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Bulletin No 225480
Rev. B

Gems™ Sensors & Controls

ELS-950 Series
Electro-Optic Level Switch

Specifications

Materials **Housing and Prism**	Polysulfone
Operating Pressure	0 to 250 psig, (0 to 17 bar) Max.
Operating Temperature	-40°F to 230°F (-40°C to +110°C)
Input Voltage	*See Part Number Chart*
Output Configuration	Open drain may sink 40mA max.
Current Consumption (No Load)	~ 4mA @ 5Vdc ~ 10mA @ 12 Vdc
Repeatability	±1 mm
Ambient Light Immunity	See Ambient Light Test
Approval Specifications	U.L. Listed per E108913 "Class 2 Circuit" CE Approved per EN61326

Input Power	Actuation Condition	Mounting Type		
		1/4" NPT	1/2"-20UNF-2B	M12x1-8
5 VDC ±10%	Wet	224504	224501	224508
	Dry	224505	224502	224509
12 VDC ±10%	Wet	224506	224503	224510
	Dry	224507	223625	224511

Note: Not for use in freezing liquids

Installation

1. For NPT threaded units:
   a. 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.***
   b. Thread sensor into tank wall and tighten by hand. Further tighten an additional one to two threads past hand-tightness. **(Avoid over tightening, as this may damage threads.)**
2. For 1/2" and M12 straight threaded units:
   a. Thread sensor into tank wall by hand until sensor housing contacts tank wall surface. (See below for mating o-ring gland design information.)
   b. The sensor shall be torque tightened to 12 to 24 in-lb (1.4 to 2.7 N-m). This range is slightly more than "hand-tight" to insure sealing, and less than that which would cause housing or thread damage.
   c. **CAUTION:** Under no circumstances shall the sensor be tightened more than 1/6 turn beyond that required to seat the bottom of the sensor housing with the outside wall of the tank.
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 on next page for output configuration.

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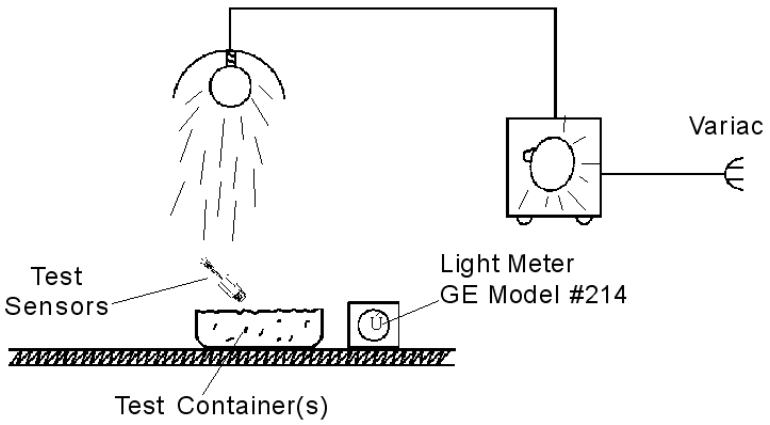
This product complies with EN61326 Electrical Equipment for Measurement, Control and Laboratory use- EMC Requirements for Minimum Requirements and Industrial Locations.

Special caution should be taken to meet EN61000-4-5 Surge Immunity if any of the following conditions apply to the installation: The product is installed outside; the cable is greater than 30 meters in length. In order to meet the Surge Immunity requirements, the following conditions must be followed during installation:

1. Shielded cable must be used, and the shield must be tied to earth ground (not power supply ground) on at least one end of the cable shield/drain wire. The shield must be maintained all the way from sensor to the power supply.
2. If unshielded cable is used, an earth grounded metal conduit can be used to replace the shielded cable.
3. For the sensor with metal body or enclosure the body/enclosure must be grounded to earth. If a protective metal housing is used, the metal housing should be grounded to earth.
4. If a protective plastic housing is used, the housing must be able to withstand at least 2 kV from the housing to earth ground.



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.

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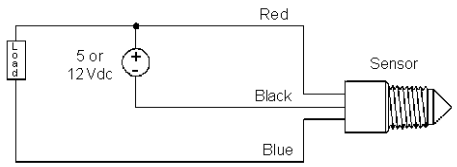
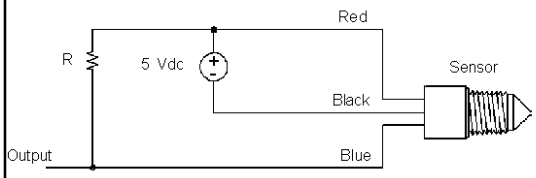
Typical Wiring Diagrams

External Load



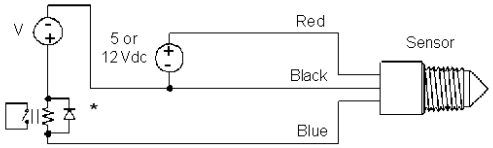
Note: May sink up to 40mA max. Use diode suppression for inductive loads.

CMOS / TTL Output



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

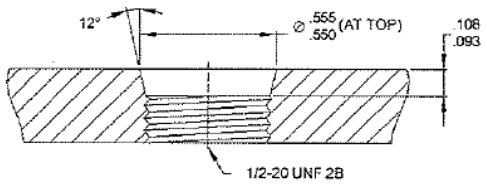
Relay Output



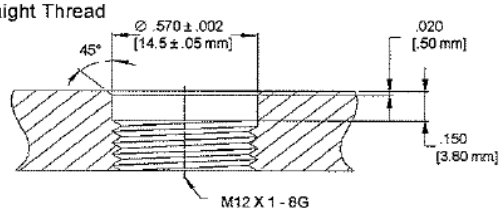
Note: * For inductive loads, use diode suppression

Mating O-Ring Gland Design

1/2" Straight Thread
SAE #5 TUBE FITTING



M12 X 1 Straight Thread



Return Policy

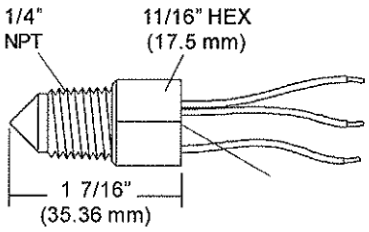
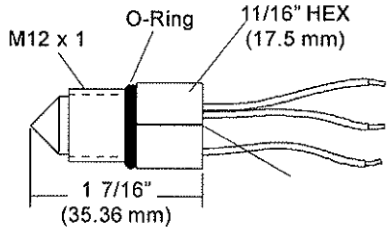
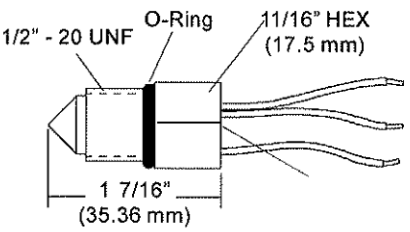
Returns are accepted on stock items up to 30 days from date of order. You must contact our Returns Department for a Return Authorization (RA) number. Return the goods - freight prepaid - in the original container and include original packing slip.

C. O. D. returns are not accepted. Gems reserves the right to apply restocking charges.

Maintenance

Sensor may require a periodic cleaning of prism surface. ***Chlorinated hydrocarbons must not be used for cleaning.*** A mild detergent may be used to clean prism surface.

Dimensions

1/4" NPT Mounting	M12 x 1	1/2"-20 UNF
		

Electrical Termination: Lead Wires, 22 AWG, TPE Jacketed, 6" to 8" Extended

Important Points:

- Gems products must be maintained and installed in strict accordance with the National Electrical Code and the applicable Gems Product Instruction Bulletin that covers installation, operation and proper maintenance. Failure to observe this information may result in serious injury or damages.
- Please adhere to the pressure and temperature limitations shown throughout this catalog for our sensors. These limitations must not be exceeded. These pressures and temperatures take into consideration possible system surge pressures, temperatures and their frequencies.
- Selection of materials for compatibility with the media is critical to the life and operation of Gems products. Take care in the proper selection of materials of construction, testing is required.
- Our sensors have been designed to resist shock and vibration. However, shock and vibration should be minimized.
- Filter liquid media containing particulate and/or debris to ensure the proper operation of our products.
- Electrical entries and mounting points in an enclosed tank may require liquid/vaporsealing.
- Our sensors must not be field-repaired.
- Physical damage sustained by product may render it unserviceable.

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ELECTRICAL ENGINEERING & FLUID CONTROL DISTRIBUTORS
Est.1899

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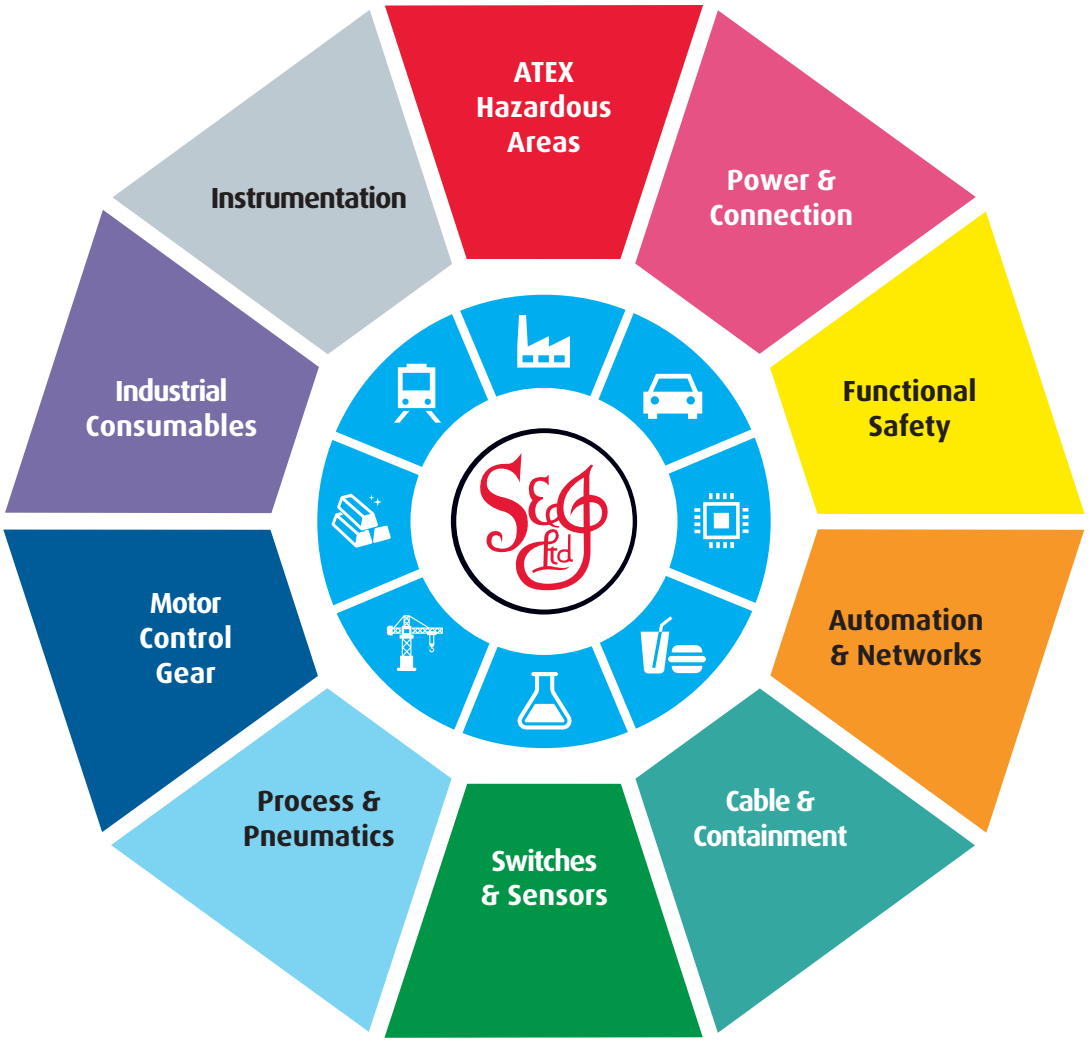

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