

## PART 1 GENERAL

### 1.1 Section includes:

- A. Online sensor to detect mineral oils in water.

### 1.2 Measurement Procedures

- A. The method of detection is by UV fluorescent measurement for polycyclic aromatic hydrocarbons (PAH)
  - 1. Excitation wavelength: 255 nm
  - 2. Emission (measurement) wavelength: 370 nm

### 1.3 Alternates

- A. Other methods of such as those that require oil to be extracted into an organic solvent prior to measurement are not acceptable.
- B. Other methods of such as those that require addition of a detergent surfactant to a sample prior to measurement are not acceptable.
- C. Other methods of such as those that require measure turbidity of the sample (surface scattering) are not acceptable.

### 1.4 System Description

- A. Performance Requirements
  - 1. Range: 0 to 900 ppb ( $\mu\text{g/L}$ ) PAH<sub>PHE</sub>
  - 2. Resolution: 0.1 ppb PAH
  - 3. Limit of detection: 3 ppb PAH
  - 4. Reproducibility: 2.5 % of measurement value at a constant temperature
  - 5. Accuracy:  $\pm 5\%$  or  $\pm 5 \mu\text{g/L}$  (the larger value) at a constant temperature and flow
  - 6. Response time: 60 seconds ( $T_{90}$ )

### 1.5 Certifications

- A. CE approved
- B. DNVGL-CG-0339
- C. MEPC.259(68)
- D. FCC SDoC – FCC Part 15B, Class A, when used with SC1000 Controller

### 1.6 Environmental Requirements

- A. Operational Criteria
  - 1. Temperature:
    - a. Sample: 0 to 50 °C (32 to 122 °F)
  - 2. Pressure:
    - a. Sensor: 7 bar maximum
  - 3. Sensor distance, wall to ground: 100 mm (3.94 in.) minimum

1.7 Warranty

- A. The product includes a one-year warranty from the date of shipment.
- B. Optional service agreement: annual preventive maintenance (Hach Service Partnership Program)

1.8 Maintenance Service

- A. Inspection interval: every 2 years
- B. Lamp replacement interval: every 5 years
- C. Routine maintenance: clean the optics as conditions require, calibration as required

PART 2 PRODUCTS

2.1 Brand

- A. HACH
  - 1. Model PAH500 Oil-in-Water Online Sensor

2.2 Manufactured Unit

- A. Display units: ppb, ppm, µg/L, mg/L
- B. Calibration: Factory five-point calibration with phenanthrene; user calibrated with phenanthrene and/or DI water.
- C. The sensor operates reagent-free without sample conditioning in the range from 0 to 200 ppm total suspended solids in the sample.
- D. The sensor can be connected to a HACH SC1000 controller.
- E. Connection information:
  - 1. Sensor: 8-pin (PUR)
  - 2. Controller: M12

2.3 Equipment

- A. Materials:
  - 1. Measurement sensor:
    - a. Sensor enclosure: Titanium and NBR (nitrile butadiene rubber)
    - b. Sensor wetted materials: Quartz glass, fluorosilicone and titanium
    - c. Digital gateway: Ryton (PPS); flame rating UL94 V0)
  - 2. Mounting bracket: Type 1 PVC (ASTM D1784-11)
  - 3. Mounting hardware: 18-8 stainless steel (ASTM A380)

2.4 Components

- A. Standard equipment:
  - 1. Sensor with gateway, cable and mounting hardware
- B. Required equipment:
  - 1. HACH SC1000 controller
- C. Dimensions:
  - 1. Sensor: (Ø x L): 76.2 x 145.1 mm (3.0 x 5.7 in.)
  - 2. Digital gateway: (Ø x L): 34.6 x 182.4 mm (1.36 x 7.18 in.)

3. Cable: 1.0 m (3.2 ft), 7.7 m (25.3 ft), 15.0 m (49.2 ft), or 31 m (101.7 ft)
- D. Weight:
  1. Sensor: 1.0 kg (2.2 lbs)
  2. Gateway: 145 g (0.3 lbs)

## 2.5 Accessories

- A. Extension cable (up to total maximum length of 31 m (101.7 ft.))

## PART 3 EXECUTION

### 3.1 Preparation

- A. Mounting: as shown in drawings
- B. Plumbing: as shown in drawings
  1. Tubing: 6 mm (¼-inch) ID recommended
  2. Fittings: ¼-18 NPT 6 mm (¼-inch) ID fittings

### 3.2 Installation

- A. Install and plumb sensor following transmittal drawings and instrument user manual
  1. Contractor will install the sensor in strict accordance with the manufacturer's instructions and recommendation.
  2. Manufacturer's representative will include a half-day of start-up service by a factory-trained technician upon request (additional costs).

### 3.3 Manufacturer's Service and Start-Up

- B. 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.
- C. 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.
- D. 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.
- E. Use of manufacturer's service parts and reagents is required. Third-party are not approved for use.

END OF SECTION