

DUST SENSE Series

ELECTRODYNAMIC™
INSIDE

Dust Gross

Filter Failure

Detectors

For OEMs and
Integrators



*DUST SENSE 30c shown

- Dual alarms (early warning and filter failure)
- Integrated sensor and control unit
- Digital averaging avoids false alarms from baghouse cleaning pulses
- DUST SENSE 30c version with scalable 4-20mA output



Certificate No: 9389

technology/applications

System Description and Product Range

The **DUST SENSE 10c** and **DUST SENSE 30c** are reliable, cost-effective instruments for the continuous monitoring of fabric filter baghouses for broken bags. The instruments combine the benefits of PCME's *ElectroDynamic™* Probe Electrification technology and dual local alarms with dual alarm relays, and scaled 4-20mA output (30c only) from a single integrated unit to deliver pragmatic and dependable broken bag monitoring. The **DUST SENSE** Series instruments exclude short term signal increases associated with pulse cleaning of bagfilters by appropriate setting of the alarm delay period. As 'Dust Gross Filter Failure Detectors', the instruments detect significant increases in particulate loading which indicates a failure in the arrestment plant.

Using PCME's patented *ElectroDynamic™* Probe Electrification technology, the instruments extract a specific frequency band from the induced AC current signature and filter out the DC current caused by direct particle collisions. This technology outperforms conventional DC triboelectric systems and alternative AC systems by extending the velocity range over which the instrument has no cross sensitivity to changing velocity, and is unaffected by build-up of particulate on the sensing rod thereby eliminating concerns of signal drift.

Process and Application Conditions



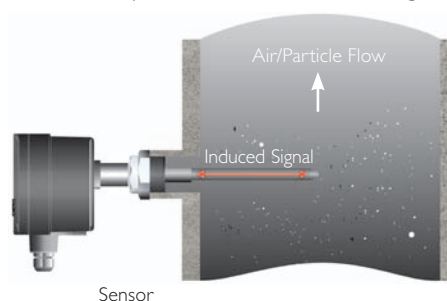
- Stack temperatures to 250°C
- Duct diameters to 4m
- Dry (non-condensing) applications
- For use after bagfilters also cartridge filters, cyclones and others
- Base dust level response < 1 mg/m³ to 500 mg/m³
- Ideal minimum gas velocity > 6 m/s

Principles of Operation

The instruments use PCME'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 of the sensor rod (which causes signal drift issues for other systems),
- Not affected by velocity variations within typical bagfilter 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.



ELECTRODYNAMIC™

ElectroDynamic™ Probe Electrification systems have the following added benefits:

- 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 PCME's Continuous Emission Monitors (CEMs) approved by MCERTS and TUV.

product features

Added Value Features

Dual Alarming for Early Warning

Dual alarming allows operators to configure a Limit Alarm level from 2 to 10,000 units for flexible sensitivity to suit a wide range of process conditions, with the Early Warning Alarm level set to 50% of the Limit Alarm. Operators can set these alarms to instantaneous or average levels above the normal level of emissions to indicate early warning of filter failure or gross failure detection. Alarm delay and data averaging are user selectable.

Digital Averaging Avoids False Alarms

Dust levels are averaged using a 'walking window' filter, which when combined with alarm delay ensures minimised false alarms due to short term spikes in dust levels, such as during bagfilter pulse cleaning cycles.

The **DUST SENSE 30C** additionally features **4-20mA output** scaled to 0-200% of the Limit Alarm level, which is of benefit to plant operators when integrating the instrument with external equipment for trending and external indication of the dust level relative to the instrument's Limit Alarm.



DUST SENSE 30c combined sensor and control unit features 4-20mA output in addition to the basic features of the **DUST SENSE 10c**

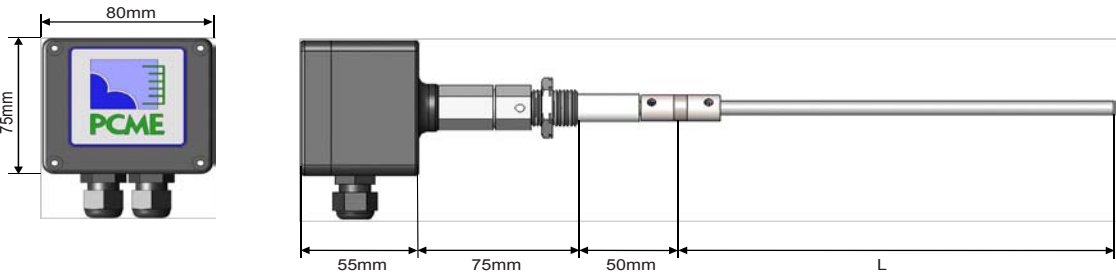
Specifications

Feature	DUST SENSE 10c Combined Sensor & Control Unit	DUST SENSE 30c Combined Sensor & Control Unit
Enclosure Temperature Rating	-20°C to + 50°C	-20°C to + 50°C
Enclosure Rating	IP65	IP65
Enclosure Size (mm)	80 W x 75 H x 57 D	80 W x 75 H x 57 D
Enclosure Material	Die-cast Aluminium (polyester powder coated)	Die-cast Aluminium (polyester powder coated)
Weight (gms)	600 (not including rod)	680 (not including rod)
Power supply	24VDC, 40mA	24VDC, 100mA
Outputs	2 x Relay (SPCO, 0.5A @ 24V)	2 x Relay (SPCO, 0.5A @ 24V) 1 x 4-20mA (non-isolated 250Ω)
Stack / Duct Connection	½" BSP or ½" NPT	½" BSP or ½" NPT
Cable Entries	2 x PG9	2 x PG9
Stack temperatures	-20°C to + 125°C option to + 250°C	-20°C to + 125°C option to + 250°C

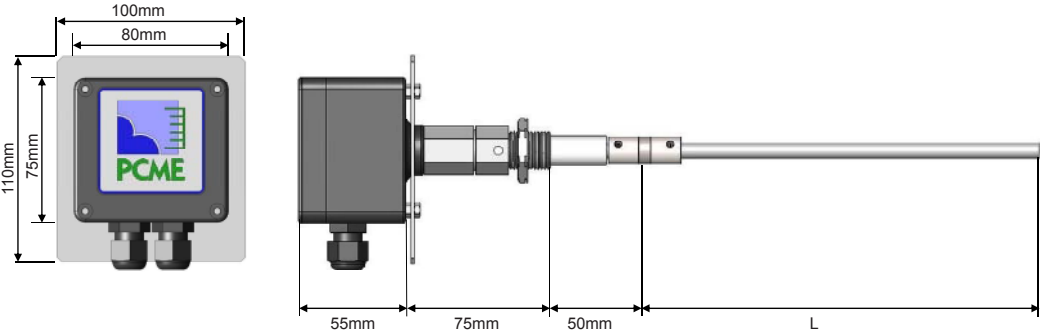
specifications

Dimensions

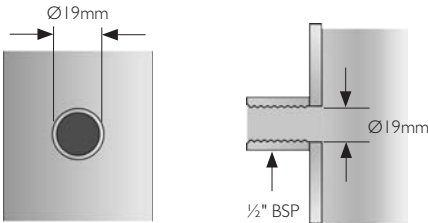
Sensor 125°C Variant



250°C Variant



Duct Connection



Order Codes

DUST SENSE 10/30 c - 1 2

Mechanical Options (1 2)

1	Sensor Type	Standard sensor up to 125°C Standard sensor up to 250°C	std option	125C 250C
2	Rod Length	0100mm to 0800mm	specify	RODxxxx

Example: DS 30 -

1	2
250C	ROD0800

About PCME Ltd

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

Baghouse images reproduced with kind permission of Dantherm Filtration Ltd

Contact your national or area sales and service office