating modes → Timer

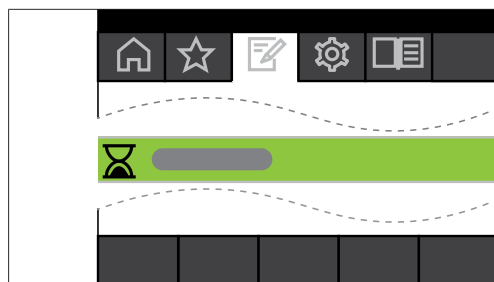


Fig. 31: Selecting the option [Timer] on the *Operating modes* menu

- Navigate to the *Operating modes* menu and select the menu item [Timer], see Chapter 6.1 "Navigating the menu", page 46.
- ⇒ The display shows the home screen with the symbol for timer-controlled distillation in the status bar.

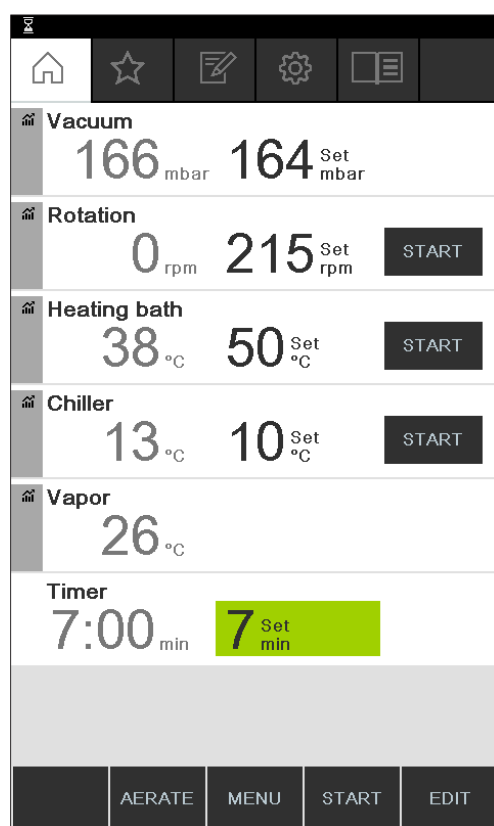


Fig. 32: [Timer] screen showing timer setting highlighted in green

- Set the time period after which distillation is to be automatically stopped.
- Select and edit other parameters as necessary.

In this operating mode, the following parameters and readings are available:

Parameters and readings	Equipment possibly required
<ul style="list-style-type: none"> Specified setting for vacuum Actual reading for current pressure in distillation system 	VacuBox (e.g. with Vacuum Pump V-300/ V-600)
<ul style="list-style-type: none"> Actual reading and specified setting for rotation speed (evaporating flask) 	Rotavapor R-300

Parameters and readings	Equipment possibly required
• Actual reading and specified setting for heating bath temperature	Heating Bath B-301/B-305
• Actual reading and specified setting for cooling temperature	Recirculating Chiller F-3xx
• Actual reading for vapor temperature	AutoDest sensor or vapor temperature sensor
• Actual reading and specified setting for duration of distillation (timer)	
• Actual reading for lift	

Starting timer-controlled distillation

Precondition:

☒ Timer and process parameters have been set.

► Press the function button START.



Fig. 33: "Timer" screen while distillation is in progress

⇒ The display shows the home screen in inverse type with the symbol for timer-controlled distillation in the status bar. The actual readings for the timer and the other parameters are shown in the left-hand column of the display. The right-hand column shows the corresponding specified settings.

Editing timer and parameter settings while distillation is in progress

There is the facility for changing the timer setting and other parameters while timer-controlled distillation is in progress.

Precondition:

- ☒ Timer-controlled distillation process has been started.

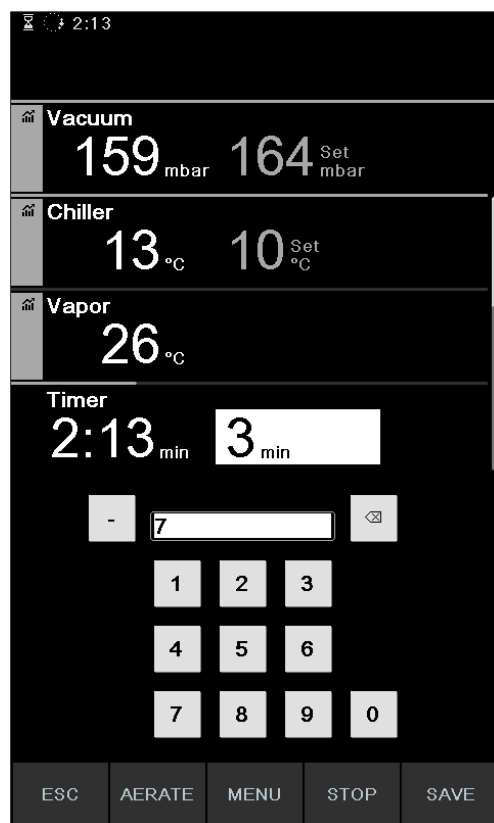


Fig. 34: Editing parameters while distillation is in progress


- Enter the new setting for the timer.
 - ⇒ While the parameters are being edited, the distillation process continues running in the background (identifiable by the  symbol on the status bar).



Fig. 35: Saving edited parameter settings

- ⇒ After the parameters have been altered, the timer jumps to the new setting and starts counting down the time from the beginning. The progress bar in the status bar jumps back to the beginning.
- Edit other parameters as necessary.

Stopping timer-controlled distillation

The timer-controlled distillation process stops automatically when the preset time has elapsed. After completion of timer-controlled distillation, an audible signal consisting of three beeps sounds at regular intervals if the corresponding option has been set on the Configuration menu.



NOTE

The audible signal is canceled as soon as the next user action is registered.

There is the facility for stopping distillation before the set time has elapsed.

- To stop the timer-controlled distillation process prematurely, press the function button STOP.
- ⇒ On completion of timer-controlled distillation, the display shows the following information:

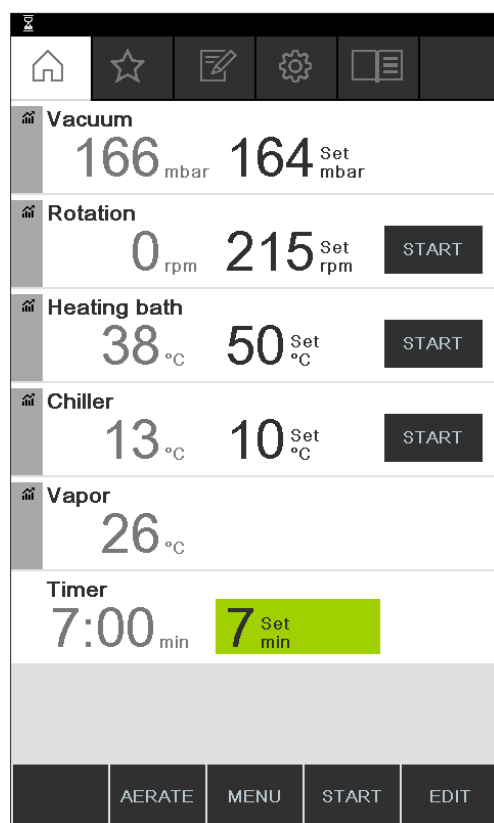


Fig. 36: "Timer" screen after completion of distillation

6.2.5 Executing Continuous Pumping mode

In *[Continuous pumping]* mode, the system continues running in idling mode to dry out the vessels and tubing after a distillation process has finished.

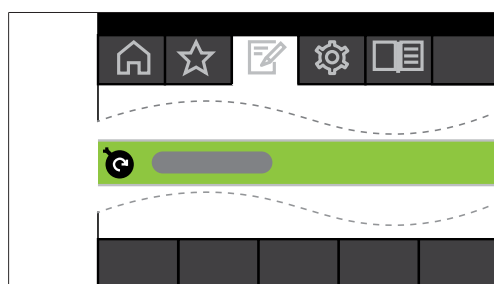


NOTE

In *[Continuous pumping]* mode, the settings for manual or timer-controlled distillation are ignored.

Navigation path

→ Operating modes → Continuous pumping

Fig. 37: Selecting the option *[Continuous pumping]* on the *Operating modes* menu

- Navigate to the *Operating modes* menu and select the menu item *[Continuous pumping]*, see Chapter 6.1 "Navigating the menu", page 46.
- ⇒ The display shows the home screen with the symbol for continuous pumping in the status bar.

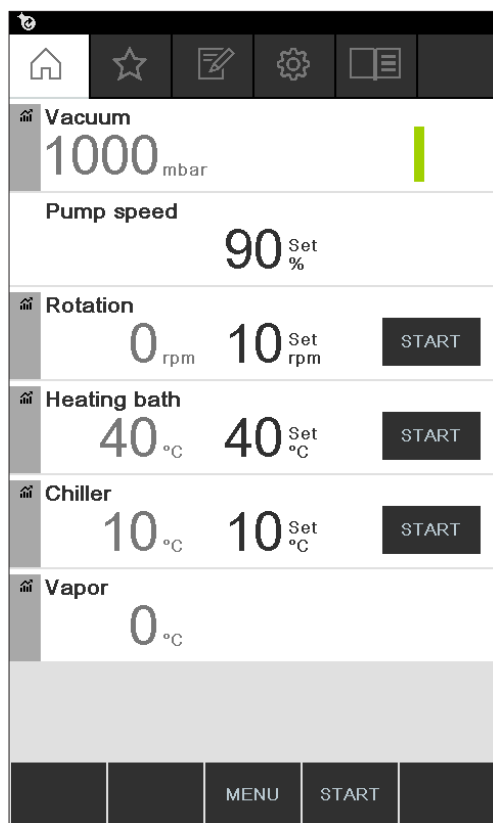


Fig. 38: *Continuous pumping* screen.



NOTE

In [*Continuous pumping*] mode, only the following parameters can be edited: Rotation (rotation speed of the evaporating flask), Heating bath (temperature) and Recirculating chiller (temperature). Those processes cannot be started via the interface unit and instead have to be started manually on the equipment concerned.

- Select and edit the settings for individual process parameters as necessary.
- Press the function button **START** to start the drying process.
- ⇒ The drying process continues running until it is stopped manually.



Fig. 39: Continuous pumping for drying the system started

- ▶ To edit individual process parameters while drying is in progress, select and edit the parameter concerned in each case.
- ▶ To stop the drying process, press the function button **STOP**.

In this operating mode, the following parameters and readings are available:

Parameters and readings	Equipment possibly required
• Actual reading for current pressure in distillation system	VacuBox (e.g. with Vacuum Pump V-300/V-600)
• Specified setting for maximum pump speed	VacuBox (e.g. with Vacuum Pump V-300/V-600)
• Actual reading and specified setting for Rotavapor R-300 rotation speed (evaporating flask)	
• Actual reading and specified setting for Heating Bath B-301/B-305 heating bath temperature	
• Actual reading and specified setting for Recirculating Chiller F-3xx cooling temperature	
• Actual reading for vapor temperature	AutoDest sensor or vapor temperature sensor
• Actual reading for lift	



NOTE

The pressure (vacuum) cannot be altered. The vacuum pump runs at the maximum speed setting.

6.2.6 Executing AutoDest mode

Automatic distillation requires the use of an AutoDest sensor. The AutoDest sensor is connected to the VacuBox (see Chapter 5.3 "Connecting AutoDest sensor to vapor temperature sensor (optional accessory)", page 41) and measures the inlet and outlet temperature of the coolant and the vapor temperature at the cooling condenser. From those three readings, the system calculates the parameter settings required for optimum distillation. During automatic distillation, the temperatures of the heating bath, coolant and vapor are constantly measured and the specified setting for the pressure adjusted accordingly.



⚠ CAUTION

Risk of personal injury and property damage from unexpected equipment behavior

- Always carefully check the pre-programmed settings before every distillation process.

Navigation

→ Operating modes → AutoDest

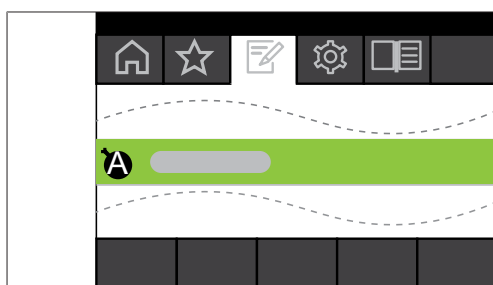


Fig. 40: Selecting the option [AutoDest] on the *Operating modes* menu

Precondition:

- ☒ An AutoDest sensor has been installed and calibrated, see Chapter 7.7 "Calibrating AutoDest sensor", page 93.
- ☒ The system is not leaking. See Chapter 7.2 "Performing a leak test", page 89
- Navigate to the *Operating modes* menu and select the menu item [AutoDest], see Chapter 6.1 "Navigating the menu", page 46.
- ⇒ The display shows the home screen with the symbol for automatic distillation in the status bar.

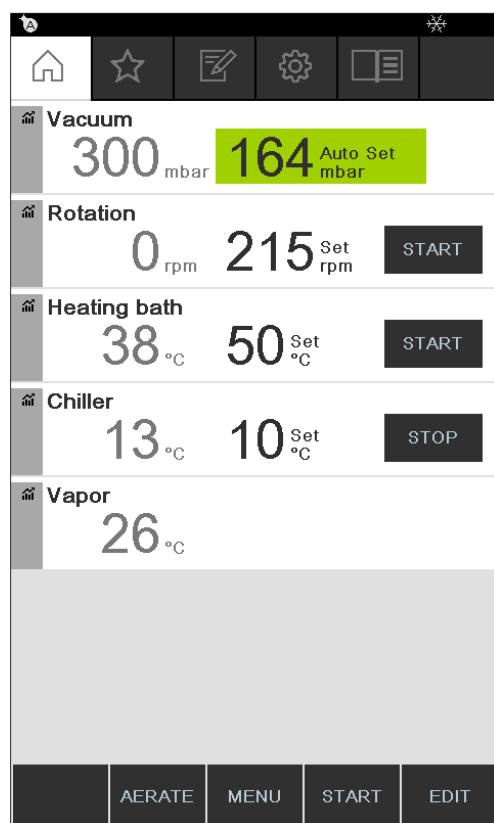


Fig. 41: Home screen showing *[AutoDest]* symbol

- Select and edit the required settings for individual process parameters as necessary. When doing so, make sure that the temperatures for heating bath and coolant are set so as to be 40 °C apart.

In this operating mode, the following parameters and readings are available:

Parameters and readings	Equipment possibly required
<ul style="list-style-type: none"> Specified setting for vacuum Actual reading for current pressure in distillation system 	VacuBox (e.g. with Vacuum Pump V-300/V-600)
<ul style="list-style-type: none"> Actual reading and specified setting for Rotavapor R-300 rotation speed 	
<ul style="list-style-type: none"> Actual reading and specified setting for Heating Bath B-301/B-305 heating bath temperature 	
<ul style="list-style-type: none"> Actual reading and specified setting for Recirculating Chiller F-3xx cooling temperature 	
<ul style="list-style-type: none"> Actual reading for vapor temperature 	AutoDest sensor
<ul style="list-style-type: none"> Actual reading for lift 	

Starting automatic distillation

Precondition:

- ☒ Process parameters have been set.
- Press the function button START.

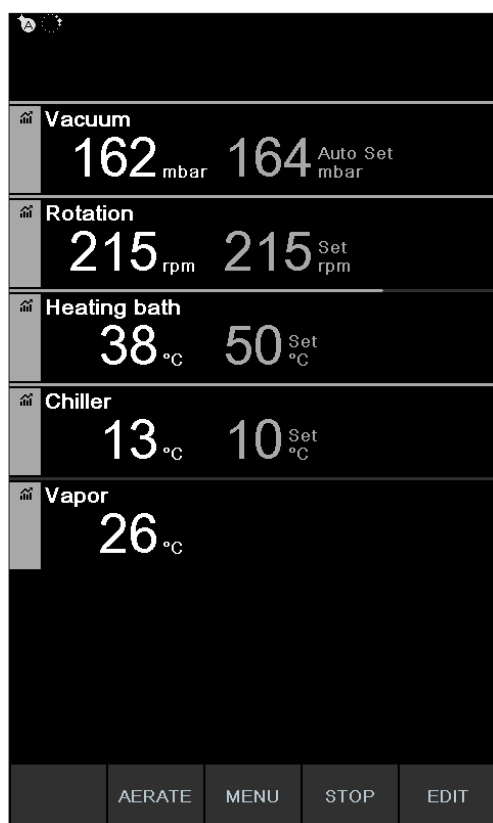



Fig. 42: Information displayed during automatic distillation

- ⇒ The display shows the home screen in inverse type.
- ⇒ The status bar shows the symbol  for distillation in progress.

Editing parameters during automatic distillation

There is the facility for altering the process parameters while automatic distillation is in progress, see Chapter "Editing parameters during manual distillation", page 57.



NOTE

If the specified setting for the pressure is altered manually, the level set automatically is lost and the operating mode switches to manual distillation.



NOTE

The specified settings for the individual parameters may only be altered gradually, otherwise distillation may be aborted.

Stopping automatic distillation



NOTE

The distillation process stops automatically as soon as the solvent in the evaporating flask has evaporated.

There is the option for stopping distillation prematurely.

- To stop the automatic distillation process prematurely, press the function button STOP.

- ⇒ The display shows the home screen with the current readings and specified settings. The status bar shows the cooling symbol, if applicable, together with a timer that is counting down.

6.2.7 Executing Drying mode

In *[Drying]* mode, the remaining product in the evaporating flask is gently dried after completion of a distillation process. For this purpose, the evaporating flask on the Rotavapor R-300 rotates in alternating directions at defined intervals (e.g. 5 seconds).

Navigation path

→ Operating modes → Drying

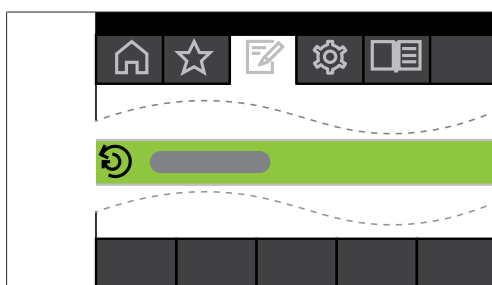


Fig. 43: Selecting the option *[Drying]* on the *Operating modes* menu

- Navigate to the *Operating modes* menu and select the menu item *[Drying]*, see Chapter 6.1 "Navigating the menu", page 46.



Fig. 44: Home screen showing *[Drying]* symbol

- ⇒ The display shows the home screen with the symbol for automatic drying in the status bar.

**NOTE**

Timer and rotation interval: the timer sets the duration of the complete drying process. The rotation interval specifies the period of time that the evaporating flask rotates in each direction.

In this operating mode, the rotation speed is limited to 150 rpm.

- ▶ Set the desired rotation interval for the evaporating flask by means of the process parameter *[Rotation interval]*.
 - ▶ Set the desired length of the drying process by means of the process parameter *[Timer]*.
 - ▶ To start the process for drying the product, press the function button **START**.
- ⇒ The process stops automatically when the preset time has elapsed.

In this operating mode, the following parameters and readings are available:

Parameters and readings	Equipment possibly required
<ul style="list-style-type: none"> Specified setting for vacuum Actual reading for current pressure in distillation system 	VacuBox (e.g. with Vacuum Pump V-300/V-600)
<ul style="list-style-type: none"> Actual reading and specified setting for rotation speed (evaporating flask) Specified setting for rotation interval 	Rotavapor R-300
<ul style="list-style-type: none"> Actual reading and specified setting for heating bath temperature 	Heating Bath B-301/B-305
<ul style="list-style-type: none"> Actual reading and specified setting for cooling temperature 	Recirculating Chiller F-3xx
<ul style="list-style-type: none"> Actual reading for vapor temperature 	AutoDest sensor or vapor temperature sensor
<ul style="list-style-type: none"> Actual reading and specified setting for duration of drying process (timer) 	Rotavapor R-300 "Drying" mode is not available with R-220 Pro.
<ul style="list-style-type: none"> Actual reading for lift 	Rotavapor R-300 Display of lift position is not available for Rotavapor R-220 Pro.

6.2.8 Executing Methods mode

The interface unit provides the facility for programming a sequence of up to 12 steps with defined times and parameters. Up to 15 methods can be created. In Methods operating mode, automatic distillation is not possible.

The following steps can be programmed:

Step	Possible settings
Gradient	<p>In this mode, the following process parameters can be defined:</p> <ul style="list-style-type: none"> • Initial vacuum • Terminal vacuum • Timer • Rotation • Heating bath • Recirculating Chiller • On start: immerse flask • On finish: lift out flask • On finish: Aerate system <p>The initial and terminal vacuum settings can be identical, e.g. to prevent foam formation with natural products. Alternatively, the foam sensor can be used.</p>
Paused	<p>A message can be selected that is to be displayed when the previous step is stopped:</p> <ul style="list-style-type: none"> • Remove the receiving flask • Remove the evaporating flask • Clean condenser • Fit bath cover • Clean system • Fit receiving flask • Fit dry receiving flask • Replenish solvent • Transfer contents to drying flask • Fit dry evaporating flask <p>The subsequent step has to be started manually.</p>
Drying (only with Rotavapor R-300)	<ul style="list-style-type: none"> • Vacuum • Rotation • Rotation interval • Heating bath • Recirculating Chiller • Timer • On start: immerse flask • On finish: lift out flask • On finish: Aerate system

Step	Possible settings
AutoDest	<ul style="list-style-type: none"> • Rotation • Heating bath • Recirculating Chiller • On finish: lift out flask • On finish: Aerate system

Example

- Step 1: **Gradient.** 300 mbar.
- Step 2: **Pause.** Message "Fit dry receiving flask".
- Step 3: **Drying.** 150 rpm, 5 minutes.

Creating a method

Navigation path

→ Operating modes → Methods

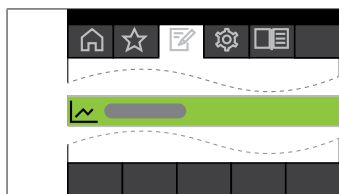


Fig. 45: Selecting the option [Methods] on the *Operating modes* menu

- Navigate to the *Operating modes* menu and select the menu item [Methods], see Chapter 6.1 "Navigating the menu", page 46.



Fig. 46: Creating a new method

- To create a new method, press **NEW**.

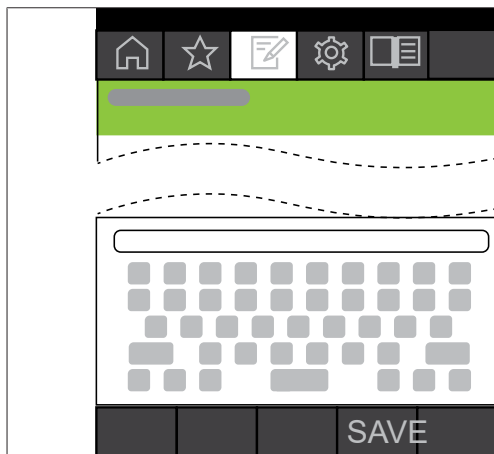
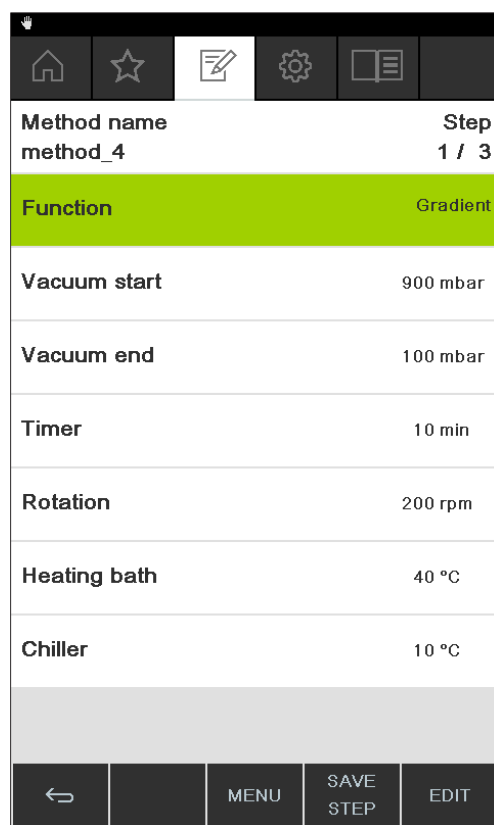


Fig. 47: Entering a method name

- ▶ To give the method a name, select the menu item *[Method name]*.
- ▶ Use the keyboard to enter a name for the method and press **SAVE** to save it.

Defining the method

- ▶ Select menu item **INSERT ABOVE** or **INSERT BELOW**.
- ⇒ The step is shown on the display.



Function	Gradient
Vacuum start	900 mbar
Vacuum end	100 mbar
Timer	10 min
Rotation	200 rpm
Heating bath	40 °C
Chiller	10 °C

Fig. 48: Assigning a function and entering settings

- ▶ Select the menu item *[Step...]*
 - ▶ Press **EDIT**
 - ▶ Select the menu item *[Function]* to assign a function.
 - ▶ Save the assigned function by pressing **SAVE**.
- ⇒ The possible settings for the function concerned appear.
- ▶ Enter the desired settings.
 - ▶ Press **SAVE STEP** to save the edited step.
 - ▶ Define all the other steps as described above and then save the method by choosing **SAVE METHOD**.



NOTE

Any of the settings for a method can be edited at any time, e.g. number of steps, assigned functions, etc.



NOTE

Drying not available with R-220 Pro:

The option "Drying" is not available if the Interface I-300 Pro is operated with the Rotavapor R-220 Pro.

Starting a method

Navigation path

→ Operating modes → Methods

Precondition:

☒ A method has been created.

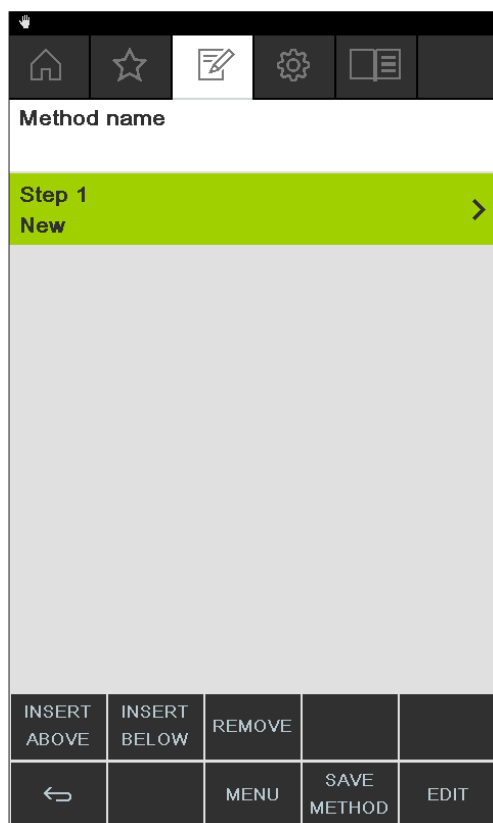


Fig. 49: Selecting a method



NOTE

Graph display of specified settings:

When the method is created and selected, the graph progression shows all specified settings of the programmed parameters. The specified settings are displayed across all programmed steps.

- Select a method and press START to start the distillation process immediately.

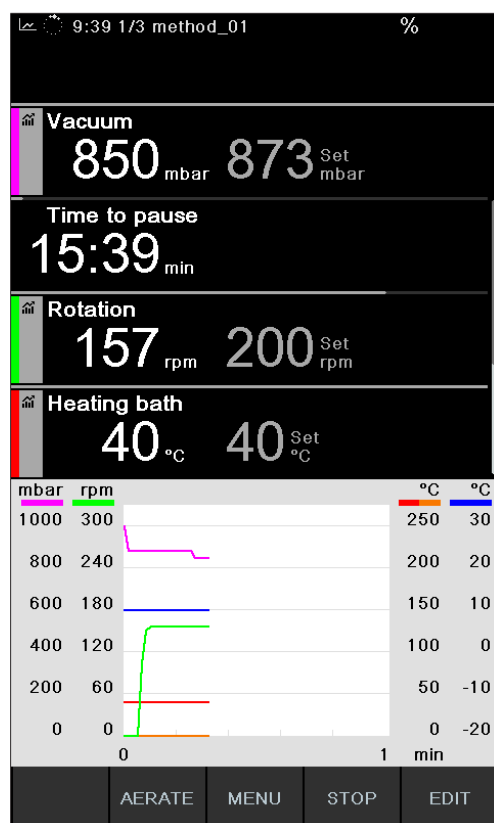



Fig. 50: Display while method is running

⇒ The display shows the home screen in inverse type.

⇒ The status bar shows the symbol  for distillation in progress and the symbol for "Methods".



NOTE

The status bar also indicates which step of the distillation process is currently in progress.



NOTE

Display of remaining time:
while a method is in progress, the display shows the remaining time until the next user intervention.

6.3 Displaying reading graphs

The Interface I-300 Pro offers the facility for displaying graphs of process data readings while distillation is in progress. You can individually select which process parameters are to be shown as graphs.

The following readings can be shown as graphs:

- Actual vacuum
- Actual rotation speed
- Actual heating bath temperature
- Actual recirculating chiller temperature
- Actual vapor temperature

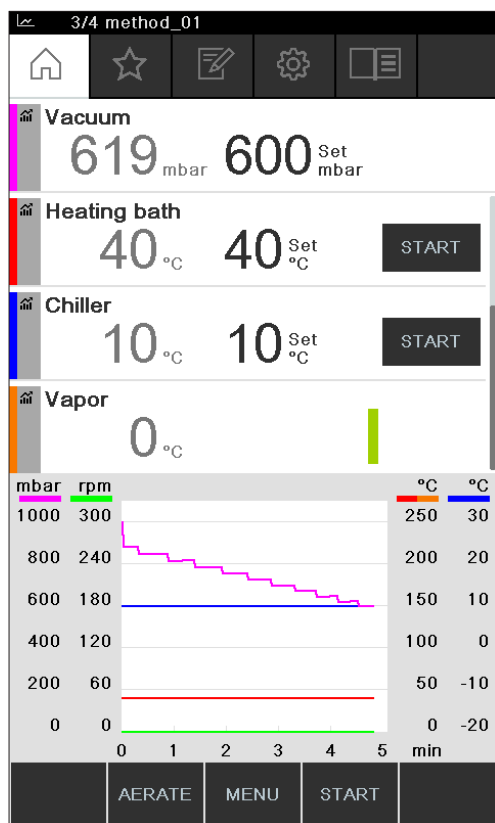


Fig. 51: Activating a graph

Precondition:

☒ The home screen is displayed.

- To display the reading graph for a process parameter, tap the gray icon on the left next to the parameter concerned (in this example, vacuum).
 - ⇒ The icon changes color and the graph display appears.
 - ⇒ While distillation is in progress, the graph of each selected parameter is shown in the color matching the parameter concerned.

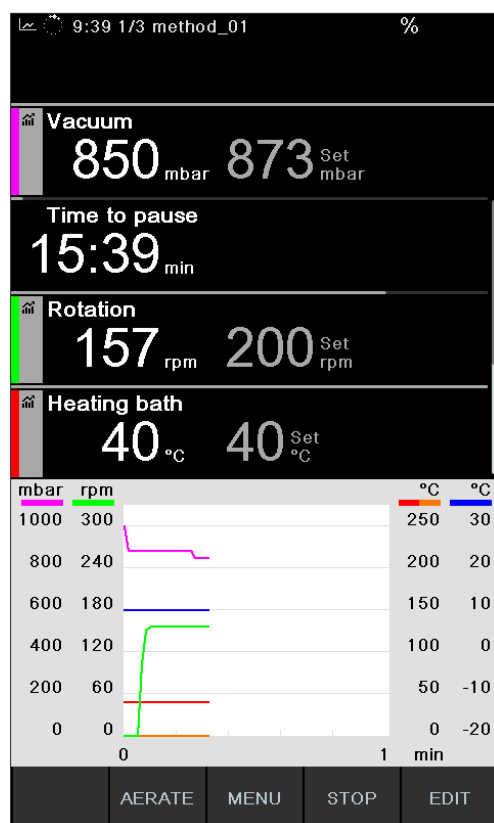


Fig. 52: Parameter reading graph during distillation



NOTE

The graphs can also be displayed during and after a distillation process. As soon as a new distillation process is started, the data from the previous process is lost.

6.4 Recording process data

The Interface I-300 Pro offers the facility for saving process data from a distillation process to an SD card.

The following process data is recorded:

- Actual and specified pressure
- Actual and specified rotation speed
- Actual and specified heating bath temperature
- Actual and specified recirculating chiller temperature
- Actual vapor temperature
- Events such as defoaming and AERATE
- Difference between inlet and outlet temperature at AutoDest sensor

The data is saved as a TXT file in CSV format. Recording starts every time a distillation process is started if the option has been set accordingly in the settings. The data records are identified by date and time (see Chapter 3.6.4 "Configuration menu", page 22). Management and deletion of the recorded data is the responsibility of the user.

```

Time s,Pressure actual mbar,Pressure set mbar,Bath actual °C,Bath set °C,
Chiller actual °C,Chiller set °C,Rotation rpm,Vapor °C,Hold,AutoDest delta °C,
Foam present,Foam control
1, 960.4, 100.0,*,*, 15.9, 10.0,00, 0.0,0,0,0,0
2, 960.4, 100.0,*,*, 15.9, 10.0,17, 0.0,0,0,0,0
3, 960.4, 100.0,*,*, 15.9, 10.0,22, 0.0,0,0,0,0
4, 953.8, 100.0,*,*, 15.9, 10.0,23, 0.0,0,0,0,0
5, 920.5, 100.0,*,*, 15.9, 10.0,24, 0.0,0,0,0,0
6, 861.5, 100.0,*,*, 15.9, 10.0,24, 0.0,0,0,0,0
7, 789.7, 100.0,*,*, 15.9, 10.0,24, 0.0,0,0,0,0
8, 711.2, 100.0,*,*, 15.9, 10.0,23, 0.0,0,0,0,0
9, 635.9, 100.0,*,*, 15.9, 10.0,19, 0.0,0,0,0,0

```

Fig. 53: Example of a TXT file

**NOTE**

The process data may only be recorded on the genuine BUCHI SD card.

6.4.1 Inserting an SD card

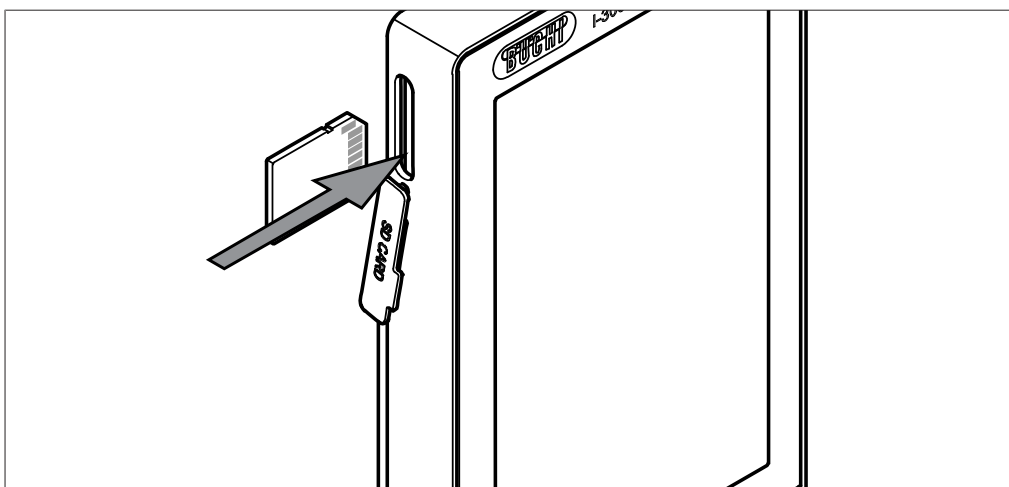



Fig. 54: Inserting SD card

1 Slot

2 BUCHI SD card



- The BUCHI SD card is inserted in the slot in the interface unit as shown. When doing so, make sure that the bevelled corner of the SD card is at the top right.
- ⇒ The display shows the symbol  for SD card inserted on the status bar.

6.4.2 Activating recording

Navigation path

→ Configuration → Settings → Record data

Precondition:

- ☑ An SD card has been inserted and the status bar on the display shows the symbol  for SD card inserted.
- ▶ Navigate to the "Settings" screen and select the menu item "Record data", see Chapter 6.1 "Navigating the menu", page 46.
- ▶ Select the option "On".
- ⇒ When a distillation process is started, the SD card inserted symbol changes to the symbol  for recording process data.

6.5 Solvent library

The [Interface I-300 Pro] has an internal solvent library. Stored in that library are the most common solvents together with an algorithm in each case. Based on the chemical properties of the solvent, the algorithm calculates and dynamically sets the ideal vacuum according to the current readings for heating bath and coolant temperature. That means that the distillation process can be started immediately even if the ideal heating bath and coolant temperatures have not yet been reached.

6.5.1 Using the solvent library

A distillation process can be started directly from the solvent library. Alternatively, the process parameters can be copied from a specific solvent and manually edited before starting the distillation process.

Navigation path

→ Libraries → Solvent library



Fig. 55: Selecting [Solvent library] on the *Libraries* menu

- ▶ Navigate to the *Libraries* menu and select the menu item [Solvent library], see Chapter 6.1 "Navigating the menu", page 46.
- ⇒ The display shows the Solvent library submenu.

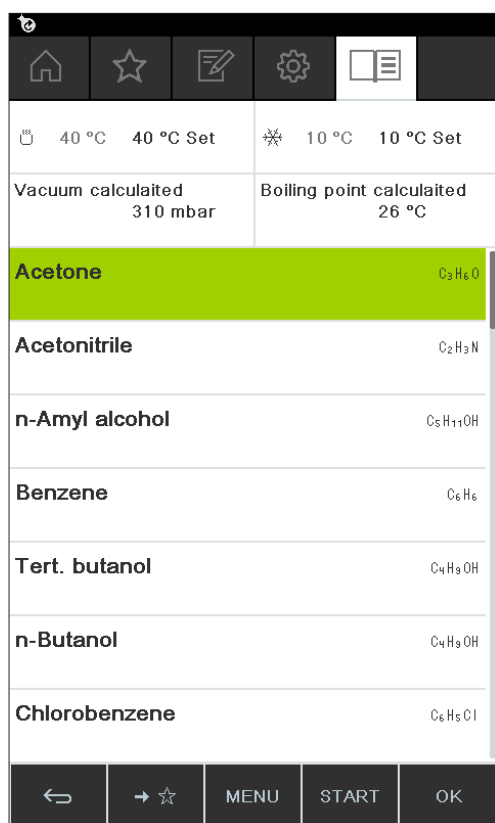


Fig. 56: Selecting *[Acetone]* from the submenu *[Solvent library]*

- Select the desired solvent (e.g. acetone).



NOTE

When the heating bath and the recirculating chiller are connected, the actual figures are automatically applied. If equipment of a different make is connected, the set temperatures on the devices concerned have to be entered as specified settings on the interface.



NOTE

Display of calculated values for solvent:

The calculated values for a solvent are based on the chemical properties of the chosen solvent and the settings entered or readings communicated from the heating bath and recirculating chiller.

- Enter the specified settings for heating bath and coolant temperature if necessary.



Fig. 57: Selecting "Set" temperature for heating bath when using equipment of a different make

- To start a distillation process directly from the solvent library, press the function button **START**.
 - ⇒ The distillation process is started directly.
- To apply the settings for the selected solvent and return to the interface unit home screen, press **OK**. On the home screen, the settings for the individual process parameters can be edited.

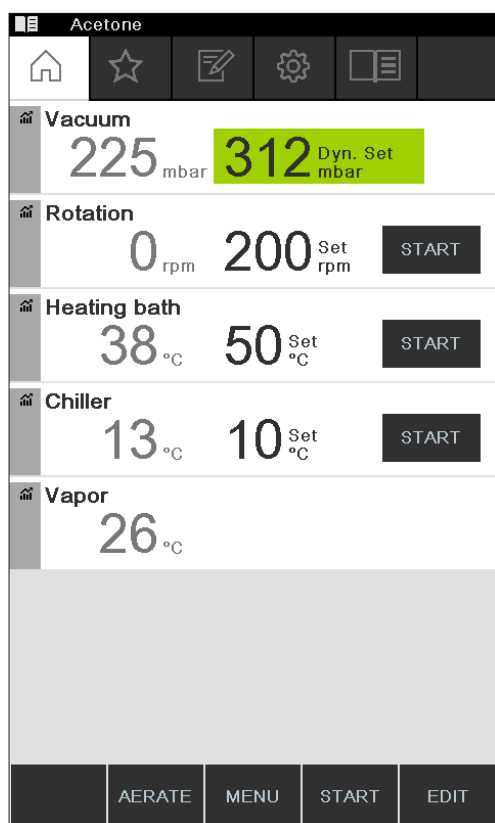


Fig. 58: Editing the specified settings for the selected solvent on the home screen



NOTE

The temperatures for heating bath and coolant should be set so as to be 40 °C apart.

6.5.2 Creating your own solvent library

You can also create your own solvent library in which you can enter details of up to 60 of your own solvents.

Navigation

→ Tools → Own solvent library

- ▶ Navigate to the "Tools" screen and select the menu item "Own solvent library", see Chapter 6.1 "Navigating the menu", page 46.
- ▶ Press NEW to create a new solvent.
- ⇒ The following settings appear:

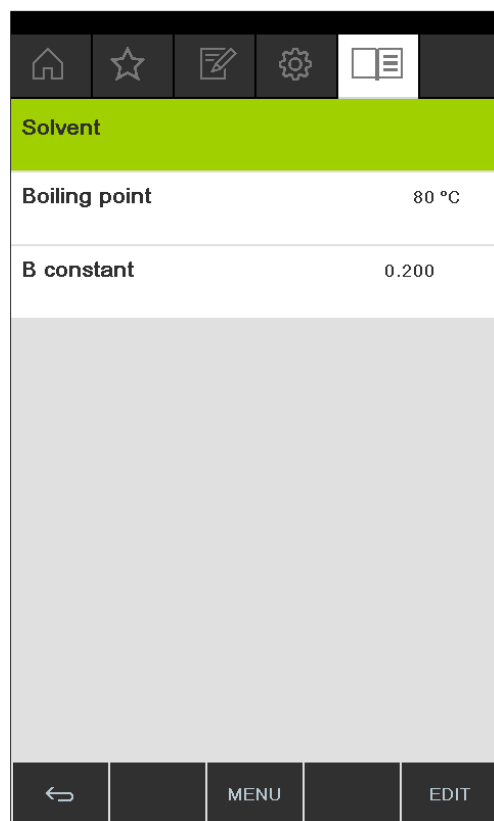



Fig. 59: Creating a new solvent

- ▶ Select the menu item "Solvent".
- ▶ Use the keyboard to enter a name for the solvent and press SAVE to save it.
- ▶ Enter the boiling point and beta constant of the solvent.
- ▶ To return to the solvent library, press the function button .

⇒ The newly created solvent now appears in the solvent library.

**NOTE**

The solvents created can be edited at any time by choosing EDIT or deleted by choosing REMOVE. In addition, the solvents can also be added to your favorites, see Chapter 6.8 "Creating favorites", page 85.

6.6 Activating eco mode

The [Interface I-300 Pro] offers an "eco mode" option for saving energy if the distillation system remains inactive for a predefined period of time. In eco mode, the distillation system shuts down the activity of the heating bath and recirculating chiller after a defined delay period so that:

- The heating bath does not reheat until the heating bath temperature has dropped to a defined minimum temperature.
- The recirculating chiller does not re-chill until the coolant temperature has risen to a defined maximum temperature.

Navigation path

→ Configuration → Settings → eco mode

- ▶ Navigate to the "Settings" screen and select the menu item "eco mode", see Navigating the menu.
- ▶ On the menu item "eco mode", select the option "On".
- ▶ On the menu item "Activate after", enter the figure for the delay period.
- ▶ On the menu item "Heating bath temperature drop", enter the difference between the current temperature setting and the desired minimum temperature.
- ▶ On the menu item "Coolant temperature rise", enter the difference between the current temperature setting and the desired maximum temperature.

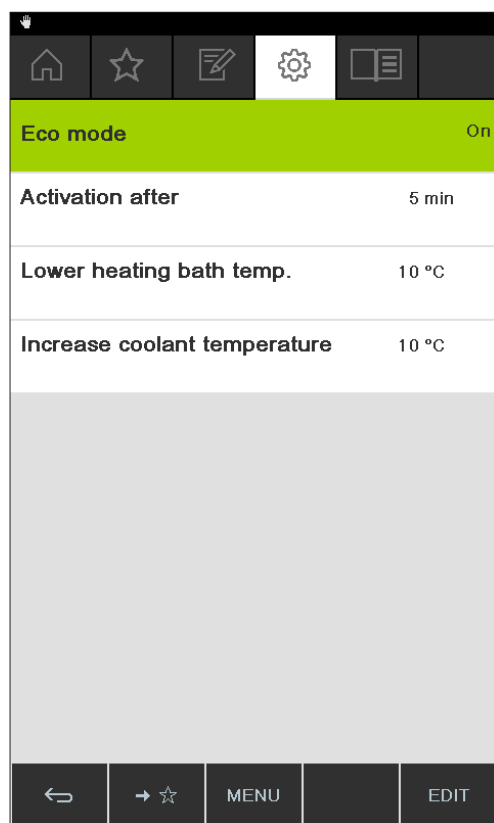


Fig. 60: Selecting "eco mode"

6.7 Setting hysteresis

The hysteresis setting is only relevant if the distillation system is not being operated with a BUCHI Vacuum Pump V-300 but with a different make of pump or with a laboratory vacuum supply, and is controlled by means of a valve.

The hysteresis setting ensures precise pressure regulation by the valve or the valve unit. The hysteresis is the maximum allowed deviation of the vacuum from the specified setting before the system corrects the pressure. The pump is switched off/ valve is closed when the vacuum has reached the lowest possible pressure. If the pressure rises and the set hysteresis is exceeded, the pump is switched on again/the valve opened again.

Navigation path

→ Configuration → Settings → Pressure hysteresis

- ▶ Navigate to the "Settings" screen and select the menu item "Pressure hysteresis", see Chapter 6.1 "Navigating the menu", page 46.

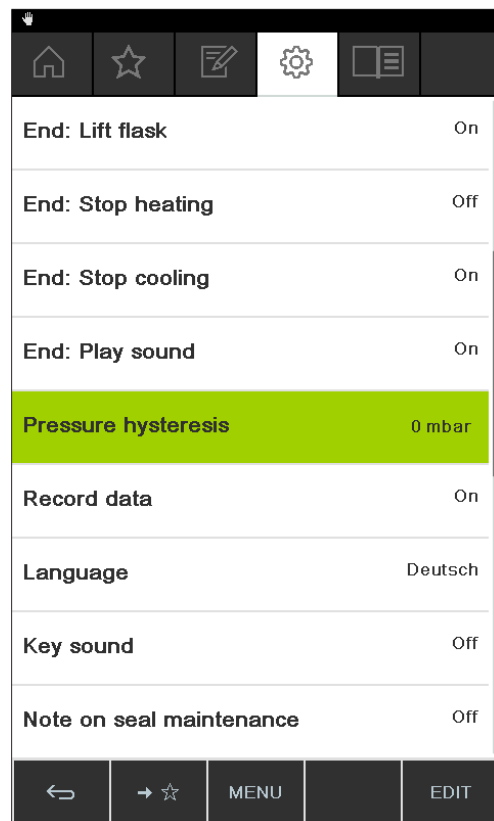


Fig. 61: Setting pressure hysteresis

- Enter the desired figure for the maximum vacuum deviation from the specified setting.

6.8 Creating favorites

The Interface I-300 Pro offers the facility for saving individual functions and settings as favorites (bookmarks).

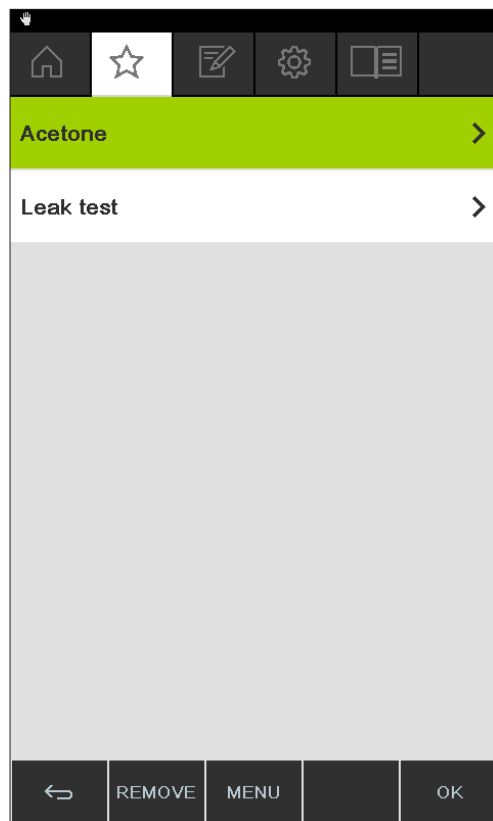


Fig. 62: Submenu "Favorites"

Clicking on any of the saved favorites takes you directly to the screen concerned.

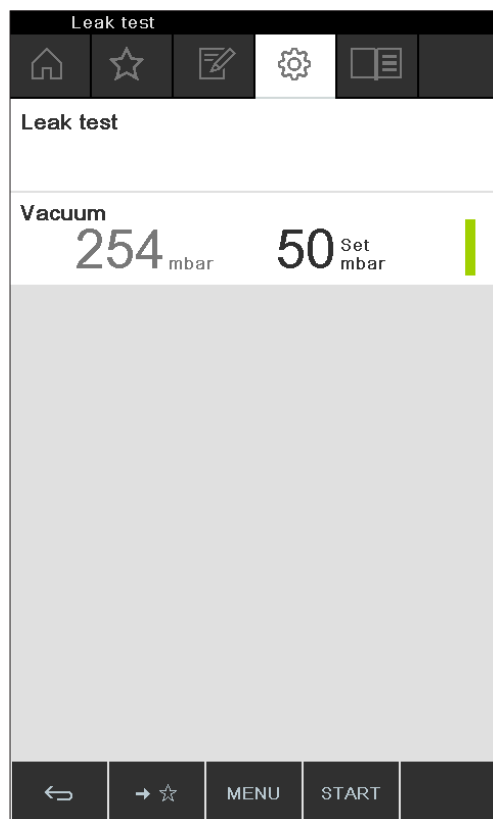


Fig. 63: Example of frequently used screen showing function button "Add to favorites" in bottom menu bar

- ▶ Navigate to a frequently used screen on the interface unit.
- ▶ To add that screen to your favorites, press the function button below the symbol



- ⇒ The screen will then be listed on the submenu "Favorites" the next time it is opened.

6.9 Activating Come here function

All apps connected to the instrument are sent a message.

Navigation path



Precondition:

- ☒ Monitoring services have been installed and set up. For details see "*BUCHI Cloud and Monitoring Services Quick Guide*" or <https://www.buchi.com/en/buchi-cloud>.
- ▶ Navigate to the *Start* screen and select the function button [*Come here*], see Navigating the menu.
- ⇒ All apps connected to the instrument receive a message.

6.10 Controlling lift position via the interface unit

The rotary drive unit of the Rotavapor R-300 can be raised or lowered using the lift control function on the interface unit. To be able to control the lift position using the interface unit, a depth stop has to be set. For details, refer to the Rotavapor operating instructions. The home screen of the interface unit then shows the parameter "Lift" together with the actual position and the depth stop setting. If the rotary drive unit is lowered into the heating bath as far as the depth stop, the actual position is the same as the selected setting.

Using the interface unit, the lift position can either be fully lowered as far as the depth stop or fully raised.

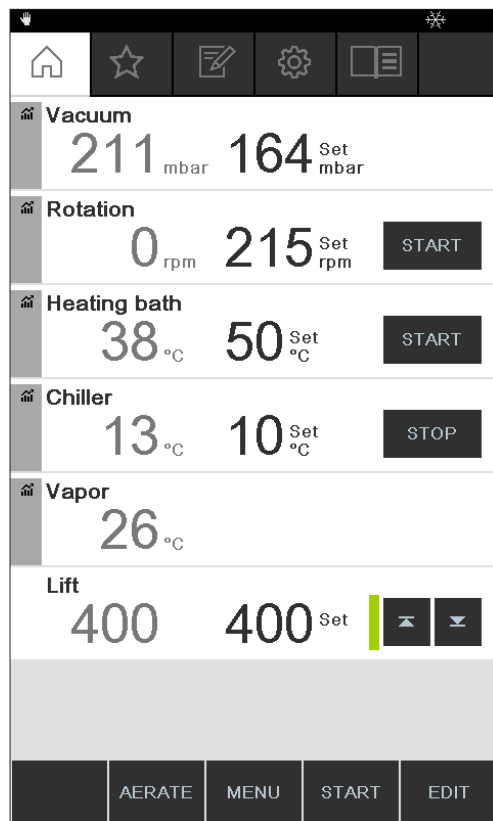


Fig. 64: Lift position: rotary drive unit lowered

- To lower the rotary drive unit into the heating bath, press the Down arrow button. **CAUTION! Risk of pinching injuries.** If using the protection shield, make sure that your fingers or other parts of the body are not trapped.
 - ⇒ The rotary drive unit is lowered as far as the depth stop.
- To raise the rotary drive unit out of the heating bath, press the Up arrow button.
 - ⇒ The rotary drive unit is raised fully out of the heating bath.

7 Cleaning and servicing



NOTE

- ▶ Carry out only the service and cleaning operations described in this section.
- ▶ Do not carry out any servicing and cleaning operations that involve opening the housing.
- ▶ Use only genuine BUCHI spare parts in order to ensure correct operation and preserve the warranty.
- ▶ Carry out the service and cleaning operations described in this section to extend the lifetime of the instrument.

7.1 Cleaning the casing/display

- ▶ Use a damp cloth to clean the device.
- ▶ To clean the casing, only use ethanol or soapy water.

7.2 Performing a leak test

Use the leak test to check the system for leaks.

Navigation path

→ Configuration → Maintenance → Leak test

Precondition:

☒ All openings in the vacuum system are sealed.

- ▶ Navigate to the *Maintenance* screen and select the menu item *[Leak test]*, see Navigating the menu.

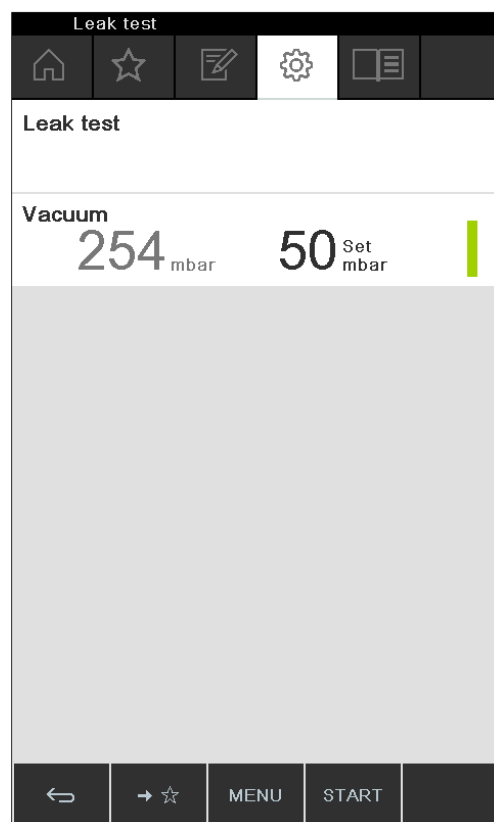


Fig. 65: Leak test screen

- Press the function button START to start the leak test.
- ⇒ The system is evacuated to 50 mbar within 2 minutes.
- ⇒ After a stabilization period of 30 seconds, the leakage rate is shown.

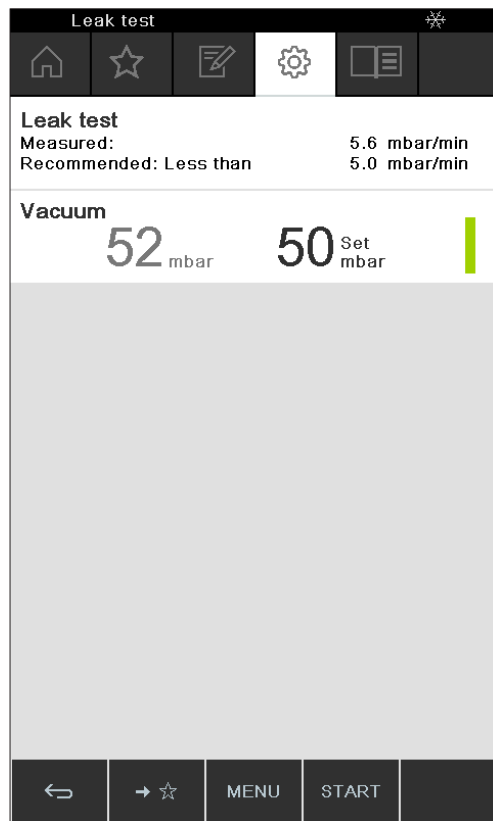


Fig. 66: Display of leakage rate



NOTE

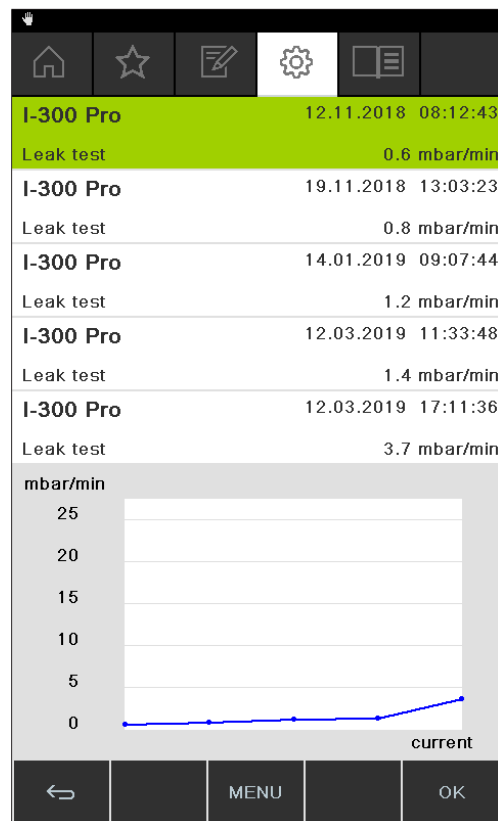
Typically, an airtight system should have a leakage rate of less than 5 mbar/min.

7.3 Opening leak test history

Use the function Test results to view details of leak tests previously carried out.

Navigation path

→ Configuration → Maintenance → Test results



- ▶ Navigate to the *Maintenance* sub-screen and select the menu item [*Test results*], see Chapter 6.1 "Navigating the menu", page 46.
 - ⇒ The display shows the *Test results* view.
- ▶ Select a leak test from the list.
 - ⇒ The display shows the readings obtained in the leak test.

7.4 Fitting GL14 cap nut with tube seal

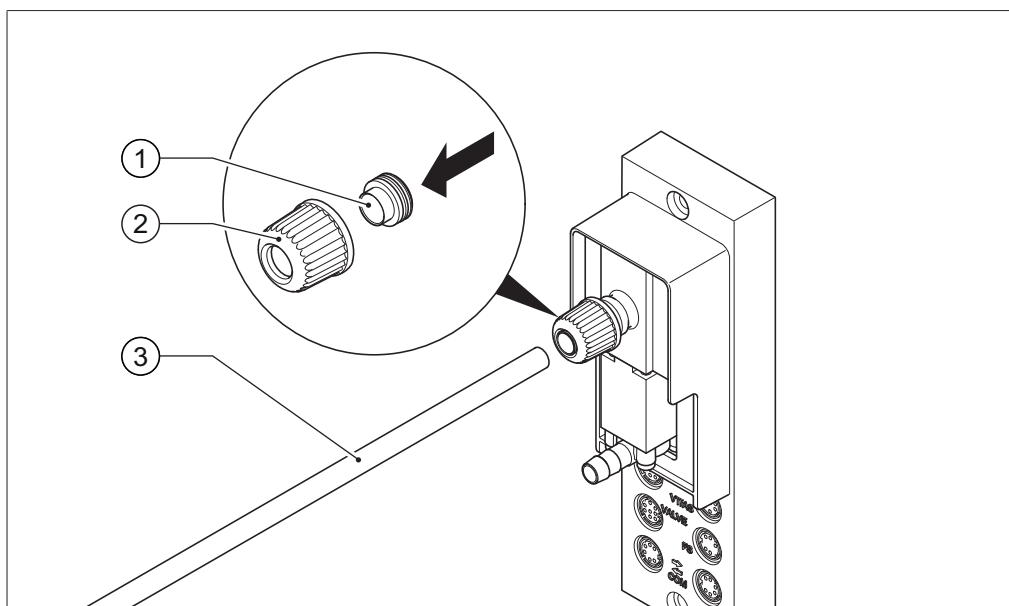


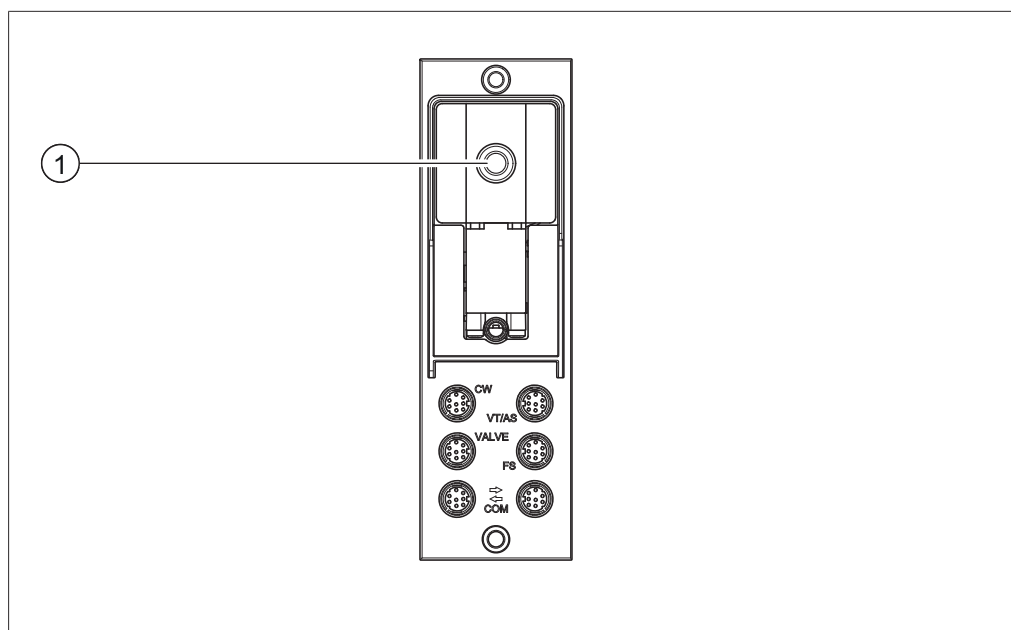
Fig. 67: Fitting GL14 cap nut with tube seal (example shows VacuBox)

- | | | | |
|---|--------------|---|--------|
| 1 | Tube seal | 3 | Tubing |
| 2 | GL14 cap nut | | |

- ▶ Insert the tube seal (1) in the GL14 cap nut (2) ensuring it is straight. **NOTICE! Risk of damaging tube seal.** Make sure that the tube seal does not twist or jam in the GL14 cap nut.
- ▶ Loosely screw the GL14 cap nut together with tube seal onto the device concerned (example shows VacuBox) or the Woulff bottle.
- ▶ Carefully insert the end of the tube (3) into the GL14 cap nut and tube seal.
- ▶ Tighten the GL14 cap nut and tube seal.

7.5 Checking seals

Seals are wearing parts. They have to be regularly inspected, cleaned and, if necessary, replaced. The life of a seal depends on how much it is used and how well it is looked after.



- ▶ Unscrew the GL14 cap nut from the vacuum connection (1) and remove the tube seal.
- ▶ Check the tube seal for signs of damage and cracks.
- ▶ Rinse intact tube seals in water or ethanol and dry with a soft cloth.
- ▶ Replace damaged tube seals.

7.6 Checking vacuum seal

Navigation path

→ Configuration → Maintenance

Precondition:

- ☒ The status bar shows the maintenance symbol.
- ▶ Check the vacuum seal. See operating instructions of the connected rotary evaporator.
- ▶ Navigate to the *Maintenance* sub-screen and select the menu item *[Reset rotation hours]*, see Chapter 6.1 "Navigating the menu", page 46.
- ▶ When asked to confirm, press *[OK]*.
- ⇒ The rotation hours are reset.

7.7 Calibrating AutoDest sensor

The AutoDest sensor measures the temperature of the coolant at the inlet and outlet of the cooling condenser.

Adjust the sensors so that the difference is no more than 0.1 °C.

Navigation path

→ Configuration → System information → AutoDest sensor

- ▶ Place the AutoDest sensor in a homogeneous water bath.
- ▶ Navigate to the *System information* sub-screen and select the menu item *[AutoDest sensor]*, see Chapter 6.1 "Navigating the menu", page 46.

- ▶ Wait until the difference indicated has stabilized.
- ⇒ The two condenser sensors are now at the same temperature.

Navigation path

→ Configuration → Maintenance → Calibrate AutoDest sensor

- ▶ Navigate to the *Maintenance* sub-screen and select the menu item [*AutoDest sensor*], see Navigating the menu.
- ▶ Press the navigation control to choose OK and confirm the calibration offset.

7.8 Calibrating the pressure sensor

The pressure sensor is calibrated at the factory by BUCHI prior to delivery. However, it can be recalibrated with the aid of an external reference pressure gauge at any time.

Navigation path

→ Configuration → Servicing

- ▶ Navigate to the "Configuration" screen and select the menu item "Servicing", see Chapter 6.1 "Navigating the menu", page 46.

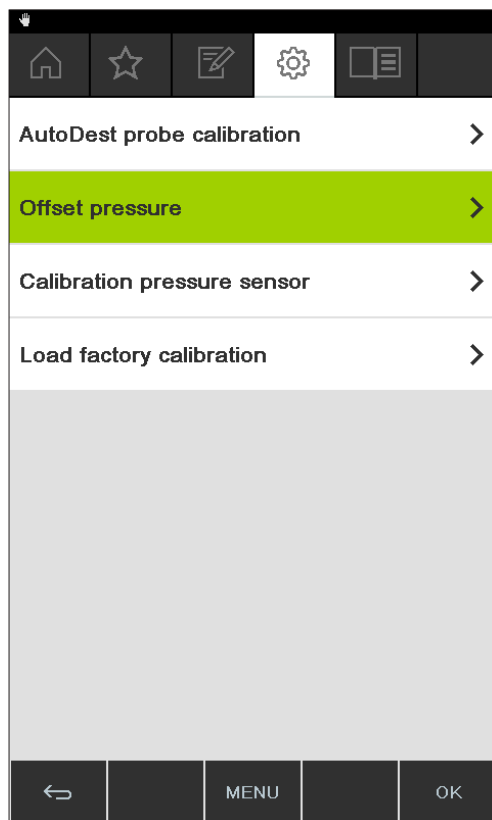


Fig. 68: Selecting item on the "Service" screen

7.8.1 Offset calibration

An offset has to be specified if the pressure indicated on the interface unit differs from the pressure indicated by an external reference pressure gauge. The difference between the two figures is referred to as the offset. The offset applies to the entire pressure range.

Navigation path

→ Configuration → Servicing → Pressure offset

- ▶ Connect the reference pressure gauge to the same vacuum system that the pump and interface unit are connected to.
- ▶ Navigate to the "Service" screen and select the menu item "Pressure offset", see Chapter 6.1 "Navigating the menu", page 46.

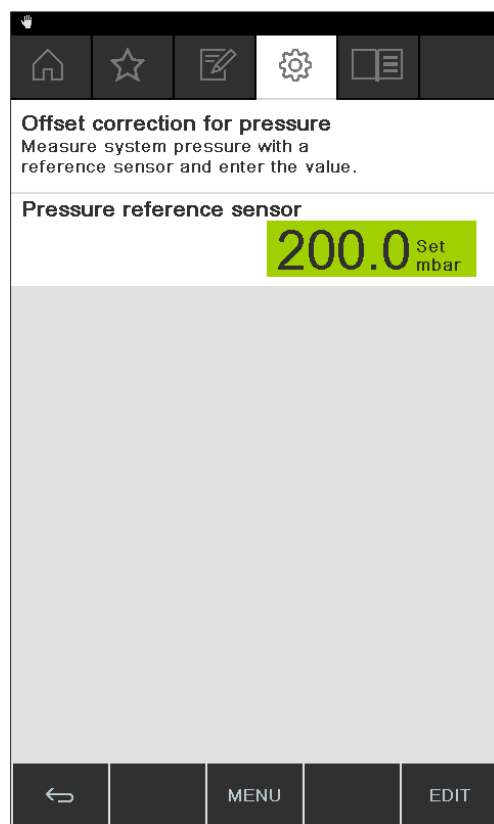


Fig. 69: Menu item "Pressure offset"

- ▶ Enter the pressure measured by the reference sensor.
- ⇒ The measured readings will then automatically be adjusted by the specified offset.

7.8.2 Simple calibration

This calibration method is used to adjust the linearity of the pressure sensor at specific predefined pressure levels. During the calibration sequence the pressure sensor is calibrated at room temperature in six stages at normal atmospheric pressure and at 800, 600, 400, 200 and 10 mbar.

During the calibration sequence, the system carries out a plausibility check on the measured readings and indicates a fault if the confirmed readings are implausible.

Navigation path

→ Configuration → Servicing → Pressure calibration

- ▶ Connect the reference pressure gauge to the same vacuum system that the pump and interface unit are connected to.
- ▶ Navigate to the "Service" screen and select the menu item "Pressure calibration", see Chapter 6.1 "Navigating the menu", page 46.

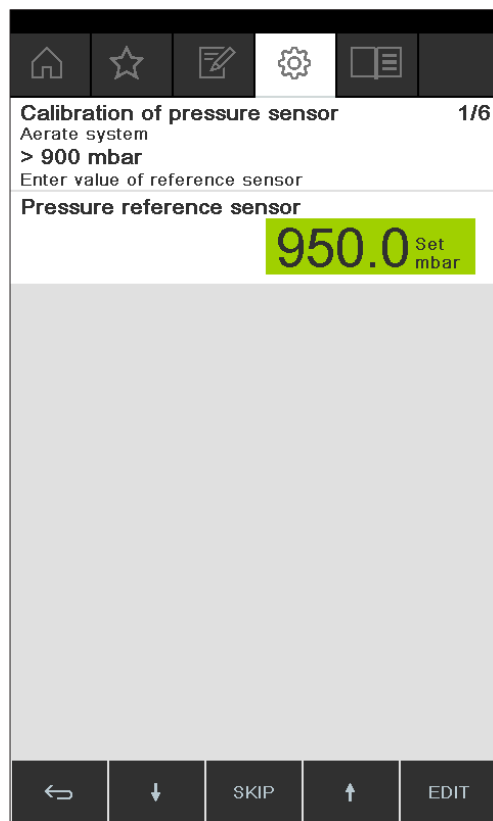




Fig. 70: Menu item "Pressure calibration"

- ▶ In the first stage, enter the pressure indicated by the reference pressure gauge.
- ▶ In the second stage, use the function buttons  and  to increase/decrease the vacuum in the system until the pressure shown on the reference gauge is within ± 10 mbar of the specified setting.
- ▶ Enter the pressure indicated by the reference pressure gauge.
- ▶ Repeat the process for all subsequent stages.
- ▶ To skip a stage, press the function button SKIP.
- ⇒ After the last stage, the calibration settings are saved.
- ▶ To return to the menu, press the function button ESC or OK.

7.8.3 Loading factory calibration

This function enables you to reset the calibration to the factory settings as supplied. Any previously saved calibration settings will be deleted.

Navigation path

→ Configuration → Servicing → Back to factory calibration

- ▶ Navigate to the "Service" screen and select the menu item "Back to factory calibration", see Chapter 6.1 "Navigating the menu", page 46.
- ⇒ The device asks you to confirm that the factory calibration should be reloaded.

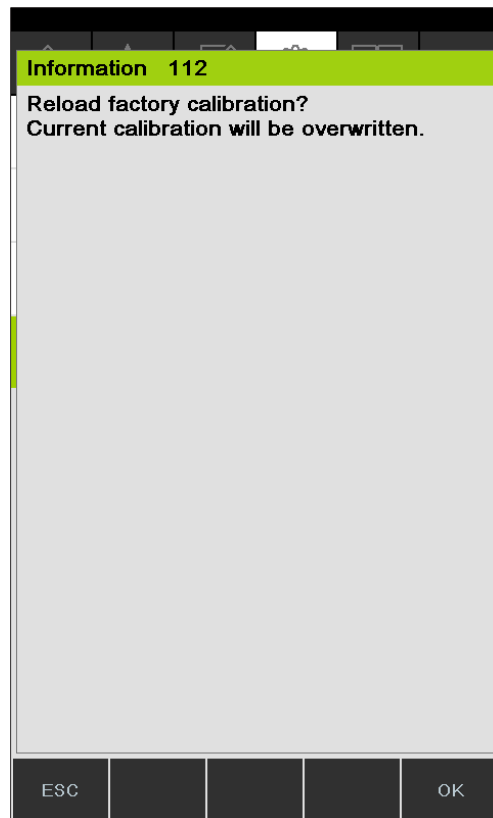


Fig. 71: Menu item "Back to factory calibration"

- ▶ Press the function button OK to confirm or the function button ESC to retain the existing calibration settings.

7.9 Setting up Rotavapor® Open Interface

Rotavapor® Open Interface enables you to obtain an overall view of the status and communication of third party equipment with the device.



NOTE

Use of the function is at your own risk.

For information about programming see <https://www.buchi.com/en/content/buchi-cloud-services>

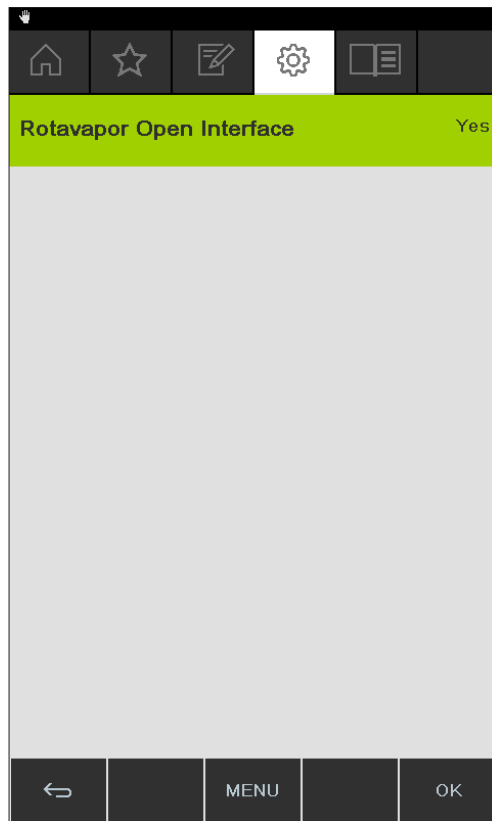


NOTE

The password for Rotavapor® Open Interface is displayed only once.

Navigation path

→ Configuration → Settings → Rotavapor Open Interface



- ▶ Connect the interface to a LAN network. For connection details see Chapter 3.5 "Configuration", page 14
- ▶ Navigate to the *Rotavapor Open Interface* sub-screen and select the option [Yes], see Chapter 6.1 "Navigating the menu", page 46.
- ▶ Confirm the action when asked.
 - ⇒ The interface shows the password
- ▶ Restart the interface.
 - ⇒ The Rotavapor® Open interface unit is set up.

8 Help with faults

8.1 Faults, possible causes and remedies

Fault	Possible cause	Remedy
Device does not work	Device is not connected to power supply.	► Check power supply (see Connections).
Valve or pump frequently switches over	System is leaking.	► Check system for leaks (see Rotavapor operating instructions). ► If necessary, replace tubing and/or seals.
	Hysteresis setting is too small.	► Select a larger hysteresis (for terminal vacuums greater than 700 mbar, set to automatic hysteresis; see Manual mode).
Valve does not switch over	Valve coil is dirty.	► Contact BUCHI Customer Service.
	Valve lead not plugged in.	► Plug in valve lead.
	Valve is not adjusted.	► Contact BUCHI Customer Service.
Vacuum is not achieved	Back-evaporation from the receiving flask.	► Empty receiving flask (see Rotavapor operating instructions).
	System is leaking.	► Check system for leaks (see Rotavapor operating instructions). ► If necessary, replace tubing and/or seals.
	Water pressure of glass filter pump is too low.	► Increase water flow (see pump operating instructions).
	Vacuum pump is too weak.	► Use suitably dimensioned vacuum pump.

8.2 Error messages



NOTE

The system indicates faults by showing error messages and suggests remedial measures.

8.3 Customer service

Repairs to the device may only be carried out by authorized service technicians. The service technicians have been comprehensively technically trained and are aware of the potential hazards that can arise from the device.

The addresses of the official BUCHI Customer Service offices can be found on the BUCHI website at: www.buchi.com. If you have any questions regarding technical issues or faults, please contact those offices.

Customer Services can offer you:

- supply of spare parts
- repairs
- technical advice

8.4 eSupport

eSupport enables you to send a service ticket directly to a BUCHI technical engineer.

Navigation path

→Configuration →BUCHI Cloud Services



Precondition:

- ☒ The BUCHI Cloud Services have been installed and set up. For details see "*BUCHI Cloud and Monitoring Services Quick Guide*" or <https://www.buchi.com/en/buchi-cloud>.
- Navigate to the *BUCHI Cloud Services* sub-screen, see Chapter 6.1 "Navigating the menu", page 46.
- ⇒ The interface shows the current status of the request.

9 Taking out of service and disposal

9.1 Taking out of service

- ▶ Switch off the *[Interface I-300 Pro]* and disconnect it from the mains power supply.
- ▶ Remove all tubing and communication cables from the device.

9.2 Disposal

The operator is responsible for proper disposal of the *[Interface]*.

- ▶ When disposing of equipment observe the local regulations and statutory requirements regarding waste disposal.

10 Appendix

10.1 Solvent table

Solvent	Formula	Molar mass in g/mol	Evaporation energy in J/g	Boiling point in °C at 1013 mbar	Density in g/cm ³	Vacuum in mbar for 40 °C boiling point
Acetone	CH ₃ H ₆ O	58.1	553	56	0.790	556
<i>n</i> -pentanol	C ₅ H ₁₂ O	88.1	595	137	0.814	11
Benzene	C ₆ H ₆	78.1	548	80	0.877	236
<i>n</i> -butanol	C ₄ H ₁₀ O	74.1	620	118	0.810	25
<i>tert</i> -butanol	C ₄ H ₁₀ O	74.1	590	82	0.789	130
Chlorobenzene	C ₆ H ₅ Cl	112.6	377	132	1.106	36
Chloroform	CHCl ₃	119.4	264	62	1.483	474
Cyclohexane	C ₆ H ₁₂	84.0	389	81	0.779	235
Diethyl ether	C ₄ H ₁₀ O	74.0	389	35	0.714	850
1,2-dichloroethane	C ₂ H ₄ Cl ₂	99.0	335	84	1.235	210
<i>cis</i> -1,2- dichloroethene	C ₂ H ₂ Cl ₂	97.0	322	60	1.284	479
<i>trans</i> -1,2- dichloroethene	C ₂ H ₂ Cl ₂	97.0	314	48	1.257	751
Di-isopropyl ether	C ₆ H ₁₄ O	102.0	318	68	0.724	375
Dioxane	C ₄ H ₈ O ₂	88.1	406	101	1.034	107
DMF (dimethylfor- mamide)	C ₃ H ₇ NO	73.1	–	153	0.949	11
Acetic acid	C ₂ H ₄ O ₂	60.0	695	118	1.049	44
Ethanol	C ₂ H ₆ O	46.0	879	79	0.789	175
Ethylacetate	C ₄ H ₈ O ₂	88.1	394	77	0.900	240
Heptane	C ₇ H ₁₆	100.2	373	98	0.684	120
Hexane	C ₆ H ₁₄	86.2	368	69	0.660	360
Isopropanol	C ₃ H ₈ O	60.1	699	82	0.786	137
Isopentanol	C ₅ H ₁₂ O	88.1	595	129	0.809	14
Methylethylketone	C ₄ H ₈ O	72.1	473	80	0.805	243
Methanol	CH ₄ O	32.0	1227	65	0.791	337
Dichlormethane	CH ₂ Cl ₂	84.9	373	40	1.327	850
Pentane	C ₅ H ₁₂	72.1	381	36	0.626	850
<i>n</i> -propanol	C ₃ H ₈ O	60.1	787	97	0.804	67
Pentachloroethane	C ₂ HCl ₅	202.3	201	162	1.680	13
1,1,2,2-tetra- chloroethane	C ₂ H ₂ Cl ₄	167.9	247	146	1.595	20
Tetrachloromethane	CCl ₄	153.8	226	77	1.594	271

Solvent	Formula	Molar mass in g/mol	Evaporation energy in J/g	Boiling point in °C at 1013 mbar	Density in g/cm ³	Vacuum in mbar for 40 °C boiling point
1,1,1-trichloroethane	C ₂ H ₃ Cl ₃	133.4	251	74	1.339	300
Tetrachloroethene	C ₂ Cl ₄	165.8	234	121	1.623	53
THF (tetrahydrofu- ran)	C ₄ H ₈ O	72.1	–	67	0.889	374
Toluene	C ₇ H ₈	92.2	427	111	0.867	77
Trichloroethene	C ₂ HCl ₃	131.3	264	87	1.464	183
Water	H ₂ O	18.0	2261	100	1.000	72
Xylene (mixture)	C ₈ H ₁₀	106.2	389	–	–	25
<i>o</i> -xylene	C ₈ H ₁₀	106.2	–	144	0.880	–
<i>m</i> -xylene	C ₈ H ₁₀	106.2	–	139	0.864	–
<i>p</i> -xylene	C ₈ H ₁₀	106.2	–	138	0.861	–

10.2 Spare parts and accessories

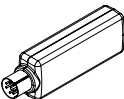
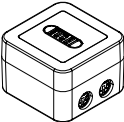
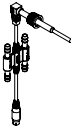
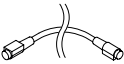
Use only genuine BUCHI consumables and spare parts in order to ensure correct, safe and reliable operation of the system.

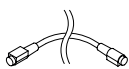
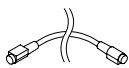
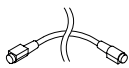


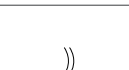
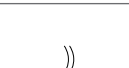
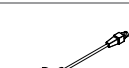

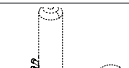




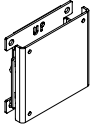
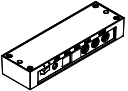

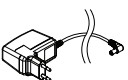

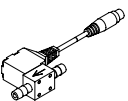

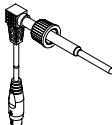

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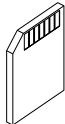
Any modifications of spare parts or assemblies are only allowed with the prior written permission of BUCHI.

10.2.1 Accessories

	Order no.	Image
BUCHI Bluetooth® Dongle, connects instrument to smartphone via Bluetooth®	11067770	
StatusLight cpl., incl. communication cable Indicates the status of the instrument (instrument is ready to use, has an error or is in operation).	11068959	
AutoDest sensor. Incl. cap nut, seal GL14 For automatic distillation. Measures temperature of cooling media and the vapor temperature. Vacuum is adjusted according to cooling capacity of condenser. Meant to be used with the Interface I-300 / I-300 Pro and glass assembly V, HP or S.	11059225	
Communication cable. BUCHI COM, 0.3 m, 6p Enables connection between Rotavapor® R-300 / R-220 Pro, Interface I-300 / I-300 Pro, Vacuum Pump V-300 / V-600, Recirculating Chiller F-3xx, VacuBox and LegacyBox.	11058705	

	Order no.	Image
Communication cable. BUCHI COM, 1.8 m, 6p Enables connection between Rotavapor® R-300 / R-220 Pro, Interface I-300 / I-300 Pro, Vacuum Pump V-300 / V-600, Recirculating Chiller F-3xx, VacuBox and LegacyBox.	11058707	
Communication cable. BUCHI COM, 5.0 m, 6p Enables connection between Rotavapor® R-300 / R-220 Pro, Interface I-300 / I-300 Pro, Vacuum Pump V-300 / V-600, Recirculating Chiller F-3xx, VacuBox and LegacyBox.	11058708	
Communication cable. BUCHI COM, 15 m, 6p Enables connection between Rotavapor®, Interface, Vacuum Pump, Recirculating Chiller, VacuBox and LegacyBox.	11064090	
Mini-DIN to DC-Jack, 300 mm Meant to be used with 1 Vacuum Pump V-300 and 2 evaporator systems with Interface I-300/I-300 Pro and Rotavapor® of older generations. Connection between VacuBox and power adapter of the Interface I-300/I-300 Pro.	11062266	
Communication cable. Mini-DIN, Y-piece, 2.0 m Meant to be used with 1 Vacuum Pump V-300 and 2 Rotavapor® systems with the Interface I-300/I-300 Pro. Connection between VacuBox and Vacuum Pump V-300.	11062255	
Communication cable RJ45, 2 m Connection between vacuum controller/interface and recirculating chiller, vacuum controller/interface and vacuum pump or steam distillation unit and Eco titrator.	044989	
Communication cable. RJ45, 5 m Connection between vacuum controller/interface and recirculating chiller or vacuum controller/interface and vacuum pump.	11056240	
Cooling water valve. 24VAC Valve opens cooling water feed during distillation. Meant to be used with a vacuum controller/interface.	031356	
Fastening set. For VacuBox, incl. holder 2 pcs, tube Used to fasten VacuBox on the Vacuum Pump V-300 or V-600.	11062957	
Foam sensor. Incl. holder Prevents sample from foaming into the condenser by aeration of system temporarily. Meant to be used with the Interface I-300 / I-300 Pro.	11061167	
Holder. To fix interface on lab stand To fix Interface I-300 / I-300 Pro, VacuBox and LegacyBox on lab stand, Rotavapor® R-21x or Vacuum Pump V-7xx. Incl. support, fixing clamp.	11059021	


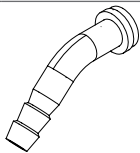
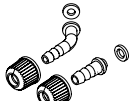


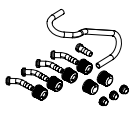
	Order no.	Image
Holder, set. To fix Interface and Woulff bottle on lab stand To fix Interface I-300 / I-300 Pro, VacuBox, LegacyBox and Woulff bottle / valve unit on a lab stand, Rotavapor® R-21x or Vacuum Pump V-7xx. Incl. holder for Interface and Woulff bottle, 2 M4x8 screws.	11065362	
Holder. Wall mount, incl. support set To fasten Interface on wall.	11059132	
LegacyBox. Incl. accessory kit Interface between Interface I-300 / I-300 Pro (with VacuBox) to peripherals of older generations (Vacuum Pump V-7xx, Recirculating Chiller F-1xx).	11061166	
Level sensor. Incl. O-ring, cable, rubber band Prevents an overflow in the receiving flask of condenser/secondary condenser. Placed on receiving flask. Meant to be used with the Interface I-300 / I-300 Pro.	11060954	
Power adapter. 30 V, 30 W, frequency 50/60 Hz To power vacuum controller directly or to power interface via LegacyBox or VacuBox.	11060669	
Stand. V stand with rod, 600 mm Used as a holder for interface or vacuum controller when they cannot be mounted on a peripheral or wall.	048891	
Vacuum valve. Magnetic valve, 24V/4W, Mini-DIN, 1.5 m Flow valve without flask, meant to be used with a centralized vacuum source or an unregulated vacuum pump. Meant to be used with the Interface I-300 / I-300 Pro.	11060706	
Valve unit. Incl. Woulff bottle, 125 mL, P+G, holder Magnetic valve, meant to be used with the Interface I-300 / I-300 Pro. For operation with non-BUCHI vacuum pumps or house vacuum.	11061887	
Vapor temperature sensor. Incl. cap nut, seal GL14 Measures the vapor temperature inside the system. Meant to be used with the Interface I-300 / I-300 Pro.	11060707	
Woulff bottle. 125 mL, P+G, incl. holder For trapping particles and droplets and for pressure equalization.	11059905	

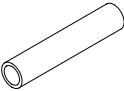
	Order no.	Image
SD card. For Interface I-300 Pro Records all process parameters. The set of data can be exported for further analysis.	11061548	

Tubing

	Order no.
Tubing. Natural rubber, Ø6/16 mm, red, per m Use: Vacuum.	017622
Tubing. Nylflex, PVC-P, Ø8/14 mm, transparent, per m	004113
Tubing. Synthetic rubber, Ø6/13 mm, black, per m Use: Vacuum.	11063244


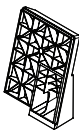
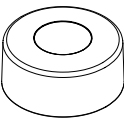
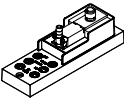
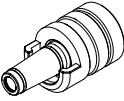

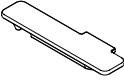
10.2.2 Wearing parts

	Order no.	Image
Cap nuts, set. 10 pcs, screw cap with hole GL14, seal EPDM Content: Cap nuts, seals	041999	
Hose barb. Bent, GL14, incl. silicone seal	018916	
Hose barbs, set. 2 pcs, bent (1), straight (1), GL14, silicone seal Content: Hose barbs, cap nuts, seals	041939	
Screwing set, Hose barbs and seals GL14 Content: Hose barbs bent 4 pcs, hose barbs straight 1 pc, cap nuts 4 pcs, screw caps 2 pcs, seals EPDM 3 pcs.	11061921	
Hose barbs, set. 4 pcs, bent GL14, silicone seal Content: Hose barbs, cap nuts, seals	037287	
Hose barbs, set. 4 pcs, straight, GL14, silicone seal Content: Hose barbs, cap nuts, seals	037642	
Hose, set. Incl. GL14 set, FEP tube 11061756 Used to connect VacuBox and Valve unit/Woulff bottle when both are fixed on the Rotavapor® R-300.	11065373	

	Order no.	Image
Tubing. FEP, Ø6/8 mm, transparent, 40 mm Connection tubing Woulff bottle.	11059909	

10.2.3 Spare parts

Further spare parts

	Order no.	Image
Holder. For valve unit/Woulff bottle To fasten valve unit or Woulff bottle.	11059908	
Halterung. Inkl. Support, Befestigungs-Set Zur Befestigung der Kontrolleinheit am Rotavapor®.	11059029	
Navigation knob. Ø30mm, green/grey, incl. knob case, cover For Rotavapor® R-300, Heating Bath B-300 Base, Interface I-300/I-300 Pro and Recirculating Chiller F-305/F-308/F-314.	11059157	
VacuBox. Incl. support set Communication interface between Rotavapor® R-300 and Interface I-300/I-300 Pro or Vacuum Pump V-300/V-600 and Interface I-300/ I-300 Pro.	11060914	
Support foam sensor, Incl. clamping nut, support ring To fasten foam sensor on glass assembly	11059024	
Glass tube, Spare glass part for foam sensor (11059245)	11058922	
Covering SD-card. For SD-card	11060814	

10.3 Health and safety approval

To guarantee the health and safety of our staff and to comply with the law and the regulations for handling hazardous materials, for the purposes of health and safety at work and safe disposal of waste, no products may be sent back to BÜCHI Labortechnik AG or repaired unless we have received the declaration below, completed and signed.

Products sent to us will not be accepted for repair until we have received this declaration.

- Copy the form overleaf and complete it.

- ▶ Make sure that you know the full details of the substances with which the device has been in contact and that all questions have been answered fully and correctly.
- ▶ Send the completed form to us in advance by post or fax. The declaration must reach us before the device.
- ▶ Enclose a copy of the declaration with the device.
- ▶ If the product is contaminated, inform the carrier (in accordance with GGVE/ GGVS/RID/ADR).

If the declaration is missing or the procedure described is not followed, the repairs will be delayed. We ask for your understanding and cooperation with regard to these measures.

10.4 Health and safety

Declaration regarding the safety, hazards and safe disposal of waste

To guarantee the health and safety of our staff and to comply with the law and the regulations for handling hazardous materials, regarding health and safety at work, and to comply with safety regulations, health and safety requirements and requirements for safe disposal of waste such as chemical waste, chemical residues or solvents, the form below must be fully completed and signed whenever devices or faulty components are to be sent back to our factory.

Products or components will not be accepted if this declaration has not been provided.

Device	Model:	Part/Device no.:
Declaration for non-hazardous materials	We hereby assure that the products returned <div style="margin-left: 20px;"> <input type="checkbox"/> have not been used in the laboratory and are new. <input type="checkbox"/> have not been in contact with toxic, corrosive, biologically active, explosive, radioactive or other hazardous materials. <input type="checkbox"/> are not contaminated. The solvents or residues of the substances pumped have been removed. </div>	
Declaration for hazardous materials	In respect of the products returned, we hereby assure that <div style="margin-left: 20px;"> <input type="checkbox"/> all substances (toxic, corrosive, biologically active, explosive, radioactive or otherwise hazardous) that have been pumped by the products or have otherwise been in contact with the products are listed below. <input type="checkbox"/> the products have been cleaned, decontaminated, sterilised inside and outside and all inlets and outlets are sealed. </div>	
	List of hazardous materials that have been in contact with the products:	
	Chemical, material	Hazard category

Final declaration We hereby declare that

- we are fully conversant with the substances that have been in contact with the products and have answered all questions correctly.
- we have taken all measures necessary to prevent potential hazards in respect of the products returned.

Company name or stamp:

Place, date:

Name (block letters), position
(block letters):

Signature:

10.5 Handling data

The following communication details relate to Version 1.0 of the interface. Information is subject to amendment in respect of extent and content.

**NOTE**

External control of the equipment via the BUCHI Cloud is not implemented.

Data transmission via the LAN interface to the server

Category	Frequency
System data: <ul style="list-style-type: none"> • Serial number of interface unit • System name of interface unit • Interface unit model (I-300 or I-300 Pro) • Firmware version of interface unit • MAC address of interface unit 	Every time connection is established
Status data: <ul style="list-style-type: none"> • Process status (e.g. "Ready", "Running") 	Whenever process changes
Event data: (Messages that appear as pop-ups on the display, e.g. "Distillation successfully completed") <ul style="list-style-type: none"> • Event message ID • Event message level (information, warning or error) 	On occurrence Event messages are managed by the server and distributed to the clients from there for push notifications.

Category	Frequency
Process data:	Regular data transmission
• Actual reading and specified setting for pressure	When process is running: once per second at most
• Actual reading and specified setting for heating bath temperature	On standby: at least every 60 seconds
• Actual reading and specified setting for recirculating chiller temperature	
• Actual reading and specified setting for rotation speed	
• Actual reading and specified setting for timer	
• Actual vapor temperature	
• Results (stop status, foam detection, receiving flask full)	
• Timestamp	

All of the above data (except MAC address) is broadcast to the connected clients (e.g. mobile phone) and processed there.

Data transmission from clients to the server

Category	Frequency
Client data:	When connection is established or changed
• App language selected	
• Type of operating system	
• Operating system version	
• Platform for push notifications	
• Push tone setting (not used)	
• Desired push notification type for each configured device (system data, process data, method data)	
• Client ID (automatically generated)	
• Model designation of mobile phone	

Data storage period

Category	Storage period
• System data (inc. date and time of last connection)	Permanent
• Client data (inc. date and time of last connection)	At most 1 year after last use
• Status data	At least 24 hrs, max. 48 hrs
• Event data	Data that is older than 24 hrs is deleted after 24 hrs.
• Process data	

Data configuration settings

Destination host	connect.buchi.com
Destination port	443
Protocol	HTTPS (TLS 1.2)
Certificates	RSA 2048 bit, SHA-256
Server location	Ireland (operator: Amazon Web Services)

10.5.1 Counter data

- Duty hours of instruments in the system
- Number of starts in various modes
- Duty hours of instruments in the system
- Max. readings for temperature and current

10.5.2 Data configuration settings

Destination host	connect.buchi.com
Destination port	443
Protocol	HTTPS (TLS 1.2)
Certificates	RSA 2048 bit, SHA-256
Server location	Ireland (Operator: Amazon Web Services)

10.5.3 Data storage period

Permanent	System data (inc. date and time of last connection)
No more than 1 year after last use	Contact details (inc. date and time of last connection)
At least 24 hours, max. 48 hours	Status data Event data Process data

10.5.4 Device settings

- All settings that are displayed on the Settings menu of the interface

10.5.5 Error data

- Error number generated by instrument
- The time (UTC) at which the error occurred

10.5.6 Maintenance data

- All maintenance tests showing details of results and progression.

10.5.7 System configuration data

- System name
- Article numbers
- Serial number
- Firmware versions
- Parts list version
- Instruments installed in the system
- Sensors installed in the system

10.5.8 Distillation process data

- All process data that is required for running a distillation process (e.g. pressure, temperature, rotation speed)
- All data of the connected sensors in the system

10.5.9 Contact data

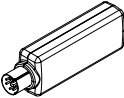


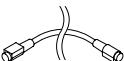
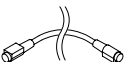
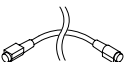
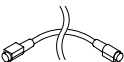
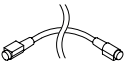


Only if a system owner has been defined

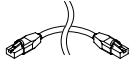
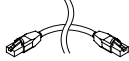
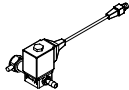
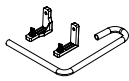
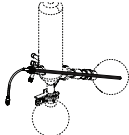
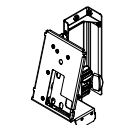
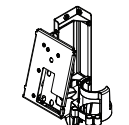
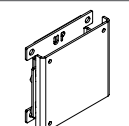
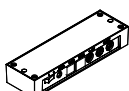

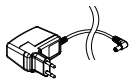
- First name
- Family name
- Country
- E-mail address
- Phone number
- Company
- Data protection and policy agreement for user
- Agreement regarding the sending of marketing material


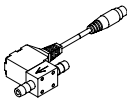

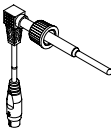

10.5.1 Location data

- 0**
- The coordinates of the mobile device.

11 Accessories

	Order no.	Image
BUCHI Bluetooth® Dongle, connects instrument to smartphone via Bluetooth®	11067770	
StatusLight cpl., incl. communication cable Indicates the status of the instrument (instrument is ready to use, has an error or is in operation).	11068959	
AutoDest sensor. Incl. cap nut, seal GL14 For automatic distillation. Measures temperature of cooling media and the vapor temperature. Vacuum is adjusted according to cooling capacity of condenser. Meant to be used with the Interface I-300 / I-300 Pro and glass assembly V, HP or S.	11059225	
Communication cable. BUCHI COM, 0.3 m, 6p Enables connection between Rotavapor® R-300 / R-220 Pro, Interface I-300 / I-300 Pro, Vacuum Pump V-300 / V-600, Recirculating Chiller F-3xx, VacuBox and LegacyBox.	11058705	
Communication cable. BUCHI COM, 0.9 m, 6p Enables connection between Rotavapor® R-300 / R-220 Pro, Interface I-300 / I-300 Pro, Vacuum Pump V-300 / V-600, Recirculating Chiller F-3xx, VacuBox and LegacyBox. Enables connection between Pure® C-900, C-106 Fraction Collector, C-107 UV Detector.	11070540	
Communication cable. BUCHI COM, 1.8 m, 6p Enables connection between Rotavapor® R-300 / R-220 Pro, Interface I-300 / I-300 Pro, Vacuum Pump V-300 / V-600, Recirculating Chiller F-3xx, VacuBox and LegacyBox.	11058707	
Communication cable. BUCHI COM, 5.0 m, 6p Enables connection between Rotavapor® R-300 / R-220 Pro, Interface I-300 / I-300 Pro, Vacuum Pump V-300 / V-600, Recirculating Chiller F-3xx, VacuBox and LegacyBox.	11058708	
Communication cable. BUCHI COM, 15 m, 6p Enables connection between Rotavapor®, Interface, Vacuum Pump, Recirculating Chiller, VacuBox and LegacyBox.	11064090	
Mini-DIN to DC-Jack, 300 mm Meant to be used with 1 Vacuum Pump V-300 and 2 evaporator systems with Interface I-300/I-300 Pro and Rotavapor® of older generations. Connection between VacuBox and power adapter of the Interface I-300/I-300 Pro.	11062266	
Communication cable. Mini-DIN, Y-piece, 2.0 m Meant to be used with 1 Vacuum Pump V-300 and 2 Rotavapor® systems with the Interface I-300/I-300 Pro. Connection between VacuBox and Vacuum Pump V-300.	11062255	

	Order no.	Image
Communication cable RJ45, 2 m Connection between vacuum controller/interface and recirculating chiller, vacuum controller/interface and vacuum pump or steam distillation unit and Eco titrator.	044989	
Communication cable. RJ45, 5 m Connection between vacuum controller/interface and recirculating chiller or vacuum controller/interface and vacuum pump.	11056240	
Cooling water valve. 24VAC Valve opens cooling water feed during distillation. Meant to be used with a vacuum controller/interface.	031356	
Fastening set. For VacuBox, incl. holder 2 pcs, tube Used to fasten VacuBox on the Vacuum Pump V-300 or V-600.	11062957	
Foam sensor. Incl. holder Prevents sample from foaming into the condenser by aeration of system temporarily. Meant to be used with the Interface I-300 / I-300 Pro.	11061167	
Holder. To fix interface on lab stand To fix Interface I-300 / I-300 Pro, VacuBox and LegacyBox on lab stand, Rotavapor® R-21x or Vacuum Pump V-7xx. Incl. support, fixing clamp.	11059021	
Holder, set. To fix Interface and Woulff bottle on lab stand To fix Interface I-300 / I-300 Pro, VacuBox, LegacyBox and Woulff bottle / valve unit on a lab stand, Rotavapor® R-21x or Vacuum Pump V-7xx. Incl. holder for Interface and Woulff bottle, 2 M4x8 screws.	11065362	
Holder. Wall mount, incl. support set To fasten Interface on wall.	11059132	
LegacyBox. Incl. accessory kit Interface between Interface I-300 / I-300 Pro (with VacuBox) to peripherals of older generations (Vacuum Pump V-7xx, Recirculating Chiller F-1xx).	11061166	
Level sensor. Incl. O-ring, cable, rubber band Prevents an overflow in the receiving flask of condenser/secondary condenser. Placed on receiving flask. Meant to be used with the Interface I-300 / I-300 Pro.	11060954	
Power adapter. 30 V, 30 W, frequency 50/60 Hz To power vacuum controller directly or to power interface via LegacyBox or VacuBox.	11060669	

	Order no.	Image
Stand. V stand with rod, 600 mm Used as a holder for interface or vacuum controller when they cannot be mounted on a peripheral or wall.	048891	
Vacuum valve. Magnetic valve, 24V/4W, Mini-DIN, 1.5 m Flow valve without flask, meant to be used with a centralized vacuum source or an unregulated vacuum pump. Meant to be used with the Interface I-300 /I -300 Pro.	11060706	
Valve unit. Incl. Woulff bottle, 125 mL, P+G, holder Magnetic valve, meant to be used with the Interface I-300/ I-300 Pro. For operation with non-BUCHI vacuum pumps or house vacuum.	11061887	
Vapor temperature sensor. Incl. cap nut, seal GL14 Measures the vapor temperature inside the system. Meant to be used with the Interface I-300 / I-300 Pro.	11060707	
Woulff bottle. 125 mL, P+G, incl. holder For trapping particles and droplets and for pressure equalization.	11059905	

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