DATA SHEET

Stainless Steel High Level
Drum Indication Switch

M4169-1

M4169-1 high level indication product is designed for tanks or standard 20, 30, and 55-gallon drums. This level indicator will mount directly to standard 3/4" NPT bungs.

These basic dry contact float level switches require no power source. Units can also be ordered with an LED alarm box with on board battery powered indication. Optional LED alarm boxes are available in a fixed-mount (to the level switch). This option provide both the level switch and the alarm with battery power for ease of use in remote sites where a power source is not readily available.

Applications

- Petroleum based liquids, lubricating oils, gasoline, and diesel fuels
- Widely used in vehicle storage tanks, generators, and transmission and hydraulic systems

Materials

- Stem: 316 stainless steel
- Float: 316 stainless steel

Specifications

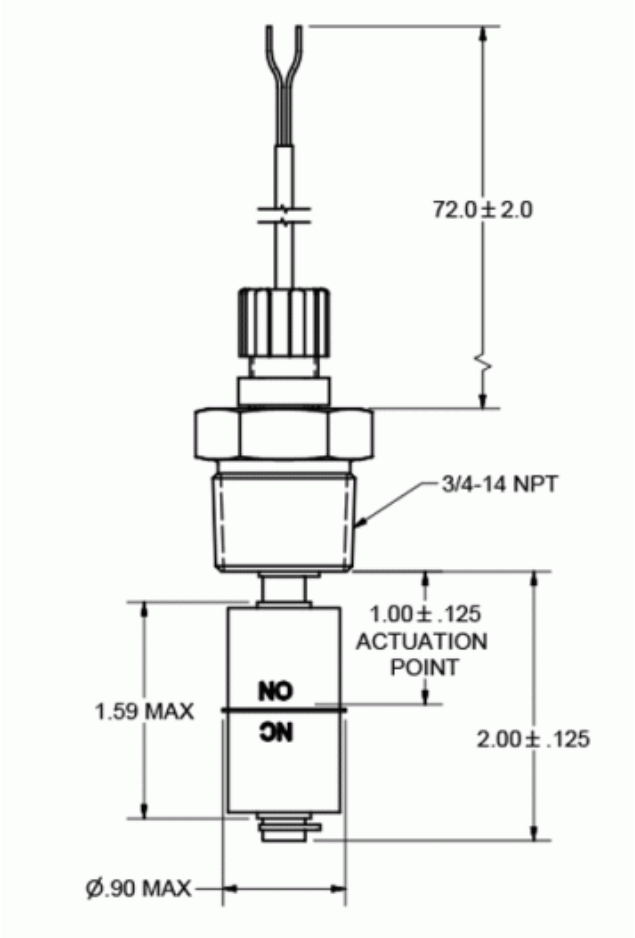
- Max. temperature: 302°F / 150°C
- Max. pressure: 250 psi
- Minimum Media SG: 0.91
- Float diameter: .90"
- Switch rating: 30 watt SPST T
- Mounting: 3/4" NPT
- Lead wires: 72", 22 AWG, 2 conductor, Halar jacketed cable

Electrical Ratings

- 240V AC, 0.14A; 120V AC, 0.28A
- 120V DC, 0.07A; 24V DC, 0.28A

Operation

- Normally open, closes on rising level



Part Numbers	Description	Approvals
M4169-1	Stainless Steel High Level Drum Indication Switch	CE, NSF
M4169-1-FM	M4169-1 w/ Fixed Mount Alarm Box	

NOTE: Other fittings and voltages are available. Contact us to discuss your application.

Custom Configurations

Contact us directly
for custom solutions.
Email: info@madisonco.com

Electrical Considerations

When using Madison level switches, it is important to consider the application's electrical parameters. Our level switches utilize reed switch technology, which are glass encapsulated, magnetically actuated switches. Madison generally provides electrical ratings for resistive loads; however, where the maximum current of the load permits, the switches are capable of controlling devices such as motors, solenoids or coils that produce capacitive or inductive electrical loads. Where possible, Madison recommends the use of general-purpose/isolation relays or controllers to protect the switch.

Protection Techniques and Common Failure Modes

Reed Switch protection is the most successful method of increasing the performance and life of your level sensor. Since every application varies, it is important to understand your protection options. The life of the reed switch is typically 1 million cycles, within rated load conditions. The table below is a guide to suggested protection techniques and common failure modes associated with each load type.

Load	Load Example	Protection	Diagram	Common Failure Modes	Failure Mode Description
Resistive (DC)	Indicator Lamp, Heaters	Current Limiting Resistor	A	In-rush Current (Switching)	In-rush current exceeds rating and welds switch closed
				Over-Current (Carry)	Carry-current exceeds rating and switch welds or burns open like a fuse
Inductive & Capacitative (DC)	Relay Coil, Solenoids, Motor	Reversing Diode	B	Over-Voltage (Arcing)	Voltage arcing during switching welds contacts closed
Inductive & Capacitive (AC or DC)		Resistor & Capacitor Network	C		
Resistive, Inductive & Capacitive (AC or DC)	Indicator Lamp, Heaters, Relay Coil, Solenoids, Motor	Varistor or MOV	D	Over-Voltage (Arcing)	Transients voltage spikes exceed breakdown voltage and weld switch closed

Capacitive Load

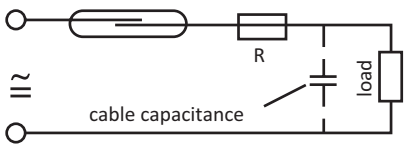


Diagram A: Current Limiting Resistor

Inductive Load

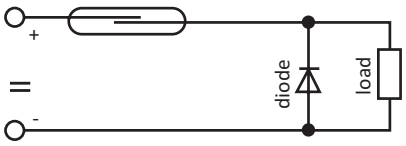


Diagram B: Reversing Diode

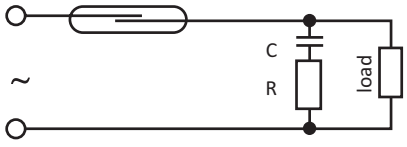


Diagram C: RC Network

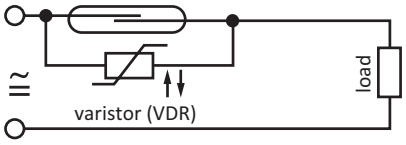


Diagram D: Varistor or MOV

For DC circuits: Insert a 1N4004 diode across the load (i.e.: relay coil) with the cathode end (marked with circular line) connected toward the positive side. This way the diode conducts only when the field collapses. General rule is to use a diode with a voltage rating at least three times the circuit voltage. A 1N4004 has a rating of 1 amp continuous, 30 amp surge, 400V max. Refer to diagram B.

For typical 120V AC circuits: Insert a 50 to 100 ohm, 1/2 watt Resistor in series with a .1 micro farad 400 to 600 volt capacitor across the switch. The capacitor is a high impedance to 60 hertz, but is essentially a short circuit to high frequencies of generated voltages. Alternately, a varistor V130LA10A by itself across the switch will also work for 120V AC. Refer to diagram D.

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