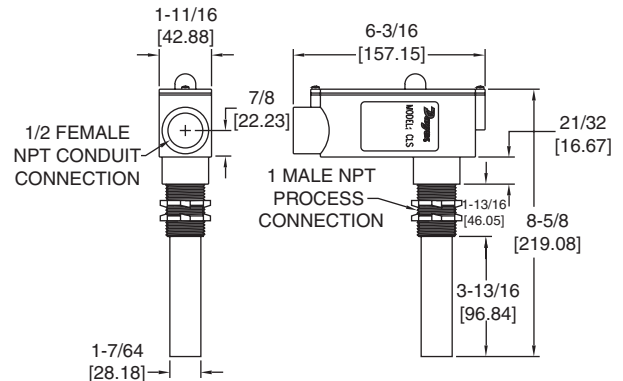




# Model CLS1 Capacitance Level Switch

## Specifications - Installation and Operating Instructions



### DESCRIPTION

Model CLS Capacitance Level Switch provides reliable point level measurement of solids, liquids and slurries in metallic or non-metallic tanks and vessels. Model CLS detects the presence or absence of material in contact with the probe by sensing a change in the capacitance. Electronics provide highly sensitive measurement detection (requires less than a 1 picofarad shift from ambient). State of the art technology ignores material build-up on the vessel sidewall or along the probe assembly. One time calibration is simple with a single multi-turn potentiometer. Red LED on housing indicates sensor status. Unit features an adjustable 1-30 second time delay and a 5 amp, SPDT fail-safe relay output. Model CLS can be mounted vertically or horizontally.

### INSTALLATION

#### Location and Mounting

The probe should be located out of the direct flow of material. The CLS is designed to mount utilizing a 1" NPS.

#### Grounding

An equipment grounding connection (earth ground) must be supplied to the unit for safety and to insure proper operation of the unit. The CLS uses earth ground as a reference for calibration and detecting a covered or uncovered condition.

A ground reference conductor is integrated within the probe allowing operation of the unit in non-metallic vessels. Installation in a grounded metallic vessel will in some cases provide enhanced sensitivity.

#### Input Power and Field Wiring

The CLS operates from 115 VAC. Field wiring should conform to all national and local electrical codes.

Terminals for the input power are labeled on the circuit

### PHYSICAL DATA

**Sensitivity:** Adjustable to <1 pF.

**Fail-Safe:** Switch Selectable, High/Low.

**Time Delay:** Adjustable 1 to 30 seconds.

**Supply Voltage:** 120 VAC, 1.5VA.

**Output Relay:** SPDT, 5 amp @ 250 VAC.

**Probe Material:** CPVC.

**Enclosure:** NEMA 4X (IP56), Dust Tight, Water Resistant.

**Enclosure Material:** PVC.

**Mounting:** 1" male NPT.

**Conduit Opening:** 1/2" female NPT.

**Temperature Range:**

Probe:

-40 to 240°F (-40 to 116°C),  
Electronics: -40 to 185°F (-40 to 85°C).

**Weight:** 2.0 lbs (0.91 kg).

board; L for the 115 volt hot wire, N for the neutral wire, and G for the safety ground wire. Recommended wire size is 18 or 16 AWG.

*Note: The terminals are unpluggable to facilitate wiring. Hold down on the circuit board transformer when pulling up on the terminals to unplug them.*

### FAIL-SAFE SELECTION

#### Description

Fail-Safe means that the relay contact positions are set up so that in the event of a power failure the relay will de-energize to a condition that is deemed safe for the application.

#### Fail-Safe High

Fail-Safe High means that the relay will be energized when the probe is uncovered and will de-energize when the probe is covered. In this mode, a power failure will cause the relay contacts to indicate that the probe is covered.

FAIL SAFE HIGH RELAY CONTACT POSITION



**Fail-Safe Low**

Fail-Safe Low means that the relay will be de-energized when the probe is uncovered and will energize when the probe is covered. In this mode, a power failure will cause the relay contacts to indicate that the probe is uncovered.

FAIL SAFE LOW RELAY CONTACT POSITION



**CALIBRATION**

A multi-turn CALIBRATE control is used to compensate for the capacitance of the empty vessel and to set up the desired sensitivity. A tool for adjusting the control is provided on the inside of the lid of the CLS. When finished, return the tool to its clip in the lid for future use.

**Calibration Verification**

Following calibration, the sensitivity setting that you have set in should be checked by verifying that the CLS senses a covered probe condition with your material.

**Calibration Procedure**

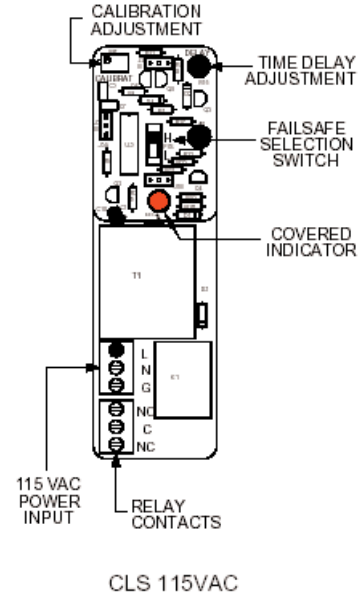
( Probe must be uncovered, material at least 2 feet away from probe )

1. If the COVERED indicator light is OFF, turn the CALIBRATE control counter clockwise (CCW) until the indicator turns ON. If the COVERED indicator is ON proceed with step 2.
2. Turn the CALIBRATE control slowly clockwise (CW) to the point where the COVERED indicator just turns OFF. Now continue to turn the control clockwise (CW) to the desired sensitivity setting.

		Material Dielectric Constant
HIGH sensitivity:	1/8 to 1/2 turn	3 or less
MEDIUM sensitivity:	1/2 to 1 turn	3 to 6
LOW sensitivity:	1 turn or more	6 or more

**RELAY TIME DELAY**

The CLS has a single turn control for adjusting the time delay from approximately 1 to 30 seconds. This is a time delay for the output relay to change states after a covered or uncovered condition is sensed. The COVERED indicator light will immediately respond to a change in covered or uncovered condition regardless of the time delay setting. Minimum time delay, 1 second, DELAY control full counter clockwise, CCW. Maximum time delay, 30 seconds, DELAY control full clockwise, CW.



**LIMITED WARRANTY**

The manufacturer warrants this equipment for one (1) year according to the following terms:

- 1.) This warranty extends to the original purchaser only and commences on the date of original purchase.
- 2.) The manufacturer will repair or replace any part of this equipment found to be defective, provided such part is delivered prepaid, to the factory. Manufacturer's obligation is limited to the cost of material and labor to repair or replace and does not include transportation expenses.
- 3.) This warranty shall not apply to any product that has, in our judgment, been tampered with, altered, subject to misuse, neglect or accident. In addition, the warranty does not extend to repairs made necessary by normal wear.
- 4.) This warranty is in lieu of all other warranties, expressed or implied.