

Quick Start

TankPro® Series Level Sensor + LED Display



Designed by Icon Process Controls

- ☐ Suitable For Foam | Vapor | Turbulence | Condensate
- ☐ Exceptional Chemical Resistance
- ☐ PTFE Teflon Jacketed Cable

PVC	PP	PVDF	PTFE	316 SS
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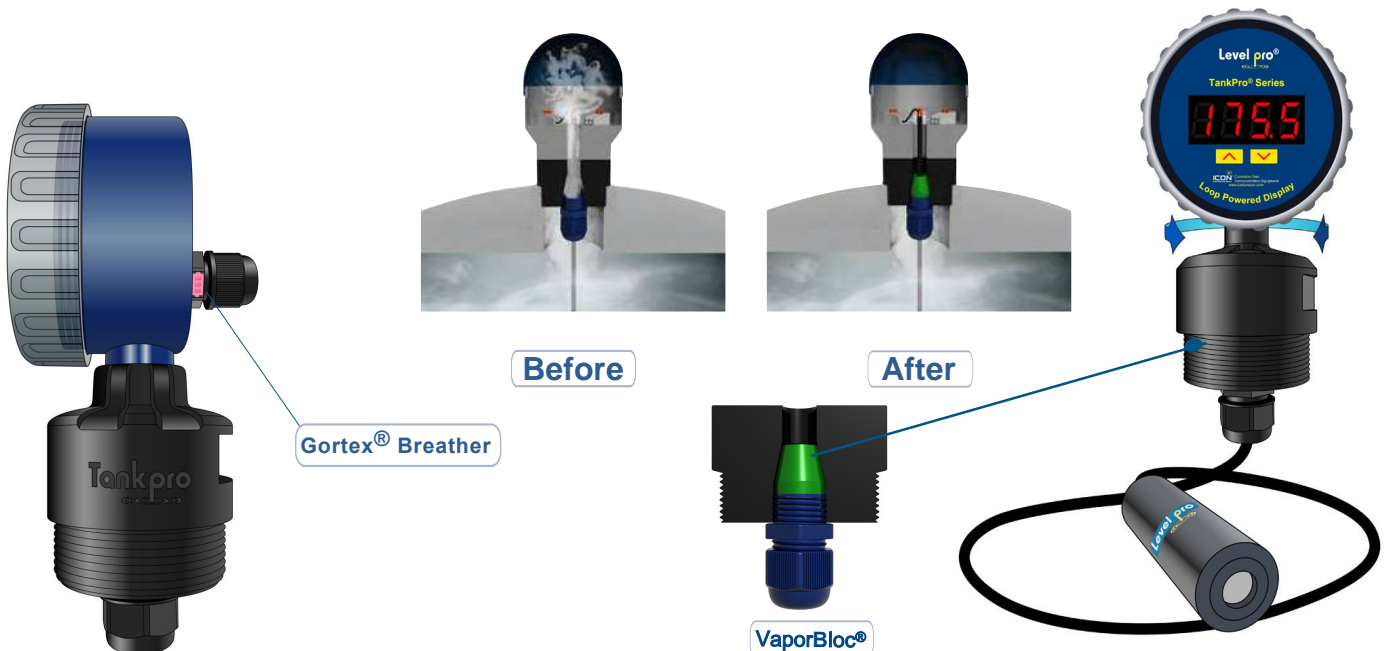
Seals: FFKM | FPM | EPDM



The Solution to Tough Applications Where Ultrasonic Sensors Simply **DO NOT WORK!**



100 Series Submersible Sensor



Before

After

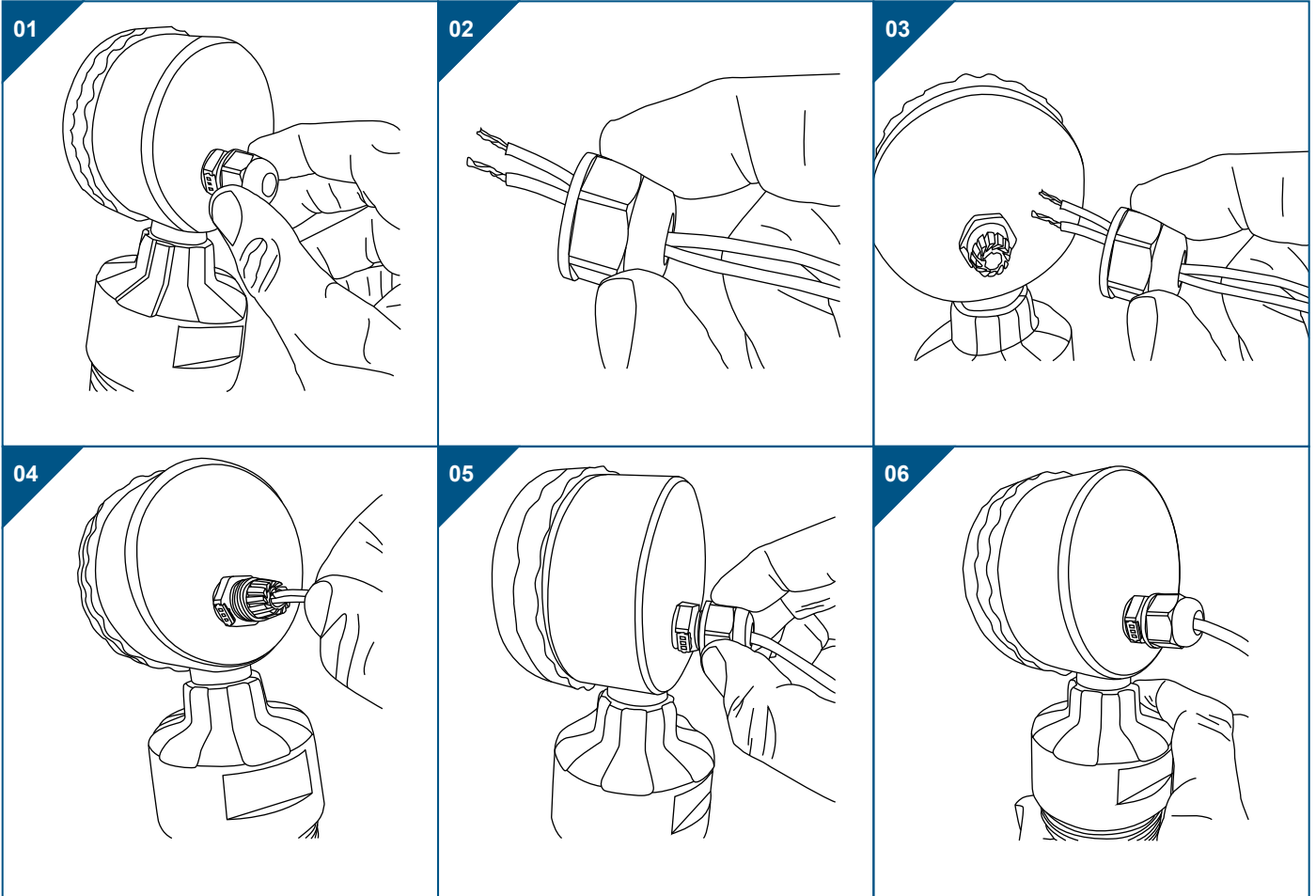
Gortex® Breather

VaporBloc®

Tankpro[®] Series

Continuous Level Transmitter + LED Display

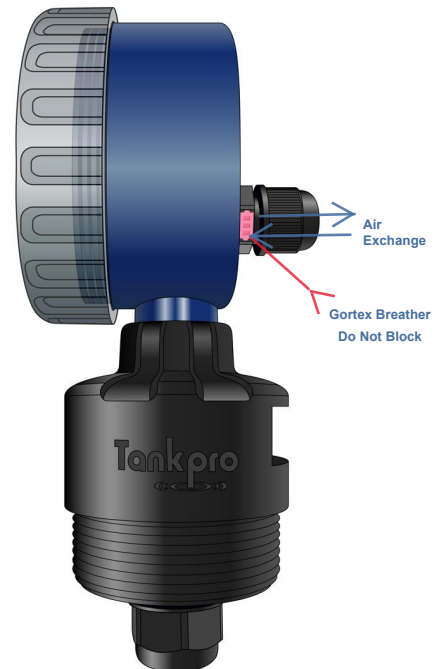
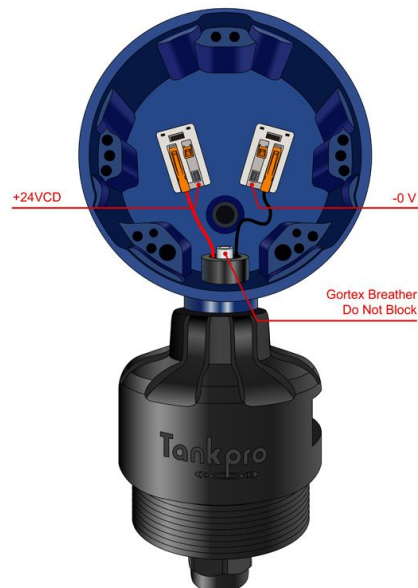
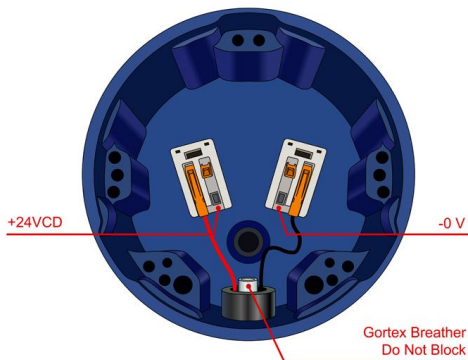
Wiring



Power Supply | 24 VDC

Connector 1 | 24VDC

Connector 2 | 0V



Understanding Level Measurement

Submersible Sensors

All Submersible Sensors have a Calibrated Range that is Based on H₂O that has a Specific Gravity or Density = 1

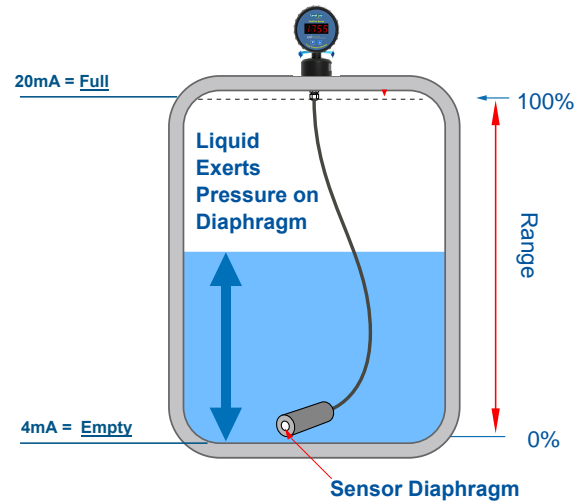
1. **Range Value** | The Overall Measuring Distance that the Sensor has been calibrated to by the Factory - The Range will be Located on the Sensor Body

2. **Empty:** The Pressure being exerted on the sensor diaphragm at **Lowest Point.** Normally this is when the Tank is Empty

Empty = 4mA setting.

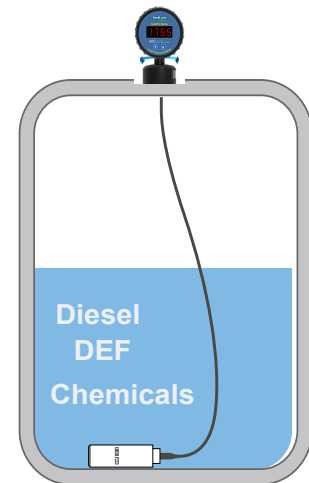
3. **Full** | The Pressure being exerted on the sensor's diaphragm at the highest point **Liquid Level** within the Tank

Full = 20mA setting.



Application Details

- **Chemical** _____
- **Concentration** _____
- **Specific Gravity** _____
- **Temperature** _____
- **Solids** Yes No
- **Out-gassing or Vapors** Yes No



- **Tank Dimensions W x H inches**
W = _____ H = _____
- **Vertical** **Horizontal**
- **Flat Bottom** **Conical Bottom**

Getting Started

- Submersible Pressure Sensors are designed to be completely submersed within the liquid. The transmitters can rest along the bottom of the tank or be suspended at any desired level within the tank.
- Please note that the physical location of the level transmitter will indicate the lowest level of measurement within the tank.
ex: Positioning the transmitter 12" from the bottom of the tank, then the lowest reading of liquid will be 12" from the bottom (Figure 2)

When the Liquid To Be Measured is Not H₂O the New Range of the Sensor Needs to be Determined.

To Achieve this Simply Divide the Range of the Sensor Body by the Specific Gravity of the Liquid.

$$\text{SENSOR RANGE} / \text{S.G} = \text{NEW RANGE}$$

The Importance of the Liquids Specified Gravity

The S.G of a Liquid has a Direct Effect on the Sensors Output when Measuring the Height of the Liquid

Liquids with a SG < 1.0 are Lighter than H₂O i.e. Oil

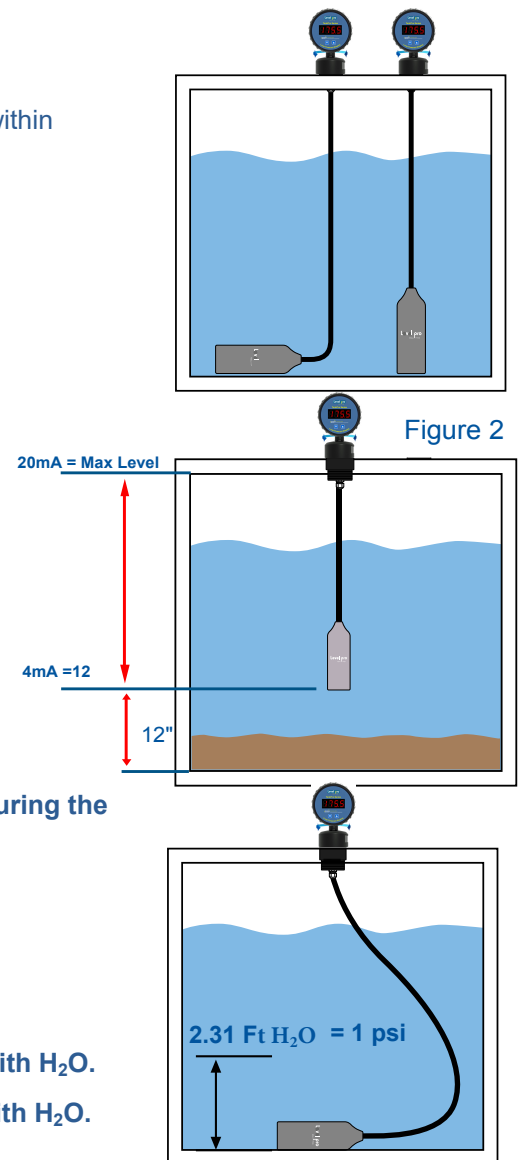
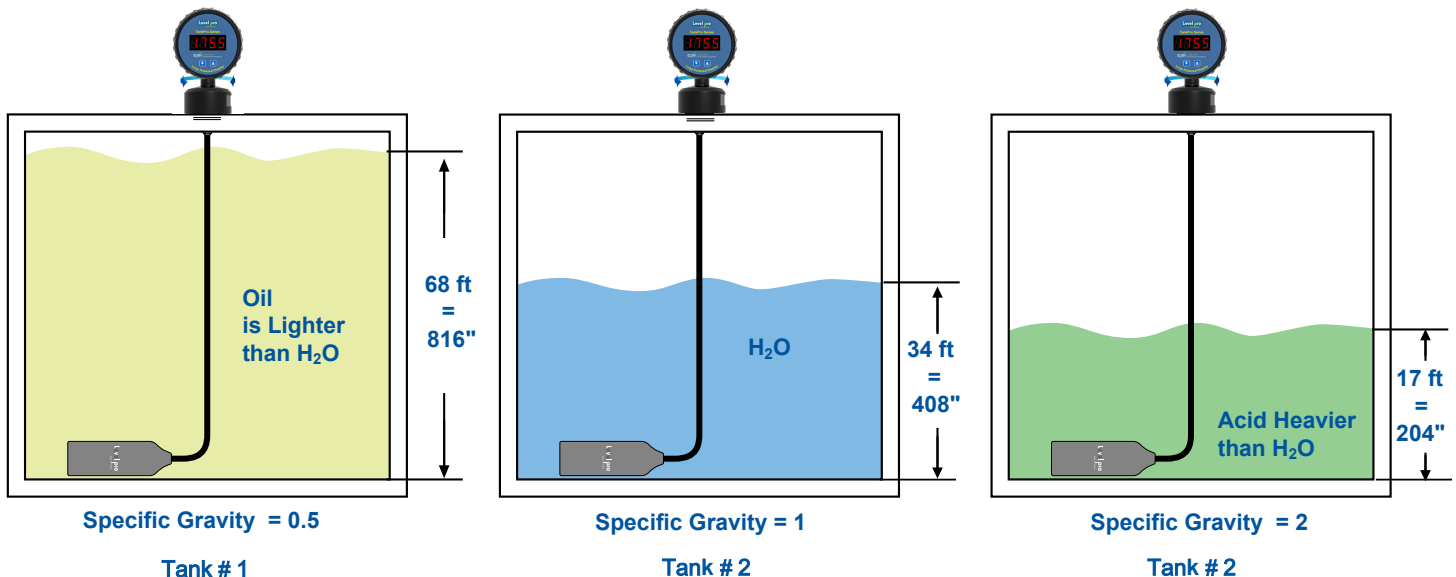
Liquids with a SG > 1.0 are Heavier than H₂O i.e. Sulfuric Acid

H₂O has a SG = 1.0.

S.G < 1.0 Requires **More Liquid** to Equal the Same Pressure or Height as with H₂O.

S.G > 1.0 Requires **Less Liquid** to Equal the Same Pressure or Height as with H₂O.

Here are some examples of how the submersible sensor range changes when submersed into liquids with different Specific Gravities.



Calculating Max Range of Sensor

Lets assume the calibrated range of the submersible sensor is 34' or 408". The range is always referenced H₂O which has a specific gravity S.G or (Density) equal to 1

Calibrated Range/S.G = Liquid Level Measurement Range $34/1 = 34'$ or $408/1 = \text{Liquid Level Range} = 408''$

Example 1.

The liquid in Tank # 1 has a S.G =0.5 which is lighter than that of H₂O

To determine the New Range of the sensor simply divide the H₂O Range (34') by the S.G of the liquid that is going to be in the tank. S.G =0.5

$34/.5 = 68$ feet or 816 inches

Since the oil is a lighter fluid than H₂O the new measuring range of the sensor has increased and is now 68' or 816"

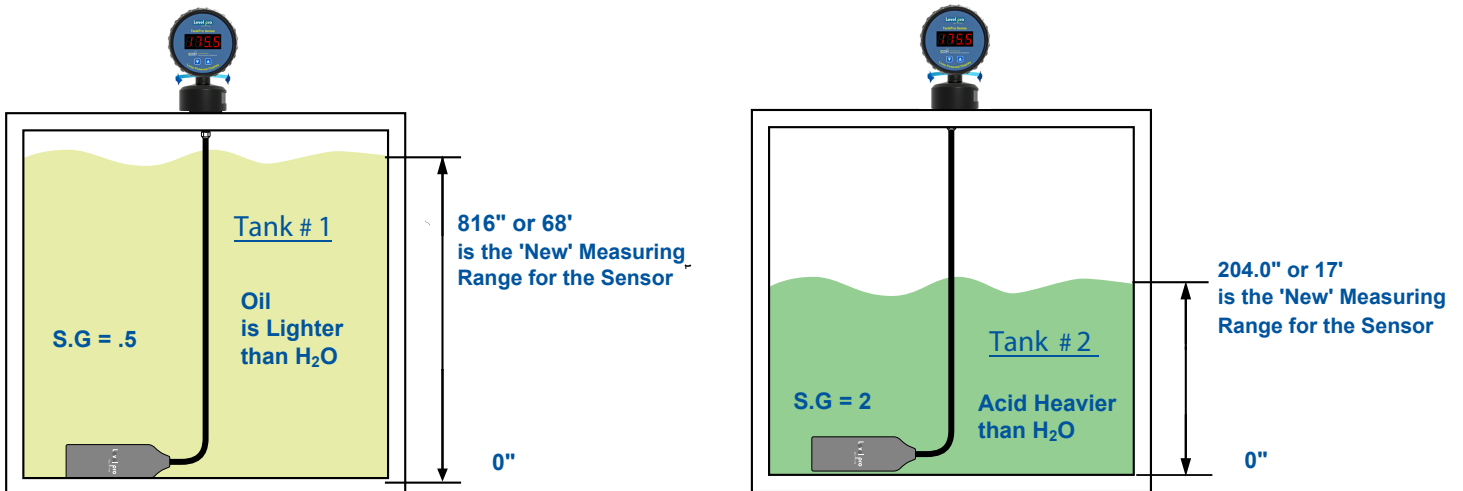
Example 2.

The liquid in Tank # 3 has a S.G. = 2 which is 2X heavier than H₂O

The 34' sensor is now going to be installed into a tank to measure a liquid with a S.G = 2

Range /S.G = New Range of the Sensor

$34/2 = 17$ feet or 204"



Oil S.G = 0.5	Sensor Signal	Display Reading
Tank 1 Empty	4.0mA	0"
Tank 1 Full	20.0mA	816"
Acid S.G = 2.0	Sensor Signal	Display Reading
Tank 2 Empty	4.0mA	0"
Tank 2 Full	20.0mA	204"

Installation

The Submersible Level Sensor is designed to operate while immersed in liquid.

- ❑ **Avoid:** Installing the level transmitter along the bottom of the tank if materials such as sludge will build up and coat/cover the transmitter.

This also includes any debris that will settle along the bottom of the tank.

In these applications, it is best to suspend the transmitter above the highest level of sludge/debris that will occur. **See Fig A.**

- ❑ **Location:** Select a location where the temperature of the transmitter will be within the specification of the sensor.

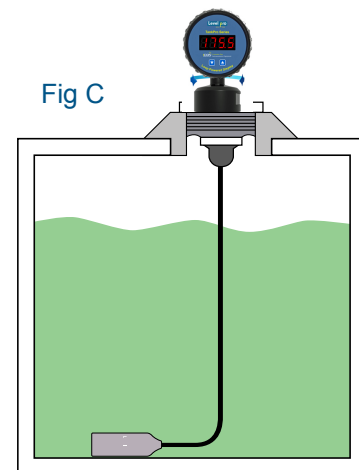
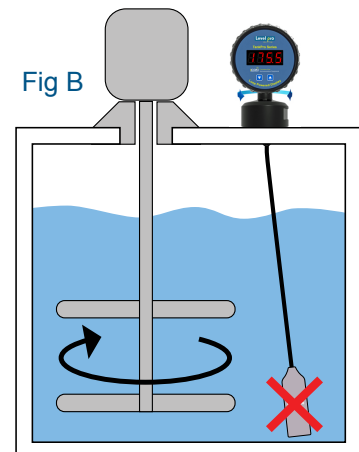
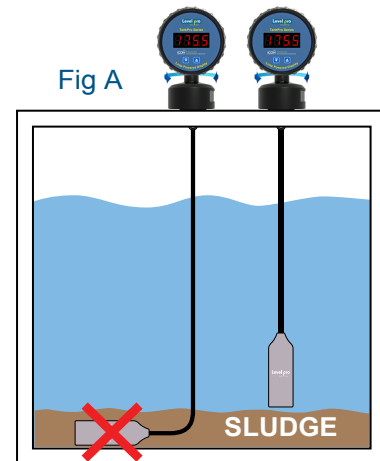


- ❑ **Installations where other tank requirements will cause the transmitter to move or swing.**

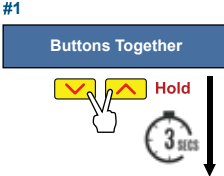

















A mixer blade could cause the level transmitter to whip around within the tank. An alternative would be to move the transmitter to a more stable section of the tank or to install the Transmitter inside a still-well/drop tube. This will minimize the effects created by the mixer.

- ❑ **Position: The transmitter is not position sensitive.**

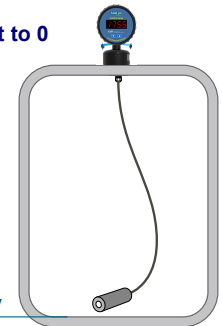
- ❑ **Mounting :** The transmitter can be mounted via several methods. It can be suspended from the cable, it can be placed resting on the bottom of the tank in either horizontal or vertical orientation, or it can be attached to a pipe or hardwired using the LP100 conduit box on the top of the housing.



Programming Display

STEPS	DISPLAY	OPERATION
		Press and Hold Both SE-1 } 4mA Display Data Default = 0 SE-2 } 20mA Display Data } Enter Value SE-3 } 4mA Alarm Set SE-4 } 20mA Alarm Set SE-5 } Symbol Set - Default = Blank
#1 Buttons Together 	SE-1 Low Value - 4mA = 0	Press  2 Secs } LCD Default 0000 Press  Change Decimal Point Press  Change Number [0-9] Press  3 Sec to Store Data
	SE-2 High Level Value - 20mA	Press  2 Secs Press  Select Number Digit Press  Change Number [0-9] to Set Alarm Press  3 Sec to Store Data
	SE-3 Low Level Alarm Value	Press  2 Secs } Displays 'NO' Press  Again to Select Number Press  Change Number [0-9] to Set Alarm Press  3 Sec to Store Data
	SE-4 High Level Alarm Value	Press  2 Secs } displays 'NO' Press  Again to Select Number Press  Change Number [0-9] Press  3 Sec to Store Data
	SE-5 Blank	Press & Hold 2 Sec Return to Main Display Main Display in Inches 

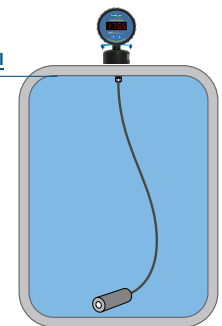
SE-1
 Default Set to 0



4mA = Empty

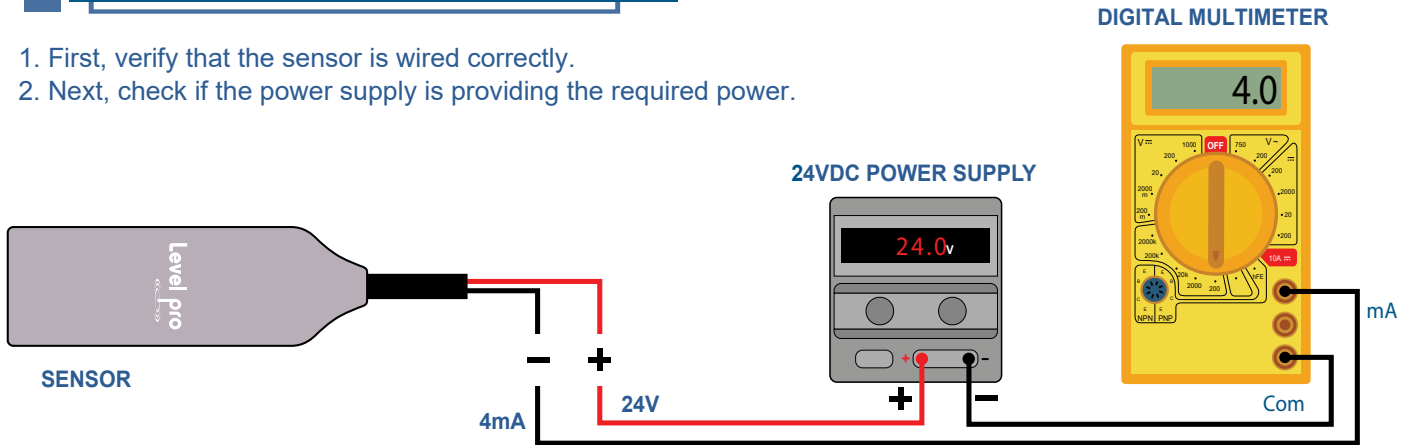
SE-2

20mA = Full



Trouble Shooting the Sensor

1. First, verify that the sensor is wired correctly.
2. Next, check if the power supply is providing the required power.



If transmitter is not functioning properly, isolate the transmitter from the system and wire as shown above. The Multi-Meter should read 4mA when the sensor is not submersed in Liquid.

Display Not Turning On

- Check Wiring
- Check Power Supply

Display Indicates LL

- Check Power Supply
- Check Wiring

Determine 20mA Value to Program d IH on Display

Example: S.G of the Liquid is Heavier than H₂O

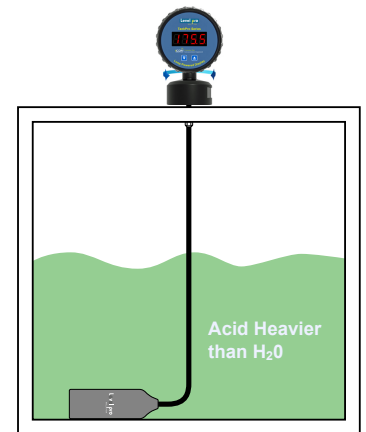
The Submersible Sensor Range is 34' is now going to be installed into a tank of Acid

S.G = 2

S.G = 2: Sensor Range = 0 - 34'

To calculate the New Range of the Sensor = Range/S.G | 34/2 = 17.5 ft or 204 inches

The liquid is Heavier than H₂O so the Overall Sensor Range Has been reduced to 17 ft or 204 inches.



8814

20mA = Full Level Value
Default = 100 | Refer to Reference Picture

88100

20mA = the High Tank Level Value of the sensor. Inches | Feet | Gallons

* This number is determined by dividing the max range of the sensor by the Specific Gravity

Display Inches

Range/S.G = 34'/S.G = New Full Range of Sensor | 20mA

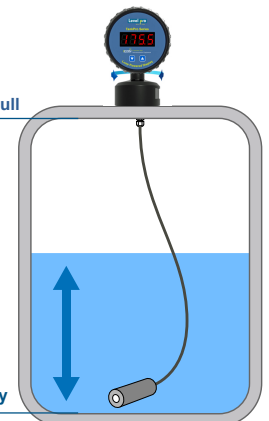
Display Gallons

Range / S.G x Gal/Inch = Gallons



20mA = Full

4mA = Empty

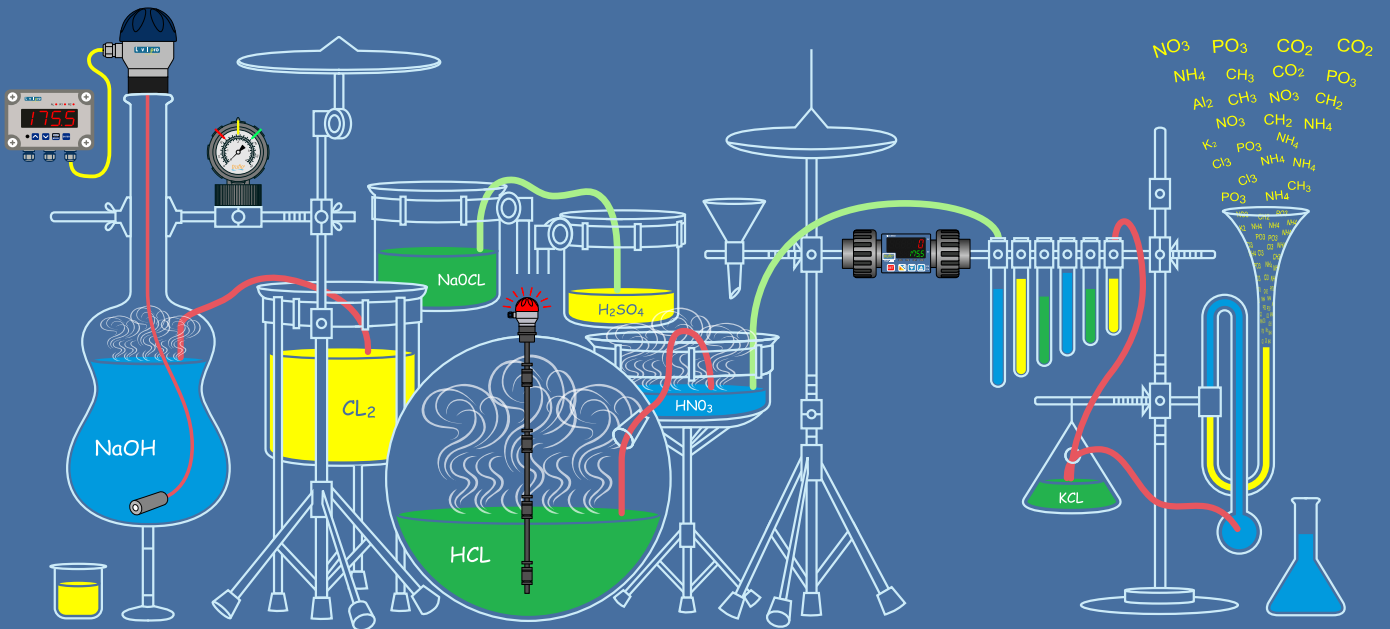


Incorrect Display Reading

- ❑ The reference or capillary tube is fitted with a Gortex® Breather - this must remain attached in order to prevent moisture, particulate or insects from entering. Do Not Remove.
- ❑ Avoid blocking or bending the ventilation tube.
- ❑ The LP100 Installation Junction Box is fitted with a Gortex® Breather to allow air to pass but not water. Please Ensure this Not Blocked
- ❑ Always keep the cable termination clean, dry and free of moisture and prevent liquid from entering the vent tube
- ❑ Confirm Programming Input for 20mA (d IH on Display) is Correct
- ❑ Confirm Specific Gravity of Liquid is Correct.



CORROSION



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