Atlas Scientific™
Environmental Robotics

V 1.8
Revised 7/22

Gen 2

Mini Lab Grade D.O. Probe

Reads	**Dissolved Oxygen**
Range	**1 – 50 mg/L**
Accuracy	**+/– 0.2 mg/L**
Response time	**~0.5 mg/L/per sec**
Temperature range °C	**1 – 50 °C**
Max pressure	**689 kPa (100PSI)**
Max depth	**70m (230 ft)**
Connector	**Male SMA**
Cable length	**45cm (18")**
Internal temperature sensor	**No**
Time before recalibration	**~6 Months**
Life expectancy	**2.5 Years**
Maintenance	**~6 Months**

RoHS COMPLIANT

1980's — Today

Despite appearances THE KCl CREEP is really quite harmless.

The white crystals
you may find on your electrode
are formed by potassium chloride (KCl)
from the electrode filling solution.
Rinse the KCl from the electrode
with distilled water and proceed as usual.

Dried KCl residue from Electrolyte solution

Decades later...

KCl continues to behave the same way.

If you encounter the "KCl CREEP" rinse off your probe with water, and carry on. ***Your probe is not damaged.***

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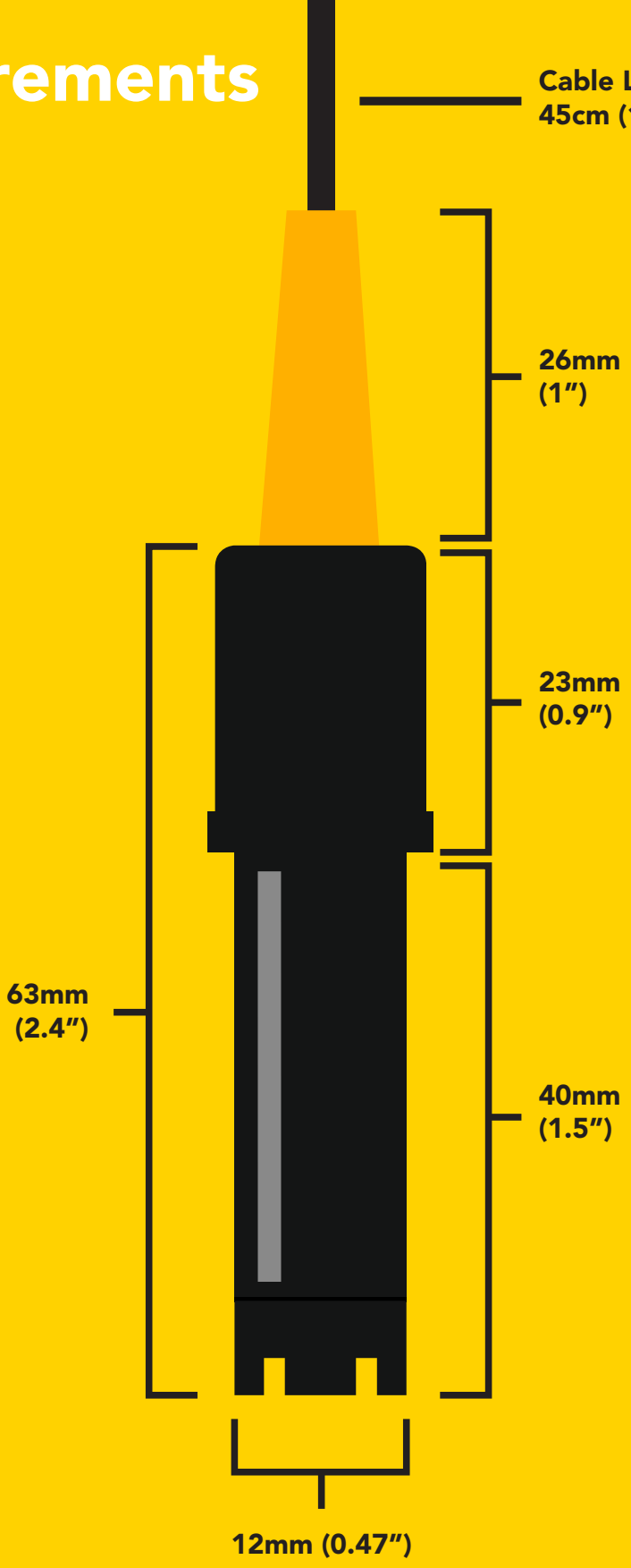
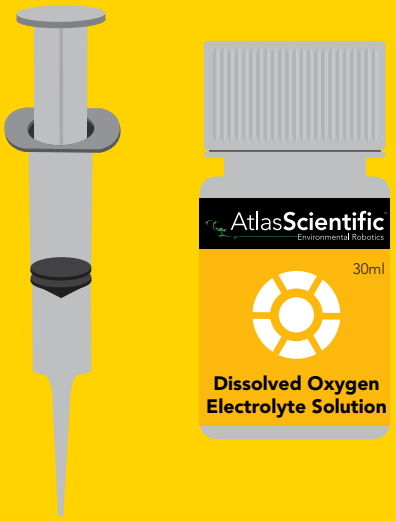
Measurements



Included with probe

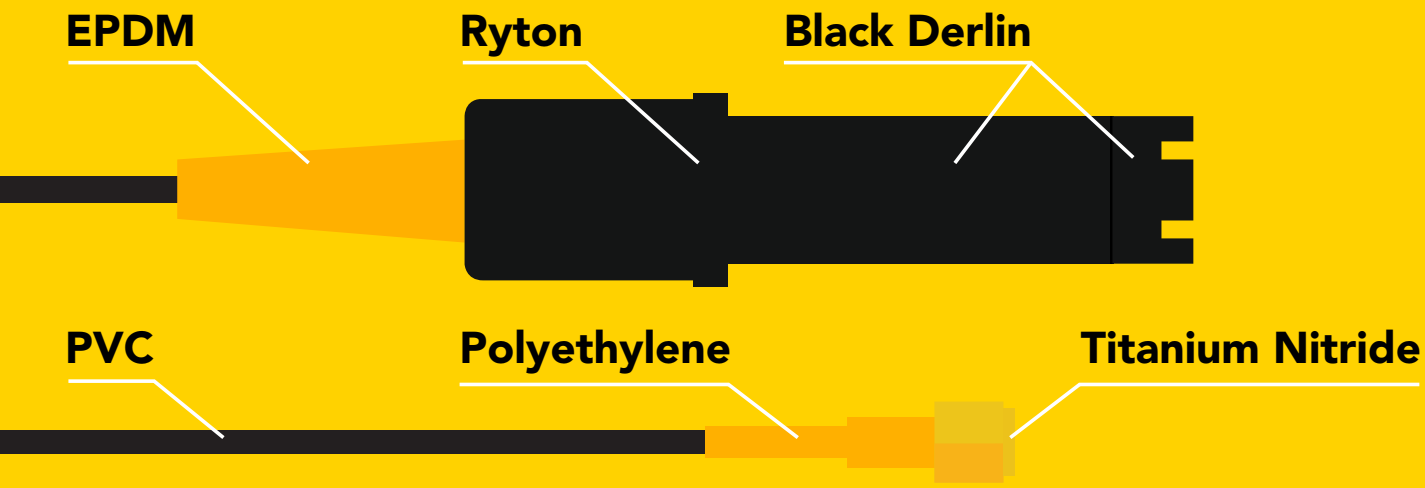


Replacement Membrane Cap

Specifications

Max depth	**70m (230 ft)**
Cable length	**45cm (18")**
Weight	**52 grams**
Speed of response	**~0.5 mg/L/per sec**
Dimensions	**12mm x 89mm (0.47" x 3.4")**
SMA connector	**Male**
Membrane type	**PTFE**
Sterilization	**Chemical only**
Food safe	**Yes**

Materials



This Mini Dissolved Oxygen probe can be *fully submerged* in fresh or salt water, up to the SMA connector *indefinitely*.

Typical applications

- Standard Lab use
- Field use
- Hydroponics
- Fish keeping
- Wine making
- Environmental monitoring

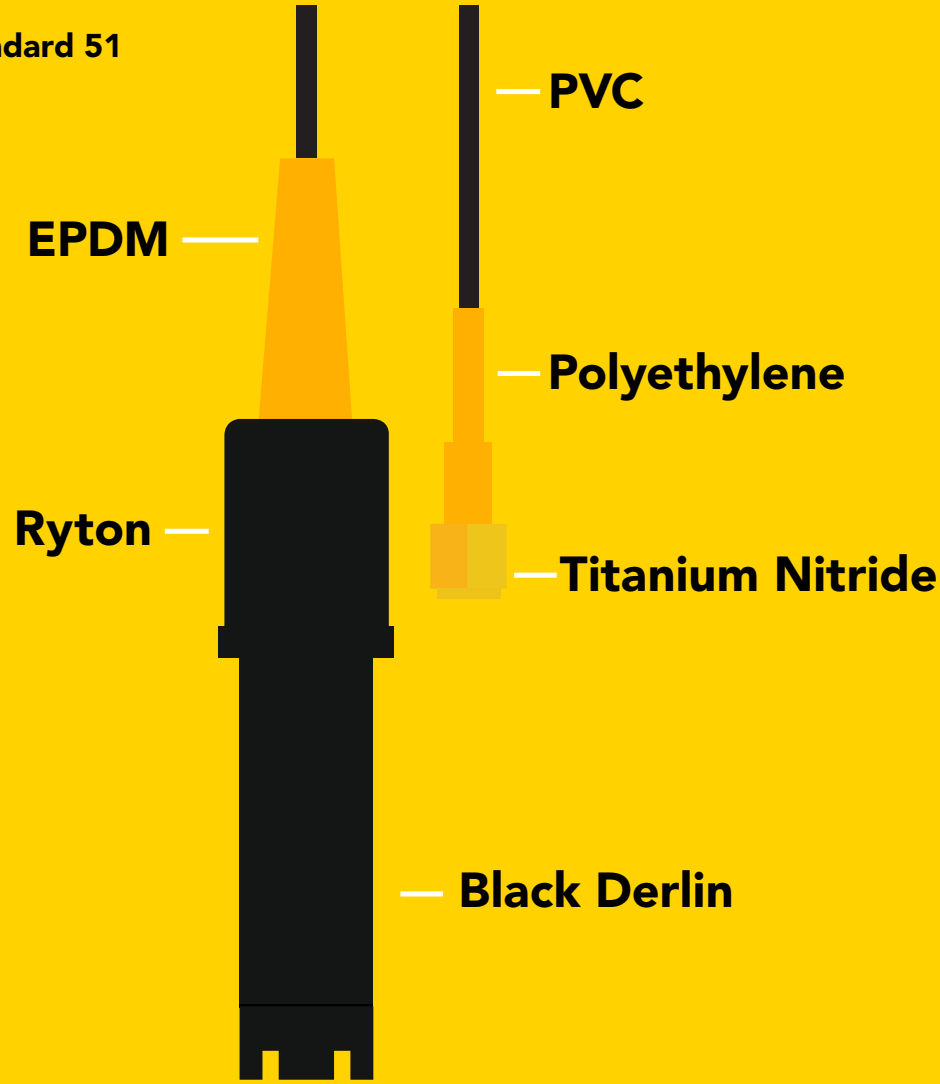
NSF/ANSI 51 Compliant

Food Safe

Atlas Scientific LLC, hereby certifies that,

Mini Dissolved Oxygen Probe
Part # ENV-20-DOX

Complies with NSF/ANSI Standard 51



- **PVC**
  NSF-51 Compliant
- **Ryton**
  NSF-51 Compliant
- **EPDM**
  NSF-51 Compliant
- **Black Derlin**
  NSF-51 Compliant
- **Polyethylene**
  NSF-51 Compliant
- **Titanium Nitride**
  NSF-51 Compliant

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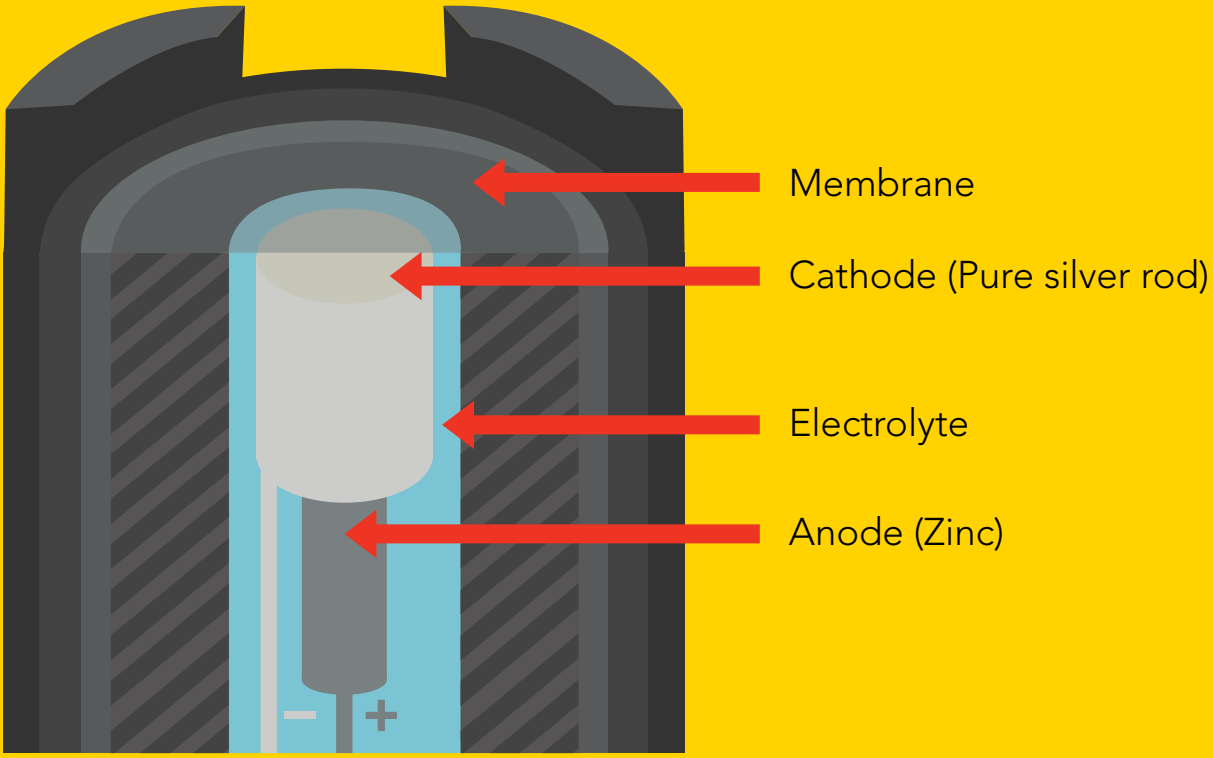
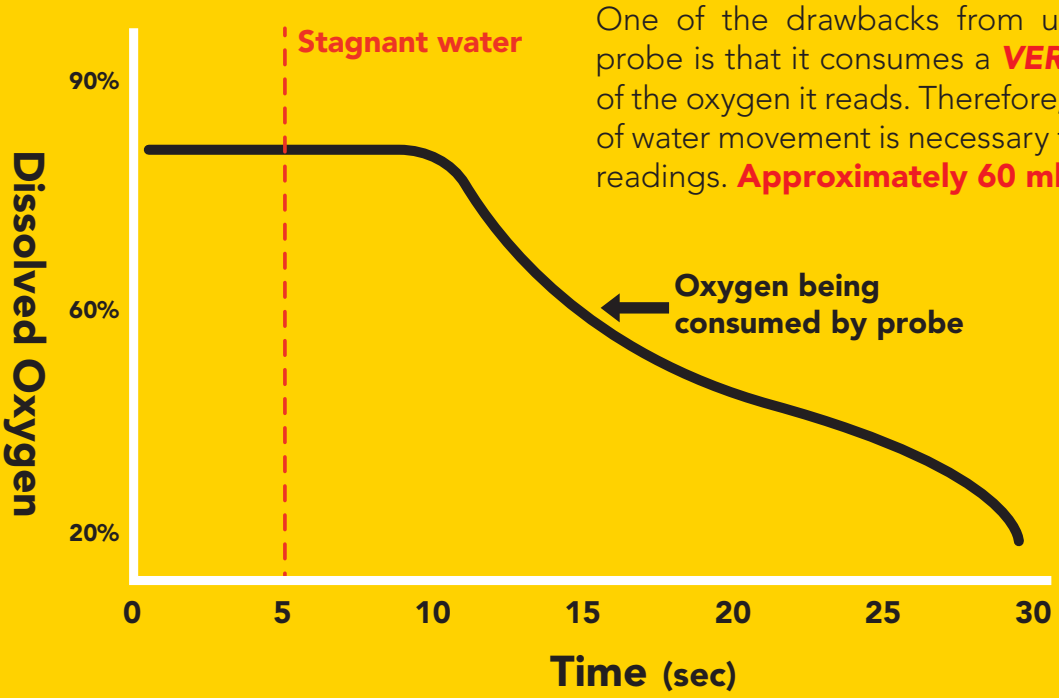
Operating principle

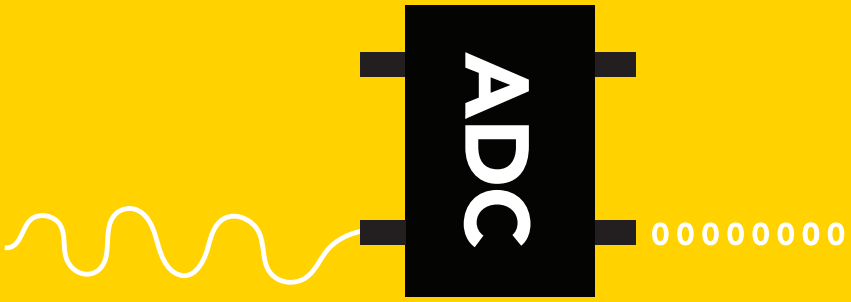
A galvanic dissolved oxygen probe consists of a PTFE membrane, an anode bathed in an electrolyte and a cathode. Oxygen molecules defuse through the probes membrane at a constant rate (without the membrane the reaction happens to quickly). Once the oxygen molecules have crossed the membrane they are reduced at the cathode and a small voltage is produced. If no oxygen molecules are present, the probe will output 0 mV. As the oxygen increases so does the mV output from the probe. Each probe will output a different voltage in the presence of oxygen. The only thing that is constant is that **0mV = 0 Oxygen**.





One of the drawbacks from using a galvanic probe is that it consumes a ***VERY*** small amount of the oxygen it reads. Therefore, a small amount of water movement is necessary to take accurate readings. **Approximately 60 ml/min**.

This galvanic dissolved oxygen probe is a passive device that generates a small voltage from 0mv – 60+ mv depending on the oxygen saturation of the PTFE sensing membrane. This voltage can easily be read by a multimeter or an analog to digital converter.



Can be read with Multimeter

Can be read with ADC

How often do you need to recalibrate a dissolved oxygen probe?

Because every use case is different, there is no set schedule for recalibration.

The dissolved oxygen probe reacts with oxygen in the water, the more oxygen it reacts with the more the probe is depleted of its electrolyte solution. Typically a dissolved oxygen probe will last ~6 months before the electrolyte is depleted *(results will vary)*. When the electrolyte is depleted, the probe will read very low numbers. Best practice is to replace the electrolyte solution and PTFE membrane every 6– 12 months.

The Mini Lab Grade Dissolved Oxygen probe comes with:

30ml Dissolved Oxygen Electrolyte Solution

Syringe

Replacement Membrane Cap

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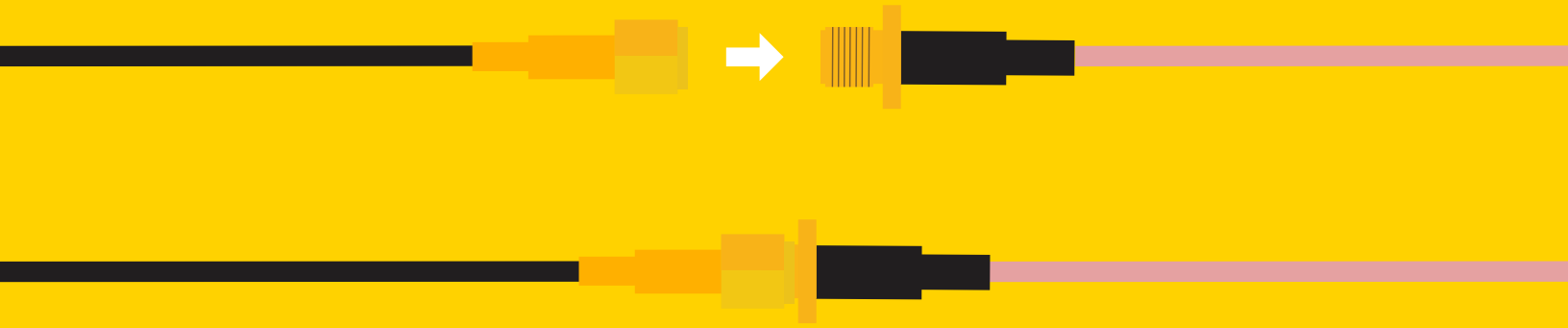
Extending the probe cable length

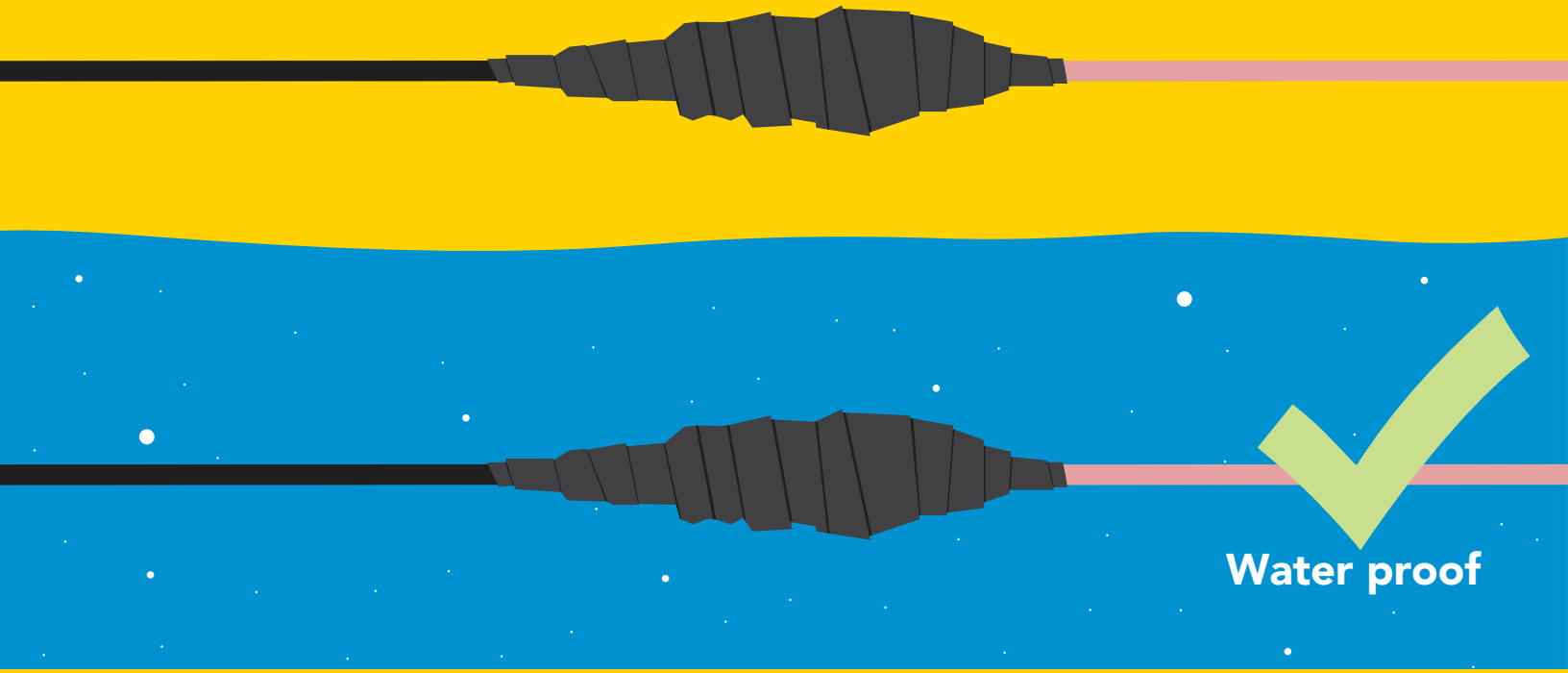
You can extend the cable to greater than 100 meters with no loss of signal. Atlas Scientific has tested up to 300 meters without a problem, however you run the risk of turning your D.O. probe into an antennae, picking up noise along the length of your cable.

If you want to extend your cable, we recommend that you use proper isolation, such as the ***Basic EZO™ Inline Voltage Isolator***, or ***Tentacle Shield***. Be sure to calibrate your probe with the extended cable.

Extending a probe cable can be easily done with our ***SMA Extension Cable***. Simply connect the SMA end of the probe to the Extension cable, and you are all set.



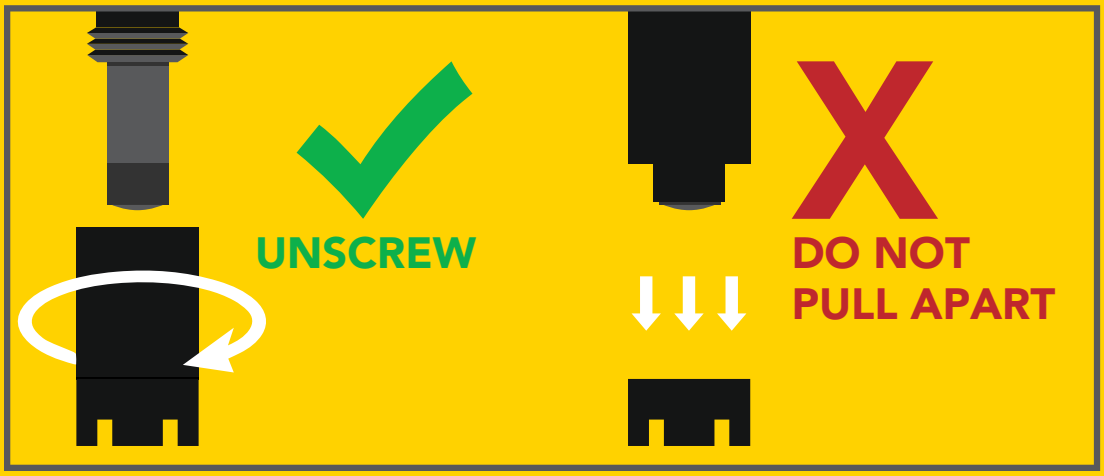
If you need to water proof a SMA connection, we highly recommend using a product like ***Coax-Seal*** to safely cover and prevent any water damage that may occur.

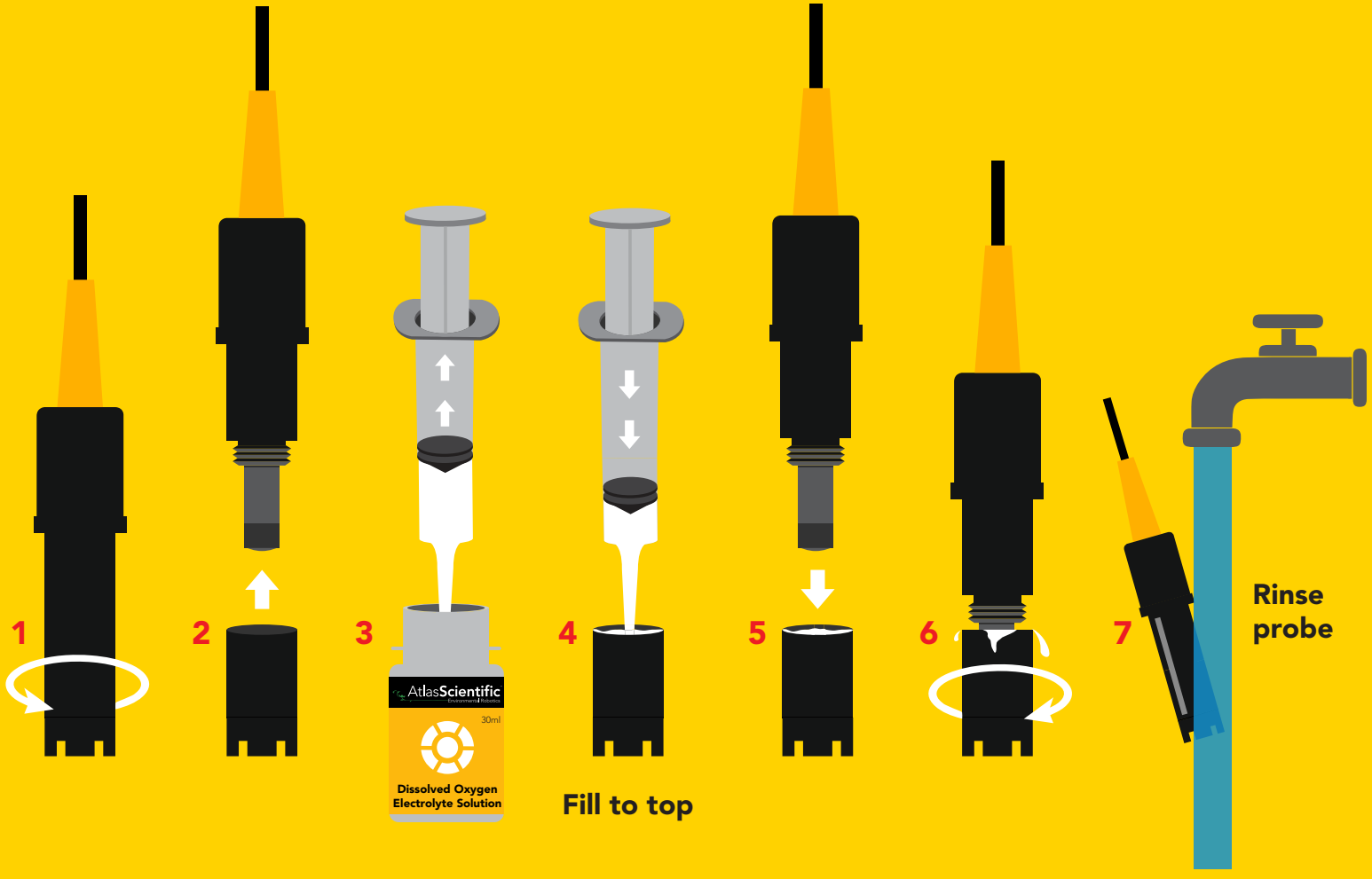


How to add more electrolyte solution

During usage, a small amount of electrolyte solution within the dissolved oxygen probe will deplete. In this case, you will need to add more solution into the probe.

To add more electrolyte solution: Carefully unscrew the probes membrane cap, and drain any remaining electrolyte solution. Using the supplied syringe, **inject solution into the membrane cap until it's filled to the top**. Screw membrane cap back onto probe. Once the probe is reassembled, rinse of the probe.



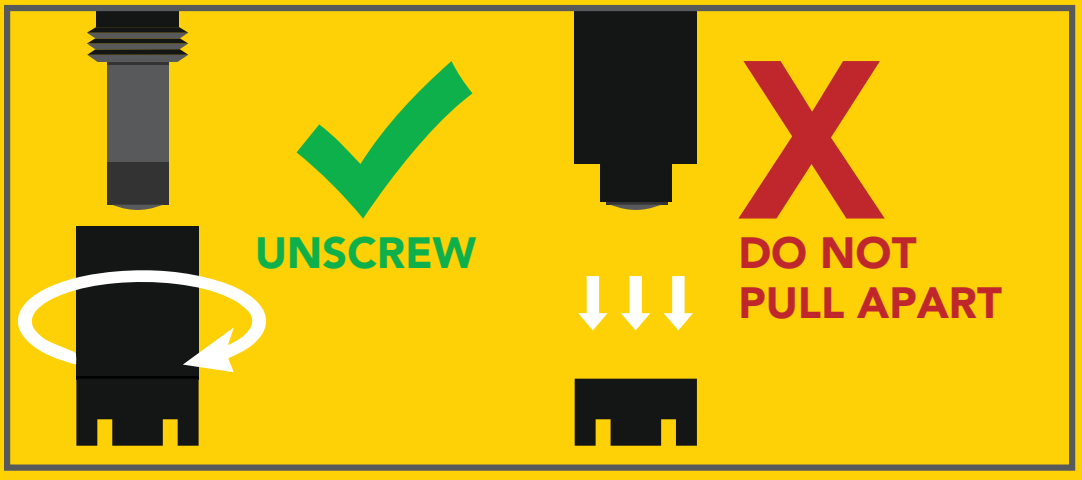


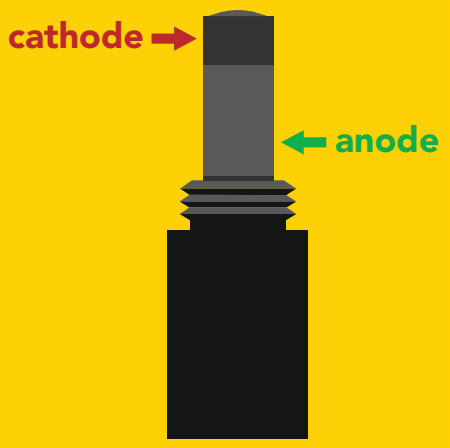
How to recondition the Mini Lab Grade Dissolved Oxygen probe

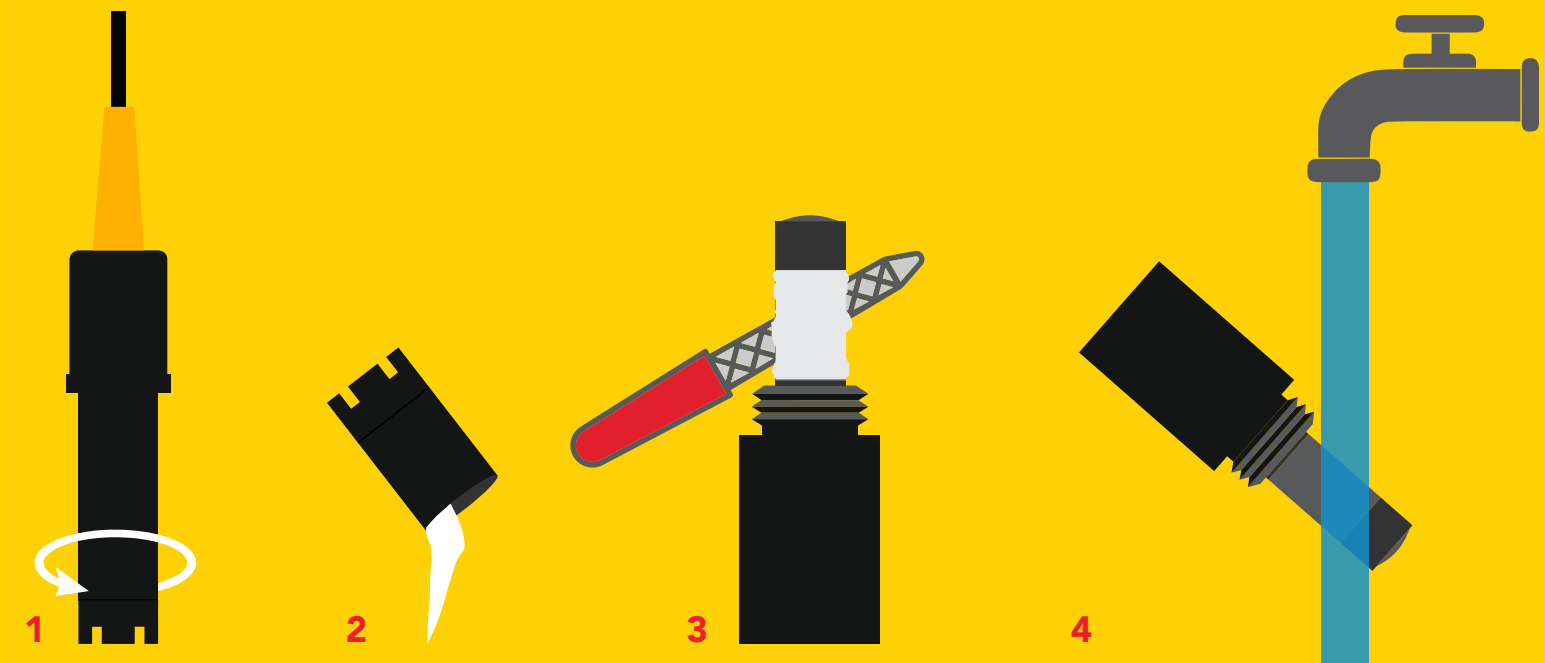
During usage, a small amount of corrosion *(zinc oxide)* may build up around the anode of the probe, this will cause irregular readings. In this case, you will need to recondition the probe.

To recondition the probe: Carefully unscrew the probes membrane cap, and drain any remaining electrolyte solution. Using a small file, carefully file off the corrsion buildup around the anode of the probe. ***Do not file the cathode***, as this will damage the probe. Once the corrosion has been removed, rinse the off the anode.

Using the supplied syringe, **inject solution into the membrane cap until it's filled to the top**. Screw the membrane cap back onto probe. Once the probe is reassembled, rinse of the probe.







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Probe cleaning

Over time dissolved oxygen probes can become dirty and covered in chemical deposits. Soft coatings can be removed by lightly brushing around the sides of the probe and membrane cap. If the probes membrane is in need of cleaning, use a mild bleach mixture to gently wash away any deposits.

DO NOT USE A BRUSH TO CLEAN THE MEMBRANE

If the probes membrane is ripped it must be replaced, as it will cause irregular readings.