

Let GEMS Keep an "Eye" on Your Liquid Level

Compact, Electro-Optic Liquid Level Switches and Controllers

- ▶ Small size
- ▶ Economically priced
- ▶ Built in, solid-state electronics
- ▶ No moving parts
- ▶ Traingular prism, not susceptible to droplets
- ▶ Simple, one-unit installation

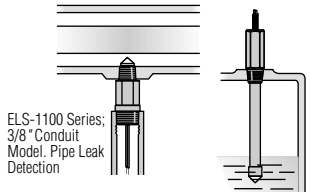
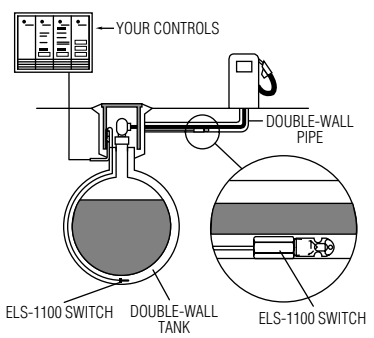
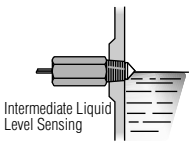
ELS Series Level Switches are low cost, compact, optical level sensors with built-in switching electronics. With no moving parts, these small units are ideal for a variety of point level sensing applications - especially where dependability and economy are a must.

The sensor offers ±1mm repeatability and broad liquid compatibility. They are not recommended for use in any liquid that crystallizes or leaves a solid residue.

Level switches are suitable for high, low or intermediate level detection in practically any tank, large or small. Installation is simple and quick through the tank top, bottom or side. Solid state switching ensures dependability over long service life.

Typical Applications

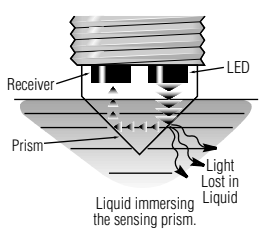
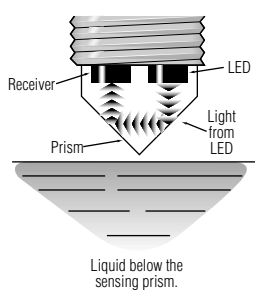
- ▶ Medical laboratory
- ▶ Food and beverage systems
- ▶ Pharmaceuticals
- ▶ Petrochemicals
- ▶ Leak detection
- ▶ Hydraulic reservoirs
- ▶ Machine tools



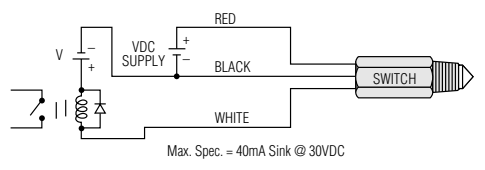
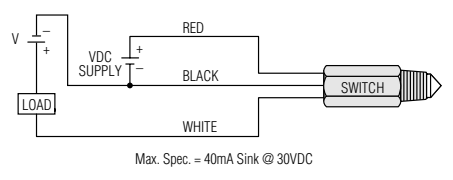
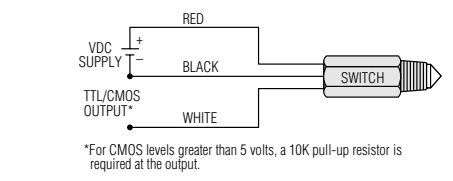
ELS-1100 Series; High Liquid Level Sensing

Simple Operating Principle

The electro-optical sensor contains an infrared LED and a light receiver. Light from the LED is directed into a prism which forms the tip of the sensor. With no liquid present, light from the LED is reflected within the prism to the receiver. When rising liquid immerses the prism, the light is refracted out into the liquid, leaving little or no light to reach the receiver. Sensing this change, the receiver actuates electronic switching within the unit to operate an external alarm or control circuit.



Typical Wiring Diagrams - ELS-1100 and ELS-300 Series



Reflective Surface

Any optical sensor may be affected by reflective surfaces. Consult GEMS if prism is to be less than 50mm from any reflective surface.

LEVEL SWITCHES

ELS-1100 Series



ELS-1100

These Polysulfone units are both compact and economical. They feature a variety of mountings, power requirements and electrical terminations to make it easy to find a perfect match for your application.

ELS-1100HT/HTS

Slightly larger than the ELS1100, the "HT" or High Temperature version is made from high performance Isoplast® plastic. This material provides extended temperature, durability and chemical compatibility .. all at a low cost! The HT small (HTS) protrudes only 13mm when fitted.

ELS-1100TFE

When high purity or resistance to chemical attack is vital, ELS-1100TFE sensors are the ultimate solution. They feature a pure Teflon® body and prism construction. Even the Hypalon® vapor barrier and Teflon® coated lead wires give evidence to the care we've taken to make this the perfect liquid level sensor for pharmaceuticals, semiconductor manufacturing, food and beverage, chemical processing, or anywhere purity or chemical resistance is the major criteria.

ELS-1100FLG

The easy solution for thin wall tanks ($\leq 6.5\text{mm}$ thick): ELS1100FLG Series. No threads needed with these flanged units. Slip through a 19mm hole and tighten the jam nut; Viton® gasket forms a tight seal. Ideal for sheet metal, moulded plastic tanks and medical applications where elimination of exposed threads removes potential bacterial breeding grounds.



ELS-300 Series

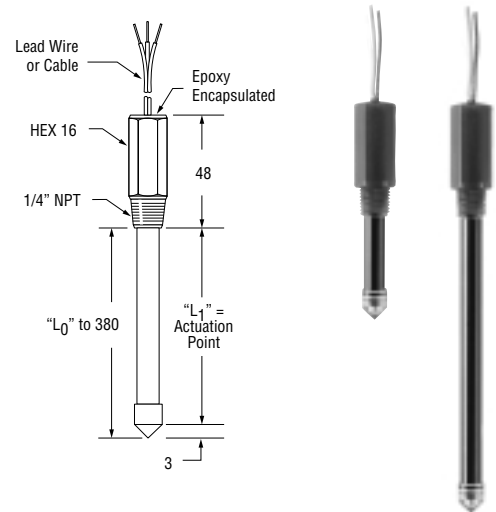
Customized lengths up to 380mm

Stretch out and take a dip with the custom length ELS-300 Series. They feature the same materials and performance of our ELS-1100 Series and are suitable for general purpose use where a top or bottom mount is required. They provide the ability to detect liquid levels within 15 inches of the top or bottom on a tank.

Specifications

Wetted Materials	Polysulfone
Operating Pressure	0 to 10 bar, Maximum
Operating Temperature*	-18 to +80°C
Input Power	5 VDC or 10-28 VDC
Output	TTL/CMOS Compatible. Open Collector Output

*These switches are not for use in freezing liquids.
Contact Sales Office for more information
Order as : ELS-300, L1= (state length required)



LEVEL SWITCHES

Opto-Pak™

Controller for Gems Electro-Optic Switches

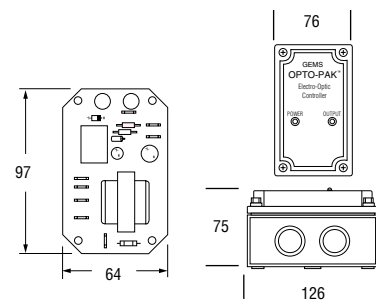
Extend power and switching capabilities of 10 to 28 VDC Electro-Optic switches

GEMS Opto-Pak Controllers convert standard 220 VAC line current to the 10-28 input power required for ELS-1100 and ELS-300 operation, and provide an SPDT, 5 Amp relay output for direct control of moderate loads.

Two models are available: an open circuit board Opto-Pak Controller for incorporation into custom enclosures, and the self-contained, IP 65 model pictured here.

- ▶ Operates with 10-28 VDC ELS-1100, ELS-1100HT*, ELS-1200* and ELS-300 Series Electro-Optic Switches.
- ▶ Converts TTL output signal to an SPDT 5 Amp relay output.
- ▶ Available as open board or mounted in IP 65 junction box.

*12 VDC versions only.



Specifications

Voltage Input	220 VAC $\pm 10\%$, 50/60 Hz
Maximum Current Draw	70mA @ 220 VAC
Relay Output	SPDT; 5 Amps @ 115 VAC, 5 Amps @ 30 VDC
Operating Temperatures	-13°F to +158°F (-25°C to +70°C)
Electrical Connections	1/4" Male Spade Terminals*
*Ten (10) 1/4" female spade connectors (not shown) shipped loose with each unit.	
Open Board	PN 162171
IP65 Enclosure	PN 190460

Specifications

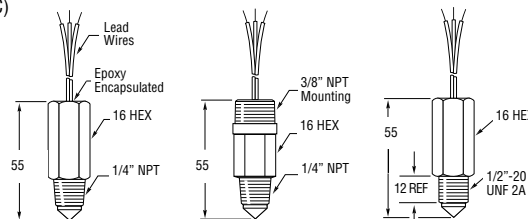
	ELS-1100/FLG	ELS-1100HT/HTS	ELS-1100TFE
Materials Housing and Prism	Polysulfone (PSU) or Nylon (PA) Polysulfone or Nylon**	Isoplast®	Teflon (PTFE)
Operating Pressure	10 bar, Maximum	10 bar, Maximum	10 bar, Maximum
Operating Temperature*	-18°C to +80°C	-40°C to +100°C	-18°C to +80°C
Current Consumption	18 mA, approximately	45 mA, approximately	18mA, approximately
Output**	TTL/CMOS compatible. Open collector output may sink 40 mA Up to 30 VDC	TTL/CMOS compatible. Transistor output with 10Kohms pull up resistor may sink 18mA 12VDC input power units switch a maximum 5 VDC on output	TTL/CMOS compatible. Open collector output may sink 40 mA Up to 30 VDC
Repeatability	±1mm	±1mm	±1mm
EMI Susceptibility	Meets (MIL-STD-461B Part 2 Modified) Specification of 10 V/M for frequency range 30 to 1000 MHz (Except 609 MHz = 9V/M and 679 MHz = 7.5 V/M)		
Electrical Termination	Lead wire, 22 AWG PVC, 0.3m	Lead wires, 22AWG, Polymeric, 0.3m	Teflon (PTFE) Cable, 18AWG, 0.6m

* These switches are not for use in freezing liquids.
** Not suitable for long term immersion in water.

Order data

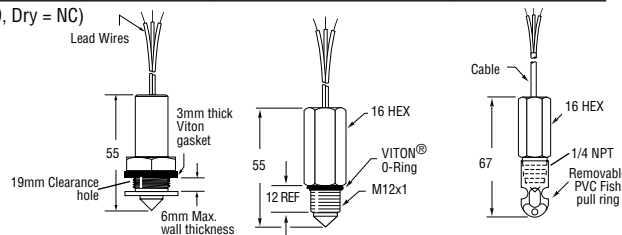
Supply	Probe Conditions at Current Sink	1/4 NPT Polysulfone	1/4 NPT + 3/8 Cond Polysulfone	Nylon	1/2" UNF Polysulfone
5V dc	Wet Dry	138167	144225	175631	144235
10-28Vdc	Wet Dry	142700 143570	143585 143590	157750 175632	143580 143575

(Wet = NO, Dry = NC)



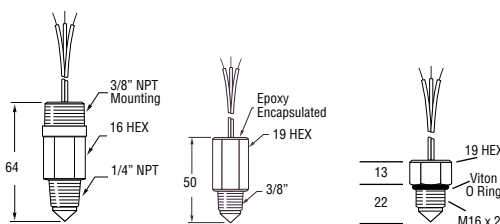
Supply	Probe Conditions at Current Sink	Flange Polysulfone	M12 x 1 Polysulfone	Nylon	Fish Pull Polysulfone
5V dc	Wet Dry	187575 187590	166541	175630	139293
10-28Vdc	Wet Dry	187585 187580	169555 143590	175620 175632	143577 148973

(Wet = NO, Dry = NC)



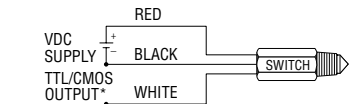
Supply	1/4 NPT ELS-1100TFE	3/8 NPT ELS-1100HT Isoplas	M16 x 2 ELS-1100HTS Isoplas
5Vdc	-	153061 153062	191341 191342
10-28Vdc	173800 173700	153063* 153064*	-

(Wet = NO, Dry = NC)

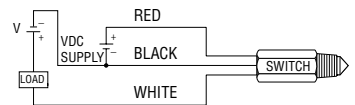


Optional Boot for ELS-1100TFE - PN 185551

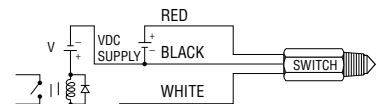
Typical Wiring Diagrams ELS1100 and ELS300 Series



* For CMOS levels greater than 5 volts, a 10K pull-up resistor is required at the output

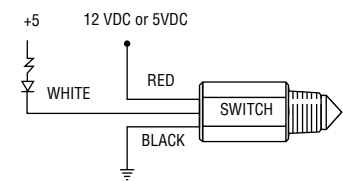


*Max. Spec. = 40mA Sink @ 30VDC

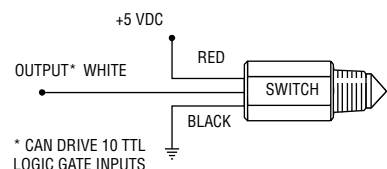


*Max. Spec. = 40mA Sink @ 30VDC

ELS-1100HT/HTS Transistor Output



TTL Compatible Output



* CAN DRIVE 10 TTL LOGIC GATE INPUTS

Intrinsically Safe Versions

GEMS ELS-1100 Switches may be rendered intrinsically-safe for Class 1, division 1, Group C & D when used with appropriate GEMS Zener Barriers. Call Gems Sensors for special ELS-1100-IS (intrinsically-safe) part numbers and Installation Bulletins 148745 and 148744, File No. E44570.

