ELS-1150 Series Features Best Performance-to-Size Ratio

The ELS-1150 electro-optic level switches maintain the top-performing environmental capabilities of their larger family members while featuring an overall size that is 50% smaller. At just 1.38˝ long, the nickel-plated carbon steel ELS-1150 represents the smallest electro-optic level sensor in its performance class, and by far the most economical. ELS-1150 switches utilise a strong, glass prism fused to a carbon steel housing to easily monitor vessels pressurized up to 172 bar. Their compact package size makes them the ideal candidate for monitoring the small, pressurised vessels found in HVAC, refrigeration and hydraulic applications. They are most commonly used for low, high and intermediate level detection.

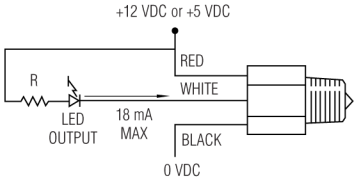
ELS-1150

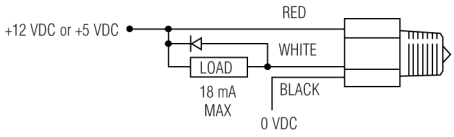
Specifications

Mounting	1/2˝ NPT
Materials	
Housing	Nickel-Plated Carbon Steel
Prism	Fused Glass
Operating pressure	170 bar Maximum
Operating temperature*	-40°C to +100°C
Current consumption	~45 mA
Output	Open Collector Output, 18 mA Sink, Max.
Electrical termination	22 AWG, Polymeric, 0.3m
Repeatability	±1 mm
Approvals	CE, UL

* These switches are not for use in freezing liquid

Typical Wiring Diagrams

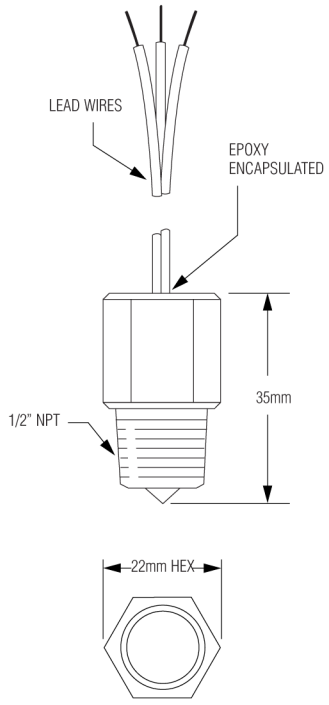




Note: Inductive loads must be diode suppressed.

Dimensions

ELS-1150 Series



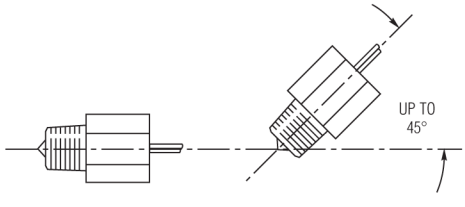
How To Order

Specify Part Number based on Input Power and Output Condition Required

Input Power	Probe Conditions at Current Sink	Part Numbers
5 VDC	Wet	194469
	Dry	194470
12 VDC	Wet	194471
	Dry	194472
24 VDC	Wet	**203385**
	Dry	**205600**

Mounting Attitude

These units must be mounted horizontally or up to 45° from horizontal only.



Standard Products in **bold**

ELS-1200 Series

Integral Electronics

High pressure liquid processes can now be monitored effectively with very little intrusion into tanks or piping. ELS-1200 switches feature fused glass prisms fused to zinc/nickel plated, carbon steel housings. You will find them to be a compact, reliable and durable solution to liquid level monitoring of refrigerant, compressor oil, hydraulic system reservoirs and machine tools.

Removable Electronics

These electro-optic switches feature a one piece removable electronics module with 1/2" NPT conduit connection and an internal O-ring seal to protect against external moisture intrusion. Simply unthread the 1/2" NPT conduit connection for easy replacement of the electronics module without the inconvenience of emptying or depressurising tanks. ELS-1200 switches feature glass prisms fused to zinc/nickel plated, carbon steel housings. Select from either 1/2" NPT mounting connections, or 3/4"-16 UNJF-3A straight thread connections with an external O-ring seal. They monitor high pressure liquid processes with very little intrusion into tanks or piping.

Specifications

Mounting	1/2" NPT or 3/4"-16 UNJF-3A Thread (Viton 'O' ring)
Materials	
Housing	Zinc/Nickel Plated Carbon Steel①
Prism	Fused Glass
Operating Pressure	172 bar, Maximum*
Operating Temperature* **	
5/12 VDC	-40°C to +100°C
24/120 VAC	-29°C to +116°C (Prism tip) -29° to 75°C (Electronics)
Current Consumption	
5/12 VDC	~45 mA
24/120 VAC	~6 mA
Output	
5/12 VDC	TL/CMOS compatible. Transistor output with 10K pull up Resistor may sink 18mA. 12 VDC Input power units switch a maximum 5 VDC on output
24/120 VAC	Normally Open: SPST (10 VA Resistive) Max. Switching Volts: V in ±10% Max. Switching current: 225 mA @ rated voltage @ 25°C
Electrical Termination**	
5/12 VDC	22 AWG, Polymeric, 0.3m extended lead wires
24/120 VAC	20 AWG, Polyester, 0.3m extended lead wires
Repeatability	±1mm

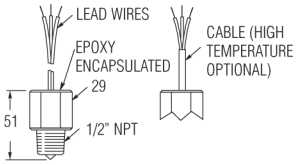
* For straight thread mounting units when installed with tube fitting per MS 33649
** Consult GEMS for cable options
*** These switches are not for use in freezing liquids. Consult factory for higher temperature units.
① Hastelloy thread with Stainless Steel body is available for harsh environments. Contact Sales Office for details

How To Order

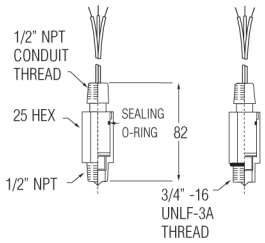
Input Power	Probe Condition at Current Sink	Electronics	Mounting Style	
			1/2" NPT	3/4"-16 UNJF
5 VDC	Wet	Integral	153842	- - -
	Dry		154177	- - -
	Wet	Removable	171574	161431
	Dry		160953	161432
12 VDC	Wet	Integral	153843	- - -
	Dry		154178	- - -
	Wet	Removable	160646	161433
	Dry		160954	161434
24 VAC	Wet	Removable	166852	168174
	Dry		166854	168422
120 VAC	Wet	Removable	164219	166848
	Dry		164222	166850

Dimensions

ELS-1200 Integral Electronics

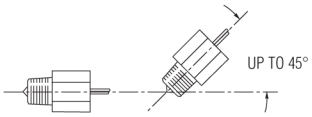


ELS-1200 Removable Electronics



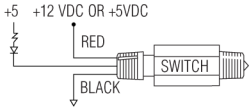
Mounting Attitude

These units must be mounted horizontally or up to 45° from horizontal only.

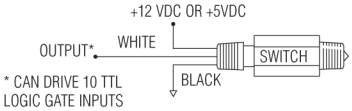


Wiring Diagrams

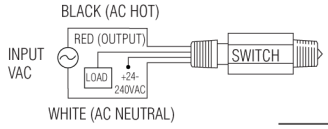
Transistor Output



TTL Compatible Output



SPST, 24 or 120 VAC Output



ELS-900—Our Smallest Optic Yet. Handles Temperatures to 257°F!

The smallest electro optic sensor in our arsenal, the ELS-900 also carries the highest temperature capability of any of our optic sensors. Its Polyethersulfone housing extends this sensor's compatibility and is very affordable in high volumes. Excellent for industrial OEMs preferring optics with high temperature and small space requirements.

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

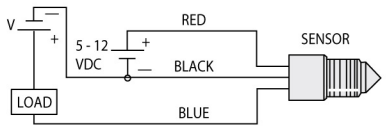
Specifications

Housing Material	Polyethersulfone
Operating Pressure	0 to 250 PSI (17 bar), Maximum
Operating Temperature*	-40°F to +257°F (-40°C +125°C)
Current Consumption	4 mA, for 5 Vdc (No Load) 10 mA for 12 Vdc (No Load)
Output	May Sink 40 mA. max., up to 30 VDC
Repeatability	±1 mm
EMI	CE approved per EN 61000
Shock Tested	Per MIL-Std-202 Method 204
Vibration Tested	Per MIL-Std-202 Method 213B

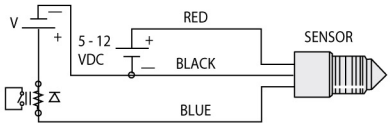
* These switches are not for use in freezing liquids

Wiring Diagrams

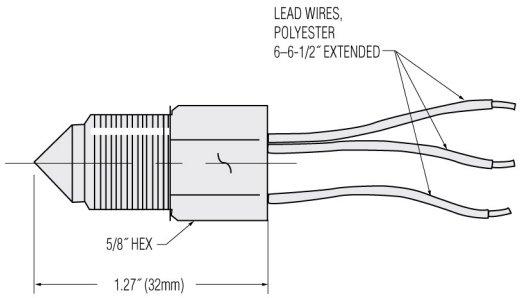
External Load



Relay Output



Dimensions



How To Order

Specify Part Number based on Input and Output Condition required.

Input Power	Condition	1/4˝ NPT	1/2˝-20 SAE #5	M12x1-8
5 V	Wet	**207200** ⚡	**208993**	**208997**
	Dry	**207300** ⚡	**208994**	**208998**
12 V	Wet	**205200** ⚡	**208991**	**208995**
	Dry	**205300** ⚡	**208992**	**208996**

⚡ – Stock Items.

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

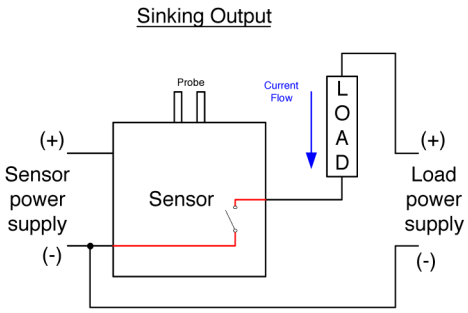
Converts TTL output signal to 5 Amp relay output. Available as open circuit board or mounted in a NEMA 4X enclosure (pictured). See Page A-35.

ELS-900 Electro-Optic Level Switch

Frequently Asked Questions

Can you explain what the sinking output means?

Sinking and sourcing are terms used to describe how an associated load (the device being turned on or off by the sensor) is powered in relation to the sensor. **Sinking**, the more widely used of the two, involves the switching of load current (power) supplied by a power source *external* to the sensor. In a sinking configuration, current passes through the load first, through the output switch of the sensor second and lastly to ground. A sensor with a sinking output switches the ground, or negative, leg of the circuit.



What's the difference between wet sink and dry sink?

Wet sink means the load is energized ("ON") as long as the sensor tip is immersed in fluid. **Dry sink** means the load is energized as long as the sensor tip is dry (i.e. not immersed in fluid).

How does ambient light affect the sensor?

Ambient light, especially in the Infrared spectrum at modest intensities can cause the sensor to switch to the "on" state. Precautions should be made to prevent this situation.

How close to a reflective surface can you mount the sensor?

If the sensor is mounted within 2" of a highly reflective surface (i.e. polished stainless steel, mirror, etc.), it can switch to the "on" state. Blackening or dulling these surfaces can reduce this effect.

Can I get a different output?

The ELS-900 is currently available in 5 or 12 VDC, wet or dry sink. If you require a different output, please contact AEL to see what we have in development.

Does the ELS-900 offer reverse voltage protection?

Yes.

Is there a time delay?

The ELS-900 does not offer a time delay. If you require a time delay, use the ELS-1100 series.

What are the EMI susceptibility specifications?

The ELS-900 has been approved to CE EN 61000.

Can you use the ELS-900 in dirty liquids, such as old engine coolant?

Yes. The ELS-900 will perform in milky, cloudy and/or dirty liquids. Coating liquids are NOT recommended.

ELS-900 Series
Electro-Optic Level Switch

Specifications

Materials	
Housing and Prism	Polyethersulfone
Operating Pressure	0 to 250 psig, Max.
Operating Temperature	-40°F to 257°F (-40°C to +125°C)
Current Consumption	18 mA, Approximately
Input Voltage	***See Part Number Chart***
Output Configuration	Open drain may sink 40mA max.
Current Consumption	~ 4mA @ 5Vdc
(No Load)	~ 10mA @ 12 Vdc
Repeatability	±1 mm
Ambient Light Immunity	See Ambient Light Test
Approval	UL / CUL Pending
Specifications	CE approved per EN 61000 EMC

Note: Not for use in freezing liquids

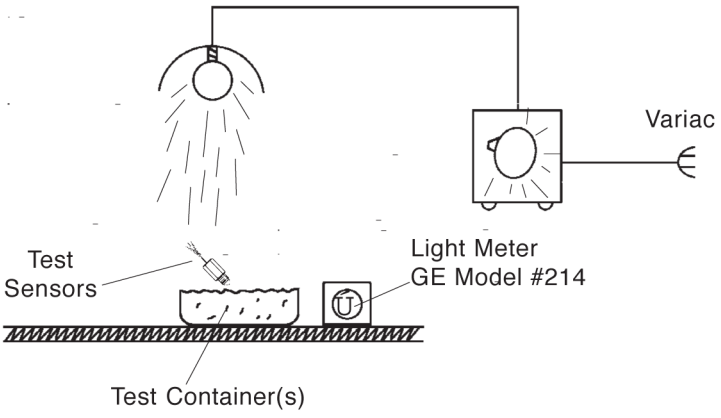
Part Number Chart

Thread	Part Number	Output State	Input Voltage
1/4" NPT	205200	Wet Sink	12V
	205300	Dry Sink	12V
	207200	Wet Sink	5V
	207300	Dry Sink	5V
1/2"-20 SAE	208991	Wet Sink	12V
	208992	Dry Sink	12V
	208993	Wet Sink	5V
	208994	Dry Sink	5V
M12X1-8	208995	Wet Sink	12V
	208996	Dry Sink	12V
	208997	Wet Sink	5V
	208998	Dry Sink	5V

Installation

1. For NPT threaded units, use Teflon (TFE) thread tape or Permatex #80725 plastic pipe sealant to seal thread.
   Caution: Pipe Sealant must not come in contact with prism surface.
2. Thread sensor into tank wall and tighten by hand. Further tighten an additional one to two threads past hand-tight. (Avoid overtightening, as this may damage threads)
3. Sensor may be installed in horizontal or up to 45° from horizontal plane for best operation. Vertical mounting is possible, may be droplet sensitive, depending on viscosity of media.
4. **Caution:** Do not install sensor close to infrared sources or incandescent light. Reflective surfaces may interfere with proper operation of the optical sensor. (Consult Gems Sensors if prism is to be mounted less than 2" from any reflective surface.)
5. Connect voltage supply (Vdc ± 10%) Between red (+) and black (-) of the unit.
   Caution: Do not connect output (blue wire) to Vdc power without a load.
   See wiring diagrams for output configuration.

The test depicted below was performed to determine the sensor immunity level to ambient light. The recorded ambient is the maximum level at which the sensor performs/detects normally.



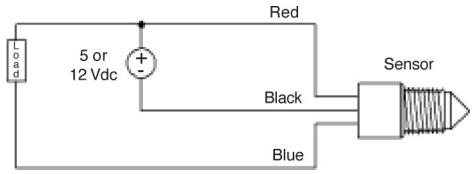
Max Ambient Light	
Black Container	Opaque Container
390 FT-CD	30 FT-CD

Note: 1 Ft-Cd = 10.7 Lux

Above testing is based on minimum readings of at least two (2) samples.

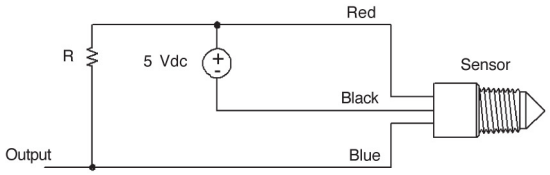
Typical Wiring Diagrams

External Load



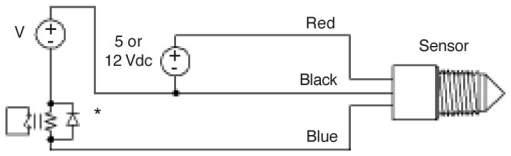
Note: May sink up to 40mA max. Use diode suppression for inductive loads.

CMOS / TTL Output



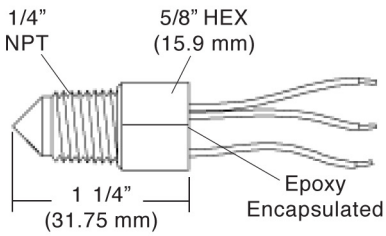
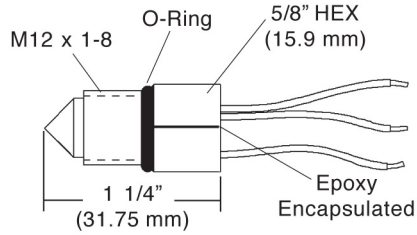
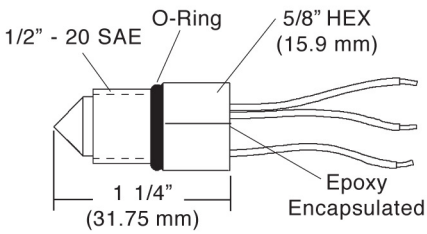
Max. current sink = 40mA
R = Pull-up Resistor (4.7K 1/4W)

Relay Output



Note: * For inductive loads, use diode suppression

Dimensions

1/4" NPT Mounting	M12 x 1-8	1/2"-20 SAE
		

Electrical Termination: Lead Wires, 22 AWG, Polyester Jacketed, 6" to 6 1/2" Extended