

The DL5000 Equilibrium Dissolved Oxygen Probe Specification

Overview

The DL 5000 Dissolved Oxygen probe is based on a unique equilibrium probe technology. This patented equilibrium probe technology is based on the partial pressure of oxygen rather than the diffusion rate of oxygen through the probe membrane. The materials of construction combined with this unique design result in a no-internal-maintenance probe that is independent of process flow and fouling. Bottom line—an accurate, reliable, maintenance-free, Dissolved Oxygen measurement.

Description

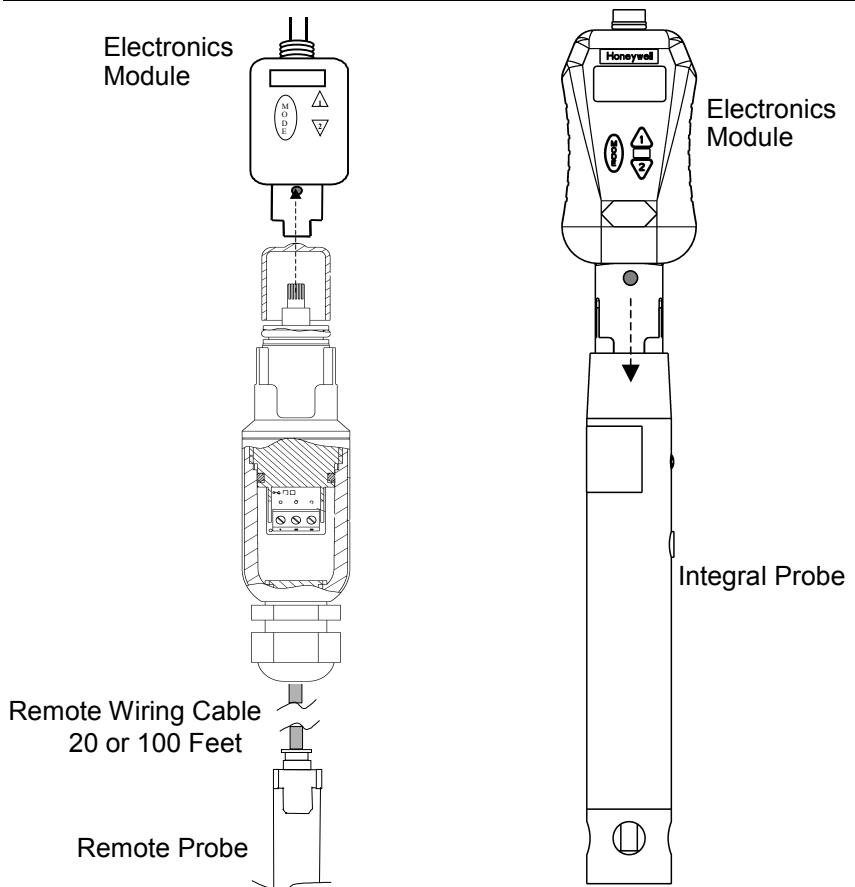
The DL5000 is housed in either a stainless steel or PVC casing. It can be ordered as an integral unit to be used with the DL 424 or 425 sensor module or as a remote probe with a cable. The remote DL5000 probe can be used with:

- The DirectLine 424 or 425 sensor module in new installations
- An existing Honeywell 7020 Series DO Analyzer

Applications

Typical **ppb** applications include power plant and semiconductor applications for corrosion detection or deaerator efficiency.

PPM applications include aeration, effluent, stream and aquaculture monitoring for compliance and control.



Features

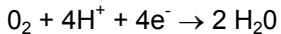
- Unique equilibrium probe technology
- Unaffected by fouling or changes in sample flow
- Reduced maintenance costs - no periodic replacement of anode or electrolyte
- Heavy duty membrane – eliminates replacement requirements
- Rugged PVC or 316 stainless steel construction
- Immersion, insertion or flow –through mountings
- Process temperature measurement

Probe Operating Principle

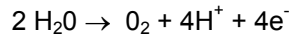
The Honeywell dissolved oxygen probe includes permanent anode, cathode and reference electrodes surrounded by a permanent electrolyte and membrane. When the probe is immersed in a sample, oxygen diffuses through the membrane and is reduced at the cathode. Simultaneously, an equal amount of oxygen is generated at the anode. The diffusion continues until the partial pressure of oxygen on both sides of the membrane is equal and balanced. The current necessary to maintain this

equilibrium is converted by the DL424/425 sensor module to give the concentration of dissolved oxygen in the solution. The reactions are:

At cathode:



At anode:



Combining these reactions, it can be seen that no oxygen is consumed, no water is produced, and no net reaction occurs. Electrodes, electrolyte and membrane are permanent with

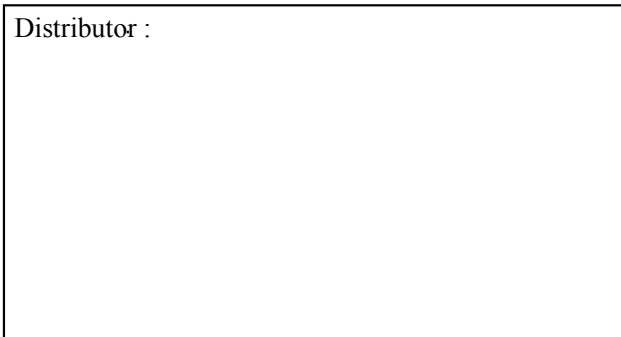
no internal maintenance ever required with the Honeywell probes.

Conventional diffusion-type probes, on the other hand, work on either the galvanic or polarographic principle. Both require a continuous oxygen transfer through the membrane in a 1-way reaction. They are highly dependent on sample flow past the membrane to replenish consumed oxygen and on consistent membrane cleanliness to give a constant diffusion rate of oxygen. Periodic electrode, electrolyte, and membrane maintenance is required with diffusion-type probes.

Specifications

DL5000 Series Probe	
Response Time	90% in 60 seconds (after probe warm-up)
Oxygen Consumption	Negligible
Operating Temperature Range	2-60C (35.6-140F); must not freeze
Storage Temperature Range	2-60C (35.6-140F)
Maximum Flow	300 mL/min. with flow chamber; no dependence on stirring or flowrate
Maximum Pressure	PVC: 207 kPa (30 psig) SS: 345 kPa (50 psig)
Calibration	Air and sample
Dimensions	219 mm x 34 mm OD (8.62" x 1.315" OD), 1" NPT pipe size, 6.1 m (20 ft) waterproof cable, 30.48m (100 ft) cable available for ppm applications
Weight	PVC: 0.6 kg (1.24 lb) SS: 1.5 kg (3.5 lb)
Probe Accuracy:	ppm: ±0.2 ppm at calibration conditions after stabilization ppb: ±2 ppb or 5% of reading after stabilization, whichever is greater.
Interferences	Dissolved Hydrogen (present in boiler water reactor nuclear power plant samples) can cause significant negative interference in measurement. Honeywell DO probe is not recommended for these types of applications.
Probe to Analyzer Maximum Distance	ppm: 30.4 m (100 ft) ppb: 6.08 m (20 ft)

Distributor :



For more information, contact Honeywell sales at 1-800-343-0228.

Honeywell

Industrial Process Control
Honeywell
1100 Virginia Drive
Fort Washington, PA 19034