

## PART 1 GENERAL

### 1.1 Section includes

- A. Sensor for continuous monitoring of ammonium nitrogen and nitrate nitrogen in one probe in wastewater treatment.
- 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. It includes the capability to connect to a laboratory spectrophotometer to correct process measurements based on lab samples, without having to remove the process sensor from the water.

### 1.2 Measurement Procedures

- A. The method of measuring ammonium nitrogen and nitrate nitrogen is by ion-selective electrodes (ISE).
  - 1. A differential pH electrode is used as the reference.
  - 2. A potassium ISE is used to correct the ammonium value for the presence of potassium ion.
  - 3. A chloride ISE is used to correct the nitrate value for the presence of chloride ion.
  - 4.

### 1.3 Alternates

- A. Other sensors that do not use a differential pH reference electrode are not acceptable.
- B. Other sensors that do not use both potassium ISE to correct the ammonium value and chloride ISE to correct the nitrate value 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 ammonium: 0.2 to 1000 mg/L NH<sub>4</sub>-N
  - 2. Measurement range nitrate: 0.2 to 1000 mg/L NO<sub>3</sub>-N
  - 3. Accuracy: 5% of measured value ±0.2 mg/L (with standard solution)
  - 4. Detection limit: 0.2 mg/L
  - 5. Response time: less than 3 minutes (T90)
  - 6. 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
  - 7. 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. CE approved

### 1.6 Environmental Requirements

- A. Operational Criteria
  - 1. Operating temperature -20 to 45 °C (-4 to 114 °F)

2. Sample temperature: 2 to 40 °C (35 to 104 °F)
3. Sample pH: 5 to 9
4. Sensor immersion depth: 0.3 to 3.0 meters (1 to 10 feet) maximum
5. Sample pressure: 0.3 bar (4.4 psi) maximum

1.7 Warranty

- A. The product includes a one-year warranty from date of shipment. (excluding wearparts)

1.8 Maintenance Service

- A. Scheduled maintenance:
  1. Monthly: visual inspection, if necessary, clean with brush and clear water
  2. Bi-annually: replace calibrated sensor cartridge

PART 2 PRODUCTS

2.1 Manufacturer

- A. Hach Company, Loveland, CO
  1. AN-ISE sc Ammonium and Nitrate Combination Sensor

2.2 Manufactured Unit

- A. The AN-ISE sc Ammonium and Nitrate Combination Sensor consists of a digital sensor with integrated, replaceable sensor cartridge.
- B. The integrated sensor cartridge includes ammonium ISE, nitrate ISE, differential pH electrode, potassium ISE, chloride ISE, and temperature sensor.

2.3 Equipment

- A. The sensor is designed to connect to a universal digital controller.
- B. The sensor cartridge is factory calibrated with all electrodes individually calibrated and also calibrated to each other.
- C. The sensor does not require sample conditioning.
- D. The sensor can perform one- or two-point inline matrix corrections to adapt it to a wastewater matrix.
- E. The sensor is corrosion resistant and fully immersible.

2.4 Components

- A. Standard equipment:
  1. Probe:
    - a. stainless steel (1.4571)
    - b. Ends: ASA + PC
  - B. Dimensions: 12.6 x 3.3 inches (320 mm x 84.5 mm)
  - C. Weight: 5.3 lbs. ( 2.4 kg)

2.5 Accessories

- A. Digital controller
- B. Cables and power cord
- C. Mounting kit
  - 1. Rail Mount
  - 2. Chain Mount
  - 3. Rim Mount
- D. Cleaning unit
- E. High Output Air Blast Cleaning Compressor

PART 3 EXECUTION

3.1 Preparation

- A. The sensor must be installed with the head submerged at least 30 cm below the surface, at least 10 cm above the bottom of the tank, and at least 30 cm from the wall of the tank.

3.2 Installation

- A. Contractor will install the probe 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

END OF SECTION