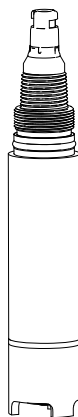


Brief Operating Instructions

Oxymax COS51D

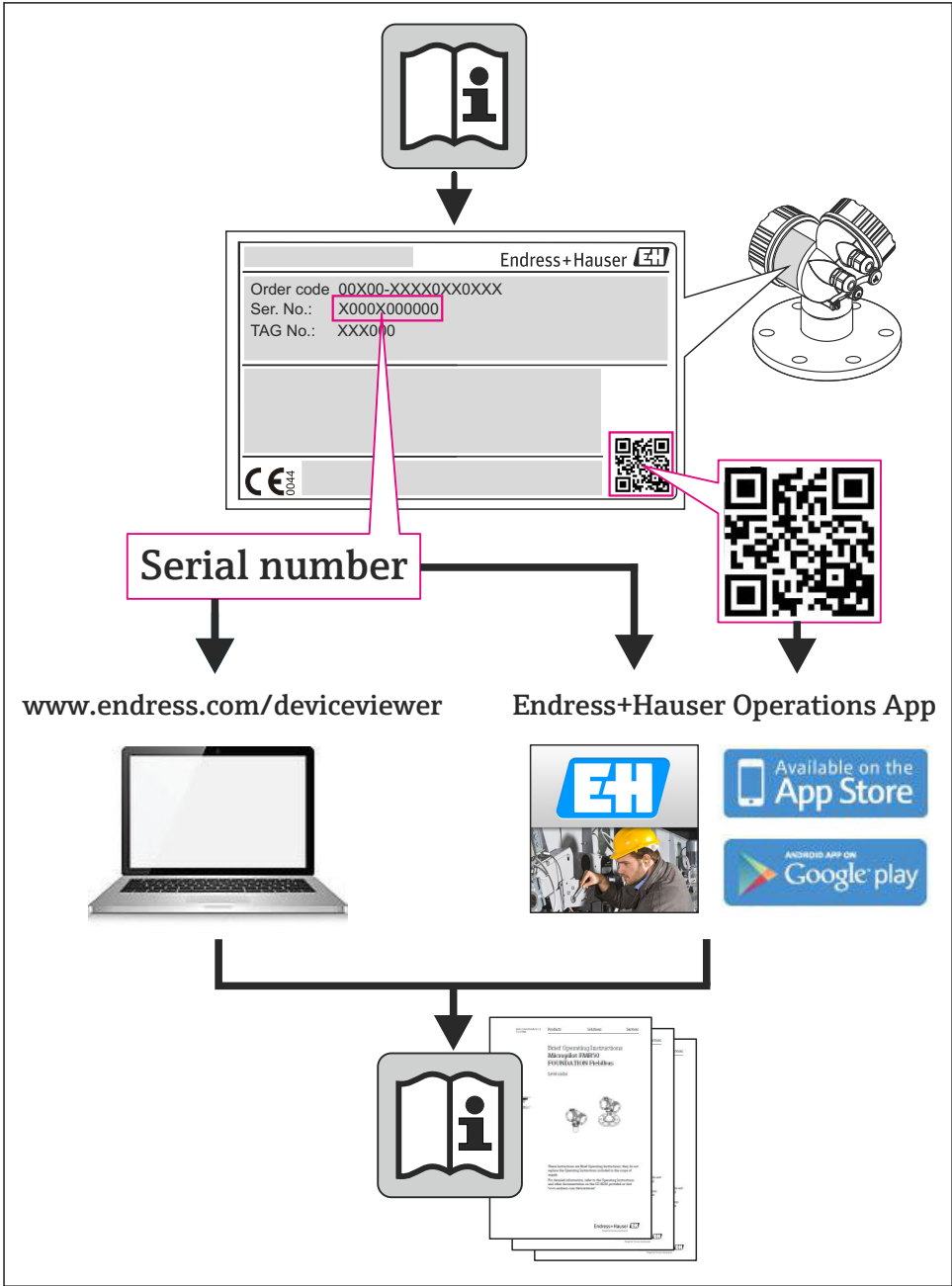
Amperometric sensor for the measurement of
dissolved oxygen
Memosens technology



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

Detailed information on the device can be found in the Operating Instructions and in the other documentation available at:

- www.endress.com/device-viewer
- Smart phone/tablet: Endress+Hauser Operations App



A0023555

EG/EU-Konformitätserklärung
EC/EU-Declaration of Conformity
Déclaration CE/UE de Conformité

Endress+Hauser 
 People for Process Automation



Company Endress+Hauser Conducta GmbH+Co. KG
 Dieselstraße 24, 70839 Gerlingen, Germany
 erklärt als Hersteller in alleiniger Verantwortung, dass das Produkt
 declares as manufacturer under sole responsibility, that the product
 déclare sous sa seule responsabilité en qualité de fabricant que le produit

Product Memosens Sensoren / Memosens sensors / Memosens capteurs
 COS21D-*12*1
 COS22D-BA****3
 COS51D-G*8*0
 zusammen mit Messkabel / together with measuring cable / ensemble avec cable de mesure
 CYK10-a**b a = G, E; b = 1, 2
 CYK20-BAab a = B1, B2; b = C1, C2

Regulations den folgenden Europäischen Richtlinien entspricht:
 conforms to following European Directives:
 est conforme aux prescription des Directives Européennes suivantes :

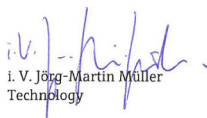
EMC 2014/30/EU
 ATEX 2014/34/EU

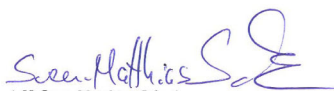
Standards angewandte harmonisierte Normen oder normative Dokumente:
 applied harmonized standards or normative documents:
 normes harmonisées ou documents normatifs appliqués :

EN 61326-1	(2013)	EN 60079-0	(2012)	+ A11 (2013)
EN 61326-2-3	(2013)	EN 60079-11	(2012)	
		EN 60079-26	(2007)	+ Corrigendum 1

Certification EG-Baumusterprüfbescheinigungs-Nr. BVS 04 ATEX E 121 X
 EC-Type Examination Certificate No.
 Numéro de l'attestation d'examen CE de type
 Ausgestellt von/issued by/délivré par DEKRA EXAM GmbH (0158)
 Qualitätssicherung/Quality assurance/Système d'assurance DEKRA EXAM GmbH (0158)
 qualité

Gerlingen, 20.04.2016
 Endress+Hauser Conducta GmbH+Co. KG


 i. V. Jörg-Martin Müller
 Technology


 i. V. Sven-Matthias Scheibe
 Technology Certifications and Approvals

EC_00357_01.16

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1 Document information

1.1 Warnings

Structure of information	Meaning
 DANGER Causes (/consequences) 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) 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) 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 Consequences of non-compliance (if applicable) ► Action/note	This symbol alerts you to situations which may result in damage to property.

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 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.
- Measuring point faults may be repaired only by authorized and specially trained personnel.



Repairs not described in the Operating Instructions provided may only be carried out directly by the manufacturer or by the service organization.

2.2 Designated use

The oxygen sensor is suitable for continuous measurement of dissolved oxygen in water.

The sensor is particularly suitable for:

- Measuring, monitoring and regulating the oxygen content in activated sludge basins
- Monitoring the oxygen content in the wastewater treatment plant outlet
- Monitoring, measuring and regulating the oxygen content in public waters and fish farming water
- Monitoring of oxygen enrichment in drinking water

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 Occupational safety

As the user, you are responsible for complying with the following safety conditions:

- Installation guidelines
- Local standards and regulations
- Regulations for explosion protection

Electromagnetic compatibility

- The product has been tested for electromagnetic compatibility in accordance with the applicable European 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

1. Before commissioning the entire measuring point, verify that all connections are correct. Ensure that electrical cables and hose connections are undamaged.
2. Do not operate damaged products, and safeguard them to ensure that they are not operated inadvertently. Label the damaged product as defective.

3. If faults cannot be rectified:

Take the products out of operation and safeguard them to ensure that they are not operated inadvertently.

NOTICE

Non-designated use

Incorrect measurements, malfunctions and even measuring point failure could result

- ▶ Only use the product in accordance with the product specifications.
- ▶ Pay particular attention to the technical data on the nameplate.

2.5 Product safety

2.5.1 State of the art

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 European standards have been observed.

2.5.2 Electrical equipment in hazardous areas

ATEX II 1G / IECEx Ex ia IIC T6 Ga

- The certified oxygen sensor Oxymax COS51D-G*8*0 may only be connected to certified, intrinsically safe, digital sensor circuits of the transmitter Liquiline M CM42-*E/F/I***** in conjunction with the measuring cable CYK10-G***. The electrical connection must be made according to the wiring diagram.
- The cable CYK10-G and its terminal head must be protected against electrostatic charging if it is run through zone 0.
- The sensors may not be operated under process conditions in which electrostatic charging of the sensor and the connecting cable is likely to occur. Intended use of the sensor in liquids with a conductivity of at least 10 nS/cm can be classified as electrostatically safe.
- Hazardous area versions of digital sensors with Memosens technology are indicated by a red-orange ring in the plug-in head.
- The maximum permitted cable length between the sensor and transmitter is 100 m (330 ft).
- Full compliance with regulations for electrical systems in hazardous locations (EN/IEC 60079-14) is mandatory when using the devices and sensors.

FM/CSA IS/NI Cl.1 Div.1 GP: A-D

Observe the documentation and the control drawings of the transmitter.

Temperature class ATEX, IECEx, FM/CSA

	Temperature class T6
Ambient temperature T _a	-5 to +50 °C

If the specified ambient temperature is complied with, temperatures that are unacceptably high for the temperature class will not occur on the sensor.

3 Certificates and approvals

3.1 Ex approvals

Version COS51D-G*8*0

ATEX II 1G / IECEx Ex ia IIC T6 Ga

Version COS51D-O*8*0

FM/CSA IS/NI Cl.1 Div.1 GP: A-D

3.2 Certification body

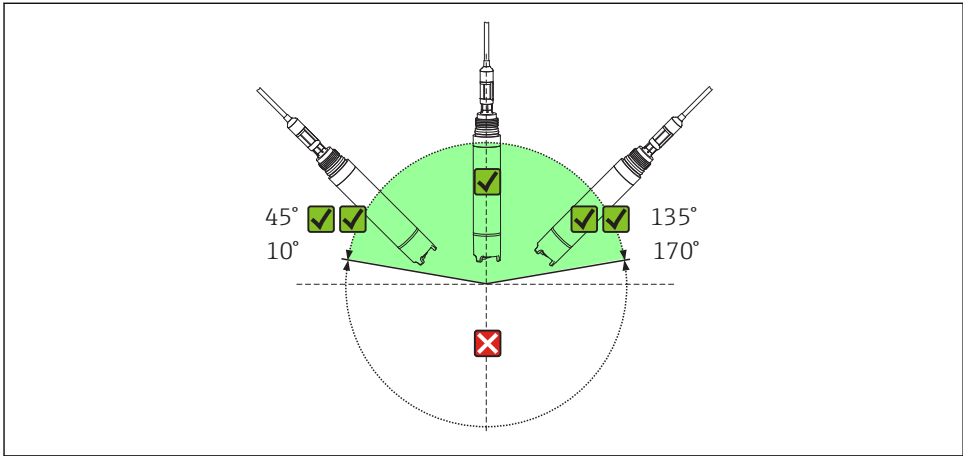
DEKRA EXAM GmbH

Bochum

4 Installation

4.1 Installation conditions

4.1.1 Orientation



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 1 Permitted orientations

The sensor must be installed at an angle of inclination of 10 to 170 ° in an assembly, bracket or appropriate process connection. Recommended angle: 45°, to prevent the formation of air bubbles.

Inclination angles other than those mentioned are not permitted. Do **not** install the sensor overhead.



Observe the instructions for installing sensors in the Operating Instructions for the assembly used.

4.1.2 Mounting location

- Choose a mounting location that can be easily accessed at a later stage.
- Ensure that upright posts and fittings are fully secured and vibration-free.
- Select an installation location which produces a typical oxygen concentration for the individual application.

4.2 Mounting the sensor

Installation in suitable assembly is required (depending on the application)

WARNING

Electrical voltage

In the event of a fault, non-grounded metallic assemblies may be under voltage and then are not touchable.

- ▶ When using metallic assemblies and installation equipment, observe the national grounding provisions.

For a complete installation of a measuring point, proceed as follows:

1. Install a retractable or a flow assembly (if used) into the process.
2. Connect the water supply to the rinse connections (if you use an assembly with cleaning function).
3. Install and connect the oxygen sensor.
4. Install the suspended assembly or immersion assembly (if used) into the process

NOTICE

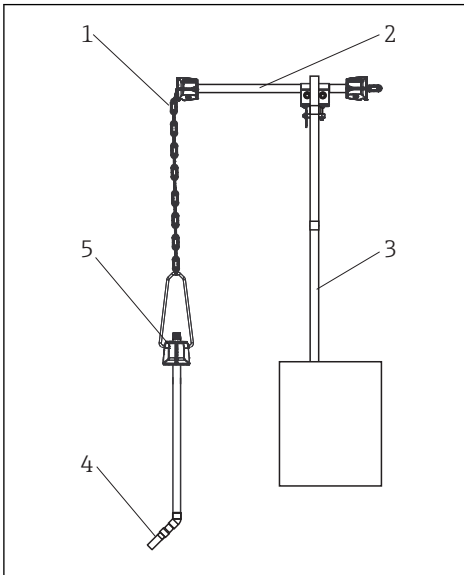
Installation error

Cable open circuit, loss of sensor due to cable separation, unscrewing of membrane cap

- ▶ For immersion operation, the sensor must be installed in an immersion assembly (e.g. CYA112). Do not install the sensor suspended from the cable.
- ▶ Screw the sensor into the assembly so that the cable is not twisted.
- ▶ Avoid exerting excessive tensile force on the cable (e.g. from jerky pulling).
- ▶ Select an installation location that is easy to access for later calibrations.
- ▶ Observe the instructions for installing sensors in the Operating Instructions for the assembly used.

4.3 Installation examples

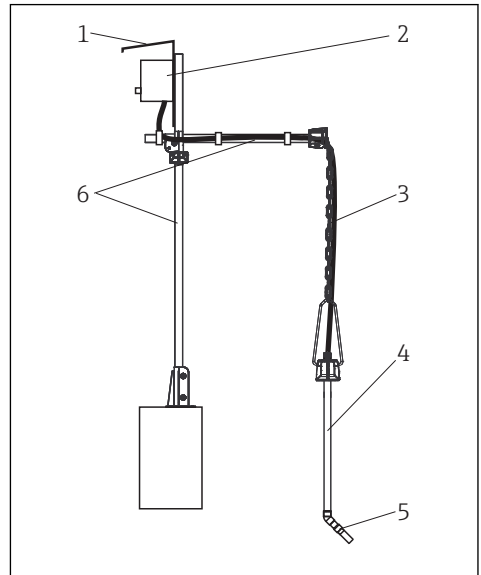
4.3.1 Universal assembly holder and chain assembly



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 2 Chain holder on railing

- 1 Chain
- 2 Holder Flexdip CYH112
- 3 Rail
- 4 Sensor Oxymax
- 5 Wastewater assembly Flexdip CYA112

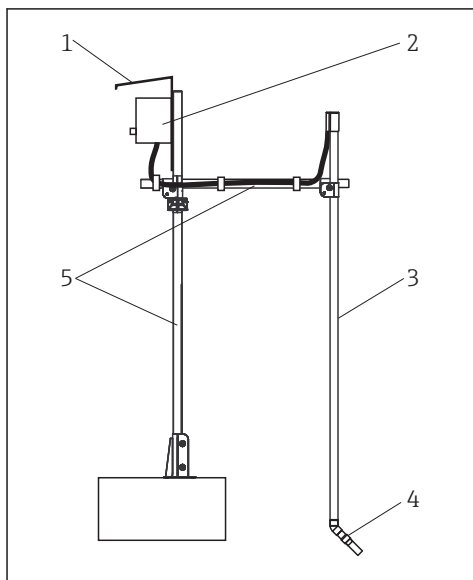


A0030565

 3 Chain holder on upright post

- 1 Weather protection cover CYY101
- 2 Controller / transmitter
- 3 Chain
- 4 Wastewater assembly Flexdip CYA112
- 5 Sensor Oxymax
- 6 Holder Flexdip CYH112

4.3.2 Universal assembly holder and permanently mounted immersion assembly

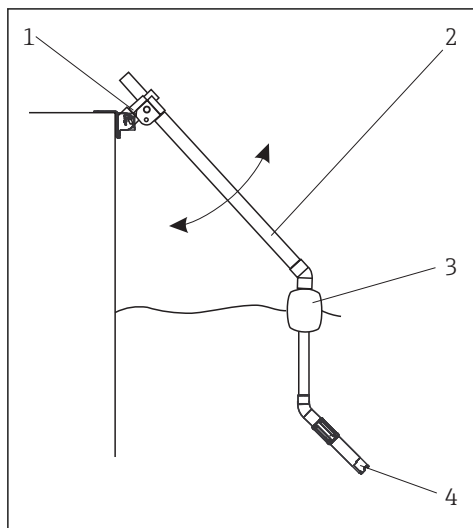


A0030567

 4 Assembly holder with immersion tube

- 1 Protective cover
- 2 Controller / transmitter
- 3 Flexdip CYA112 immersion assembly
- 4 Sensor Oxymax
- 5 Assembly holder Flexdip CYH112

4.3.3 Basin rim mounting with immersion tube

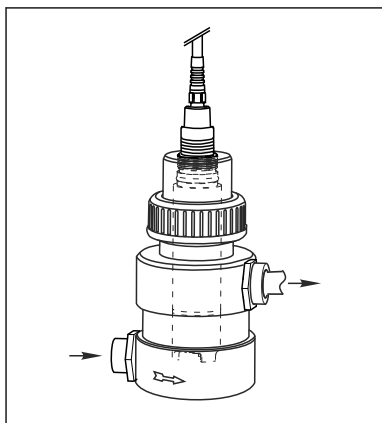


A0030568

5 Basin rim mounting

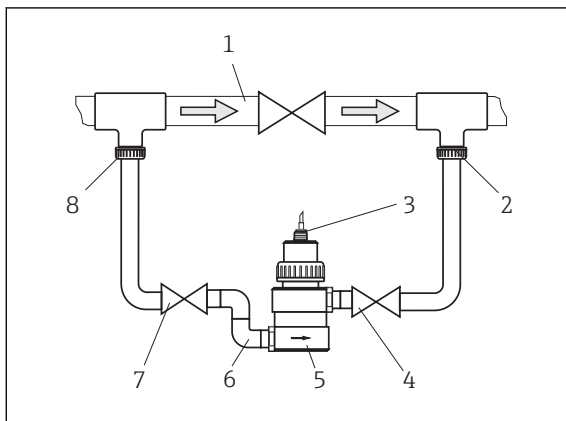
- 1 Pendulum holder CYH112
- 2 Assembly Flexdip CYA112
- 3 Assembly float
- 4 Sensor Oxymax

4.3.4 Flow assembly COA250



A0013319

6 COA250

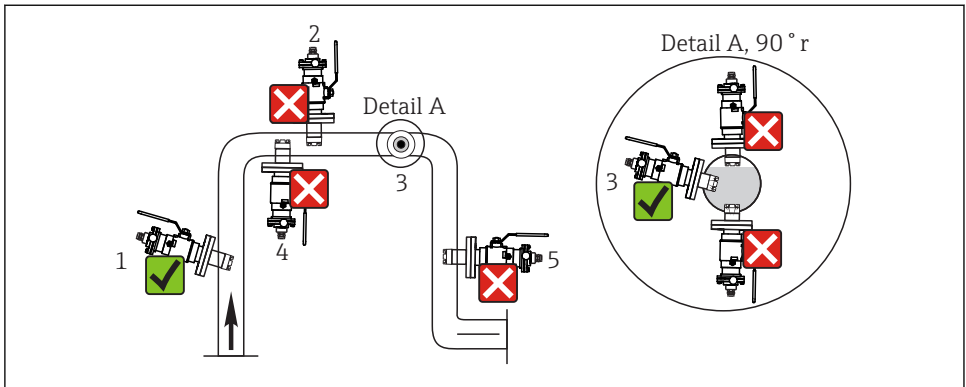


A0030570

7 Bypass installation with manually actuated valves or solenoid valves

- 1 Main pipe
- 2 Medium return
- 3 Oxygen sensor
- 4, 7 Manually actuated or solenoid valves
- 5 Flow assembly COA250-A
- 6 90 ° pipe elbow
- 8 Medium removal

4.3.5 Retractable assembly COA451



A0030571

 8 Permissible and impermissible sensor installation positions with retractable assembly COA451

- 1 Ascending pipe, best position
- 2 Horizontal pipe, sensor top down, impermissible due to air cushion or foam bubble forming
- 3 Horizontal pipe, lateral installation with permissible installation angle (acc. to sensor version)
- 4 Down pipe, impermissible

4.4 Post-installation check

- Are the sensor and cable undamaged?
- Is the orientation correct?
- Is the sensor installed in an assembly and is not suspended from the cable?
- Avoid the penetration of moisture by fitting the protective cap to the immersion assembly.

5 Electrical connection

WARNING

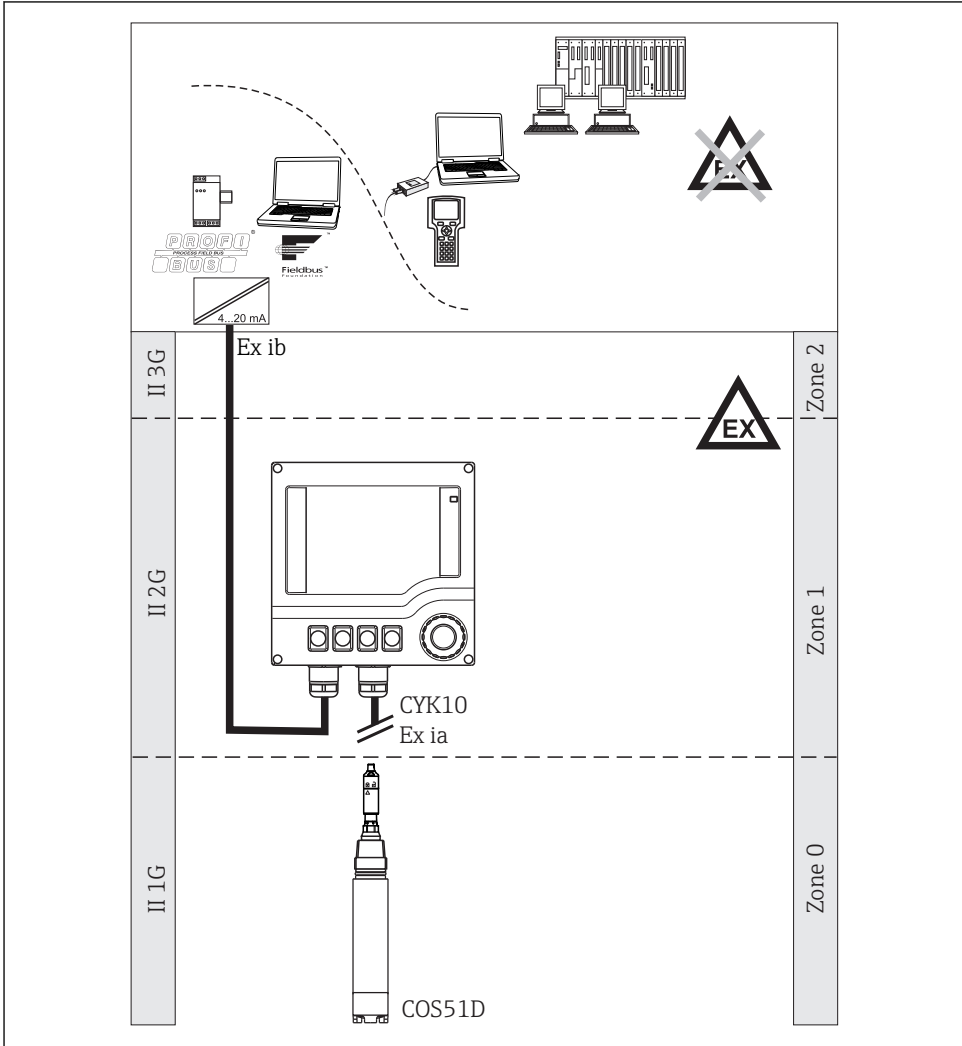
Device is live

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 Connection conditions

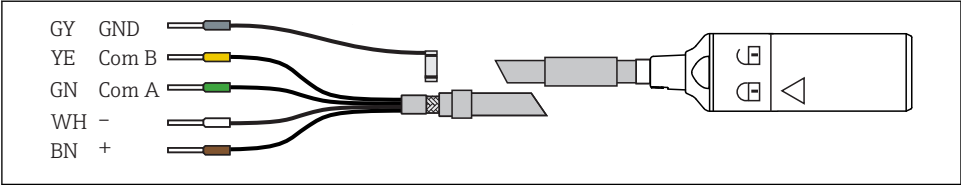
5.1.1 Quick wiring guide (only COS51D-G*8*0)



A0030551

5.2 Connecting the sensor

The electrical connection of the sensor to the transmitter is performed using the measuring cable CYK10.



9 Measuring cable CYK10

5.3 Ensuring the degree of protection

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

- ▶ Exercise care when carrying out the work.

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) which are loose or insufficiently secured.

5.4 Post-connection check

Device condition and specifications	Notes
Are the outside of the sensor, assembly, cable undamaged?	Visual inspection
Electrical connection	Notes
Are the installed cables strain-relieved and not twisted?	
Is a sufficient length of the cable cores stripped, and is it positioned in the terminal correctly?	Check the fit (by pulling gently)
Are all the screws terminals properly tightened?	Tighten
Are all cable entries mounted, tightened and leak-tight?	For lateral cable entries, make sure the cables loop downwards to allow water to drip off
Are all cable entries installed downwards or mounted laterally?	

6 Commissioning

6.1 Function check

Before first commissioning, check if:

- the sensor is correctly installed
- the electrical connection is correct.

If using an assembly with automatic cleaning, check that the cleaning medium (e.g. water or air) is connected correctly.

WARNING

Escaping process medium

Risk of injury from high pressure, high temperatures or chemical hazards

- ▶ Before applying compressed air to an assembly with cleaning facility, make sure the connections are correctly fitted.
- ▶ Do not install the assembly in the process if you cannot make the correct connection reliably.

6.2 Sensor polarization

NOTICE

Incorrect measurements due to ambient influences

- ▶ Be absolutely certain to avoid direct sunlight on the sensor.
- ▶ Make sure you comply with the instructions for commissioning in the Operating Instructions of the transmitter.

The sensor has been tested at the factory for proper function and is shipped in ready-to-operate condition.

To prepare for the calibration, carry out the following steps:

1. Pull off the sensor protection cap.
2. Expose the sensor, which should be dry on the outside, to the air atmosphere.
 - ↳ The air should be saturated with water vapor. Therefore, install the sensor as close as possible to a surface of water. However, the sensor membrane must remain dry during calibration. Therefore, avoid direct contact with the surface of water.
3. Connect the sensor to the transmitter.
4. Switch on the transmitter.
 - ↳ When the sensor is connected to the transmitter, the polarization takes place automatically after the power-up of the transmitter.
5. Wait for the polarization time to run out.

6.3 Sensor calibration

Calibrate the sensor (e.g. air calibration) immediately after the polarization time runs out.

1. Remove the sensor from the medium.

2. Clean the outside of the sensor with a damp cloth. Then dry the sensor diaphragm carefully with a paper towel for example.
3. Allow a temperature equalization time of 20 minutes to elapse.
 - ↳ Make sure that the sensor is not exposed to any direct ambient influences (direct sunlight, drafts) during this time.
4. When the measured value displayed on the transmitter is stable, carry out the calibration and adjustment according to the Operating Instructions for the transmitter. Pay particular attention to the software settings for the stability criteria for calibration.

Re-immerses the sensor in the medium after the calibration/adjustment.



Make sure you comply with the instructions for calibration in the Operating Instructions of the transmitter.



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