



Environmental Products

These Sensors may not be compatible with indicating and alarm equipment supplied by other manufacturers

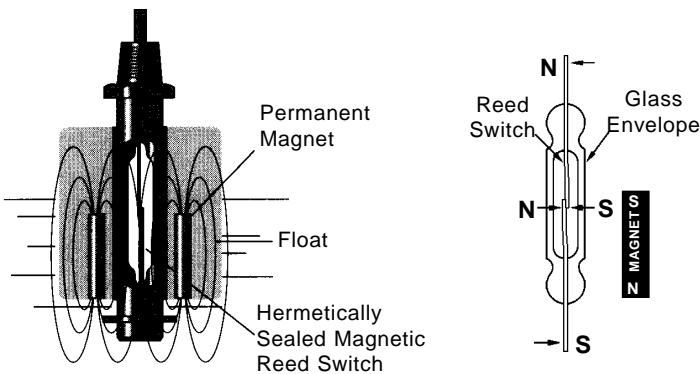
Note: LS-270 sensors are non-voltage producing devices and do not contain energy storing components. However, since primary use is in hazardous locations, an appropriate intrinsically safe interface device is required.

With an integral mounting bracket and slosh shield, the Gems LS-270 single float, liquid level sensor is ideally suited for use in containment sump areas. It requires no calibration, and is easy to install and maintain. When positioned vertically at the bottom of a sump, it reliably senses the presence of a liquid. It detects hydrocarbons and water as low as 1-3/8" from the bottom of a tank or sump.

Six feet of neoprene cable provides a waterproof electrical connection. A tough, polycarbonate shield protects the float from debris, and makes the LS-270 a fine choice for underground sump environments.

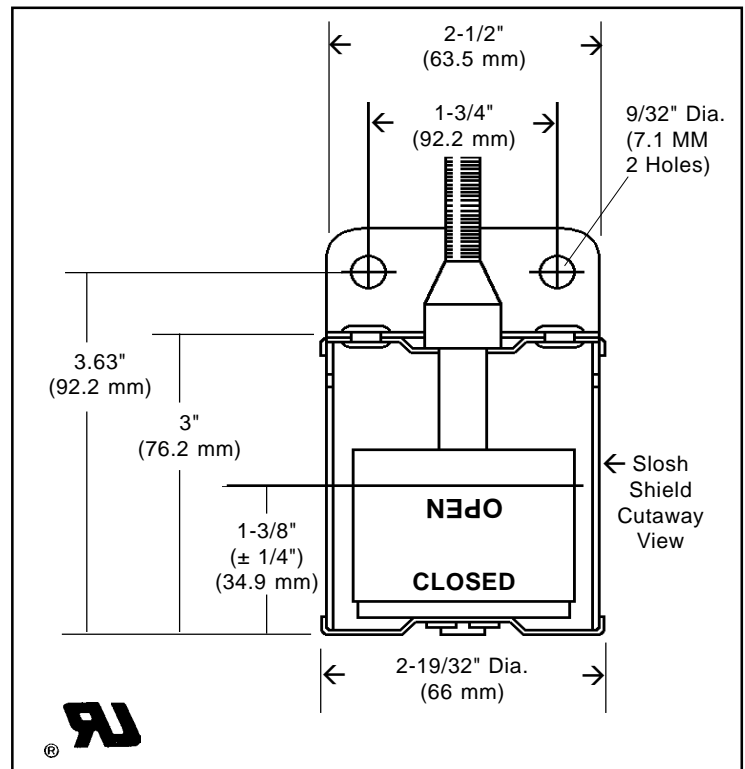
Sensor Operating Principle

Gems LS-270 liquid level sensor operates on a direct, simple principle. A float is equipped with powerful, permanent magnets. As the float rises or lowers with liquid level, it actuates a magnetic reed switch mounted within the stem. This condition either opens or closes the electrical circuit to operate an external alarm or control circuit. When mounted vertically, this basic design provides a consistent accuracy of $\pm 1/4$ inch.

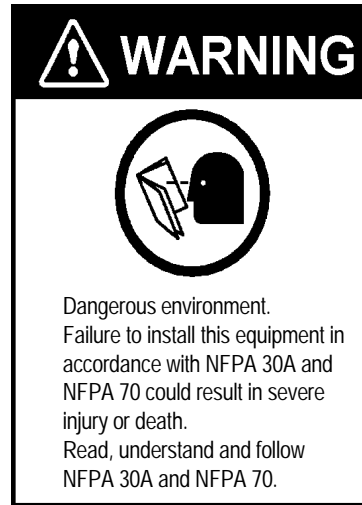
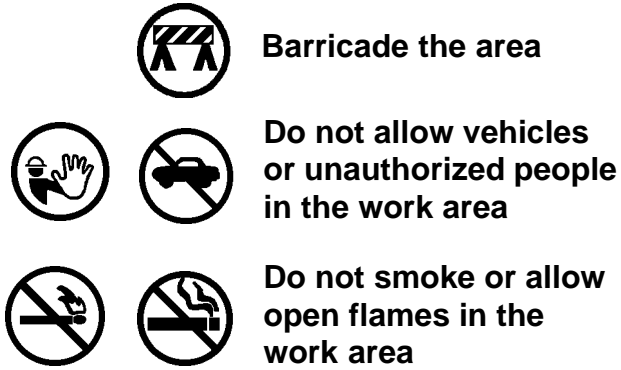


Note: Please refer to specific Gems outline drawings for operational specifications.

Dimensions



Read all instructions before beginning - Follow all safety precautions



WARNINGS

Read the instructions and warnings carefully before installing the sensor. This unit must be installed in accordance with National Electrical Code ANSI/NPFA-70, 1990; as well as Federal, State and local codes and any other applicable safety codes.

1. To avoid electrical shock, which could kill you, be sure AC power to monitor is off during installation.
2. The nature of the sensor is that it is a non-voltage producing device, containing limited energy-storing components. However, since its primary use is in a hazardous location, an appropriate intrinsically safe interface device must be used.

Note: Failure to observe these warnings could result in serious injury and death, as well as undetected potential environmental and health hazards.

- IMPORTANT -

This manual assumes all preliminary site preparation is completed and that field wiring from the monitor to the sensor junction box is in place.

Installation Instructions

A. Pre-installation Sensor Testing

1. Temporarily connect the two-wire sensor cable to the field wires in the sensor junction box.
2. Turn Power on.
3. Turn the LS-270 upside down. Audible and visual indicators should alarm.
4. To remove alarm condition, turn the sensor right side up.

B. Sensor Installation Instructions

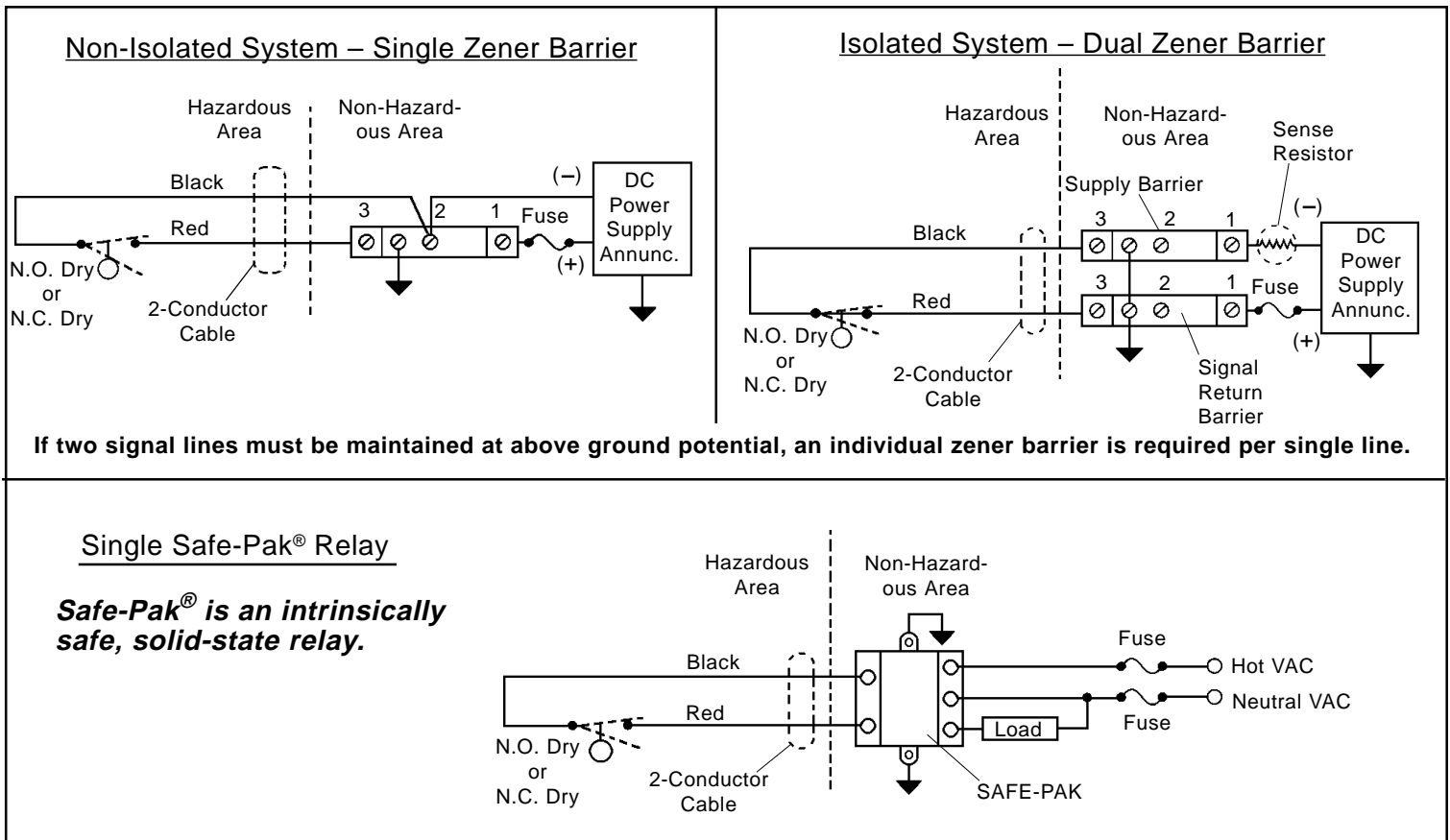
1. Turn off power to the control.

Note: Do not install the sump sensor if any liquid is present in the sump.

Failure to comply can result in equipment damage or undetected potential environmental and health hazards.

2. Make sure no liquid is present in the sump.
3. Attach the sensor (using the integral bracket) so that it sits at the bottom of the sump.
4. Feed the sensor cable through the cord grip on the junction box.
5. Tighten the cord grip nut to ensure a watertight seal at the cable entry.
6. Using wire nuts, connect the two-wire cable to the field wires in the sensor junction box.

Typical Wiring Diagrams



Maintenance

Note: Please consult your state E.P.A. office or appropriate regulatory agency regarding periodic inspection of the sensor. There are no user serviceable parts.

WARNING

Product must be maintained and installed in strict accordance with the National Electrical Code and the applicable GEMS technical bulletin and instruction bulletin. Failure to observe this warning could result in serious injuries or damages.

Warranty

Gems' standard warranty applies

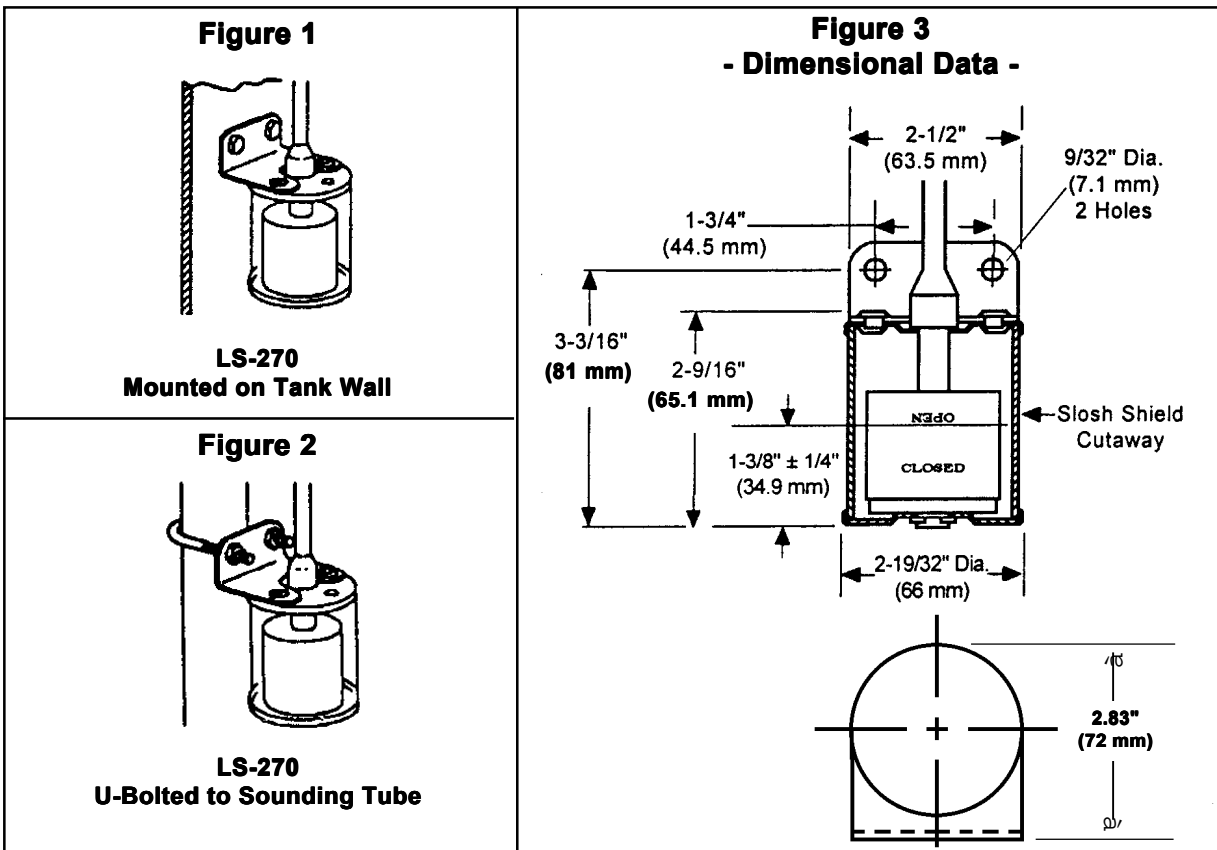


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Installation

Install LS-270 units vertically. With cable upward, position unit at desired actuation level.
(See Figures 1 and 2 for suggested mounting methods.)



Specifications

Stem/Float Material	304 Stainless Steel/Buna N
Other Wetted Material	Beryllium-Copper, Copper-Nickel
Slosh Shield Material	Lucite (Polycarbonate)
Operating Temperature	-40°F to +140°F (-40°C to +60°C)
Pressure Rating	150 PSIG, Max.
Switch	See Electrical Data (Pg. 2)
Switch Actuation	Approx. half the distance from end of stem to mounting, or at halfway point of float travel (in liquid with sp. gr. of 1.0)
Lead Wires	18/2 Cable, 6 Ft. long, Neoprene® with waterproof cable
Float Specific Gravity	0.43

Note: To determine fluid specific gravity, add 0.1 to float specific gravity in clean fluid and 0.3 to float specific gravity in dirty or viscous liquids.

Electrical Data

Standard reed switches in GEMS level switches are hermetically-sealed, magnetically actuated, make-and-break type. Switches are SPST or SPDT. See the **"Switch Rating" chart below** for maximum load characteristics of GEMS level switches.

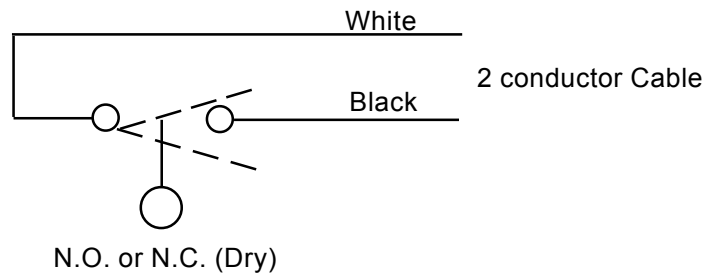
Switch Ratings - Maximum Resistive Load

VA	Volts	Amps AC	Amps DC
10 General Use	0-50	.2	.13
	100	N.A.	.1
	120	.08	N.A.
20 General Use	0-30	.4	.3
	120	.17	.13
	240	.08	.06
50 General Use	0-50	0.5	0.5
	120	.4	.4
	240	.2	.2
100*	0-50	.25	.25
	120	.8**	N.A.
	240	.4	N.A.

* Level switch units with 100 VA switches are not U.L. recognized or CSA approved

** Limited to 50,000 operations

Typical Wiring Diagram - SPST Switch

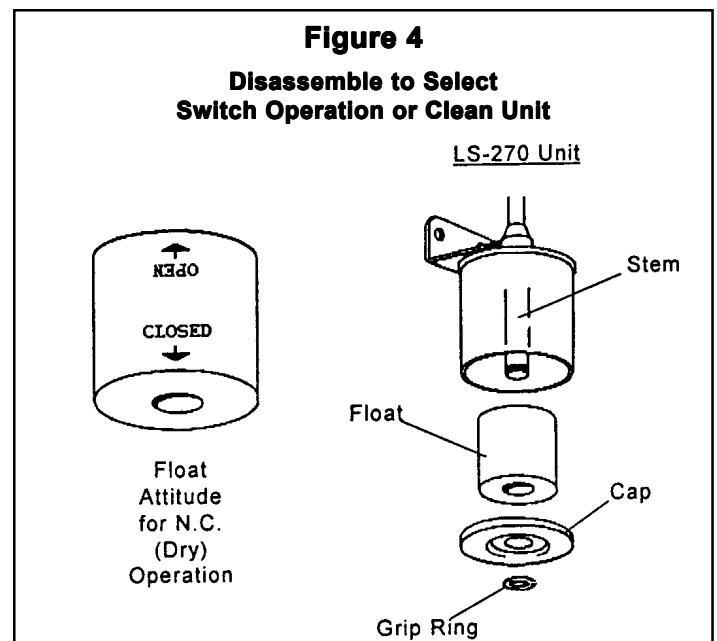


To Select Switch Operation ... LS-270 units are supplied with SPST switch N.C. or N.O. (dry). To convert switch operation: Remove grip ring and cap from unit, invert float on stem and reassemble unit.

Maintenance ... Elastomer seals in sensor and cable are subject to deterioration and aging and should be periodically checked. Life expectancy of seals varies with application.

For an occasional cleaning when excessive contamination is present in the liquid: Remove float as shown in Figure 4. Wipe down components and reassemble unit.

CAUTION: Be sure to reassemble float with same end upward on stem.



Reed Switch Protection

When switching inductive loads such as relays, solenoids, and transformers, reed switch contacts require protection to ensure long, dependable life. When current is interrupted, the inductive load generates a high voltage which can appear across the switch contacts and result in an arc. Arcing can cause the contacts to burn, weld or stick. The purpose of protection circuits is to prevent arcing by dissipating the voltage through an alternate path.

Recommended Protection

D.C.

A 1N4004 diode (or equivalent) connected cathode to positive (*See Figure 5*) is recommended. The diode does not conduct when the load is energized, but conducts and shunts out the generated voltage when the switch opens.

A.C.

A resistor and capacitor, connected in parallel with the switch (*See Figure 6*) is recommended. The capacitor is a high impedance to 50/60 Hz, but is essentially a short circuit to high frequencies of generated voltages.

Transients

Transient suppressors or varistors may also be used to dissipate the transient and protect the switch contacts. The devices in the table below may be used for selection.

	Maximum Ratings (25°C)			
	Continuous		Transient	
	RMS	DC	Energy	Peak Current
	Volts	Volts	Joules	Amperes
V47A7	30	38	8.8	1,000
V250LA20A	250	330	72	4,500
V120LA20A	130	175	70	6,500

Figure 5

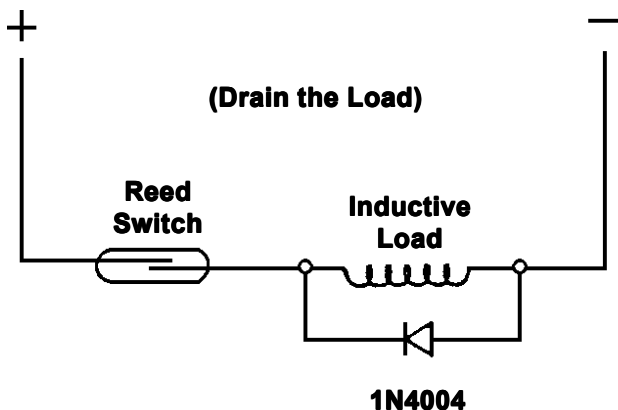
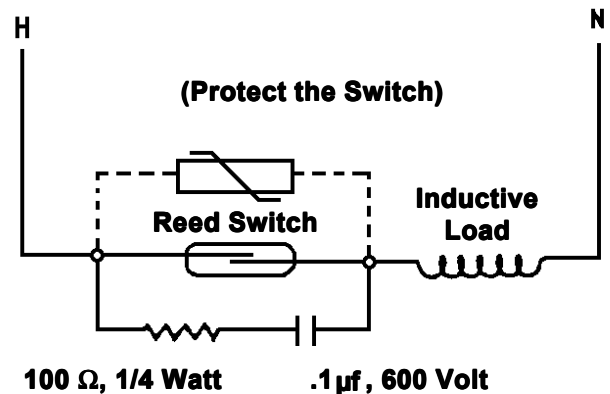


Figure 6



Important Points!

Product must be maintained and installed in strict accordance with the National Electrical Code and GEMS product catalog and instruction bulletin. Failure to observe this warning could result in serious injuries or damages.

An appropriate explosion-proof enclosure or intrinsically safe interface device must be used for hazardous area applications involving such things as (*but not limited to*) ignitable mixtures, combustible dust and flammable materials.

Pressure and temperature limitations shown on individual catalog pages and drawings for the specified level switches 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 level switches. Take care in the proper selection of materials of construction; particularly wetted materials.

Life expectancy of switch contacts varies with applications. Contact GEMS if life cycle testing is required.

Ambient temperature changes do affect switch set points, since the specific gravity of a liquid can vary with temperature.

Level switches have been designed to resist shock and vibration; however, shock and vibration should be minimized.

Liquid media containing particulate and/or debris should be filtered to ensure proper operation of GEMS products.

Electrical entries and mounting points may require liquid/vapor sealing if located in an enclosed tank.

Level switches must not be field repaired.

Physical damaged sustained by the product may render it unserviceable.



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