Optical Liquid Level Switches

Optomax Basic Series

- Optics only solution
- Customer is responsible for interfacing the switch to their application
- 3 wire (common cathode/emitter) and 4-wire (galvanically isolated) version available
- Polysulfone or Trogamid® housing material options
- Internal and external mounting options



Description

The Optomax Basic is a compact, OEM-focused liquid level sensing solution designed for space-constrained [a] and cost-sensitive applications. Offering fast response times and easy installation, this optics-only sensor is ideal for integration into custom systems. With a solid-state design and no moving parts, it ensures high reliability and longevity.

Compatible with a broad range of fluids and chemicals, it interfaces easily with customer electronics and can be tailored to meet specific application requirements,making it a flexible and affordable choice for OEM designs.

Specifications

Technical Specifications	
Supply voltage (Vs)	Any with suitable LED current limiting resistor
LED forward current (If)	10mA recommended
Output signal	Phototransistor open collector. Refer to circuit diagram section on datasheet
Operating temperatures	Standard: -25...+80°C (-13...+176°F)
Storage temperatures	Standard: -30...+85°C (-22...+185°F)
Housing material [b]	Polysulfone or Trogamid® [c]
Switch termination	24AWG, 250mm PVDF wires, 10mm tinned
Output Values	
Output voltage (Vout):	Refer to circuit diagram section

Core Applications

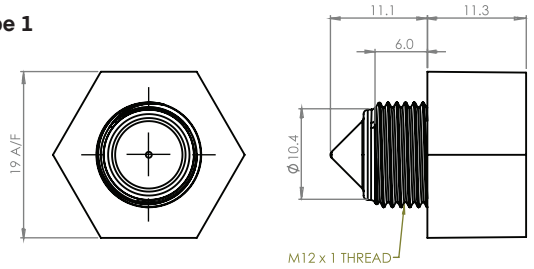
- Tank or vessel level control monitoring
- Protecting robotic process automation systems
- Food & beverage applications
- Fluid control systems
- SCR (Selective Catalytic Reduction) Emissions Systems

[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 either with Polysulfone or Trogamid®. Some common fluids and compatibility can be found in SST's Liquid Level Switches – Installation, Operation and Compatibility Guide
[c] When using Trogamid® above +85°C some oil based liquids can cause deformation of the sensing tip, and must be tested for compatibility

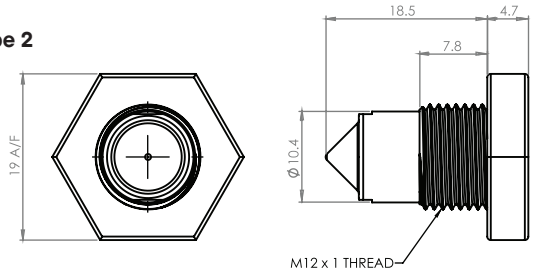
Outline Drawing

All dimensions shown in mm. Tolerances = ±0.5mm.

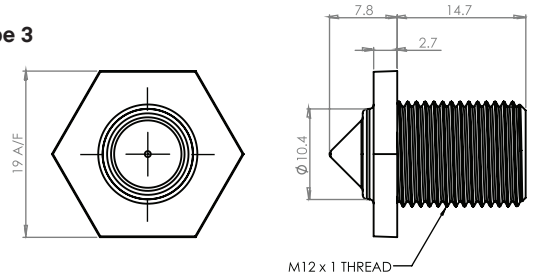
Type 1



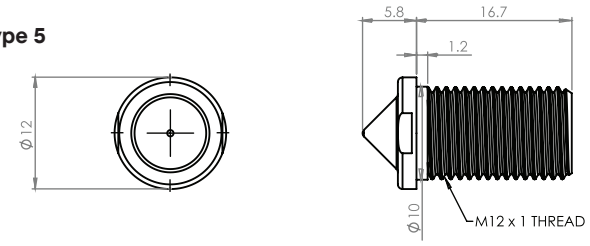
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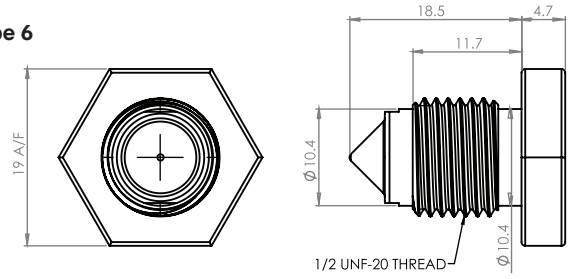
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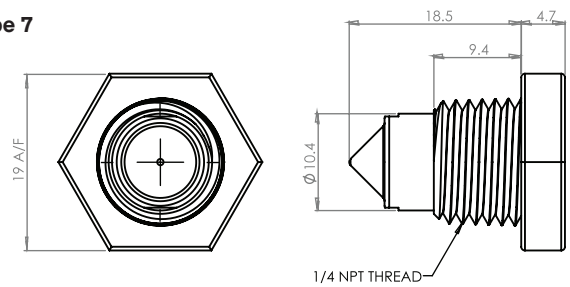
Type 5



Type 6



Type 7



[d] When correctly sealed.

Housing Specifications

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

Housing Type			
	Type 1	Type 2	Type 3
Thread	M12x1x 8g		
Pressure [d]	7 bar / 101 psi maximum		
Tightening Torque	1.5 Nm / 13.26 in-lbs maximum		

Housing Type			
	Type 5	Type 6	Type 7
Thread	M10x1	1/2"-20 UNF	1/4" NPT
Pressure [d]	20 bar / 290 psi max.	7 bar / 101 psi maximum	
Tightening Torque	1.5 Nm / 13.26 in-lbs maximum		

Electrical Interface

Flying Leads—3-wire option

Wire	Designation
Red	LED Anode
Green	Output
Blue	0V

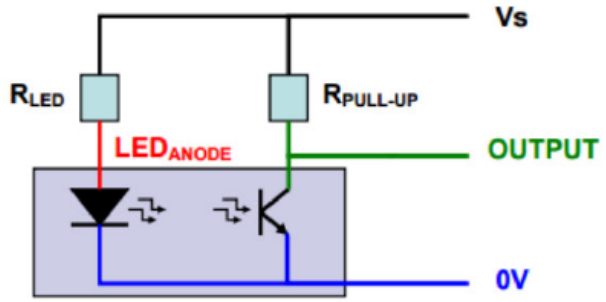
Flying Leads—4-wire option

Wire	Designation
Red	LED Anode
Green	Output
Blue	0V LED
Black	0V Phototransistor

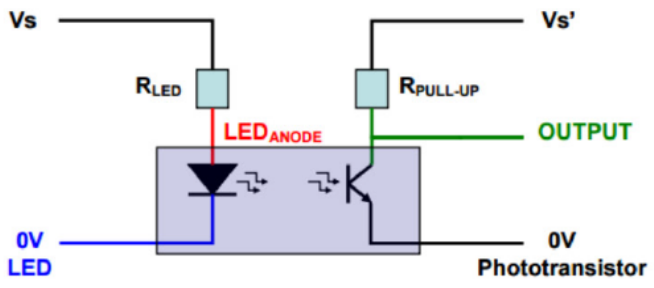
Circuit Diagrams

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

Flying Leads—3-wire option



Flying Leads—4-wire option



Notes: The 4-wire version provides galvanic isolation between input (IR-LED) and output (Phototransistor).

Pre-selected R_{LED} and $R_{PULL-UP}$ value for different supply voltages				
Vs	R_{LED}	$R_{PULL-UP}$	V_{OUTPUT} in Air	V_{OUTPUT} in Water
3.3V	200R	2K	<0.75V	>2.5V
5V	360R	2K	<1V	>4.25V
8V	680R	2.5K	<1.5V	>7.25V
12V	1K	3K	<3V	>11.25V
15V	1.3K	3.5K	<3.25V	>14.25V
24V	2.2K	4K	<10.5V	>22.5V

Typical installation: You must select suitable resistors for your chosen supply voltage. Forward voltage of LED is 1.3V and LED current should be 10mA (depending on application liquid). Therefore, for a supply of Vs = 5V for example:

$$R_{LED} = \frac{(V_s - 1.3)V}{10mA} = \frac{5 - 1.3}{0.01} = 370\Omega \approx 360\Omega \text{ (standard value)}$$

Caution: Failure to select the correct resistor values may result in 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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Sensor mounted from inside vessel

L L X X 0 0 A X

Housing Material	Housing Type	Termination
C Polysulfone	3 Type 3 M12x1-8g	3 3-wire Output
T Trogamid ®	5 Type 5 M10x1	4 4-wire Output

Sensor mounted from outside vessel

L L X X 0 0 A X S H

Housing Material	Housing Type	Termination
C Polysulfone	1 Type 1 M12x1-8g	3 3-wire Output
T Trogamid ®	2 Type 2 M12x1-8g	4 4-wire Output
	6 Type 6 1/2"-20 UNF	
	7 Type 7 1/4" NPT	

Notes:

- Type 3 and Type 5 sensors are mounted internally.
- Types 1, 2, 6 & 7 sensors are mounted externally.

Caution

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.

Accessory Table

Thread	Housing Type	Accessory	Material	Order Code
M12	Type 2	Seal washer	Nitrile	41000190-002
M12	Type 2	Seal washer	EPDM	41000190-003
M12	Type 2	Seal washer	VAMAC	41000190-004
M12	Type 2	'O' ring	As required	Not Sold by SST
M12	Type 2	Nut	Zinc-plated brass	LL-NUT-ZNC
M12	Type 2	Nut	Stainless steel	LL-NUT-STS
1/2" -20 UNF	Type 6	'O' ring	As required - See SAE J1926-1	Not sold by SST
1/4" NPT	Type 7	Sealing tape	PTFE	Not sold by SST
1/4" NPT	Type 7	Sealing compound	Sealing compound must be compatible with housing material	Not sold by SST

Caution

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.

Information

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 or Trogamid®.

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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