

Operating Instructions

Condumax CLS19

For conductive measurement of conductivity in liquids

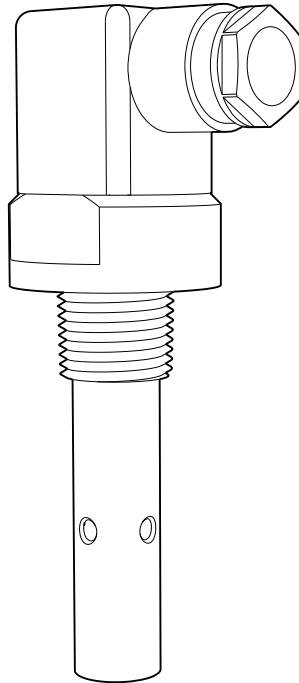






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1 About this document

1.1 Warnings

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

1.2 Symbols

Symbol	Meaning
	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

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 sensor is designed for the conductive measurement of conductivity in the pure and ultrapure water range. It is used in the following areas:

- Monitoring of ion exchangers
- Reverse osmosis

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

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.

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 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.

3.2 Product identification

3.2.1 Nameplate

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

- Manufacturer identification
 - Order code
 - Serial number
 - Cell constant (nominal value)
- ▶ Compare the information on the nameplate with the order.

3.2.2 Product identification

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.

Manufacturer's address

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

3.3 Scope of delivery

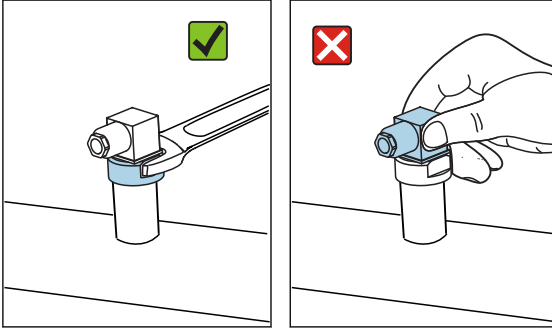
The scope of delivery includes:

- Sensor in the version ordered
- Mounted plug-in jack, Pg 9
- Operating Instructions

4 Installation

4.1 Mounting the sensor

The sensors are installed directly via the process connection thread NPT ½". As an option, the sensor can also be installed using a commercially available T-piece or cross fitting or using a flow assembly.

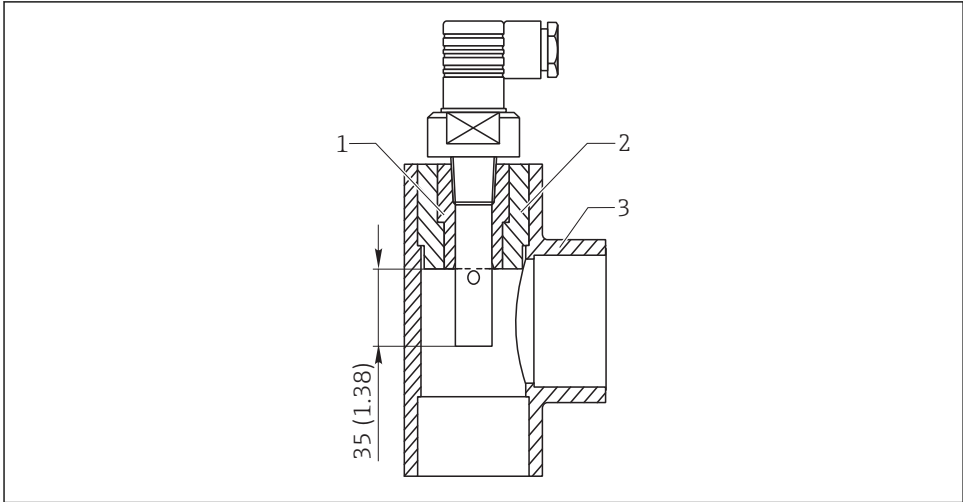


NOTICE


Incorrect mounting or disassembly

The head could become loose and fall off, resulting in total sensor failure!

- ▶ Only mount the sensor via the process connection.
- ▶ To do so, use a suitable tool, such as an open-ended wrench.



A0036892

 1 With NPT ½" thread in T-piece or cross fitting

- 1 T-piece or cross fitting (DN 32, 40 or 50)
- 2 Glue-in VC threaded coupling (NPT ½" for DN 20)
- 3 Glue-in adapter coupling (for DN 32, 40, 50)

1. Ensure that the electrodes are fully immersed in the medium during measurement. Immersion depth: at least 35 mm (1.38").
2. If using the sensor in the ultrapure water range, you must work under air-evacuated conditions.
 - ↳ Otherwise, the CO₂ in the air can dissolve in the water and its (weak) dissociation can increase the conductivity by up to 3 µS/cm.

4.2 Post-installation check

1. Are the sensor and cable undamaged?
2. Is the sensor installed in the process connection and is not suspended from the cable?

5 Electrical connection

WARNING

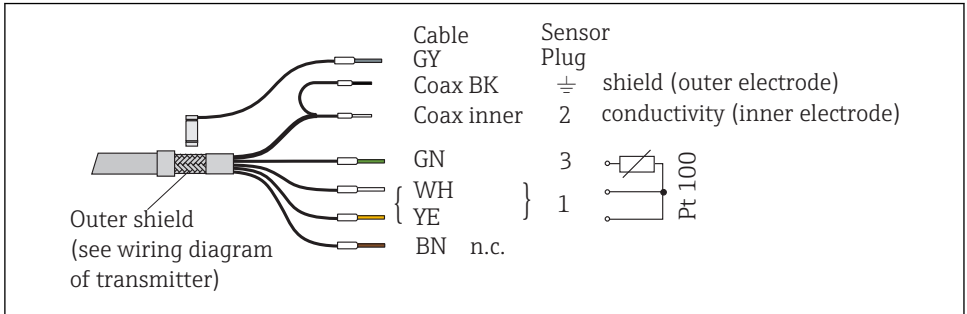
Device is live!

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.

5.1 Connecting the sensor

The sensor is connected via the CYK71 measuring cable with shield. The wiring diagram is provided in the Operating Instructions of the transmitter used.



A0024205-EN

2 Measuring cable CYK71

A VMB junction box and another CYK71 cable are required for the cable extension.

5.2 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.

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.

5.3 Post-connection check

Device condition and specifications	Action
Are the sensor, assembly or cables free from damage on the outside?	▶ Perform a visual inspection.
Electrical connection	Action
Are the mounted cables strain-relieved and not twisted?	▶ Perform a visual inspection. ▶ Untwist the cables.
Is a sufficient length of the cable cores stripped, and are the cores positioned in the terminal correctly?	▶ Perform a visual inspection. ▶ Pull gently to check they are seated correctly.
Are all the screw terminals properly tightened?	▶ Tighten the screw terminals.

Device condition and specifications	Action
Are all cable entries mounted, tightened and leak-tight?	▶ Perform a visual inspection.
Are all cable entries installed downwards or mounted laterally?	In the case of lateral cable entries: ▶ Point cable loops downward so that water can drip off.

6 Commissioning

Prior to initial commissioning, ensure that:

- The sensor is correctly installed
 - The electrical connection is correct
- ▶ At the transmitter, enter all the settings specific to the parameters and measuring point.
The measuring point is then ready to measure.

7 Maintenance

⚠ CAUTION

Corrosive chemicals

Risk of chemical burns to the eyes and skin and risk of damage to clothing and equipment!

- ▶ It is absolutely essential to protect the eyes and hands properly when working with acids, alkalis and organic solvents!
- ▶ Wear protective goggles and safety gloves.
- ▶ Clean away splashes on clothes and other objects to prevent any damage.
- ▶ Comply with instructions in the safety data sheets for the chemicals used.

⚠ WARNING

Thiocarbamide

Harmful if swallowed! Limited evidence of carcinogenicity! Possible risk of harm to the unborn child! Dangerous for the environment with long-term effects!

- ▶ Wear protective goggles, protective gloves and appropriate protective clothing.
- ▶ Avoid all contact with the eyes, mouth and skin.
- ▶ Avoid discharge into the environment.

Clean away fouling on the sensor as follows depending on the type of fouling:

1. Oily and greasy films:
Clean with fat solvent, e.g. alcohol, or hot water and agents containing surfactants (alkaline) (e.g. dishwashing detergent).
2. Lime and metal hydroxide buildup and low solubility (lyophobic) organic buildup:
Dissolve buildup with diluted hydrochloric acid (3 %) and then rinse thoroughly with plenty of clear water.

3. Sulfidic buildup (from flue gas desulfurization or wastewater treatment plants):
Use a mixture of hydrochloric acid (3 %) and thiocarbamide (commercially available) and then rinse thoroughly with plenty of clear water.
4. Buildup containing proteins (e.g. food industry):
Use a mixture of hydrochloric acid (0.5 %) and pepsin (commercially available) and then rinse thoroughly with plenty of clear water.
5. Readily soluble biological buildup:
Rinse with pressurized water.

After cleaning, rinse the sensor thoroughly with water.

8 Repair

8.1 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.

To ensure the swift, safe and professional return of the device:

- ▶ Refer to the website www.endress.com/support/return-material for information on the procedure and conditions for returning devices.

8.2 Disposal



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 Endress+Hauser for disposal under the applicable conditions.

9 Technical data

9.1 Input

9.1.1 Measured variables

- Conductivity
- Temperature

9.1.2 Measuring ranges

Conductivity	(in relation to water at 25 °C (77 °F))
CLS19 -A	0.04 to 20 µS/cm
CLS19 -B	0.10 to 200 µS/cm

Temperature

9.1.3 Cell constant

CLS19 -A	$k = 0.01 \text{ cm}^{-1}$
CLS19 -B	$k = 0.1 \text{ cm}^{-1}$

9.1.4 Temperature compensation (optional)

Pt100

9.2 Power supply

9.2.1 Cable entry

Pg 9

9.3 Environment

9.3.1 Degree of protection

IP65

9.4 Process

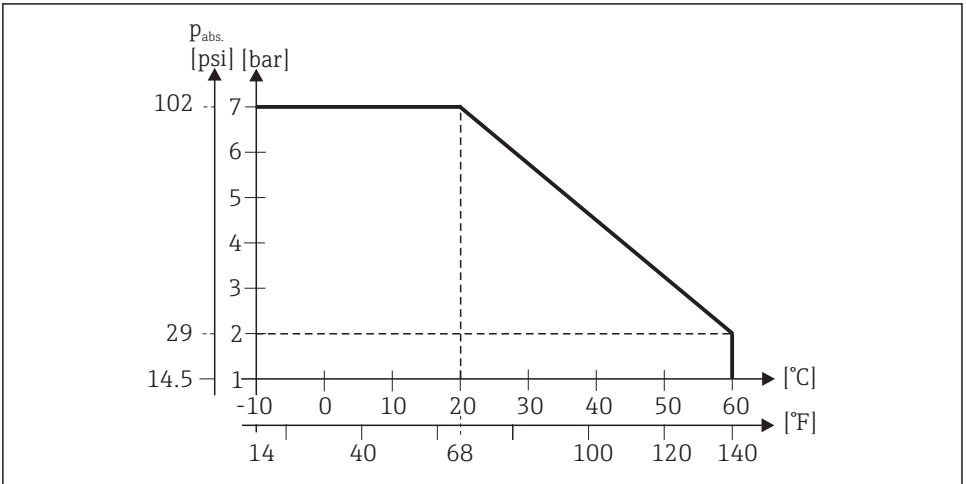
9.4.1 Process temperature

-10 to +60 °C (+10 to +140 °F)

9.4.2 Process pressure

max. 7 bar (102 psi), absolute, at 20 °C (68 °F)

9.4.3 Temperature/pressure ratings



A0036899

3 Mechanical pressure-temperature resistance

9.5 Mechanical construction

9.5.1 Weight

0.1 kg (0.2 lbs)

9.5.2 Materials

Electrodes

Stainless steel 1.4571 (AISI 316Ti)

Sensor shaft

Polyethersulfone (PES-GF20)

9.5.3 Process connection

Thread NPT 1/2"

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