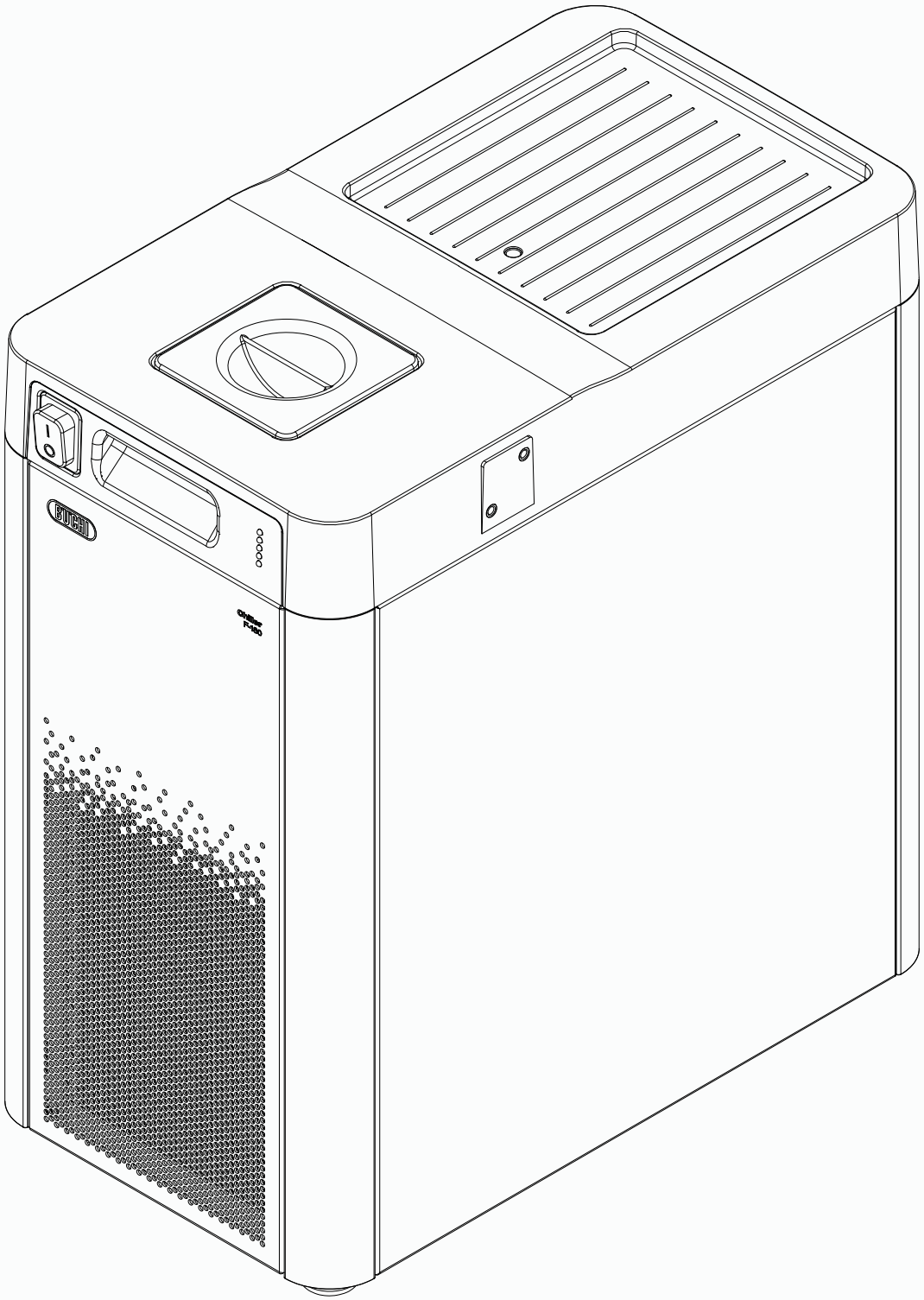

Operation Manual

Recirculating Chiller F-180

BÜCHI

Imprint

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Table of contents

1 About this document

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

▶ Contact BÜCHI Labortechnik AG Customer Service.

https://www.buchi.com/contact

1.1 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 has been designed and built as an item of laboratory equipment. It is intended to be used for cooling sealed circulation systems (e.g. evaporators, reaction vessels).

2.2 Use other than that intended

Use of any kind other than that referred to and any application that does not comply with the technical specifications in Chapter 3.5 “Technical data”, page 12 constitutes use other than that intended.
In particular, the following applications are not permissible:

- Installation of the instrument in areas that require apparatus that is safe to use in potentially explosive atmospheres.
- Use of accessories or replacement parts that are not specified in the operating instructions provided.
- The instrument may not be used in conjunction with flammable substances.
- Placing objects on top of the instrument, that are not part of the installation.
- Use of the instrument without following the instructions of the connected devices.

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

2.3 Staff qualification

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

Users

The users are persons that meet the following criteria:

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

Operator

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

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

The following warning and directive symbols are displayed in this operation manual.

Symbol	Meaning
	General warning
	Explosive substances
	Flammable substances
	Hot surface
	Read manual

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 Flammable refrigerant

⚠ WARNING

Flammable refrigerant (R290/propane)

Leaking refrigerant may produce an inflammable mixture with air.

- ▶ Repairs must be carried out by BUCHI authorized service technicians only.

2.7.2 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.

2.7.3 Overheating and toxic vapors

Should the instrument overheat and/or catch fire, corrosive and toxic vapors may be produced.

- ▶ Do not inhale vapors in the event of fire and/or explosion.
- ▶ Wear a protective breathing mask.
- ▶ Avoid overheating the instrument by carefully following the installation instructions.

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.

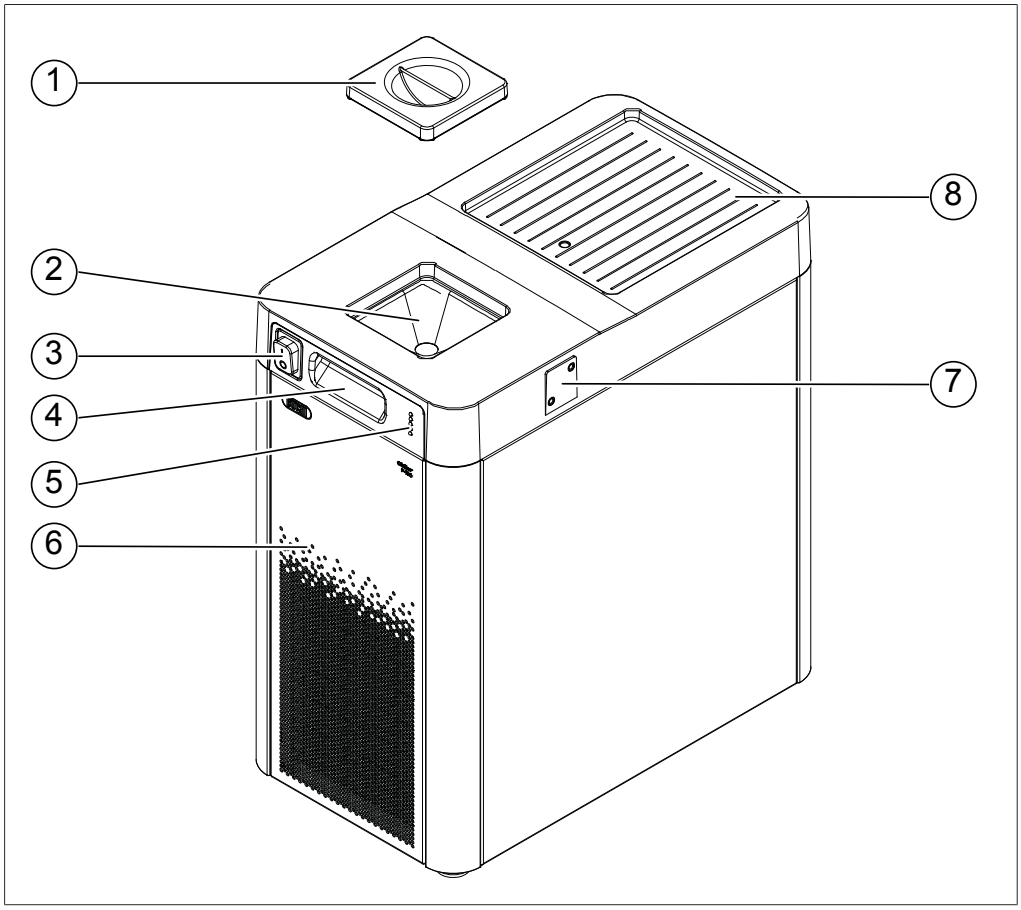
3 Product description

3.1 Description of function

The instrument is a closed-circuit cooler for use with evaporators.
The instrument is designed to operate independently with a fixed cooling temperature or be connected to one or two Rotavapor® units. If the instrument is connected to the Rotavapor®, the cooling temperature is controlled by the Rotavapor® interface.

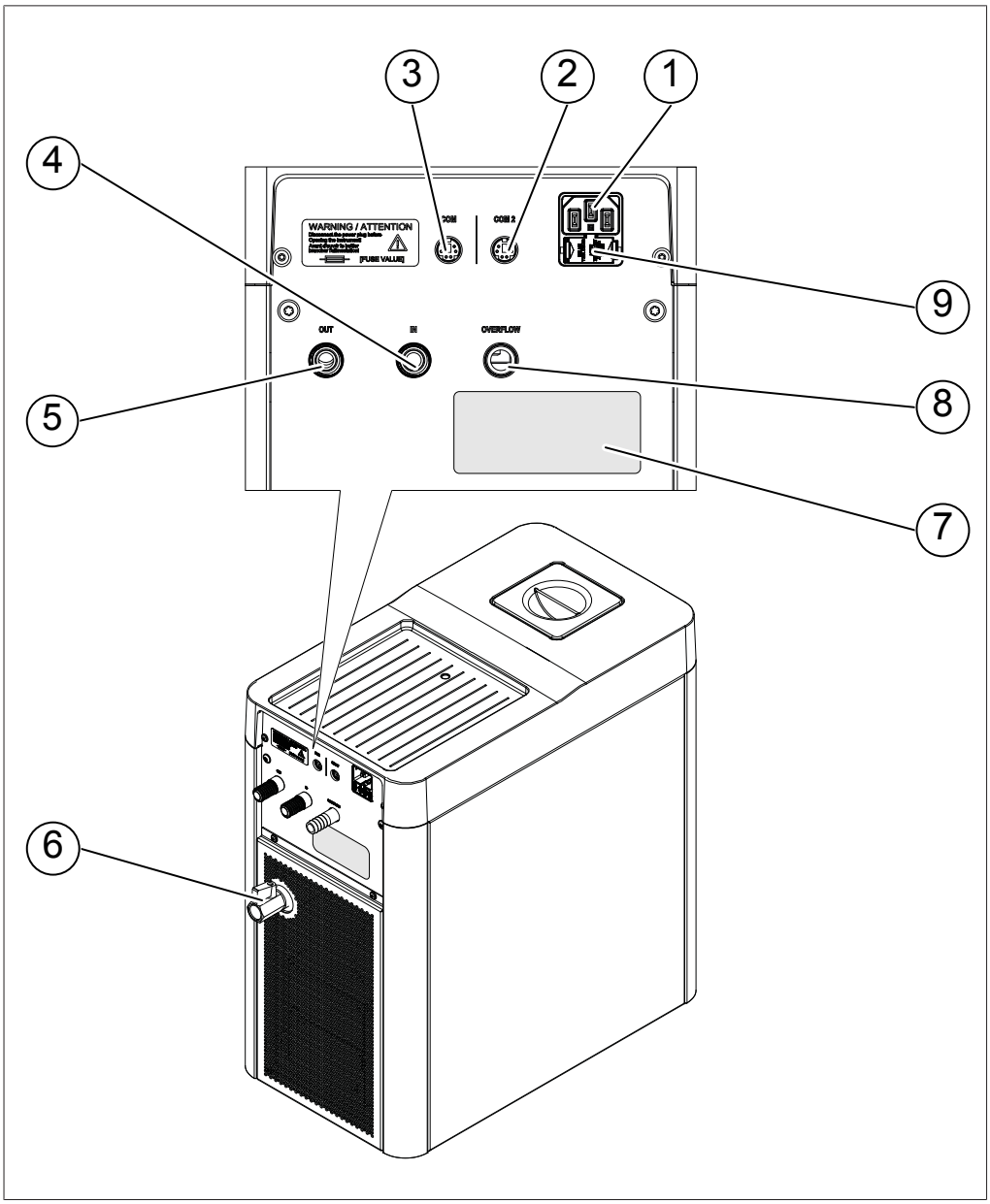
3.2 Configuration

3.2.1 Front view



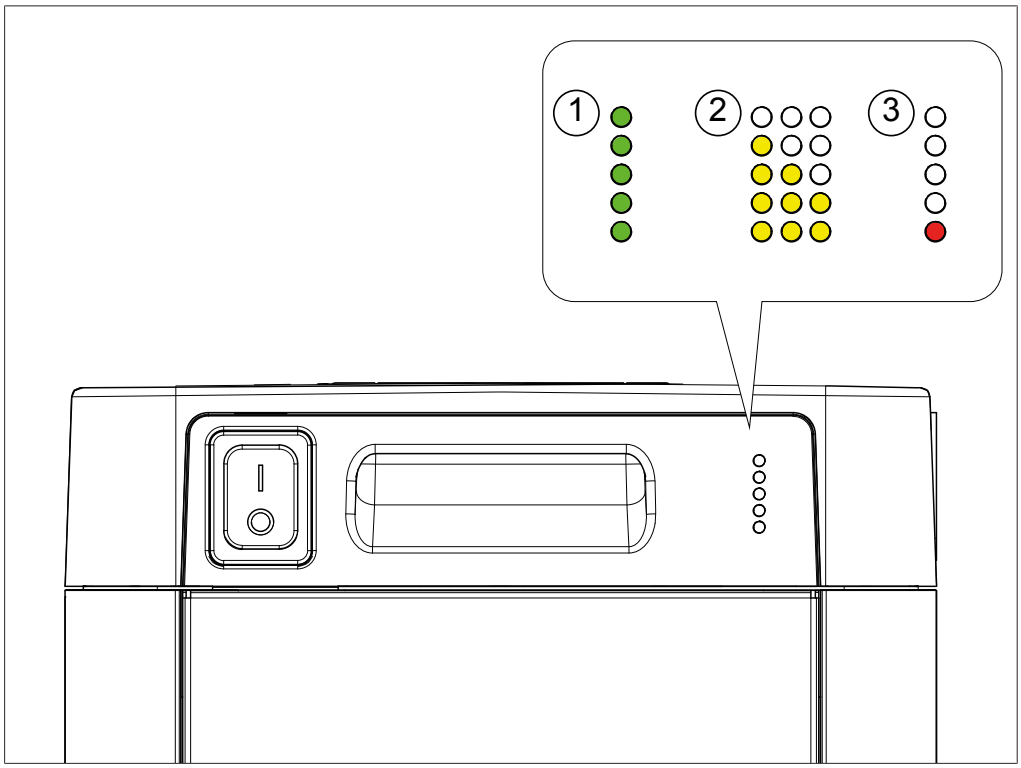
1	Coolant lid	2	Coolant inlet
3	Main switch	4	Handle
5	Level indicator	6	Service front cover
7	Secondary Condenser mounting area	8	Vacuum pump mounting area

3.2.2 Rear view



1 Power supply connector
2 Communication *COM 2*
3 Communication *COM*
4 Cooling fluid *IN*
5 Cooling fluid *OUT*
6 Drain tap for coolant tank
7 Type plate
8 Tank *OVERFLOW*
9 Fuse

3.2.3 Level indicator



1 Coolant tank **full**
2 Coolant tank **medium**
3 Coolant tank **low**

3.3 Scope of delivery

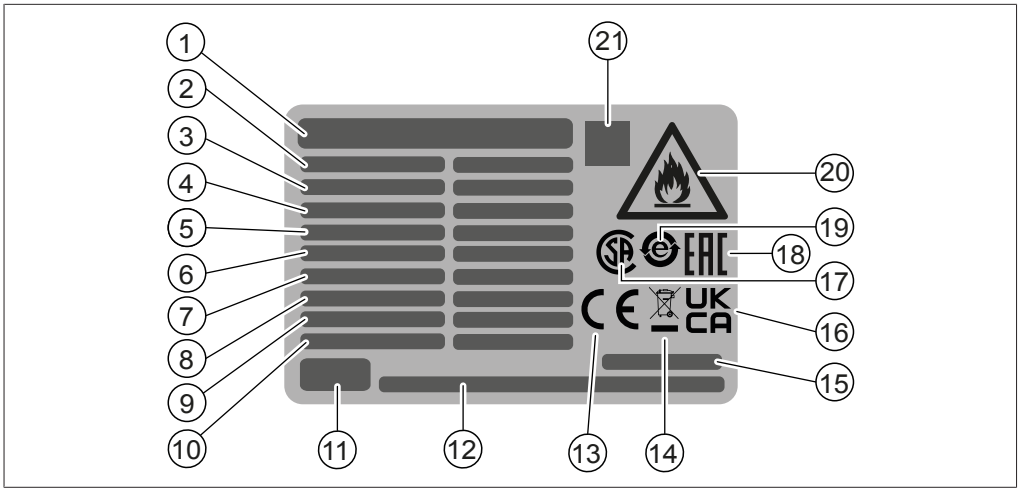
NOTE

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 following type plate is an example. For more details refer to the type plate on the instrument.
The type plate is located at the rear of the instrument.



1	Instrument name	2	Serial number
3	Article number	4	Refrigerant/-quantity
5	Pressure high-/low-side	6	Input voltage range
7	Frequency	8	Fuse protection
9	Power consumption	10	Year of manufacture
11	Company logo	12	Company name, address and website
13	Symbol for "CE conformity"	14	Symbol for "Do not dispose of as household waste"
15	Product origin	16	Symbol for "UK Conformity Assessed"
17	Symbol for "CSA certified"	18	Symbol for "Eurasian Conformity"
19	Symbol for "electronics recycling"	20	Warning symbol for flammable substance (refrigerant)
21	QR-Code contains "Item number, Serial number"		

3.5 Technical data

3.5.1 Recirculating Chiller F-180

Specification	Value
Dimensions (W × D × H)	240 mm × 450 mm × 465 mm
Weight	20 kg
Connection voltage (UL/CSA)	115 − 127 VAC ± 10% or 200 − 240 VAC ± 10%
Connection voltage (CE, CB scheme)	100 − 127 VAC ± 10% or 200 − 240 VAC ± 10%
Frequency	50 / 60 Hz
Power consumption	500 VA
Fuse (2×)	T 6.3 A H 250 V
Overvoltage category	II
IP Code	IP20
Pollution degree	2
Front side	unobstructed cooling air supply
Minimum clearance on rear side	20 cm

Specification	Value
Noise level	standby: 55 dB max.: 68 dB
Pump pressure	0.5 bar
Tubing connection	Ø 8 mm (GL-14)
Flow rate (when connected to one Rotavapor®)	1.2 L/min
Flow rate (nothing connected)	3.5 L/min
Refrigerant	R290 (82 g)
Setpoint temperature without remote control	+ 10 °C
Temperature range if controlled via Rotavapor®	0 °C to +25 °C
Temperature regulation accuracy	± 2 °C
Tank volume	4.5 L
Heating emission	1300 W
Cooling capacity at 15 °C[1]	600 W
Cooling capacity at 10 °C[1]	500 W
Cooling capacity at 0 °C[1]	350 W
Temperature display	no display
Compatibility with interface	Rotavapor® interface
Certificates (version dependent)	CB, CE, UL / CSA

[1] Measured at 20°C ambient temperature

3.5.2 Ambient conditions

For indoor use only.

Specification	Value
Max. altitude above sea level	2,000 m
Ambient and storage temperature	5−40 °C
Max. relative humidity	80% for temperatures up to 31 °C decreasing linearly to 50% relative humidity at 40 °C

3.5.3 Materials

Component	Material
Recirculating Chiller casing	PBT, stainless steel 1.4301
Refrigerant	R290 (82 g)

3.5.4 Installation site

The installation site must meet the following requirements:

- The installation site meets the safety requirements. See Chapter 2 “Safety”, page 6
- The installation site meets the specifications according to the technical data (e.g. weight, dimension, minimum clearance on all sides, etc.). See Chapter 3.5 “Technical data”, page 12.
- The installation site has a firm, level and nonslip surface.
- The installation site has no obstacles (e.g. water taps, drains, etc.).
- The installation site has an own mains outlet socket for the instrument.
- The installation site allows that the power supply can be disconnected at any time in case of an emergency.
- The installation site is not exposed to external thermal loads, such as direct solar radiation.
- The installation site has enough space that cables / tubes can be routed safely.
- The installation site meets the requirements for the connected instruments. See related documentation.

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.

- ▶ Transport the instrument in an upright position.
- ▶ Empty the coolant tank before transportation.
- ▶ After transportation, check the instrument for damage.
- ▶ Damage that has occurred in transit should be reported to the carrier.
- ▶ Keep packing for future transportation.

4.2 Storage

- ▶ Make sure that the ambient conditions are complied with (see Chapter 3.5 “Technical data”, page 12).
- ▶ Wherever possible, store the instrument in its original packaging.
- ▶ Empty the coolant tank before storing the instrument.
- ▶ After storage, check the instrument and all tubing for damage and replace if necessary.

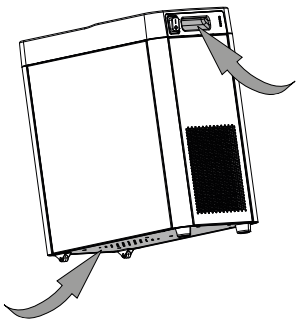
4.3 Lifting the instrument

NOTICE

Dragging the instrument can damage the feet of the instrument.

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

▶ Lift the instrument at the points indicated.



5 Installation

5.1 Important considerations prior to commissioning

⚠ DANGER

Risk of fatal injury if used in potentially explosive atmospheres

- ▶ Do not bring the instrument into close proximity with flammable vapors.
- ▶ Do not place any open solvent containers near to the instrument.

⚠ WARNING

Risk of fire from overheating instrument

- ▶ Do not cover over the instrument.
- ▶ Make sure there is adequate air circulation.

NOTICE

Risk of overheating and fire

- ▶ Set up the instrument in a clean and dry place.
- ▶ To avoid obstructing the airflow around the instrument, follow this spacing recommendations:
  Allow a minimum of 20 cm free space at the rear of the instrument.
  Ensure free access of cooling air at the front of the instrument.

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

NOTICE

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

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

- ▶ Use only BUCHI power supply cables.

NOTICE

The power supply cable is for disconnecting the instrument.

- ▶ Easy access must be guarantee to the mains plug at all times.

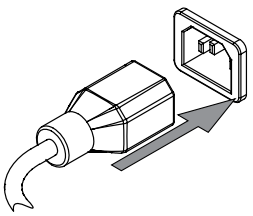
Precondition:

☑ The electrical installation is as specified on the type plate.

☑ The electrical installation is equipped with a proper grounding system.

☑ The electrical installation is equipped with suitable fuses and electrical safety features.

☑ The installation site is as specified in the technical data. See Chapter 3.5 “Technical data”, page 12.



▶ Connect the power supply cable to the connection on the instrument. See Chapter 3.2 “Configuration”, page 9.

▶ Connect the mains plug to an own mains outlet socket.

5.4 Installing the Rotavapor®

▶ Installation of the Rotavapor®. See additional manual according to purchase order.

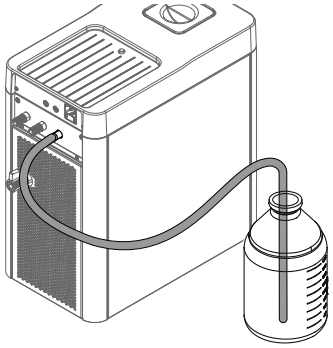
5.5 Installing the vacuum pump

▶ Installation of the vacuum pump. See additional manual according to purchase order.

5.6 Installing the tank overflow

▶ Install a hose to the tank overflow connection.

▶ Place the hose into a glass bottle.



5.7 Connecting the cooling

Precondition:

☑ The instrument is installed.

▶ Cut the hose to needed lengths.

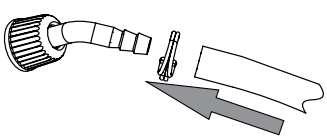
Recommended lengths:

1.5 m (Coolant hose 1)

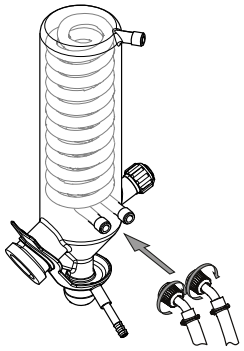
1.5 m (Coolant hose 2)

▶ Install the coolant hoses onto the hose nipples.

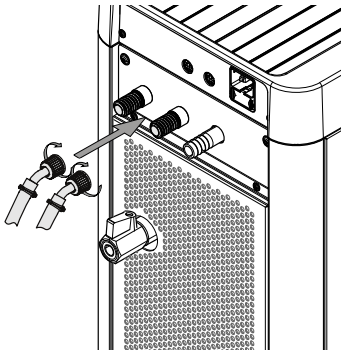
▶ Secure the coolant hoses in place with a hose clip.



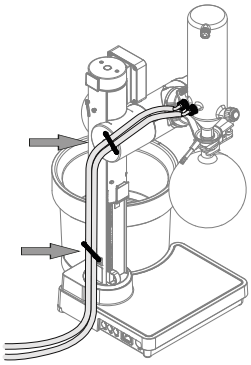
▶ Attach the coolant hoses to the condenser.
Coolant outlet **OUT** (left)
Coolant inlet **IN** (right)



▶ Attach the coolant hoses to the recirculating chiller.
Coolant outlet **OUT** (left)
Coolant inlet **IN** (right)



▶ Clamp the hoses through the fixtures.



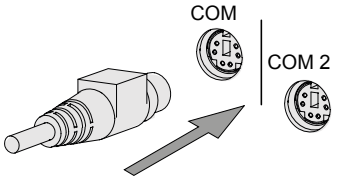
NOTE
If two Rotavapor® units should be connected to the instrument, the hoses must be connected in parallel. It is recommended to use a cooling valve to avoid cooling the unused Rotavapor® unnecessarily (see Chapter 10.1.1 “Accessories”, page 29).

5.8 Connecting the BUCHI communication cable

NOTE
It is possible to connect one or two Rotavapor® units.

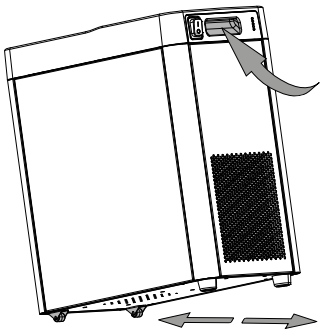
Precondition:
☑ The Rotavapor® is installed.

▶ Plug the communication cable into the instrument at the rear side (COM or COM2).
▶ Connect the communication cable to the Rotavapor®.



5.9 Positioning the instrument

- ▶ Hold the handle.
- ▶ Push or pull the instrument to position under the laboratory bench.

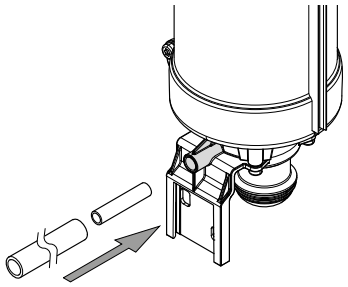


5.10 Accessories

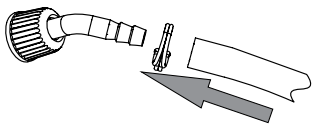
5.10.1 Installing the secondary condenser

There is the option to install the secondary condenser on the recirculating chiller instead on the vacuum pump.

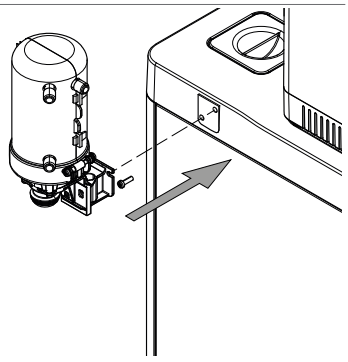
- ▶ Attach the tube and the hose to the secondary condenser.
  Recommended hose length: *0.6 m*



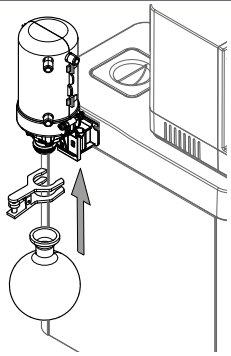
- ▶ Install the hose onto the hose nipple.
- ▶ Secure the hoses in place with a hose clip.



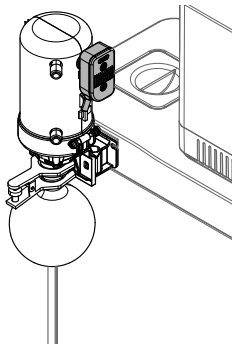
- ▶ Install the mounting rail with the secondary condenser by using the screws.
- ▶ Tighten the screws.



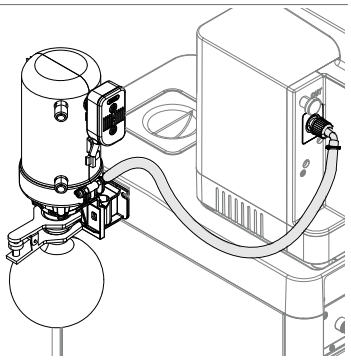
- ▶ Fit the receiving flask onto the condenser from below.
- ▶ Secure the receiving flask with the ball joint clamp.



▶ Attach the silencer to the secondary condenser.

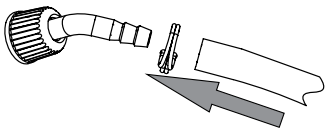


▶ Connect the hose onto the vacuum pump connection *OUT*.
▶ Connect the secondary condenser. See Chapter 5.10.2 “Connecting cooling to the secondary condenser”, page 20.



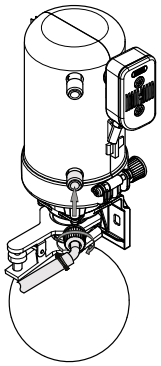
5.10.2 Connecting cooling to the secondary condenser

▶ Install the coolant hoses onto the hose nipples.
▶ Secure the coolant hoses in place with a hose clip.

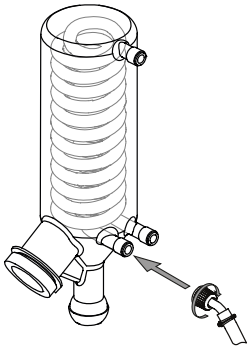


Precondition:
☑ The secondary condenser is installed to the recirculating chiller.

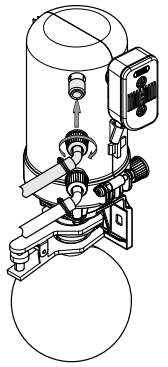
▶ Attach the hose to the secondary condenser.



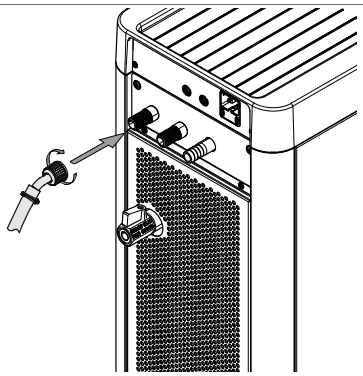
▶ Attach the hose to the condenser.



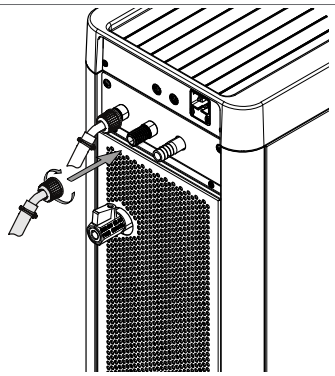
▶ Attach the hose to the secondary condenser.



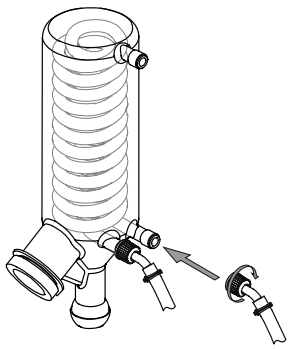
▶ Attach the hose to the coolant connection *OUT*.



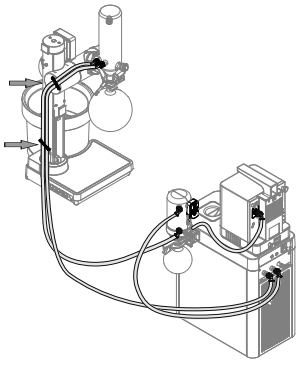
▶ Attach the hose to the coolant connection *IN*.



▶ Attach the hose to the condenser.



▶ Clamp the hose through the fixtures.



6 Operation

6.1 Filling the tank

NOTICE

Risk of property damage if incorrect coolant used

- ▶ Only use a non-flammable, common laboratory cooling liquid as a coolant.
- ▶ Do not use silicone oil.
- ▶ When selecting the coolant, take account of the chiller temperature setting.
- ▶ Make sure that the coolant is suitable for the desired chiller temperature setting, especially with regard to the freezing point.
- ▶ BUCHI recommends a mixture of ethylene glycol and water with a ratio of 40:60.
- ▶ The addition of anticorrosive additives is recommended.

NOTE

Always ensure the water level remains at or above the minimum specified. Allowing it to fall below this level could result in overheating or damage to the system.

NOTE

Always ensure that the coolant lid is closed during operation to avoid contamination.

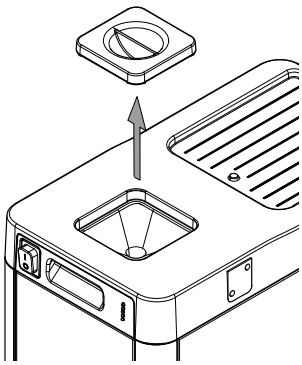
Precondition:

☑ The recirculating chiller is installed.

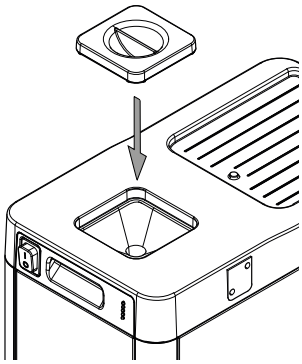
☑ The coolant hoses are connected and the cooling circuit is closed.

☑ The instrument is not in operation and has cooled down.

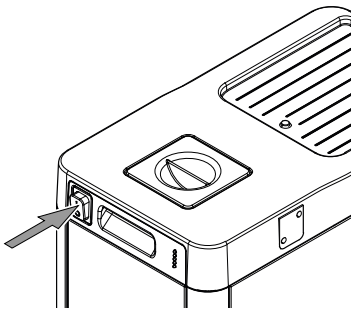
- ▶ Switch on the instrument.
- ▶ Open the coolant lid.



- ▶ Fill the suitable coolant into the coolant inlet.
  See Chapter 3.5 “Technical data”, page 12.
- ▶ Check the level indicator to see the tank level.
- ▶ Close the coolant lid.



▶ Switch the main switch OFF and ON again to start the instrument.



6.2 Automatic cooling

NOTE
The instrument has a set temperature of + 10 °C and cannot be adjusted.

Precondition:
☑ The instrument is installed.

▶ Switch on the instrument.

⇨ The cooling process is activated automatically.

6.3 Controlling the cooling temperature

NOTE
The cooling temperature can be regulated if a Rotavapor® is connected to the instrument.

It is possible to connect two Rotavapor® units to the instrument. In this case, the last temperature setting will be taken as the reference for both Rotavapor® units.

Precondition:
☑ A Rotavapor® is installed and connected to the instrument.

▶ Switch on the instrument.

▶ Adjust and start the cooling temperature. See additional manual according to purchase order.

7 Cleaning and servicing

NOTE

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

7.1 Maintenance work

Action		Daily	Weekly	Monthly	Twice a year	Yearly	Additional information
7.2	Checking the coolant level	1					
7.3	Cleaning the housing		2				
7.4	Cleaning the heat exchanger and air ventilation grills			2			
7.5	Exchanging the coolant				1		
7.6	Inspecting and replacing the hoses					2	or when system is leaking

1 - User; 2 - Operator

7.2 Checking the coolant level

NOTE

The coolant fill level must always be checked before using the instrument!
The required level of coolant depends on the length of the tubing and/or the number of instruments and condensers connected.

- ▶ Check the coolant level. See Chapter 3.2.3 “Level indicator”, page 11.

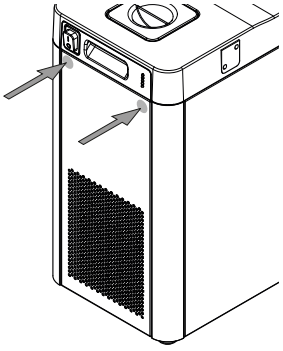
⇨ If needed add or drain the coolant.
See Chapter 6.1 “Filling the tank”, page 22.
See Chapter 7.5 “Exchanging the coolant”, page 25.

7.3 Cleaning the housing

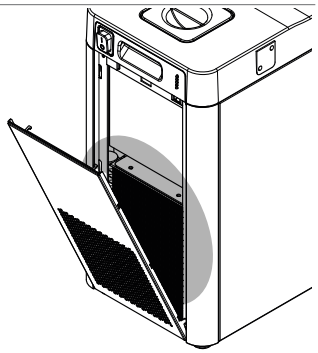
- ▶ Wipe down the level indicator with a damp cloth.
- ▶ Wipe down the housing with a damp cloth.
- ▶ If heavily soiled, use ethanol or a mild detergent.

7.4 Cleaning the heat exchanger and air ventilation grills

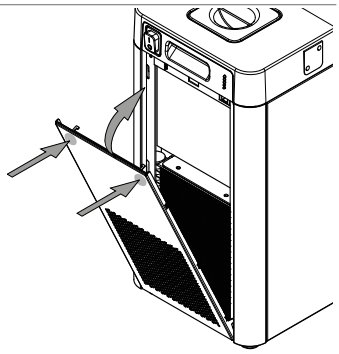
Precondition:
☑ The instrument is switched off.



▶ Open the service front door.
▶ Clean the heat exchanger gently with a vacuum cleaner.
▶ Close the service front door.



▶ Remove dust and foreign objects gently from the air ventilation grills with a vacuum cleaner fitted with a soft brush.



▶ Close the service front door.

7.5 Exchanging the coolant

Precondition:
☑ The instrument is not in operation and has cooled down.

▶ Install the tank overflow. See Chapter 5.6 “Installing the tank overflow”, page 17.
▶ Open the drain tap and allow coolant to run into the receptacle.
▶ Check the level indicator to see the tank level.
▶ Close the drain tap, when the desired quantity of coolant has been removed.
▶ Fill int tank with new coolant. See Chapter 6.1 “Filling the tank”, page 22.

7.6 Inspecting and replacing the hoses

▶ Inspect the hoses for damages and cracks.
▶ Replace damaged hoses.

8 Help with faults

8.1 Troubleshooting

Problem	Possible cause	Action
Instrument is not working	No electrical connection	▶ Establish an electrical connection. See Chapter 5.3 “Establishing electrical connections”, page 16.
	Main switch is off	▶ Switch on the main switch.
	Blown fuse(s)	▶ Replace the fuse(s). See Chapter 8.2 “Replacing the fuse(s)”, page 27. ▶ Contact BUCHI Customer Service.
Cooling medium is leaking	Tube is leaking	▶ Replace the tubing. See Chapter 7.6 “Inspecting and replacing the hoses”, page 25.
	Cooling connector is not tightened	▶ Check the cooling connection.

8.1.1 Error codes

NOTE
The level indicator displays the error code. The LED blinks red at one-second intervals.

NOTE
To clear an error code, restart the instrument by switching the main switch OFF and ON again.

LED	Error code	Description	Action
○○○○○●	1	Cooling water level	▶ Fill up the tank. See Chapter 6.1 “Filling the tank”, page 22.
○○○●○○	2	Sensor cooling water level	▶ Contact BUCHI Customer Service.
○○○●●	3	Board temperature	▶ Let the instrument cool down. If the Error still appears, contact BUCHI Customer Service.
○○●○○○	4	Sensor EEV temperature	▶ Let the instrument cool down. If the Error still appears, contact BUCHI Customer Service.
○○●○●○	5	Sensor EEV pressure	▶ Let the instrument cool down. If the Error still appears, contact BUCHI Customer Service.
○○●●○○	6	Sensor condenser temperature	▶ Let the instrument cool down. If the Error still appears, contact BUCHI Customer Service.

LED	Error code	Description	Action
○ ○ ● ● ●	7	Fan blocked	▶ Contact BUCHI Customer Service.
○ ● ○ ○ ○	8	Pump blocked	▶ Contact BUCHI Customer Service.
○ ● ○ ○ ●	9	Compressor overpressure	▶ Let the instrument cool down. If the Error still appears, contact BUCHI Customer Service.
○ ● ○ ● ○	10	Air in the pump	▶ Place the outlet hose in a larger beaker flask. ▶ Start the instrument again to let the air out.

8.1.2 Customer service

Only authorized service personnel are allowed to perform repair work on the instrument 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 instrument. 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

8.2 Replacing the fuse(s)

⚠ CAUTION

Electrical voltage at conductive parts

Risk of electric shock

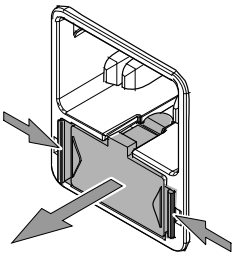
▶ Observe general safety regulations when handling electrical equipment.
▶ Work on electrical equipment must be performed by authorized and qualified personnel.
▶ Disconnect the power plug before opening the instrument.
▶ Do not touch any live parts.

Precondition:
☑ Instrument is disconnected from the main supply.

▶ Remove the fuse holder.

⇨ The fuse holder contains two fuses (T 6.3 A H 250 V).

▶ Replace the blown fuse(s).
▶ Push the fuse holder back in place.
▶ Reconnect the main supply.



9 Taking out of service and disposal

9.1 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 instrument.

9.2 Disposal and recycling

The operator is responsible for the proper disposal and recycling of the product, equipment, and packaging in accordance with local waste disposal and recycling regulations.

⚠ CAUTION

Potential environmental hazard

The refrigerant (see Chapter 3.5 “Technical data”, page 12) used to operate the instrument is toxic and must not be allowed to enter the soil or groundwater.

- ▶ Dispose the instrument properly, if necessary using a professional disposal service.

- ▶ Comply with local regulations and statutory requirements for waste disposal, when disposing or recycling the instrument, equipment or packaging.
  https://www.buchi.com/sustainable-disposal
- ▶ Observe the disposal or recycling regulations for the materials used. For the used materials see Chapter 3.5 “Technical data”, page 12 or the material labeling on the parts.
- ▶ Packaging materials must be separated and disposed of according to local recycling guidelines.

9.3 Returning the instrument

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

10 Appendix

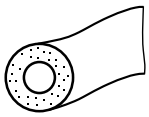
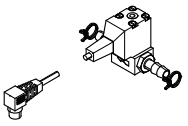
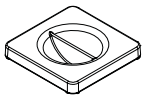
10.1 Spare parts and accessories

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

NOTE

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

10.1.1 Accessories

	Order no.	Image
Hose insulation, Kaiflex, 11/23, 1 m, black Use: cooling media, hose insulation	028696	
Cooling valve To operate one recirculating chiller F-180 with two Rotavapor R-80/R-180.	11084320	
Coolant lid Use: for filling funnel	11084309	

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