



ID-223ET ETHANOL CONCENTRATION SENSOR

ID-223ET APPLICABILITY

Leakwise ID-223ET sensors detect the presence of Ethanol in water or of Gasoline-Ethanol mixtures spilled to clean water, in many relevant locations where such leaks can happen. The sensor will detect the leak also in dry sumps. In addition, these sensors monitor the build-up of the detected Ethanol concentration and provide leak trend. Early spill detection and monitoring is done at:

- Around above-ground Ethanol or Gasoline-Ethanol mixtures storage tanks
- Oil/water separators and treatment plants
- Stormwater run-off at Ethanol manufacturing / loading areas
- Wastewater sewer systems at Ethanol manufacturing / loading areas

The sensor can be installed in sumps, canals, retention ponds etc. In addition, the ID-223ET monitors wastewater treatment plant discharge to ensure regulatory compliance and alerts plant operators of any upsets in the treatment process.

These sensors can monitor leaks of additional soluble hydrocarbons, such as Methanol.

ID-223 DESCRIPTION

A Leakwise system consists of a controller and one or more sensors. The ID-223ET 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-223ET is controlled by the analogue PS-220 Controller, which has two field-adjustable alarm points:

- Low oil alarm - Detection of a first predefined low Ethanol concentration
- High oil alarm - Detection of a second predefined high Ethanol concentration, or detection of a dry sump situation in specific applications.

The ID-223ET can detect Ethanol concentration in water from 10% to 100% (by volume) reliably, repeatedly and without false alarms. It monitors online changes in Ethanol concentration and reports it through a 4-20 mA analogue output signal from the controller. Controller relays are used for local and remote alarms and control. Continuous built-in diagnostics monitor sensor operation. An alternative SLC-220 digital controller handles up to four sensors in the same way. 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) or where the water is turbulent.

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

- ID-223ET/500 - up to 500 mm (19.7 in) as standard; specific adaptations are possible
- ID-223ET/2000 - up to 2,000 mm (6.6 ft.) as standard, or up to 5,000 mm (16.4 ft.) on request
- ID-223ET/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 upper layer. Since water absorbs more electromagnetic energy than hydrocarbons, changes in the absorption rate of water indicate the presence and changes in Ethanol concentration. Leakwise ET sensors are used for detection and monitoring concentration of soluble hydrocarbons in water and other aqueous solutions, and can also indicate a dry sump condition - No other Ethanol monitoring system does this.

TECHNICAL SPECIFICATIONS

ID-223 Sensor Specifications

OPERATION	
Summary	Floating sensor capable of monitoring soluble hydrocarbons and other organic solvents in or on water and in sumps that may be dry.
OPERATING RANGE	
Detection Range	10% to 100% (by volume) of Ethanol in water with a wide range of salinity
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-223ET/500 ID-223ET/2000 ID-223ET/2500
Standard 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 St. Steel.
Integral Cable	10 m (~33 ft.) supplied with sensor, 3 x 18 AWG, blue PVC jacket
Accessories	Integral stiller: all sub-models; Anti-Submersion air pocket: ID-223/500 and ID-223/2500

PS-220 Controller Specifications and Options

SPECIFICATIONS	
PS-220 Description	PS-220 Controller is an analogue 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 analogue output proportional Ethanol concentration, current source.
/420/BG	4-20 mA analogue output and a Bar-Graph display (20 bars) of Ethanol concentration.
/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 communication, (RS-232 and RS-485) and remote cellular connectivity.
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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, 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.
Additional	Manufacturing: ISO 9001:2015. Sensor with SLC-220 controller: SIL 2 capability verified.