envea

# Filter Performance Monitors

ELECTRODYNAMIC™ INSIDE

## SPECIFIC FEATURES:

- Self-contained leak monitoring system for on-line and off-line cleaned multi-compartment bag filters
- Identifies compartments with broken or leaking bags before large-scale emission events occur
- Reduces filter maintenance intervals, process down-time and filter costs
- PC-ME DUST TOOLS software options for comparing compartment emissions and locating specific, failing bag rows
- Sensor Probe Check option for improved data integrity and Quality Assurance

THE QUEEN'S AWARDS FOR ENTERPRISE: 2017
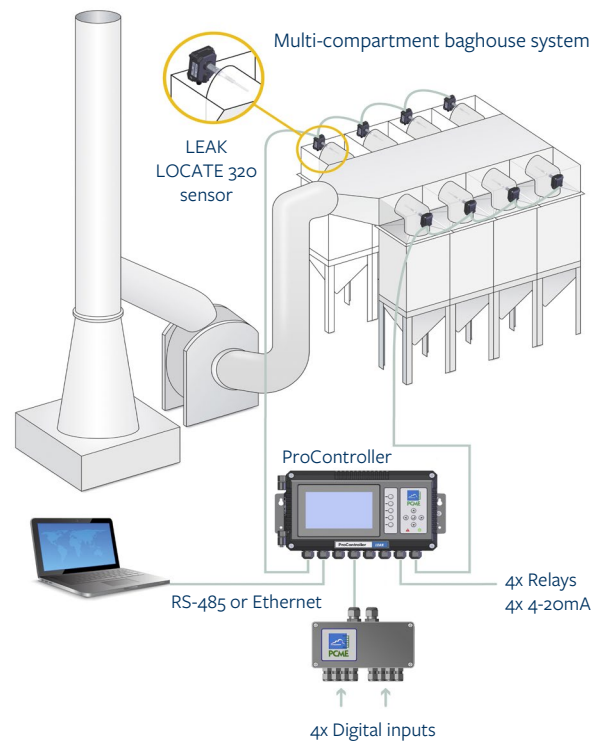
# TECHNOLOGY

## SYSTEM DESCRIPTION

The PCME LEAK LOCATE 320 is a digitally networked, multi-compartment baghouse monitoring system providing remote observation of the condition of bag and cartridge filters.

An *ElectroDynamic®* sensor is installed in the outlet of each compartment to monitor dust emission levels. The network of sensors is connected to the ProController, which provides a large graphical user interface giving a clear indication of each compartment's dust level and onward communication to a PC or PLC network.

The system is supported by the PC-ME DUST TOOLS software suite for PCs, with advanced features for monitoring emission trends and identifying failing or broken bags. For on-line cleaned bag filters the specific bag row containing leaking bags can be located.

The PCME LEAK LOCATE 320 is a valuable filter-maintenance tool:

- giving advance warning of filter deterioration
- enabling users to make significant savings in spares, maintenance time and lost production time
- reducing the likelihood of large-scale emission events occurring.

Multi-compartment baghouse system

LEAK LOCATE 320 sensor

ProController

RS-485 or Ethernet

4x Relays
4x 4-20mA

4x Digital inputs

## PRINCIPLE OF SENSOR OPERATION

The sensors use ENVEA's unique and patented *ElectroDynamic®* Probe Electrification technology. Particulates in the airstream interact with the sensing rod to induce a charge signature. The sensor electronically filters the resulting signal to reject signals outside a defined frequency range (rejecting the DC Triboelectric signal), making it less susceptible to changes in particle velocity and eliminating the effect of any particulate contamination on the sensing rod (unlike Triboelectric dust monitors which suffer from sensor contamination issues).

The optional sensor Probe Check is a valuable additional feature for detectingcontamination across the insulator, for improved Quality Assurance.

## PROCONTROLLER - FEATURES AND FUNCTIONS

- Navigation keys (Up/Down/Right/Left/Enter, plus five function keys (incl. 2x user-programmable short-cut keys, 2x menu keys, and 1x back button) for rapid menu access and response
- Powering the sensor network
- Setup and configuration of the sensor network (optional setup via System Set software module, see software options below)
- Icon-driven, multi-lingual menu
- Dynamic or manual allocation of Ethernet settings
- Scaling the output of sensors (to between 0 and 100%) to provide an indication of relative emission levels between compartments
- Displaying overviews of sensor and system status, including Probe Check results, and alarms and emission levels per compartment
- Providing alarm relay outputs that can be configured to suit requirements, e.g. high and high/high emission alarms, sensor status and system failures
- Providing multiple, simultaneous data viewing for up to five clients (via USB 2.0, RS-232/RS-485 over Modbus, Ethernet)
- Connecting to accessory network modules for additional I/Os and increased network robustness (refer to the controller specifications on page 4).

On-line Pulse screen
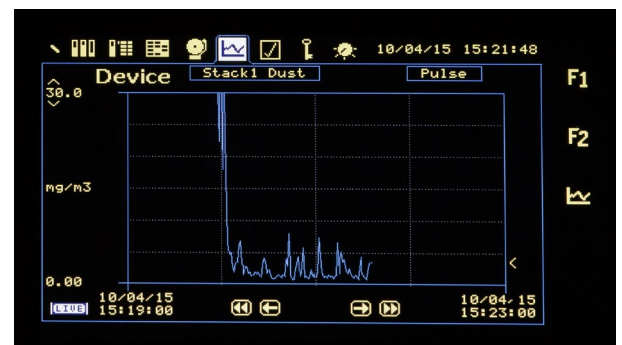
Sensor/chamber dust level Overview screen
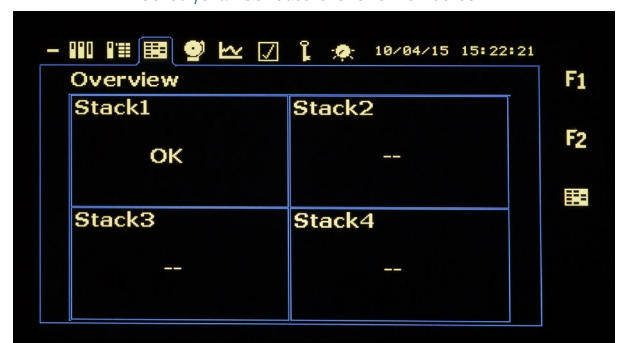
# PRODUCT FEATURES

## PC-ME DUST TOOLS OPTIONS

PC-ME DUST TOOLS is a powerful supporting software suite with functions that enable users to get the longest possible service life from their filters and minimise the risk of filter failure.

The software can be used in conjunction with the ProController for setting up and configuring the sensor network and for a range of different data viewing and recording functions.

| Software Module | Description |
|---|---|
| Online | Real-time display of alarms and emissions data from the network of sensors. |
| Predict | Graphical analysis tool for locating failing and faulty bag filter media, using real-time data only. |
| System Set | Interface for configuring the settings of all sensors in the network, and a backup of sensor configuration files. |
| Data Download | Facility for downloading logged data (pulse emissions and alarms) from the ProController to PCs. |
| Automatic Download | Automated facility for downloading logged data from the ProController to PCs at user-configurable, timed intervals. |
| Data Viewer | Graphical tool for instantaneous and long-term analysis of trends in emissions data. |
| Predict Viewer | Full Predict functionality for logged data, in addition to real-time data. |
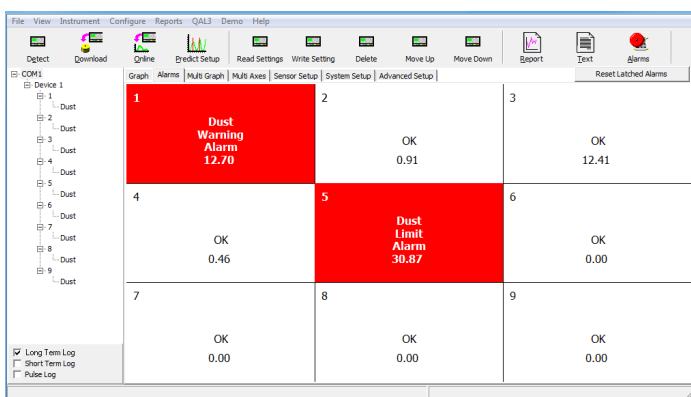
PC-ME DUST TOOLS 'Online' module –
Overview display of dust levels and alarms for all compartments
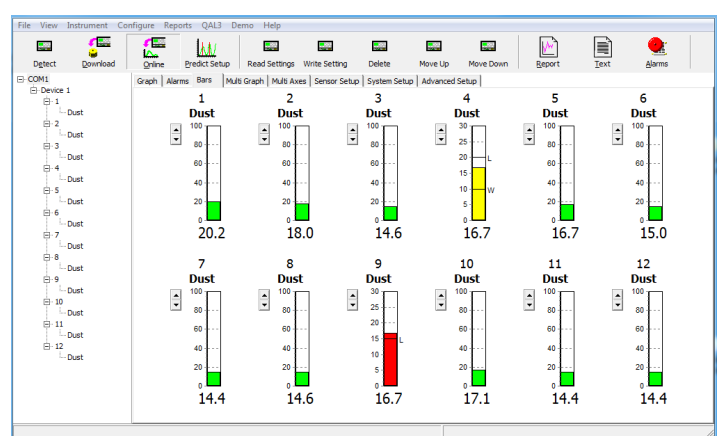
PC-ME DUST TOOLS 'Online' –
Bar graph display of alarms and dust levels for all compartments

## FILTER DIAGNOSTICS

The advance warning of filter failure provided by the PCME LEAK LOCATE 320 offers the following benefits to filter maintenance departments.

• Scheduled maintenance
• Reduced maintenance time
• Lower labour cost
• Reduced spare filter inventories
• Decreased use of filter media
• Decreased process downtime
• Reduced environmental emissions due to better filter control.
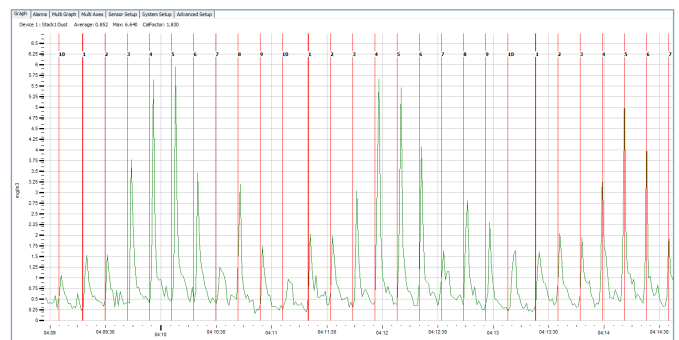
PC-ME DUST TOOLS 'Predict' – Line graph display of dust levels
and bag-row identifiers during an on-line cleaning sequence

### On-line (Pulse Jet) Cleaning

For on-line cleaned bag filters, where the compartment continues to filter during the pulse cleaning process, the PCME LEAK LOCATE 320 system will continuously monitor and display the emission trend profile of each compartment, both during and after the cleaning process.

Synchronising the PCME LEAK LOCATE 320 network of sensors with the cleaning controller enables each dust emission peak to be associated with the particular bag row being cleaned. Using the PC-ME DUST TOOLS 'Predict' software option, the bag rows with the highest emission peaks can be identified to locate leaking and broken bags, and also to detect faulty valve operation.

The 'Predict Viewer' software option uses pulse-logged data so the historical emission profile of each compartment can be viewed over the lifetime of the filter. Slow changes in cleaning performance and deterioration of specific bag rows can be detected readily.

### Off-line Cleaning

For off-line cleaned bag filters, where the compartment is closed during the pulse cleaning process, the PCME LEAK LOCATE 320 system can be used to show leaking bags in compartments and monitor the overall efficiency of the baghouse, but not to locate specific bag-row failures.
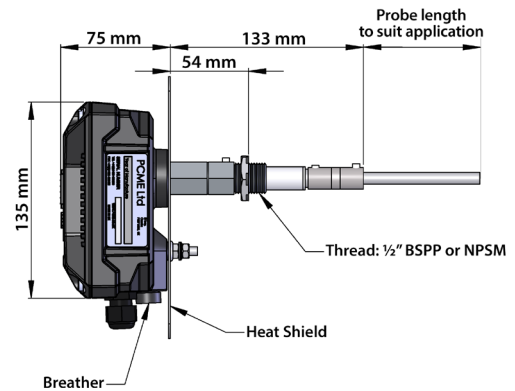
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## SENSOR OPTIONS AND SPECIFICATIONS

| 320 Sensor Options | | | | Order Code |
|---|---|---|---|---|
| Flue Gas Temperature | -20 to +125°C | | standard | 125C |
| | -20 to +250°C | | option | 250C |
| Rod Length | 300 mm (std.) or 400, 500, 600, 800, 1000 mm | | specify | RODxxxx |
| Rod Type | Stainless Steel Rod (½" lock nut stack connection) | | standard | S |
| Sensor Connection | British Standard Pipe (BSP) | | standard | BSPP or BSPT |
| | National Pipe (NP) | | FoC option | NPSM or NPT |
| Air Purge | none | | standard | 0 |
| | Air purge unit (½" BSPP or NPSM) | | option | AP-BS/AP-NP |
| | Filter + Regulator assembly for purge fitting | | option | FFR |
| Probe Check | none | | standard | 0 |
| | Manual initiation | | option | MSC |
| Hazardous Zone Category | None | | standard | 0 |
| | ATEX Zone 22 (Cat. 3D) | | option | X22 |

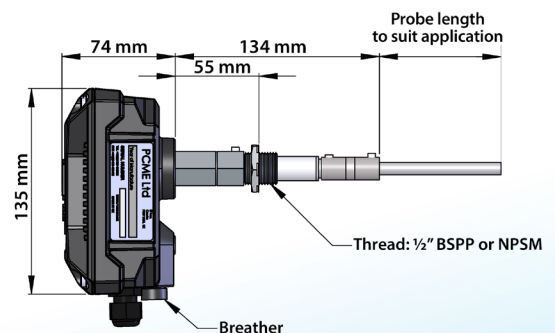| 320 Sensor Specifications | |
|---|---|
| Ambient Temperature | -20°C to +50°C (-4°F to 122°F) |
| Enclosure Dimensions | W 111 x H 135 x D 75 mm (4.4 x 5.3 x 3 in.) |
| Power Supply Voltage | 24V DC (from the control unit) |
| Current consumption | 20 mA |

**High Temperature Sensor 250°C**



75 mm — 133 mm — Probe length to suit application
54 mm
135 mm
Thread: ½" BSPP or NPSM
Heat Shield
Breather

| ProController Feature | Description |
|---|---|
| No. of Sensors/Channels | 4–32 (1 sensor per chamber) |
| Advanced I/O | Ethernet (RJ45, 100Base T/Tx, 100 Mb/s) USB 2.0 (standard type A) |
| Data Logging | Capacity given for four sensors: • Pulse log: 8 hours @ 1 s • Alarm log: 500 entries |
| Advanced I/O | Ethernet (100Base-T/Tx,100 Mb/s), USB 2.0 (type A, M:M) |
| Outputs | 1x RS-485 (Modbus RTU) 1x RS-232 4x Relays (3A, @250V AC or 24V DC, configurable) |
| Inputs | 4x Digital inputs 2x 4-20 mA inputs |
| Enclosure Dimensions | W 390 x H 221 x D 118 mm (15.4 x 8.7 x 4.6 in.) |
| Enclosure Protection Rating | IP66 |
| Ambient Temperature | -20°C to +50°C (-4°F to 122°F) |
| Power Supply Voltage | 85–265 V AC (50/60 Hz) |
| Current consumption | 40 W |

**Standard Sensor 125°C**



74 mm — 134 mm — Probe length to suit application
55 mm
135 mm
Thread: ½" BSPP or NPSM
Breather

## SYSTEM OPTIONS AND ACCESSORIES

| ProController | | Order code |
|---|---|---|
| Accessories | IP65 Cable Mount | ACCPRO-ETH-CONN |
| | USB 2.0 (standard A-to-A) cable | ACCPRO-USB-LEAD |

| Net Modules | | Order code |
|---|---|---|
| ROM | Relay Output Module with 8x additional relay outputs | ACCROM |
| AIM Digital | Auxiliary Input Module with 4x additional digital inputs | ACCAIM |
| Network Spur | Spur for connecting 'spur-linked' sensor networks | ACCSPUR |
| Power Supply Repeater | Voltage and signal boost for extended cable runs and large sensor networks | ACCPWR |

| PC-ME DUST TOOLS Software Suite | Order code |
|---|---|
| Online | ONLINE |
| Predict | PREDICT |
| System Set | SYSSET |
| Data Downloader | DOWNLOAD |
| AutoDownload | AUTODOWN |
| Data Viewer | DATAVIEW |
| Predict View | PREDVIEW |
| Multi-user License (for 2 to 5 users) | SOFL-2<5 |
| Multi-user License (for 6 to 10 users) | SOFL-6<10 |

*Note: Further information related to product, options and order codes available on request from ENVEA.*

## 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.