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

TI387C/07/en/06.05
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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

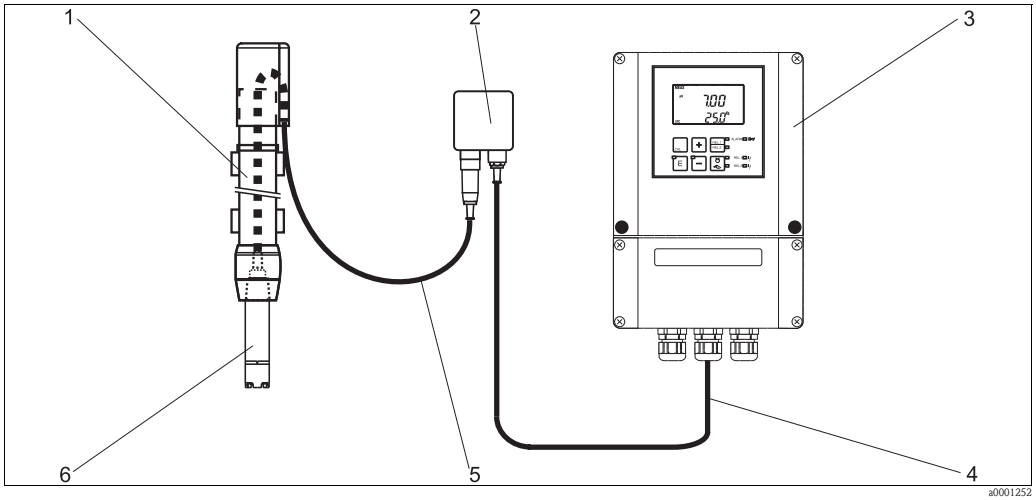


Fig. 1: Measuring system (example)

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

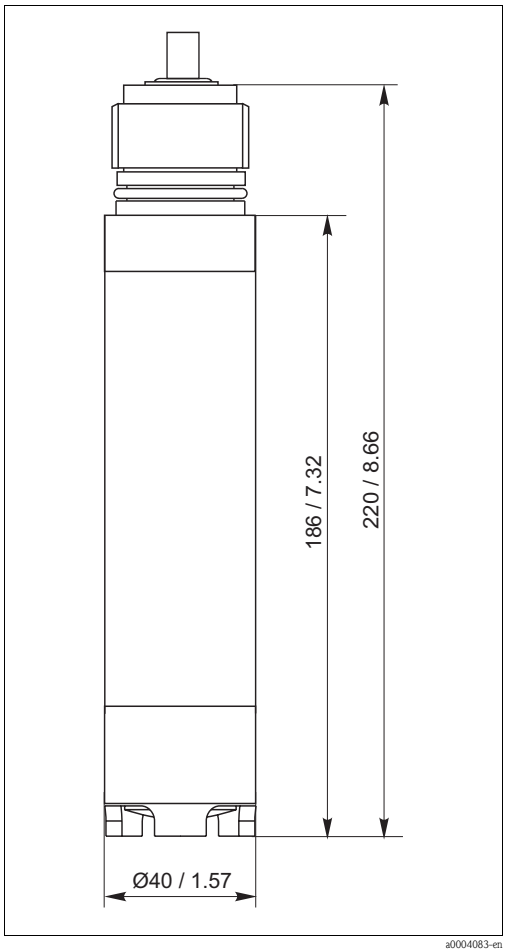
Process temperature	–5 to 50 °C (23 to 122 °F)
Process pressure	maximum allowed over pressure: 10 bar (145 psi)

Performance characteristics

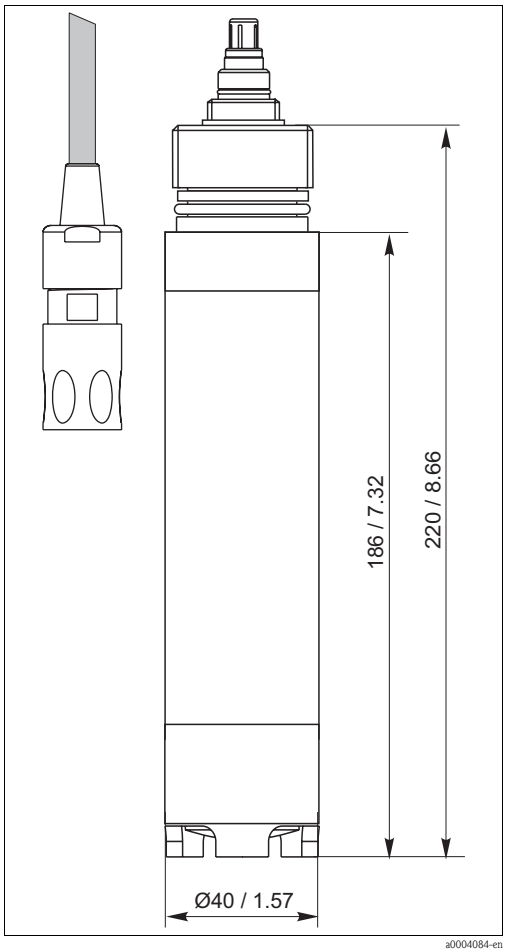
Response time t_{90}	t_{90}: 60 s
Maximum measured value	±2 % of measuring range end
Repeatability	±0.5 % of measuring range end
Life time of the sensor cap	1 year (protect against direct sun light)

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

Sensor cable

shielded 7-core fixed cable or double-shielded coaxial cable with 4 pilot wires (with TOP68 plug connection)

Cable entry at transmitter

- SXP plug (field device)
- Terminal connection (panel mounted device)

Cable specification

max. 100 m / 328 ft (including cable extension)

Temperature compensation

internal

Interface

RS 485

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

Accessories

Assemblies (selection)

- Immersion assembly COA110
  for sensor immersion in the basin, PVC pipe resp. PUR floating body with SS 1.4571 (AISI 316Ti) immersion tube;
  Ordering acc. to product structure (see Technical Information TI 035C/07/en)
- Immersion assembly Dipfit W CYA611
  for sensor immersion in basins, open channels and tanks, PVC;
  Ordering acc. to product structure (Technical Information TI 166C/07/en)
- Flow assembly COA250
  for sensor installation in pipe lines, PVC;
  ordering acc. to product structure (Technical Information TI111C/07/en)
- Retractable assembly Cleanfit COA451
  manually driven retractable assembly, stainless steel, with ball valve, for oxygen sensors;
  ordering acc. to product structure (Technical Information TI368C/07/en)

Universal immersion assembly holder

- Immersion assembly holder CYH101
  for pH, ORP, oxygen, conductivity assemblies and for oxygen and turbidity sensors;
  Ordering acc. to product structure (Technical Information TI092C/07/en)

Measuring cable

- Measuring cable OMK
  for use as extension cable between junction box VS and transmitter, not terminated
  sold by the metre - order no. 50004124

Junction box

- VS junction box
  with plug-in socket and 7-pole plug,
  for cable extension from sensor to transmitter, IP 65;
  order no. 50001054

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