

Care and Maintenance

Storage

Short-term (less than one week)



Remove the restrictor and the end cap.



Put the restrictor on the instrument in calibration mode.



Pour 15 mL (0.5 oz) of clean water into the restrictor.



Thread the cap onto the sonde and store.

Long-term (more than one week)



Remove pH/ORP sensor and any ISE sensors.



Dampen the sponge inside the pH/ISE sensor storage caps with Storage Solution or pH 4 calibration standard.



Replace the caps at both ends of the sensor. Use electrical tape to seal the storage cap.



Thread the restrictor onto the sonde.



Store the sonde between -40 and 65° C. See the Instrument Specifications section for additional storage temperature requirements for pH/ORP and ISE sensors.

Cleaning the Sonde

Rinse the sonde thoroughly. Clean with warm water and mild soap, then rinse the sonde again. Allow to air dry.



Prevent water from entering the cable connector.

Removing the Restrictor

If the restrictor or end cap are stuck and difficult to remove by hand, use strap wrenches to provide extra leverage. Remove the end cap bumper before using strap wrenches.



Never use pipe wrenches or a vise grip which may damage the instrument. Never insert tools into the restrictor holes for leverage, as they may damage the wiper shaft or sensors. Strap wrenches should only be used when necessary to remove or loosen parts. Tighten parts by hand only.

Maintenance Schedule



For best results, send the instrument and sensors for factory maintenance and calibration every 12 to 18 months.

User-Serviceable Parts



O-rings

Lubricate O-rings during initial setup. Check and replace O-rings if worn, damaged, or discolored.



Wiper Brush

Replace brush according to site needs when bristles are visibly bent, damaged, or fouled.



Desiccant Capsule

Replace the desiccant capsule when the desiccant turns pink.



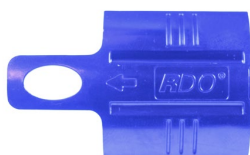
Bumpers

Replace bumpers and collar when they are visibly worn or damaged.



Sensors

See each sensor instruction sheets for details about maintaining and replacing each sensor.



RDO Sensor Cap

Refer to the sensor cap instruction sheet for details.



Sensor Fill Solution

Refer to the instructions for the pH/ORP sensor and ISE sensors like Nitrate, Ammonium, and Chloride for details.



Reference Junction

Refer to the instructions for the pH/ORP sensor and ISE sensors like Nitrate, Ammonium, and Chloride for details.

Wiper Maintenance



Replace brush according to site needs when bristles are visibly bent, damaged, or fouled.

Replace wiper brush.



Loosen brush housing with hex key.



Slide the old brush off of the wiper shaft.



Slide the new brush onto the wiper shaft.



Tighten brush screw with hex key.

Replacing Desiccant

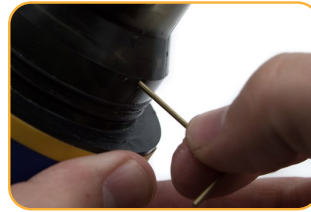
A replaceable desiccant capsule prevents moisture from damaging the instrument and batteries. Check the capsule periodically. A pink color indicates expired/exhausted desiccant.



Remove the battery cover.



Remove the wrench from the back of the battery compartment.



Use the wrench to push the desiccant capsule out of the hole in the back of the battery compartment.

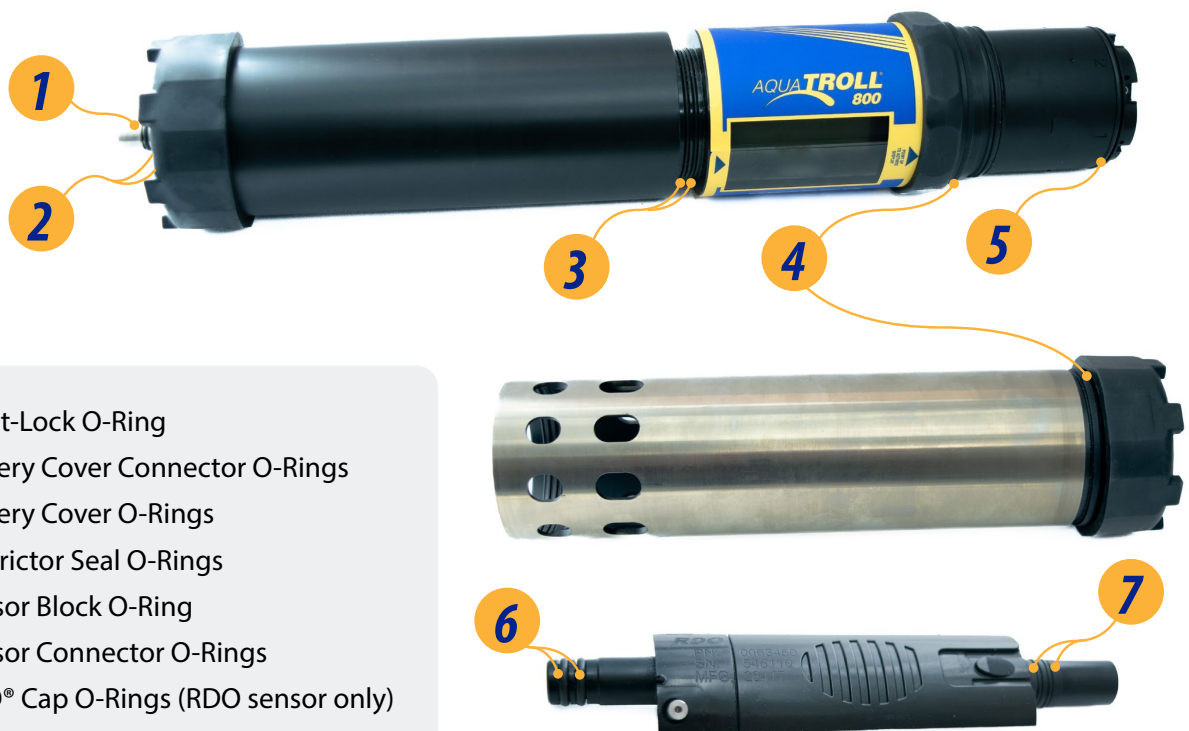


Insert a new capsule. Replace the wrench and battery cover.

Replacing O-Rings



Replace O-rings when performing routine maintenance. Refer to the diagram below for the location of each O-ring. Apply a thin layer of grease to each O-ring after installing.



1. Twist-Lock O-Ring
2. Battery Cover Connector O-Rings
3. Battery Cover O-Rings
4. Restrictor Seal O-Rings
5. Sensor Block O-Ring
6. Sensor Connector O-Rings
7. RDO® Cap O-Rings (RDO sensor only)



Never use metal objects to remove O-rings. They can scratch the plastic and compromise the quality of the seal. If necessary, wood or plastic tools may be used to gently remove O-rings.

Cleaning and Storing the pH/ORP Sensor and Ion-Selective Electrode (ISE) sensors

Storage



Dampen the sponge inside the sensor storage cap with Storage Solution or pH 4 calibration standard.



Replace the caps at both ends of the sensor. Use electrical tape to seal the storage cap.



Do not store the pH/ORP sensor or ISE sensors in DI water. It will deplete the reference solution and drastically reduce the life of the sensor.

Routine Maintenance

If the ORP platinum electrode is dull or dirty, it can be cleaned with a swab and methanol or isopropyl alcohol. Rub the electrode gently until it is shiny. The pH sensor must be kept moist for the life of the sensor. The sensor fill solution has a shelf life of 2 years. Replace the fill solution every 5 to 6 months or when:

1. The sensor fails to calibrate within the acceptable slope and offset range.
2. Sensor readings vary or are slow to respond.
3. Readings during calibration at pH 7 are greater than +30 mV or less than -30 mV.

Replacing the Filling Solution



Remove sensor from sonde and unscrew reference junction.



Discard old solution onto a paper towel and throw it in the trash. Do not discard down the drain.



Insert tube from filling solution bottle into sensor.



Squeeze solution into reservoir until full. Slowly remove tube.



Reinstall reference junction. Dry sensor body.



Soak ISE sensors for 2 hours in the highest concentration calibration standard you plan to use.



Rinse the sensor thoroughly prior to calibration.

Replacing the Junction



If the sensor fails to calibrate after you replace the fill solution, replace the reference junction.



Remove sensor from sonde and unscrew reference junction.



Discard old solution onto a paper towel and throw it in the trash. Do not discard down the drain.



Insert tube from filling solution bottle into sensor.



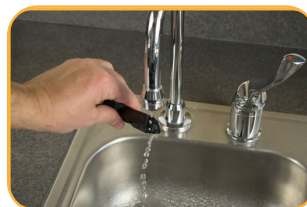
Squeeze solution into reservoir until full. Slowly remove tube.



Reinstall reference junction and wipe sensor body dry.



Soak ISE sensors for 2 hours in the highest concentration calibration standard you plan to use.



Rinse the sensor thoroughly prior to calibration.



Keep the reference junction damp at all times.

Cleaning

Begin with the gentlest cleaning method and continue to the others only if necessary. Do not directly wipe the glass bulb. To clean the pH sensor, gently rinse with cold water. If further cleaning is required, consider the nature of the debris.

To remove crystalline deposits:

1. Clean the sensor with warm water and mild soap.
2. Soak the sensor in 5% HCl solution for 10 to 30 minutes.
3. If deposits persist, alternate soaking in 5% HCl and 5% NaOH solutions.

To remove oily or greasy residue:

1. Clean the sensor with warm water and mild soap.
2. Methanol or isopropyl alcohol may be used for short soaking periods, up to 1 hour.
3. Do not soak the sensor in strong solvents, such as chlorinated solvents, ethers, or ketones, such as acetone.

To remove protein-like material, or slimy film:

1. Clean the sensor with warm water and mild soap.
2. Soak the sensor in 0.1 M HCl solution for 10 minutes and then rinse with deionized water.

Cleaning and Storing the RDO Sensor

Routine Maintenance

1. Leave the sensor cap on.
2. Rinse the sensor with clean water.
3. Gently wipe with a soft cloth or brush if biofouling is present.
4. If extensive fouling or mineral buildup is present, soak the sensor in vinegar for 15 minutes, then soak in deionized water for 15 minutes.



Do not use organic solvents—they will damage the sensor cap. Do not remove the sensor cap when rinsing or brushing.

5. After cleaning the sensor, perform a 100% Saturation Calibration.

Cleaning the Optical Window

Clean the optical window only when changing the sensor cap.

1. Remove the cap.
2. Gently wipe the sensing window with the supplied lens cloth.



Do not wet the lens with any liquid.

Storage

Prior to installation, store the sensor body and cap in the factory supplied containers. Once installed on the sonde, the RDO sensor can be stored wet or dry depending on the sensor configuration of the sonde.



Never store the RDO sensor without the sensor cap once it has been installed on the sonde.

Cleaning and Storing the Turbidity Sensor

Routine Maintenance

The optical windows should be clear of foreign material. To clear material gently rub the sensing windows using clean water and a soft cloth or swab. Do not use solvents on the sensor.

Storage

Prior to installation, store the sensor in the factory supplied container. Once installed on the sonde, the turbidity sensor can be stored wet or dry depending on the sensor configuration of the sonde.

Cleaning and Storing the Conductivity Sensor



Soaking the sensor in vinegar for longer than one hour can cause serious damage.

Begin with the most gentle cleaning method and continue to the other methods only if necessary.

To clean the conductivity sensor face, gently rinse with clean, cold water. If further cleaning is required, consider the nature of the debris.

To remove crystalline deposits:

1. Clean the sensor face with warm water and mild soap.
2. Use a soft brush to gently clean the sensor pins and temperature button. Ensure removal of all debris around the base of the pins and button.
3. If crystalline deposits persist, soak in 5% HCl for 10 to 30 minutes followed by warm soapy water and soft brushing.
4. If deposits persist, alternate soaking in 5% HCl and 5% NaOH solutions followed by warm soapy water and soft brushing.

To remove oily or greasy residue:

1. Clean the sensor face with warm water and mild soap.
2. Using a soft brush, gently clean the sensor pins and temperature button. Ensure removal of all residue around the base of the pins and temperature button.
3. Isopropyl alcohol may be used for short soaking periods, up to one hour.
4. Do not soak in strong solvents such as chlorinated solvents, ethers or ketones (such as acetone).

To remove protein-like material, or slimy film:

1. Clean the sensor face with warm water and mild soap.
2. Using a soft brush, gently clean the sensor pins and temperature button. Ensure removal of all material/film around the base of the pins and temperature button.
3. Soak the sensor in 0.10% HCl for 10 minutes and then rinse thoroughly with distilled water.

Storage

Prior to installation, store the sensor in the factory supplied container.

Once installed on the sonde, the Temperature Sensor and Conductivity Sensor can be stored wet or dry depending on the sensor configuration of the sonde.

Cleaning the Copper Antifouling Restrictor

When copper is deployed in environmental waters, particularly marine environments, the copper will oxidize and develop a patina, which may affect optical sensor readings. Avoid soaking the restrictor in solvents or acids so that the natural patina is preserved and calibrations are representative of field conditions.

1. Remove the restrictor from the sonde.
2. Remove the restrictor end cap.
3. Gently remove biofilm with a cloth or soft bristle brush, mild soap, and warm water.
4. Rinse the restrictor in water and air dry.