

DATA SHEET

Stainless Steel Continuous
Float Level Sensors

C4651 Series

The C4651 Series monitor liquid levels in small tanks or vessels. These sensors are ideal for water-based fluids or industrial liquid level applications and provide accurate tank level readout and control. The analog continuous level output can be combined with PLC's or digital panel meters or other devices to provide up-to-the-minute level readout and fluid level control.

Applications

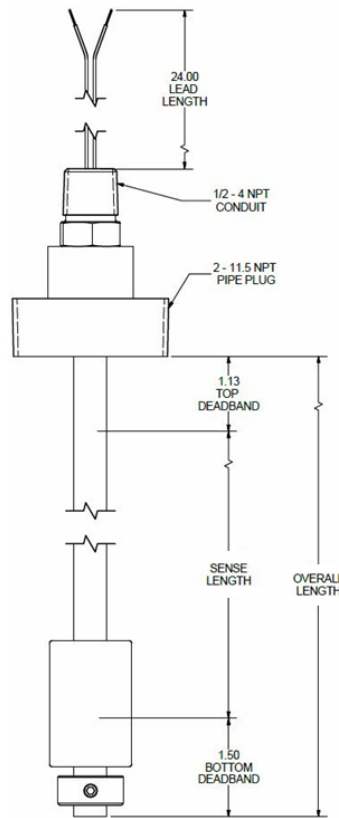
- Small tanks with general fluids
- Ideal for waters, waste and industrial applications

Specifications

- Max. temperature: -40- 221°F / -40- 105°C, non-freezing liquids
- Resolution: 1/4"

**Custom
Configurations**

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



Part Numbers	Sensing Length	Float Material	Stem Material	Mounting	Float Diameter	Minimum Media SG	Input Voltage	Output
C4651-12802	16"	Polypropylene	316 Stainless Steel	1-1/2" NPT	1.5" OD	0.96	12-30V DC	4-20 mA
C4651-12803	21.13"	316 Stainless Steel		2" NPT	2.13" OD	0.69		
C4651-12804	29.38"	Buna-N		2" NPT	1.25" OD	0.56		

NOTE: Other fittings and voltages are available. [Contact us](#) to discuss your application.

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 & Capacitive (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

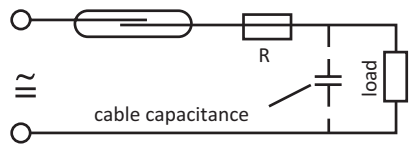


Diagram A: Current Limiting Resistor

Inductive Load

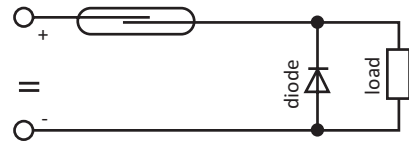


Diagram B: Reversing Diode

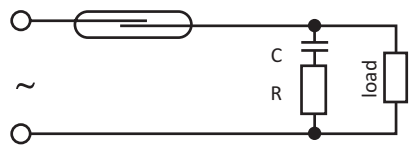


Diagram C: RC Network

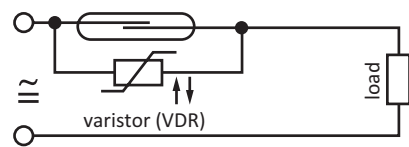


Diagram D: Varistor or MOV

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.



Madison Company | Sensing Solutions since 1959

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