



Technical Information Memosens COL37E

Agile, optical oxygen sensor for laboratory measurements and random sampling in the field



Digital with Memosens 2.0 technology

Application

Typical applications include:

Measurements in surface water, wastewater and process water

Your benefits

- Optical low-maintenance Memosens oxygen sensor
- Fast response time $t_{98} : < 20$ s
- Integrated temperature sensor for effective temperature compensation
- Memosens technology guarantees reliable measured values
- Internal storage of sensor data enables simple GLP
- Suitable for use with Liquiline Mobile, Liquiline To Go and Memobase Plus

Other advantages provided by Memosens technology

- Maximum analysis safety
- Data security thanks to digital data transmission
- Very easy to use as sensor data saved in the sensor

Function and system design

Measuring principle

Sensor structure

Oxygen-sensitive molecules (markers) are integrated into the optically active layer (luminescence layer).

The luminescence layer, an optical insulating layer and a cover layer are applied on top of one another on the carrier. The cover layer is in direct contact with the medium.

The sensor optics are directed at the rear of the carrier and therefore at the luminescence layer.

Measurement process (principle of luminescence quenching)

If the sensor is immersed in the medium, an equilibrium is very quickly established between the oxygen partial pressure in the medium and the luminescence layer.

1. The sensor optics send orange light pulses to the luminescence layer
2. The markers "respond" (luminesce) with darkred light pulses.
 - ↳ The decay time and intensity of the response signals are directly dependent on the oxygen content and oxygen partial pressure.

If the medium is free from oxygen, the decay time is long and the signal is very intense.

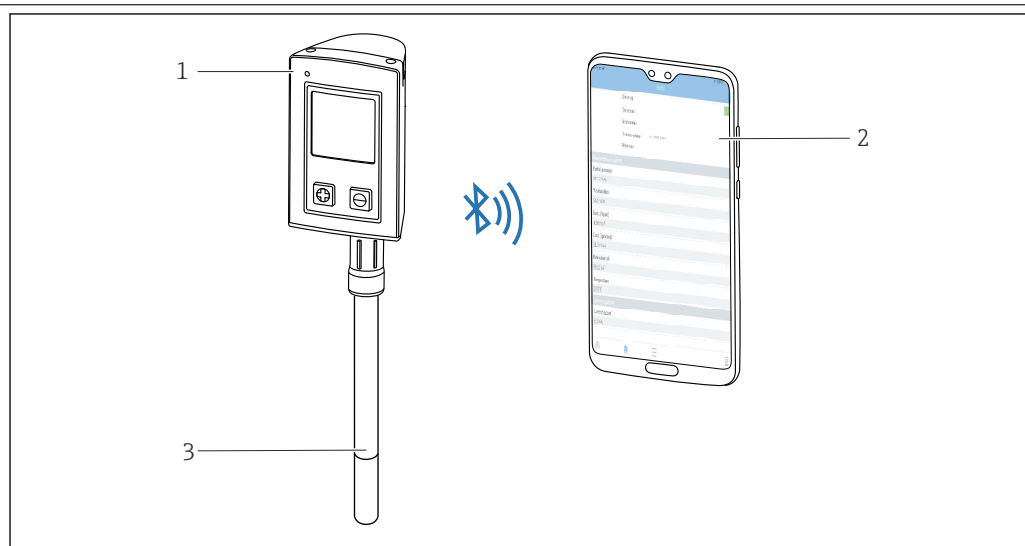
Any oxygen molecules present mask the marker molecules. As a result, the decay time is shorter and the signals are less intense.

Measurement result

- The sensor calculates the measurement result on the basis of the signal intensity and decay time using the Stern-Volmer equation.

The sensor provides measured values for temperature and partial pressure as well as a raw measured value. This value corresponds to the luminescence decay time and is approx. 14 μ s in air and approx. 56 μ s in oxygen-free media.

Measuring system



A0047929

1 Measuring system

- 1 Transmitter CML18
- 2 Smartphone with Smartblue app (optional)
- 3 Memosens COL37E

Communication and data processing

Communication with the handheld device

-  Always connect digital laboratory sensors with Memosens technology to a handheld device with Memosens technology, e.g. CML18.

Digital laboratory sensors can store measuring system data in the sensor, including:

- Manufacturer data
 - Serial number
 - Order code
 - Date of manufacture
- Calibration data
 - Calibration date
 - Number of calibrations
 - Serial number of the handheld device used to perform the last calibration or adjustment
- Application data
 - Temperature application range
 - Oxygen application range
 - Date of initial commissioning

Input

Measured variables	Dissolved oxygen [mg/l, µg/l, ppm, ppb, %SAT or hPa] Oxygen (gaseous) [hPa or %Vol] Temperature [°C, °F]
Measuring ranges	0 to 200 % SAT Measuring ranges apply for 25 °C (77 °F) and 1013 hPa (15 psi)  The sensor has a measuring range of up to max. 1000 hPa. The measured errors indicated are reached in the optimum measuring range, but not over the entire measuring range.

Performance characteristics

Response time ¹⁾	From air to nitrogen at reference operating conditions: ■ t_{90} : < 20 s ■ t_{98} : < 20 s
Reference operating conditions	Reference temperature: 25 °C (77 °F) Reference pressure: 1013 hPa (15 psi)
Maximum measured error ²⁾	±1 % or ±8 µg/l (ppb) of the measured value (the higher value is relevant in each case) ³⁾

Environment

Ambient temperature range	-5 to +60 °C (23 to 140 °F)
Storage temperature range	-25 to 50 °C (-13 to 122 °F) at 95% relative humidity, non-condensing
Degree of protection	IP68

1) Average of all sensors that have undergone a final inspection
 2) In accordance with IEC 60746-1 at rated operating conditions
 3) In accordance with IEC 60746-1 at rated operating conditions

IP69

Process

Process temperature range	-5 to +60 °C (23 to 140 °F)
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Chemical resistance	NOTICE Halogen-containing solvents, ketones and toluene Halogen-containing solvents (dichloromethane, chloroform), ketones (e.g. acetone, pentanone) and toluene have a cross-sensitive effect and result in decreased measured values or, at worst, in the complete failure of the sensor! ► Use the sensor only in media that are free from halogens, ketones and toluene.
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Mechanical construction

Weight	0.1 kg (0.20 lbs)
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Materials	Parts in contact with medium <table border="0"> <tr> <td>Sensor shaft</td> <td>Stainless steel 1.4435 (AISI 316L)</td> </tr> <tr> <td>Seals/O-rings</td> <td>EPDM</td> </tr> <tr> <td>Spot cap</td> <td>Stainless steel 1.4435 (AISI 316L)</td> </tr> <tr> <td>Spot layer</td> <td>Silicone</td> </tr> </table>	Sensor shaft	Stainless steel 1.4435 (AISI 316L)	Seals/O-rings	EPDM	Spot cap	Stainless steel 1.4435 (AISI 316L)	Spot layer	Silicone
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Seals/O-rings	EPDM								
Spot cap	Stainless steel 1.4435 (AISI 316L)								
Spot layer	Silicone								

Temperature sensor	Pt1000 (Class A according to DIN IEC 60751)
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Ordering information

Product page	www.endress.com/col37e
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Accessories

Device-specific accessories	Measuring cable Memosens data cable CYK10 ■ For digital sensors with Memosens technology ■ Product Configurator on the product page: www.endress.com/cyk10  Technical Information TI00118C Memosens laboratory cable CYK20 ■ For digital sensors with Memosens technology ■ Product Configurator on the product page: www.endress.com/cyk20
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Zero-point gel

COY8

Zero-point gel for oxygen and disinfection sensors

- Oxygen-free and chlorine-free gel for the verification, zero point calibration and adjustment of oxygen and disinfection measuring points
- Product Configurator on the product page: www.endress.com/coy8



Technical Information TI01244C

Transmitter

Liquiline Mobile CML18

- Multiparameter mobile device for laboratory and field
- Reliable transmitter with display and app connection
- Product Configurator on the product page: www.endress.com/CML18



Operating Instructions BA02002C

Memobase Plus CYZ71D

- PC software to support laboratory calibration
- Visualization and documentation of sensor management
- Sensor calibrations stored in database
- Product Configurator on the product page: www.endress.com/cyz71d



Technical Information TI00502C

Maintenance kit

- Maintenance kit for Memosens COL37E
- Scope of delivery of the:
 - Spot cap
 - O-ring mounting tool
 - Maintenance instructions
 - Calibration bottle
 - O-rings
 - Certificate
- Ordering information: www.endress.com/col37e under "Accessories/spare parts"



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