



Level



Pressure



Flow



Temperature



Liquid
Analysis



Registration



Systems
Components



Services



Solutions

Technical Information

Oxymax W COS41



Potentiostatic amperometric two-electrode sensor

Long-term stable sensor for water and wastewater applications



Application

The continuous measurement of the dissolved oxygen concentration is very important in many areas of water management:

- Sewage treatment plants:
Oxygen measurement and regulation in the activated sludge basin for a highly efficient biological cleaning process
- Water monitoring:
Oxygen measurement in rivers, lakes or seas as an indicator of the water quality
- Water treatment:
Oxygen measurement for status monitoring of drinking water for example (oxygen enrichment, corrosion protection etc.)
- Fish farming:
Oxygen measurement and regulation for optimum living and growth conditions

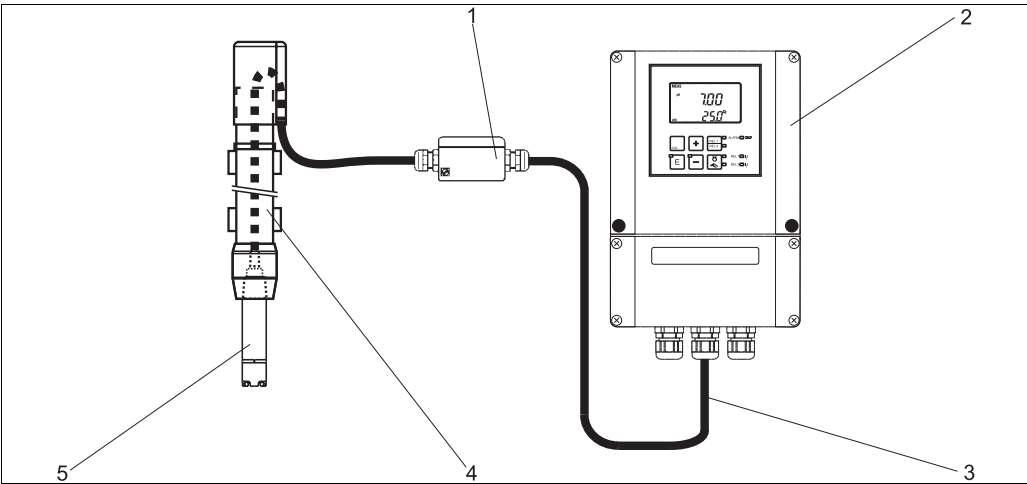
Your benefits

- Maximum measurement accuracy:
 - Long maintenance intervals
 - Intelligent sensor self monitoring
- Membrane covered sensor, i.e.:
 - high O₂ selectivity
 - Minimum maintenance effort
 - Minimum calibration effort thanks to simple calibration in air

Function and system design

Measuring principle	The oxygen molecules diffused through the membrane are reduced to hydroxide ions (OH-) at the cathode. Silver is oxidized to silver ions (Ag+) at the anode (this forms a silver halogenide layer). A current flows due to the electron donation at the cathode and the electron acceptance at the anode. Under constant conditions, this flow is proportional to the oxygen content of the medium. This current is converted in the transmitter and indicated on the display as an oxygen concentration in mg/l, as a saturation index in % SAT or as an oxygen partial pressure in hPa.
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Measuring system	A complete measuring system comprises at least: ■ Oxygen sensor ■ Transmitter, e.g. Liquisys M COM223/253 ■ Special measuring cable ■ Assembly, e.g. flow assembly COA250, immersion assembly CYA611 or retractable assembly COA451 Optional: ■ Universal suspension assembly support CYH101 for immersion operation ■ Junction box VBM (with cable extension) ■ Automatic spray cleaning system Chemoclean
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- Measuring system (example)
- 1 Junction box VBM (optional)
 - 2 Transmitter Liquisys M COM253
 - 3 Special measuring cable
 - 4 Immersion assembly
 - 5 Oxygen sensor

Input

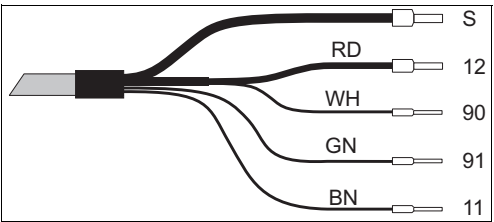
Measured variable	dissolved oxygen [mg/l, ppm, % SAT or hPa]
Measuring range	with Liquisys M COM 223/253-DX/DS: 0.05 ... 20.00 mg/l (ppm) 0.00 ... 200 % SAT 0 ... 400 hPa

Wiring

Electrical connection

Direct connection to the transmitter

The sensor is connected using a special measuring cable. The wiring diagram is contained in the Operating Instructions of the COM223/253-DX/DS transmitter.

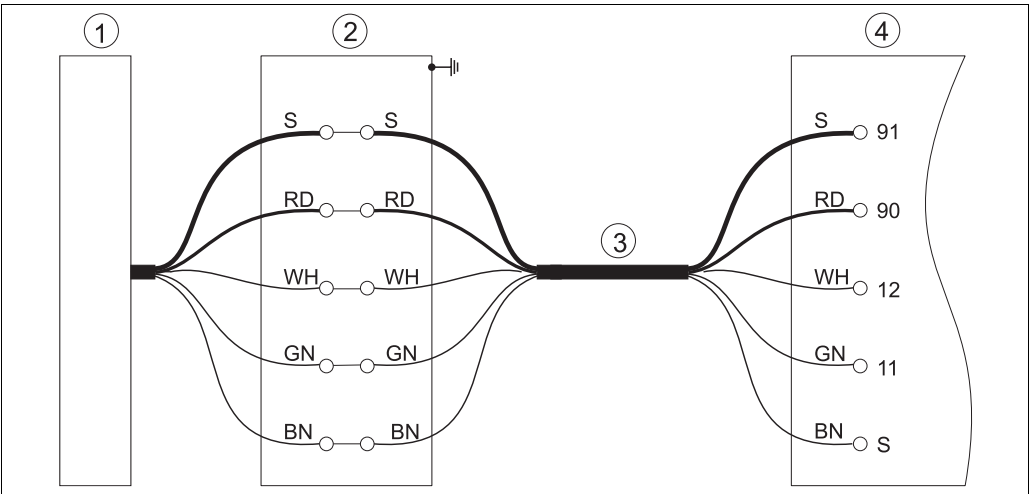


Special measuring cable CYK71

Terminal	Assignment
S	Outer shield
12	Active inner shield (NTC)
90	Cathode
91	Anode
11	NTC temperature sensor

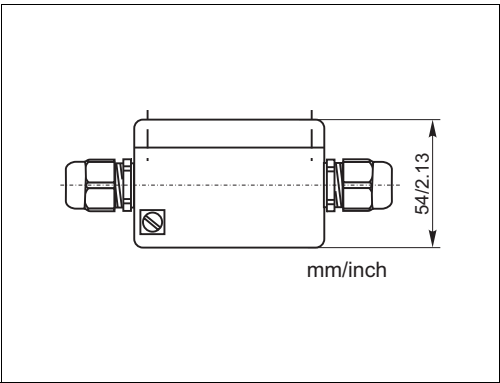
Connection with cable extension

To lengthen the sensor connection beyond the length of the fixed cable, you require a junction box VBM. The connection is lengthened to the transmitter using the special measuring cable CYK71.

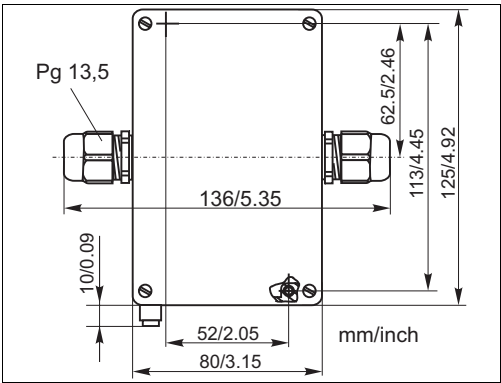


Connection via junction box VBM

- 1 Sensor
- 2 Junction box
- 3 Extension cable
- 4 Transmitter



Junction box VBM, side view



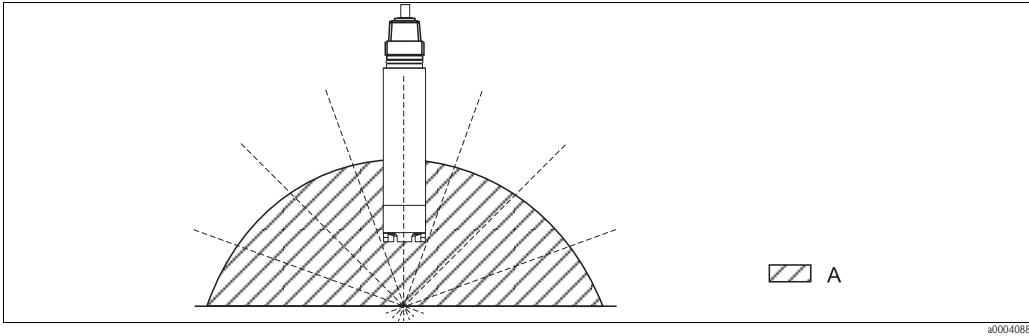
Junction box VBM, top view

Performance characteristics

Response time	T ₉₀ : 3 minutes T ₉₀ : 9 minutes (each at 20 °C (68 °F))	
Reference operating conditions	Reference temperature:	25 °C (77 °F)
	Reference pressure:	1013 hPa (15 psi)
Signal current in air ¹⁾	approx. 300 nA	
Zero current	zero current free	
Measured value resolution	0.01 mg/l (0.01 ppm)	
Maximum measured error	±1 % of measured value ²⁾	
Long-term drift	with permanent polarization: < 1 % per month	
Influence of medium pressure	Pressure compensation not necessary	
Polarization time	< 60 minutes	
Oxygen intrinsic consumption	Approx. 90 ng/h in air at 25 °C (77 °F)	

Installation

Angle of installation	The sensor can be installed up to the horizontal in an assembly, support or a suitable process connection. Other angles are not permissible. Do not install the sensor overhead.
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Angle of installation
A Permissible installation positions: 0 ... 180 °, overhead installation is not permitted



Note!
Make sure you comply with the instructions for installing sensors. You will find them in the Operating Instructions for the assembly used.

1) For the reference operating conditions indicated
2) In accordance with IEC 746-1 at nominal operating conditions

Environment

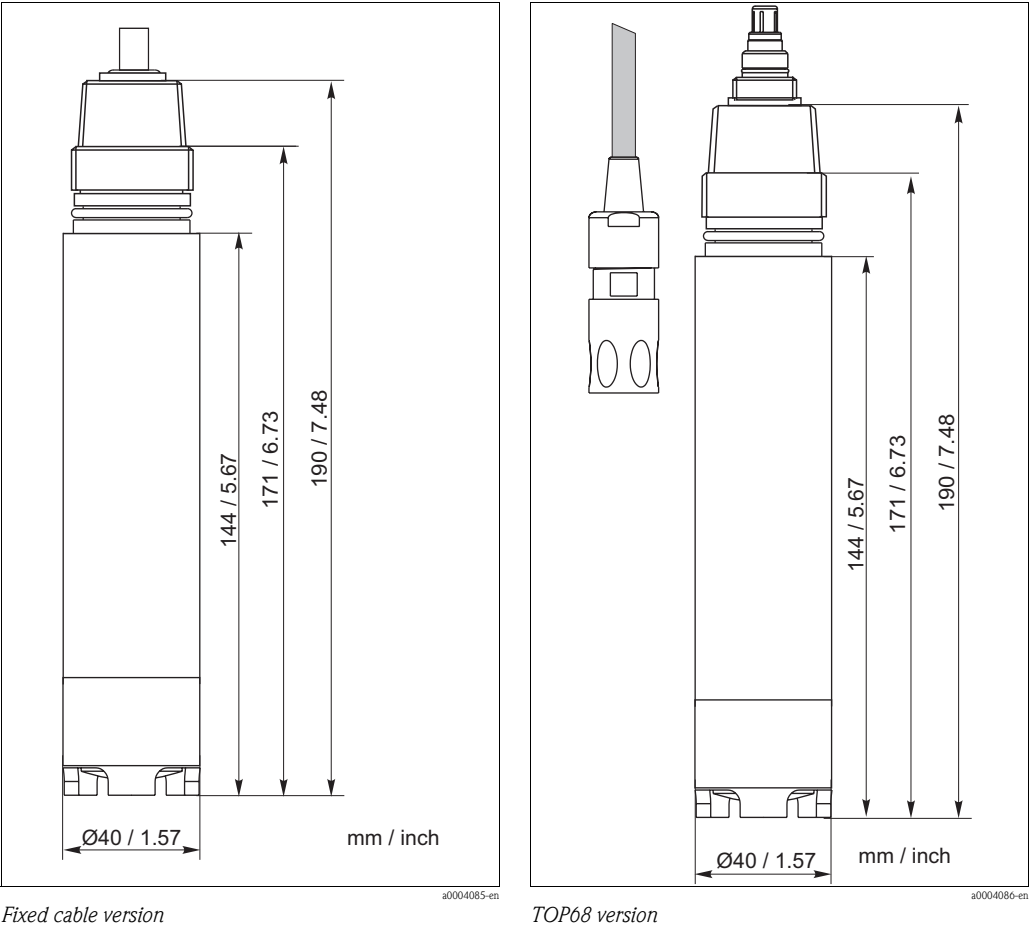
Ambient temperature range	−5 to 50 °C (20 to 120 °F)
Storage temperature	filled with electrolyte: −5 to 50 °C (20 to 120 °F) without electrolyte: −20 to 60 °C (0 to 140 °F)
Ingress protection	- Fixed cable versions: IP 68 (10 m (33 ft) water column at 25 °C (77 °F) in 30 days) - Top 68 plug-in head versions: IP 68 (1 m (3.3 ft) water column at 50 °C (122 °F) in 7 days)

Process

Process temperature	−5 to 50 °C (20 to 120 °F)
Process pressure	max. 10 bar (145 psi) permissible overpressure Underpressure operation is not permissible.

Mechanical construction

Design, dimensions



Weight	with cable length 7 m (23 ft): 0.7 kg (1.5 lbs.) with cable length 15 m (49 ft): 1.1 kg (2.4 lbs.) with TOP68 plug-in connection: 0.3 kg (0.66 lbs.)
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Material	Sensor shaft:	POM
	Membrane cap:	POM
	Cathode:	Gold
	Anode/Reference electrode:	Silver / silver bromide
Process connection	G1 and NPT ¾"	
Maximum cable length	max. 50 m (164 ft)	
Membrane thickness	approx. 50 µm	
Electrolyte	Alkaline electrolyte	

Ordering information

Product structure	Cable length		
	2	Cable length: 7 m (22.97 ft)	
	4	Cable length: 15 m (49.22 ft)	
	8	Without Cable (TOP 68 version only)	
	9	Special design to customer specifications	
	Cable connection		
	F	Fixed cable connection	
	S	Cable connection using TOP 68 plug	
	COS 41-		Complete order code

Scope of delivery	The following items are included in the delivery:
	■ Oxygen sensor with transport protection cap for membrane protection ■ Accessories set with the following contents: – 2 replacement cartridges (replacement membrane caps) – 10 plastic ampoules containing electrolyte – 1 sealing kit with 3 O-rings – 6 abrasive sheets ■ Operating Instructions (on CD only) ■ Brief Operating Instructions (paper version)

Accessories



Note!

In the following sections, you find the accessories available at the time of issue of this documentation. For information on accessories that are not listed here, please contact your responsible service.

Assemblies (selection)

Flow assembly COA250

- for sensor installation in pipe lines, PVC
- ordering acc. to product structure (Technical Information TI111C/07/en)

Immersion assembly Dipfit W CYA611

- for sensor immersion in basins, open channels and tanks, PVC
- ordering acc. to product structure (Technical Information TI166C/07/en)

Zero solution

- 3 units to produce 3 x 1 liter oxygen-free solution
- order no. 50001041

Measuring cable

COK41 special measuring cable

- for COS41 oxygen sensors with TOP68 plug-in head
- Order numbers:
 - Cable length 7 m (23 ft): 51506817
 - Cable length 15 m (49 ft): 51506818

CYK71 measuring cable

- non-terminated cable for the connection of sensors (e.g. conductivity sensors) or the extension of sensor cables
- Sold by the meter, order numbers:
 - non-Ex version, black: 50085333
 - Ex version, blue: 51506616

Junction box

Junction box VBM

- For cable extension, with 10 terminals
- IP 65 (≅ NEMA 4X)
- Material: aluminum
- Order numbers:
 - cable entry Pg 13.5: 50003987
 - cable entry NPT ½": 51500177

Transmitter

Liquisys M COM 223/253

- Transmitter for oxygen measurement
- field or panel-mounted housing
- Hart® or Profibus available
- Ordering acc. to product structure, see Technical Information (TI 199C/07/en)



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