

Frequently Asked Questions About DO

How should I install a DO Sensor?

A DO sensor must be at least 15° above horizontal to consistently function properly. DO NOT install DO sensors in a port perpendicular to the vessel wall. The liquid in the sensor contains small air bubbles. If not inclined slightly above horizontal, a bubble can adhere to the cathode where it will affect the sensor's performance.

What is the probe measuring?

OxyProbes measure the partial pressure of oxygen. The partial pressure of Oxygen is dependent on the mixture of the gases and the pressure inside the vessel. Uncompensated variations in pressure can be a significant source of error. When reading % saturation or ppm, the operating pressure of the vessel should be entered into the transmitter if the process pressure is not the same as the calibration pressure. This number should account for elevation above sea level and/or any overpressure on the vessel. The pressure can be entered in mm Hg, inches Hg or bar.

Why should DO sensors be calibrated after sterilization?

Calibration: To optimize the readings, dissolved oxygen probes should be calibrated in the process media, after sterilization. This is due to several factors:

1. Sterilization could alter the sensor output. The tension of the membrane against the cathode is an important factor in the sensor signal. The high temperatures of sterilization may cause the membrane to stretch. Calibrating after sterilization will account for any possible change in the sensor's output.
2. Many bioprocess applications involve aerating or sparging the vessel while applying an over pressure to the tank. This overpressure may affect the readings if not taken into account during the calibration.
3. Since the membrane permeability is slightly different in air than in water and the ambient relative humidity of air is usually less than 100%, air calibrations can differ from aqueous calibrations by a very small amount.

In summary, when measuring dissolved oxygen as % saturation, the calibration should be performed under process conditions to minimize error and maximize accuracy and reproducibility.

What is the transmitter measuring?

Polarographic DO sensors measure the partial pressure of Oxygen within the vessel. In order for the transmitter to convert the sensor's current output to % saturation or ppm concentration, the transmitter must know the operating temperature and pressure of the sample media.

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