

How to Apply Proximity Sensing in Washdown Environments



HOW TO

Damp or humid industrial environments or those that require frequent washdowns by water, foam or cleaning/disinfecting agents, produce adverse conditions for proximity sensors. It takes more than a run-of-the-mill sensor to withstand the rigors of these environments, commonly found in food and beverage industries, and it is increasingly important that sensors have the inherent ability to function in these applications.

Dairies, breweries, frozen foods, and packaging and filling applications use sensors for the detection of various materials, like stainless steel and aluminum. Sensors are used on conveyors, bottling and canning lines, packaging and filling functions, or other types of machinery, whether for diverting objects to different lines or making sure a gate is closed before a tank is filled. But due to the nature of these industries, washdown operations must be performed to adhere to sanitary and hygienic regulations set forth by the FDA and other agencies.

Standard sensors fail in these applications because residue penetrates through the front cap and connector insert due to ingress from temperature shock, or the housing materials cannot tolerate the acidity of the cleaning agent. To withstand the rigors imposed by these wet environments, sensors have been designed to resist the ingress of water and vapors while retaining all technical abilities. This is done by integrating design features into the front cap and connector insert, and using different housing materials like 316 grade stainless steel.

Different manufacturers use different methods to prevent access through the sensors' front cap: some use plastic or LCP caps, while others modify the inside of the cap by inserting an o-ring. Manufacturers have also potted these sensors with different materials and modified the connector inserts to help prevent moisture ingress. Doing this enables sensors specified for washdown capabilities to re-

sist high pressure, aggressive cleaning agents and sudden temperature variations. Because they are able to function in these environments, these sensors are required to have a higher environmental protection rating than standard proximity sensors.

Finding the most appropriate sensor for a washdown environment is a complex decision. Not only must these sensors resist wet, humid or damp surroundings, they must also perform their normal functions and be rated for the food and beverage industry. Therefore, not all sensors able to perform in washdown environments may be suitable for other applications.

Variations in the sensors' temperature ratings, mounting requirements and noise immunity capabilities all affect the sensors function and feasibility in certain applications. To counter these common industrial issues, manufacturers have incorporated washdown technology with other sensors. For instance, TURCK has taken technology from its **uprox+** and washdown sensors to produce the **uprox+** WD (washdown) sensor. These sensors have been designed for high EMI, and have reduced metal free mounting zones making them able to be mounted in metal and next to other sensors. Because they are Factor 1 sensors, they can also detect all metals at the same range and have a higher tolerance for temperature variations.

It is also important to keep in mind that having a sensor function properly in washdown environments is only useful if the components attached to the sensor are also able to function in these environments. To address this, some manufacturers of washdown sensors have also used that technology to develop corresponding washdown connectors to ensure optimal protection and performance in these environments.