

# DISSOLVED OXYGEN SENSOR CARE AND USE INSTRUCTIONS

## Introduction

Your Sensorex Dissolved Oxygen (DO) sensor is a galvanic electrochemical device; i.e. it does not require power from your meter or controller to generate its signal. The DO sensor will provide a millivolt signal proportional to the concentration of oxygen in the water (model DO6400, DO6400TC) or 4-20mA current output (models DO6441 and DO6442). The signal output is proportional to ppm of oxygen for probes with millivolt signal output or changes linearly with ppm of oxygen sensors with 4-20mA output. The partial pressure of oxygen, which is directly proportional to the percent saturation of oxygen in a specified sample, can be calculated based upon the oxygen solubility which is a function of temperature, salinity, total atmospheric pressure, etc.

Your Dissolved Oxygen sensor consists of an cathode, anode, and an electrolyte separated from your process fluid by an oxygen permeable membrane. The oxygen passing through the membrane reacts at the cathode, giving up electrons, which produces an electrical current.

## Electrical Connections

DO6400 and DO6400TC models:

Red wire of Sensor to DO input + (cathode)  
 Black wire of Sensor to DO input - (anode)  
 White and Green wires of Sensor to Temperature input (10k NTC)  
 (see wiring FIG 2.)

DO6441 and DO6442 models:

Red wire of Sensor to DO input + (cathode)  
 Black wire of Sensor to DO input - (anode)  
 (see wiring FIG 3.)

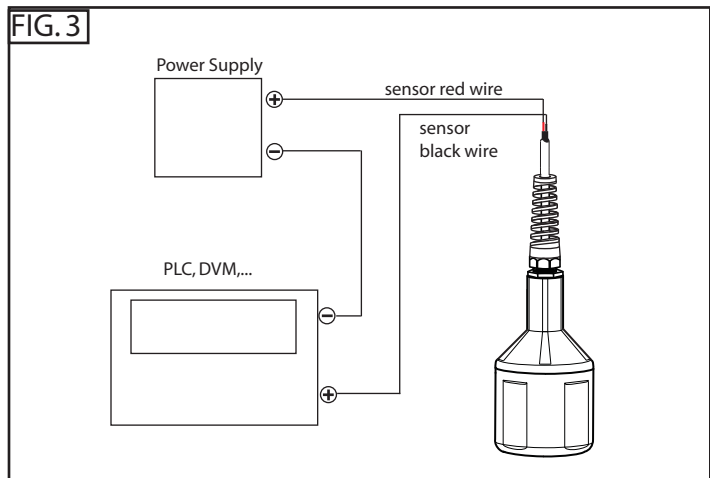
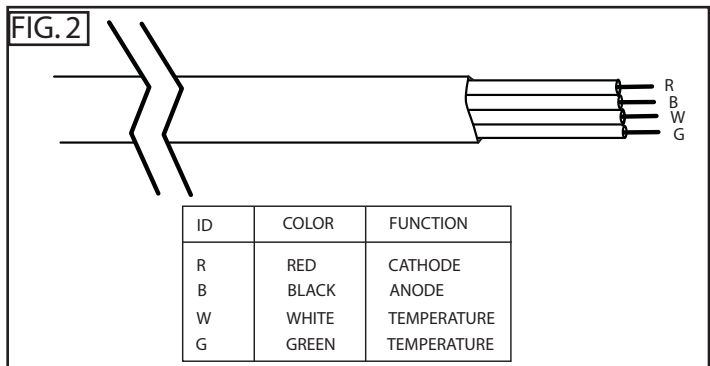
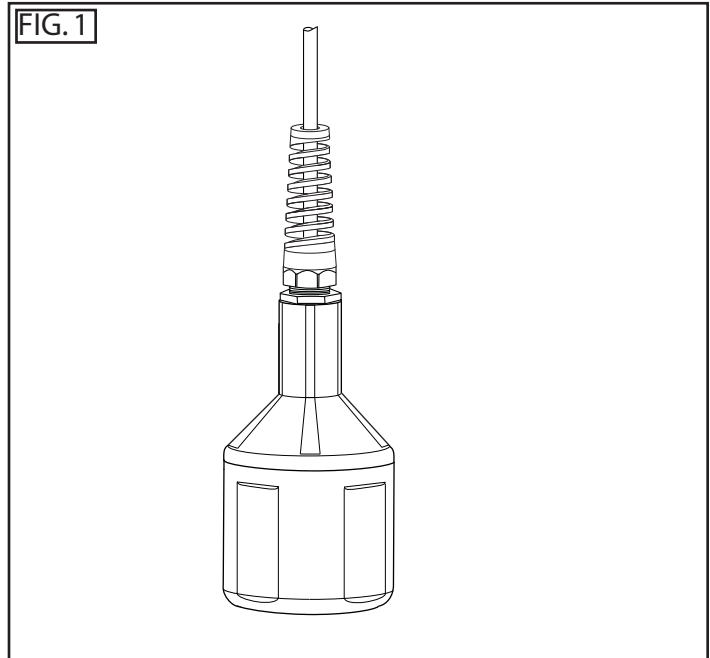
## Getting Your DO Sensor Ready to Use

**Your DO sensor is shipped to you dry and is not ready for use.** See steps #1, #7, #8, #9 and #10 of the "Sensor Re-conditioning" section of this sheet for instructions on sensor preparation. The installed membrane shipped with the probe is usable if it passes the leak test in step #8. Maintenance items included with your sensor include: 1 each membrane lock tool, 2 each Teflon or HDPE membranes, 2 each membrane o-rings and 250mL of electrolyte.

## Calibration

The simplest method to calibrate your DO sensor is to hold it in air. You may also bubble air past the sensor in water. The sensor is pre-calibrated at the factory (see Specifications Section for calibration range). If you want a 2-point calibration, a saturated solution of sodium sulfite ( $\text{Na}_2\text{SO}_3$ ) is suggested.

17g Sodium sulfite in 125mL DI water is more than enough. Sodium sulfite will not reach a true zero output but it should reach less than 1 mV or less than 4.5mA in 5 minutes or less (see Specifications section for range).

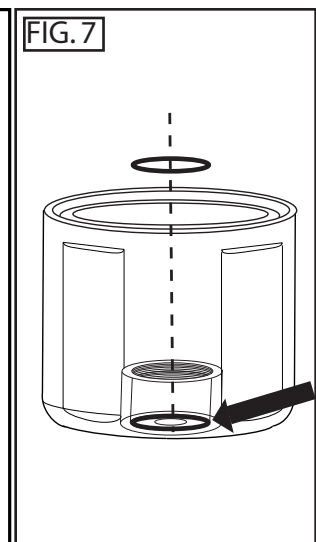
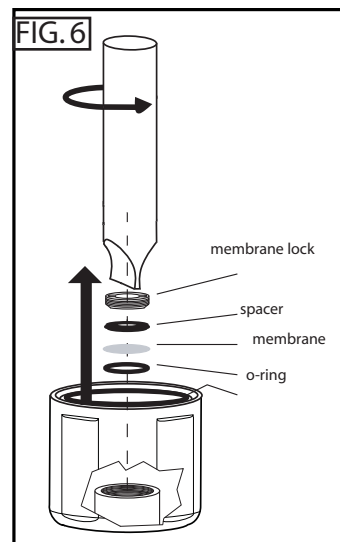
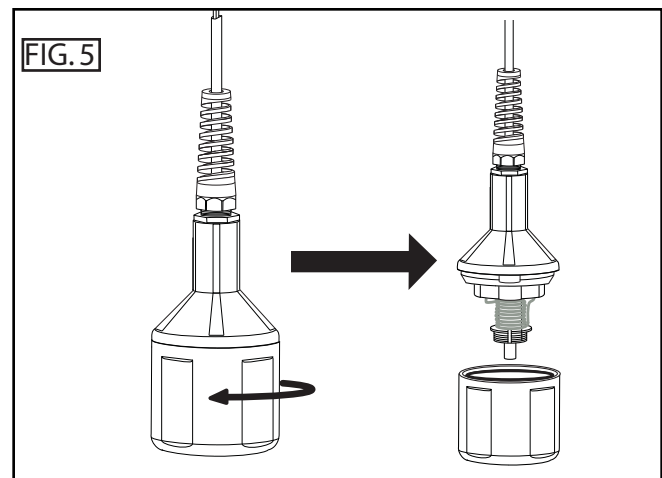
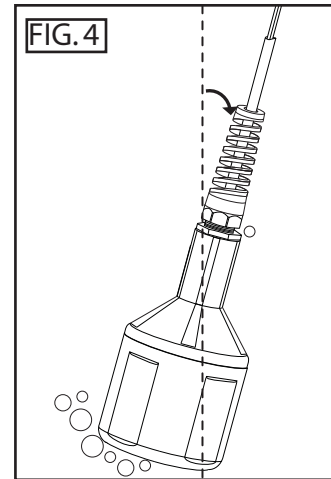


## Mounting Your DO Sensor

Submersion mounting of the sensor is recommended. To prevent air bubbles from becoming trapped on the membrane and producing falsely high DO readings, it is recommended that the sensor be mounted at a slight angle. See FIG. 4.

## Sensor Re-Conditioning

1. Unscrew the lower body from the upper body(FIG. 5).
2. Safely dispose of the electrolyte that is a special molarity, reagent grade Sodium Chloride solution (salt water). Make sure o-ring does not fall out of cap.
3. Using the Membrane Tool, unscrew the Membrane Lock in the lower body as shown in FIG. 6
4. Remove and dispose of the membrane and its o-ring as show in FIG 6.
5. To clean, take the top part of the sensor and immerse in vinegar (distilled white vinegar) for about 30 minutes. If you don't have vinegar, you can use a SOFT toothbrush, dish washing powder, and clean water, clean the cathode, anode, and plastic between them. Rinse all components thoroughly with clean water after cleaning. See FIG. 8.
6. First, install a new o-ring into the lower body membrane cavity (the o-ring must go all the way to the bottom as shown in FIG 7), then a new membrane (**remove paper backing from membrane before installing**), then the spacer. Using the Membrane tool, install the Membrane Lock on top of the spacer as shown in FIG. 9. Make sure cap is upright (not sideways) when screwing in lock.
7. Inspect the membrane for wrinkles--replace if it is wrinkled.
8. Pour some water into the lower body and look for leakage around the membrane (see FIG. 10)--replace it if there is leakage. If no leakage, dispose of the water.
9. Fill the bottom cap **to the top** with fresh electrolyte.
10. Keep the sensor upright so that the cable is pointed upwards(not sideways). Screw the bottom cap onto the upper body until hand tight. Excess electrolyte will leak out at the joint between the sensor's cap and upper body.



### Sensor Repair

Do not attempt to repair any part of the sensor. **If the sensor's cable is damaged, consult the factory for details.**

### Sensor Storage

If long-term storage of probes is required, empty electrolyte out of probe, rinse with clean water and remove the membrane. **STORE DRY & EMPTY.**

## SPECIFICATIONS

#### Sensor Materials:

Top and bottom cap:	Noryl®
Sensor body:	Delrin®
Anode:	Zinc wire
Cathode:	Silver

#### Output at 100% saturation(mV models):

PTFE membrane	31+/-5 mV
HDPE membrane	48+/-8 mV

#### Output at 100% saturation(mA models):

DO6441	18-20mA
DO6442	10-12mA

#### Output at 0% saturation(mV models):

PTFE & HDPE membrane	<1mV
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#### Output at 0% saturation(mA models):

	<4.5mA
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#### Temperature Range:

Max	50 deg C
Min	0 deg C

#### Response Time:

PTFE membrane	5 minutes from 100% to 0% oxygen (<1mV or 4.5mA)
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Water Flow Rate	Min 2 inch/second across membrane.
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#### Wetted Materials:

Body	Noryl®
Membrane	Teflon® or HDPE
Cable	4-conductor, 24AWG, Copper/PVC, polyurethane outer jacket.

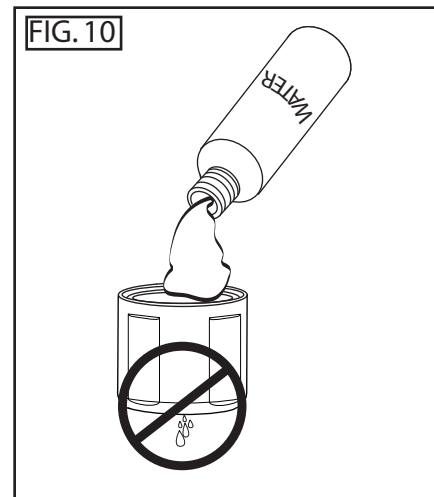
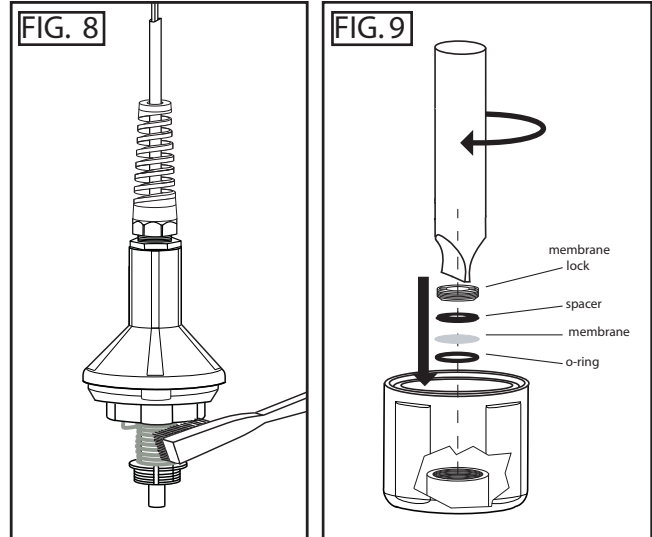
#### Wiring:

DO6400, DO6441*, DO6442*	Red = +, Black = -
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DO6400/TC	Red = +, Black = - Wht = Temp Grn = Temp
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Note: \* 4-20mA output versions

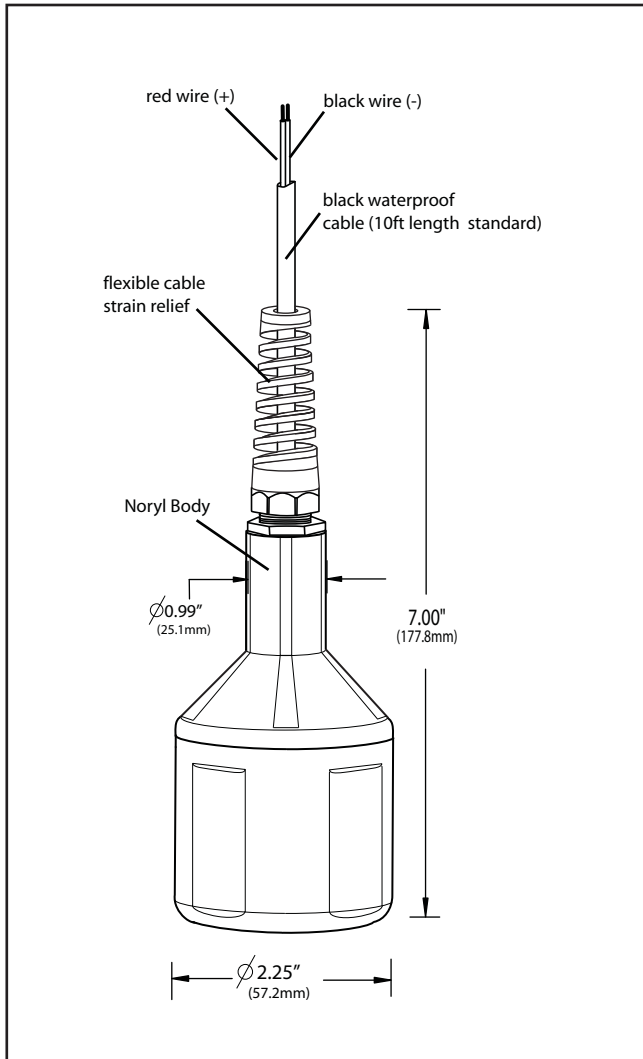
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Delrin is a registered trademark of E.I. DuPont de Nemours Co.  
Noryl is a registered trademark of General Electric Company





## OUTLINE AND DIMENSIONS

### DO6400 and DO6441, 6442



### DO6400TC

