

Dust Monitor with Filter Leak Detection

PROCESS & EMISSIONS MONITORING SYSTEMS



ELECTRODYNAMIC™
INSIDE

SPECIFIC FEATURES:

- Reliable detection and monitoring of leaking and broken bags in faulty/failing dust collectors
- Separate Control Unit for convenient user interface at remote location from sensor in duct
- 0-100% trending or scaling for mg/m^3 indication of dust output
- Options for in-built sensor zero and reference self-checks for regulatory compliance
- Probe Check (Insulator Short-Circuit Check) option for improved data integrity
- Early prediction and location of leaking and broken bags in fabric filters

TECHNOLOGY

SYSTEM DESCRIPTION

The PCME LEAK ALERT 65-02 is particularly suitable for use with dust collectors. It provides reliable and robust monitoring of particulate dust levels and leaks from faulty filter media in baghouses. The sensor, installed after the filter, conditions, amplifies and analyses the dust signal and communicates a secure digital signal to the remotely located control unit, where instrument set-up, configuration, local display, and 4-20mA output signals functionality are provided.

The PCME LEAK ALERT 65-02 benefits from ENVEA's unique *ElectroDynamic™* Probe Electrification technology. Advanced unique features enable configuration for bagfilters irrespective of cleaning sequence. The external display, keypad and patented self-check options provide ease of use and added Quality Control.

PROCESS APPLICATION CONDITIONS

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The PCME LEAK ALERT 65-02 is the ideal solution for continuous monitoring of fabric filter dust collectors. Applications include:

Stack flue gas temperatures up to 400°C at monitoring point

Duct diameters to 4 metres

Dry and humid applications. Up to 95% relative humidity, non-condensing

Online or Offline bag cleaning sequences

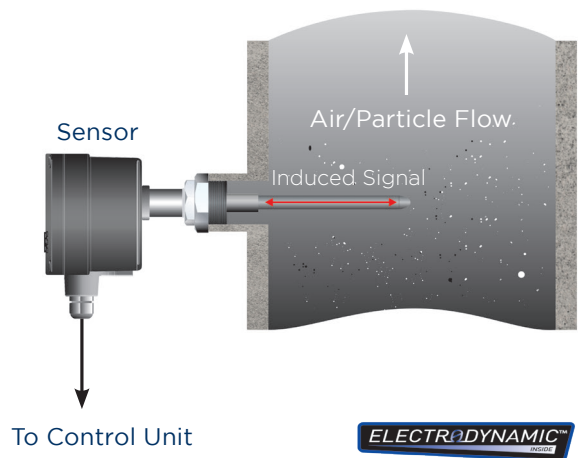
Acid gas environments

PRINCIPLES OF OPERATION

The PCME LEAK ALERT 65-02 uses ENVEA's unique and patented *ElectroDynamic™* Probe Electrification technology. Particulates 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 (rejecting the DC Triboelectric signal), making the instrument less susceptible to changes in particle velocity and eliminating the effect of any particulate contamination on the sensing rod (affecting Triboelectric dust monitors).

ElectroDynamic™ technology does not rely on particles colliding with the probe, and therefore measures a more representative area of the stack and does not require long sensor probe rods. The rod can be fully insulated to provide a reliable solution for high-humidity applications (patented option).

- ➔ **Not affected by contamination on the sensor rod (unlike Triboelectric systems).**
- ➔ **Not affected by velocity variations within typical bagfilter velocity ranges (unlike Triboelectric systems).**
- ➔ **Provides stable results and calibrations. Drift due to electrostatic charging is avoided when standard probes are used in dry applications.**



INSTRUMENT SELF-CHECKS

Probe Check (Insulator Short-Circuit Check) for detection of insulator contamination (patented option)

ElectroDynamic™ sensors are tolerant to dust contamination on 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).

The Probe Check (Insulator Short-Circuit Check) provides a reliable method for detecting insulator contamination, and hence improved Quality Assurance.

The probe check tests for contamination between the sensor rod and the base of the rod. If the Probe Check fails then the probe should be inspected and cleaned, as interference to the dust signal is likely. The probe check can be configured to be activated manually or run automatically.

Electronic Zero and Reference drift detection

Electronic and signal measurement malfunctions are detected. This Quality Assurance feature is required by European and ASTM (US) performance standards for Filter Leak monitors.

The Zero Self-Check tests that the electronics read zero when no external signal is present and hence checks for electronic drift.

The internal Reference Self-Check (Span or Upscale Check) tests the correct electronic response to a known input signal. The signal is applied directly to the sensor so any malfunctions in the sensor, cabling or Control Unit are detected (unlike other Triboelectric systems).

PRODUCT FEATURES

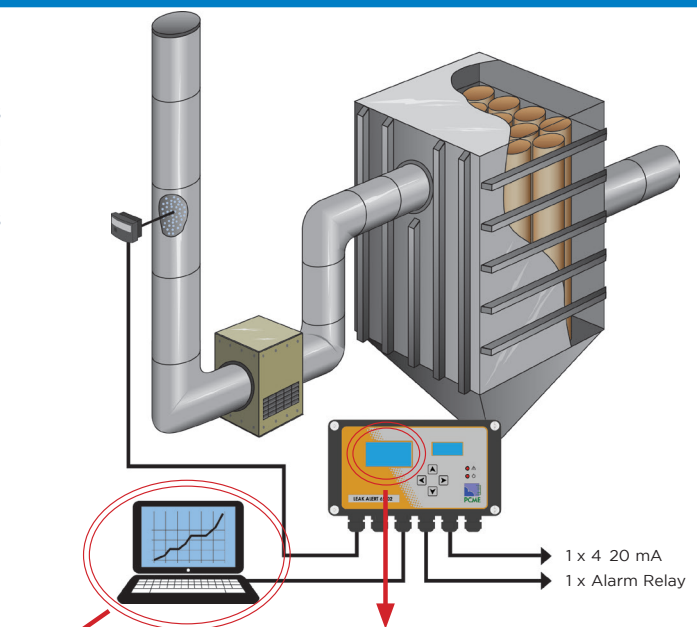
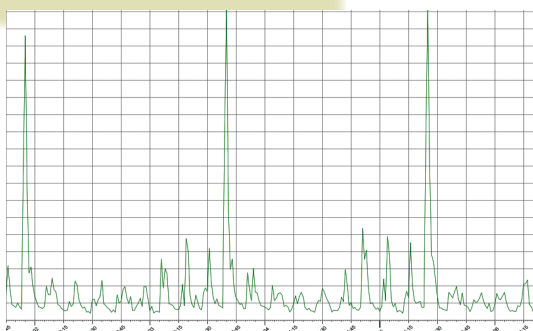
ADDED VALUE FEATURES AND BENEFITS

Sensor	
Wide dynamic range	Low dust levels are monitored accurately without compromising the accuracy of measurements of large spikes in dust levels (e.g. from bag cleaning pulses) by using state of the art Digital Signal Processing (DSP).
Probe Check (Insulator Short-Circuit Check)	If contamination of the sensor's insulator occurs with conductive material or moisture, it is rapidly detected and an alarm signal is triggered so corrective maintenance work can be carried out. This ensures correct operation of the sensor. This unique feature minimises false alarms and maintenance requirements.
Electronic Zero and internal Reference drift checks	The measurement accuracy and operation of the electronics are checked directly at the sensor. Any electronic malfunctions are detected and an alarm signal is triggered. This QA feature is required by European and US (ASTM) performance standards for Filter Leak Monitors as required by EN15859 and D7392-07.
Rugged sensor options	Alternative versions of the sensor probe can be used in challenging stack environments e.g. high humidity, temperatures up to 400°C, corrosive and hazardous (ATEX Zone 2/22) applications.
Floating nut stack connection	Quick and straightforward installation and removal of the sensor from the stack without the need to rotate the sensor, or use specialised stack connections, or remove the cables from the sensor.
Control Unit	
Separate Control Unit	Convenient sensor set-up and display away from stack or duct (up to 500m using standard cabling).
Digital communications between sensor and control unit (DSP)	Improved immunity to noise with no need for special connection cable (e.g. coax).
Scaling Factor	Data via control unit's display or through the 4-20mA outputs can be either 0-100% alarm level or be scaled via results from isokinetic emission tests to give mg/m ³ readings.
Control Unit Bag Pulse Display	The Bag Pulse Display allows users to locate failing rows of filter media through visual identification of the emission profile created when on-line reverse-jet pulse cleaning systems are used.

FILTER CLEANING "PULSE DISPLAY" OPTIONS

The PCME LEAK ALERT 65-02 supports two methods of displaying the analysis of the dust pulses associated with the bag cleaning cycle: Bag Pulse Display on the controller and PC-ME Dust Tools Software. This permits the early detection of leaking and broken bags (for Pulse Jet cleaning systems) and easy visual identification of specific failing bag rows (Leak Locate capability). The main benefits of monitoring the filter media cleaning sequences via the display or software options are:

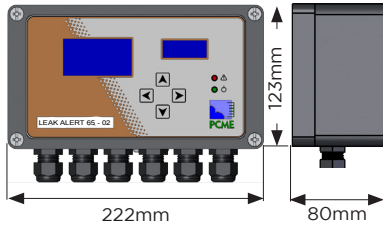
- ⇒ Scheduled maintenance
- ⇒ Reduced maintenance times
- ⇒ Lower labour cost
- ⇒ Reduction of spare filter inventories
- ⇒ Decreased filter media consumption
- ⇒ Decreased process downtime
- ⇒ Reduced environmental emissions due to better filter control



Bagfilter cleaning pulses using the Bag Pulse display on the Control Unit

DIMENSIONS

Control Unit



Control Unit Features	Specification
Number of Sensor Channels	1
2-line 8-digit display	Menu map and relative dust level 0-100% (or mg/m ³ - option)
Bag Pulse Display (option)	Large Bag Pulse Display screen with graphical display of dust levels (option)
Instrument Set-up and Configuration	Via Control Unit keypad with menu map or remotely via PC-ME Dust Tools software (option)
Outputs	1 x 4-20mA (Isolated 500 Ohm) 1 x Alarm Relay (1A DC or AC rms @ 24V DC) 1 x RS232 or RS485
Inputs	Digital input for: Plant off indication or filter cleaning start sequence (bag row failure detection)
Power Supply	100-240VAC 50/60Hz
Cable from Sensor to Control Unit	4-core screened cable (10m included)

PRODUCT SPECIFICATION

Sensor Mechanical	Description	Order Code	
Stack Temperature	Up to 250°C	250C	Standard
	Up to 400°C	400C	Option
Rod Length	100mm to 1000mm (xxxx is the length in mm)	RODxxxx	>500 mm Option
Rod Type	Stainless Steel Rod	S	Standard
	Insulated (PTFE coated Rod)	I	Option
	Passive Section	P	Option
Sensor Connection	1.5" British Standard Pipe Tapered (BSPT)	BSP	Standard
	2" ANSI Flange	2FL	Option
Air Purge Adaptors	None	0	Standard
	Air Purge Fitting	AP	Option
	2" ANSI Flanged Air Purge Adapter	S250	Option
	Low Temp. 2" ANSI Acid Flange (up to 250°C)	H250	Option
	High Temp. 2" ANSI Acid Flange (up to 400°C)	H400	Option

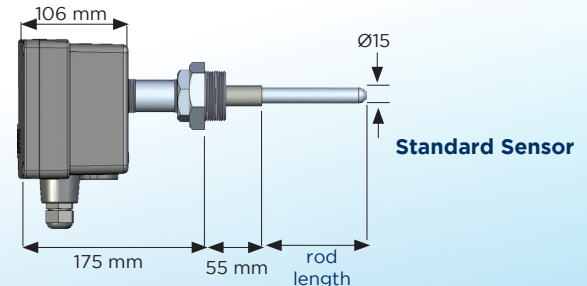
Note: For more information related to the product specification and options, refer to the PCME LEAK ALERT 65-02 Specification Guide.

Accessories	Description	Order Code	
Filter Regulator	Filter + Regulator Assembly	FFR	Option
	Advanced Filter + Flow Regulator Assembly	FFRC	Option
Cable	Extra Length of 4 Core Cable	CAB4	Option
PC-ME Dust Tools Software	Online	ONLINE	Option
	Predict (includes Online)	PREDICT	Option
	Device Set remote system setup from PC	DEVSET	Option
	External Connector to PC RS232 port	FLY	Option
	RS232 Download Serial Cable	CAB232	Option
	RS232 to USB port converter	ACC2-U	Option

Control Unit	Description	Order Code	
Bag Pulse Display	None	CON-6502-STD	Standard
	Leak Alert 65-02 Control Unit with Bag Pulse Display	CON-6502-BPD	Option
Data outputs	4-20 mA only	0	Standard
	RS485 + 4-20 mA	485	Option
	RS232 + 4-20 mA	232	Option
Scaling Method	Trend (%)	%	Standard
	mg/m ³	SF	Option

Sensor Electronic Options	Description	Order Code	
Probe Check (Insulator Short Circuit)	None	0	Standard
	Manually initiated Short Circuit Check in Insulator	MSC	Option
	Automatic Short Circuit Check in Insulator	ASC	Option
Electronic Self-Checks (1)	None	0	Standard
	Manually Initiated Zero and Reference Checks	MAN	Option
	Automatic Zero and Reference Checks	AUTO	Option

(1) To comply with the US ASTM fabric filter bag leak detector these options must be included



	ATEX II 3 D	ATEX II 3 G
Hazardous Zone	ZONE 22	ZONE 2
Certificate number:	Sira 10ATEX4144X	PCME 14ATEX6502X
Certification code:	Outside stack (enclosure):	
	Ex tc IIIC T80°C Dc IP66 Ta = -20°C to +55°C	Ex nA IIB T6 Gc Ta = -20°C to +50°C
	Inside stack (probe²):	
	Ex tc IIIC Dc IP66 Ta = -20°C to +250°C	Ex nA IIB Gc Ta = -20°C to +250°C
	II 3D	II 3G

² The probe does not generate heat, so the surface temperature is dependent upon the stack temperature. This can be a maximum of +250°C (482°F).

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.



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