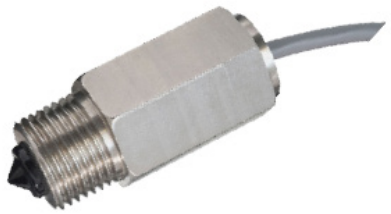
Optical Liquid Level Switches

LLHP High Performance Series

- Designed for applications requiring a robust metal housing and larger threads for external mounting
- Reverse polarity, ESD and transient over-voltage protected
- Standard and extended temperature ranges available
- Stainless steel housing with Polysulfone sensing tip [b]
- Choice of terminations and output configurations
- Liquid level switches that can detect almost any liquid type; oil or water based



Description

Designed for tough and chemically aggressive environments, the LLHP series features larger mounting threads and rugged stainless steel housings. These microcontroller-based, solid-state sensors use infrared optics to detect almost all oil- and water-based liquids.

Users can configure the signal to switch high or low depending on wet or dry conditions. Push-pull output is available on the lower supply voltage range (4.5-15.4 V_{DC}), sinking or sourcing up to 100mA. N and P-type outputs are available on the higher supply voltage range (10-45V_{DC}), sinking or sourcing up to 800mA. The sensors have chemically resistant Polysulfone tip and operate across -25...+80°C (standard) or -40...+125°C (extended), making them ideal for demanding applications [a].

Specifications

Technical Specifications	
Supply voltage (Vs)	4.5...15.4V_{DC} or 10...45V_{DC}
Supply current (Is)	15mA max. (Vs = 12V_{DC}) or 35mA max. (Vs = 45V_{DC})
Output sink and source current (Iout)	100mA max. (15.4V_{DC}) or 800mA max. (45V_{DC})
Operating temperature [b]	Standard: -25...+80°C (13...+176°F)
	Extended: -40...+125°C (–40...+257°F)
Storage temperature	Standard: -30...+85°C (22...+185°F)
	Extended: -40...+125°C (–40...+257°F)
Housing material	Stainless Steel with Polysulfone tip [b]
Sensor termination	Various; refer to next page
Output Values when Vs = 4.5...15.4V_{DC}	
Output current (Iout):	100mA max
Output voltage (Vout):	Output High: Vout = Vs - 1.5V max
	Output Low: Vout = 0V + 0.5V max
Output Values when Vs = 10...45V_{DC}	
Output current (Iout):	800mA max
Output voltage (Vout):	Output High: Vout = Vs - 1.8V max
	Output Low: Vout = 0V + 0.7V max

Core Applications

- Accurate, fast response, high reliability, long life
- Ideal for aggressive and harsh environments
- Easy to install
- Options to meet application specific requirements
- Robust electronics
- Easy to interface with customer electronics

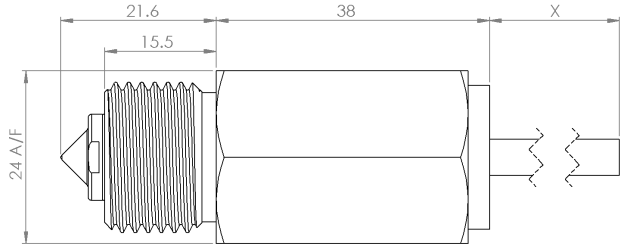
[a] Avoid reflective surfaces within 10mm of the sensing tip, see SST's Liquid Level Switches – Installation, Operation and Compatibility Guide.

[b] Before use check that the fluid in which you wish to use these devices is compatible with Polysulfone. Some common fluids and compatibility can be found in SST's Liquid Level Switches – Installation, Operation and Compatibility Guide.

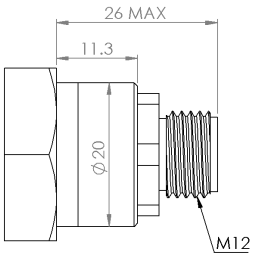
Outline Drawing

All dimensions shown in mm. Tolerances = ±1mm.

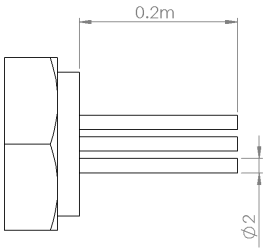
Cable



Brad Harrison micro



Flying Leads



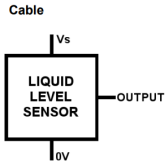
Housing Specifications

Installation drawings and 3D (.step) files available on the product webpage.

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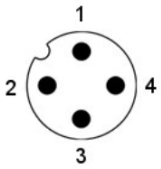
Housing Type				
Thread	1/2" BSPP	3/8" BSPP	1/2" NPT	3/4"-16 UNJF
Pressure [c]	25 bar / 363 psi maximum			
Sensor termination	Cable: 3m length (IP67)			
	M12x1 Brad Harrison micro (IP67)			
	Flying leads: 24AWG, 0.2m PTFE wires, 8mm tinned (IP65)			

Electrical Interface

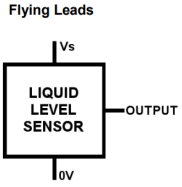


Wire	Designation
Red	Vs
White	Output
Black	0V

Brad Harrison micro



Pin	Designation
1	Vs
2	Not connected
3	0V
4	Output



Wire	Designation
Red	Vs
Green	Output
Blue	0V

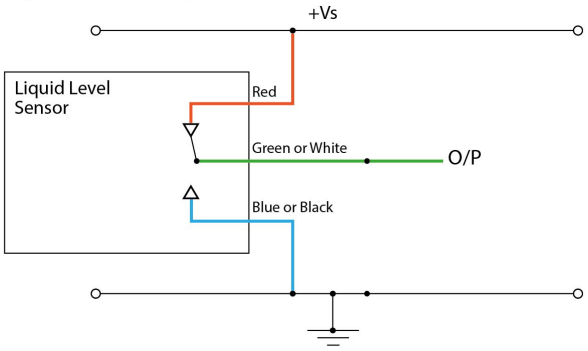
[c] When correctly sealed.

Circuit Diagrams

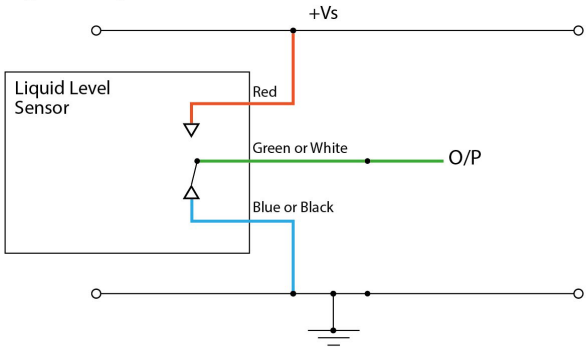
In order to suit any application, these sensors have been designed with various output circuit configurations.

4.5V—15.4V$_{DC}$

1 Digital Output High in Air

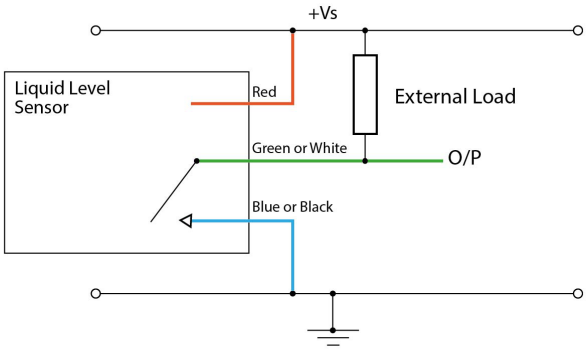


2 Digital Output Low in Air

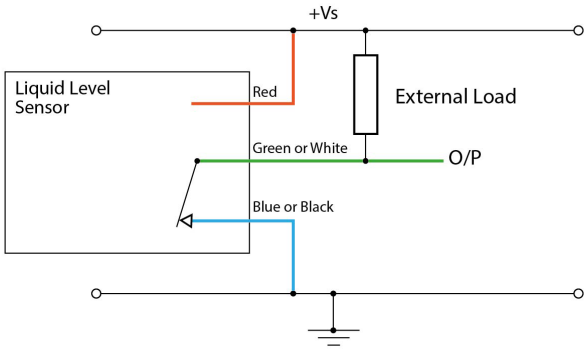


10V—45V$_{DC}$

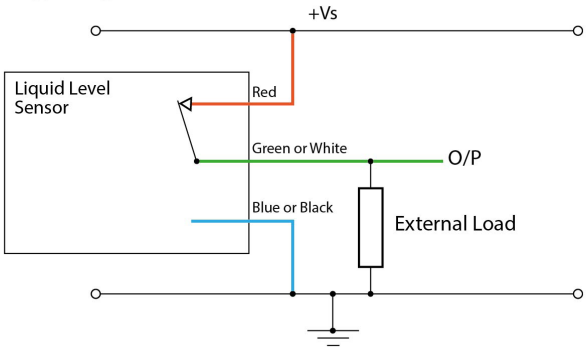
5 N-Type High in Air



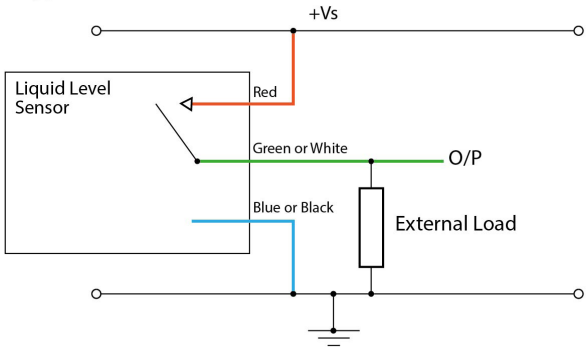
6 N-Type Low in Air



7 P-Type High in Air



8 P-Type Low in Air



Take care when connecting loads. The minimum load impedance should not be less than Vs/max output current.
Note: Shorting the output to Vs or 0V will result in irreparable damage to the sensor.

Ordering Guide

Generate your specific part number using the convention shown below.
Use only those letters and numbers that correspond to the sensor and output options you require — omit those you do not.

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L L H P X X X X X X

Housing Material
A Polysulfone tip

Output Type / Logic	
1 Push Pull High in Air (100mA, 4.5-15.4V)	2 Push Pull Low in Air (100mA, 4.5-15.4V)
5 N-Type High in Air (800mA, 10—45V)	6 N-Type Low in Air (800mA, 10—45V)
7 P-Type High in Air (800mA, 10—45V	8 P-Type Low in Air (800mA, 10—45V)

Housing Type
2 Stainless steel 3/8" BSPP
5 Stainless steel 1/2" BSPP
8 Stainless steel 1/2" NPT
B Stainless steel 3/4"-16 UNJF

Operating Temp.
0 -25...+80°C
1 -40...+125°C

Termination
D M12x1 Brad Harrison (IP67)
M Cable 3.0m [d] (IP67)
P Flying leads 24AWG 0.2m (IP65)

Internal Seal Washer
1 Nitrile rubber
5 Viton

Note: Not all combinations are configurable and minimum order quantities (MOQs) may apply in some cases.

[d] Cable option is limited to an ambient temperature range of -20...+80°C (-4°F...+176°F)

Caution	Information
Do not exceed maximum ratings and ensure sensor(s) are operated in accordance with their requirements. Carefully follow all wiring instructions. Incorrect wiring can cause permanent damage to the device. SST Sensing Ltd recommend using alcohol based cleaning agents. Do NOT use chlorinated solvents such as trichloroethane as these are likely to attack the sensor material. **Failure to comply with these instructions may result in product damage.**	As customer applications are outside of SST Sensing Ltd.'s control, the information provided is given without legal responsibility. Customers should test under their own conditions to ensure that the equipment is suitable for their intended application. Before use, check that the fluid in which you wish to use these devices is compatible with Polysulfone. General Note: SST Sensing Ltd. reserves the right to make changes to product specifications without notice or liability. All information is subject to SST Sensing Ltd's own data and considered accurate at time of going to print. **For technical assistance or advice, please email: sensors@dwyeromega.com**

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