



Sea-Bird Electronics, Inc.  
1808 136th Place NE  
Bellevue, WA 98005  
USA

Phone: (425) 643-9866  
Fax: (425) 643-9954  
E-mail: seabird@seabird.com  
Web: www.seabird.com

**APPLICATION NOTE NO. 13-2**

**Revised June 1994**

**"BECKMAN" DISSOLVED OXYGEN SENSOR  
DISASSEMBLY (REASSEMBLY) INSTRUCTIONS**

The SensorMedics "Beckman" type dissolved oxygen sensor module as supplied by Sea-Bird has a working life of 12 to 24 months. After such time, or when satisfactory calibrations can no longer be obtained, the module must be replaced. Referring to the drawing below, the necessary steps are as follows:

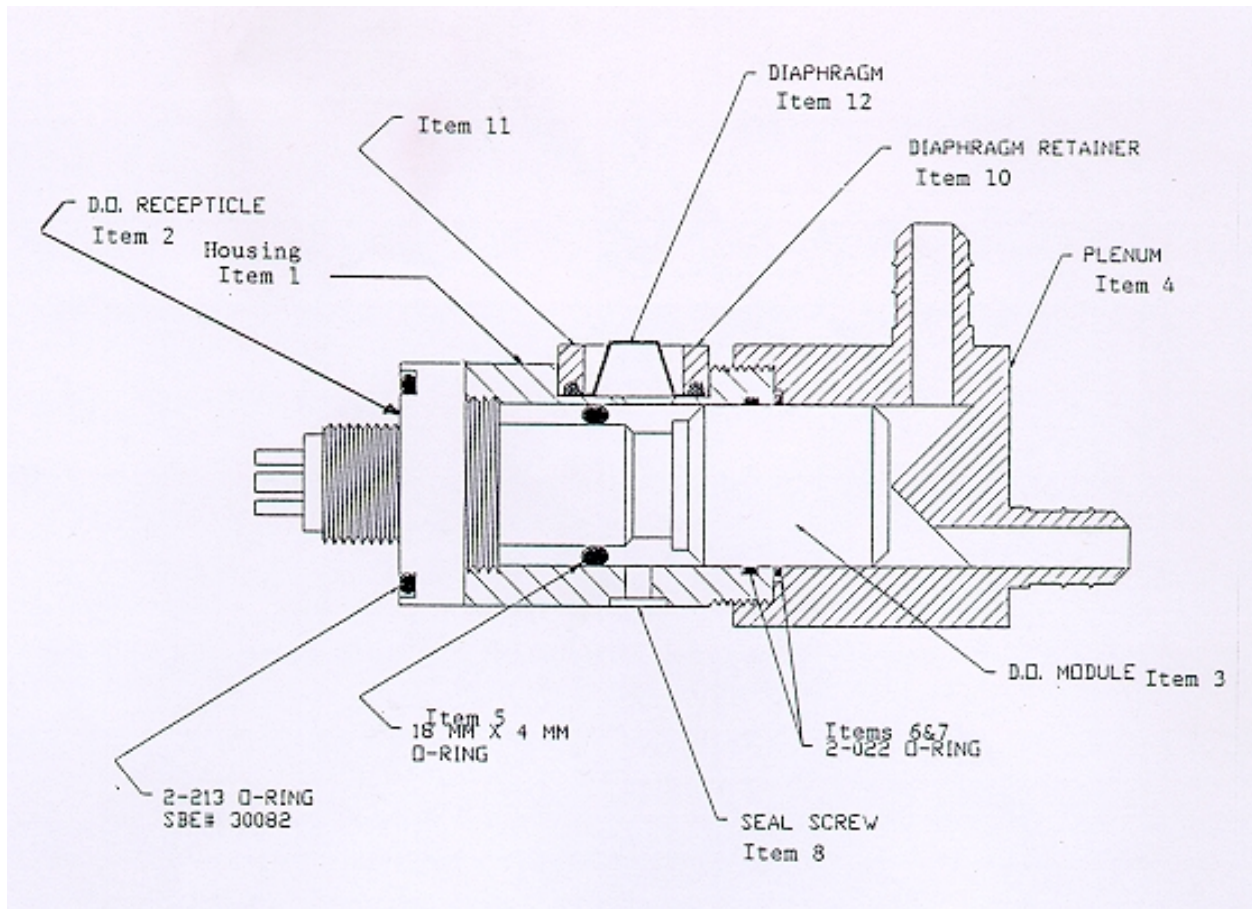
**DISASSEMBLY** (Steps 1 & 2 apply when the sensor is used with a pump and attached to a CTD)

1. Disconnect the two sections of tubing which connect the Oxygen Sensor Assembly to the conductivity cell and pump. Disconnect the electrical cable from the opposite end of the assembly.
2. Remove the Oxygen Sensor Assembly from its mount by removing the clamp that retains it.
3. Remove the Seal Screw (item 8) to drain the Housing (item 1) of oil.
4. Remove the Plenum (item 4) from the housing by unthreading counter clockwise. This item is only used with a pumped sensor.
5. Remove the Oxygen Sensor Module (item 3) from the Receptacle (item 2) and housing by turning it counter clockwise (like a light bulb). Discard the Oxygen Sensor Module.
6. Wipe all of the parts reasonably free of oil. Do not use solvents of a type that will attack plastics.

**REASSEMBLY**

1. Unthread the housing from the receptacle. Place O-ring (item 5) in housing. Use O-ring insertion tool (item 9) to position the O-ring at its proper location (push the tool as far into the housing as it will go; the easiest way is to stand the tool on a flat surface with the O-ring resting on top). Now re-thread the receptacle while being careful that the tool remains fully inserted. Remove the tool.
2. Connect the power to the sensor and monitor the output signal. At this point, the oxygen current signal should be 0 volts. The membrane temperature reading will be normal in accordance with ambient temperature.

3. Remove the new Oxygen Sensor Module from its sealed package. **CAUTION - DO NOT ALLOW ANYTHING TO CONTACT THE OXYGEN SENSOR MODULE'S TEFLON MEMBRANE. DO NOT GET ANY OIL ON THE MEMBRANE.**
4. Fill the receptacle with 4 cc of oil (approximately half full). Insert the Oxygen Sensor Module past the first O-ring and then invert the assembly so that any trapped air inside can escape through the fill hole.
5. While observing the sensor output, slowly thread the module clockwise into the housing until the output voltage jumps to about +5 volts. This indicates that the sensor module's spring contact has been engaged. Turn the Oxygen Sensor Module another full turn clockwise to ensure positive contact. Observe the output for a minute or so; it should begin to change downward and eventually (after 10 minutes or so) reach an equilibrium value representative of the atmospheric partial pressure of oxygen (typically about 2 volts). Exhaling on the sensor should cause the output voltage to drop slightly.
6. Examine the assembly for trapped air, especially the diaphragm area (item 12). Trapped air can be removed from the diaphragm by repeatedly depressing the diaphragm about 1/8 inch with a finger. Do not collapse the diaphragm because it may not return to the original shape. This would require removal of the diaphragm retainer (item 10) and reshaping of the diaphragm. **CAUTION - DO NOT PUMP THE DIAPHRAGM WITH THE SEAL SCREW IN PLACE.**
7. Top off the Receptacle reservoir. Blot away the excess oil, but leave the fill hole completely full. Verify that the oil Seal Screw (item 8) has its 'O'-ring in place, then insert it and tighten to assure a good seal.
8. After insertion of the Seal Screw, do not rotate the sensor module, as this will dislodge the 'O'-ring and cause loss of oil. **If the oil reservoir is not completely free of trapped air, the 'O'-ring (item 5) may tip, permitting sea-water to enter the sensor receptacle area.**
9. Slide the Plenum 'O'-ring (item 7) over the Oxygen Sensor Module and push it down flush with the housing.
10. Re-thread the Plenum (item 4) into place until it bottoms against the Housing.
11. Position the unit with the oxygen sensor pointing down and let sit for several hours. This will allow the small air bubbles to rise upward to the 'O'-ring (item 5). These bubbles can then be removed at the fill hole. **IMPORTANT - ANY AIR BUBBLES THAT APPEAR DURING NORMAL USE SHOULD BE REMOVED IMMEDIATELY.**
12. Remount the Oxygen Sensor Assembly to the CTD (if applicable).



Item 1	Housing	Sea-Bird PN 23407
Item 2	Receptacle	Sea-Bird PN 24016
Item 3	Oxygen Sensor	Sea-Bird PN 24105
Item 4	Plenum	Sea-Bird PN 80657.1
Item 5	'O'-ring	Sea-Bird PN30081
Item 6	'O'-ring	Sea-Bird PN30074
Item 7	'O'-ring	Sea-Bird PN30074
Item 8	Seal-Screw	Sea-Bird PN 24019
Item 9	'O'-ring Insertion Tool	Sea-Bird PN 24017
Item 10	Diaphragm Retainer	Sea-Bird PN 23408
Item 11	4-40 Socket Head Cap Screw	Sea-Bird PN 30438
Item 12	D.O. Diaphragm	Sea-Bird PN 30439
Item 13	D.O. Refill oil (6 oz.)*	Sea-Bird PN 24020

\*Pharmacy grade pure mineral oil (intestinal lubricant) is suitable.