



Level



Pressure



Flow



Temperature



Liquid
Analysis



Registration



Systems
Components



Services



Solutions

Technical Information

Oxymax W COS61

Dissolved oxygen measurement

Optical sensor acc. to the fluorescence quenching principle



Application

The continuous measurement of the concentration of dissolved oxygen 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

- Optical technology:
 - Minimum maintenance
 - Maximum availability
- Compatible with tried-and-tested COS31 with COM2x3W:
 - Easy measuring point changeover to optical technology
- Compatible with COS41 with COM2x3D with conversion kit
- Sensor with digital signal processing:
 - Calibration data saved in sensor
 - High degree of EMC protection thanks to digital communication with the transmitter
- Extended maintenance intervals and a high degree of long-term stability
- Intelligent self-monitoring guarantees reliable measured values
- No flow needed - measurement possible in still water

Function and system design

Measuring principle

- Sensor structure:
 - Oxygen-sensitive molecules (markers) are integrated in an optically active layer (fluorescent layer).
 - The fluorescent layer surface is in contact with the medium.
 - The sensor optics are directed at the back of the fluorescent layer.
- The oxygen partial pressure in the medium and that in the fluorescent layer are balanced:
 - If the sensor is immersed in medium, the equilibrium is formed very quickly.
- Measuring process:
 - The sensor optics transmit green light pulses to the fluorescent layer.
 - The markers "respond" (fluoresce) with red light pulses.
 - The duration and intensity of the response signals depend directly on the oxygen contents or partial pressure.
 - If the medium is free of oxygen, the response signals are long and very intense.
 - Oxygen molecules quench the marker molecules. As a result, the response signals are shorter and less intense.
- Measurement result:
 - The sensor returns a signal in proportion to the oxygen concentration of the medium.
 - The fluid temperature and air pressure are already taken into account in the sensor.

Sensor monitoring

The optical signals are continuously monitored and analysed for plausibility.

If inconsistencies occur, an error message is output via the transmitter.

Aging of the sensor cap is detected. The transmitter first displays a warning for predictive maintenance and later generates an error message.

In addition, the following fault conditions are detected in conjunction with the sensor check system of Liquisys M COM2x3:

- Implausibly high or low measured values
- Disturbed regulation due to incorrect measured values

Measuring system

The complete measuring system consists of the following at least:

- Oxygen sensor
- Transmitter, e.g. Liquisys M COM223/253
- Special measuring cable if extension is necessary
- Assembly, e.g. COA250 flow assembly, CYA611 immersion assembly or COA451 retractable assembly

Optional:

- CYH101 universal immersion assembly holder for immersion operation
- VS junction box (for cable extension)
- Chemoclean automatic spray cleaning system

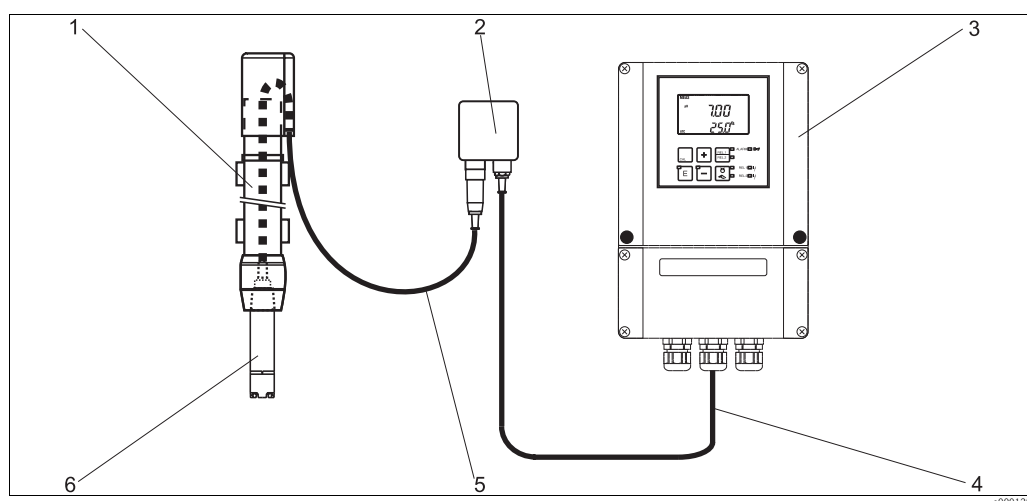


Fig. 1: Measuring system (example)

- 1 CYA611 immersion assembly
- 2 VS junction box (optional)
- 3 Liquisys M COM253 transmitter
- 4 Measuring cable, extension optional
- 5 Sensor cable
- 6 COS61 oxygen sensor

Input

Measured variable Dissolved oxygen [mg/l, % SAT, hPa]
Temperature [° C, ° F]

Measuring range with Liquisys M COM 223/253:
0 to 20 mg/l (0 to 20 ppm)
0 to 200 % SAT
0 to 400 hPa

Environment

Ambient temperature range -20 to +60 °C (-4 to 140 °F)

Storage temperature -20 to +70 °C (-4 to 158 °F) at 95% relative humidity, non condensing

Ingress protection IP 68

Process

Process temperature -5 to 50 °C (23 to 122 °F)

Process pressure maximum allowed over pressure: 10 bar (145 psi)

Performance characteristics

Response time t_{90} t_{90} : 60 s

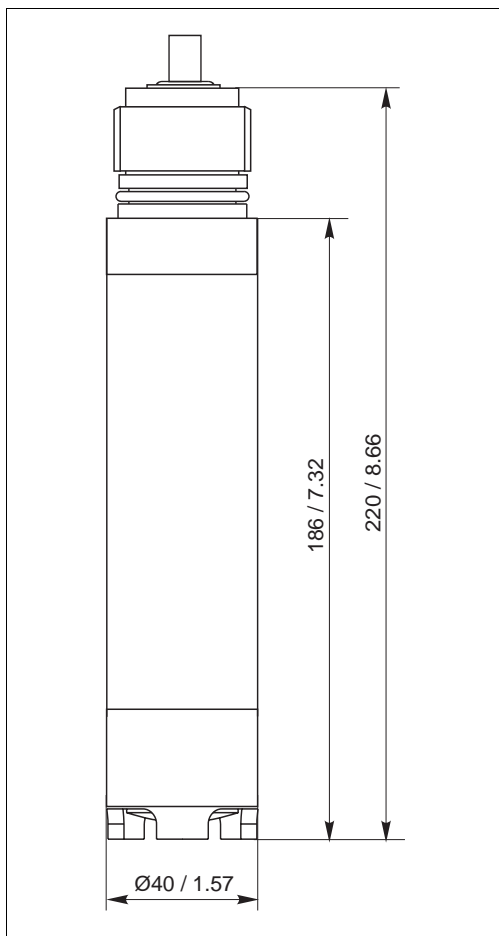
Maximum measured value ±2 % of measuring range end

Repeatability ±0.5 % of measuring range end

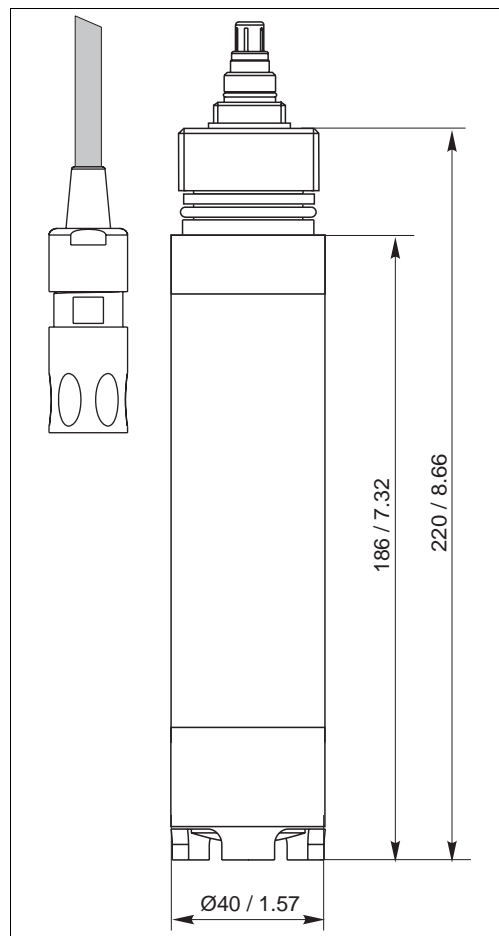
Life time of the sensor cap 1 year (protect against direct sun light)

Mechanical construction

Design, dimensions



Fixed cable version



TOP68 version

Weight	with cable length 7 m (22.97 ft): 0.7 kg (1.5 lb.)
	with cable length 15 m (49.22 ft): 1.1 kg (2.4 lb.)
	with TOP68 plug-in connection: 0.3 kg (0.7 lb.)

Materials	Sensor shaft:	stainless steel 1.4571 (AISI 316Ti)
	Cap with fluorescence layer:	POM
	Fluorescence layer:	Silicon

Process connection	G1
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Sensor cable	shielded 7-core fixed cable or double-shielded coaxial cable with 4 pilot wires (with TOP68 plug connection)
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Cable entry at transmitter	■ SXP plug (field device)
	■ Terminal connection (panel mounted device)

Cable specification	max. 100 m / 328 ft (including cable extension)
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Temperature compensation	internal
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Interface	RS 485
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Certificates and approvals

EMC compatibility

Interference emission and interference immunity complies with EN 61326: 1997 / A1: 1998

Ordering information

Product structure

Certificate	
A	Ex free version
Cable length	
0	Cable length: 1.5 m (4.9 ft)
1	Cable length: 7 m (23 ft)
2	Cable length: 15 m (49 ft)
8	Without cable (for TOP 68 version)
9	Special version acc. to customers specification
Sensor head	
F	G1, fixed cable with SXP plug
S	G1, TOP68 plug
Accessories	
0	without accessories
COS61-	complete order code

Scope of delivery

The scope of delivery comprises:

- Oxygen sensor with transportation cap
- Operating Instructions, English

广州晋合水处理设备有限公司



地 址：广东省广州市海珠区工业大道333号华新园区7幢218

电 话：020-88191905

传 真：020-61139917

邮 编：510300

邮 箱：jinhewater@jinhewater.com

网 址：<http://www.jinhewater.com>

Endress+Hauser 
People for Process Automation