LEAKWISE®
Oil on Water Detection & Monitoring

Agar Environmental Ltd.
Data Sheet

ID-221 Oil Sheen Sensor

Applications

The Leakwise ID-221 sensor detects the presence of and monitors the buildup of thin layers of hydrocarbons on water. Many petroleum and power companies use it for early detection, warning, and control of oil leaks and spills in wet sumps, 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, storm water 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 (also called detectors). 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 the liquid level. The ID-221 operates with fluctuating liquid levels up to 45 m (150 ft.), and is controlled by the analog PS-220 Controller, which has two field-adjustable alarm points:

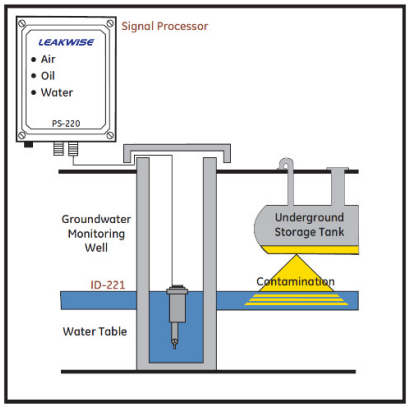
- Low oil alarm - Detection of a first predefined layer thickness of hydrocarbons
- High oil alarm - Detection of a hydrocarbon layer at a second predefined thickness

The ID-221 can detect as little as 0.3 mm (0.01 in) oil on water reliably, repeatedly, and without false alarms. It can also monitor on-line changes in oil layer thickness up to 25 mm (1.0 in). The Controller relays are used for local and remote alarms and control. Continuous built-in diagnostics monitor sensor operation. A stilling well is recommended for all ID-221 installations (available as an optional accessory).

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 Specifications[1]

ID-221 Sensor Specifications

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: 150 mm (5.9 in); fits into 96 mm (4.0 in) stilling well
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

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 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-221 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 TÜV - 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.

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