

PART 1 GENERAL

1.1 Section includes

- A. Luminescent Dissolved Oxygen sensor for continuous measurement of dissolved oxygen (DO) in aqueous solutions.
- B. Includes the capability to remotely monitor sensors on any browser-enabled device and present diagnostics on the overall health of the measurements (on Predictive Diagnostics-enabled sensors), as well as upcoming and required maintenance - reducing user risk and downtime.

1.2 Measurement Procedures

- A. The method of measuring dissolved oxygen will be a probe using luminescent sensor technology.
 - 1. Blue LED light excites platinum based luminescent material in the probe. Red light is emitted by luminescent material with characteristics that are directly proportional to the amount of dissolved oxygen present. The red light is measured with a photo detector.
 - 2. Red LED light is used to zero the instrument between measuring cycles.

1.3 Alternates

- A. Other methods of dissolved oxygen measurement such as galvanic, polarographic, or luminescent measurements using Ruthenium are not acceptable.
- B. Other probes that require membranes, electrolytes, or electrodes are not acceptable.
- A. Other instruments that do not have predictive diagnostic capabilities are unacceptable

1.4 System Description

- A. Performance Requirements
 - 1. Measurement range: 0.01 to 20.00 mg/L
 - 2. Resolution: 0.01 mg/L
 - 3. Accuracy
 - a. Less than 5 ppm: ± 0.1 ppm
 - b. Greater than 5 ppm: ± 0.2 ppm
 - 4. Repeatability: ± 0.1 ppm
 - 5. Response Time:
 - a. Less than 40 seconds to 90% at 20 °C
 - b. Less than 60 seconds to 95% at 20 °C
 - 6. Temperature sensor: PT100 integrated, external sensor
 - 7. Temperature range: 0 to 50 °C
 - 8. Temperature accuracy: $\pm 0.2^{\circ}\text{C}$
 - 9. When connected to a multi-parameter digital controller the overall status of the instrument performance is displayed as a percentage value via a measurement indicator
 - 10. When connected to a multi-parameter digital controller the overall time remaining until maintenance tasks are due is displayed in days

1.5 Certifications

- A. General Purpose CSA/CSA_{NRTL} and FM (UL Pending) when used with an approved controller.
- B. Class 1, Div 2 Groups A thru D CSA/CSA_{NRTL} and FM (UL Pending) when used with an approved controller.

1.6 Environmental Requirements

A. Operational Criteria

1. Operating temperature: 0 to 50 °C
2. Relative humidity: 95%, non condensing
3. Immersion depth: 15 meters (50 ft.), maximum
4. Immersion pressure: 345 kPa, maximum
5. Sample pH range: 0.0 to 12.0
6. Distance, analyzer to sensor: 1000 meters, maximum

1.7 Warranty

- A. The probe body is warranted for 3 years from date of purchase
- B. The sensor cap is warranted for 2 year from date of purchase

1.8 Maintenance Service

A. Scheduled maintenance:

1. Sensor cleaning: 90 days or depending on conditions
2. Sensor and sensor cap inspection: 90 days
3. Sensor cap replacement: once every 2 years
4. Calibration: per regulatory agency schedule, otherwise calibration-free

B. Unscheduled maintenance

1. Replace fuse
2. Clean instrument enclosure

PART 2 PRODUCTS

2.1 Manufacturer

- A. Hach Company, Loveland, CO
 1. Model Hach LDO™ Dissolved Oxygen Probe

2.2 Manufactured Unit

A. The Hach LDO system consists of:

1. Submersible probe with stainless steel body, CPVC ends, replaceable sensor cap, and integral cable.

2.3 Equipment

- A. The Hach LDO Probe works with the sc100, sc200, or sc1000 controllers only.
- B. The sensor is made of polybutyl methacrylate.
- C. The probe is made of CPVC and 316 stainless steel – 1.4404.
- D. The probe is made with Viton o-rings.
- E. The probe is entirely corrosion-resistant and fully immersible.
- F. The probe utilizes a 1" NPT external thread for mounting hardware connections.
- G. The probe does not require sample conditioning or electrolyte solutions.
- H. The probe interface to the controller is MODBUS®.
- I. The operation of the probe is not affected by: H₂S, pH, K⁺, Na⁺, Mg²⁺, Ca²⁺, NH₄⁺, Al³⁺, Pb²⁺, Cd²⁺, Zn²⁺, Cr (total), Fe²⁺, Fe³⁺, Mn²⁺, Cu²⁺, Ni²⁺, Co²⁺, CN⁻, NO₃⁻, SO₄²⁻, S₂⁻, PO₄³⁻, Cl⁻, Anion Active Tensides, Crude Oils, Cl₂ < 4 ppm.
- J. The probe is factory calibrated and needs no calibration or polarization prior to use.

2.4 Components

- A. Standard equipment:
 - 1. Probe
 - 2. Sensor cap
 - 3. Integral cable
 - 4. Manual
- B. Dimensions
 - 1. Probe & Sensor Cap
 - a. Length: 10.0 in. (255 mm)
 - b. Diameter: 1.94 in. (49.3 mm)
 - 2. Integral cable: 30 ft. (10 m)
- C. Weight: 2 lbs., 3 oz. (1.0 kg)

2.5 Accessories

- A. Plug in extension cables to extend the distance between the sensor and controller up to 985 ft. (10 m).
- B. Junction box for extension cables for lengths greater than 100 m.
- C. Extension cables
- D. Pole mount kit
- E. Ball float mount kit
- F. In-line union mount kit
- G. Flow cell mount kit
- H. Economy probe mounting hardware
- I. Air blast cleaning assembly

PART 3 EXECUTION

3.1 Preparation

- A. Mounting:
 - 1. The sensor must be mounted to a Hach mounting assembly directly in the solution to be measured.
 - 2. Pole or ball-float mount
- B. Distance, analyzer to sensor: 300 meters, maximum

3.2 Installation

3.3 Contractor will install the analyzer in strict accordance with the manufacturer's instructions and recommendation.

- A. Manufacturer's representative will include a half-day of start-up service by a factory-trained technician, if requested.
 - 1. Contractor will schedule a date and time for start-up.
 - 2. Contractor will require the following people to be present during the start-up procedure.
 - a. General contractor
 - b. Electrical contractor
 - c. Hach Company factory trained representative
 - d. Owner's personnel
 - e. Engineer

3.4 Manufacturer's Service and Start-Up

- A. Contractor will include the manufacturer's services to perform start-up on instrument to include basic operational training and certification of performance of the instrument.
- B. Contractor will include a manufacturer's Service Agreement that covers all the manufacturer's recommended preventative maintenance, regularly scheduled calibration and any necessary repairs beginning from the time of equipment startup through to end user acceptance / plant turnover and the first 12 months of end-user operation post turnover.
- C. Items A and B are to be performed by manufacturer's factory-trained service personnel. Field service and factory repair by personnel not employed by the manufacturer is not allowed.
- D. Use of manufacturer's service parts and reagents is required. Third-party parts and reagents are not approved for use.

END OF SECTION