



# Application Alley

**PARTNER | SOLVE | DELIVER**

## **Automotive - Fluid Level**

**Adaptable Multi-Point Fluid Level Sensor**



Custom  
Engineered  
Solutions for  
Tomorrow

## Introduction

Liquid systems all have their own specialty aspects and their own peculiarities. The liquids vary in density and viscosity (flow level) in going from water with a centi-poise of 1 to liquid epoxies having up to 10,000 centi-poise. Also, the temperatures can vary from  $-40^{\circ}\text{C}$  for flour-inert (3-M liquids) to  $200^{\circ}\text{C}$  for pressure heated water and other special liquids. Meeting these extremes is no easy matter. Standex-Meder's new LS04 series attacks these extremes along with multiple sensing points and multiple floats. Therefore, liquid baths having two or more different liquids with different densities and viscosities can be simultaneously measured and their liquid levels monitored.



Figure 1. A triple float sensor connected to the top part of a container

## Features

- All inclusive fluid level sensor having the sensing element (reed switch), float, and magnet all as one component mounted on a PCB internal to the stem
- Ability to perform under hot and cold liquid systems
- Up to 9 point liquid level sensing
- Up to 6 active floats on one stem or shaft
- Meets RoHS Directive 2002/95/EC
- Hermetically sealed

- Dynamically tested contacts
- Reliable switching
- Stem length for 100 mm to 250 mm
- Ability to exist in oil, gasoline, petrol, water and mild acids

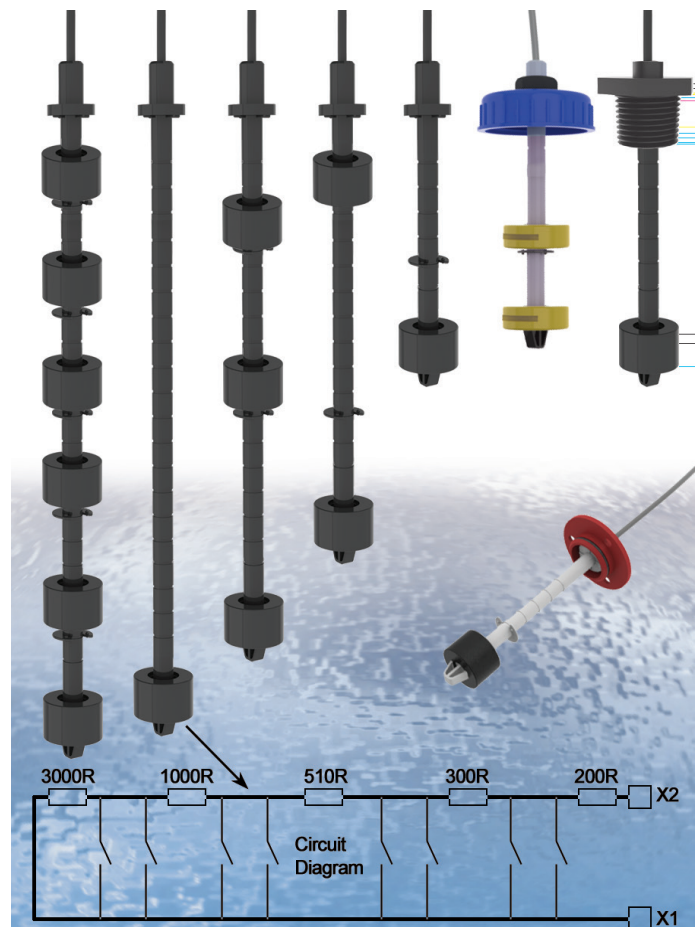


Figure 2. A representation of the versatility of the LS04 series showing multiple float and stem configurations.

## Applications

- Single and multipoint liquid level sensing for an assortment of liquid systems running either hot and/or cold fluids

### MEDER's Versatile Approach to Liquid Level Sensing Offers the Needed Design Answers

Because of the plethora of requirements in liquid systems, sensing the levels and controlling their depth, takes on an assortment of requirements. Essentially every liquid system needs liquid level controls and almost all require a unique set of sensing parameters. For one sensing company to tool all these level sensing conditions would be insurmountable. Standex-Meder's goal however, is to satisfy all our customer's requirements. To solve this conundrum the Standex-Meder engineers have cleverly developed a set of tools that offer the versatility needed to satisfy the above requirements.

Specifications (@ 20°C) LS04 Series			
	Min	Max	Units
<b>Operate Specifications</b>			
Must close distance	Ref	Ref	mm
Must open distance	Ref	Ref	mm
Hysteresis			
<b>Load characteristics</b>			
Switching voltage		1000	V
Switching current		1.0	Amps
Carry current		2.0	Amps
Contact rating		200	Watts
Static contact resistance		150	mΩ
Dynamic contact resistance		200	mΩ
Breakdown voltage	4000		V
Operate time		0.8	msec
Release time		0.05	msec
Operate temp	-40	200	°C
Storage temp	-20	100	°C

The LS04 Series approach has been tooled to handle up to 9 sensing positions and up to 6 individual floats on one shaft. This tooling versatility allows us to meet most of the more challenging Liquid System level sensing requirements. The stem or shaft ranges from 100 mm up to 250 mm representing a long vertical sensing range. Standard PVC cable is used to protect and insulate the electrical wiring that is all epoxied into the stem.

This tooling can be molded in various plastics, each capable of meeting the rigors of certain liquids. For instance molding the stem or shaft of the sensor with polyamide (PA) and a float of NBR (Nitrile Butadiene Rubber) will allow usage in oils, gasoline, and petrol. Using Polypropylene (PP) will be ideal for water and dilute acidic liquids.

Standex-Meder's new designs encompass it

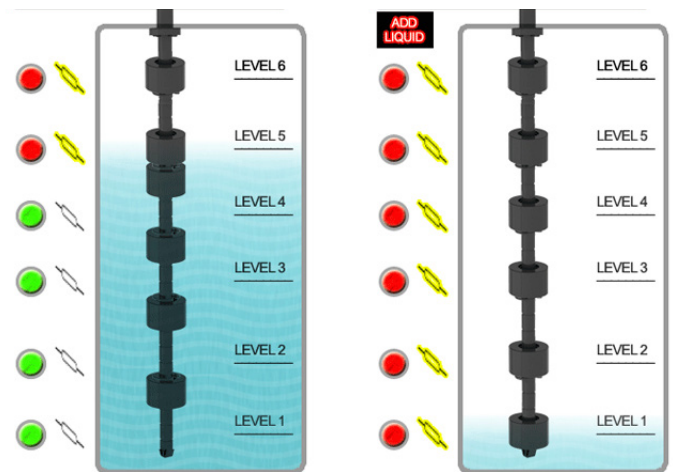




Figure 3. Shows the LS04 operating at different levels of liquid detection.

all – the reed sensor, the float, and the magnet along with a PCB and its associated circuitry. This saves the system designer's valuable time by only having to specify and qualify one component. They no longer have to work with several different suppliers and coordinate between them.




Since this sensor requires some electrical circuitry, using a printed circuit board with plated thru solder holes guarantees reliable connections using an automated wave soldering system. The PCB is a long thin circuit board that runs down the length of the stem. And in this manner the hermetically sealed reed switches are properly placed and positioned in their sensing locations.

Another critical element is the acknowledgement that during assembly, problems can occur. Standex-Meder tests all sensors 100% for all operating conditions, but in addition tests for dynamic contact resistance (DCR). Essentially this test is a guard against the many faults that can occur during assembly. If the reed contacts have any internal contaminations; or the reed capsule has been stressed or a slight crack has occurred, this DCR will detect these conditions and reject the sensor. This testing is all carried out in an automated testing system. Standex-Meder's design for manufacturing approach provides a long reliable life in the field.

**Adaptable Multi-Point Liquid Level Series**

Series	Dimensions		Illustration
	mm	inches	
LS04	W	0.984	
	H	25	
	L	165	
LS05	W	0.276-0.630	
	H	0.276-0.630	
	L	3.150-78.740	

**Single Point Liquid Level Series**

Series	Dimensions		Illustration
	mm	inches	
LS01	W	19	
	H	24	
	L	42	
LS02	W	19	
	H	24	
	L	75	
LS03	W	25	
	H	25	
	L	80	

Find out more about our ability to propel your business with our products by visiting [www.standexmeder.com](http://www.standexmeder.com) or by giving us a [hello@standexelectronics.com](mailto:hello@standexelectronics.com) today! One of our brilliant engineers or solution selling sales leaders will listen to you immediately.

## About Standex-Meder Electronics

Standex-Meder Electronics is a worldwide market leader in the design, development and manufacture of standard and custom electro-magnetic components, including magnetics products and reed switch-based solutions.

Our magnetic offerings include planar, Rogowski, current, and low- and high-frequency transformers and inductors. Our reed switch-based solutions include Meder, Standex and OKI brand reed switches, as well as a complete portfolio of reed relays, and a comprehensive array of fluid level, proximity, motion, water flow, HVAC condensate, hydraulic pressure differential, capacitive, conductive and inductive sensors.

We offer engineered product solutions for a broad spectrum of product applications in the automotive, medical, test and measurement, military and aerospace, as well as appliance and general industrial markets.

Standex-Meder Electronics has a commitment to absolute customer satisfaction and customer-driven innovation, with a global organization that offers sales support, engineering capabilities, and technical resources worldwide.

Headquartered in Cincinnati, Ohio, USA, Standex-Meder Electronics has eight manufacturing facilities in six countries, located in the United States, Germany, China, Mexico, the United Kingdom, and Canada.

For more information on Standex-Meder Electronics, please visit us on the web at [www.standexmeder.com](http://www.standexmeder.com).

### Contact Information:

Standex-Meder Electronics  
World Headquarters  
4538 Camberwell Road  
Cincinnati, OH 45209 USA

**Standex Americas (OH)**  
+1.866.STANDEX (+1.866.782.6339)  
[info@standexelectronics.com](mailto:info@standexelectronics.com)

**Meder Americas (MA)**  
+1.800.870.5385  
[salesusa@standexmeder.com](mailto:salesusa@standexmeder.com)

**Standex-Meder Asia (Shanghai)**  
+86.21.37820625  
[salesasia@standexmeder.com](mailto:salesasia@standexmeder.com)

**Standex-Meder Europe (Germany)**  
+49.7731.8399.0  
[info@standexmeder.com](mailto:info@standexmeder.com)