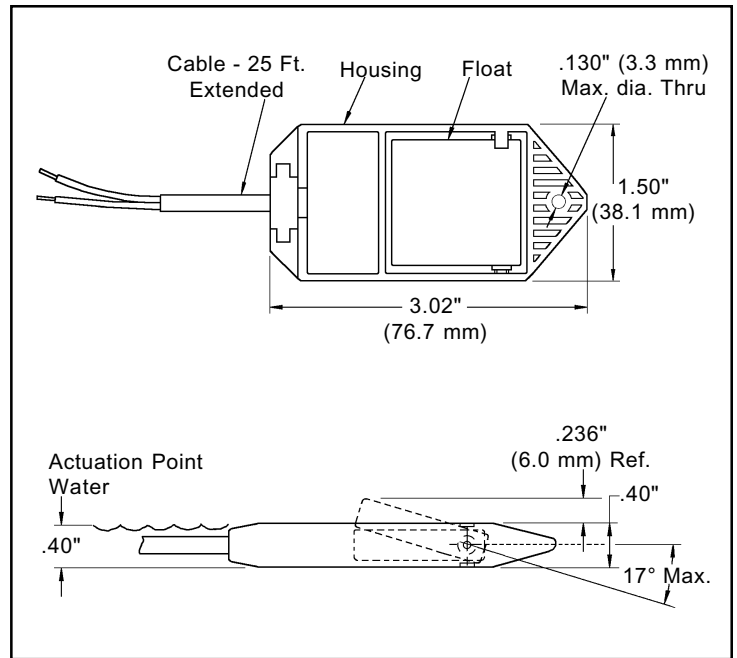**Gems** Sensors

Environmental Products

> **These sensors may not be compatible with indicating and alarm equipment supplied by other manufacturers.**

Note

LS-10 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 device is required.

The Gems LS-10 liquid sensor accurately detects the presence of liquid in fiberglass double-wall tanks, containment sumps, and double-wall pipes. Dry contact switching ensures dependability throughout its long service life. This reusable sensor easily fits small interstitial spaces and senses liquid hydrocarbons or water. The unit is unaffected by hydrocarbon vapors; thereby reducing the risk of false alarms.

Dimensions

Cable - 25 Ft. Extended | Housing | Float | .130" (3.3 mm) Max. dia. Thru | 1.50" (38.1 mm) | 3.02" (76.7 mm)

Actuation Point Water | .40" | .236" (6.0 mm) Ref. | .40" | 17° Max.

The LS-10's rounded design makes it easy to remove for cleaning and reinstall after an alarm condition is triggered, or for maintenance.

Sensor Operating Principle

The LS-10 liquid level sensor operated 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 housing. This condition either opens or closes the electrical circuit to operate an external alarm or control circuit.
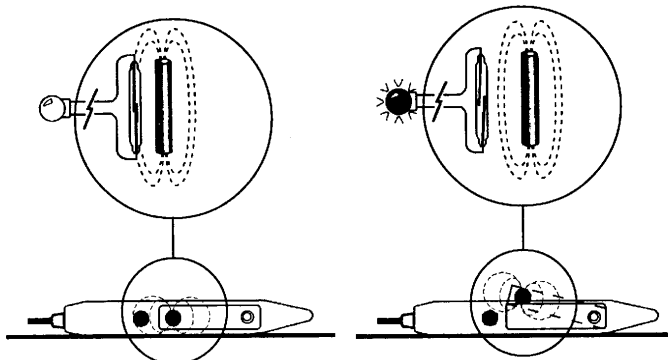
Note

Please refer to specific Gems outline drawings for operational specifications.
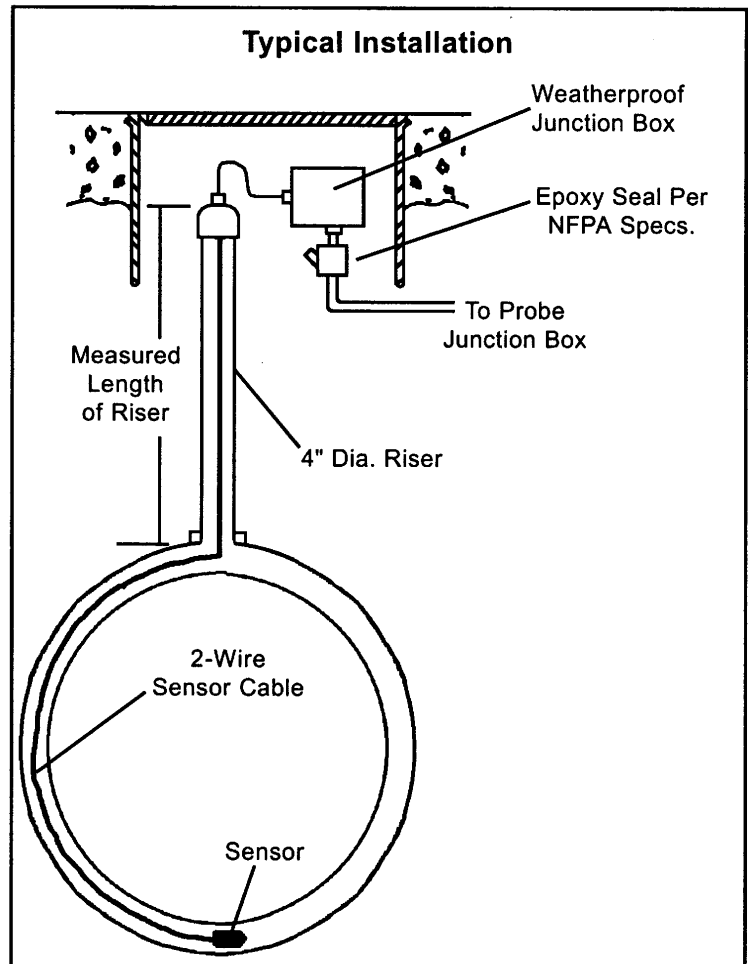
Installation Instructions

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. Place sensor on a flat horizontal surface. No alarm condition should be present.
4. Pick up sensor and hold in midair. Audible and visual indicators should alarm.
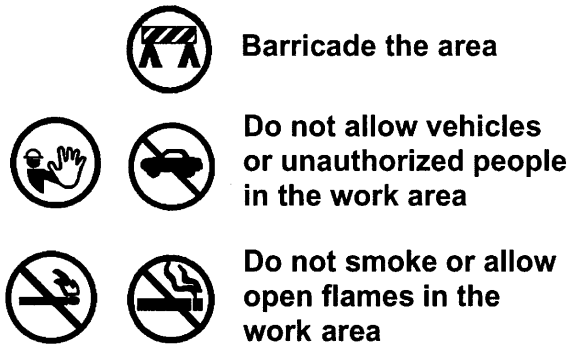5. To remove alarm condition, again place sensor on flat horizontal surface.

B. Sensor Installation Instructions

1. Turn off power to the control. Make sure no liquid is present in the annular space. **Note: Do not install if any liquid is present in the annular space. Failure to comply with this will lead to an alarm.**
2. Calculate the length of sensor cable which will be pulled through the tank to the top of the riser pipe. Add the length of the riser pipe to one-half the circumference of the tank:

   For a 4 Ft. diameter tank, add 6 Ft., 3 -1/2 In.
   For a 6 Ft. diameter tank, add 9 Ft., 5 In.
   For a 8 Ft. diameter tank, add 12 Ft., 6 -3/4 In.
   For a 10 Ft. diameter tank, add 15 Ft., 8 -1/2 In.

3. Measure and mark this length with a piece of tape on the sensor cable.
4. Push a "fish" tape around the tank.
5. Attach a pull-string to the fish tape and pull through the interstitial space.
6. Connect the pull-string to the hole on the front end of the sensor.
7. Carefully pull the sensor through the tank's interstitial space until the mark of the cable has reached the top of the riser pipe. Sensor should now be at the bottom of the tank.
8. Feed sensor cable through the cord grip on the junction box.
9. Tighten the cable bushing nuts on the riser cap.
10. Using wire nuts, connect the two-wire sensor cable to the field wires in the sensor junction box.

Typical Installation

Weatherproof Junction Box

Epoxy Seal Per NFPA Specs.

To Probe Junction Box

Measured Length of Riser

4" Dia. Riser

2-Wire Sensor Cable

Sensor

Read all instructions before beginning - Follow all safety precautions

Barricade the area

Do not allow vehicles or unauthorized people in the work area

Do not smoke or allow open flames in the work area

⚠ WARNING

Dangerous environment.
Failure to install this equipment in accordance with NFPA 30A and NFPA 70 could result in severe injury or death.
Read, understand and follow NFPA 30A and NFPA 70.
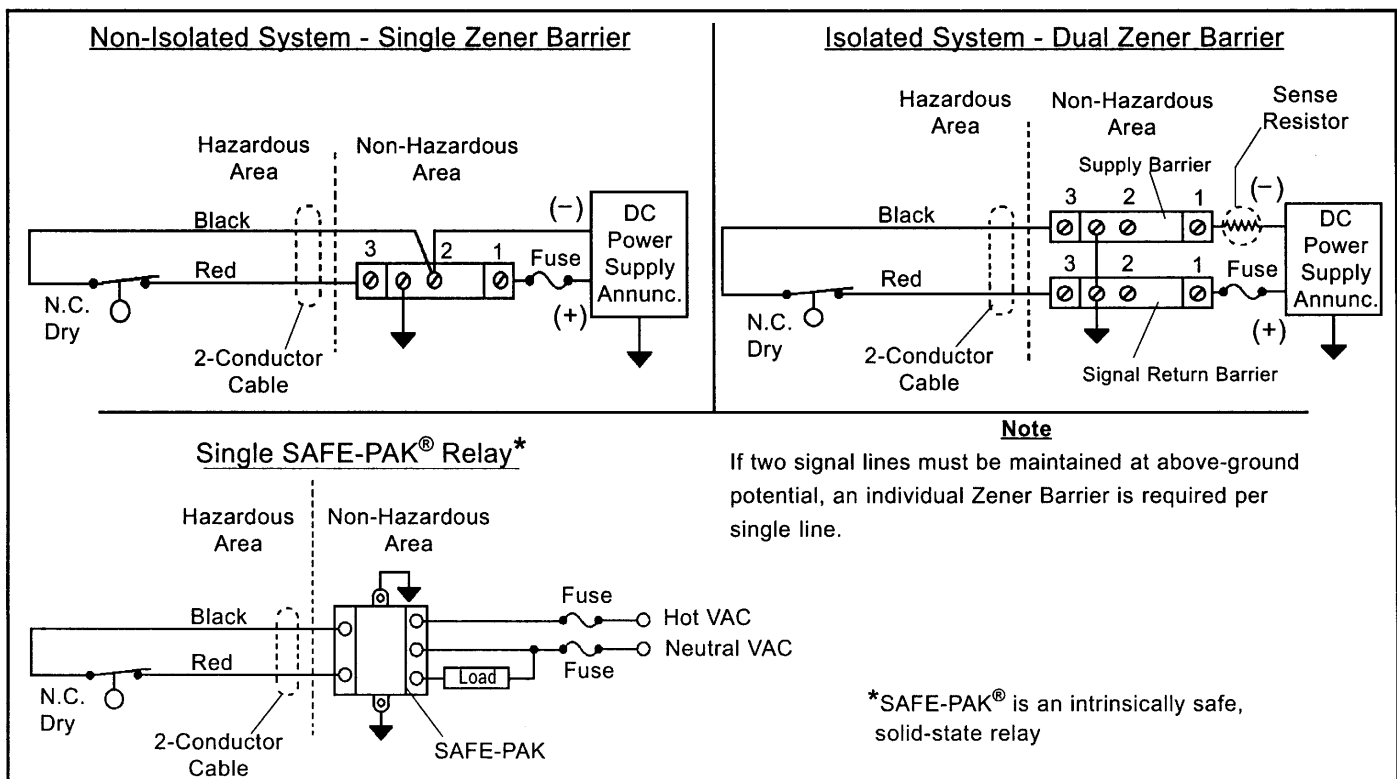
NFPA®

nec®

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.

Non-Isolated System - Single Zener Barrier

Hazardous Area | Non-Hazardous Area

Black
Red
N.C. Dry
2-Conductor Cable
3 2 1 Fuse
(−) (+) DC Power Supply Annunc.

Isolated System - Dual Zener Barrier

Hazardous Area | Non-Hazardous Area | Sense Resistor

Supply Barrier
Black
Red
N.C. Dry
2-Conductor Cable
3 2 1
3 2 1
Signal Return Barrier
(−) (+) Fuse DC Power Supply Annunc.

Single SAFE-PAK® Relay*

Hazardous Area | Non-Hazardous Area

Black
Red
N.C. Dry
2-Conductor Cable
SAFE-PAK
Fuse
Fuse
Load
Hot VAC
Neutral VAC

Note
If two signal lines must be maintained at above-ground potential, an individual Zener Barrier is required per single line.

*SAFE-PAK® is an intrinsically safe, solid-state relay

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.

MEMBER

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Sensors