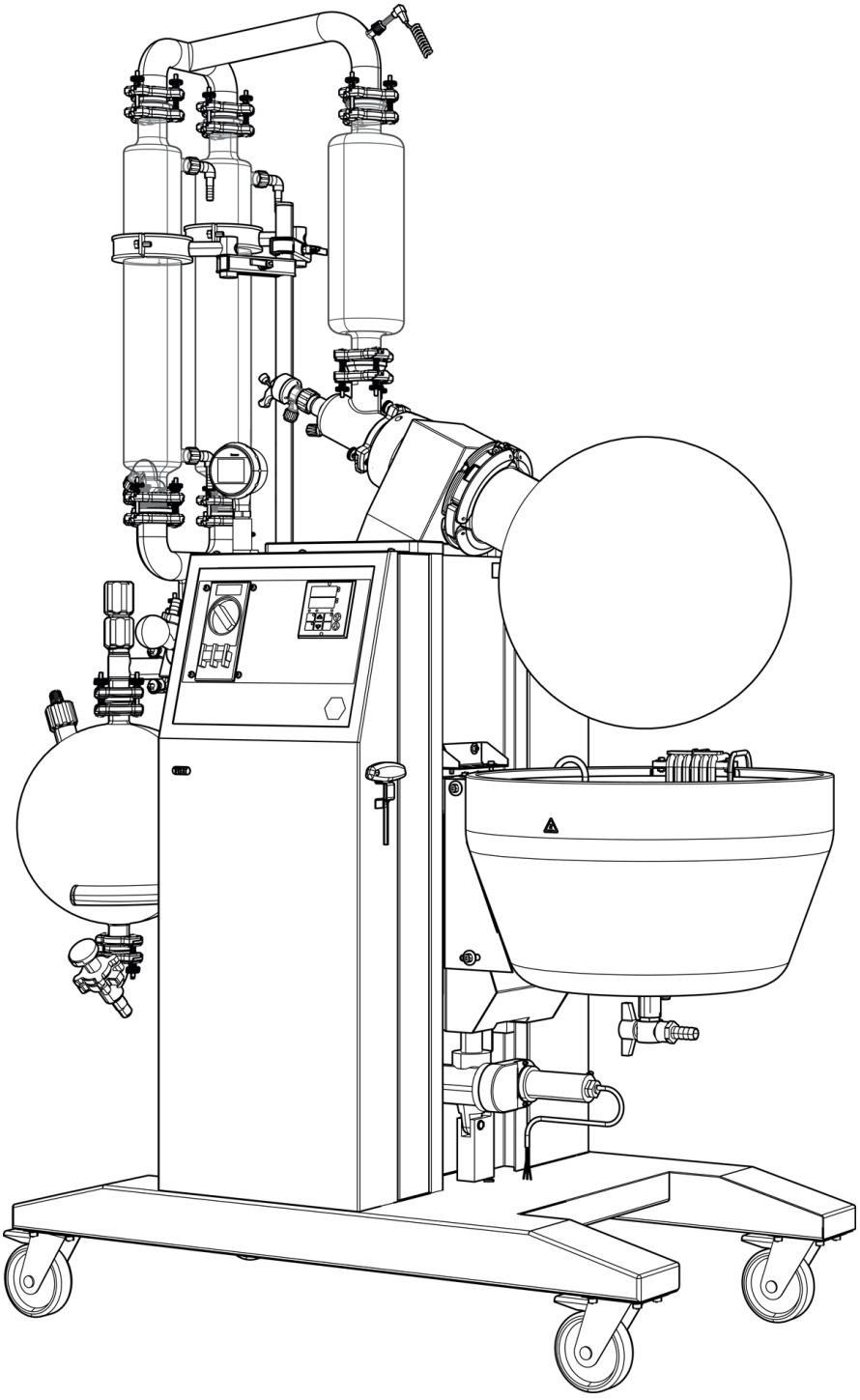
Rotavapor® R-250Ex
Operation Manual



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1 About this document

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

▶ Contact BÜCHI Labortechnik AG Customer Service.

https://www.buchi.com/contact

1.1 Mark-ups and symbols

NOTE

This symbol draws attention to useful and important information.

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

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

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

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

1.2 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.

1.3 Connected instruments

In addition to this operation manual, follow the instructions and specifications in the documentation for the connected instruments.

2 Safety

2.1 Intended use

The instrument is designed for rotary evaporation.
The instrument can be used in laboratories and production for the following tasks:

- Evaporating solvents
- Synthesis of chemicals
- Purification of chemicals
- Concentration of solvents
- Recycling of solvents
- Recrystallization
- Drying of powders and granulates

2.2 Use other than intended

The use of the instrument other than described in proper use and specified in technical data is use other than that intended.
The operator is responsible for damages or hazards that are caused by use other than that intended.
Especially the following uses are not permitted:

- Use of the instrument for food, pharmacy and cosmetic products without appropriate cleaning.
- Use of samples, which can explode or inflame (example: explosives, etc.) due to shock, friction, heat or spark formation.
- Use of the instrument with solvents containing peroxides.
- Use of the instrument in overpressure situations.
- Use of the instrument with other than original BUCHI glassware.
- Use of the instrument with explosive gas mixtures.
- The use of the instrument for drying hard, brittle substances that could damage the glassware.
- Use of the instrument with a heating medium with a flash point less than 200 °C.

For some applications the use is only permitted under inert conditions.

2.3 Staff qualification

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

Users

Users are persons that meet the following criteria:

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

Operator

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

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

BUCHI service technicians

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

2.4 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.

2.5 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.

2.6 Warning symbols

The following warning symbols are displayed in this operation manual or on the instrument.

Symbol	Meaning
	General warning
	Instrument damage
	Dangerous electrical voltage

Symbol	Meaning
	Hot surface
	Hand injuries
	ATEX protection

2.7 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.

2.7.1 Faults during operation

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

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

2.7.2 Hot surfaces

The surfaces of the device can become very hot, up to 150 °C . If touched they can cause skin burns.

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

2.7.3 Dangerous vapors

The use of the instrument can produce dangerous vapors that are capable of causing life-threatening toxic effects.

- ▶ Do not inhale any vapors produced during processing.
- ▶ Ensure that vapors are removed by a suitable fume hood.
- ▶ Only use the instrument in well ventilated areas.
- ▶ If vapors escape from connections, check the seals concerned and replace them if necessary.
- ▶ Do not process any unknown fluids.
- ▶ Observe the safety data sheets for all substances used.

2.7.4 Dangerous particles

The use of the instrument can produce dangerous particles that can cause life-threatening toxic effects.

- ▶ Do not inhale any particles produced during processing.
- ▶ Ensure that particles are removed by a suitable fume hood.
- ▶ Only use the instrument in well ventilated areas.
- ▶ If particles escape from connections, check the seals concerned and replace them if necessary.
- ▶ Do not process any unknown fluids.
- ▶ Observe the safety data sheets for all substances used.

2.7.5 Glass breakage

Broken glass can cause severe cuts.
Damaged glass components may implode if subjected to a vacuum.
Minor damage to the ground joints impairs the sealing effect and may therefore diminish performance.

- ▶ Handle the flask and other glass components carefully and do not drop them.
- ▶ Always visually inspect glass components for damage every time they are to be used.
- ▶ Do not continue to use glass components that are damaged.
- ▶ Always wear protective gloves when disposing of broken glass.

2.7.6 Rotating parts

The evaporating flask and the vapor duct are rotated by the rotary drive unit. Hair, clothing or jewelry can become caught up if allowed to come into contact with the rotating parts.
At high speeds, the heating fluid may be sprayed out by the rotation of the evaporating flask.

- ▶ Wear work overalls or protective clothing.
- ▶ Do not wear loose or baggy items of clothing such as scarves or neck-ties.
- ▶ Tie up long hair.
- ▶ Do not wear jewelry such as necklaces or bracelets.

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 instrument is a rotary evaporator with the aid of which single-stage distillation can be carried out quickly without unduly stressing the product. The basis of the process is the evaporation and condensation of solvents in a rotating evaporating flask under reduced pressure or vacuum.

- The product is heated in the evaporating flask by the heating bath.
- The rotary drive unit evenly rotates the evaporating flask.
  - The rotation increases the surface area of the liquid which leads to an increased evaporation rate.
  - The rotation constantly mixes the product which prevents localized overheating and delayed evaporation.
- The vapor passes from the evaporating flask through the vapor duct into the cooling section.
- In the cooling section, the thermal energy of the vapor is transferred to the coolant fluid so that the vapor re-condenses.
- The resulting solvent is collected in the receiving flask and can then be reused or properly disposed of.

3.2 Configuration

3.2.1 Front view

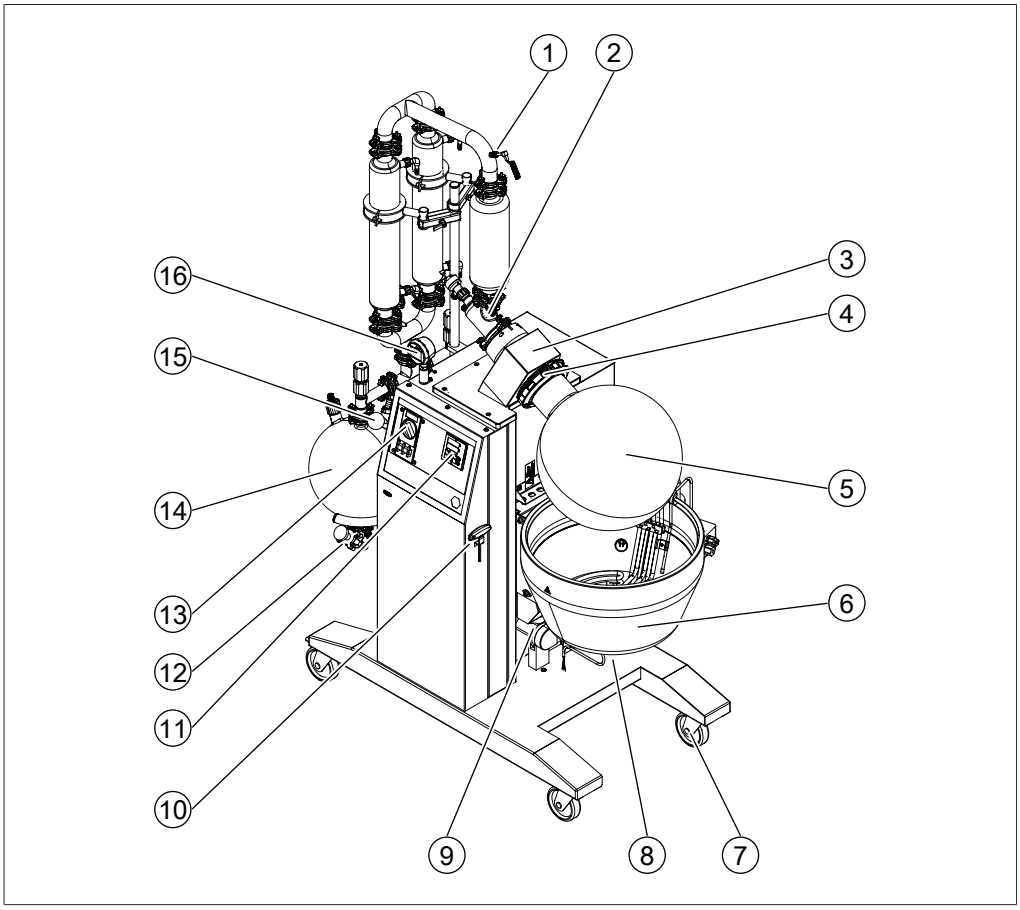


Fig. 1: Front view (example glassware)

1	Vapor temperature sensor	2	Distribution piece
3	Gear box	4	Snap flange coupling
5	Evaporation flask	6	Heating bath
7	Castor wheels	8	Drain valve heating bath
9	Heating bath lift	10	Hex key for snap flange coupling
11	Control panel	12	Drain valve receiver
13	On/Off master switch	14	Receiver flask
15	Cooling water tap	16	Vacuum control

3.2.2 Rear view

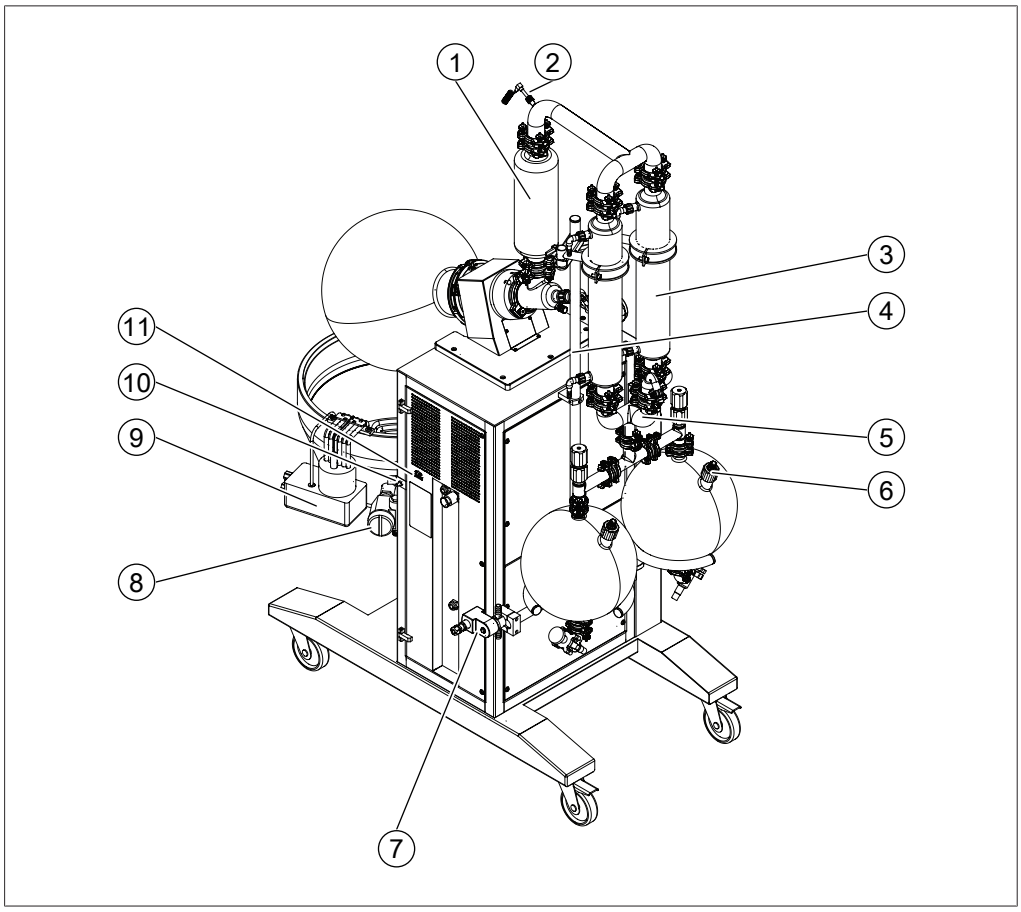


Fig. 2: Rear view (example glassware)

1	Expansion vessel	2	Vapor temperature sensor
3	Condenser	4	Support rod
5	Yoke	6	Receiver aeration valve
7	Vacuum valve (option)	8	Level sensor
9	Heater	10	Connection for equipotential
11	Vapor temperature connection		

3.3 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.

3.4 Type plate

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

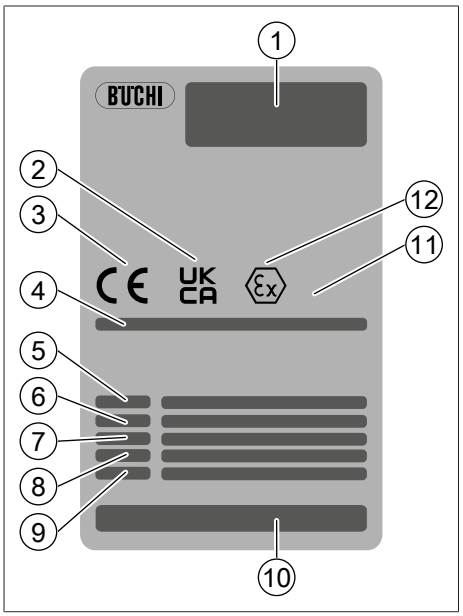


Fig. 3: Type plate

1	Company name and address	2	Symbol for "UK Conformity Assessed"
3	Symbol for "CE conformity "	4	ATEX rating
5	Instrument name	6	Power consumption maximum
7	Input voltage	8	Fabrication number
9	Year of manufacture	10	Country of origen
11	ATEX information (equipment group, safety category, atmosphere)	12	Symbol for "Ex certification"

3.5 Technical data

3.5.1 Rotavapor® R-250 EX

Dimensions (W x D x H) (without glass)	1410 x 830 x 1550 mm
Dimensions (W x D x H) (with glass max.)	1450 x 830 x 2260 mm
Weight (with glass max.)	295 kg
Voltage	400 – 440 V (3Ph, N, G)
Frequency	50 - 60 Hz
Max. power consumption	7'500- 9'100 W

3.5.2 Ambient conditions

For indoor use only.

Max. altitude above sea level	2000 m
Ambient and storage temperature	5 – 40 °C

Maximum relative humidity	80% for temperatures up to 31 °C decreasing linearly to 50 % relative humidity at 40 °C

3.5.3 Materials

Housing	Stainless steel 1.4301 (AISI 304)
Gear head	Aluminum cast (3.2373)
Painting	Powder coated with Epoxy (EPX)
Bath pan	Stainless steel 1.4404 (AISI 316L)
Heating element	Stainless steel 1.4404 (AISI 316L)
Glass	Borosilicate 3.3
In contact with product	FDA approved materials
Leakage of the complete system	< 1 mbar/min

3.5.4 Standards

Ex label	Ex II 2 G
CE marking	Yes

3.5.5 Safety

Safety coated glassware	No, due to the risc of electrostatic charges
Over temperature protection of the bath	Separate monitoring circuit with manual reset Error if temperature is 15 °C above set value
Rotation	Soft start
At any Error	Heater off, rotation off, bath lowers Indication of error

3.5.6 Display

Bath temperature	Yes (1 °C steps)
Vapor temperature	Yes (1 °C steps)
Set rotation speed	Yes (1 rpm steps)
Set bath temperature	Yes (1 °C steps)
Actual vacuum	Yes (1 mbar steps)
Set vacuum	Yes (1 mbar steps)

3.5.7 Cooling

Consumption	200 – 400 liter/hour (adjustable via integrated needle valve)
Restriction	max. 2,7 bar abs. without pulsation

3.5.8 Heathing (bath

Medium	Water or oil
Temperature range	Ambient to 115 °C (T4) or 150 °C (T3)
Heating capacity	6600 W (3 W/cm2)
Accuracy	+/- 2 °C

3.5.9 Rotation

Motor	400 V (3Ph; 2A at 50 Hz)
Controlling	Frequency inverter
Speed	0 – 100 rpm
Accuracy	+/- 1 rpm at 5 rpm up tp +/- 5 rpm at 100 rpm

3.5.10 Sensors

Vapor temperature	PT-1000, 2 wire
Bath temperature	PT-1000, 2 wire
Vacuum	Piezoresistive measuring cell; stainless steel 1.4435 (AISI 316L)

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

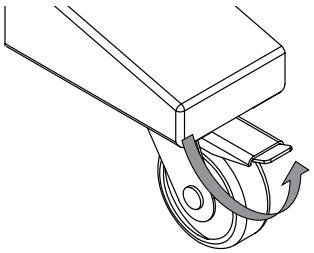
- ▶ Make sure that the ambient conditions are complied with (see Chapter 3.5 "Technical data", page 14).
- ▶ Wherever possible, store the device in its original packaging.
- ▶ After storage, check the device, all glass components, seals and tubing for damage and replace if necessary.

4.3 Lifting the instrument

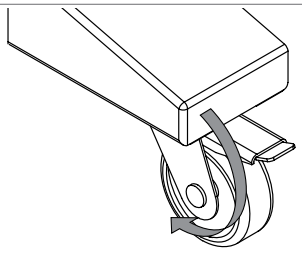
The instrument is heavy (see Chapter 3.5 "Technical data", page 14) and requires special equipment to lift it. Furthermore protective measures should be considered.

4.4 Moving the instrument

- ▶ Release the castor breaks.
- ▶ Move the instrument to the designated place.



- ▶ Lock the castor breaks.

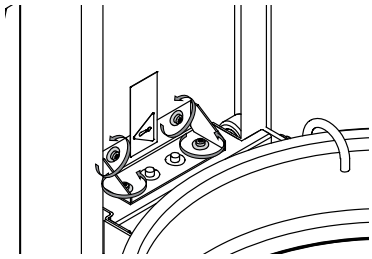


4.5 Installing and removing the transportation lock

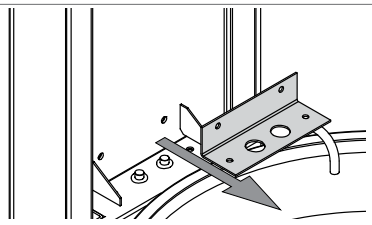
NOTE

Installing is done in reverse sequence.

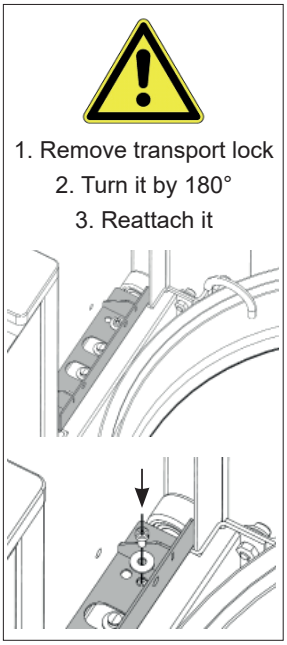
▶ Loosen the transportation lock screws.



▶ Remove the transportation lock.



▶ Reattach the transportation lock as shown on the label.



5 Installation

5.1 Installation site

The installation site must meet the following requirements:

- Firm and level surface.
- Considering the maximum product dimensions, weight and the environmental conditions as described in Chapter 3.5 "Technical data", page 14.
- Clearance on all sides 0.5 m minimum, better 1.2 m.
- The location should not have a lot of personal traffic.
- The explosion protection classification of the device needs to be permissible for the ex-classification of the room. In particular, the zone allocation and the temperature class must agree.
- Clear access to mains switch and power supply cable.
  (Note: it must be possible to switch off the equipment involved in the distillation process and disconnect the electrical connections at any time).
- If distilling under vacuum, there must be fume extraction apparatus available.

5.2 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.

5.3 Establishing electrical connections

⚠ WARNING

Death or serious burns by electric current.

▶ Have the installation carried out by an electrician or a person with similar expert knowledge.
▶ After installation, check electrical safety.

The instrument is design for stationary installation.

Precondition:
☑ The electrical installation is as specified in the technical data. See Chapter 3.5 "Technical data", page 14
☑ The installation site is as specified in the technical date. See Chapter 3.5 "Technical data", page 14

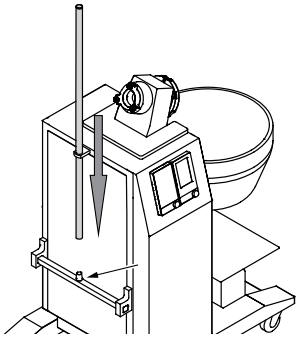
▶ Have the installation carried out by an electrician or a person with similar expert knowledge.
▶ Carry out the installation according to the instructions. See *Guide for electrical installation*.
▶ Ensure a equipotential conductor is connected.

5.4 Securing against earthquakes

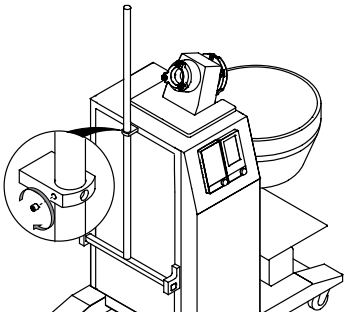
▶ Secure the instrument against tilting and unintentional moving in earthquake prone regions.

5.5 Installing the support rod

▶ Attach the support rod to the instrument.



▶ Secure the support rod in place with a headless screw.



*The instrument shown in the picture might have small differences at the interface.

5.6 Installing the glassware

NOTE

Glassware is delivered as per the purchase order, order confirmation and delivery note.

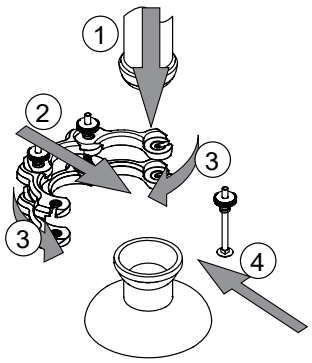
NOTE

For a safe handling of the evaporation flask the Kolbentraghilfe (optional) can be used. See Chapter 11.2 "Spare parts and accessories", page 56.

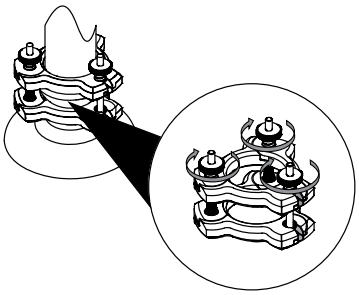
5.6.1 Glassware assembling instructions

Assembling instruction EasyClamp DN40

▶ Attach the two glass pieces.

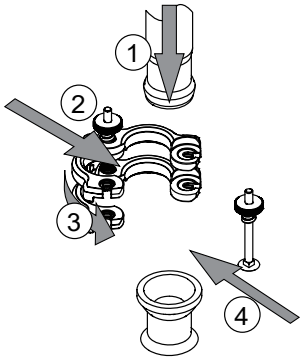


▶ Secure the connection in place with the easy clamp.

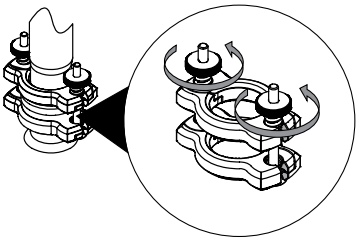


Assembling instruction EasyClamp DN25

▶ Attach the two glass pieces.

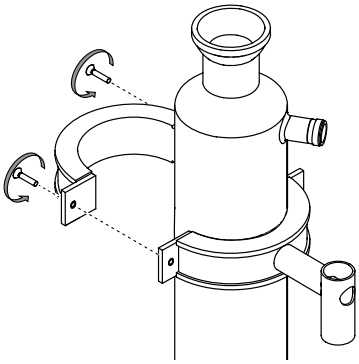


▶ Secure the connection in place with the easy clamp.



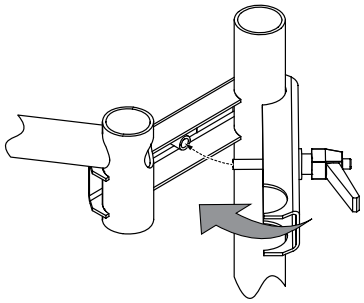
Assembling instruction glass bracket

▶ Attach the glass bracket to the condenser.

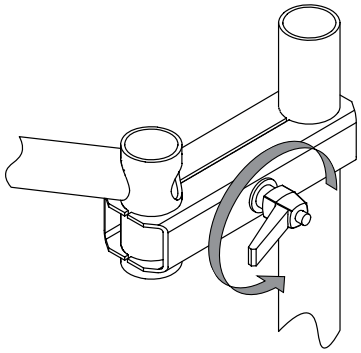


Assembling instruction bracket

▶ Attach the expansion vessel to the distribution piece.

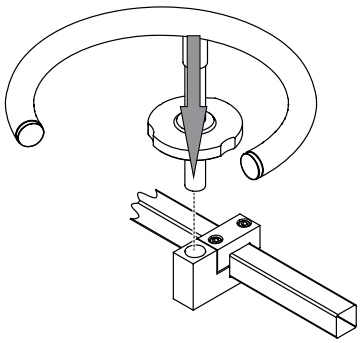


▶ Secure the expansion vessel in place with the easy clamp.



Assembling instruction receiving vessel support

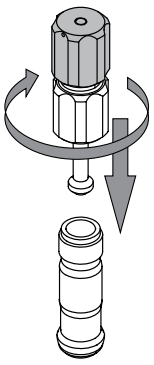
▶ Put the receiving vessel support on the instrument.



Assembling instruction shut off tap

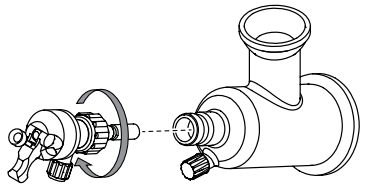
NOTICE! Tighten the shut off tap with your hands.

▶ Attach the shut off tap to the glassware using the white handle.



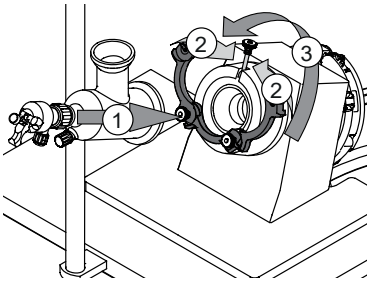
5.6.2 Installing the inlet valve (example)

► Attach the inlet valve to the distribution piece.

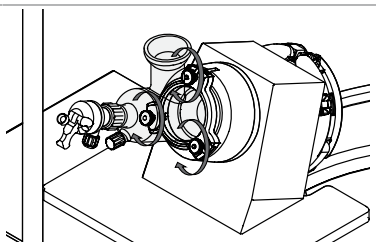


5.6.3 Installing the distribution piece (example)

► Attach the distribution piece to the gear box.
► Close the easy clamps.



► Secure the distribution piece in place.



5.6.4 Installing the glass assembly R (option)

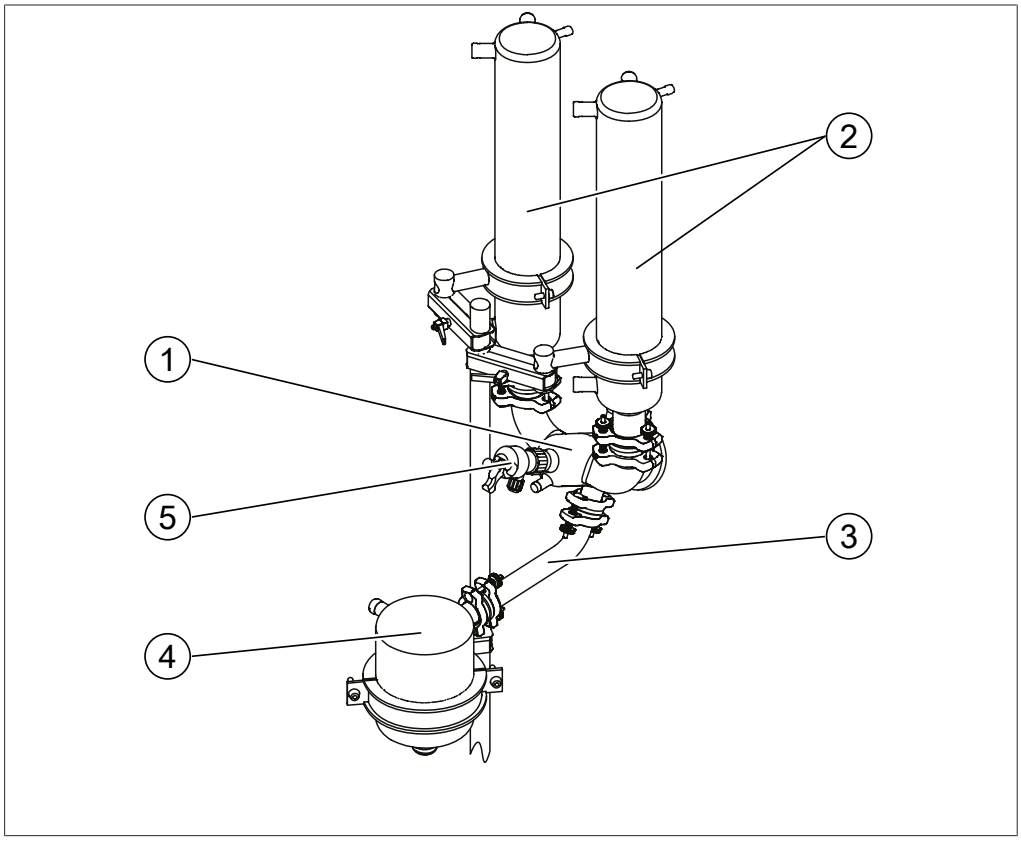


Fig. 4: Installation order Condenser R

► Install the glass parts in the indicated order.

5.6.5 Installing the glass assembly D (option)

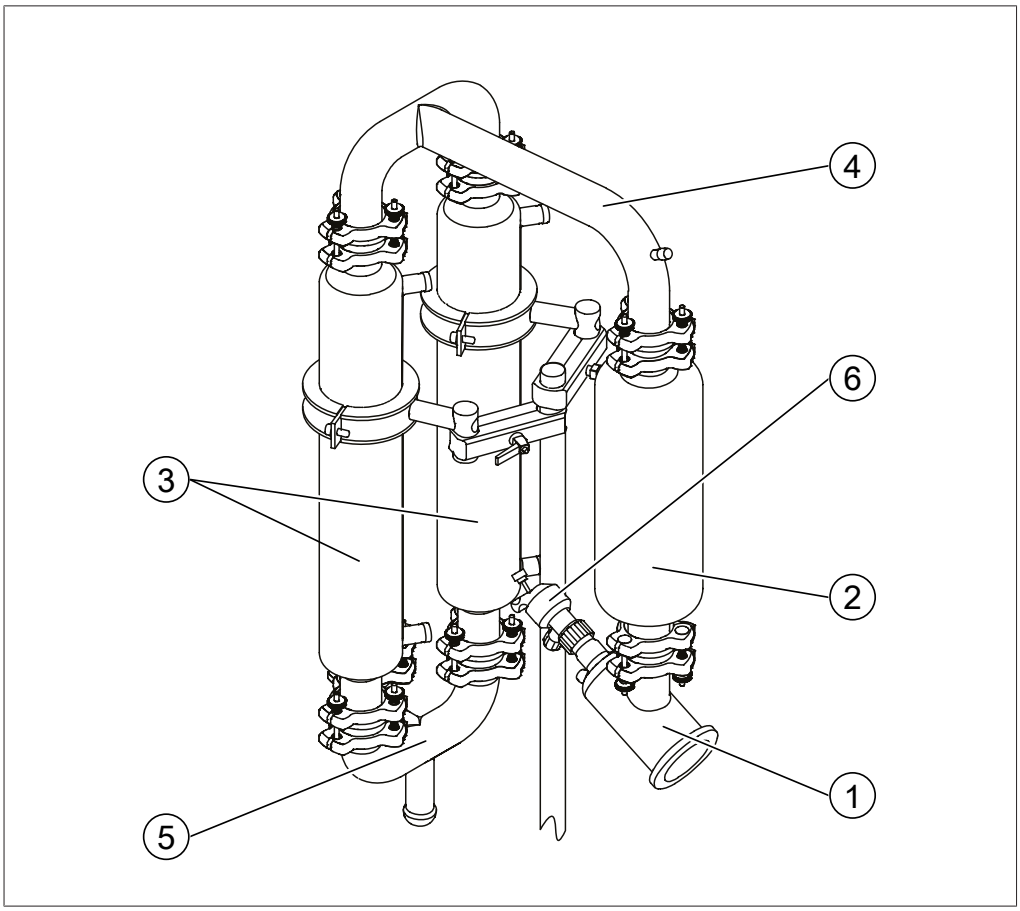


Fig. 5: Installation order glass assembly D

► Install the glass parts in the indicated order.

5.6.6 Installing the double receiver

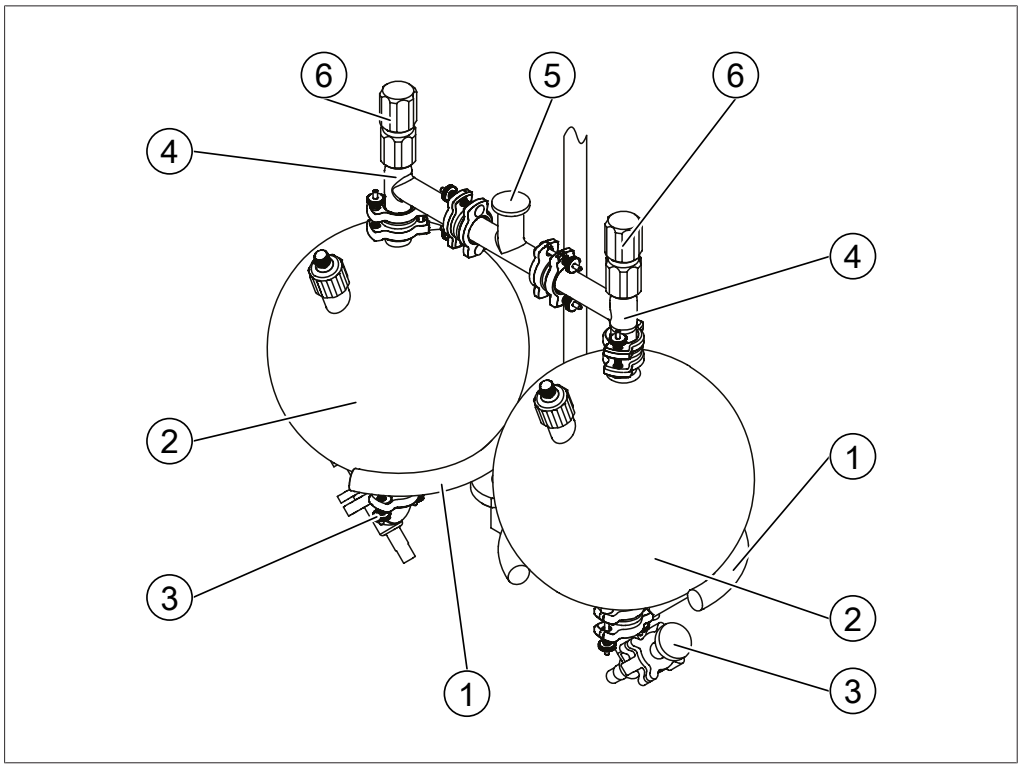


Fig. 6: Installation order double receiver

▶ Install the glass parts in the indicated order.

5.6.7 Installing the single receiver (option)

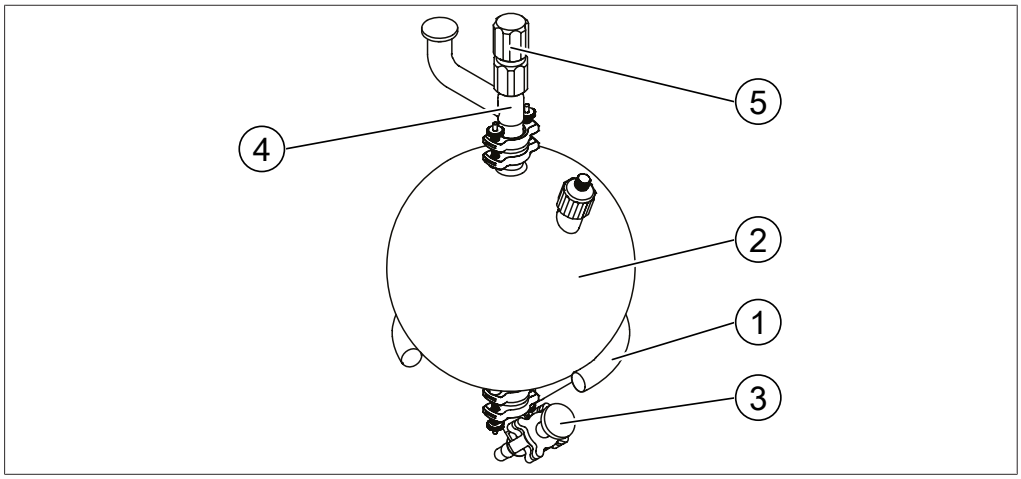
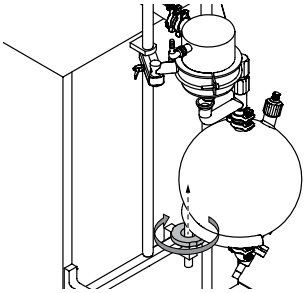


Fig. 7: Installation order single receiver

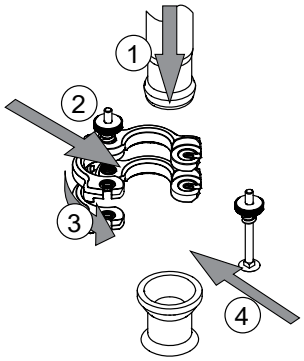
▶ Install the glass parts in the indicated order.

5.6.8 Connecting the receiver with the glass assembly (example)

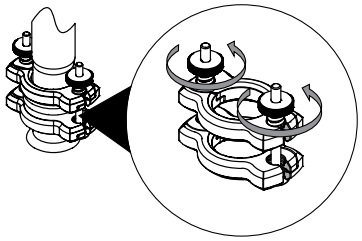
Precondition:
☑ The requested receiver is installed.
☑ The requested glass assembly is installed.
▶ Adjust the height of the receiver with the wheel.



▶ Attach the two glass pieces.



▶ Secure the connection in place with the easy clamp.

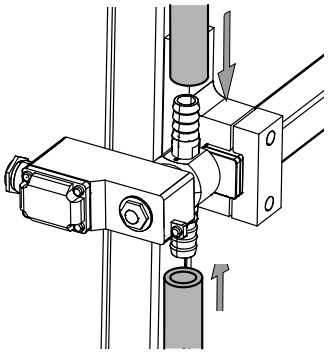


5.7 Installing the vacuum supply

5.7.1 Installing a non BUCHI vacuum pump (option)

Precondition:
☑ The vacuum meets the technical specifications.
See Chapter 3.5 "Technical data", page 14
▶ If a vacuum pump is used, prepare the vacuum pump. See related documentation.

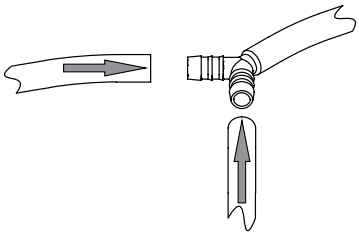
▶ Attach the vacuum hose to the vacuum valve.



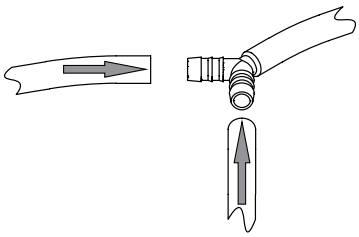
5.7.2 Installing the vacuum connection glass assembly R (option)

Precondition:
☑ A vacuum pump must be installed.

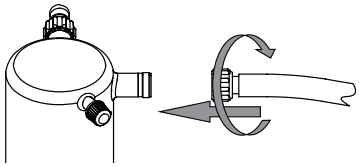
▶ Attach the condenser vacuum hoses to the Y piece.



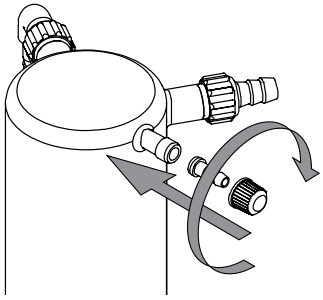
▶ Attach the condenser vacuum hoses to the Y piece.



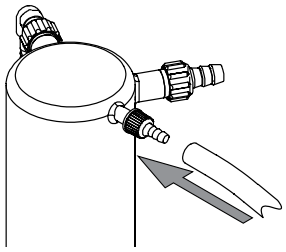
▶ Attach the vacuum hoses to the condensers.

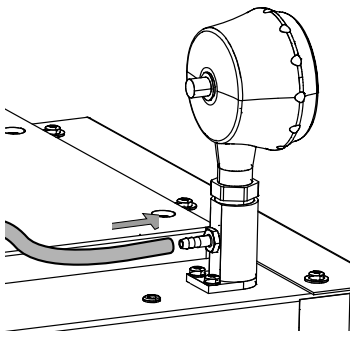


▶ Attach the hose barb to the condenser.



▶ Attach the vacuum hose for the vacuum controller onto the condenser

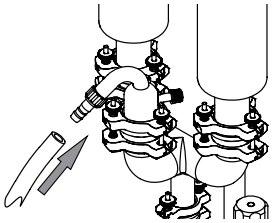




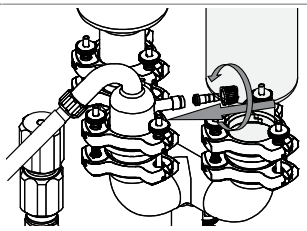
5.7.3 Installing the vacuum connection glass assembly D (option)

Precondition:
☑ A vacuum pump must be installed.

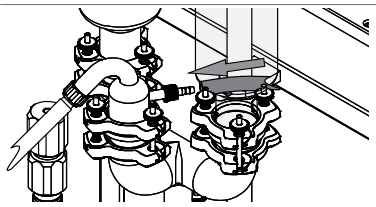
▶ Attach the vacuum hose to the vacuum connector.

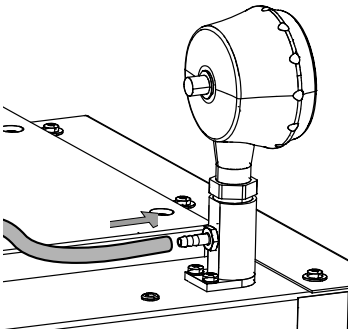


▶ Attach the hose barb to the vacuum connector.



▶ Attach the vacuum hose to the vacuum controller.

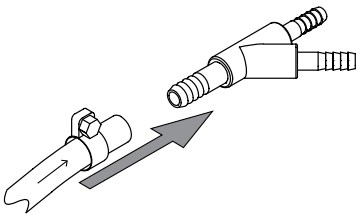




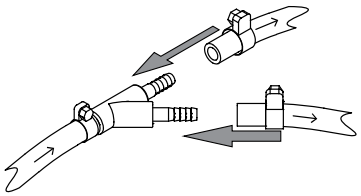
5.8 Installing the cooling water supply

5.8.1 Installing the cooling water supply with a recirculating chiller (option)

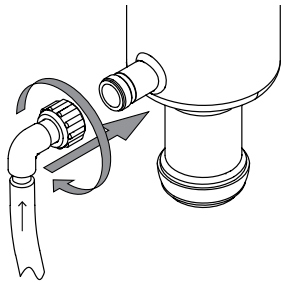
▶ Attach the inlet water supply hose to the Y-piece.



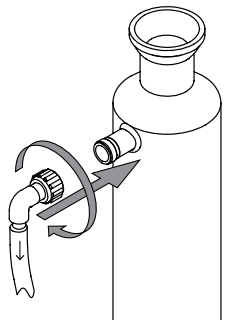
▶ Attach the inlet condenser hoses to the Y-piece.
▶ Secure the hoses in place with a hose clamp.



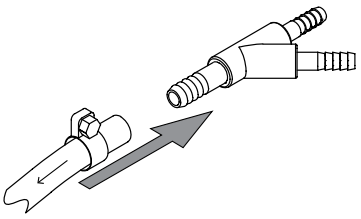
▶ Attach the water hose to the inlet connection.



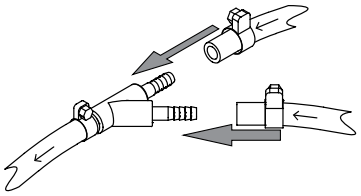
▶ Attach the hose to the outlet connection.



▶ Attach the outlet water supply hose to the Y-piece.



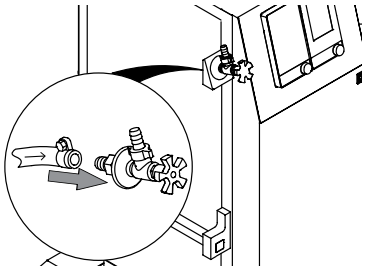
▶ Attach the outlet condenser hoses to the Y-piece.
▶ Secure the hoses in place with a hose clamp.



▶ Attach the outlet water supply hose to the chiller.

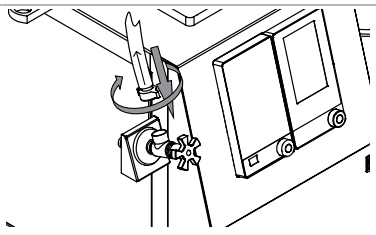
5.8.2 Installing the cooling water supply without a recirculating chiller (option)

Precondition:
☑ The water supply meets the technical specification. See Chapter 3.5 "Technical data", page 14

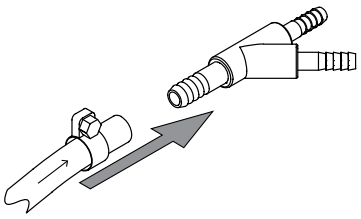


▶ Attach the water supply hose to the cooling water tap.
▶ Secure the water supply hose in place with a hose clamp.

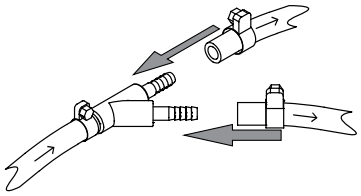
▶ Attach the condenser hose to the cooling water tap.



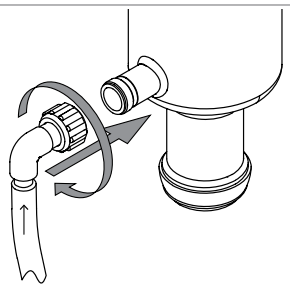
▶ Attach the inlet water supply hose to the Y-piece.



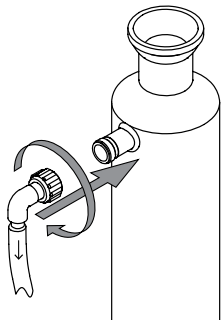
▶ Attach the inlet condenser hoses to the Y-piece.
▶ Secure the hoses in place with a hose clamp.



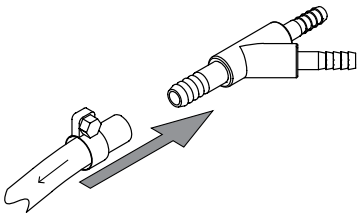
▶ Attach the water hose to the inlet connection.



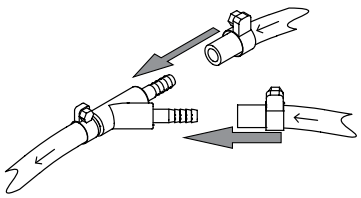
▶ Attach the hose to the outlet connection.



▶ Attach the outlet water supply hose to the Y-piece.



▶ Attach the outlet condenser hoses to the Y-piece.
▶ Secure the hoses in place with a hose clamp.



▶ Put the other end of the hose in a sink.

5.9 Heating bath installations

⚠ CAUTION

Risk of skin burns from hot fluids and surfaces

- ▶ Do not put your hands in the hot fluid.
- ▶ Do not carry, shift, tip or otherwise move the heating bath when it is filled with hot fluid.
- ▶ Do not fill the heating bath right to the very top. Allow for the expansion of the fluid when heated.
- ▶ Do not switch on the heating bath when it is empty.

5.9.1 Heating medium

NOTE

Revise the safety information of the used heating medium.

The level sensor is designed for temperatures up to max. 150°C. Higher temperatures cannot be obtained with the unit.
Suitable heating media include:

- Water (some Borax should be added when using deionized water).
- Heat transfer oils suitable for use at temperatures up to 160° C.
- Water-soluble polyethylene glycol (e.g., Polyethylene glycol 600).

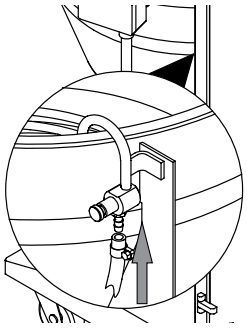
After the oil bath has been standing opened for a prolonged period, condensation water can collect on the bottom. When the bath is used again, it must be heated above 100°C with rotating flask in order to drive the water out.

5.9.2 Installing the heating bath replenishment (option)

NOTE

If oil is used as heating medium do not install the heating bath replenishment.

- ▶ Attach the water supply to the heating bath replenishment.
- ▶ Secure the hose in place with a hose clamp.

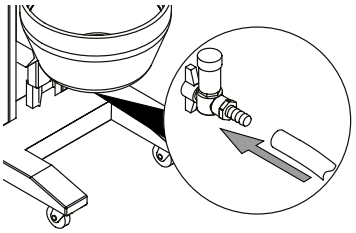


5.9.3 Installing the drain connection at the heating bath

NOTE

- ▶ If a heating medium other than clean water is used:
  ⇨ Obey local regulations and statutory requirements regarding disposal.

▶ Attach the drain hose to the drain valve.



▶ Install the other end on a receiving system (e.g. drain).

5.10 Installing the sensors

NOTE

Glassware is delivered as per the purchase order, order confirmation and delivery note.

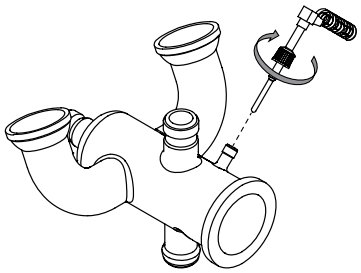
5.10.1 Installing the vapor temperature sensor

According to the configuration there are two locations where the sensor can be installed:

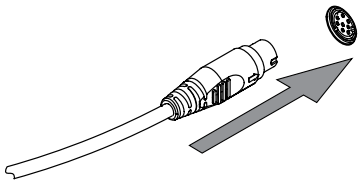
- Chapter "Installing the vapor temperature sensor at the glass assembly R", page 32
- Chapter "Installing the vapor temperature sensor at the glass assembly D", page 32

Installing the vapor temperature sensor at the glass assembly R

▶ Attach the vapor temperature sensor to the distribution piece.

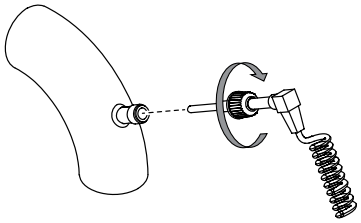


▶ Connect the vapor temperature sensor cable to the related connection on the instrument. See Chapter 3.2 "Configuration", page 12

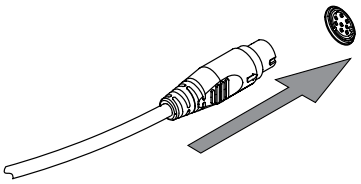


Installing the vapor temperature sensor at the glass assembly D

▶ Attach the vapor temperature sensor to the U-tube.



▶ Connect the vapor temperature sensor cable to the related connection on the instrument. See Chapter 3.2 "Configuration", page 12



6 Interface

6.1 Layout of the interface

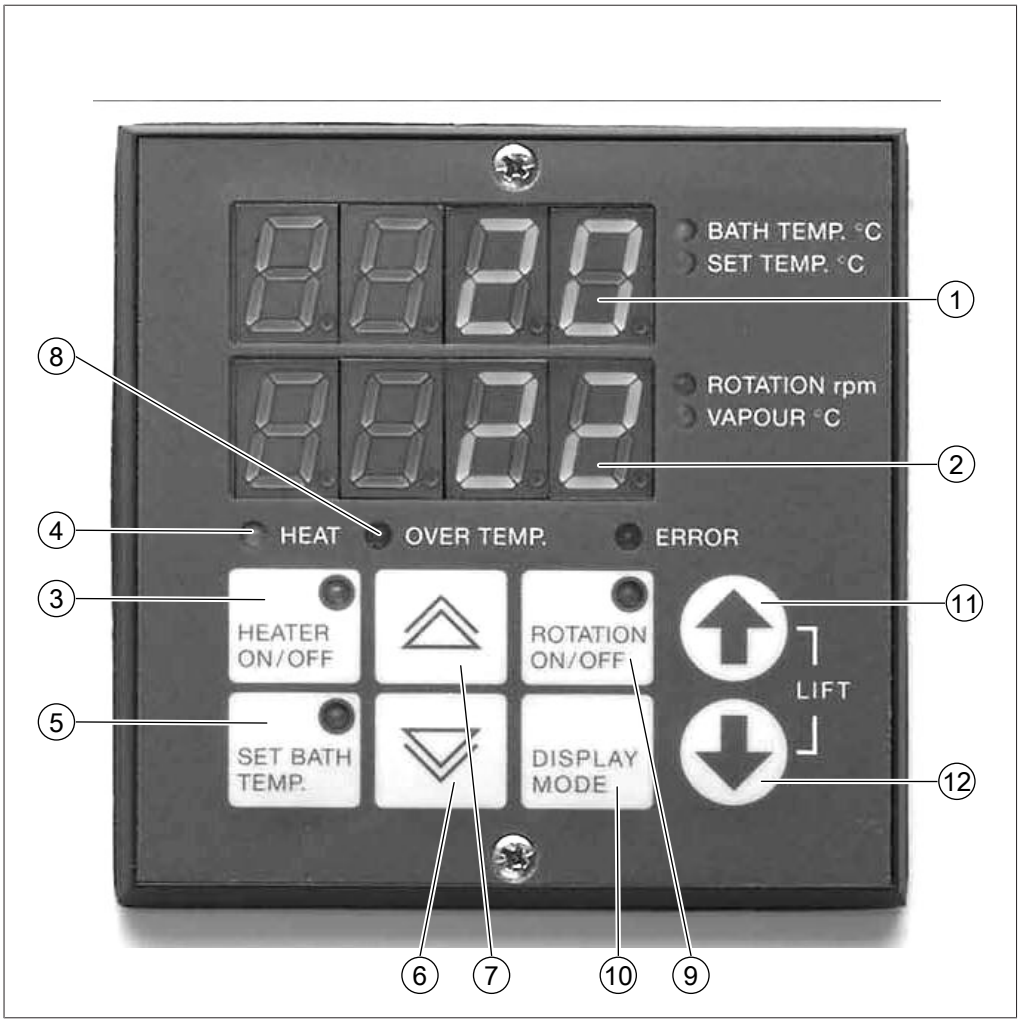


Fig. 8: Interface

Heater

3	Heater on/off (displayed by LED)	4	When the heater is warming up, the LED illuminates
5	Activating the setpoint bath temperature Setting: The display (1) switches to setpoint mode	6 & 7	Setting the bath temperature setpoint. If no entry is made within 2 seconds, the display returns to the actual bath temperature.
8	The red LED illuminates if the overtemperature protection has been triggered.		

Rotation

9	Rotation on/off (shown by LED)	6 & 7	The rotation speed can be changed using these two pushbuttons.

10 In “Display Mode” the information shown on the display (2) changes between the rotation speed and the vapor temperature.

Bath lift

11 & 12 These buttons lower and raise the bath, respectively.

When the unit is switched off or in the event of a power failure, the bath can be lowered automatically so that the evaporating flask is always separated from the source of heat.

NOTE

Do not use the main switch to lower the bath with the battery.

The voltage of the battery could be too low in cause of a power failure.

6.2 Setting the maximum setpoint temperature

- ▶ To activate the input mode of the maximum setpoint temperature press the *[Set Temp.]* button (5) and simultaneously turning on the main switch.
- ▶ To set the required figure press the *[SET UP]* and *[SET DOWN]* buttons (6), (7).
- ▶ Press the *[Set Temp.]* button (5) to save the entry.

⇨ The unit is in operating mode.

6.3 Setting the option for automatic lowering of the bath in the event of a power failure

NOTICE

In case of a power failure, the instrument can be overheated if this option is not activated.

.

- ▶ To activate this option press the *[Lift down]* button (12) and simultaneously turn on the main switch.

⇨ The display (2) indicates whether the bath is moving down *[on]* or not *[off]*.

- ▶ Switch between the two options by pressing the *[Lift down]* button (12).
- ▶ Press the *[Set Temp.]* button (5) to save the entry.

⇨ If the option is activated, the bath is automatically lowered when the equipment is switched on.

⇨ This ensures the lowering of the bath in case of a short power failure.

6.4 Vacuum controller

Operation

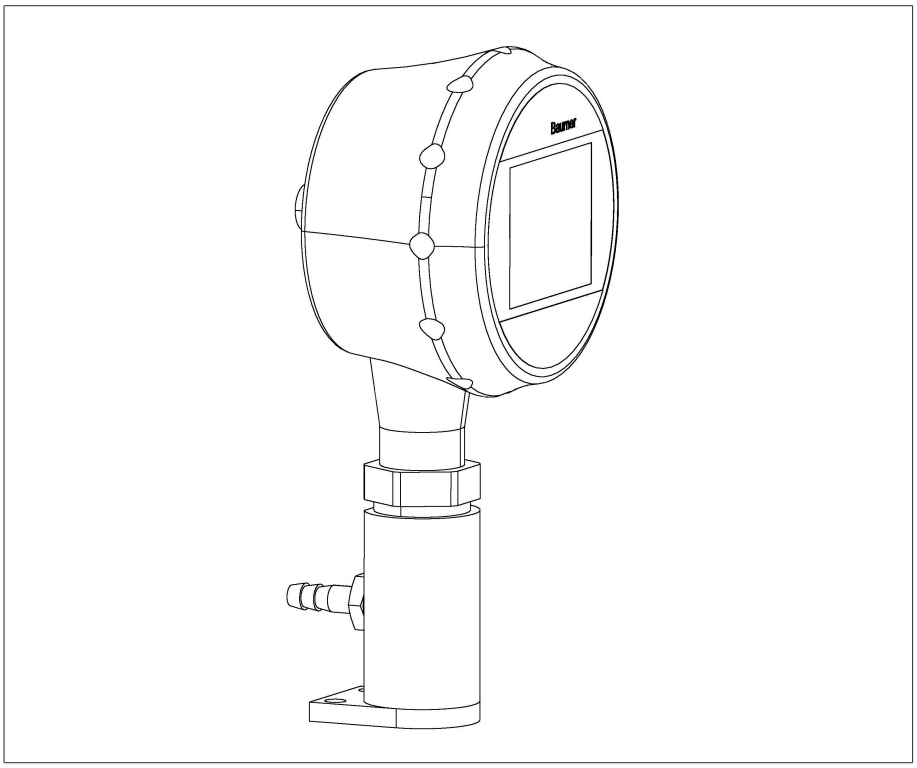


Fig. 9: Vacuum controller

The vacuum controller is operated by its touch screen. To control the vacuum you need to set two values. The lower vacuum level (Relay 1 set point) is the ultimate vacuum that has to be reached. When reaching the upper vacuum level (Relay 1 reset point) the vacuum valve opens again. In between these two levels the vacuum in the system is being controlled.

Setting options

The display shows the actual pressure in the system.

▶ Touch the screen to access the menu.

▶ Press *[Menu]* to enter the settings.

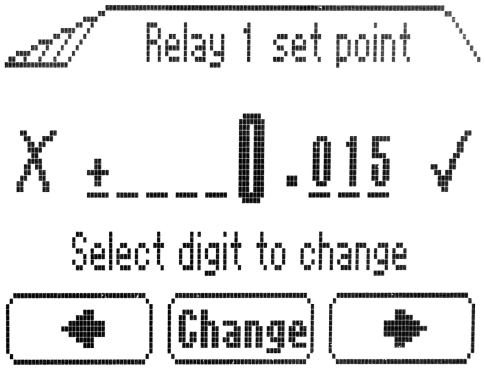
▶ Select *[Relay setup]* by pressing the arrow buttons.
▶ Press *[Enter]*.
⇨ The setting menu opens.

▶ Select *[Relay 1 set point]*.
▶ Set the value of the pressure at which the vacuum valve will close.

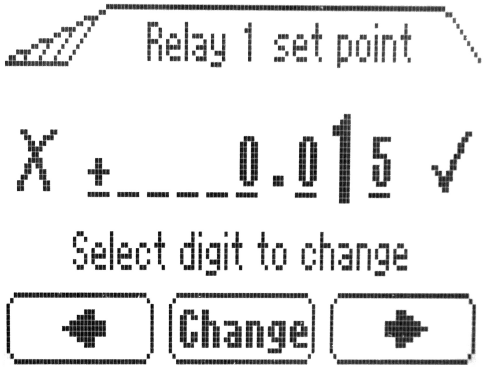
▶ Press *[Enter]* to confirm.

The actual vacuum setting is being displayed.

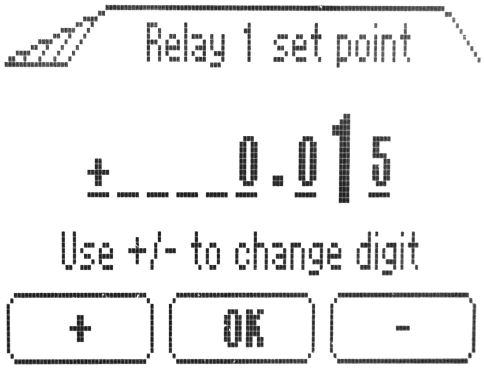
▶ Press *[Change]* to set another vacuum.



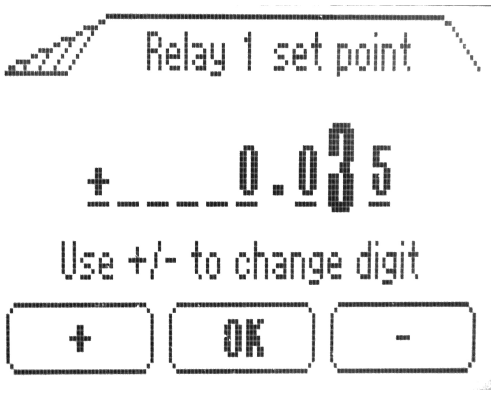
▶ Move to the desired digit by pressing the arrow buttons.



▶ Press *[Change]* to set a new value.

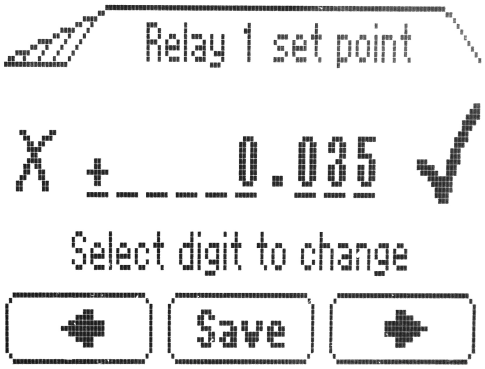


▶ Press *[+]* or *[-]* to change the value.



▶ Press *[OK]* to save the entry.

1



▶ Select the check mark by pressing the arrow buttons.

▶ Press *[Save]* to save the entries and exit.

▶ Select *[Relay 1 reset point]* by pressing the arrow buttons to set the value for the upper pressure limit.

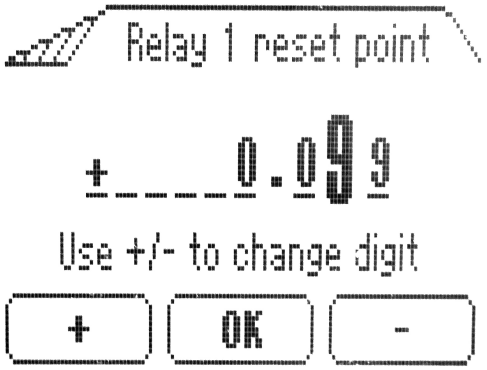
⇨ The vacuum valve will open again if this value is reached.

The actual vacuum setting is being displayed.

▶ To change it press *[Change]*.

▶ Select the desired digit by pressing the arrow buttons.

▶ Press*[Change]* to change the value.



▶ Press *[+]* or *[-]* to change the value.

▶ Press *[OK]* to save the entry.

- ▶ Select the check mark by pressing the arrow buttons.
- ▶ Save the vacuum setting by pressing *[Save]*.

After 10 seconds of inactivity the display reverts to the standard screen and displays the actual pressure in the system.

7 Operation

⚠ DANGER

The danger zone around the instrument can extend outward by up to 10 m.

Damaged glass parts could implode and cause serious injuries.

- ▶ In this area are only trained stuff as described in Chapter 2.3 "Staff qualification", page 7 are allowed to work.
- ▶ Respect the danger zone by up to 10m to the instrument.
- ▶ Avoid being close to the instrument.
- ▶ If not avoidable, use protective equipment.

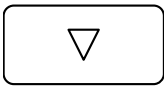
7.1 Preparing for an evaporation

7.1.1 Installing and removing the evaporation flask

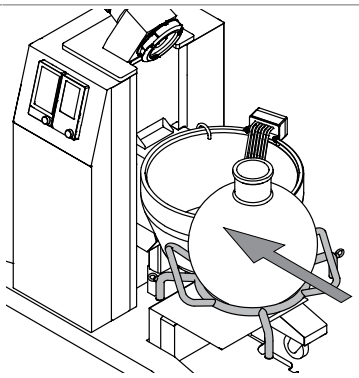
NOTE

Removing is done in reverse sequence.

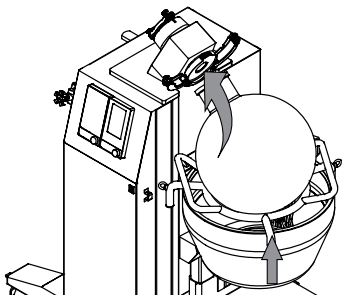
▶ Move the heating bath in a lower position.



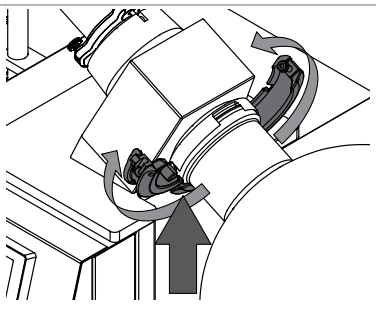
▶ Put the evaporation flask and the flask handler (option) an the instrument.



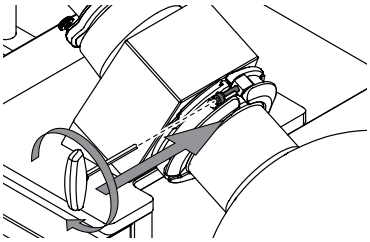
▶ Lift the heating bath and move the evaporation flask to the snap flange.



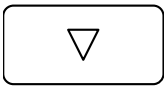
▶ Close the snap flange coupling.



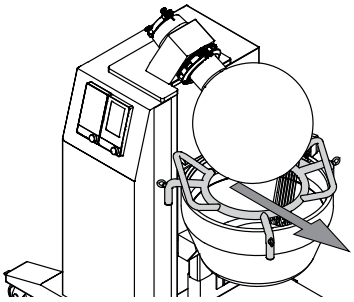
▶ Torque the screw to 4 NM.



▶ Lower the heating bath.

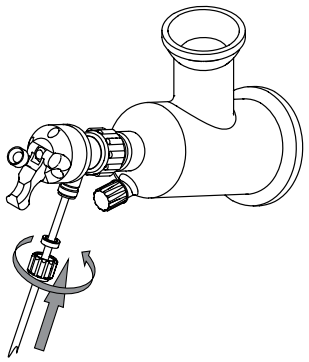


▶ Remove the flask handler.

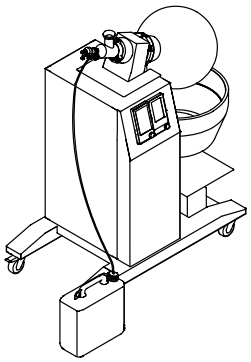


7.1.2 Operating the inlet valve

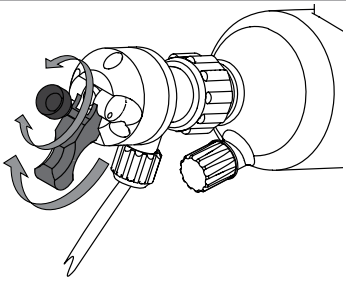
▶ Attach the solvent hose to the inlet valve.



▶ Put the solvent hose into the solvent.



▶ Set the flow rate.



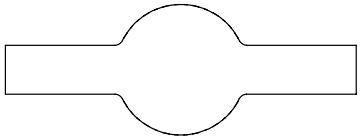
7.1.3 Preparing the heating bath

⚠ CAUTION

Risk of skin burns from oil splashes

- ▶ Do not put water into hot oil.
- ▶ Make sure that the heating oil complies with the technical data. See Chapter 3.5 "Technical data", page 14

▶ Make sure, that the drain valve is closed.

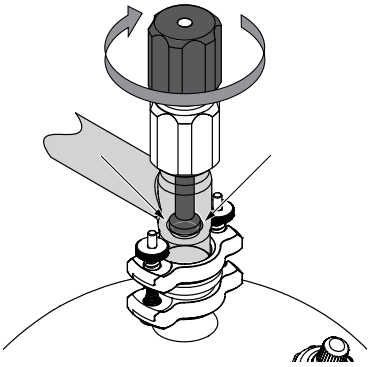


▶ Fill heating medium until the max. filling level.
Max. filling level see Chapter 3.2 "Configuration", page 12

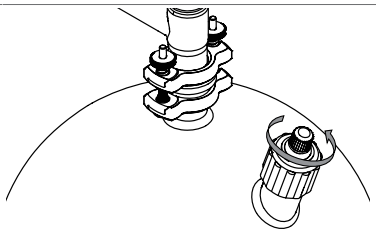
7.1.4 Draining distillate

Precondition:
☑ A distillate collection is available.

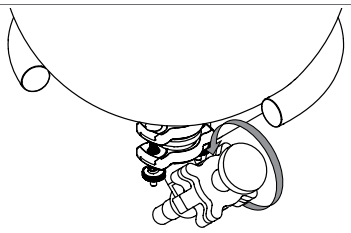
▶ Close the shut off tap.
▶ Make sure, that the plunger closes the hole.



▶ Loose the aeration valve.



▶ Open the drain valve.



7.2 Carrying out an evaporation

7.2.1 Preparing the instrument

Precondition:
☑ All commissioning operations have been completed. See Chapter 5 "Installation", page 19
☑ Make sure that no defective sealings or glass parts are used.

▶ Set the On/Off master switch to On.

⇨ The instrument is starting up.

▶ Check the filling level of the heating bath.

7.2.2 Starting an evaporation

▶ Attach the prepared evaporation flask to the instrument. See Chapter 7.1.1 "Installing and removing the evaporation flask", page 42.
▶ Set heating bath temperature.
▶ Switch on the recirculating chiller or open the water tap.
▶ Set the vacuum on the vacuum control unit.
▶ Add product. See Chapter 7.1.2 "Operating the inlet valve", page 43.
▶ Lift the heating bath.
▶ Start the rotation.

7.2.3 Task during an evaporation

▶ If necessary, carry out the following tasks:

- Adjust the vacuum.
- Adjust the bath temperature.
- Adjust rotation speed.
- Add product. See Chapter 7.1.2 "Operating the inlet valve", page 43
- Remove distillate. See Chapter 7.1.4 "Draining distillate", page 44

7.2.4 Ending an evaporation

Precondition:
☑ The sample is evaporated.

▶ Aerate the system.
▶ Lower heating bath.
▶ Empty the receiver flask. See Chapter 7.1.4 "Draining distillate", page 44.
▶ Wait until the evaporation flask temperature is less than 40 °C.
▶ Remove the evaporation flask. See Chapter 7.1.1 "Installing and removing the evaporation flask", page 42.
▶ Clean the glassware.

7.2.5 Shutting down the instrument

▶ 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

NOTICE

For safe servicing the instrument it needs to be disconnect from the mains power supply.

- To avoid a reconnecting by a third person secure the mains power supply with a padlock.

The instrument is designed for operating 8h a day during at least 10 years. During the life time of the instrument regular maintenance work is required and an annually inspection carried out by a BUCHI service technician is recommended.

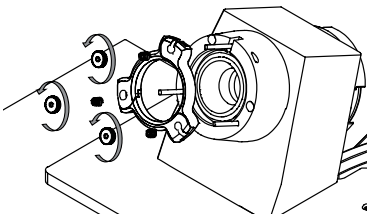
Component	Action	Frequency
Vacuum seal	▶ Rinse the sealing with water or ethanol ▶ Wipe the sealing lip with a soft lint-free cloth.	monthly
Instrument	▶ Perform a leak test. ▶ If necessary, search for leaks. ▶ If necessary, change the vacuum seal. See Chapter 8.3 "Replacing the evaporation flask seal", page 47	monthly
Glassware	▶ Wipe down with a damp cloth.	monthly
Heating bath	▶ Check the heating bath. ▶ If necessary, decalcify the heating bath.	monthly
Casing	▶ Wipe down the casing with a damp cloth. ▶ If heavily soiled, use ethanol or a mild detergent.	monthly
Warning symbols	▶ Check that the warning symbols on the instrument are legible. ▶ If they are dirty, clean them.	monthly

8.2 Replacing the vacuum seal

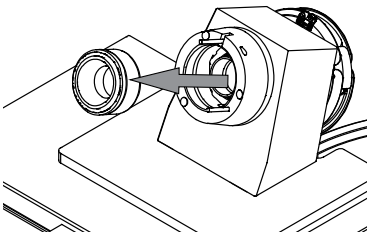
NOTE

Installing is done in reverse sequence.

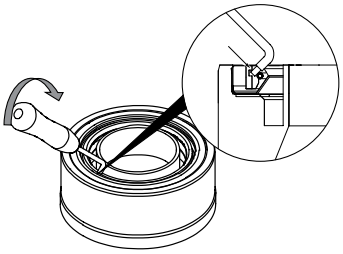
▶ Remove the easy clamp from the instrument.



▶ Remove the sealing holder from the instrument.



▶ REmove the sealing from th sealing holder.

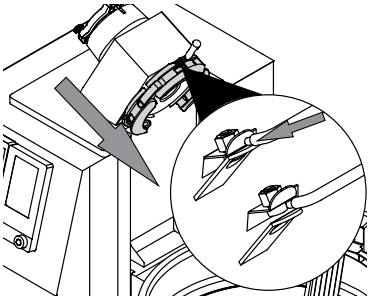


8.3 Replacing the evaporation flask seal

NOTE

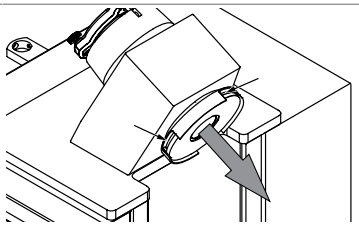
Installing is done in reverse sequence.

▶ Remove the snap flange coupling with the provided tool.



NOTICE! Make sure, that the vapor duct does not fall down during carrying out this action step.

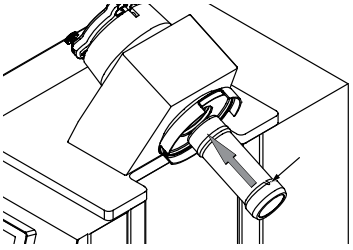
▶ Remove the evaporation flask seal.



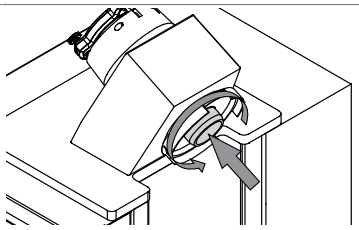
▶ If the vapor duct fall down, install the vapor duct. See Chapter 8.4 "Installing the vapor duct", page 48

8.4 Installing the vapor duct

▶ Put the vapor duct in the instrument.



▶ Apply a light force and turn the vapor duct until the shaft starts turning.



9 Help with faults

9.1 Customer service

Only authorized service personnel are allowed to perform repair work on the device which is not described in this manual. Authorization requires a comprehensive technical training and knowledge of possible dangers which might arise when working at the device. Such training and knowledge can only be provided by BUCHI.
The customer service and support offers the following support:

- Spare part delivery
- Repairs
- Technical advice

Addresses of official BUCHI customer service offices can be found on the BUCHI website.
www.buchi.com

9.2 Troubleshooting

Problem	Possible cause	Action
Bath cannot be lifted	No power supply for bath lift, control defective	▶ Contact BUCHI Customer Service.
	Bath lift defective	▶ Contact BUCHI Customer Service.
	Bath too heavy, when completely filled and additional full evaporating flask is mounted	▶ Only fill the bath to the mark at the inside of the pan
Heating does not operate	Safety temperature cutout has been activated	▶ Reset safety temperature cutout, see Chapter 9.4 "Resetting the Safety Temperature Cutout", page 50
	Level sensor is activated	▶ Fill bath with heating medium
	PT-1000 defective (Error E0)	▶ Check PT-1000 in the bath ▶ Replace if necessary
	Heater coils defective	▶ Contact BUCHI Customer Service.
Rotation does not function	Rotary drive defective	▶ Contact BUCHI Customer Service.
	Rotary drive overheated	▶ Allow it to cool down ▶ Start it up again
Operator’s panel only displays dashes	Connection to intrinsically safe operator’s panel interrupted	▶ Contact BUCHI Customer Service.

9.3 Error messages

Error message	Possible cause	Solution
E0	Sensor is defective or a short-circuit has occurred.	▶ Switch the unit OFF.
E1	No heating medium in the bath.	▶ Switch the unit OFF. ▶ Refill the bath.

Error message	Possible cause	Solution
E2	The motor is defective or blocked.	▶ Switch the unit OFF.
	No voltage.	
E3	Drive defective.	▶ Switch the unit OFF.
	Mechanical blocking.	
	No power.	
	Semi-conductor relay defective.	
E4	PB battery defective.	▶ Press any button.
E5	Hardware defect.	▶ Press any button. ▶ Work can then be continued, but a Service technician must be notified of the problem.
E27	Cables or plugs defective.	▶ Switch the unit off.
E28	Overtemperature cutoff is active.	▶ Reset the overtemperature cutoff, see Resetting the overtemperature protection.

To let all possible error messages appear, the device must be shut off and on at least once per 24 h.

9.4 Resetting the Safety Temperature Cutout

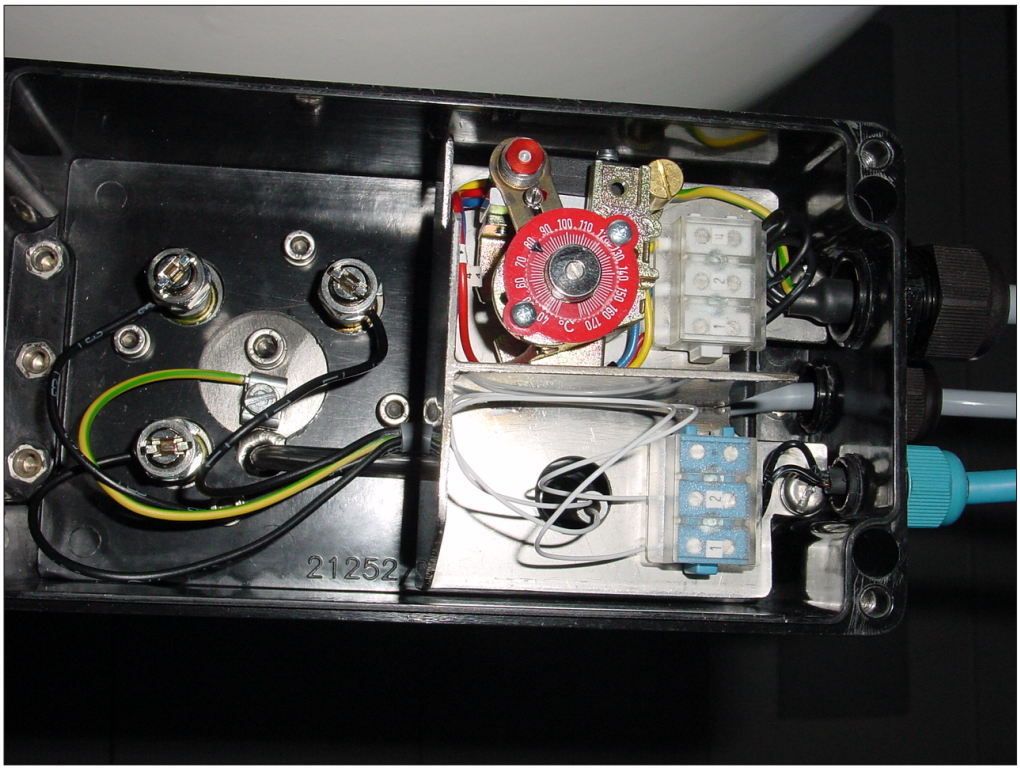


Fig. 10: Safety temperature cutout in the heater terminal box

The rated cut-out temperature of the over-temperature cutout is defined by temperature class T3 and T4. The safety temperature cutout is fitted with a microswitch with a flameproof enclosure, which is in the “increased safety” terminal box.
The system is based on a liquid-filled capillary tube with a bellows fitting.

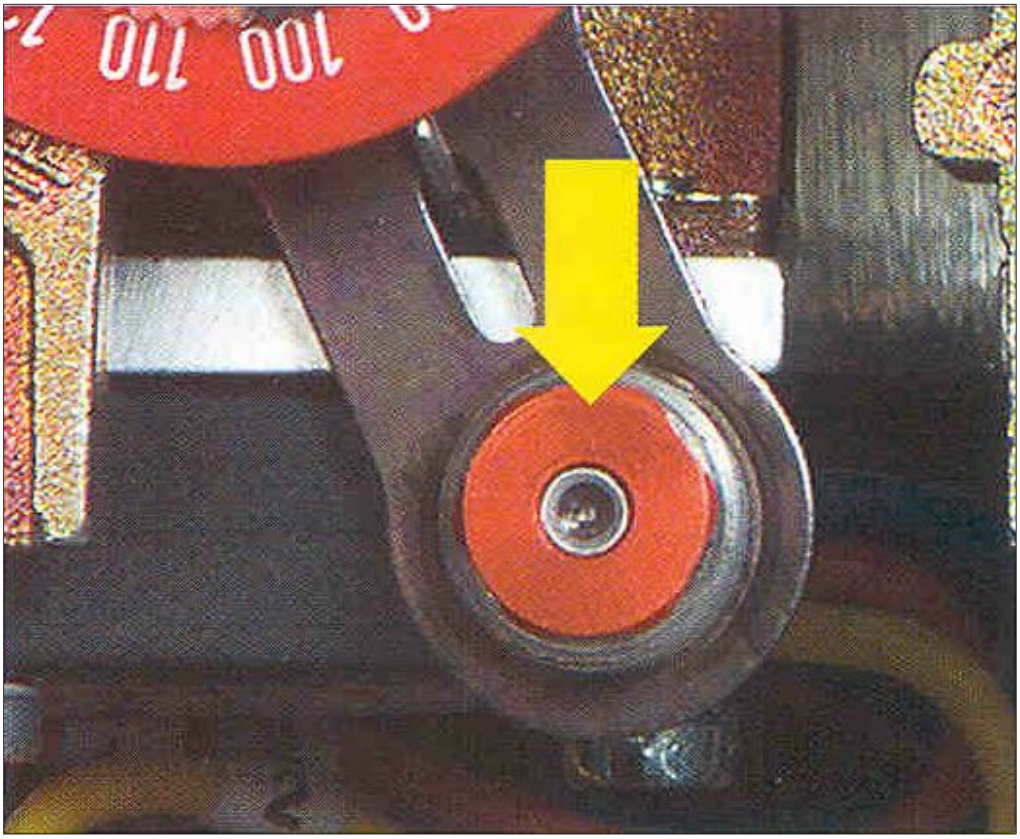


Fig. 11: Resetting the safety temperature cutout

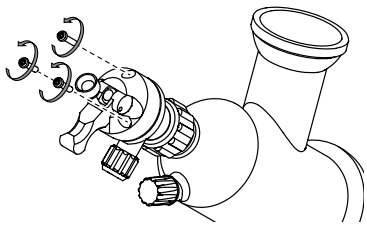
Standard EN 50019 stipulates that the safety temperature limiter may only be reset using a tool (opening the terminal box) and then by hand. Automatic resetting is not possible. The temperature cutout cannot be reset until the temperature falls below the rated cut-out temperature.

9.5 Replacing the inlet valve plunger

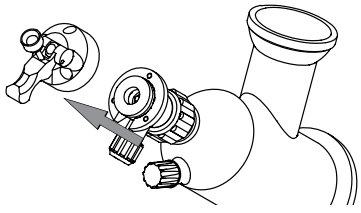
NOTE

Installing is done in reverse sequence.

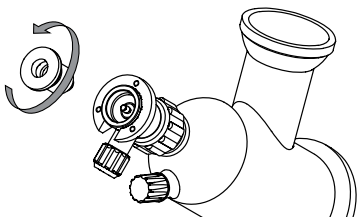
▶ Loosen the screws that attach the inlet valve cover to the inlet valve.



▶ Remove the inlet valve cover.



▶ Remove the plunger.



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. Materials used see Chapter 3.5 "Technical data", page 14.

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 Solvent table

Solvent	Formula	Molar mass in g/mol	Evaporation energy in J/g	Boiling point in °C at 1013 mbar	Density in g/cm^3	Vacuum in mbar for 40 °C boiling point
Acetone	CH_3H_6O	58.1	553	56	0.790	556
n-pentanol	$C_5H_{12}O$	88.1	595	137	0.814	11
Benzene	C_6H_6	78.1	548	80	0.877	236
n-butanol	$C_4H_{10}O$	74.1	620	118	0.810	25
tert-butanol	$C_4H_{10}O$	74.1	590	82	0.789	130
Chlorobenzene	C_6H_5Cl	112.6	377	132	1.106	36
Chloroform	$CHCl_3$	119.4	264	62	1.483	474
Cyclohexane	C_6H_{12}	84.0	389	81	0.779	235
Diethyl ether	$C_4H_{10}O$	74.0	389	35	0.714	850
1,2-dichloroethane	$C_2H_4Cl_2$	99.0	335	84	1.235	210
cis-1,2-dichloroethene	$C_2H_2Cl_2$	97.0	322	60	1.284	479
trans-1,2-dichloroethene	$C_2H_2Cl_2$	97.0	314	48	1.257	751
Di-isopropyl ether	$C_6H_{14}O$	102.0	318	68	0.724	375
Dioxane	$C_4H_8O_2$	88.1	406	101	1.034	107
DMF (dimethylformamide)	C_3H_7NO	73.1	–	153	0.949	11
Acetic acid	$C_2H_4O_2$	60.0	695	118	1.049	44
Ethanol	C_2H_6O	46.0	879	79	0.789	175
Ethylacetate	$C_4H_8O_2$	88.1	394	77	0.900	240
Heptane	C_7H_{16}	100.2	373	98	0.684	120
Hexane	C_6H_{14}	86.2	368	69	0.660	360
Isopropanol	C_3H_8O	60.1	699	82	0.786	137
Isopentanol	$C_5H_{12}O$	88.1	595	129	0.809	14
Methylethylketone	C_4H_8O	72.1	473	80	0.805	243
Methanol	CH_4O	32.0	1227	65	0.791	337
Dichlormethane	CH_2Cl_2	84.9	373	40	1.327	850
Pentane	C_5H_{12}	72.1	381	36	0.626	850
n-propanol	C_3H_8O	60.1	787	97	0.804	67
Pentachloroethane	C_2HCl_5	202.3	201	162	1.680	13
1,1,2,2-tetrachloroethane	$C_2H_2Cl_4$	167.9	247	146	1.595	20
Tetrachloromethane	CCl_4	153.8	226	77	1.594	271
1,1,1-trichloroethane	$C_2H_3Cl_3$	133.4	251	74	1.339	300
Tetrachloroethene	C_2Cl_4	165.8	234	121	1.623	53

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

11.2 Spare parts and accessories

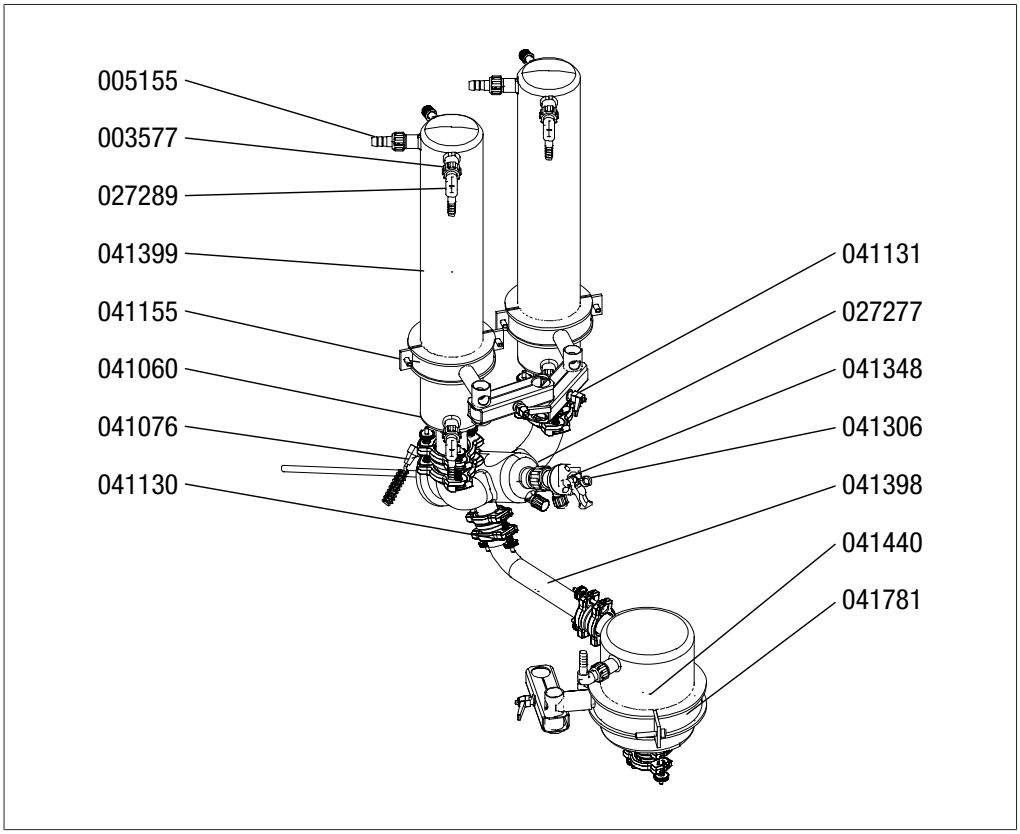
Use only genuine BUCHI consumables and spare parts in order to ensure correct, safe and reliable operation of the system.

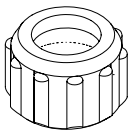
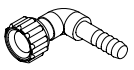
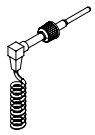
NOTE

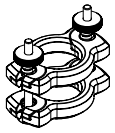
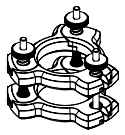
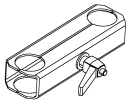
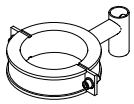
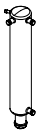
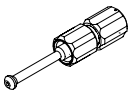
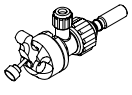
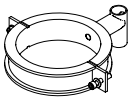
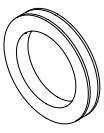
Any modifications of spare parts or assemblies are only allowed with the prior written permission of BUCHI.

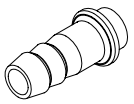
11.2.1 Spare parts glass ware

Spare parts glass assembly R

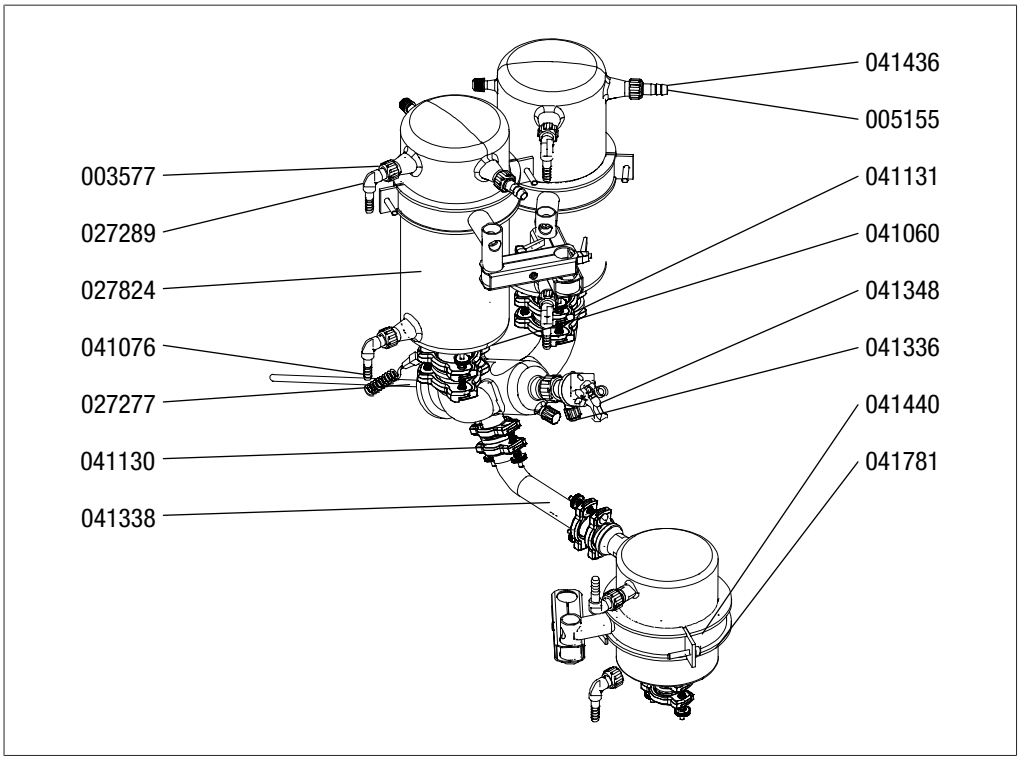


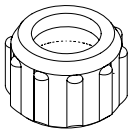
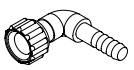
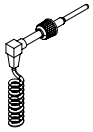
	Order no.	Image
Cap nut SVL 22	003577	
Screwed fitting Svl 22	027289	
Vapor temperature sensor, complete	041076	

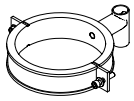
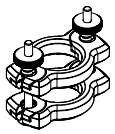
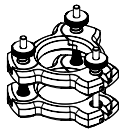
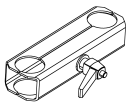
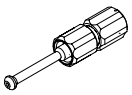
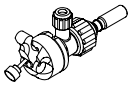
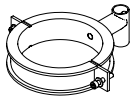
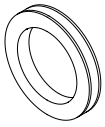
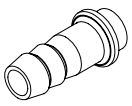
	Order no.	Image
EasyClamp, DN25	041130	
EasyClamp, DN40	041131	
Pivoting clamp, complete	041151	
Glass clamp 100 mm, complete	041155	
Cooler, 3-coil, closed	041399	
Set of bolts for EasyClamp, DN25	041240	
Set of bolts for EasyClamp, DN40	041241	
Distillate cooler	041440	
Industrial tap, large	041060	
Distribution piece "R"	041306	
Connection DN 25	041398	
Inlet valve, complete	041348	
Glass clamp 150 mm, complete	041781	
Seal PTFE	005155	

	Order no.	Image
PTFE hose connection SVL 22	041436	
PTFE hose, Outer Diam. 10 mm conductive	040039	

Spare parts glass assembly RB

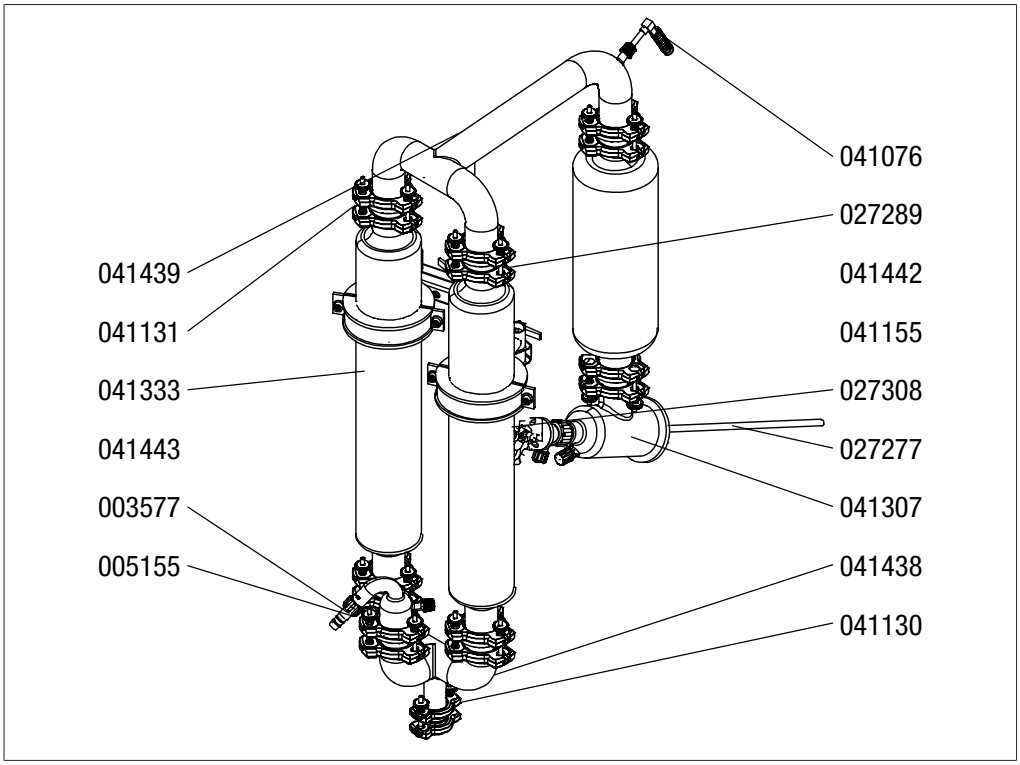


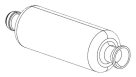
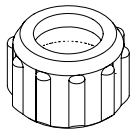
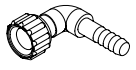
	Order no.	Image
Cap nut SVL 22	003577	
Screwed fitting Svl 22	027289	
Cooler Bullfrog, closed	041458	
Vapor temperature sensor, complete	041076	

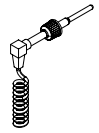
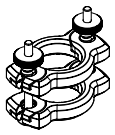
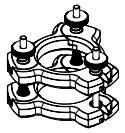
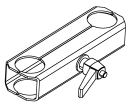
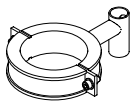
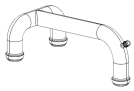
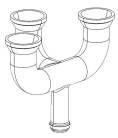
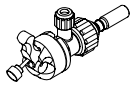
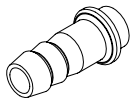
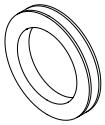
	Order no.	Image
Glass clamp 160 mm, complete	041120	
EasyClamp, DN25	041130	
EasyClamp, DN40	041131	
Pivoting clamp, complete	041151	
Set of bolts for EasyClamp, DN25	041240	
Set of bolts for EasyClamp, DN40	041241	
Distillate cooler	041440	
Industrial tap, large	041060	
Distribution piece "R"	041306	
Connection DN 25	041398	
Inlet valve, complete	041348	
Glass clamp 150 mm, complete	041781	
Seal PTFE	005155	
PTFE hose connection SVL 22	041436	

	Order no.	Image
PTFE hose, Outer Diam. 10 mm conductive	040039	

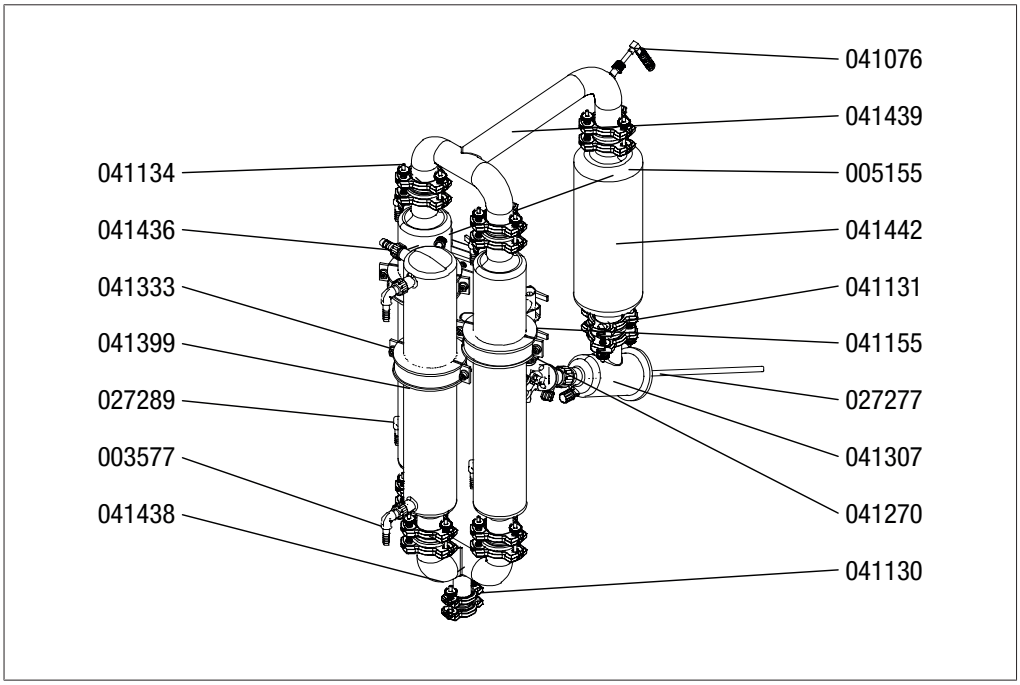
Spare parts glass assembly D

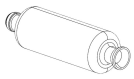
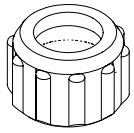
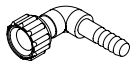
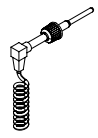
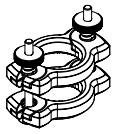
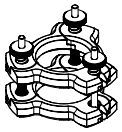


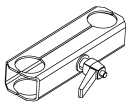
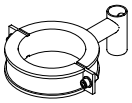
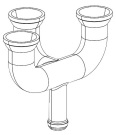
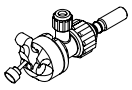
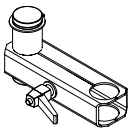
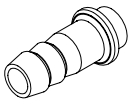
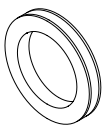
	Order no.	Image
Vacuum connector	041443	
Expansion vessel	041442	
Cap nut SVL 22	003577	
Screwed fitting Svl 22	027289	
Cooler, 3 coil	041333	

	Order no.	Image
Vapor temperature sensor, complete	041076	
EasyClamp, DN25	041130	
EasyClamp, DN40	041131	
Pivoting clamp, complete	041151	
Glass clamp 100 mm, complete	041155	
Set of bolts for EasyClamp, DN25	041240	
Set of bolts for EasyClamp, DN40	041241	
U-frame	041439	
Distribution piece “D”	041307	
Frame DN25/3xDN40	041438	
Inlet valve, complete	041348	
PTFE hose connection SVL 22	041436	
Seal PTFE	005155	
PTFE hose, Outer Diam. 10 mm conductive	040039	

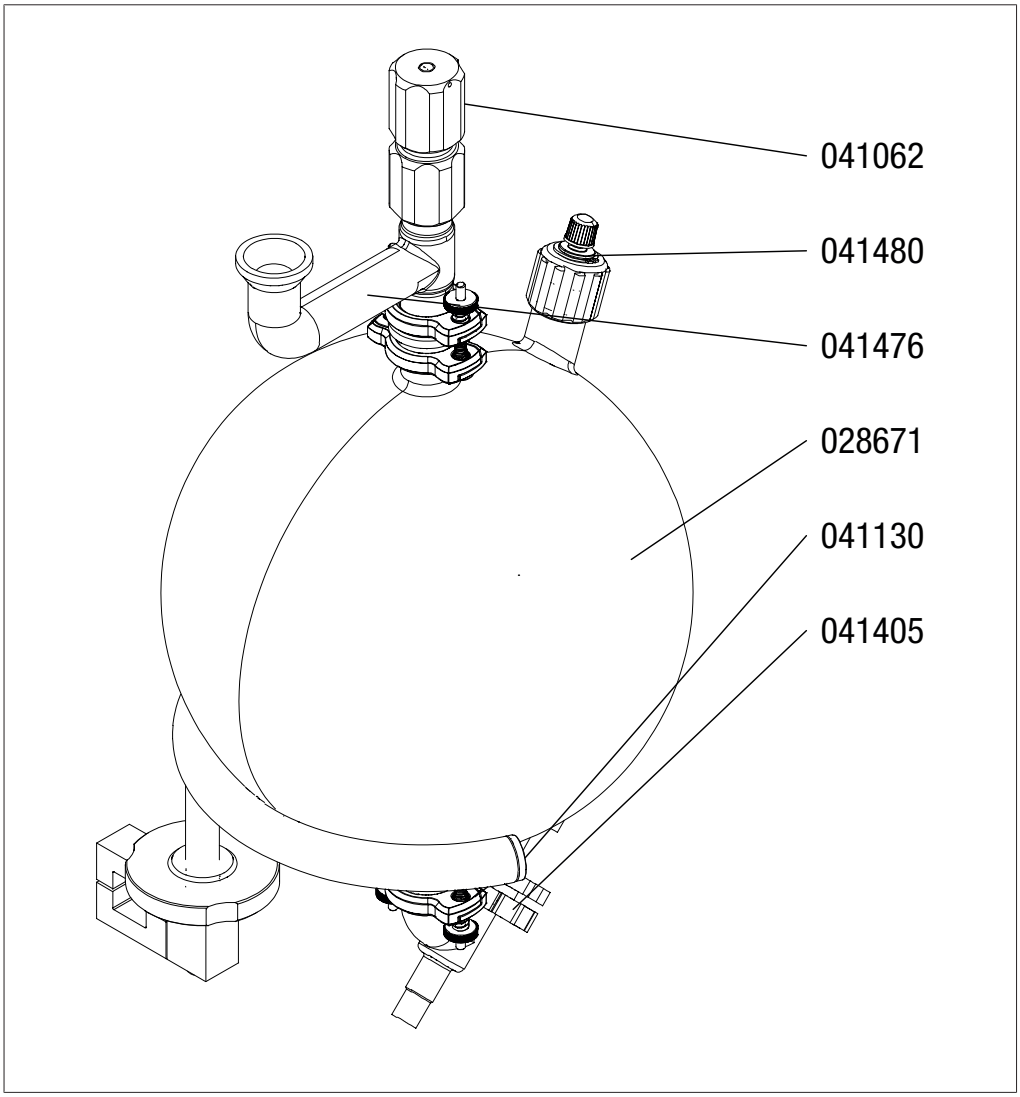
Spare parts glass assembly D3

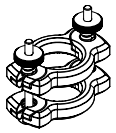
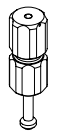
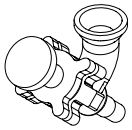


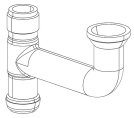
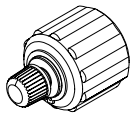
	Order no.	Image
Vacuum connector	041443	
Expansion vessel	041442	
Cap nut SVL 22	003577	
Screwed fitting Svl 22	027289	
Vapor temperature sensor, complete	041076	
EasyClamp, DN25	041130	
EasyClamp, DN40	041131	

	Order no.	Image
Pivoting clamp, complete	041151	
Glass clamp 100 mm, complete	041155	
Cooler, 3-coil, closed	041399	
Set of bolts for EasyClamp, DN25	041240	
Set of bolts for EasyClamp, DN40	041241	
U-frame	041439	
Distribution piece “D”	041307	
Frame DN25/3xDN40	041438	
Inlet valve, complete	041348	
Extension	041270	
PTFE hose connection SVL 22	041436	
Cooler, 3 coil	041333	
Seal PTFE	005155	
PTFE hose, Outer Diam. 10 mm conductive	040039	

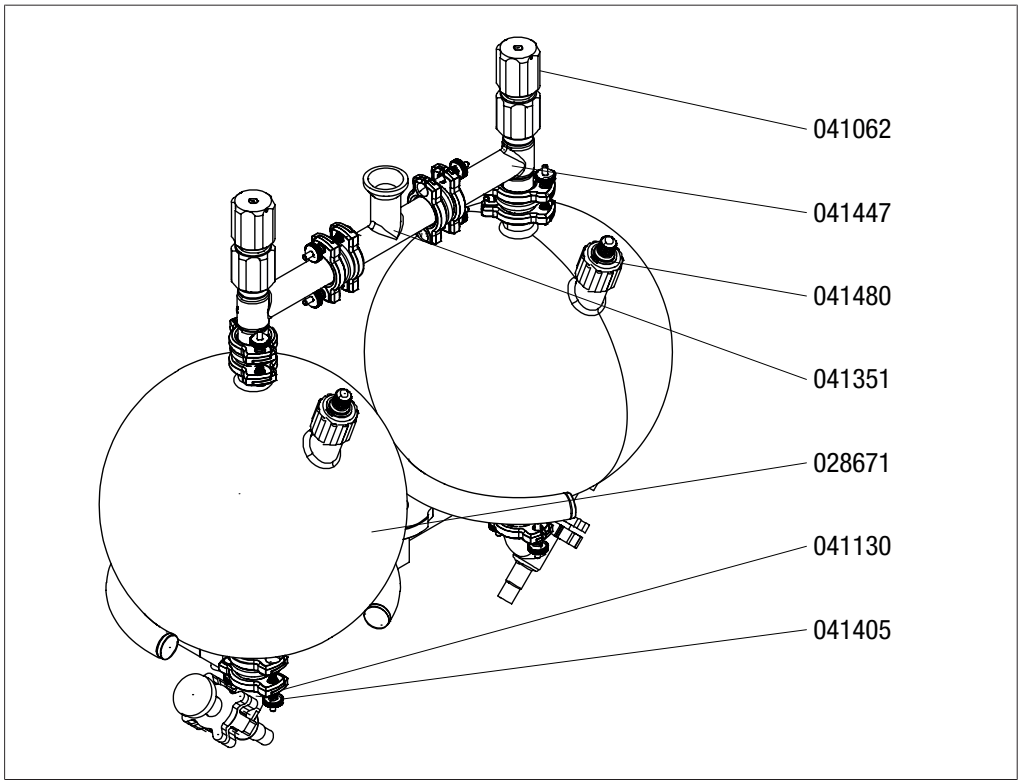
Spare parts single receiver

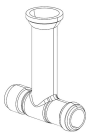
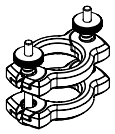
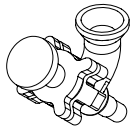


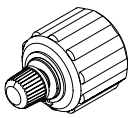
	Order no.	Image
EasyClamp, DN25	041130	
Industrial tap, small	041062	
Angle seat drain valve	041405	
Receiving flask 20 lt.	028671	

	Order no.	Image
Branching piece R-250	041476	
Ventilation duct, complete	041480	

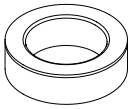
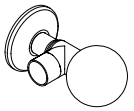
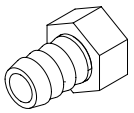
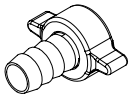
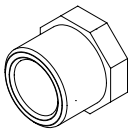
Spare parts double receiver



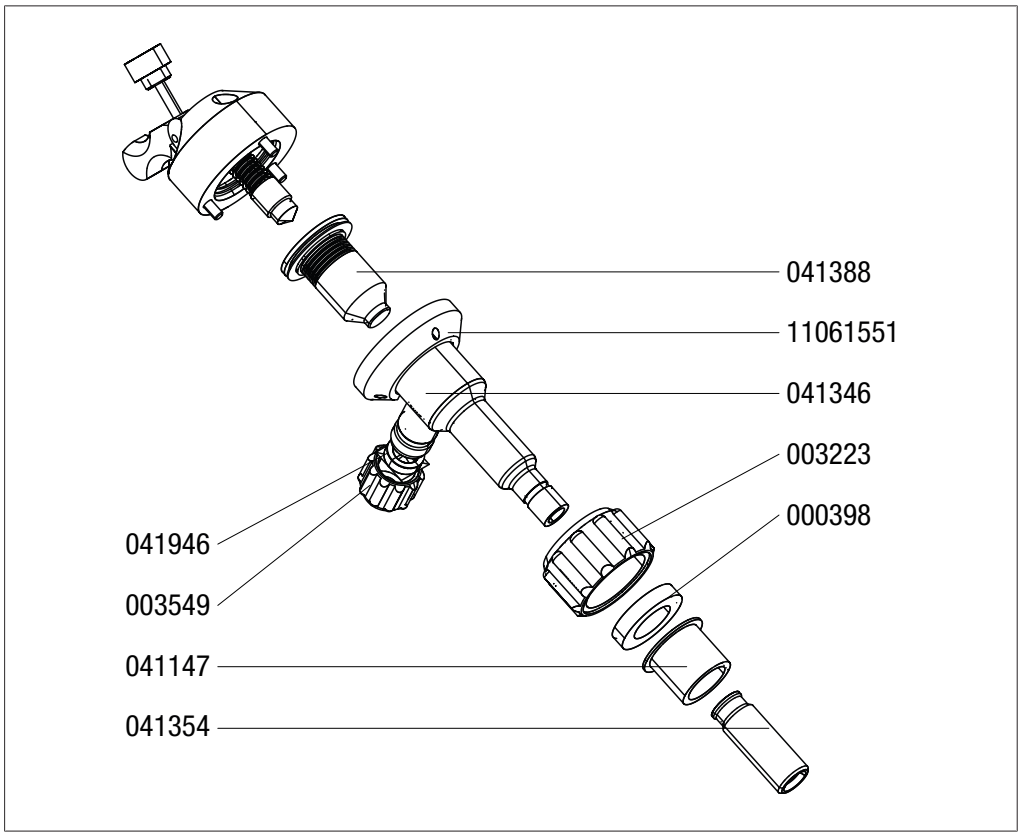
	Order no.	Image
Branching piece 1	041447	
EasyClamp, DN25	041130	
Industrial tap, small	041062	
Angle seat drain valve	041405	

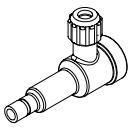
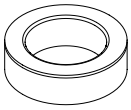
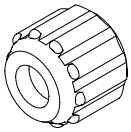
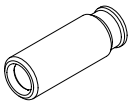
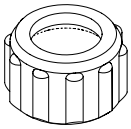
	Order no.	Image
T-piece DN 3x40	041351	
Receiving flask 20 lt.	028671	
Ventilation duct, complete	041480	

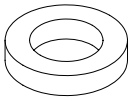
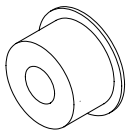
11.2.2 Further spare parts

	Order no.	Image
FEP coated silicon gasket for DN25 (set of 5)	11056381	
FEP coated silicone gasket for DN40 (set of 5)	11056382	
Set of 5 SVL 15 seals	041946	
Cooling water tap, complete	003693	
Nipple ¾“ x 20 mm	003810	
Nipple ¾“ x 16 mm	041412	
Reducer ½“ x ¾“	041448	

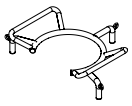
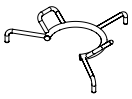
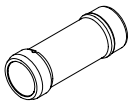
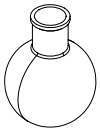
11.2.3 Inlet valve



	Order no.	Image
PTFE bellow	041388	
Glass body	041346	
Set of 5 SVL 15 seals	041946	
Screw Cap SVL 15	003549	
Connection, PTFE	041354	
Screw ring SVL 30	003223	

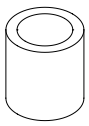
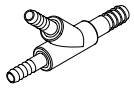
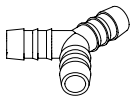
	Order no.	Image
Seal SVL 30	000398	
Support ring inlet valve	041147	
Flange	11061551	

11.2.4 Accessories

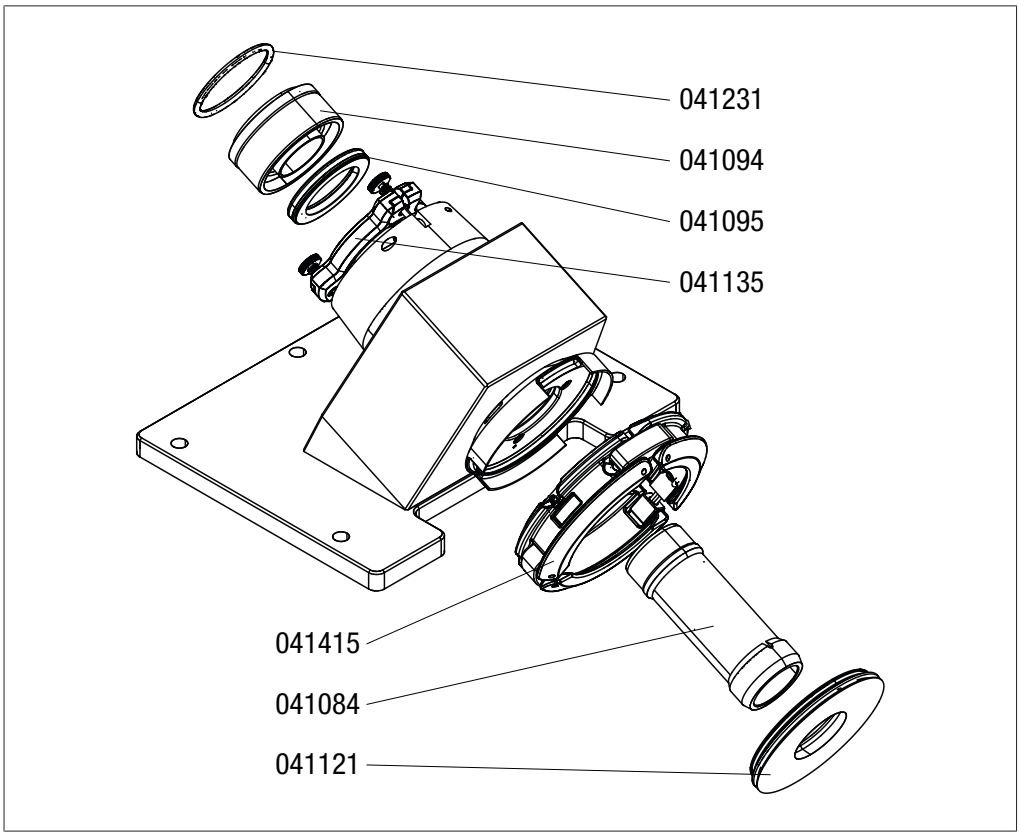
	Order no.	Image
Manual flask handler for 50 L flask For easy mounting and removal of the flasks along with safe transport	041414	
Manual flask handler for 20 L flask For easy mounting and removal of the flasks along with safe transport.	041410	
Flange adapter for flasks , SJ29.2/32 To use a 1, 2 or 3 L evaporating flask with SJ29.2/32	11058738	
Vapor duct with integrated sinter plate The integrated sinter plate P3 protects the condenser assembly against powder and dust during the drying process.	041100	
Stopper, PE, 120 mm To close the evaporating flask	11057349	
IQ/OQ R-250 Pro official BUCHI document	11071749	
Repeating OQ R-250 Pro	11071750	
Flask outlet suction system With magnetic tip and PTFE tube (diameter 10 mm)	041464	
Evaporating flask 50 L	041339	
Evaporating flask 20 L	041432	
Drying flask 20 ltr.	041393	
Drying flask 50 ltr.	041394	

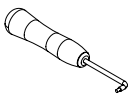
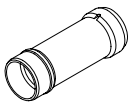
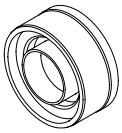
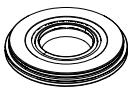
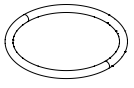
	Order no.	Image
Flask crane For the safely secured transport of a 50 liter flask. Incl. the 50 liter manual flask handler.	041494	

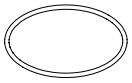
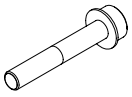
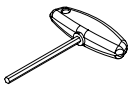
11.2.5 Hoses

	Order no.	Image
Tubing, PVC, 10/15 mm, transparent, per m	027146	
PVC hose, ID 14 mm	017383	
Y-piece, 12 mm / 16 mm	041473	
Tubing. Nylflex, PVC-P, Ø8/14 mm, transparent, per m	004113	
Softaflex, ID 19 mm	037617	
Spiralflex hose, ID 16 mm	041441	
Tubing. Synthetic rubber, Ø6/13 mm, black, per m Use: Vacuum.	11063244	
Y-piece, Outer Diam. 16 mm	041449	
T-reducer, 16 / 8 mm	041474	
Tubing. PTFE, Ø8/10 mm, white, per m Use: Vacuum, feeding (industrial Rotavapor®).	027277	
PTFE hose, Outer Diam. 10 mm conductive	040039	

11.2.6 Gear box



	Order no.	Image
Seal tool	020075	
Vapor duct	041084	
Seal holder	041094	
Vacuum seal	041095	
Evaporating flask seal, complete	041121	
Set of 5 distribution head sealings	041231	

	Order no.	Image
O-ring 130x5.0 Fpm70	027378	
EasyClamp element, DN70	041135	
Set of 5 O-rings 64 x 5.0	041229	
Snap flange coupling, complete	041415	
Screw cap	041416	
Tool	041472	

11.3 EU Declaration of EX topics

This document is not further translated.

thuba®
THE EXPLOSIONPROOFING COMPANY

EU-Konformitätserklärung
Déclaration UE de conformité
EU Declaration of conformity

Wir / *Nous* / We,

thuba Ltd.
PO Box 4460
CH-4002 Basel

Production
Stockbrunnenrain 9
CH-4123 Allschwil

erklären in alleiniger Verantwortung, dass die
déclarons de notre seule responsabilité que les
bearing sole responsibility, hereby declare that the

Rotavapor R-250 Ex

den grundlegenden Sicherheits- und Gesundheitsschutzanforderungen nach Anhang II der untenstehenden Richtlinie entspricht.
répond aux exigences essentielles en ce qui concerne la sécurité et la santé fondamentales selon l'annexe II des directives suivantes.
satisfies the fundamental health and safety protection requirements according to Annex II of the directive named below.

Bestimmungen der Richtlinie *Désignation de la directive* Provisions of the directive	Titel und/oder Nummer sowie Ausgabedatum der Normen *Titre et/ou No. ainsi que date d'émission des normes* Title and/or No. and date of issue of the standards
2014/34/EU: Geräte und Schutzsysteme zur bestimmungsgemässen Verwendung in explosionsgefährdeten Bereichen *2014/34/UE: Appareils et systèmes de protection destinés à être utilisés en atmosphère explosible* 2014/34/EU: Equipment and protective systems intended for use in potentially explosive atmospheres	EN IEC 60079-0:2018-04 EN 60079-1:2014-10 EN IEC 60079-7:2015-12+A1:2018-01 EN 60079-11:2012-01 EN ISO 80079-36:2016 EN ISO 80079-37:2016 EN 60079-14:2014-03 EN 60079-17:2014-03 EN 60529:1991-10+A1:2000-A2:2013 EN 60034-1:2010 EN 60034-5:2001+A1:2007 EN 60034-6:1993 EN 60034-7:1993+A1:2001 EN 60034-8:2007+A1:2014 EN 60034-9:2005+A1:2007 EN 60034-12:2002+A1:2007 EN 60034-14:2004+A1:2007 EN 60947-8:2003+A1:2006+A2:2012 EN 60204-1:2006-06+A1:2010-05 EN 61439-1:2011-10 EN 61439-2:2011-10 EN 60519-1:2015 EN 60519-2:2006 EN 60730-1:2011 EN 60730-2-9:2010
2014/30/EU: Elektromagnetische Verträglichkeit *2014/30/UE: Compatibilité électromagnétique* 2014/30/EU: Electromagnetic compatibility	EN 60947-1:2007-07+A1:2011-01+A2:2014-11 EN 61326-1:2013

Folgende benannte Stelle hat die Bewertung des Moduls «Qualitätssicherung Produktion» nach der Richtlinie 2014/34/EU Anhang IV durchgeführt:
L'organe reconnu ci-après a procédé à l'évaluation de la conformité prescrite par la directive 2014/34/UE de l'annexe IV:
The following notified body has carried out the conformity assessment procedure according to Directive 2014/34/EU, Annex IV:

DEKRA Testing and Certification GmbH
0158
Dinnendahlstrasse 9
D-44809 Bochum

Basel, 8. November 2022
Ort und Datum
Lieu et date
Place and date

Peter Thurnherr
Geschäftsführender Inhaber / Elektroingenieur FH
Administrateur délégué / Ingénieur HES
Managing Proprietor, B. Sc. Electrical Engineer

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