

**Measurement  
Solutions**

# Hydrostatic & Submersible

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**Level Instruments**  
for the Australian market



# Hydrostatic and Submersible Level Transmitters

Hydrostatic and submersible level instruments use the head pressure of a fluid to infer level. It's one of the oldest and most common methods around, and with good reason. Using pressure to measure level is a simple, reliable and for the most part cost effective solutions for a wide range of applications across many industries.

The equation to convert pressure (P) to level (L) is:

$$L = \frac{P}{\rho g}$$

Thus, the equation for pressure (P) generated is:

$$P = L\rho g$$

Where:

L = level of fluid in metres above the sensor

P = pressure in kPa

$\rho$  = density of the fluid in g/cm<sup>3</sup>

g = gravity, (Can be considered 9.81 m/s<sup>2</sup> for most locations)

## Example 1 - Level where pressure is known

1. Pressure (P) of 4.9 kPa
2. Fluid density ( $\rho$ ) of 1 g/cm<sup>3</sup>
3. Gravity (g) at sea level = 9.81 m/s<sup>2</sup>

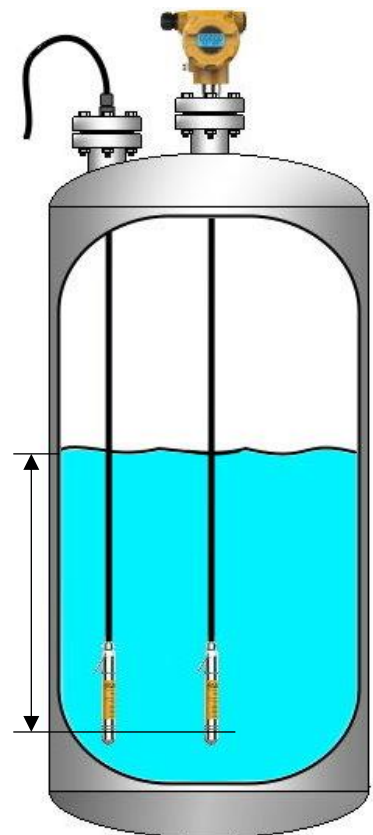
$$L = \frac{4.9}{1 \times 9.81} = \mathbf{0.5 \text{ metres}}$$

## Example 2 – Pressure when level is known

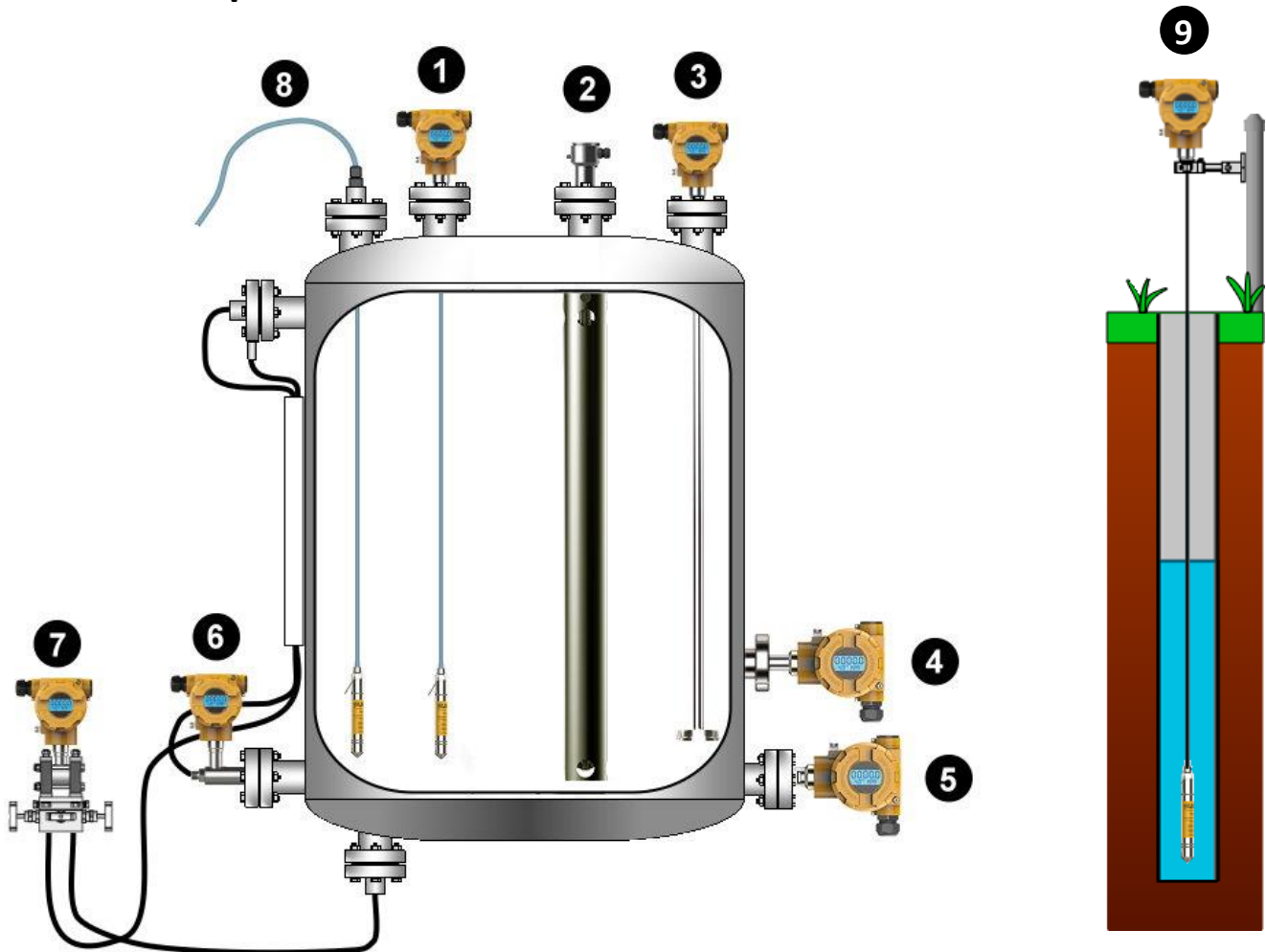
1. Fluid level (L) is 0.5 metres
2. Fluid density of 1 g/cm<sup>3</sup>
3. Gravity at sea level = 9.81 m/s<sup>2</sup>

$$P = 0.5 \times 1 \times 9.81 = \mathbf{4.9 \text{ kPa}}$$

L = 0.5 m



## Installation Options



1. Top mount hydrostatic level transmitter with a flexible insertion length.
2. Rigid top mount hydrostatic level transmitter for pressurised vessels.
3. Rigid top mount hydrostatic level transmitter.
4. Hygienic gauge pressure/level for pharmaceutical or sanitary applications.
5. Gauge pressure/level transmitter.
6. Differential pressure transmitter for pressurised vessels.
7. Remote differential pressure transmitter.
8. Submersible level transmitter.
9. Submersible level transmitter for bores and wells.

## Submersible Level Sensors

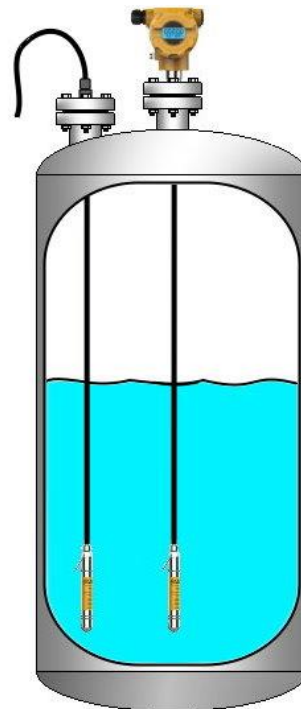
Submersible level transmitters offer a convenient and low-cost solution for measuring fluid and slurry levels in dams, tanks, weirs, wells and just about any atmospheric body of water.

The sensor is fully submerged in the fluid and signal sent via the cable or to a remote head for display and transmission.

Calibration features can also be provided via remote indications heads or via HART, Modbus and Profibus protocols

### Advantages

- Low cost, high value, superior long-term stability
- Low power options for battery and solar
- Integrated over voltage and surge protection circuit
- Cable lengths up to 2000 m



### SGE-25 & SGE-25.SMART

- General purpose 25 mm diameter sensor, 316LSS body
- 4-20 mA, VDC, HART or Modbus communication.
- Optional Hastelloy C276 body for aggressive mediums



### SGE-16

- 16 mm diameter, 316SSL body
- Ideal for narrow bores and confined installations.



### SGE-25C

- Flush sensor resists build up
- 25mm diameter body, 316LSS body
- HART, mA and VDC output options



### SGE-25S & SGE-25S.Smart

- Extra Large diaphragm for the thick and contaminated fluids
- 4-20 mA, VDC, HART or Modbus communication.
- Optional Titanium body for aggressive mediums



### APC-2000ALW/L

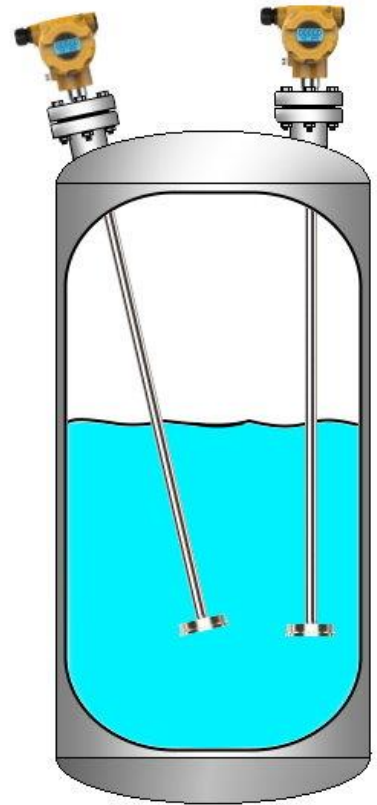
- Local keypad and display with easy configuration
- Flange, threaded, pipe clamp or other connection.
- 4-20 mA with HART
- IECEx approval

## Rigid Hydrostatic Level Transmitters

Aplisen's hydrostatic level transmitters can also be provided in a rigid configuration that fixes its position. This is ideal for applications that have moving or agitated product which could cause a conventional submersible sensor to move around.

### Advantages:

1. Fixed position
2. Resistance to agitation
3. Can be mounted at an angle to accommodate specific geometric requirements or to assist clearing internal obstacles.



### APC-2000ALW/P

#### *Rigid Smart Hydrostatic Level Transmitter*

- Ranges from 200 mm up to 3000 mm
- High accuracy
- HART compatible
- Programable via local display
- Temperatures up to 260 deg C
- Fixed or adjustable insertion lengths



### PCE-28P

#### *Rigid Hydrostatic Level Transmitter*

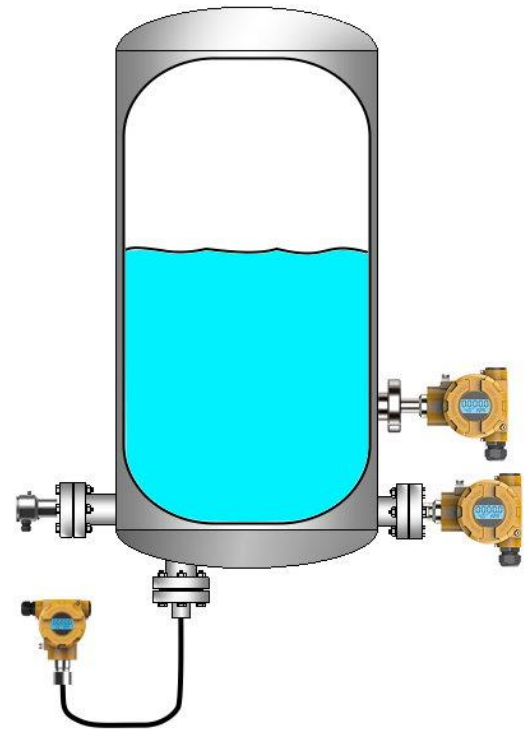
- Ranges from 200 mm up to 3000 mm
- Temperatures up to 260 deg C
- IECEx and DNV approval
- Fixed or adjustable insertion lengths

## Gauge Pressure & Level Transmitters

For non-pressurised vessels, a gauge pressure transmitter is a convenient and relatively low-cost option for level measurement. They can be easily installed at the base of the tank for easy access and inspection. The water produces a pressure proportional to the level of water above the sensor

### Advantages of this method are:

1. Simple installation
2. Easy removal and inspection
3. Device is often located in a convenient location for maintenance staff.
4. Not effected by foam and condensate.
5. Can withstand high pressures
6. Low cost, high value level solution



### APC-2000

#### Premium SMART Gauge transmitter



- 0.075% accuracy (down to 0.025% on request)
- Spans as low as 10 mm of water.
- 4-20mA, HART and Profibus protocols
- DNV, IECEx, Hygienic and other approvals
- 5-year warranty

### PCE-28/ALW

#### Gauge Transmitter with Local Display



- Local display sealed to IP65 or IP67
- 304 and 316SS bodies
- Spans as low as 255 mm of water.
- DNV, IECEx, Hygienic and other approvals

### PCE-28.SMART

#### SMART Gauge Transmitter



- 0.1% accuracy
- Spans as low as 10 mm of water.
- 4-20mA, HART and Modbus protocols
- DNV, IECEx, Hygienic and other approvals

### PCE-28

#### Gauge Transmitter



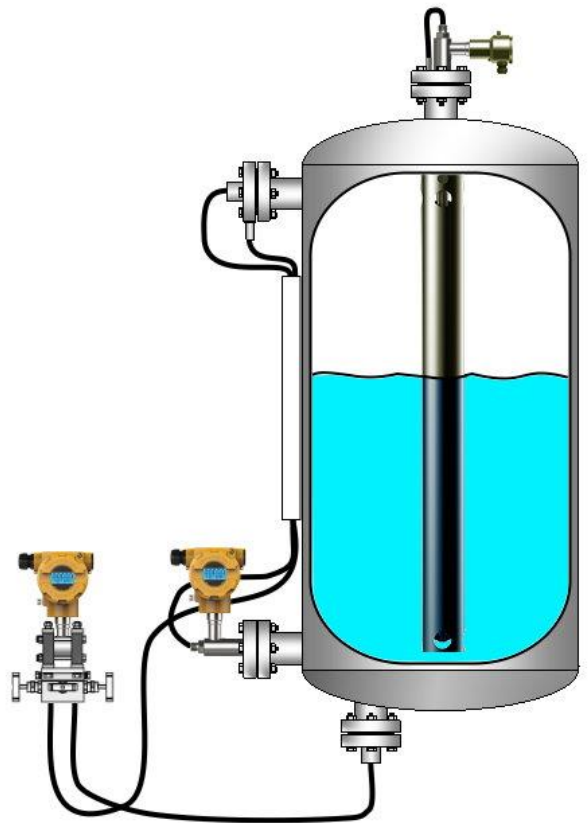
- 316SS, Hastelloy C276 wetted
- Spans as low as 255 mm of water.
- DNV, IECEx, Hygienic and other approvals
- High temp options

## Differential Pressure & Level Transmitters

A DP transmitter is ideal for pressurised or closed tank applications. A closed vessel may not equalise to atmosphere correctly and pressurised vessel will load up the measurement with the amount of pressure present.

### Advantages:

1. Compensate for vessel pressure and vapour space
2. Equalise vessel pressure where ventilation is poor
3. Greater measurement stability on shallow spans
4. Low cost, high value level solution



### APR-2000

#### *Premium SMART DP transmitter*

- 0.075% accuracy (down to 0.25% on request)
- Spans as low as 10 mm of water.
- 4-20 mA with HART
- DNV, IECEx, Hygienic and other approvals
- 5-year warranty



### APR-2000 Y

#### *Single entry DP Level transmitter*

- Single vertical entry
- Up to 0.16% accuracy
- Spans as low as 160 mm of water.
- IECEx approval















### PRE-28

#### *DP transmitter*

- 0.25% accuracy
- 304 and 316SS bodies
- Spans as low as 160 mm of water.
- DNV, IECEx, Hygienic and other approvals

# Diaphragm Seals

Diaphragm seals are a great way of isolating pressure instruments from coatings, solids, temperature, pulsation, corrosion and more.

S-CompCH	S-Comp	S-Nord	S-Mazut
			
Large diaphragm with teflon or tantalum wetted parts for corrosives	Seal with seperatable lower section and high linearity	high-temperature applications with low ambient temperature	Compact seal for integral and remote mounitng.
SP	ST	S-Comp 10M	Sanitary
			
Flush faced seal for thick or coating mediums	Extended face to accommodate nozzles	High pressure	DIN, Tri-Clover, Universal
S-TK	S-Homogenizer	S-RC	S-RCF50
			
Seal cleaning	Homogeniser	High temperature compact with flush face	High temperature, high linearity with flush face



## Indicators



IP66, 4-20 mA loop monitor



Single Channel indicators with alarms



Dual Channel monitor with differential and alarm features



6 Channel universal monitor with alarms and data logging

## Mounting Brackets



SG



C-2



PC



AL



FI25

## Valves/Manifolds



Needle Valve



2 valve manifold



3 valve manifold



5 valve manifold

## Universal HART Communication

### Bluetooth and USB compatible HART modem

- Universal connectivity
- Compatible with other brands
- USB for communication and charging
- Bluetooth for wireless communication
- Programmable features
- Mobile app available for android devices

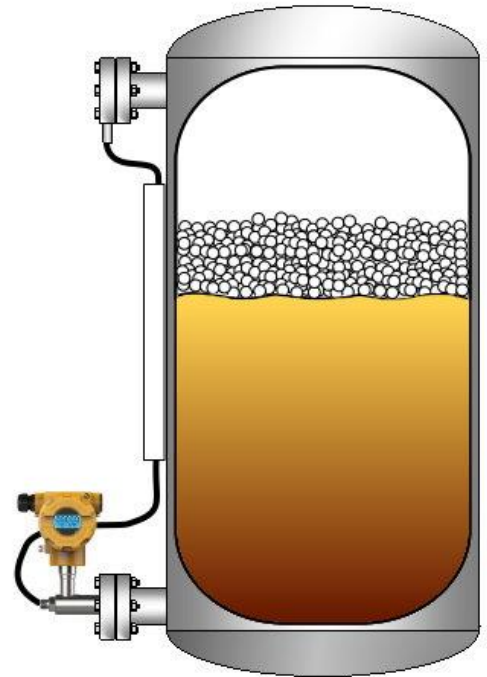


## Example Applications

### Foaming Products

DP level transmitters are a good choice for products prone to producing or experiencing foam. As the foam is light, it generates very little in the way of head pressure and its impact can be considered negligible.

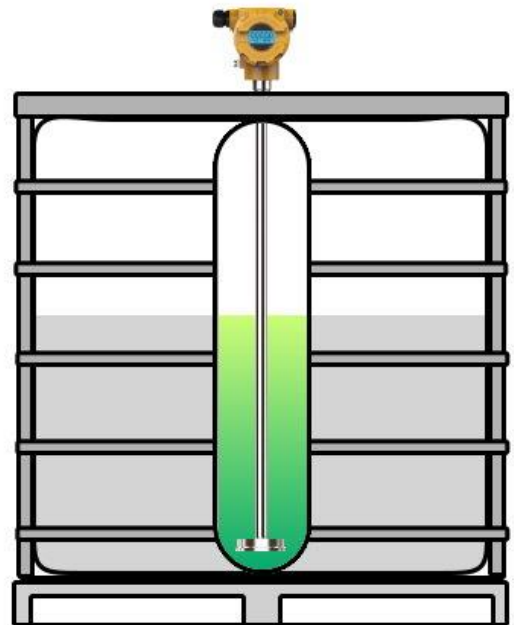
Large flush flanged or sanitary diaphragm seals can be equipped to address other process requirements.



### Monitoring in Small Tanks

Aplisens range of hydrostatic transmitters are capable of measuring levels as low as a few centimetres which makes them ideal for shallow sumps and small containers.

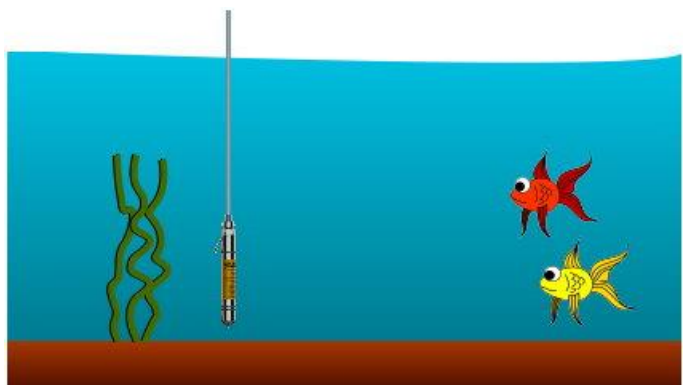
The rigid sensing elements on the APC-2000ALW/P and PCE-28P can also be equipped with quick change mountings for rapid change over from one vessel to another.



### Dam and River Levels

An easy way to monitor levels in rivers and dams is to use a submersible level transmitter. They are simply dropped to bottom of the body of water and ideally suspended from their lifting handle.

Fixed cable lengths in excess of 2000 metres are available for long runs back to a suitable panel or junction box. Large flush sensors and protective cages can also be equipped as required.

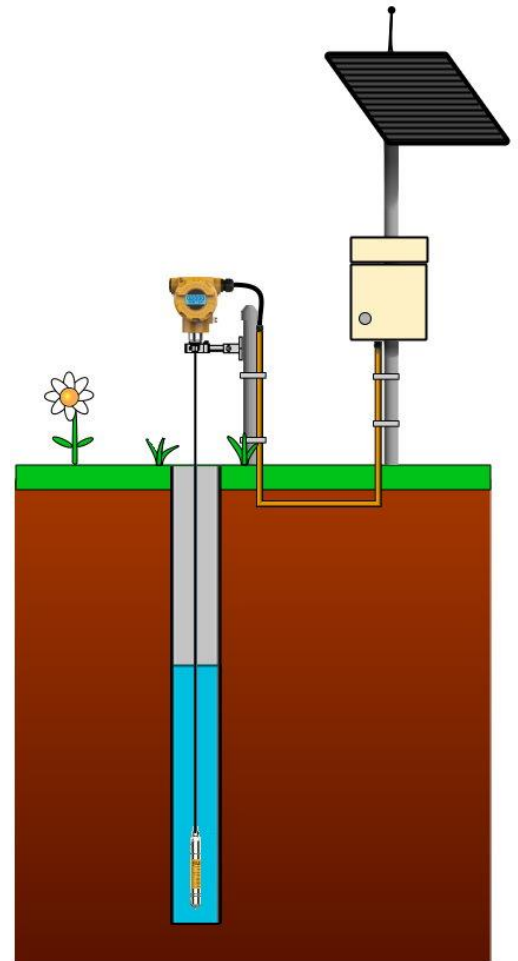


## Monitoring of Dams, Bores & Ground Water

With measurement ranges as deep as 500 mH<sub>2</sub>O, and industry leading long-term stability, Aplisens family of submersible level transmitters can reliably monitor levels of ground and bore water for year of unattended service.

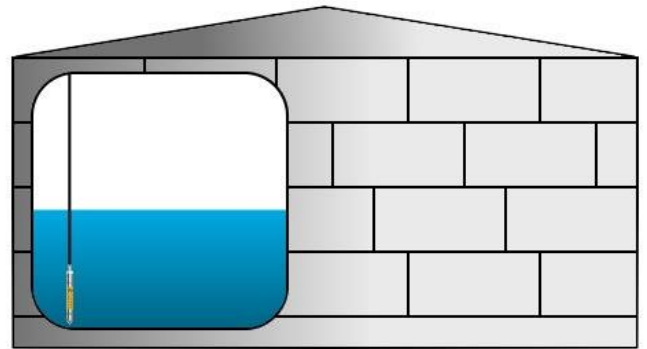
All Hastelloy C276 or titanium devices can be provided for high salinity and flush faces for coating prone or particle rich fluids.

The SGE family of submersibles is also available in an ultra-low power consumption format consuming only a handful of mW. Great for remote locations running on battery and solar supply.



## Storage Vessels

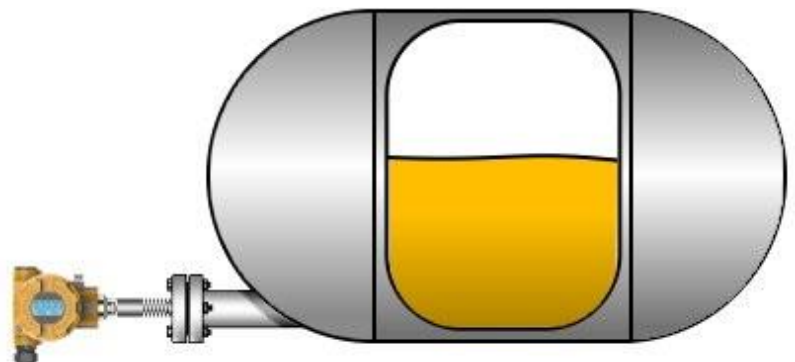
One of the most cost effective and reliable ways to monitor storage tank levels.



## Hot Oil Levels

Integral mount sensors can be used on fluids in excess of 300 degrees.

A high temperature radiator keeps the electronics cool while a special diaphragm seal and fill ensures stability over the operating range.



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