

PART 1 GENERAL

- 1.1 Section includes:
 - A. Amperometric Chlorine Dioxide sensor for monitoring chlorine dioxide in water
- 1.2 Measurement Procedures
 - A. The method of measuring chlorine dioxide will be with a two-electrode amperometric sensor with a membrane selective to chlorine dioxide, immersed in an electrolytic medium
- 1.3 Alternates
 - A. Other methods of chlorine dioxide measurement, such as single electrode amperometric, which can show interference from chlorine, are not acceptable
 - B. Systems that do not use a gas diffusion membrane are not acceptable
- 1.4 System Description
 - A. Performance Requirements
 1. Measurement range: 0 to 2 ppm or 0 to 2 mg/L chlorine dioxide
 2. Detection limit: 10 ppb or 0.01 mg/L chlorine dioxide
 3. Accuracy: 5% or ± 10 ppb chlorine dioxide, whichever is greater
 4. Response time: 90% at T_{90} seconds
 5. Calibration
 - a. Electrical zero or chemical zero with dechlorinated or deozoned water
 - b. Calibration of the slope by comparison with laboratory instrument
 - c. pH calibration with single or two point using standards or comparison with lab method and process sample
- 1.5 Certifications (when connected to an sc controller)
 - A. EMC: CE compliant for conducted and radiated emissions CISPR 11 (Class A limits), EMC Immunity EN 61326-1 (Industrial limits)
 - B. Safety: General Purpose UL/CSA 61010-1 with cETLus safety mark
 - C. Australian C-TICK and Korean KC Markings
 - D. NEMA 4X/IP66 dust and water ingress ratings
- 1.6 Environmental Requirements
 - A. Operational Criteria
 1. Storage Temperature Range
 - a. -20 to 60 °C (-4 to 140 °F)
 2. Operating Temperature Range
 - a. 0 to 45 °C (32 to 113 °F)
 3. Sample Temperature Range
 - a. 2 to 45 °C (35 to 113 °F)
 4. Sample Pressure Range
 - a. 1.4 to 28 psi (0.1 to 2 bar)
 5. Sample pH Range
 - a. pH 4 to pH 8 (Acidification unit available for >8 pH)

- 1.7 Warranty
 - A. Warranted for one year from date of shipment against manufacturer defects.

- 1.8 Maintenance Service
 - A. Scheduled Maintenance
 - 1. Chlorine dioxide sensor calibration every two months
 - 2. Replace tubing annually
 - B. Unscheduled Maintenance
 - 1. Replace membrane and electrolyte each 6 months (3 to 12 month range depending on sample)
 - 2. Clean flow cell as required by sample (recommended every 6 months)

PART 2 PRODUCTS

- 2.1 Manufacturer
 - A. Hach Company, Loveland, CO
 - 1. Model 9187sc Amperometric Chlorine Dioxide Analyzer

- 2.2 Manufactured Unit
 - A. The 9187sc Amperometric Chlorine Dioxide Analyzer consists of:
 - 1. Two-electrode amperometric Chlorine Dioxide sensor
 - 2. Chlorine Dioxide electrode
 - 3. Mounting panel
 - 4. Digital cable to connect analyzer to sc controller

- 2.3 Equipment
 - A. The 9187sc Chlorine Dioxide analyzer works with Hach sc controllers only and connects to the controller by a digital plug-and-play interface.
 - B. The amperometric chlorine dioxide cell of the analyzer consists of
 - 1. Gold cathode
 - 2. Silver anode
 - 3. pH buffered Potassium Chloride reference electrolyte
 - 4. Sensor membrane to filter chlorine dioxide species selectively and to provide interface between the electrochemical cell and the sample
 - C. The chlorine dioxide analyzer automatically compensates for temperature utilizing an embedded temperature sensor.
 - D. Wetted materials as follows:
 - 1. Chlorine Electrode: gold cathode/silver anode
 - 2. Sensor body: PVC
 - 3. Measuring cell: Acrylic

- 2.4 Components
 - 1. Mounting panel

2. Amperometric Chlorine Dioxide sensor with membrane and electrolyte
3. Flow cell
4. Digital sc sensor cable
5. User manual
- B. Dimensions: 270 x 250 mm x 155 mm (10.63 x 9.84 x 6.1 in)
- C. Weight: 6.5 kg (14 lb)

2.5 Accessories

- A. Required
 1. Hach sc Controller
- B. Optional
 1. Acidification Unit
 2. Intermittent Flow Unit

PART 3 EXECUTION

3.1 Preparation

1. Mounting
 - a. Instrument is able to be wall or panel mounted. The pre-assembled analyzer panel must be mounted to allow clearance above the measurement sensor for sensor removal.
2. Sample inlet
 - a. ¼ inch OD connection
3. Sample Flow Rate
 - a. Minimum of 14L/hr
4. Drain Fitting
 - a. ½ inch ID connection

3.2 Installation

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

3.3 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