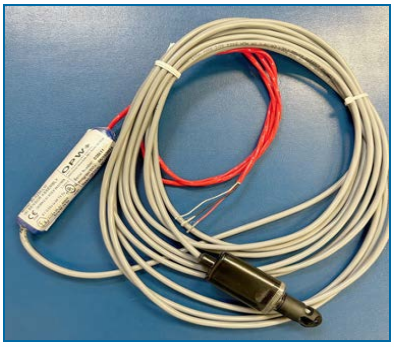
# Discriminating Interstitial Sensor (Optical)

## Smart Sensor Equipped with Intellisense™ Technology

### 30-0236-LW



## Description

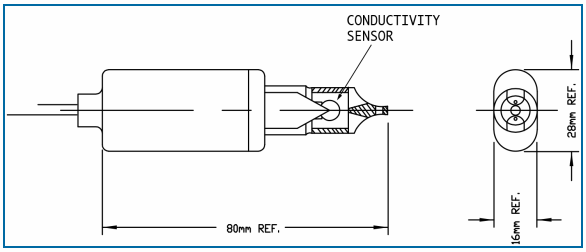
The primary function of the Discriminating Interstitial Optical Liquid Sensor is to monitor the interstitial area of double-walled tanks. This sensor uses a long-life, solid-state optical prism. These sensors can also be used in sumps, fuel dispenser pans and other locations where there is liquid that could indicate that a leak has occurred.

The sensor can tell the difference between water and hydrocarbons and will cause an alarm condition when it senses a liquid. If there is a break in the cable it will cause an alarm condition in the system.

| Specifications | |
|---|---|
| Primary Use: | Liquid detection in the interstitial space of double-walled tanks. |
| Alternate Use(s): | Fuel Dispenser Pans and STP Sumps |
| Detects: | Liquids: Hydrocarbon and Water |
| Operating Temperature: | -40°C to +70°C (-40°F to 158°F) |
| Dimensions: | 0.7 inches (1.8cm) x 2.8 inches (7cm) |
| Nominal resistance (uncontaminated) | Less than 5,000 ohms |
| Nominal resistance (contaminated) | More than 30,000 ohms |
| Cable: | Belden #88760 or Alpha #55371<br>4.5 m (15 feet) of gas & oil resistant cable to the inline ISIM + 1.3 m (4 feet) ISIM tail |
| Maximum Wiring Length*: | 305 m (1,000 ft.) field wiring |

| Specifications | |
|---|---|
| Alarm Threshold Configuration: | Fully Automatic |
| Diagnostic Reading on Sensor Setup: | **0.02 to 0.03 and 0.23 to 0.25** (normal),<br>**0.02 to 0.03 and 0.02 to 0.03** (water alarm),<br>**0.23 to 0.25 and 0.23 to 0.25** (hydrocarbon alarm) |
| Multi-Drop Restriction | ProGauge / Integra: 12 on each I.S. barrier channel (48 total per barrier)<br>Nano: See Mixed Multi-Drop Installation in the M2010 Nano Installation Guide. |
| Connections: | Red = Power, Black = Signal, Shield = Ground |

**NOTE:** *This is the maximum length of wire to be used to connect all sensors on one channel. This length includes the wire from the VSmart to each sensor board in the string.




30-0236-LW Dimensions

## Installation

**WARNING:** Make sure you read and fully understand the warnings and information found in the **Hazardous Areas** section of your console's Installation Guide before you install or do the servicing of this sensor.

**IMPORTANT:** This Smart Sensor must ONLY be connected to a ProGauge or OPW Fuel Management Systems 12V VSmart Module. This will make sure that operation conditions are safe.

**CAUTION:** ALWAYS obey Local and National Electrical Codes applicable to the installation location.

Make sure that the cables from the field wiring to the controller are in conduit that is dedicated to intrinsically safe wiring.

Use wire-nuts and epoxy-resin seal-packs for field connections (refer to M00-390008 Waterproof Electrical Connections for information).

**IMPORTANT:** This sensor can only be used with a 12V IS Module. Sensors can be connected in parallel up to a maximum of 12 sensors on each channel (48 total on each barrier). This Sensor CANNOT be connected in parallel with devices other than Smart Sensors. It cannot be mixed with non-Smart sensors.

- This sensor uses ONE I.S. Module position
- Start with the Connections table and “Typical Installation" drawing below.
- Measure the length of the circular space in the monitoring pipe from top to bottom and subtract 1.3 cm (0.5 in.) for a total measurement to be used for the sensor installation.
- Measure the calculated length from the sensor tip along the sensor cable and identify it with tape or a marker.
- Put the sensor and wire through the monitoring opening until the mark is level with the top of the opening.

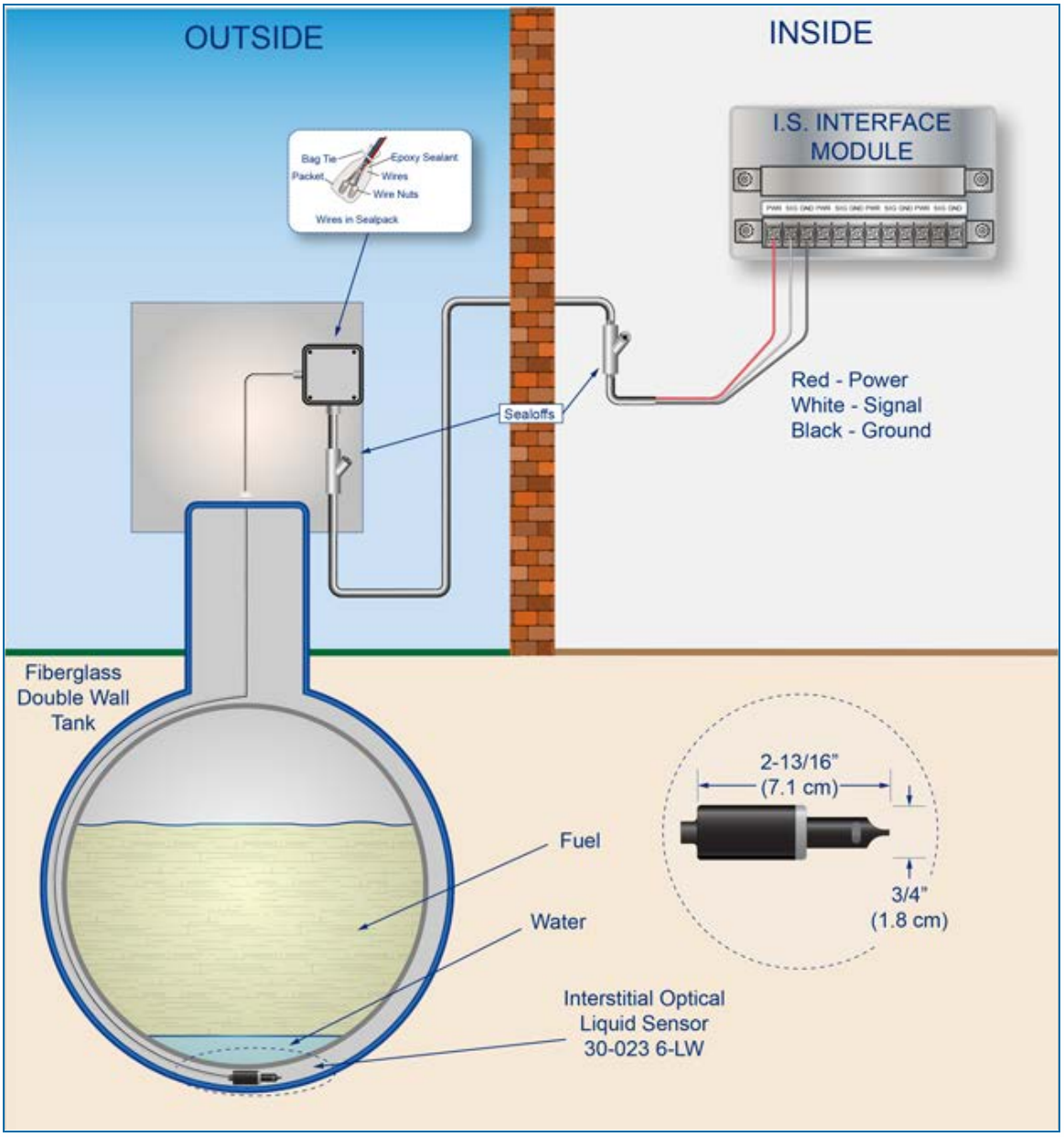
**IMPORTANT:** To prevent false alarms, the sensor must not touch the bottom of the monitoring tube

- Connect the sensor wires to the field wires in the junction box. Use the supplied cable gland and silicon wire nuts.
- Seal the electrical connections with the epoxy seal packs (refer to M00-390008 Waterproof Electrical Connections for instructions).
- Install explosion-resistant sealing fittings at both ends of the conduit. Refer to the **Probe-Cable Seal-offs** section of the console's Installation Guide for instructions.

## Connections

| Sensor Wire Color | 12V Smart Sensor Interface Channel |
|---|---|
| Red | Power |
| Black (hydrocarbon sensor) | Signal |
| Shield (or 3rd conductor) | Ground |

## Typical Installation Drawing




## Controller Setup

The sensor must be **Auto Detected** on the console. Alarm thresholds are configured automatically through the *Intellisense* mechanism between the sensor and the console.

## Test the Optical Sensor

**CAUTION:** Use caution to prevent dangerous conditions when you do work in a hazardous area.

Make sure that the area has sufficient airflow when you do a test or remove contamination from the sensor. Make sure there are no open flames or hot surfaces near the work area.

**IMPORTANT:** Make sure to test the Optical Sensor in a dark area. The sensor's optical element is light sensitive. Light can cause the sensor to not test accurately.

**Test the Water Sensor of the Device**

- Put the sensor fully into water. The test is satisfactory if an alarm condition or other event related to the water part of the sensor occurs.
- Remove the sensor from the water. Make sure that the controller is not in an alarm condition.

**Test the Hydrocarbon Liquid Sensor of the Device**

- Put the sensor fully into a non-conductive hydrocarbon (or equivalent) liquid. The test is satisfactory if an alarm condition or other event related to the hydrocarbon part of the sensor occurs. If the test results are unsatisfactory, replace the sensor.
- Remove the sensor from the hydrocarbon liquid. Make sure that the controller is not in an alarm condition.

If the controller does not go into an alarm condition, look to see if the thresholds are correctly programmed in the system. A sensor or wiring fault will cause a system alarm. Do a continuity test in the wiring and junction boxes. Make sure there is continuity with no short circuits.

**TIP:** This sensor can be cleaned with a dry cloth and put back into service again immediately.