

Dust Filter Leak Monitor

PROCESS & EMISSIONS MONITORING SYSTEMS



ELECTRODYNAMIC™
INSIDE

SPECIFIC FEATURES:

- Designed to differentiate between gross filter failure and dust leakage from faulty/failing filter systems, including bag filters
- Selection of advanced features and options for improved functionality
- Supports simple and flexible configuration via keypad/display or using the remote PC software tool
- Improved performance over previous models



TECHNOLOGY

SYSTEM DESCRIPTION

The PCME Leak Alert 73 is particularly well suited for use on fabric-filter type dust collectors (baghouses) and provides reliable and robust monitoring of particulate leaks from bags. With its compact, cost-effective transmitter design, pragmatic and reliable monitoring can now be provided for all types of industrial bag filters.

The instrument benefits, first from ENVEA's unique *ElectroDynamic™* Probe Electrification technology, second, from advanced features, enabling the Leak Alert 73 to be configured for all types of bag filters irrespective of cleaning sequence and, finally, a choice of field-upgradeable options to provide quality assurance (QA) features for the user.

The Leak Alert 73 is part of the Leak Alert family of products, which have been designed specifically to detect low and medium levels of dust leakage, in addition to gross bag failure, enabling bag filter users to maximise filter performance.



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PRINCIPLE OF OPERATION

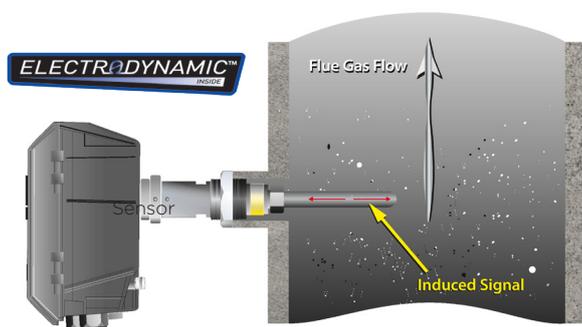


Figure 1: Principle of Operation - *ElectroDynamic™* sensors

The Leak Alert 73 combines advanced signal processing techniques with ENVEA's unique *ElectroDynamic™* Probe Electrification technology.

When the sensing probe is installed after the bag filter, particles in the airstream interact with the sensing rod to induce a charge signature. The resulting signal is filtered electronically to reject signals outside a defined frequency range (including the DC Triboelectric signal), which makes the instrument less susceptible to changes in particle velocity and virtually eliminates the effect of any particle contamination on the rod.

In bag-filter applications the instrument provides a robust signal proportional to dust emissions, which is used to monitor and detect bag leaks. The instrument has the necessary features to discriminate between the variation in dust due to the bag-cleaning sequence and real leak conditions.

ADVANCED FEATURES

The Leak Alert 73 sensors provide powerful bag-leak detection capability based on the following standard features:

Bag-leak monitoring performance

- High-quality leak response with sufficient dynamic range and time response to track emissions from single and multi-compartment, pulse-cleaned bag filters.
- Instrument drift and minimum detection level below 0.1mg/m³ with leak monitoring to 500mg/m³.
- Fully configurable warning alarm and limit alarm levels with independent alarm delay.
- Convenient bag-leak output range scaled 0-100%. Option for scaling in defined units (user selectable).
- Bag-leak locating capability by use of the optional Bag Pulse Display Module (see page 3).

Designed for practical bag-filter issues

- Suitable for ATEX/IECEx Dust zones 22 and 20
- Inbuilt surge protection to counter the effects of indirect lightning.
- Industrially hardened enclosure and sensor mechanics provide convenient connections to plant allowing armoured cable use.
- Powered directly from a mains power supply 100-240V AC (24V DC option)
- Input available for marker pulse from bag-cleaning cycle

Powerful User Interface

- Four-digit display and keypad within instrument (see Figure 3)
- Instrument setup via internal keypad or PC/laptop (requires the optional PC software suite)
- Intuitive multi-level user interface (user setup and separate engineering setup) with password protection
- Three tri-colour LEDs for Power, emission alarms and instrument self-checks.

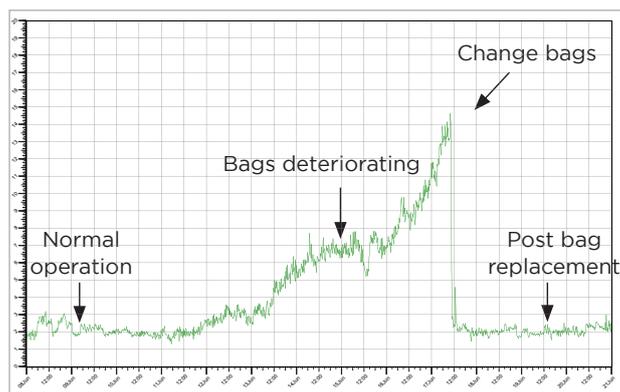


Figure 2: PCME LEAK ALERT 73 monitoring bag-leak conditions

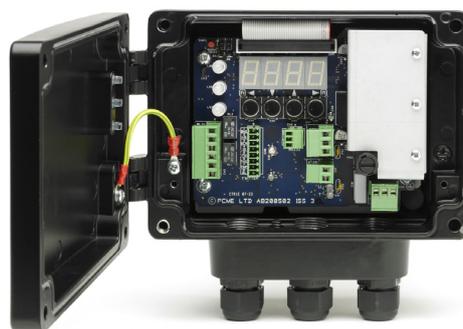


Figure 3: LEAK ALERT 73 with lid open showing three LEDs, display and internal setup keys

PRODUCT FEATURES

USER-SELECTABLE ADDED-VALUE OPTIONS

The LEAK ALERT 73 provides a full choice of user-selectable, added-value features. These include the following options:

- **Automatic insulator Short-Circuit Check for contamination detection**

ElectroDynamic™ sensors are tolerant to dust contamination of the sensor rod (unlike Triboelectric systems) due to the non-contact measurement principle; however, build-up of conductive material across the insulator at the base of the rod can lead to error (as with all Probe Electrification systems). For standard, dry dust collector applications contamination is unlikely, but a possibility. The automatically initiated Short-circuit Check provides a reliable method for detecting insulator contamination and hence improved Quality Assurance. For applications where water condensation is likely, ENVEA's patented insulated sensor is a preferred option.

- **Electronic Zero and Reference Drift detection**

Electronic dust signals are injected into the front end of the sensor electronics to ensure any electronic and signal measurement malfunction is detected. This Quality Assurance feature checks that the sensor electronics are operating within manufacturer specification.

- **User Scaling of display**

Of assistance to plant personnel wishing to manually scale the display to an approximate known dust level rather than a relative % level.



Figure 4: LEAK ALERT sensor contamination check

SENSOR SPECIFICATIONS

Feature	Specification
Ambient Temperature Range	-20°C to +50°C (-4°F to 122°F)
Sensor Variants	Standard sensor: 0-250°C (482°F) Insulated sensor: 0-250°C (482°F) High-temperature sensor: 0-400°C (752°F)
Sensor-to-Stack Connection	1½" BSP
Enclosure Protection Rating	IP65 (with hinged lid closed)
Power Requirements	100-240VAC, 50/60Hz (32 mA) or 24V DC (300mA)
Outputs (standard)	<ul style="list-style-type: none"> • 4-20 mA (500 Ω, isolated) • Warning alarm relay (SPST, 1A@24V DC), Fail safe • Emission alarm relay (SPST, 1A@24V DC), Fail safe
Outputs (optional)	<ul style="list-style-type: none"> • RS-232 (Modbus RTU) • RS-485 (Modbus RTU) } Enables use of the PC-ME DUST TOOLS PC Software suite
Inputs	Plant Stop signal (output set to zero when plant is off), marker pulse for start of bag-cleaning sequence, multiple calibrations
External Indicators (3x LEDs)	<ol style="list-style-type: none"> 1. Power/sensor OK 2. Warning and limit alarm 3. Self-check status (optional)
User Controls	4-digit Display and Setup buttons Options: external display and / or external keypad (excl. Ex sensor version, see Sensor Options on page 4)
Cable Entries	3x M20 cable glands
Air Purge	Air purge fittings: ¼" BSP connection to instrument airline Options: 1½" BSP or 2" ANSI flanged air purge process connection. Requires external supply of 5-10 litres/min of dry, clean (oil-free) instrument air, depending on dust loading.

BAG PULSE DISPLAY MODULE

The LEAK ALERT 73 may be upgraded to provide Leak-Locate capability by connecting it to a separate Bag Pulse Display (BPD). This enables plant operators to locate the position of failing bag rows in the dust collector, hence reducing bag-replacement costs and minimising time diagnosing dust collector faults.

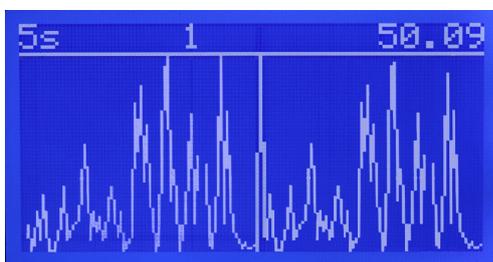


Figure 5: Pulse Display - permits failing bag rows to be identified during bag cleaning (see BPD displays, right)

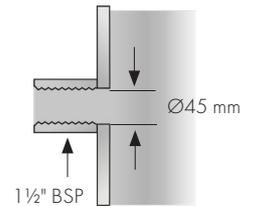
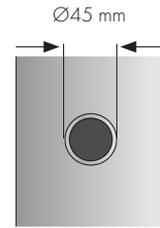
SPECIFICATIONS

PCME LEAK ALERT 73

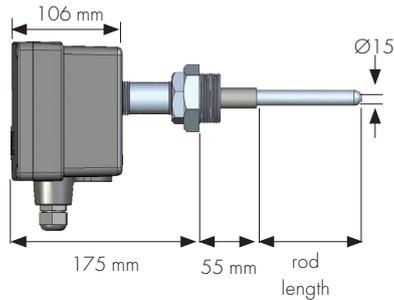
DIMENSIONS

LEAK ALERT 73

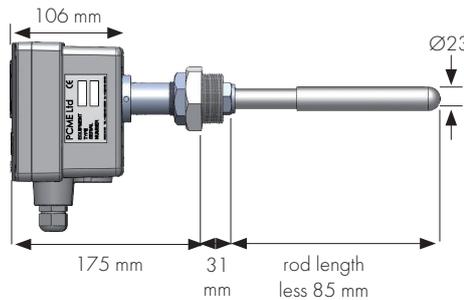
(standard version, shown without external display and optional external keypad)



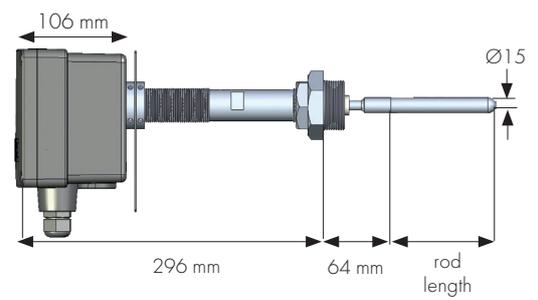
250°C Stainless Steel



250°C Insulated (PTFE)



400°C Stainless Steel (with heat shield)



ORDER CODES

LEAK ALERT 73

1 2 3 4 5 - A B C D E F G H I J - P

Mechanical Options (1-5)

Option	Description	Temperature Range	Standard Option	Options
1	Stack Temperature	up to 250°C up to 400°C*	standard option	250C 400C
2	Rod Length	0100* - 0500 mm (standard) 0600, 0800, 1000 mm (option)	specify	RODxxxx
3	Rod Material	Stainless steel Insulated (PTFE)	standard option	S I
4	Air Purge	not required Air Purge Fitting (1 1/2" BSP) 2" ANSI Flanged Air Purge *	- option option	0 AP S250
5	Air Filter/Regulator	not required Filter + Regulator assembly	- option	0 REG

PC Software Options (PC-ME DUST TOOLS)

Configuration Options	Device Set
Real-time Data Options	Online (for viewing emissions) Predict (for baghouse performance monitoring)

*not available with insulated rod option ** excl. 400°C sensor version
***choose F or G (these options are exclusive; note that option P requires option F)

For further details on options and order information please contact your local ENVEA representative

Example: SEN73 -

1	2	3	4	5	A	B	C	D	E	F	G	H	I	J	P
250C	ROD0500	S	AP	REG	SC	MAN	SF	0	AC	485	0	0	EK	ED	BPD

Sensor Features and Accessories (A-J, P)

Option	Feature	Availability	Standard Option	Options
A	Sensor Self-checks	none Automatic. Short-circuit Check	- option	0 SC
B	Electronic Self-Checks	None Manual (zero, reference)	standard option	0 MAN
C	Scaling Method	Trending 0-100% Scaling Factor	standard option	% SF
D	Hazardous Zone Classification*	not required ATEX Dust zone 22 ATEX Dust zone 20/21 ** IECEX Dust zone 22 IECEX Dust zone 20/21 **	- option option option option	0 X22 X20 I22 I20
E	Power Supply Voltage	100-240V AC (non-Ex only) 24V DC (no cost option)	standard option	AC 24DC
F	RS-485 Output***	not included RS-485 included***	- option	0 485
G	RS-232 Data Output ***	not included RS-232 included	- option	0 232
H	External Connector for RS-232	Internal connector External connector (non-Ex only)	standard option	0 FLY
I	Keypad	Internal keypad External keypad	standard option	IK EK
J	Display	Externally viewable	standard	ED
P	Leak-Locate Capability	not included Bag Pulse Display (req. option F)	- option	0 BPD

ABOUT ENVEA

As a progressive environmental Company, ENVEA specialises in particulate measurement for industrial processes. With a worldwide reputation for reliability, innovation and technological excellence, the Company produces under the trademark envea™ equipment for concentration and mass monitoring for regulatory, environmental and process control requirements. A dedicated team of qualified application and sales engineers is always on hand and should be consulted in the selection and usage of the most suitable equipment for any particulate application.



ENVEA UK
ENVEA House Rose and Crown Road
Swavesey / Cambridge - UK CB24 4RB
+44 (0)1480 468200
contact.gb@envea.global



www.envea.global