Electro-Optic Level Switches

Single Point

- Small size
- Economically priced
- Built-in, solid-state electronics
- No moving parts
- 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.

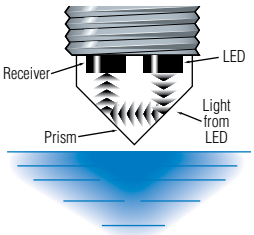
Level switches are suitable for high, low or intermediate level detection in practically any tank, large or small. Installation is simple and quick through the tank top, bottom or side. Solid state-switching ensures dependability over long service life.

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.

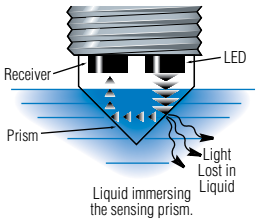
General Operating Principle

The electro-optic 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.



Liquid below the sensing prism.



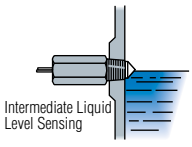
Liquid immersing the sensing prism.

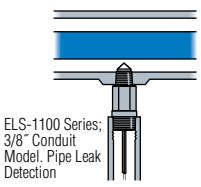
Reflective Surface

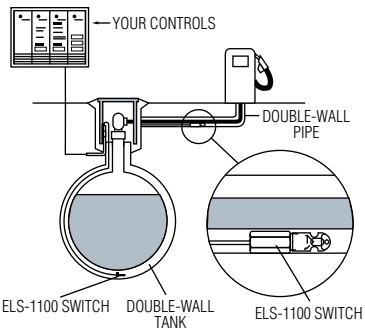
Any optical sensor may be affected by reflective surfaces. Consult Gems if prism is to be less than 2 inches from any reflective surface.

Typical Applications

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







Industry's Largest Selection!

ELS-950

ELS-1100

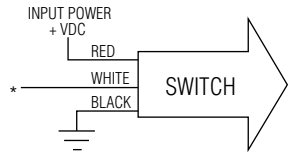
ELS-1100HTS

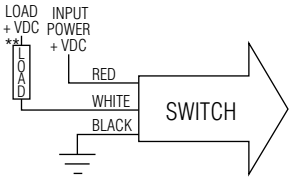
ELS-1150
Stainless Steel

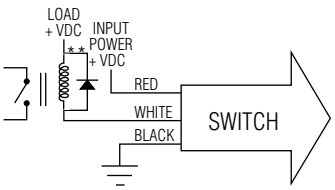
ELS-1100FLG

ELS-1100TFE

Typical Wiring Diagrams - For all electro-optic units not otherwise specified.







*** TTL/CMOS Output-For levels greater than 5 volts, a 10K pull-up resistor is required at the output.**
**** Maximum load=40mA @ 30VCD.**

Order from: C A Briggs Company; 622 Mary Street; Suite 101 - Warminster, PA 18974
Phone: 267-673-8117 - Fax: 267-673-8118; E-Mail: Sales@cabriggs.com - www.cabriggs.com

ELS-950 Series
Rugged Electro-Optic Level Sensors

The ELS-950 Series represents Gems' smallest electro-optic level sensors developed to monitor a broad range of media including OHV type fluids.

Our UL-approved design features a TPE over-molded electronics insert, TPE insulated wires, and fluorocarbon o-ring seals that create a watertight, environmentally resistant assembly, ideally suited for use in harsh environments offering excellent temperature and pressure capabilities.

The ELS-950 is excellent for industrial OEMs requiring a solid-state sensor for small space and high temperature environments.

File No. E108913

Specifications

Materials	
Housing	Polysulfone (Contact Gems for alternative material types)
Prism	Polysulfone
O-Ring	Fluorocarbon (1/4˝ MNPT - None)
Electronics	Over-molded TPE
Operating Pressure	0 to 250 PSI (0 to 17 bar) maximum
Operating Temperature*	-40°F to +230°F (-40°C to 110°C)
Current Consumptions (No Load)	
5 VDC	4 mA No Load
12 VDC	10mA No Load
Output	Sink 40 mA max., up to 30 VDC
Repeatability	±1 mm
Lead Wires	3x TPE Insulated; 22 AWG
Approvals	CE, UL file No. E108913
	IP66/67 Rating
	ROHS Compliant

* These switches are not for use in freezing liquids or steam/high condensation environments. Contact Gems for alternative solutions.

How To Order

Specify Part Number based on Input and Output Condition required.

Input Power	Actuation Condition	Lead Wire Length	Mounting Type		
			1/4˝ MNPT	1/2˝- 20UNF-2B*	M12x1-8*
5 VDC ±10%	Wet	6 inches	**224504** ⚡	**224501** ⚡	**224508** ⚡
		2 meters	**226545**	**226541**	**226549**
	Dry	6 inches	**224505**	**224502** ⚡	**224509**
		2 meters	**226546**	**226542**	**226550**
12 VDC ±10%	Wet	6 inches	**224506** ⚡	**224503** ⚡	**224510** ⚡
		2 meters	**226547**	**226543**	**226551**
	Dry	6 inches	**224507** ⚡	**223625** ⚡	**224511** ⚡
		2 meters	**226548**	**226544**	**226552**

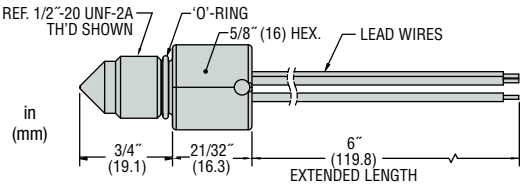
* Supplied with standard fluorocarbon o-ring.

⚡ – Stock Items.

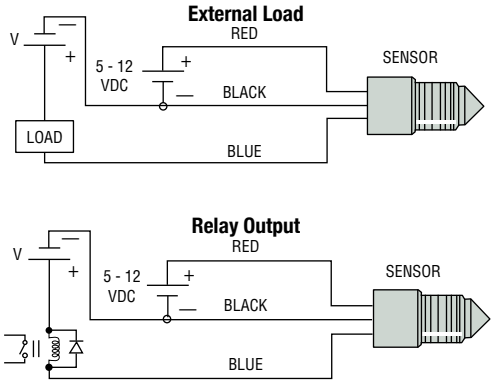
Typical Applications

- Coolant reservoir monitoring and warning
- Medical diagnostic, sterilizer, washers and dialysis equipment
- Low lubricant warning on machine tools, generator sets, on- or off-highway vehicles
- Low level warning in hydraulic reservoirs
- Plastic over flow bottles, plastic radiators
- Leak detection for drip pans

Dimensions



Wiring Diagrams



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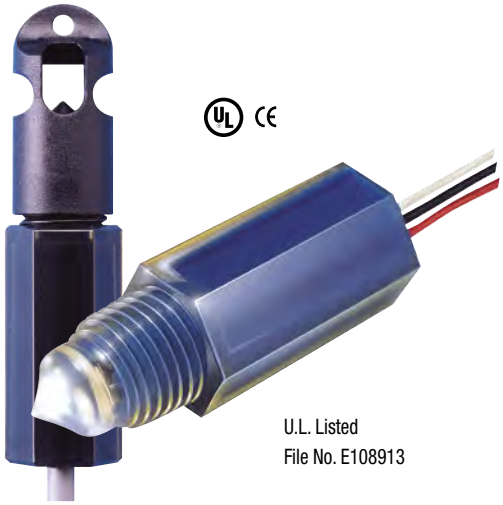
General Purpose ELS –1100 Series Satisfies Most Applications

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.



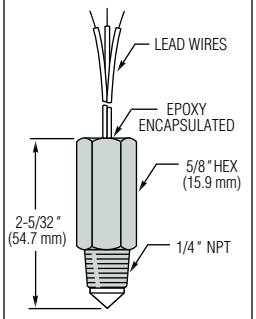
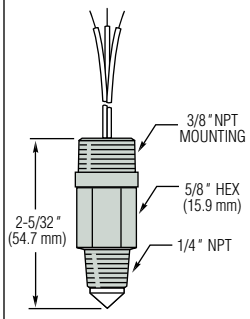
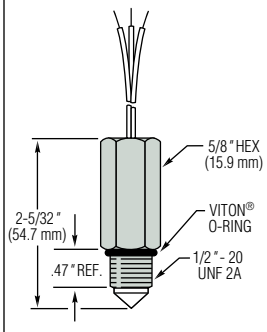
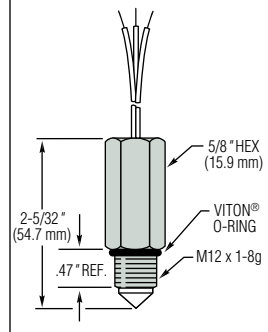
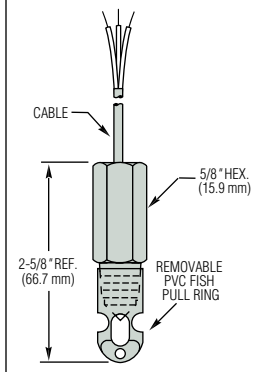
U.L. Listed
File No. E108913

Specifications

Materials	
Housing and Prism	Polysulfone or Nylon
Operating Pressure	0 to 150 PSI, Maximum
Operating Temperature*	0°F to 176°F (-17.8°C +80°C)
Current Consumption	18 mA, Approximately
Output†	TTL/CMOS Compatible. Open Collector Output May Sink 40 mA UP TO 30 VDC.
Repeatability	±1 mm
EMI Susceptability	Meets (MIL-STD-461B Part 2 Modified) Specification of 10 V/M for Frequency Range 30 to 1000 MHz (Except 609 MHz = 9 V/M and 679 MHz = 7.5 V/M).

* These switches are not for use in freezing liquid or steam/high condensation environments. Contact Gems for alternative solutions.

Dimensions

	1/4˝ NPT Mounting	1/4˝ NPT Mounting with 3/8˝ Conduit	1/2˝ Straight Thread Mounting with O-Ring	M12x1-8g Straight Thread with O-Ring	"Fish" Pull Ring
					
Electrical Termination	Lead Wires, 22 AWG, PVC Jacketed, 12˝ to 14˝ Extended				25´ Cable, 22 AWG, PVC Jacketed

How To Order

Specify Part Number based on Mounting Type, Input Power and Output Condition required.

Input Power	Probe Condition at Current Sink	Mounting Type					
		1/4˝ NPT	1/4˝ NPT & 3/8˝ Conduit		1/2˝ Straight Thread	M12x1-8g Straight Thread	"Fish" Pull Ring
		Polysulfone	Polysulfone	Nylon	Polysulfone	Polysulfone	Polysulfone
5 VDC	Wet	**138167**	**144225**	**175631**	**144235**	**166541**	—
10-28 VDC	Wet	**142700** ⚡	**143585** ⚡	**157750**	**143580**	**169555** ⚡	**143577**
	Dry	**143570** ⚡	**143590** ⚡	**175632**	**143575**	**169556**	**148973** ⚡

⚡ – Stock Items.

Intrinsically-Safe Versions

GEMS ELS-1100 Switches may be rendered intrinsically-safe for Class I, 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.

Extended Power and Switching Capabilities of 12 VDC Models with Gems.

Converts TTL output signal to 5 Amp relay output. Available as open circuit board or mounted in a NEMA 4X enclosure (pictured). See Page A-33.

Order from: C A Briggs Company; 622 Mary Street; Suite 101 - Warminster, PA 18974
Phone: 267-673-8117 - Fax: 267-673-8118; E-Mail: Sales@cabriggs.com - www.cabriggs.com

ELS –1100HT
Handles Temperatures to 212°F

Slightly larger than the ELS-1100, the "HT" or High Temperature version is made from high performance Isoplast® plastic. While maintaining broad chemical compatibility, these units also handle fluid temperatures to 212°F. They feature 3/8˝ NPT mountings and the shortest of any of our plastic electro-optic switch bodies – HTS versions are a mere 1/2˝ long!

ELS-1100HT

UL File No. E108913

"Short" HTS Version

ELS-1100HTS

UL File No. E108913

Typical Applications

- Coolant reservoir monitoring
- Medical diagnostic and sterilizer equipment
- Low lubricant warning on machine tools
- Low level warning in hydraulic reservoirs

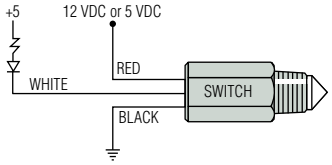
Specifications

Materials	
Housing and Prism	Isoplast®
Operating Pressure	0 to 150 PSI, Maximum
Operating Temperature*	-40°F to +212°F (-40°C +100°C)
Current Consumption	45 mA, Approximately
Output	TTL/CMOS Compatible. Transistor Output with 10K Pull Up Resistor May Sink 18 mA. 12 VDC input power units switch a maximum 5 VDC on output
Repeatability	±1 mm

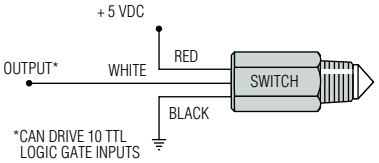
* These switches are not for use in freezing liquids or steam/high condensation environments. Contact Gems for alternative solutions.

Wiring Diagrams

Transistor Output



TTL Compatible Output



How To Order

HT Series

Specify Part Number based on Input and Output Condition required.

	Probe Condition at Current Sink	
Input Power	**Wet**	**Dry**
5 VDC	**153061**	**153062**
12 VDC*	**153063**	**153064**

*12 VDC input power units switch a maximum 5 VDC on output.
Note: Extend the power and switching capabilities of 10-28 VDC models with Gems Opto-Pak Controllers.

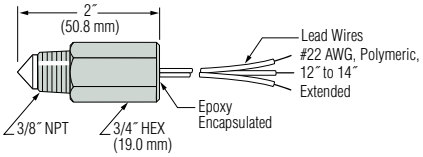
HTS Series - 5 VDC Input Only

Specify Part Number based on Wet or Dry switch actuation and mounting type.

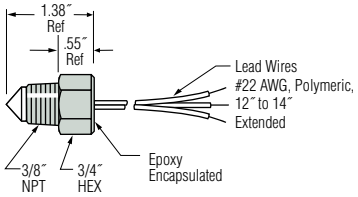
	Probe Condition at Current Sink	
Mounting Type	**Wet**	**Dry**
3/8˝ NPT	**181674**	**181675**
M16x2	**191341**	**191342**

Dimensions

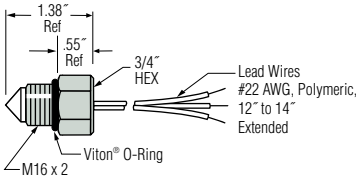
HT Series



HTS Series
3/8˝ NPT Mounting



M16 x 2 Straight Thread
Mounting with O-Ring



Extended Power and Switching Capabilities of 12 VDC Models with Gems.

Converts TTL output signal to 5 Amp relay output. Available as open circuit board or mounted in a NEMA 4X enclosure (pictured). See Page A-33.

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ELS-1100TFE Teflon®
For Ultra-Pure or Aggressive Fluids

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.

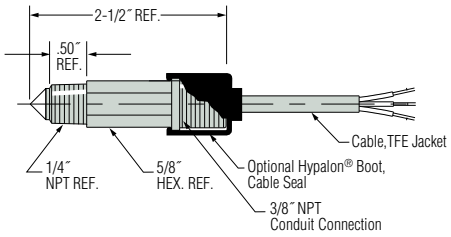
Specifications

Materials	
Housing and Prism	Teflon®
Operating Pressure	0 to 150 PSI, Maximum
Operating Temperature*	0°F to 176°F (-17.8°C +80°C)
Input Voltage	10 - 28 VDC
Current Consumption	18 mA, Approximately
Output†	TTL/CMOS Compatible. Open Collector Output May Sink 40 mA Up to 30 VDC.
Repeatability	±1 mm
EMI Susceptability	Meets (MIL-STD-461B Part 2 Modified) Specification of 10 V/M for Frequency Range 30 to 1000 MHz (Except 609 MHz = 9 V/M and 679 MHz = 7.5 V/M).

* These switches are not for use in freezing liquid or steam/high condensation environments. Contact Gems for alternative solutions.

† See Page A-25 for Wiring Diagrams

Dimensions



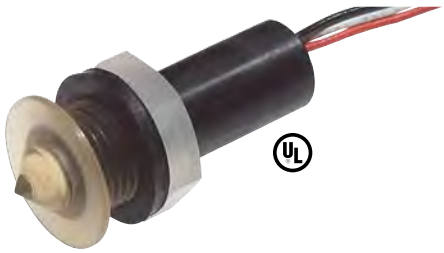
How To Order

Specify Part Number based on Output Condition and Boot Option.

Probe Condition at Current Sink	Part Number	
	With Cable Boot	No Cable Boot
Wet	**187595**	**173800**
Dry	**185600**	**173700**

ELS-1100FLG Flange Mounting for Installations Without Threaded Holes

The easy solution for thin wall tanks (≤1/4˝ thick): ELS-1100FLG Series. No threads needed with these flanged units. Slip through a .75˝ hole and tighten the jam nut; Viton® gasket forms a tight seal. Ideal for sheet metal, molded plastic tanks and medical applications where elimination of exposed threads removes potential bacterial breeding grounds.



Specifications

Materials	
Housing and Prism	Polysulfone
Operating Pressure	0 to 150 PSI, Maximum
Operating Temperature*	0°F to 176°F (-17.8°C +80°C)
Input Voltage	10 - 28 VDC
Current Consumption	18 mA, Approximately
Output†	TTL/CMOS Compatible. Open Collector Output May Sink 40 mA Up to 30 VDC.
Repeatability	±1 mm
EMI Susceptability	Meets (MIL-STD-461B Part 2 Modified) Specification of 10 V/M for Frequency Range 30 to 1000 MHz (Except 609 MHz = 9 V/M and 679 MHz = 7.5 V/M).

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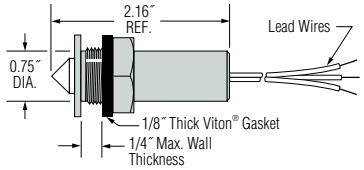
† See Page A-25 for Wiring Diagrams

Dimensions



How To Order

Specify Part Number based on Input Power and Output Condition Required.

	Probe Condition at Current Sink	
Input Power	**Wet**	**Dry**
5 VDC	**187575**	**187590**
10-28 VDC	**187585**	**187580**

Extended Power and Switching Capabilities of 12 VDC Models with Gems.

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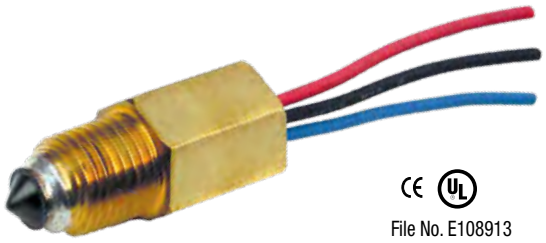
NOTES

ELS-950M Series
Rugged Electro-Optic Level Sensors

The ELS-950M Series represents Gems' most compact alloy-housed electro-optic level sensors. They monitor a broad range of media including OHV type fluids.

Our UL-approved design features a brass housing, fused glass prism, and TPE insulated wires. They provide a durable, watertight, and environmentally resistant assembly, ideally suited for use in harsh environments including outdoors and engine bays. They offer excellent temperature and pressure capabilities. The ELS-950M is excellent for industrial OEMs requiring a solid-state sensor for small space and high temperature environments.



File No. E108913

Specifications

Materials	
Housing	Brass
Prism	Fused Glass
O-Ring	Fluorocarbon (1/4˝ MNPT - None)
Electronics	Over-molded TPE
Operating Pressure	0 to 250 PSI (0 to 17 bar) maximum
Operating Temperature*	-40°F to +230°F (-40°C to 110°C)
Current Consumptions (No Load)	
5 VDC	4 mA No Load
12 VDC	10mA No Load
Output	Sink 40 mA max., up to 30 VDC
Repeatability	±1 mm
Lead Wires	3x TPE Insulated; 22 AWG
Approvals	CE, UL file No. E108913
	IP66/67 Rating

* These switches are not for use in freezing liquids or steam/high condensation environments. Contact Gems for alternative solutions.

How To Order

Specify Part Number based on Input and Output Condition required.

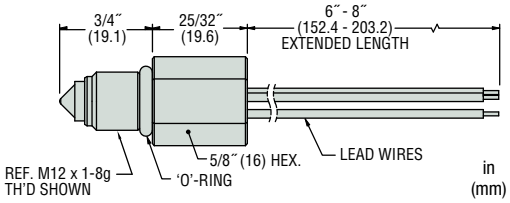
Input Power	Actuation Condition	Lead Wire Length	Mounting Type		
			1/4˝ MNPT	1/2˝- 20UNF-2B*	M12x1-8*
5 VDC ±10%	Wet	6 inches	**232175**	**232171**	**232179**
	Dry	6 inches	**232176**	**232172**	**232180**
12 VDC ±10%	Wet	6 inches	**232177**	**232173**	**232181**
	Dry	6 inches	**232178**	**232174**	**232182**

* Supplied with standard fluorocarbon o-ring.

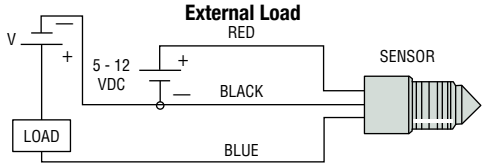
Typical Applications

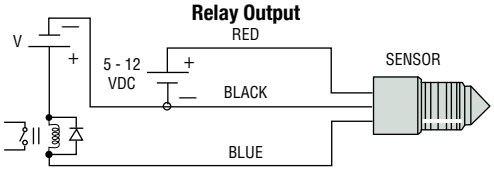
- Coolant reservoir monitoring and warning
- Low lubricant warning on machine tools, generator sets, on- or off-highway vehicles
- Low level warning in hydraulic reservoirs
- Leak detection for drip pans

Dimensions



Wiring Diagrams





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