

Why Ethanol Leak Detection Matters

Ethanol plays an increasingly important role in modern fuel blends. Oil and gas companies now produce, transport, and store ethanol on a massive scale as they meet government blending mandates and consumer demand for lower-emission gasoline. Unlike traditional hydrocarbons, ethanol mixes easily with water. That simple fact creates a problem. Leaks often escape traditional detection systems because the alcohol dissolves into water rather than separating on the surface like gasoline or diesel.

This challenge presents ethanol handling as a distinct kind of risk. Contaminated groundwater can spread fuel compounds farther and faster when ethanol is present. Regulators take a closer look at these leaks because they can create long-lasting environmental and safety issues. Companies need a reliable way to identify problems before they turn into violations or costly cleanups.

How Leaks Happen in Transfer and Storage

Ethanol moves from refineries to terminals and ultimately into pipelines and trucks. Each step creates opportunities for leaks. Unlike crude oil or refined fuels, ethanol does not stay separate from water. When a tank, pipe, or fitting leaks, the ethanol can dilute into surrounding water sources. Once this happens, most conventional sensors fail to detect the problem because they are designed to spot hydrocarbons floating on water, not alcohol dissolved within it.

The Naftosense Solution

Naftosense developed a new detection system built specifically for this challenge. The technology ignores the presence of water and zeros in on ethanol and other alcohols. It works even at 20 percent concentration, which is the level regulators see as a real problem, while anything under 20 percent usually isn't treated as a threat. This approach gives operators confidence that they can identify issues promptly and take action before minor problems escalate into significant events.

Naftosense's ethanol leak detection system consists of probes installed in sumps, containment areas and low points. Sensor probes (FLD-PSP) are factory installed in a SS slotted tube and connect to a field box (FLD-MXM). The (FLD-SSM) master controller has latching alarms with push button reset. Alarm outputs include Mod Bus RTU and 4-20mA outputs to integrate into SCADA / PLC.



The FLD-PSP is a fully encapsulated high-performance sensing probe designed for detecting leaks of alcohols and ethanol. It is also sensitive to fossil and sustainable fuels, crude oil and polar/non-polar solvents.

Typical Detection Time at Ambient Temperature	
20%-100% vol. alcohol in water	2 - 2.5 minutes
Gasoline and other hydrocarbons	30 seconds - 10 minutes
Hydrocarbon vapors	3 to 4 minutes

The FLD-MXM-PS is an advanced acquisition module designed for reliable detection and location of unwanted presence of polar solvents such as alcohols, ethanol, acetone/MEK, etc. It can also be used to detect hydrocarbon liquids and their vapors.

The module provides the leak alarm level allowing adjustable thresholding from the associated monitoring panel. The FLD-MXM-PS module has built-in specific algorithm for tracking the electrical conductivity between the detection cable sensor wires for very efficient reduction of the false positives due to condensation, conductive dust, dirt, etc. (intelligent thresholding).

FLD-SMP-MB-420 is designed to be connected to one FLD-MXM-4-PS monitoring module, connected to one polar solvents or hydrocarbon sensor. Because the ERBUS provides both power and communications you can connect the monitoring module to the proprietary bus eliminating the need of additional infrastructure. The maximum distance covered with wired layout (sensor and jumper) is up to 1 mile.

High-level interfacing to DCS/SCADA is implemented through either 4-20 mA output or Modbus RTU. FLD-SMP-MB-420 must use two Zener barriers and be mounted in an approved enclosure for classified locations. The reset of leak alarms can be forced manually, or through a specialized command sent through the Modbus RTU interface.



FLD-PSP



FLD-MXM-PS



FLD-SMP

