LEAKWISE
OIL ON WATER DETECTION SYSTEMS

DATA SHEET

# ID-221 OIL SHEEN SENSOR

## ID-221 APPLICABILITY

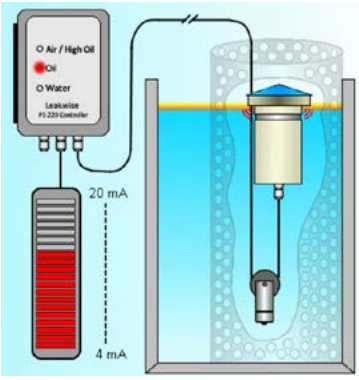
Leakwise ID-221 sensors detect the presence of thin layers of hydrocarbons on the surface of water in many locations where oil leaks can happen. In addition, the sensors monitor the buildup of the detected oil and provide leak trend. Many petroleum and electricity generation companies use it for early detection, warning and control of oil leaks and spills in wet sumps, storage tanks and groundwater monitoring wells with a minimum water level of 30 cm (12.0 in). Other applications include hydrocarbon detection and monitoring in oil/water separators, cooling water trenches, stormwater runoffs, retention ponds, boiler condensate tanks and wastewater sewer systems.

## ID-221 DESCRIPTION

A Leakwise system consists of a controller and one or more sensors. The ID-221 sensor has a high-frequency transmitter mounted on a float that maintains its position precisely at the liquid/air interface, despite fluctuations in liquid level up to 45 m (150 ft.) variation. A single ID-221 sensor 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

The ID-221 can detect as little as 0.3 mm (0.01 in) oil layer on water reliably, repeatedly and without false alarms. It also monitors online changes in oil layer thickness up to 25 mm (1.0 in) and report it through a 4-20 mA output signal from the controller. Controller relays are used for local and remote alarms and control. Continuous built-in diagnostics monitor sensor operation. The SLC-220 digital controller handles up to four sensors. A stilling well is recommended for all ID-221 installations (available as an optional accessory).




## PRINCIPLE OF OPERATION

Leakwise sensors use a high-frequency Electromagnetic Absorption technique. Each floating sensor houses high-frequency electromagnetic energy transmitting and receiving antennas that 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. Leakwise sensors are used for detection and monitoring the buildup of separated or emulsified non-soluble hydrocarbons on water and other aqueous solutions. In addition, the sensors differentiate between a wet and a dry sump. No other oil sheen monitoring system does this.

# TECHNICAL SPECIFICATIONS

## ID-221 Sensor Specifications

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| **OPERATION** | |
| **Summary** | Floating sensor capable of monitoring hydrocarbons and other organic solvents in wet sumps. |
| **OPERATING RANGE** | |
| **Detection Range** | 0.3 - 25 mm (0.01 - 1.0 in) of hydrocarbon on water or brine |
| **Water Level Variation** | Minimum: 30 cm (~12 in) above well/tank/sump bottom; Maximum: 45 m (~150 ft.). |
| **Water Lateral Velocity** | ~20 cm/sec (~8 in/sec) when installed in a stilling well |
| **Water Temperature** | 0 - 70 °C (32 - 158 °F); no freezing |
| **Air Temperature** | -10 - 80 °C (14 - 176 °F) |
| **PHYSICAL SPECIFICATIONS** | |
| **Sensor** | Materials: Hydrocarbon resistant polymers, 316 stainless steel; Diameter: 87 mm (3.4 in), height: 235 mm (9.3 in); fits into 100 mm (4.0 in) stilling wells |
| **Integral Cable** | 10 m (~33 ft.) supplied with sensor, additional length to order up to 50 m (164 ft.) total |
| **Accessories** | Stilling well in 1 m and 2 m long sections, which can be assembled to any required length. |

## PS-220 Controller Specifications and Options

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| **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-221 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 relays with dry contacts and one fail relay contact: SPDT rated 4A (3A for fail contact) at 250 VAC or 30 VDC, normally open and normally closed, and four status indication lights: Water, Oil, Air/High Oil and Fail. Includes built-in diagnostics. |
| **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): 305 x 195 x 120 mm (12.0 x 7.7 x 4.7 in) 2 Kg (4.4 lb.);<br>/N7 for NEMA 7: 278 x 259 x 166 mm (11.0 x 10.2 x 6.5 in) 8.5 Kg (18.7 lb.);<br>/Exd for Ex d: 355 x 276 x 200 mm (14.0 x 10.9 x 7.9 in), 14 Kg (30.9 lb.); |
| | /BP: without an enclosure, to be mounted in a local cabinet. 190 x 180 x 130 mm, 1 Kg. |
| **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

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| **SLC-220** | Digital Signal Processor for up to four ID-220 Series sensors support, with various output options, including relays, lights, 4-20 mA, LCD, Modbus in RS-232 and RS-485 communication, and remote cellular connectivity. |

## Sensor and PS-220 Controller Certifications

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| **ID-221 Sensor** | ATEX Intrinsically Safe: II1G Ex ia IIC T4 Ga -40 °C to +70 °C. Also: IECEx, UKEX and cETLus |
| **PS-220 Enclosure** | For hazardous areas: North America - NEMA 7, Class I, Div 1, Groups B, C & D; NEMA 4<br>Europe ATEX & IECEx - II2(1)GD, Ex db [ia Ga] IIC T6 Gb IP66 |
| **Combined System Performance** | Approved for operation in hazardous locations when Zener Safety Barriers are added<br>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 |
| **Manufacturing** | ISO 9001:2015 Certified |





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