

# Model DO90 Trace DO<sub>2</sub> Sensor



**ELECTRO-CHEMICAL DEVICES**

## Features

- Large Measurement Range
- Lead Silver Galvanic Cell
- Minimal maintenance
- Replaceable Electrode
- Easy Calibration
- Digital Signal

## Benefits

- 0.001 to 20.00 mg/L
- Long term stability
- Drift < 1% per Month
- No membrane or fill solutions to mess with
- Air Calibration and Zero Calibration
- Noise Free signal, Calibration Stored in the Sensor



*Model DO90  
ppb Dissolved Oxygen*

## Description

The Model DO90 Trace DO<sub>2</sub> is designed for the continuous measurement of trace levels of dissolved oxygen in aqueous systems. The primary application of the Model DO90 trace dissolved oxygen sensor is in the monitoring of boiler feedwater. Oxygen should only be present in trace quantities, excessive concentrations of oxygen can result in corrosion damage to the components of the Steam Cycle.

Boiler feed water is thermally and chemically degassed to achieve oxygen-free water. This state must be maintained throughout the Steam Cycle.

Using periodic grab samples to measure the ppb oxygen concentration introduces the risk of significant sampling errors. The Model S80 DO will continuously measure the ppb level of dissolved oxygen directly in the process eliminating grab sampling errors and providing highly reliable information.

The Model DO90 Trace DO<sub>2</sub> is a Lead Silver Galvanic sensor with a durable PFA Teflon® membrane. Oxygen diffusing through the membrane is reduced at the cathode producing hydroxide ions which react with the lead ions in the electrolyte to form lead hydroxide. The anode dissolves more lead ions into the electrolyte sending electrons to the cathode to reduce any oxygen present. The current flows from the Lead anode dissolving into the electrolyte to the cathode where electrons react with the Oxygen which reacts with the lead ions in solution. Under constant conditions, the current is proportional to the oxygen concentration of the medium.

The Model DO90 Trace DO<sub>2</sub> is a digital sensor, all of the signal

conditioning, calibration and diagnostic functions are performed inside the sensor. The DO90 sensor has an easily replaceable electrode cartridge eliminating the need for messy electrolyte/membrane replacement kits. The Model T80 Analyzer is compatible with both the Model DO90 trace dissolved oxygen sensor and other Model S80 sensors.

The Model DO90 flow cell has been specially designed for use with the Model DO90 trace dissolved oxygen sensor. The orientation of the inlet and outlet sample lines automatically purge air from the flow cell. The measurement chamber is optimized for fast response and all wetted parts are 316L stainless steel.

Installation of the flow cell is easy, using either the clamp style holders for wall mount or the two 10 x 32 threaded ports on the backside of the flowcell for panel mounting. Simply connect the input and output sample lines to the ¼" tube fittings and insert the sensor into the flow cell, tighten it in place with the threaded cap and it is ready to go. The 316 SS flange fitting allows for easy removal of the Model DO90 sensor from the flow cell for air calibration.

The Model DO90 Trace DO<sub>2</sub> is available as separate components, sensor, fittings, flowcell, Model T80 Transmitter or as a complete panel mounted system. The Panel mounted system is a complete plumb and play device, mount the panel (17" x 12" panel), plumb ¼" sample tubing to the tube fittings and power to the analyzer either Loop Powered or 110/220 VAC. The system is also available as a complete kit, less the panel, for mounting to an existing water panel.

# Model DO90 Trace DO<sub>2</sub> Sensor

## Specifications

### Measuring principle:

Galvanic, Silver cathode, Lead anode, self polarizing

### Measured Parameter:

Oxygen partial pressure-proportional current signal

### Measuring Range:

0.001 ... 20.00 mg/l or ppm/ppb auto-ranging

### Process Temperature Range:

-5 °C ... 50 °C

### Process pressure range:

0-15 psi maximum overpressure

Vacuum operation is not permitted

### Slope:

approx. 1.5nA/ppbO<sub>2</sub> at 20 °C and 1013 hPa

### Temperature Compensation:

NTC temperature sensor 100 kΩ, 0 ... 50 °C

### Response time:

t90: 30 sec / t99: 90 sec

### Polarization time:

< 60 minutes

### Minimum Flow Rate:

(200 ml/min with PN 1000008-1 flow cell

### Drift:

With continuous polarization: < 1% / month

### Materials of Construction:

Sensor body: Flanged stainless steel AISI 316 Ti

Electrode body: PEEK

Membrane: PFA Teflon®

Cathode: Silver

Anode: Lead

### Process Connection:

¼" 316 SS tube fittings

### Electrical connection (transmitter side)

Digital signal on a shielded 4-wire cable

### Membrane:

2 mil thickness (approx.)

### Maximum Total Cable Length:

100 m cable extension

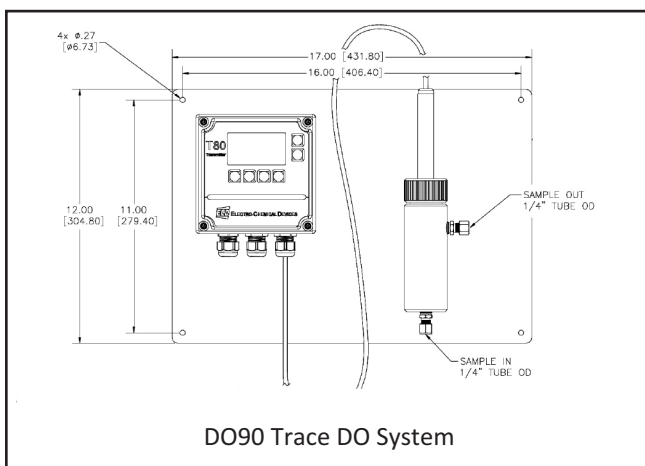
### Shipping Weight:

Model DO90 sensor with 10' cable length, 0.7 kg

Stainless Steel Flow cell, 2.0 kg

Part No.	Model and Product Description
1200200-1 (1200200-98)	DO90 Trace DO System, Loop Powered w/ PVC Panel, complete system, plumb and play ready (Kit with no panel)
1200200-2 (1200200-99)	DO90 Trace DO System, AC Powered & Relays w/ PVC Panel, complete system, plumb and play ready (Kit with no Panel)

Part No.	Spare Parts and Accessories Description
2005621.VIT	Dissolved Oxygen Electrode, ppb
1000008-1	DO90 Flow cell , 316 SS, ¼" Tube fittings
3501041-1	Replacement Threaded Cap for Flow cell
9310051-1	¼" 316 SS Tube fitting
DO90-01-0000-0B	Model DO90 ppb Dissolved Oxygen Sensor, 4' cable, complete with electrode
DO90-01-0001-0B	Model DO90 ppb Dissolved Oxygen Sensor, as above with Flow Cell



Specifications subject to change without notice.

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Model DO90 D1916