PCME LEAK ALERT 75/80

EUROTEC
TECNOLOGIE IMPIANTISTICHE - AUTOMAZIONE - TELECONTROLLO

envea

Filter Dust & Leak Monitors

PROCESS & EMISSIONS MONITORING SYSTEMS



ELECTRODYNAMIC™ INSIDE

SPECIFIC FEATURES:

- Range of leak and dust monitors for control and monitoring of arrestment plant, especially bagfilters
- Versions with European (TUV & MCERTS) approvals as 'filter dust monitors' and 'filter leak monitors' and meeting US Standards for Bagfilters (MACT)
- Selection of advanced features and options for improved performance, incl. automatic internal zero and reference self-checks for regulatory compliance

THE QUEEN'S AWARDS FOR ENTERPRISE: INNOVATION 2017

IEC IECEx

MCERTS CLASS 2 & 3 EQUIVALENT

TECHNOLOGY

SYSTEM DESCRIPTION

LEAK ALERT 75/80 instruments are particularly suited for use on fabric-filter type dust collectors (baghouses), and provide reliable and robust monitoring of particulate dust levels and leaks from faulty bag media. With compact, cost-effective transmitter design, reliable monitoring can now be provided for all types of industrial filters. The instruments benefit from ENVEA's unique *ElectroDynamic™* Probe Electrification technology and advanced features enabling configuration for all types of bag filters irrespective of cleaning sequence, including an external display, keypad and probe-rod self-check option, which provides added quality control. The Leak Alert sensors are approved and meet the requirements for Filter Dust Monitors and Filter Leak Monitors under EN 15859 and also the US ASTM D7392-07 requirements for Bag-Leak Detectors, falling under MACT.

PRINCIPLE OF OPERATION

The instruments use ENVEA's unique and patented *ElectroDynamic™* Probe Electrification technology. The sensor electronics measures the current signature created by particles interacting with the grounded sensing rod which protrudes into the stack. The electronics extract a specific frequency band of this signal and filters out the DC current caused by particle collisions (unlike DC Triboelectric systems and 'induction sensing and protected probe' systems).

Advantages from this technology are that the signal generated is:

- Unaffected by contamination on the sensor rod (which causes signal drift issues for other systems).
- Not affected by velocity variations within typical bag-filter velocity ranges (unlike other systems).
- Stable, reliable and does not drift due to electrostatic charging, which may occur with protected probe systems in dry flue gas applications.

In addition, *ElectroDynamic™* Probe Electrification technology provides sufficient dynamic range to follow 'on-line' and 'off-line' bag cleaning cycles for predictive filter failure and faulty bag leak-location detection.

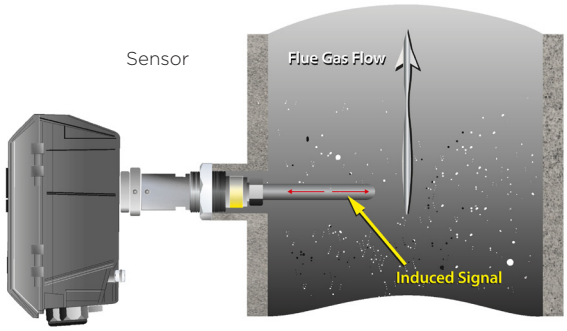


Figure 1: Principle of Operation – ElectroDynamic™ sensors

Added Value Features

- An optimised frequency spectrum to extend the velocity range over which the system has no cross-sensitivity to changing velocity (see TUV approvals).
- Unique digital signal processing algorithms in the sensor give the wide dynamic range required for measurement accuracy during arrestment plant cleaning and high reproducibility of signal tracking.
- Uses the same technology as in ENVEA's Continuous Emission Monitors approved by TUV and MCERTS equivalent.

ADDED FEATURES

The Leak Alert 75/80 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/m with leak monitoring to 500 mg/m .
- Fully configurable warning and limit alarm levels with independent alarm delay.
- Convenient bag-leak output range in defined units (user selectable).
- Bag-leak location capability by use of the optional Filter Display Module (FDM). Faulty bag media can be determined by row assisting bag replacement and reducing the cost of operating bag filters (application dependent, please consult your local ENVEA representative).

Designed for practical bag-filter issues

- Suitable for ATEX Dust zone 22 (with options for zones 20 and 21).
- 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).

Powerful User Interface

- Internal or external 4-digit display (external as standard on LEAK ALERT 80).
- Instrument setup via keypad or PC/laptop (requires the 'Device Set' software).
- Option for external keypad (standard on LEAK ALERT 80).
- Intuitive multi-level menu (User/Engineering setup) with password protection.
- Three tri-colour LEDs for Power, Emission alarms and instrument Self-checks.

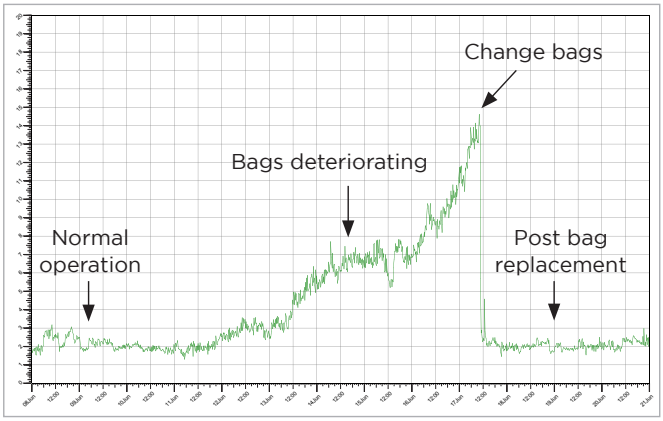


Figure 2: Cleaning pulses highlighting broken and leaking bags (source: PC-ME DUST TOOLS software)

PRODUCT FEATURES

USER-SELECTABLE ADDED-VALUE OPTIONS

The Leak Alert 75/80 provides a full choice of user-selectable added-value features. These include the following options:



Figure 3: LEAK ALERT sensor contamination check

- **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 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**

  Signals are injected into the front end of the sensor electronics to ensure any electronic and signal measurement malfunction is automatically detected. This Quality Assurance feature is required by European and ASTM (US) performance standards for Filter Leak Monitors. This feature is controlled either manually or automatically (model specific).

- **User Scaling of display**

  The LEAK ALERT sensors can be specified with a choice of two forms of user scaling providing assistance to plant personnel wishing to scale the display to an approximate known dust level (LEAK ALERT 80) or those wishing to display emissions relative to a 100% full scale (LEAK ALERT 75).

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	100–240V AC, 50/60Hz (32 mA) or 24V DC (300 mA)
Outputs (standard) Outputs (optional)	• Isolated 4-20 mA (500 Ω) • Warning alarm relay (SPST, 1A@24V DC), Fail safe • Emission alarm relay (SPST, 1A@24V DC), Fail safe • RS-232 (Modbus RTU) • RS-485 (Modbus RTU)
Inputs	Plant Stop signal (output set to zero when plant is off), marker for start of bag-cleaning sequence
External Indicators (3x LEDs)	1. Power/sensor OK 2. Warning and limit alarm 3. Self-check status (optional)
User Controls	4-digit Display and Setup buttons with menu-selectable items Option: external keypad (standard on LEAK ALERT 80)
Cable Entries	3x M20 cable glands
Air Purge	Air purge fitting: ¼" BSP connection to instrument airline Requires external supply of 5–10 l/min of dry, clean, oil-free instrument air, depending on dust loading.

Note: Optional external keypad and display for all sensor types (excl. Ex variants), refer to the Sensor Options on page 4.

FILTER DISPLAY MODULE

The LEAK ALERT 75/80 may be upgraded to provide Leak Locate capability by connecting to a separate Filter Display Module (FDM). 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.

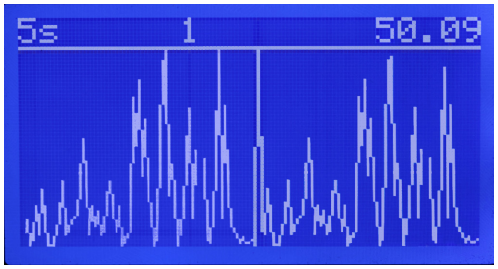


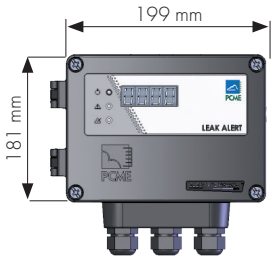
Figure 4: Large Pulse Display permits failing bag rows to be identified during bag cleaning (see FDM, right)

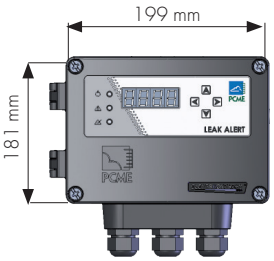


SPECIFICATIONS

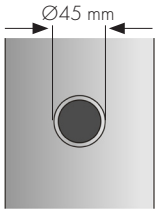
DIMENSIONS

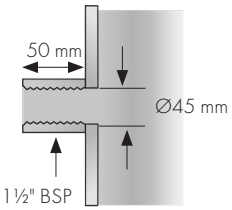
Leak Alert Sensor (shown with optional external display and keypad)



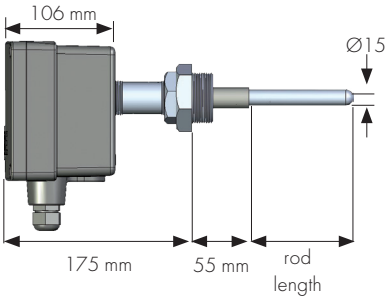


Duct Connection

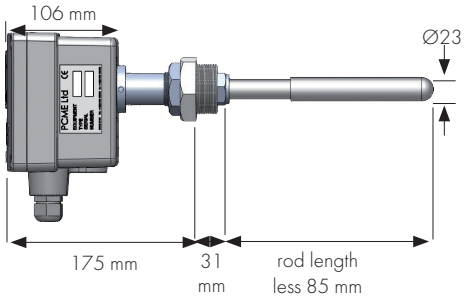




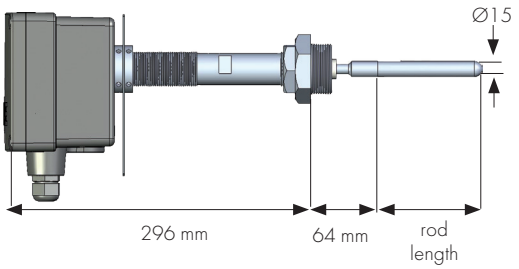
250°C Stainless Steel



250°C Insulated



400°C Stainless Steel



ORDER CODES

INSTRUMENT TYPE: 80 FILTER DUST MONITOR
75 FILTER LEAK MONITOR

Mechanical Options (1–5)				
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	none Air Purge Fitting 2" Flanged Air Purge Fitting (250°C)	– option option	0 AP S250
5	Air Filter/ Regulator	none Filter + Regulator assembly	– option	0 REG

PC Software Options (PC-ME DUST TOOLS)		
Configuration Options	Device Set	
Real-time Data Options	Online	Predict (req. Online)

**not available with insulated rod option ** standard on LEAK ALERT 80 sensors*
****choose F or G (these options are exclusive; note that option P requires option F)*

Note: For details on options and order information please refer to the order form for this instrument (available from your local ENVEA representative on request).

Sensor Features and Accessories (A–J, P)				
A	Sensor Self-checks	none Short-circuit Check	– option	0 SC
B	Electronic Drift Checks	Manual Automatic	standard option	MAN AUTO
C	Scaling Method	Trending 0–100% Scaling Factor	standard 75 option**	% SF
D	Hazardous Zone Classification*	not required ATEX Dust zone 22 ATEX Dust zone 20/21 (250°C) IECEx Dust zone 22 IECEx Dust zone 20/21 (250°C)	– option option option option	0 X22 X20 I22 I20
E	Power Supply Voltage	100–240V AC (non-Ex only) 24V DC (no cost option)	– option	AC 24DC
F	RS-485 Data Output	not included RS-485 included***	– option	0 485
G	RS-232 Data Output	not included RS232 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 75 option 75	IK EK
J	Display	Externally viewable	standard	ED
P	Leak-Locate Capabilities	not included Filter Display Module (req. F)***	– option	0 BPD

Example: SEN80 –	250C	ROD0800	I	AP	REG	0	MAN	SF	0	24DC	232	0	FLY	EK	ED	–	0

Serie LEAK ALERT 75
Sistema elettrodinamico di monitoraggio filtri

Il misuratore di polvere elettrodinamico LEAK ALERT 75 è uno strumento approvato dall'MCERTs in accordo alla direttiva EN 15859 per il monitoraggio in continuo dei filtri a maniche (Filter Leak Monitor) e soddisfa i requisiti della US ASTM D7392-07 (Bag Leak Detector) e ricade quindi sotto la US MACT.

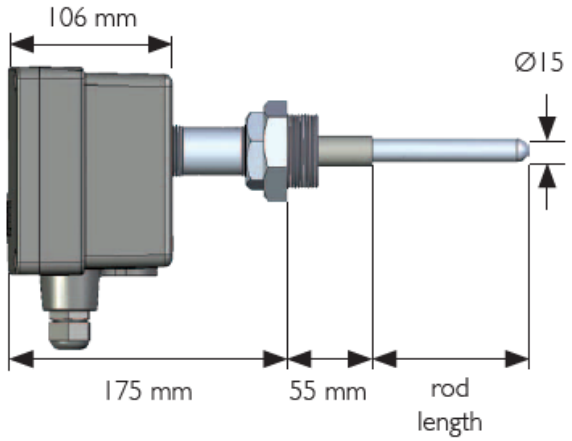
I misuratori di polvere elettrodinamici rilevano l'induzione elettromagnetica generata dalla carica elettrostatica delle particelle di polvere che fluiscono intorno all'elettrodo, da cui è possibile calcolare la concentrazione di polvere nei fumi.

Siccome lo strumento elabora la parte variabile della corrente che si genera sull'elettrodo non è necessario che le particelle di polvere impattino sull'elettrodo stesso per generare un segnale; questo rende lo strumento particolarmente idoneo a misurare basse concentrazioni di polvere, perché la misurazione avviene in tutto il volume che circonda l'elettrodo.

Tutte le parti sensibili sono situate nella custodia del sensore, che è del tutto privo di parti in movimento.

Lo strumento può effettuare periodicamente (con avvio manuale o come opzione anche con avvio automatico) una verifica automatica di zero e di span.

Tipicamente lo strumento si compone semplicemente di un sensore con display e tastiera incorporati. Il sensore è alimentato a 24 Vcc o 230 Vca e ha un'uscita analogica 4-20 mA e 2 contatti di allarme e warning.



Per la presente offerta abbiamo considerato un elemento sensibile (rod) da 300 mm.

È eventualmente possibile collegare un'unità display da campo per mostrare graficamente l'andamento della concentrazione di polvere. Questa unità display può essere posizionata sia nei pressi del punto di misurazione che a distanza.

Il LEAK ALERT 75 è facile da installare, non richiede l'esecuzione di complesse opere sui camini e necessita di pochissima manutenzione perché non ci sono filtri da sostituire o ottiche da pulire e la misurazione non viene disturbata dall'eventuale stratificazione di polvere sul sensore.

Caratteristiche sonda
Sonda standard per temperatura fumi fino a 250° (disponibile anche per temperatura fino a 400°C)
Lunghezza parte attiva sonda (elemento sensibile) da 100 a 1000 mm
Materiale sonda AISI 316, materiale isolante in PTFE o PEEK
Attacco al processo 1½" BSP
Custodia con grado di protezione IP65
Disponibile in esecuzione ATEX per installazione in zona 22 o zona 20
Temperatura ambiente: -20...+50°C
Ingresso cavi 3xM20 completi di pressacavo
Sistema di purga ad aria compressa
Conforme alle US ASTM D7392-07 e EN 15859 (Filter Leak Detectors)
Conforme allo standard US EPA MACT



Vantaggi del sistema:

- Conforme alla EN 15859 per il monitoraggio perdite dei filtri
- Tarabile in mg/m^3 per calcolare i flussi di massa
- Ampia zona di misurazione (molto più estesa rispetto al volume dell'elemento sensibile)
- La misurazione non è disturbata dalle variazioni di velocità né dallo sporcamento della sonda
- Verifica automatica di zero e di span
- Richiede pochissima manutenzione
- Monitorare il filtro localmente e/o da remoto con un unico sensore
- Individuare tempestivamente eventuali problemi al filtro permette di programmare anticipatamente la manutenzione anziché intervenire a perdita avvenuta, mantenendo basse le emissioni
- Individuare facilmente le file con maniche in fase di deterioramento o bucate, accorciando drasticamente il tempo di sostituzione maniche

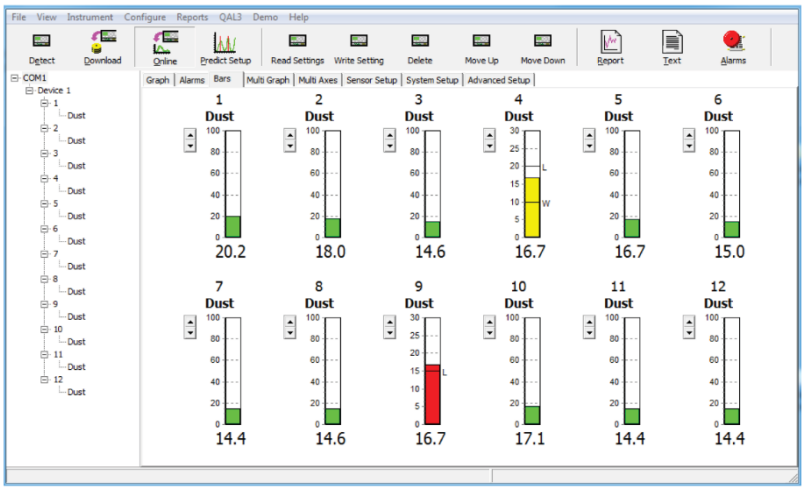
Descrizione dei moduli software opzionali

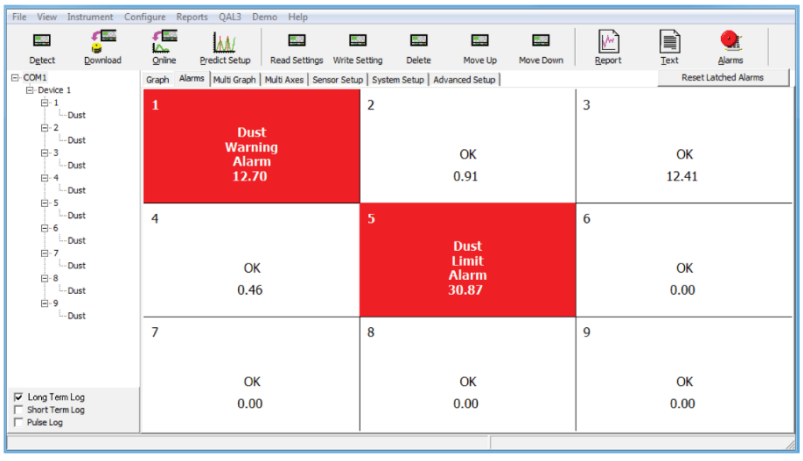
Per sfruttare al massimo la potenzialità del sistema LEAK ALERT 75, si può collegare il sensore ad un PC tramite una linea seriale RS232.

Sul PC è possibile installare il software PC-ME DUST TOOL, che è composto da vari moduli per meglio soddisfare le esigenze più varie.

Modulo Online

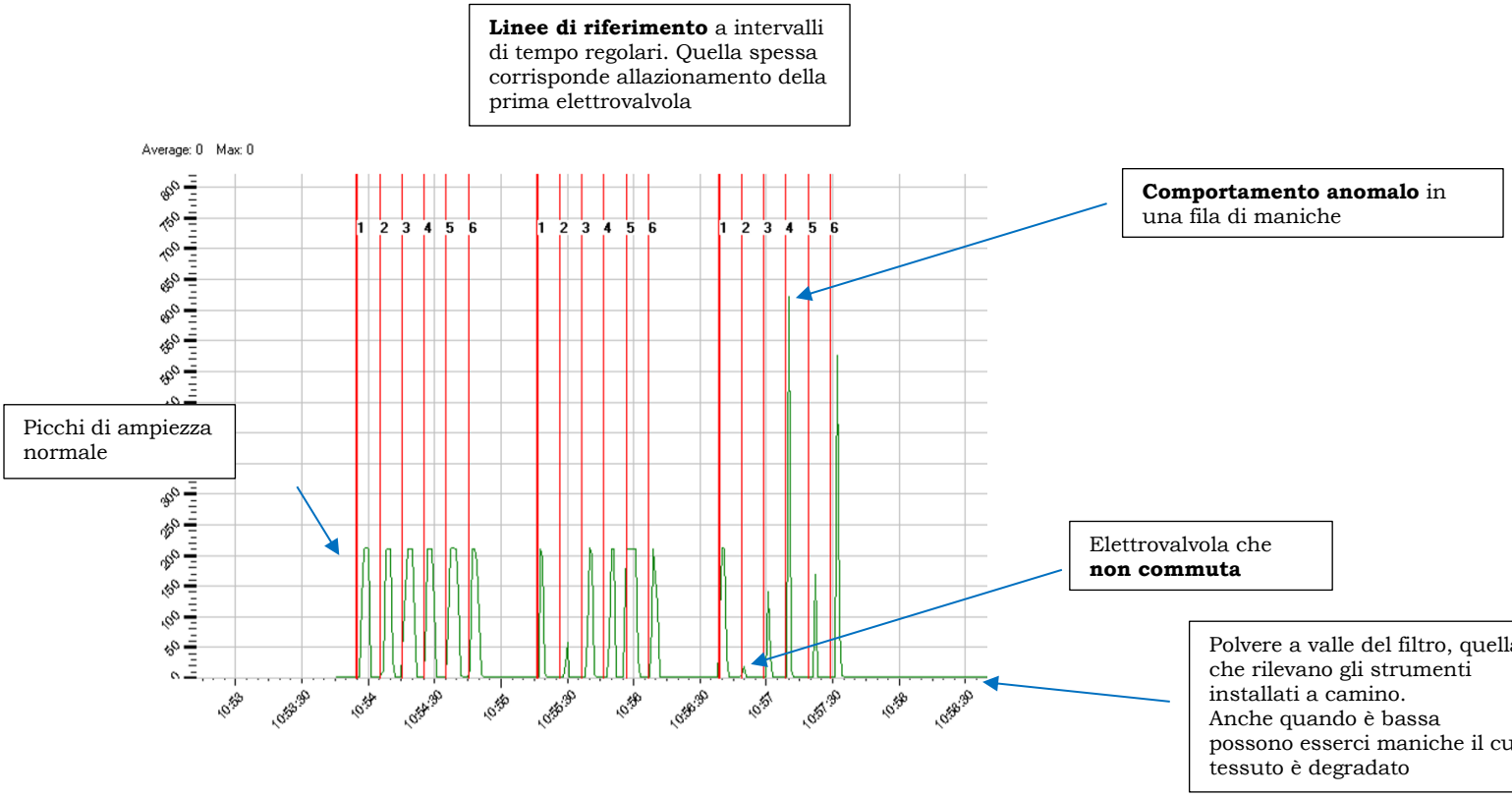
Consente la lettura e la visualizzazione in tempo reale dei valori misurati da uno o più sensori. L'utilizzatore può osservare i valori istantanei della quantità di polvere su dei bar graph ed il trend della concentrazione su un grafico a scorrimento orizzontale. Il software notifica all'utente l'eventuale superamento delle soglie di allarme impostate.





Modulo Predict

Tool di analisi per permettere la localizzazione di maniche forate o in fase di deterioramento prima che avvenga una rottura.
Durante le fasi di soffiaggio aria nelle maniche le maglie si allargano lasciando passare per un breve intervallo di tempo una quantità di polvere maggiore del solito.
Osservare in forma grafica la forma e l'ampiezza dei picchi permette di individuare in quale fila si trovino gli elementi filtranti che richiedono o richiederanno manutenzione. Il modulo permette inoltre di rilevare se le elettrovalvole che gestiscono gli scuotimenti commutano correttamente.



Quando l'apertura delle valvole avviene a intervalli di tempo regolari è consigliabile acquisire il contatto di inizio sequenza al DI del sensore, in questo modo il software oltre a visualizzare i brevi picchi di emissione su ciascuna fila di maniche li evidenzierà con delle linee di riferimento rosse (più spessa quella della prima elettrovalvola, a seguire le successive distanziate secondo la sequenza di azionamento).

SPECIFICATIONS

	IECEx	ATEX
	ZONE 20/21	
Certificate number:	IECEx SIR 09.0126X	Sira 09ATEX9306X
Certification code:	**Outside stack (enclosure):**	
	Ex tb IIIC T80°C Db IP66 T_a= -20°C to +55°C	Ex tb IIIC T80°C Db IP66 T_a = -20°C to +55°C
	Inside stack (sensor probe[D]):	
	Ex ta IIIC Da IP66 T_a = -20°C to +250/400°C	Ex ta IIIC Da IP66 T_a = -20°C to +250/400°C **II 2/1D**

	ZONE 22	
Certificate number:	IECEx Sira 09.0126X	Sira 10ATEX4144X
Certification code:	**Outside stack (enclosure):**	
	Ex tc IIIC T80°C Dc IP66 T_a= -20°C to +55°C	Ex tc IIIC T80°C Dc IP66 T_a = -20°C to +55°C
	Inside stack (probe):	
	Ex tc IIIC Dc IP66 T_a = -20°C to +250 /400°C	Ex tc IIIC Dc IP66 T_a = -20°C to +250/400°C **II 3D**

D *The probe does not generate heat, so the surface temperature is dependent upon the stack temperature. This can be a maximum of +250 °C or +400 °C (480 °F or 750 °F), depending on the build.*

Castel Maggiore (BO) 40013
Via Lirone 60/i

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