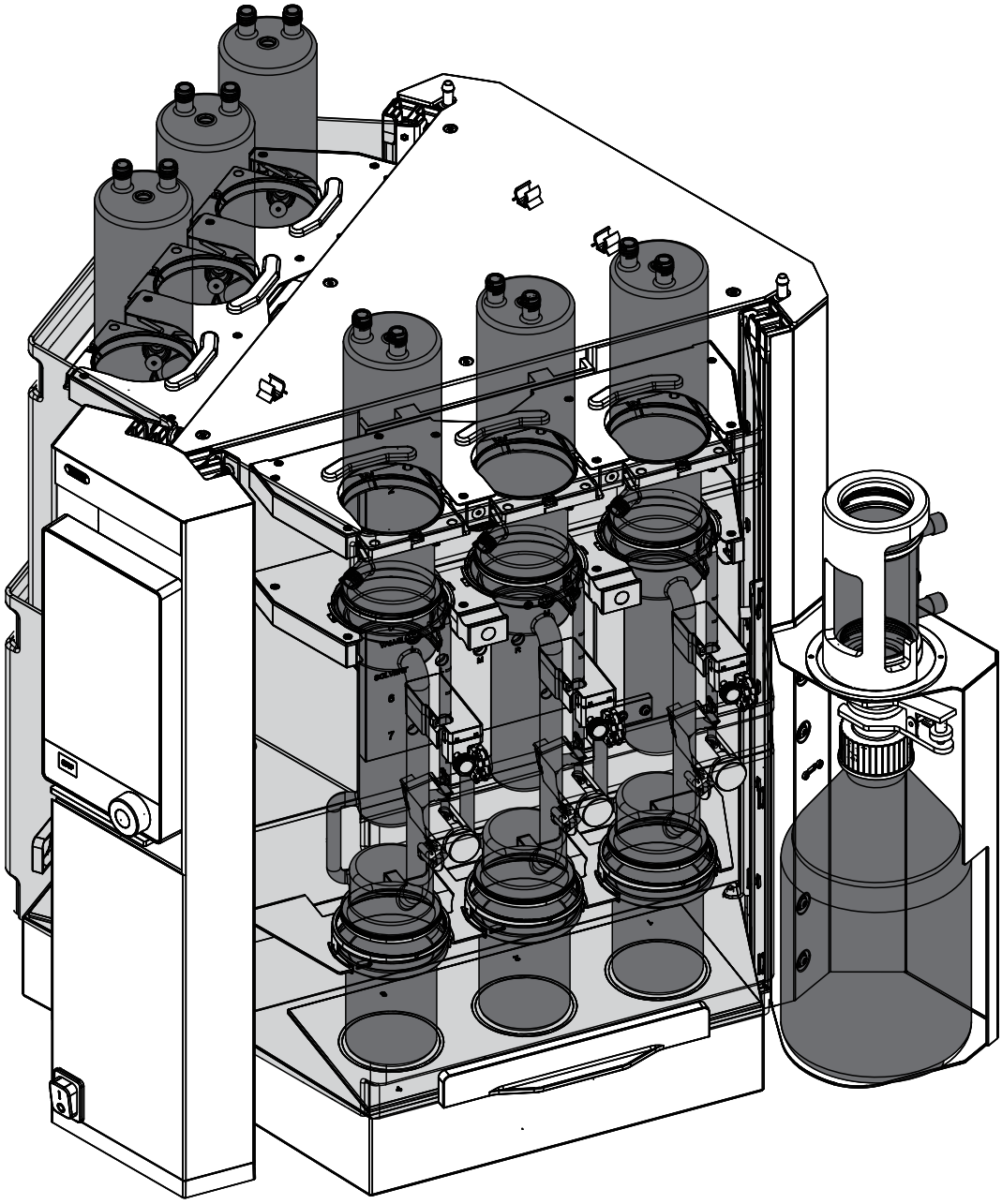
FatExtractor E-500

Operation Manual



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1 About this document

This operation manual is applicable for all variants of the instrument.
Read this operation manual before operating the instrument and follow the instructions to ensure safe and trouble-free operation.
Keep this operation manual for later use and pass it on to any subsequent user or owner.
BÜCHI Labortechnik AG accepts no liability for damage, faults and malfunctions resulting from not following this operation manual.
If you have any questions after reading this operation manual:

▶ Contact BÜCHI Labortechnik AG Customer Service.

https://www.buchi.com/contact

1.1 Warning notices in this document

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

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

1.2 Symbols

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

1.2.1 Warning symbols

Symbol	Meaning
	General warning
	Hot surface
	Breakable items
	Hand injuries
	Flammable substances

1.2.2 Mark-ups and symbols

NOTE

This symbol draws attention to useful and important information.

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

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

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

Mark-up	Explanation
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 Proper use

The FatExtractor E-500 is designed for the extraction (solid-liquid extraction) of samples with known solvents and the reduction or drying of the extract.
The FatExtractor E-500 can be used in laboratories for the following tasks:

- Soxhlet Extraction
- Hot Extraction
- Economic Continuous Extraction

The FatExtractor E-500 is available in an essential and a extended resistance configuration.
The FatExtractor E-500 essential can be used with following solvents:

- Chloroform
- Hexane
- Petroleum ether
- Other solvents only with the prior written approval of BÜCHI Labortechnik AG.

The FatExtractor E-500 extended resistance version, can be used additionally with the following solvents:

- Diethyl ether
- Pentane
- Acetone
- MTBE
- Dichloromethane
- Other solvents only with the prior written approval of BÜCHI Labortechnik AG.

2.2 Use other than that intended

Use of any kind other than that described in Chapter 2.1 "Proper use", page 10 and any application that does not comply with the technical specifications constitutes use other than that intended.
In particular, the following applications are not permissible:

- Use of the instrument in areas which require explosion-safe apparatus.
- Processing samples which could be caused to explode or ignite by impact, friction, heat or sparks (e.g. explosives).
- Use of the instrument with samples that react with solvent.
- Use of the instrument with solvents containing peroxides.
- Use of the instrument with other than original BUCHI glassware.
- Use of the instrument in overpressure situations.
- Use of solvent with ignition point less than 160°C.
- Use of solvents other than defined in Chapter 2.1 "Proper use", page 10 without the prior written approval of BÜCHI Labortechnik AG.

2.3 Staff qualification

Unqualified persons are unable to identify risks and are therefore exposed to greater dangers.
The instrument may only be operated by suitably qualified laboratory staff.
These operating instructions are aimed at the following target groups:

Users

Users are persons that meet the following criteria:

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

Operator

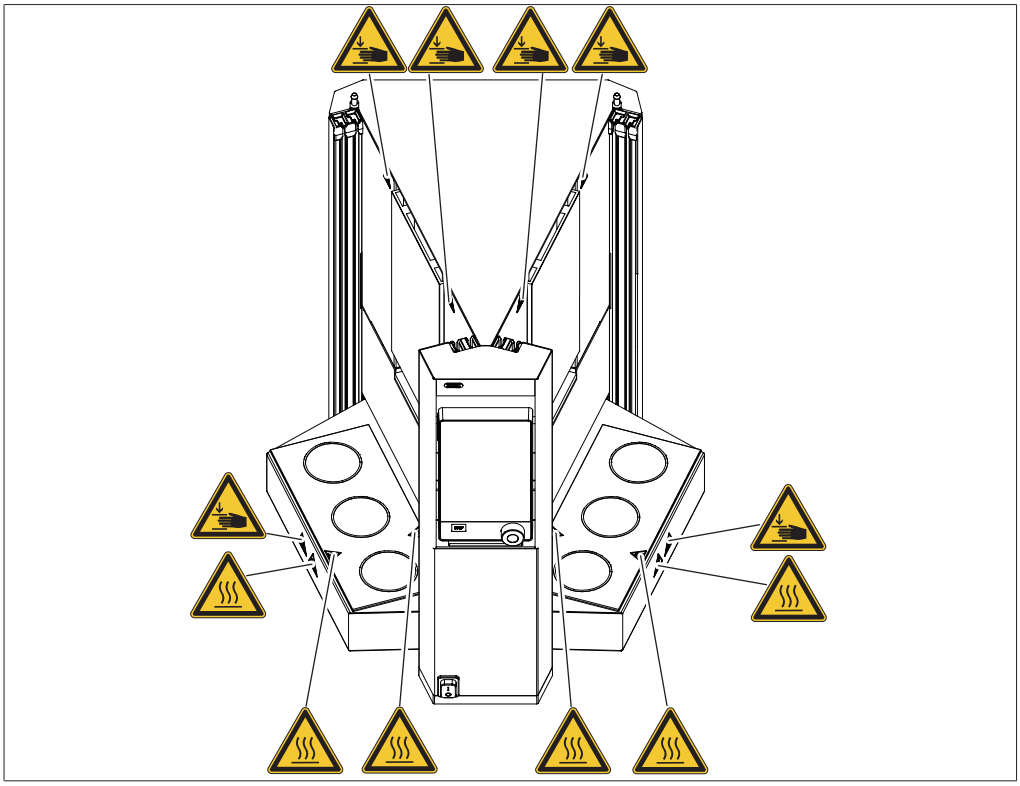
The operator (generally the laboratory manager) is responsible for the following aspects:

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

BUCHI service technicians

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

2.4 Location of warning signs on the product



Hot surfaces

Hand injuries

2.5 Protection devices

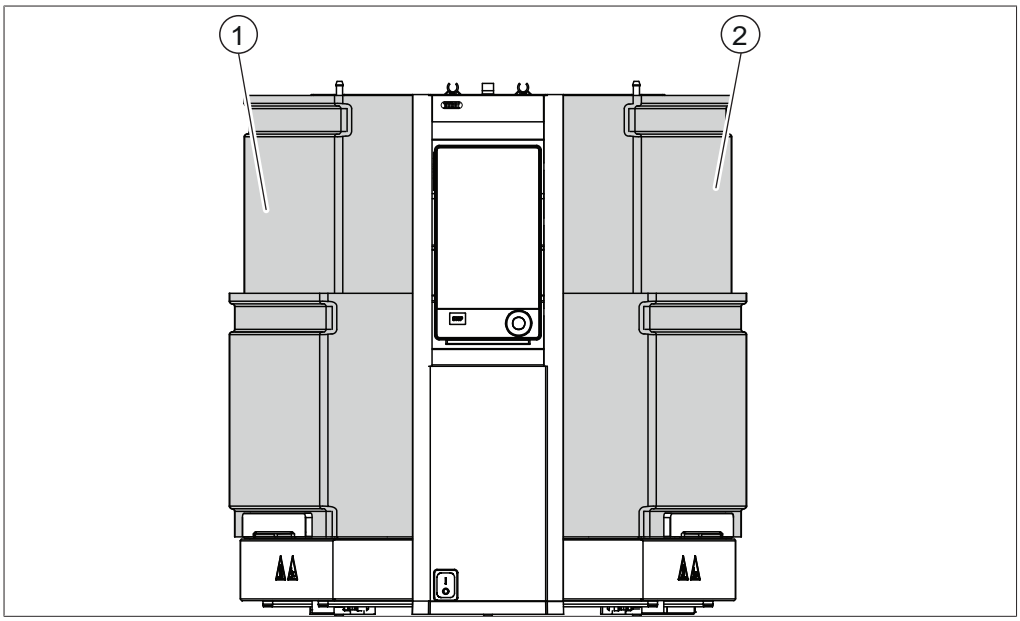


Fig. 1: Protection devices

1 Protection shield

2 Protection shield

2.6 Residual risks

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

2.6.1 Hot surfaces

The surfaces of the device can become very hot. If touched they can cause skin burns.

- ▶ Do not touch hot surfaces or else wear suitable protective gloves.

2.6.2 Empty beakers on heating plates

Empty beakers on active heating plates lead to very hot surfaces and can damage the instrument and the beakers.

- ▶ Remove empty beakers from the instrument.
- ▶ Deactivate heating positions not used.
- ▶ Use optimized extraction parameters, drying parameters and solvent amounts (e.g. from BUCHIs technical and application notes).

2.6.3 Mechanical damages

If a device is damaged, sharp edges, moving parts or exposed electrical wires can cause injuries.

- ▶ Check device regularly for visible damage.
- ▶ Make sure that the locking mechanism of the protection shield is working properly.
- ▶ If faults occur:

- Switch off the device immediately.
- Unplug the power cord.
- Inform the operator.
- Cool the device before taking any further action.

- ▶ Do not continue to use devices that are damaged.

2.6.4 Glass breakage

Broken glass can cause severe cuts.
Not visible cracks on glassware can lead to breakage.

- ▶ Wear protective gloves when handling broken glassware.
- ▶ Handle the glass components carefully and do not drop them.
- ▶ Always place the glassware in a suitable holder when they are not in use.
- ▶ Prevent any mechanical impact.
- ▶ Prevent thermal shocks on glassware (e.g. do not put hot glassware on cold surface).
- ▶ Always visually inspect glass components for damage every time they are used.
- ▶ Do not continue to use glass components that are damaged.
- ▶ Do not use beakers which have been heated empty on a heating plate for more than 20 minutes.

2.6.5 Glass damages during extraction process

Glass damages during the extraction process can cause instrument damages caused by solvents, coolant and fire.

▶ If fault occurs:

- Switch off the device immediately.
- Unplug the power cord.
- Inform the operator.
- Let the temperature of the instrument decrease under observation until it is the same as the ambient.

2.6.6 Overfilled extraction beakers

Overfilled extraction beakers can cause spills and lead to instrument damage or fire.

▶ Do not fill more than the indicated maximum quantity. See Chapter 3.5 "Technical data", page 25

2.6.7 Spilled hazardous materials

It is the responsibility of the operator to ensure the safety of users and the selection of correct decontamination agents.

▶ Make sure that the personal protective equipment meets the requirements of the safety data sheets for the chemicals used.
▶ Make sure that the decontamination agent meets the requirements of the safety data sheets for the chemicals used.
▶ Make sure that the decontamination agent is compatible with the materials used. See Chapter 3.5 "Technical data", page 25
▶ If you have any further questions, contact BUCHI Customer Service.

2.6.8 Solvent leakages during extraction process

Solvent leaking systems can cause dangerous solvent vapors that lead to instrument damage or fire.

▶ Check proper installation of the sealings and condition of sealings before each use.
▶ Change seals if necessary.
▶ Check all the connections of solvent tubes after installation.
▶ Observe the instrument after the start of the extraction until the solvent condenses.

▶ If fault occurs:

- Switch off the device immediately.
- Unplug the power cord.
- Inform the operator.
- Let the temperature of the instrument decrease under observation until it is the same as the ambient.

2.6.9 Incorrect function of the Analyte Protection Sensors

▶ Do not cover or modify the analyte protection sensors.
▶ Only use clean beakers for extraction.

- Keep the reflector foils clean.

2.6.10 Traces of dark extracts or residuals of extract foam

Traces of dark extracts or residuals of extract foam on the beaker walls can lead to the incorrect functioning of the analyte protection sensor.

2.7 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.

2.8 Modifications

Unauthorized modifications can affect safety and lead to accidents.

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

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

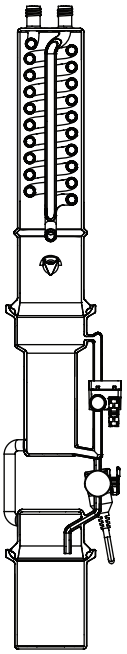
3 Product description

3.1 Description of function

The FatExtractor E-500 is designed to carry out the following solid-liquid extraction methods:

- Soxhlet Extraction (see Chapter 3.1.1 "Soxhlet Extraction", page 16)
- Hot Extraction (see Chapter 3.1.2 "Hot Extraction", page 17)
- Economic Continuous Extraction (see Chapter 3.1.3 "Economic Continuous Extraction", page 17)

3.1.1 Soxhlet Extraction



Step 1: Extraction

- The sample is located in the extraction chamber.
- The beaker contains the solvent.
- The magnetic valve is closed, the solvent is collected up to the optical sensor and extracts the analyte.
- When the optical sensor is reached, the magnetic valve opens and the solvent containing the analyte flows back into the beaker.

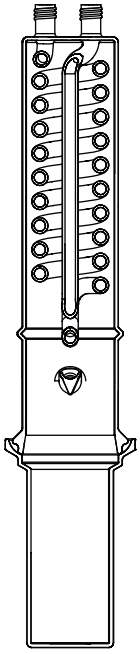
Step 2: Rinsing

- The magnetic valve is open, the solvent flows back into beaker, the solvent is not collected.

Step 3: Drying

- The solvent is heated, vapor rises up to the condenser, condenses and flows into tank.
- The analyte remains in the beaker.

3.1.2 Hot Extraction



Step 1: Extraction

- The sample is located in the beaker.
- The beaker contains the solvent.
- The solvent is heated, vapor rises up to the condenser, condenses and drops into the beaker with the sample.

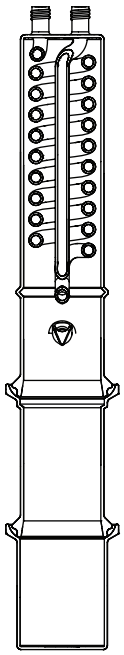
Step 2: Rinsing

- The solvent in the beaker is heated up and evaporated.
- The vapor rises up to the condenser.
- The condensed solvent flows into the beaker with the sample.
- The tank bottle valve opens periodically and condensed solvent flows in the tank bottle.
- The solvent level decreases.

Step 3: Drying

- The solvent is heated, vapor rises up to the condenser, condenses and flows into tank.
- The analyte remains in the beaker.

3.1.3 Economic Continuous Extraction



Step 1: Extraction

- The sample is located in the extraction chamber.
- The beaker contains the solvent.
- The solvent is heated, vapor rises up around the sample to the condenser, condenses and drops back into extraction chamber through the sample into the beaker.

Step 2: Drying

- The solvent is heated, vapor rises up around the sample to the condenser, condenses and flows into tank.
- The analyte remains in the beaker.

3.1.4 Description of the Analyte Protection Sensor (option)

The Analyte Protection Sensor protects the analyte from overheating.
The Analyte Protection Sensor triggers under the following situations:

	Soxhlet Extraction	Hot Extraction	Economic Continuous Extraction
Presence of beaker	X	X	X
Presence of solvent (Level check)	X	X	X
Extraction step	X	X	X
Rinse step	X	-	X
Dry step	X*	-	X*

* with SmartDrying. See Chapter 8.11 "Setting SmartDrying (Soxhlet and Economic Continuous Extraction only)", page 63

3.2 Configuration

3.2.1 Front view

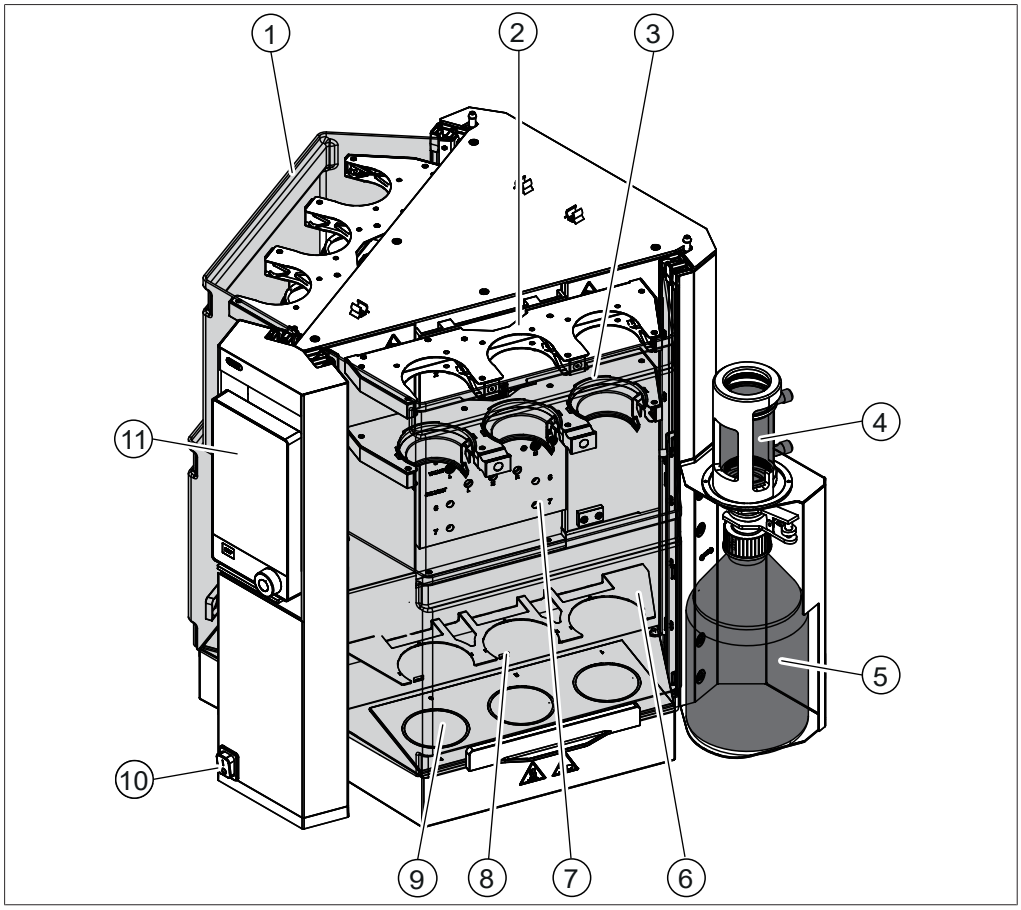


Fig. 2: Front view

1	Protection shield	2	Condenser rack
3	Chamber rack	4	Condenser solvent tank
5	Solvent tank	6	Beaker rack
7	Installation board	8	Analyte Protection sensor (Option)
9	Heating plate	10	On/Off master switch
11	Pro interface		

3.2.2 Rear view

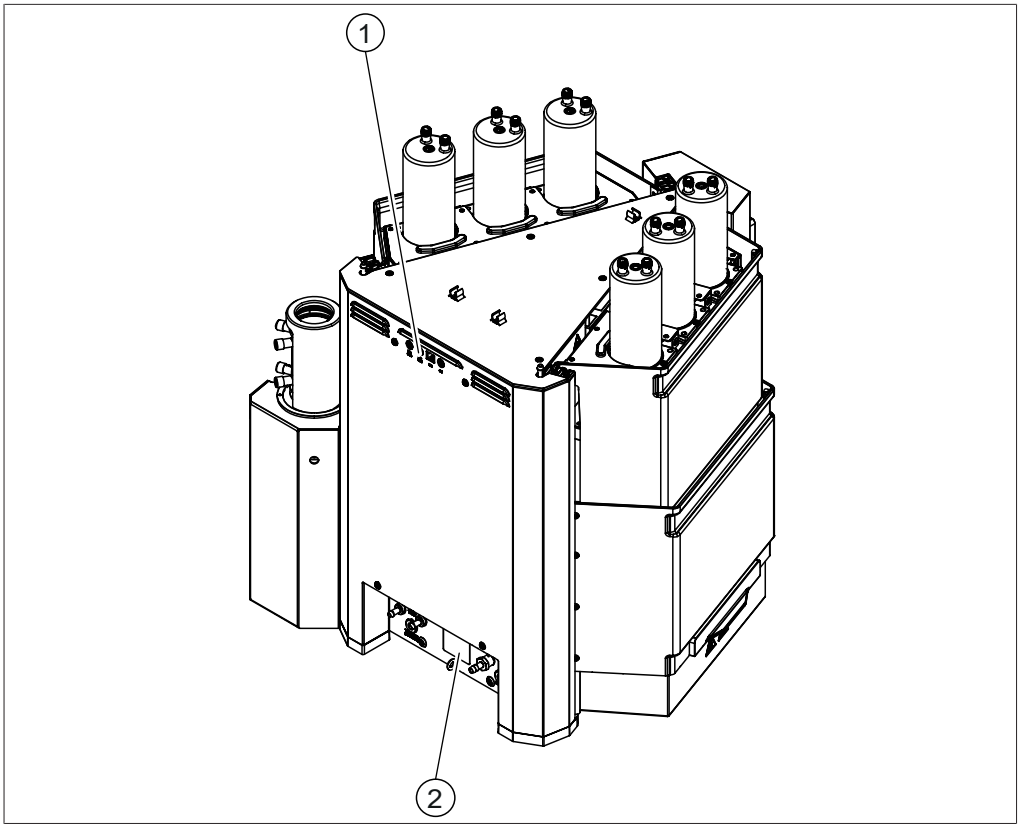


Fig. 3: Rear view

1 Upper connections
See Chapter 3.2.3 "Upper connections on the rear side", page 20

2 Lower connections
See Chapter 3.2.4 "Lower connections on the rear side", page 21

3.2.3 Upper connections on the rear side

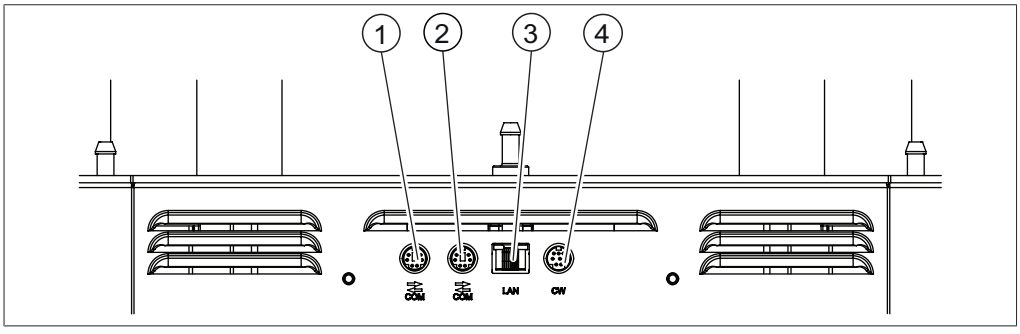


Fig. 4: Connections on the top

1 Standard BUCHI communication port (COM)

2 Standard BUCHI communication port (COM)

3 LAN port

4 Port for the cooling water valve

3.2.4 Lower connections on the rear side

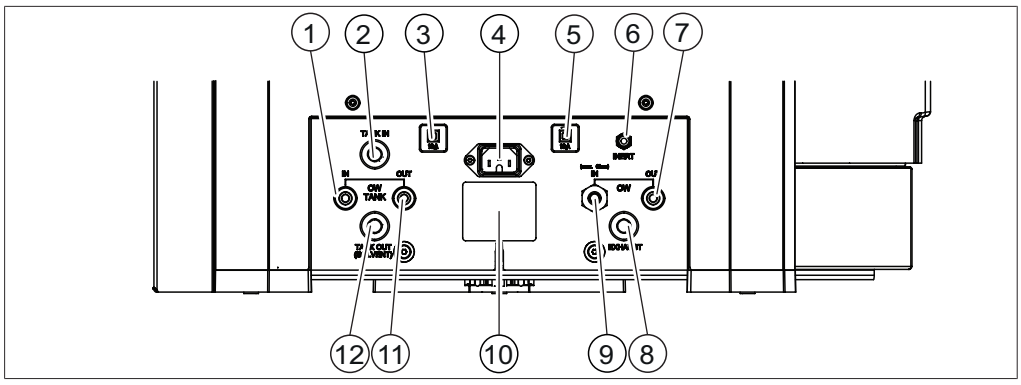


Fig. 5: Connections on the buttom

1	Coolant water solvent tank in (marked **IN**)	2	Solvent in (marked **TANK IN**)
3	Fuse	4	Power supply connection
5	Fuse	6	Inert gas connection (option) (marked **INERT**)
7	Coolant water out (marked **OUT**)	8	Exhaust (marked **EXHAUST**)
9	Coolant water in (marked **IN**)	10	Type plate
11	Coolant water solvent tank out (marked **OUT**)	12	Solvent out (marked **TANK OUT (SOLVENT)**)

3.2.5 Installation board

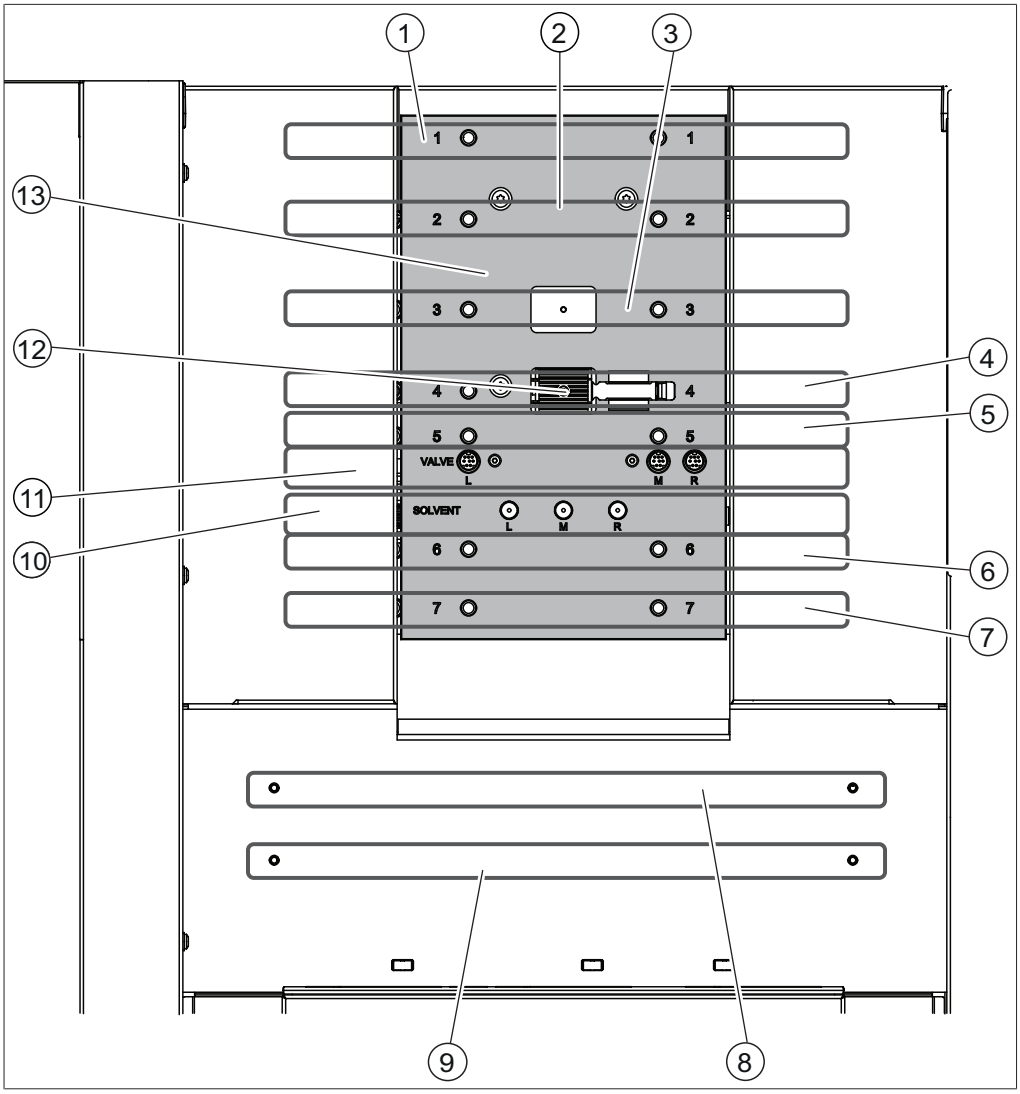


Fig. 6: Installation board

1	For UniversalExtractor E-800	2	Condenser rack Soxhlet Extraction
3	For UniversalExtractor E-800	4	Chamber rack Soxhlet Extraction
5	Condenser rack Economic Continuous Extraction	6	Condenser rack Hot Extraction
7	Chamber rack Economic Continuous Extraction	8	Beaker rack Hot Extraction
9	Beaker rack Soxhlet Extraction / Economic Continuous Extraction	10	Solvent collector tube
11	Socket for sensor	12	Attachment clip for tube
13	Lift		

3.2.6 Interface

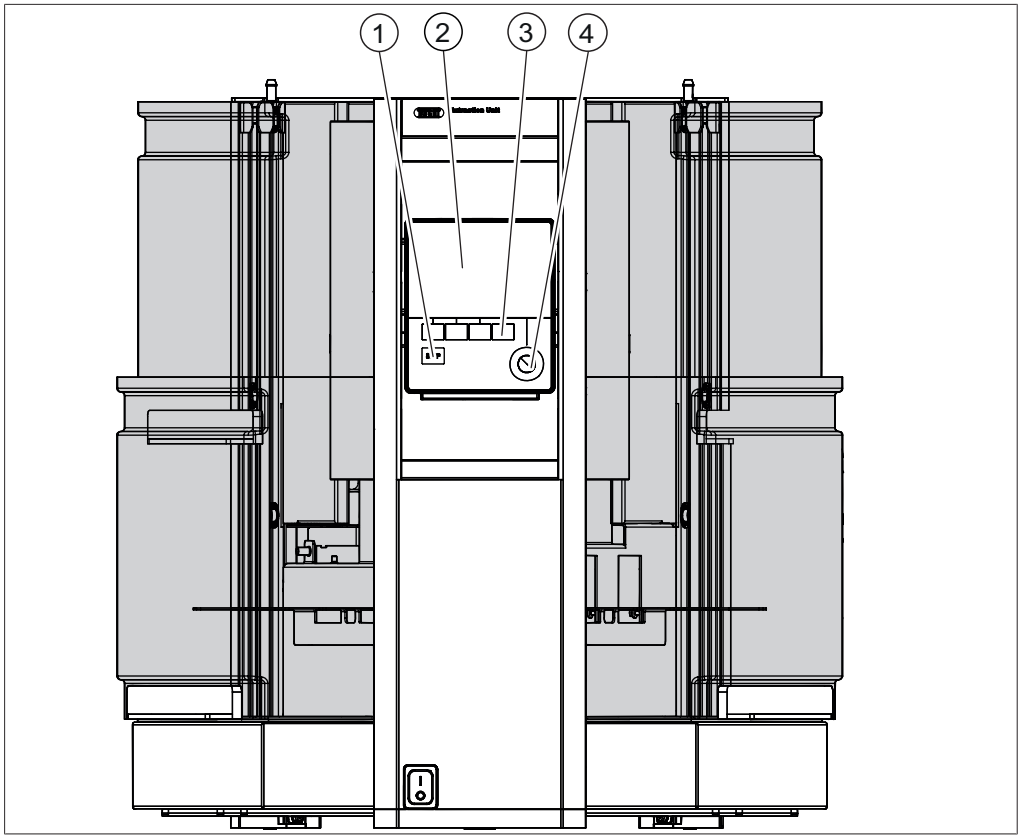


Fig. 7: Interface

1 ***Stop*** button
2 Screen
3 Function buttons
4 Navigation control

3.2.7 Pro Interface

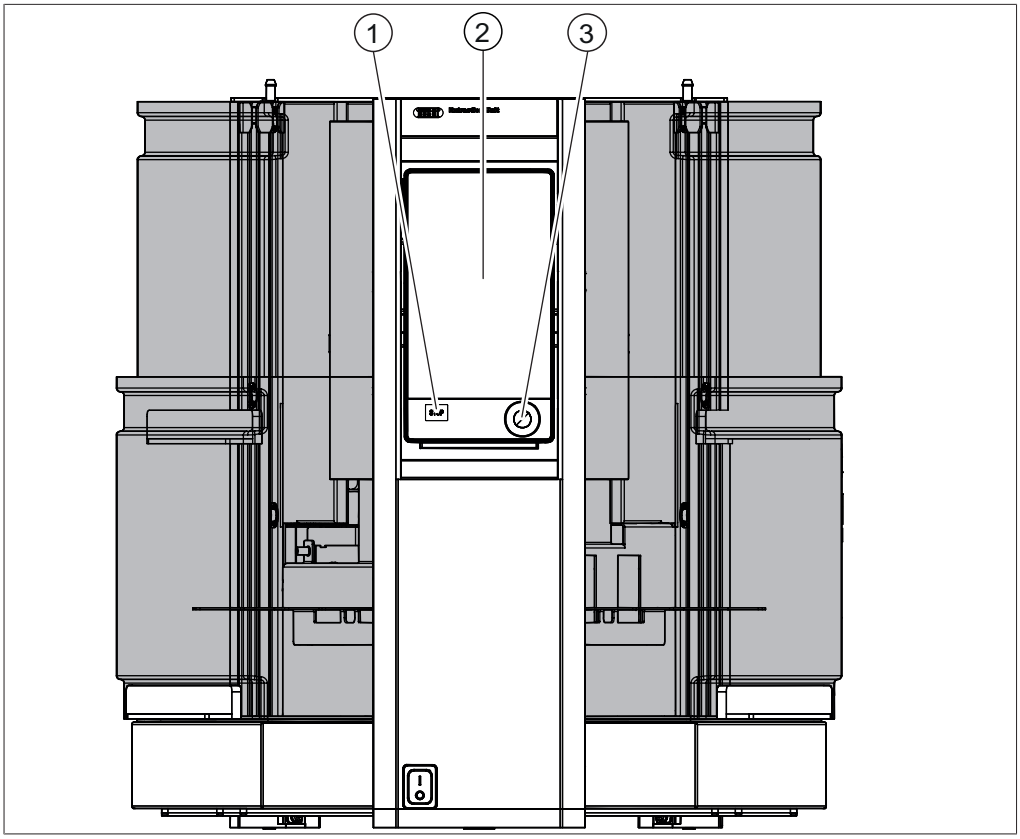


Fig. 8: Interface Pro

1 ***Stop*** button
2 Touch-screen display
3 Navigation control

3.3 Type plate

The type plate identifies the instrument. The type plate is located at the rear of the instrument.

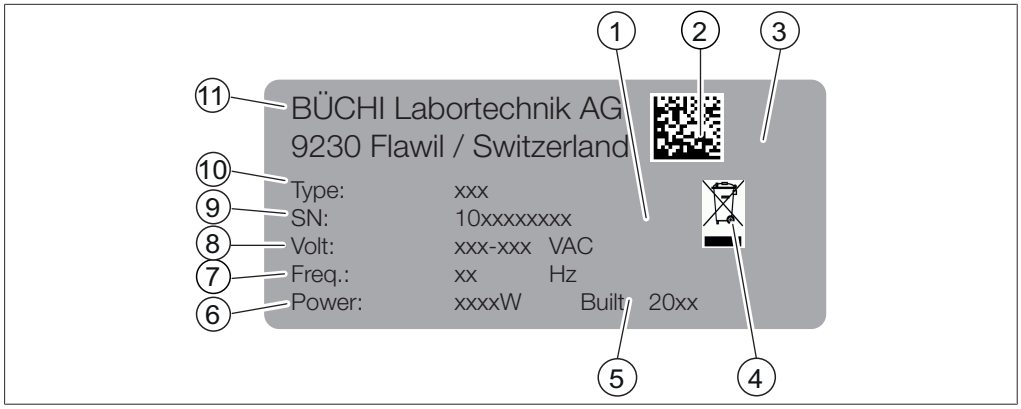


Fig. 9: Type plate

1	Symbol for "electronics recycling"	2	Initial product code
3	Approvals	4	Symbol for "Do not dispose of as household waste"
5	Year of manufacture	6	Power consumption maximum
7	Frequency	8	Input voltage range
9	Serial number	10	Instrument name
11	Company name and address		

3.4 Scope of delivery

NOTE

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

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

3.5 Technical data

3.5.1 FatExtractor E-500

Specification	E-500
Power consumption	1300 W
Connection voltage	100 - 240 ± 10 % VAC
Fuse	10 A
Frequency	50 / 60 Hz
Overvoltage category	II
Pollution degree	2
Protection Class	1
Dimensions (W x D x H) (with glassware Soxhlet Extraction)	638 x 595 x 742 mm
Dimensions (W x D x H) (with glassware Hot Extraction)	638 x 595 x 613 mm
Dimensions (W x D x H) (with glassware Economic Continuous Extraction)	638 x 595 x 622 mm

Specification	E-500
Minimum clearance (W x D)	200 mm
Minimum clearance (H)	500 mm
Weight (without glassware)	41.8 kg
Weight (with glassware Soxhlet Extraction)	49.6 kg
Total heating power (rated)	600 W
Total heating power (maximum)	1200 W
Hose connection	6 / 9 mm
Minimum water flow	100 mL/min
Allowed water pressure (nominal value)	6 bar
Allowed water pressure (maximum)	8 bar
Inlet cooling medium temperature	25 °C below the boiling point of the solvent
Number of extraction positions	6
Solvent tank volume	2 L
Max. filling level (Extraction glass chamber Soxhlet)	120 mL
Max. filling level (Extraction glass chamber Soxhlet LSV)	195 mL
Max. working volumes (Beaker)	175 mL
Max. working volumes (Beaker HE)	100 mL
Language	DE, EN, IT, ES, FR, JA, CN, PL, RU
Method storage (Interface)	20 methods
Method storage (Pro interface)	40 methods

3.5.2 Ambient conditions

For indoor use only.

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 % relative humidity at 40 °C
Storage temperature	max. 45 °C

3.5.3 Materials

Component	Materials of construction
Housing	Steel 1.4301/304 with powder coating
Exhaust	Aluminium
	PE-UHMW 1000
Protection shield	PMMA GS
Glass ware	Borosilikat 3.3
Sealings glassware	FKM or PTFE
Solvent tank	Borosilikat 3.3
Solvent tank valve	PTFE / FFKM
Tubing	FEP

4 Transport and storage

4.1 Transport

NOTICE

Risk of breakage due to incorrect transportation

- ▶ Make sure that the instrument is fully dismantled.
- ▶ Pack all instrument components properly to prevent breakage. Use the original packaging whenever possible.
- ▶ Avoid sharp movements during transit.

- ▶ After transporting, check the instrument and all glass components for damage.
- ▶ Damage that has occurred in transit should be reported to the carrier.
- ▶ Keep packaging for future transportation.

4.2 Storage

- ▶ Make sure that the ambient conditions are complied with (see Chapter 3.5 "Technical data", page 25).
- ▶ Wherever possible, store the device in its original packaging.
- ▶ After storage, check the device, all glass components, seals and tubing for damage and replace if necessary.

4.3 Lifting the instrument

⚠ WARNING

Danger due to incorrect transportation

The possible consequences are crushing injuries, cuts and breakages.

- ▶ The instrument should be transported by two persons at the same time.
- ▶ Lift the instrument at the points indicated.

NOTICE

Dragging the instrument can damage the feet of the instrument.

- ▶ Lift the instrument when positioning or re-locating.

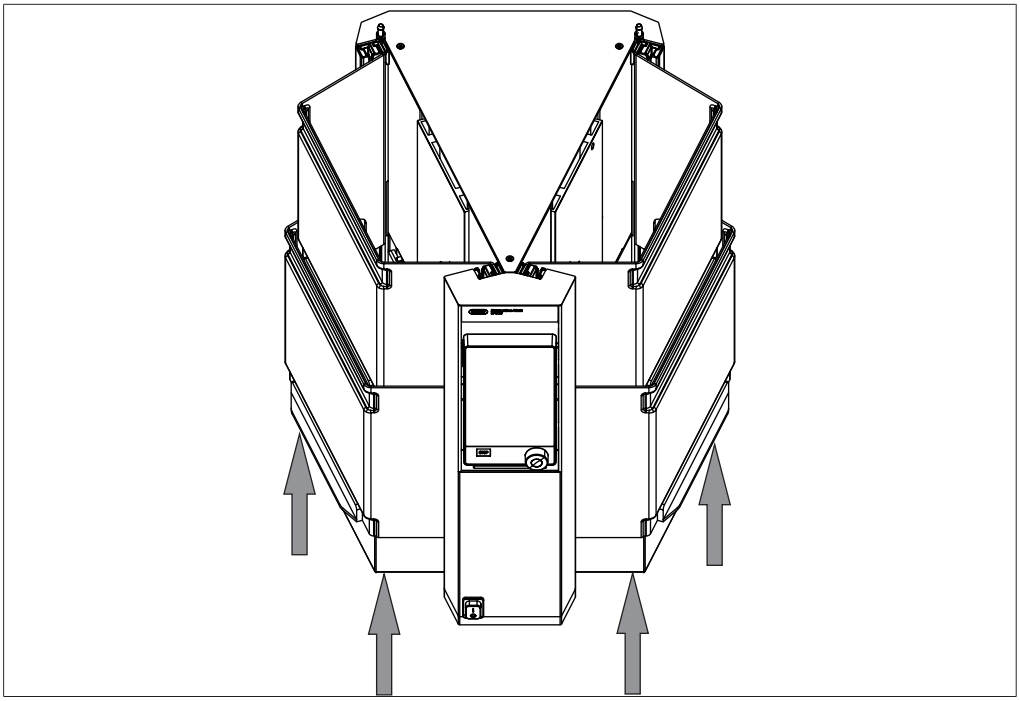


Fig. 10: Lifting the instrument

- Lift the instrument – this requires two persons each lifting at the points indicated on the left and right side of the instrument.

5 Installation

5.1 Before installation

NOTICE

Instrument damage due to switching it on too early.

Switching on the instrument too early after transportation can cause damage.

▶ Climatize the instrument after transportation.

5.2 Installation site

The installation site must meet the following requirements:

- Firm, level surface
- Make sure that the installation site meets the requirements of the safety data sheets for all solvents and samples used.
- Inside a fume hood or minimum 500 mm space requirement above the instrument.
- Make sure that no instruments generating heat or corrosive vapors are in the same fume hood (e.g. HydrolEx H-506).
- Take into account the maximum product dimensions and weight. See Chapter 3.5 "Technical data", page 25
- Do not expose the instrument to any external thermal loads, such as direct solar radiation or other ignition source.
- Do not place any flammable devices or substances close to the instrument, as they could ignite due to the heat from the heating plates.
- Make sure that cables / tubes can be routed safely.

NOTE

Make sure that the power supply can be disconnected at any time in an emergency.

5.3 Establishing electrical connections

NOTE

Observe the regulatory provisions when connecting the instrument to power supply.

- ▶ Use external main switches (e.g., emergency off) in accordance with the standards IEC 60947-1 and IEC 60947-3.
- ▶ Use additional electrical safety features (e.g., residual-current circuit breakers) to comply with local laws and regulations.

The power supply must fulfill the following conditions:

1. Provide the mains voltage and frequency specified on the type plate of the instrument.
2. Be designed for the load imposed by the instruments connected.
3. Be equipped with suitable fuses and electrical safety features.
4. Be equipped with a proper grounding.

NOTICE

Risk of instrument damage because of not suitable power supply cables.

Not suitable power supply cables can cause bad performance or an instrument damage

- ▶ Use only BUCHI power supply cables.

- ▶ Make sure that all connected devices are grounded.
- ▶ Make sure that the power plug is freely accessible at all times.
- ▶ Insert the power cable into the connection labeled **Power IN** on the back of the instrument.
- ▶ Insert the power plug into the power socket.

5.4 Securing against earthquakes

The instrument has an earthquake fixing point to protect the device against falling.

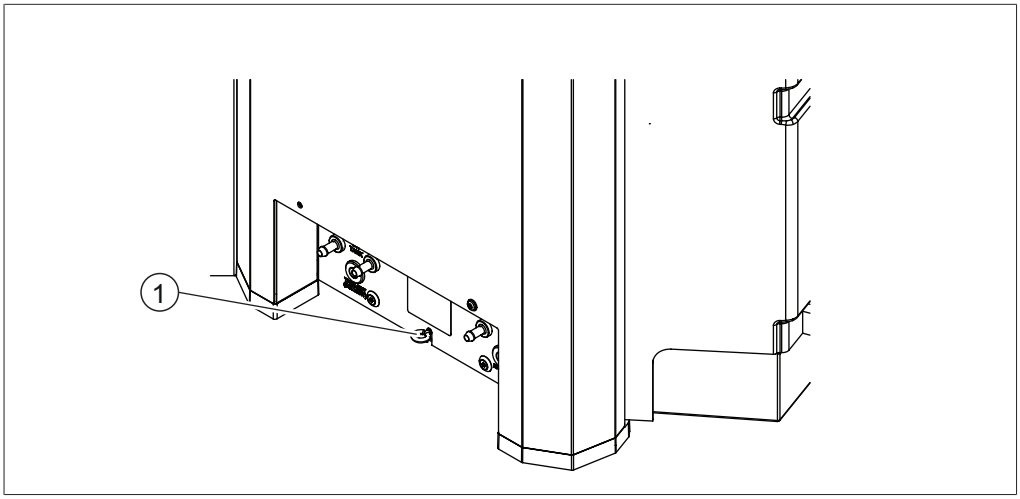


Fig. 11: Securing against earthquakes

1 Lashing mount

▶ Tie the lashing mount to a fixed point using strong cord or a wire.

5.5 Connecting the coolant hose

There are two possibilities for coolant supply:

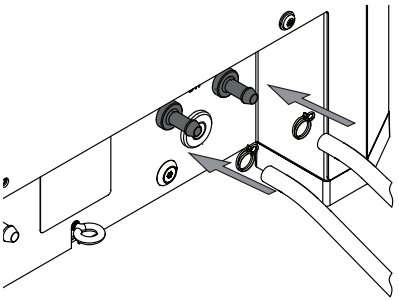
- Cooling water valve
- BUCHI Recirculating Chiller

See Chapter 14.2 "Spare parts and accessories", page 86

Precondition:

☑ The coolant connection complies with the specified parameters. See Chapter 3.5 "Technical data", page 25

☑ Make sure that the instrument is not connected to the power supply.



▶ Install the inlet tube onto the connection marked **CW IN**.

▶ Attach the inlet tube in place with a hose clip.

▶ Install the drain tube onto the connection marked **CW OUT**.

▶ Attach the drain tube in place with a hose clip.

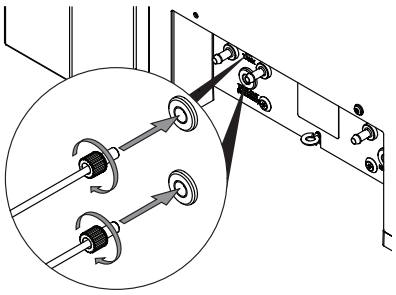
5.6 Connecting the solvent tubes to the condenser tank bottle

NOTE

Leave the connection nuts in place when disassembling.

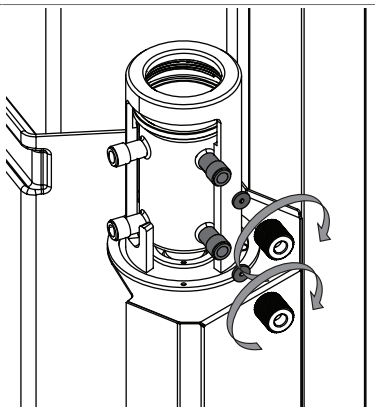
Precondition:

☑ Make sure that the instrument is not connected to the power supply.



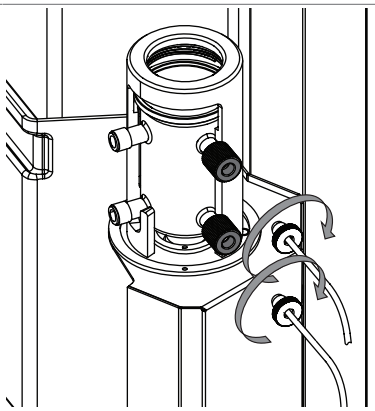
▶ Attach the inlet tube onto the connection marked **TANK IN**.

▶ Attach the drain tube onto the connection marked **TANK OUT (SOLVENT)**.



▶ Attach a solvent connection nut with seals to the connection marked **OUT**.

▶ Attach a solvent connection nut with seals to the connection marked **IN (SOLVENT)** .



▶ Attach the inlet tube onto the connection marked **OUT** .

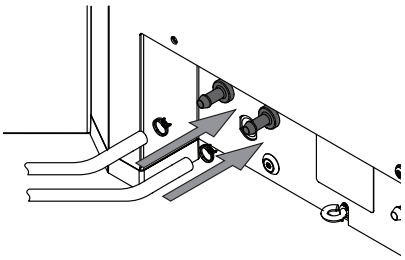
▶ Attach the drain tube onto the connection marked **IN (SOLVENT)** .

▶ Make sure that the solvent collector circuit is complete. See Chapter 14.1 "Schematics", page 85

5.7 Connecting the coolant tubes to the condenser tank bottle

Precondition:

☑ Make sure that the instrument is not connected to the power supply.



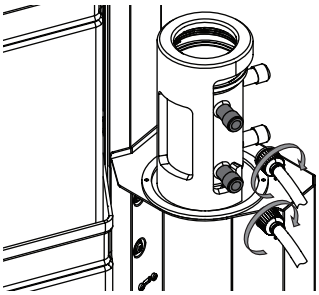
▶ Install the inlet tube onto the connection marked **CW TANK OUT**.

▶ Attach the inlet tube in place with a hose clip.

▶ Install the drain tube onto the connection marked **CW TANK IN**.

▶ Attach the drain tube in place with a hose clip.

- ▶ Attach the inlet tube onto the connection marked **CW IN** .
- ▶ Attach the drain tube onto the connection marked **CW OUT**.



- ▶ Make sure that the solvent collector circuit is complete. See Chapter 14.1 "Schematics", page 85

5.8 Preparing the tank bottle

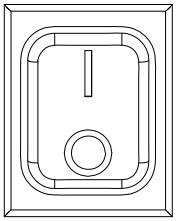
NOTICE

Risk of broken parts by using tools

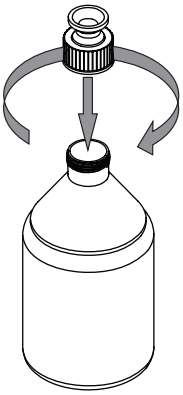
Using tools for preparing the instrument can break parts.

- ▶ Tighten all parts with your hands.

- ▶ Switch the ***On/Off*** master switch to Off.



- ▶ Put the bottle cap on the bottle.



- ▶ Put the tank bottle in the instrument.

▶ Attach the joint clip.

5.9 Preparing the instrument for Soxhlet Extraction

5.9.1 Installations for Soxhlet Extraction

▶ Prepare the condenser. See Preparing the condenser

▶ Prepare the extraction glass chamber Soxhlet. See Chapter 5.9.3 "Installing the extraction glass chamber Soxhlet", page 36

▶ Install the protection shields. See Chapter 5.12.1 "Installing two protection shields (Soxhlet only)", page 39

▶ Select the Soxhlet method on the interface. See Chapter 5.14 "Selecting a configuration", page 43

5.9.2 Preparing the extraction glass chamber Soxhlet

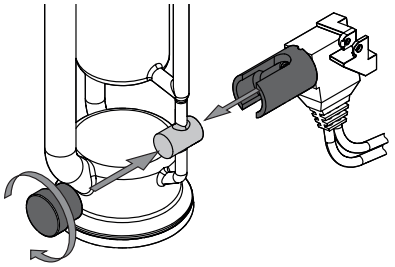
NOTICE

Risk of broken parts by using tools

Using tools for preparing the instrument can break parts.

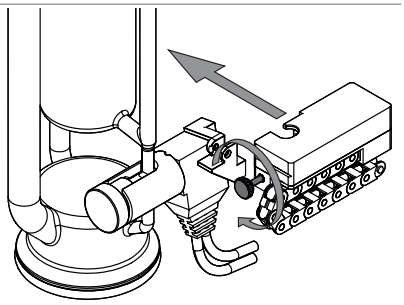
▶ Tighten all parts with your hands.

▶ Attach the valve to the extraction glass chamber at the point indicated.



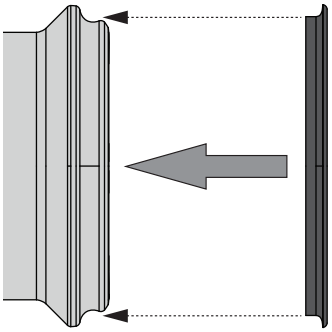
NOTICE! Make sure that the sensor is not bent during carrying out this action step

▶ Attach the sensor to the extraction glass chamber.



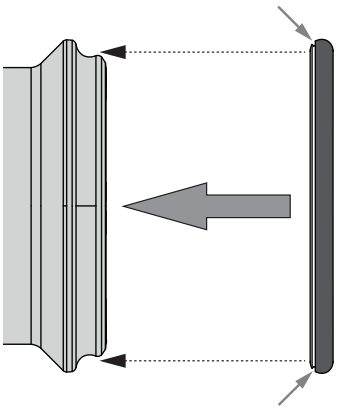
NOTICE! Depending on the instrument variation the seal can be different. The FatExtractor E-500 essential comes with FKM seals.

▶ Attach the FKM sealing to the extraction glass chamber.



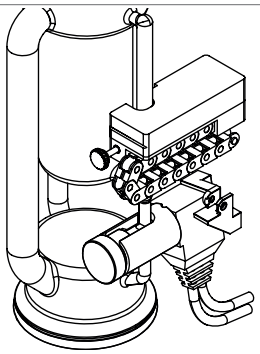
NOTICE! Depending on the instrument variation the seal can be different. The FatExtractor E-500 extended resistance comes with PTFE seals.

NOTICE! Make sure that the small gap of the sealing shows in the direction of the extraction glass chamber.



▶ Attach the PTFE sealing to the extraction glass chamber.

The extraction glass chamber is prepared.



5.9.3 Installing the extraction glass chamber Soxhlet

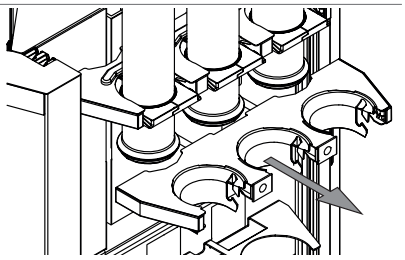
NOTICE

An incorrect assembled extraction glass chamber can cause glass breakage.

▶ Install the extraction glass chamber according to following instructions.

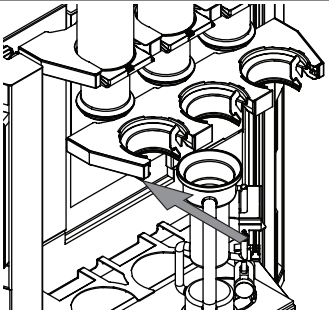
▶ Prepare the extraction glass chamber Soxhlet.
See Chapter 5.9.2 "Preparing the extraction glass chamber Soxhlet", page 35

▶ Pull the chamber rack.

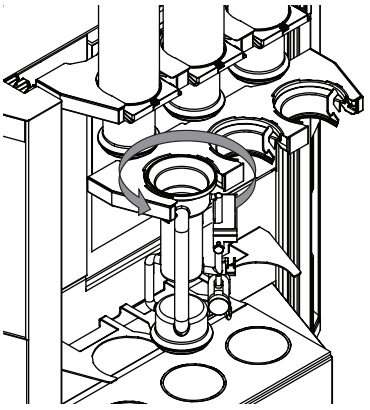


Precondition:
☑ Start with the extraction glass chamber on the left side.
☑ Make sure that the BUCHI Logo points to the front.

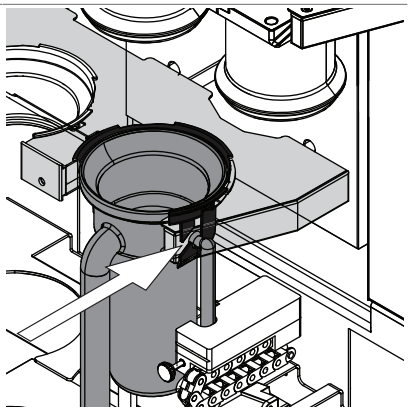
▶ Put the extraction glass chamber in the chamber rack.



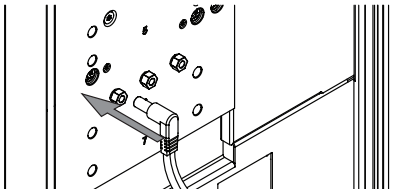
▶ Turn the extraction glass chamber 45° counterclockwise.



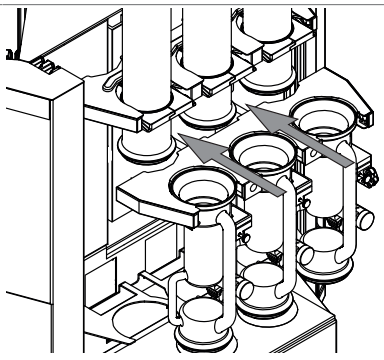
▶ Make sure that the extraction glass chamber locks at the hook.



▶ Connect the valve with the socket for sensor on the installation board.



▶ Push the chamber rack in the instrument.



5.10 Preparing the instrument for Hot Extraction

5.10.1 Installations for Hot Extraction

▶ Prepare the condenser. See Preparing the condenser

▶ Install the protection shields. See Chapter 5.12.2 "Installing one protection shield (Hot and Economic Continuous Extraction only)", page 40

▶ Select the Hot Extraction method on the interface. See Chapter 5.14 "Selecting a configuration", page 43

5.11 Preparing the instrument for Economic Continuous Extraction

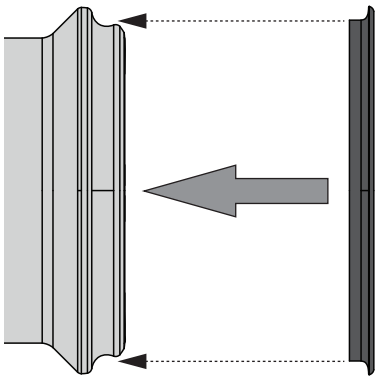
5.11.1 Installations for Economic Continuous Extraction

- ▶ Prepare the condenser. See Preparing the condenser
- ▶ Prepare the Economic Continuous Extraction chamber. See Chapter 5.11.3 "Installing the extraction glass chamber Economic Continuous Extraction", page 38
- ▶ Install the protection shields. See Chapter 5.12.2 "Installing one protection shield (Hot and Economic Continuous Extraction only)", page 40
- ▶ Select the Economic Continuous Extraction configuration on the interface. See Chapter 5.14 "Selecting a configuration", page 43

5.11.2 Preparing the extraction glass chamber for an Economic Continuous Extraction

NOTICE! Depending on the instrument variation the seal can be different. The FatExtractor E-500 essential comes with FKM seals.

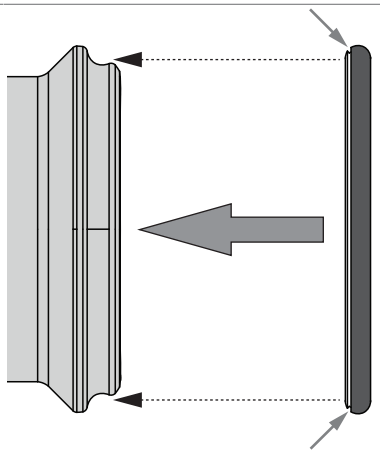
▶ Attach the FKM sealing to the extraction glass chamber.



NOTICE! Depending on the instrument variation the seal can be different. The FatExtractor E-500 extended resistance comes with PTFE seals.

NOTICE! Make sure that the small gap of the sealing shows in the direction of the extraction glass chamber.

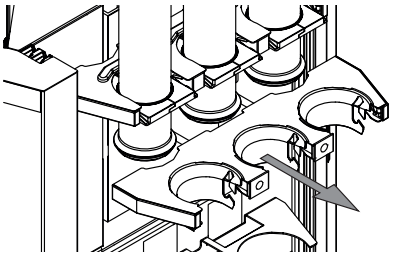
▶ Attach the PTFE sealing to the extraction glass chamber.



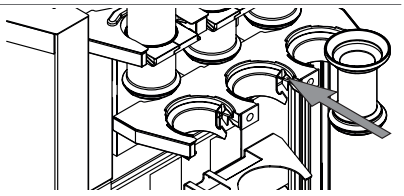
5.11.3 Installing the extraction glass chamber Economic Continuous Extraction

- ▶ Prepare the extraction glass chamber. See Preparing the extraction glass chamber for an Economic Continuous Extraction

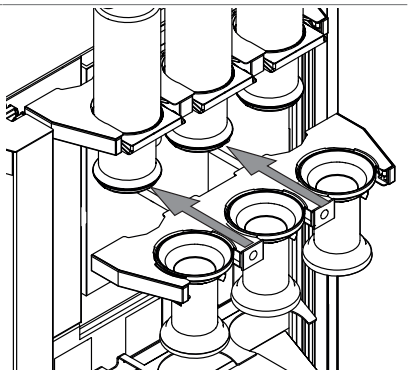
▶ Pull the chamber rack.



▶ Put the extraction glass chamber in the instrument.



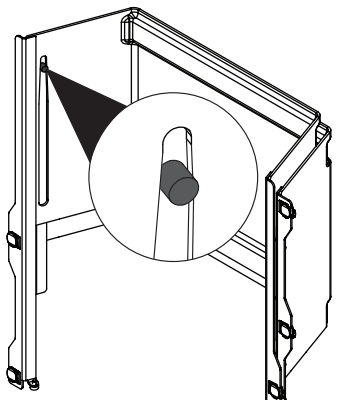
▶ Push the chamber rack in the instrument.



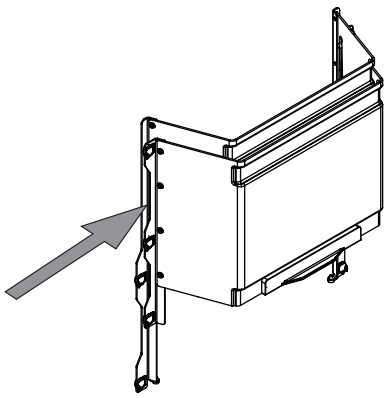
5.12 Installing the protection shields

5.12.1 Installing two protection shields (Soxhlet only)

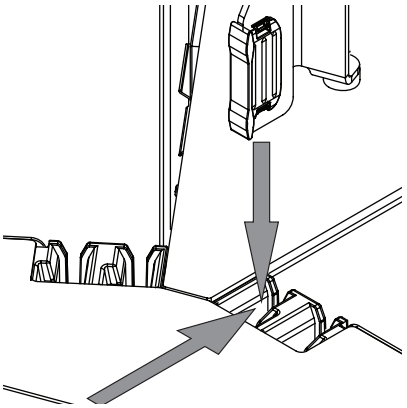
▶ Make sure, that both protections shields fit together.



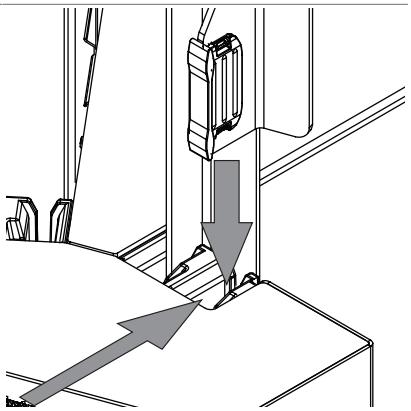
▶ Hold both protection shields on both sides at the point indicated.



▶ Put the rear protection shield on both sides into the rear slot at the same time.

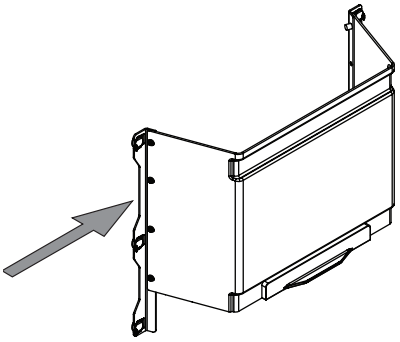


▶ Put the front protection shield on both sides into the front slot at the same time.



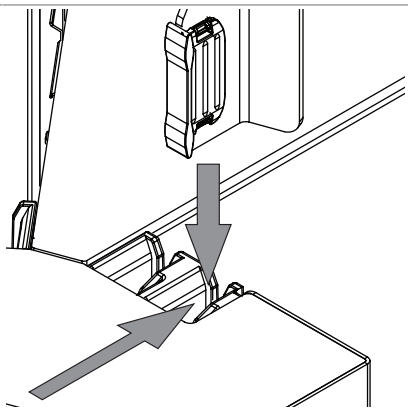
5.12.2 Installing one protection shield (Hot and Economic Continuous Extraction only)

▶ Hold the protection shield on both sides at the point indicated.



NOTICE! An incorrectly installed protection shield causes an error message on the interface.

▶ Put the protection shield on both sides into the front slot at the same time.



5.13 Preparing the condenser

NOTICE

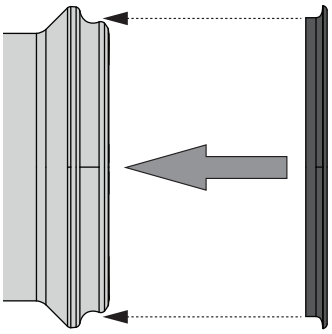
Risk of broken parts by using tools

Using tools for preparing the instrument can break parts.

▶ Tighten all parts with your hands.

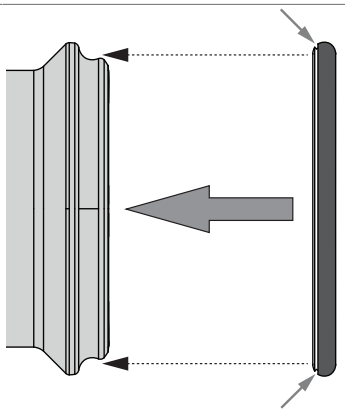
NOTICE! Depending on the instrument variation the seal can be different. The FatExtractor E-500 essential comes with FKM seals.

▶ Put the FKM sealing on the bottom of the condenser.

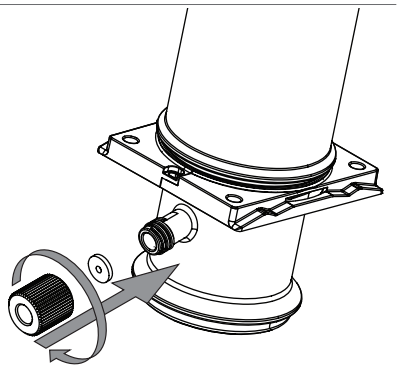


NOTICE! Depending on the instrument variation the seal can be different. The FatExtractor E-500 extended resistance comes with PTFE seals.
NOTICE! Make sure that the small gap of the sealing show in the direction of the condenser.

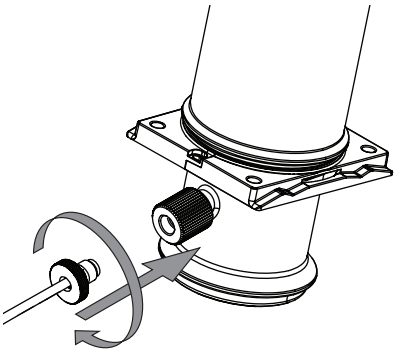
▶ Put the PTFE sealing on the bottom of the condenser.



▶ Attach the solvent connection nut with the seal to the condenser.

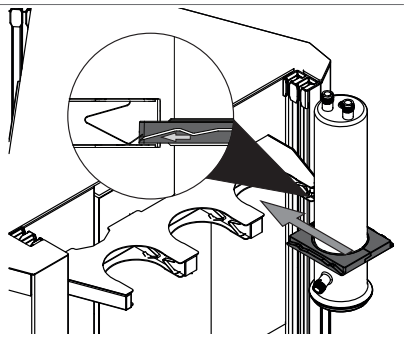


▶ Connect the solvent collector tube.

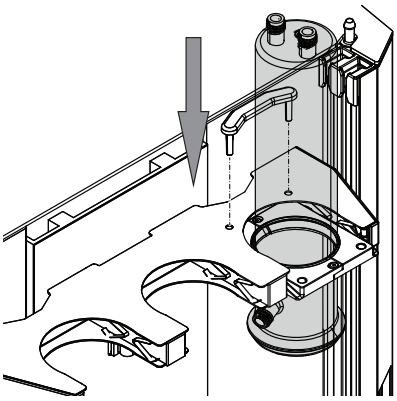


NOTICE! Do not use force to carry out this action step.

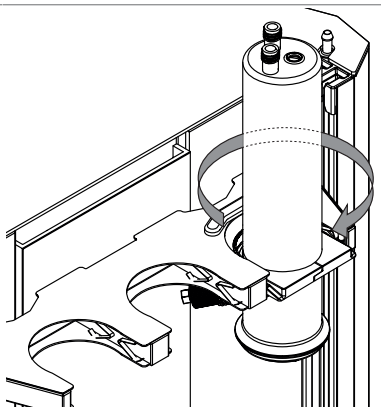
▶ Put the condenser in the condenser rack.



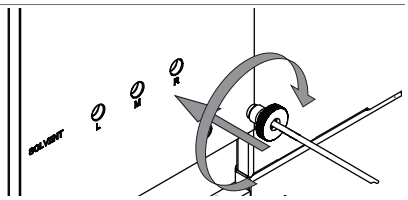
▶ Secure the condenser with the flange lock.



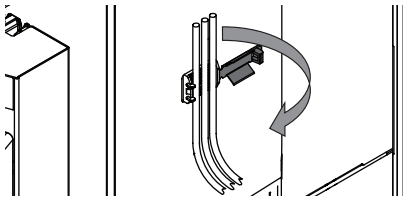
▶ Turn the condenser.



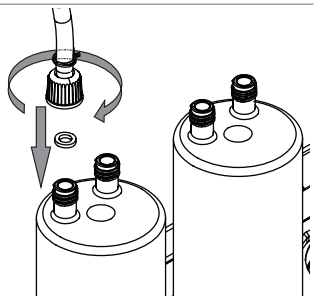
▶ Connect the solvent collector tube to the installation board



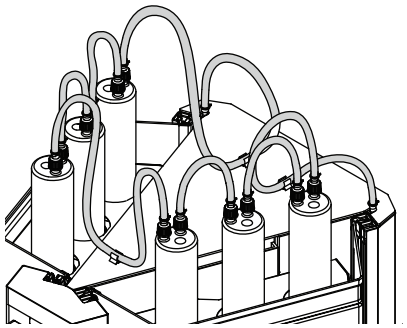
▶ Attach the tubes with the attachment clip to the installation board.



▶ Connect the condensers.



▶ Establish a condenser circuit.



▶ Make sure that the condenser circuit is complete. See Chapter 14.1 "Schematics", page 85

5.14 Selecting a configuration

Navigation path		
➔	⚙	➔ *[Settings]*

Precondition:

☑ Switch the On/Off master switch to On.

▶ Navigate to the *[Settings]* submenu via the navigation path.

▶ Tap the action *[Select configuration]*.

⇨ The display shows a dialog with the selectable configurations.

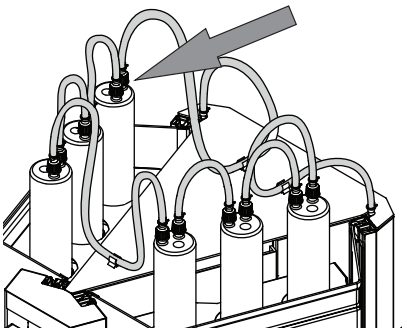
▶ Tap the configuration according to the installed glass setup.

⇨ The configuration is selected.

⇨ The dialog box closes.

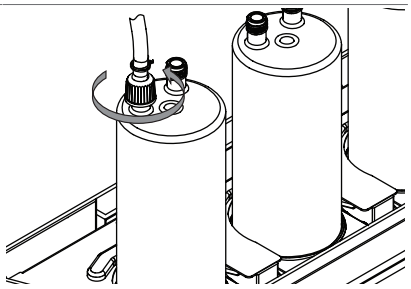
5.15 Disassembling the condenser circuit

▶ Disconnect the indicated condenser connection.

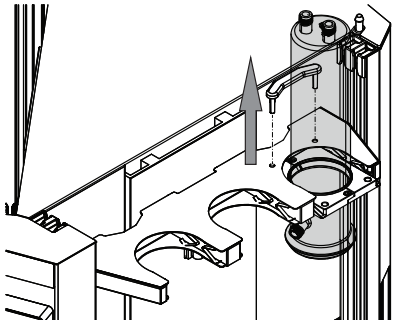


▶ Make sure, that there is no coolant in the condenser circuit.

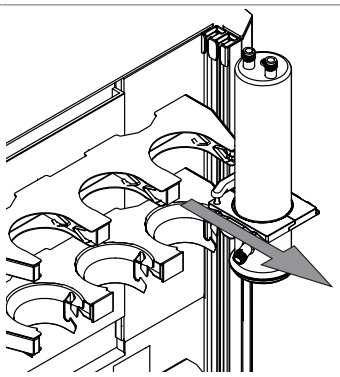
▶ Disconnect the other condenser connections.



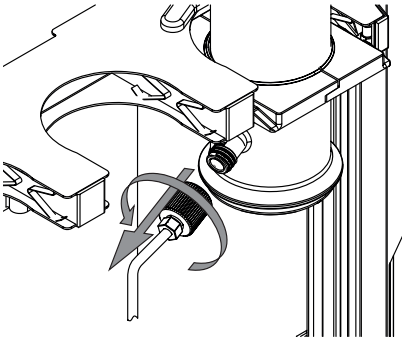
▶ Remove the flange lock.



▶ Pull the condenser out of the condenser rack.



▶ Disconnect the solvent collector tube.



▶ Disconnect the solvent collector tube from the installation board.

5.16 Mobile connection

5.16.1 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

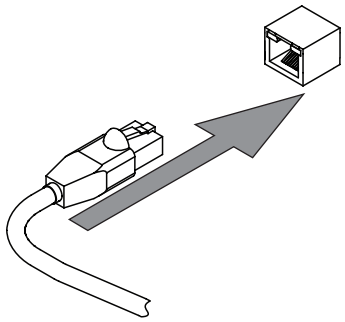
If there is no DHCP server available enter the IP address, gateway subnet mask and DNS server manually.

5.16.2 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.

6 Operating the interface

⚠ CAUTION

Risk of injury from glass splinters

Sharp objects can damage the display.

▶ Keep sharp objects away from the display.

6.1 Layout of the interface

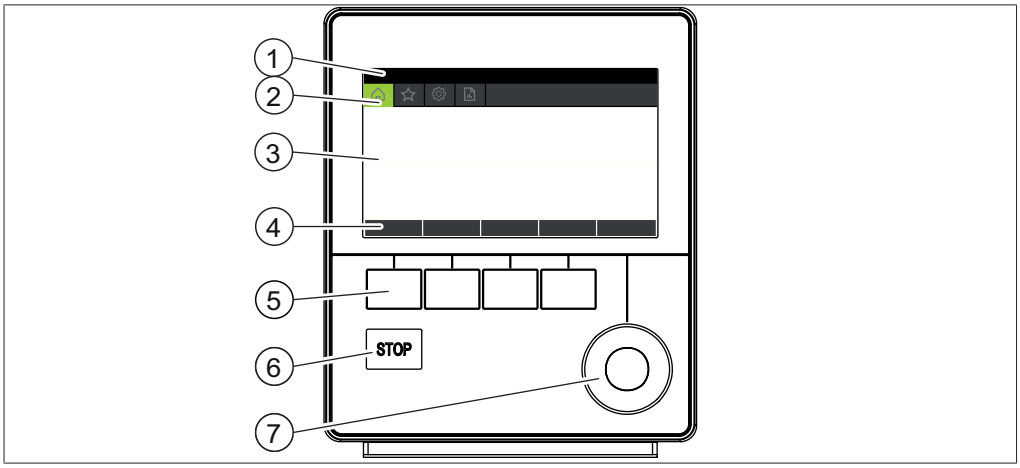


Fig. 12: Interface

No.	Description	Function
1	Status bar	Shows the actually used solvent and extraction method.
2	Menu bar	Shows symbols representing the menus.
3	Content area	Shows current settings, submenus or actions depending on current operation.
4	Function bar	Shows functions that can be performed according to the current operation.
5	Function buttons	Pressing a function button performs the assigned function on the function bar.
6	Stop button	The extraction stops. • The valves close. • The heaters switch off. • The coolant keeps running 15 min.
7	Navigation control	Used for navigating the user interface. Pressing the control performs the assigned function on the function bar.

6.2 Function bar

The function bar shows available functions according to the current operation.

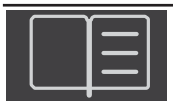
The functions on the function bar are executed by tapping the relevant function buttons.

Symbol	Description	Meaning
	*[Back]*	The display reverts to the previous view.
OK	*[Confirm]*	Confirms an entry.
DELETE	*[Delete]*	Deletes the selected entry.
SAVE	*[Save]*	Saves the setting.
MENU	*[Menu]*	Allows selection of a menu from the menu bar using the navigation control.
START	*[Start]*	Starts an extraction process.
STOP	*[Stop]*	Aborts extraction on all extraction positions.
ESC	*[Escape]*	Cancels the actual entry.
DOWN	*[Down]*	The lift moves down.
UP	*[Up]*	The lift moves up.
COPY	*[Copy]*	Copies the selected method.
SKIP	*[Skip]*	Skips the actual extraction step.
VIEW	*[View]*	Shows the parameters of the running extraction.
ABORT	*[Abort]*	Aborts extraction on the selected extraction position.

6.3 Menu bar

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

Menu symbol	Meaning	Submenu/Actions
	*[Home]* menu	• Process control parameters
	*[Method]* menu	• Editing and saving extraction methods
	*[Configuration]* menu	• Change settings • Service menu • System information

Menu symbol	Meaning	Submenu/Actions
	*[Solvent]* menu	• Solvent library • Editing and saving solvents

6.3.1 Home menu

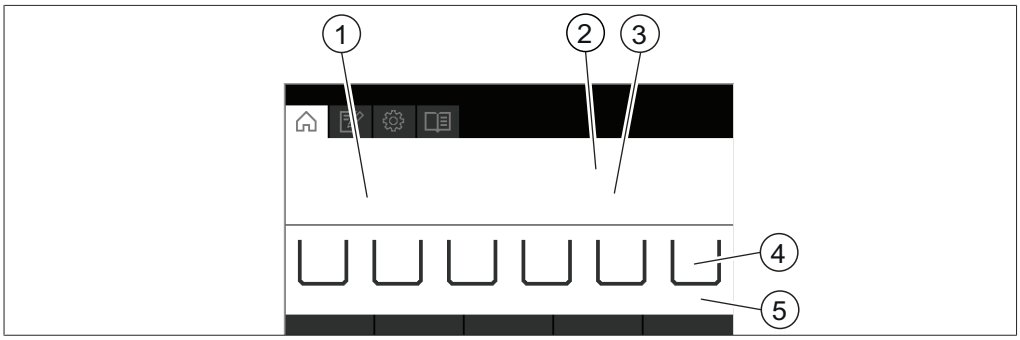


Fig. 13: Interface

1 Time remaining
2 Method
3 Status
4 Extraction positions
5 Extraction cycles (Soxhlet Extraction only)

6.3.2 Method menu

The *[Method]* menu allows saving methods. See Chapter 8 "Editing a method", page 58

6.3.3 Configuration menu

On the *[Configuration]* menu, you can enter a variety of settings and retrieve information.

Submenu Settings

The submenu *[Settings]* contains system settings for the instrument.

Action	Option	Explanation
[Language]	Choice of display language on the interface	The following languages are available: English/German/French/Italian/ Spanish/Japanese/Chinese/Russian/ Polish
[Beeper]	Off/On	Setting for audible signal in response to input controls.
[Display brightness]	Enter setting	Display brightness level in %: 0 - 100

Action	Option	Explanation
[Configuration]	Choice of extraction method	The following configurations are available: SOX (Soxhlet Extraction) / HE (Hot Extraction) / ECE (Economic Continuous Extraction)
[Max. Cycle time] (Soxhlet Extraction only)	Enter value	Maximum cycle time in minutes: 0 - 240
[Analyte protection (option)]	View	Threshold for empty-no beaker
		Threshold for full-empty beaker
[Mobile connection QR code]	View	The control unit shows a QR code for connecting the Extraction Reports app with the instrument.
[Mobile connection password]	View	The control panel shows a password for entry in the Extraction Reports app.
[Network]	Enter value	The following parameters can be edited: Device name/DHCP/MAC address/ System IP address/Subnet mask/ Gateway
[Delete app connection]	Confirmation question	Resets external connections to the instrument.
[Demo Mode]	On/Off	Simulate an extraction.

Submenu Service

⚠ WARNING

Incorrect use of the actor settings.

Incorrect use of the actors settings can cause instrument damages and injuries.

▶ Carry out the actor setting as described.

Action	Option	Explanation
[Sensors]	View	All sensor signals can be observed: • Flow senors • Level sensors • Analyte protection (option) • Protection shield • Valves • Lift current • Line voltage • Line frequency
[Actors]	Change settings	The following settings can be changed: • Valves: Soxhlet valves See Chapter 11.4 "Draining solvent from Extraction glass chamber (Soxhlet only)", page 80 Tank valves See Chapter 11.3 "Draining solvent from the instrument", page 79 Cooling water valve On/Off • Heater On/Off • Pump On/Off • Lift current ▶ Tap up or down. ⇨ Display shows the actual current consumption. • Beeper On/Off • Chiller On/Off (option)

Submenu System information

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

Action	Option	Explanation
[Extraction unit]	View	The following information on the Extraction Unit is available: • Serial number • Firmware version • Operating hours • Board temperature • Code

Action	Option	Explanation
[Interface]	View	The following information on the interface is available: • Serial number • Firmware version • Operating hours • Board temperature • Code • 30 V Operating voltage • 5 V Operating voltage

Submenu History QR code

Shows the history list of the data export QR codes to export data. SeeChapter 9.6 "Exporting extraction parameters", page 75

Submenu Data use

Action	Option	Explanation
[Number of extractions]	View	Shows the number of extractions performed with the instrument.
[Time of extraction]	View	Shows the time the instrument performed extractions.

6.3.4 Solvent menu

The solvent menu contains the available solvents for the extraction methods. The solvent menu allows editing individual solvents. See Chapter 10 "Editing a solvent", page 76

6.4 Status bar

The status bar shows actual information about the instrument (e.g. extraction method, LAN connection, etc.).

7 Operating the interface pro

⚠ CAUTION

Risk of injury from glass splinters

Sharp objects can damage the display.

▶ Keep sharp objects away from the display.

7.1 Layout of the interface

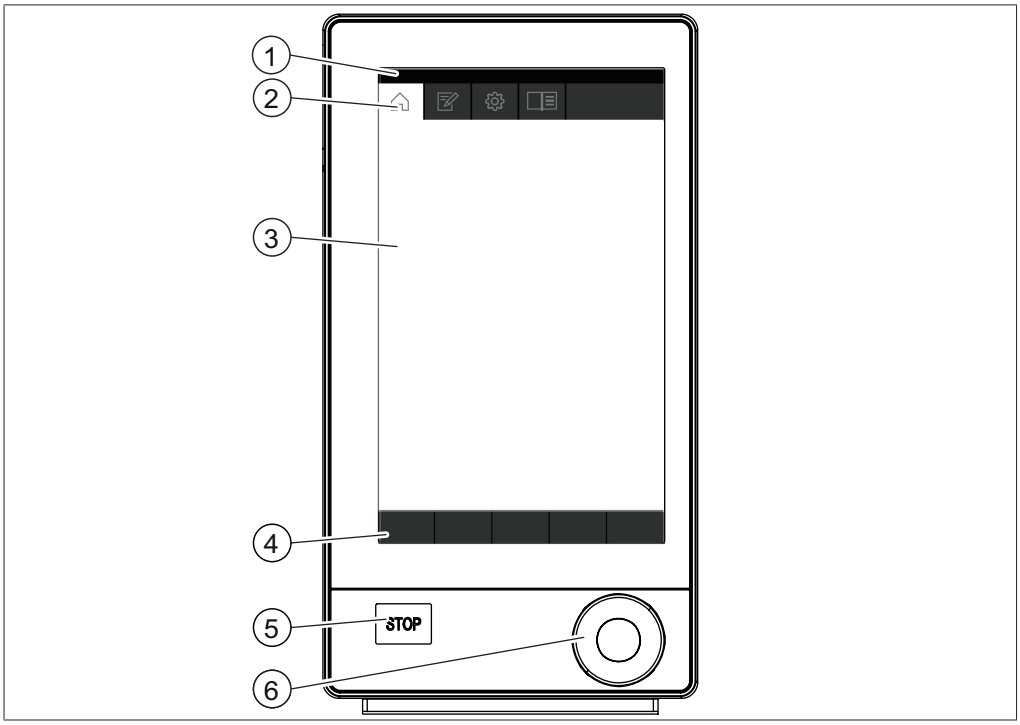


Fig. 14: Interface Pro

No.	Description	Function
1	Status bar	Shows the currently used solvent and extraction method.
2	Menu bar	Shows symbols representing the menus.
3	Content area	Shows current settings, submenus or actions depending on the current operation.
4	Function bar	Shows functions that can be performed according to the current operation.
5	Stop button	The extraction stops. • The valves close. • The heaters switch off. • The coolant keeps running 15 min.
6	Navigation control	Used for navigating the user interface. Pressing the control performs the assigned function on the function bar.

7.2 Function bar

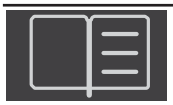
The function bar shows available functions according to the current operation.
The functions on the function bar are executed by tapping the relevant function buttons.

Symbol	Description	Meaning
	*[Back]*	The display reverts to the previous view.
OK	*[Confirm]*	Confirms an entry.
DELETE	*[Delete]*	Deletes the selected entry.
SAVE	*[Save]*	Saves the setting.
MENU	*[Menu]*	Allows selection of a menu from the menu bar using the navigation control.
START	*[Start]*	Starts an extraction process.
STOP	*[Stop]*	Aborts extraction on all extraction positions.
QR Code	*[QR Code]*	The display shows a QR Code which contains the data of all extraction parameters.
UP	*[Up]*	The lift moves up.
DOWN	*[Down]*	The lift moves down.
ESC	*[Escape]*	Cancels the actual entry.
COPY	*[Copy]*	Copies the selected method.

7.3 Menu bar

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

Menu symbol	Meaning	Submenu/Actions
	*[Home]* menu	• Process control parameters
	*[Method]* menu	• Editing and saving extraction methods
	*[Configuration]* menu	• Change settings • Service menu • System information

Menu symbol	Meaning	Submenu/Actions
	*[Solvent]* menu	• Solvent library • Editing and saving solvents

7.3.1 Home menu

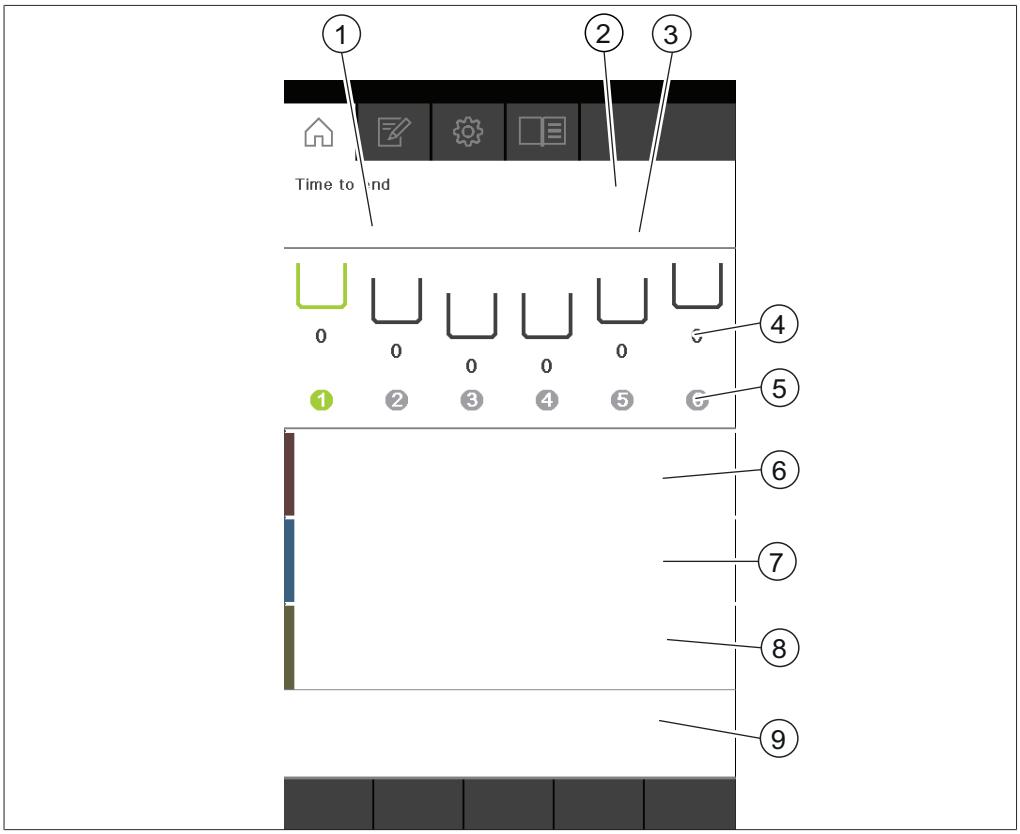


Fig. 15: Home menu

1	Time remaining	2	Method
3	Status	4	Extraction cycles (Soxhlet Extraction only)
5	Extraction position	6	Extraction time and heating level
7	Rinse time and heating level	8	Drying time and heating level
9	Control buttons		

On the home menu the following control buttons are available:

Button	Meaning
	Skips the actual step.
	Aborts extraction on the selected extraction position.
	Editing the running method.

7.3.2 Method menu

The *[Method]* menu allows saving methods. See Chapter 8 "Editing a method", page 58

7.3.3 Configuration menu

On the *[Configuration]* menu, you can enter a variety of settings and retrieve information.

Submenu Settings

The submenu *[Settings]* contains system settings for the instrument.

Action	Option	Explanation
[Language]	Choice of display language on the interface	The following languages are available: English/German/French/Italian/ Spanish/Japanese/Chinese/Russian/ Polish
[Date]	Date input	Enter in sequence: Day, month, year. Apply the settings by pressing *[OK]*.
[Time]	Time input	Enter in sequence: Minutes, hours. Apply the settings by pressing *[OK]*.
[Beeper]	Off/On	Setting for audible signal in response to input controls.
[Display brightness]	Enter setting	Display brightness level in %: 0 - 100
[Configuration]	Choice of extraction method	The following configurations are available: SOX (Soxhlet Extraction) / HE (Hot Extraction) / ECE (Economic Continuous Extraction)
[Max. Cycle time] (Soxhlet Extraction only)	Enter value	Maximum cycle time in minutes: 0 - 240
[Analyte protection (option)]	View	Threshold for empty-no beaker
		Threshold for full-empty beaker
[Mobile connection QR code]	View	The control unit shows a QR code for connecting the Extraction Reports app with the instrument.
[Mobile connection password]	View	The control panel shows a password for entry in the Extraction Reports app.
[Network]	Enter value	The following parameters can be edited: Device name/DHCP/MAC address/ System IP address/Subnet mask/ Gateway

Action	Option	Explanation
[Delete app connection]	Confirmation question	Resets external connections to the instrument.
[Demo Mode]	On/Off	Simulate an extraction.

Submenu Service

⚠ WARNING

Incorrect use of the actor settings.

Incorrect use of the actors settings can cause instrument damages and injuries.

▶ Carry out the actor setting as described.

Action	Option	Explanation
[Sensors]	View	All sensor signals can be observed: • Flow senors • Level sensors • Analyte protection (option) • Protection shield • Valves • Lift current • Line voltage • Line frequency
[Actors]	Change settings	The following settings can be changed: • Valves: Soxhlet valves See Chapter 11.4 "Draining solvent from Extraction glass chamber (Soxhlet only)", page 80 Tank valves See Chapter 11.3 "Draining solvent from the instrument", page 79 Cooling water valve On/Off • Heater On/Off • Pump On/Off • Lift current ▶ Tap up or down. ⇨ Display shows the actual current consumption. • Beeper On/Off • Chiller On/Off (option)

Submenu System Information

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

Action	Option	Explanation
[Extraction unit]	View	The following information on the Extraction Unit is available: • Serial number • Firmware version • Operating hours • Board temperature • Code
[Interface]	View	The following information on the interface is available: • Serial Number • Firmware version • Operating Hours • Board temperature • Code • Operation voltage 30 V • Operation voltage 5V

Submenu History QR code

Shows the history list of the data export QR codes to export data. SeeChapter 9.6 "Exporting extraction parameters", page 75

Submenu Data use

Action	Option	Explanation
[Number of extractions]	View	Shows the number of extractions performed with the instrument.
[Time of extraction]	View	Shows the time the instrument performed extractions.

7.3.4 Solvent menu

The solvent menu contains the available solvents for the extraction methods. The solvent menu allows editing individual solvents. See Chapter 10 "Editing a solvent", page 76

7.4 Status bar

The status bar shows actual information about the instrument (e.g. extraction method, LAN connection, etc.).

8 Editing a method

This chapter describes how to edit a method.

NOTE

Depending on the extraction method you edit, the display shows the available parameters for this extraction method.

8.1 Creating a new method

Navigation path

➔ 

- ▶ Navigate to the *[Method]* menu via the navigation path.
- ▶ Select the submenu *[Define method]* with the navigation control.
- ⇨ The display highlights the selection in green.
- ▶ Tap the function *[OK]* on the function bar.
- ⇨ The new method is created.
- ⇨ The display shows the view *Method*.
- ▶ Tap the function *[Save]* on the function bar.
- ⇨ The method is saved.

8.2 Changing the name of a method

Navigation path

➔ 

- ▶ Navigate to the *[Method]* menu via the navigation path.
- ▶ Tap the name of the method that you wish to edit.
- ⇨ The display shows the view *Method*.
- ▶ Tap the function *[Edit]* on the function bar.
- ▶ Select the action *[Method name]* with the navigation control.
- ⇨ The display shows a dialog with an alphanumeric input box.
- ▶ Enter a name for the method.
- ▶ Tap the function *[Save]* on the function bar.
- ⇨ The new name is saved.
- ⇨ The dialog box closes.

8.3 Setting the solvent of a method

The following solvents are selectable:

- Chloroform
- Diethyl ether
- Hexane
- Petroleum ether
- User defined solvent

The control sets the heating level for the selected solvent automatically.

Navigation path

➔ 

- ▶ Navigate to the *[Method]* menu via the navigation path.
- ▶ Tap the name of the method that you wish to edit.

⇨ The display shows the view *Method*.

- ▶ Tap the function *[Edit]* on the function bar.
- ▶ Select the action *[Solvent]* with the navigation control.

⇨ The display shows a dialog with the selectable solvents.

- ▶ Select the solvent you wish to use with the navigation control.
- ▶ Tap the function *[OK]* on the function bar.
- ▶ Tap the function *[Save]* on the function bar.

⇨ The solvent is saved.

⇨ The dialog box closes.

8.4 Setting the extraction time of a method

Enter the duration of the extraction step in minutes.

- at least 0 minutes
- maximum 5940 minutes / 99 hours

Navigation path

➔ 

- ▶ Navigate to the *[Method]* menu via the navigation path.
- ▶ Tap the name of the method that you wish to edit.

⇨ The display shows the view *Method*.

- ▶ Tap the function *[Edit]* on the function bar.
- ▶ Select the action *[Extraction time]* with the navigation control.
- ▶ Turn the navigation control until the required value.
- ▶ Tap the function *[OK]* on the function bar.
- ▶ Tap the function *[Save]* on the function bar.

⇨ The value is saved.

⇨ The dialog box closes.

8.5 Setting the extraction cycles of a method (Soxhlet Extraction only)

The extraction time and the number of extraction cycles are interdependent.

- If the number of extraction cycles is set to zero, the extraction will finish after the selected time.
- If the extraction time is set to zero, the extraction will finish after the number of extraction cycles is reached.
- If the extraction time and a number of extraction cycles is set, the extraction will finish once both settings are fulfilled.

The number of extraction cycles is selectable from 0 to 5940.

Navigation path

➔ 

- ▶ Navigate to the *[Method]* menu via the navigation path.
- ▶ Tap the name of the method that you wish to edit.

⇨ The display shows the view *Method*.

- ▶ Tap the function *[Edit]* on the function bar.
- ▶ Select the action *[Extraction cycle]* with the navigation control.
- ▶ Turn the navigation control until the required value.
- ▶ Tap the function *[OK]* on the function bar.
- ▶ Tap the function *[Save]* on the function bar.

⇨ The number of extraction cycles is saved.

8.6 Setting the extraction heating level of a method

The default setting for the heating level setting is depending on the selected solvent. Change the heating level to compensate ambient conditions.
The user defined solvents have no predefined heating level. The heating level must be chosen when creating a method. Please refer to BUCHI's application notes.

⚠ WARNING

Setting the heating level too high

The consequences are device damage, serious injuries or death.

- ▶ Use the pre-set heating levels.
- ▶ Adjust the heating level to compensate the ambient conditions.

Navigation path

➔ 

- ▶ Navigate to the *[Method]* menu via the navigation path.
- ▶ Tap the name of the method that you wish to edit.

⇨ The display shows the view *Method*.

- ▶ Tap the function *[Edit]* on the function bar.
- ▶ Select the action *[Extraction heating level]* with the navigation control.
- ▶ Turn the navigation control until the required value.
- ▶ Tap the function *[OK]* on the function bar.
- ▶ Tap the function *[Save]* on the function bar.

⇨ The heating level is saved.

8.7 Setting the Soxhlet valve open time of a method (Soxhlet only)

The Soxhlet valve open time depends on the position of the level sensor and the sample structure.
Set the Soxhlet valve opening time so that the Extraction glass chamber Soxhlet is completely emptied.
The following open times are available:

Open time	Level sensor position	Explanation
[short]	bottom	The sample structure is easily releasing the solvent.
		Hydrolysed sample in the glass sample tubes are extracted.
[mid]	middle	The sample structure is easily releasing the solvent.
[long]	top	The sample structure is easily releasing the solvent.
	bottom	The sample structure is slowly releasing the solvent.
[max]	top	The Soxhlet LSV chamber is used.
		The sample structure is slowly releasing the solvent.

Navigation path

➔ 

- ▶ Navigate to the *[Method]* menu via the navigation path.
- ▶ Tap the name of the method that you wish to edit.

⇨ The display shows the view *Method*.

- ▶ Tap the function *[Edit]* on the function bar.
- ▶ Select the action *[Sox valve open time]* with the navigation control.

⇨ The display shows a dialog with the selectable values.

- ▶ Tap the function *[OK]* on the function bar.
- ▶ Tap the function *[Save]* on the function bar.

⇨ The Soxhlet valve open time is saved.

8.8 Setting the rinse time of a method (Soxhlet and Hot Extraction only)

Enter the duration of the rinse step in minutes.

- at least 0 minutes
- maximum 5940 minutes / 99 hours

Navigation path

➔ 

- ▶ Navigate to the *[Method]* menu via the navigation path.
- ▶ Tap the name of the method that you wish to edit.

⇨ The display shows the view *Method*.

- ▶ Tap the function *[Edit]* on the function bar.
- ▶ Select the action *[Rinse time]* with the navigation control.
- ▶ Turn the navigation control until the required value.

- ▶ Tap the function *[OK]* on the function bar.
- ▶ Tap the function *[Save]* on the function bar.

⇨ The time is saved.

8.9 Setting the rinse heating level of a method (Soxhlet and Hot Extraction only)

The default setting for the rinse heating level is depending on the selected solvent. Change the rinse heating level to compensate ambient conditions.

⚠ WARNING

Setting the heating level too high

The consequences are device damage, serious injuries or death.

- ▶ Use the pre-set heating levels.
- ▶ Adjust the heating level to compensate the ambient conditions.

Navigation path

➔ 

- ▶ Navigate to the *[Method]* menu via the navigation path.
- ▶ Tap the name of the method that you wish to edit.

⇨ The display shows the view *Method*.

- ▶ Tap the function *[Edit]* on the function bar.
- ▶ Select the action *[Rinse heating level]* with the navigation control.
- ▶ Turn the navigation control until the required value.
- ▶ Tap the function *[OK]* on the function bar.
- ▶ Tap the function *[Save]* on the function bar.

⇨ The heating level is saved.

8.10 Setting the number of drains for a method (Hot Extraction only)

During each drain 3 - 4 mL of solvent is drained into the solvent tank.
The level in the beaker is lowered to finally rinse the sample without touching the extract.

Navigation path

➔ 

- ▶ Navigate to the *[Method]* menu via the navigation path.
- ▶ Tap the name of the method that you wish to edit.

⇨ The display shows the view *Method*.

- ▶ Tap the function *[Edit]* on the function bar.
- ▶ Select the action *[No. of drains]* with the navigation control.

⇨ The display shows a dialog with the selectable values.

- ▶ Select the value you wish to use with the navigation control.
- ▶ Tap the function *[OK]* on the function bar.

▶ Tap the function *[Save]* on the function bar.

⇨ The value is saved.

⇨ The dialog box closes.

8.11 Setting SmartDrying (Soxhlet and Economic Continuous Extraction only)

Smart-Drying automatically sets the parameters for the drying step.
The following parameters are set automatically:

- Rinse heating level (without analyte protection only)
- Drying time
- Drying heating level

Navigation path

➔ 

▶ Navigate to the *[Method]* menu via the navigation path.
▶ Tap the name of the method that you wish to edit.

⇨ The display shows the view *Method*.

▶ Tap the function *[Edit]* on the function bar.
▶ Tap the action *[SmartDrying]*.

⇨ The function is enabled.

8.12 Setting the drying time of a method

NOTICE

Risk of beaker damage or deterioration of the analyte due to incorrect settings of the drying step.

Incorrect drying step settings can damage the analyte and the beaker.

▶ Changing the default settings is at your own risk.

The duration of the drying time of a method depends on the solvent volume.

Navigation path

➔ 

▶ Navigate to the *[Method]* menu via the navigation path.
▶ Tap the name of the method that you wish to edit.

⇨ The display shows the view *Method*.

▶ Tap the function *[Edit]* on the function bar.
▶ Select the action *[Drying time]* with the navigation control.
▶ Turn the navigation control until the required value.
▶ Tap the function *[OK]* on the function bar.
▶ Tap the function *[Save]* on the function bar.

⇨ The time is saved.

8.13 Setting the drying heating level of a method

The default setting for the drying heating level is depending on the selected solvent. Change the drying heating level to compensate fluctuations in ambient conditions.

⚠ WARNING

Setting the heating level too high

The consequences are device damage, serious injuries or death.

- ▶ Use the pre-set heating levels.
- ▶ Adjust the heating level to compensate the ambient conditions.

Navigation path

➔ 

- ▶ Navigate to the *[Method]* menu via the navigation path.
- ▶ Tap the name of the method that you wish to edit.

⇨ The display shows the view *Method*.

- ▶ Tap the function *[Edit]* on the function bar.
- ▶ Select the action *[Drying heating level]* with the navigation control.
- ▶ Turn the navigation control until the required value.
- ▶ Tap the function *[OK]* on the function bar.
- ▶ Tap the function *[Save]* on the function bar.

⇨ The heating level is saved.

9 Performing an extraction

9.1 Task during performing an extraction

9.1.1 Adding solvent through the condenser

There are two possibilities to add solvent throught the condenser:

1. with a dispenser see Chapter "Adding solvent through the condenser with a dispenser", page 65
2. with a funnel Chapter "Adding solvent through the condenser with a funnel", page 66

Adding solvent through the condenser with a dispenser

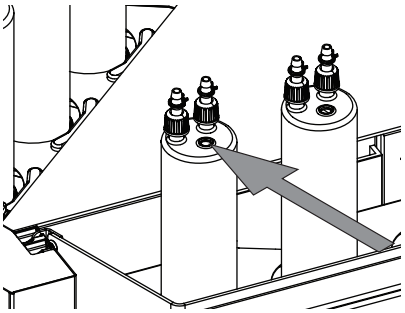
⚠ CAUTION

Not correctly installed condenser

A not correctly installed condenser can cause skin burns or a building fire

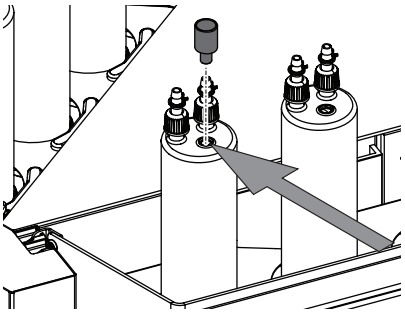
- ▶ A beaker is placed under the position.
- ▶ An extraction glass chamber is installed at the position (Soxhlet and Economic Continuous Extraction only).
- ▶ The lift is in the lower position.

- ▶ Insert the nozzle of the dispenser into the condenser.
- ▶ Add solvent with a dispenser.



Use the support solvent supply (option)

- ▶ Put a support solvent supply on the condenser.
- ▶ Insert the nozzle of the dispenser into the support solvent supply.
- ▶ Add solvent with a dispenser.



Adding solvent through the condenser with a funnel

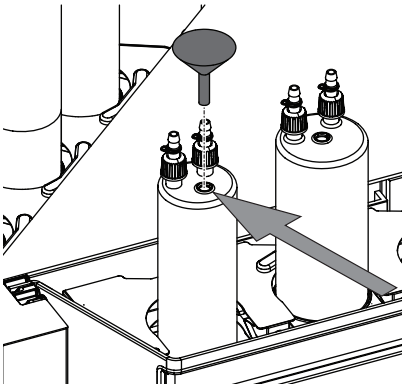
⚠ CAUTION

Not correctly installed condenser

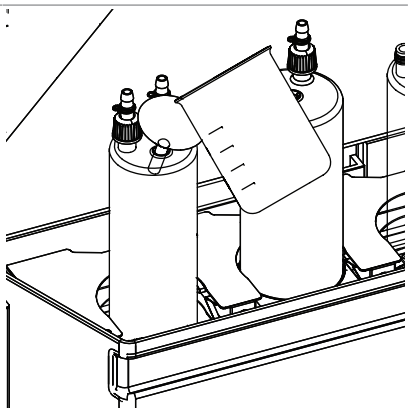
A not correctly installed condenser can cause skin burns or a building fire

- ▶ A beaker is placed under the position.
- ▶ An extraction glass chamber is installed at the position (Soxhlet and Economic Continuous Extraction only).
- ▶ The lift is in the lower position.

▶ Put a funnel on the condenser.



▶ Add solvent through the funnel.

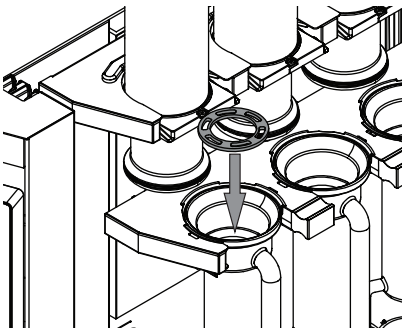


9.2 Putting the glass sample tube with frit in the extraction glass chamber

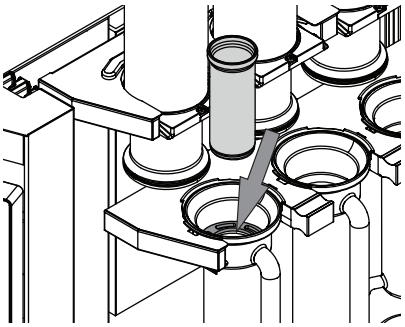
NOTE

Instead of glass sample tube with frit it is possible to insert a thimble.

▶ Put the holder for the glass sample tube with frit into the extraction chamber.



▶ Put the glass sample tube with frit into the holder in the extraction chamber.

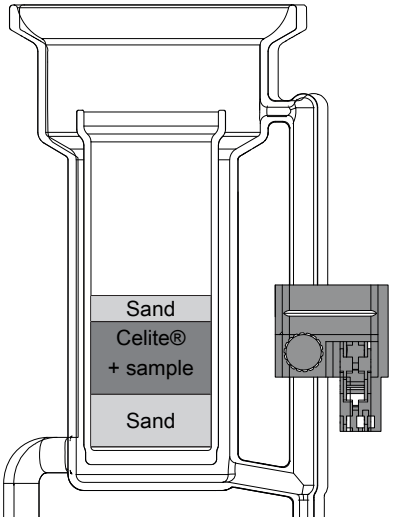


9.3 Performing a Soxhlet Extraction

9.3.1 Adjusting the optical sensor on the extraction glass chamber Soxhlet

▶ Adjusting the optical sensor on the extraction glass chamber Soxhlet.

- White line to the center of the upper sand layer.



9.3.2 Preparing the instrument for a Soxhlet Extraction

Precondition:

☑ All commissioning operations have been completed. See Chapter 5 "Installation", page 30

☑ Make sure that the configuration Soxhlet Extraction is selected. See Chapter 5.14 "Selecting a configuration", page 43

☑ Make sure that there are no extraction beakers in the instrument.

☑ Make sure that no defective sealings or glass parts are used.

☑ Make sure that the tank bottle is empty and installed. See Chapter 5.8 "Preparing the tank bottle", page 34

▶ Switch the ***On/Off*** master switch to On.

⇨ The instrument is starting up.

9.3.3 Selecting a method

Navigation path

➔ ⌂

▶ Navigate to the *[Home]* menu via the navigation path.

▶ Tap the method.

⇨ The display shows a dialog with the selectable methods.

▶ Select the method you wish to use.

▶ Tap the function *[OK]* on the function bar.

⇨ The method is selected.

9.3.4 Selecting the extraction positions

The extraction positions can show the following status:

Status	Meaning
	The extraction position is activated. The extraction position will be heated.
	The extraction position is not activated. The extraction position will not be heated.
	The extraction for this extraction position is aborted. The extraction position is not heated anymore.

Navigation path

➔ 

▶ Navigate to the *[Home]* menu via the navigation path.

▶ Select the extraction position with the navigation control.

▶ Tap the function *[OK]* on the function bar.

⇨ The status of the extraction position is changed.

9.3.5 Starting a Soxhlet Extraction

NOTE

Boiling retardation

▶ The beakers contain an integrated boiling surface.

⇨ No boiling aids are needed.

NOTE

As an alternative fill the solvent at the beginning of an extraction through the condenser. See Chapter 9.1.1 "Adding solvent through the condenser", page 65

Navigation path

➔ 

Precondition:

☑ The instrument has been prepared.

☑ A method is selected.

☑ The sample is prepared (in the glass sample tube or in the thimble).

▶ Switch on the connected recirculating chiller or open the water tap.

▶ Pull the chamber rack out of the instrument.

▶ Place the prepared glass sample tube or thimble with the corresponding holder in the extraction chamber.

- ▶ Set the optical sensor to the correct position. See Chapter 9.3.1 "Adjusting the optical sensor on the extraction glass chamber Soxhlet", page 67
- ▶ Push the chamber rack back in the instrument.
- ▶ Fill the beaker with organic solvent.
- ▶ Put the beaker on the corresponding position on the heating plate.
- ▶ Close the protection shield.
- ▶ Navigate to the *[Home]* menu via the navigation path.
- ▶ Tap the function *[Down]* on the function bar.

⇨ The lift moves down.

- ▶ Wait until the lift is in the lower position.
- ▶ Make sure that all components of the glass setup are aligned.

Testing procedure:

- Move each condenser a small distance forward and backward.

- ▶ Tap the function *[Start]* on the function bar.

⇨ The display shows the *[Home]* menu with a black background.

⇨ The instrument is starting the selected method.

- ▶ Wait until the solvent boils and condenses.
- ▶ Make sure that there are no leaks.

9.3.6 Ending a Soxhlet Extraction

⚠ WARNING

Risk of dangerous vapors, hot parts and hot glassware.

A hot instrument can cause building fire, skin burns or death.

- ▶ Wait 15 min before opening the lift.
- ▶ Do not touch hot parts or surfaces.
- ▶ Use pliers to remove the glassware.

Navigation path
➔ ⌂

Precondition:

☑ The *[Start]* menu is showing the status **Finished**.

☑ The instrument temperature is less than 150 °C.

- ▶ Tap the function *[Up]* on the function bar.

⇨ The lift moves up.

- ▶ Open the protection shield.
- ▶ Remove the beaker for further processing.
- ▶ Remove the glass sample tube or thimble from the extraction glass chamber.
- ▶ Switch off the connected recirculating chiller or close the water tap.
- ▶ Empty the solvent tank. See Chapter 11.2 "Removing the tank bottle", page 78

9.3.7 Shutting down the instrument

Navigation path
➔ ⌂

Precondition:

☑ The extraction process has ended.

▶ Switch the On/Off master switch to Off.

9.4 Performing a Hot Extraction

9.4.1 Preparing the instrument for a Hot Extraction

Precondition:

☑ All commissioning operations have been completed. See Chapter 5 "Installation", page 30

☑ Make sure that the configuration Hot Extraction is selected.

☑ Make sure that there are no extraction beakers in the instrument.

☑ Make sure that no defective sealings or glass parts are used.

☑ Make sure that the tank bottle is empty and installed. See Chapter 5.8 "Preparing the tank bottle", page 34

▶ Switch the ***On/Off*** master switch to On.

⇨ The instrument is starting up.

9.4.2 Selecting a method

Navigation path
➔ ⌂

▶ Navigate to the *[Home]* menu via the navigation path.

▶ Tap the method.

⇨ The display shows a dialog with the selectable methods.

▶ Select the method you wish to use.

▶ Tap the function *[OK]* on the function bar.

⇨ The method is selected.

9.4.3 Selecting the extraction positions

The extraction positions can show the following status:

Status	Meaning
⌴	The extraction position is activated. The extraction position will be heated.
×	The extraction position is not activated. The extraction position will not be heated.
a	The extraction for this extraction position is aborted. The extraction position is not heated anymore.

Navigation path

➔ 

- ▶ Navigate to the *[Home]* menu via the navigation path.
- ▶ Select the extraction position with the navigation control.
- ▶ Tap the function *[OK]* on the function bar.

⇨ The status of the extraction position is changed.

9.4.4 Starting a Hot Extraction

NOTE

Boiling retardation

- ▶ The beakers contain an integrated boiling surface.

⇨ No boiling aids are needed.

Navigation path

➔ 

Precondition:

☑ The instrument has been prepared.

☑ A method is selected.

☑ The sample is prepared (in the glass sample tube or in the thimbles).

- ▶ Switch on the connected recirculating chiller or open the water tap.
- ▶ Place the prepared glass sample tube or thimble with the corresponding holder in the beaker.
- ▶ Put the beaker on the corresponding position on the heating plate.
- ▶ Close the protection shield.
- ▶ Navigate to the *[Home]* menu via the navigation path.
- ▶ Tap the function *[Down]* on the function bar.

⇨ The lift moves down.

- ▶ Wait until the lift is in the lower position.
- ▶ Make sure that all components of the glass setup are aligned.

Testing procedure:

- Move each condenser a small distance forward and backward.

- ▶ Fill the solvent via the condenser. See Chapter "Adding solvent through the condenser with a funnel", page 66
- ▶ Tap the function *[Start]* on the function bar.

⇨ The display shows the *[Home]* menu with a black background.

⇨ The instrument is starting the selected method.

- ▶ Wait until the solvent boils and condenses.
- ▶ Make sure that there are no leaks.

9.4.5 Ending a Hot Extraction

⚠ WARNING

Risk of dangerous vapors, hot parts and hot glassware.

A hot instrument can cause building fire, skin burns or death.

- ▶ Wait 15 min before opening the lift.
- ▶ Do not touch hot parts or surfaces.
- ▶ Use pliers to remove the glassware.

Navigation path

➔ ⌂

Precondition:

☑ The *[Start]* menu is showing the status **Finished**.

☑ The instrument temperature is less than 150 °C.

- ▶ Tap the function *[Up]* on the function bar.

⇨ The lift moves up.

- ▶ Open the protection shield.
- ▶ Remove the beaker for further processing.
- ▶ Switch off the connected recirculating chiller or close the water tap.
- ▶ Empty the solvent tank. See Chapter 11.2 "Removing the tank bottle", page 78

9.4.6 Shutting down the instrument

Navigation path

➔ ⌂

Precondition:

☑ The extraction process has ended.

- ▶ Switch the On/Off master switch to Off.

9.5 Performing an Economic Continuous Extraction

9.5.1 Preparing the instrument for an Economic Continuous Extraction

Precondition:

☑ All commissioning operations have been completed. See Chapter 5 "Installation", page 30

☑ Make sure that the configuration Economic Continuous Extraction is selected.

☑ Make sure that there are no extraction beakers in the instrument.

☑ Make sure that the tank bottle is empty and installed. See Chapter 5.8 "Preparing the tank bottle", page 34

☑ Make sure that no defective sealings or glass parts are used.

- ▶ Switch the ***On/Off*** master switch to On.

⇨ The instrument is starting up.

9.5.2 Selecting a method

Navigation path

➔ 

▶ Navigate to the *[Home]* menu via the navigation path.
▶ Tap the method.
⇨ The display shows a dialog with the selectable methods.
▶ Select the method you wish to use.
▶ Tap the function *[OK]* on the function bar.
⇨ The method is selected.

9.5.3 Selecting the extraction positions

The extraction positions can show the following status:

Status	Meaning
	The extraction position is activated. The extraction position will be heated.
	The extraction position is not activated. The extraction position will not be heated.
	The extraction for this extraction position is aborted. The extraction position is not heated anymore.

Navigation path

➔ 

▶ Navigate to the *[Home]* menu via the navigation path.
▶ Select the extraction position with the navigation control.
▶ Tap the function *[OK]* on the function bar.
⇨ The status of the extraction position is changed.

9.5.4 Starting an Economic Continuous Extraction

NOTE

Boiling retardation

▶ The beakers contain an integrated boiling surface.
⇨ No boiling aids are needed.

NOTE

As an alternative fill the solvent at the beginning of an extraction through the condenser. See Chapter 9.1.1 "Adding solvent through the condenser", page 65

Navigation path

➔ 

Precondition:
☑ The instrument has been prepared.
☑ A method is selected.

☑ The sample is prepared (in the glass sample tube or in the thimbles).

- ▶ Switch on the connected recirculating chiller or open the water tap.
- ▶ Place the prepared glass sample tube or thimble with the corresponding holder in the extraction chamber.
- ▶ Fill the beaker with organic solvent.
- ▶ Put the beaker on the corresponding position on the heating plate.
- ▶ Close the protection shield.
- ▶ Navigate to the *[Home]* menu via the navigation path.
- ▶ Tap the function *[Down]* on the function bar.

⇨ The lift moves down.

- ▶ Wait until the lift is in the lower position.
- ▶ Make sure that all components of the glass setup are aligned.

Testing procedure:

- Move each condenser a small distance forward and backward.

- ▶ Tap the function *[Start]* on the function bar.

⇨ The display shows the *[Home]* menu with a black background.

⇨ The instrument is starting the selected method.

- ▶ Wait until the solvent boils and condenses.
- ▶ Make sure that there are no leaks.

9.5.5 Ending an Economic Continuous Extraction

⚠ WARNING

Risk of dangerous vapors, hot parts and hot glassware.

A hot instrument can cause building fire, skin burns or death.

- ▶ Wait 15 min before opening the lift.
- ▶ Do not touch hot parts or surfaces.
- ▶ Use pliers to remove the glassware.

Navigation path	
➔	⌂

Precondition:

☑ The *[Home]* menu is showing the status **Finished**.

☑ The instrument temperature is less than 150 °C.

- ▶ Tap the function *[Up]* on the function bar.

⇨ The lift moves up.

- ▶ Open the protection shield.
- ▶ Remove the beaker for further processing.
- ▶ Remove the glass sample tube or thimble from the extraction glass chamber.
- ▶ Switch off the connected recirculating chiller or close the water tap.
- ▶ Empty the solvent tank. See Chapter 11.2 "Removing the tank bottle", page 78

9.5.6 Shutting down the instrument

Navigation path
➔ ⌂

Precondition:

☑ The extraction process has ended.

▶ Switch the On/Off master switch to Off.

9.6 Exporting extraction parameters

NOTE

The number of saved QR Codes is limited.

▶ When the internal memory is full, the older QR Codes will be overwritten.

9.6.1 Exporting extraction parameters without cloud connection

Precondition:

☑ The App is installed on a mobile device.

☑ An extraction is finished.

▶ Tap the button *[QR Code]* on the function bar.

⇨ The display shows a QR code.

▶ Scan the QR code on the display with the camera function of the App.

9.6.2 Exporting extraction parameters with cloud connection

Precondition:

☑ The App is installed on a mobile device.

☑ An extraction is finished.

☑ The instrument is connected via LAN cable. See Chapter 5.16 "Mobile connection", page 45

▶ The extraction parameters are automatically transferred to the App.

10 Editing a solvent

The solvent menu contains the predefined solvents for the extraction procedures. Additional solvents can be added by following the instructions in Chapter 2 "Safety", page 10.
The user defined solvents have no predefined heating level. The heating level must be chosen when creating a method. Please refer to BUCHI's application notes.

10.1 Creating a new solvent

Navigation path

➔ 

- ▶ Navigate to the *[Solvent]* menu via the navigation path.
- ▶ Tap the submenu *[Create own]*.

⇨ The new solvent is created.

10.2 Changing the name of a solvent (own created solvents only)

Navigation path

➔ 

- ▶ Navigate to the *[Solvent]* menu via the navigation path.
- ▶ Tap the name of the solvent you wish to edit.

⇨ The display highlights the selection in green.

- ▶ Tap the function *[OK]* on the function bar.

⇨ The display shows the view *Solvent*.

- ▶ Tap the action *[Name]*.

⇨ The display shows a dialog with an alphanumeric input box.

- ▶ Enter a name for the solvent.
- ▶ Tap the function *[Save]* on the function bar.

⇨ The new name is saved.
⇨ The dialog box closes.

11 Cleaning and servicing

NOTE

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

11.1 Regular maintenance work

⚠ CAUTION

Hot surfaces.

Skin burns from hot surfaces.

- ▶ Let the instrument cool down sufficiently before carrying out any maintenance work.

NOTE

It is the responsibility of the operators to select the correct cleaning agents and materials.

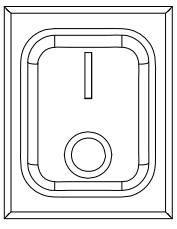
- ▶ Do not use abrasive cleaning material.
- ▶ Make sure that the cleaning agent meets the requirements of the safety data sheets for the chemicals used.
- ▶ Make sure that the cleaning agent is compatible with the materials used. See Chapter 3.5 "Technical data", page 25
- ▶ If you have any further questions, contact BUCHI Customer Service.

Component	Action	Frequency
Solvent tank	▶ Empty the solvent tank. See Chapter 11.2 "Removing the tank bottle", page 78	After every extraction
Glass parts	▶ Check all glass parts for defects. ▶ If defective, replace defect glass parts	Before every extraction
Sealings	**NOTICE! Do not clean in dishwasher.** ▶ Check all sealings for scratches and other defects. ▶ If defective or damaged, replace the sealing.	Daily
Magnetic valve	▶ Check all magnetic valves for leaks. ▶ If leaking, contact BUCHI customer service.	Daily

Component	Action	Frequency
Heating plate	▶ Wipe down the heating plate with a damp cloth. ▶ If heavily soiled, use ethanol or a mild detergent. ▶ If cracked or broken, contact BUCHI customer service.	Weekly
Hoses and hose connections	▶ Check the hoses and hose connections for defects (cracks, brittle areas). ▶ If defective, replace defect hoses.	Weekly
Housing	▶ Wipe down the housing with a damp cloth. ▶ If heavily soiled, use ethanol or a mild detergent.	Weekly
Warning symbols	▶ Check that the warning symbols on the instrument are legible. ▶ If they are dirty, clean them.	Weekly
Protection shields	**NOTICE! Do not use Acetone** ▶ Wipe down the protection shields with a damp cloth. ▶ Make sure that they click into place. If not, replace the gliding elements. See Replacing the gliding elements ▶ If defective or damaged, replace them.	Weekly
Reflector foil for analyte protection	**NOTICE! Do not use any detergent** ▶ Switch the On/Off master switch to Off. ▶ Make sure that there are no extraction beakers in the instrument. ▶ Check the reflector foil for dirt. ▶ If dirty, wipe down the reflector foil with a damp cloth. ▶ Switch the ***On/Off*** master switch to On.	Weekly
Interface	▶ Wipe down the display with a damp cloth.	Monthly

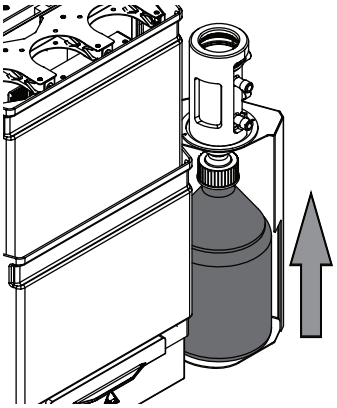
11.2 Removing the tank bottle

▶ Switch the ***On/Off*** master switch to Off.

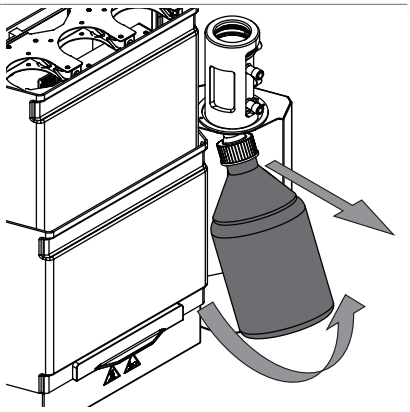


▶ Remove the joint clip.

▶ Push the solvent tank up.



▶ Tilt the solvent tank at 20° and remove it.



11.3 Draining solvent from the instrument

1. Switch on the pump. See Chapter 11.3.1 "Switch on the pump", page 79
2. Open the tank valves. See Chapter 11.3.2 "Open the tank valves", page 79
3. Switch of the valves. See Chapter 11.3.3 "Switch of the pump", page 80

11.3.1 Switch on the pump

Navigation path

➔ ⚙ ➔ *[Service]* ➔ *[Actors]*

Precondition:

☑ A tank bottle is installed. See Chapter 5.8 "Preparing the tank bottle", page 34

▶ Navigate to *[Actors]* via the navigation path.

⇨ The display shows the view *Actors*.

▶ Enable the action *[Pump]*.

11.3.2 Open the tank valves

Navigation path

➔ ⚙ ➔ *[Service]* ➔ *[Actors]* ➔ *[Valves]*

▶ Navigate to *[Valves]* via the navigation path.

⇨ The display shows the view *Valves*.

▶ Select the position of the tank valve you wish to open.

- ▶ Open the tank valve.
- ▶ Wait until all solvent is in the tank bottle.
- ▶ Close the tank valve.

11.3.3 Switch of the pump

Navigation path

➔ ⚙ ➔ *[Service]* ➔ *[Actors]*

- ▶ Navigate to *[Actors]* via the navigation path.

⇨ The display shows the view *Actors*.

- ▶ Disable the action *[Pump]*.

11.4 Draining solvent from Extraction glass chamber (Soxhlet only)

Navigation path

➔ ⚙ ➔ *[Service]* ➔ *[Actors]* ➔ *[Valves]*

Precondition:

☑ Solvent remains in the extraction glass chamber.

☑ The lift is in the lower position.

☑ The instrument has ambient temperature.

☑ A beaker is placed under the extraction glass chamber Soxhlet position.

- ▶ Navigate to *[Valves]* via the navigation path.

⇨ The display shows the view *Valves*.

- ▶ Select the position of the Soxhlet valve you wish to open.
- ▶ Open the Soxhlet valve.
- ▶ Wait until the extraction glass chamber is empty.
- ▶ Close Soxhlet valve.

12 Help with faults

12.1 Troubleshooting

Problem	Possible cause	Action
Flange lock is not inserted completely	The condenser is not in the right position.	▶ Move the condenser flange a little bit until the lock falls into the holes.
Instrument does not work	Instrument is not connected to the power supply.	▶ Make sure that the power supply is connected and switched on.
Method cannot be started	Solvent tank is full	▶ Empty the solvent tank.
	Protection shield is open	▶ Close the protection shield.
Method stops	Cooling water flow is too low	▶ Check the cooling water connection and all hoses for bends and remove them, if necessary.
	Cooling water sensor is defective (may be the coolant is contaminated with algae, lime, etc.)	▶ Contact BUCHI Customer Service.
	Protection shield lifted	▶ Close the protection shield.
	Tank bottle full	▶ Empty the tank bottle. See Chapter 11.2 "Removing the tank bottle", page 78

Problem	Possible cause	Action
Loss of solvent	Seals wrong, deformed or damaged	▶ Exchange the seals.
	Incorrect positioning of the beaker/ glassware and seals	▶ Move each condenser a small distance forward and backward. ▶ Check that the sealings are correctly installed. ▶ Contact BUCHI Customer Service.
	Not sufficient cooling	▶ Make sure that the cooling fits the requirements. See Chapter 3.5 "Technical data", page 25
	Incorrect installed solvent collector circuit	▶ Make sure that the solvent collector circuit is correctly installed. See Chapter 5.7 "Connecting the coolant tubes to the condenser tank bottle", page 33 and Chapter 5.6 "Connecting the solvent tubes to the condenser tank bottle", page 32
	Incorrect installed extraction glass chamber	▶ Make sure that the extraction glass chamber is correctly installed. See Chapter 5.9.2 "Preparing the extraction glass chamber Soxhlet", page 35
Boiling retardation	Incorrect positioning of the beaker	▶ Make sure that the beakers are correctly installed in the beaker brackets and on the heating plate.
	Too long waiting time between preparation of the instrument and start	▶ Start the instrument quickly after solvent was added
	Boiling surface of the beaker is dirty	▶ Clean the beaker
	Boiling surface of the beaker is worn	▶ Replace the beaker

Problem	Possible cause	Action
No boiling	Incorrect positioning of the beaker	▶ Make sure that the beakers are correctly installed in the beaker brackets and on the heating plate
	Beaker position is not active	▶ Activate the beaker position
	Heater power is set too low	▶ Adapt the heating power to the ambient conditions (temperature, level above sea). ▶ Choose correct solvent
Elution of Celite®	Too much organic solvent for extraction	▶ Stick to the standard application parameters
	Sand/Celite® layers mixed up	▶ Clean the extraction chambers

12.2 Draining solvent from Extraction glass chamber (Soxhlet only)

Navigation path

➔ ⚙ ➔ *[Service]* ➔ *[Actors]* ➔ *[Valves]*

Precondition:

☑ Solvent remains in the extraction glass chamber.

☑ The lift is in the lower position.

☑ The instrument has ambient temperature.

☑ A beaker is placed under the extraction glass chamber Soxhlet position.

▶ Navigate to *[Valves]* via the navigation path.

⇨ The display shows the view *Valves*.

▶ Select the position of the Soxhlet valve you wish to open.

▶ Open the Soxhlet valve.

▶ Wait until the extraction glass chamber is empty.

▶ Close Soxhlet valve.

13 Taking out of service and disposal

13.1 Taking out of service

- ▶ Remove all solvents and coolants.
- ▶ Switch off the instrument and disconnect it from the mains power supply.
- ▶ Clean the instrument.
- ▶ Remove all tubing and communication cables from the device.

13.2 Disposal

The operator is responsible for proper disposal of the instrument.

- ▶ When disposing the equipment observe the local regulations and statutory requirements regarding waste disposal.
- ▶ When disposing, observe the disposal regulations of the materials used. Materials used see Chapter 3.5 "Technical data", page 25.

13.3 Returning the instrument

Before returning the instrument, contact the BÜCHI Labortechnik AG Service Department.
https://www.buchi.com/contact

14 Appendix

14.1 Schematics

14.1.1 Condenser circuit

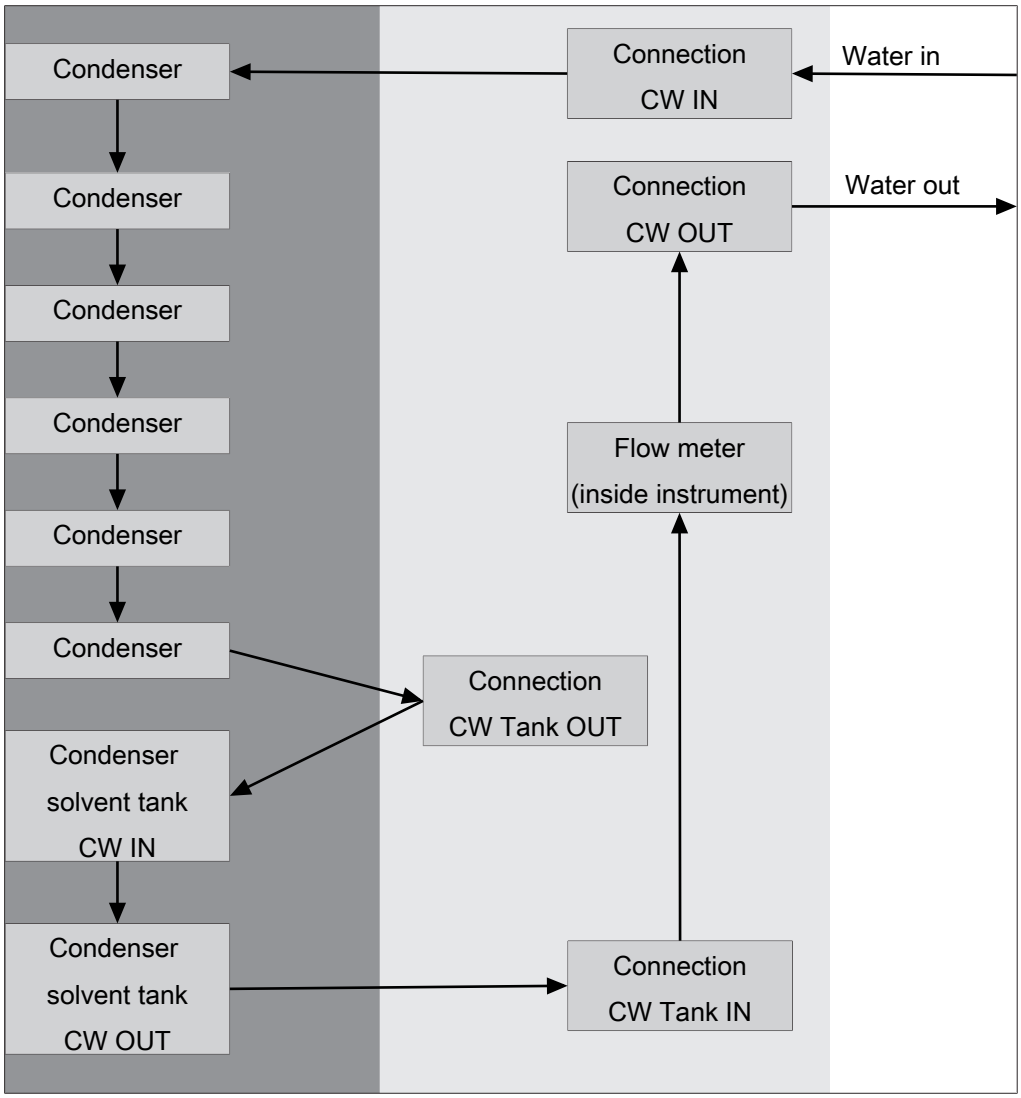


Fig. 16: Condenser circuit

14.1.2 Solvent collector schematic

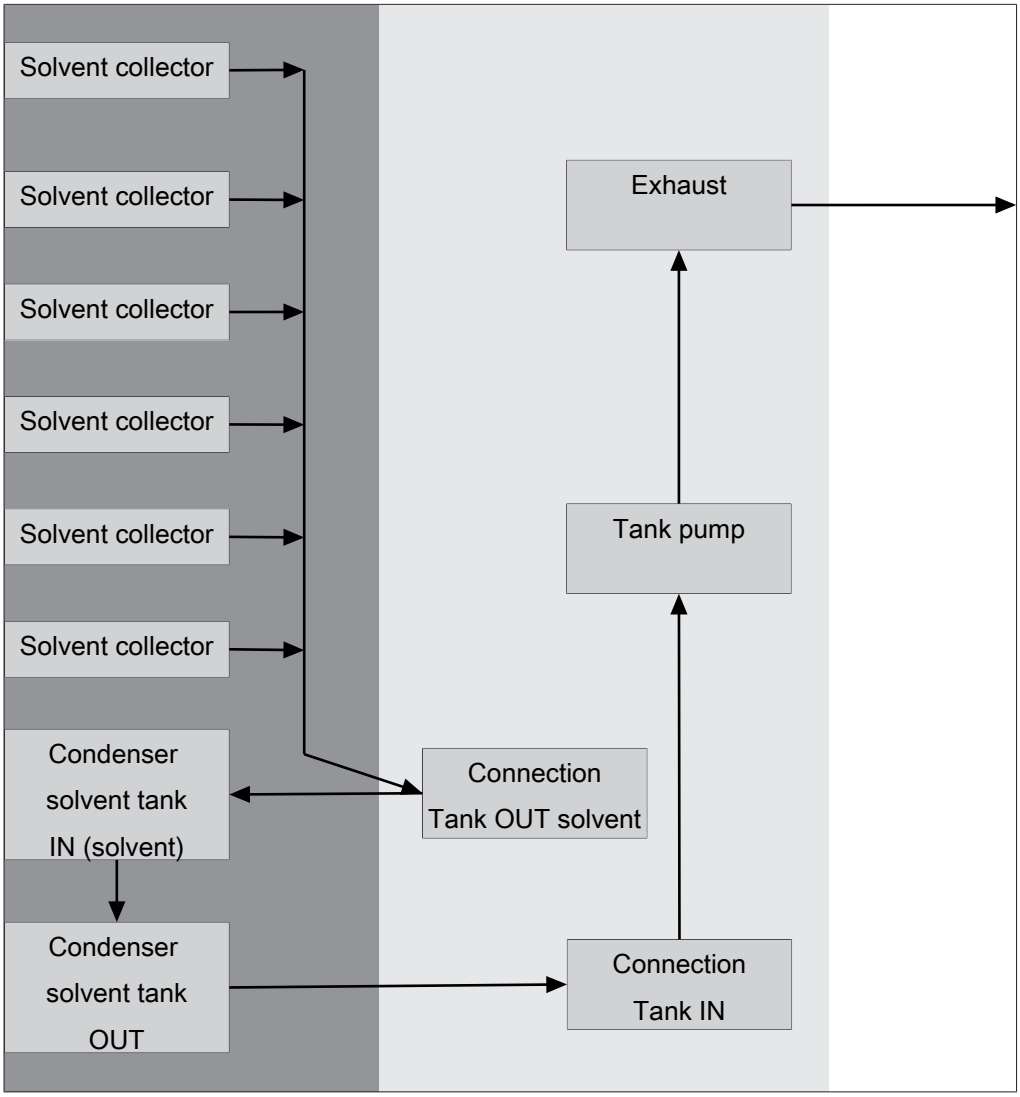


Fig. 17: Solvent circuit

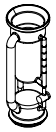
14.2 Spare parts and accessories

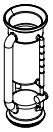
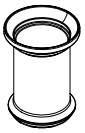
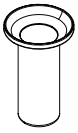
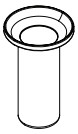
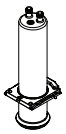
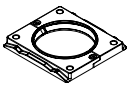
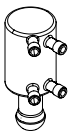
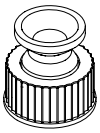
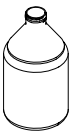
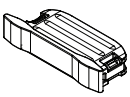
Use only genuine BUCHI consumables and spare parts in order to ensure correct, safe and reliable operation of the system.

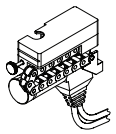
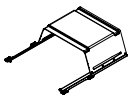
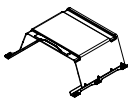
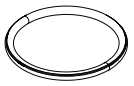
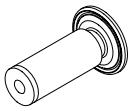
NOTE

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

14.2.1 Spare parts

	Order no.	Image
Extraction glass chamber Soxhlet	11062496	

	Order no.	Image
Extraction glass chamber Soxhlet LSV	11062497	
Extraction glass chamber ECE	11062499	
Set of beakers, 2 pcs.	11067474	
Set of beakers, 12 pcs.	11074664	
Set of beakers HE, 2 pcs.	11067475	
Set of beakers HE, 12 pcs.	11074665	
Condenser E-500 cpl.	11067063	
Condenser flange E-500	11067817	
Condenser tank bottle	11065966	
Tank adapter, PTFE	11064590	
Tank bottle 2 L, GL 45	11070509	
Set of gliding elements including magnets, 10 pcs.	11067827	

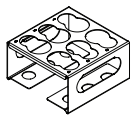
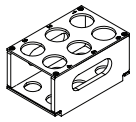
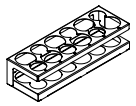
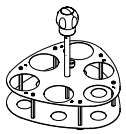
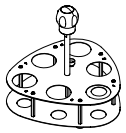
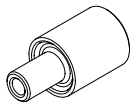
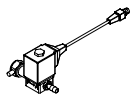
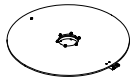
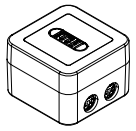
	Order no.	Image
Soxhlet assembly cpl. One part constiting of magnetic valve and level sensor for extraction glass chamber Soxhlet	11067065	
Protection shield top, cpl.	11067832	
Protection shield bottom, cpl.	11067831	
Set of seals E-500, FKM, 6 pcs.	11069012	
Set of seals E-X00, PTFE, 2 pcs.	11067483	
Membrane with anchor for magnetic valve unit	037534	
Joint clip	11070136	
Set of beaker brackets, 3 pcs.	11067828	
Set of beaker brackets HE, 3 pcs.	11067829	
Reflectorfoil analyte protection, 6 pcs.	11068522	
Reflector foil for tank level sensor	11068018	
Knurled nut and sealing disks, 2 pcs. Connection of the draining tubes to the condensers	11068520	
Set of flange locks, 6 pcs.	11067833	
Silicone hose D6/9 L=3 m	048355	
Set of draining tubes SOX, FEP The draining tubes connect the receiving funnel in the condensers with the tank valve to drain solvent into the tank.	11067478	
Set of draining tubes HE, FEP The draining tubes connect the receiving funnel in the condensers with the tank valve to drain solvent into the tank.	11067480	
Set of draining tubes ECE, FEP	11067479	

14.2.2 Conversion and upgrade kits

The FatExtractor E-500 can be converted into another configuration with an easy change of glass assembly. Choose the needed conversion kit according to the matrix.

	Order no.
Conversion kit from Soxhlet / ECE to HE incl.: 6 beakers HE (3 x 11067475) , beaker brackets HE (2 x 11067829), set of draining tubes for HE (11067480), beaker carrier cover for HE	11068487
Conversion kit from Soxhlet / Universal to ECE Includes 6 Extraction glass chamber ECE (11062499), set of draining tubes for ECE (11067479)	11068488
Conversion kit from HE to Soxhlet Includes 6 Extraction glass chamber Soxhlet (11062496), 6 beaker (3 x 11067474), 6 beaker brackets (2 x 11067828), 6 Soxhlet assemblies cpl. (11067065) and a chamber rack (11067077), set of draining tubes for Soxhlet (11067478), two safety shields top, cpl. (2 x 11067832)	11068489
Conversion kit from HE to ECE Includes 6 Extraction glass chamber ECE (11062499), 6 beaker (3 x 11067474), 6 beaker brackets (2 x 11067828), set of draining tubes for ECE (11067479) and a chamber rack (11067077)	11068491
Conversion kit from ECE to Soxhlet Includes 6 Extraction glass chamber Soxhlet (11062496), 6 Soxhlet assemblies cpl. (11067065) and set of draining tubes for Soxhlet (11067478), two safety shields top, cpl. (2 x 11067832)	11068492
Conversion kit HE to Soxhlet LSV Includes 6 Extraction glass chamber Soxhlet LSV (11062497), 6 beaker (3 x 11067474), 6 beaker brackets (2 x 11067828), 6 Soxhlet assemblies cpl. (11067065) and a chamber rack (11067077), set of draining tubes for Soxhlet (11067478), two safety shields top, cpl. (2 x 11067832)	11068490
Conversion kit ECE to Soxhlet LSV Includes 6 Extraction glass chamber Soxhlet LSV (11062497), 6 Soxhlet assemblies cpl. (11067065) and a set of draining tubes for Soxhlet (11067478), two safety shields top, cpl. (2 x 11067832)	11068493
Upgrade kit Analyte protection For later upgrade of a FatExtractor E-500 with analyte protection sensor	11068524
Upgrade kit Interface Pro For later upgrade of a FatExtractor E-500 with a Pro interface (7 " touch screen)	11068525
Conversion kit HE to Soxhlet LSV PTFE Includes 6 Extraction glass chamber Soxhlet LSV (11062497), 6 beaker (3 x 11067474), 6 beaker brackets (2 x 11067828), 6 Soxhlet assemblies cpl. (11067065) and a chamber rack (11067077), set of draining tubes for Soxhlet (11067478), two safety shields top, cpl. (2 x 11067832), , E-X00 seals, PTFE	11073684
Conversion kit from HE to Soxhlet PTFE Includes 6 Extraction glass chamber Soxhlet (11062496), 6 beaker (3 x 11067474), 6 beaker brackets (2 x 11067828), 6 Soxhlet assemblies cpl. (11067065) and a chamber rack (11067077), set of draining tubes for Soxhlet (11067478), two safety shields top, cpl. (2 x 11067832), , E-X00 seals, PTFE	11073683
Conversion kit from HE to ECE PTFE Includes 6 Extraction glass chamber ECE (11062499), 6 beaker (3 x 11067474), 6 beaker brackets (2 x 11067828), set of draining tubes for ECE (11067479) and a chamber rack (11067077), , E-X00 seals, PTFE	11073685

14.2.3 Accessories

	Order no.	Image
Holder for glass sample tubes, stainless steel	11067219	
Holder for glass sample tubes, PTFE	11067220	
Holder for extraction thimbles (diameter 25 - 43 mm)	11068443	
Extraction beaker carrier Allows to carry 6 beakers (11067474)	11067042	
Extraction beaker HE carrier Allows to carry 6 beakers HE (11067475)	11067493	
Set condenser insulations E-500, 6 pcs. The insulation of the condensers prevent condensing water and is recommended in high humidity environment	11069078	
Set insulation cooling water hoses The insulation of the water hoses prevent condensing water and is recommended in high humidity environment.	11069079	
Support solvent supply Allows to fix the tubes of solvent dispensers to the condensers for convenient solvent addition.	11068306	
Cooling water valve. 24VAC Valve opens cooling water feed during distillation. Meant to be used with a vacuum controller/interface.	031356	
Extension cable for the cooling water valve, 2 m	11069477	
Turning disk Allows for turning the instrument for easier access.	11067985	
StatusLight cpl., incl. communication cable Indicates the status of the instrument (instrument is ready to use, has an error or is in operation).	11068959	
Funnel	11067473	

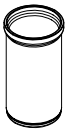
14.2.4 Consumables

	Order no.
Quartz sand 0.3 - 0.9 mm, 2.5 kg	037689
Celite® 545, 1 kg	11068920

14.2.5 Holder for extraction thimbles

	Order no.
Set of holders for glass sample tubes with frit, PTFE, 3 pcs.	11067485
Set of holders for LSV glass sample tubes, PTFE, 3 pcs.	11067486
Holders for thimbles d25, PTFE, 3 pcs.	11067488
Holders for thimbles d33, PTFE, 3 pcs.	11067490
Holders for thimbles d43, PTFE, 3 pcs.	11067491

14.2.6 Glass sample tubes and extraction thimbles

	Order no.	Image
Glass sample tubes with frit, 6 pcs. Working volume: 64 mL Filling volume: 82 mL	11067497	
Glass sample tubes LSV with frit, 6 pcs. Working volume: 116 mL Filling volume: 144 mL	11067814	
Extraction thimbles 25 x 100 mm, 25 pcs. Working volume: 44 mL	018105	
Extraction thimbles 33 x 94 mm, 25 pcs. Working volume: 64 mL	11058983	
Extraction thimbles, Set. 25 pcs, 43 x 118 mm, cellulose For Soxhlet extraction unit. Working volume: 150 mL	018106	

14.2.7 Documentation

	Order no.
IQ/OQ for FatExtractor E-500 Installation/Operation qualification for the FatExtractor E-500 incl. binder with documents IQ/OQ, inspection and basic tag (English)	11068557
Repeating OQ for FatExtractor E-500 Repeating operation qualification for FatExtractor E-500, incl. document, inspection and basic tag (English)	11068559

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