LXT-800
Turbidity Measurement
Drinking Water, Industrial Water, Water Treatment
LXT-800 Series Turbidity Sensors

APPLIEDICATIONS
- All phases of drinking water processing
- Monitoring Surface Waters
- Coagulation and flocculation
- Filter rupture monitoring
- Filter backwash
- Control of Clear Rinse Water
- Monitoring Sewage Treatment Plants discharge
- Monitoring of industrial water discharge
- Recycling of industrial water
- Monitoring of Cooling water
- Monitoring of Boiler feedwater
- Monitoring of phase separation processes

FEATURES AND BENEFITS
- Intelligent Sensor Technology
  Factory Calibration Stored in Sensor
  Self Monitoring Diagnostics
  Integrated Temperature Measurement
- Multiple Installation Methods
  Immersion assembly
  Flow through assembly
  Gas debubbler assembly
- Digital Data Transmission
  200 m between sensor and transmitter
  Insensitive to electromagnetic interference
- Self Cleaning Design
  Inclined sensor surface to enhance self cleaning with moderate flow
  Sapphire measuring windows for improved scratch resistance
  Wiper Unit can be retrofitted

GENERAL DESCRIPTION

The LXT-800 is a nephelometric turbidity sensor designed for use in water and wastewater. Turbidity, the cloudiness or haziness of a water sample, is caused by particles suspended in the water, typically clay and silt. Since bacteria and viruses can be attached to these particles, turbidity has become a critical indicator of the overall water quality.

The LXT-800 uses an optical method for determining the turbidity; a light beam is directed into the sample where it is scattered by suspended particles in the water. The amount of scattering depends on the amount of material in the water, the wavelength of light used and the size and composition of the suspended particles.

The LXT-800 uses a long lived near infrared LED light source (880 nm) and the 90° scattered light method in accordance with ISO 7027 / EN 27027 to assure accurate turbidity values under standardized and comparable conditions. The 90° scattered light detection method is the most common sensor design for turbidity. This sensor has the advantage of a high sensitivity at low levels of turbidity, a simple optical configuration and a balanced sensitivity to all particle sizes. Three detectors monitor the light beam at an angle of 90°. The first detector, inside the sensor, (see Figure 1) is the reference detector that compensates for changes in the LED light source caused by aging or other variations. The second detector measures a short path length, which is best for high concentration measurements. The third detector measures the longer path length which is best for lower concentrations. The turbidity signal is constantly adjusted versus the reference detector and digital filter functions help to suppress interfering signals while the self monitoring diagnostics assure a highly reliable measurement.

![Figure 1](image1.png)

![Figure 2](image2.png)
The Optical Surface must remain clean for accurate measurements. The inclined sensor face of the LXT-800 should be oriented into the flow for optimum self cleaning. Periodic cleaning is required for all turbidity sensors. In most cases this entails simply removing the sensor and wiping the optical surface with a soft cloth to remove any dirt or biofilms. An optional automated mechanical wiper is available for installations where manual wiping is inadequate. This option can be ordered with the LXT-800 or retrofit to an existing sensor in order to maximize the accuracy and minimize the maintenance requirement. The Flow Through Assembly provides a port for accommodating a spray cleaning capability.

Air bubbles in the water reflect light and will interfere with the measurement. Micro air bubbles can form when a water sample is depressurized. Care must be taken to ensure the water sample at the measurement point has a higher head pressure than the incoming sample. Water siphoning out from the measurement point can release dissolved gases in the flow cell and create noisy erratic readings. If air bubbles cannot be removed from the sample then the optional wiper assembly effectively removes air bubbles that form on or cling to the optical window. The De-Bubbler flow cell removes air bubbles that are entrained in the sample flow.

The LXT-800 sensors are factory calibrated in formazine, FNU (Formazine Nephelometric units) and are ready to use in most clean water applications. The factory calibration is permanently stored in the sensor’s memory and these values are also used for diagnostic purposes throughout the sensor’s life. Two other nonvolatile memory banks are available to store user initiated calibration data.

The LXT-800 Turbidity Sensor is easy to install, it is easy to use with FNU factory calibration, it is Plug and Play. With the rugged construction including a tough sapphire optical window, self monitoring diagnostics with plausibility checking and an automatic wiper based cleaner the LXT-800 Turbidity sensor is reliable, accurate and requires minimal maintenance, it is the solution.

**SPECIFICATIONS**

**Measurement Principle**  
Nephelometric 90; NIR scattered light, ISO 7027

**Light source and wavelength**  
LED, 880 nm

**Optical Reference Compensation**  
Reference Photodiode

**Measurement Range**  
0.000 - 9999 FNU, 0.00 - 3000 ppm  
0.0 - 3.0 g/l, 0 - 20%

**Accuracy**  
Maximum error < 5% of reading

**Repeatability**  
<1% of reading

**Temperature Sensor**  
NTC, 30 k-ohm @ 25;C

**Temperature Range**  
Operating: -5; - 50;C  
Storage: -20; - 60;C

**Pressure/Temperature Rating**  
6 bar @ 25;C 1 bar @ 50;C

**Power**  
110/220 VAC @ 50/60 Hz  
Optional 24 VDC (12-50 VDC) @ 0.25A

**Alarm Relay Ratings**  
(2) SPDT 230 VAC/5A or  
30 VDC/5A resistive ma

**Wetted Materials**  
PVC, PPS GF40, Sapphire (wiper rubber)

**Sensor Cable**  
Shielded 7 core cable  
7 meter (23 ft) or 15 meter (49 ft) lengths

**Process Connection**  
G1 Thread, ¾” FNPT

**Maximum Cable Length**  
200 m maximum from LXT-220 controller

**Dimensions**  
Length 8.7” (220 mm)  
Diameter 1.6” (40 mm)

**Weights**  
Cable length 7 m (23 ft): 0.7 kg (1.5 lbs)  
Cable length 15 m (49 ft): 1.1 kg (2.4 lbs)
# LXT-800 Series Turbidity Sensors

<table>
<thead>
<tr>
<th>Model and Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>LXT-800 Turbidity Sensor with 7 meter cable</td>
</tr>
<tr>
<td>LXT-800 Turbidity Sensor with 15 meter cable</td>
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<tr>
<td>LXT-800 Turbidity Sensor with 7 meter cable &amp; Automatic Wiper</td>
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<tr>
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<tr>
<td>LXT-800 Turbidity Sensor with 7 meter cable &amp; Flow Through Assembly</td>
</tr>
<tr>
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<td>LXT-800 Turbidity Sensor with 7 meter cable &amp; De-Bubbler Assembly</td>
</tr>
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<tr>
<td>LXT-800 Turbidity Analyzer, 115 VAC, (1) 0/4-20 mA output, (1) Failure Alarm Relay*</td>
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<tr>
<td>LXT-800 Turbidity Analyzer, 230 VAC, (1) 0/4-20 mA output, (1) Failure Alarm Relay*</td>
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<tr>
<td>LXT-800 Turbidity Analyzer, 24 VDC, (1) 0/4-20 mA output, (1) Failure Alarm Relay*</td>
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<tr>
<td>Consult factory for optional dual 0/4-20 mA outputs and multiple relays up to (4) additional relays</td>
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## ACCESSORIES

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<tbody>
<tr>
<td>Immersion Assembly (Cap/Cable feed-through, 1 meter down pipe)</td>
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<tr>
<td>Rail Mounting Brackets, (2) Quick Release &quot;U&quot; clamps for 2&quot; Guard Rail mounting</td>
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<tr>
<td>LXT-800 5 Conductor Cable, per meter</td>
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<tr>
<td>NEMA 4X Junction Box, (2) cable glands, terminal strip, PVC box, 6&quot;x3&quot;x2&quot;, LWD</td>
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<tr>
<td>Service Kit, for Wiper Arm, rubber and mounting material (3 sets)</td>
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<tr>
<td>LXT-800 Check Unit, used to check Stability of the sensor, (calibration cup)</td>
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## DIMENSIONS

![Flow Through Assembly](image1.png)
![De-Bubbler Assembly](image2.png)

**Warranty**

Instrument is warranted for one year against defects in material or workmanship

NOTE: Specifications and features will vary with application. The above are established and validated during design, but are not to be construed as test criteria for every product. All specifications and features are subject to change without notice.