Interface I–300

Operation Manual

Imprint

Contents

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 device. 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	Symbol	Meaning
⚠	General warning	⚠	Corrosive substance
⚡	Dangerous electrical voltage	🔥	Flammable substance
☣	Biological hazard	EX	Potentially explosive atmosphere
⚠	Breakable items	⚠	Dangerous gases
♨	Hot surface	✖	Health-harming or irritant substances

Symbol	Meaning	Symbol	Meaning
⚠	Risk of hand injury	⚠	Strong magnetism

1.2.2 Mark-ups and symbols

ℹ 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
Window	Software Windows are marked-up like this.
Tab	Tabs are marked-up like this.
Dialog	Dialogs are marked-up like this.
[Button]	Buttons are marked-up like this.
[Field names]	Field names are marked-up like this.
[Menu / Menu item]	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]* 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]* 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 Chapter 2.1 "Intended use", page 8 and any application that does not comply with the technical specifications (see Chapter 3.6 "Technical data", page 23) 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 device 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 device.
- 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 device.

Operator

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

- The device 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 device 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 device has been developed and manufactured using the latest technological advances. Nevertheless, risks to persons, property or the environment can arise if the device is used incorrectly.
Appropriate warnings in this manual serve to alert the user to these residual dangers.

2.4.1 Faults during operation

If a device is damaged, sharp edges, moving parts or exposed electrical wires can cause injuries.
▶ Regularly check device for visible damage.
▶ If faults occur, switch off the device immediately, unplug the power cord and inform the operator.
▶ Do not continue to use devices 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 may impair safety and lead to accidents.
▶ Use only genuine BUCHI accessories, spare parts and consumables.
▶ Technical modifications to the device or accessories should only be carried out with the prior written approval of BÜCHI Labortechnik AG and only by authorized BUCHI technicians.

BUCHI accepts no liability whatsoever for damage arising as a result of unauthorized modifications.

3   Product description

3.1   Description of function

The *[Interface I-300]* is designed for indicating, adjusting and controlling the complete distillation system. The Interface I-300 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[1]		X		

* Option
[1] Interface I-300 Pro only

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 68

3.3 Configuration

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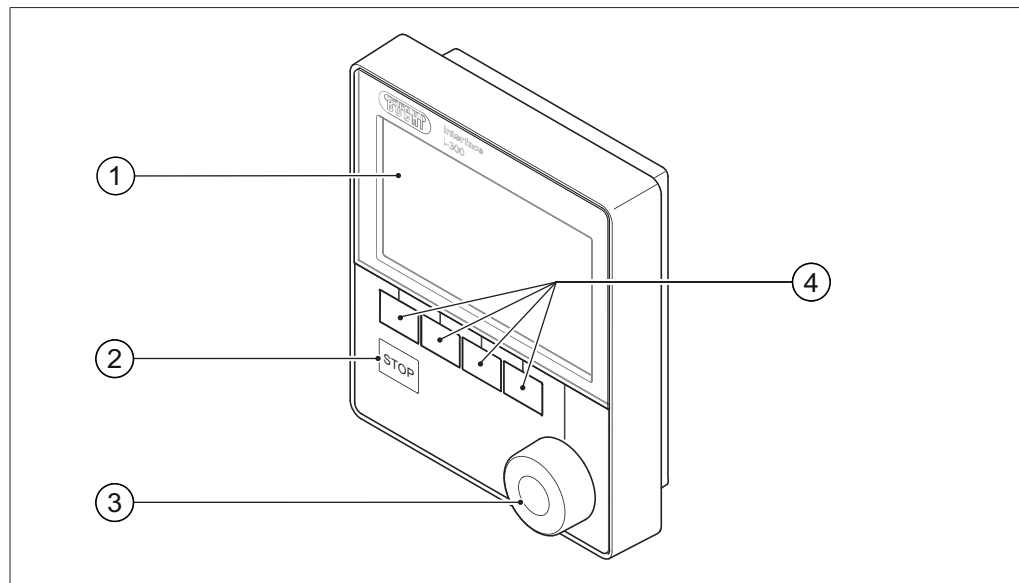
Fig. 1: Front view of Interface I-300

1	Display	3	Navigation control
2	STOP button (emergency stop)	4	Function buttons

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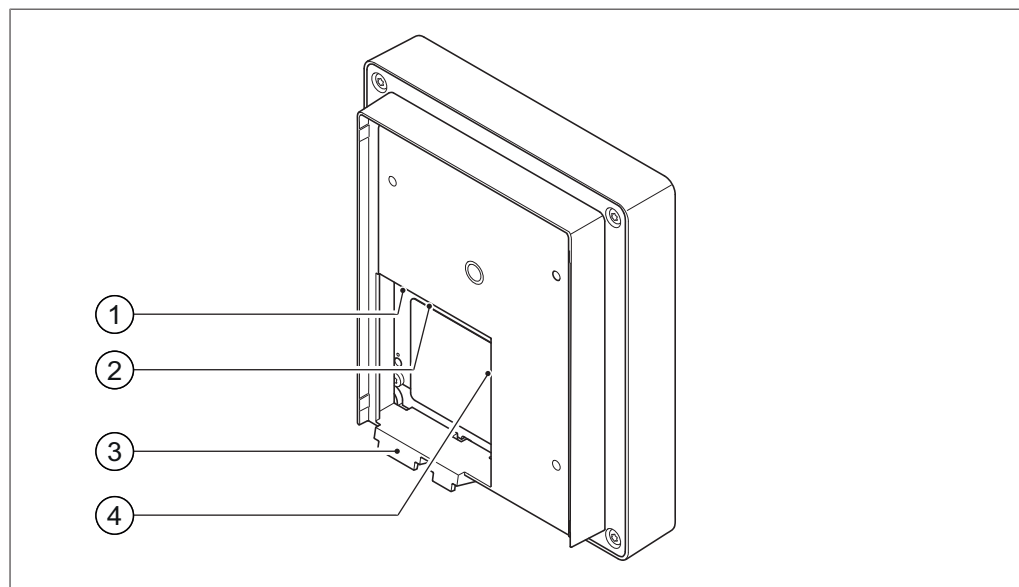
Fig. 2: Rear view of Interface I-300

1	LAN port	3	Locating lug for bracket
2	Standard BUCHI communication port (COM)	4	MicroSD card (not used)

3.3.3   VacuBox (connections)

Other BUCHI laboratory equipment is connected to the *[Interface I-300]* 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 33.
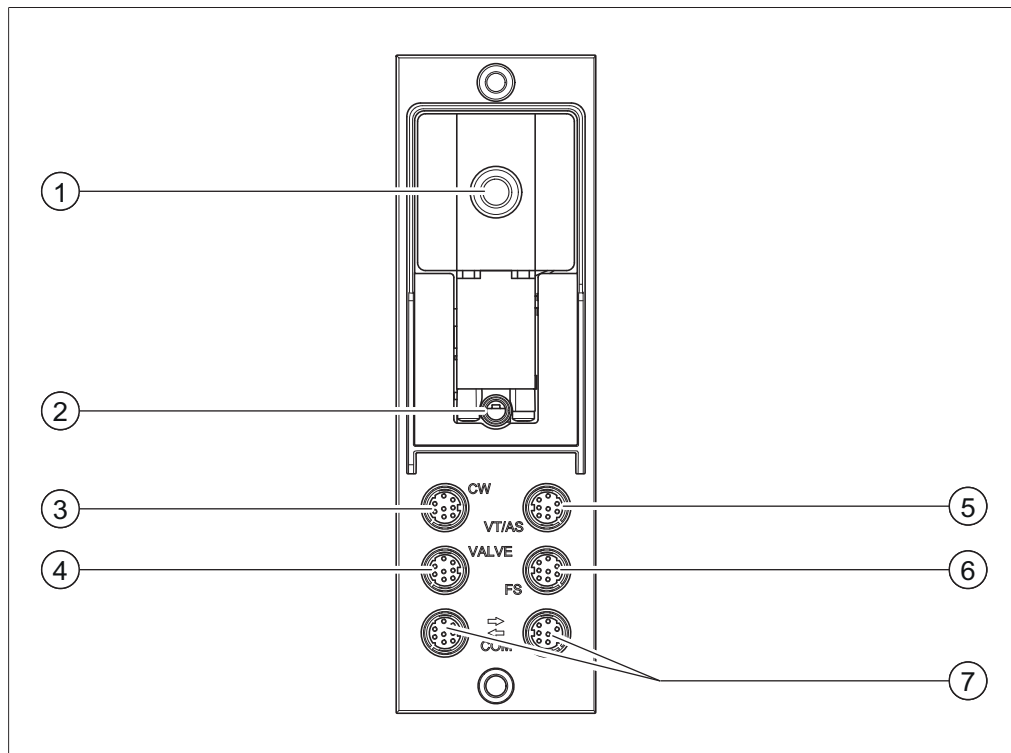
Fig. 3: Connections on the VacuBox

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)		

3.3.4   LegacyBox (connections)

Connection of a LegacyBox is required whenever legacy BUCHI laboratory equipment is to be controlled via the *[Interface I-300]*. 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.
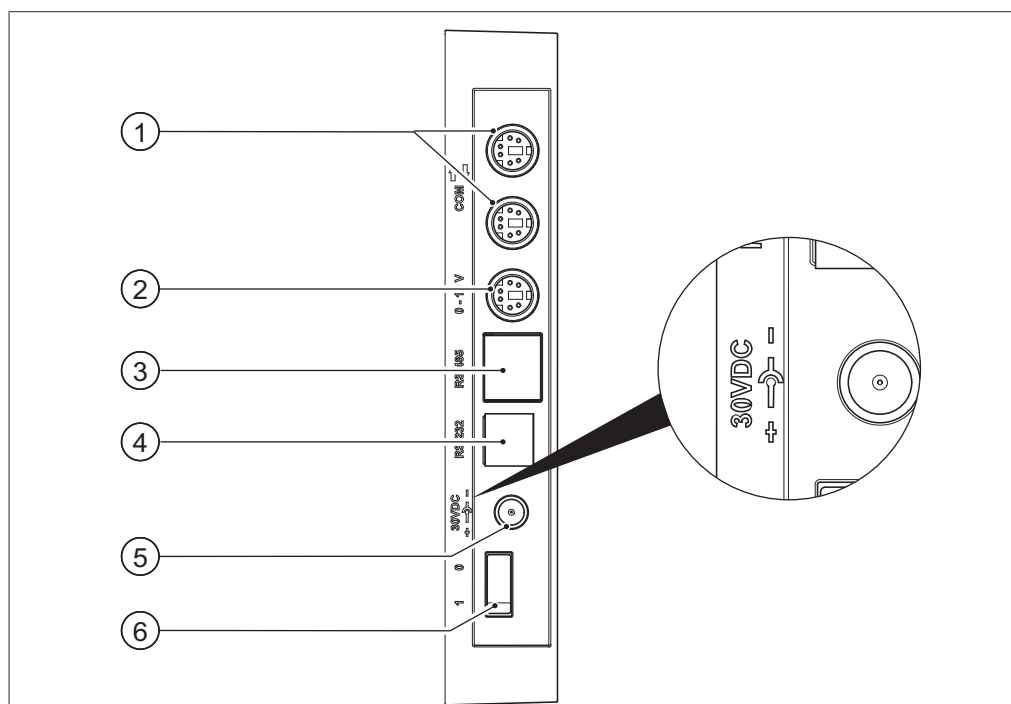
Fig. 4: Connections on the LegacyBox

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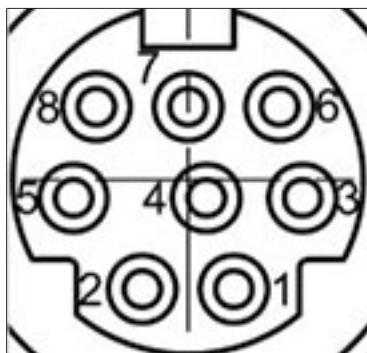
Fig. 5: 8-pin MiniDin pin assignment, view of socket

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

3.3.5   Display (touch-screen)
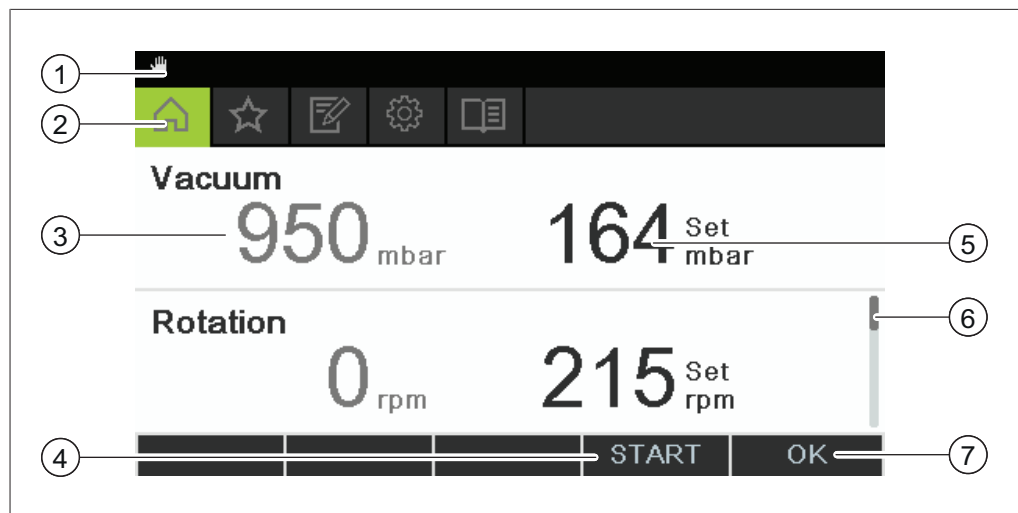
Fig. 6: Display layout

1   Status bar   5   Current setting (e.g. vacuum)

2   Menu bar   6   Scroll bar

3   Current reading (e.g. vacuum)   7   Function activated if navigation con-
                                                 trol is pressed

4   Functions of the function buttons be-
     low (context-dependent)

3.3.6 Type plate

The type plate is on the rear of the *[Interface I-300]*.
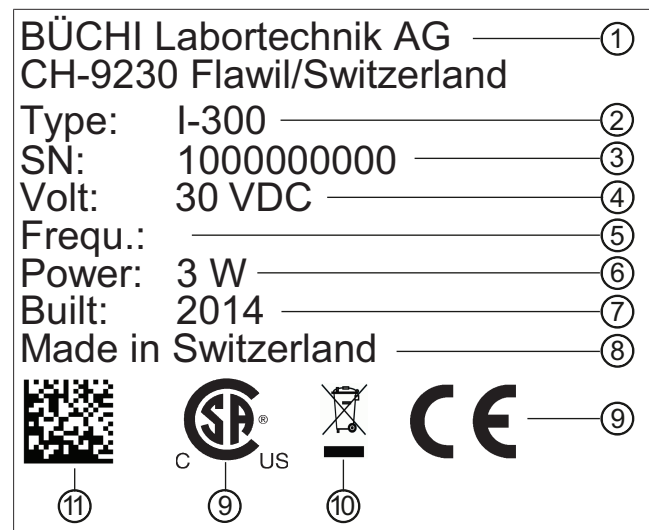
Fig. 7: Type plate (example)

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.

3.4 Navigating through the menu system

3.4.1 Menu bar

The menus are represented by symbols on the menu bar. Navigation through the menus is by the input controls.
The following menus are available:

Symbol	Meaning	Sub-items
	Home screen	• Process control parameters • Graphs
	Favorites	• Bookmarks for frequently used individual starting points

Symbol	Meaning	Sub-items
	Operating modes	- Manual - Timer - Continuous pumping - AutoDest - Drying
	Configuration	- Maintenance - Settings - BUCHI Cloud Services - Service - System information
	Libraries	- Solvent library - Wearing parts - Startup info

3.4.2 Favorites menu

For creating favorites. See Creating favorites

3.4.3 Operating modes menu

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

Operating mode	Purpose	Content
[Manual]	Carrying out distillation with manually set parameters	See Chapter 6.2.3 "Executing Manual mode", page 44
[Timer]	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 47
[Continuous pumping]	Drying the system after distillation	See Chapter 6.2.5 "Executing Continuous Pumping mode", page 50
[AutoDest]	Carrying out automatic single or multi-stage distillation with specified settings for the vacuum continuously adjusted by the system	See Chapter 6.2.6 "Performing automatic distillation", page 52

Operating mode	Purpose	Content
[Drying]	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 55

3.4.4   Configuration menu

The *[Configuration]* menu contains the following submenus:

- Maintenance see Maintenance submenu
- Settings see Settings submenu
- BUCHI Cloud Services see Chapter "BUCHI Cloud Services submenu ", page 21
- System information see System Information submenu

Maintenance submenu

The submenu *[Maintenance]* contains the following actions:

Action	Option	Explanation
[Leak test]	START	For carrying out a leak test on the distillation system
[Seal servicing]	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
[On finish: lift out flask]	On/Off	Evaporating flask is automatically lifted out of the heating bath after automatic or manual termination of distillation.
[On finish: stop heating]	On/Off	Heating of heating bath stops after automatic or manual termination of distillation.
[On finish: stop cooling]	On/Off	The Recirculating Chiller F-3xx automatically switches off after automatic or manual termination of distillation.
[On finish: play sound]	On/Off	An audible signal is sounded after automatic or manual termination of distillation.
[Pressure hysteresis]	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.
[Language]	Choice of language used for Interface display	English, Deutsch, Francais, Italiano, Espanol, Russian, Portugues, Japanese, Chinese, Indonesian, Korean
[Button tone]	On/Off	A beep sounds when a function button or the navigation control is pressed.
[Seal servicing information]	On/Off	The interface shows information about regular servicing of the system seals. The message appears periodically after every 500 hours of rotation.
[Temperature unit]	Choice of unit for indication of temperatures	°C (Celsius), °F (Fahrenheit) or K (Kelvin)
[Pressure Unit]	Choice of unit for indication of (negative) pressure	hPa (hectopascals), mbar (millibars), torr (= mmHg), mmHg (millimeters of mercury)
[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 %.
[eco mode]	On/Off and entry of figures	See Chapter 6.4 "Activating eco mode", page 58

Action	Option	Explanation
[Reduced view]	On/Off	Reduced number of parameters on the home screen.
[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
[System owner]	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 *"BUCHI Cloud and Monitoring Services Quick Guide"*
[eSupport]	Status	Shows the status of an eSupport request. See Chapter 8.4 "eSupport", page 68

submenu Service

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

Action	Option	Content
[Calibrate AutoDest sensor]	Perform calibration	Calibration sequence between the two condenser sensors. Precondition: the two condenser sensors are at the same temperature. See Chapter 7.6 "Calibrating AutoDest sensor", page 63.
[Pressure offset]	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 7.7.1 "Offset calibration", page 65.

Action	Option	Content
[Pressure calibration]	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 7.7.2 "Simple calibration", page 65.
[Load factory calibration]	Calibration reset	The current pressure sensor calibration data is overwritten by the factory calibration settings. See Chapter 7.7.3 "Loading factory calibration", page 66.

System Information submenu

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

3.4.5   Libraries menu

Action	Option	Explanation
[Solvent library]	Select	The solvent library itemizes the commonly used solvents in alphabetical order.
[Wearing parts]	View	Shows a list of wearing parts.
[Startup info]	View	Shows the home screen.

3.4.6   Symbols on the status bar

Symbol	Status
✋	Manual distillation
〰	Distillation using a method
↺	Drying
Ⓐ	AutoDest distillation
∴	Distillation running
↻	Continuous pumping
⇄	The instrument is connected to the BUCHI Cloud.
⧖	Timed distillation

Symbol	Status
	For checking vacuum seal See Chapter 7.3 "Checking vacuum seal", page 62

3.5   Scope of delivery

NOTE

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

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

3.6   Technical data

3.6.1   Interface

Specification	Interface I-300
Dimensions (W x D x H) Interface	121 x 50 x 141 mm
Dimensions (W x D x H) Shipping box	300 x 85 x 340 mm
Weight	400 g
Power consumption	3 W
Power supply voltage	30 VDC ± 5 %
Display	
Protection class	IP21
Approvals	CE / CSA

3.6.2   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	± 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

	VacuBox	LegacyBox
Power connections / output voltage	30 VDC ± 5 %	30 VDC ± 5 %
Hysteresis	Automatic or 1 - 200 mbar	Automatic or 1 - 200 mbar
Protection class	IP 21	IP 21
Approvals	CE / CSA	CE / CSA

3.6.3 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.

3.6.4 Materials

Component	Material
Pressure foil	Polyester
Casing	PBT
Vent tube connection	PPS
Pressure sensor	Al_2O_3 96%

4   Transport and storage

4.1   Transport

⚠️	**NOTICE**

Risk of breakage due to incorrect transportation

▶ Make sure that all parts of the device 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 device 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 3.6 "Technical data", page 23).

▶ 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 5.1.3 "Mounting interface unit on laboratory stand (optional accessory)", page 29.

5.1.1   Mounting interface on Rotavapor R-300

The *[Interface I-300]* can be mounted and connected up on the vertically adjustable arm of the Rotavapor R-300.
Tools required: Torx keys Tx20 and Tx30
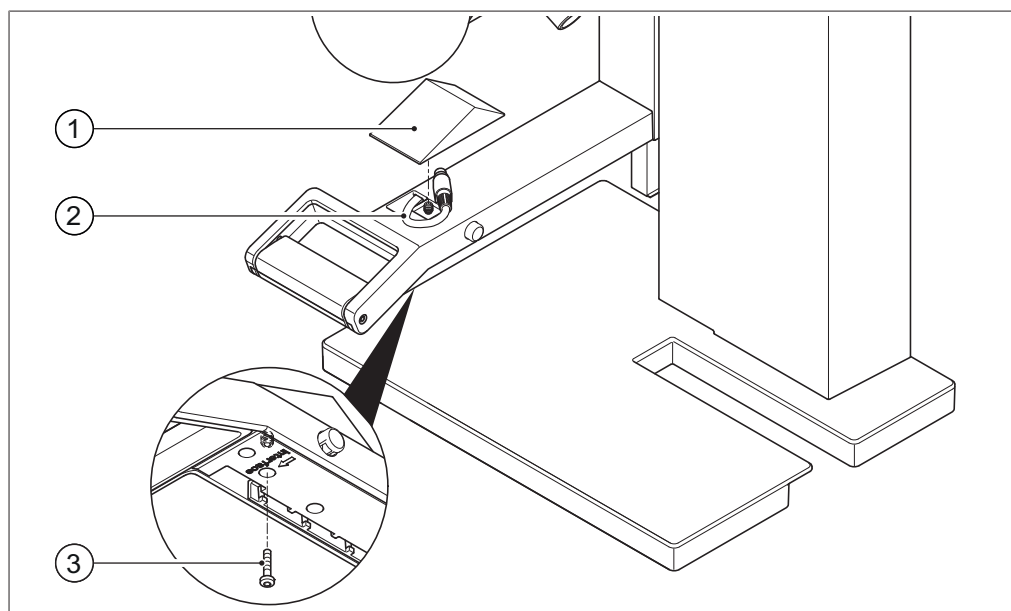
Fig. 8: Handle of Rotavapor R-300

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.
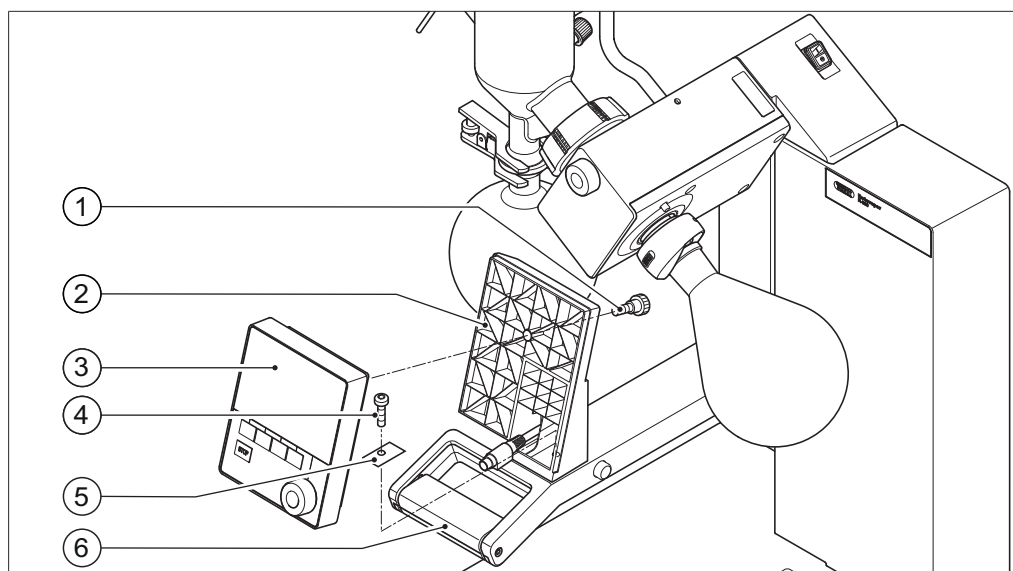
Fig. 9: Fitting the holder and interface unit on the handle

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
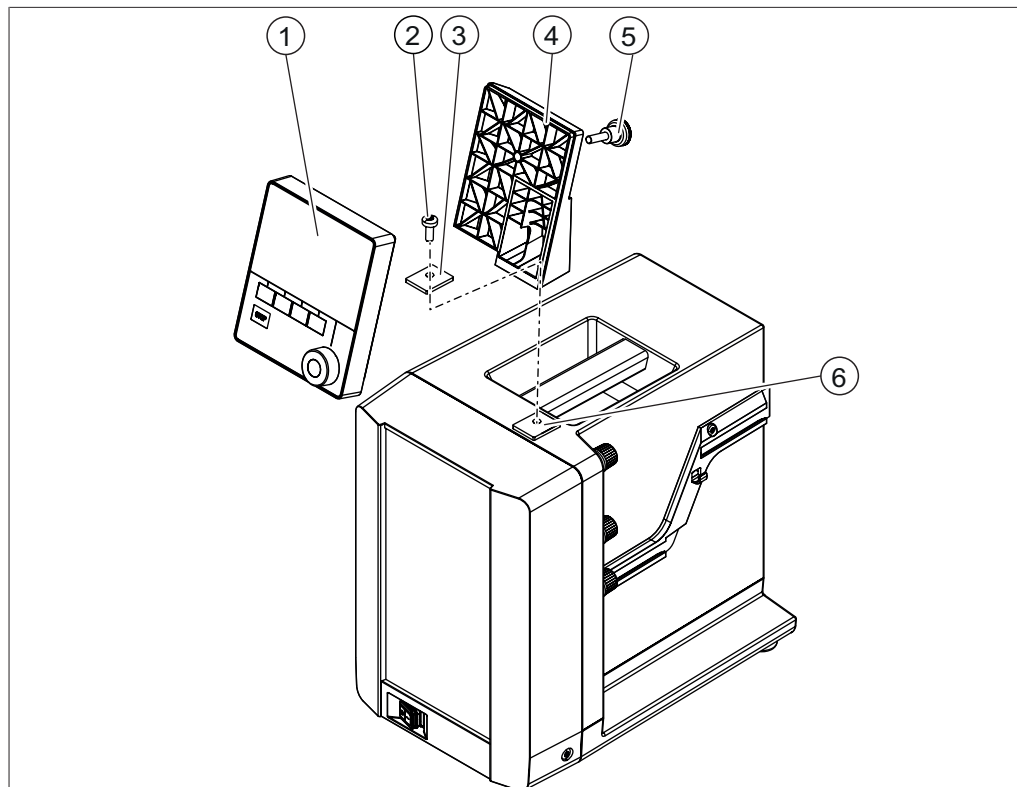
Fig. 10: Fitting interface unit on Vacuum Pump V-300

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]* 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 laboratory stand (optional accessory)
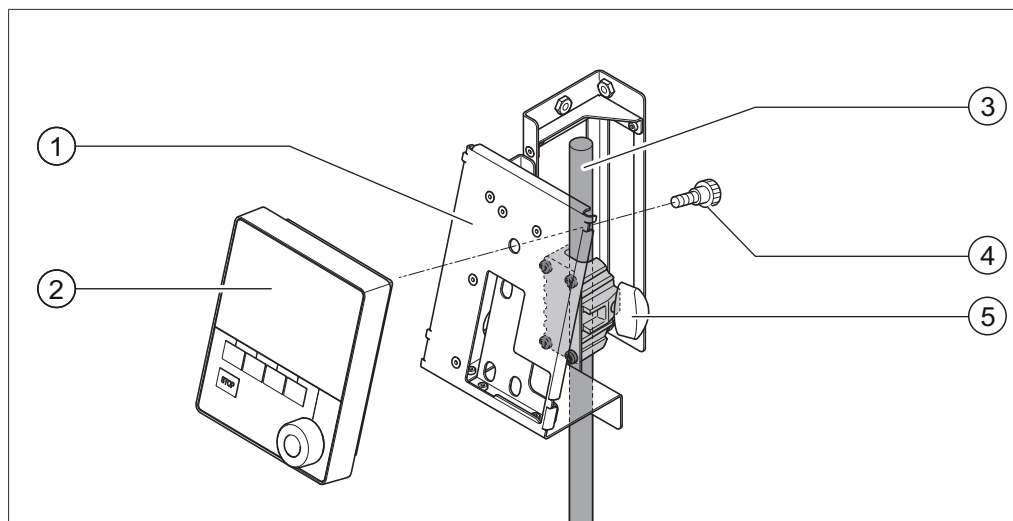
Fig. 11: Mounting interface unit on laboratory stand

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

The *[Interface I-300]* 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).

5.1.4   Mounting interface unit on a wall bracket (optional accessory)
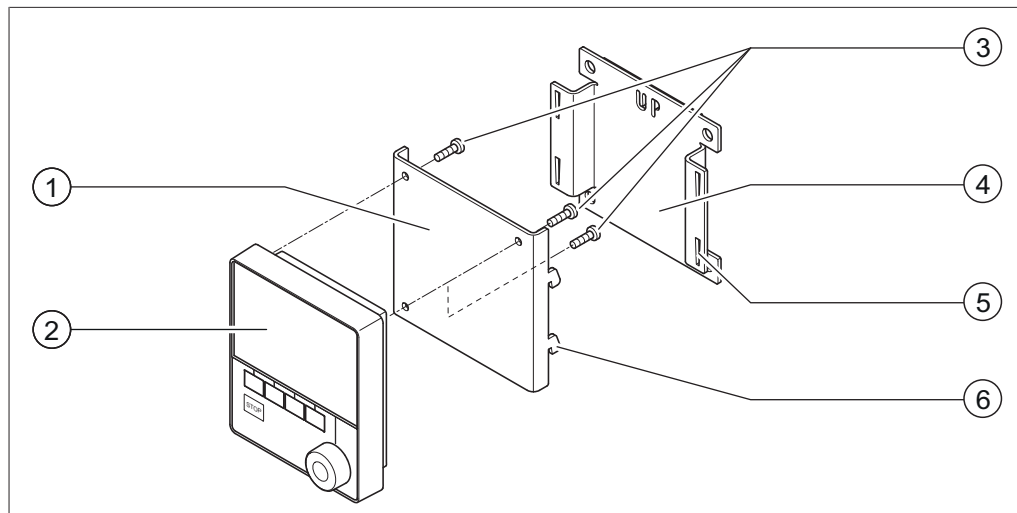
Fig. 12: Two-piece wall bracket for interface unit

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]* 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 unit

In order to use the Interface I-300/I-300 Pro to best effect, we recommend that it is used together with the following devices:
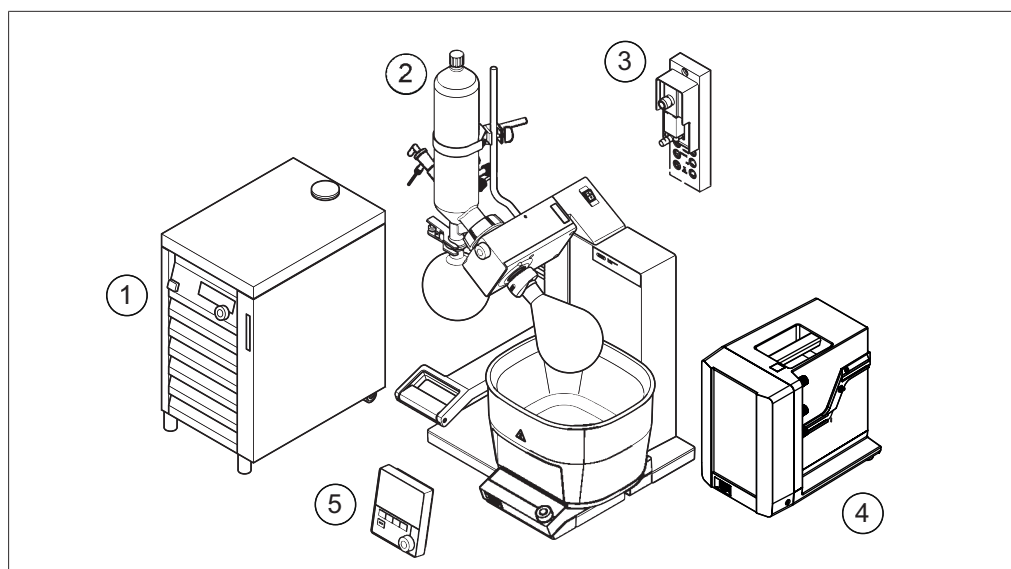
Fig. 13: Typical application (example)

1	Recirculating Chiller F-3xx	4	Vacuum Pump V-300
2	Rotavapor R-300 with heating bath B-305 or B-301	5	Interface I-300
3	VacuBox		

The F-3xx is a recirculating chiller with a sealed circulation system. It is available in various capacity ratings.

The Interface I-300/I-300 Pro together with the VacuBox can be used to control and monitor the vacuum. It can control the Rotavapor, the Vacuum Pump V-300 and the Recirculating Chiller F-3xx.

The Vacuum Pump V-300 is a diaphragm pump designed for evacuating laboratory apparatus. It can be operated either as a standalone device or combined with optional accessories such as an interface unit and a secondary condenser to form a complete vacuum system. 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 34.

Data communication between the laboratory equipment takes place via the communication ports. See Chapter 5.2.3 "Overview: Setting up communication connections (COM)", page 33.

The coolant circulates around the distillation system through a separate circulation system. See Overview: setting up coolant tubing connections.

5.2.1 Connecting communication cables to interface unit

The communication connections between the Interface I-300, the VacuBox and the other BUCHI laboratory equipment are established using the standard BUCHI communication cable (with green connector). 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 see Chapter 3.3.2 "Rear view", page 12.
- For connection options on the VacuBox see Chapter 3.3.3 "VacuBox (connections)", page 13.

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.
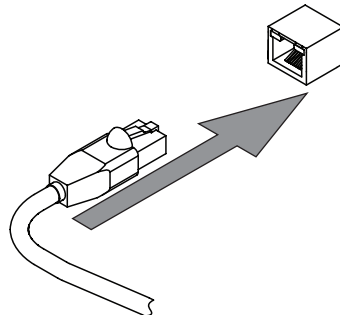
Navigation path

➜   ⚙   ➜ *[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.

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.
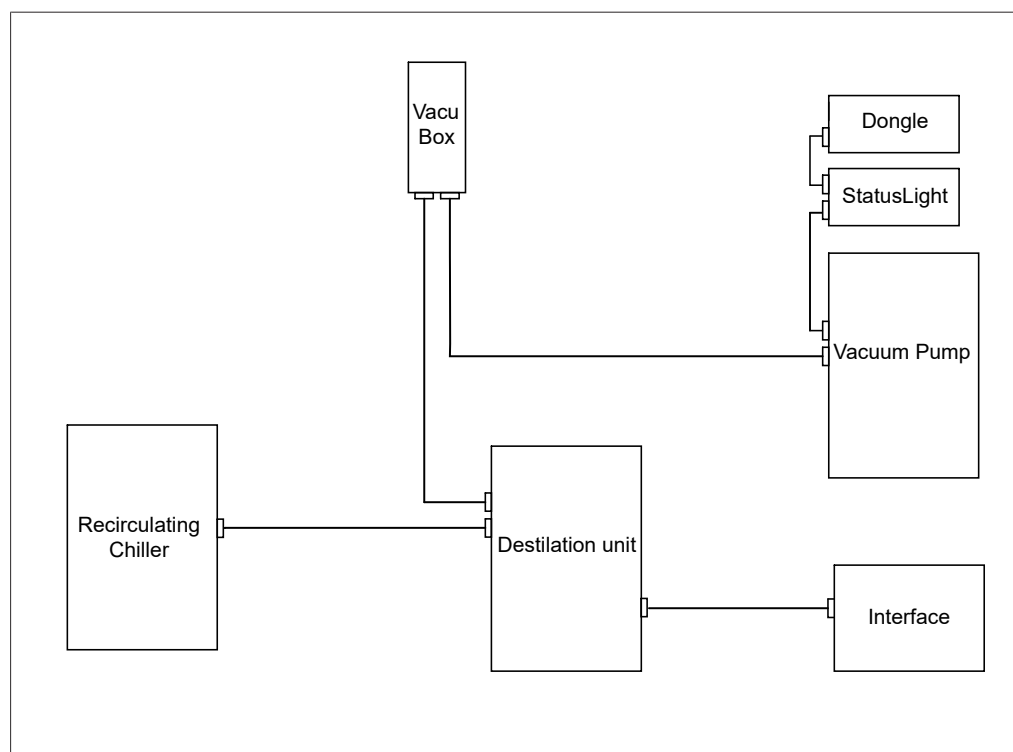
Fig. 14: Schematic diagram of communication connections between the BUCHI laboratory equipment (example)

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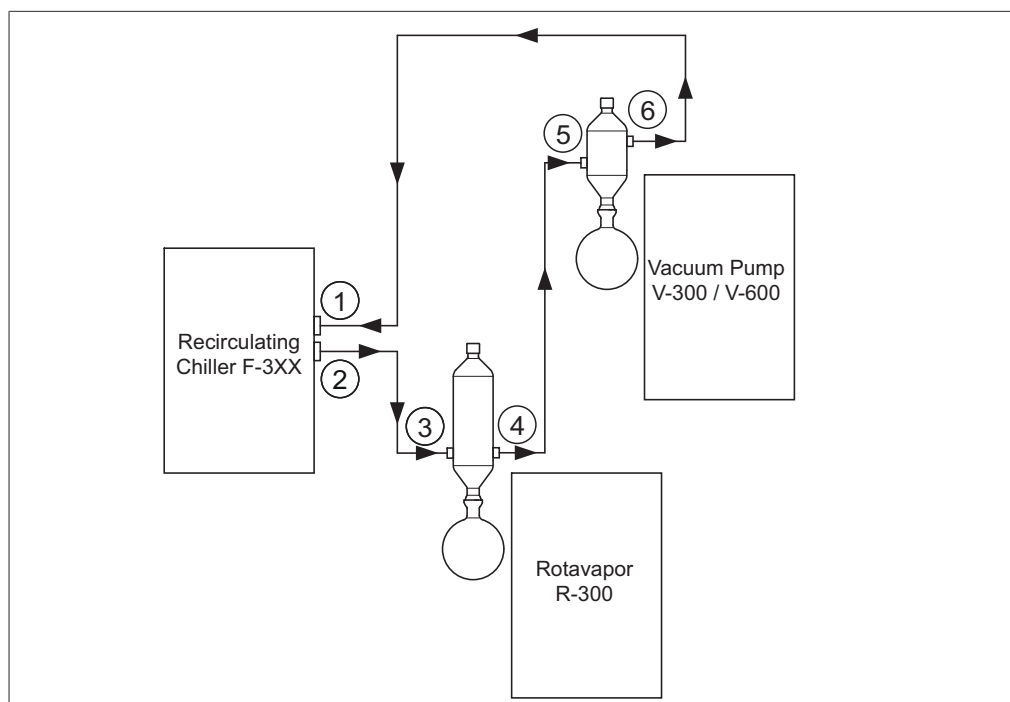
Fig. 15: Coolant tubing connections in a BUCHI distillation system (example)

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).

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.
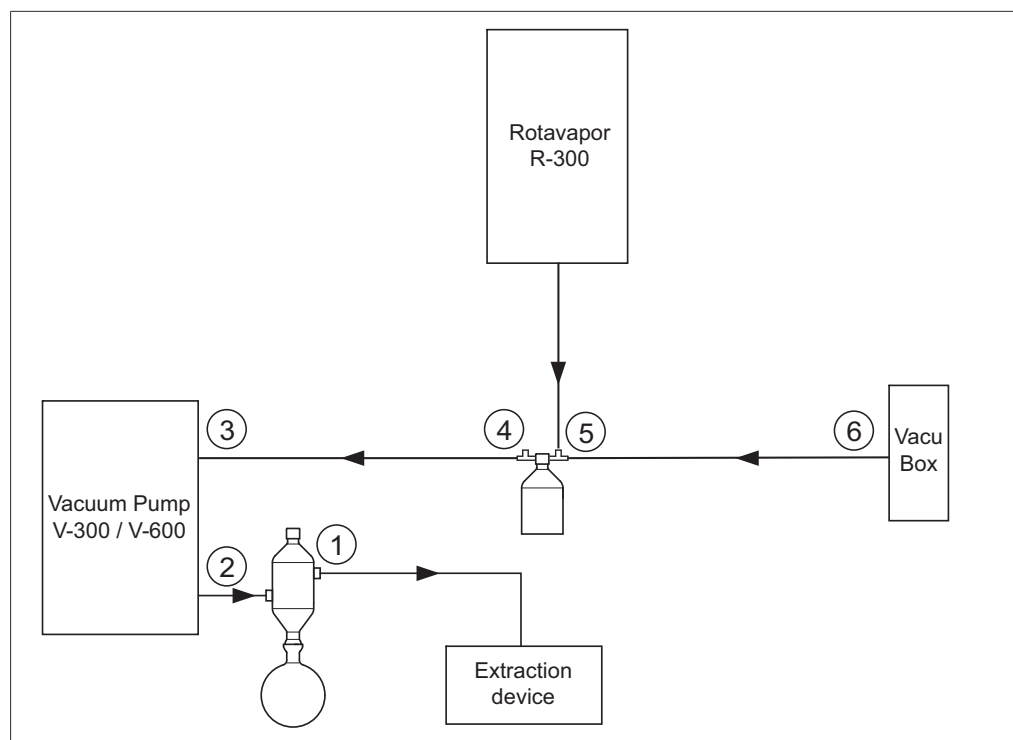
Fig. 16: Coolant tubing connections in a BUCHI distillation system

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.

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
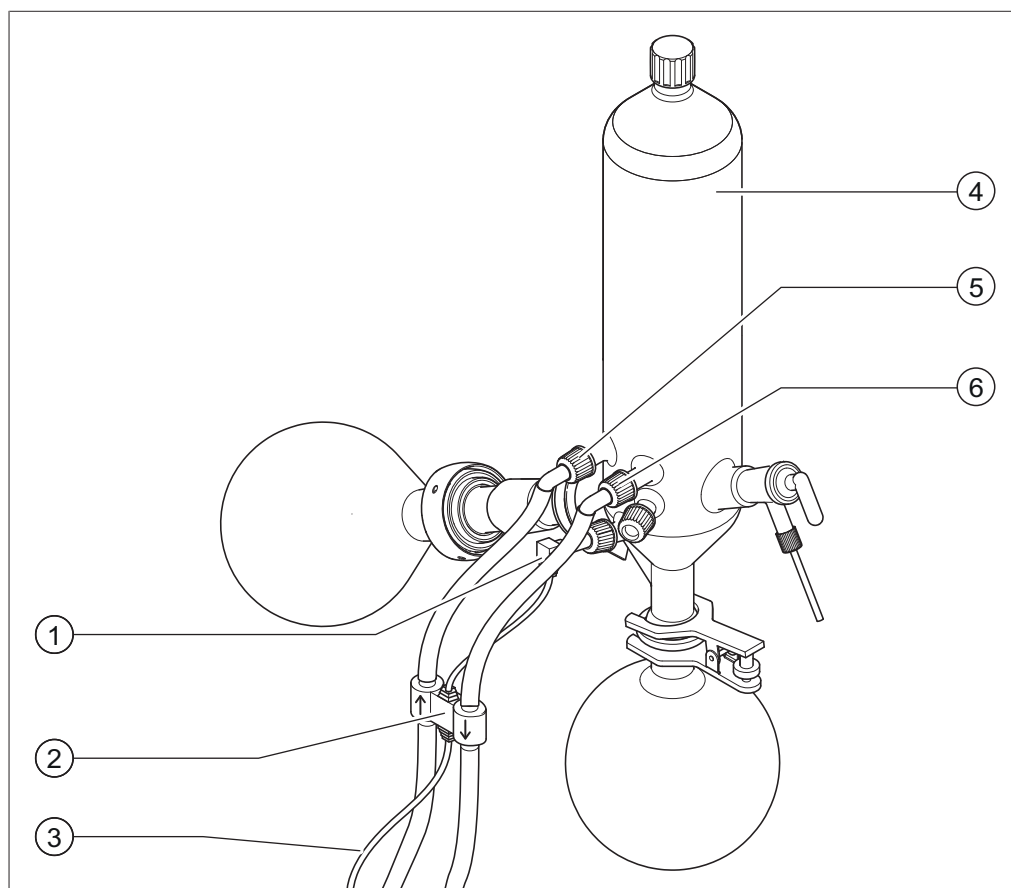
Fig. 17: AutoDest sensor, vapor temperature sensor and cooling condenser with evaporating flask and receiving flask of a Rotavapor R-300

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 3.3.3 "VacuBox (connections)", page 13.

> **NOTICE**
>
> **Risk of heat damage to electronic components**
>
> ▶ Only use the foam sensor at vapor temperatures up to 85 °C.
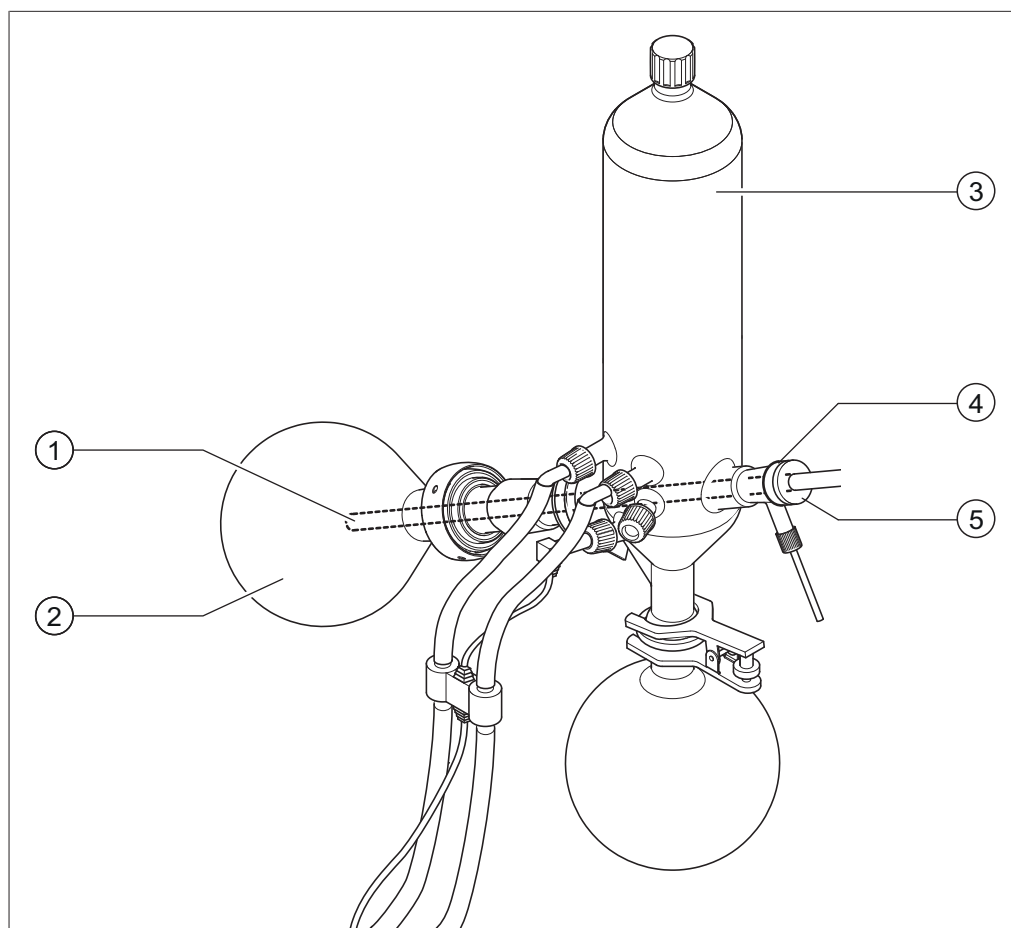
Fig. 18: Foam sensor in the evaporation unit of a Rotavapor R-300

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 3.3.3 "VacuBox (connections)", page 13.

NOTE

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 drip catcher of the cooling condenser. The tip of the washer should point downwards.

5.5   Connecting valve unit for external vacuum

The *[Interface I-300]* can be used together with the VacuBox to control an external vacuum. That requires the use of a vacuum valve and a mains power supply adaptor. For precise control of the vacuum, the use of a Woulff bottle is also recommended. The interface unit and the VacuBox can be mounted on a laboratory stand, see Chapter 5.1.3 "Mounting interface unit on laboratory stand (optional accessory)", page 29.

▶ Connect the vacuum valve to the VacuBox using 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 external power supply by means of the mains adaptor.

NOTE

To adjust the regulation accuracy, the hysteresis can be altered on the interface unit, see Chapter 6.5 "Setting hysteresis", page 59.

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 32) 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

The main menu icons are shown in the top menu bar on the display. 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.
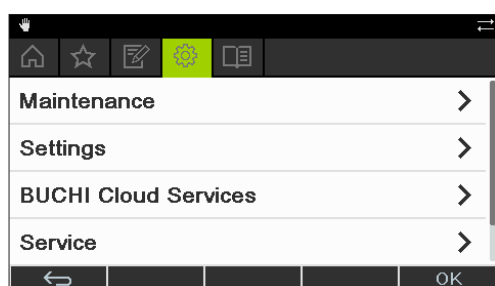
Fig. 19: Opening the menu on the Interface I-300

▶ 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.
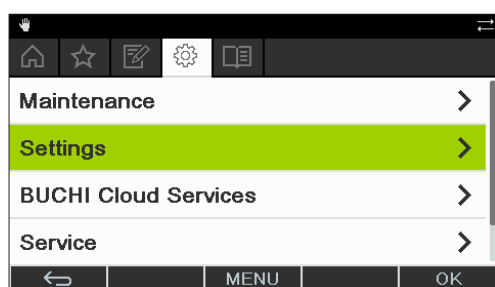
⇨ The display shows the desired submenu on the next menu level down.

▶ 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 offers the facility for manually setting various parameters. The parameters are shown on the home screen of the interface unit. Rotating the navigation control selects each parameter in turn. The currently selected parameter is highlighted in green.
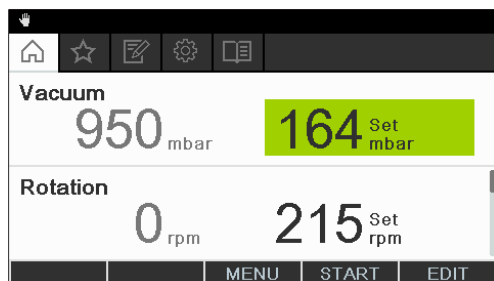
Fig. 21: Entering the settings

▶   Use the navigation control to select the desired parameter.
▶   Press the navigation control to choose EDIT and confirm the selection.
⇨   The selected figure is shown in inverse type and the word "Set" flashes.
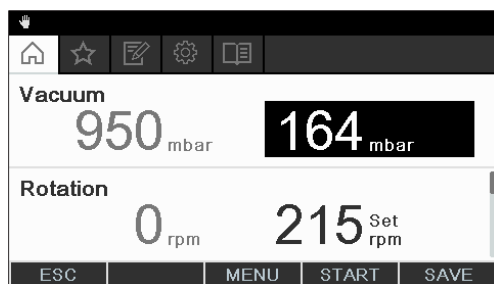
Fig. 22: Edited parameter shown in inverse type

▶   To increase or decrease the figure, turn the navigation control clockwise or counter-clockwise.
▶   Press the navigation control to choose SAVE and save the setting.
⇨   The new parameter setting is shown highlighted in green again.

6.1.3   Changing settings

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

▶   Use the navigation control to select the desired setting, see Chapter 6.1.1 "Selecting menu items", page 40.
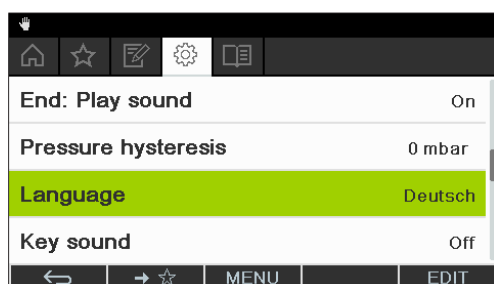
Fig. 23: Example of a setting

▶   Press the navigation control to choose EDIT and confirm the selection.
⇨   The options for the setting are shown.

▶ To select an option, turn the navigation control. A green bar appears next to the selected option.
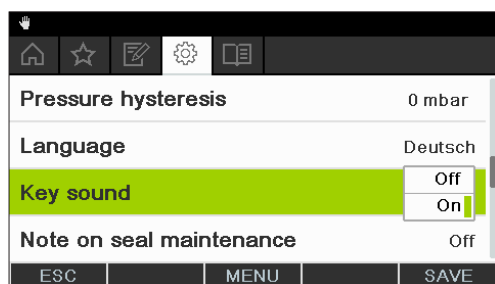
Fig. 24: Options for the setting

▶ Press the navigation control to choose SAVE and save the selected option.

6.2 Performing distillation

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

Operating mode	
[Manual]	See Performing manual distillation
[Timer]	See Performing timer-controlled distillation
[Continuous pumping]	See Chapter 6.2.5 "Executing Continuous Pumping mode", page 50
[AutoDest]	See Performing automatic distillation
[Drying]	See Chapter 6.2.7 "Executing Drying mode", page 55

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
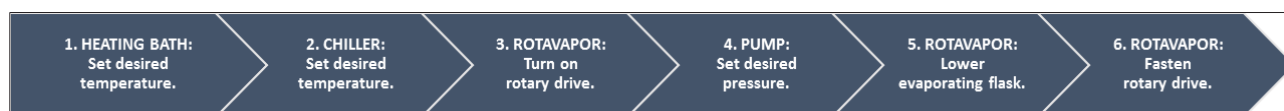
Step	Component	Action
1	Heating bath	Set the required temperature and start the heating bath.
2	Recirculating chiller	Set the required temperature and start the recirculating chiller.
3	Rotavapor	Start rotation at a slow speed.

Step	Component	Action
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

| 1. PUMP / VALVE UNIT: Turn off vacuum pump. Close valve unit. | 2. INTERFACE: Vent Rotavapor | 3. ROTAVAPOR: Slow down rotation. | 4. ROTAVAPOR: Lift out evaporating flask. | 5. ROTAVAPOR: Stop rotation | 5. HEATING BATH: Stop heating. | 6. CHILLER: Stop chilling. |

Step	Component	Action
1	Vacuum pump/Valve unit	Stop pressure regulation.
2	Interface unit	Vent the system (AERATE).
	Rotavapor	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	Stop cooling (OFF).
	Recirculating chiller	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.

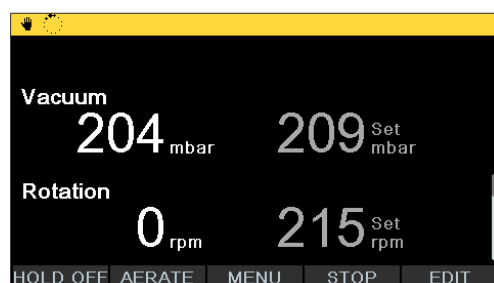⇨ While venting is active, the status bar is shown in yellow on the display.

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.
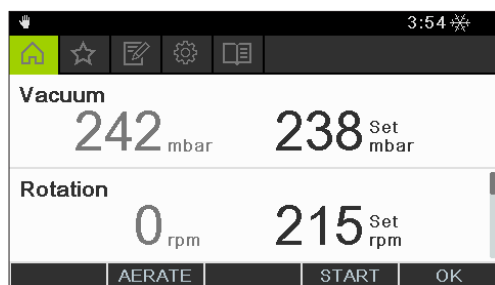

Fig. 26: Home screen after completion of distillation

▶ 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 ❄OFF.

⇨ 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
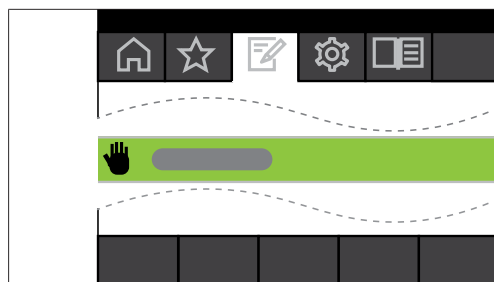
➔ Operating modes ➔ Manual

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 40.

⇨ The display shows the home screen with the symbol for manual distillation in the status bar.
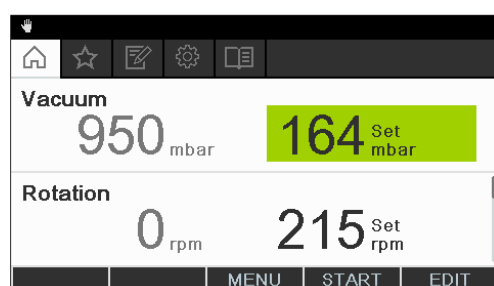
Fig. 28: Home screen showing *[Manual]* symbol

▶ 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
• Specified setting for vacuum • Actual reading for current pressure in distillation system	VacuBox (e.g. with Vacuum Pump V-300/V-600)
• Actual reading and specified setting for rotation speed (evaporating flask)	Rotavapor R-300
• 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

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 40.

⇨ The display shows the selected parameter setting highlighted in inverse type.
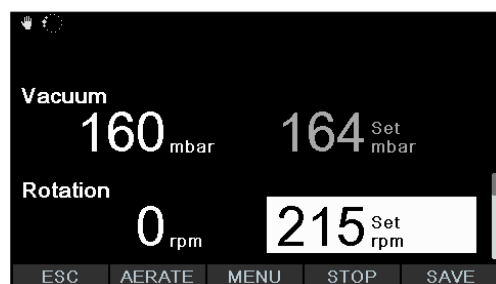
Fig. 30: Editing parameters while distillation is in progress

▶ 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 40.

⇨ The display shows the home screen with the symbol for timer-controlled distillation in the status bar.
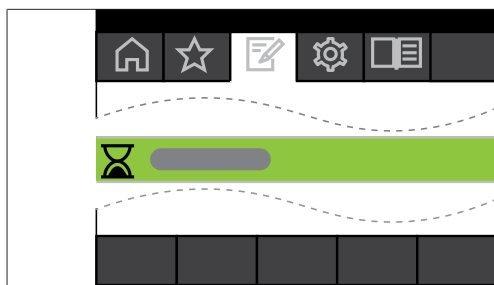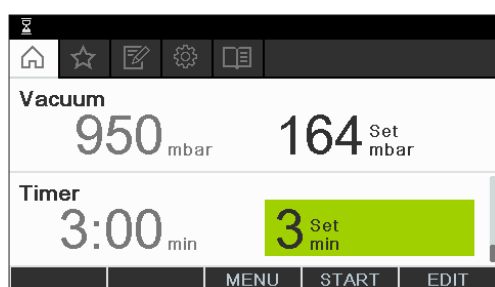

Fig. 32: *[Timer]* screen showing timer setting highlighted in green

▶ 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
• Specified setting for vacuum • Actual reading for current pressure in distillation system	VacuBox (e.g. with Vacuum Pump V-300/V-600)
• Actual reading and specified setting for rotation speed (evaporating flask)	Rotavapor R-300
• 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)	

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.
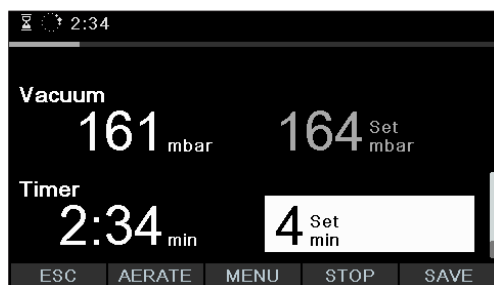
Fig. 34: Editing parameters while distillation is in progress

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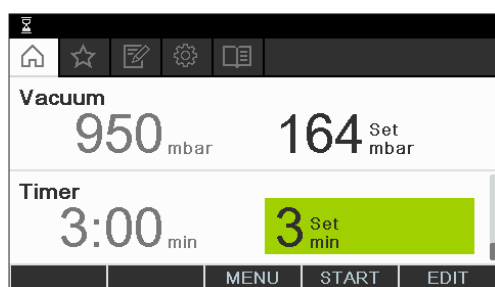
Fig. 36: "Timer" screen after completion of distillation

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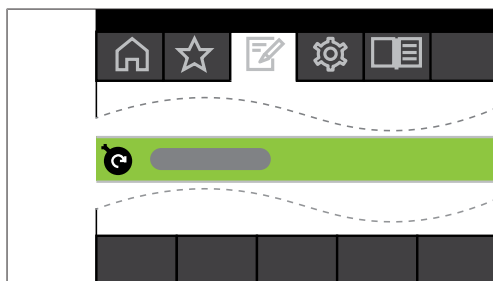
Fig. 37: Selecting the option *[Continuous pumping]* on the *Operating modes* menu

▶ Navigate to the *Operating modes* menu and select the menu item *[Continuous pumping]*, see Chapter 6.1 "Navigating the menu", page 40.

⇨ 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.

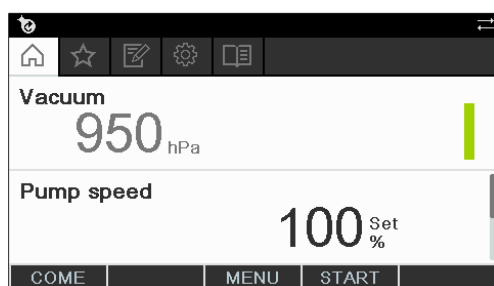▶ Select and edit the settings for individual process parameters as necessary.
▶ Press the function button **START** to start the drying process.
⇨ The drying process continues running until it is stopped manually.
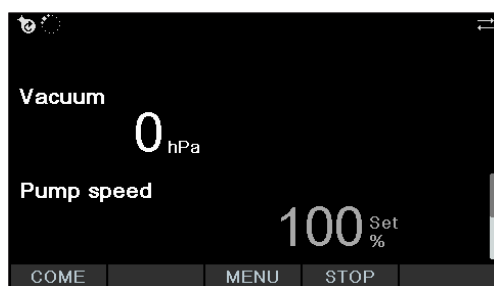
Fig. 39: Continuous pumping for drying the system started

▶ 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)
• Actual reading and specified setting for rotation speed (evaporating flask)	Rotavapor R-300
• 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

Parameters and readings	Equipment possibly required
• Actual reading for vapor temperature	AutoDest sensor or vapor temperature sensor

NOTE

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

6.2.6   Performing automatic distillation

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 36) 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. In particular, check the setting for immersion of the evaporating flask at the start of the distillation process.

Navigation path

➜ Operating modes ➜ AutoDest

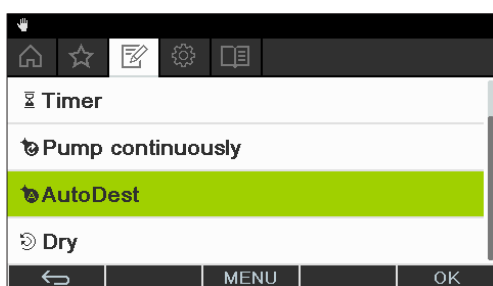Fig. 40: Selecting "AutoDest" on the submenu "Operating modes"

Precondition:

☑ An AutoDest sensor has been installed and calibrated, see Chapter 7.6 "Calibrating AutoDest sensor", page 63.

▶ Navigate to the "Operating modes" screen and select the menu item "AutoDest", see Chapter 6.1 "Navigating the menu", page 40.

⇨ 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
Specified setting for vacuum Actual reading for current pressure in distillation system	VacuBox (e.g. with Vacuum Pump V-300/V-600)
Actual reading and specified setting for rotation speed (evaporating flask)	Rotavapor R-300
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

Starting automatic 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. 42: Information displayed during automatic distillation

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 47.

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 as otherwise distillation may be aborted.

Stopping automatic distillation

The automatic distillation process stops automatically as soon as the solvent in the evaporating flask has evaporated. After completion of automatic distillation, an audible signal consisting of three beeps sounds at regular intervals if the corresponding option has been set on the Configuration menu.
There is the facility 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

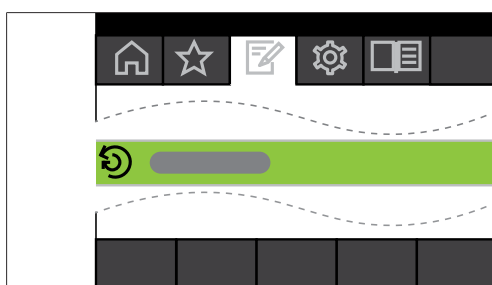➔ Operating modes ➔ Drying

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 40.
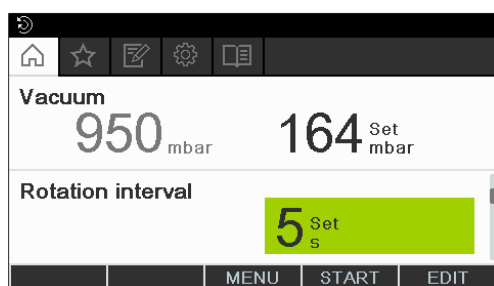

Fig. 44: Home screen showing *[Drying]* symbol

⇨ 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 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**
• Specified setting for vacuum • Actual reading for current pressure in distillation system	VacuBox (e.g. with Vacuum Pump V-300/ V-600)
• Actual reading and specified setting for rotation speed (evaporating flask) • Specified setting for rotation interval	Rotavapor R-300
• 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 drying process (timer)	

6.3   Using the solvent library

The *[Interface I-300]* 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. A distillation process can be started directly from the solvent library.

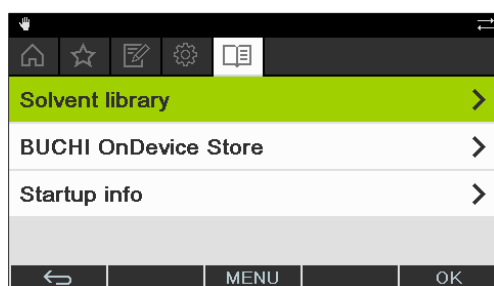**Navigation path**

➜ Tools➜ Solvent library

Fig. 45: Selecting "Solvent library" on the "Operating modes" screen

▷ Navigate to the "Operating modes" screen and select the menu item "Solvent library", see Chapter 6.1 "Navigating the menu", page 40.
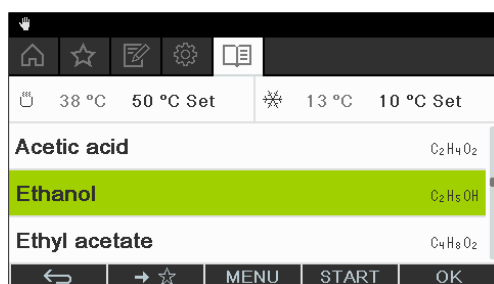
⇨ The display shows the Solvent library submenu.

Fig. 46: Selecting "Ethanol" from the Solvent library submenu

▷ Select the desired solvent (e.g. Ethanol) from the solvent library.

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.
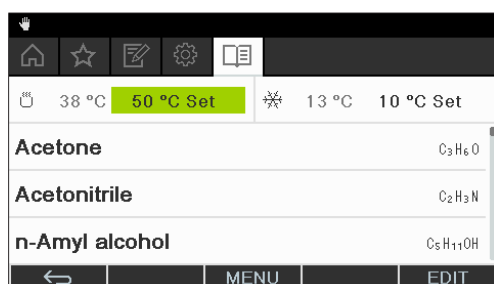
Fig. 47: Selecting "Set" temperature for heating bath when using equipment of a different make

▷ Enter the specified settings for heating bath and coolant temperature if necessary.
▷ To start a distillation process directly from the solvent library, press the function button START.
▷ 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. 48: Editing the specified settings for the selected solvent on the home screen

NOTE

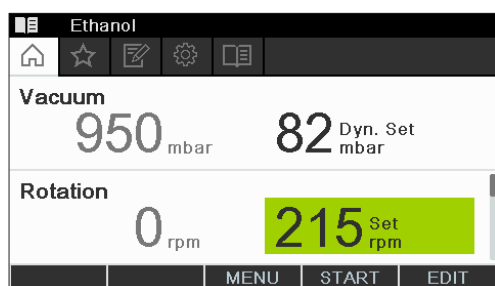The temperatures for heating bath and coolant should be set so as to be 40 °C apart.

6.4   Activating eco mode

The *[Interface I-300]* 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 Chapter 6.1 "Navigating the menu", page 40.
▶ 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.
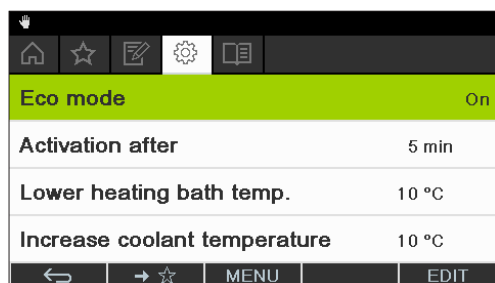

Fig. 49: Selecting "eco mode"

6.5   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 40.
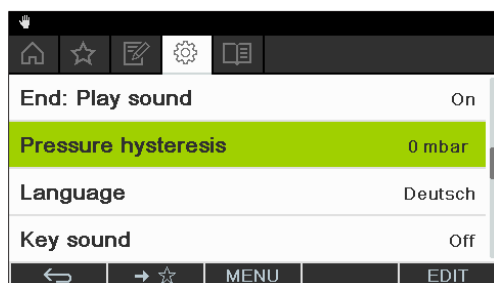

Fig. 50: Setting pressure hysteresis

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

6.6   Creating favorites

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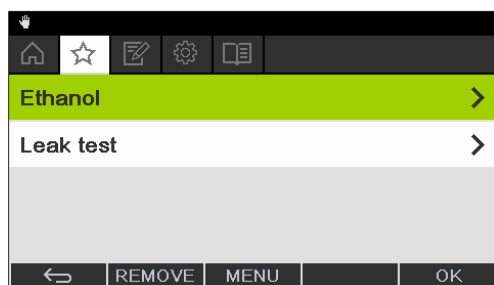

Fig. 51: Submenu "Favorites"

Clicking on any of the saved favorites takes you directly to the screen concerned.
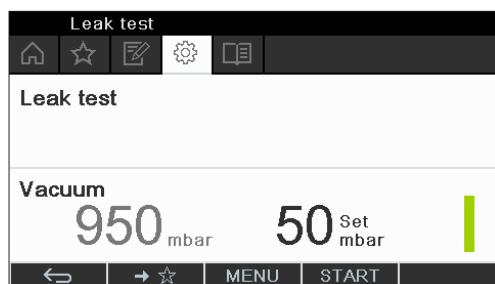
Fig. 52: Example of frequently used screen showing function button "Add to favorites" in bottom menu bar

▶ 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.

6.7 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 Chapter 6.1 "Navigating the menu", page 40.

⇨ All apps connected to the instrument receive a message.

7 Cleaning and servicing

NOTE

Users may only carry out the servicing and cleaning operations described in this section.

Any servicing and repair work which involves opening up the casing may only be carried out by BUCHI service technicians.

▶ Use only genuine BUCHI consumables and spare parts in order to ensure correct operation of the device and preserve the warranty.

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

Navigation path

➡ Configuration ➡ Servicing ➡ Leak test

The leak test provides the facility for checking the system for possible leaks.

Precondition:
☑ All openings in the vacuum system are sealed.

▶ Navigate to the "Servicing" screen and select the menu item "Leak test", see Chapter 6.1 "Navigating the menu", page 40.
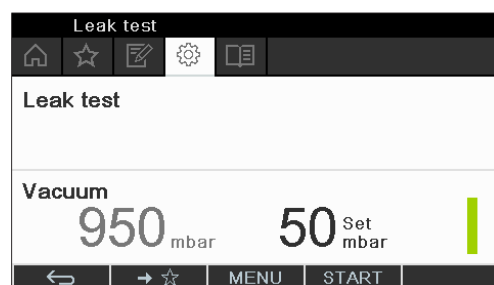
Fig. 53: Leak test screen

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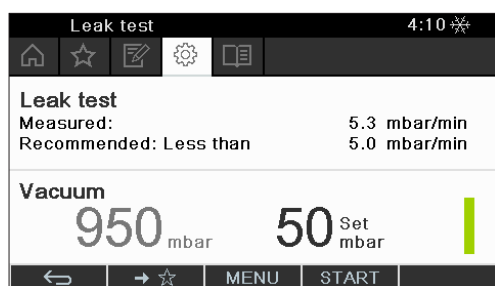⇨ After a stabilization period of 30 seconds, the leakage rate is shown.

Fig. 54: Display of leakage rate

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

7.3   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 40.

▶ When asked to confirm, press *[OK]*.

⇨ The rotation hours are reset.
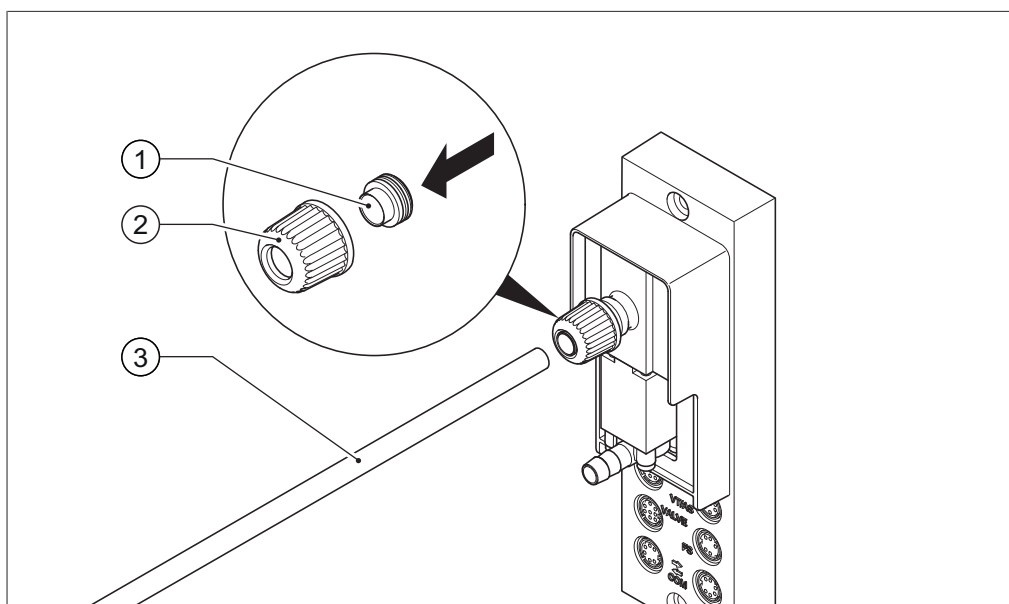
7.4   Fitting GL14 cap nut with tube seal

Fig. 55: 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.
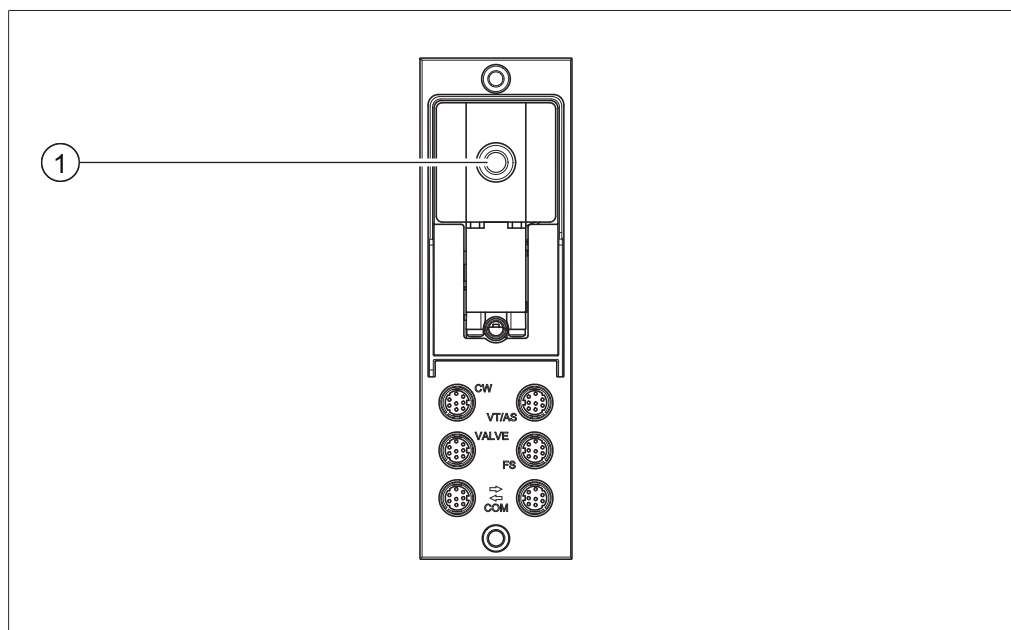
▶ Unscrew the GL14 cap nut from the vacuum connection (1) and remove the tube seal.

▶ 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   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 *[Au-toDest sensor]*, see Chapter 6.1 "Navigating the menu", page 40.

▶ 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 Chapter 6.1 "Navigating the menu", page 40.

▶ Press the navigation control to choose OK and confirm the calibration offset.

7.7   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 Navigating the menu.
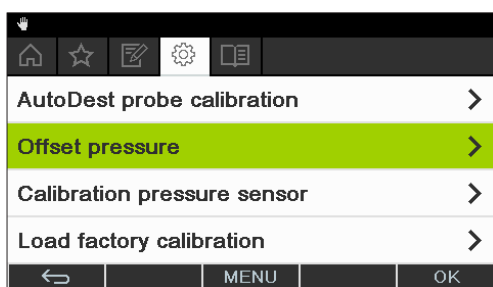

Fig. 56: Selecting item on the "Service" screen

7.7.1 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 40.
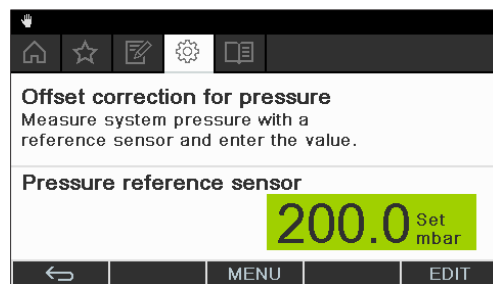

Fig. 57: Menu item "Pressure offset"

▶ Enter the pressure measured by the reference sensor.

⇨ The measured readings will then automatically be adjusted by the specified offset.

7.7.2 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 40.
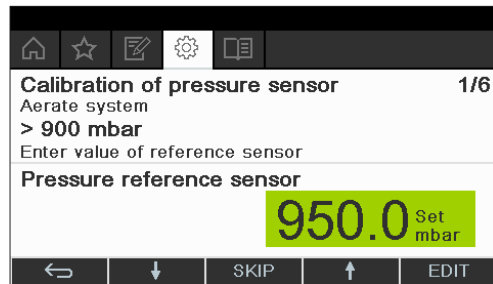
Fig. 58: Menu item "Pressure calibration"

▶ 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.

7.7.3 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 40.

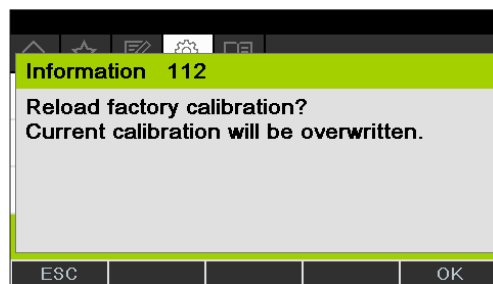⇨ The device asks you to confirm that the factory calibration should be reloaded.

Fig. 59: Menu item "Back to factory calibration"

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

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 body is dirty.	▶ Contact BUCHI Customer Service.
	Valve lead not plugged in.	▶ Plug in valve lead.
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 40.

⇨ 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]* 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_3H_6O	58.1	553	56	0.790	556
n-pentanol	$C_5H_{12}O$	88.1	595	137	0.814	11
Benzene	C_6H_6	78.1	548	80	0.877	236
n-butanol	$C_4H_{10}O$	74.1	620	118	0.810	25
tert-butanol	$C_4H_{10}O$	74.1	590	82	0.789	130
Chlorobenzene	C_6H_5Cl	112.6	377	132	1.106	36
Chloroform	$CHCl_3$	119.4	264	62	1.483	474
Cyclohexane	C_6H_{12}	84.0	389	81	0.779	235
Diethyl ether	$C_4H_{10}O$	74.0	389	35	0.714	850
1,2-dichloroethane	$C_2H_4Cl_2$	99.0	335	84	1.235	210
cis-1,2-dichloroethene	$C_2H_2Cl_2$	97.0	322	60	1.284	479
trans-1,2-dichloroethene	$C_2H_2Cl_2$	97.0	314	48	1.257	751
Di-isopropyl ether	$C_6H_{14}O$	102.0	318	68	0.724	375
Dioxane	$C_4H_8O_2$	88.1	406	101	1.034	107
DMF (dimethylfor-mamide)	C_3H_7NO	73.1	–	153	0.949	11
Acetic acid	$C_2H_4O_2$	60.0	695	118	1.049	44
Ethanol	C_2H_6O	46.0	879	79	0.789	175
Ethylacetate	$C_4H_8O_2$	88.1	394	77	0.900	240
Heptane	C_7H_{16}	100.2	373	98	0.684	120
Hexane	C_6H_{14}	86.2	368	69	0.660	360
Isopropanol	C_3H_8O	60.1	699	82	0.786	137
Isopentanol	$C_5H_{12}O$	88.1	595	129	0.809	14
Methylethylketone	C_4H_8O	72.1	473	80	0.805	243
Methanol	CH_4O	32.0	1227	65	0.791	337
Dichlormethane	CH_2Cl_2	84.9	373	40	1.327	850
Pentane	C_5H_{12}	72.1	381	36	0.626	850
n-propanol	C_3H_8O	60.1	787	97	0.804	67
Pentachloroethane	C_2HCl_5	202.3	201	162	1.680	13
1,1,2,2-tetra-chloroethane	$C_2H_2Cl_4$	167.9	247	146	1.595	20
Tetrachloromethane	CCl_4	153.8	226	77	1.594	271

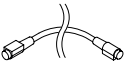| Solvent	Formula	Molar mass in g/mol	Evaporation energy in J/g	Boiling point in °C at 1013 mbar	Density in g/cm^3	Vacuum in mbar for 40 °C boiling point
1,1,1-trichloroethane	$C_2H_3Cl_3$	133.4	251	74	1.339	300
Tetrachloroethene	C_2Cl_4	165.8	234	121	1.623	53
THF (tetrahydrofuran)	C_4H_8O	72.1	–	67	0.889	374
Toluene	C_7H_8	92.2	427	111	0.867	77
Trichloroethene	C_2HCl_3	131.3	264	87	1.464	183
Water	H_2O	18.0	2261	100	1.000	72
Xylene (mixture)	C_8H_{10}	106.2	389	–	–	25
o-xylene	C_8H_{10}	106.2	–	144	0.880	–
m-xylene	C_8H_{10}	106.2	–	139	0.864	–
p-xylene	C_8H_{10}	106.2	–	138	0.861	–

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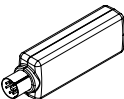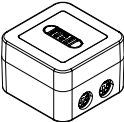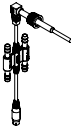
Use only genuine BUCHI consumables and spare parts in order to ensure correct, safe and reliable operation of the system.
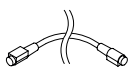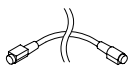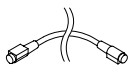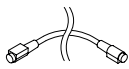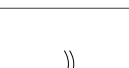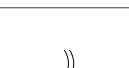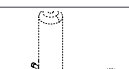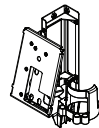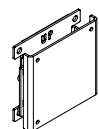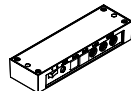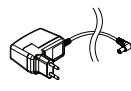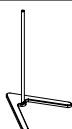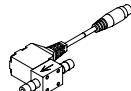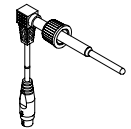
NOTE

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® Needed for firmware updates and eSupport.	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	

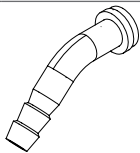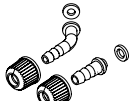|	Order no.	Image
Communication cable. BUCHI COM, 0.9 m, 6p	11070540	
Enables connection between Rotavapor® R-300 / R-220 Pro, Interface I-300 / I-300 Pro, Vacuum Pump V-300 / V-600, Recirculating Chiller F-3xx, VacuBox and LegacyBox.		
Communication cable. BUCHI COM, 1.8 m, 6p	11058707	
Enables connection 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.		
Communication cable. BUCHI COM, 5.0 m, 6p	11058708	
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.		
Communication cable. BUCHI COM, 15 m, 6p	11064090	
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.		
Mini-DIN to DC-Jack, 300 mm	11062266	
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.		
Communication cable. Mini-DIN, Y-piece, 2.0 m	11062255	
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.		
Communication cable. RJ45, 2 m	044989	
Connection between vacuum controller/interface and recirculating chiller or vacuum controller/interface and vacuum pump.		
Communication cable. RJ45, 5 m	11056240	
Connection between vacuum controller/interface and recirculating chiller or vacuum controller/interface and vacuum pump.		
Cooling water valve. 24VAC	031356	
Valve opens cooling water feed during distillation. Meant to be used with a vacuum controller/interface.		
Fastening set. For VacuBox, incl. holder 2 pcs, tube	11062957	
Used to fasten VacuBox on the Vacuum Pump V-300 or V-600.		
Foam sensor. Incl. holder	11061167	
Prevents sample from foaming into the condenser by aeration of system temporarily. Meant to be used with the Interface I-300 / I-300 Pro.		

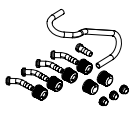|	Order no.	Image
Holder. To fix interface on lab stand	11059021	
To fix Interface I-300 / I-300 Pro, VacuBox and LegacyBox on lab stand, Rotavapor® R-21x or Vacuum Pump V-7xx. Incl. support, fixing clamp.		
Holder, set. To fix Interface and Woulff bottle on lab stand	11065362	
To fix Interface I-300 / 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.		
Holder. Wall mount, incl. support set	11059132	
To fasten Interface on wall.		
LegacyBox. Incl. accessory kit	11061166	
Interface between Interface I-300 / I-300 Pro (with VacuBox) to peripherals of older generations (Vacuum Pump V-7xx, Recirculating Chiller F-1xx).		
Level sensor. Incl. O-ring, cable, rubber band	11060954	
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.		
Power adapter. 30 V, 30 W, frequency 50/60 Hz	11060669	
To power vacuum controller directly or to power interface via LegacyBox or VacuBox.		
Stand. V stand with rod, 600 mm	048891	
Used as a holder for interface or vacuum controller when they cannot be mounted on a peripheral or wall.		
Vacuum valve. Magnetic valve, 24V/4W, Mini-DIN, 1.5 m	11060706	
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.		
Valve unit. Incl. Woulff bottle, 125 mL, P+G, holder	11061887	
Magnetic valve, meant to be used with the Interface I-300/ I-300 Pro. For operation with non-BUCHI vacuum pumps or house vacuum.		
Vapor temperature sensor. Incl. cap nut, seal GL14	11060707	
Measures the vapor temperature inside the system. Meant to be used with the Interface I-300 / I-300 Pro.		
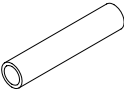
	Order no.	Image
Woulff bottle. 125 mL, P+G, incl. holder For trapping particles and droplets and for pressure equal-ization.	11059905	

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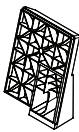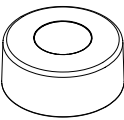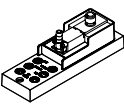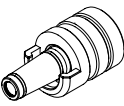
	Order no.	Image
Tubing. FEP, Ø6/8 mm, transparent, 40 mm	11059909	
Connection tubing Woulff bottle.		

10.2.3 Spare parts

Seals

	Order no.
Set. For Woulff bottle/valve unit	045544
Content: O-ring (048406, 5pcs), O-ring (047169, 5pcs).	
Set. For Woulff bottle/valve unit	045545
Content: O-ring (048406, 5pcs), O-ring (047169, 5pcs), spare parts for valve unit (047258), seal (047165).	
Seal	038225
For cap nut GL14, EPDM seal	

Further spare parts

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

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

☐ have not been used in the laboratory and are new.

☐ have not been in contact with toxic, corrosive, biologically active, explosive, radioactive or other hazardous materials.

☐ are not contaminated. The solvents or residues of the substances pumped have been removed.

Declaration for hazardous materials

In respect of the products returned, we hereby assure that

☐ 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.

☐ the products have been cleaned, decontaminated, sterilised inside and outside and all inlets and outlets are sealed.

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:	Every time connection is established
• 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	
Status data:	Whenever process changes
• Process status (e.g. "Ready", "Running")	

Category	Frequency
Event data:	On occurrence
(Messages that appear as pop-ups on the display, e.g. "Distillation successfully completed")	Event messages are managed by the server and distributed to the clients from there for push notifications.
• Event message ID	
• Event message level (information, warning or error)	
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 Distillation session data

- Serial number of the control unit
- Number of times instrument commissioned
- The method of execution, e.g. Manual, CloudDest, AutoDest
- Was distillation stopped or aborted?
- CloudDest parameters set by the user

10.5.3 Error data

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

10.5.4 Maintenance data

- All maintenance tests showing details of results and progression.

10.5.5 System configuration data

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

10.5.6 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

10.5.7 Device settings

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

10.5.8 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

10.5.9 Location data

- The coordinates of the mobile device.

We are represented by more than 100 distribution partners worldwide.
Find your local representative at:

www.buchi.com   Quality in your hands