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SITRANS F

FUS-LDS Leak Detection System

Security and reliability all in one

www.siemens.com/leakdetection

The Siemens FUS-LDS offers a complete hardware and software solution for detecting and localizing pipeline leaks.

Pipeline leaks can have catastrophic consequences for human health, the environment and the global economy, which is why corporations responsible for transporting oil and other hazardous liquids face increasingly stringent governmental regulations. It is therefore vital for pipeline companies to invest in an accurate and reliable leak detection system capable of detecting even the smallest of leaks.

The Siemens FUS-LDS Leak Detection System offers a complete software and hardware solution for detecting and localizing pipeline leaks. Siemens uses its own equipment, ultrasonic clamp-on flowmeters, to accurately measure the flow of product in a pipeline. This complete monitoring of the pipeline allows the system to live up to safety requirements while satisfying one major goal: providing users and the community with peace of mind.

How it works
The Siemens leak detection system consists of two or more site stations, each of which typically contains a SITRANS FUH1010 clamp-on ultrasonic flowmeter, a clamp-on RTD temperature sensor and a method of data communication. A computer terminal known as the master station runs the leak detection software and polls each of the site stations once per minute for a wide range of data including standard volumetric flow rate, liquid temperature, sonic velocity and meter diagnostics.

The FUS-LDS uses a standard volume balance method that continually monitors differences in flow rate between each pipeline segment. It detects releases in real time at both dynamic and static flow conditions by means of pre-set alarm thresholds, which means that the system does not require continuous operator attention. An alarm is activated to call for operator attention if an imbalance between the inlet and outlet data is detected during any of four integration periods (1, 5, 15 or 60 minutes). The user can then quickly pinpoint the location of a release by interacting with the user-friendly display. In addition, a visual trend line facilitates identification of leakage or product theft that occurs before the alarm thresholds are breached.

An integrated solution
While most suppliers offer only the software component of a leak detection system, Siemens provides a comprehensive package complete with software as well as all flow and temperature instrumentation.

Since Siemens provides both the software and hardware, users are ensured the best possible performance under any operating conditions. This benefit also extends to the customer service experience, as Siemens is responsible for the entire system and serves as the singular contact for all support requests.

Innovative software
Merging innovation with insight into customer needs, Siemens recently enhanced its already powerful SIMATIC WinCC process visualization system with master station leak detection software to ensure greater ease of use for pipeline operators. The Microsoft® Windows®-based SIMATIC WinCC has now been integrated to provide a dynamic graphic user interface (GUI) for the FUS-LDS.

The upgraded software allows the user to visually identify pipeline locations on a map and highlight specific flowmeters or line segments. SIMATIC WinCC provides a pop-up window with status information on a flowmeter or a pipeline segment, while still providing the status of the entire pipeline. This improves process efficiency, as the operator will better understand what is happening across the pipeline and be able to react instantly to any situation before it escalates, as well as determine exactly where a leak event occurred. SIMATIC WinCC significantly decreases the amount of training required for pipeline operators to utilize the system effectively and offers the necessary alarm audit logs to meet regulatory requirements.

High level of accuracy

Since the Siemens FUS-LDS is based on standard volume balance technology, it provides very accurate estimate parameters for location, flow rate and total volume in the case of a product release. This makes it possible for the system to locate an event within ±150 meters and enables distinction between a leak and other pipeline operations such as pump startup or shutdown and valves opening or closing. Product changes and pig passage can also easily be recognized and tracked by means of alarm thresholds. The FUS-LDS thresholds are based on four rolling averaged integration periods of 1, 5, 15 and 60 minutes. Fixed and independent thresholds are set at decreasing sensitivities for each of the integration periods. For typical pipeline operation, the thresholds are set at 3.0%, 2.5%, 2.0% and 1.0% of pipeline throughput for the four integration periods, respectively. Operators can also utilize visual trending for even greater sensitivity.

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The clamp-on advantange

The Siemens leak detection system utilizes SITRANS FUH1010 clamp-on ultrasonic flowmeters, which feature a measurement accuracy rate of ±0.5-1% of flow for velocities ≥0.3 m/s or ≥1 ft/s (calibratable to 0.15-0.3% of flow). This is accomplished primarily through the use of Siemens' patented Wide-Beam transit time technology, which utilizes the resonance frequency of the pipe wall to produce a particularly strong, focused and coherent signal. This increases flow measurement precision by reducing sensitivity to any change in the liquid type or physical properties.

All Siemens clamp-on sensors are clamped onto the outside of the pipe, which makes installation straightforward; it will not be necessary to cut the pipe or shut down operations to install the flowmeters that are so vital to the leak detection system.

In addition, since the clamp-on sensors have no moving parts and are never in contact with the media, they do not require periodic cleaning. The result is a significant reduction in maintenance expenses.

Other clamp-on benefits

Fast, easy and cost-efficient on-site measurement of any pipe from 25 mm-1.52 m (1-60 in)

- Available in three different enclosures: standard IP65 (NEMA 4X) wall mount, IP65 (NEMA 7) compact explosionproof and IP66 (NEMA 7) wall mount explosionproof
- Available in single-, dual- and four-beam versions
- Capable of measuring bidirectional flow
- Available with FM, CSA, ATEX, C-Tick and INMETRO approvals

Other FUS-LDS benefits

- Data communication from site stations to the master station can be accomplished by multiple methods including hardwired (point-to-point), hardwired with short-haul modems, leased-line telephone, cellular phone, wireless radio, Ethernet, fiber optic , satellite or any other means that can transmit RS232 ASCII text from point to point
- Automatic application condition (AppConn™) technology avoids false alarms by sensing pipeline application conditions and dynamically compensating the affected area until conditions improve
- Automatic data archiving and audit trail provide the user with the ability to play back the pipeline operation and do trending analysis

More information:
www.siemens.com/flow

Contact:
www.siemens.com/processinstrumentation

For more information and technical descriptions,
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