What are the advantages of capacitive level measurement technology?

Even the non-nautical amongst us can appreciate that one of the biggest problems with measuring the levels of fuel and water in vessel is that the sea is rarely flat. With the contents of the tanks seldom calm, obtaining a stable and accurate level reading can be difficult.

The most common marine based level sensors use floats that sit on the surface of the liquid being measured. This positioning exposes the floats to the turbulent motion experienced inside the tank, resulting in inaccurate and unreliable measurement data.

Capacitive liquid levels sensors do not use a float and have no moving parts whatsoever. Instead they have a hollow probe which is immersed into the liquid and the actual level measurement takes place inside the probe. Using holes in the end cap of the sensor, liquid flows in and out from the bottom of the sensor where turbulence is at a minimum. This provides a very significant suppression of surface level fluctuations as the submerged holes slow rapid changes in liquid level on the outside, which the sensor does not pick up.

This all helps in providing an accurate, reliable and consistent level output from the sensor, letting you know exactly how much fuel is available in the tank whatever the sea conditions.

Solid-state capacitive technology also offers excellent long term reliability as there's no mechanical linkages to break or wear out, outlasting other sensor types which would perish in the applications.

Better still, capacitive level sensors also provide a continuous, 'stepless' output, as opposed to many float sensors which have a series of reed switches that require a significant level change to affect the output. This is because the fluid level has to change enough for the float to 'de-activate' one reed switch and 'activate' the next one along, thereby providing a 'stepped' or coarse resolution.

The capacitive sensor generates a continuous output relating directly to the level of liquid inside the sensor with a very fine resolution, as it is not jumping from one switch to the next. Additionally, there is always the possibility that one reed switch could fail, resulting in a large measurement 'dead spot' on the sensor.

The sensors can be used with metal and plastic tanks, and for the awkward shaped tank do not have to be installed vertically-indeed they can be mounted up to an angle of 60° from vertical without modification, to help cover the full depth of an irregular tank shape.

The advantages of capacitive sensing technology can also be utilised across a range of harsh environment applications to provide long-term cost effective reliability.