LEAKWISE
OIL ON WATER DETECTION SYSTEMS

DATA SHEET

ID-223 OIL SHEEN SENSOR

ID-223 APPLICABILITY

Leakwise ID-223 sensors detect the presence of thin layers of hydrocarbons on the surface of water in many locations where oil leaks can happen, in wet and also in dry sumps. In addition, the sensors monitor the buildup of the detected oil and provide leak trend. Early spill detection and monitoring is done at:

- Above-ground oil storage tanks
- Transformer sumps in switchyards and remote power distribution substations
- Oil/water separators
- Cooling water systems and trenches
- Stormwater 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 alerts plant operators of any upsets in the treatment process.

ID-223 DESCRIPTION

A Leakwise system consists of a controller and one or more sensors. 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 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 also monitors online changes in oil layer thickness up to 20 mm (0.8 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 tube (available as an optional accessory) is recommended for ID-223 installations where lateral water velocity exceeds 30 cm/sec (11.8 in/sec).

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

- ID-223/500 - up to 500 mm (19.7 in)
- ID-223/2000 - up to 2,000 mm (6.6 ft.) as standard, or up to 5,000 mm (16.4 ft.) on request
- ID-223/2500 - up to 2,500 mm (8.2 ft.) as standard, or up to 5,500 mm (18 ft.) on request

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, and indicate a dry sump condition. No other oil sheen monitoring system does this.

TECHNICAL SPECIFICATIONS

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 and ID-223/2500		

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 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.); /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.); /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 20 mm (0.8 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 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

ID-223 Sensor	ATEX Intrinsically Safe: II1G Ex ia IIC T4 Ga -40 °C to +70 °C. tAlso: IECEx, UKEX and cETLus
PS-220 Enclosure	For hazardous areas: North America - NEMA 7, Class I, Div 1, Groups B, C & D; NEMA 4 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
	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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