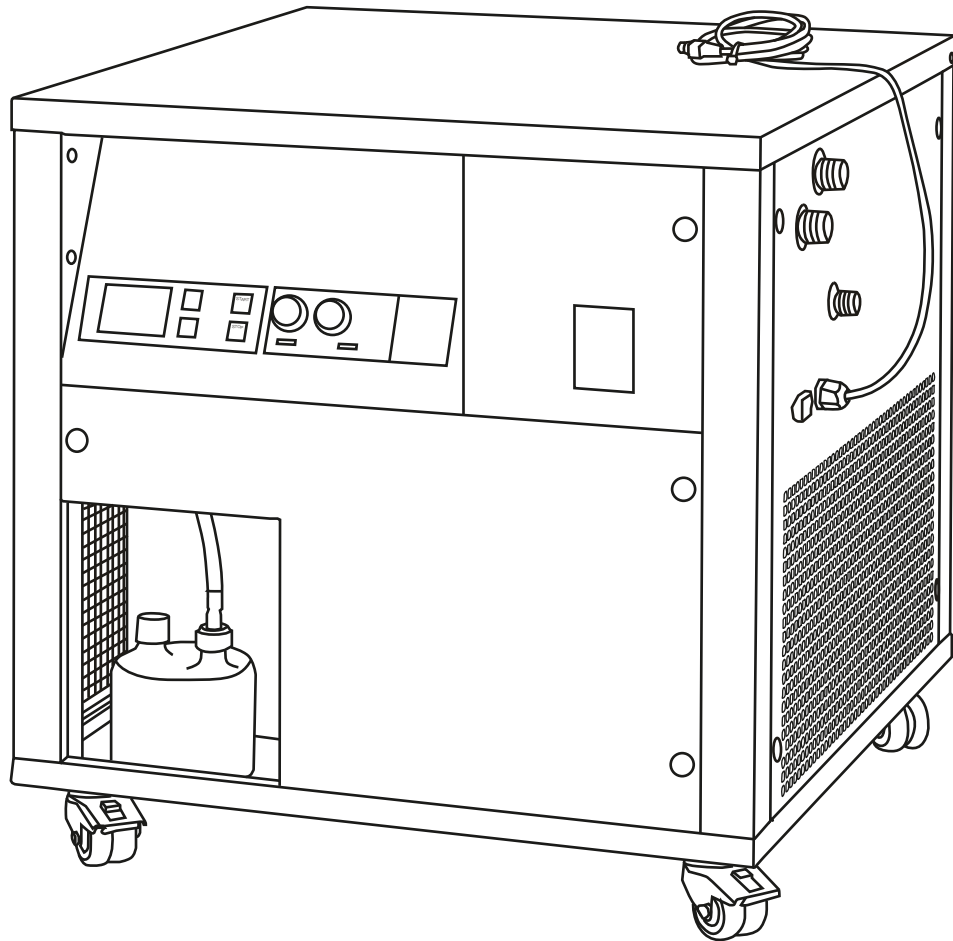




Inert Loop B-295 SE Operation Manual



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1 About this document

This operation manual is applicable for all variants of the instrument.

Read this operation manual before operating the instrument and follow the instructions to ensure safe and trouble-free operation.

Keep this operation manual for later use and pass it on to any subsequent user or owner.

BÜCHI Labortechnik AG accepts no liability for damage, faults and malfunctions resulting from not following this operation manual.

If you have any questions after reading this operation manual:

► Contact BÜCHI Labortechnik AG Customer Service.

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

1.1 Warning notices in this document




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

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

1.2 Symbols

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

1.2.1 Warning symbols

Symbol	Meaning
	General warning
	Device damage
	Health-harming or irritant substances

1.2.2 Mark-ups and symbols



NOTE

This symbol draws attention to useful and important information.

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

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

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

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

1.3 Connected devices

In addition to these operating instructions, follow the instructions and specifications in the documentation for the connected devices.

1.4 Trademarks

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

2 Safety

2.1 Proper use

The instrument is designed and built for laboratories.

The instrument can be used for the following tasks:

- Condense solvent vapors from the stream of drying gas coming from BUCHI Spray Drying Instruments in closed mode.
- Work under inert condition with BUCHI Spray Drying Instruments.
- Monitoring the O₂ level in closed mode.

2.2 Use other than intended

Use of any kind other than that described in Chapter 2.1 "Proper use", page 7 and any application that does not comply with the technical specifications (See Chapter 3.4 "Technical data", page 13) constitutes use other than that intended.

In particular, the following applications are not permissible:

- Use of the instrument in rooms which require ex-protected instruments.
- Use of the instrument with non-BUCHI instruments.
- Use of the instrument for processing substances outside of research and development.
- Use of the instrument outside a fume hood.
- Use of the instrument with samples with unknown chemical composition.
- Use of the instrument with substances that react with the materials used. See Chapter 3.4 "Technical data", page 13
- Use of the instrument with toxic substances without appropriate safety measures.
- Use of the instrument with biohazardous materials such as viruses or bacteria.
- Use of the instrument with corrosive samples.
- Use of the instrument with solvents with boiling points which are less than 39 °C.
- Use of the instrument with solvents with melting points which are more than 6 °C.
- Use of the instrument without Dehumidifier with solvents containing more than 10 % water.
- Use of the instrument with solvents containing peroxides.
- Use of the instrument with samples, which can explode or inflame (example: explosives, etc.) due to shock, friction, heat or spark formation.

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

2.3 Staff qualification

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

The device may only be operated by suitably qualified laboratory staff.

These operating instructions are aimed at the following target groups:

Users

Users are persons that meet the following criteria:

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

Operator

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

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

BUCHI service technicians

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

2.4 Residual risks

The device has been developed and manufactured using the latest technological advances. Nevertheless, risks to persons, property or the environment can arise if the device is used incorrectly.

Appropriate warnings in this manual serve to alert the user to these residual dangers.

2.4.1 Faults during operation

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

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

2.5 Personal protective equipment

Depending on the application, hazards due to heat and/or corrosive chemicals may arise.

- ▶ Always wear appropriate personal protective equipment such as safety goggles, protective clothing and gloves.
- ▶ Make sure that the personal protective equipment meets the requirements of the safety data sheets for all chemicals used.

2.6 Modifications

Unauthorized modifications may impair safety and lead to accidents.

- ▶ Use only genuine BUCHI accessories, spare parts and consumables.

- ▶ Technical modifications to the device or accessories should only be carried out with the prior written approval of BÜCHI Labortechnik AG and only by authorized BUCHI technicians.

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

3 Product description

3.1 Description of function

The Inert Loop B-295 SE is an accessory for BUCHI Spray Drying Instruments, which enables the safe use of organic solvents in closed loop mode.

The spray drying process in closed loop mode generates an inert gas stream loaded with solvent vapors. The Inert Loop B-295 SE is used to condense these solvent vapors from the gas stream and to monitor its oxygen concentration.

The gas flow enters the Inert Loop B-295 SE and passes the preheat exchanger where it is cooled before entering the condenser. After solvent vapor condensation, the gas stream is reheated by the preheater before being returned to the spray drying process. The excess inert gas leaves the Inert Loop B-295 SE via the exhaust and the condensed solvent vapors are collected in a closed bottle.

The following spray drying modes are available:

Spray drying mode	Solvent composition
Open mode	up to 20 % organic solvent
Closed mode with B-295 (When using Ultrasonic Package accessory Inertgas adapter is necessary)	between 90 % - 100 % organic solvent
Closed mode with B-295 and B-296 (When using Ultrasonic Package accessory Inertgas adapter is necessary)	between 20 % - 80 % organic solvent

3.2 Configuration

3.2.1 Front view

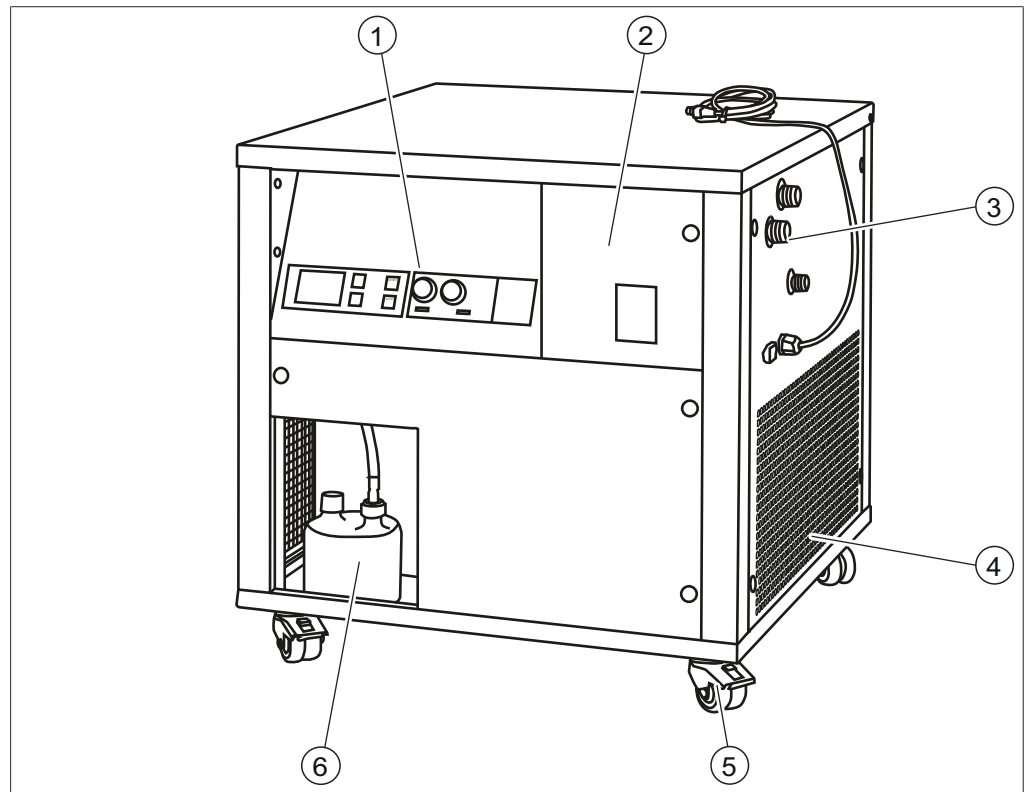


Fig. 1: Front view

- | | | | |
|---|---------------------------------------------------------------------|---|--------------------------------------------------|
| 1 | Control elements
(See Chapter 3.2.3 "Control elements", page 12) | 2 | Oxygen analyzer
(Front cover oxygen analyzer) |
| 3 | Side connections
(See Chapter 3.2.2 "Side connections", page 12) | 4 | Ventilation slots |
| 5 | Castor brake | 6 | Solvent collection flask |

3.2.2 Side connections

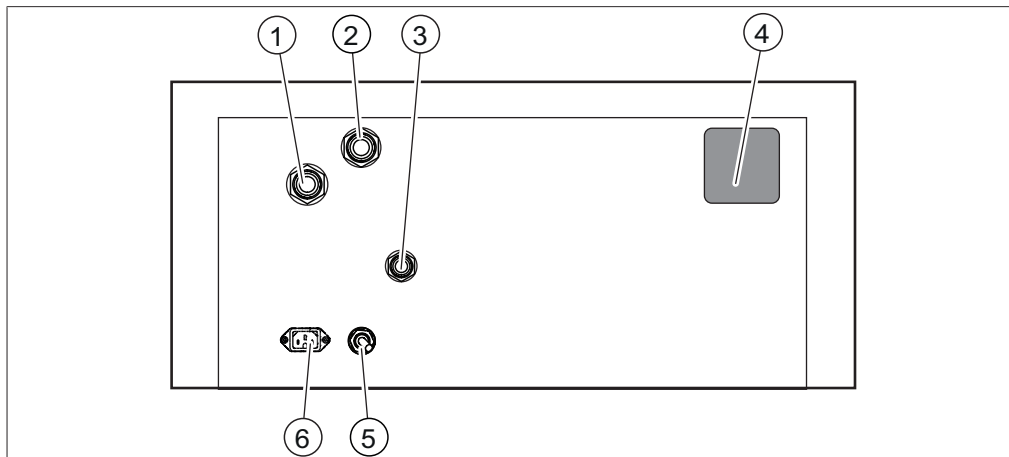


Fig. 2: Side connections

- | | |
|---------------------------------------------------|--------------------------------------------------------------|
| 1 Process gas out
(marked: OUT) | 2 Process gas in
(marked: IN) |
| 3 Exhaust connection
(marked: Exhaust) | 4 Type plate
(See Chapter 3.2.4 "Type plate",
page 12) |
| 5 Communication cable | 6 Power connection
(marked: Power IN) |

3.2.3 Control elements

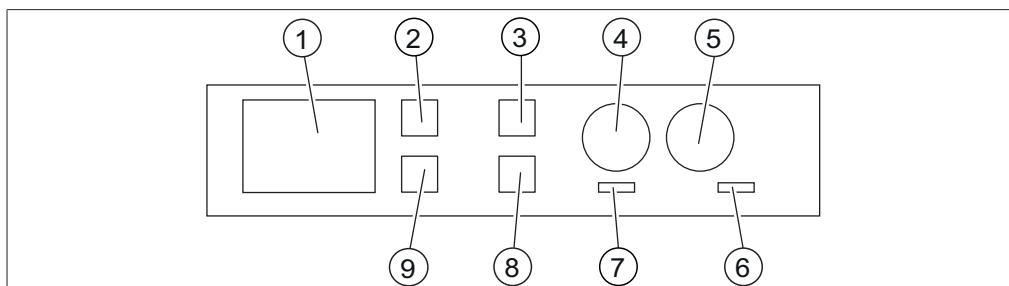


Fig. 3: Control elements

- | | |
|-------------------------|----------------------|
| 1 Display | 2 Set temperature up |
| 3 Switch on | 4 Signal lamp oxygen |
| 5 Signal lamp pressure | 6 Signal lamp power |
| 7 Signal lamp operation | 8 Switch off |
| 9 Set temperature down | |

3.2.4 Type plate

The type plate identifies the instrument. The type plate is located at the left side of the instrument. See Chapter 3.2.2 "Side connections", page 12

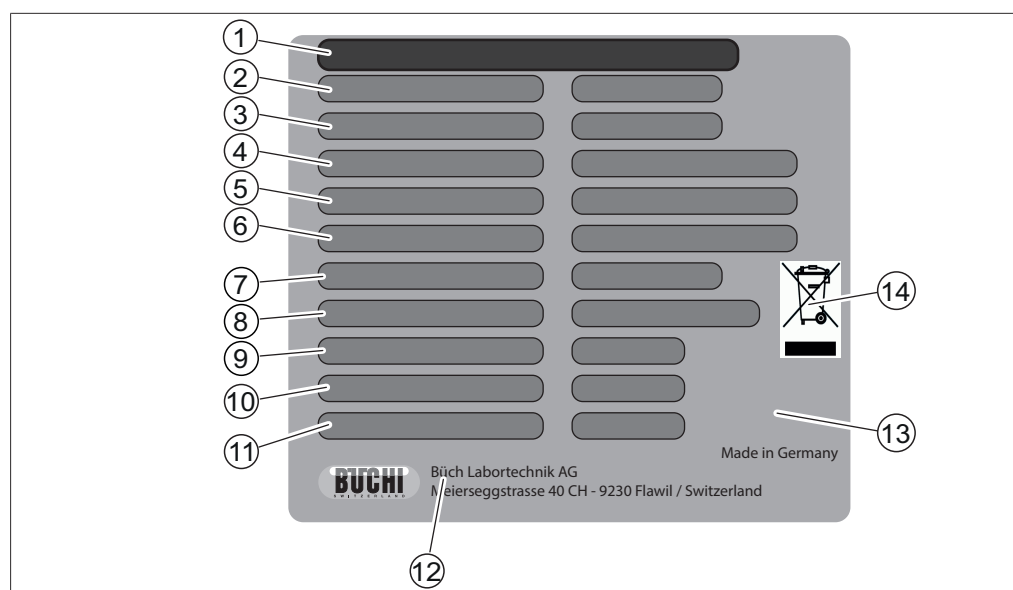


Fig. 4: Type plate

1	Instrument name	2	Serial number
3	Article number	4	Refrigerant details Filling capacity
5	Global warming potential	6	Input voltage range Frequency
7	Power consumption maximum	8	Fuse type
9	High-pressure system design pressure	10	Low-pressure system design pressure
11	Year of manufacture	12	Company name and address
13	Approvals	14	Symbol for "Do not dispose of as household waste"

3.3 Scope of delivery



NOTE

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

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

3.4 Technical data

3.4.1 Inert Loop B-295 SE

	Inert Loop B-295 SE	Inert Loop B-295 SE	Inert Loop B-295 SE	Inert Loop B-295 SE
	230 V / 50 Hz	220 V / 60 Hz	200 V / 50 Hz	200 V / 60 Hz
Power consumption	1600 VA	1910 VA	1650 VA	1910 VA
Connection voltage	220 ... 240 VAC	208 ... 220 VAC	200 VAC	200 VAC
Fuse (Characteristic)	10 A (T)	10 A (T)	10 A (T)	10 A (T)
Frequency	50 Hz	60 Hz	50 Hz	60 Hz

	Inert Loop B-295 SE 230 V / 50 Hz	Inert Loop B-295 SE 220 V / 60 Hz	Inert Loop B-295 SE 200 V / 50 Hz	Inert Loop B-295 SE 200 V / 60 Hz
Overvoltage category	II	II	II	II
Degree of protection	I	I	I	I
Pollution degree	II	II	II	II
Dimensions (W x D x H)	657 x 653 x 680 mm	657 x 653 x 680 mm	657 x 653 x 680 mm	657 x 653 x 680 mm
Weight	98 kg	98 kg	99 kg	99 kg
Refrigerant	R449A, CFC free	R449A, CFC free	R449A, CFC free	R449A, CFC free
Filling amount of refrigerant	0.98 kg	0.98 kg	0.98 kg	0.98 kg
CO ₂ -equivalent	1369.06 kg CO ₂	1369.06 kg CO ₂	1369.06 kg CO ₂	1369.06 kg CO ₂
Safety Group Refrigerants (ASHRAE)	A1 (lower toxicity, no flame propaga- tion)	A1 (lower toxicity, no flame propaga- tion)	A1 (lower toxicity, no flame propaga- tion)	A1 (lower toxicity, no flame propaga- tion)
Maximum allowable pressure (PS) [low pressure side]	22 bar	22 bar	22 bar	22 bar
Maximum allowable pressure (PS) [high pressure side]	26 bar	26 bar	26 bar	26 bar
Cooling capacity at the process gas (at -23 ° C)	800 W	920 W	800 W	920 W
Compressor cooling capacity (according to EN12900, at -15 ° C)	1334 W	1925 W	1334W	1925 W
Control range process gas tem- perature	min -30 to 8°C	min -30 to 8 °C	min -30 to 8 °C	min -30 to 8 °C
Minimum distance to all sides	300 mm	300 mm	300 mm	300 mm
EMC to EN 61326-1 Emmission	Class B	Class B	Class B	Class B
EMC to EN 61326-1 Immision	Industry	Industry	Industry	Industry

3.4.2 Ambient conditions

For indoor use only.

Max. altitude above sea level	2000 m
Ambient temperature	5–40 °C
Maximum relative humidity	80 % for temperatures up to 31 °C decreasing linearly to 50 % relative hu- midity at 40 °C
Storage temperature	max. 40 °C

3.4.3 Materials

Component	Materials of construction
Hose connections, tubing, weld-on nipple	Stainless steel 1.4571
Pre-heat exchanger, condensate separator	Stainless steel 1.4301
Plate heat exchanger	Stainless steel 1.4401
Screw connections, Ball valve	Stainless steel 1.4408
Sealing ball valve	PTFE
Pipe elbow	Stainless steel 1.4307
Pressure switch	PVDF, Viton, NBR/aramid fiber composite
Oxygen sensor	PA, PPS, PTFE, stainless steel
Black hoses	EPDM
Drain tube	PVC
Woulff bottle	Glass
Plate heat exchanger	Stainless steel solder

4 Transport and storage

4.1 Transport



NOTICE

Risk of breakage due to incorrect transportation

- ▶ Make sure that all parts of the device are safely packed in such a way as to prevent breakage, ideally in the original box.
- ▶ Avoid sharp movements during transit.

-
- ▶ After transportation, check the device for damage.
 - ▶ Damage that has occurred in transit should be reported to the carrier.
 - ▶ Keep packing for future transportation.

4.2 Storage

- ▶ Make sure that the ambient conditions are complied with (see Chapter 3.4 "Technical data", page 13).
- ▶ Wherever possible, store the device in its original packaging.
- ▶ After storage, check the device, all seals and tubing for damage and replace if necessary.

4.3 Lifting the instrument



WARNING

Danger due to incorrect transportation

The possible consequences are crushing injuries, cuts and breakages.

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

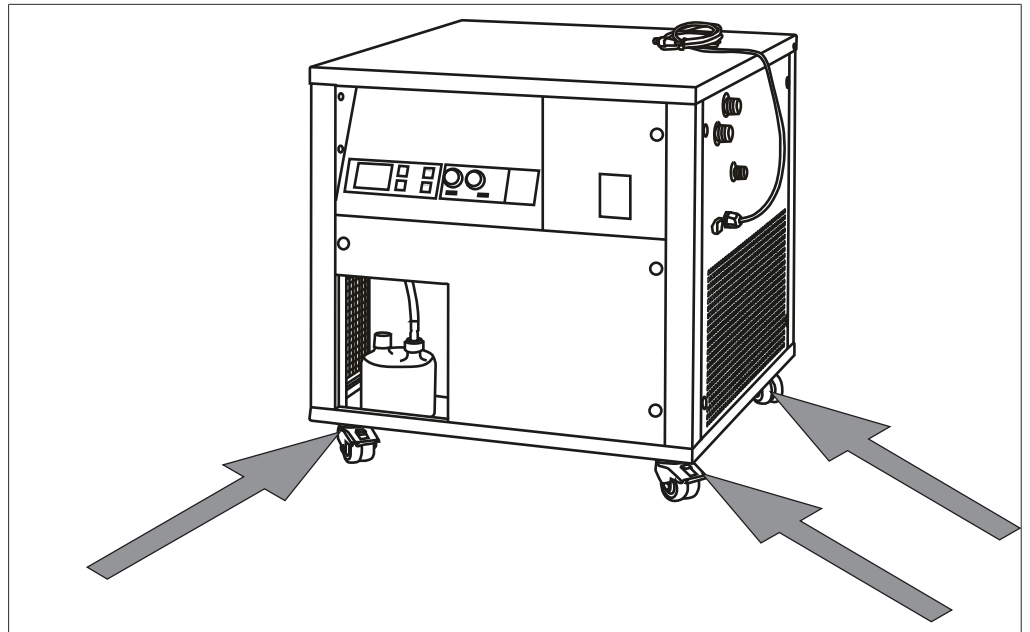


Fig. 5: Lifting the instrument

- ▶ Lift the instrument by the base plate next to the castors.

5 Installation

5.1 Before installation



NOTICE

Instrument damaged if switched on too early.

After transporting, wait twelve hours before switching on the instrument. The fluid in the cooling system requires twelve hours to collect in the refrigerant compressor.

5.2 Installation site

The installation site must meet the following requirements:

- Firm, nonslip and level surface
- Take into account the maximum product dimensions and weight. See Chapter 3.4 "Technical data", page 13
- Do not expose the instrument to any external thermal loads, such as direct solar radiation.
- Clearance on all sides of the instrument must be at least 300 mm.
- Make sure there is free flow of air to the side of the instrument.
- Do not place loose papers or cloths below or to the sides of the instrument, as these could impede the air circulation if drawn in.
- Put the instrument on the castors.
- Make sure that cables / tubes are safe routed.
- Make sure the castor brakes are locked.
- Place only BUCHI spray dryer on the instrument.
- Do not place the instrument near vibration-sensitive devices.



NOTE

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

5.3 Establishing electrical connections



NOTE

Observe the legal requirements when connecting the instrument to the power supply.

- ▶ Use additional electrical safety features (e.g., residual-current circuit breakers) to comply with local laws and regulations.

The power supply must fulfil the following conditions:

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



NOTICE

Risk of property damage and diminished performance due to use of unsuitable power cables.

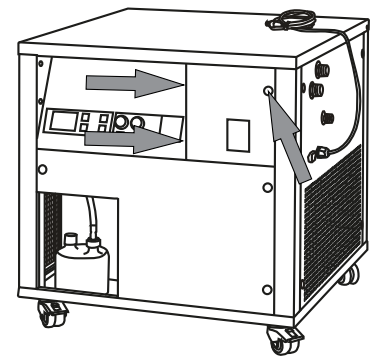
The power supply cables supplied with the product by BUCHI precisely match the requirements of the device. If other power cables that do not meet those requirements are used, the device may be damaged and/or its performance diminished.

- ▶ Use only the power supply cables supplied with the product or ordered separately from BUCHI.
- ▶ If using any other power supply cables, make sure that they match the specifications on the type plate.

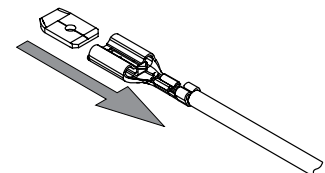
- ▶ Make sure that all connected devices are earthed.
- ▶ Plug the power cable into the connection on the instrument. See Chapter 3.2 "Configuration", page 11
- ▶ Plug the mains plug into the mains outlet socket.

5.4 Installing the oxygen sensor

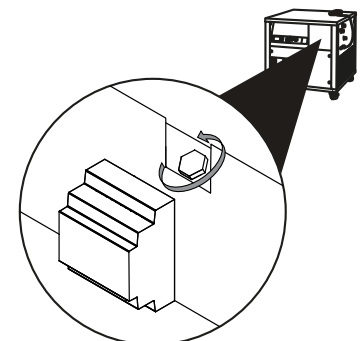
- ▶ Open the front cover oxygen sensor.



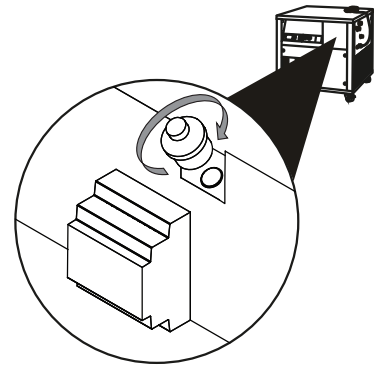
- ▶ Remove the grounding cable from the front cover oxygen sensor.



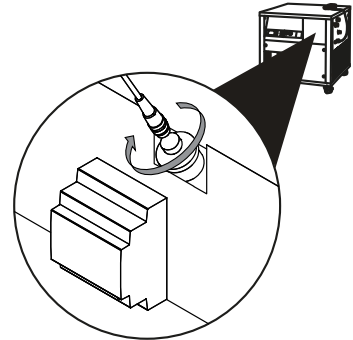
- ▶ Remove the screw plug.



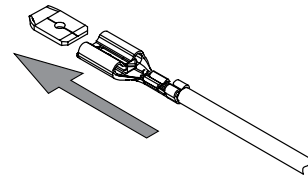
- ▶ Remove the foil from the oxygen sensor.
- ▶ Install the new oxygen sensor.



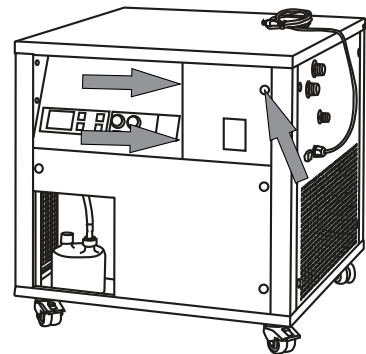
- ▶ Connect the sensor cable.



- ▶ Calibrate the sensor. See Chapter 8.1 "Calibrating the oxygen analyzer", page 29
- ▶ Install the grounding cable.



- ▶ Install the front cover

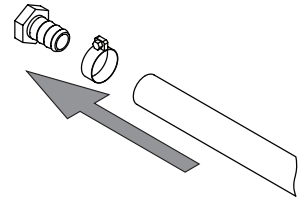


5.5 Connecting the Inert Loop B-295 SE with a spray drying system

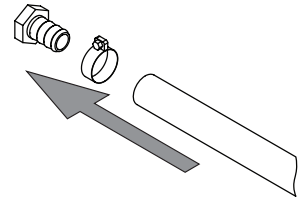
- ▶ Connect the communication cable to the spray dryer.

Connection at the spray dryer see related operation manual.

- ▶ Install the process gas tube with gas from BUCHI instrument onto the connection marked **IN**.
- ▶ Attach the tube in place with a hose clamp.

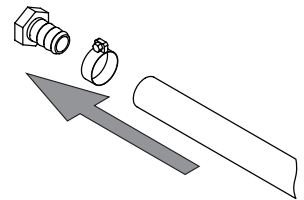


- ▶ Install the process gas tube with direction to the BUCHI instrument onto the connection marked **OUT**.
- ▶ Attach the tube in place with a hose clamp.



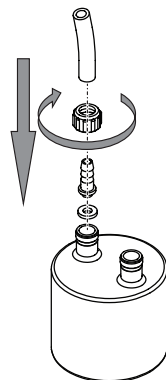
5.6 Installing the exhaust gas hose

- ▶ Install the exhaust tube onto the exhaust connection.
- ▶ Attach the tube in place with a hose clamp.
- ▶ Place the other end of the tubing to a fume hood.

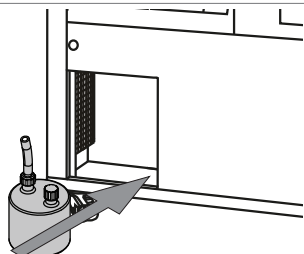


5.7 Installing the solvent receiving vessel

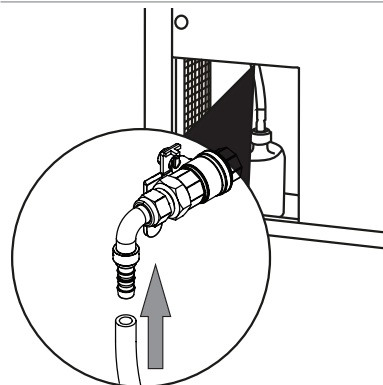
- ▶ Put the PTFE hose connection on the bottle.



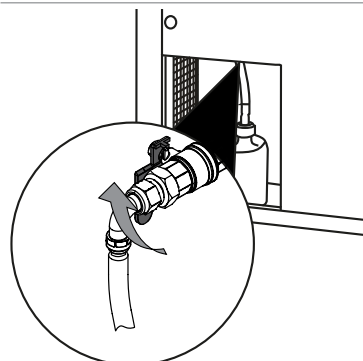
- ▶ Put the solvent receiving vessel in place.



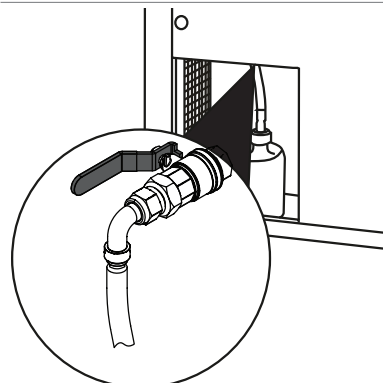
- ▶ Install the PTFE hose onto the condensate drain valve.



- ▶ Open the condensate drain valve.



- ▶ Make sure that the lever of the condensate drain valve is in the position indicated.



6 Operation

6.1 Preparing the instrument

Precondition:

- ☑ All commissioning operations have been completed. See Chapter 5 "Installation", page 18
- ▶ Press the button **Switch off**.

6.2 Starting the instrument



NOTICE

Too frequent switching on the instrument

Too frequent switching on the instrument can cause an instrument damage.

- ▶ Wait 10 minutes before restarting the instrument.



NOTE

The correct oxygen value is between 20 - 21 %.

If this value is not reached.

- ▶ Calibrate the oxygen sensor.
- ▶ Replace the oxygen sensor.

Precondition:

- ☑ The instrument is prepared. See Chapter 6.1 "Preparing the instrument", page 23
- ☑ Make sure that the solvent receiving vessel is empty. See Chapter 7.3 "Empty the solvent receiving vessel", page 28
- ▶ Switch on the connected spray dryer. See Operation manual of the connected spray dry.
 - ⇒ The signal lamp oxygen is on.
 - ⇒ The signal lamp pressure is on.
- ▶ Check the oxygen value.
- ▶ Set condenser temperature. See Chapter 6.6 "Setting condenser temperature", page 24
- ▶ Press the button **Start**.
- ▶ Make sure, that the compressor is working.
- ▶ Switch on the aspirator. See Operation manual of the connected spray dryer.
 - ⇒ The signal lamp pressure is off.
- ▶ Switch on the spray gas.
- ▶ Wait until the oxygen level is less than 6 %.
 - ⇒ The signal lamp oxygen is off.
- ▶ All following functions of the instrument are controlled by the spray drying system.

6.3 Tasks during spray drying

- ▶ Check the filling level of the solvent receiving vessel.
 - ⇒ If necessary empty it. See Chapter 7.3 "Empty the solvent receiving vessel", page 28

- ▶ Check the temperature.

6.4 Shutting down the instrument

Precondition:

- The spray drying process is finished. See operation manual of the connected spray dryer.
- ▶ Switch off the spray gas. See operation manual of the connected spray dryer.
 - ⇒ The signal lamp oxygen is on.
- ▶ Switch off temperature. See operation manual of the connected spray dryer.
- ▶ Wait until the temperature is less than 70 °C.
- ▶ Switch off the aspirator. See operation manual of the connected spray dryer.
 - ⇒ The signal lamp pressure is on.
- ▶ Empty the solvent receiving vessel. See Chapter 7.3 "Empty the solvent receiving vessel", page 28

6.5 Switching off the instrument

Precondition:

- The instrument is shut down. See Chapter 6.4 "Shutting down the instrument", page 24
- ▶ Press the button **Stop**.
- ▶ Disconnect the communication cable.
- ▶ Disconnect the power cable.

6.6 Setting condenser temperature

Increase temperature

- ▶ Press the button **UP**.

Decrease the temperature

- ▶ Press the button **DOWN**.

7 Cleaning and servicing



NOTE

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

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

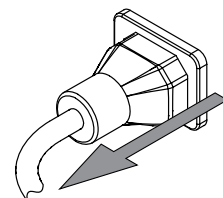
- ▶ Use only genuine BUCHI consumables and spare parts in order to ensure correct operation of the device and preserve the warranty.

7.1 Regular maintenance work

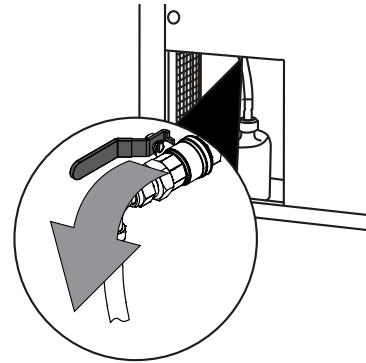
Component	Action	Frequency
Checking seals	<ul style="list-style-type: none"> ▶ Check for damages and wear ▶ Replace the seals if necessary 	Weekly
Quick connectors	<ul style="list-style-type: none"> ▶ Check the seals for damages and wear ▶ Replace the seals if necessary 	Weekly
Solvent recovery vessel	<ul style="list-style-type: none"> ▶ Check the solvent recovery vessel for defects ▶ If defective, replace the solvent recovery vessel ▶ Check the seals for damages and wear ▶ Replace the seals if necessary 	Weekly
Casing	<ul style="list-style-type: none"> ▶ Wipe down the casing with a damp cloth. ▶ If heavily soiled, use ethanol or a mild detergent. 	Weekly
Ventilation slots	<ul style="list-style-type: none"> ▶ Remove dust and foreign objects from the ventilation slots using compressed air or a vacuum cleaner 	Monthly
Oxygen Sensor	<ul style="list-style-type: none"> ▶ Calibrate the oxygen analyzer. See Chapter 8.1 "Calibrating the oxygen analyzer", page 29 	Yearly

7.2 Cleaning the instrument

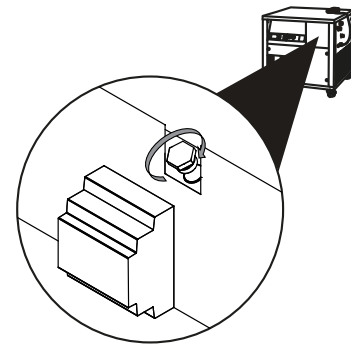
- ▶ Disconnect the power cable.



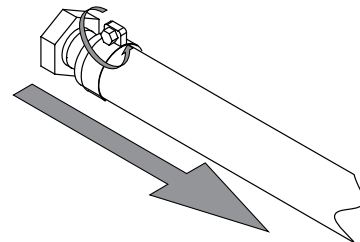
- ▶ Close the condensate drain valve.



- ▶ Remove the oxygen sensor. See Chapter 8.2.1 "Removing the oxygen sensor", page 31
- ▶ Insert the screw plug.



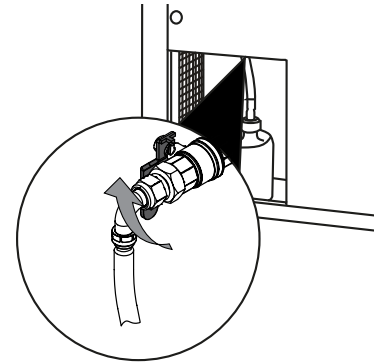
- ▶ Disconnect the process gas tubes at the connected spray dryer.



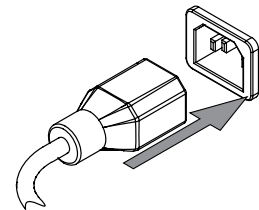
- ▶ Place the end of the process gas tubes in a top position.
- ▶ Place the end of the exhaust gas tube in a top position.
- ▶ Fill in about 2 liter cleaning liquid (e.g. ethanol) into the process gas tube connected to the connection marked **IN** until the liquid reaches the exhaust connection.
- ▶ Wait 5 minutes.

NOTICE! Check the filling level of the solvent receiving vessel during the draining process. If necessary empty it. See Chapter 7.3 "Empty the solvent receiving vessel", page 28

- ▶ Drain the cleaning liquid through the condensate drain valve and the process gas tube connected to the connection marked **OUT**.



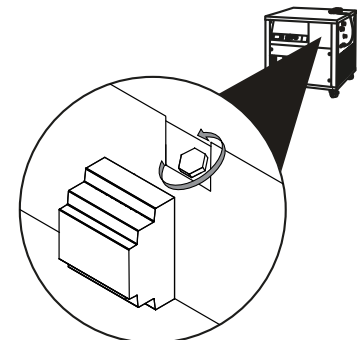
- ▶ Repeat the cleaning procedure until the washing solution is free from particles or chemicals
- ▶ Install the inlet tube to the connected spray dryer. See Chapter 5.5 "Connecting the Inert Loop B-295 SE with a spray drying system", page 20
- ▶ Place the end of the exhaust gas tube to a fume hood.
- ▶ Place the end of the outlet tube to a fume hood.
- ▶ Connect the power supply.



- ▶ Press the button Switch off.



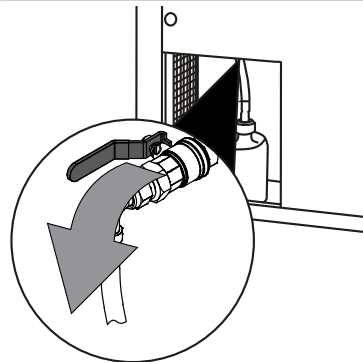
- ▶ Establish a cold dry stream of drying gas to dry the instrument.
- ▶ Dry the instrument for 10 Minutes.
- ▶ Remove the screw plug.



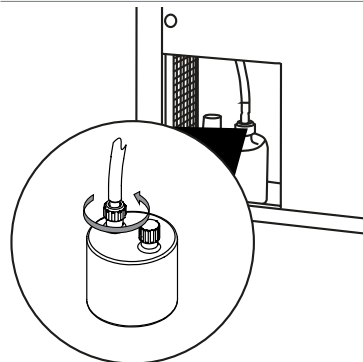
- ▶ Install the oxygen sensor. See Chapter 8.2.2 "Installing the oxygen sensor", page 32

7.3 Empty the solvent receiving vessel

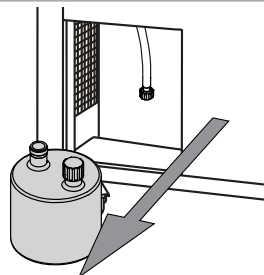
- ▶ Close the condensate drain valve.



- ▶ Disconnect the solvent receiving vessel.



- ▶ Remove the solvent receiving vessel from the instrument.



- ▶ Empty the solvent receiving vessel.
- ▶ Install the solvent receiving vessel in reverse order.

8 Help with faults

8.1 Calibrating the oxygen analyzer



NOTE

The correct oxygen value is between 20 - 21 %.

If this value is not reached.

- ▶ Calibrate the oxygen sensor.
- ▶ Replace the oxygen sensor.

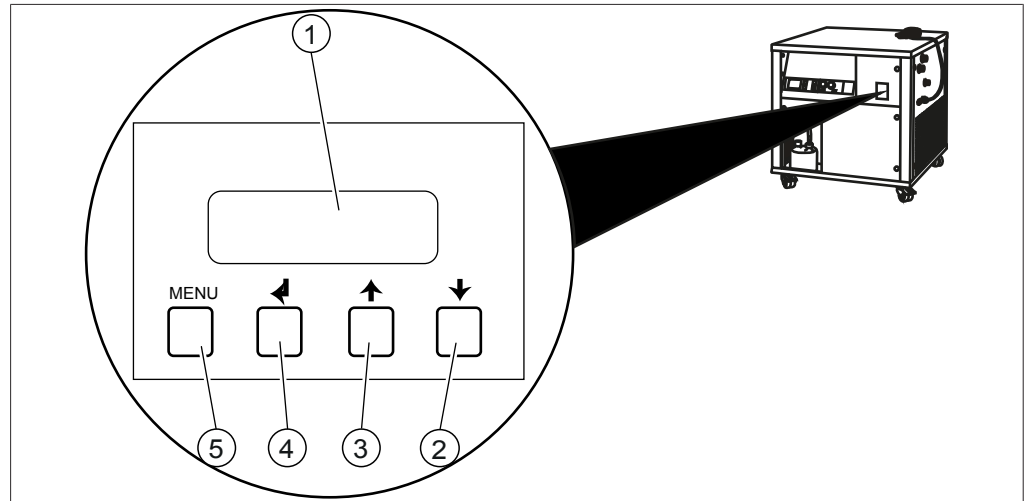


Fig. 6: Control elements oxygen sensor

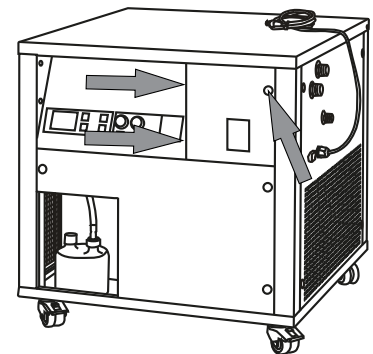
- | | | | |
|---|-----------|---|-----------|
| 1 | Display | 2 | DECREMENT |
| 3 | INCREMENT | 4 | ENTER |
| 5 | MENU | | |



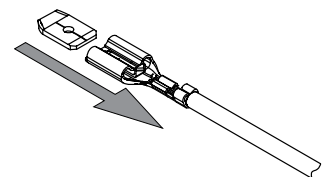
NOTE

To abort the calibration process press the button **MENU**.

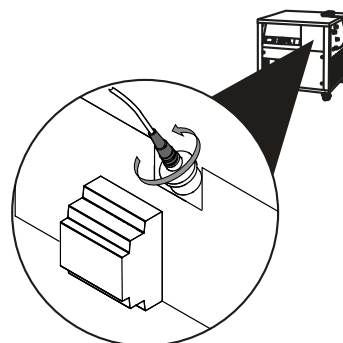
- ▶ Open the front cover oxygen sensor.



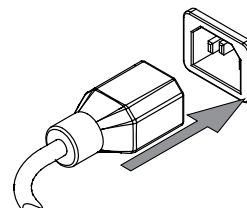
- ▶ Remove the grounding cable from the front cover oxygen sensor.



- ▶ Remove the connected oxygen sensor.



- ▶ Connect the power cable.



- ▶ Press the button **MENU**.
⇒ The display shows [PASS].



- ▶ Press the following sequence of buttons without interruption.



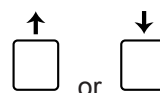
- ▶ Press the button **MENU**.
⇒ The display shows [E:1]



- ▶ Press the button **ENTER**.



- ▶ Press the button **INCREMENT** or **DECREMENT** to set calibration gas level (Air: 20.9 % O₂)



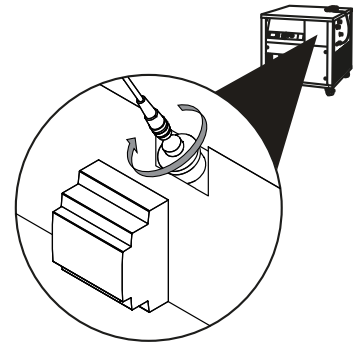
- ▶ Press button **ENTER** to span the sensor.
⇒ The display shows [- - -].



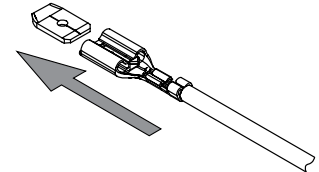
- ▶ Press the button **MENU**.
⇒ The span value will be displayed on exit as % of the initial calibration value.
⇒ The calibration is passed when the value is between 20 and 21.
⇒ The calibration is finished.



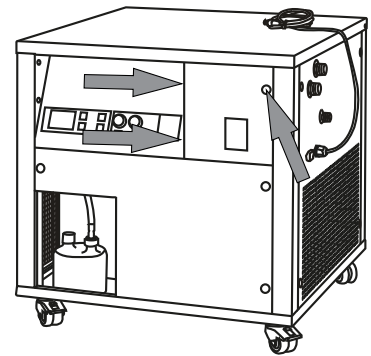
- ▶ Install the connected oxygen sensor.



- ▶ Install the grounding cable.



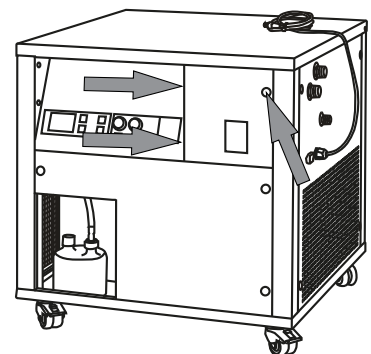
- ▶ Install the front cover.



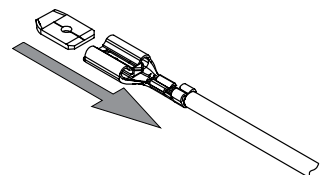
8.2 Changing the oxygen sensor

8.2.1 Removing the oxygen sensor

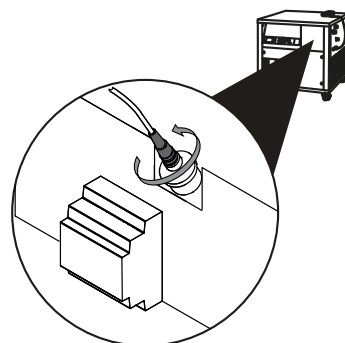
- ▶ Open the front cover oxygen sensor.



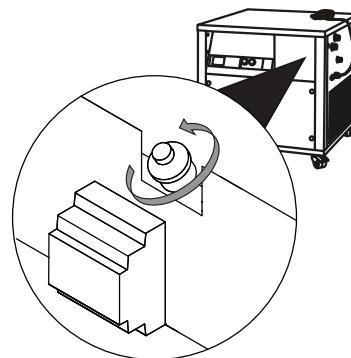
- ▶ Remove the grounding cable from the front cover oxygen sensor.



- ▶ Disconnect the sensor cable by turning the plug.



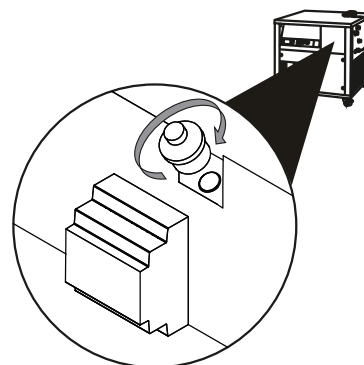
- ▶ Remove the oxygen sensor.



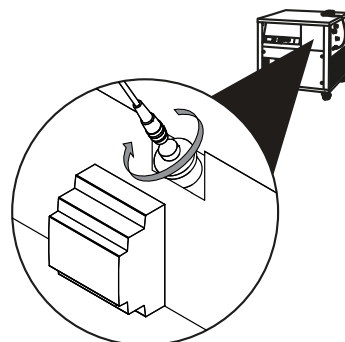
8.2.2 Installing the oxygen sensor

Precondition:

- The oxygen sensor is removed. See Chapter 8.2.1 "Removing the oxygen sensor", page 31
- ▶ Remove the foil from the oxygen sensor.
- ▶ Install the new oxygen sensor.

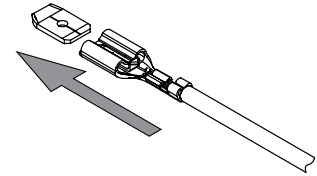


- ▶ Reconnect the sensor cable.

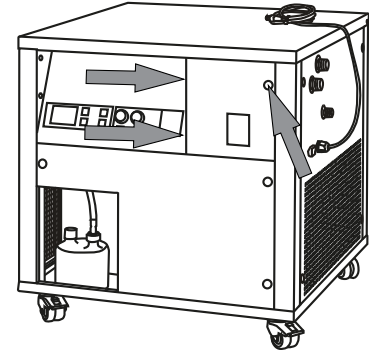


- ▶ Calibrate the sensor. See Chapter 8.1 "Calibrating the oxygen analyzer", page 29

- ▶ Install the grounding cable.



- ▶ Install the front cover



8.3 Error messages



NOTICE

Too frequent switching on the instrument

Too frequent switching on the instrument can cause an instrument damage.

- ▶ Wait 10 minutes before restarting the instrument.

Fault code	Fault	Remedy
E01	Temperature sensor defective	<ul style="list-style-type: none"> ▶ Switch off the instrument. ▶ Wait until the instrument is in ambient temperature.
E02	Temperature error	<ul style="list-style-type: none"> ▶ Remove dust and foreign objects from the ventilation slots using compressed air or a vacuum cleaner. ▶ Switch on the instrument. ▶ Contact BUCHI Customer Service.
E04	Compressor pressure fault	<ul style="list-style-type: none"> ▶ Switch off the instrument. ▶ Wait until the instrument is in ambient temperature. ▶ Switch on the instrument. ▶ Contact BUCHI Customer Service.
E05	Data error	<ul style="list-style-type: none"> ▶ Switch off the instrument. ▶ Switch on the instrument. ▶ Contact BUCHI Customer Service.
E06	Electronic circuitry overheated	<ul style="list-style-type: none"> ▶ Switch off the instrument. ▶ Wait until the instrument is in ambient temperature. ▶ Remove dust and foreign objects from the ventilation slots using compressed air or a vacuum cleaner. ▶ Switch on the instrument. ▶ Contact BUCHI Customer Service.

9 Taking out of service and disposal

9.1 Taking out of service

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

9.2 Refrigerant



CAUTION

Potential environmental hazard.

The instrument uses refrigerant. See Chapter 3.4 "Technical data", page 13

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

9.3 Disposal

The operator is responsible for proper disposal of the instrument.

- ▶ When disposing of 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 3.4 "Technical data", page 13

9.4 Returning the instrument

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

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

10 Appendix

10.1 Spare parts and accessories

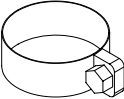
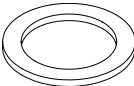

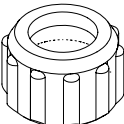
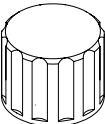
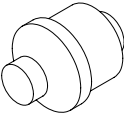
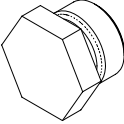
Use only genuine BUCHI consumables and spare parts in order to ensure correct, safe and reliable operation of the system.



NOTE

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

10.1.1 Spare parts

	Order no.	
Polypress tube (2 m)	046329	
Quick hose coupling	045656	
PTFE tube to receiving vessel	004105	
Seal PTFE	005155	
PTFE hose connection SVL 22	027338	
	Order no.	Image
Hose clamps	004236	
Sealing FKM for hose coupling	11056479	
Woulf Bottle	041875	
Screw cap SVL 22	003577	
Screw cap SVL22	005222	
Oxygen sensor	046348	
Oxygen sensor plug	11070257	

	Order no.	Image
Receiving vessel for solvent	040398	

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