



Echotouch™, EchoSpan® & EchoSwitch® Ultrasonic Liquid Level Sensors

Overview

The Echotouch, EchoSpan and EchoSwitch are innovative ultrasonic liquid level sensor families that replace float, conductance and pressure sensors that fail due to contact with dirty, sticky and scaling media in small, medium and large capacity tanks. Applied in chemical, water and wastewater applications, these general purpose non-contact sensors are available with single and multi-function capabilities including continuous level measurement, switching and control.

For input to a PLC or other controller, measurement outputs include current, voltage and frequency. Models with three relays can be configured for level alarms and/or stand-alone level control such as automatic fill or empty functions using the embedded level controller. Units are easily configured using built-in pushbuttons.



Echotouch, EchoSpan & EchoSwitch Ultrasonic Liquid Level Sensors General Specifications

| Model | LU20-5001-IS | LU80-5101 | LU81-5101 | LU83-5101 | LU84-5101 | LU77-5004 | LU74-5004 | LU78-5004 |
|---------------------|---|---------------------------------|--------------------------------|--------------------------------|----------------------------------|--|---------------------------------|--------------------------------|
| Price | | | | | | | | |
| Type | Echotouch | EchoSpan | | | | EchoSwitch | | |
| Class | Intrinsically safe | General Purpose (non-hazardous) | | | | | | |
| Range | 6in to 18ft (15cm to 5.5 m) | 4in to 9.8 ft (10cm to 3m) | 8in to 18ft (20cm to 5.5 m) | 8in to 26.2 ft (20cm to 8m) | 12in to 32.8 ft (30cm to 10m) | 4in to 9.8 ft (10cm to 3m) | 8in to 18 ft (20cm to 5.5 m) | 8in to 26.2 ft (20cm to 8m) |
| Output Types | 4-20 mA, two-wire | | | | | (1) SPDT relay, (2) SPST relays 4-20 mA, two-wire | | |
| Install | Vertical, top of tank | | | | | | | |
| Mounting | 2in MNPT | 1in MNPT | 2in MNPT | | | 1in MNPT | 2in MNPT | |
| Relays | No relay | | | | | (1) SPDT relay, (2) SPST relays | | |
| Configuration | Pushbutton / LCD | | | | | | | |
| Ambient Temperature | -4° to 140°F (-20° to 60°C) | -40° to 160°F (-40° to 71°C) | | | | | | |
| Process Temperature | -40° to 140°F (-40° to 60°C) | -4° to 140°F (-20° to 60°C) | | | | | | |
| Pressure | 30 PSI (2 bar) @ 25°C, derated @ 1.667 psi (0.113 bar) per °C above 25°C (77°F) | 30 PSI (2 bar) MAX | | | | | | |

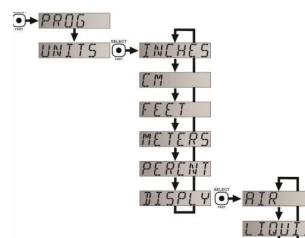
Pushbutton Configuration

With no software or PC required, the Echotouch, EchoSpan, and EchoSwitch ultrasonic level sensors are easily configured using integral pushbuttons and LCD digital display. Configuration parameters are organized in a simple menu structure so that parameter values are easily accessed and set or changed as needed. Parameters are stored in non-volatile memory so the setting values are not lost when the sensor is powered down, allowing configuration before installation in the field.



Click on the thumbnail or go to <https://www.automationdirect.com/VID-LE-0002> for a short video introduction to Flowline EchoTouch, EchoSpan, EchoSwitch and PodView product lines.

Example - EchoSpan Display and Menu





Echotouch™ LU20 Ultrasonic Level Transmitter



Part No. LU20-5001-IS

Overview

The Echotouch LU20 ultrasonic level transmitter is CSA approved for intrinsically safe applications. The two-wire ultrasonic transmitter provides non-contact measurement up to 18ft (5.5m) and is ideally suited for corrosive, slurry or waste liquids. The transmitter is typically selected for atmospheric bulk storage, day tank and waste sump applications located within a classified hazardous area. Media examples include diesel fuel and hydrochloric acid. The transmitter is calibrated in less than a minute using the LCD display, 4-button interface and intuitive calibration menu. All user setpoints are held in non-volatile memory. In the event of acoustic signal loss, the transmitter will hold the current output at the user designated safe state.

Features

- LCD digital display indicates level in inches or centimeters
- Polypropylene enclosure rated NEMA 4X / IP65 with rugged Kynar transducer
- Simple pushbutton calibration for all user setpoints
- Adjustable dead band and range filters eliminate false echo returns

Agency Approvals

- CSA: Class I, Groups A, B, C & D; Class II, Groups E, F and G; Class III; T3C



LU20-5001-IS Technical Specifications

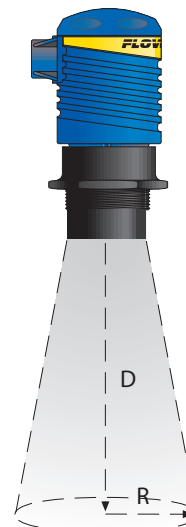
| | |
|----------------------------|--|
| Price | |
| Range | 6in to 18ft (15cm to 5.5 m) |
| Accuracy | ± 0.25% of span in air |
| Resolution | 0.125 in (3mm) |
| Sensing Dead Band* | 6in (15cm) |
| Beam Width | 8° conical |
| Configuration | Pushbutton / LCD |
| Display Type | LCD, 4-digit |
| Display Units | Inch or cm |
| Memory | Non-volatile |
| Loop Supply Voltage | 12 - 32 VDC |
| Loop Resistance | 600Ω max @ 24VDC, 900Ω max @ 32VDC |
| Signal Output | 4-20 mA, two-wire |
| Signal Invert | 4-20 mA or 20-4 mA |
| Loop Fail-Safe | 4mA, 22mA or hold last |
| Calibration | digital, pushbutton, LCD |
| Process Temperature | -4° to 140°F (-20° to 60°C) |
| Ambient Temperature | -4° to 140°F (-20° to 60°C) |
| Pressure | 30 psi @ 77°F, derated @ 1.667 psi per 1.8°F above 77°F (2 bar @ 25°C, derated @ 0.113 bar per 1°C above 25°C) |
| Enclosure Rating | NEMA 4X (IP65) |
| Installed Height | 5.1 in (13cm) above tank process mount |
| Enclosure Material | Polypropylene, UL94V0 |
| Transducer Material | Polyvinylidene Fluoride, Kynar |
| Process Mount | 2in MNPT (See accessories for installation fittings) |
| Terminal Block | 26-12 AWG (tighten torque, 0.4 Nm), removable |
| Conduit Entrance | Single, 1/2 in FNPT |
| Weight (lbs) | 2.2 |
| Classification | Intrinsically safe (Haz-Loc) |
| Agency Approvals | CSA: Class I, Groups A, B, C & D; Class II, Groups E, F and G; Class III; T3C, CE, RoHS |
| I.S. Parameters | CSA Vmax < 32.0 V; Imax < 130 mA; Ca = 0 µF; La = 0 µH |
| Certificates | CSA: LR79326-10 |
| Compliance | CE: EN 50082-2 immunity, EN 55011 emission (Recommended I.S. barrier MTL7706+) |

* Dead band is the minimum distance the sensor must be mounted above the max liquid level.

Beam Cone Data

The "Beam Cone" is the amount in which the ultrasonic wave increases in diameter (Radius?) as the wave travels away from the sensor. This is important to note during installation to prevent objects in the tank from providing false echoes.

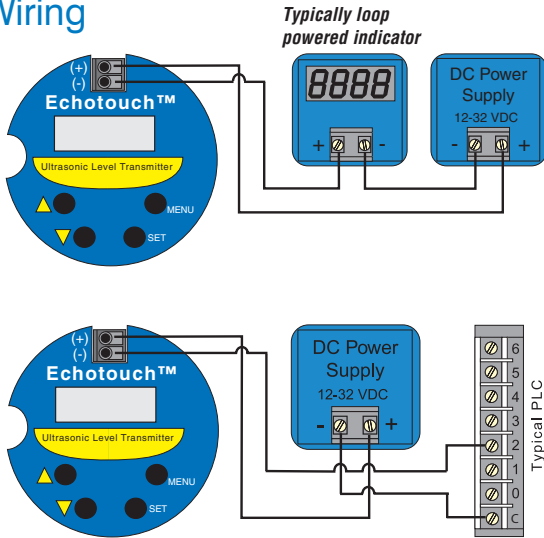
| Depth (feet) | Radius (inches) | Radius (cm) |
|--------------|-----------------|-------------|
| 1 | 1.2 | 3.1 |
| 3 | 2.9 | 7.3 |
| 5 | 4.6 | 11.6 |
| 7 | 6.2 | 15.9 |
| 9 | 7.9 | 20.1 |
| 11 | 9.6 | 24.4 |
| 13 | 11.3 | 28.7 |
| 15 | 13.0 | 32.9 |
| 17 | 14.6 | 37.2 |
| 19 | 16.3 | 41.3 |





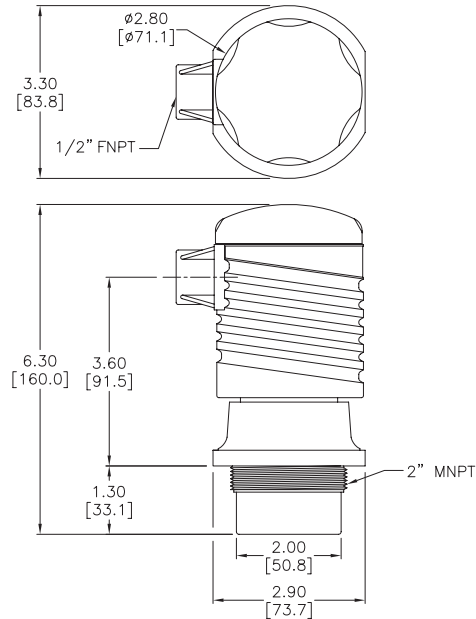
Echotouch™ LU20 Ultrasonic Level Transmitter

Wiring



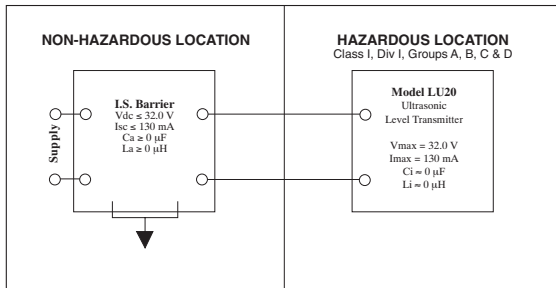
Dimensions

inches [mm]



See our website www.AutomationDirect.com for complete Engineering drawings.

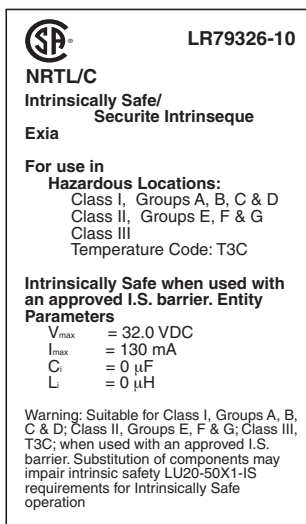
Control Drawing



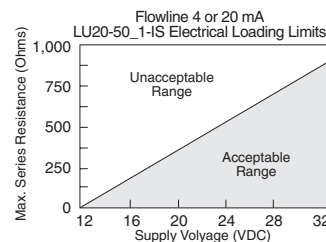
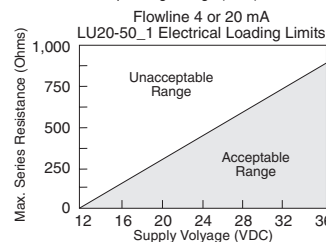
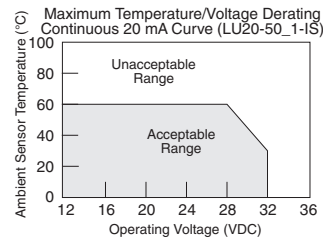
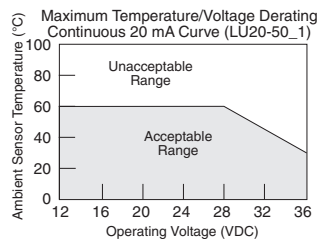
Control drawing for the LU20-5001-IS ultrasonic level transmitter approved under the entity concept as an I.S. apparatus

Control Drawing: LU20CD
Rev. 7-24-97

CSA Label



Temperature and Resistance Derating Charts





Ultrasonic Liquid Level Sensor Accessories

| Ultrasonic Liquid Level Sensor Accessories | | | | | |
|--|------------|---|----------|--------|-------|
| Part No. | Item Photo | Description | Quantity | Weight | Price |
| LI40-1001 | | Flowline PodView general purpose digital indicator, displays tank level or volume and sensor relay status, 6-digit LCD display with four relay status indicators, 3-button user interface, polycarbonate panel mount enclosure with NEMA 4 (IP65) faceplate, 6-foot (1.8-meter) 22AWG 4-conductor cable, for use with Flowline EchoPod DL, DS and DX series ultrasonic level sensor with firmware V50.0 or later. | 1 | 0.6 | |
| LM50-1001 | | Flowline side mount bracket, 2 inch NPT female threads, polypropylene (PP), for use with Flowline DL34, LU23, LU28, LU29, LU74, LU78, LU81, LU83, LU84, UG01, UG03, UG06, US01 and US03 series ultrasonic level sensors | 1 | 0.4 | |
| LM50-1001-1 | | Flowline side mount bracket, 2 inch NPT female threads, polypropylene (PP), and 2 inch NPT male x 1 inch NPT female reducer bushing (PVC), for use with Flowline DL14, DL24, DS14, DL10, DX10, LU27, LU77, and LU80 series ultrasonic level sensors | 1 | 0.6 | |
| LM52-1400 | | Flowline reducer bushing, 2 inch NPT male x 1 inch NPT female threads, PVC, for use with Flowline DL14, DL24, DS14, DL10, DX10, LU27, LU77, and LU80 series ultrasonic level sensors | 1 | 0.2 | |
| LM52-2400 | | Flowline reducer bushing, 3 inch NPT male x 2 inch NPT female threads, PVC, for use with Flowline DL34, LU23, LU28, LU29, LU74, LU78, LU81, LU83, LU84, UG01, UG03, UG06, US01 and US03 series ultrasonic level sensors | 1 | 0.6 | |
| LM52-3800 | | Flowline reducer bushing, PVC, 4in male NPT to 2in female NPT. For use with Flowline DL34, LU23, LU28, LU29, LU74, LU78, LU81, LU83, LU84, UG01, UG03, UG06, US01, and US03 series ultrasonic level sensors. | 1 | 2.0 | |
| LM52-1890 | | Flowline low-profile bulkhead fitting, 1 inch NPT female x slip socket, with mounting nut, PVC, for use with Flowline DL14, DL24, DS14, DL10, DX10, LU27, LU77 and LU80 series ultrasonic level sensors | 1 | 0.5 | |
| LM52-2890 | | Flowline low-profile bulkhead fitting, 2 inch NPT female x slip socket, with mounting nut, PVC, for use with Flowline DL34, LU23, LU28, LU29, LU74, LU78, LU81, LU83, and LU84 series ultrasonic level sensors | 1 | 1.2 | |
| LM52-1850 | | Flowline mounting flange, 1 inch NPT female threads, CPVC, for use with Flowline DL14, DL24, DS14, DL10, DX10, LU27, LU77, and LU80 series ultrasonic level sensors | 1 | 0.5 | |
| LM52-2850 | | Flowline mounting flange, 2 inch NPT female threads, CPVC, for use with Flowline DL34, LU23, LU28, LU29, LU74, LU78, LU81, LU83, LU84, UG01, UG03, UG06, US01 and US03 series ultrasonic level sensors | 1 | 1.0 | |
| 204038 | | Replacement mounting gasket, for use with Flowline DL14, DL10, DX10, and DS14 series ultrasonic level sensors | 1 | 0.1 | |
| 200128 | | Replacement mounting gasket, for use with Flowline DL24, LU27, LU77, and LU80 series ultrasonic level sensors | 1 | 0.1 | |
| 200129 | | Replacement mounting gasket, for use with Flowline DL34, LU23, LU28, LU29, LU74, LU78, LU81, LU83, and LU84 series ultrasonic level sensors | 1 | 0.1 | |

When installing the 1" NPT level sensors care should be used to mechanically isolate the sensor housing from the tank. This can easily be done by using any of the Flowline mounting accessories which are designed to provide the isolation needed.

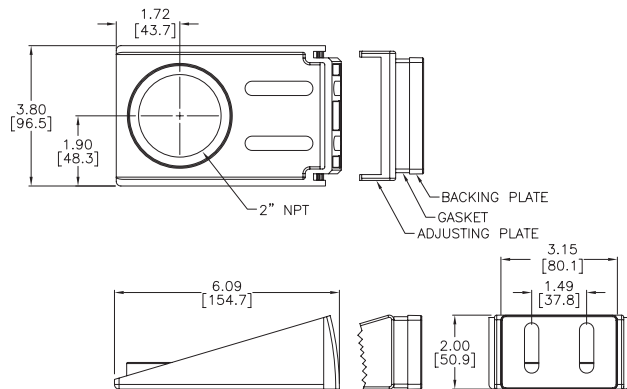


Ultrasonic Liquid Level Sensor Accessories

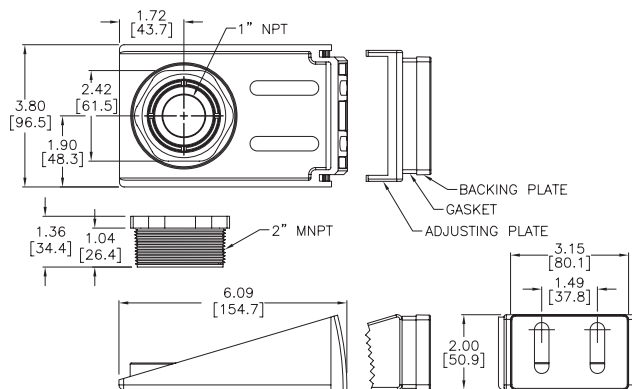
Dimensions

inches [mm]

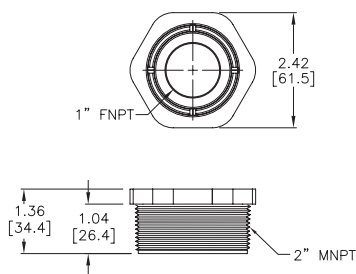
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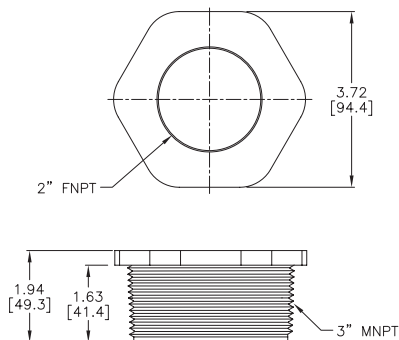
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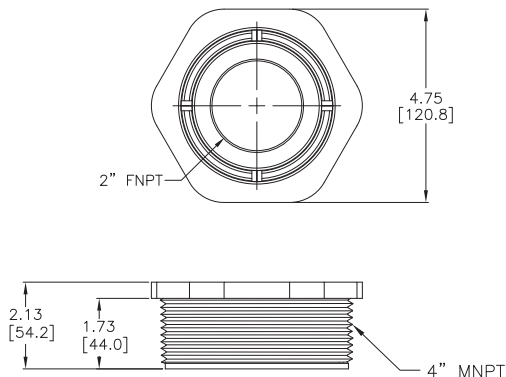
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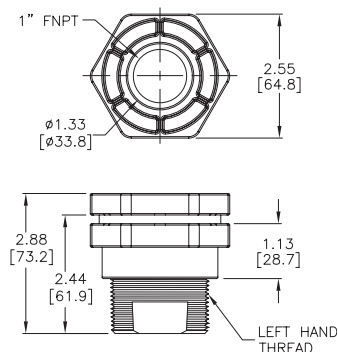
LM52-2400



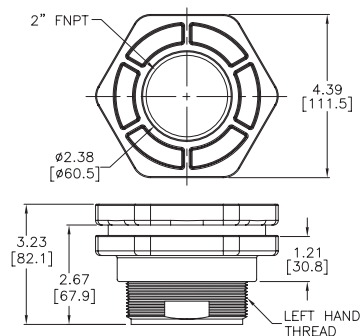
LM52-3800



LM52-1890



LM52-2890



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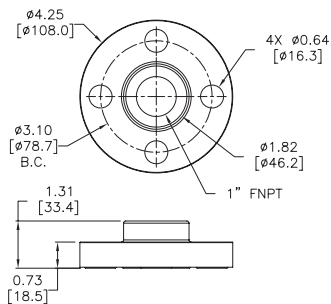


Ultrasonic Liquid Level Sensor Accessories

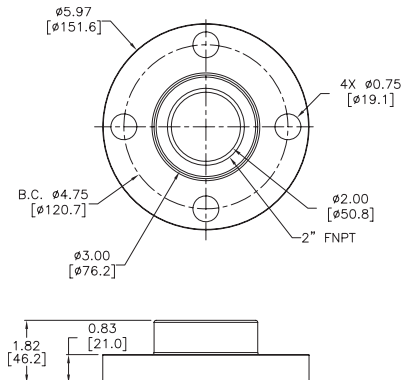
Dimensions

inches [mm]

LM52-1850



LM52-2850



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