

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 Pt-100 resistance temperature device (RTD).
- Easy in-air calibration.
- Fast comedown 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 and allows for quick sensor replacement.

High performance design

- Measures dissolved oxygen between 0.1 ppb and 20 ppm.
- 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.

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 comedown 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 (PN 24091-00).

Contents

| | |
|---------------------------|---|
| Overview..... | 2 |
| Ordering information..... | 2 |
| Specifications..... | 3 |
| Dimensional drawings..... | 5 |
| Accessories..... | 8 |

Table 1: Rosemount 499ATrDO Ordering Information

| Option | Description |
|--|---|
| 499ATrDO | Dissolved Oxygen Sensor - Trace DO |
| Transmitter compatibility | |
| 54 | Rosemount 1056, 1066-DO, 56, and 5081-A compatible |
| Cable options | |
| – | Integral 25-ft. (7.6 m) optimum EMI/RFI protected cable |
| 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 cell option | |
| – | No selection |
| 70 | Includes low flow cell |
| Special | |
| – | No selection |
| 99 | Special (consult factory) |
| Calibration and conformance certificates - optional level | |
| 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) |

Specifications

Table 2: 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) |

Table 2: Sensor Specifications (continued)

| Physical characteristics | Specifications |
|---|--|
| 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 Table 1 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. |
| 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. |

Table 3: Flow Cell Specifications

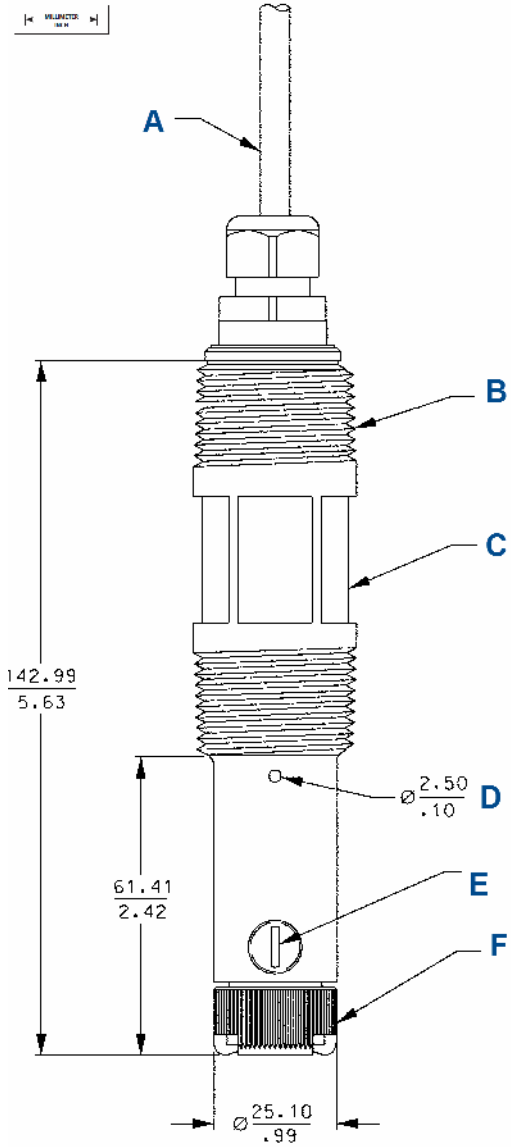
| | |
|--------------------------|---|
| Part number | 24091-00 |
| Wetted parts | Polycarbonate, polyester, 316 stainless steel, and silicone |
| Maximum pressure | 90 psig (722 kPa abs) |
| Process connections | ¼-in. OD tubing compression fitting or ¼-in. female national pipe thread (FNPT) |
| Weight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

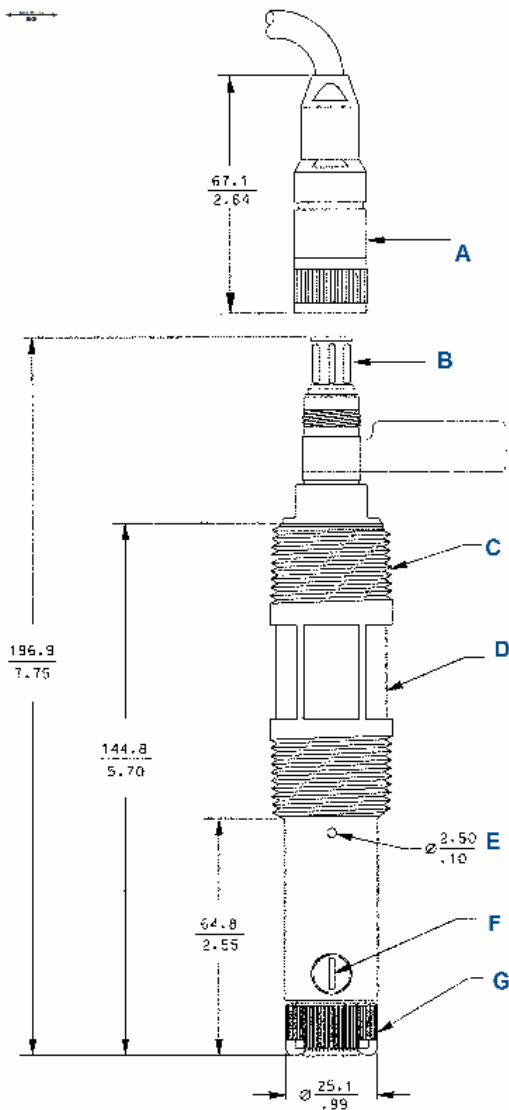
Dimensional drawings

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

Accessories

Table 4: 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 5: Other Accessories

| Part number | Description |
|-------------|-------------|
|-------------|-------------|

Table 6: 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 |

GLOBAL HEADQUARTERS

Emerson Automation Solutions
6021 Innovation Blvd
Shakopee, MN 55379, USA
📞 +1 800 999 9307 or +1 952 906 8888
📠 F +1 952 949 7001
✉️ liquid.csc@emerson.com

NORTH AMERICA

Emerson Automation Solutions
8200 Market Blvd
Chanhassen, MN 55317
📞 Toll Free +1 800 999 9307
📠 F +1 952 949 7001
✉️ liquid.csc@emerson.com

EUROPE

Emerson Automation Solutions
Neuhofstrasse 19a P.O. Box 1046
CH-6340 Baar
Switzerland
📞 T + 41 (0) 41 768 6111
📠 F + 41 (0) 41 768 6300
✉️ liquid.csc@emerson.com


MIDDLE EAST AND AFRICA

Emerson Automation Solutions
Emerson FZE
Jebel Ali Free Zone
Dubai, United Arab Emirates, P.O. Box 17033
📞 T +971 4 811 8100
📠 F +971 4 886 5465
✉️ liquid.csc@emerson.com

ASIA-PACIFIC

Emerson Automation Solutions
1 Pandan Crescent
Singapore 128461
Singapore
📞 T +65 777 8211
📠 F +65 777 0947
✉️ liquid.csc@emerson.com

 [Linkedin.com/company/Emerson-Automation-Solutions](https://www.linkedin.com/company/Emerson-Automation-Solutions)

 twitter.com/rosemount_news

 [Facebook.com/Rosemount](https://www.facebook.com/Rosemount)

 [youtube.com/RosemountMeasurement](https://www.youtube.com/RosemountMeasurement)

©2019 Emerson. All rights reserved.

The Emerson logo is a trademark and service mark of Emerson Electric Co. Rosemount is a mark of one of the Emerson family of companies. All other marks are the property of their respective owners.