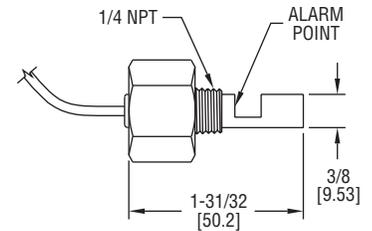
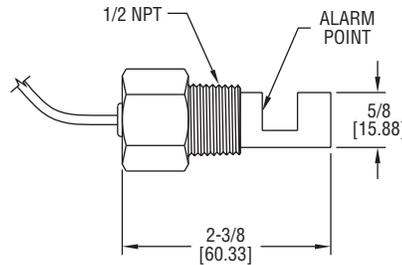
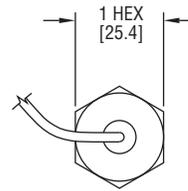




Series MULS Miniature Ultrasonic Level Switch

Specifications - Installation and Operating Instructions



The Series MULS Miniature Ultrasonic Level Switch measures liquid at a single point providing an output for high or low level alarm, overflow prevention, or pump protection. The Series MULS uses ultrasonic wave propagation between the transducer gap to sense the presence or absence of a liquid. Units can be mounted within 15° of horizontal with no additional calibration required. The switches include a 0.5 second delay and have repeatability of less than .08 in. (2 mm). The Series MULS can be used to monitor and control levels of water, chemicals, lubricants, acids, or beverages in vessels, storage bins, or tanks.

The switch operates using ultrasonic sound wave propagation. Ultrasonic sound waves are greatly attenuated when transmitted through the air. Conversely, when a liquid is present, the transmission of the sound waves is greatly enhanced. The unit generates electrical signals that are converted to bursts of ultrasonic energy at the sensor. The ultrasonic bursts are transmitted across the liquid sensing gap of the sensor. Upon receipt of a valid signal at the receiver, the solid-stage electronics generate a "data enable" condition indicating that a liquid is present. The signal energizes a relay and provides an output condition.

INSTALLATION

The Series MULS level switch should be mounted within 15° of horizontal. Make sure all wiring conforms to local and national electrical codes.

SPECIFICATIONS

Service: Compatible liquids (non-coating, low viscosity).

Wetted Material: 316L SS.

Temperature Limits: -20 to 176°F (-29 to 80°C).

Pressure Limits: 250 psig (17.24 bar).

Enclosure Rating: General purpose.

Repeatability: ≤ .08" (2 mm).

Switch Type: SPST normally open dry relay, NPN transistor sink, or PNP transistor source.

Electrical Rating: Relay: 1A @ 5-30 VDC, source & sink: 100mA.

Electrical Connections: 12" (304.8 mm) 5 conductor cable, 24 AWG wire.

Leakage Current: Less than 50µA, sinking and sourcing.

Power Requirements: 5 to 30 VDC.

Process Connection: 1/4" or 1/2" male NPT.

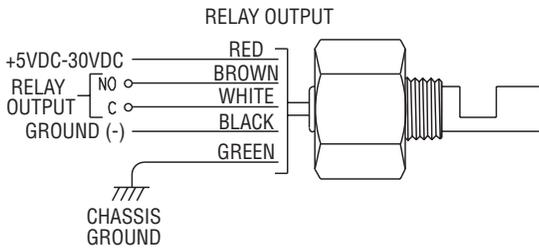
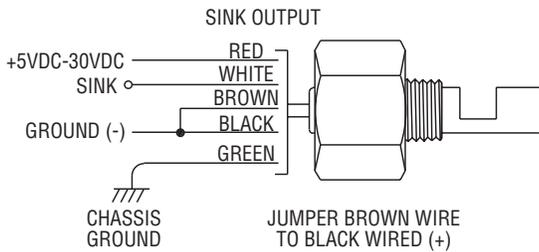
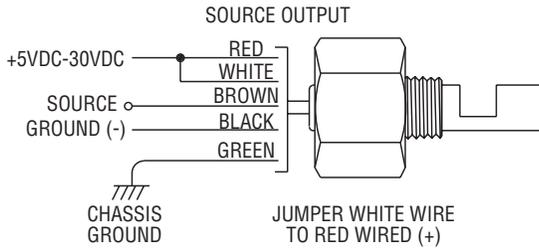
Mounting Orientation: Within 15° of horizontal.

Delay: 0.5 seconds.

PRELIMINARY OPERATIONAL CHECK

Before installing the unit, a simple operation check should be performed as follows:

1. Fill a container with a liquid.
2. Connect the power and control wiring cable to the electronic control unit.
3. Apply power from the source.
4. Place the sensor in the liquid. The relay should energize.
5. Remove the sensor from the liquid. The relay will de-energize indicating the system is functioning properly.
6. Disconnect the power to the unit.
7. Proceed to final installation if results were positive.



FINAL INSTALLATION

1. Drill a suitable hole in the vessel or pipe wall and tap for suitable NPT. If this is a walled vessel or material is not suitable for threading, weld or braze a bushing to accept the sensor.
2. Screw the sensor in the threaded section and make sure there is a good seal. Use a pipe compound or sealing tape to avoid excessive tightening. Do not over tighten.
3. Run the power and control wiring cable to the electronic control unit.
4. Connect the wires as shown in the diagram for the desired output configuration.

Observe all applicable electrical codes and proper wiring procedures.

MAINTENANCE

The electronics are constructed with solid-state components and are epoxy potted. Periodically, check and clean the sensor when used with liquids that cause a coating buildup on the sensor. No other maintenance is required. A periodic check of the system calibration is recommended. The Series MULS is not field serviceable and should be returned if repair is needed (field repair should not be attempted and may void warranty). Be sure to include a brief description of the problem plus any relevant application notes. Contact customer service to receive a return goods authorization number before shipping.