

PART 1 GENERAL

1.1 Section includes

NT3100sc UV Nitrate Sensor for continuously monitoring nitrate in water.

1.2 Measurement Procedures

Nitrate dissolved in water absorbs UV light with wavelengths below 250 nm. The nitrate absorption of UV light makes it possible to photometrically determine the dissolved nitrate concentrations without reagents. The sensor is put directly in the medium. The color of the medium does not have an effect on the measurement because the measuring principle is based on the analysis of invisible UV light.

1.3 Alternates

Other methods of nitrate measurement, such as colorimetric, amperometric, potentiometric, and iodometric with electrodes, or those that require reagents are not acceptable.

1.4 System Description and Performance Requirements

NT3100sc UV Nitrate Sensor

1. Measuring range (depending on model):

- 1 mm path: 0.1 to 90 mg/L NO₃-N
- 2 mm path: 0.05 to 50 mg/L NO₃-N
- 5 mm path: 0.02 to 25 mg/L NO₃-N

2. Accuracy (depending on model):

- 1 mm path: $\pm 5\%$ of the measured value ± 0.1 mg/L NO₃-N
- 2 mm path: $\pm 4\%$ of the measured value ± 0.1 mg/L NO₃-N < 22 mg/L or $\pm 5\%$ of the measured value ± 0.1 mg/L NO₃-N ≥ 22 mg/L
- 5 mm path: $\pm 3\%$ of the measured value ± 0.1 mg/L NO₃-N < 13 mg/L or $\pm 5\%$ of the measured value ± 0.1 mg/L NO₃-N ≥ 13 mg/L

3. Resolution (depending on model):

- 0.01 to 9.99 mg/L
- 10.0 to 99.9 mg/L
- 100 mg/L

4. Detection limit (depending on model):

- 1 mm path: 0.1 mg/L NO₃-N
- 2 mm path: 0.05 mg/L NO₃-N
- 5 mm path: 0.02 mg/L NO₃-N

1.5 Certifications

CE, CMIM, UKCA, FCC, and ISED approved

1.6 Environmental Requirements

- Ambient temperature: 2 °C to 40 °C (36 °F to 100 °F), 95% relative humidity, non-condensing

- Sensor pressure limit: 0.5 bar
- Sample temperature: 2 °C to 40 °C (36 °F to 100 °F), 95% relative humidity, non-condensing

1.7 Warranty

- Global, except EU: The product includes a one-year warranty from the date of shipment.
- EU: The product includes a two-year warranty from the date of shipment.

1.8 Maintenance Service

1. Scheduled maintenance:
 - Visual inspection: Weekly
 - Clean measuring path: As necessary
 - Validate probe calibration: Every 6 months (based on non-abrasive water conditions)
 - Replace wiper blade: Every 3 months (based on non-abrasive water conditions and default settings)
 - Service inspection: Annually (a minimum of one inspection per year is required. For the best performance and uptime, the manufacturer recommends 2 inspections per year.)
2. Wearing parts consumption:
 - Wiper blades: 1 every 3 months (based on non-abrasive water conditions and default settings)
 - Wiper motor: 1 every 7 years (based on default settings)
 - Wiper shaft with seals: 1 every 2 years (based on default settings)
 - Housing seals: 1 every 2 years (replace each time the probe is opened)
 - Flashlamp: 1 every 10 years

PART 2 PRODUCTS

2.1 Manufacturer

Hach Company, Berlin, Germany

2.2 Manufactured Unit

The NT3100sc UV Nitrate consists of an immersible stainless steel probe with 10-meter cable.

2.3 Equipment

1. The sensor is equipped with a self-cleaning wiper system to prevent erroneous values and maintenance problems caused by surface films or particles.
2. The sensor is equipped with a 10 m cable, extension cables are available: 5, 10, 15, 20, 30 and 50 m. The maximum cable length is 60 m (190 ft).
3. The sensor uses no reagents.
4. The sensor has the following characteristics:
 - Enclosed in stainless steel, IP 68 environmental rated.
 - NT3100sc uses turbidity compensated, 2-beam ultraviolet absorption technology with 2-channel beam path.
 - The measurement beam has a wavelength of 210 nm and is absorbed by nitrate and nitrite.
 - The reference beam has a wavelength of 350 nm and is used to adjust for turbidity interference. However, there may be applications where the combination of these compounds absorbs too much light. Thus, there is not sufficient light transmitted to the sensors and inaccurate measurements occur. Make sure to select the probe with the correct path length.
 - A built-in wiper mechanically cleans the measuring window.
5. The measurement interval is user-selectable from 15 seconds to 30 minutes. Up to 12 signals can be averaged.

2.4 Components

1. Standard equipment:
 - NT3100sc UV sensor with 10m cable
 - Wiper blade 1, 2 or 5 mm (quantity: 5)
 - LZY261—Screw set, probe adapter for pole mount
 - User Manual
2. Dimensions
 - Ø: 70 mm
 - Length: 470 mm
3. Weight: 4.8 kg (10.6 lb) with 10 m cable

2.5 Accessories

- Flow through unit (bypass panel) or sedimenter for use when direct immersion in sample is impractical
- Replacement wipers
- Mounting hardware
- Standards
- Cable extensions

PART 3 EXECUTION

3.1 Preparation

1. The optional fixed point installation kit recommended for mounting the probe.
2. The probe can be mounted to a flow through unit when direct immersion in a sample stream is impractical.

3.2 Installation

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, if requested.
 - Contractor will schedule a date and time for start-up.
 - 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

1. 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.
2. 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.
3. Items 1 and 2 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.
4. Use of manufacturer's service parts and reagents is required. Third-party parts and reagents are not approved for use.

END OF SECTION