

Optical dissolved oxygen sensor

Model: OXY-DIOS-DSP

Applications:

- wastewater treatment – activated sludge process
- water intakes – control of water quality
- fish farms – aeration ponds
- composting plant – process control
- monitoring of rivers and lakes



OXY-DIOS-DSP is a high quality process, dissolved oxygen sensor applied in sewage, potable and industrial water. Our sensor assures fast measurement response and minimal drift. In typical applying conditions it requires calibration once a year, and measuring windows replacement every two years. By using measurement method, our device does not need electrolytes and replaceable membrane.

OXY-DIOS-DSP Sensor's body was completely made with stainless titanium steel and measurement window was made with hard sapphire glass. Pneumatic cleaning system has built-in head as a standard, that is why periodical maintenance is not required. Our sensor does not require the use of any additional, external transmitter, what reduces buying costs and connection complication. Communication with PLC can be based on one of buses RS485/MODBUS, CANBUS/CANopen or current loop 4-20mA. Basic configuration can be made by built-in USB port standard and attached cable.

Features of the sensor:

- Optical measurement of the concentration of dissolved oxygen in water and waste water
- High stability and accuracy of measurement
 - fluorescence quenching method
 - trigonometric measurement of the phase - DSP signal processing
- Low maintenance, calibration ones a year without additional equipment
 - build-in atmospheric/hydrostatic pressure sensor
 - build-in humidity sensor
- High environmental resistance
 - titanium stainless steel body
 - the measuring window of sapphire glass.
 - no plastic parts working in wastewater
- Build-in transmitter RS485/MODBUS, CANBUS/CANopen, current loop 4-20mA, USB
- Working without the flow of water / wastewater
- Built-in pneumatic cleaning system of measuring window
- Low cost of purchase and maintenance, measuring window replaced every two years



User manual describes the theory of operation, construction details and methodology of calibration
<http://www.sensor.integron.pl/index.php/en/service/download/user-manuals>



Technical specification		
Type	Dissolved oxygen sensor in water	
Model	OXY-DIOS-DSP INTEGRON Poland EU	
Measurement method	Optical – fluorescence quenching with frequency modulation excitation light, trigonometric measurement of the phase	
Optical head	447 / 650 nm with reference channel 617 nm, replaceable	
Measuring window	Type	Porphyrin platinum closed in a polymer-glass matrix
	Substrate	Sapphire glass dim. ϕ 12.5 mm / 1 mm
	Durability	Up to 2 year
	Chemical resistance	Methanol, ethanol, isopropanol
Minimum flow	No need for flow of water / wastewater	
Calibration	One point	0% - O ₂ , aqueous solution of sodium sulfite Na ₂ SO ₃ or nitrogen 4.0
	Two point	0% / 20.946% O ₂ (air - built-in barometer and humidity sensor) or air saturated with water vapour
Working temperature	0 to 50°C	
Storage temperature	-20 to 70°C	
Maximum depth	30 m	
Measured parameters	Concentration, saturation, temperature, O ₂ partial pressure, air / hydrostatic pressure, humidity	
Measuring range O₂	Partial pressure O ₂	0 to 400 mBar
	Concentration	0 to 20 mg/L
	Saturation	0 to 200%
Measurement accuracy O₂	Range 0 to 5.0 mg/L, 20°C	+/-0.10 mg/L
	Range 5.0 to 20.0 mg/L, 20°C	+/-0.20 mg/L
Measurement resolution O₂	Range 0 to 1.0 mg/L	0.001 mg/L
	Range from 1.0 mg/L	0.01 mg/L
Response time	21% O ₂ to 0% O ₂ (20°C - nitrogen), T ₉₀ < 40 s, 21% O ₂ to 0% O ₂ (20°C - water), T ₉₀ < 60 s, membrane with improved mechanical strength	
Resistance to environmental factors	H ₂ S, pH, K ⁺ , Na ⁺ , Mg ₂ ⁺ , Ca ₂ ⁺ , NH ₄ ⁺ , Al ₃ ⁺ , Pb ₂ ⁺ , Cd ₂ ⁺ , An ₂ ⁺ , Cr, Fe ₂ ⁺ , Fe ₃ ⁺ , Mn ₂ ⁺ , Cu ₂ ⁺ , Ni ₂ ⁺ , CO ₂ ⁺ , CN ⁻ , NO ₃ ⁻ , SO ₄ ²⁻ , S ₂ ⁻ , PO ₄ ³⁻ , Cl ⁻	
Temperature	Sensor type	Pt1000 class A
	Accuracy	+/- 0.2°C

	Resolution	0.01°C
	Range	-20 do +85°C
Materials	stainless steel-titanium EN 1.4571, stainless steel EN 1.4301, sapphire glass AL ₂ O ₃ , FPM, silicon	
Dimensions	Diameter	35 mm
	Length	238 mm
Weight	900 g	
Protection level	IP68	
Socket connection	Type	M12A, 8 pins, male, IP68
	Recommended plug	Binder 99 0486 12 08
Electromagnetic immunity	EN 61326 Class B	
Window cleaning system	Pneumatic - compressed gas, rotating nozzles	
	Connection	Quick connector PA 6/4mm pipe
Power	+24VDC, +/-20%	0.1A inactive current outputs
		1.1A active current outputs
	Overvoltage protection	28.8V
	Undervoltage protection	18.2V
	Overcurrent protection	1.2A, electronic with autorestart
Control outputs	24V/0.5A-Source, according IEC 61131-3, short circuit protection	
Communication MODBUS (RS485)	Mode	RTU, ASCII
	Terminator	Built-in 120 Ohm, attached electronically
Communication CANOPEN (CANBUS)	Mode	SDO, PDO mapowane
	Terminator	Built-in 120 Ohm, attached electronically
Current loop 4-20mA	Resolution / Accuracy	5.5uA / 0.05%
	Galvanic isolation	1kV
	Alarm	NAMUR43 / 22mA
Warranty	Sensor	3 lata
	Measuring window	2 lata
Expected lifetime	8 years for work in municipal wastewater	