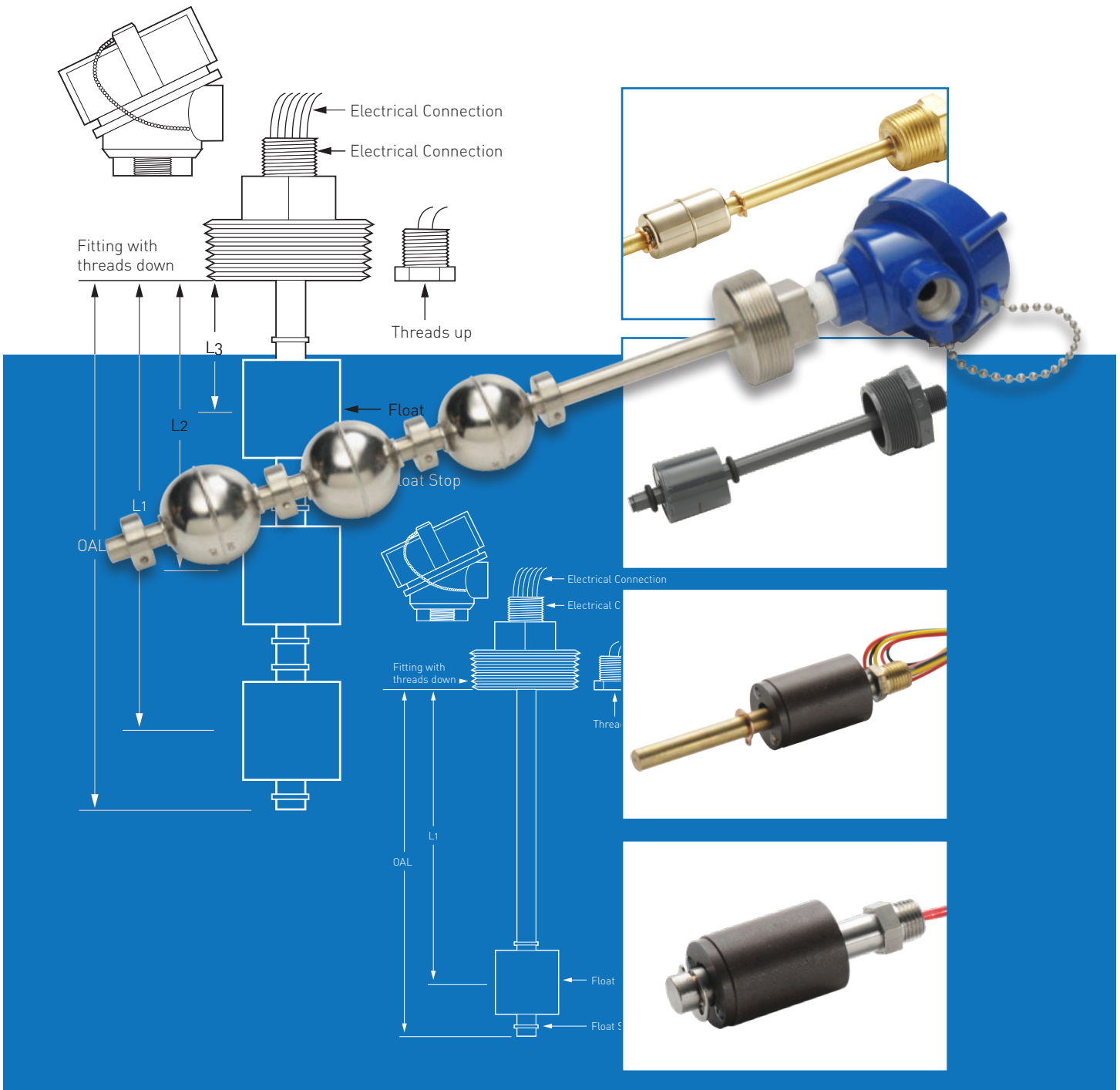


# FPI SENSORS INTERNATIONAL

A H I G H E R L E V E L O F S A T I S F A C T I O N

## The Ultimate Guide to Float Level Sensors: Installation Guide for Float Sensors



# Liquid level float sensor installation guide

## Basic instructions

### Pre-Installation

1. Make sure the area of installation is free from hazardous or flammable materials. If not, then be sure to use appropriate enclosure and protection.
2. Confirm the pressure and temperature limitations of the sensor will not be exceeded.
3. Confirm that the sensors' materials are compatible with the liquid and environment in which the sensor will be operating.
4. Ensure that the electrical load placed on the sensor switches does not exceed its maximum ratings.
5. Minimize both shock and vibration to provide maximum sensor switch life.
6. Make sure the sensor is mounted in a tank area that is free of severe turbulence or is protected from such turbulence by appropriate slosh shields.
7. Inspect the sensor housing and electrical terminations to ensure they are clean and dry.
8. Inspect all components for damage and report any damage to the carrier within 24 hours of receipt.
9. Ensure that the length and the inside diameter of the mounting are sized correctly to accommodate the application.

### Handling

Be careful to not bend the sensor stem during installation. Most float style liquid level sensors have an internal, hermetically sealed glass switch(s) that can be damaged by bending. Also, be careful not to apply excessive shock or vibration to the sensor during installation.

### Mounting

Sensors typically are mounted with a female coupler at the top, bottom or side of the tank that has threads matching the sensor. Sensors can be mounted up to 30° off the straight-line orientation.

When threading metal threads into a metal coupling, pipe sealant or Teflon tape is recommended. To avoid potential compatibility problems, a compatible pipe sealant is recommended when sealing plastic threaded units. Engage the thread by hand, then use a wrench to rotate the sensor clockwise until it is tight within the mounting. When threading the sensor into the coupling, be sure to avoid overtightening, which can strip or damage the thread. The actuation points are typically measured from the face of the fitting, so the distance that the fitting is threaded into the coupling at installation will affect the exact actuation point(s).

### Wiring:

*When connecting the wires to the sensor, be sure to confirm the proper wire color. Take care when handling the wires and feeding the wires through conduit or tight spaces to insure lead wire insulation is not compromised or damaged. Do not allow lead wires to be contacting sharp metal surfaces. It is important that lead wires are terminated in a controlled environment (inside a housing or enclosure) or terminated with a weather proof termination. Make sure the point where the insulation is removed from the wire is not exposed to high moisture content as the space between the wire and the insulation can leach moisture into the sensor. It is best practice to route the sensor wires in their own conduit with a reasonable separation from high power wires to minimize electrical noise problems.*

## Contact protection

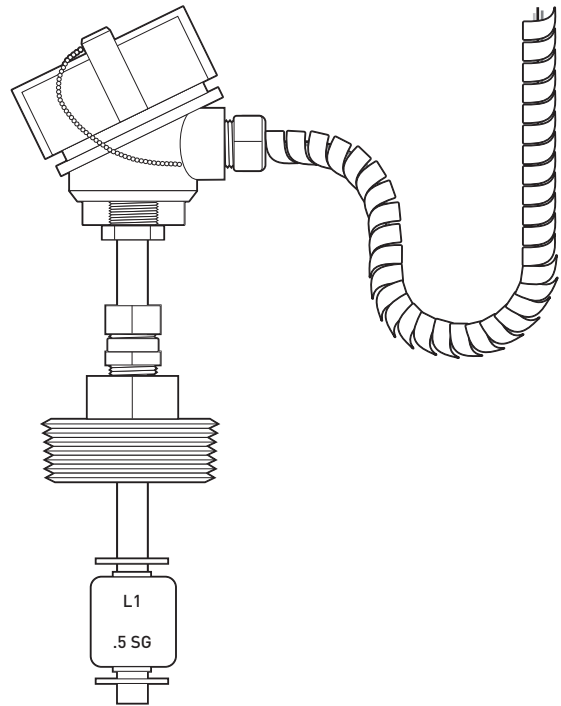
To maintain the life and reliability of the internal reed switch, it is essential to provide protection when switching inductive loads. In an inductive load, when the switch opens the energy stored in the load can generate high frequency voltage spikes across the switch contacts. (known as “Fly Back” power) If the power is large enough, it can initiate arcing and weld the contacts together. Damage can be minimized by suppressing the voltage and current spikes. In some applications, a relay is required to isolate the float switch from a large load. In this scenario, the float switch will be connected in series with a relay input coil that will activate the main relay contacts typically draws less than 500 mA. When the float switch is closed, the relay coil is activated and closes the relay output contacts. These contacts turn on or off the high current required by the large load, such as a pump.

## Moisture protection

The lead wires exiting the sensor are typically potted with epoxy. Although this potting provides some protection to the interior of the sensor, if moisture is present in the conduit, there is a potential for this moisture to wick down the wire leads into the sensor’s internal assembly where the moisture can contaminate the internal wire harness and switches resulting in the failure of the sensor. Keeping the moisture away from the area where the leads exit the sensor and away from the area where the insulation is stripped from the lead wire will help minimize this potential problem. See Conduit illustration.

When running conduit to the sensor, be sure to run the conduit below the connection point to the sensor to create a water trap (like a sink drain trap) This trap will collect the condensation build up, preventing the moisture from accumulating on the end of the sensor where the leads exit.

## Conduit illustration



There are design options that can be considered to protect the sensor from moisture contaminating the internals of the sensor. One popular option is to select a cable for lead wires and a sealed “cord grip” to create a water tight seal at the end of the sensor. There are other options create a water tight sensor. Contact FPI Sensors to discuss your specific application requirements.

## Compression tube fittings installation procedure

Compression fittings are typically found on units with the field adjustable stem length option and long sensors that exceed 100" or sensors where installation clearance above the tank is limited. For an adjustable sensor, loosen the compression fitting and slide the stem so the floats are at the desired depth in the tank and then tighten compression fitting. For tube connections, loosen the nut on the fitting and insert tubing until the tube bottoms in the fitting body. Tube alignment with fitting is very important. Tighten nut finger tight, then wrench tighten 1¼ more turns).

## Installation quick check items

1. Confirm the peak electrical load across the sensors switches do not exceed the switch's maximum rating
2. Confirm the maximum temperature of the system does not exceed the maximum temperature rating of the sensor
3. Confirm the pressure in the tank does not exceed the maximum pressure rating of the sensor
4. Be sure there is not ferrous material near the sensor. Nearby (as a guideline, within 6 inches, however further separation may be required for certain sensors) ferrous material can disrupt the sensors magnetic field and interfere with the sensors operation.
5. Confirm the wiring and conduit are properly installed to insure moisture does not accumulate in the area the leads exit the sensor and the lead wire connections are protected against moisture contamination.

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