BA00468C/07/EN/17.26-00
71793001
2026-10-08

Operating Instructions
Ceramax CPS341D

pH sensor for use in the pharmaceutical industry and food production
Digital with Memosens technology



Endress+Hauser
People for Process Automation

Table of contents

1 About this document 4
1.1 Warnings 4
1.2 Symbols used 4
1.3 Documentation 5

2 Basic safety instructions 6
2.1 Requirements for the personnel 6
2.2 Intended use 6
2.3 Workplace safety 6
2.4 Operational safety 6
2.5 Product safety 7

3 Product description 8
3.1 Product design 8

4 Incoming acceptance and product identification 11
4.1 Incoming acceptance 11
4.2 Product identification 11
4.3 Scope of delivery 12
4.4 Certificates and approvals 12

5 Installation 13
5.1 Installation requirements 13
5.2 Installing the sensor 19
5.3 Installing the electrolyte vessel 20
5.4 Mounting the optional electrolyte monitor 22

6 Electrical connection 23
6.1 Connecting the sensor 23
6.2 Connecting the optional electrolyte monitor 24

7 Commissioning 24
7.1 Preparatory steps 24

8 Operation 29
8.1 Adapting the measuring instrument to the process conditions 29

9 Diagnostics and troubleshooting 30
9.1 General troubleshooting 30

10 Maintenance 31
10.1 Maintenance tasks 31

11 Repair 36
11.1 General information 36
11.2 Spare parts 36
11.3 Return 36
11.4 Disposal 36

12 Accessories 37
12.1 Device-specific accessories 37

13 Technical data 39
13.1 Input 39
13.2 Performance characteristics 39
13.3 Environment 39
13.4 Process 40
13.5 Mechanical construction 40

Index 42

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 used

- 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

1.2.1 Symbols on the device

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

1.3 Documentation

The following manuals which complement these Operating Instructions can be found on the product pages on the Internet:
- Technical Information for the relevant sensor
- Operating Instructions for the transmitter used

In addition to these Operating Instructions, an XA with "Safety instructions for electrical apparatus in the hazardous area" is also included with sensors for use in the hazardous area.

▶ Please follow instructions on use in the hazardous area carefully.



Safety instructions for electrical apparatus in hazardous area, Ceramax CPS341D, XA01541C

Additionally, the following applies to hygienic sensor versions:



Special Documentation for hygienic applications, SD02751C

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 sensor is designed for the continuous measurement of the pH value in liquids.

A list of recommended applications is provided in the Technical Information for the relevant sensor.

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

Before commissioning the entire measuring point:

1. Verify that all connections are correct.
2. Ensure that electrical cables and hose connections are undamaged.

Procedure for damaged products:

1. Do not operate damaged products, and protect them against unintentional operation.

2. Label damaged products as defective.

During operation:

- If errors cannot be rectified,
  take products out of service and protect them against unintentional operation.

⚠ CAUTION

Programs not switched off during maintenance activities.
Risk of injury due to medium or cleaning agent!
- Quit any programs that are active.
- Switch to the service mode.
- If testing the cleaning function while cleaning is in progress, wear protective clothing, goggles and gloves or take other suitable measures to protect yourself.

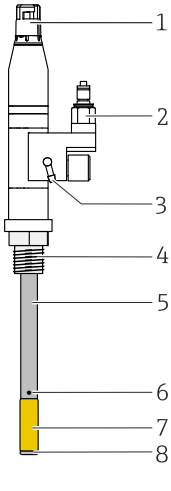
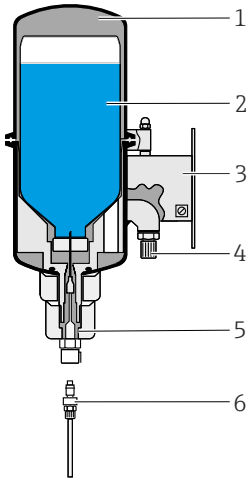
2.5 Product safety

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

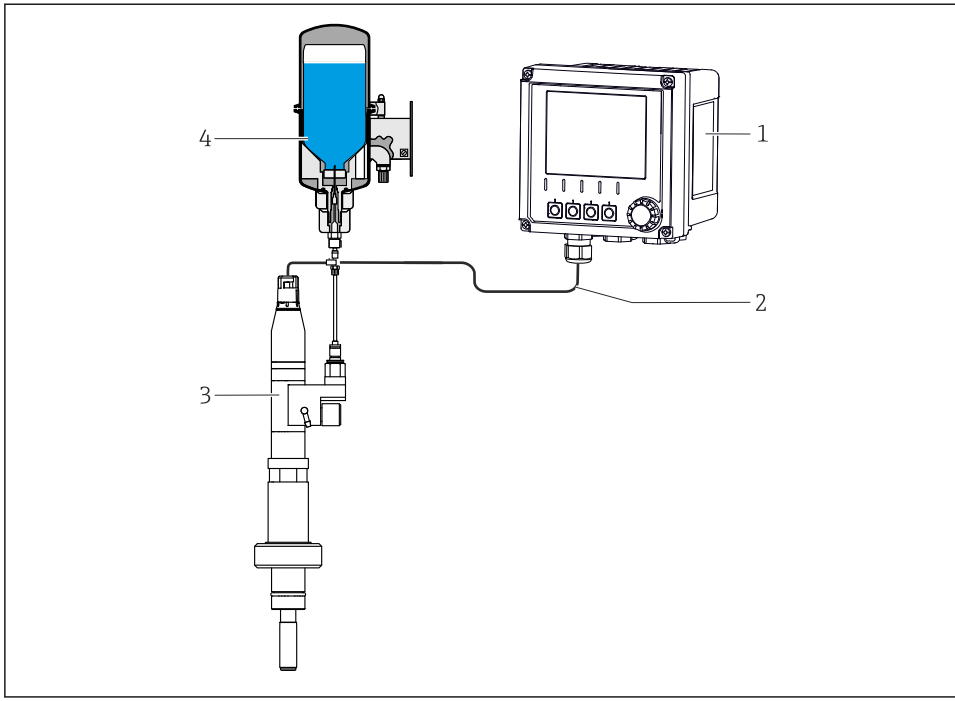
3.1 Product design

The measuring sensor is divided into the pH sensor with a process connection and the pressurized reference system with an electrolyte bottle and hose connections.

pH sensor	Pressurized reference system
	
1 Sensor	*2 Electrolyte vessel*
1 Memosens plug-in head *2 Electrolyte supply* *3 Vent* *4 Thread for selectable process connection* *5 Enamel-lined steel pipe* *6 Rhodium dot* *7 pH-sensitive enamel with metal lead* *8 Junction*	*1 Electrolyte vessel* *2 Electrolyte bottle with septum* *3 Mounting plate* *4 Compressed air connection* *5 Electrolyte supply coupling* *6 Electrolyte hose*

3.1.1 Measuring system

A complete measuring system comprises at least:
- pH sensor CPS341D
- Electrolyte vessel CPS341Z-D1
- Transmitter, e.g. Liquiline CM44x, CM42B, CM42
- Memosens data cable CYK10 or CYK20



A0063063

3 Measuring system

1 CM42B transmitter
2 Memosens data cable
3 pH sensor CPS341D
4 Electrolyte vessel CPS341Z - D1 + D5

The ultrasonic sensor CPS341Z-D2 can be used to monitor the level of the electrolyte.

3.1.2 Measuring principle

pH measurement

The pH value is used as a unit of measurement for the acidity or alkalinity of a medium. The enamel of the electrode delivers an electrochemical potential that depends on the pH value of the medium. This potential is generated by the selective accumulation of H^+ ions on the outer layer of the pH-sensitive enamel. As a result, an electrochemical boundary layer with an electrical potential difference forms at this point. An integrated Ag/AgCl reference system serves as the required reference electrode.
The measured voltage is converted to the corresponding pH value using the Nernst equation.

Zero point

For standard pH sensors, the zero point and the Isotherm intersection point are fixed at pH 7 and 0 mV, regardless of the measurement temperature. In the case of the enameled pH sensor

CPS341D, the isotherm intersection is around pH 1 (the exact value is specified in the manufacturer's certificate). The zero point (0 mV) therefore varies depending on the measured temperature. As a result, the zero point is between 8.65 ± 1 pH depending on the temperature.

This must be taken into consideration to determine undesired asymmetry.

4 Incoming acceptance and product identification

4.1 Incoming acceptance

On receipt of the delivery:

1. Check the packaging for damage.
   ↳ Report all damage immediately to the manufacturer.
   Do not install damaged components.
2. Check the scope of delivery using the delivery note.
3. Compare the data on the nameplate with the order specifications on the delivery note.
4. Check the technical documentation and all other necessary documents, e.g. certificates, to ensure they are complete.

If one of the conditions is not satisfied, contact the manufacturer.

4.2 Product identification

4.2.1 Nameplate

The following information on the device can be found on the nameplate:
- Manufacturer identification
- Order code
- Extended order code
- Serial number
- Safety information and warnings

▶ Compare the information on the nameplate with the order.

4.2.2 Identifying the product

Product page

www.endress.com/cps341d

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. Page search (magnifying glass symbol): Enter valid serial number.
3. Search (magnifying glass).
   ↳ The product structure is displayed in a popup window.

4. Click the product overview.
   ↳ Here you will find information pertaining to your device, including the product documentation.

4.2.3 Manufacturer address

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

4.3 Scope of delivery

The scope of delivery comprises:
- Ordered version of the sensor
- Operating Instructions
- Safety instructions for the hazardous area (for sensors with Ex approval)
- Supplementary sheet for optionally ordered certificates

4.4 Certificates and approvals

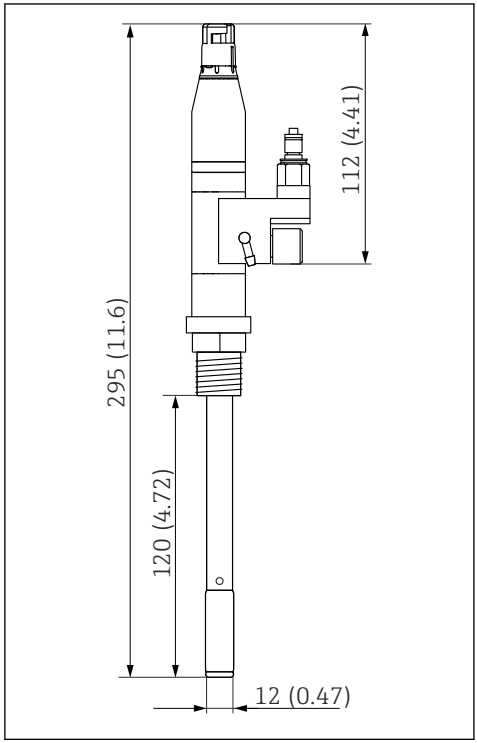
Current certificates and approvals for the product are available at www.endress.com on the relevant product page:

1. Select the product using the filters and search field.
2. Open the product page.
3. Select **Downloads**.

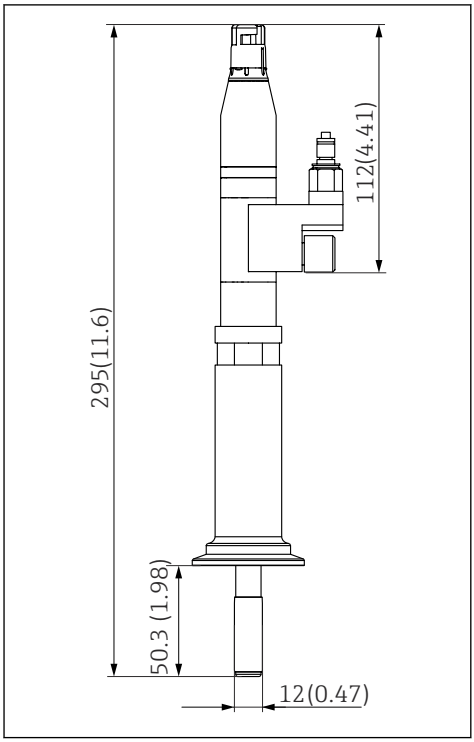
5 Installation

5.1 Installation requirements

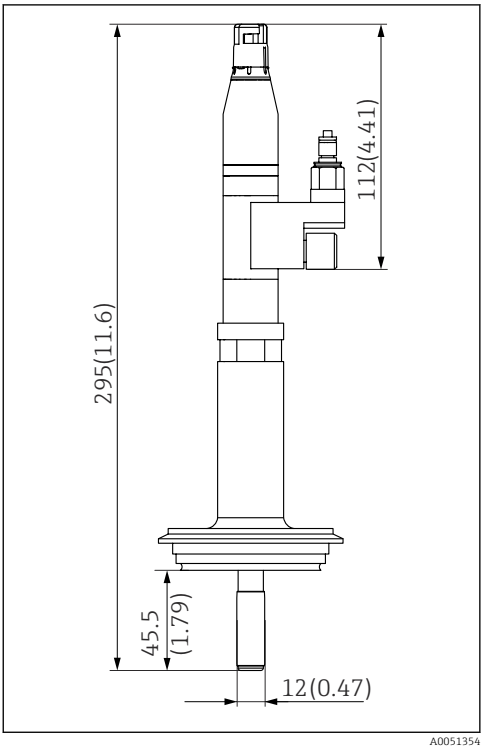
5.1.1 Dimensions



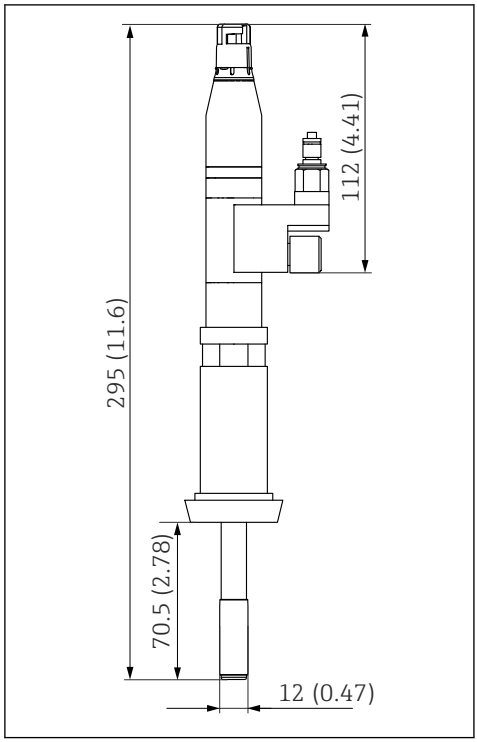
4 Sensor without process connection, dimensions: mm (in)



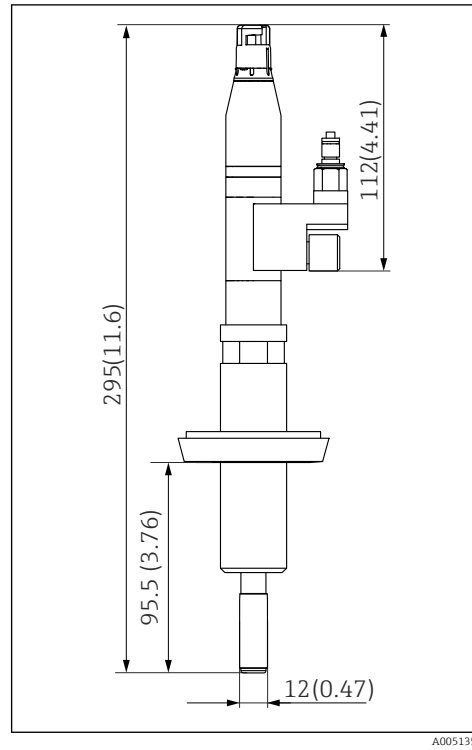
5 *Sensor with process connection Tri-Clamp DN50, dimensions: mm (in)*



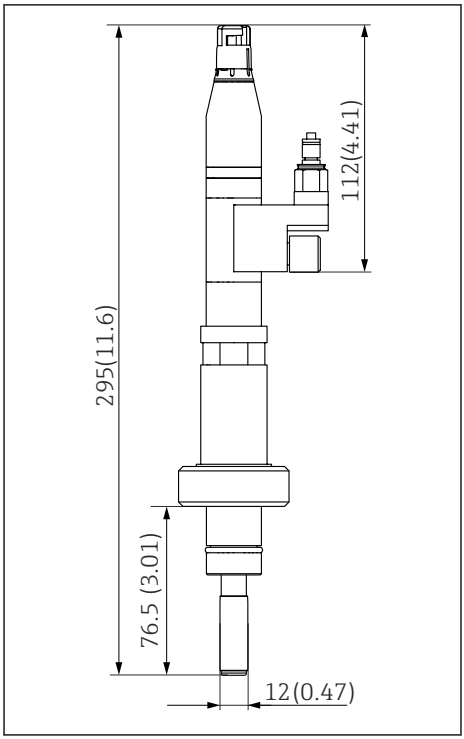
6 *Sensor with process connection Varivent DN50, dimensions: mm (in)*



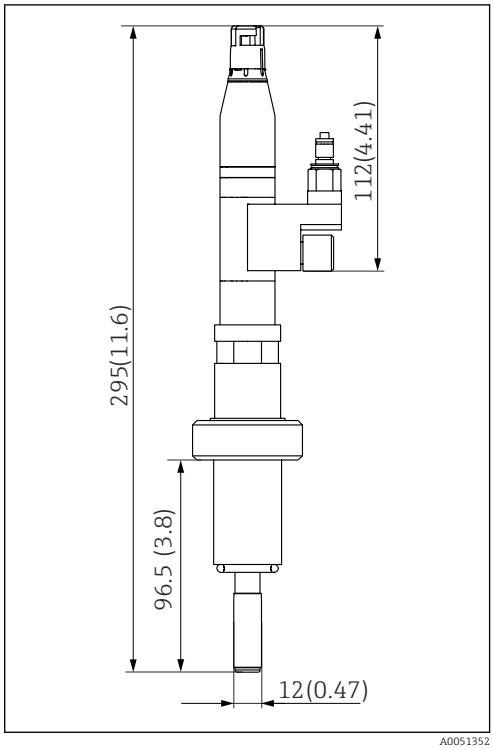
7 *Sensor with process connection milk pipe DN25, dimensions: mm (in)*



8 *Sensor with process connection milk pipe DN50, dimensions: mm (in)*



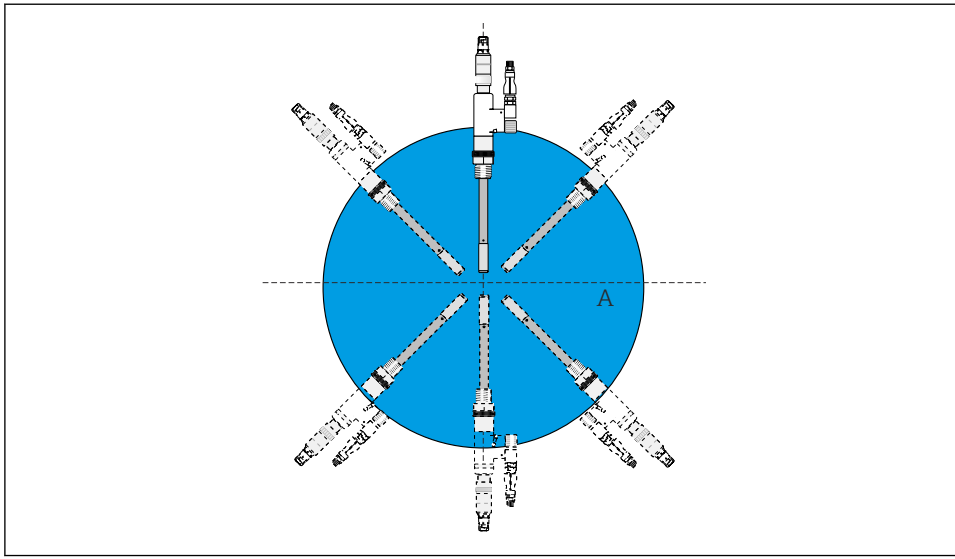
9 Sensor with process connection socket DN25, dimensions: mm (in)



10 Sensor with process connection socket DN30, dimensions: mm (in)

5.1.2 Orientation

▶ Install the sensor at any angle.



A0013862

11 *Orientation*

A Any installation angle 0 to 360 °

5.1.3 Instructions for pipe installation

NOTICE

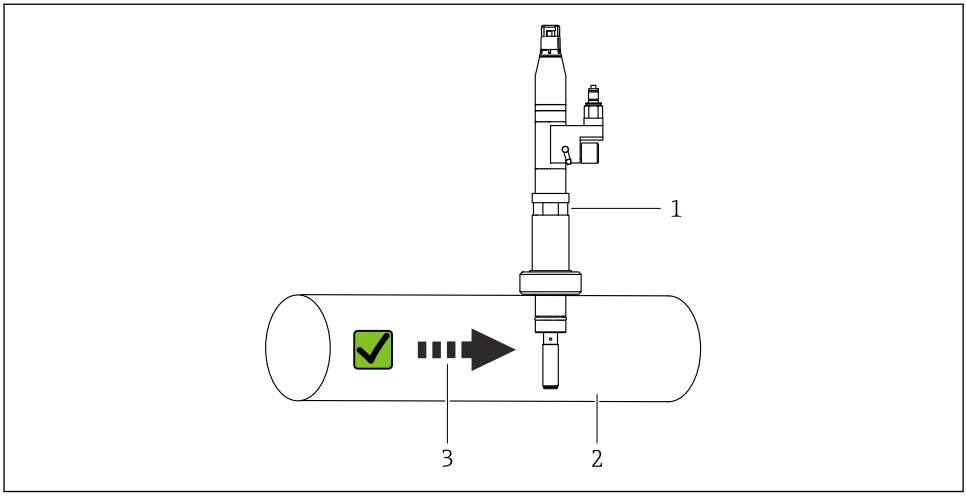
Measurement error due to air in the pipe

► Ensure that the pipe is completely filled with medium.

NOTICE

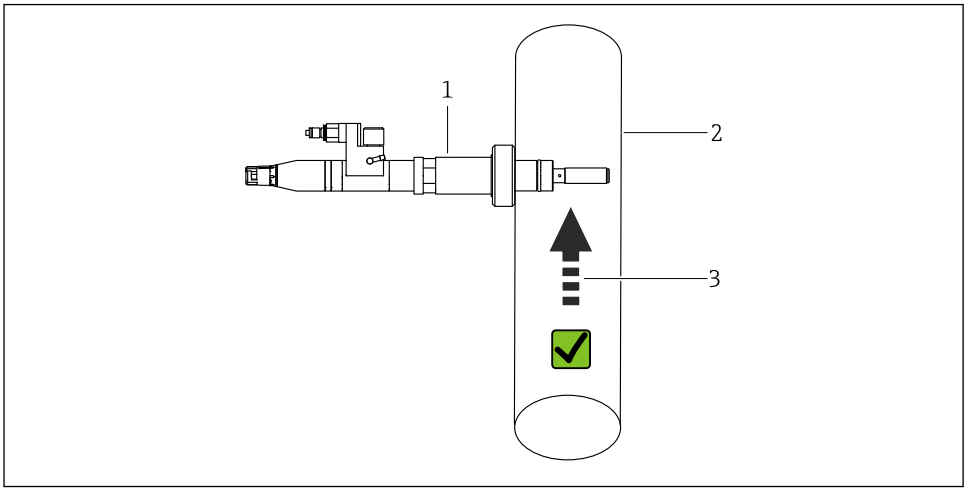
Measurement error due to flow directed at the junction

► Ensure that the flow of the medium is not directed straight at the sensor junction.



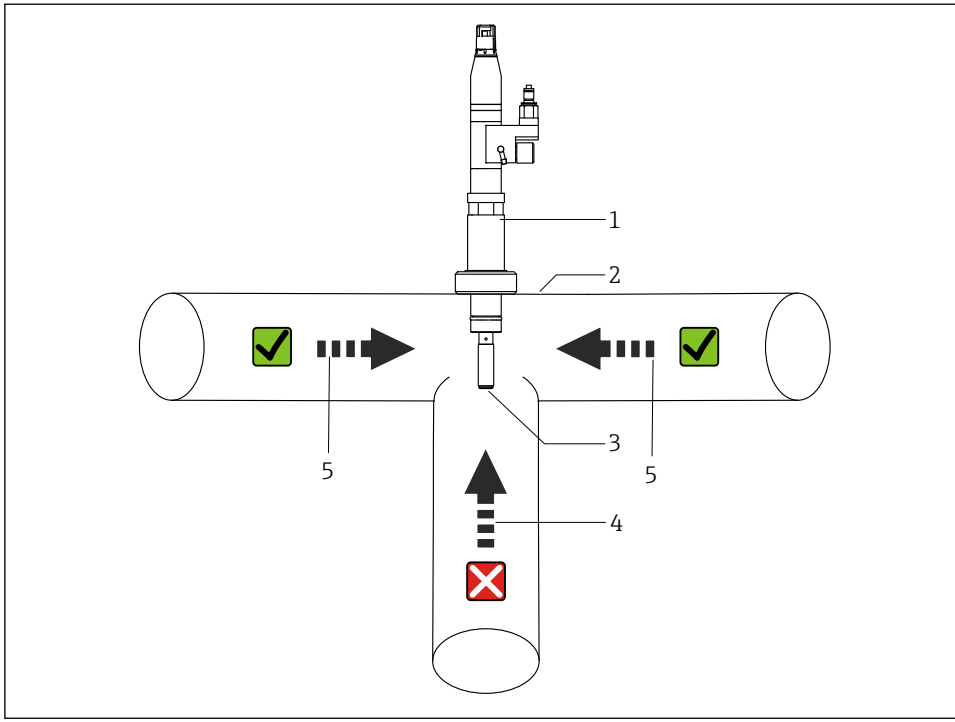
A0062750

1 Sensor
2 Pipe
3 Flow direction



A0062749

1 Sensor
2 Pipe
3 Flow direction



1 Sensor
2 Pipe (T-piece in this case
3 Junction
4 Incorrect flow direction
5 Correct flow direction

5.2 Installing the sensor

NOTICE

Internal fittings can damage the sensor enamel!

► When installing in containers and pipes, keep a sufficient distance from internal fittings and the wall.

Installing the sensor in the process

1. Version with M20: screw in the sensor at an existing process connection.
2. All other versions: mount the sensor on a process connection that is appropriate for the sensor version.

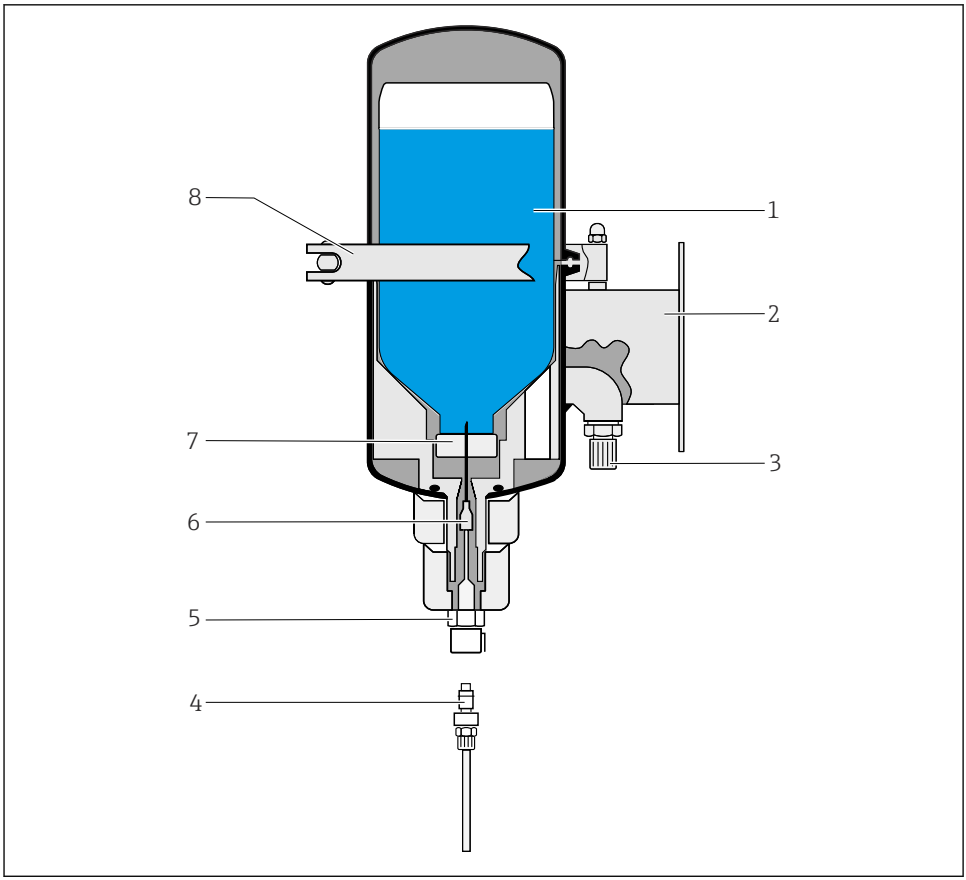
5.3 Installing the electrolyte vessel

NOTICE

Internal pressure in electrolyte system too low

Medium enters the sensor through the junction and contaminates the electrolyte!

- ▶ Set the compressed air supply so that the pressure in the electrolyte vessel is always at least 0.5 bar (7.3 psi) above the process pressure.



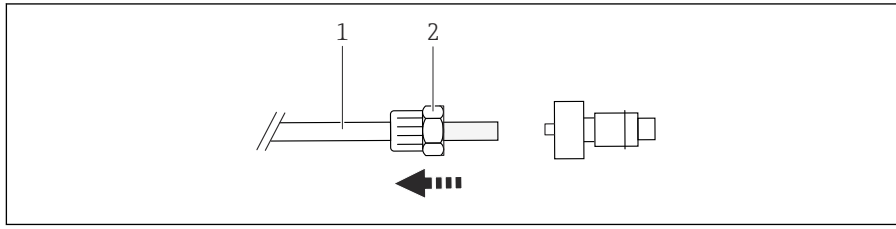
12 *Electrolyte vessel CPS341Z*

1 *Electrolyte bottle*
2 *Mounting plate*
3 *Compressed air connection G1/4*
4 *Self-locking connector with electrolyte hose*
5 *Self-locking coupling*
6 *Cannula*
7 *Septum*
8 *Clamp*

1. Mount the electrolyte vessel vertically on a wall.
2. Observe the maximum distance between the electrolyte vessel and the sensor: 5 m (16 ft) (length of electrolyte hose).
3. If necessary, shorten the electrolyte hose supplied to the desired length → 20.
4. Connect the hose end with the self-locking coupling to the connector of the sensor's KCl coupling.
5. Connect the hose end with the self-locking connector to the self-locking coupling of the electrolyte vessel.
6. Connect the compressed air supply to the G1/4 coupling via a pressure-reducing valve provided by the customer.
7. Set the internal pressure in the electrolyte vessel in such a way that it is at least 0.5 bar (7.3 psi) above the process pressure but does not exceed the permitted process pressure of the sensor of 7 bar (101.5 psi) absolute.

A higher differential pressure is possible but increases the level of electrolyte consumption.

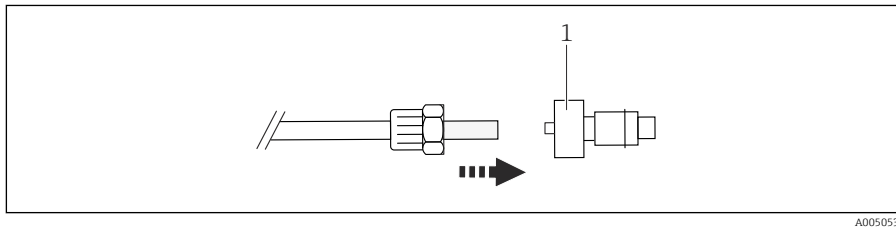
5.3.1 Mounting the self-locking connector on the electrolyte hose

1. Using a hose cutter or a sharp blade, cut the electrolyte hose to the desired length.
2. 

A0050513

1 Hose
2 Lock nut

Slide the lock nut onto the hose.

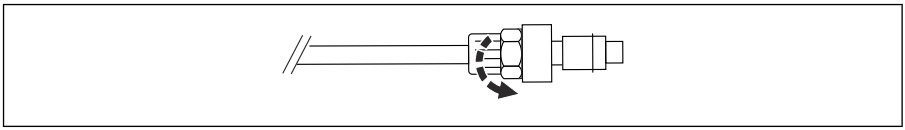
3. Warm the hose end slightly.
4. 

A0050531

1 Connection

Push the hose onto the connection.

5.

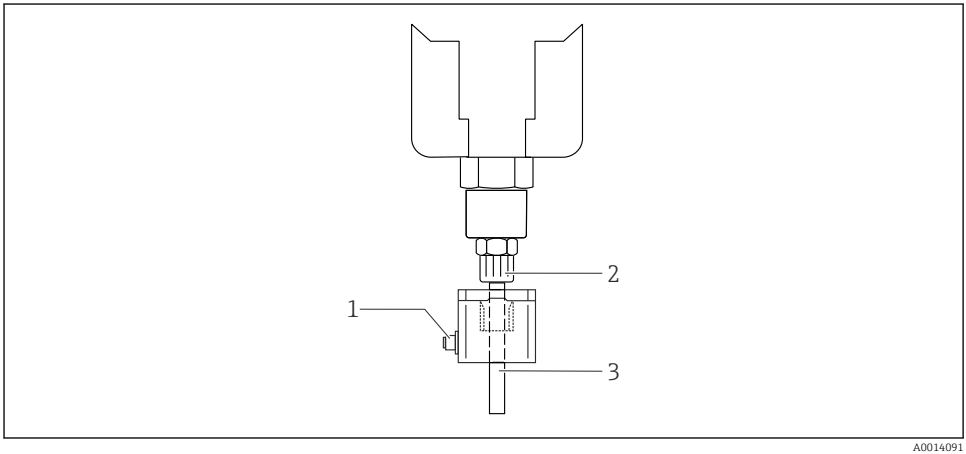


A0050532

Close the lock nut.

6. Tighten the lock nut.

5.4 Mounting the optional electrolyte monitor



A0014091

13 *Electrolyte monitoring*

1 M12 connection
2 Electrolyte vessel
3 Electrolyte hose

1. Remove the cover of the electrolyte monitor (bubble sensor).
2. Attach the bubble sensor to the electrolyte hose at the outlet of the electrolyte vessel.
3. Fit the cover back on.
4. Connect the connector of the CPS341Z-D3 connecting cable to the M12 connection.

▶ Always order the connecting cable when ordering the sensor. The bubble sensor does not work without a cable.

Connection of the external supply voltage → 24

6 Electrical connection

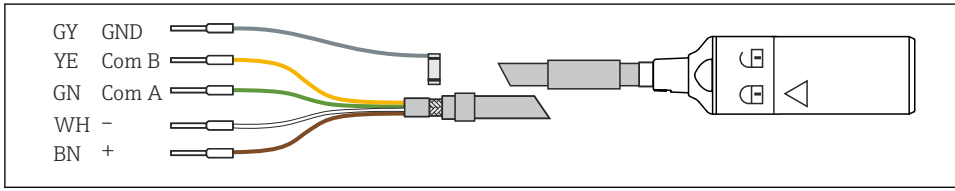
6.1 Connecting the sensor

NOTICE

If the sensor is in contact with the medium and the transmitter is disconnected from the power supply, polarization processes can cause an irreversible zero point shift and thus irreparable damage to the sensor.

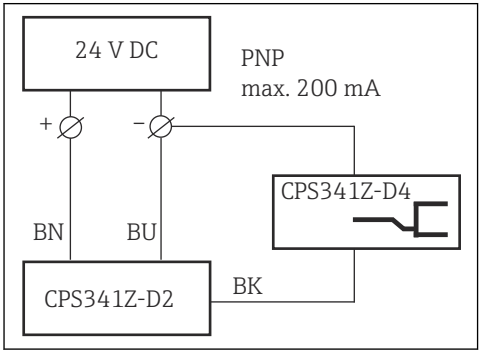
- Perform a calibration. → 29
- Regenerate the sensor, e.g. in 3 M KCl for 24 hours.
- Leave the transmitter switched on while the sensor is immersed in the medium. The sensor can be irreversibly damaged if it is immersed in the medium without being powered.
- When performing maintenance work when the sensor is connected, remove the sensor from the medium and dry it before disconnecting the transmitter from the power supply.
- Avoid any kind of conductive connection between the reference and the pH-sensitive enamel when the device is switched off.
- If the sensor has been removed from the medium: to protect the junction, it is essential to use the KCl protective cap specially designed for CPS341D and the red sealing cap on the electrolyte connection.

The electrical connection to the transmitter is established using measuring cable CYK10.

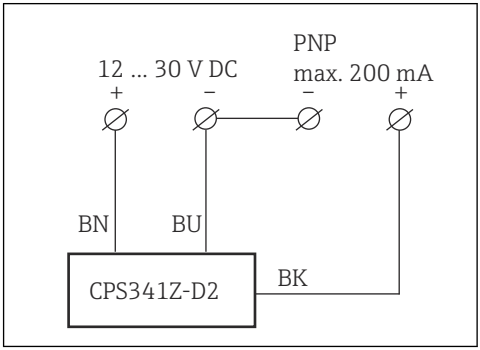


14 *Measuring cable CYK10*

6.2 Connecting the optional electrolyte monitor



15 *Connection to the customer power supply with a relay*



16 *Connection to the customer power supply with a PLC*

1. Connect the connecting cable to an on-site power supply (→ 15, → 16).
2. Connect the M12 connector to the M12 coupling of the bubble sensor (if you have not already done so during installation).

Light emitting diodes in the cable connector indicate the status in the electrolyte supply system:
- Green = supply voltage on
- Green + yellow = air bubble in the electrolyte hose or electrolyte vessel is empty

7 Commissioning

7.1 Preparatory steps

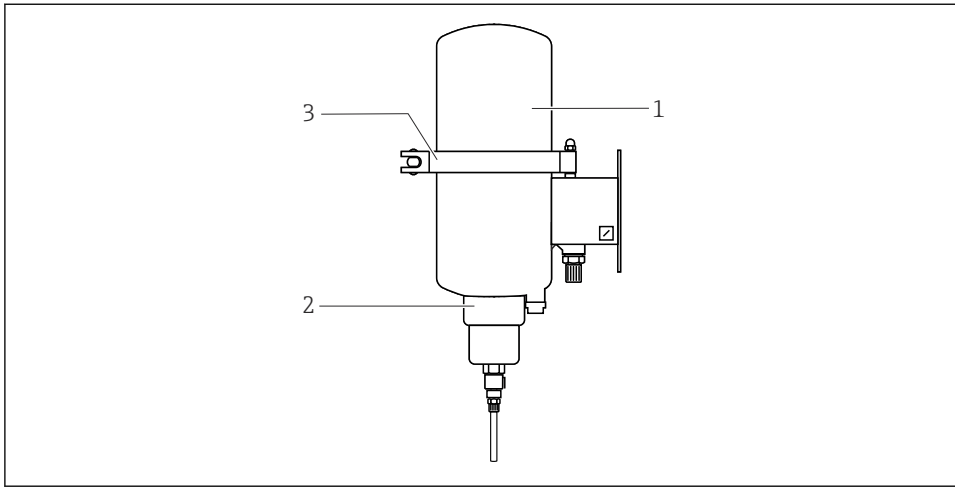
Prior to initial commissioning, ensure that:
- The sensor has been installed correctly.
- The electrical connection is correct.

▶ For sterile applications, disinfect the entire electrolyte system with 70% ethanol before commissioning (ethanol is not included in the delivery).

Sensor commissioning is a multi-step process:

1. Disinfection of the electrolyte system (optional, for sterile applications).
2. Regeneration of the sensor.
3. Filling of the electrolyte vessel.
4. Calibrate sensor.

7.1.1 Disinfecting the electrolyte system



A0014072

1 Top part of the electrolyte vessel
2 Thread adapter nut on plastic insert
3 Clamp

The KCl supply system is disinfected with ethanol until venting is complete.

Preparations

► The parts of the sensor in contact with medium must be sterilized using appropriate procedures (SIP) before any further steps are taken.

Inserting the ethanol bottle

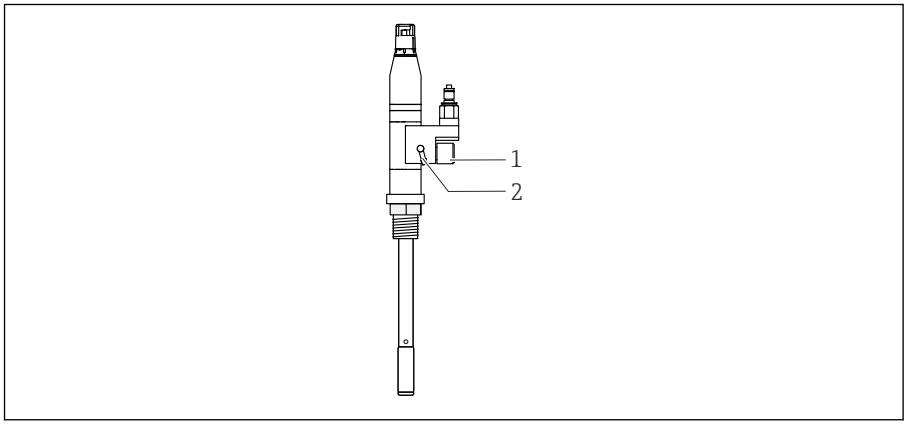
1. Loosen the clamp on the mounted electrolyte vessel.
2. Remove the top part of the electrolyte vessel.
3. Fill an empty septum bottle with 70% ethanol.
4. Place the bottle into the bottom part of the electrolyte vessel with the septum in a central position and pointing downwards.
   ↳ This causes the cannula of the electrolyte vessel to pierce the septum.
5. Fit the top part.
6. Seal the vessel tightly with the clamp.
7. If you have not already done so, connect the electrolyte vessel and the sensor via the electrolyte hose that can be plugged in at both ends.

NOTICE

Ethanol can flow through the sensor and irreversibly damage it!

▶ Only flush the KCl supply system with ethanol until venting is complete.

Disinfecting the electrolyte system

1. Apply at least 3 bar (43.5 psi) gauge pressure to the electrolyte vessel.
2. 

A0014073

1 Vent screw
2 Vent opening

Open the vent screw on the sensor until at least 100 ml (3.4 fl oz) of 70 % ethanol solution has been released from the vent opening.

3. Leave the 70% ethanol solution to act for a maximum of 5 minutes.

Removing the ethanol bottle

1. Switch off the compressed air.
2. Release the pressure on the electrolyte vessel. For this, slacken the thread adapter nut on the plastic insert by 2-3 turns.
3. Once the vessel is unpressurized tighten the thread adapter nut immediately.
4. Loosen the clamp on the electrolyte vessel.
5. Remove the top part.
6. Remove the ethanol bottle.
7. Fill the sensor with electrolyte directly after the disinfection process.

7.1.2 Regeneration of the sensor

For new sensors that have been dry for an extended period, slightly greater measurement errors may occur during commissioning. Regeneration eliminates these errors. During the regeneration process, the necessary gel layer forms on the surface of the pH-sensitive enamel.

If the sensor is cleaned and sterilized in the container or pipe before commissioning, additional regeneration is no longer required.

Regeneration is performed with the sensor installed and connected. The transmitter must be switched on.

Choose from the following 3 options:

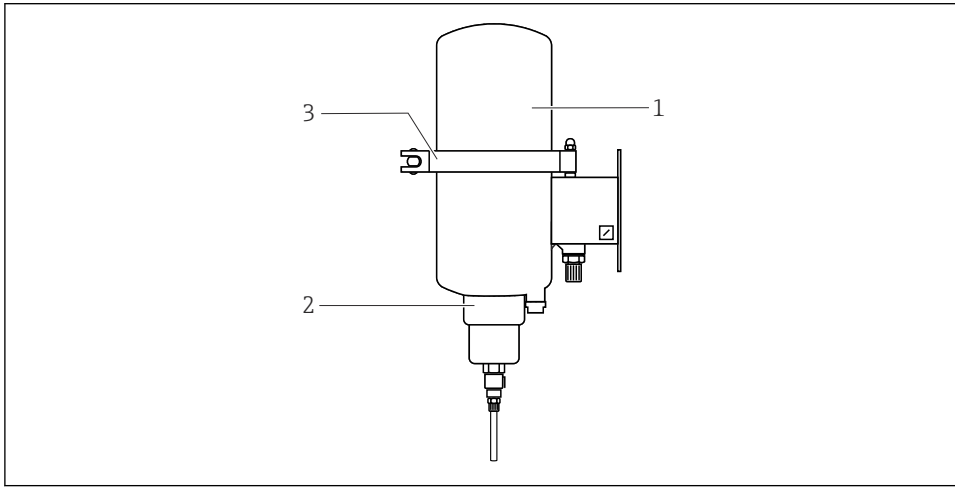
1. Soak the sensor for 24 hours.
2. Immerse the sensor in 70 to 100 °C (160 to 210 °F) hot water for 30 minutes.
3. Steam-treat the sensor for 10 to 15 minutes.

7.1.3 Filling the electrolyte vessel

The electrolyte must be free from bubbles over the entire fill section. This is the only way to ensure a correct electrical connection between the reference electrode and the junction.

The electrolyte is a 3M KCl solution with an added inhibitor (1 ml/l colloidal silica) that prevents germ formation.

Only use the sensor with electrolyte vessel CPS341Z-D1, and fill it with CPS341Z-D5.



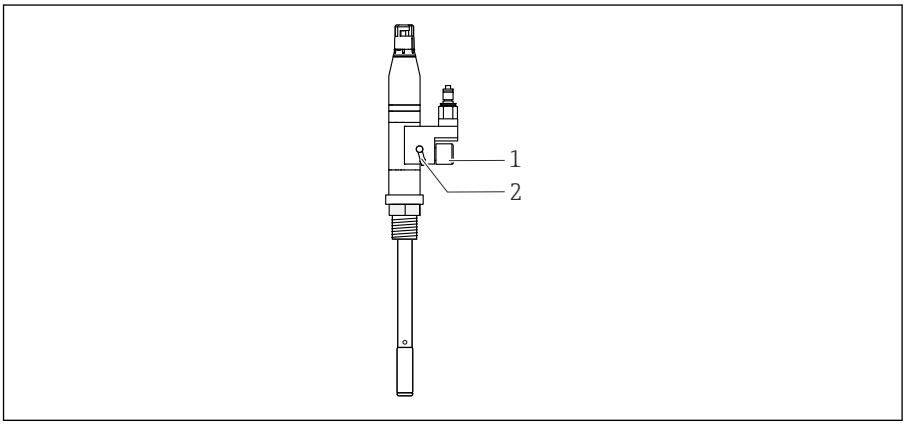
A0014072

1 Top part of the electrolyte vessel
2 Thread adapter nut on plastic insert
3 Clamp

Inserting the electrolyte bottle

1. Loosen the clamp on the mounted electrolyte vessel.
2. Remove the top part of the electrolyte vessel.
3. Remove the red sealing cap on the electrolyte bottle.
4. Place the bottle into the bottom part of the electrolyte vessel with the septum in a central position and pointing downwards.
   ↳ This causes the cannula of the electrolyte vessel to pierce the septum.
5. Fit the top part.
6. Seal the vessel tightly with the clamp.

Filling the electrolyte system

1. Apply a pressure of at least 0.5 bar (7.3 psi) above process pressure to the electrolyte vessel.
2. If you have not already done so,
   connect the electrolyte vessel and the sensor via the electrolyte hose that can be plugged in at both ends.
3. Connect the sensor to the transmitter.
4. Switch on the transmitter.
5. 

A0014073

1 Vent screw
2 Vent opening

   Open the vent screw on the sensor until the electrolyte flows from the vent opening without bubbles.
6. If the electrolyte system was disinfected beforehand, allow at least 100 ml (3.4 fl oz) of electrolyte to escape.
7. Close the vent screw.
8. Clean the sensor around the vent opening with water.

9. Establish the process pressure in the electrolyte vessel.

8 Operation

8.1 Adapting the measuring instrument to the process conditions

8.1.1 Calibrating the sensor

▶ Follow the instructions in the Operating Instructions of the transmitter.

Need for calibration

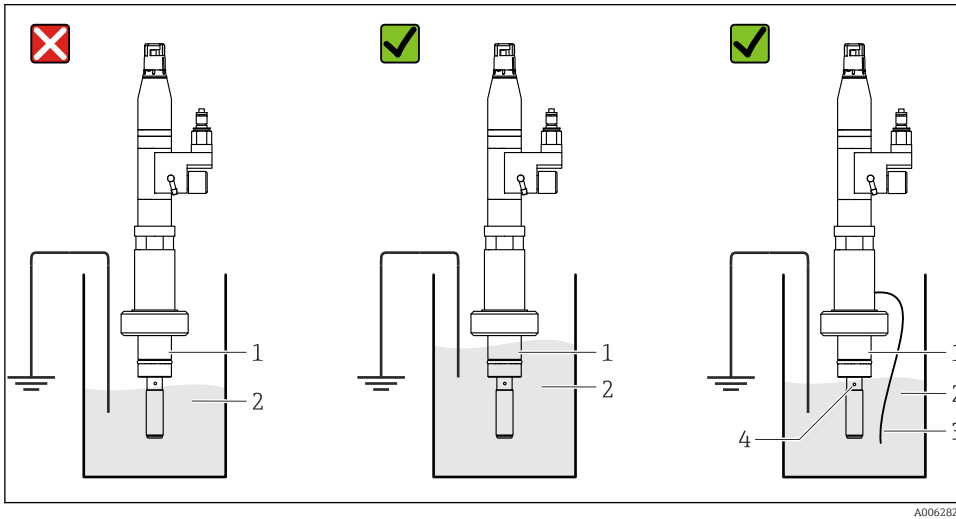
NOTICE

When uninstalled: no electrical contact between the process connection of the sensor and the calibration buffer

Measured values may vary!

▶ Immerse the sensor in the calibration buffer (1) up to the process connection (2).

▶ Alternatively, establish electrical contact between the process connection and calibration buffer, e.g. using a wire (3). The rhodium dot (4) must be immersed in the calibration buffer.



A0062821

1 Process adapter
2 Calibration buffer
3 Electrical connection between process adapter and calibration buffer via wire
4 Rhodium dot

The calibration data are stored in the Memosens plug-in head at the factory and are transferred to the transmitter. The sensor is ready for operation immediately.

If the device has not been in operation for an extended period, the following is recommended:

1. Verify the calibration data.
2. Recalibrate if necessary.

Types of calibration

The following types of calibration are possible:
- 2-point calibration
  With calibration buffers
- 1-point calibration
  - Entry of an offset or a reference value
  - Sample calibration with laboratory comparative value
- Data entry
  Entry of the zero point, slope and temperature
- Temperature adjustment by entering a reference value

9 Diagnostics and troubleshooting

9.1 General troubleshooting

Problem	Cause	Solution
Reading fluctuates when the electrolyte hose is touched	▪ Not vented sufficiently ▪ Insufficient pressure	1. Vent 2. Check and increase pressure.
Reading does not change in media with different pH values	Hole in pH enamel/ insulation error	▶ Contact the Service Department to arrange a repair.
Measured value fluctuates when sensor is not installed	No electrical contact between the process connection of the sensor and the medium	1. Immerse the sensor in the medium as far as the sensor process connection. 2. Establish an electrical contact with the process connection, e.g. using a wire.

Problem	Cause	Solution
Zero point drifts, is no longer in permitted range, shifts during venting	Reference electrode defective	▶ Contact the Service Department to arrange a repair.
Slope too low or very slow reaction	Limescale or other buildup	1. Measure potential at pH 4 and pH 7. 2. Check slope: at least 55 mV/pH at 25 °C (77 °F) 3. Immerse the sensor for 30 minutes in 10% HCl. Then wet the sensor with water and measure again. 4. If acid treatment does not have the desired effect, have the sensor inspected by the Service Department.

10 Maintenance

10.1 Maintenance tasks

10.1.1 Changing the electrolyte bottle

NOTICE

Process pressure and process temperature

The penetration of medium can contaminate the sensor reference system!

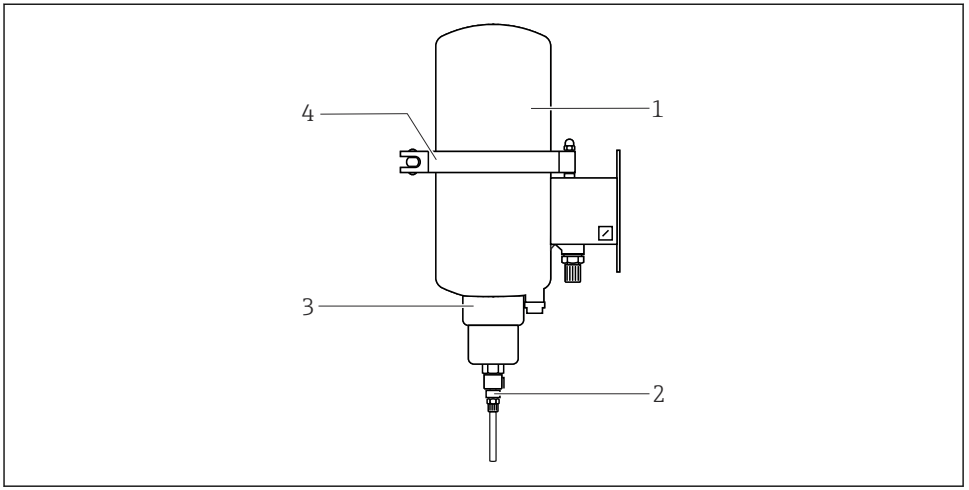
- ▶ Only replace the bottle of electrolyte when no process pressure is applied and at temperatures below 80 °C (176 °F).
- ▶ If it is not possible to replace the bottle without process pressure and at temperatures below 80 °C (176 °F), replace the electrolyte bottle very quickly. After removing the empty electrolyte bottle, insert the new bottle immediately without waiting. Set the pressure (at least 0.5 bar (7.3 psi) above process pressure).

Ensure that the electrolyte system is always full:

- ▶ Replace the electrolyte bottle before the bottle is completely empty.

If you are using the optional electrolyte monitor, a message is activated when the first air bubble is detected at the outlet of the vessel.

- ▶ Change the electrolyte bottle immediately.

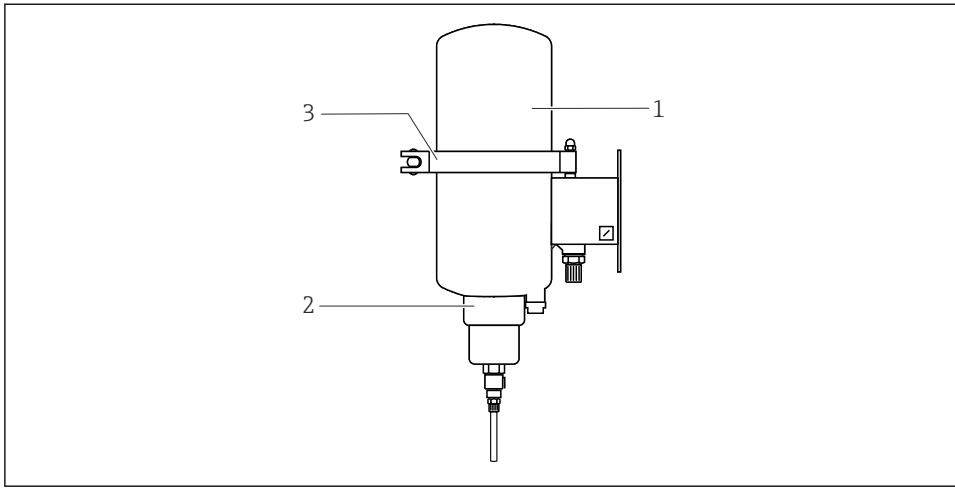


A0014074

1 *Top part of the electrolyte vessel*
2 *Coupling unlocking unit*
3 *Thread adapter nut on plastic insert*
4 *Clamp*

Releasing the pressure on the electrolyte vessel

1. Disconnect the electrolyte hose from the outlet of the electrolyte vessel by pressing the unlocking unit on the coupling.
2. Remove the electrolyte hose with the connector.
   ↳ The pressure is maintained briefly in the electrolyte hose and in the sensor in this way.
3. Switch off the compressed air.
4. Depressurize the electrolyte vessel by loosening the coupling nut on the plastic insert).



A0014072

1 Top part of the electrolyte vessel
2 Thread adapter nut on plastic insert
3 Clamp

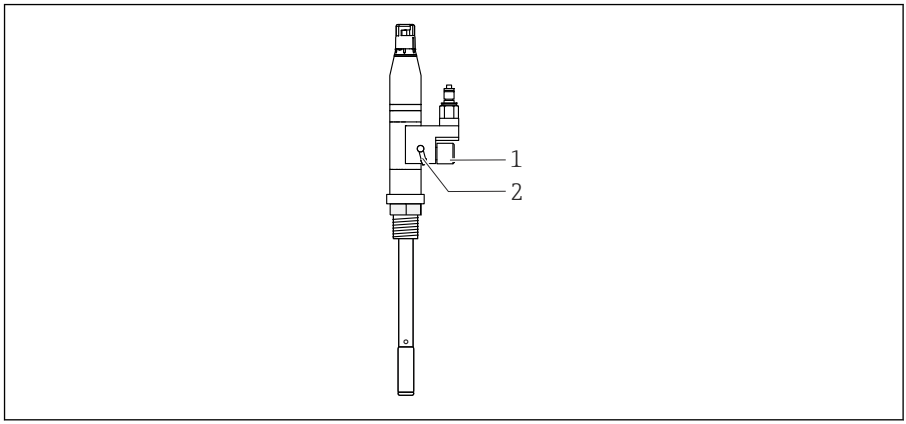
Inserting the electrolyte bottle

1. Loosen the clamp on the mounted electrolyte vessel.
2. Remove the top part.
3. Remove the red sealing cap on the electrolyte bottle.
4. Place the bottle into the bottom part of the electrolyte vessel with the septum in a central position and pointing downwards.
   ↳ This causes the cannula of the electrolyte vessel to pierce the septum.
5. Fit the top part.
6. Seal the vessel tightly with the clamp.

Filling the electrolyte system

1. Reinsert the (self-locking) connector of the electrolyte hose into the coupling on the electrolyte vessel.
2. Apply a pressure of at least 0.5 bar (7.3 psi) above process pressure to the electrolyte vessel.

3.



1 Vent screw
2 Vent opening

Open the vent screw on the sensor until the electrolyte flows from the vent opening without bubbles.

4. Close the vent screw.
5. Clean the sensor around the vent opening with water.
6. Establish the process pressure in the electrolyte vessel.

10.1.2 Cleaning the sensor

Cleaning agent

NOTICE

Fluorinated acids and abrasive cleaners

Fluorinated acids (e.g. hydrofluoric acid) and abrasive substances corrode the enamel!

- ► Never use fluorinated acids to clean the sensor.
- ► Do not use metal or abrasive cleaning agents.

Suitable cleaning agents

- Water or solvents
- Non-scratch stainless steel cleaner
- Diluted hydrochloric acid (5 % to 20 %)

Cleaning the sensor

NOTICE

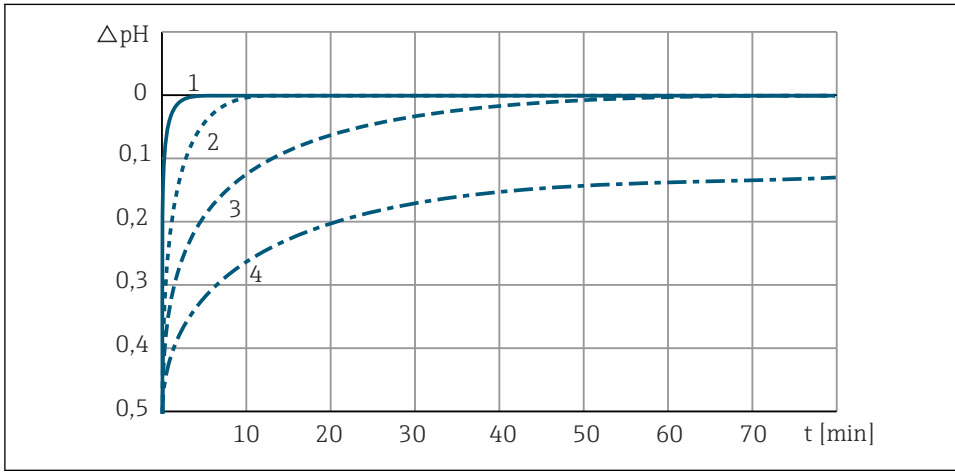
Acids and alkalis

Increased enamel corrosion if permitted process limits are exceeded!

- ► Avoid exceeding the maximum permitted temperatures and cleaning times.
- ► Please note that when cleaning with alkalis, the level of corrosion doubles with every 10 °C (50 °F) increase in temperature.
- ► Do not use concentrations that are higher than the permitted alkali or acid concentrations.

The sensor can be cleaned in place (CIP). Examples:
- 2% alkaline solution, 85 °C (176 °F), 1 hour
- 1.5% acid, 60 °C (140 °F), 15 minutes
- Water vapor, 135 °C (275 °F)

Cleaning with alkaline media affects the gel layer of the enamel. This results in a zero point shift which, in turn, causes temporary measurement errors. Regenerating the sensor through subsequent steam treatment, for example, regenerates the gel layer and corrects the zero point shift.



17 *Regeneration after 30 minutes CIP with 2% NaOH at 85 °C (185 °F)*

1 Regeneration with steam, 135 °C (275 °F)
2 Regeneration with water, 95 °C (203 °F)
3 Regeneration with water, 80 °C (176 °F)
4 Regeneration with water, 25 °C (77 °F)

Sterilizing the sensor

The sensor can be sterilized in place (SIP). The following are permitted for SIP:
- Process fluid
- Water vapor
- Alcohol solutions
- Aseptic solutions

11 Repair

11.1 General information

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

11.2 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.

11.3 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

11.4 Disposal

The device contains electronic components. The product must be disposed of as electronic waste.

▶ Observe the local regulations.



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.

12 Accessories

The following are the most important accessories available at the time this documentation was issued.

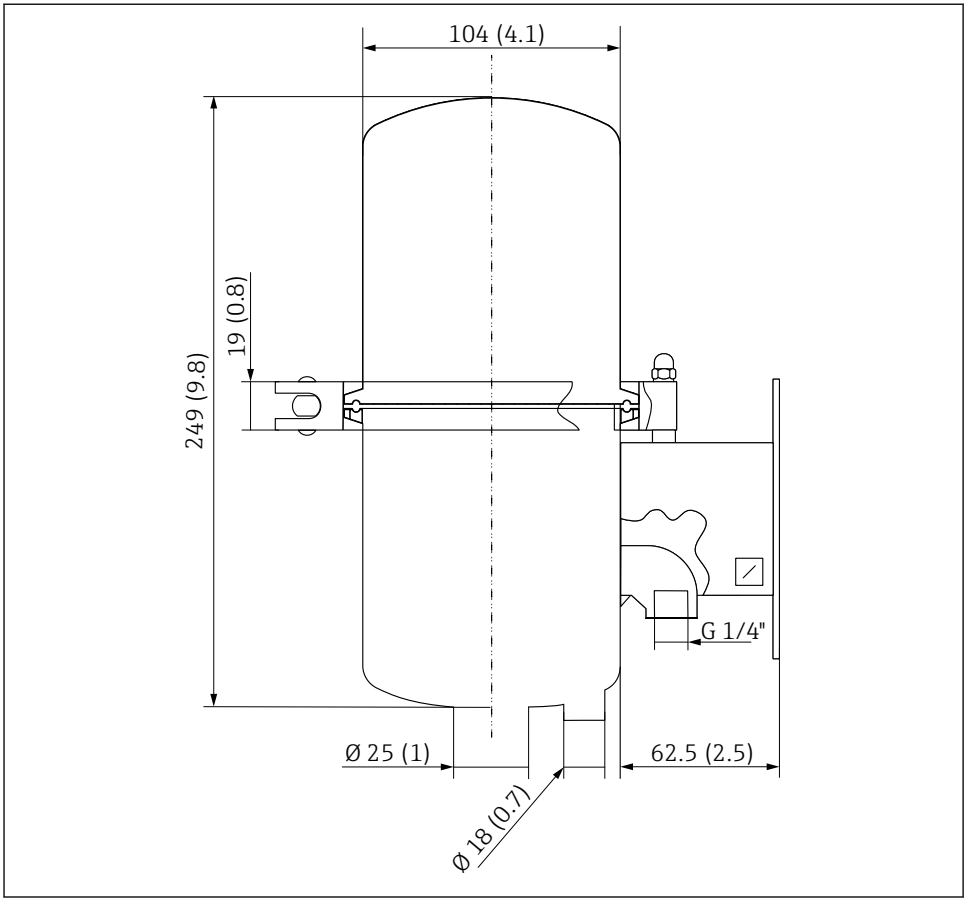
Listed accessories are technically compatible with the product in the instructions.

1. Application-specific restrictions of the product combination are possible.
   Ensure conformity of the measuring point for the application. This is the responsibility of the operator of the measuring point.
2. Pay attention to the information in the instructions for all products, particularly the technical data.
3. For accessories not listed here, please contact your Service or Sales Center.

12.1 Device-specific accessories

Electrolyte vessel CPS341Z-D1
Pressurized electrolyte vessel for safe supply of KCl to the sensor

The electrolyte supply can be monitored by the ultrasonic level monitoring sensor CPS341Z-D2 (air bubble sensor). For the ultrasonic sensor, a supply voltage of 18 to 30 V DC at maximum 70 mA (without switching current) is necessary. The signal is output via the relay CPS341Z-D4 and is also indicated visually via the LED display CPS341Z-D3.



18 Electrolyte vessel CPS341Z Dimensions: mm (in)

CPS341Z-	Accessories for Ceramax CPS341D
A1	Welding socket DN30, straight
A2	Dummy plug for welding socket DN30
A3	Welding socket DN25, straight
A4	Welding socket DN25, beveled
D1	Electrolyte vessel, stainless steel
D2	Ultrasonic sensor level monitoring
D3	Cable with LED indicator
D4	Relay, type KCD2-R, P+F

CPS341Z-	Accessories for Ceramax CPS341D
D5	KCl electrolyte, sterile, 1 l (0.26 gal) plastic bottle
D7	Plastic bottle, empty
D8	Protective cap

Memosens data cable CYK10
- For digital sensors with Memosens technology
- Product Configurator on the product page: www.endress.com/cyk10

Technical Information TI00118C

High-quality buffer solutions from Endress+Hauser - CPY20
High-quality CPY20 pH buffers ensure maximum precision in pH calibrations. Available in pH 2.0, pH 4.0, pH 7.0, pH 9.0, pH 9.2, pH 10.0 and pH 12.0.
Further details and Product Configurator on the product page: www.endress.com/cpy20

13 Technical data

13.1 Input

13.1.1 Measured variables

pH value

Temperature

13.1.2 Measuring range

0 to 10 pH (linear range)

-2 to 14 pH (application)

0 to 140 °C (32 to 280 °F)

13.2 Performance characteristics

13.2.1 Reference system

Ag/AgCl with 3 M KCl and inhibitor (1 ml/l colloidal silica)

13.3 Environment

13.3.1 Ambient temperature range

NOTICE

Risk of damage from frost!
▶ Do not use the sensor at temperatures below 0 °C (32 °F).

13.3.2 Storage temperature

0 to 50 °C (32 to 122 °F)

13.3.3 Degree of protection

IP 68 (10 m (33 ft) head of water at 25 °C (77 °F) over 45 days, 1 mol/l KCl)

13.3.4 Electromagnetic compatibility (EMC)

Interference emission and interference immunity as per EN 61326: 2012

13.4 Process

13.4.1 Process temperature range

0 to 140 °C (32 to 284 °F)

13.4.2 Process pressure range

0.8 to 7 bar (11.6 to 101.5 psi) (absolute)

13.4.3 Conductivity

Min. 50 µS/cm

13.5 Mechanical construction

13.5.1 Weight

0.6 kg (1.3 lbs)

13.5.2 Materials

Sensor body:	Glass-lined steel, chemically resistant and shock resistant
Adapter and terminal head:	Stainless steel 1.4404 (AISI 316 L), PVDF, PTFE
Electrolyte vessel:	Stainless steel 1.4301 (AISI 304)
Process connections:	Stainless steel 1.4404 (AISI 316 L)

13.5.3 Volume

Volume of electrolyte in sensor: 1.6 ml (0.05 fl oz)

13.5.4 Temperature sensor

NTC 30K

13.5.5 Plug-in head

Memosens plug-in head for digital, non-contact data transmission, pressure resistance 16 bar (232 psi) (relative)

13.5.6 Process connections

Depending on version
- M20 (replacement for installed sensor)
- Nipple DN25
- Nipple DN30
- Varivent DN50/40
- Dairy fitting DN50
- Dairy fitting DN25
- Tri-Clamp DN50

Index

A
Accessories 37
Ambient temperature range 39
Approvals 12

C
Calibrating the sensor 29
Calibration
  Need 29
  Types 30
Certificates 12
Cleaning agent 34
Commissioning 24
Conductivity 40

D
Degree of protection 40
Diagnostics 30
Dimensions 13
Disposal 36

E
Electrical connection 23
Electrolyte
  Bottle change 31
  Connecting the optional monitor 24
  Disinfecting the system 25
  Filling the vessel 27

I
Identifying the product 11
Incoming acceptance 11
Input 39
Installation requirements 13
Intended use 6

M
Maintenance 31
Materials 40
Measured variables 39
Measuring range 39
Mechanical construction 40

N
Nameplate 11

O
Operational safety 6
Orientation 16

P
Process connections 41
Process pressure 40
Process temperature 40
Product description 8
Product safety 7

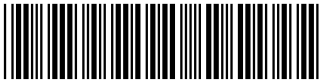
R
Repair 36
Return 36

S
Safety
  Operation 6
  Product 7
  Workplace safety 6
Safety instructions 6
Scope of delivery 12
Sensor
  Cleaning 34
  Connecting 23
  Description 8
  Regeneration 27
  Sterilization 35
Storage temperature 40
Symbols 4

T
Technical data 39
Troubleshooting 30

U
Use 6

W
Warnings 4
Weight 40
Workplace safety 6



www.addresses.endress.com

Endress+Hauser

People for Process Automation