Liquid Level Switch

Reliable Precision in Liquid Level Detection

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Liquid Level Switch

APPLICATION

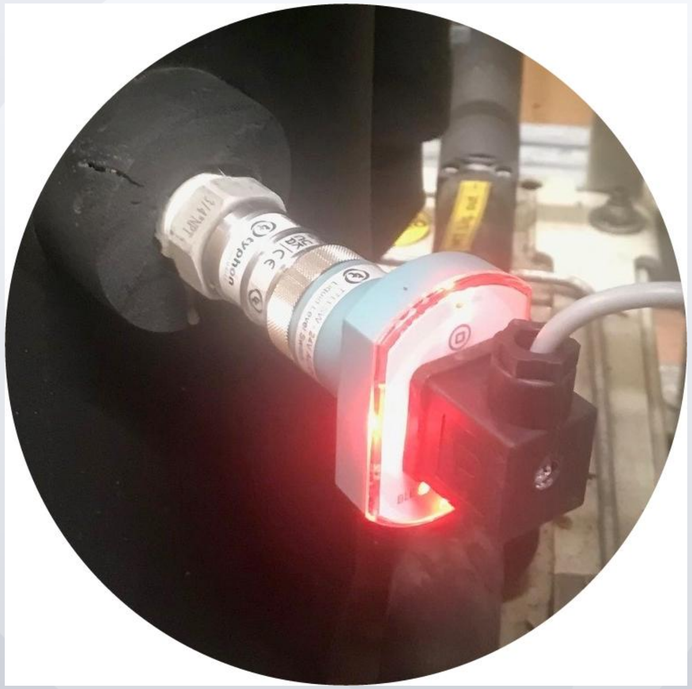
- Detect the presence of liquid in vessels, tanks, separators, compressors, standpipes and other applications.
- Detect level in all types of refrigerant media and oil
- Applicable for all types of cooling and heating systems (including heat pumps application)

PATENT PENDING

CO2, NH3, OIL, HFC, HFO, CFC, ALCOHOL, WATER, BRINE, OIL - Return Sensor

Key Features

- **Flexible Output:** SSR Output - NO/NC - Source/Sink - LED indication changeable by Bluetooth
- **Fail-Safe Overload Protection:** Resettable output overload protection – self-Protecting output
- **Universal Media Combability:** CO2, NH3, OIL, HFC/HFO/CFC, ALCOHOL, WATER/BRINE, OIL - Return Sensor
- **Robust design:** Measuring capacitance & conductance – unaffected by metal or conductive parts
- **High Reliability:** 1000 VAC Galvanic Isolation for improved reliability and sensitivity
- **One Sensor, All media:** Reduce complexity and simplify inventory - ONE Switch for everything
- **Easy setup:** Configure, diagnose and view live data via Bluetooth + TT SmartConfig App
- **Future proof:** Reduced PFAS content - Higher signal accuracy and environmental compliance
- **Industrial longevity:** No moving or mechanical part to wear out
- **Service-Friendly:** Replacement of electronic part without removing mechanical part
- **Industrial durability:** High pressure up to 150 bar / IP66 protection degree
- **Patent Pending:** Innovative technology for maximum reliability



Measuring principle

- Capacitance Measuring Principle

The capacitive measuring principle is based on the working principle of a capacitor. A capacitor creates an electric field between two conductive plates when the voltage is applied. The capacitance is calculated from the electric field and is than transform into a level.

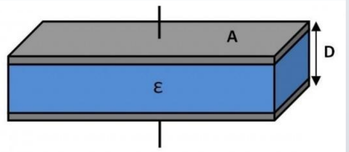
The electric field is depending on 3 things:

dfgfgfgfdfg

• **Plate size** – Bigger plates can “hold” more charge.
• **Distance between plates** – Closer plates can “hold” more charge.
• **Material between the plates** – Different media have different dielectric constant (εr).

The distance of the conducting sheets (d) and the size (A) of the plates themselves are always kept constant to a capacitive sensor. Which means the only thing changing is the dielectric constants(εr) of the media.

$$C = \epsilon_0 \epsilon_r * \frac{A}{D}$$



Combined with

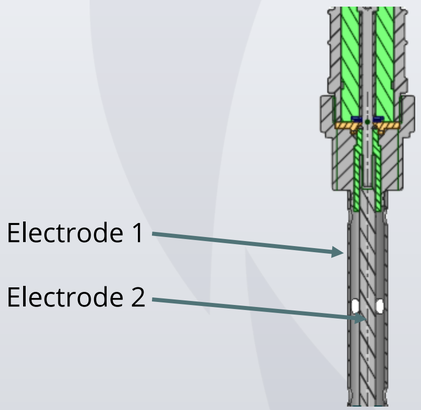
Medium	Dielectric Constant (εr, ~20–25 °C)
Ammonia (R717)	17
CO_2 (R744)	1.6
Propane (R290)	1.6 - 1.8
Propylene (R1270)	1.9
R134a (HFC)	13.6
R404A / R507A (HFC blends)	9 - 12
R1234yf (HFO)	9.5
Ethylene Glycol (30–50% aq.)	37 - 42
Propylene Glycol (30–50% aq.)	30 - 35
Brine (20–30% aq.)	70 - 80
Water	78.5
Ice (solid H_2O)	3.2
PAG Oil	5 - 7
POE Oil	4 - 6
PAO Oil	2.1 - 2.3
Air (gas)	1.0

- Conductance Measuring Principle

The conductance measuring consist of two electrodes and measure how well a material (media) can let electricity flow between the two electrodes.

How to use the conductance measuring principle:

• Detect level in tanks with conductive liquids
• Quality control (checking salt concentration in water).
• Leak detection (if a conductive liquid appears).



Designs & Forms

TTLLSW

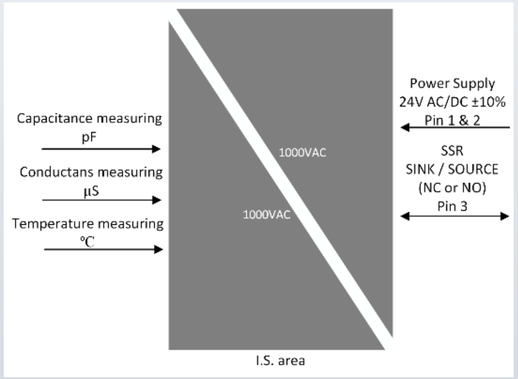
- **Thread:** ½” NPT, ½” BSPP, ¾ NPT, ¾ NPT
- **Universal Media Combability:** CO2, NH3, OIL, HFC/HFO/CFC, ALCOHOL, WATER/BRINE
- **Flexible design:** Easy to handle and ship, installation in low ceiling height
- **Installation:** Vessels, tanks, separators, compressors, standpipes and other applications
- **One Sensor, All media:** Reduce complexity and simplify inventory - ONE Switch for everything
- **Reduced PFAS content** - Higher signal accuracy and reliability

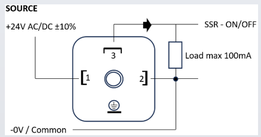
Electronic part

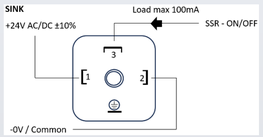
TTLLS-EL

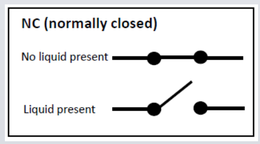
- Measuring capacitance and conductance - not impacted by metal parts or any conductive parts
- The liquid level switch has an SSR output function which is activated by the liquid level.
- Alarm output - SSR Relay 100mA
- 1000 VAC Galvanic Isolation - Increase reliability and sensitivity.
- Configuration, diagnostic and Live data on site via Bluetooth

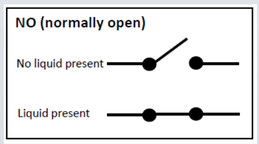
- 4 x Indication LED's when liquid is presence and not presence.
- 1 x Blue LED for indicating Bluetooth activ
- Universal Media Combability: CO2, NH3, OIL, HFC/HFO/CFC, ALCOHOL, WATER/BRINE
- Industrial durability - High pressure up to 150 bar / IP66 protection degree
- Patent pending technology
- ISO4400/DIN43650 Plug











Mechanical part

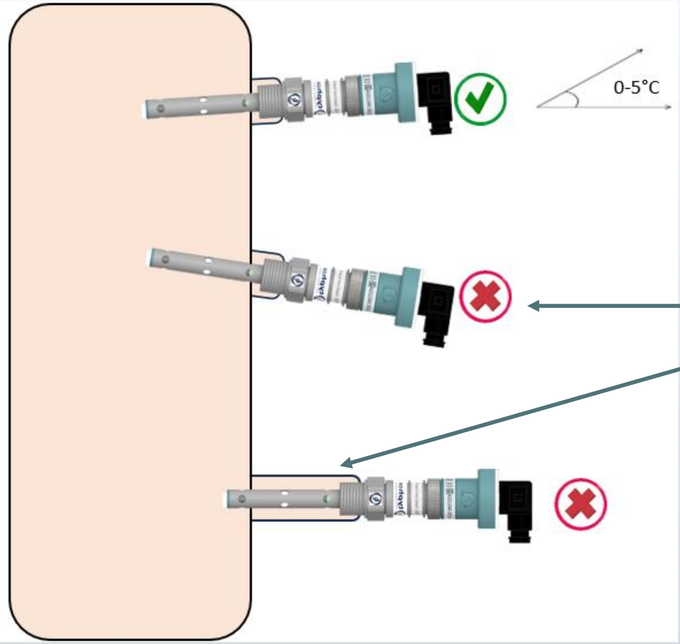
TTLLSW-Mec

- Stainless Steel design
- PTFE Sealing, PEEK & O-ring

- PEEK End plug
- Stainless steel electrode 1
- Stainless steel electrode 2

Installation

- The switch shall as minimum be installed horizontal, and best with a little downwards degree of 0-5 degree. Especially liquid with high viscosity, is recommend having a small downward degree to ensure that liquid can drain from the switch



- Minimum a degree 0-5 degree downwards.

- Downwards welding socket can trap liquid inside the welding socket and mislead to incorrect measuring.
  Long welding sockets can cause gas pockets and mislead to incorrect measuring

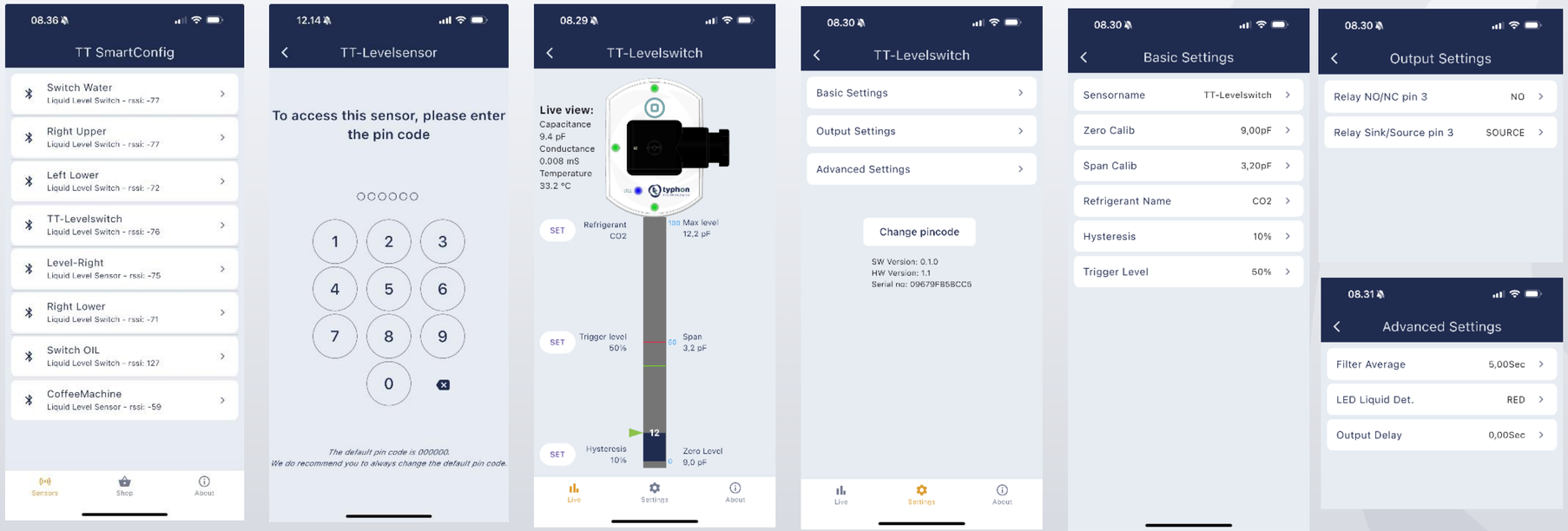
TT SmartConfig App

- TT SmartConfig App is used for configuration of Typhon Technologies sensors.
- TT SmartConfig App connects to the device using Bluetooth connection.
- TT SmartConfig App provides all configurations settings and gives live status of the sensors.

Download on the App Store

Available on the Google Play

"TT SmartConfig" App available for IOS and Android phone



THANK YOU