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Find the *Emerson / Rosemount Analytical 499A TrDO-54-VP* at our website: *Click HERE*

Product Data Sheet
PDS 71-499ATrDO/rev.I
June 2013

Trace Dissolved Oxygen Sensor

- RUGGED CONSTRUCTION.
- EASILY REPLACEABLE MEMBRANE; no special tools required.
- AUTOMATIC COMPENSATION for changes in membrane permeability with temperature.
- AUTOMATIC PRESSURE EQUALIZATION maintains correct membrane tension.
- SELF-DEPLETING DESIGN means rapid consumption of internal oxygen. Comedown time following maintenance and calibration is fast.



FEATURES AND APPLICATIONS

The Model 499A TrDO sensor is intended for the determination of trace (ppb) levels of dissolved oxygen in steam power plants and high purity cooling water.

The 499A TrDO is a membrane-covered amperometric sensor. The sensor consists of a gas-permeable TFE membrane stretched tightly over a gold cathode. A silver anode and an electrolyte solution complete the internal circuit. During operation, oxygen diffuses from the sample through the membrane to the cathode. A polarizing voltage applied to the cathode converts all the oxygen entering the sensor to hydroxide ions. The reaction produces a current, which the analyzer measures. The current is directly proportional to the rate at which oxygen reaches the cathode, which is ultimately proportional to the concentration of oxygen in the sample.

Because the rate of diffusion of oxygen through the membrane depends on temperature, sensor response must be corrected for temperature changes. A Pt100 RTD in the sensor measures the temperature, and the analyzer automatically performs the correction. The analyzer also uses the temperature measurement during automatic air calibration.

Calibration is easy. Simply expose the sensor to water-saturated air and press a button. The analyzer measures the barometric pressure and temperature and calculates the equilibrium solubility of atmospheric oxygen at the prevailing temperature and pressure.

Maintenance is fast and easy. Replacing the membrane requires no special tools or fixtures. Simply place a few drops of electrolyte solution in the membrane assembly, place it on the cathode, and screw the retainer in place. To replenish the electrolyte solution, unscrew the fill plug, add the reagent from a squeeze bottle, and replace the plug.

Pressure changes have little influence on sensor response. A flexible bladder in the sensor prevents distortion of the membrane by keeping the pressure inside the sensor equal to the sample pressure.

Comedown time is rapid. An out-of-the-box 499A TrDO sensor is accurate at the 1 ppb level within five hours after being placed in service. Unlike competing sensors that use a separate oxygen-scavenging electrode, the 499A TrDO relies on a self-depleting design to reduce internal oxygen and achieve fast comedown. The result is a more robust, reliable sensor.

The 499A TrDO sensor is available with a Variopol (VP) watertight connector. Wire the interconnecting cable to the analyzer and run the cable to the sensor. The sensor plugs into the cable receptacle. To replace the sensor, simply disconnect the Variopol fitting and plug in a new sensor.

The sensor is intended for use with the low flow cell PN 24091-00.

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SENSOR SPECIFICATIONS

Pressure: 0 to 65 psig (101 to 549 kPa abs)

Temperature:

32-122°F (0-50°C); membrane permeability correction defined between 41 and 113°F (5 & 45°C)

Wetted Materials: Noryl[2], Viton[3], Teflon[4] (TFE), silicone

Cathode: gold (not normally wetted)

Process Connection: 1 inch MNPT

Electrolyte Volume: 25 mL (approx.)

Electrolyte Life: 4 to 6 months (approx.)

Sensor Life: 2 years (approx.)

Temperature Sensor: Pt 100 RTD (Type B)

Cable Length (standard integral cable): 25 ft (7.6 m)

Cable Length (maximum): 300 ft (91 m)

Range: 0.1 ppb to 20 ppm

Accuracy at 25°C following air calibration:

<20 ppb	±1 ppb
>20 ppb	±5% of reading

Drift: <4% over 60 days

Sample Flow: 1.6-6.3 gph (100-400 mL/min.) recommended. Response changes less than 2% when flow is maintained in recommended range. At 0.8 gph (50 mL/min), sensor response is about 90% of value at 100 mL/min.

Response Time at 25°C: <20 sec to 90% of final reading at 25°C (0 to 200 ppb oxygen)

Comedown Time to 1 ppb:

New sensor: <5 hours

Following membrane change: <1 hour

Following air calibration: <1 hour

Shelf Life: 3 months. If the shelf life has been exceeded, the sensor can still be used. The comedown time will be longer.

Weight/Shipping Weight: 1 lb/3 lb (0.5 kg/1.5 kg)

[2] Noryl is a registered trademark of General Electric.

[3] Viton is a registered trademark of E.I. duPont de Nemours & Co.

[4] Teflon is a registered trademark of E.I. duPont de Nemours & Co

FLOW CELL SPECIFICATIONS

LOW FLOW CELL PN 24091-00

Wetted Parts: polycarbonate, polyester, 316 stainless steel, silicone

Process Connection: 1/4-inch OD tubing compression fitting or 1/4-inch FNPT

Maximum Pressure: 90 psig (722 kPa abs)

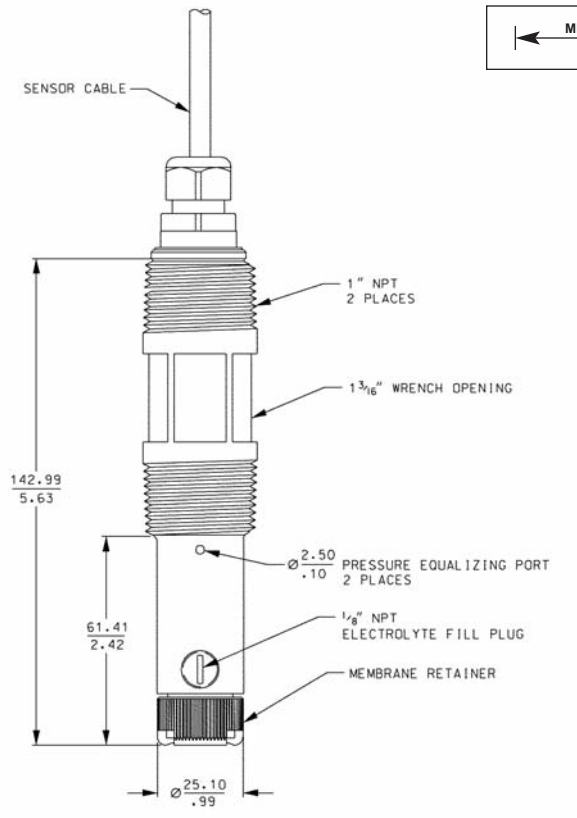
Maximum Temperature: 158°F (70°C)

Weight/Shipping Weight: 1 lb/2 lb (0.5 kg/1.0 kg)

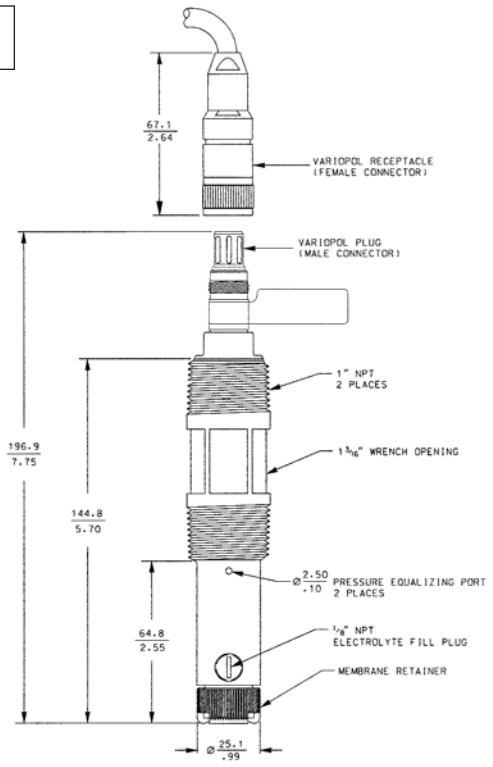
Note: The temperature and pressure specifications for the low flow cell exceed the specifications for the sensor.

ANALYZER COMPATIBILITY

Use the Model 499A TrDO with Models 1056, 56, 54eA, 5081-A, 1066, or Xmt-A.

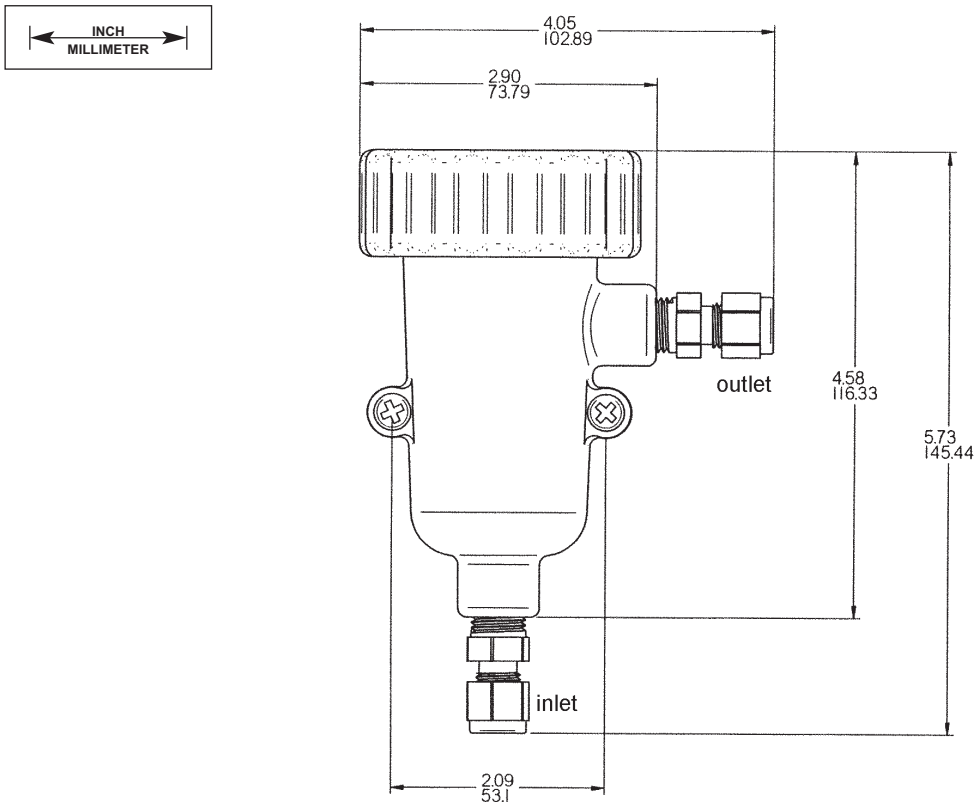


Sensor Dimensions (Integral Cable)



Sensor Dimensions (Variopol)

Length of assembled sensor is 9.3 in. (236 mm).



Low Flow Cell (PN 24091-00)

ORDERING INFORMATION

The Model 499A TrDO sensor is intended for the determination of dissolved oxygen at the ppb (part per billion) level. Three replacement membrane assemblies, three O-rings, and a 4-oz (125 mL) bottle of electrolyte solution are provided with each sensor. To reduce initial comedown time, the sensor is shipped with the membrane in contact with saturated sodium sulfite solution. The sensor should be used only with the low flow cell (PN 24091-00).

MODEL 499A TrDO TRACE (ppb) DISSOLVED OXYGEN SENSOR	
CODE	Required selection
54	For use with 1056, 56, 54eA, 5081-A, 1066, and Xmt-A analyzers

CODE	Optional selection
60	Optimum EMI/RFI Cable (not available with -VP option)

CODE	Optional selection
VP	Sensor with Variopol 6 fitting (interconnecting cable must be ordered separately)
70	Includes low flow cell (PN 24091-00)

499A TrDO	-54	-70	-VP	EXAMPLE

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FOR FIRST TIME VARIOPOL INSTALLATIONS

PART #	DESCRIPTION
23747-06	Interconnecting cable, VP 6, 2.5 ft (0.8 m)
23747-04	Interconnecting cable, VP 6, 4 ft (1.2m)
23747-02	Interconnecting cable, VP 6, 10 ft (3.0 m)
23747-07	Interconnecting cable, VP 6, 15 ft (4.6 m)
23747-08	Interconnecting cable, VP 6, 20 ft (6.1 m)
23747-09	Interconnecting cable, VP 6, 25 ft (7.6 m)
23747-10	Interconnecting cable, VP 6, 30 ft (9.1 m)
23747-03	Interconnecting cable, VP 6, 50 ft (15.2 m)
23747-11	Interconnecting cable, VP 6, 100 ft (30.5 m)

ACCESSORIES

PART #	DESCRIPTION
24091-00	Low flow cell
9200266	Extension cable, standard, not terminated (specify length)
9200275	Extension cable, optimum EMI/RFI, not terminated (specify length)
23747-00	Extension cable, optimum EMI/RFI, terminated (specify length)
23550-00	Junction box, 12 terminals
33523-00	Electrolyte fill plug
9550094	O-ring, Viton 2-014
33521-00	Membrane retainer
23501-04	Trace dissolved oxygen membrane kit, includes one membrane assembly and one O-ring
23502-04	Trace dissolved oxygen membrane kit, includes three membrane assemblies and three O-rings
9210264	#1 Dissolved oxygen sensor fill solution, 4 oz (125 mL)

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