

PART 1 GENERAL

1.1 Section includes

- A. Turbidity and suspended solids sensor for monitoring water and sludge concentrations and turbidity values.
- 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 turbidity and suspended solids will be with a dual-beam infrared/scattered light photometer. LED light source transmits light at 45 degrees to the sensor face.
 - 1. Nephelometric photoreceptors will detect scattered light at 90 degrees to the transmitted beam for turbidity.
 - 2. Back-scatter photoreceptors will detect scattered light at 140 degrees to the transmitted beam for suspended solids.

1.3 Alternates

- A. Other methods of turbidity and suspended solids measurement, such as four-beam or surface scatter methods, are not acceptable.
- B. Other instruments that do not have predictive diagnostic capabilities are unacceptable

1.4 System Description

- A. Performance Requirements
 - 1. Measurement range
 - a. Turbidity: 0.001 to 4000 NTU
 - b. Suspended solids: 0.001 to 50.000 mg/L or 0.000001 to 50.0 g/L (ts-line or inline), or 0.001 to 500.000 mg/L or 0.000001 to 500 g/L (hs-line or highline)
 - 2. Accuracy
 - a. Turbidity: Less than 1% of reading or ± 0.001 NTU, whichever is greater
 - b. Suspended solids: Less than 5% of reading (depends on homogeneity of municipal activated sludge)
 - 3. Repeatability
 - a. Turbidity: Less than 1% of reading
 - b. Suspended solids: Less than 3% of reading (depends on homogeneity of municipal activated sludge)
 - 4. Detection limit
 - a. Turbidity: 0.001 NTU
 - b. Suspended solids: 0.001 mg/L
 - 5. Response time: Initial response 1 second
 - 6. Signal Averaging Time: User selectable ranging from 1 to 300 seconds
 - 7. Units of measure:
 - a. Turbidity: User Selectable NTU, FNU, EBC, FTU and TE/F
 - b. Suspended Solids: User Selectable g/L, mg/L, ppm, or % solids
 - 8. 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
 - 9. When connected to a multi-parameter digital controller the overall time remaining until maintenance tasks are due is displayed in days

- A. Safety: Listed by ETL to UL 61010A-1: Certified by ETL to CSA C22.2 No. 1010.1
EMC Emissions & Immunity: CE certified to EN 61326-1/A1, /A2 & EN 61010-1/A1, /A2

1.6 Environmental Requirements

- A. Operational Criteria
 - 1. Sample flow velocity: 3 m/s (9.8 ft./s) maximum
 - 2. Sample pressure: 6 bar (87 psi) maximum
 - 3. Sample temperature: 0 to 40 degrees C
 - 4. Operating temperature: 0 to 40 degrees C

1.7 Warranty

- A. The product includes a one-year warranty from the date of shipment.

1.8 Maintenance Service

- A. Scheduled maintenance:
 - 1. Clean measurement windows: as experience dictates
 - 2. Change wiper blades: from 3 to 6 months (depending on the application)
 - 3. Replace probe seals: every two years
- B. Unscheduled maintenance
 - 1. Clean instrument enclosure

PART 2 PRODUCTS

2.1 Manufacturer

- A. Hach Company, Loveland, CO [select one]
 - 1. Model SOLITAX™ t-line sc Turbidity Sensor for immersion in open tanks
 - 2. Model SOLITAX ts-line sc Turbidity and Suspended Solids Sensor for immersion in open tanks
 - 3. Model SOLITAX hs-line sc Turbidity and Suspended Solids Sensor for immersion in open tanks
 - 4. Model SOLITAX inline sc Turbidity and Suspended Solids Sensor for insertion in pipes
 - 5. Model SOLITAX highline sc Turbidity and Suspended Solids Sensor for insertion in pipes

2.2 Manufactured Unit

- A. The SOLITAX sc Turbidity and Suspended Solids Sensor consists of a sensor contained in stainless steel or PVC, depending on model, with a silicon wiper blade and integral cable.

2.3 Equipment

- A. The SOLITAX sc sensor is a digital sensor designed to connect to a universal controller (the SC4500 or SC1000 controller).
- B. The sensor provides sample color-independent measurement.
- C. The sensor is equipped with a self-cleaning device to prevent erroneous values and maintenance problems caused by biological activity, scum build-up, and gas bubbles.
- D. The signal average time for the sensor is user-selected from 1 to 300 seconds.
- E. The sensor measures turbidity or turbidity and suspended solids (depending on the sensor)
- F. The sensor must be serviceable.

- G. The sensor is factory calibrated and needs no calibration prior to use.
- H. The sensor shall be capable of immersion in tank or insertion in pipe

2.4 Components

- A. Standard equipment:
 - 1. Sensor with 33 ft. (10 m) cable
 - 2. Manual
- B. Dimensions
 - 1. Models t-line sc, ts-line sc, and hs-line sc for immersion:
 - a. Length: 7.87 inches (200 mm)
 - b. Diameter: 2.36 inches high (60 mm)
 - 2. Models inline sc and highline sc for insertion:
 - a. Length: 12.40 inches (315 mm)
 - b. Diameter: 2.36 inches high (60 mm)
- C. Weight
 - 1. Models inline sc and highline sc for insertion: 5.3 lb. (2.4 kg)
 - 2. Models t-line sc, ts-line sc, and hs-line sc for immersion:
 - a. Stainless steel: 3.0 lb. (1.38 kg)
 - b. PVC: 1.2 lb. (0.52 kg)

2.5 Accessories

- A. Calibration kit
- B. Wiper blades
- C. Sun shield for controller
- D. Installation:
 - 1. Fixed point installation kit for immersion
 - 2. Insertion mounting kit
 - 3. Sensor adapters
 - 4. Handrail mounting kit
- E. Extension cables

PART 3 EXECUTION

3.1 Preparation

- A. Immersion sensors:
 - 1. Install the sensor with the optical window facing downstream in the direction of the flow to protect the sensor against the oncoming flow of large objects.
- B. Insertion sensors:
 - 1. Pipe diameter: minimum 4 inches (100 mm) diameter in carbon or stainless steel.
 - 2. Install minimum 5 ft. (1.5 m) or three times the pipe diameter (whichever is greater) downstream of pumps, valves, or pipe elbows.
- C. Locate the sensor 33 ft. (10 m) from the controller with the standard sensor cable. (Maximum distance between sensor and controller of 328 ft. (100 m) with optional extension cables.)

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

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