

# Improving your sensor's performance and longevity

The primary components of a Dissolved Oxygen or pH measurement loop are the [sensors](#) and the [transmitters](#). The sensors are designed to be as robust as possible but still require regular inspection and maintenance. Some items, such as membrane cartridges, are consumables and need to be replaced on a frequent basis. Others, such as [4-pin connectors](#), provide a safe and repeatable method of restoring a damaged sensor back to “as new” condition.

Still others, such as [o-rings](#) and gaskets, ensure that the effects of normal wear and tear are eliminated and optimum performance is restored. Below you will find supplies to keep your sensors in optimum condition. If you need something not shown, please feel free to [contact us](#).

## 25 mm Membrane Cartridges

The [OxyProbe® 25 mm membrane cartridges](#) are a rather complex item. The body is composed of a chemical resistant polymer with a unique silicone internal bladder which contains the internal electrolyte. The shape of this bladder, combined with the shape of the polymer body, allows for the expansion of the electrolyte during the sterilization cycle without distortion of the actual sensing membrane. The sensing membrane is reinforced with an internal stainless steel mesh. Rather than use a nickel-plated brass membrane retainer ring, Broadley-James uses a 316L stainless steel retainer.



The combined effect of these improvements is a durable, yet precise and repeatable, membrane cartridge assembly. Each membrane is individually leak tested and visually inspected under high magnification prior to packaging in its own protective vial.

## O-rings

One of the smallest parts plays one of the biggest roles. [O-rings](#) are the first and only defence against contamination. To properly perform their intended function o-rings must have the proper fit, compression, elasticity, chemical resistance, and durability. All of our o-rings are compatible with steam sterilization and are highly chemical resistant. The sealing materials are all in accordance with FDA guidelines. Documentation of the o-ring compliance is available upon request.



An interesting and perhaps little known fact about our [o-ring catalogue pages](#) is that the items are shown actual size! If you have

The contents of this publication are presented for information purposes only, and while every effort has been made to ensure their accuracy, they are not to be construed as warranties or guarantees, express or implied, regarding products or services described herein or in their use or applicability. All sales are governed by our terms and conditions, which are available on request. We reserve the right to modify or improve the design or specification of such products at any time.

© 2022 Broadley-James Corporation. All rights reserved. Visit [www.broadley-james.com/trademarks](http://www.broadley-james.com/trademarks) for trademark information.

TMP-BF-102101

# Improving your sensor's performance and longevity

an o-ring and are not sure of the type, just place it on top of the image in the catalogue. If it matches then you have found your part.

## Broadley-James provides complete D.O. sensor rebuild service.

[Our sensor rebuild service](#) includes rebuilding, testing, polishing and certifying any of the D.O. sensor designs for the cost of 1 hour of labour plus parts. While the modular design of the 25 mm and 19 mm OxyProbe D.O. sensors facilitates rapid rebuilding of the sensor by the customer, it is recommended that 12 mm D.O. sensors always be rebuilt by Broadley-James due to the difficulty in removing the anode/cathode assembly.

### The Rebuild Service Consists of The Following 7 Steps:

- 1. Inspect the Connector Plug and Wiring** - Occasionally the connector pins become bent or broken during use, so the connector will be replaced if necessary. The optional right-angle connector minimizes cable fatigue and makes it easier to remove the sensor. Its low profile will also provide additional clearance between vessels. Any D.O. sensor with a straight connector can easily be converted to this right angle style.
- 2. Replace Cathode Assembly** - This is the heart of the sensor. The glass tip should never be bumped or hit. Imperfections in the polish or curve of the tip will affect sensor readings and calibration. For example, nicks in the glass allow pools of electrolyte to form. During the process, oxygen will collect in these same spots and interfere with the reading. If a pool of electrolyte is near the platinum wire of the cathode, the sensor will not zero.
- 3. Replace all O-rings** - All [o-rings](#) are replaced during the rebuild. The unique feature of the Broadley-James D.O. sensor is that all seals are mechanical seals. There are no adhesive sealants to leak or fail while the sensor is in process. It is much easier to replace o-ring seals rather than sealant. With sealant, it is necessary to eliminate all residue before re-applying another seal. Always inspect o-rings for wear prior to use. Good o-ring seals are critical to sensor performance for the following reasons: To keep moisture out of the wiring pocket allowing the sensor to withstand washdowns and autoclaving, to prevent the process from contaminating the sensor and wiring and to seal the sensor securely into the port to prevent leakage.
- 4. Polish the Outer Body** - The sensor is polished down to the base metal. Dirt, tarnish and steam scorch marks are removed from the surface. The body of the sensor is fabricated from 316L stainless steel to withstand repeated exposure to both CIP and SIP conditions. Anything less would allow pitting and corrosion of the metal over time. The extra polishing step ensures the sensor is as clean as possible before returning it to service after the rebuild.

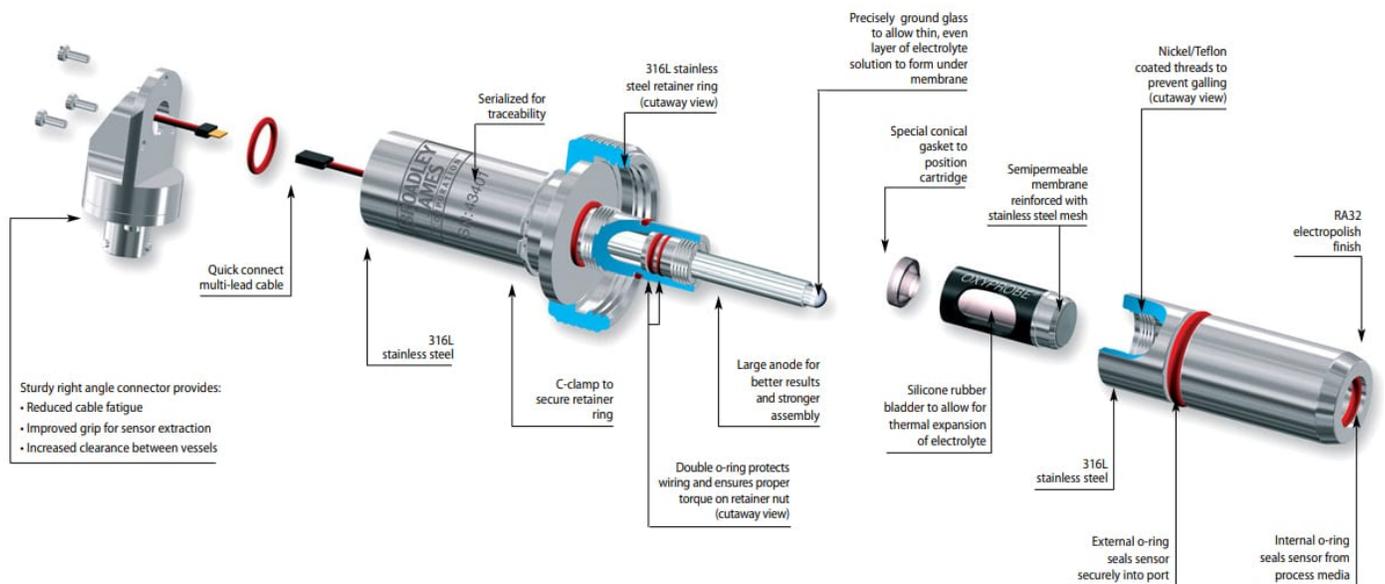
The contents of this publication are presented for information purposes only, and while every effort has been made to ensure their accuracy, they are not to be construed as warranties or guarantees, express or implied, regarding products or services described herein or in their use or applicability. All sales are governed by our terms and conditions, which are available on request. We reserve the right to modify or improve the design or specification of such products at any time.

© 2022 Broadley-James Corporation. All rights reserved. Visit [www.broadley-james.com/trademarks](http://www.broadley-james.com/trademarks) for trademark information.

TMP-BF-102101

# Improving your sensor's performance and longevity

- 5. Replace Membrane Cartridge** - The silicone membrane is reinforced with stainless steel mesh and can easily be damaged. Just a bump on a hard surface can ruin its integrity. Eventually, it will become clogged, stretched or damaged, so it should be changed regularly. Inspection and calibration of the sensor will determine when to change the [membrane cartridge](#). Broadley-James has designed a membrane testing kit to confirm that the membrane has not been compromised prior to use. The membrane cartridge is replaced during rebuild service.
- 6. Refill Electrolyte Solution** - It is recommended that the [electrolyte solution](#) be changed after every run for the sensor to work at optimum reliability. The surface of the cathode assembly is ground to allow a thin layer of electrolyte to be trapped between the membrane and the glass. It is this solution which completes the circuit of the sensor. The electrolyte, along with the membrane, is replaced during the rebuild.
- 7. Provide Quality Assurance** - Certificate and 1 -Year Warranty. As a final step, Broadley-James Corporation will heat sterilize the sensor and test it to ensure it is working correctly. A QA certificate is provided which includes the date of rebuild and calibration results. The serial numbers of the sensor and cathode are kept on file. This documentation will serve as the new warranty against manufacturer's defects in parts and workmanship.



The contents of this publication are presented for information purposes only, and while every effort has been made to ensure their accuracy, they are not to be construed as warranties or guarantees, express or implied, regarding products or services described herein or in their use or applicability. All sales are governed by our terms and conditions, which are available on request. We reserve the right to modify or improve the design or specification of such products at any time.

© 2022 Broadley-James Corporation. All rights reserved. Visit [www.broadley-james.com/trademarks](http://www.broadley-james.com/trademarks) for trademark information.

TMP-BF-102101