LT-73X Series

Ultra-Low Inline Turbidity Sensors
For Drinking & Industrial Water Applications

LT-73X Series Sensor Description

The **LT-73X Series** are proprietary inline turbidity sensors offered in a variety of ranges from 0.001 to 1,000 NTU with ultra-low resolution. Sensor format details are provided in the specification table of this document with options meeting ISO-7027 and EPA-180.1 compliance guidelines. Each of the LT-73X series sensors offer a unique flat surface distal end in a quartz glass plate, allowing for extended cleanliness and easy maintenance. These sensors are designed for optimal accuracy and performance in a wide range of turbidity water samples using 90° surface scatter configuration, offered in two flow assembly installation formats (FR-100 Flow Reservoir or FT-100 Inline Tee), making them highly versatile for a wide variety of drinking or industrial water applications. All LT-73X series sensors are offered in Warm White Light (LED) or InfraRed LED (860nm). They are powered by a 24 VDC/2W power supply and offer both 4-20 mA and RS-485 Modbus output signals. When clean, the unique Pyxis sensor design offers a calibration stability of <0.02NTU for up to 1-year of operation with no need for calibration. Additionally, these sensors can be wirelessly accessed via Bluetooth for Diagnostics, Cleaning & Calibration when using the **uPyxis APP** for mobile or desktop devices and the **MA-CR** Bluetooth Adapter.

*Figure 1 -
LT-73X Series Ultra-Low Turbidity Sensors*

FR-100 Flow Reservoir Assembly for Drinking Water Installations

For use in drinking water installations, the LT-73X Series turbidity sensors should be installed using the Pyxis **FR-100** flow reservoir assembly. This uniquely designed reservoir operates in a by-pass format at a 200-400mL/min flow rate and serves as a calming vessel prior to the sensors measurement of ultra-low turbidity. Specifically designed to reduce stray light interference, the FR-100 reservoir assembly also allows for the elimination of air bubble entrainment, drop-out of large particulate and suspended solids including precipitated inorganics such as iron and manganese. The FR-100 flow reservoir assembly comes wall or panel mountable and complete including ¼" tubing inlet with isolation valve, pressure reducing valve, in-line flow meter, ⅜" tubing sample output and overflow assembly as well as ½" NTP bottom blowdown ball valve for solids removal. The LT-73X Series sensors easily install via the union adapter provided on the side wall of the FR-100 flow reservoir for simple removal and maintenance. When emptied and cleaned, the FR-100 also serves as a ZERO-point calibration of the sensor via the uPyxis APP. Replacement sensors or reservoirs may be purchased independently and as desired.

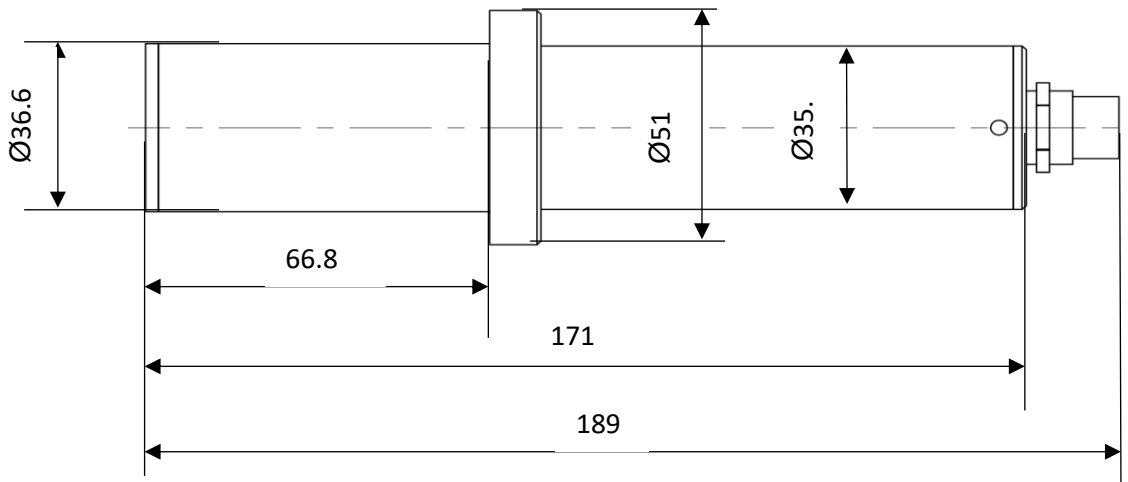*Figure 2 – FR-100 Flow Reservoir Assembly for Drinking Water*

FT-100 In-Line Tee Assembly Installations

For use in alternative installations, the LT-73X Series turbidity sensors may also be installed using the Pyxis **FT-100** in-line flow Tee assembly. This uniquely designed in-line Tee operates at up to 40 Liters/Min (10.6 GPM) flow rate and operating pressures as high as 6.9 bar (100psi). Constructed of Schedule 40-CPVC and designed with a unique 45° downward angle for extended sensor cleanliness, the FT-100 in-line Tee assembly allows for users to install the LT-73X Series in pressurized flow applications with limited space. This in-line Tee dramatically reduces the installation space requirement and is highly compatible with most by-pass sensor plumbing installations allowing the user to easily remove the sensor for wireless cleaning and maintenance. When emptied and cleaned, the FT-100 may also serve as a ZERO-point calibration of the sensor via the uPyxis APP. The FT-100 inline-Tee assembly offers 1.5" FNPT and 1.5" FNPT Socket Adapters with quick unions to allow for rapid installation or replacement. The FT-100 inline-Tee assembly may be purchased independently as desired.

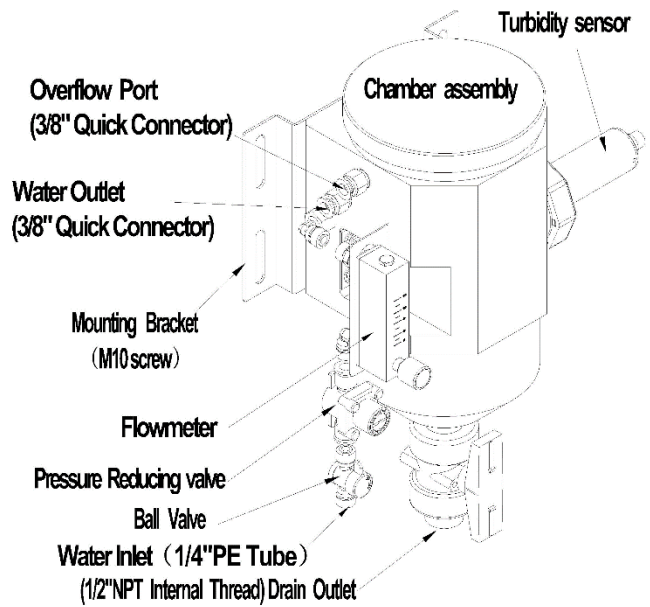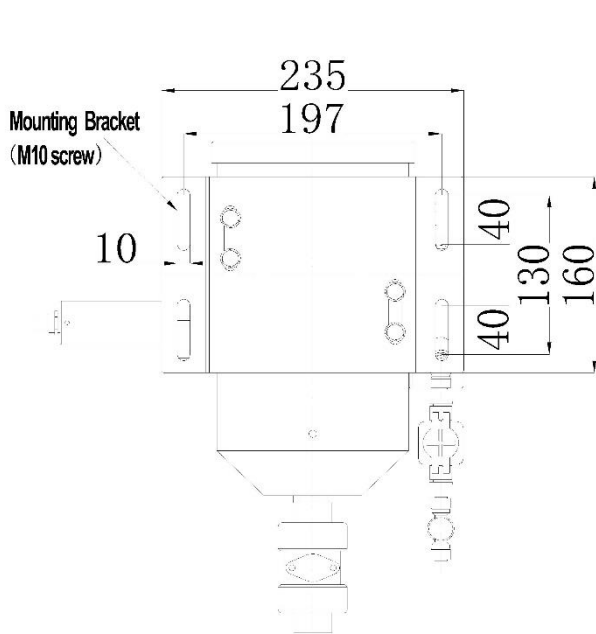*Figure 3 – FT-100*
In-Line Tee Assembly

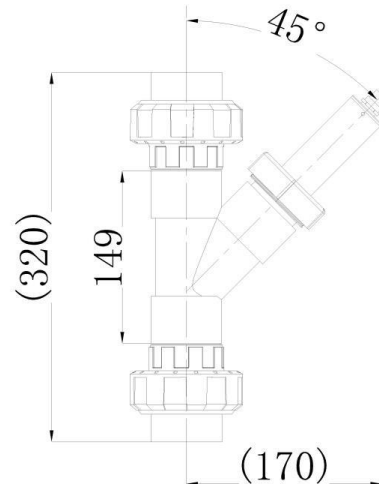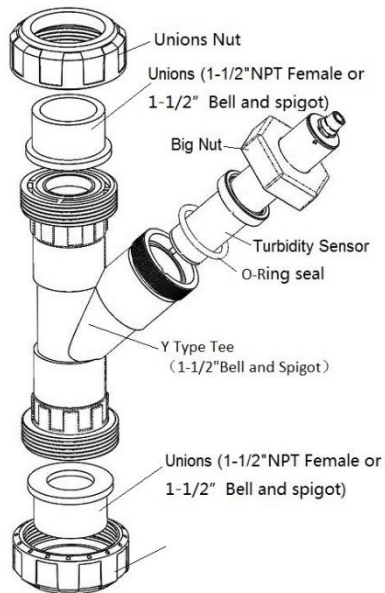## LT-73X Series Ultra-Low Turbidity Sensor Dimensions (mm)

Specifications

Item	LT-736	LT-736B	LT-739	LT-739B	LT-737	LT-737B
P/N	53215	53223	53221	53225	53216	53224
Light Source (LED)	Warm White	860nm	Warm White	860nm	Warm White	860nm
Compliance	EPA180.1	ISO-7027	EPA180.1	ISO-7027	EPA180.1	ISO-7027
Range (NTU)	0.002 – 1000.00		0.002-40.00		0.001 – 5.000	
Accuracy Using FR-100	+/- 0.005 NTU or 2% <10NTU +/-0.01 NTU or 2% >10NTU		+/- 0.005 NTU or 2% <40NTU +/-0.02 NTU or 2% >40NTU		+/- 0.005 NTU or 1%	
Accuracy Using FT-100	+/- 0.01 NTU or 2% <10NTU +/-0.02 NTU or 2% >10NTU		+/- 0.01 NTU or 2% <40NTU +/-0.05 NTU or 2% >40NTU		+/- 0.01 NTU or 1%	
Repeatability Using FR-100	+/- 0.001 NTU or 0.5% <10NTU +/-0.01 NTU or 1% >10NTU		+/- 0.001 NTU or 0.5% <40NTU +/-0.02 NTU or 1% >40NTU		+/-0.001 NTU or +/-0.5%	
Repeatability Using FT-100	+/- 0.002 NTU or 1% <10NTU +/-0.02 NTU or 1% >10NTU		+/- 0.002 NTU or 1% <40NTU +/-0.05 NTU or 1% >40NTU		+/-0.002 NTU or +/-1%	
Calibration Stability	< 0.02 NTU/year drift *(Assuming sensor is clean)*		< 0.02 NTU/year drift *(Assuming sensor is clean)*		< 0.01 NTU/year drift *(Assuming sensor is clean)*	
Power Supply	22 – 26V DC, Power Consumption – 1.5W					
Outputs	Isolated 4 – 20 mA Analog Output & Isolated RS-485 Digital Output					
Wireless Access	Bluetooth Enabled with used w/ MA-CR or PowerPACK Adapters					
Installation	FR-100 Flow Reservoir Assembly / FT-100 In-Line Tee with 1.5" NPT Glue & Thread					
Weight	800 Gram (2.1 lbs – Sensor Only)					
Operational Pressure	LT-73X Series Sensors up to 100 psi (6.9 Bar) FR-100 Reservoir Atmospheric Pressure FT-100 Inline Tee up to 100 psi (6.9 Bar)					
Operating Sample Temperature	1-50ºC (33.8 – 131ºF)					
Sample Flow Rate	LT-73X Series Sensors = 0 – 40 L/min (0-10.6 GPM) FR-100 Flow Reservoir = 200 – 400mL/min FT-100 Inline Tee = 0 - 40 L/Min (0-10.6 GPM)					
Wet Material	LT-73X Series - 304 Stainless Steel / PVC & Polycarbonate					
Cable Length	Standard MA-4.9CR Cable (8Pin Adapters – 4.9ft) Flying Lead MA-1.5CR Cable (8 Pin Adapter / Flying Leads – 1.5ft) *Extension Cables Available*					
Calibration	Pyxis Formazin Standards & Dry Secondary Zero Standard for Field Cal = 0.01 Repeatability Pyxis Solid State Calibration Kit Pyxis Lab Factory Ultra-Pure Calibration Services = 0.001 Repeatability					
Rating	IP67 (sensor)					
Regulation	CE Marked					
Dimension	189mm (7.4inch) Length x 36mm (1.44inch) Body Diameter					

FR-100 Flow Reservoir Assembly Dimensions (mm) & Diagram

235
197
Mounting Bracket
(M10 screw)
10
40
40
40
130
160

Overflow Port
(3/8" Quick Connector)
Water Outlet
(3/8" Quick Connector)
Mounting Bracket
(M10 screw)
Turbidity sensor
Chamber assembly
Flowmeter
Pressure Reducing valve
Ball Valve
Water Inlet (1/4"PE Tube)
(1/2"NPT Internal Thread) Drain Outlet

FT-100 In-Line Tee Assembly Dimensions (mm) & Diagram

Unions Nut
Unions (1-1/2"NPT Female or
1-1/2" Bell and spigot)
Big Nut
Turbidity Sensor
O-Ring seal
Y Type Tee
(1-1/2"Bell and Spigot)
Unions (1-1/2"NPT Female or
1-1/2" Bell and spigot)

45°
(320)
149
(170)

Cleaning & Calibration

The LT-73X Series ultra-low turbidity sensors are uniquely designed and highly stable. Simple maintenance cleaning of the sensors on a regular and consistent basis should enable use of the Pyxis LT-73X Series without the need for calibration. When clean, Pyxis Lab guarantees a calibration stability of <0.02NTU drift per year. For most water applications when used with FR-100 (Flow Reservoir) or FT-100 (In-Line Tee), the LT-73X Series can maintain accuracy and precision without cleaning for the period of one month. Cleaning and calibration frequencies are application dependent on the contaminant level of suspended solids, iron, manganese, oil, and bacteria. When calibration is required, the LT-73X Series can be wirelessly diagnosed, cleaned and calibrated using the **MA-CR** or PowerPACK Series Bluetooth adapters and **uPyxis** APP for Mobile or Desktop, using the empty/pre-cleaned reservoir or in-line tee as the ZERO calibration and an approved Formazin turbidity calibration standard for the known SLOPE calibration. This approach guarantees a 0.01NTU resolution. For a 0.001 NTU resolution guarantee, the sensor and its reservoir or inline-Tee will require factory calibration at Pyxis Lab Inc. in Lafayette Colorado available. Contact order@pyxis-lab.com for details.

Figure 4 – MA-CR Bluetooth Adapter (left) / uPyxis Mobile APP (center) / Pyxis Turbidity Calibration Standards (right)

LT-73X Series Premounted w/FR-100 Reservoir and UC-100 Display/Data Logging Transmitter

Order Information   P/N

LT-736 Ultra-Low Turbidity *(Warm White LED 0.000-1,000.00 NTU)*	53215
LT-737 Ultra-Low Turbidity *(Warm White LED 0.000-5.000 NTU)*	53216
LT-739 Ultra-Low Turbidity *(Warm White LED 0.000-40. 00 NTU)*	53221
LT-736B Ultra-Low Turbidity *(InfraRed LED 0.000-1,000.00 NTU)*	53223
LT-737B Ultra-Low Turbidity *(InfraRed LED 0.000-5.000 NTU)*	53224
LT-739B Ultra-Low Turbidity *(InfraRed LED 0.000-40. 00 NTU)*	53225
FR-100 Flow Reservoir Assembly *(Drinking Water Required for LT-73X Series)*	50779
FT-100 In-Line Tee Assembly *(Pressurized In-Line Flow Tee for LT-73X Series)*	50780

Optional Accessories Information   P/N

MA-CR Bluetooth Adapter *(8Pin Adapter Enables Wireless Calibration w/uPyxis APP)*	MA-CR
Power*PACK-1 (Single Chanel Auxiliary Power Supply w/Bluetooth For ST/LT Series Sensors)*	MA-BLE-1
UC-100S *(UC-100 Display & Data Logging Terminal Standard Unit)*	UC-100S
UC-100G *(UC-100 Display & Data Logging Terminal with Integrated 4G Gateway)*	UC-100G
UC-100 Back Panel *(UC-100 Premounted on Back Panel)*	UC-100 Panel
Pyxis Turbidity Calibration Std – 2.0 NTU	57010-6
Pyxis Turbidity Calibration Std – 10.0 NTU	57010-4
Pyxis Turbidity Calibration Std – 100 NTU	57010
Pyxis Turbidity Calibration Std – 500 NTU	57010-2
MA-C10 *(10' Extension Cable for ST/LT Series Sensors)*	50738
MA-C25 *(25' Extension Cable for ST/LT Series Sensors)*	50740
MA-C50 *(50' Extension Cable for ST/LT Series Sensors)*	50705
MA-C100 *(100' Extension Cable for ST/LT Series Sensors)*	50706