

JERGUSON® SOLUTIONS

Top Mount Displacers for Fixed Roof and Floating Roof Tanks

Application Summary

Petroleum derived liquids often utilize fixed roof or floating roof type storage tanks. This paper is primarily focused on floating roof type tanks. In this application the top of the tank floats on the surface of the liquid. The floating roofs are designed to reduce emissions by eliminating the vapor buildup above the volatile liquids inside of the storage tanks.

In the event of a damaged rim seal, or a drain clog allowing build-up of rainwater on the roof, tanks can be susceptible to overflow of the product or sinking of the roof itself. Tank overflow failure will result in the release of toxic vapors, pollutants, and volatile chemicals into the atmosphere, as well as result in substantial costs from cleanup, loss of product and potential fines. A catastrophic rain event could cause both flooding and sinking of the roof causing an overflow.

As a result of the environmental impact of these catastrophic failures, API 2350 was created to recommend options for proper level/limit and overflow protection. It also addresses need for "proofer" or manual check devices.



Application Issues

In order to prevent overflow, several detection methods can be used. Top mounted displacer operated level switches are one of the original single point detection methods and are still widely used for high level detection.

Existing installations may suffer from a lack of reliability either due to inherent issues of a return spring type switch with exposed pivots or commonly used "brass chunks" unable to detect liquid in the event of an overflow or sunken roof. Additionally, manual check devices used to periodically test function of the switch by use of a cable accessible from ground level at the side of the tank may suffer from corrosion failures of the linkage in the check device. Units which consist of carbon steel material of construction are prone to failure due to material corrosion causing seizure or breakage of the lever assembly.



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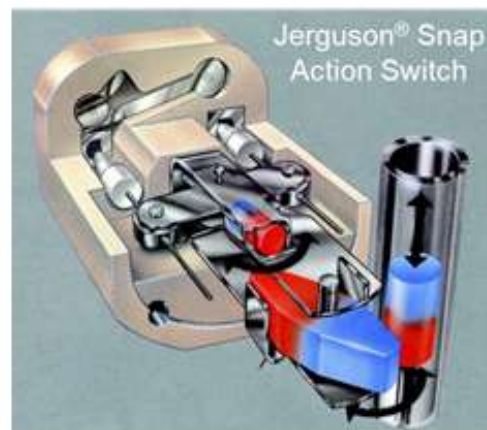
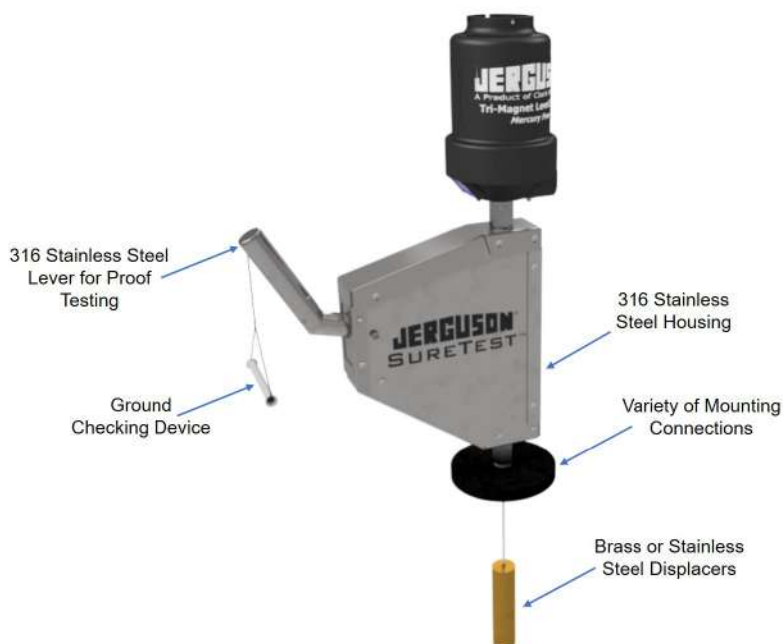
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The Jerguson® Solution

The Jerguson top mounted displacer level switch with optional SureTest™ Rooftop manual check feature provides a reliable method of testing semi-annually as recommended per API 2350. The Jerguson displacer level switch with SureTest Rooftop Device utilizes a brass displacer per API Standard 2350 to detect high level. This is done when the switch is activated on the rising action of the displacer either by contacting the floating roof or the detection of a liquid in the event the seal fails. (Stainless steel displacer is available for fixed roof applications). A brass displacer with beaded chain is used to provide a spark free encounter when the roof meets the displacer. The 316 Stainless Steel lever and housing provides a corrosion resistant design, eliminating faulty conditions and reducing potential failure due to material corrosion. This product utilizes the Jerguson Tri-Magnet switch. The Jerguson Tri-magnet switch is based on a unique three-dimensional magnet design where the snap action is accomplished by the utilization of magnetic repulsion and attraction. Lastly, only Jerguson features the Tri-Magnet switch mechanism, tested to 800,000 cycles without failure.

API 2350 is recommended guidance to addresses overfill protection as it relates to inventory measurement with tank gauging systems. The Jerguson Top Mount Displacer with SureTest Rooftop Device meets the requirements set forth in API 2350 for high-high tank alarms, providing the ability to operate on the high level of the floating roof tank and/or function with the liquid if the floating roof fails/sinks. Periodic proofing, as recommended in the standard, can be performed by using the Stainless-steel lever to raise the assembly and provide a reliable function test, as recommended by the API 2350.

The Jerguson Design incorporated.



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