

ID-223 Oil Sheen Sensor

Applications

The Leakwise ID-223 sensor detects the presence of and monitors the buildup of thin layers of hydrocarbons in wet and dry environments. Many petroleum and power companies have installed the ID-223 in wet or dry sumps for early detection, warning, and control of oil leaks and spills from:

- Above-ground oil storage tanks
- Transformer sumps in switchyards and remote power distribution substations
- Oil/water separators
- Cooling water systems and trenches
- Storm water run-off
- Wastewater sewer systems

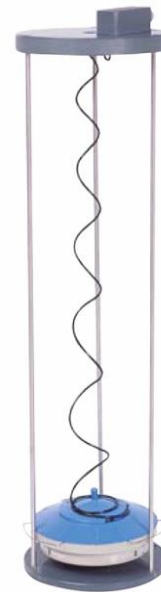
Other common applications include detecting and monitoring hydrocarbon leaks and spills in canals, retention ponds, and boiler condensate tanks. In addition, the ID-223 monitors wastewater treatment plant discharge to ensure regulatory compliance and can alert plant operators of any upsets in the treatment process.

ID-223 Description

A Leakwise system consists of a controller and one or more sensors (also called detectors). The ID-223 sensor has a high frequency transmitter mounted on a float built in a guiding cage. The floating sensor maintains its position precisely at the liquid/air interface, despite fluctuations in the liquid level. The ID-223 is controlled by the analog PS-220 Controller, which has two field-adjustable alarm points:

- Low oil alarm - Detection of a first predefined layer thickness of hydrocarbons
- High oil alarm - Detection of a hydrocarbon layer at a second predefined thickness, or detecting a dry sump situation in certain applications

The ID-223 can detect as little as 0.3 mm (0.01 in) oil on water reliably, repeatedly, and without false alarms. It can also monitor on-line changes in oil layer thickness up to 20 mm (0.8 in). The Controller relays are used for local and remote alarms and control. Continuous built-in diagnostics monitor sensor operation. A stilling well (available as an optional accessory) is recommended for ID-223 installations where lateral water velocity exceeds 30 cm/sec (11.8 in/sec).



ID-223/500

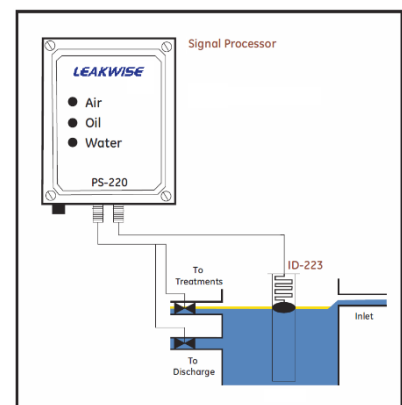
The Leakwise ID-223 has three sub-models for different maximum water fluctuation capability:

- ID-223/500 - up to 500 mm (19.7 in)
- ID-223/2000 - up to 2,000 mm (6.6 ft.)
- ID-223/2500 - up to 2,500 mm (8.2 ft.)

Principle of Operation

The Leakwise sensors use a patented, high-frequency Electromagnetic Absorption technique. Each floating sensor houses a high-frequency electromagnetic energy transmitting and receiving antennas which continuously monitor the liquid surface. Since water absorbs more electromagnetic energy than hydrocarbons, changes in the absorption rate of water indicate the presence or buildup of hydrocarbons.

The Leakwise sensors can be used to detect and monitor the buildup of separated or emulsified non-soluble hydrocarbons on water and other aqueous solutions. No other oil sheen monitoring system does this.



Technical Specifications¹



ID-223 Sensor Specifications

Operation

Summary Floating sensor capable of monitoring hydrocarbons and other organic solvents on water and in sumps that may be dry.

Operating Range

Detection Range 0.3 - 20 mm (0.01 - 0.8 in) of hydrocarbon on water or brine
Water Level Variation Depends on sensor sub-model – see below
Water Lateral Velocity ~30 cm/sec (~11.8 in/sec) without a stiller; May be doubled with a stiller.
Water Temperature 0 - 70° C (32 - 158° F); no freezing
Air Temperature -10 - 80° C (14–176° F)

Physical Specifications

| Sub-Models | ID-223/500 | ID-223/2000 | ID-223/2500 |
|-------------------|--|------------------------------|------------------------------|
| Floating Range | 40 – 500 mm (1.6 – 19.7 in) | 70 – 2000 mm (2.8 – 78.7 in) | 70 – 2500 mm (2.8 – 98.4 in) |
| Guiding Cage Dia. | 180 mm (7.1 in) | 560 mm (22.1 in) | 280 mm (11.0 in) |
| Sensor | Diameter: 160 mm (6.3 in); Materials: Hydrocarbon resistant polymers, 316 stainless steel. | | |
| Integral Cable | 10 m (~33 ft.) supplied with sensor, 3 x 18 AWG, blue PVC jacket | | |
| Accessories | Integral stiller for each sub-model; Anti-Submersion air pocket for ID-223/500. | | |

PS-220 Controller Specifications and Options

Specifications

PS-220 Description PS-220 Controller is an analog signal processor and power supply in a NEMA 4 enclosure, and supports a single ID-223 sensor.
Temperature Ambient temperature range: -40 - 85° C (-40 - 185° F)
Cable length to Sensor Up to 1,200 m (3,937 ft.) subject to hazardous area restrictions.
PS-220/RL/LI Two alarm relay dry contacts and one fail contact: SPDT rated 4A (3A for fail contact) at 250 VAC or 30 VDC, normally open and normally closed, and four indicating lights: Air/Oil/Water/Fail. Includes a built-in diagnostics feature.
Wiring Connections Terminal blocks: 14 AWG maximum for sensor and 4-20 mA output wires; 12 AWG maximum for power and relays wires.

Options

Enclosure Options **/N4** for NEMA 4X (IP65): 300 x 190 x 120 mm (12.0 x 7.5 x 4.7 in) (standard enclosure);
/N7 for NEMA 7: 278 x 259 x 166 mm (11.0 x 10.2 x 6.5 in);
/Exd for Ex d: 302 x 233 x 154 mm (12.0 x 9.2 x 6.1 in).
Input Power Options 220 or 110 VAC (50 - 60 Hz) or 9 - 36 VDC (@ 5 Watts); may also be solar powered.
/420 4-20 mA analog output proportional to hydrocarbon thickness up to 25 mm (1.0 in), current source
/420/BG Bar graph display (20 bars) of hydrocarbon thickness in addition to 4-20 mA analog output.
/CEN Zener Safety Barriers to allow installation of the sensor in hazardous areas.
/AUD Audio alarm option (available in weather-proof or explosion-proof enclosure).

Other Controllers – Refer to separate data sheets

SLC-220 Digital Signal Processor for Multiple (2 / 4 standard, more in a network) ID-220 Series sensor support, with various output options, including relay, lights, 4-20 mA, LCD, Modbus in RS-232 and RS-485 communication, and cellular remote connectivity.
WSP-220 Wireless communication – Point-to-Point data radio.

Sensor and PS-220 Controller Certifications

ID-223 Sensor ATEX Intrinsically Safe: II1G Ex ia IIC T4 Ga -40° C to +70° C. Also: IECEx and cETLus
PS-220 Enclosure For hazardous areas: North America - NEMA 7, Class I, Div 1, Groups B, C & D; NEMA 4
Europe – II2GD Ex d IIC T6 IP66
Combined System Approved for operation in hazardous location
Performance EPA - Conforms to Spill Prevention, Control and Countermeasure (SPCC) - Oil Pollution Prevention regulation (40 CFR part 112), and EPA/530/UST-90/009 - Leak Detection Methods
TUV - Type approval in accordance with WHG (Water Resources Law) § 19 h
Manufacturing ISO 9001:2015 Certified

¹ Specifications may be subject to change without prior notice.
For special applications, it may be possible to offer products that deviate from the above specifications.