

Rosemount™ 499ATrDO

Trace Dissolved Oxygen Sensor



A reliable sensor for measuring trace levels of dissolved oxygen

The Rosemount 499ATrDO dissolved oxygen sensor is an easy to use amperometric sensor with a rugged construction. This sensor is ideal for measuring trace dissolved oxygen concentrations in steam power plants and in high purity cooling water.

Overview



Ease of maintenance

- Extend sensor life with simple membrane and electrolyte replacement; no special tools needed.
- Automatic temperature correction with integral Pt100 resistance temperature device (RTD).
- Easy in-air calibration.
- Fast acclimation time; an out-of-the-box Rosemount 499ATrDO sensor is accurate at the 1 ppb level within five hours after being placed in service.
- Variopol (VP6) cable connector option
 - Eliminates cable twisting
 - Allows for quick sensor replacement

High performance design

- Measures dissolved oxygen between 0.1 ppb (parts per billion) and 20 ppm (parts per million).
- Operates in process temperatures up to 122 °F (50 °C).
- High accuracy of ±1.0 ppb when measuring concentrations below 20 ppb.
- Internal flexible bladder allows automatic pressure equalization for minimal influence from pressure changes on sensor response.

Contents

Overview.....	2
Ordering information.....	3
Specifications.....	5
Dimensional drawings.....	6
Accessories.....	9

Ordering information



The Rosemount 499ATrDO Trace Dissolved Oxygen Sensor is intended for the determination of dissolved oxygen at the ppb (parts per billion) level. The sensor is available with either an integral cable or Variopol (VP6) quick disconnect fitting. 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 acclimation time, the sensor is shipped with the membrane in contact with a saturated solution of sodium sulfite. The sensor is intended for use with the low flow cell (Part number 24091-00).

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Model

Code	Description
499ATrDO	Dissolved Oxygen Sensor - Trace DO

Transmitter compatibility

Code	Description
54	Rosemount 1056, 1066-DO, 56, and 5081-A compatible

Additional options

Cables

If no cable option is selected, the default cable length of 25 ft. (7.6 m) will be included.

Code	Description
VP	Sensor with VP6 fittings (requires VP interconnecting cable)
02	Integral 15-ft. (4.6 m) optimum EMI/RFI protected cable
03	Integral 33-ft. (10 m) optimum EMI/RFI protected cable
50	Integral 50-ft. (15 m) optimum EMI/RFI protected cable
06	Integral 100-ft. (30 m) optimum EMI/RFI protected cable

Flow cells

Code	Description
70	Includes low flow cell

Calibration Certificates

Code	Description
CC	Certificate of Calibration (no test data given)
LC	Loop Calibration Certificate (sensor and transmitter calibrated together, with test data)
EC	Electronic Calibration Certificate (sensor calibrated against factory instrument, with test data)

Material Traceability Certificates

Code	Description
MC	Material Traceability Certification

Specifications

Table 1: Sensor Specifications

Physical characteristics	Specifications
Range	0.1 ppb to 20 ppm
Pressure	0 to 65 psig (101 to 549 kPa abs)
Temperature (operating)	32 to 122 °F (0 to 50 °C)
Wetted parts	Noryl®, Viton®, Teflon® (TFE), and silicone
Cathode	Gold (not normally wetted)
Accuracy	Accuracy depends on the accuracy of the chemical test used to calibrate the sensor.
Linearity	±5% of reading or ±3 ppb (whichever is greater) at 77 °F (25 °C)
Repeatability	±2% of reading at constant temperature
Response time	< 20 sec to 90% of final reading at 77 °F (25 °C) (0 to 200 ppb oxygen)
Membrane permeability connection	Defined between 41 and 113 °F (5 and 45 °C)
Electrolyte volume	0.8 oz. (25 mL), approximately
Electrolyte life	4 to 6 months (approximately)
Sensor life	2 years (approximately)
Accuracy at 77 °F (25 °C) following air calibration	<20 ppb: ±1 ppb >20 ppb: ±5% of reading
Cable length	See Cables for standard cable lengths.
Cable length (maximum)	300 ft. (91 m), up to 100 ft. (30.5 m) is standard.
Sample flow	1.6-6.3 gph (100-400 mL/min) recommended. Response changes less than 2% when flow is maintained at recommended range. At 0.8 gph (50 mL/min), sensor response is about 90% of value at 100 mL/min.
Acclimation 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 acclimation time will be longer.

Table 2: Flow Cell Specifications

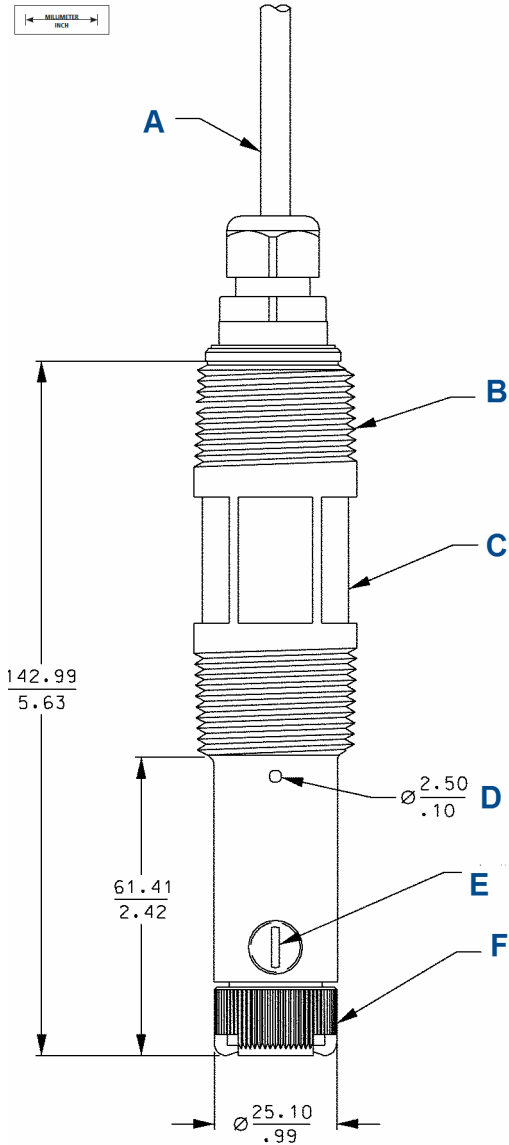
Part number	24091-00
Wetted parts	Polycarbonate, polyester, 316 stainless steel, and silicone
Maximum pressure	90 psig (722 kPa abs)
Process connections	¼-in. OD tubing compression fitting or ¼-in. female national pipe thread (FNPT)
Weight/shipping weight	1 lb./2 lb. (0.5 kg/1.0 kg)

Note

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

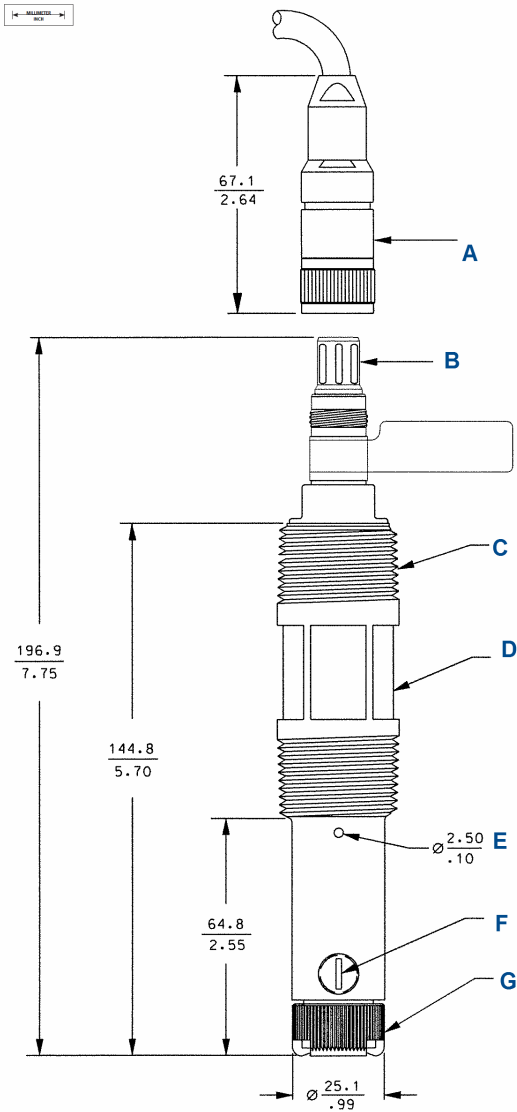
Dimensional drawings

Figure 1: Standard Sensor with Integral Cable



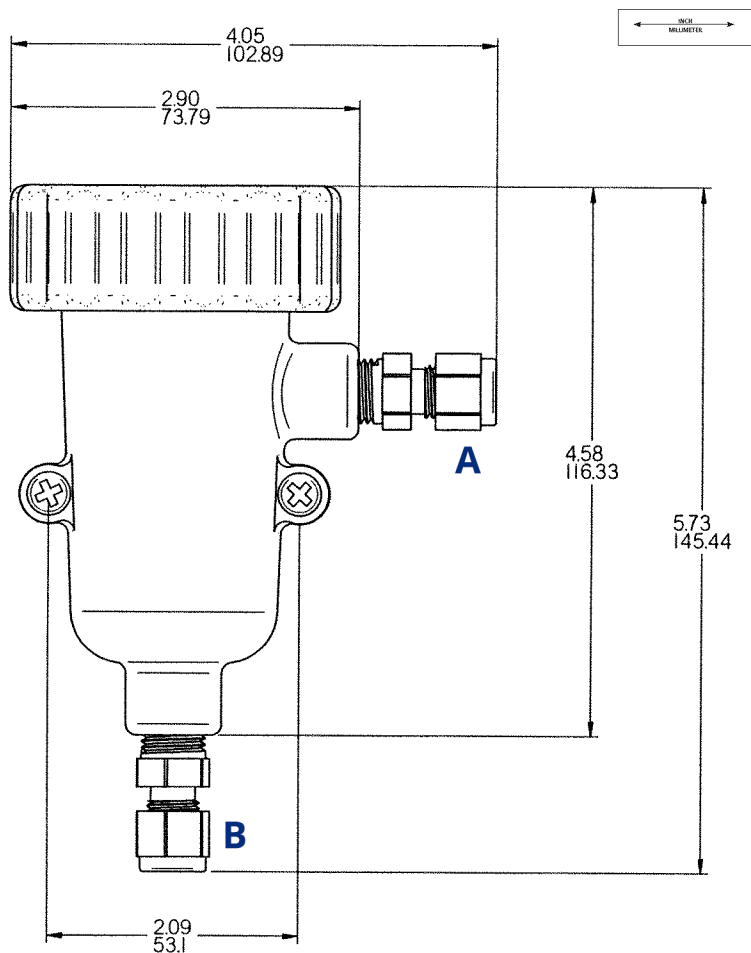
- A. Sensor cable
- B. 1 in. national pipe thread (NPT), two places
- C. 1 3/16 in.-wrench opening
- D. Pressure equalizing port, two places
- E. 1/8 in. NPT, electrolyte fill plug
- F. Membrane retainer

Figure 2: Sensor with Variopol Cable Connector



- A. Variopol receptacle (female connector)
- B. Variopol plug (male connector)
- C. 1 in. NPT, two places
- D. 1 3/16 in. wrench opening
- E. Pressure equalizing port, two places
- F. 1/8 in. NPT electrolyte fill plug
- G. Membrane retainer

Figure 3: Low Flow Cell (PN 24091-00)



A. Outlet

B. Inlet

Accessories

Table 3: Connector Cable (Required for All First Time Installations)

Part number	Description
23747-02	Cable, VP 6, conductivity/amperometric, 10 ft. (3.0 m)
23747-03	Cable, VP 6, conductivity/amperometric, 50 ft. (15.2 m)
23747-04	Cable, VP 6, conductivity/amperometric, 4 ft. (1.2 m)
23747-05	Cable, VP 6, conductivity/amperometric, 2.25 ft. (0.7 m)
23747-06	Cable, VP 6, conductivity/amperometric, 2.5 ft. (0.8 m)
23747-07	Cable, VP 6, conductivity/amperometric, 15 ft. (4.6 m)
23747-08	Cable, VP 6, conductivity/amperometric, 20 ft. (6.1 m)
23747-09	Cable, VP 6, conductivity/amperometric, 25 ft. (7.6 m)
23747-10	Cable, VP 6, conductivity/amperometric, 30 ft. (9.1 m)
23747-11	Cable, VP 6, conductivity/amperometric, 100 ft. (30.5 m)

Table 4: Other Accessories

Part number	Description
23747-00	Interconnect cable, prepped, specify length per foot
24091-00	Cell, low flow, ¼ in. (6.4 mm) inlet and outlet
9200266-LQD	Cable, 5 conductors, 1/22 GA 3/24 GA OD JKT PVC
9200275	Extension cable, shielded 9-conduit, unprepped, specify length per foot
9390004	Rotameter, 0.5 to 5.0 gph

Table 5: Spare Parts

Part number	Description
23501-04	Membrane assembly with O-ring, trace dissolved oxygen, Quantity:1
23502-04	Membrane assembly with O-ring, trace dissolved oxygen, Quantity:3
33521-00	Membrane retainer
33523-00	Fill plug
9210264	Amperometric sensor fill solution, 4 oz. (125 mL)
9550094	O-ring, Viton® 2-014

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