

Dissolved Oxygen Sensor

For additional information, please refer to the Instruction Manuals CD shipped with this product, or visit our website at www.emersonprocess.com/raihome/liquid/.

1.0 SPECIFICATIONS

Temperature Range: -10 to 100°C (14 to 212°F)

Maximum Pressure: 174 psig (1200 kpa abs, 12 bar)

Measurement Range: 10 ppb to 20 ppm or 0.1% to 200% saturation, depending on instrument

Wetted Materials: Stainless Steel, Gold, Silicone, FDA-approved EPDM

Process Connections: PG 13.5 thread

Cable Connector: Variopol


Cable Compatibility: VP 6.0

Compatible Analyzers: Rosemount Analytical Models 54eA, 5081-A, and Xmt-A

Compatible Mounting Accessory: Insertion or Retractable Mounting Assembly, TriClamp Assembly

WARNING
Do not exceed temperature and pressure limitations of 100°C (212°F) and 174 psig (1200 kpa abs, 12 bar).

WARNING
Before removing the sensor, be absolutely certain that the process pressure is reduced to 0 psig and the process temperature is lowered to a safe level!



WARNING
The electrolyte is acidic. Protect your hands with gloves and use safety goggles. Avoid contact of the electrolyte with the skin, eyes, and mucous membranes.

2.0 INSTALLATION

2.1 UNPACKING AND INSPECTION

Inspect the carton for damage. If damage is found, contact the carrier immediately.

2.2 SENSOR PREPARATION

Sensor Preparation Guidelines: Carefully remove the plastic cap covering the sensing end of the sensor. Avoid causing a vacuum by gently and slowly twisting the sensor and cap until it is removed. Sensor is shipped dry, so electrolyte must be added prior to installation.

Remove membrane cartridge. Add 2 ml of electrolyte to the membrane cartridge. Screw membrane cartridge back onto sensor body. Refer to Section 6.3 for additional details.

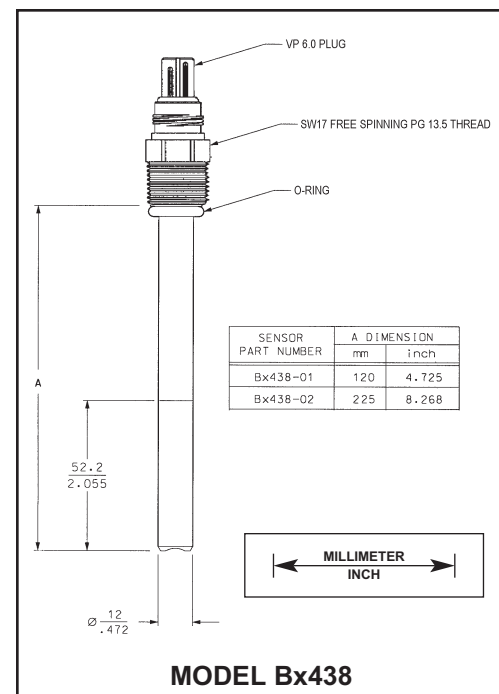
Connection of the Sensor to the Analyzer/ Transmitter:

1. Wire the sensor to the analyzer/transmitter. See the wiring tables in Section 3.0.
2. Apply power to the analyzer/transmitter. After 24 hours, the sensor should be ready for calibration. The polarization time is necessary to get stable signals from the sensor. If the sensor is disconnected from the analyzer/transmitter for a short time, allow the sensor to stabilize for at least three times longer than the time it was disconnected. Time needed for stabilization should not exceed 24 hours.

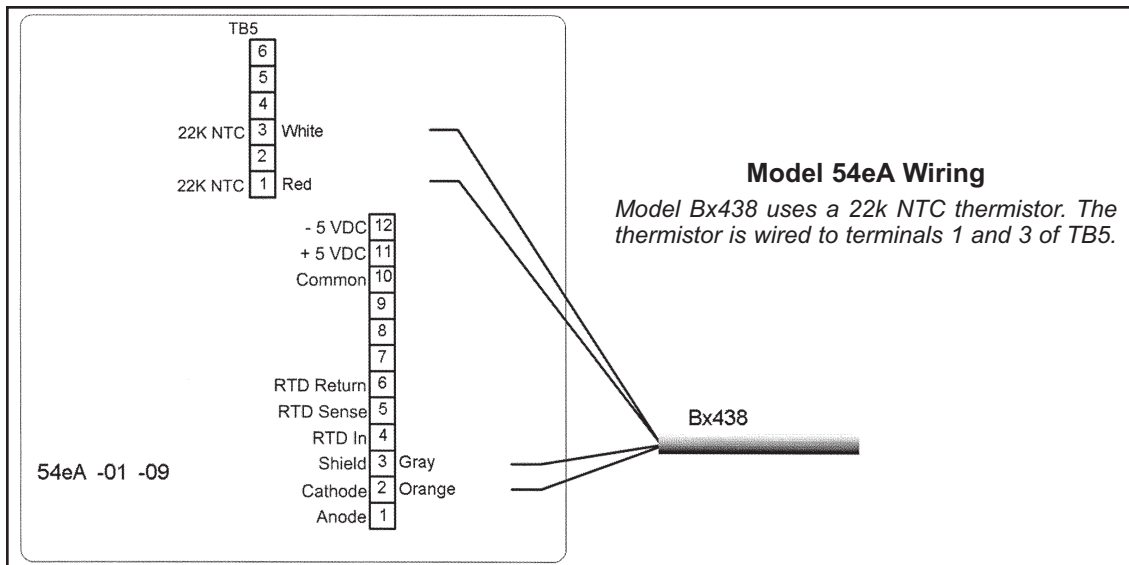
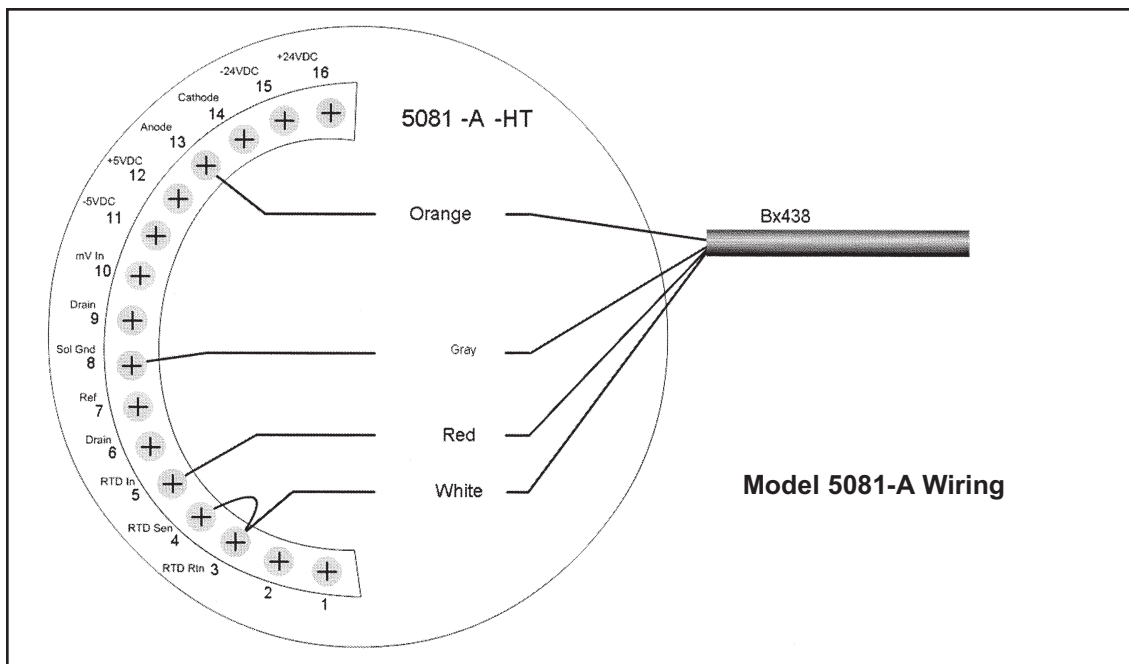
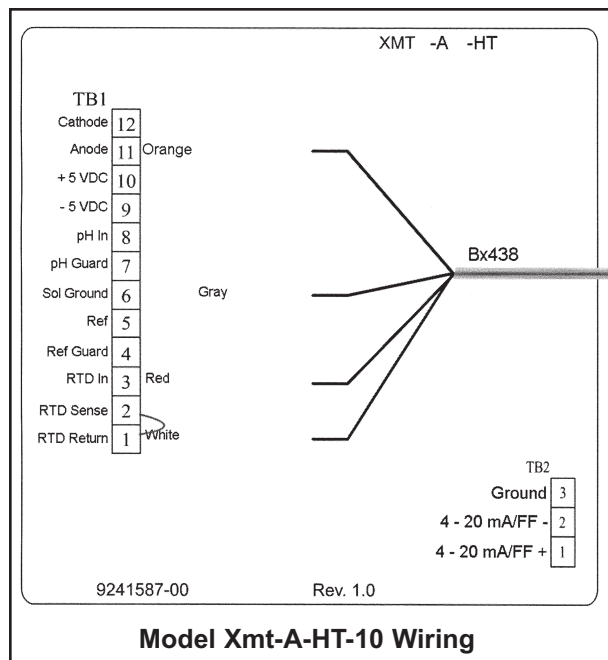
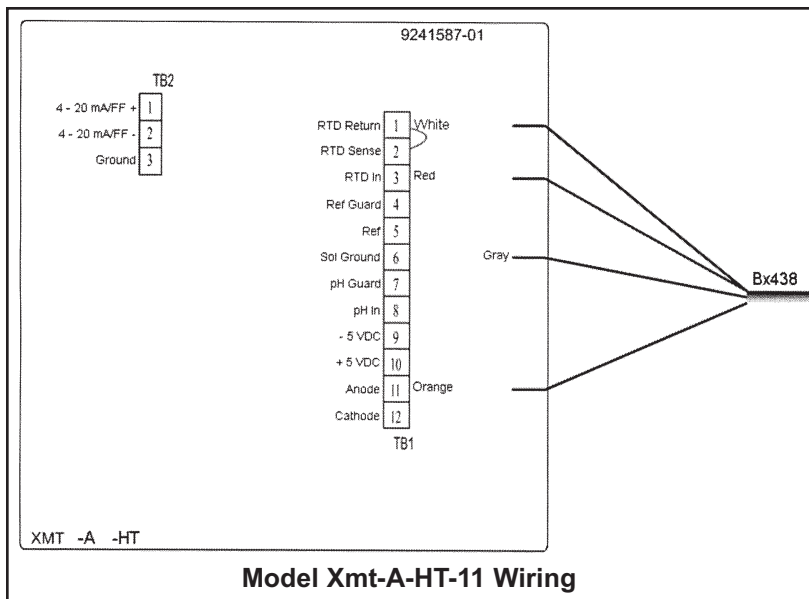
Mounting Guidelines: Mount the sensor using the PG 13.5 process thread.

NOTE

Do not install the sensor upside down.



3.0 WIRING



4.0 STERILIZATION

Before autoclaving the sensor, cover the connector end of the sensor with a tight protective cap (PN 9160490). If the connector end gets wet despite the protective cap, dry the connector with pressurized air or a hair dryer. Drying prevents corrosion and damage to insulation.

No protection is necessary when doing in-situ sterilization.

5.0 INSTRUMENT SET-UP

The analyzer must be set up for the proper service.

5.1 MODEL 54eA

Program the 54eA as follows:

Measure: Oxygen

Sensor: SSDO other

Measure Units: % sat, ppb or ppm (depending on service)

5.2 MODEL Xmt-A

Program the Xmt-A as follows:

Measure: Oxygen

Manufacturer: Rosemount

Application: Biopharm

Units: % sat, ppb or ppm (depending on service)

Refer to Model Xmt-A manual (PN 51-Xmt-A-HT) for additional set-up instructions.

5.3 MODEL 5081-A

Program the Xmt-A as follows:

Type: O₂

Units: ppm, ppb, or % (depending on service)

Sensor: Sd01

Refer to Model 5081-A manual (PN 51-5081A-HT) for additional set-up instructions.

6.0 CALIBRATION AND MAINTENANCE

Dismounting the sensor: Unscrew the free rotating PG 13.5 threaded connector and pull the sensor out of the process or mounting assembly.

6.1 CALIBRATION

1. Refer to the analyzer instruction manual for details.
2. Be sure the sensor has been operating for at least 24 hours before zeroing and calibrating.
3. Perform a zero check of the sensor by placing it in nitrogen gas or in water containing about 5% sodium sulfite. If using nitrogen gas, be sure the membrane is dry. Make sure the current output drops below 1 nA. If the sensor does not reach 1 nA, then either the zero solution needs to be replaced or the sensor membrane needs to be replaced.

4. If sodium sulfite was used to zero the sensor, rinse the sensor with water and gently dry the membrane. Place the sensor in water-saturated air. Once the reading is stable, complete the full-scale calibration. Consult the analyzer instruction manual for details.
5. Calibration can also be done using air-saturated water or air-saturated medium. Although the sensor has an extremely low oxygen consumption rate, the liquid should be gently stirred during calibration.

NOTE

A warning message "Sensor output very low/ high" may appear on the 54eA. Press **cont** (F3 key). Verify that the sensor output in air meets factory specifications (180 nA - 400 nA).

6.2 SENSOR MAINTENANCE

Periodically check sensor response in air and nitrogen.

1. Place the sensor in air. Allow the reading to become stable and note the value. Also note the sensor current, which should be between 180 and 400 nA.
2. Place the sensor in nitrogen. A small plastic bag with a stream of nitrogen gas discharging into the bottom works well.
3. After 90 seconds, the sensor current should be less than 2% of the value in air.

For troubleshooting information, see Section 7.0.

6.3 REPLACING THE ELECTROLYTE AND THE MEMBRANE CARTRIDGE:

Replace the membrane cartridge (membrane kit PN 24107-00) as follows:

1. Hold the sensor vertically with the membrane pointing down. Carefully unscrew the membrane cartridge.
2. Carefully clean the tip of the glass body with a soft tissue, or clean with the polishing tool in one direction only.

WARNING

Do not polish the cathode!

NOTE

When replacing the membrane cartridge, do not touch the anode wire.

3. Check the small o-ring above the glass body. If it is damaged, replace it.
4. Use the plastic pipette in the membrane kit to add 1.5 ml of electrolyte solution to the new membrane cartridge.
5. Carefully screw the cartridge onto the sensor shaft. If too much electrolyte solution was used, the excess must be pushed out. Wash off the excess electrolyte with water.

7.0 TROUBLESHOOTING

Below is a list of possible problems and solutions for Model Bx438 dissolved oxygen sensor.

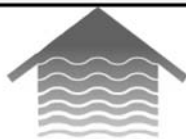
CURRENT IN AIR TOO HIGH (>500 nA at 25°C)		SLUGGISH RESPONSE		CURRENT IN AIR TOO LOW (<80 nA at 25°C)	
Problem	Solution	Problem	Solution	Problem	Solution
Very thin or defective membrane	Replace with new membrane cartridge	Contaminated, fouled, or dirty membrane	Clean membrane or replace with new membrane cartridge	Contaminated, fouled, or dirty membrane	Clean membrane or replace with new membrane cartridge
Defective glass body or connector	Return to Rosemount Analytical, Liquid Div.	Loose membrane	Replace with new membrane cartridge	Dried out electrolyte film	Loosen membrane cartridge and tighten
Poisoned anode	Return to Rosemount Analytical, Liquid Div.	Dried out electrolyte film	Loosen membrane cartridge and tighten	Cathode contaminated by silver	Return to Rosemount Analytical, Liquid Div.
—	—	Cathode contaminated by silver	Return to Rosemount Analytical, Liquid Div.	Exhausted electrolyte	Fill with new electrolyte
—	—	—	—	Defective glass body or connector	Return to Rosemount Analytical, Liquid Div.

Membrane kit consists of three replacement membranes and spare o-rings. Reference part number 24107-00. Electrolyte must be purchased separately. Reference part number 24108-00.



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