

Operation Manual

Universal Extractor E-800



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

1.3 Trademarks

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

2 Safety

2.1 Proper use

The UniversalExtractor E-800 is designed for the extraction (solid-liquid extraction) of samples with known solvents or solvent mixtures and the reduction or drying of the extract. The UniversalExtractor E-800 can be used in laboratories for the following tasks:

- Hot Extraction (with Hot Extraction beaker, without chamber heater)
- Soxhlet Extraction (with and without chamber heater)
- Continuous Extraction (with and without chamber heater)
- Hot Extraction (with chamber heater)
- Soxhlet warm Extraction (with chamber heater)
- Twisselmann Extraction (with chamber heater)

2.2 Use other than intended

Use of any kind other than that described in Proper use 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 highly flammable solvents with other heating levels as recommended in the menu.
- Use of the instrument with other than original BUCHI glassware.
- Use of the instrument in overpressure situations.
- Use of the instrument with strong acids and alkaline solutions.
- Use of the instrument with solvents with boiling points which are less than 30 °C.
- Use of the instrument with solvents with boiling points which are more than 150 °C.
- Use of the instrument with solvents with ignition points which are less than 160 °C.

2.3 Staff qualification

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

The instrument must be operated by suitably qualified laboratory staff.

These operating instructions are aimed at the following target groups:

Users

The 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

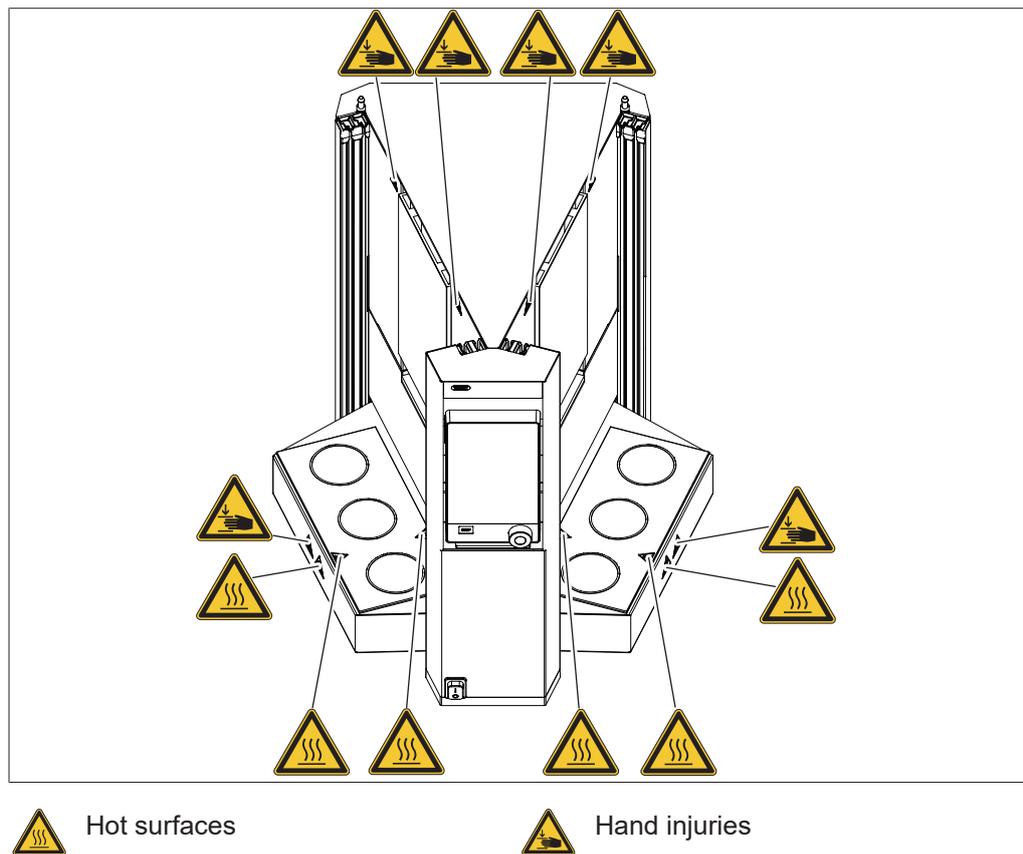
The operator (generally the laboratory manager) is responsible for the following aspects:

- The instrument must be correctly installed, commissioned, operated and serviced.
- Only suitably qualified staff must 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@buchicom).

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



2.5 Protection devices

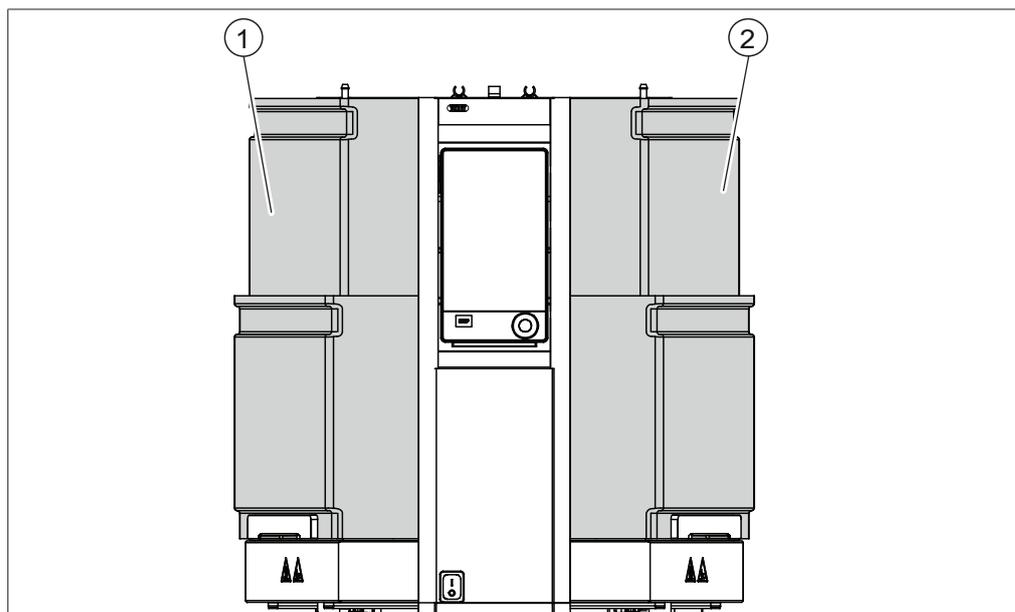


Fig. 1: Protection devices

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 instrument can become hot. If touched they can cause skin burns.

- ▶ Do not touch hot surfaces or 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 BUCHI's 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 24

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 24
- ▶ 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.

2.6.11 Addition of solvents to the library

New solvents can be added to the solvent library. Heating levels for these solvents will either be recommended by the E-800 based on physical properties of the solvent or selected by the operator based on own experience.

- ▶ Make sure to use the recommended heating levels.
- ▶ Use only solvents that fulfill the specifications described in Chapter 2.1 “Proper use”, page 9.
- ▶ Do not increase heating levels for highly flammable solvents.

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 UniversalExtractor E-800 is designed to carry out the following solid-liquid extraction methods:

- Hot Extraction (without chamber heater). See Chapter 3.1.1 “Hot Extraction (with Hot Extraction beaker)”, page 14
- Soxhlet Extraction (with and without chamber heater). See Chapter 3.1.2 “Soxhlet Extraction (with extraction glass chamber universal)”, page 15
- Continuous Extraction (with and without chamber heater). See Chapter 3.1.3 “Continuous Extraction (with extraction glass chamber universal)”, page 15
- Hot Extraction (with chamber heater). See Chapter 3.1.4 “Hot Extraction (with extraction glass chamber universal)”, page 16
- Soxhlet warm Extraction (with chamber heater). See Chapter 3.1.5 “Soxhlet Warm Extraction (with extraction glass chamber universal)”, page 16
- Twisselmann Extraction (with chamber heater). See Chapter 3.1.6 “Twisselmann Extraction (with extraction glass chamber universal)”, page 17

3.1.1 Hot Extraction (with Hot Extraction beaker)

Step 1 extraction

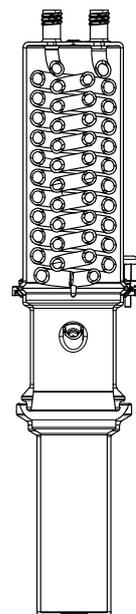
- The sample is located in the extraction chamber.
- The beaker contains the solvent.
- The solvent is heated, vapor rises up to the condenser, condenses and drops into the beaker, containing the sample.

Step 2 rinsing

- The solvent in the beaker is heated 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.



3.1.2 Soxhlet Extraction (with extraction glass chamber universal)

Step 1 extraction

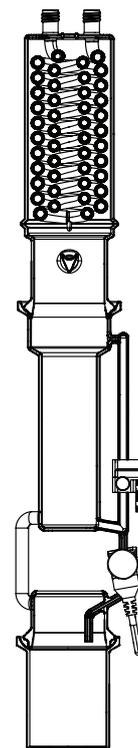
- The sample is located in the extraction chamber.
- The beaker contains the solvent.
- The solvent is heated, vapor rises up to the condenser, condenses and drops into the extraction chamber with the sample.
- The magnetic valve is closed, the solvent is collected up to the level sensor and extracts 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 solvent is heated, vapor rises up to the condenser, condenses and drops into the extraction chamber with the sample.
- 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.



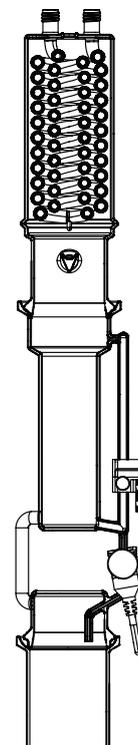
3.1.3 Continuous Extraction (with extraction glass chamber universal)

Step 1 extraction

- The sample is located in the extraction chamber.
- The beaker contains the solvent.
- The solvent is heated, vapor rises up to the condenser, condenses and drops into the extraction chamber with the sample.
- The magnetic valve is open, the solvent extracts the analyte and flows back into the beaker.

Step 2 drying

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



3.1.4 Hot Extraction (with extraction glass chamber universal)

Step 1 extraction

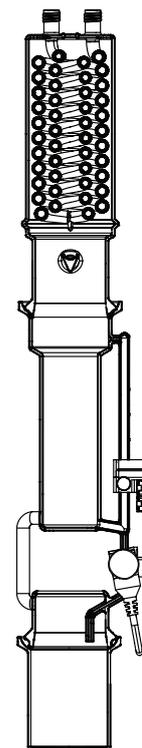
- The sample is located in the extraction chamber.
- The beaker contains the solvent.
- The solvent is heated, vapor rises up to the condenser, condenses and drops into the extraction chamber with the sample.
- The magnetic valve is closed, the solvent is collected up to the level sensor.
- The analyte is extracted.
- The solvent is heated in the extraction chamber, vapor rises up to the condenser, condenses and drops back into the extraction chamber.
- The magnetic valve opens regularly to release a small portion of extract into the beaker.

Step 2 rinsing

- The solvent is heated, vapor rises up to the condenser, condenses and drops into the extraction chamber with the sample.
- 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.



3.1.5 Soxhlet Warm Extraction (with extraction glass chamber universal)

Step 1 extraction

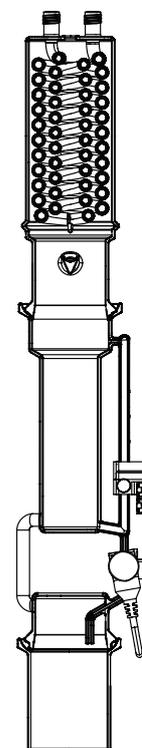
- The sample is located in the extraction chamber.
- The beaker contains the solvent.
- The solvent is heated, vapor rises up to the condenser, condenses and drops into the extraction chamber with the sample.
- The solvent in the extraction chamber is heated.
- The magnetic valve is closed, the solvent is collected up to the level 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 solvent is heated, vapor rises up to the condenser, condenses and drops into the extraction chamber with the sample.
- 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.



3.1.6 Twisselmann Extraction (with extraction glass chamber universal)

Step 1 extraction

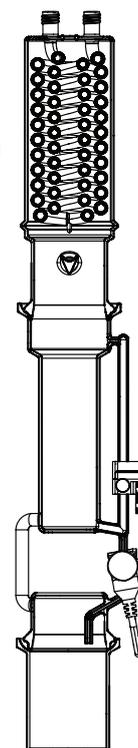
- The sample is located in the extraction chamber.
- The beaker contains the solvent.
- The magnetic valve is closed, the solvent is collected in the extraction chamber. The solvent is heated, vapor rises up to the condenser, condenses, and drops back through the sample into the extraction chamber.

Step 2 rinsing

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



3.1.7 Description of the analyte protection

The Analyte Protection protects the analyte from overheating. It is not available for the method Hot Extraction (with Hot Extraction beaker).

The Analyte Protection triggers under the following situations:

	Hot Extract- ion beaker	Soxhlet Extract- ion	Conti- uous Extract- ion	Hot Extract- ion with extraction glass chamber universal	Soxhlet Warm Extract- ion	Twissel- mann Extract- ion
Presence of beaker	-	X	X	X	X	X
Presence of solvent (Level check)	-	X	X	X	X	X
Extraction step	-	X ¹	X ¹	X ¹	X ¹	X ¹
Rinse step	-	X ¹	-	X ¹	X ¹	X ¹
Dry step	-	X ¹	X ¹	X ¹	X ¹	X ¹

¹ activation inert gas

3.2 Configuration

3.2.1 Front view (with chamber heater)

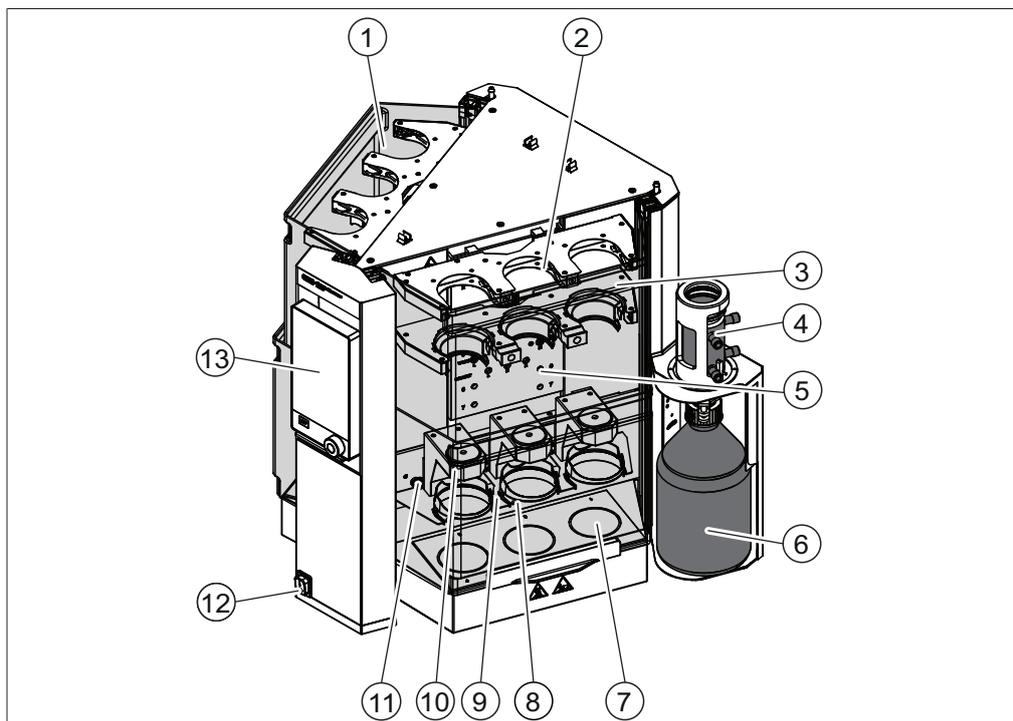


Fig. 2: Front view

- | | | | |
|----|----------------------------------|----|---------------------------|
| 1 | Protection shield | 2 | Condenser rack |
| 3 | Chamber rack | 4 | Condenser tank bottle |
| 5 | Installation board | 6 | Tank bottle |
| 7 | Heating plate | 8 | Analyte protection sensor |
| 9 | Beaker rack | 10 | Chamber heater |
| 11 | Inert gas connection
(option) | 12 | On/Off master switch |
| 13 | Pro Interface | | |

3.2.2 Front View (without chamber heater)

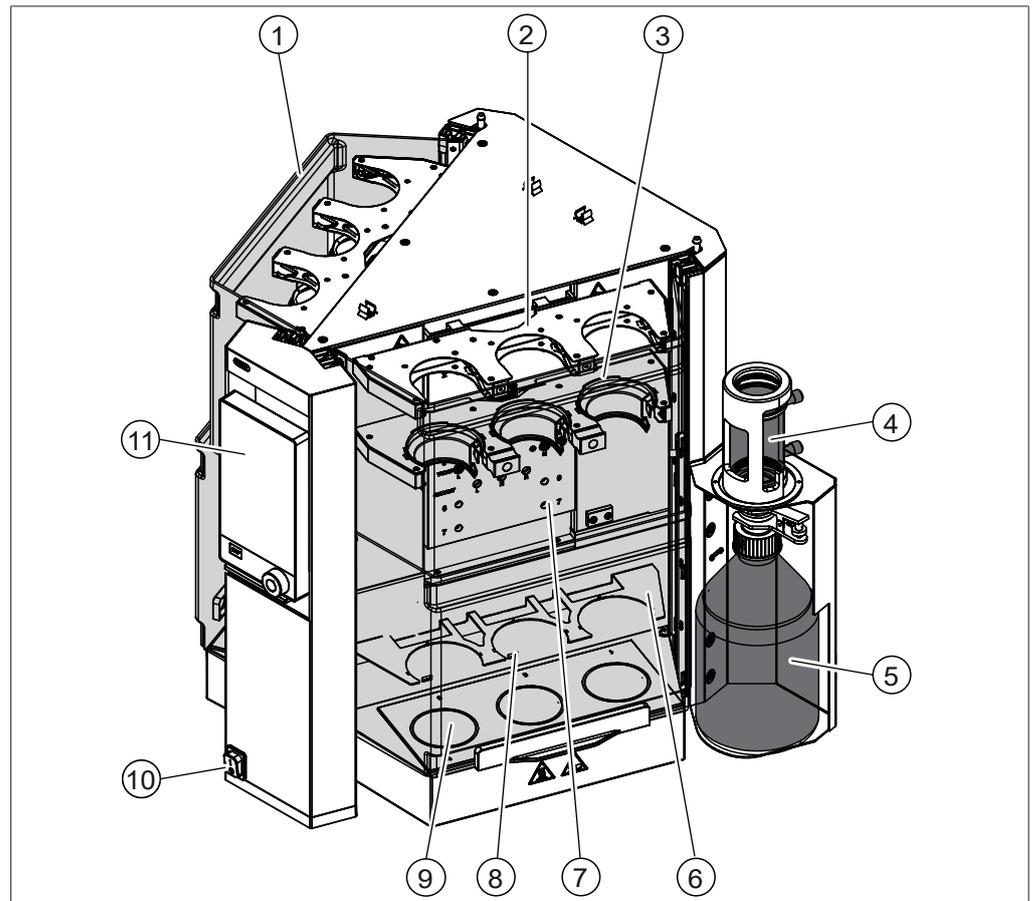


Fig. 3: Front view

- | | | | |
|----|--------------------|----|---------------------------|
| 1 | Protection shield | 2 | Condenser rack |
| 3 | Chamber rack | 4 | Condenser tank bottle |
| 5 | Tank bottle | 6 | Beaker rack |
| 7 | Installation board | 8 | Analyte protection sensor |
| 9 | Heating plate | 10 | On/Off master switch |
| 11 | Pro Interface | | |

3.2.3 Front view (HE beaker)

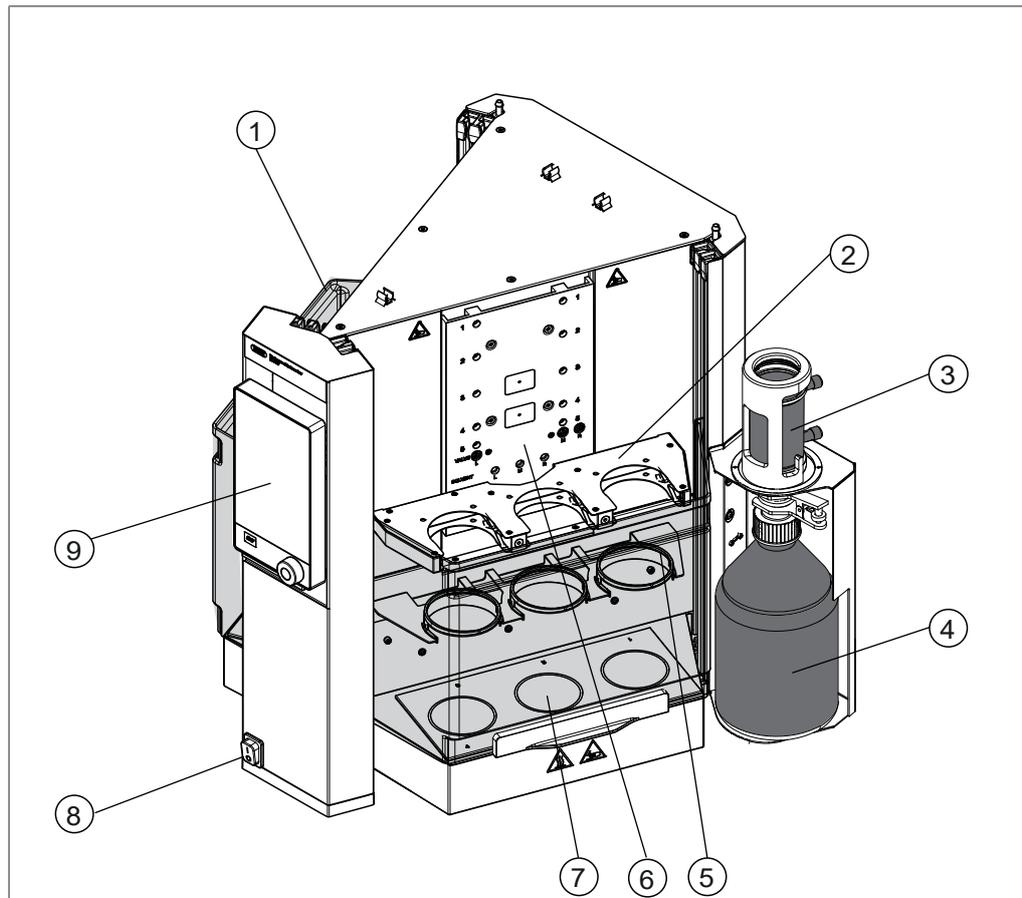


Fig. 4: Front view

- | | | | |
|---|-----------------------|---|----------------------|
| 1 | Protection shield | 2 | Condenser rack |
| 3 | Condenser tank bottle | 4 | Tank bottle |
| 5 | Beaker rack | 6 | Installation board |
| 7 | Heating plate | 8 | On/Off master switch |
| 9 | Pro Interface | | |

3.2.4 Rear view

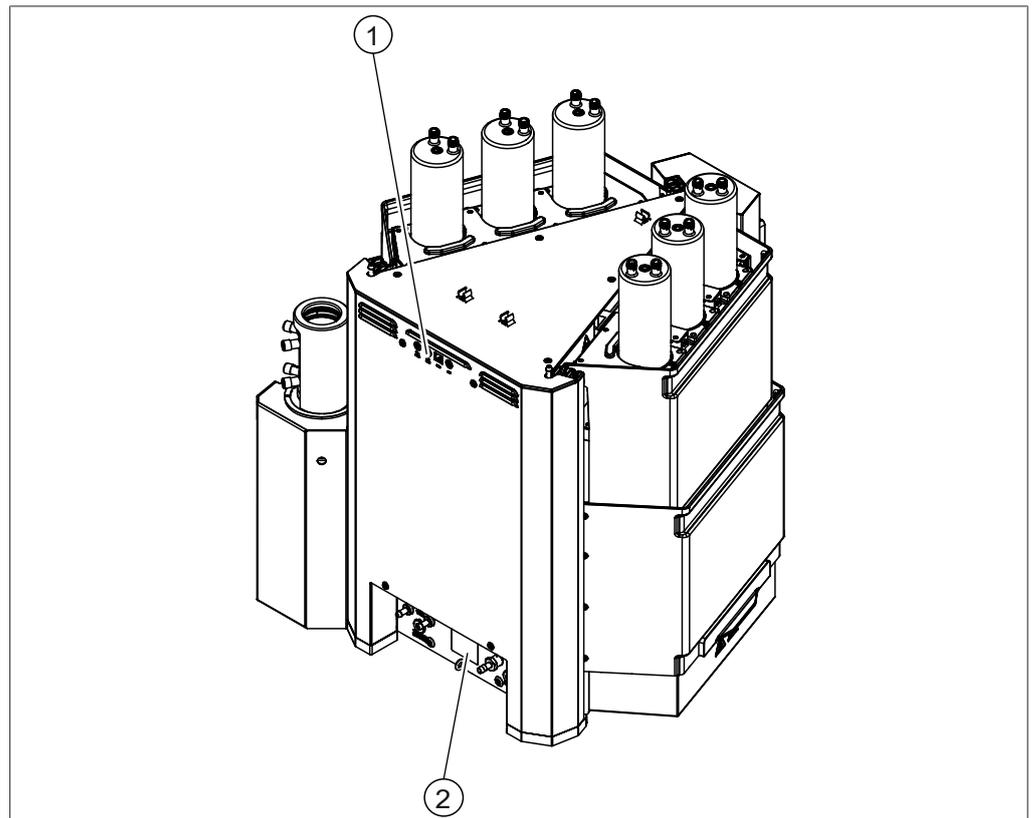


Fig. 5: Rear view

- | | |
|--|--|
| <p>1 Upper connections
See Chapter 3.2.5 “Upper connections on the rear side”, page 21</p> | <p>2 Lower connections
See Chapter 3.2.6 “Lower connections on the rear side”, page 22</p> |
|--|--|

3.2.5 Upper connections on the rear side

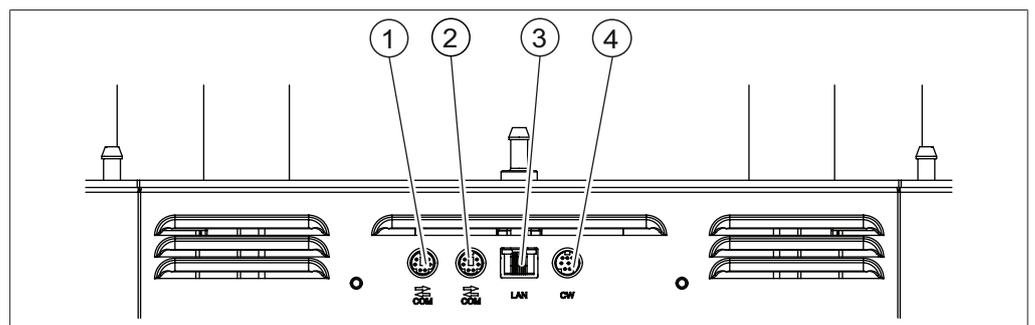


Fig. 6: Connections on the top

- | | |
|--|--|
| <p>1 Standard BUCHI communication port (COM)</p> | <p>2 Standard BUCHI communication port (COM)</p> |
| <p>3 LAN port</p> | <p>4 Port for the cooling water valve</p> |

3.2.6 Lower connections on the rear side

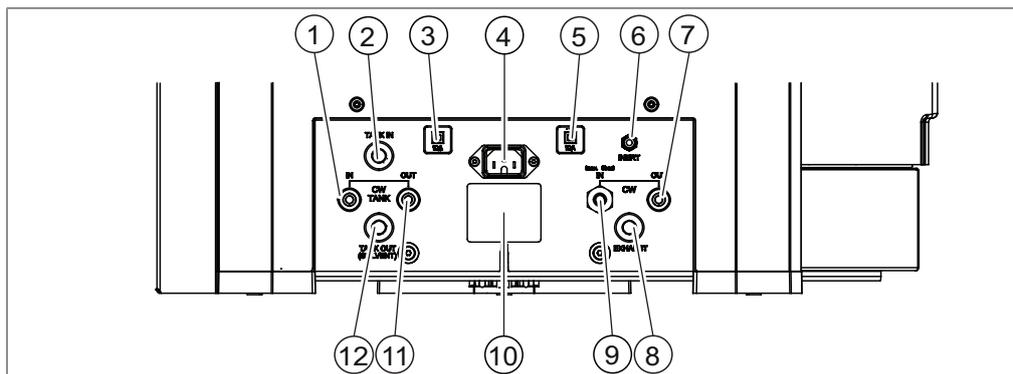


Fig. 7: Connections on the bottom

- | | | | |
|----|--|----|---|
| 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)) |

3.2.7 Installation board

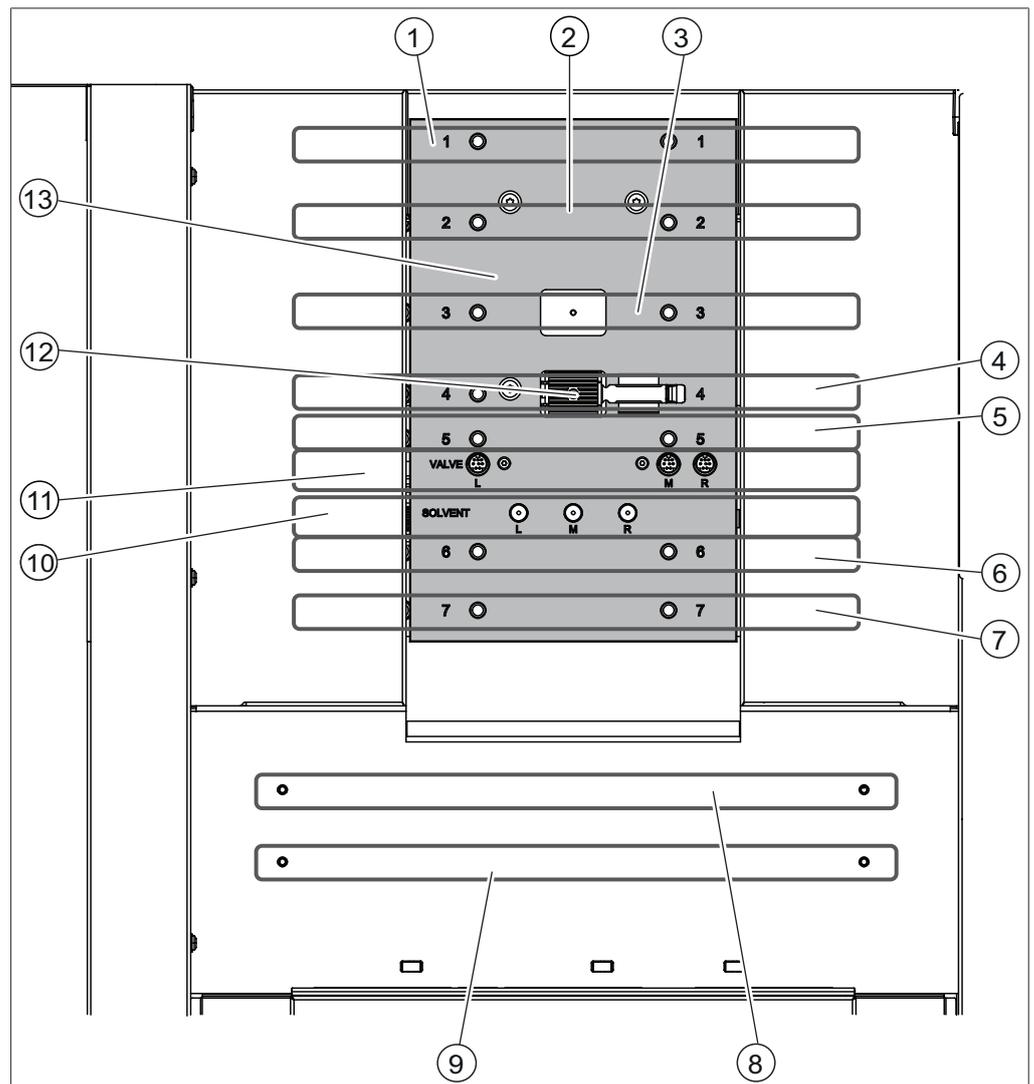


Fig. 8: Installation board

- | | | | |
|----|--------------------------|----|-------------------------------|
| 1 | Condenser rack Universal | 2 | FatExtractor E-500 only |
| 3 | Chamber rack Universal | 4 | FatExtractor E-500 only |
| 5 | FatExtractor E-500 only | 6 | Condenser rack Hot Extraction |
| 7 | FatExtractor E-500 only | 8 | Beaker rack Hot Extraction |
| 9 | Beaker rack Universal | 10 | Solvent collector tube |
| 11 | Sensor plugs | 12 | Attachment clip for tube |
| 13 | Lift | | |

3.3 Type plate

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

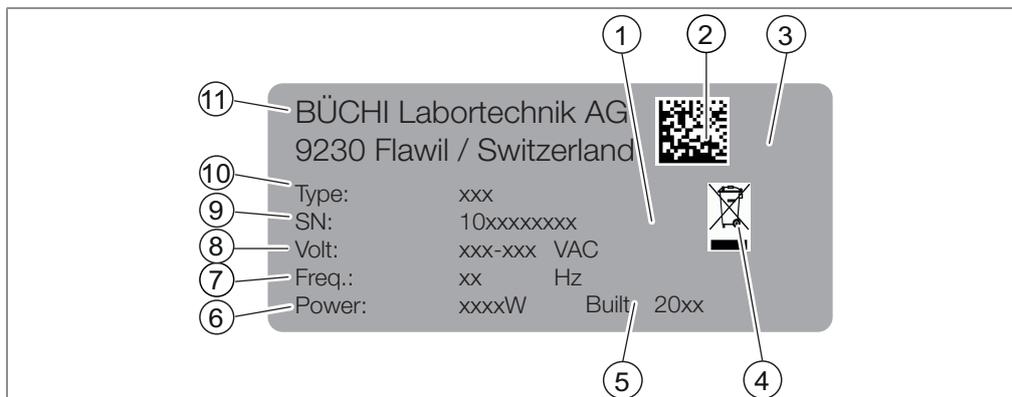


Fig. 9: Type plate

- | | | | |
|----|------------------------------------|----|---|
| 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 UniversalExtractor E-800

Specification	UniversalExtractor E-800
Power consumption	1780 W
Connection voltage	200 - 240 ± 10 % VAC
Fuse	10 A
Frequency	50 / 60 Hz
Overvoltage category	II
Pollution degree	2
Dimensions (W x D x H) (without glassware)	638 x 595 x 613 mm
Dimensions (W x D x H) (with glassware Universal)	638 x 595 x 752 mm
Weight (without glassware)	44.8 kg

Specification	UniversalExtractor E-800
Weight (with glassware Universal)	52.6 kg
Total heating power (rated)	1680 W
Total Heating power (maximum)	1680 W
Hose connection	6 / 9 mm
Allowed water pressure (nominal value)	6 bar
Allowed water pressure (maximum)	8 bar
Minimum water flow	100 mL/min
Inlet cooling medium temperature	25 °C below the boiling point of the solvent
Number of extraction positions	6
Solvent tank volume	2 L
Allowed inert gas pressure (maximum)	3 bar
Max. filling level (Extraction glass chamber Universal)	190 mL
Max. filling level (Extraction glass chamber Universal LSV)	315 mL
Max. working volumes (Beaker Universal)	175 mL
Max. working volumes (Beaker LSV)	320 mL
Max. working volumes (Beaker Hot Extraction)	100 mL
Language	DE, EN, IT, ES, FR, JA, CN, PL, RU
Method storage	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 coated
Protection shield	PMMA GS
Glass ware	Borosilikat 3.3
Sealings glassware	PTFE (with FKM core)
Tank bottle	Borosilikat 3.3
Tank bottle valve	PTFE / FFKM
Sealing solvent connection	PTFE
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 24).
- ▶ Wherever possible, store the instrument in its original packaging.
- ▶ After storage, check the instrument, 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.

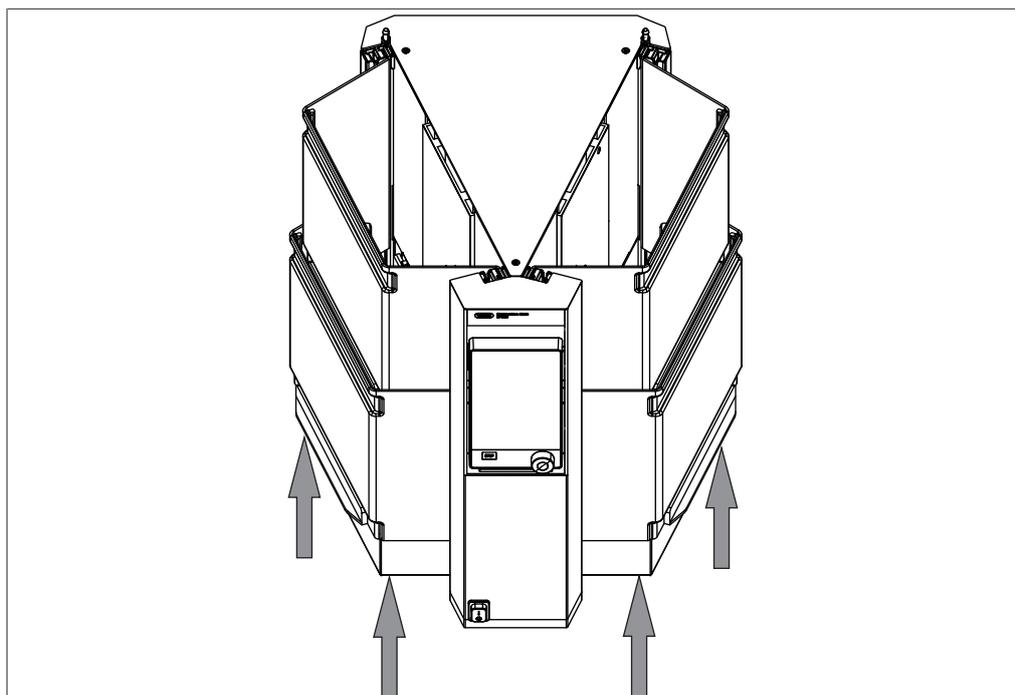


Fig. 10: Lifting the instrument

- ▶ 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.
- 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 24
- 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.

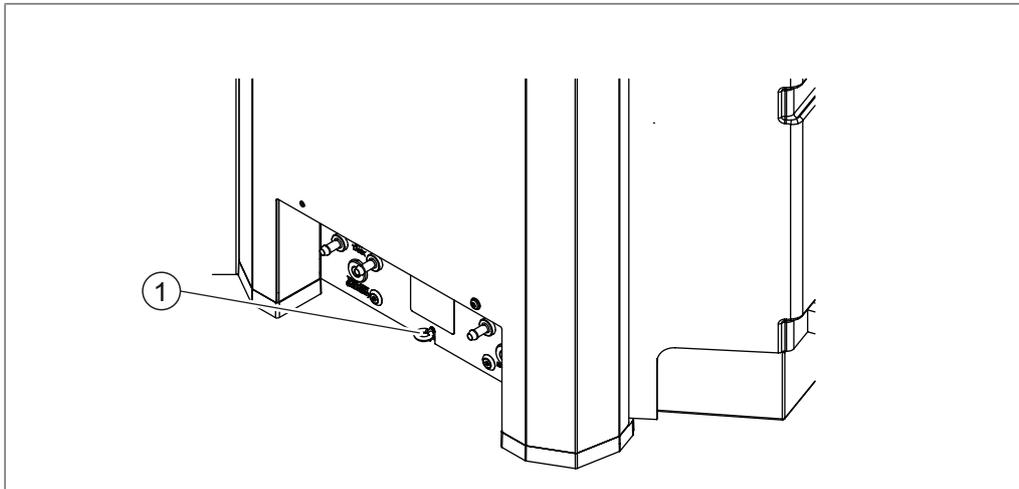


Fig. 11: Securing against earthquakes

1 Lashing mount

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

5.5 Connecting the coolant hose

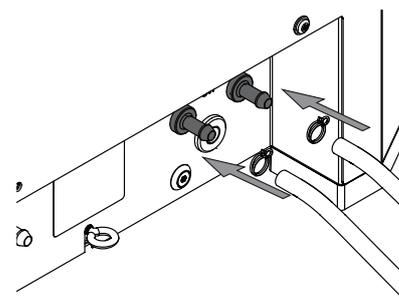
There are two possibilities for coolant supply:

- Cooling water valve
- BUCHI Recirculating Chiller

See Chapter 11.3 "Spare parts and accessories", page 77

Precondition:

- ☑ The coolant connection complies with the specified parameters. See Chapter 3.5 “Technical data”, page 24
- ☑ 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

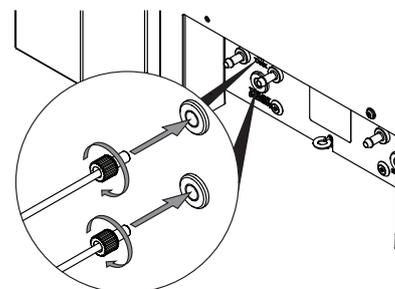


NOTE

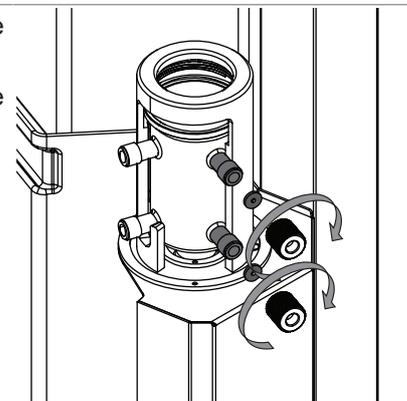
Leave the connection nuts in place when disassembling.

Precondition:

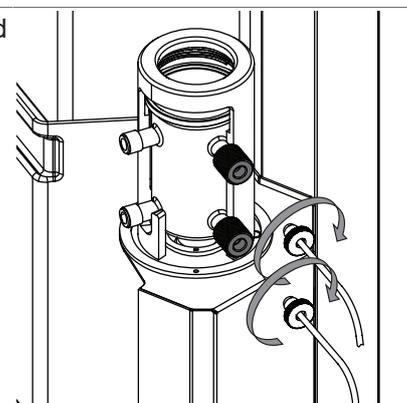
- ☑ Make sure that the instrument is not connected to the power supply.
- ▶ Attach the inlet tube onto the connection marked **TANK IN**.
- ▶ Attach the drain tube onto the connection marked **TANK OUT (SOLVENT)**.



- ▶ 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)**.

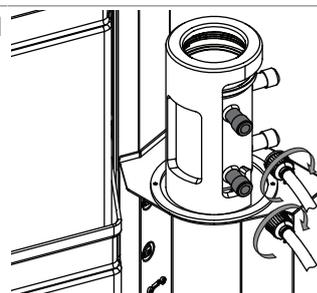
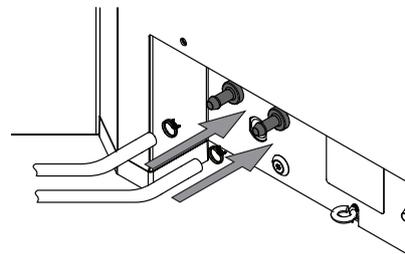


- ▶ Make sure that the solvent collector circuit is complete. See Chapter 11.1 “Schematics”, page 75

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**.



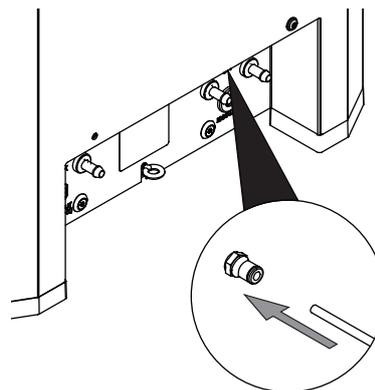
- ▶ Make sure that the solvent collector circuit is complete. See Chapter 11.1 “Schematics”, page 75

5.8 Connecting inert gas (option)

5.8.1 Connecting inert gas to the instrument (option)

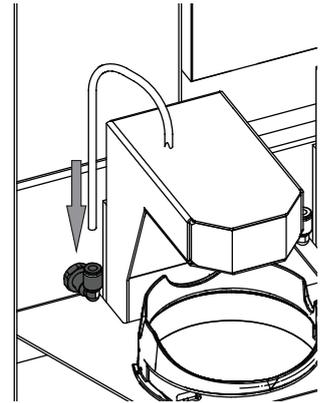
Precondition:

- Make sure that the instrument is not connected to the power supply.
- ▶ Attach the inert gas tube onto the connection marked **INERT**.

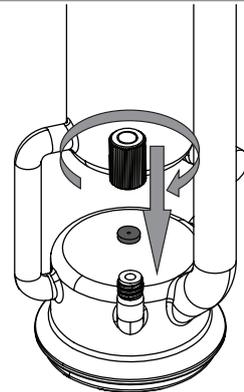


5.8.2 Connecting inert gas to the extraction glass chamber (option)

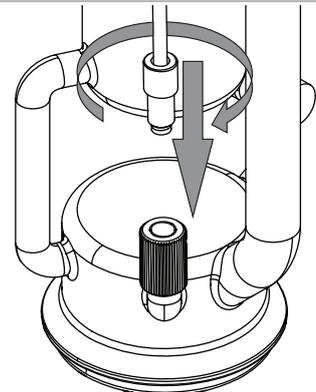
- ▶ Attach the inert gas tube onto the connection.



- ▶ Attach the inert gas connection nuts onto the extraction glass chamber.



- ▶ Connect the inert gas tube.



5.9 Preparing the extraction glass chamber universal



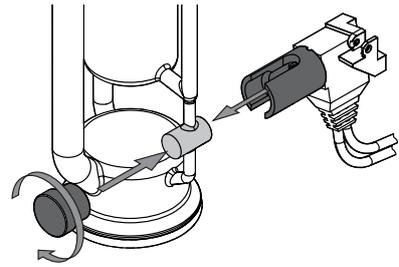
NOTICE

Risk of broken parts by using tools

Using tools for preparing the instrument can break parts.

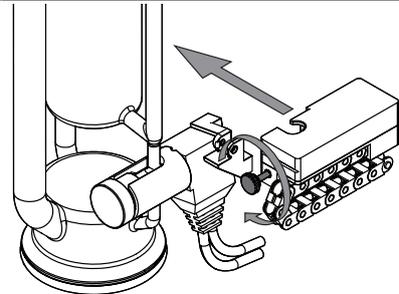
- ▶ Tighten all parts with your hands.

- ▶ Install the valve at the extraction glass chamber universal.



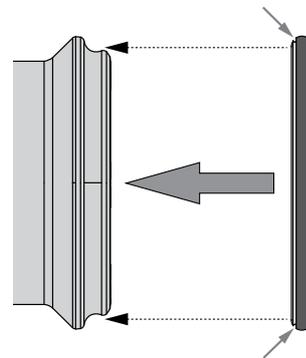
NOTICE! Make sure that the sensor is not bent during carrying out this action step

- ▶ Install the sensor at the extraction glass chamber universal.

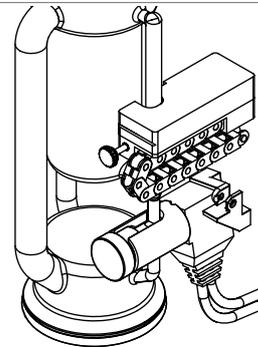


NOTICE! Make sure that the small gap of the sealing shows in the direction of the extraction glass chamber.

- ▶ Attach the sealing to the extraction glass chamber.



The extraction glass chamber universal is prepared.



5.10 Installing the extraction glass chamber universal



NOTICE

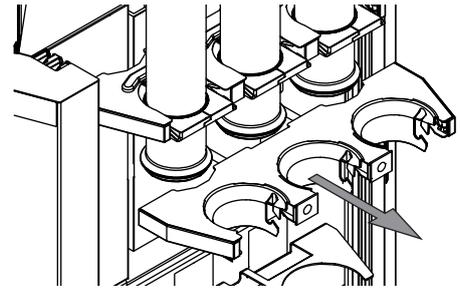
An incorrect assembled extraction glass chamber can cause glass breakage.

- ▶ Install the extraction glass chamber according to following instructions.

Precondition:

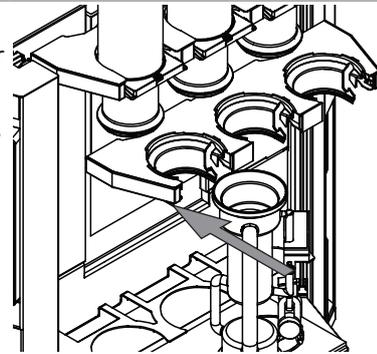
- The configuration is set to Universal.
See Selecting a configuration
- ▶ Prepare the extraction glass chamber universal. See Chapter 5.9 “Preparing the extraction glass chamber universal”, page 33

- ▶ Pull the chamber rack.

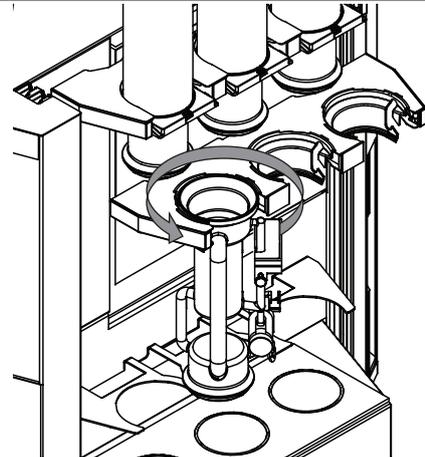


Precondition:

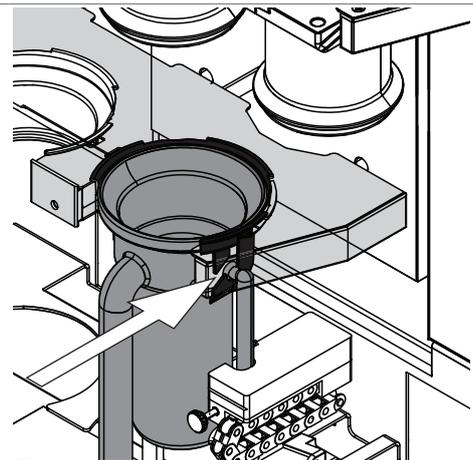
- Start with the extraction glass chamber on the left side.
- Make sure that the BUCHI Logo points to the front.
- ▶ Put the extraction glass chamber in the chamber rack.



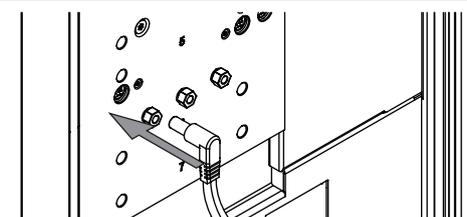
- ▶ Turn the extraction glass chamber 45° counterclockwise.



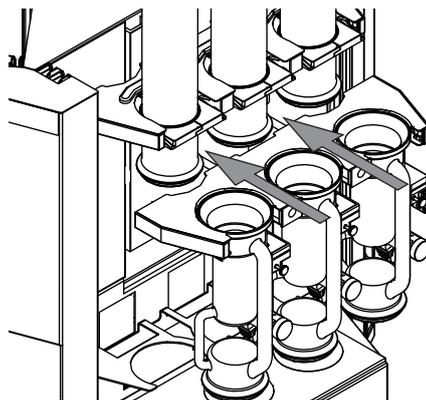
- ▶ Make sure that the extraction glass chamber locks at the hook.



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



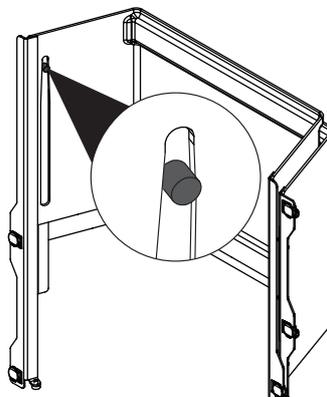
- ▶ Push the chamber rack in the instrument.



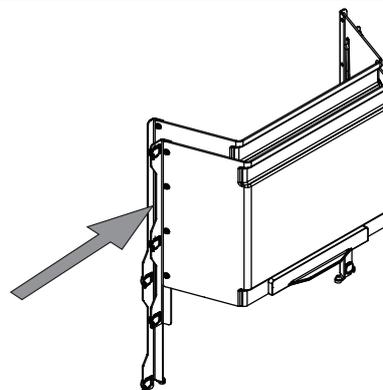
5.11 Installing the protection shields

5.11.1 Installing two protection shields (extraction glass chamber universal only)

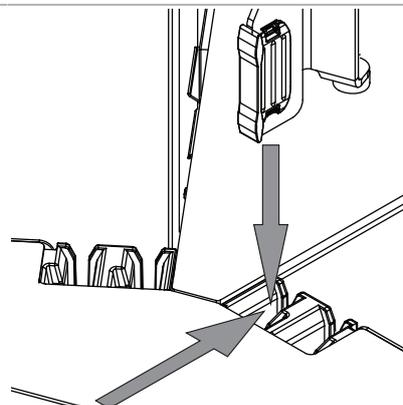
- ▶ Make sure, that both protections shields fit together.



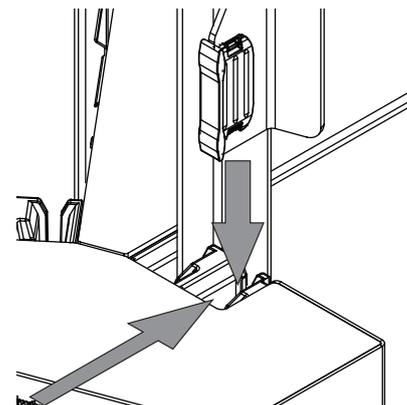
- ▶ Hold both protection shields on both sides at the point indicated.



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

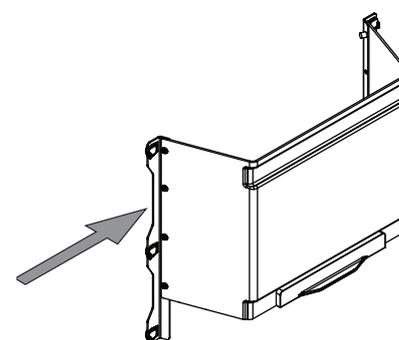


- ▶ Put the front protection shield on both sides into the front slot at the same time.



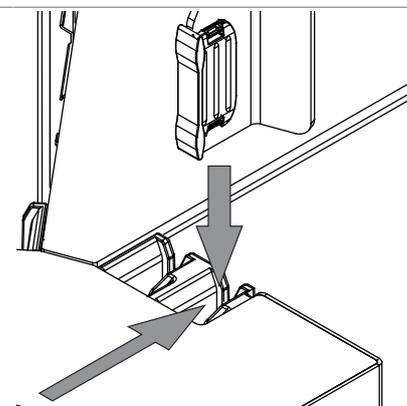
5.11.2 Installing one protection shield (Hot Extraction with beaker only)

- ▶ 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.



5.12 Preparing the condenser



NOTICE

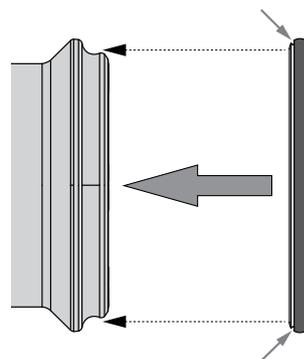
Risk of broken parts by using tools

Using tools for preparing the instrument can break parts.

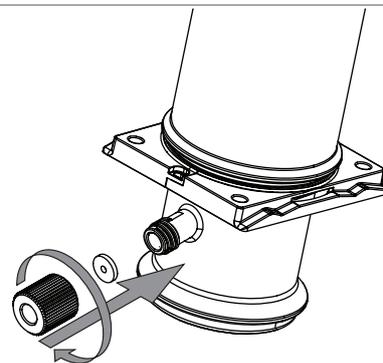
- ▶ Tighten all parts with your hands.

NOTICE! Make sure that the small gap of the sealing show in the direction of the condenser.

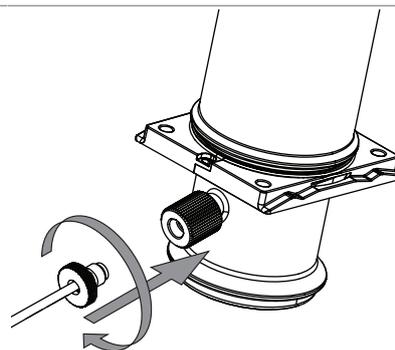
- ▶ Put the sealing on the bottom of the condenser.



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

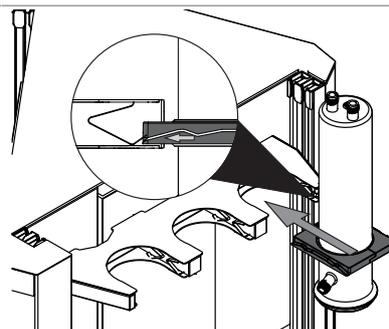


- ▶ Connect the solvent collector tube.

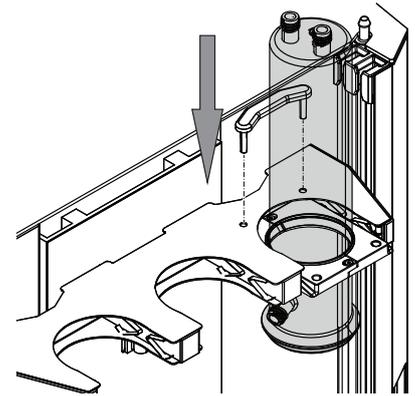


NOTICE! Do not use force to carry out this action step.

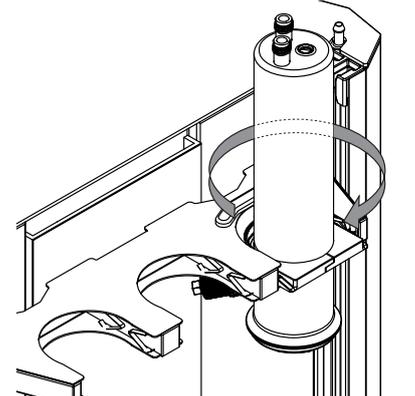
- ▶ Put the condenser in the condenser rack.



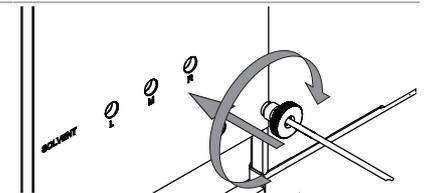
- ▶ Secure the condenser with the flange lock.



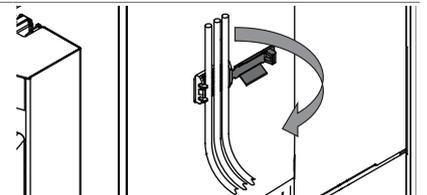
- ▶ Turn the condenser.



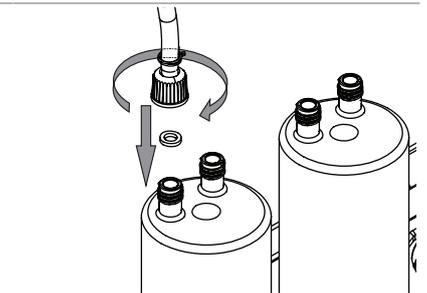
- ▶ Connect the solvent collector tube to the installation board



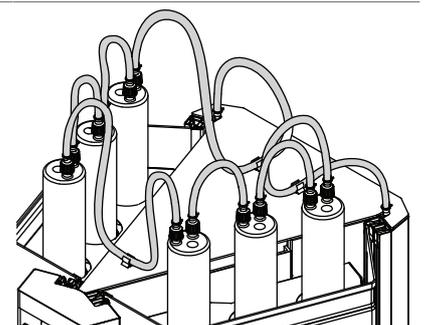
- ▶ Attach the tubes with the attachment clip to the installation board.



- ▶ Connect the condensers.



- ▶ Establish a condenser circuit.



- ▶ Make sure that the condenser circuit is complete. See Chapter 11.1 “Schematics”, page 75

5.13 Preparing the tank bottle



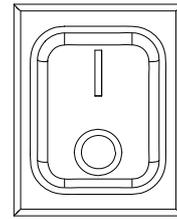
NOTICE

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.



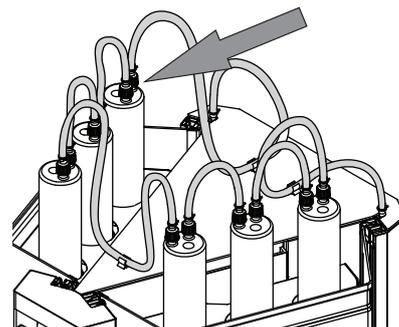
- ▶ Put the tank bottle in the instrument.



- ▶ Attach the joint clip.

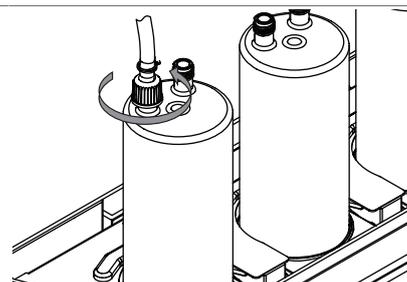
5.14 Disassembling the condenser circuit

- ▶ Disconnect the indicated condenser connection.

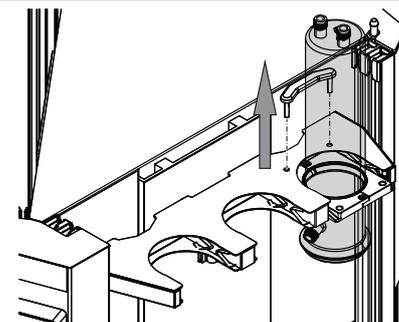


- ▶ Make sure, that there is no coolant in the condenser circuit.

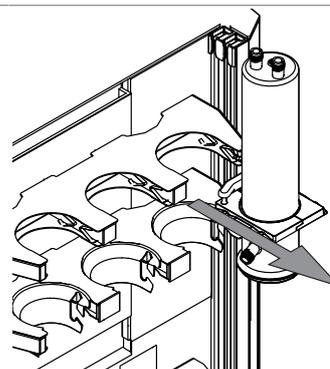
- ▶ Disconnect the other condenser connections.



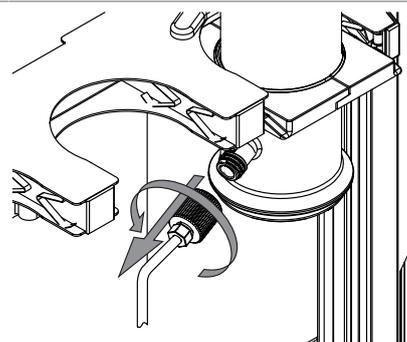
- ▶ Remove the flange lock.



- ▶ Pull the condenser out of the condenser rack.



- ▶ Disconnect the solvent collector tube.



-
- ▶ Disconnect the solvent collector tube from the installation board.
-

6 Operating the interface pro

6.1 Layout of the interface pro

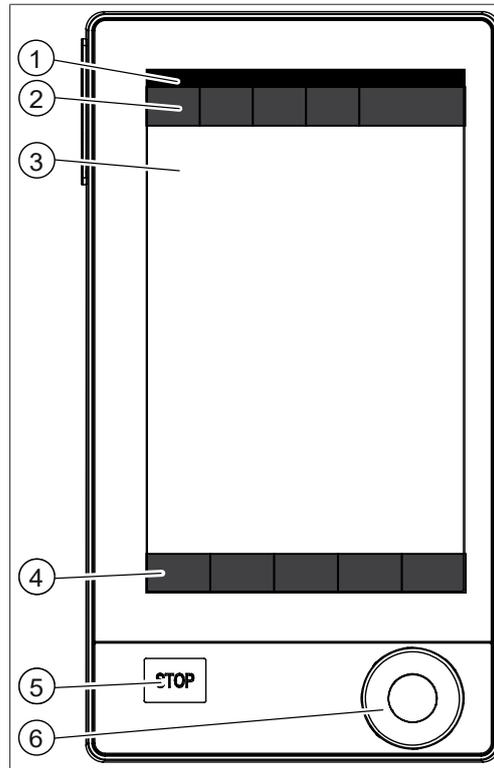


Fig. 12: Interface pro

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. <ul style="list-style-type: none"> • 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.

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.

Symbol	Description	Meaning
	<i>[Confirm]</i>	Confirms an entry.
	<i>[Delete]</i>	Deletes the selected entry.
	<i>[Save]</i>	Saves the setting.
	<i>[Menu]</i>	Allows selection of a menu from the menu bar using the navigation control.
	<i>[Start]</i>	Starts an extraction process.
	<i>[Stop]</i>	Aborts extraction on all extraction positions.
	<i>[Up]</i>	The lift moves up.
	<i>[Down]</i>	The lift moves down.
	<i>[QR Code]</i>	The display shows a QR Code (service function only).
	<i>[New]</i>	Saves a new setup
	<i>[Load]</i>	Loads setup

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
	<i>[Home]</i> menu	<ul style="list-style-type: none"> • Process control parameters
	<i>[Setup]</i> menu	<ul style="list-style-type: none"> • For saving the individual settings for the extraction positions
	<i>[Method]</i> menu	<ul style="list-style-type: none"> • For saving extraction methods • Editing and activating
	<i>[Configuration]</i> menu	<ul style="list-style-type: none"> • Change settings • Service menu • System information
	<i>[Solvent]</i> menu	<ul style="list-style-type: none"> • Solvent library See Chapter 11.2 “Solvent table”, page 76 • Editing and saving solvents

6.3.1 Home menu

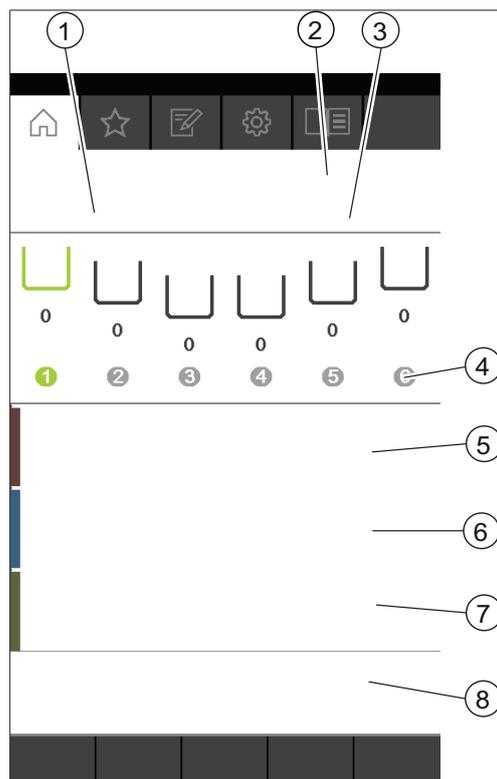


Fig. 13: Home menu

- | | | | |
|---|-----------------------------------|---|--------------------------------|
| 1 | Time remaining | 2 | Method |
| 3 | Status | 4 | Extraction position |
| 5 | Extraction time and heating level | 6 | Rinsing time and heating level |
| 7 | Drying time and heating level | 8 | Control buttons |

On the home menu the following control buttons are available:

Button	Meaning
	Skips the actual step at the selected position.
	Skips the actual step for all positions.
	Aborts extraction on the selected extraction position.
	Editing the running method.

6.3.2 Setup menu

The setup menu allows saving different methods for different extraction positions. See Chapter 6.5 “Selecting a method for an extraction position”, page 48

6.3.3 Method menu

The *[Method]* menu allows saving methods. See Chapter 6.6 “Editing a method”, page 49

6.3.4 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
<i>[Language]</i>	Choice of display language on the interface	The following languages are available: English/German/French/Italian/Spanish/Japanese/Chinese/Russian/Polish
<i>[Date]</i>	Date input	Enter in sequence: Day, month, year. Apply the settings by pressing <i>[OK]</i> .
<i>[Time]</i>	Time input	Enter in sequence: Minutes, hours. Apply the settings by pressing <i>[OK]</i> .
<i>[Beeper]</i>	Off/On	Setting for audible signal in response to input controls.
<i>[Display brightness]</i>	Enter setting	Display brightness level in %: 0 - 100
<i>[max. drying time]</i>	Enter value	Enter the maximum drying time.
<i>[Analyte protection]</i>	View	Threshold for empty-no beaker Threshold for full-empty beaker
<i>[Mobile connection QR code]</i>	View	The control unit shows a QR code (service function only).
<i>[Network]</i>	Enter value	The following parameters can be edited: Device name/DHCP/MAC address/ System IP address/Subnet mask/ Gateway
<i>[Delete app connection]</i>	Confirmation question	Resets external connections to the instrument.
<i>[Demo Mode]</i>	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
<i>[Sensors]</i>	View	All sensor signals can be observed: <ul style="list-style-type: none"> • Flow sensor • Level sensors • Analyte protection • Protection shield • Valves • Lift current • Line voltage • Line frequency
<i>[Actors]</i>	Open / close	The following settings can be changed: <ul style="list-style-type: none"> • Valves: <ul style="list-style-type: none"> Soxhlet valves See Draining solvent from Extraction glass chamber Soxhlet Tank valves See Chapter 8.3 “Draining solvent from the instrument”, page 71 Cooling water valve On/Off Gas valve On/Off (option) • Heater On/Off • Pump (solvent tank pump) On/Off • Lift current <ul style="list-style-type: none"> ▶ Tap up or down. <ul style="list-style-type: none"> ⇒ 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
<i>[Extraction unit]</i>	View	The following information on the Extraction Unit is available: <ul style="list-style-type: none"> • Serial number • Firmware version • Operating hours • Board temperature • Code

Action	Option	Explanation
[Interface]	View	<p>The following information on the interface is available:</p> <ul style="list-style-type: none"> • Serial number • Firmware version • Operating hours • Board temperature • Code • 30 V Operating voltage • 5 V Operating voltage

6.3.5 Solvent menu

The solvent menu contains the available solvents for the extraction methods. The solvent menu allows editing individual solvents. See Chapter 6.7 “Editing a solvent”, page 57

6.4 Status bar

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

6.5 Selecting a method for an extraction position



NOTE

Combination of solvents with far apart boiling points.

- ▶ Do not use solvents with boiling point differences higher than 20 °C.

Navigation path



- ▶ Navigate to the [Home] menu via the navigation path.
- ▶ Tap the extraction position you wish to edit.
- ▶ The display shows a dialog box with selectable methods.
- ▶ Select a method.
- ▶ Tap the function [OK] on the function bar.
- ▶ Select a method for each extraction position by repeating the previous four steps.

Save the selection with the following process description

Navigation path



- ▶ Navigate to the [Setup] menu via the navigation path.
- ▶ Tap the function [New] on the function bar.
 - ⇒ The new setup is created with a default name.
- ▶ Tap the new setup.
- ▶ Tap the function [OK] on the function bar.
 - ⇒ The display shows a dialog with an alphanumeric input box.
- ▶ Enter a name for the set-up.
- ▶ Tap the function [Save] on the function bar.
 - ⇒ The name is saved.
 - ⇒ The dialog box closes.

6.6 Editing a method

The Pro interface can save up to 40 extraction methods.

6.6.1 Creating a new method

Navigation path



- ▶ Navigate to the *[Method]* menu via the navigation path.
- ▶ Tap the submenu *[Define method]*.
 - ⇒ The display shows a dialog with the selectable methods.
- ▶ Tap the method you wish to use
- ▶ Tap the function *[OK]* on the function bar.
 - ⇒ The display shows the view *Method*.
- ▶ Tap the function *[Save]* on the function bar.
 - ⇒ The method is saved.

6.6.2 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.
- ▶ Tap the action *[Method name]*.
 - ⇒ 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.

6.6.3 Setting the solvent of a method



NOTE

Solvents from the Solvent menu are selectable.

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 *[Solvent]*.
 - ⇒ The display shows a dialog with the selectable solvents.
- ▶ Tap the solvent you wish to use.
- ▶ Tap the function *[OK]* on the function bar.
 - ⇒ The dialog box closes.

- ▶ Tap the function *[Save]* on the function bar.
- ⇒ The solvent is saved.

6.6.4 Setting the inert gas (option)



NOTE

If the analyte protection sensor triggers inert gas is always released.

Enabling the action *[Inert gas]* enables the following actions:

Action	Description
<i>[Inert gas Extraction]</i>	Activating the checkbox enables the inert gas during the extraction steps.
<i>[Inert gas Rinse]</i>	Activating the checkbox enables the inert gas during the rinse step.
<i>[Inert gas Drying]</i>	Activating the checkbox enables the inert gas during the drying step.

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 *[Inert gas]*.

6.6.5 Setting the extraction time of a method

Enter the duration of the extraction time 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.
- ▶ Tap the action *[Extraction time]*.
 - ⇒ The display shows a dialog box with a numeric input box.
 - ▶ Enter the value in the numeric input box.
 - ▶ Tap the function *[OK]* on the function bar.
 - ⇒ The dialog box closes.
 - ▶ Tap the function *[Save]* on the function bar.
 - ⇒ The value is saved.

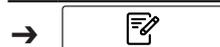
6.6.6 Setting the extraction cycles of a method (Soxhlet and Soxhlet Warm Extraction)

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.
- ▶ Tap the action *[Extraction cycle]*.
 - ⇒ The display shows a dialog box with a numeric input box.
 - ▶ Enter the value in the numeric input box.
 - ▶ Tap the function *[OK]* on the function bar.
 - ⇒ The dialog box closes.
 - ▶ Tap the function *[Save]* on the function bar.
 - ⇒ The number of extraction cycles is saved.

6.6.7 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.



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.
- ▶ Tap the action *[Extraction heating level]*.
 - ⇒ The display shows a dialog box with a numeric input box.
- ▶ Enter the value in the numeric input box.
- ▶ Tap the function *[OK]* on the function bar.
 - ⇒ The dialog box closes.
- ▶ Tap the function *[Save]* on the function bar.
 - ⇒ The heating level is saved.

6.6.8 Setting the chamber heater (Soxhlet Warm, Hot Extraction with chamber heater and Twisselmann Extraction)

The heating steps are selectable from 0 to 10.

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 *[Chamber heater]*.
 - ⇒ The display shows a dialog box with a numeric input box.
- ▶ Enter the value in the numeric input box.
- ▶ Tap the function *[OK]* on the function bar.
 - ⇒ The dialog box closes.
- ▶ Tap the function *[Save]* on the function bar.
 - ⇒ The drying heating level is saved.

6.6.9 Setting the Soxhlet valve open time of a method (Soxhlet and Soxhlet Warm Extraction)

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 universal is completely emptied.

The following open times are available:

Open time	Level sensor position	Explanation
<i>[short]</i>	bottom	The sample structure is easily releasing the solvent.
		Hydrolysed sample in the glass sample tubes are extracted.
<i>[mid]</i>	middle	The sample structure is easily releasing the solvent.
<i>[long]</i>	bottom	The sample structure is slowly releasing the solvent.
		The extraction glass chamber universal LSV is used.
	middle	The extraction glass chamber universal LSV is used.
<i>[max]</i>	top	The sample structure is easily releasing the solvent.
		The extraction glass chamber universal LSV 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.
- ▶ Tap the action *[Sox valve open time]*.
 - ⇒ The display shows a dialog with the selectable values.
- ▶ Tap the value you wish to use.
- ▶ Tap the function *[OK]* on the function bar.
 - ⇒ The dialog box closes.
- ▶ Tap the function *[Save]* on the function bar.
 - ⇒ The Soxhlet valve open time is saved.

6.6.10 Setting the rinse time of a method (Hot Extraction with beaker, Soxhlet, Soxhlet Warm, Hot Extraction with chamber heater and Twisselmann Extraction)

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.
- ▶ Tap the action *[Rinse time]*.
 - ⇒ The display shows a dialog box with a numeric input box.
- ▶ Enter the value in the numeric input box.
- ▶ Tap the function *[OK]* on the function bar.
 - ⇒ The dialog box closes.
- ▶ Tap the function *[Save]* on the function bar.
 - ⇒ The rinse time is saved.

6.6.11 Setting the number of drains for a method (Hot Extraction with beaker only)

During each drain 3-4 mL of solvent is drained into the solvent tank. The level of solvent 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 and the dialog box closes.

6.6.12 Setting the rinse heating level of a method (Hot Extraction with beaker, Soxhlet, Soxhlet Warm, Hot Extraction with chamber heater and Twisselmann Extraction)

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.
- ▶ Tap the action *[Rinse heating level]*.
 - ⇒ The display shows a dialog box with a numeric input box.
- ▶ Enter the value in the numeric input box.
- ▶ Tap the function *[OK]* on the function bar.
 - ⇒ The dialog box closes.
- ▶ Tap the function *[Save]* on the function bar.
 - ⇒ The rinse heating level is saved.

6.6.13 Setting the number of dry steps

For Soxhlet, Soxhlet warm, Hot Extraction with chamber heater, Twisselmann and Continuous Extraction a maximum of three dry steps are possible. For Hot Extraction with beaker one dry step is possible.

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 *[Dry step]*.
- ▶ Tap the *[+]* button (not visible for Hot Extraction with beaker).
 - ⇒ A drying step is added.
- ▶ Tap the function *[Save]* on the function bar.
 - ⇒ The new drying step is saved.

6.6.14 Setting the analyte protection for a dry step (not available for Hot Extraction with beaker)



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.

- ▶ Use the analyte protection for the first drying step.
- ▶ Change the default setting to the optimized parameters of your application. See *Technical Note: Heating guide for UniversalExtractor E-800*.
- ▶ Obey all safety precautions. See Chapter 2.6 "Residual risks", page 11

Checkbox	Explanation
Activated	The analyte protection is enabled.
Deactivated	The analyte protection is disabled.

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 *[Dry step]* you wish to edit.
- ▶ Activate or deactivate the checkbox according to your requirements.
- ▶ Tap the function *[Save]* on the function bar.

6.6.15 Setting the time for a dry step

Next dry step starts under the following conditions:

- the time for the dry step is reached
- the analyte protection triggers

**NOTE**

If the dry time is set to 0 and the analyte protection is activated, the dry step continues until the analyte protection triggers.

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 *[Dry step]* you wish to edit.
- ▶ Tap the number next to *[min]*.
 - ⇒ The display shows a dialog box with a numeric input box.
- ▶ Enter the value in the numeric input box.
- ▶ Tap the function *[OK]* on the function bar.
 - ⇒ The dialog box closes.
- ▶ Tap the function *[Save]* on the function bar.
 - ⇒ The time for the drying step is saved.

6.6.16 Setting the heating level for a dry step**⚠ 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.
- ▶ Tap the action *[Dry step]* you wish to edit.
- ▶ Tap the number next to heating level symbol.
 - ⇒ The display shows a dialog box with a numeric input box.
- ▶ Enter the value in the numeric input box.
- ▶ Tap the function *[OK]* on the function bar.
 - ⇒ The dialog box closes.
- ▶ Tap the function *[Save]* on the function bar.
 - ⇒ The heating level for the drying step is saved.

6.7 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 9.

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.

6.7.1 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.

6.7.2 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.

6.7.3 Changing the chamber heating level (option)

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 **[Manually]**.
 - ⇒ The display highlights the action **[Chamber heater level]** white.
- ▶ Tap the action **[Chamber heater level]**.
 - ⇒ The display shows a dialog box with a numeric input box.
- ▶ Enter a heating level for the solvent.
- ▶ Tap the function **[Save]** on the function bar.
 - ⇒ The new name is saved.
 - ⇒ The dialog box closes.

6.7.4 Changing the heating level of a solvent

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 **[Manually]**.
 - ⇒ The display highlights the action **[Heating level]** in white.
- ▶ Tap the action **[Heating level]**.
 - ⇒ The display shows a dialog box with a numeric input box.
- ▶ Enter a heating level for the solvent.
- ▶ Tap the function **[Save]** on the function bar.
 - ⇒ The new name is saved.
 - ⇒ The dialog box closes.

6.7.5 Changing the boiling point of a solvent

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 **[Manually]**.
 - ⇒ The display highlights the action **[Boiling point]** in white.
- ▶ Tap the action **[Boiling point]**.
- ▶ Tap the function **[OK]** on the function bar.
 - ⇒ The control panel shows a dialog box with a numeric input box.
- ▶ Enter the boiling point for the solvent.

- ▶ Tap the function **[OK]** on the function bar.
- ⇒ The value for the boiling point is saved.
- ⇒ The dialog box closes.

6.7.6 Changing the enthalpy of a solvent

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 **[Manually]**.
 - ⇒ The display highlights the action **[Enthalpy]** in white.
 - ▶ Tap the action **[Enthalpy]**.
 - ▶ Tap the function **[OK]** on the function bar.
 - ⇒ The display shows a dialog box with a numeric input box.
 - ▶ Enter the enthalpy for the solvent.
 - ▶ Tap the function **[OK]** on the function bar.
 - ⇒ The value for the enthalpy is saved.
 - ⇒ The dialog box closes.

6.7.7 Changing the molecular weight of a solvent

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 **[Manually]**.
 - ⇒ The display highlights the action **[Mol weight]** in white.
 - ▶ Tap the action **[Mol weight]**.
 - ▶ Tap the function **[OK]** on the function bar.
 - ⇒ The display shows a dialog box with a numeric input box.
 - ▶ Enter the mol weight for the solvent.
 - ▶ Tap the function **[OK]** on the function bar.
 - ⇒ The value for the mol weight is saved.
 - ⇒ The dialog box closes.

6.7.8 Changing the density of a solvent

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 *[Manually]*.
 - ⇒ The display highlights the action *[Density]* in white.
 - ▶ Tap the action *[Density]*.
 - ▶ Tap the function *[OK]* on the function bar.
 - ⇒ The display shows a dialog box with a numeric input box.
 - ▶ Enter the density for the solvent.
 - ▶ Tap the function *[OK]* on the function bar.
 - ⇒ The value for the density is saved.
 - ⇒ The dialog box closes.

7 Performing an extraction

7.1 Preparing the instrument for an extraction

Precondition:

- ☑ All commissioning operations have been completed. See Chapter 5 “Installation”, page 29
- ☑ Make sure that the tank bottle is empty and installed. See Chapter 5.13 “Preparing the tank bottle”, page 40
- ☑ Make sure that no defective sealings or glass parts are used.
- ▶ Switch the **On/Off** master switch to On.
 - ⇒ The instrument is starting up.

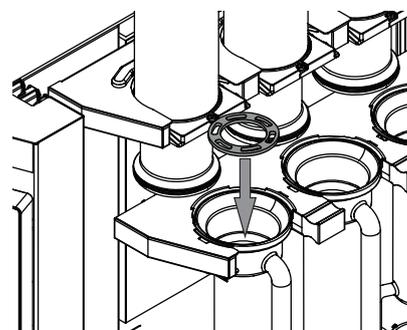
7.1.1 Putting the glass sample tube with frit in the extraction glass chamber



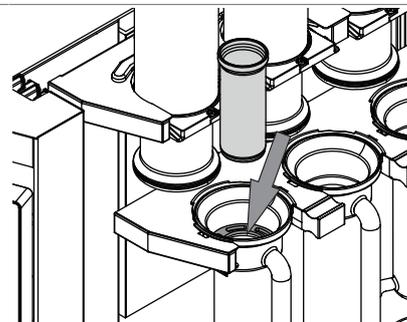
NOTE

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.

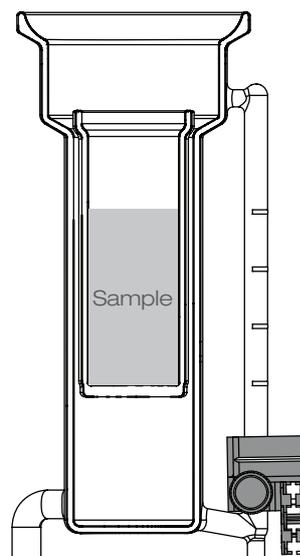


- ▶ Put the glass sample tube with frit into the holder in the extraction chamber.



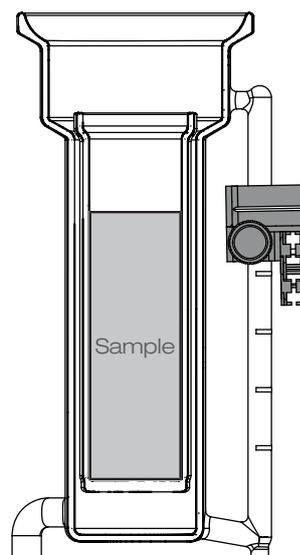
7.1.2 Adjusting the optical sensor (Twisselmann and Continuous Extraction only)

- ▶ Adjusting the optical sensor on the extraction glass chamber universal.
- White line below the sample.



7.1.3 Adjusting the optical sensor (Soxhlet, Soxhlet Warm and Hot Extraction with chamber heater)

- ▶ Adjusting the optical sensor on the extraction glass chamber universal.
- White line to the top of the sample.



7.2 Preparing the extraction positions

There are three options to prepare the extraction positions:

Option	Explanation
Select a method for all extraction positions.	See Chapter 7.2.1 "Selecting a method for all extraction positions", page 63
Select different methods for each extraction position.	See Chapter 7.2.2 "Selecting different methods for each extraction position", page 63
Select a programmed setup.	See Chapter 7.2.3 "Selecting a programmed setup", page 63

7.2.1 Selecting a method for all extraction positions

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.
 - ⇒ The status bar shows the method activated.

7.2.2 Selecting different methods for each extraction position



NOTE

Combination of solvents with far apart boiling points.

- ▶ Do not use solvents with boiling point differences higher than 20 °C.

Navigation path



- ▶ Navigate to the *[Home]* menu via the navigation path.
- ▶ Tap the extraction position you wish to edit.
- ▶ The display shows a dialog box with selectable methods.
- ▶ Select a method.
- ▶ Tap the function *[OK]* on the function bar.
- ▶ Select a method for each extraction position by repeating the previous four steps.

7.2.3 Selecting a programmed setup

Navigation path



- ▶ Navigate to the *[Setup]* menu via the navigation path.
- ▶ Select the setup you wish to use.
- ▶ Tap the function *[Load]* in the function bar.
 - ⇒ The setup is selected.

7.2.4 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.

7.3 Starting an extraction



CAUTION

Boiling retardation when using dichloromethane.

Boiling retardation can cause spills and lead to skin burns or a building fire.

- ▶ Use boiling aids, e.g. PTFE boiling chips



NOTE

Boiling retardation

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

Navigation path



Precondition:

- The instrument has been prepared. See Chapter 7.1 “Preparing the instrument for an extraction”, page 61
- The extraction positions are prepared. Chapter 7.2 “Preparing the extraction positions”, page 62
- The sample is prepared (in the glass sample tube or in the paper thimbles).
 - ▶ Switch on the connected recirculating chiller or open the water tap.
 - ▶ For Universal glass: Pull the chamber rack out of the instrument.
 - ▶ Place the prepared glass sample tube or paper thimble with the corresponding holder in the extraction chamber. See Chapter 7.1.1 “Putting the glass sample tube with frit in the extraction glass chamber”, page 61
 - ▶ Push the chamber rack back in the instrument.
 - ▶ Set the optical sensor to the correct position.
- For Hot Extraction with beaker:
 - ▶ Place the prepared glass sample tube or paper thimble with the corresponding holder in the Hot Extraction beaker.
 - ▶ Place the Hot Extraction beakers containing the samples on the corresponding positions directly on the heating plate.
- For Soxhlet, Soxhlet Warm and Hot Extraction with chamber heater. See Chapter 7.1.3 “Adjusting the optical sensor (Soxhlet, Soxhlet Warm and Hot Extraction with chamber heater)”, page 62
- For Twisselmann Extraction . See Chapter 7.1.2 “Adjusting the optical sensor (Twisselmann and Continuous Extraction only)”, page 62
 - ▶ For Universal glass: Fill the organic solvent directly into the beakers.
 - ▶ Place the beakers on the corresponding positions directly 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.
- For Hot Extraction:
 - ▶ Fill the organic solvent via the condenser. See Chapter 7.4.1 “Adding solvent through the condenser”, page 65.
 - ▶ Wait until the solvent rinses through the sample.
 - ▶ 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.

7.4 Task during performing an extraction

7.4.1 Adding solvent through the condenser

There are two possibilities to add solvent through 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.



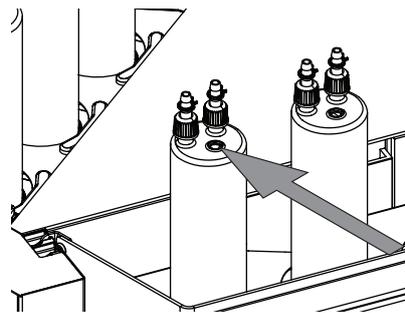
⚠ CAUTION

Not correctly installed condenser

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

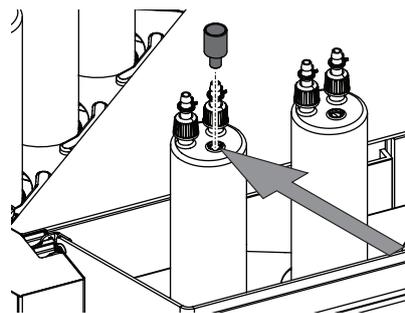
- ▶ A beaker is placed under the position.
- ▶ An extraction glass chamber is installed at the position.
- ▶ The lift is in the lower position.

- ▶ 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.



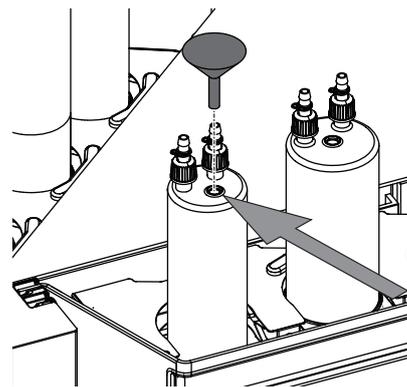
⚠ CAUTION

Not correctly installed condenser

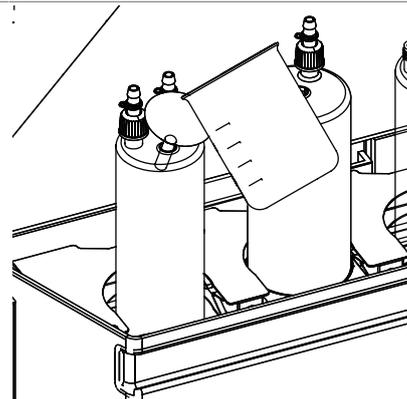
A not correctly installed condenser can cause skin burns or a building fire

- ▶ A beaker is placed under the position.
- ▶ An extraction glass chamber is installed at the position.
- ▶ The lift is in the lower position.

- ▶ Put a funnel on the condenser.



- ▶ Add solvent through the funnel.



7.5 Ending an 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.
- ▶ If necessary remove solvent from the extraction glass chamber. See Chapter 8.3 “Draining solvent from the instrument”, page 71
- ▶ Switch off the connected recirculating chiller or close the water tap.
- ▶ Empty the solvent tank. See Chapter 8.2 “Removing the tank bottle”, page 70

7.6 Shutting down the instrument

Navigation path



Precondition:

- The extraction process has ended.
- ▶ Switch the On/Off master switch to Off.

8 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.

8.1 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.

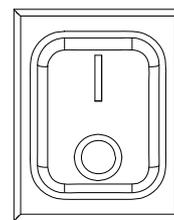
- ▶ Do not use abrasive cleaning material.
- ▶ Make sure that the cleaning agent meets the requirements of the safety data sheets for the chemicals used.
- ▶ Make sure that the cleaning agent is compatible with the materials used. See Chapter 3.5 “Technical data”, page 24
- ▶ If you have any further questions, contact BUCHI Customer Service.

Component	Action	Frequency
Solvent tank	▶ Empty the solvent tank. See Chapter 8.2 “Removing the tank bottle”, page 70	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
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

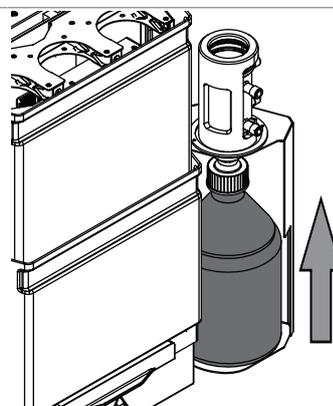
Component	Action	Frequency
Hoses and hose connections	<ul style="list-style-type: none"> ▶ Check the hoses and hose connections for defects (cracks, brittle areas). ▶ If defective, replace defect hoses. 	Weekly
Housing	<ul style="list-style-type: none"> ▶ Wipe down the housing with a damp cloth. ▶ If heavily soiled, use ethanol or a mild detergent. 	Weekly
Warning symbols	<ul style="list-style-type: none"> ▶ Check that the warning symbols on the instrument are legible. ▶ If they are dirty, clean them. 	Weekly
Protection shields	<p>NOTICE! Do not use Acetone</p> <ul style="list-style-type: none"> ▶ 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 an-alyte protection	<p>NOTICE! Do not use any detergent</p> <ul style="list-style-type: none"> ▶ 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	<ul style="list-style-type: none"> ▶ Wipe down the display with a damp cloth. 	Monthly

8.2 Removing the tank bottle

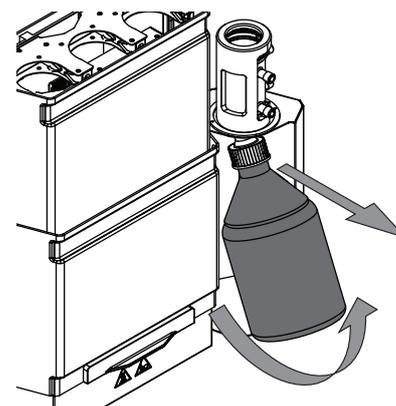
- ▶ Switch the **On/Off** master switch to Off.



- ▶ Remove the joint clip.
- ▶ Push the solvent tank up.



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



8.3 Draining solvent from the instrument

1. Switch on the pump. See Chapter 8.3.1 “Switch on the pump”, page 71
2. Open the tank valves. See Chapter 8.3.2 “Open the tank valves”, page 71
3. Switch of the valves. See Chapter 8.3.3 “Switch of the pump”, page 71

8.3.1 Switch on the pump

Navigation path

→  → [Service] → [Actors]

Precondition:

- A tank bottle is installed. See Chapter 5.13 “Preparing the tank bottle”, page 40
- ▶ Navigate to [Actors] via the navigation path.
 - ⇒ The display shows the view *Actors*.
- ▶ Enable the action [Pump].

8.3.2 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.

8.3.3 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].

9 Help with faults

9.1 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 wholes.	
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 start	Solvent tank is full	▶ Empty the solvent tank.	
	Protection shield is open	▶ Close the protective shield.	
	No solvent present	▶ Add solvent. See Chapter "Adding solvent through the condenser with a funnel", page 66	
	Not enough solvent	▶ Add solvent. See Chapter "Adding solvent through the condenser with a funnel", page 66	
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 8.2 "Removing the tank bottle", page 70	
	Not enough solvent		▶ Check for leaks.
			▶ Add solvent. See Chapter "Adding solvent through the condenser with a funnel", page 66
Loss of solvent	Seals wrong, deformed or damaged	▶ Exchange the seals.	
	Incorrect positioning of the beaker/ glassware and seals	▶ Contact BUCHI Customer Service.	

Problem	Possible cause	Action
Boiling retardation	Incorrect positioning of the beaker	▶ Place the beaker directly onto the heating plate.
	Too long waiting time between preparation of the instrument and start	▶ Start the instrument quickly after solvent was added.
	If dichloromethane is used	▶ Use boiling aids, e.g. PTFE boiling chips.
	Dirty boiling surface	▶ Replace beaker.
	Worn boiling surface	▶ Use boiling aids, e.g. PTFE boiling chips.
No boiling	Incorrect positioning of the beaker	▶ Place the beaker directly onto 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.

9.2 Draining solvent from extraction glass chamber universal

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.

10 Taking out of service and disposal

10.1 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.

10.2 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. For the used materials see Chapter 3.5 “Technical data”, page 24 or the material labeling on the parts.

10.3 Returning the instrument

Before returning the instrument, contact the BÜCHI Labortechnik AG Service Department.

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

11 Appendix

11.1 Schematics

11.1.1 Condenser circuit

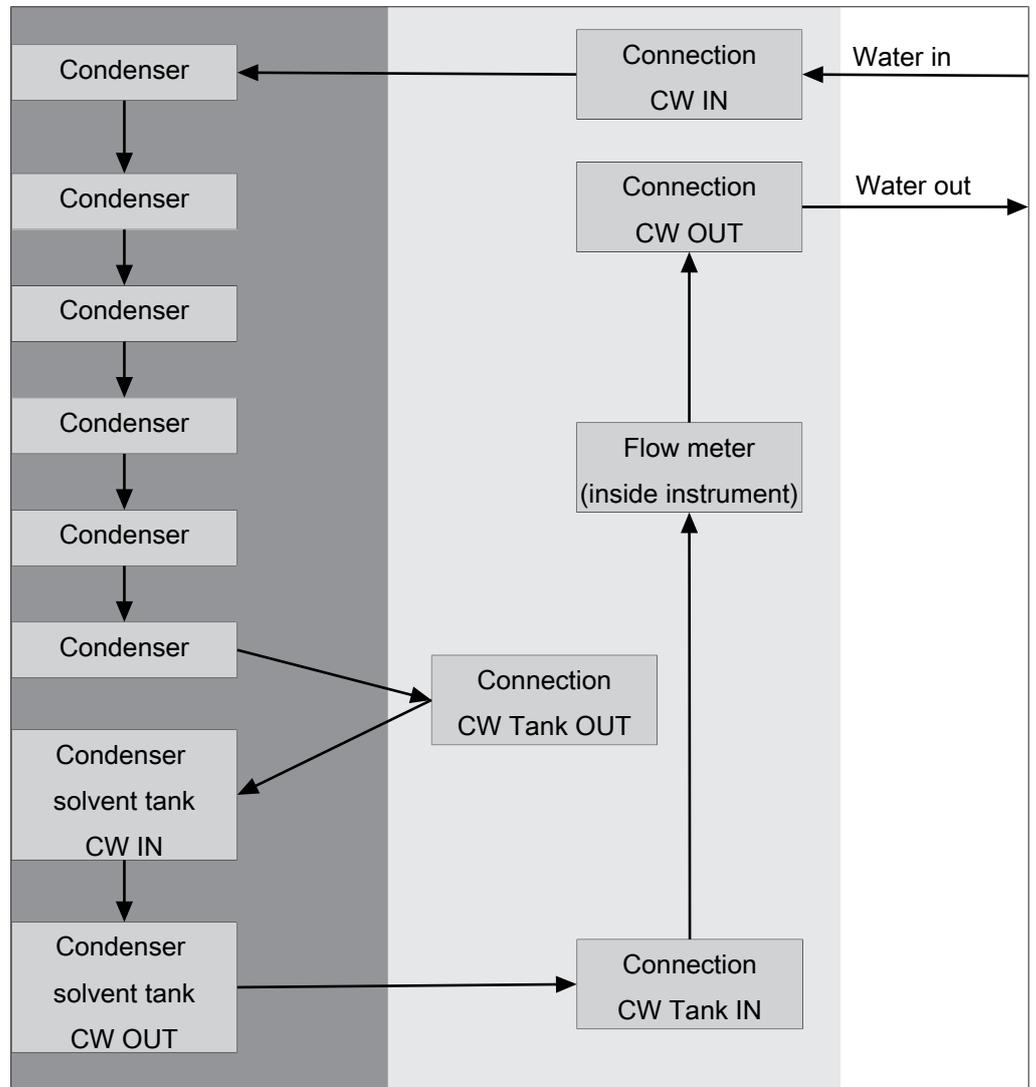


Fig. 14: Condenser circuit

11.1.2 Solvent collector schematic

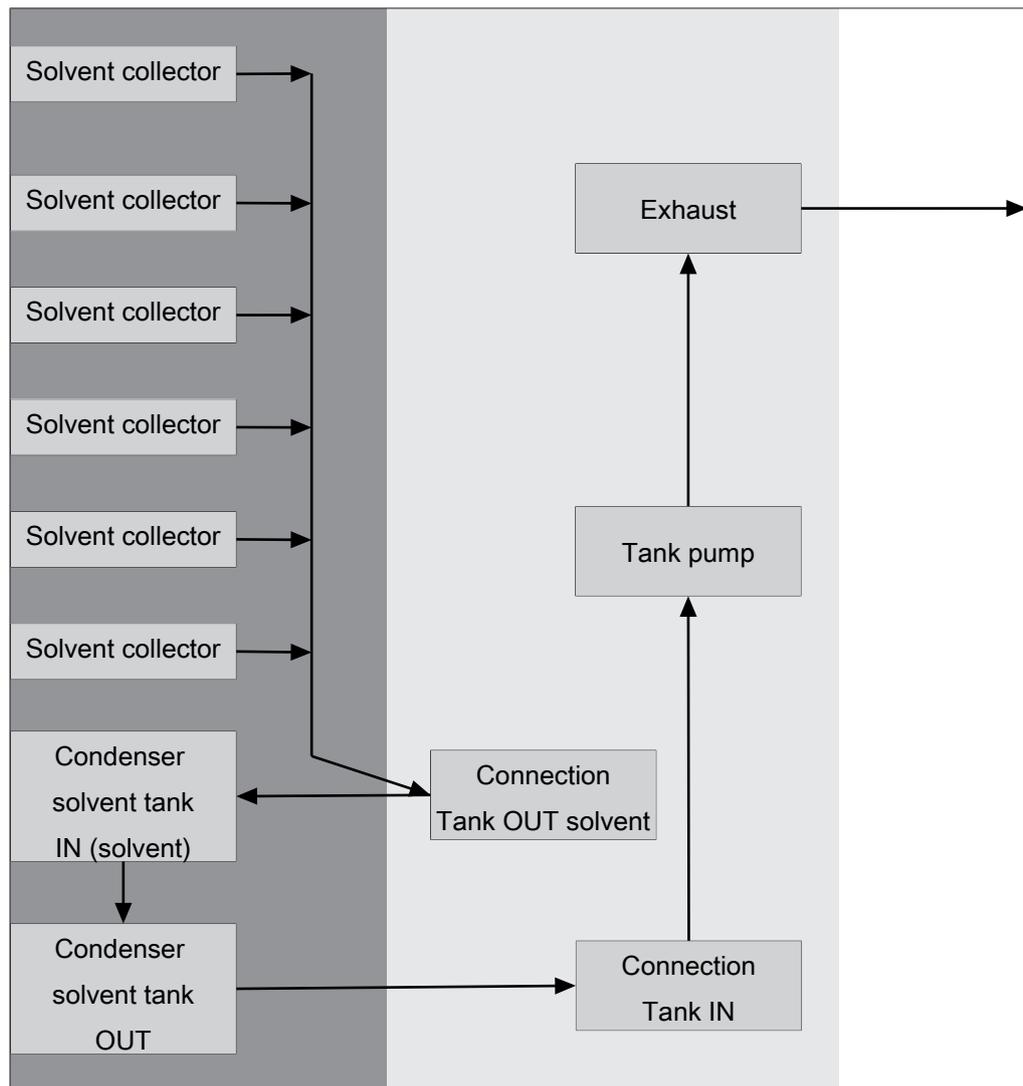


Fig. 15: Solvent circuit

11.2 Solvent table

Solvent name	Boiling point [°C]	Evaporation enthalpy [kJ/mol]	Molecular weight [g/mol]	Density (at 20 °C) [g/mL]
2-Propanol (Isopropanol, iPrOH)	82	39.85	60.1	0.78
Acetone (Propanon, AcMe)	56.05	29.1	58.08	0.791
Acetonitril (MeCN)	81.65	29.75	41.05	0.78
Benzene	80.09	30.72	78.11	0.8765
Butanon (Methylethylketon, AcEt)	79.59	31.3	72.11	0.805
Chloroform (Trichloromethane)	61	29.24	119.38	1.48
Cyclohexane	80.73	29.97	84.16	0.78
Dichloromethane (DCM)	40	28.06	84.93	1.33

Solvent name	Boiling point [°C]	Evaporation enthalpy [kJ/mol]	Molecular weight [g/mol]	Density (at 20 °C) [g/mL]
Diethylether	34.5	26.52	74.12	0.71
Pentane	36.06	25.79	72.149	0.6262
Ethanol (EtOH)	78.29	38.6	46.07	0.79
Ethyl acetate (EtOAc)	77.11	31.94	88.11	0.9
Methanol (MeOH)	64.6	35.21	32.04	0.79
Heptane	98.4	31.77	100.21	0.68
Hexane	68.73	28.85	86.18	0.66
Petrolether 40-60 °C	40-60	28.5	86.18	0.654-0.670
Tetrahydrofuran (THF)	65	29.81	72.11	0.89
Toluene	110.63	33.18	92.14	0.87
Water	100	40.65	18.0153	1
o-Xylene	144.5	36.24	106.17	0.88
m-Xylene	139.07	35.66	106.17	0.86
p-Xylene	138.23	35.67	106.17	0.86

11.3 Spare parts and accessories

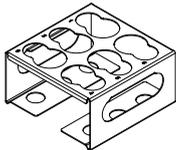
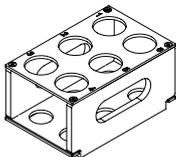
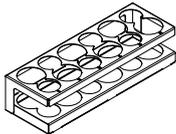
Use only genuine BUCHI consumables and spare parts in order to ensure correct, safe and reliable operation of the system.

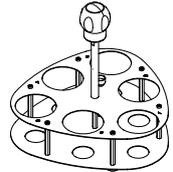
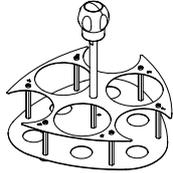
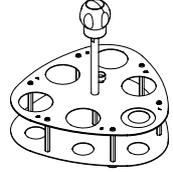
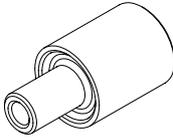
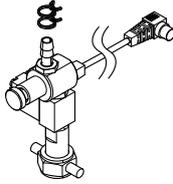
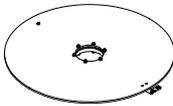


NOTE

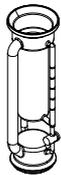
Any modifications of spare parts or assemblies are only allowed with the prior written permission of BUCHI.

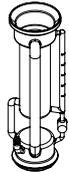
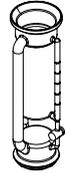
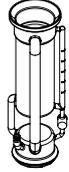
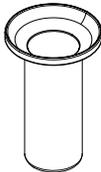
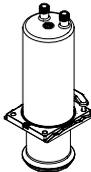
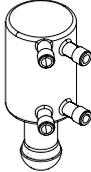
11.3.1 Accessories

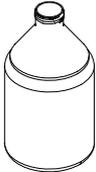
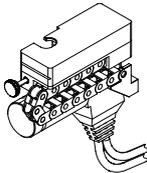
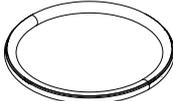
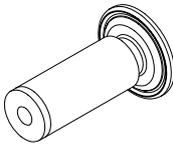
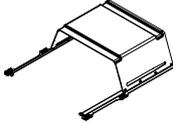
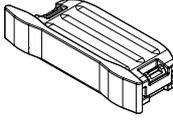
	Order no.	Image
Holder for glass sample tubes, stainless steel	11067219	
Holder for glass sample tubes, PTFE	11067220	
Holder for extraction thimbles (diameter 25 - 43 mm)	11068443	

	Order no.	Image
Extraction beaker Universal carrier Allows to carry 6 beakers Universal (11067474)	11067042	
Extraction beaker LSV carrier Allows to carry 6 beakers LSV (11067714)	11067715	
Extraction beaker HE carrier Allows to carry 6 beakers HE (11067475)	11067493	
Set condenser insulations E-800, 6 pcs. The insulation of the condensers prevent condensing water and is recommended in high humidity environment	11069077	
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, 24 VAC Valve opens cooling water feed during distillation.	031356	
Turning disk Allows for turning the instrument for easier access.	11067985	

11.3.2 Spare parts

	Order no.	Image
Extraction glass chamber universal	11062501	

	Order no.	Image
Extraction chamber universal inert	11064849	
Extraction chamber universal LSV	11062502	
Extraction chamber universal LSV inert	11064850	
Set of beakers HE, 2 pcs.	11067475	
Set of beakers, 2 pcs.	11067474	
Set of beakers LSV, 2 pcs.	11067714	
Condenser E-800 cpl.	11067064	
Condenser flange E-800	11067818	
Condenser tank bottle	11065966	

	Order no.	Image
Tank bottle 2 L, GL 45	11070509	
Tank adapter, PTFE	11064590	
Joint clip	11070136	
Soxhlet assembly cpl. One part consisting of magnetic valve and level sensor for extraction glass chamber Soxhlet	11067065	
Set of seals E-X00, PTFE, 2 pcs.	11067483	
Membrane with anchor for magnetic valve unit	037534	
Protection shield top, cpl. (with extraction glass chamber universal)	11067832	
Protection shield bottom, cpl.	11067831	
Set of gliding elements including magnets, 10 pcs.	11067827	
Reflectorfoil analyte protection, 6 pcs.	11068522	
Silicone hose D6/9 L=3 m	048355	
Set of draining tube, FEP, Universal configuration, 6 pcs.	11067477	

	Order no.	Image
Set of draining tubes FEP, HE configuration, 6 pcs. The draining tubes connect the receiving funnel in the condensers with the tank valve to drain solvent into the tank.	11067480	

11.3.3 Recirculating chiller



NOTE

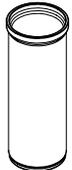
Select a chiller according to your needs. See *A comprehensive guide to evaluate recirculating chillers for extraction units*

	Order no.
Recirculating Chiller F-308 900 W at 15 °C, Display, 230 V Cooling capacity 900 W at 15 °C, for temperatures from -10 to 25 °C	11F30801
Recirculating Chiller F-308 900 W at 15 °C, Display, 115 V Cooling capacity 900 W at 15 °C, for temperatures from -10 to 25 °C	11F30802
Recirculating Chiller F-314 1400 W at 15 °C, Display, 230 V Cooling capacity 1400 W at 15 °C, for temperatures from -10 to 25 °C	11F31401
Recirculating Chiller F-314 1400 W at 15 °C, Display, 115 V Cooling capacity 1400 W at 15 °C, for temperatures from -10 to 25 °C	11F31402

11.3.4 Consumables

	Order no.
Quartz sand 0.3 - 0.9 mm, 2.5 kg	037689
Celite® 545, 1 kg	11068920
Boiling stones, PTFE	11068917

11.3.5 Glass sample tubes and extraction thimbles

	Order no.	Image
Glass sample tubes with frit, long, 6 pcs. The glass sample tubes with 150 mm length fit perfectly into the Universal glass extraction cham- ber. Working volume: 106 mL Filling volume: 123 mL	11067815	
Glass sample tubes with frit LSV, long, 6 pcs. The glass sample tubes with 150 mm length fit perfectly into the Universal LSV glass extraction chamber. Working volume: 180 mL Filling volume: 216 mL	11067816	

	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	
Extraction thimbles 25 x 150 mm, 25 pcs. The extraction thimbles with 150 mm length fit perfectly into the Universal glass extraction chamber, they need the holder 1167488 (d 25 mm) Working volume: 66 mL	11067445	
Extraction thimbles 33 x 150 mm, 25 pcs. The extraction thimbles with 150 mm length fit perfectly into the Universal glass extraction chamber, they need the holder 1167490 (d33 mm) Working volume: 120 mL	11067446	
Extraction thimbles 43 x 150 mm, 25 pcs. The extraction thimbles with 150 mm length fit perfectly into the Universal glass extraction chamber, they need the holder 1167491 (d 43 mm) Working volume: 182 mL	11067447	

11.3.6 Holder for extraction thimbles

	Order no.
Holders for thimbles d25, PTFE, 3 pcs.	11067488
Holders for thimbles d33, PTFE, 3 pcs.	11067490
Holders for thimbles d43, PTFE, 3 pcs.	11067491

	Order no.
Holders for thimbles d25, stainless steel, 6 pcs.	11068484
Holders for thimbles d33, stainless steel, 6 pcs.	11068485
Holders for thimbles d43, stainless steel, 6 pcs.	11068486
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



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