

Operating Instructions

DPD analyzer module CA75

Measurement of free chlorine or total chlorine
using the DPD method



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1 General information

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
-  Recommended
-  Not permitted or not recommended
-  Reference to device documentation
-  Reference to page
-  Reference to graphic
-  Result of an individual step

2 Basic safety instructions

2.1 Requirements for the 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 Intended use

The CA75 device is a colorimetric analyzer module for the continuous measurement of free and total chlorine in aqueous media and is suitable for the following applications:

- Disinfection monitoring in drinking water treatment
- Measuring the chlorine content in secondary water supply systems
- Monitoring of process and service water in the food and beverage industry
- Chlorine monitoring in industrial water circuits
- Analysis of chlorine content in water reuse

The analyzer module is designed exclusively for aqueous samples.

Any use other than that intended puts the safety of people and the measuring system at risk. Therefore, any other use is not permitted.

The manufacturer is not liable for harm caused by improper or unintended use.

2.3 Workplace safety

The operator is responsible for ensuring compliance with the following safety regulations:

- 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

Commissioning and operation

Damaged products can result in unforeseeable hazards!

- ▶ Operate the device only in a technically sound and safe condition.
- ▶ The operator is responsible for ensuring that the device is in good working order.

Modifications to the device

Unauthorized modifications to the device are not permitted and can lead to unforeseeable dangers!

- ▶ If modifications are nevertheless required, consult with the manufacturer.

Repair

Improper repairs compromise operational safety and can result in unforeseeable hazards!

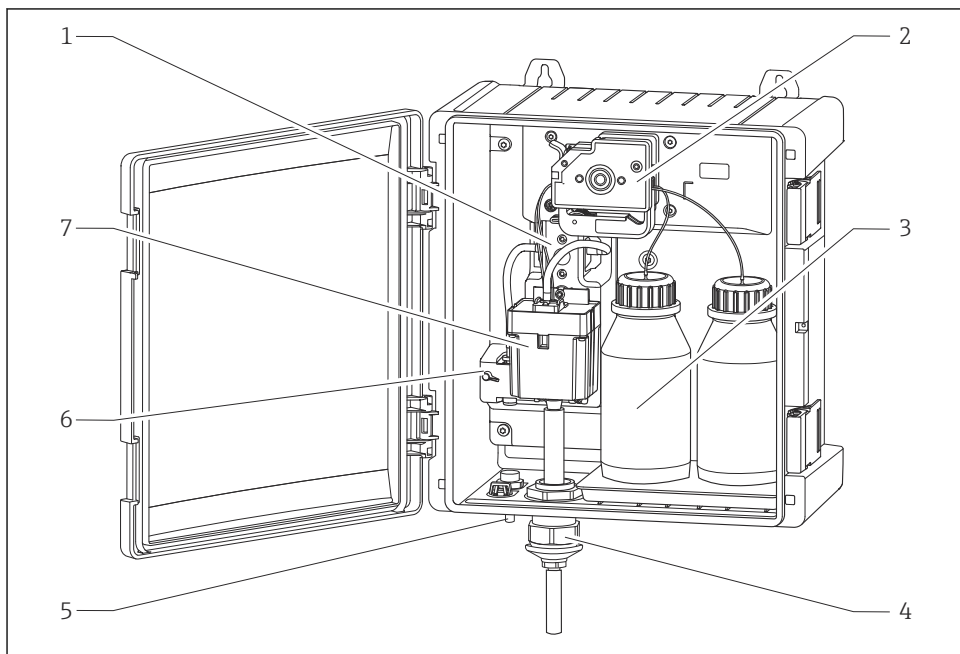
- ▶ Carry out repairs on the device only if they are expressly permitted.
- ▶ Observe national regulations pertaining to the repair of an electrical device.
- ▶ Use only original spare parts and accessories.
- ▶ If faults cannot be rectified, the product must be taken out of service and secured against unintentional operation.

2.5 Product safety

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.

3 Product description

3.1 Product design



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1 Product design of the DPD analyzer

- 1 Flow monitoring
- 2 2-channel peristaltic pump
- 3 Reagents
- 4 Drain
- 5 Sample line inlet
- 6 Valve (NC) for sample supply
- 7 Photometer module

3.2 Measuring principle

The analyzer operates using the DPD method. This method is recognized internationally for determining free and total chlorine in aqueous samples. It is based on the reaction of the reagent N,N-Diethyl-p-phenylenediamine (DPD) with chlorinated oxidizing agents. Under defined conditions, these agents produce a pink color. The intensity of the color corresponds to the chlorine concentration.

How the color is produced

Free chlorine oxidizes the added DPD to form a colored diimine derivative. The dye that is produced is sufficiently stable to allow a precise photometric evaluation. At the same time, the

dye is sensitive to chlorine-demanding substances. Therefore, the analyzer monitors the reactions using precise timing control to ensure reproducible signal development.

Photometric measurement

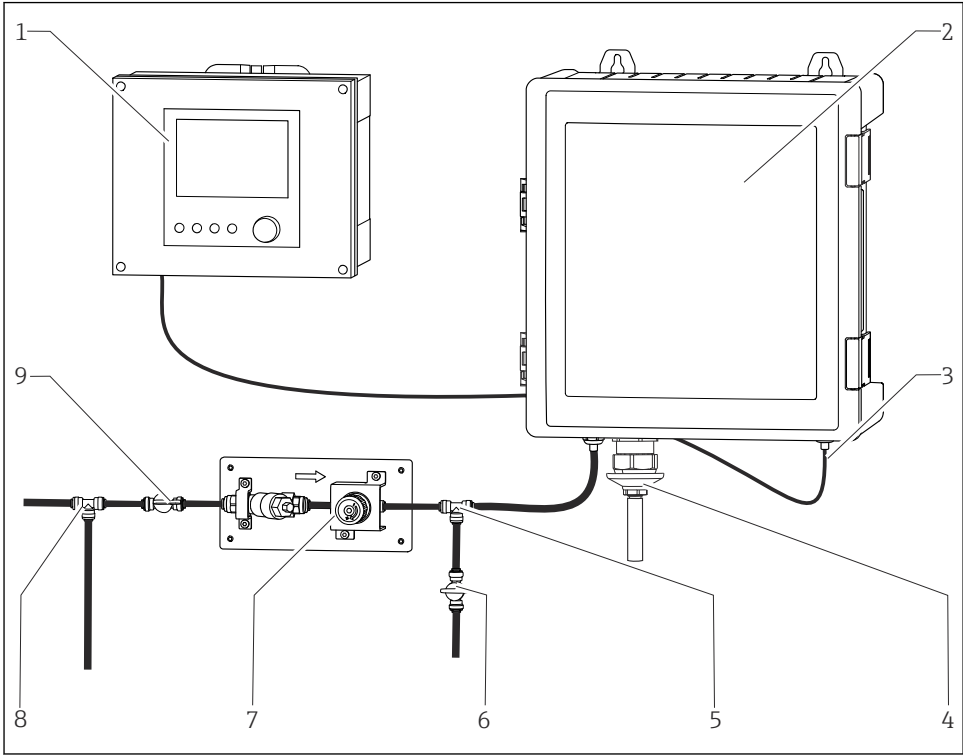
There is a continuous flow through the measuring cell. The reagent is added after sampling. The light source emits light in the visible spectrum through the sample. A detector measures the absorption at the relevant wavelength. The absorption value increases as the color concentration increases. The analyzer converts the absorption value into a chlorine measured variable using a calibration curve. The system is flushed after the measurement.

Determining free chlorine or total chlorine

Free chlorine is determined directly after the DPD is added.

The reagent for total chlorine contains an additional component. This component converts bound chlorine compounds (e.g., chloramines) into free chlorine, which reacts with the DPD.

3.3 Measuring system



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2 Measuring system

- 1 Liquiline CM44x transmitter (not in scope of delivery, must be ordered separately)
- 2 DPD analyzer module CA75
- 3 Memosens cable (included in delivery, options can be selected)
- 4 Waste outlet with waste hose (included in delivery)
- 5 T-section hose connector (included in delivery)
- 6 Shut-off valve for sampling (included in delivery)
- 7 Sample preparation system with particulate filter (included in delivery)
- 8 T-section hose connector (included in delivery)
- 9 Shut-off valve (included in delivery)

i The T-section (8) located before the shut-off valve (9) ensures that there is always a fresh sample upstream of the shut-off valve. Requirement: The hydraulic resistance of the overflow is greater than the hydraulic resistance to the analyzer so that, despite the T-section, there is always a sufficient sample flow to the analyzer module.

4 Incoming acceptance and product identification

4.1 Accepting goods

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.

4.2 Scope of delivery

The scope of delivery comprises:

- DPD analyzer module CA75 in the ordered version
- Mounted and enclosed accessories (→  10)
- Operating Instructions, BA02616C

4.3 Product identification

4.3.1 Nameplate

The nameplate provides you with the following information on your device:

- Manufacturer identification
- Extended order code
- Serial number
- Safety information and warnings

- ▶ Compare the information on the nameplate with the order.

4.3.2 Manufacturer address

Endress+Hauser Analytical Instruments (Suzhou) Co., Ltd.
Suzhou Industrial Park
No. 31 Jiang-Tian-Li-Lu
Suzhou 215126
China

4.4 Accessories mounted or enclosed

Accessories enclosed

- Accessories for mounting the analyzer module
 - 2 x wall bracket
 - 4 x stainless steel screw 5 x 15 mm (A2)
 - Stainless steel screw for wall mounting
- Accessories for sample supply and sample discharge
 - Hose for sample supply, PUN-H, length 5 m, OD 6 mm, ID 4 mm, black
 - Hose for sample discharge, PVC, length 2 m, ID 13 mm, OD 17 mm
 - Sample preparation system CA75
 - 2 x T-section hose connector, OD 6 mm, use optional
 - 2 x shut-off valve, straight, OD 6 mm, use optional
- Accessories for analyzer function
 - Magnetic stirrer, PTFE, 3 x 8 mm
 - Bottle carrier
 - 2 x reagent bottle, HDPE (natural), 500 ml, DN45
 - 2 x reagent hose set
- Accessories for maintenance work
 - 5 x Pasteur pipette, plastic, 3 ml
 - Syringe with a Luer lock connector, plastic, 50 ml
 - 2 x Luer lock female fitting, ID 3.2 mm
 - 2 x C-flex hose, length 0.25 m, ID 3.2 mm
 - 10 swabs with small tip, length 58 mm, tip 12 x 4 mm

Mounted accessories

Memosens cable, mounted and wired at the factory

4.5 Ordering information

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. Page search (magnifying glass symbol): Enter valid serial number.
3. Search (magnifying glass).
 - ↳ The product structure is displayed in a pop-up window.
4. Click the product overview.
 - ↳ A new window opens. Here you will find information relating to your device, including the product documentation.

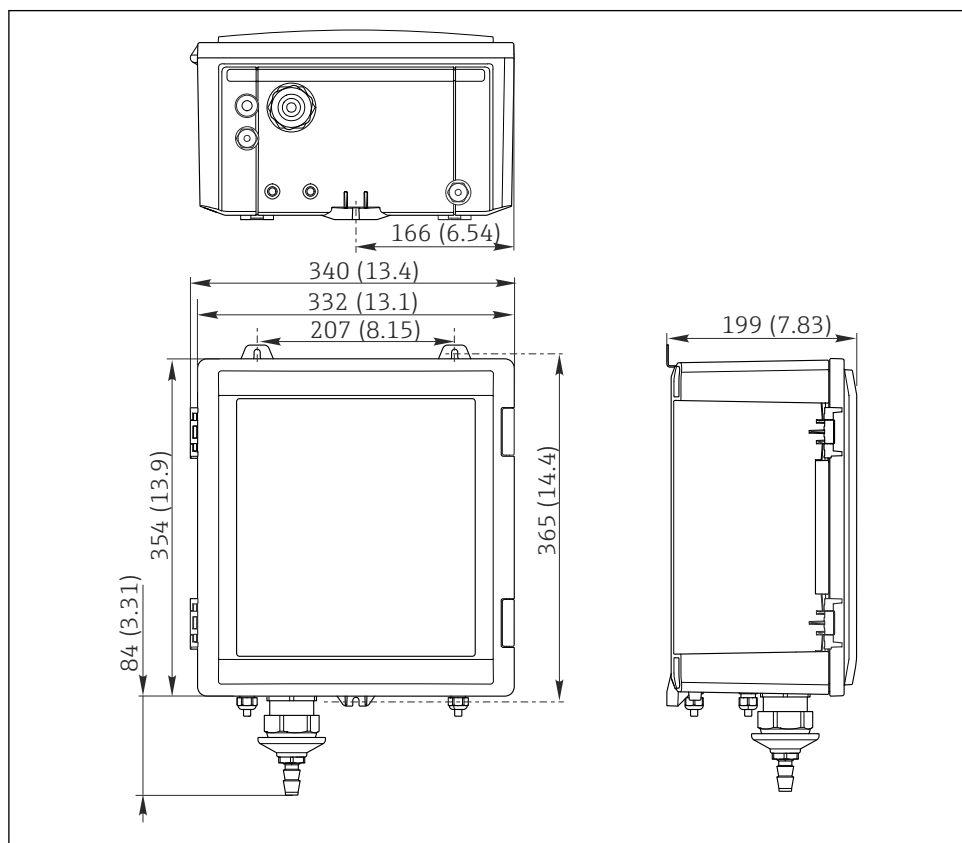
5 Assembly

5.1 Mechanical connection

5.1.1 Instructions on installation

- ▶ If mounting on a wall, make sure that the wall has sufficient load-bearing capacity and is fully perpendicular.
- ▶ Protect the device against additional heating (e.g. from heaters).
- ▶ Protect the device against mechanical vibrations.
- ▶ Protect the device against corrosive gases, e.g. hydrogen sulfide (H_2S).

The required tools and material for wall mounting (wall plugs) must be provided at the factory.



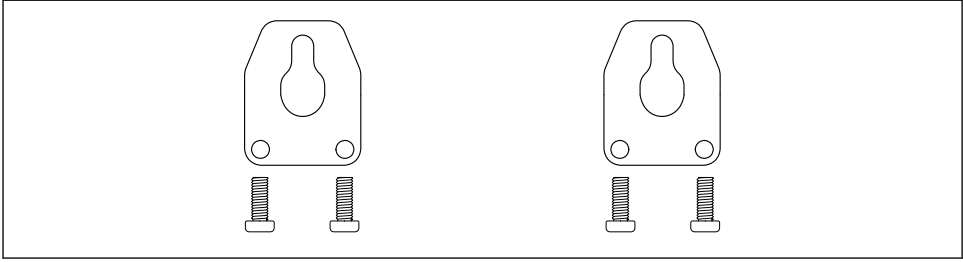
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3 Analyzer module dimensions. Unit of measurement mm (in)

5.1.2 Installing the device

Mount the analyzer on a wall

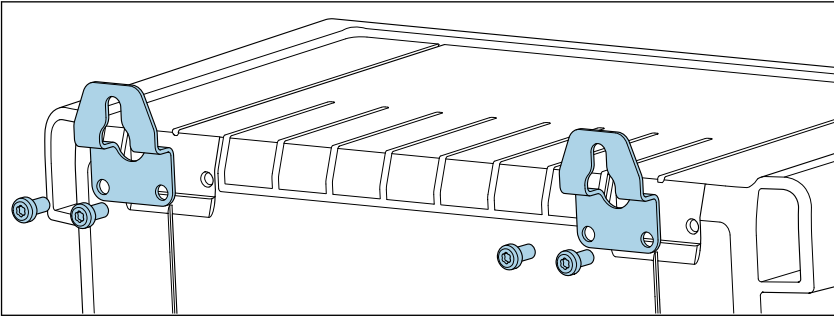
The scope of delivery includes 2 wall brackets including mounting screws.



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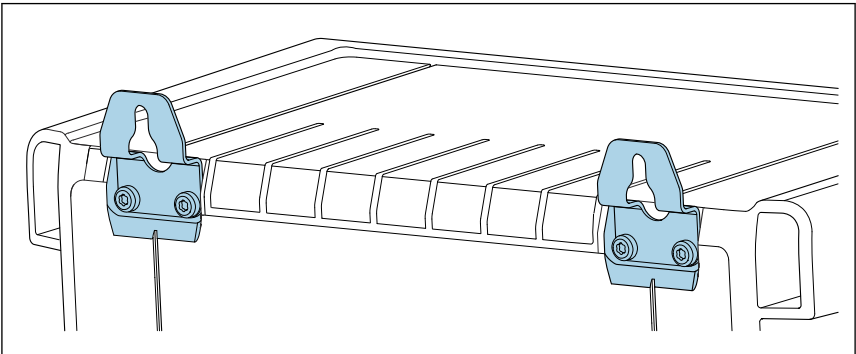
 4 Wall bracket with screws

1.



Mount the wall bracket on the analyzer housing.

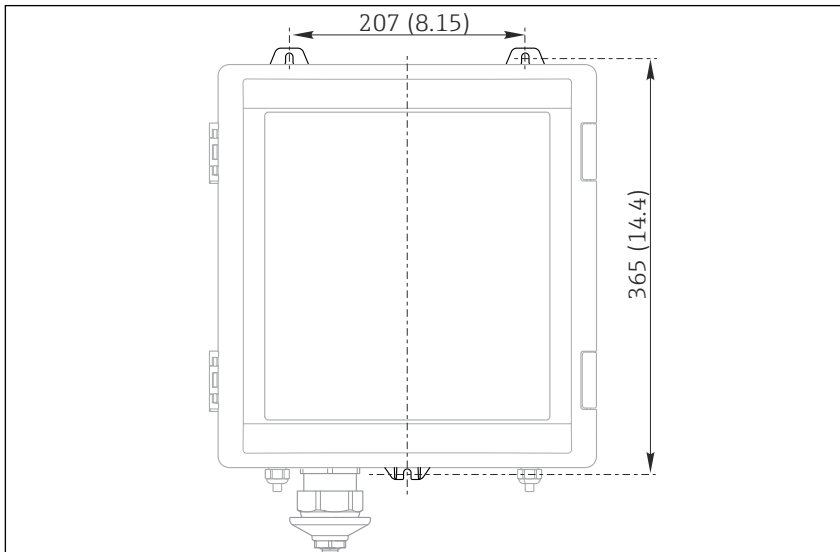
→



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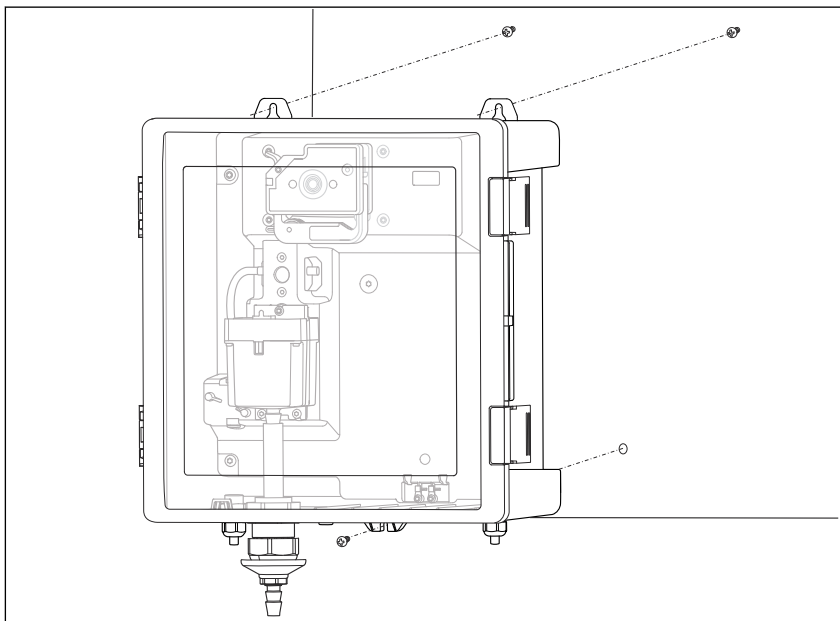
 5 Mounted wall bracket

2.



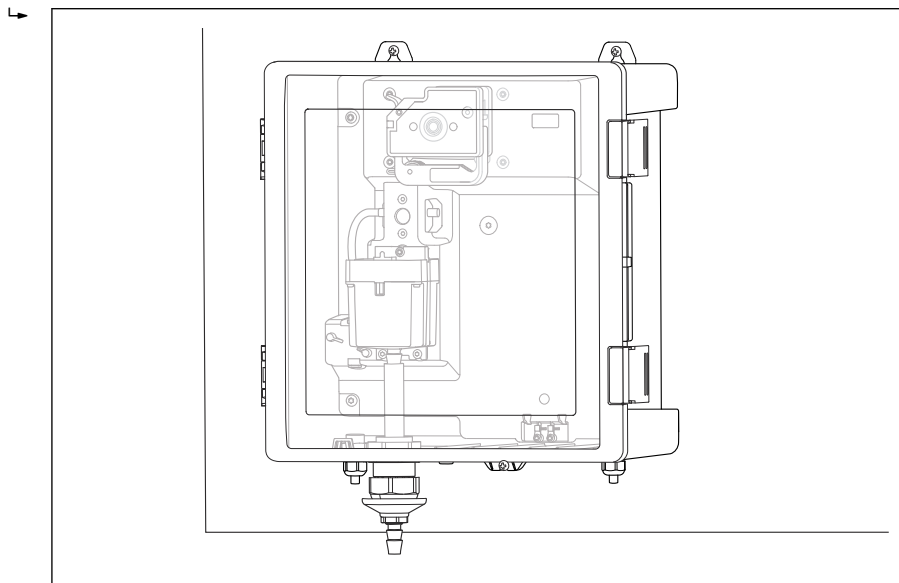
At the intended wall location, install 2 screws or other suitable mounting elements, such as wall hooks (to be provided by the customer), and drill a hole for the fixing screw at the distance shown.

3.



Hang the analyzer on the mounting elements using the wall brackets.

4. Attach the fixing screw and tighten it slightly to secure on the wall.



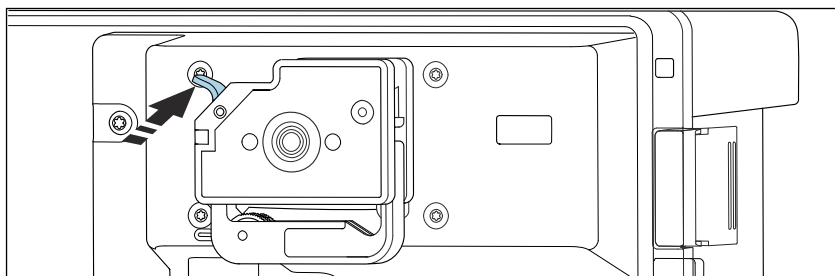
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 6 Analyzer module mounted on wall

Connect the reagent line

1. Open the door.

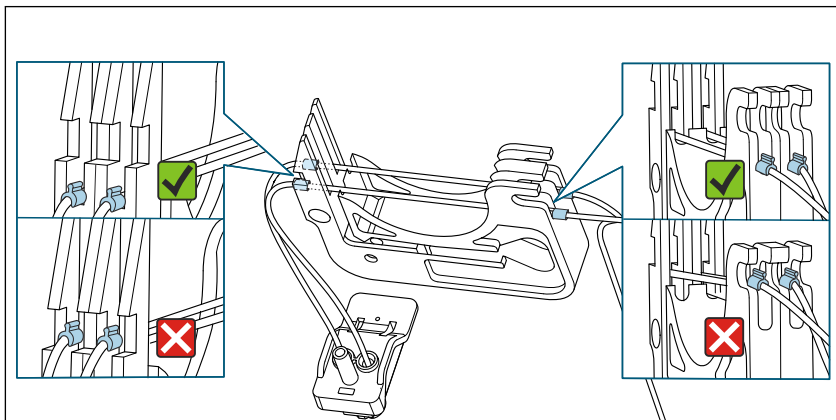
- 2.



Press the lever, pushing through the slight resistance, and release both hose cases.

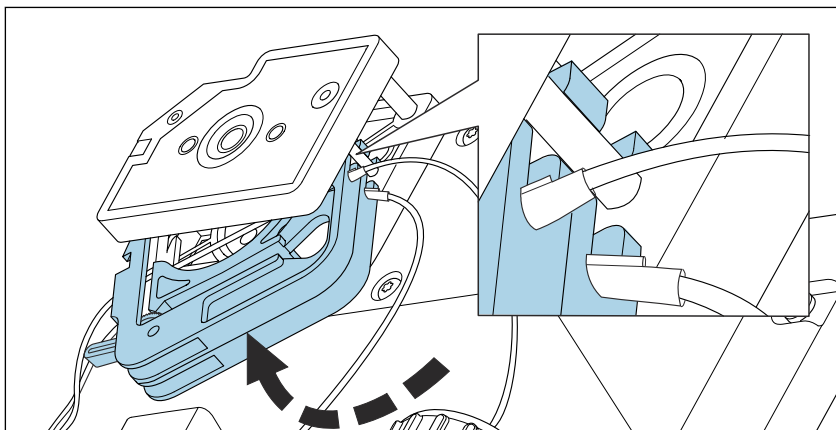
↳ The hose cases are released.

3.



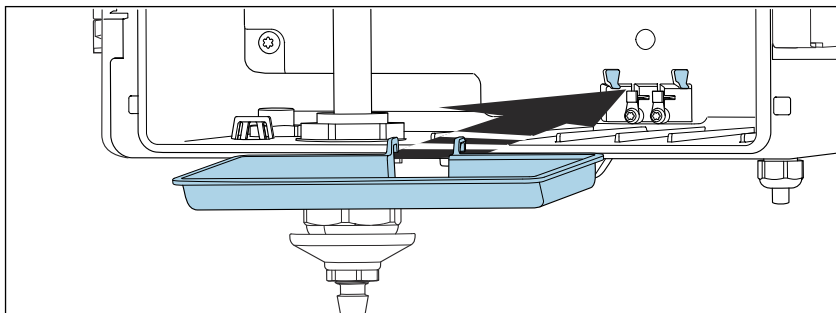
Insert the reagent hose set from the delivery into the two hose cases as shown. Use the hose holders fitted at the factory for this purpose. Make sure the holders are positioned correctly.

4.



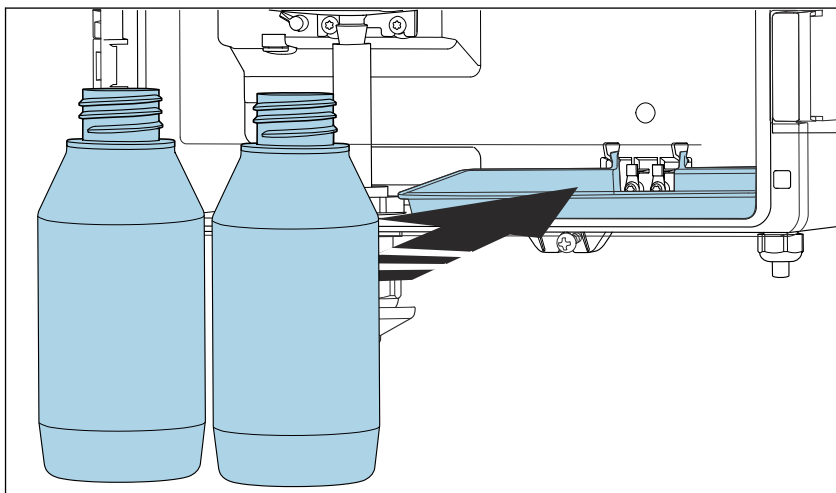
Attach both hose cases to the pump and secure them by pushing them upward until they click into place.

5.



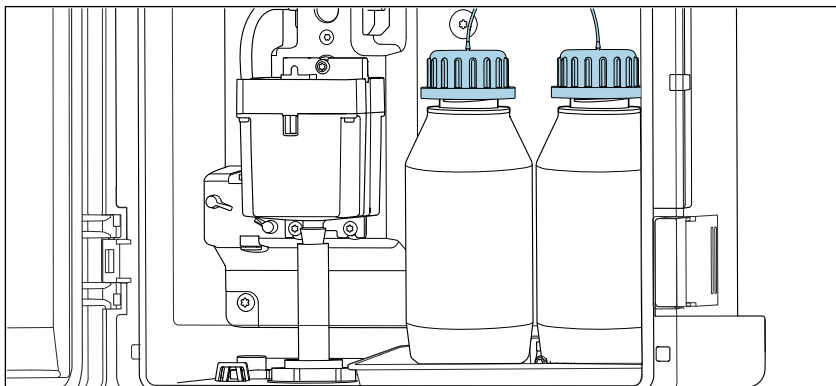
Insert the bottle carrier.

6.



Remove the blank cap from the bottles and insert the reagent bottles on the bottle carrier.

7.

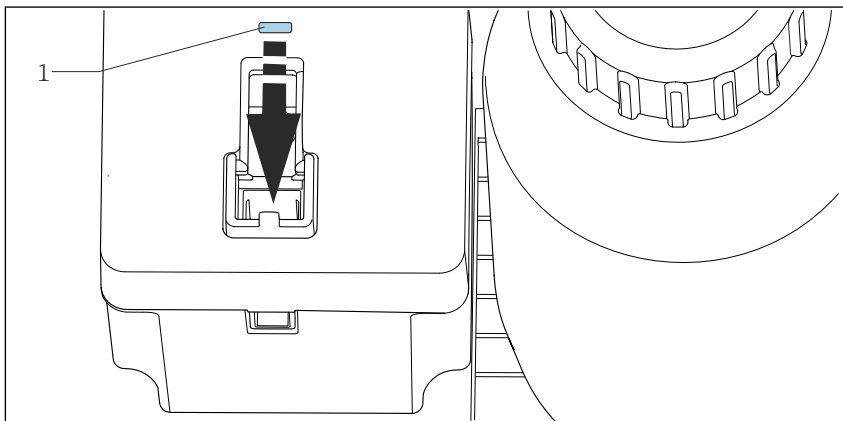


Fit the sealing cap with the hose.

Do not tighten the sealing cap until after filling with reagent (→ Commissioning).

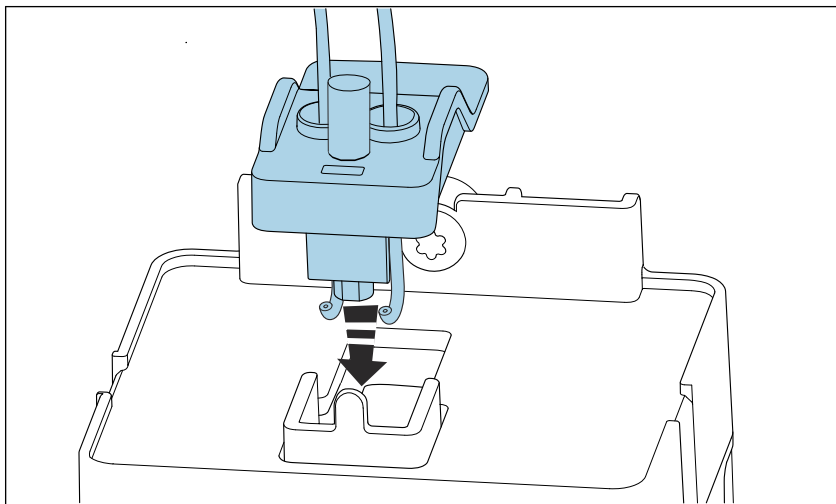
Connect the sample and reagent line to the cuvette

1.



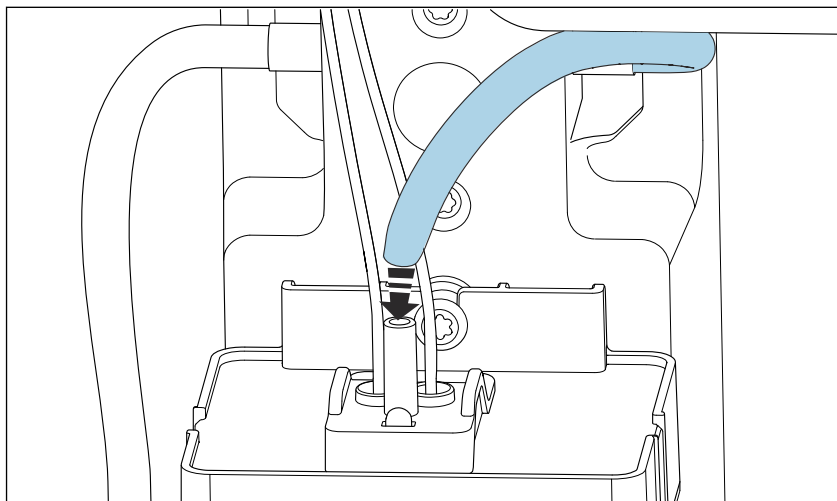
Place the magnetic stirrer (1) into the cuvette (front chamber in the figure).

2.



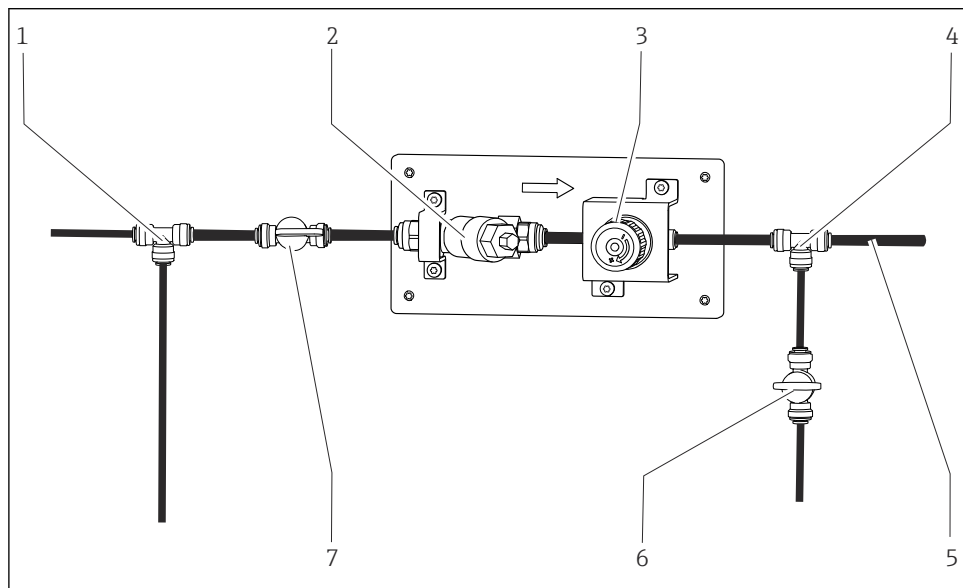
Place the cuvette cap with the pre-assembled hose connections on the cuvette and click it into place.

3.



Connect the sample line to the cuvette.

Install the sample preparation system

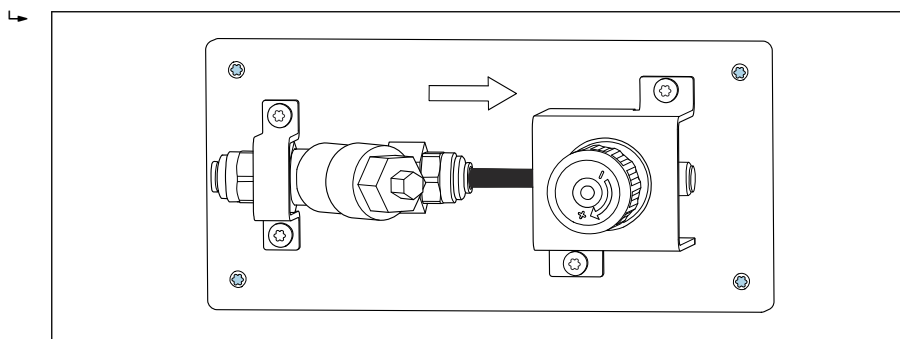


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7 Sample preparation system with optional T-sections and shut-off valves

- 1 T-section hose connector, sample inlet
- 2 Particulate filter
- 3 Pressure-reducing valve
- 4 T-section hose connector, sample supply to the analyzer module and manual sampling
- 5 Sample hose to analyzer module
- 6 Shut-off valve, manual sampling
- 7 Shut-off valve, sample inlet

1. Screw the sample preparation system supplied onto the wall near the analyzer (4 screws, to be provided by the customer).



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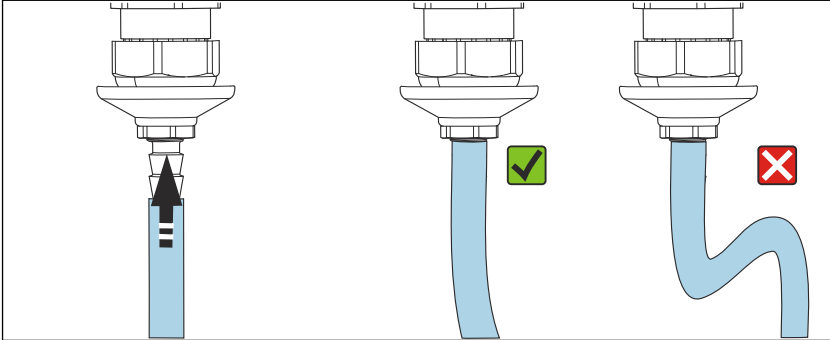
8 Installed sample preparation system

2. Establish the length of sample hose required to the analyzer module (→  7, 5). Measure the length from the pressure-reducing valve outlet (3) to the connection in the analyzer module for this purpose. The hose must not be kinked.
3. Shorten the sample hose supplied to the required length.
4. Guide the sample hose through the gland on the analyzer module housing and connect it internally (quick-release coupling).
5. If manual sampling is to be set up:
Split the sample hose to the analyzer module and connect both parts with a T-section (4).
6. Cut off 2 pieces from the remainder of the sample hose supplied.
7. Connect the T-section (4) and one shut-off valve (6) using the two hose parts.
8. Connect the sample hose with a shut-off valve (7) and a T-section (1) at the inlet of the particulate filter also. Cut the sample hose to size for this purpose.

 If manual sampling is not intended, omit the T-sections and shut-off valves. Connect the end of the pressure-reducing valve to the analyzer module using the sample hose. Connect the sample supply directly to the particulate filter.

Connect the waste hose

1. Cut the hose to the required length to reach the drain.
- 2.



Connect the hose for the waste line to the waste coupling.

3. Avoid siphon formation in the waste hose.
 - ↳ The hose must be vertical, not bent, and routed to the drain without kinking.

5.1.3 Post-installation check

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

5.2 Electrical connection

5.2.1 Connecting requirements

⚠ WARNING

Device is live!

Incorrect connection may result in injury or death!

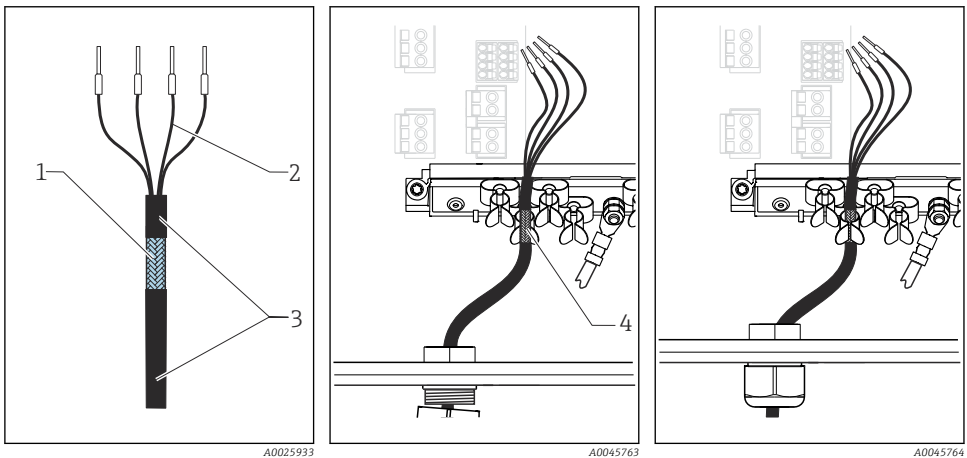
- ▶ The electrical connection may be performed only by an electrical technician.
- ▶ The electrical technician must have read and understood these Operating Instructions and must follow the instructions contained therein.
- ▶ **Prior** to commencing connection work, ensure that no voltage is present on any cable.

5.2.2 Connecting the device

Memosens cable with M12 plug

- ▶ Connect the cable to the M12 plug on a Memosens input of the transmitter.

Memosens cable with end ferrules



9 Terminated cable

- 1 Outer shield (exposed)
- 2 Cable cores with ferrules
- 3 Cable sheath (insulation)

10 Cable placed on the grounding clamp

- 4 Grounding clamp

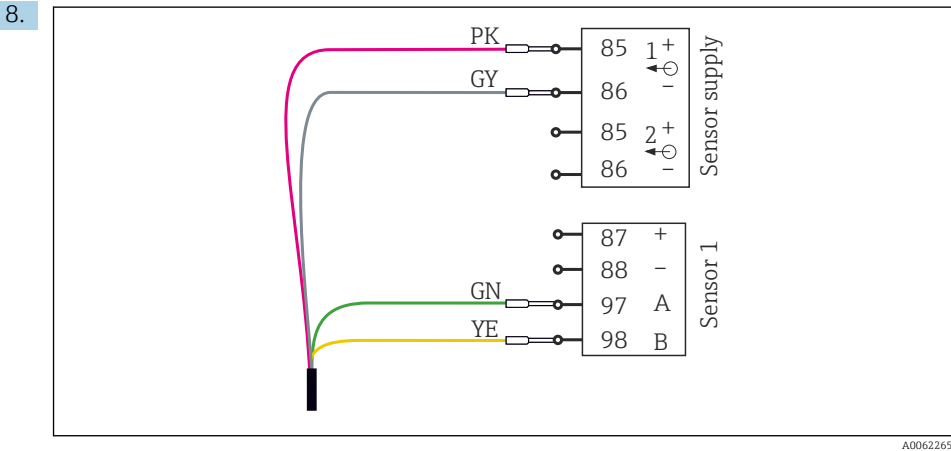
11 Cable pressed into grounding clamp

The cable shield is grounded by the grounding clip

1. Disconnect the transmitter from the power supply.
2. Open the transmitter housing.
3. Loosen the appropriate cable gland at the bottom of the housing.
4. Attach the gland to the cable end, making sure the gland is facing the right direction.
5. Pull the cable through the gland and into the housing.

6. Route the cable in the housing in such a way that the **exposed** cable shield fits into one of the cable clamps. Also make sure that the cable cores can be easily routed to the connector on the electronics module.

7. Place the cable on the cable clamp and secure it.



Connect cable cores as per the wiring diagram.

9. Tighten the cable gland on the housing from outside.

5.2.3 Ensuring the degree of protection

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

► Exercise care when carrying out the work.

Otherwise, the individual types of protection (Ingress Protection (IP), electrical safety, EMC interference immunity) agreed for this product can no longer be guaranteed due, for example, to covers being left off or cable (ends) that are loose or insufficiently secured.

5.2.4 Post-connection check

Connection errors can put the safety of people and the measuring point 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 measuring point into operation only if you can answer **yes** to **all** the following questions.

Product status and specifications

► Are the analyzer module, transmitter and cable free from damage on the outside?

Electrical connection

► Is the installed cable strain-relieved and not twisted?

► Is a sufficient length of the cable cores stripped, and are the cores correctly positioned in the terminal on the transmitter?

- ▶ Are all plug-in terminals on the transmitter securely engaged?
- ▶ Are all cable entries mounted on the transmitter, tightened and leak-tight?

6 Commissioning

6.1 Function check

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.

Errors during installation

Safety risks for staff and device malfunctions, e.g. leaks!

- ▶ Check all the hose connections to ensure that the device has been properly connected.

6.2 Starting the device

1. Connect the transmitter power supply and wait for initialization to finish.
2. In the transmitter software, go to the Memosens input for chlorine (DPD).

The input is in the service hold mode. No actions are performed on the analyzer module.

6.3 Configuring the device

Set the flow

The analyzer module monitors the sample flow continuously. The flow must be between 60 and 200 ml/min. The recommended setting is 100 ml/min.

1. Go to the function to check the flow rate in the maintenance menu of the transmitter software.
2. The pressure-reducing valve of the sample preparation system is preset to an output pressure of 0.2 bar.

Adjust the flow rate to the recommended 100 ml/min with the pressure-reducing valve.

Fill the reagent bottles and set up the sample supply

1. Select the Memosens input for chlorine (DPD) at the transmitter and go to the maintenance menu.
2. Execute the function for filling the reagents and follow the instructions in the software.

3. ⚠ CAUTION**N,N-Diethyl-p-phenylenediamine (DPD)**

Toxic if swallowed! Causes severe skin burns and severe eye damage!

- ▶ Wear protective gloves, goggles and a face shield.
- ▶ Avoid contact with the skin and eyes.
- ▶ Do not eat or drink when used.
- ▶ Follow all of the instructions on the manufacturer's safety data sheet.

Fill both bottles with reagent (1 x RB and 1 x RK).

4. NOTICE**Risk of hoses becoming twisted!**

- ▶ Turn the bottles, but not the sealing cap with the reagent hoses.

Place the sealing caps with the reagent hose on the bottles and turn the bottles to tighten.

5. Place the bottles back on the bottle carrier and close the analyzer module door.
6. Set up the sample supply and open the optional shut-off valves in the direction of the analyzer module.
7. Confirm filling of the reagents in the software.
 - ↳ Automatic flushing of the reagent hoses and the cuvette containing the sample begins.
8. Wait for automatic flushing to finish and confirm completion in the software.

Start the measurement at the transmitter

1. In the chlorine (DPD) start menu, select the measurement method and the trigger.
2. Finally, cancel the service hold.
 - ↳ The measurement starts in accordance with the specifications set.



Use the Operating Instructions for the Liquiline CM44x inputs (BA01254C) to configure the input, start a measurement and to configure diagnostic messages.

7 Troubleshooting

7.1 Information on troubleshooting

The functions of the analyzer module are monitored by the transmitter. If a diagnostic message occurs, the display alternates between the diagnostic message and the measured value in the measuring mode.

The color of the display background changes to red and the red LED on the analyzer module lights up if a diagnostic message occurs with status signal "F".

7.2 Diagnostic information via LED

	Normal	正常
	Maintenance	维护
	Warning	报警
	Error	错误

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 12 LED display on analyzer module

LED	Meaning
Green	Measurement in progress. The device is working correctly.
Blue	Device is in maintenance mode, service hold is enabled.
Yellow	Warning message pending. The device function is not yet impaired. Check the message on the transmitter and follow the recommendations in the software.
Red	An error message is pending. The device function is faulty. Check the message on the transmitter and follow the recommendations provided in the software for troubleshooting. Refer to the Operating Instructions for the transmitter.

8 Maintenance

8.1 Maintenance information

Reagents from unlicensed third-party manufacturers can lead to measurement errors because the factory calibration may become invalid.

- ▶ Recommendation: Only use reagents from Endress+Hauser or licensed third-party manufacturers.

Maintenance operations during ongoing measurements can damage the device.

- ▶ Enable the service hold on the transmitter before starting maintenance work.

8.2 Maintenance schedule

Interval	Maintenance work
Monthly	▪ Top up reagents ▪ Clean photometer cuvette ¹⁾
6 months	▪ Replace sample hose (C-flex ID 3.2 mm) ▪ Replace reagent hose set (complete incl. reagent bottle sealing caps) ▪ Alternatively: ▪ Replace the pump hoses (PharMed BPT) ▪ Replace the hose connector (ID 1 - 1.6 mm) at the sealing cap of the reagent bottles
12 months	▪ Clean the filter ▪ Clean the magnetic stirrer

1) Adjust interval to actual application

8.3 Shutting down the device

1. Set the service hold mode.
2. Remove the caps with the reagent hoses completely from the reagent bottles and suspend them in distilled water.
3. Execute the function for flushing the reagents from the maintenance menu of the transmitter software.
4. Call up the function to clean the cuvette and follow the instructions in the software.
5. Shut off the flow using the pressure-reducing valve of the sample preparation system, thus stopping the sample supply.
6. Remove the sample hose from the quick-release coupling on the analyzer module and drain the residual sample in the hose into the waste.
7. Empty the cuvette with a plastic pipette.
8. Place caps on empty reagent bottles or leave them uncovered in the analyzer module.
9. Seal reagent bottles containing residual reagents (e.g., using the blank cap from the new empty bottles). Store reagents in a cool and dark place.
10. Close the analyzer module door.

8.4 Maintenance work

8.4.1 Replacing reagents

Required materials

- New reagents CY75
- Suitable protective gloves, protective clothing, tight-fitting safety goggles and face mask in accordance with the operator guidelines

1. **⚠ CAUTION**

N,N-Diethyl-p-phenylenediamine (DPD)

Toxic if swallowed! Causes severe skin burns and severe eye damage!

- ▶ Wear protective gloves, goggles and a face shield.
- ▶ Avoid contact with the skin and eyes.
- ▶ Do not eat or drink when used.
- ▶ Follow all of the instructions on the manufacturer's safety data sheet.

Mix reagents in accordance with the instructions provided.

2. Execute the function for filling the reagents on the transmitter and follow the instructions in the software.

3. Remove the sealing caps from the empty bottles (turn bottle) and remove the empty bottles.

4. **NOTICE**

Risk of hoses becoming twisted!

- ▶ Turn the bottles, but not the sealing cap with the reagent hoses.

Place the sealing caps with the reagent hose on the new bottles and turn the bottles to tighten.

5. Place the bottles on the bottle carrier and close the door of the analyzer module.

6. Confirm filling of the reagents in the software.

- ↳ Automatic flushing of the reagent hoses and the cuvette containing the sample begins.

7. Wait for automatic flushing to finish and confirm completion in the software.

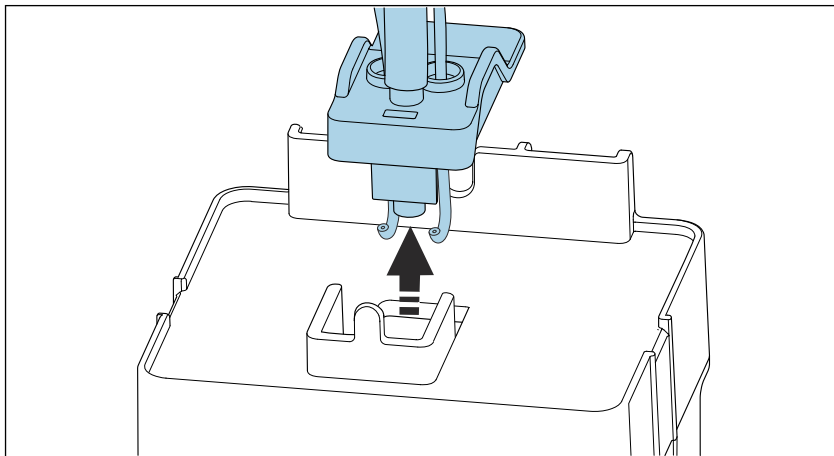
8.4.2 Cleaning the photometer cuvette

Required materials

- Cleaner CY800 or citric acid 10%
- Swab (maintenance kit or original supply)
- Suitable protective gloves, protective clothing and safety goggles in accordance with the plant operator guidelines

1. Execute the function for cleaning the photometer cuvette at the transmitter and follow the instructions in the software.

2.



Lift the cover off the photometer.

3. Add cleaner to the cuvette drop by drop (0.5 ml, 3-4 drops).
4. Clean both optical windows in the light path with a swab.
5. Put the cover of the photometer back on and confirm cleaning of the cuvette in the software.
 - ↳ Automatic flushing of the cuvette, as well as baseline and LED calibration, start.
6. Wait for automatic flushing to finish and confirm completion in the software.

8.4.3 Replacing the sample hose

Required materials

- Replacement sample hose (CAV750)
- Suitable protective gloves, protective clothing and safety goggles in accordance with the plant operator guidelines

1. Shut off the flow using the pressure-reducing valve of the sample preparation system.
2. Release the sample hose (all sections) from the quick-release couplings (→  7,  19) and dispose of it in accordance with the operator's specifications.
3. Cut new hose sections in accordance with the lengths of the old sections.
4. Insert the new hose sections into the quick-release couplings.
5. Establish flow using the pressure-reducing valve and adjust it using the flow rate test function in the transmitter software.

8.4.4 Replacing the reagent hoses

Required materials

- New reagent hose set (CAV750 - *** PA)
 - Suitable protective gloves, protective clothing and safety goggles in accordance with the plant operator guidelines
1. Execute the function for replacing the reagent hoses at the transmitter and follow the instructions in the software.
 2. Remove the sealing caps from the reagent bottles (turn bottle) and suspend in the air.
 3. Pump air through the hoses to empty them.
 4. Remove the reagent hoses from the photometer cover.
 5. Operate the lever on the pump and remove the reagent hoses from the pump cassettes (→  12).
 6. Place the reagent hoses of the new hose set on the pump cassettes (→  14).
 7. Connect the reagent hoses to the photometer cover.
 8. Fit the sealing caps on the reagent bottles (turn bottles).
 9. Confirm replacement of the reagent hoses in the software.
 - ↳ Automatic flushing of the reagent hoses and the cuvette containing the sample begins.
 10. Wait for automatic flushing to finish and confirm completion in the software.

9 Repair

9.1 Repair instructions

The repair and conversion concept provides for the following:

- The product has a modular design
- Spare parts are grouped into kits which include the associated kit instructions
- Carry out the repair according to the kit instructions
- Only use original spare parts from the manufacturer
- Repairs are carried out by the manufacturer's Service Department or by trained users
- Certified devices can only be converted to other certified device versions by the manufacturer's Service Department or at the factory
- Observe applicable standards, national regulations, Ex documentation (XA) and certificates
- Document the repair and conversion and enter, or have entered, in the Life Cycle Management tool

9.2 Spare parts

Spare parts currently available for the device can be found at: www.endress.com/onlinetools

- ▶ Quote the serial number of the device when ordering spare parts.

9.3 Return

The product must be returned if repairs or a factory calibration are required, or if the wrong product was ordered or delivered. As an ISO-certified company and also due to legal regulations, Endress+Hauser is obliged to follow certain procedures when handling any returned products that have been in contact with medium.

www.endress.com/support/return-material

9.4 Disposal instructions



If required by the Directive 2012/19/EU on waste electrical and electronic equipment (WEEE), the product is marked with the depicted symbol in order to minimize the disposal of WEEE as unsorted municipal waste. Do not dispose of products bearing this marking as unsorted municipal waste. Instead, return them to the manufacturer for disposal under the applicable conditions.

10 Accessories

Device-specific accessories

- CAV750
 - Maintenance kit CA75 DPD
 - Hoses and pump head
 - Order according to product order structure
- CY75
 - Reagents and standard solutions
 - Order according to product order structure
- CY800-AK**
 - Cleaning solution
 - Order according to product order structure

11 Technical data

11.1 Input

11.1.1 Measured variables

Options in the software

- Free chlorine (HOCl)
- Total chlorine

11.1.2 Measuring ranges

Lower range limit	0 mg/l
Upper range limit	10 mg/l

11.2 Power supply

11.2.1 Type of supply

Type of supply	Auxiliary voltage via signal line
Voltage type	Direct current

11.2.2 Supply voltage

Nominal supply voltage	24 V
Minimum supply voltage	20.4 V
Maximum supply voltage	28.8 V

11.2.3 Power consumption

Maximum power consumption	5 W
---------------------------	-----

11.3 Performance characteristics

11.3.1 Measurement error

Concentration	Maximum measured error ¹⁾
0 to 5 mg/l	5% or 0.04 mg/l ²⁾
5.1 to 10 mg/l	10%

- 1) Measured according to ISO 15839 under laboratory conditions with standard solutions
 2) The higher value counts.

11.3.2 Repeatability

Repeatability ¹⁾	0.01 mg/l or 5% ²⁾
-----------------------------	-------------------------------

- 1) Measured according to ISO 15839 under laboratory conditions with standard solutions
 2) The higher value counts.

11.3.3 Detection limit and limit of quantification

Detection limit ¹⁾	0.018 mg/l
Limit of quantification ¹⁾	0.06 mg/l

- 1) Measured according to ISO 15839 under laboratory conditions with standard solutions

11.3.4 Reagent requirement

Per measurement	0.027 ml
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11.4 Environment

11.4.1 Ambient temperature

Minimum ambient temperature	5 °C (41 °F)
Maximum ambient temperature	40 °C (104 °F)

11.4.2 Storage temperature

Minimum storage temperature	5 °C (41 °F)
Maximum storage temperature	40 °C (104 °F)

11.4.3 Degree of protection

IP66 ¹⁾

11.4.4 Electromagnetic compatibility

EN 61326-1

11.5 Process

11.5.1 Process temperature

Minimum process temperature	5 °C (41 °F)
Maximum process temperature	40 °C (104 °F), for example

11.5.2 Process pressure

Minimum process pressure (abs.)	0.3 bar (4.4 psi)
Maximum process pressure (abs.)	5.2 bar (75.4 psi) ¹⁾

1) Applies up to the inlet of the sample preparation system. A flow rate of 60 to 200 ml/min must be set in the device using the pressure-reducing valve of the sample preparation system.

11.5.3 Flow

Minimum flow	60 ml/min (0.95 gal/hr)
Maximum flow	200 ml/min (3.17 gal/hr)

11.6 Mechanical construction

11.6.1 Dimensions

→  3,  11

1) With the door closed. The drain hole was sealed with a blank cap for the tests.

11.6.2 Weight

Minimum weight	5.35 kg (11.8 lbs) ¹⁾
Maximum weight	6.52 kg (14.4 lbs) ²⁾
Weight of sample preparation system	0.52 kg (1.15 lbs)

- 1) Analyzer module, reagent bottles empty, without sample preparation system
 2) Analyzer module, reagent bottles completely full, without sample preparation system

11.6.3 Materials

Parts in contact with medium	
Sample valve	NBR (nitrile-butadiene rubber), PPS (polyphenylene sulfide)
Photometer	Borosilicate, PC (polycarbonate), EPDM (ethylene-propylene-diene rubber)
Sample hose	C-flex (thermoplastic elastomer)
Sample inlet hose	TPU (thermoplastic polyurethane)
Flowmeter	PP (polypropylene)
Waste funnel	PC (polycarbonate)
Waste hose	PVC (polyvinyl chloride)
Reagent hose	PharMed BPT (polybutylene terephthalate, thermoplastic elastomer)
Magnetic stirrer	PTFE (polytetrafluoro-ethylene)

Parts not in contact with medium	
Housing	PC (polycarbonate)
Carrier plate	PP MF30 (polypropylene, mineral-reinforced)
Bottle carrier	PP MF30 (polypropylene, mineral-reinforced) PP, MF30
Peristaltic pump	Stainless steel, PVDF (polyvinylidene fluoride)
Door clip	PA66 GF30 (polyamide 66, fiber-glass reinforced)

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