

Specifications

OPTICAL OXYGEN MICROSENSORS

1 SENSOR SPECIFICATIONS

Only valid in water/gas (typ. air components) for 2-point calibrated sensors at 20°C, 1013mbar absolute pressure, using default measuring parameters/modes!

Specifications are valid for retractable needle-type microsensors (item no.: **OXR50**), fixed needle-type microsensors (item no.: **OXF50**) and bare fiber microsensors (item no.: **OXB50**), including the following options: optical isolation (-**OI**), high speed (-**HS**), ultra-high speed (-**UHS**).

1.1 Gas Phase: partial pressure pO₂ (hPa), volume percent pV (% O₂ gas)

For a calibrated sensor, the partial oxygen pressure pO₂ in units of hPa (equivalent to mbar) is the fundamental oxygen unit measured by the oxygen meter (in gas and water phase).

Specifications		
Measuring Range Optimum Maximum (not specified)	% O₂ gas 0-50% O ₂ 0-100% O ₂	hPa 0-500 hPa 0-1000 hPa
Accuracy * at 1% O ₂ /10 hPa at 20% O ₂ /200 hPa	±0.02% O ₂ ±0.2% O ₂	±0.2 hPa ±2 hPa
Resolution at 1% O ₂ /10 hPa at 20% O ₂ /200 hPa	0.01% O ₂ 0.05% O ₂	0.1 hPa 0.5 hPa
Detection Limit	0.02% O ₂	0.2 hPa

* The absolute accuracy of full range sensors depends on the calibration mode. For 1-point calibrated sensors these values increase due to a decreasing accuracy. More details on request.

1.2 Dissolved Oxygen: % air saturation, $\mu\text{mol/L}$, mg/L = ppm , mL/L

Oxygen dissolved in water can be expressed in % air saturation and in concentration units like $\mu\text{mol/L}$, mg/L (ppm), and mL/L . For details on calculation of dissolved oxygen units from partial pressure readings (interpolation formula based on temperature, atmospheric pressure and salinity), please see the respective sensor/oxygen meter manuals.

Specifications		
Measuring Range Optimum Maximum (not specified)	% air saturation (a.s.) 0-250% a.s. 0-500% a.s.	mg/L (ppm) 0-22 mg/L 0-44 mg/L
Accuracy * at 5% a.s./0.44 mg/L at 95% a.s./8.8 mg/L	$\pm 0.1\%$ a.s. $\pm 1\%$ a.s.	± 0.01 mg/L ± 0.1 mg/L
Resolution at 5% a.s./0.44 mg/L at 95% a.s./8.8 mg/L	0.05% a.s. 0.25% a.s.	0.005 mg/L 0.025 mg/L
Detection Limit	0.1% a.s.	0.01 mg/L

* The absolute accuracy of the full range sensors depends on the calibration mode. For 1-point calibrated sensors these values increase due to a decreasing accuracy. More details on request.

1.3 General Characteristics

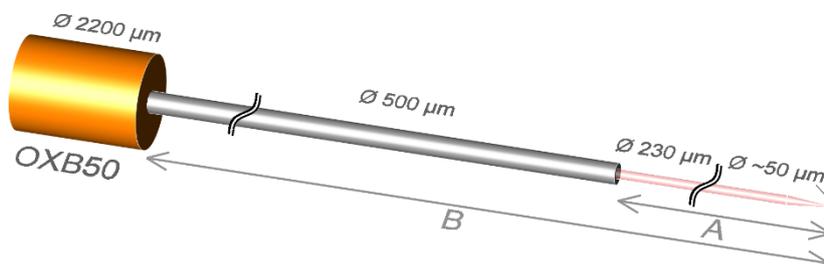
Response Time (t₉₀) ‡ Gas Water	standard <1 sec <2 sec	with -OI <2 sec <3 sec	with -HS <0.8 sec <0.8 sec	with -UHS <0.3 sec <0.3 sec
Temperature Range	specified: 0°C (32°F) to 50°C (122°F) not specified: -20°C (-4°F) to 70°C (158°F)			
Minimum Lifetime data points	standard / -OI 1,000,000	-HS <1,000,000	-UHS <<1,000,000	
Calibration Modes	1-point and 2-point calibration; obligatory to calibrate in gas (<i>water</i>) calibration standards for measurements in gas (<i>water</i>) samples			
Sensor Dimensions: OXR/OXF50 Length without cable (ca.) Shaft diameter (ca.)	OXR50 230 mm 8 mm		OXF50 190 mm 8 mm	

Needle Dimensions: OXR/OXF50 Length Diameter	OXR50 40 mm 0.5 mm	OXF50 40 mm 0.5 mm
Fiber and Sensor Tip: OXR/OXF50 Fiber & tip diameter Sensor tip position (rel. to needle)	OXR50 230 μm , 50-70 μm (tip) -6/0/+6/+12 mm	OXF50 230 μm , 50-70 μm (tip) ca. 6 mm (fixed)
Sensor Dimensions: OXB50 Fiber & tip diameter Tip geometry Stripping lengths	230 μm , 50-70 μm (tip) see image and text below A = 20mm, B = 100mm (other stripping lengths optional on request)	
Cable length	ca. 2 m or ca. 4 m (custom versions up to ca. 20 m)	
Application Areas	Laboratory, industry, research. NOT for medical or any safety-critical application. NOT for application in humans. NOT for application in food intended for human consumption.	

‡ Typical response times for 90% signal change. For liquids: measured for the transition from air into a stirred solution of 1% Na₂SO₃

Tip Geometry: OXB50

True to scale drawings with outer jacket (brown), plastic coating (grey), optical fiber (pink) and oxygen sensitive REDFLASH indicator (green).



2 APPLICABILITY AND CROSS-SENSITIVITY

	Applicability	Cross-Sensitivity	NO Cross-Sensitivity
Water/Aqueous solutions	X		
Gas Phase (typ. air components)	X		
Ethanol ^{1,2}	short-term only		
Methanol ^{1,2}	short-term only		
Isopropanol ^{1,2}	short-term only		
Other organic solvents ³		X	
Chlorine gas (Cl ₂), NO ₂ gas, bleach		X	
pH 1-14			X
CO ₂			X
CH ₄			X
H ₂ S			X
Any ionic species			X

¹ Not applicable for sensors with optical isolation (-OI).

² Only diluted and after conditioning- contact info@pyroscience.com for more information.

³ Includes liquid solvents and solvent vapors

3 CLEANING, STERILIZATION, STORAGE

Cleaning	3% H ₂ O ₂ , Soap solution, short-term Ethanol
Sterilization	short-term 70% Ethanol*, short-term 70% Isopropanol*
Storage	>3 years in darkness at room temperature

* Not applicable for sensors with optical isolation (-OI).

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