

Principle of Operation

The Leakwise ID-227 Oil Sheen Monitoring System uses the industry leading technology of Electromagnetic Energy Absorption. The instrument consists of a very high frequency transmitter connected to a mismatched antenna. The antenna is immersed in the monitored fluids. The higher the energy absorption of the fluid, the more the loading on the antenna, and therefore, more energy which has to be supplied by the transmitter.

Since water absorbs much more energy than hydrocarbons and air, the loading in water is higher. If the antenna is surrounded by an oil layer or oil/water mixture, the loading is reduced in proportion to the reduction in water content. This unique, patented technique enables the detection of small layers of free oil. It also enables continuous monitoring of oil layer buildup and the measurement of its thickness.



ID-227 Description

The floating detector with high frequency transmitter antenna is mounted on a wave rider buoy. The wave rider buoy is designed to maintain the position of the detecting antenna at the liquid air interface, despite fluctuations in the liquid level due to waves and tide. It has two field adjustable alarm points for:

- Low oil alarm – upon detecting the presence of a predefined layer of hydrocarbons.
- High oil alarm – upon detecting when the hydrocarbon layer has continued to build up to a second predefined thickness.

The ID-227 can detect as little as 0.3 mm layer of oil on water reliably, repeatedly and without false alarms. It can also monitor on-line changes in oil layer thickness up to 25 mm. The signal processor relays are used for local and remote alarm and control tasks. Delay in the relays' response time enables reliable detection regardless of waves or turbulence. A built-in test feature is continuously monitoring failure free system operation.

Applications

The ID-227 is designed to be installed off-shore near oil tanker buoy terminals, jetties and piers in order to detect floating oil sheens resulting from spills or leaks which may occur during the loading/discharge process.

Additional applications are available in detecting and monitoring floating hydrocarbons near off-shore oil rigs and in lagoons, lakes, rivers, open channels and large retention ponds.



ID-227 Technical Specifications

Operational and Design Information

Operation Floating detector capable of monitoring hydrocarbons and other organic solvents on water

Operating Range

Resolution 0.3 mm of hydrocarbon on water or brine
Working Wave Height Maximum 2 meters
Tide Range Unlimited
Current Up to 4 knots (for higher current – consult factory)
Minimum Liquid Depth 30 cm
Working Temperature 0° C to 70° C
Ambient Temperature -40° C to 85° C
Survival Conditions Extreme sea conditions

Materials

Detector Hydrocarbon resistant polymers, 316 stainless steel
Wave Rider Hydrocarbon resistant polymers or marine aluminium
Dimensions
Cable 10 m standard with detector, additional length to order
Wave Rider Buoy Diameter 900 mm, height 300 mm
PS-220 Enclosure NEMA 4X (IP-65): 275 x 230 x 130 mm; NEMA 7: 215 x 260 x 175 mm
EEx d: 305 x 235 x 190 mm

Electrical Rating

Wiring Connections 18 AWG maximum
Input Power Options 220/110 VAC, 12/24 VDC (@3.5 Watts), 12/24 VDC Solar powered
Distances to PS-220 Up to 1200 m subject to hazardous area restrictions
Wireless See Leakwise WL data sheet for battery powered wireless operation
PS-220/RL/LI Basic Analog Signal Processor and power supply including:
2 Alarm Relay Contacts: SPDT Rated 3A at 220 Volts normally open and normally closed and 3 indicating lights: Air/Oil/Water, built-in diagnostics feature

Output Options

420 4-20 mA signal proportional to hydrocarbon thickness up to 1 inch (25 mm) – current source
420/BG Bar-Graph display (20 Bars) of hydrocarbon thickness and 4-20 mA output
AUD Audio Alarm
WL Wireless communication (see Leakwise WL data sheet)
DSP-220 Digital Signal Processor for multiple ID-220 series sensor control with data logging capabilities and various output options, including: relays, lights, 4-20 mA and RS-232 or RS-422 communications (See DSP-220 data sheet for more details)

Certifications

ID-227 Detector Intrinsically Safe – EEx ia IIC T4
PS-220 Enclosure Explosion Proof: North America – NEMA 7, Class I, Div. 1, Groups C & D
Europe – EEx d IIC T6
Combined System Approved for operation in hazardous location
Performance EPA – Conforms to EPA/530/UST-90-009 for groundwater monitoring systems
TÜV – Type approval in accordance with WHG (Water Resources Law) § 19 h



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