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71525557
2021-01-31

Brief Operating Instructions
Liquiline System CA80SI

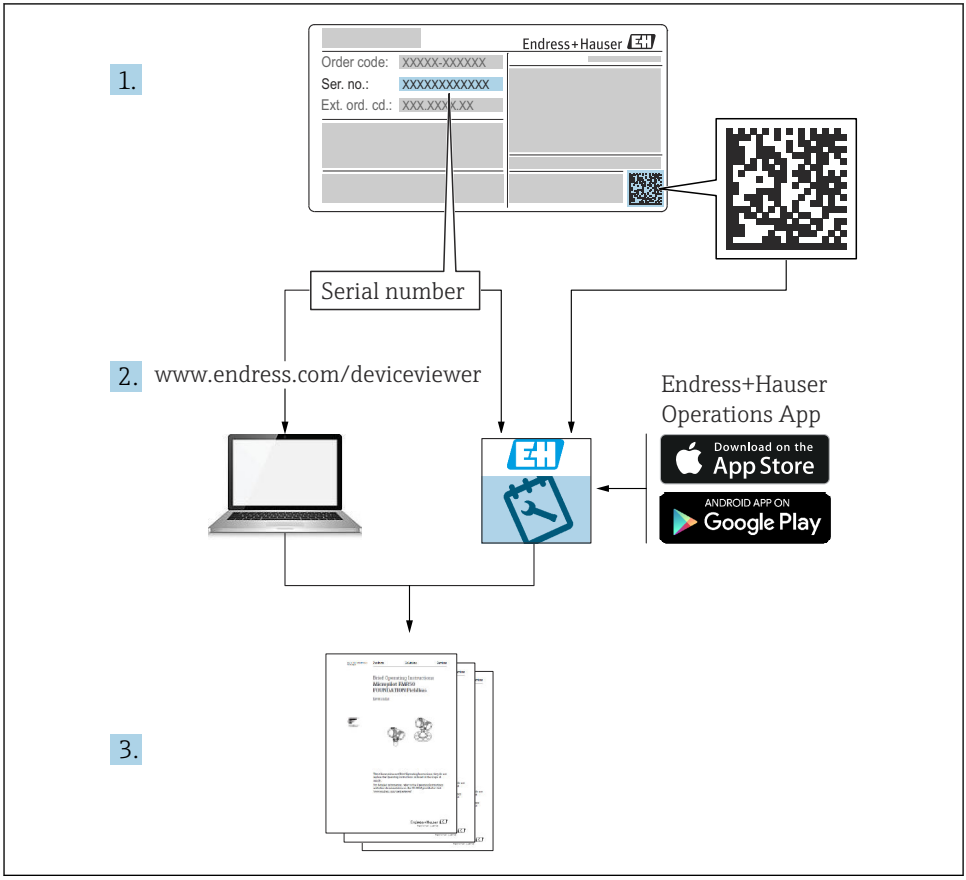
Colorimetric analyzer for silica

LENNTECH
WATER TREATMENT SOLUTIONS

These instructions are Brief Operating Instructions; they are not a substitute for the Operating Instructions pertaining to the device.

Detailed information on the device can be found in the Operating Instructions and in the other documentation available at:
- www.endress.com/device-viewer
- Smart phone/tablet: Endress+Hauser Operations App

Endress+Hauser
People for Process Automation


1.
Endress+Hauser
Order code: XXXXX-XXXXXX
Ser. no.: XXXXXXXXXXXX
Ext. ord. cd.: XXX.XXX-XXX
Serial number
2.
www.endress.com/deviceviewer
Endress+Hauser
Operations App
Download on the
App Store
ANDROID APP ON
Google Play
3.

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1 About this document

1.1 Warnings

Structure of information	Meaning
DANGER **Causes (/consequences)** If necessary, Consequences of non-compliance (if applicable) ▶ Corrective action	This symbol alerts you to a dangerous situation. Failure to avoid the dangerous situation **will** result in a fatal or serious injury.
WARNING **Causes (/consequences)** If necessary, Consequences of non-compliance (if applicable) ▶ Corrective action	This symbol alerts you to a dangerous situation. Failure to avoid the dangerous situation **can** result in a fatal or serious injury.
CAUTION **Causes (/consequences)** If necessary, Consequences of non-compliance (if applicable) ▶ Corrective action	This symbol alerts you to a dangerous situation. Failure to avoid this situation can result in minor or more serious injuries.
NOTICE **Cause/situation** If necessary, Consequences of non-compliance (if applicable) ▶ Action/note	This symbol alerts you to situations which may result in damage to property.

1.2 Symbols

- Additional information, tips
- Permitted or recommended
- Not permitted or not recommended
- Reference to device documentation
- Reference to page
- Reference to graphic
- Result of a step

1.3 Symbols on the device

- Reference to device documentation
- Caution: Hazardous voltage
- Do not dispose of products bearing this marking as unsorted municipal waste. Instead, return them to the manufacturer for disposal under the applicable conditions.

1.4 Documentation

The following instructions complement these Brief Operating Instructions and are available on the product pages on the Internet:

- Operating Instructions Liquiline System CA80SI
  - Device description
  - Commissioning
  - Operation
  - Software description (excluding sensor menus; these are described in a separate manual - see below)
  - Device-specific diagnostics and troubleshooting
  - Maintenance
  - Repair and spare parts
  - Accessories
  - Technical data
- Operating Instructions Memosens, BA01245C
  - Software description for Memosens inputs
  - Calibration of Memosens sensors
  - Sensor-specific diagnostics and troubleshooting
- Guidelines for communication via fieldbus and web server
  - PROFIBUS, SD01188C
  - Modbus, SD01189C
  - Web server, SD01190C
  - EtherNet/IP, SD01293C

2 Basic safety instructions

2.1 Requirements for personnel

- Installation, commissioning, operation and maintenance of the measuring system may be carried out only by specially trained technical personnel.
- The technical personnel must be authorized by the plant operator to carry out the specified activities.
- The electrical connection may be performed only by an electrical technician.
- The technical personnel must have read and understood these Operating Instructions and must follow the instructions contained therein.
- Faults at the measuring point may only be rectified by authorized and specially trained personnel.

Repairs not described in the Operating Instructions provided must be carried out only directly at the manufacturer's site or by the service organization.

2.2 Designated use

The Liquiline System CA80SI is a wet-chemical analyzer for almost continuous determination of the concentration of silica in ultrapure water and boiler feedwater.

The analyzer is designed for use in the following applications:
- Ultrapure water
- Boiler feedwater
- Steam and condensate analysis
- Reverse osmosis
- Desalination systems

Use of the device for any purpose other than that described poses a threat to the safety of people and of the entire measuring system, and is therefore not permitted. The manufacturer is not liable for damage caused by improper or non-designated use.

2.3 Workplace safety

As the user, you are responsible for complying with the following safety conditions:
- Installation guidelines
- Local standards and regulations
- Regulations for explosion protection

Electromagnetic compatibility
- The product has been tested for electromagnetic compatibility in accordance with the applicable international standards for industrial applications.
- The electromagnetic compatibility indicated applies only to a product that has been connected in accordance with these Operating Instructions.

2.4 Operational safety

Before commissioning the entire measuring point:

1. Verify that all connections are correct.

2. Ensure that electrical cables and hose connections are undamaged.
3. Do not operate damaged products, and protect them against unintentional operation.
4. Label damaged products as defective.

During operation:

- If faults cannot be rectified:
  products must be taken out of service and protected against unintentional operation.

⚠ CAUTION

Activities while the analyzer is in operation

Risk of injury and infection from medium!

- Before you release any hoses, make sure that no actions, such as the pumping of sample, are currently running or are due to start shortly.
- Wear protective clothing, goggles and gloves or take other suitable measures to protect yourself.
- Wipe up any spilt reagent with a disposable tissue and rinse with clear water. Then dry the cleaned areas with a cloth.

⚠ CAUTION

Risk of injury from door stop mechanism

- Always open the door fully to ensure the door stop engages properly.

2.5 Product safety

2.5.1 State-of-the-art technology

The product is designed to meet state-of-the-art safety requirements, has been tested, and left the factory in a condition in which it is safe to operate. The relevant regulations and international standards have been observed.

Devices connected to the analyzer must comply with the applicable safety standards.

2.5.2 IT security

We only provide a warranty if the device is installed and used as described in the Operating Instructions. The device is equipped with security mechanisms to protect it against any inadvertent changes to the device settings.

IT security measures in line with operators' security standards and designed to provide additional protection for the device and device data transfer must be implemented by the operators themselves.

3 Incoming acceptance and product identification

3.1 Incoming acceptance

1. Verify that the packaging is undamaged.
   ↳ Notify the supplier of any damage to the packaging.
   Keep the damaged packaging until the issue has been resolved.
2. Verify that the contents are undamaged.
   ↳ Notify the supplier of any damage to the delivery contents.
   Keep the damaged goods until the issue has been resolved.
3. Check that the delivery is complete and nothing is missing.
   ↳ Compare the shipping documents with your order.
4. Pack the product for storage and transportation in such a way that it is protected against impact and moisture.
   ↳ The original packaging offers the best protection.
   Make sure to comply with the permitted ambient conditions.

If you have any questions, please contact your supplier or your local Sales Center.

NOTICE

Incorrect transportation can damage the analyzer

▶ Always use a lifting truck or a fork-lift to transport the analyzer.

3.2 Product identification

3.2.1 Nameplate

Nameplates can be found:
- On the inside of the door on the bottom right, or on the front in the bottom right-hand corner
- On the packaging (adhesive label, portrait format)

The nameplate provides you with the following information on your device:
- Manufacturer identification
- Order code
- Extended order code
- Serial number
- Firmware version
- Ambient and process conditions
- Input and output values
- Measuring range
- Activation codes
- Safety information and warnings
- Certificate information
- Approvals as per order version

▶ Compare the information on the nameplate with the order.

3.2.2 Product identification

Product page

www.endress.com/ca80si

Interpreting the order code

The order code and serial number of your product can be found in the following locations:
- On the nameplate
- In the delivery papers

Obtaining information on the product

1. Go to www.endress.com.
2. Call up the site search (magnifying glass).
3. Enter a valid serial number.
4. Search.
   ↳ The product structure is displayed in a popup window.
5. Click on the product image in the popup window.
   ↳ A new window (**Device Viewer**) opens. All of the information relating to your device is displayed in this window as well as the product documentation.

3.2.3 Manufacturer address

Endress+Hauser Conducta GmbH+Co. KG
Dieselstraße 24
D-70839 Gerlingen

3.3 Scope of delivery

Scope of delivery
- 1 analyzer in the version ordered with optional hardware
- 1 x Brief Operating Instructions (hard copy)
- **Accessories enclosed:**
  - Wall holder unit
  - Magnetic stir bar (for installation in cuvette)
  - 10 ml dispenser with hose (for draining cuvette and sample channel)
  - SD card (optional)
  - Supply hose
  - Sample outlet hose (for sample overflow)
  - Outlet hose (for overflow at cuvette)
  - 2 m Norprene hose ID 1.6 mm (for large reagent set)
  - Cable gland M32 PA (for large reagent set)
  - Counter nut M32 PA (for large reagent set)
  - O-ring ID 29.00 W 3.00 (for large reagent set)
  - Drain plug M32x1.5 with hole 4.9 (for large reagent set)

	1-channel	2-channel	4-channel	6-channel
Filters and pressure relief valves	1 filter, 1 pressure relief valve with angle bracket	2 filters, 2 pressure relief valves with angle brackets	Panel with 4 pre-installed filters and 4 pre-installed pressure relief valves	Panel with 6 pre-installed filters and 6 pre-installed pressure relief valves
Sample channel switching	in analyzer	in analyzer	pre-installed on panel	pre-installed on panel

- If you have any queries:
  Please contact your supplier or local sales center.

3.4 Certificates and approvals

3.4.1 CE mark

The product meets the requirements of the harmonized European standards. As such, it complies with the legal specifications of the EU directives. The manufacturer confirms successful testing of the product by affixing to it the CE mark.

3.4.2 Other standards and guidelines

cCSAus

The product meets the requirements as per "CLASS 2252 06 - Process Control Equipment" and "CLASS 2252 86 - Process Control Equipment". It is tested to Canada and USA standards: CAN/CSA-C22.2 No. 61010-1-12 UL Std. No. 61010-1 (3rd Edition).

EAC

The product has been certified according to guidelines TP TC 004/2011 and TP TC 020/2011 which apply in the European Economic Area (EEA). The EAC conformity mark is affixed to the product.

4 Installation

⚠ CAUTION

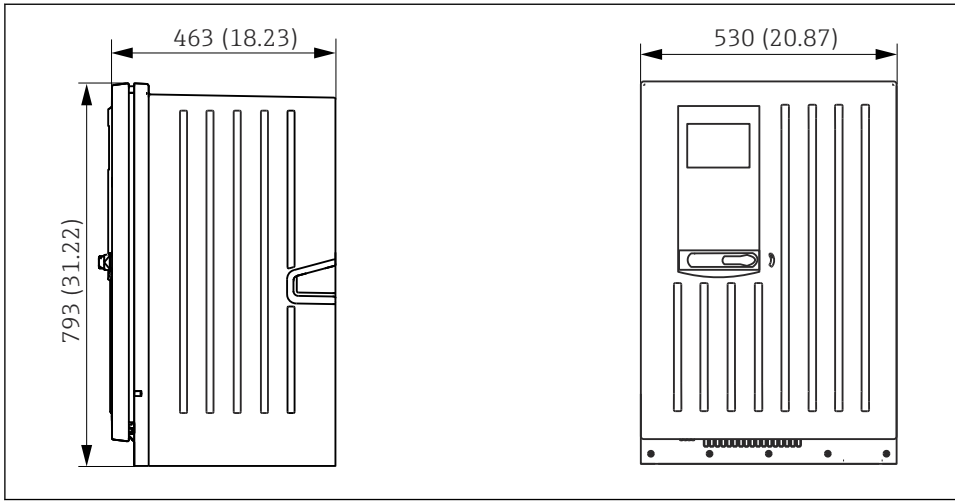
Incorrect transportation can cause injury and damage the device

- Always use a lifting truck or a fork-lift to transport the analyzer. Two people are needed for the installation.
- Lift the device by the recessed grips.

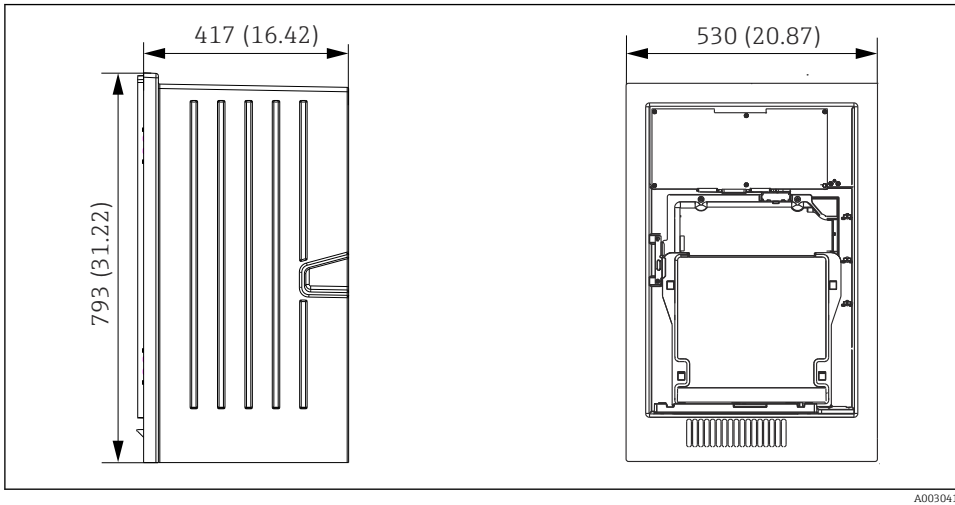
4.1 Installation conditions

The device can be installed in the following ways:
- Mounted on a wall
- Mounted on a base

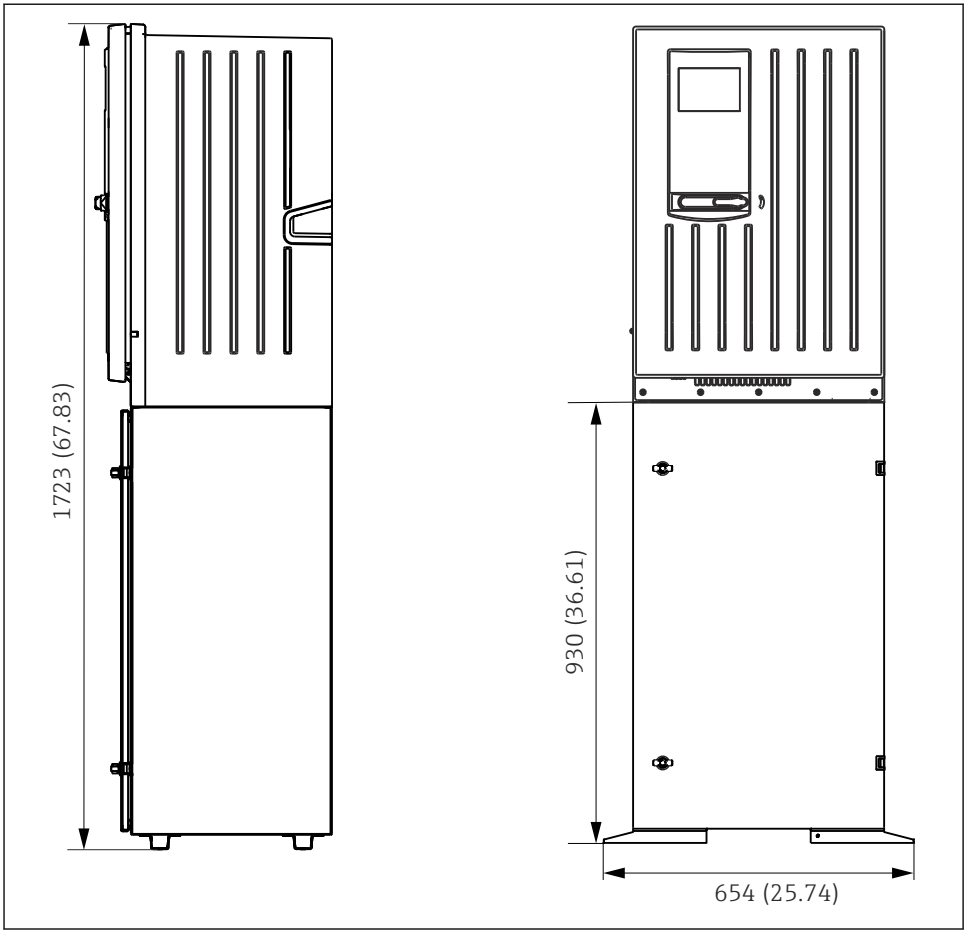
4.1.1 Dimensions



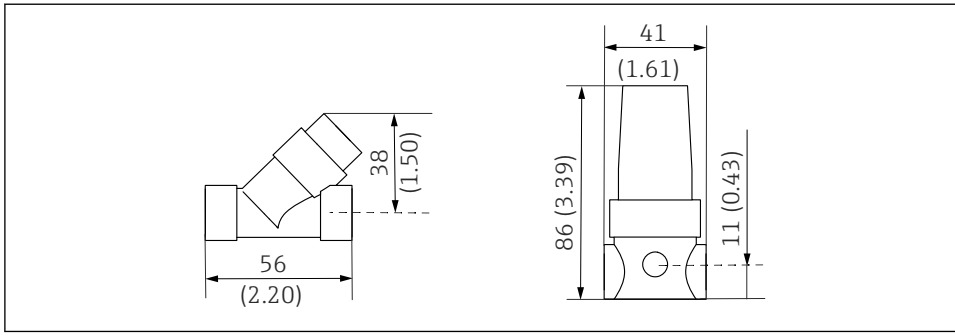
1 *Liquiline System CA80 closed version, dimensions in mm (in)*



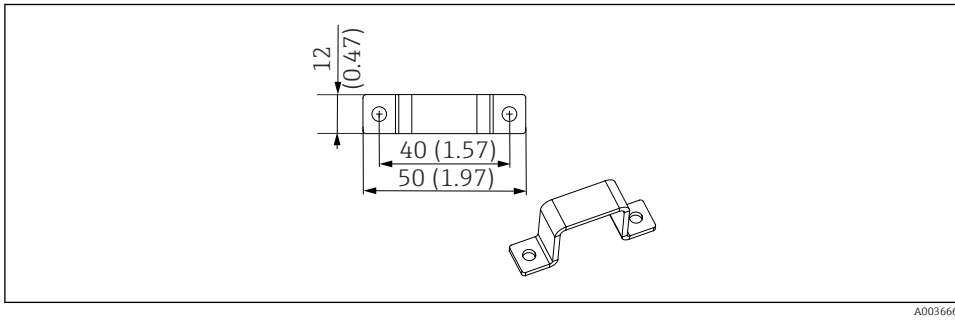
2 *Liquiline System CA80 open version, dimensions in mm (in)*



3 Liquiline System CA80 with base, dimensions in mm (in)

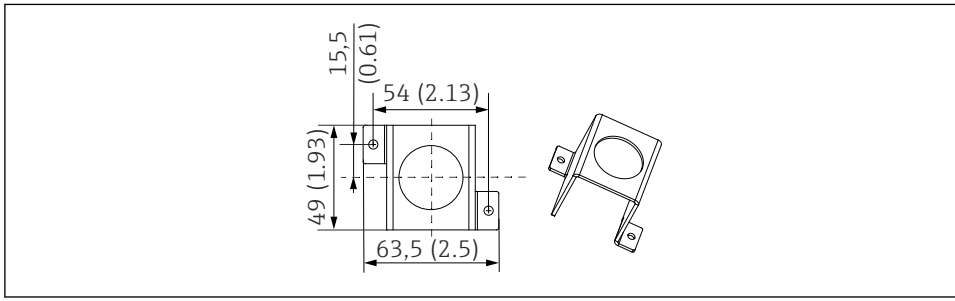


4 CA80SI 1-/2-channel version: Filter (left), pressure-reducing valve (right), dimensions in mm (in)



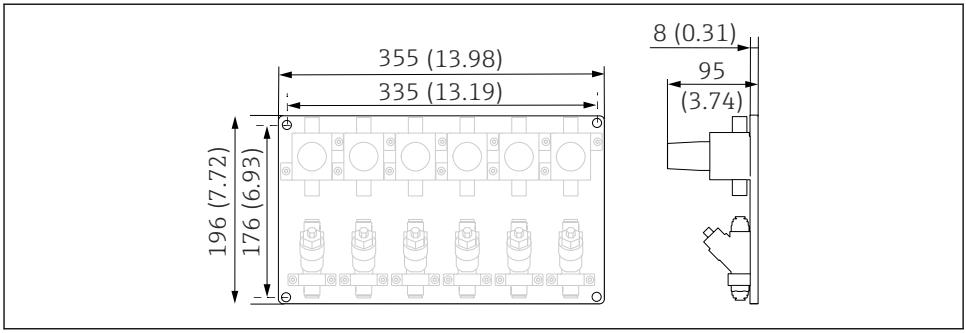
5 Dimensions of angle bracket for filter

--- *Fasteners (2 x M5)*

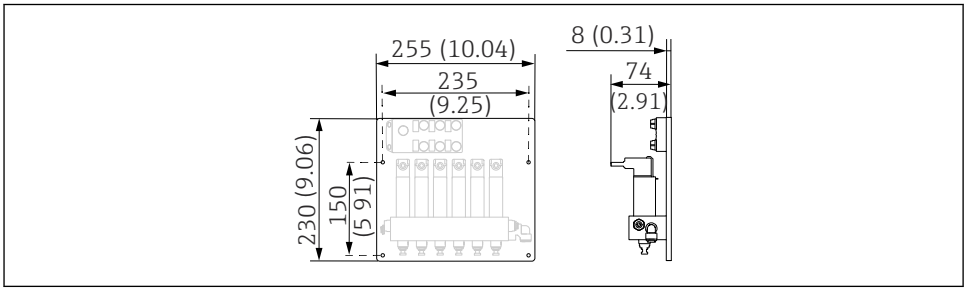


6 Dimensions of angle bracket for pressure relief valve

--- *Fasteners (2 x M5)*



7 CA80SI 4-/6-channel version: Panel with pressure-reducing valves and filters, dimensions in mm (in)



8 CA80SI 4-/6-channel version: Panel with sample channel switching, dimensions in mm (in)

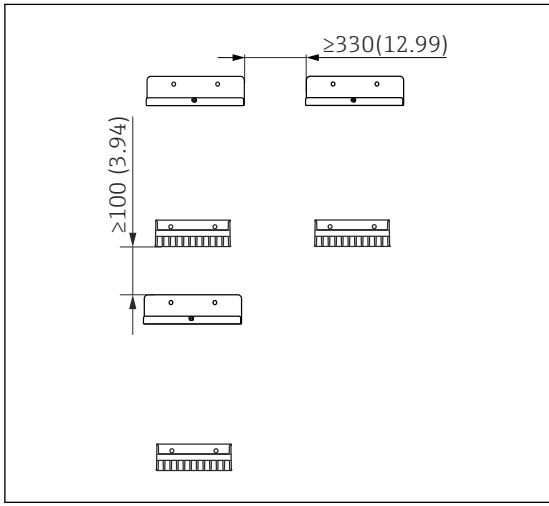
4.1.2 Mounting location

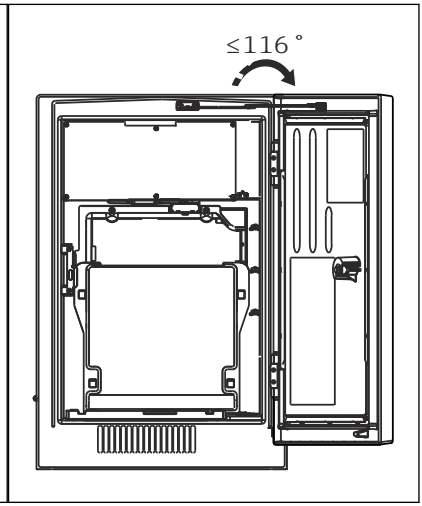
Note the following when erecting the device:

- If mounting on a wall, make sure that the wall has sufficient load-bearing capacity and is fully perpendicular.
- If mounting on a base, erect the device on a level surface.
- Protect the device against additional heating (e.g. from a heating system).
- Protect the device against mechanical vibrations.
- Protect the device against corrosive gases, e.g. hydrogen sulfide (H_2S) and chlorine gases.
- Make sure to pay attention to the maximum height difference and the maximum distance from the sampling point.
- Ensure that sample outlet hose "D" and outlet hose "W" can drain freely , without any siphoning effects.
- Make sure air can circulate freely at the front of the housing.
- Open analyzers (i.e. analyzers that are supplied without a door) may only be erected in closed areas or in a protective cabinet or similar facility.

4.1.3 Spacing requirements when mounting

Spacing required for installing analyzer

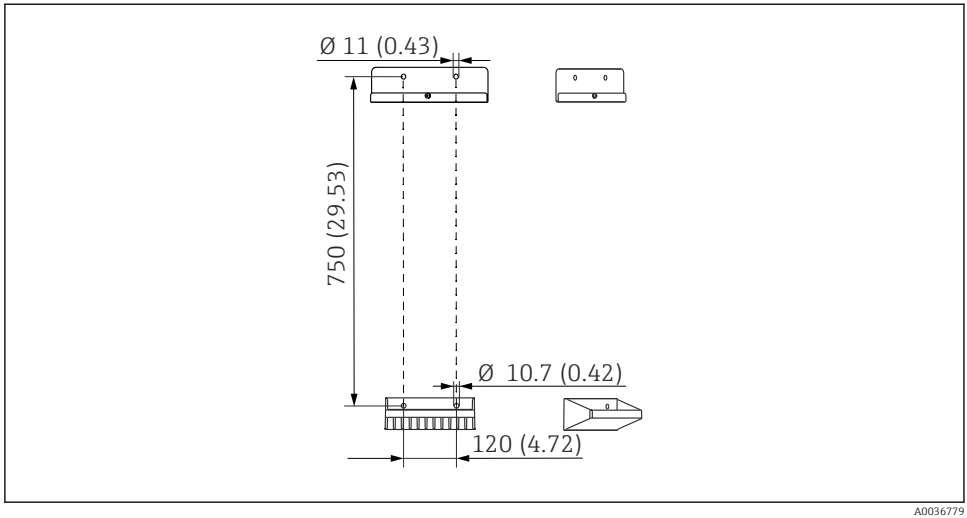




9 Minimum spacing required for mounting. Engineering unit mm (in).

10 Maximum opening angle

Spacing required for installing wall-mount version



11 Holder unit dimensions. Engineering unit mm (in)

4.2 Mounting the analyzer

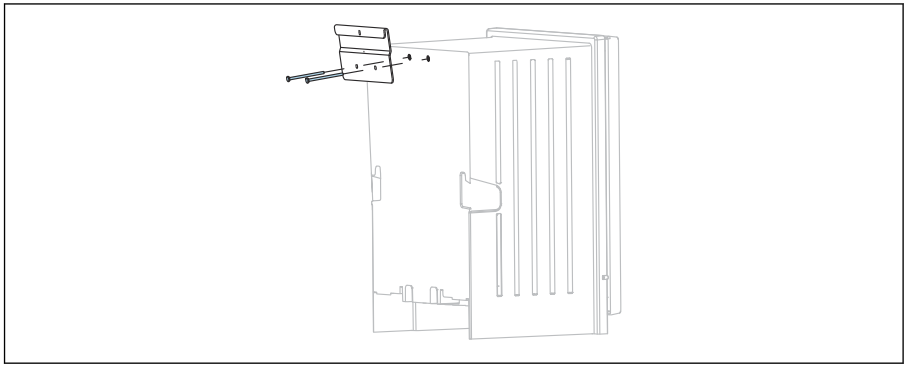
4.2.1 Mounting the analyzer on a wall

⚠ CAUTION

Incorrect installation can cause injury and damage the device

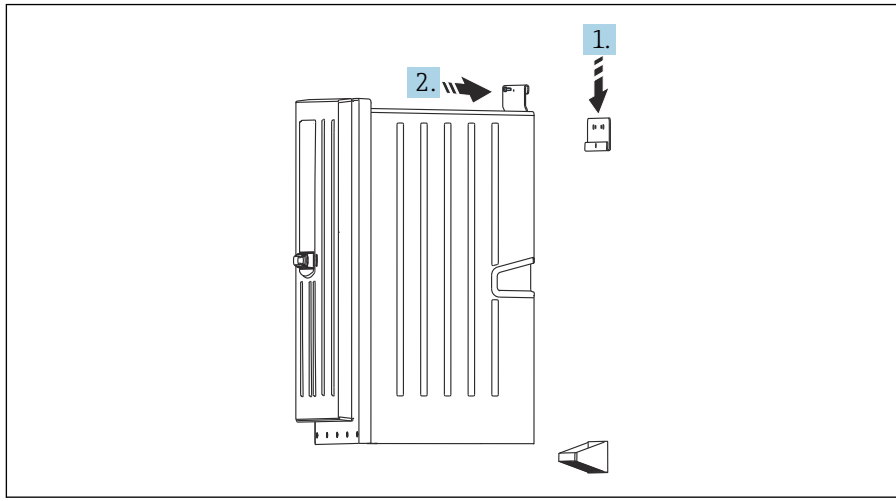
- ▶ If mounting on a wall, check that the analyzer is fully hooked into the wall holder unit at the top and bottom, and secure the analyzer to the upper wall holder unit using the securing screw.

The mounting materials required to secure the device to the wall are not supplied.

1. Provide the mounting materials to secure the device to the wall (screws, wall plugs) onsite.
2. Mount the wall holder unit (2 parts) on the wall.
3. 

   Secure the mount on the housing.

4.



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Hook the analyzer into the wall holder unit (1).

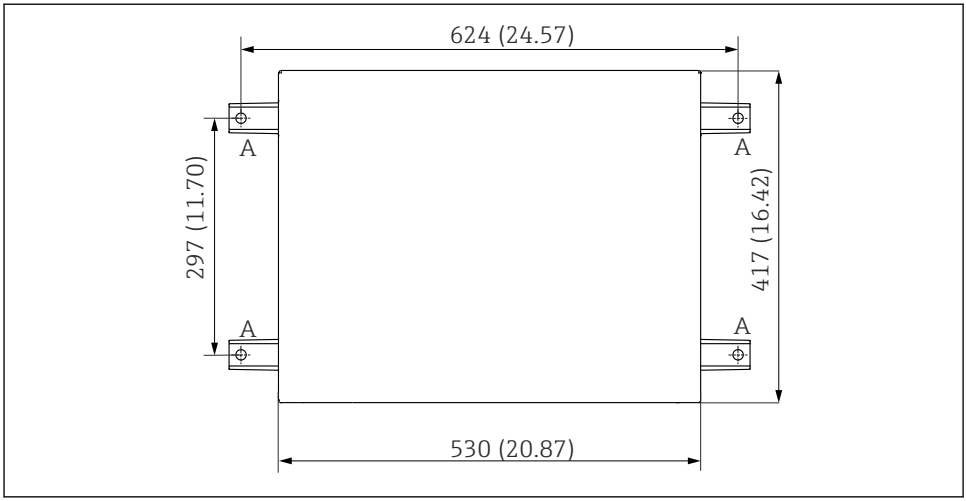
5. Fix the mount and wall holder unit in place with the screw supplied (2).

4.2.2 Installing version with analyzer stand

⚠ CAUTION

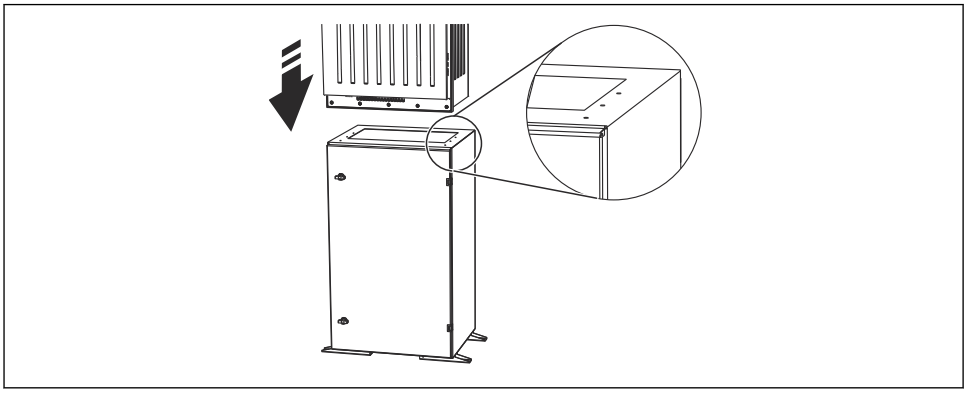
Incorrect installation can cause injury and damage the device

- ► If using the version with analyzer stand, make sure that the analyzer stand is secured to the floor.



12 *Foundation plan*

A Fasteners (4 x M10)
--- Dimensions of Liquiline System CA80

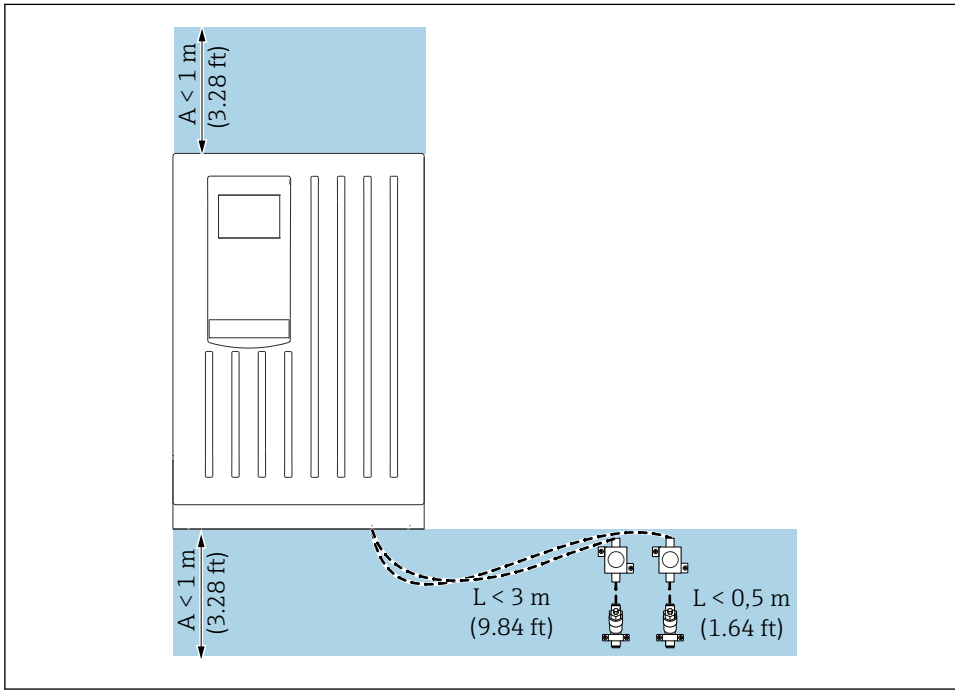


13 *Securing the base*

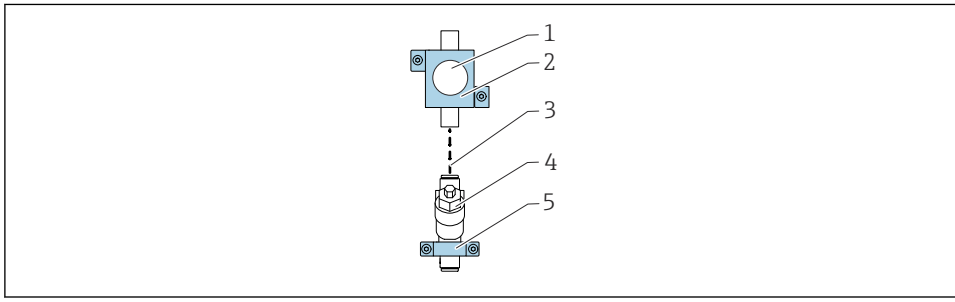
1. Screw the base to the ground.
2. With 2 people, lift the analyzer and fit it on the base. Use the recessed grips.
3. Secure the base to the analyzer using the 6 screws supplied.

4.2.3 1-/2-channel version: Installing pressure relief valve and filter

1-/2-channel device: Installation area for pressure relief valve and filter

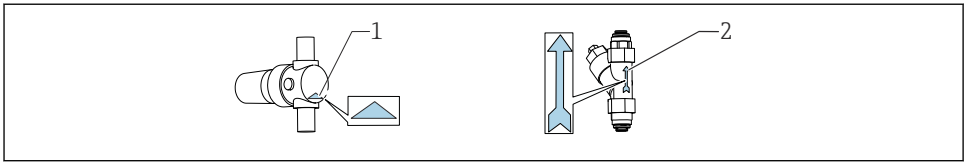


14 *Permitted installation area, engineering unit m (ft)*



15 *Installing angle brackets for pressure relief valve and filter*

1 *Pressure relief valve*
2 *Angle bracket for pressure relief valve*
3 *Hose piece (polyurethane hose, length should be < 0.5 m (1.64 ft))*
4 *Filter*
5 *Angle bracket for filter*



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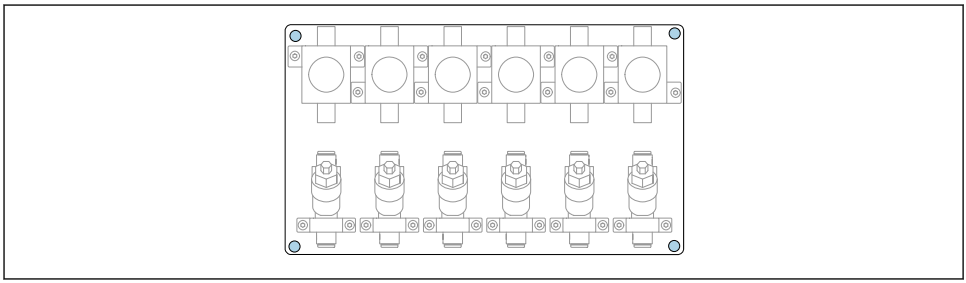
1 Correct flow direction of the pressure relief valve (indicated by triangle on pressure relief valve)
2 Correct flow direction of filter (indicated by arrow on filter)

1. Cut hose piece (polyurethane hose) to the required length (< 0.5 m (1.64 ft)).
2. Mount pressure relief valve in angle bracket: Unscrew coupling nut, guide pressure relief valve through round opening, screw coupling nut back on.
3. Attach the hose piece to the push-in connector of the pressure relief valve.
4. Mount the pressure relief valve on a level surface, e.g. on a panel. Note the direction of flow.
5. Mount the filter with the angle bracket on a level surface, e.g. on a panel. Note the direction of flow. Connect the hose piece from the pressure relief valve to the push-in connector of the filter.

4.2.4 4-/6-channel version: Installing panel with pressure relief valves and filters

Mounting materials are not supplied.

▶ Provide the mounting materials onsite.



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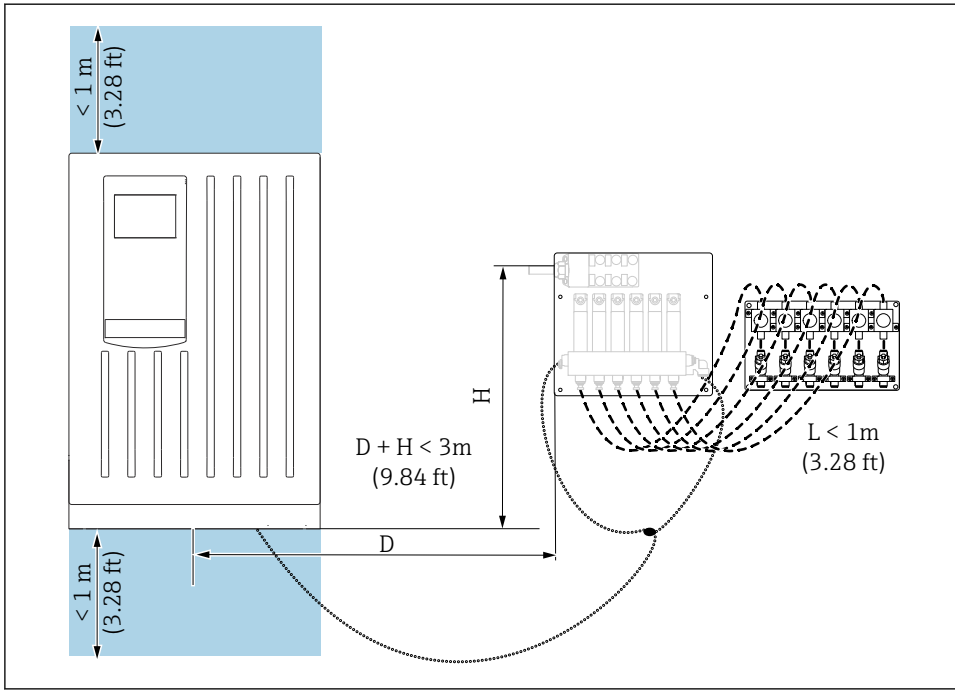
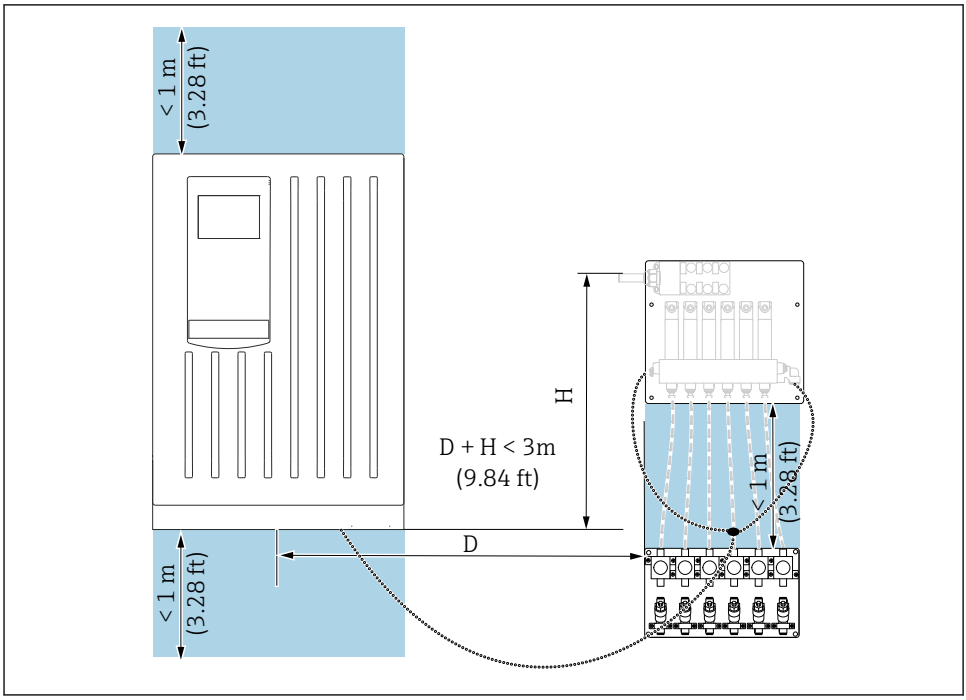
16 Panel with pressure relief valves and filters

4-/6-channel device: Installation area for sample channel switching and panel with pressure relief valves and filters



17 *Permitted installation area, can be installed to the left or right of the analyzer, engineering unit m (ft)*

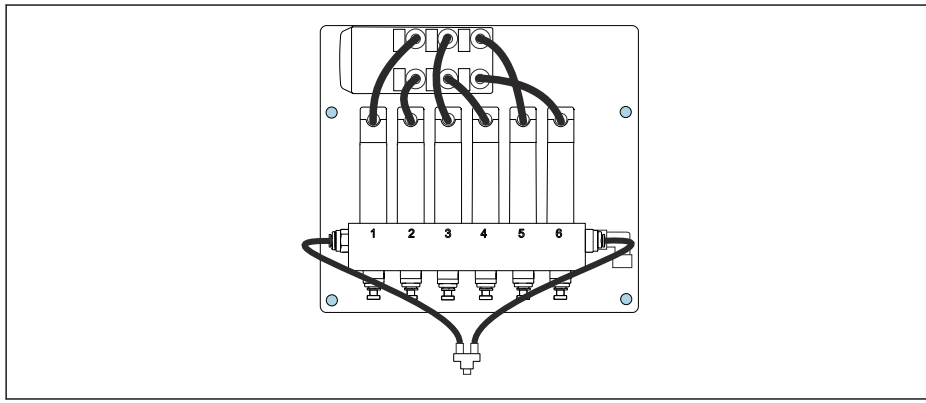


18 *Permitted installation area, engineering unit m (ft)*

4.2.5 4-/6-channel version: Installing panel with sample channel switching

Mounting materials are not supplied; they must be provided by the customer onsite.

▶



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Mount the panel via the mounting boreholes (blue).

Panel dimensions → 14

4.3 Post-installation check

After mounting, check all the connections to ensure they are secure.

5 Electrical connection

WARNING

Device is live!

Incorrect connection may result in injury or death!

- ▶ The electrical connection may be performed only by an electrical technician.
- ▶ The electrical technician must have read and understood these Operating Instructions and must follow the instructions contained therein.
- ▶ **Prior** to commencing connection work, ensure that no voltage is present on any cable.
- ▶ Before establishing the electrical connection, verify that the pre-installed power cable meets the local national electrical safety specifications.

5.1 Connection conditions

Power supply cable	Power supply cable with safety plug Cable length 4.3 m (14.1 ft) Order version CA80xx-CA (CSA C/US General Purpose): Power supply cable as per North American standard
Mains voltage	The maximum mains voltage fluctuation may not be more than ±10% of the values indicated on the nameplate.
Analog, signal and transmission lines	e.g. LiYY 10 x 0.34 mm^2

5.2 Connecting the analyzer

NOTICE

The device does not have a power switch

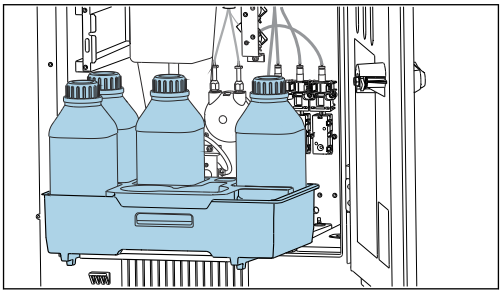
- ▶ You must install the device near (distance < 3 m (10 ft)) an easily accessible and fused plug socket so that it can be disconnected from the power supply.
- ▶ Comply with the instructions for protective grounding when installing the analyzer.

5.2.1 Routing the cable in the connection compartment

The analyzer is supplied with a pre-installed power cable.

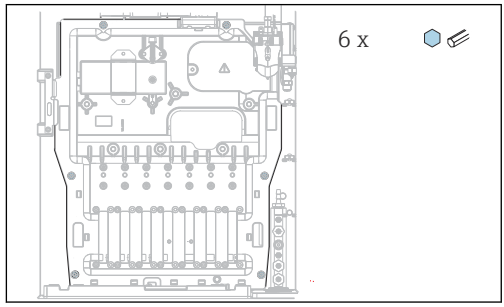
- For cabinet versions, the cable length is approx. 4.3 m (14.1 ft) from the base of the housing.
- For analyzer stands, the cable length is approx. 3.5 m (11.5 ft) from the foundation.

Connection of analog inputs and outputs, Memosens sensors or digital fieldbuses

1. 

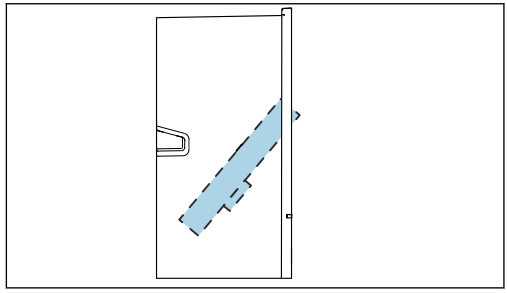
   Remove the bottle tray: Lift up the recessed grip slightly and pull it towards the front.
2. Remove all liquid-bearing sample lines.

3.



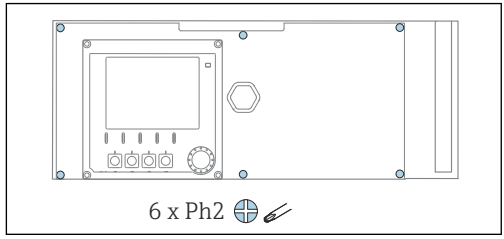
Release the 6 screws on the carrier board using a Torx screwdriver (T25).

4.



Fold out the carrier board towards the front and remove.

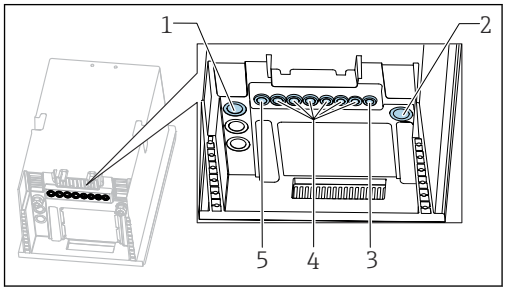
5.



Release the 6 screws on the electronics compartment cover using a Phillips-head screwdriver and fold out the cover towards the front.

6. **Only for order versions with G or NPT glands:**
Replace the pre-installed M-thread cable glands with the G or NPT cable glands that are enclosed. This does not affect the M32 hose glands.

7.



1 Sample outlet hose "D" and either sample inlet hose SP1 and SP2 (1-/2-channel version) or SPx (4-/6-channel version)
2 Outlet hose "W"
3 4-/6-channel version: Cable connection for panel
4 Connections for sensors, signal lines
5 Power cable (factory-connected)

Guide the cables through the cable glands on the bottom of the device.

For all versions

8. Route the cables on the rear panel of the device so that they are properly protected. Use cable clips.
9. Guide the cable to the electronics compartment.

After connecting:

1. Secure the electronics compartment cover with the 6 screws.
2. Fold up the carrier board and use the 6 screws to secure it after connecting.
3. Tighten the cable glands on the bottom of the device to secure the cables.
4. Place the bottle tray back into the housing.

5.3 Ensuring the degree of protection

Only the mechanical and electrical connections which are described in these instructions and which are necessary for the required, designated use, may be carried out on the device delivered.

► Exercise care when carrying out the work.

Individual types of protection permitted for this product (impermeability (IP), electrical safety, EMC interference immunity, Ex protection) can no longer be guaranteed if, for example :
- Covers are left off
- Different power units to the ones supplied are used
- Cable glands are not sufficiently tightened (must be tightened with 2 Nm (1.5 lbf ft) for the permitted level of IP protection)
- Unsuitable cable diameters are used for the cable glands
- Modules are not fully secured

- The display is not fully secured (risk of moisture entering due to inadequate sealing)
- Loose or insufficiently tightened cables/cable ends
- Conductive cable strands are left in the device

5.4 Post-connection check

WARNING

Connection errors

The safety of people and of the measuring point is at risk! The manufacturer does not accept any responsibility for errors that result from failure to comply with the instructions in this manual.

▶ Put the device into operation only if you can answer **yes** to **all** the following questions.

Device condition and specifications

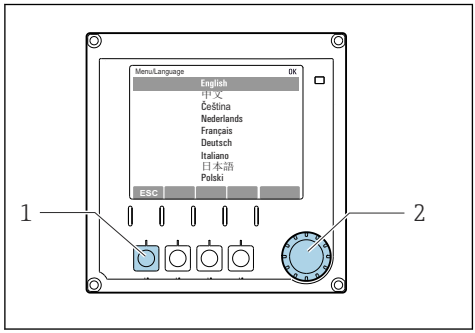
▶ Are the device and all the cables free from damage on the outside?

Electrical connection

▶ Are the mounted cables strain relieved?
▶ Are the cables routed without loops and cross-overs?
▶ Are the signal cables correctly connected as per the wiring diagram?
▶ Are all plug-in terminals securely engaged?
▶ Are all the connection wires securely positioned in the cable terminals?

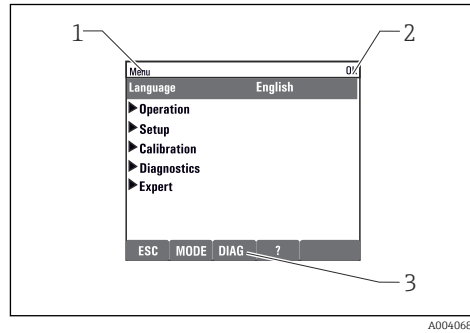
6 Operation options

6.1 Structure and function of the operating menu



19 *Display (example)*

1 *Soft key (press function)*
2 *Navigator (jog/shuttle and press/hold function)*



20 *Display (example)*

1 *Menu path and/or device designation*
2 *Status indicator*
3 *Assignment of soft keys, ESC: Go back, MODE: Fast access to frequently used functions, DIAG: Link to Diagnostics menu ?: Help, if available*

7 Commissioning

Before the supply voltage is applied
On account of the device design, high switch-on currents occur when the device is commissioned at low temperatures. The power value indicated on the nameplate refers to the power consumption after one minute of operation when the device is commissioned at 5 °C (41 °F).

Activities while the analyzer is in operation

Risk of injury and infection from medium!
- ▶ Before you release any hoses, make sure that no actions, such as the pumping of sample, are currently running or are due to start shortly.
- ▶ Wear protective clothing, goggles and gloves or take other suitable measures to protect yourself.
- ▶ Wipe up any spilt reagent with a disposable tissue and rinse with clear water. Then dry the cleaned areas with a cloth.

7.1 Preparatory steps

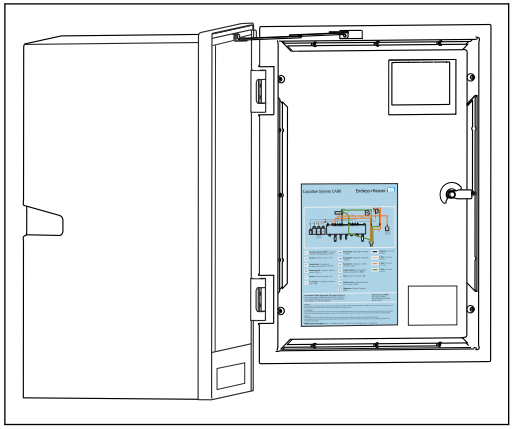
7.1.1 Commissioning steps

When commissioning the device for the first time, the device must be rinsed with process medium for a number of hours (recommended: 16 hours) so that a reliable zero point calibration can be performed.

To commission, proceed as follows:

1. Mount the analyzer on a wall or on a base.
2. 1-/2-channel version: Mount pressure relief valve and filter with angle brackets.→ 🖹 19
3. 4-/6-channel version: Mount panel with pressure relief valves and filters.→ 🖹 20
4. 4-/6-channel version: Install the panel with sample channel switching. → 🖹 23
5. Route the cable for sensor inputs and outputs.
6. Connect sample outlet hose "D".
7. Connect sample inlet hose "SPx". → 🖹 31.
8. Connect outlet hose "W" (outflow from cuvette).
9. Place the magnetic stir bar in the measuring chamber of the cuvette.
10. Connect the power supply. → 🖹 37
    ↳ The measuring device switches on.
11. Perform basic configuration of measuring device.→ 🖹 37
12. Configure the sample flow.→ 🖹 38
13. Connect reagents and standard.
14. Start the measurement.
15. Attach cover in front of cuvette assembly.

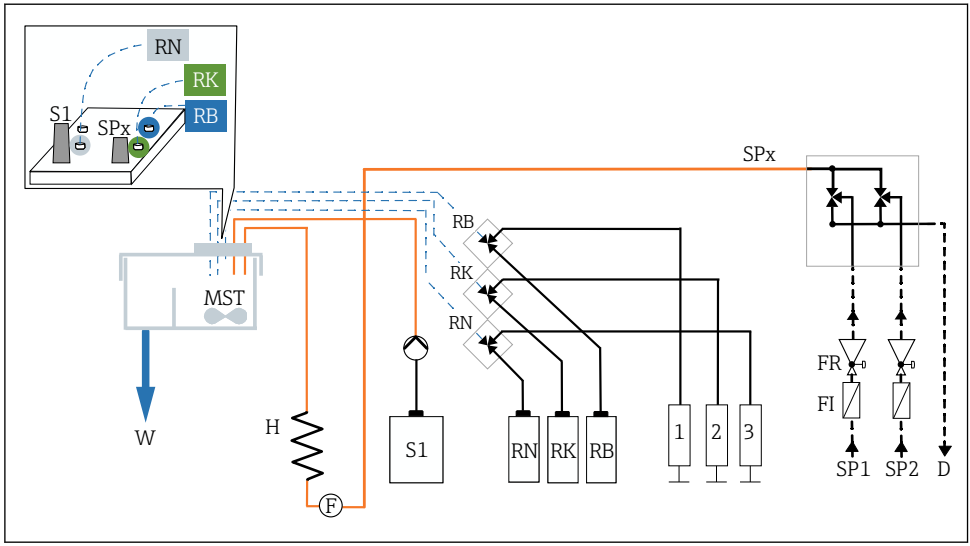
7.1.2 Hose connection diagram



The diagrams below reflect the status at the time of issue of this documentation. The hose connection diagram that applies for your device version is provided on the inside of the door of the analyzer.

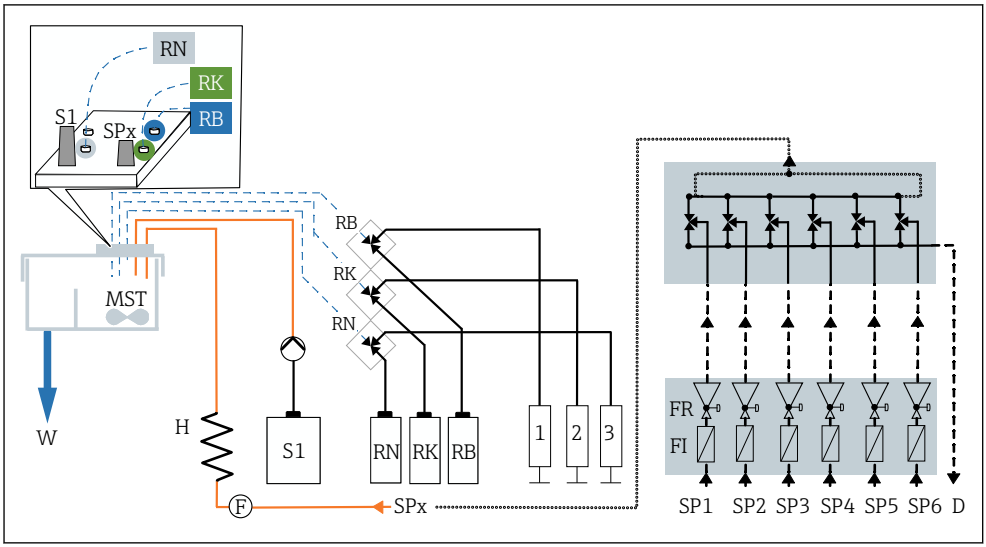
- Only connect the hoses as specified in this diagram.

21 *Hose connection diagram*



22 *Hose connection diagram for 1-/2-channel version*

D	*Sample outlet*	*RB..N*	*Reagents RB, RK, RN*
F	*Flow sensor*	*S1*	*Standard 1*
FR	*Pressure relief valve*	*SP1..6*	*Sample inlets*
FI	*Filter*	*W*	*Outlet*
H	*Heater*	*1, 2, 3*	*Dispensers*
MST	*Magnetic stirrer*		



23 *Hose connection diagram for 4-/6-channel version*

D	*Sample outlet*	*RB..N*	*Reagents RB, RK, RN*
F	*Flow sensor*	*S1*	*Standard 1*
FR	*Pressure relief valve*	*SP1..6*	*Sample inlets*
FI	*Filter*	*W*	*Outlet*
H	*Heater*	*1, 2, 3*	*Dispensers*
MST	*Magnetic stirrer*		

7.1.3 Connecting the sample outlet hose "D"

The liquid from sample outlet hose "D" contains only sample mixture. It can be disposed of accordingly.

Ensure that it can drain freely: Route sample outlet hose "D" without counterpressure.

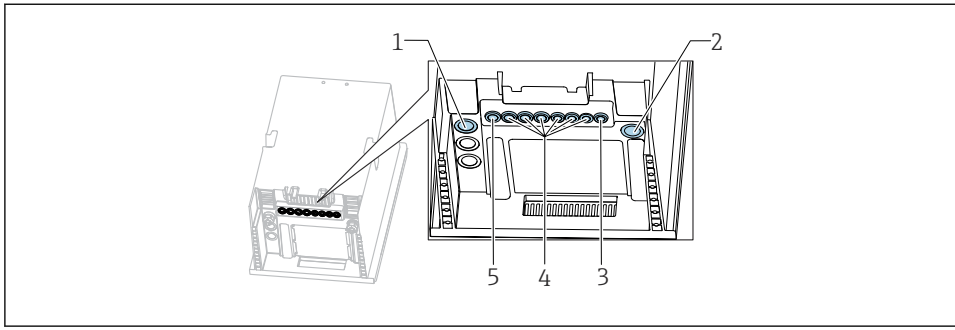
1-/2-channel version

1. Guide sample outlet hose "D" out of the housing via a hose gland.
2. Attach sample outlet hose "D" to the outlet of the sample channel switching and secure using a PG coupling with the appropriate clamping unit.

4-/6-channel version

▶ Attach sample outlet hose "D" to the outlet of the panel with the sample channel switching.

7.1.4 Connecting the sample inlet hose "SPx"



A0036036

1 *Sample outlet hose "D" and either sample inlet hose SP1 and SP2 (1-/2-channel version) or SPx (4-/6-channel version)*
2 *Outlet hose "W"*
3 *4-/6-channel version: Cable connection for panel*
4 *Connections for sensors, signal lines*
5 *Power cable*

1-channel version

1. Ensure a constant and sufficient supply of sample at the installation location.
2. Remove the drain plug from sample channel 1. Do not remove the drain plug in sample channel 2.
3. Connect sample inlet hose SP1 to sample channel 1 and guide it out of the housing via a hose gland.
4. Secure sample inlet hose SP1 with a PG gland with the appropriate clamping unit.
5. Connect sample inlet hose SP1 to the pressure relief valve. Keep the length of hose between the sample inlet hose SP1 and the pressure relief valve as short as possible: max. 3 m (9.84 ft).
6. Connect the pressure relief valve to the filter. Keep the length of hose as short as possible, max. 0.5 m (1.64 ft).

2-channel version

1. Ensure a constant and sufficient supply of sample at the installation location.
2. If a sample channel is not used:
   Do not remove the red drain plug in the valve.
3. Remove the drain plug from the sample channels.
4. Connect sample inlet hoses SP1 and SP2 to the sample channels and guide them out of the housing via a hose gland.
5. Secure sample inlet hoses SP1 and SP2 with a PG gland with the appropriate clamping unit.

6. Connect sample inlet hoses SP1 and SP2 to the pressure relief valves. Keep the length of hose between the sample inlet hose and the pressure relief valve as short as possible: max. 3 m (9.84 ft).
7. Connect the pressure relief valve to the filter. Keep the length of hose as short as possible, max. 0.5 m (1.64 ft).

4-/6-channel version

1. Ensure a constant and sufficient supply of sample at the installation location.
2. If a sample channel is not used:
   Do not remove the red drain plug in the valve.
3. Remove the drain plug from the sample channels.
4. Using the SPx sample inlet hoses, connect the channels of the panel with the sample channel switching to the pressure relief valves of the panel. Keep the length of hose between the pressure relief valves and the panel with the sample channel switching as short as possible: max. 1 m (3.28 ft).
5. Connect sample inlet hose SPx of the sample channel switching to the push-in connector upstream from the flowmeter. In the process, guide the sample inlet hose into the housing via a hose gland.
6. Plug in the connector of the panel with the sample channel switching.

7.1.5 Connecting the outlet hose "W"

1-channel, 2-channel and 4-/6-channel version

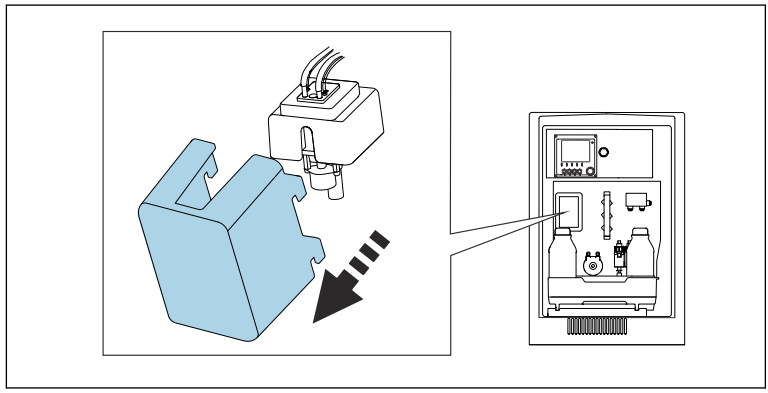
The liquid from outlet hose "W" of the cuvette contains reaction mixture. Observe the local regulations regarding waste disposal.

▶ Secure outlet hose "W" to the appropriate connector nozzle in a PG gland. Avoid counterpressure.

7.1.6 Placing the magnetic stir bar in the measuring chamber of the cuvette

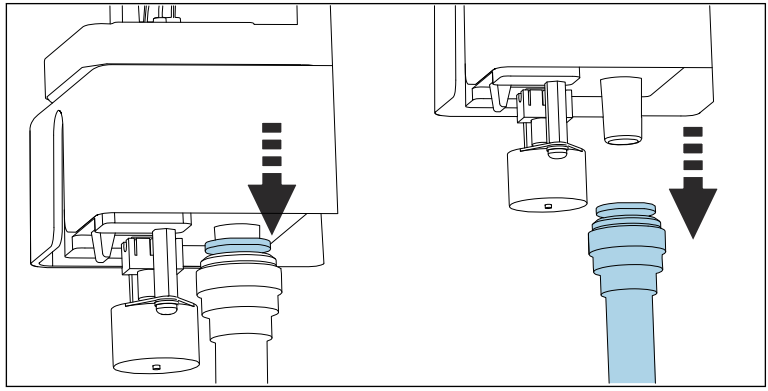
Before operating the analyzer, you must insert the magnetic stir bar supplied into the cuvette.

1.



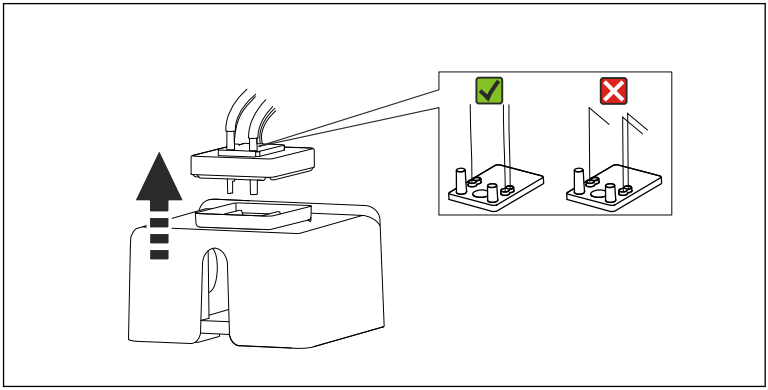
Remove the cover.

2.



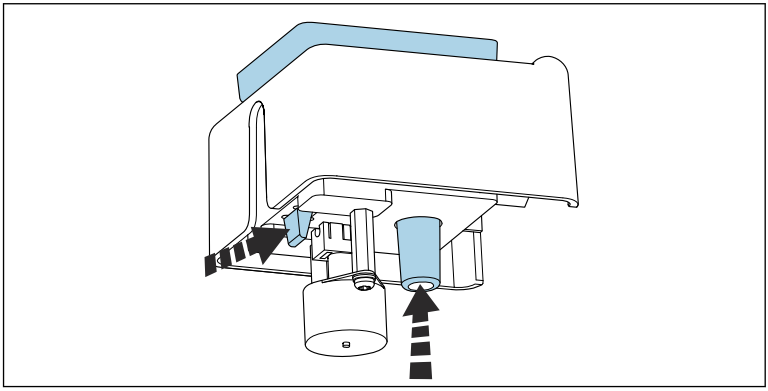
Remove outlet hose "W".

3.



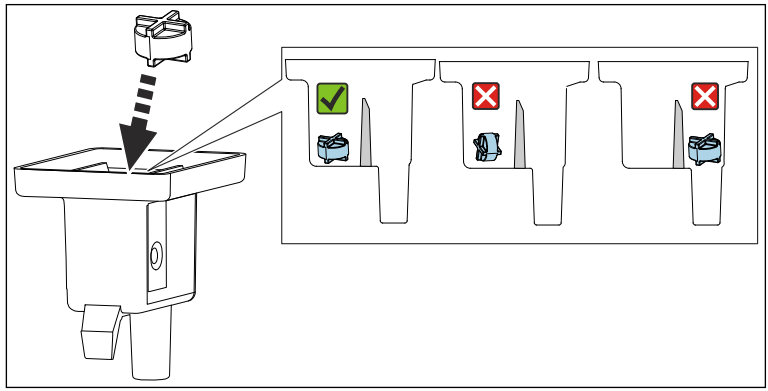
Lift the rubber cover off the cuvette. There must be no kinks in the capillaries at the capillary holder or at the valves, and the capillaries must not be removed from the hose connector.

4.



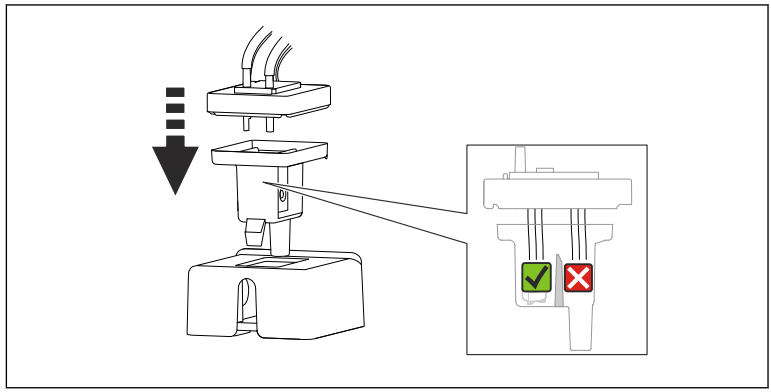
Push the cuvette out from below by pressing simultaneously against the tab and the hose attachment.

5.



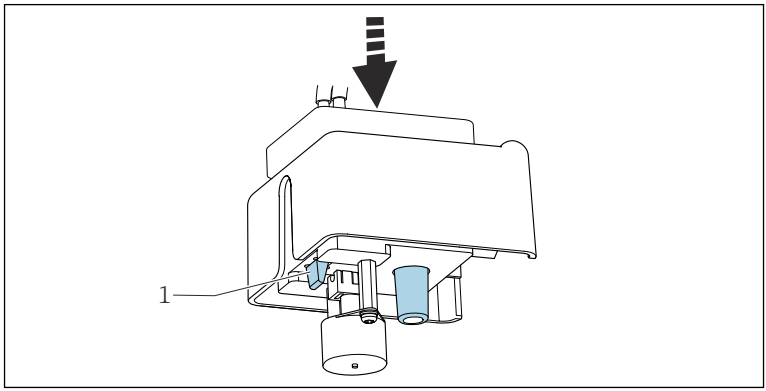
Place the magnetic stir bar in the measuring chamber, making sure that it is flat and in the measuring chamber.

6.



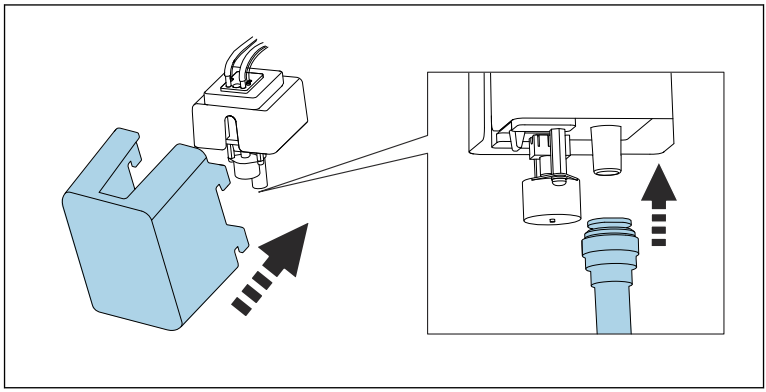
Put the rubber cover back on, making sure that all the capillaries are located in the measuring chamber.

7.



Push the cuvette with the magnetic stir bar and cover into the holder. Ensure that the tab (1) snaps into place.

8.



Connect the outlet hose "W" again and secure the cover again.

7.2 Function check

WARNING

Incorrect connection, incorrect supply voltage

Safety risks for staff and device malfunctions!

- ▶ Check that all connections have been established correctly in accordance with the wiring diagram.
- ▶ Ensure that the supply voltage matches the voltage indicated on the nameplate.

⚠ WARNING

Connection errors

The safety of people and of the measuring point is under threat. The manufacturer does not accept any responsibility for errors that result from failure to comply with the instructions in this manual.

▶ Put the device into operation only if you can answer **yes** to **all** the following questions.

Device condition and specifications

▶ Are the hoses free from damage on the outside?

Visual inspection of the liquid-bearing lines

▶ Have the bottles with reagents, and standard been inserted and connected?

▶ Is the magnetic stir bar lying flat in the measuring chamber?

7.3 Switching on the measuring device

1. Connect the power supply.
2. Wait for the initialization to finish.

7.4 Setting the operating language

Configuring the language

1. Press the soft key: **MENU**.
2. Set your language in the top menu item.
   ↳ The device can now be operated in your chosen language.

7.5 Configuring the measuring device

7.5.1 Basic setup analyzer

Making basic settings

1. Switch to the menu **Setup/Basic setup analyzer**.
   ↳ Make the following settings.

- Device tag
  Give your device any name of your choice (max. 32 characters).
- Set date
  Correct the set date if necessary.
- Set time
  Correct the set time if necessary.

2. Insert the bottles and activate the bottles used in the menu: **Bottle insertion/Bottle selection**.
3. Check the concentration of the calibration standard used: **Calibration/Settings/Nominal concentration**.

4. Optionally, also change the measuring interval: **Measurement/Measuring interval**.
   ↳ All the other settings can be left in the default factory settings for the time being.
5. Return to the measuring mode: press and hold the soft key for **ESC** for at least one second.
   ↳ Your analyzer now works with your general settings. Optionally connected sensors use the factory settings of the specific sensor type and the individual calibration settings that were last saved.

If you want to already configure additional input and output parameters in the **Basic setup analyzer**:

- Configure the current outputs, relays, limit switches and device diagnostics with the following submenus.

7.5.2 Configuring the sample flow

1. Open any shut-off valves that may be present in the sample supply lines. From this step onwards, there must be sample present at the sample channel switching filter. The recommended range is: 1.5 to 3 bar (21.8 to 43.5 psi) .
2. Configure the sample flow at the pressure relief valve and check via the **System test** menu: (**Menu/Diagnostics/System test/Analyzer/Sample channel**). Recommendation: 70 ml/min.
3. Select the relevant sample channel via **Test channel** and press **Confirm** to activate.
4. Recommendation: Do not configure the next sample channel until the sample flow has been stable for several minutes.
5. Once the sample flow is configured for all channels, select and activate the **None** sample channel to close all valves. If the channel is deactivated, sample continues to flow through each channel and is diverted via sample outlet hose "D".

7.5.3 Connecting the reagents and standard

1. Insert reagents and standard with bottle tray.
2. Connect reagent hoses to the relevant valves.
3. Connect the standard to the inlet in the hose pump.
4. **Menu/Operation /Maintenance/Bottle change mode/Bottle insertion/Bottle selection** must be selected.
5. Select all of the bottles you have inserted and confirm with **OK** .
6. The device is now ready to measure. At the start of the initial measurement, the reagent dispensers are fully opened and emptied. This is to guarantee the measuring performance from the start, and occurs after commissioning, after replacing the reagent bottles or after certain diagnostic cases.

Using the large reagent set (optional)

If the large reagent set is used, the calibration standard (5 l) must be installed outside the analyzer. The hose of the standard solution must be replaced with the long hose supplied.

1. Remove the hose for the standard from the peristaltic pump and replace it with the long hose.
2. Shorten the long hose if necessary; its length must not exceed 1.5 m (4.92 ft).
3. Cut the hose on the bottle side at an angle so that it does not attach itself to the bottle.
4. Mount the M32 coupling, including the drain plug from the CA80SI standard accessories, in the base of the analyzer.
5. Guide the hose through the new M32 coupling towards the outside and through the grommet in the bottle cover as far as the base of the standard bottle (5 l).
6. When level monitoring is activated, set the correct volume for the standard S1 (**Analyzer/Extended setup/Diagnostics settings/Bottles/Monitoring** = **On/Bottle filling levels/Start flow sum/Standard S1** → 5000 ml).

7.6 Starting the measurement

Pay attention to the following, particularly if measuring very low concentrations of silica:

- The measurement results can display an initial drift. This can be caused by the possible contamination of the components carrying sample.
- For this reason it is advisable to rinse the sample-bearing pipes for several hours with continuous measurements prior to performing a calibration.
- The stability of the calibration factors can be checked by repeating the calibration manually.

1. Select start condition **Immediate** under **Menu/Setup/Analyzer/Measurement/Start condition/Immediate**. The analyzer starts immediately with the measurement cycle once the system changes to automatic mode.
2. If necessary, adjust the measuring interval under **Menu/Setup/Analyzer/Measurement/Measuring interval**.
3. If necessary, adjust the calibration interval under **Menu/Setup/Analyzer/Calibration/Calibration interval**.
4. If necessary, adjust the sequence of sample channels under **Menu/Setup/Analyzer/Measurement/Measuring interval/Sequence of measurements**.
5. Start automatic mode: Press the **MODE** and select **Start automatic mode** must be selected.
   ↳ The display shows **Current mode**- **Automatic**.

▶ Re-attach the cover in front of the cuvette assembly.

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