

SP3 Sensor

Optical Dissolved Oxygen (ODO)



Teledyne's Optical Dissolved Oxygen (ODO) sensor, Model SP3-ODO, is an Fluorescence Quenching based optical sensor. The optical method minimizes maintenance, increases reliability, and improves long term accuracy of dissolved oxygen measurement. The sensor design is rugged, and easy to install, with the smart sensor capability. SP3-ODO is ideal for measurements in aeration basins, aquaculture and all types of environmental water with almost zero flow.

The ODO sensing element is comprised of a circular layer of optically active, oxygen sensitive membrane cap. This membrane cap is highly durable and permeable to oxygen, it will quickly equilibrate with its surroundings. Inside the sensor, there are two optical components: an emitter and detector. The emitter produces a green light and the membrane layer produces a red fluorescence. Upon contact with oxygen molecule, the red fluorescence is quenched thus lowering the intensity and duration of the red fluorescence. Based on the duration and intensity value, the sensor provides oxygen level and diagnostic parameters for the measurement



Oxygen level, water temperature, and air pressure are used by the sensor to calculate various dissolved oxygen values. The signal, then transmitted to the LXT330 universal transmitter via digital communication, unaffected by RFI and EMI noise. The optical dissolved oxygen sensor is unaffected by flow, pH, salinity, dissolved solids of the sample. While flow is not necessary, optical DO sensor can also accommodate high flow samples.

Unlike galvanic dissolved oxygen sensor, Optical Dissolved Oxygen (ODO) sensor does not require consumable electrodes, nor reagents for operation. The only serviceable part on the ODO would be the optical membrane with greater than two year service in an aeration basin. Sensor installation is either Immersion into basin or stream with sensor mounted at end of a PVC extension pipe, rail or pole mounted. Optional flow through sensor configuration is also available.

Features:

- Built based on the SP3 Smart Sensor platform, compatible with LXT330 Universal Transmitter
- Fluorescence Quenching Method for measurement of Dissolved Oxygen in water
- A fast responding and long life sensor that is not position or flow sensitive
- Calibration data stored on the sensor, with noise free stable digital output
- Replaceable optical activation cap, no reagent consumption
- Flexible sensor design: Integral Cable, Detachable Cable, Spray Clean head

Specifications

Ranges	Measurement: 0 - 20 mg/L (0 - 20 ppm), 0 - 200% Saturation, 0 - 400 hPa (0 - 6 psi) Pressure: 0 - 10 bar (145 psi)
Temperature	Operation: 20° to 120°F (-5° to 50°C) Ambient: 0° to 140°F (-20° to 60°C)
Response Time	T90 = 60 seconds
Accuracy	< 2% of measured range
Repeatability	± 0.5% of measured range
Resolution	0.01 ppm or 0.01% saturation
Wetted Materials	SS316, CPVC, Silicone
Sensor Cable	Shielded 4 core cable: 10 ft, 20 ft, 30 ft, 40 ft, 50 ft length up to 300 ft Max
Sensor Connector	Detachable Sensor Connector: Optional
Process Connection	3/4" NPT or G1 thread (can be used as immersion kit while direction is reversed)
Dimensions	8" L x 1.6" D (200 x 40 mm) 1.5 to 2.4 lbs (based on cable length)

Sensor Configurations

Model	Description
SP3-ODO	Intelligent Sensor - ODO (Optical DO)
A. Sensor Style	
0	Immersion Style Sensor - 3/4" MNPT Mounting Thread
1	Immersion Style Sensor - G1 Thread
2	Flow Cell and Sensor - 3/4" FNPT Entries
3	Flow Cell and Sensor - 1" Slip Entries
5	Flow Cell Replacement Sensor
B. Spray Cleaning Style	
00	No Spray Cleaner
01	Spray Cleaner for Immersion Style
02	Spray Cleaner for Flow Cell Style
03	PVC Compression Fitting, ODO to 1 1/2" FNPT
C. Cable Style	
0	Fixed (integral to sensor)
1	Detachable (axially) cable
D. Cable Length	
0	No Cable (replacement with detachable cable option)
1	10 ft
2	20 ft
3	30 ft
4	40 ft
5	50 ft
X	Other Length
E. Solution Ground	
0	No isolated housing ground
1	Isolated housing ground (for use on Dual Channel LXT330)
Accessories	
	Immersion Kit, user to supply 1" OD Stand pipe with 3/4" NPT adapter, cap/cable feed through
	Hand rail mounting brackets, for immersion sensors
	Replacement sensor cap (optically active component)
	Set of two (2) sealing o-rings used with sensor cap



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