RDO® PRO-X Optical Dissolved Oxygen Probe

THE IN-SITU® RUGGED DISSOLVED OXYGEN (RDO) PRO-X PROBE USES OPTICAL TECHNOLOGY FOR MEASURING DISSOLVED OXYGEN (DO) IN DEMANDING AQUACULTURE AND PROCESS ENVIRONMENTS. LOW-MAINTENANCE, EASY TO USE AND INTEGRATED DESIGN.

EPA RDO METHOD Approved

The RDO PRO-X Probe lets NPDES permit holders monitor influent, effluent and treatment processes, responding quickly to oxygen and temperature changes for more accurate results.

ELIMINATE MAINTENANCE

- Operates with very low drift for long periods of time.
- Responds quickly and accurately to oxygen and temperature changes across the full range.
- Delivers consistent, reproducible results (<0.05 mg/L).
- Eliminates membranes and filling solutions.

SIMPLE DESIGN

- Automates setup and reduces user error—calibration coefficients are loaded into sensor cap.
- Flexible communications—Standard 4-20 mA, Modbus/RS485, and SDI-12 outputs.
- Eliminates the need for a costly transmitter or controller, and requires only 8 to 36 VDC power.

COST EFFECTIVE

- Runs aerators efficiently and mitigates risks.
- Includes complete instrument with a standard 10 m cable or custom lengths up to 4,000 m.
- Easily view and filter data using In-Situ telemetry systems and HydroVu® Data Services.

ROBUST CONSTRUCTION

- Resists abrasion and photobleaching effects.
- Withstands high salinity environments—inert, non-corrosive materials used to construct probe body and sensor.
- Insensitive to interferences that plague membrane-based sensors (hydrogen sulfide, chloride, ammonium, and others).

Applications:

- **MUNICIPAL/INDUSTRIAL WATER AND WASTEWATER TREATMENT**
- **FOOD/BEVERAGE PROCESS CONTROL**
- **AQUACULTURE SETTINGS**
- **DAM DISCHARGE MONITORING**

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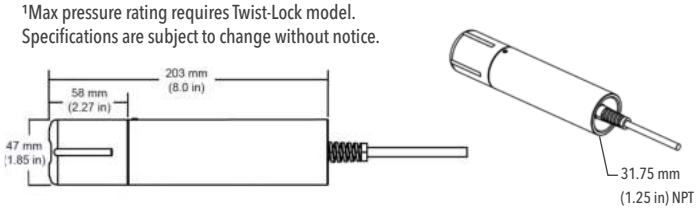
RDO PRO-X OXYGEN PROBE	
SENSOR TYPE	Optical Dissolved Oxygen Sensor
RANGE, DO	0 to 60 mg/L
ACCURACY, DO	±0.1 mg/L, 0 to 20 mg/L ±5% of reading, 20 to 60 mg/L
RESOLUTION, DO	0.01 mg/L
RESPONSE TIME, CAP	T90: <45 sec. T95: <60 sec. @ 25° C
RANGE, TEMP.	0° to 50° C (32° to 122° F)
ACCURACY, TEMP.	±0.1° C typical
RESOLUTION, TEMP.	0.01° C
SALINITY COMP.	Fixed or real-time capable
BAROMETRIC COMP.	Fixed or real-time capable
METHODS	EPA-approved In-Situ® RDO methods 1002-8-2009, 1003-8-2009, 1004-8-2009 Standard Methods 4500-O Compliant with ASTM D888-18 Method C and ISO 17289 methods.
ENVIRONMENTAL RATINGS	
PRESSURE[1]	150 psi from 0° to 50° C; 300 psi @ 25° C
DEPTH	210 m (689 ft) @ 25° C
OPERATING TEMP.	Probe: 0° to 50° C (32° to 122° F)
STORAGE TEMP.	Sensor cap: 1° to 60° C (33° to 140° F), in factory container Probe: -5° to 60° C (23° to 140° F)
COMPLIANCE	Heavy industrial, IEC 61000-6-2:2005
IP RATING	IP-67 with cap off; IP-68 with cap installed
CHEMICAL RATINGS	
INTERFERENCES	Alcohols >5%; hydrogen peroxide > 3%; sodium hypochlorite (commercial bleach) > 3%; gaseous sulfur dioxide; gaseous chlorine. Do not use the RDO sensing foil in organic solvents (e.g., acetone, chloroform, methylene chloride, etc.) or ozone, which can cause permanent damage to the sensing element (foil matrix).
GENERAL RATINGS	
COMMUNICATION OUTPUT	Modbus/RS485, SDI-12, 4-20 mA
POWER REQUIREMENTS	8 to 36 VDC
POWER CONSUMPTION	Maximum: 50 mA at 12 VDC
CABLE LENGTHS	Modbus and 4-20 mA: Up to 1,219 m (4,000 ft) SDI-12: Up to 61 m (200 ft)
INT. MOUNTING THREAD	31.75 mm (1-1/4 in) NPT
WARRANTY	Probe: 3 years from date of shipment Cap: 2 years in typical applications
WETTED MATERIALS	Acrylonitrile Butadiene Styrene (ABS) (housing, sensor nose, nose cone, back-end), Polycarbonate/ Polymethylmethacrylate (PC/PMMA) blend (RDO cap), Acrylonitrile Butadiene Rubber (NBR) (O-rings), FKM Fluoroelastomer (O-rings), Polyamide (strain relief) Polychloroprene (cable bushing), Thermoplastic Polyurethane (TPU) (cable jacket), Titanium (thermistor pin, Twist-Lock connector on applicable product models), Proprietary RDO sensing formulation (RDO cap tip)

[1]Max pressure rating requires Twist-Lock model.
Specifications are subject to change without notice.

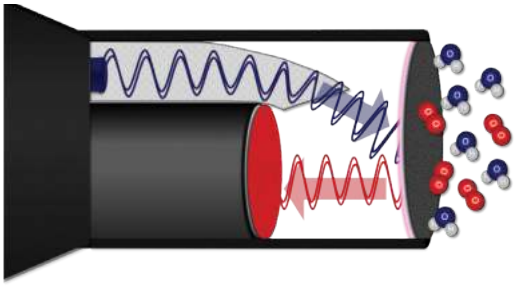


KEY ADVANTAGES

- **Long-lasting calibration**–the probe maintains calibration and operates with no drift over long-term deployments, delivering consistent, reproducible results.
- **Automatic setup**–the RDO PRO-X Cap is pre-loaded with factory calibration coefficients, serial number, and manufacture date. RDO PRO-X can use Classic, Fast, or RDO-X Cap. Ships with RDO-X Cap.
- **Sensor health diagnostics**–internal indicators alert you about excessive wear and remind you about regular maintenance intervals.
- **Fast response**–with patented signal processing, the probe responds quickly and maintains stability, even in dynamically changing conditions.

TECHNOLOGY

The low-maintenance RDO PRO-X Probe measures DO and provides extremely stable, accurate results. When the probe initiates a reading, a blue LED emits blue light, which excites lumiphore molecules in the sensing element. Excited lumiphore molecules emit red light, which is detected by a photodiode. Oxygen molecules quench the excited lumiphore molecules and prevent the emission of red light–a process called "dynamic luminescence quenching." Determination of DO concentration by luminescence quenching has a linear response over a range of concentrations.



Lumiphore molecules are excited by blue light and then emit red light, which is detected by a photodiode. Optical electronics report DO concentration in mg/L.

OFFERINGS

- **Simplified integration**–use in conjunction with the VuSitu Mobile App with Wireless TROLL Com, SCADA/PLC Systems, or telemetry systems and HydroVu Data Services.
- **Compliance certified**–CE, FCC Class B heavy industrial immunity and emissions certifications.
- **Cable or twist-lock options**–10m fixed or custom lengths.
- **Communication Device Kit** –connect RDO PRO-X to a computer via USB port to manage probe settings and communication setup.
- **Antifouling**–use antifouling guard or airblast adapter to extend deployments and protect your data.

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