PCME STACK 990

ELECTRODYNAMIC™
INSIDE

Particulate

Measurement

System

TUV Approved
Particulate CEM

- Extensively used for measurement (mg/m³) and leak location in bagfilter stack applications

- Upgradeable to include control for up to 32 sensors, plus 16 additional calculated channels (e.g. for Mass or normalised concentration)

- Advanced sensor design includes zero, span and unique contamination checks

SYSTEM DESCRIPTION

The **PCME STACK 990** is an approved particulate measurement system for continuously monitoring emissions from industrial sources. It is predominantly used to monitor particulate emissions in stacks after bagfilters, cartridge filters, cyclones and process driers. The instrument combines regulatory approvals (MCERTS and TUV BImSchV 17 and 13) for both dust measurement and leak monitoring, with reliable automatic quality assurance features, rugged operation and advanced diagnostics capability for managing and improving the operation of bagfilter arrestment plant.

There are two versions of the **PCME STACK 990**, the **Standard** and **PRO** variants. The **PCME STACK 990** Standard system is a single-sensor system, the **PCME STACK 990 PRO** is a multi-sensor networked system (for up to 32 sensors) for multi-stack and plant-wide monitoring.

In addition, both the standard and **PRO** versions of the instrument also support the following capabilities:

- Normalisation for T and O_2 (with inputs from other analysers).

- Mass calculation (kg/year) capability for both fixed and varying velocity applications (varying velocity requires velocity input).

- Emission reporting and data analysis via optional PC software.

- Internal data logging for emission recording and data archiving.

- Ex versions of the instrument are rated for Ex Gas zone 2 and Dust zones 20 and 21 (up to 400°C) as well as Gas/Dust zones 2 and 22 (up to 800°C).
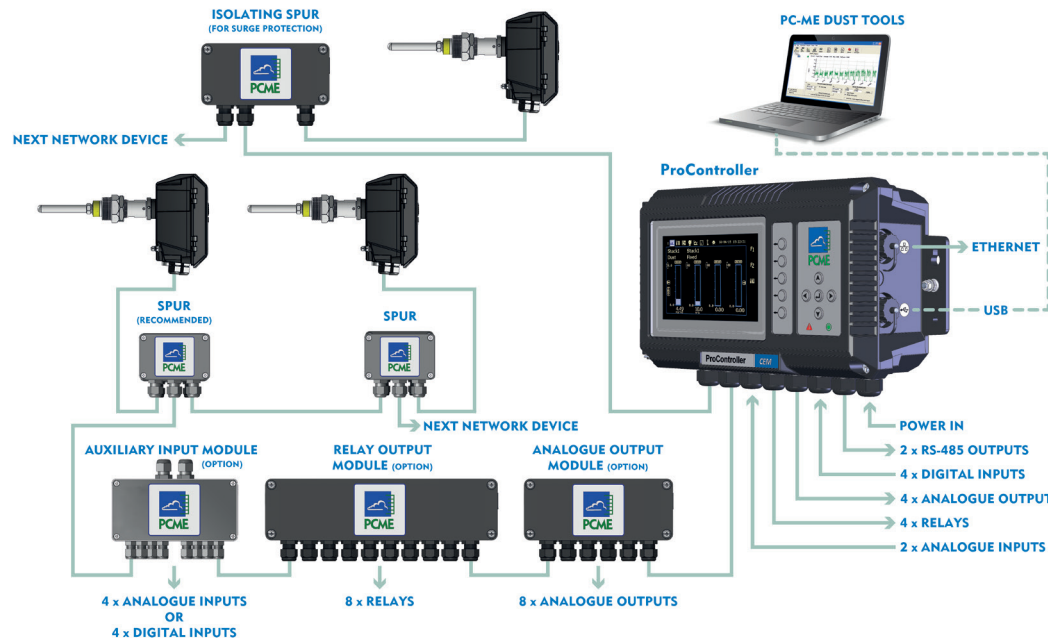
PROCESS AND APPLICATION CONDITIONS

- Stack temperature ranges: up to 250°C, options up to 400°C and 800°C

- Long-term zero drift: <0.1 mg/m³

- Measurement capability: 0–500 mg/m³

- For dry and humid applications with up to 95% RH, non-condensing.

- Not suitable for electrostatic precipitators (ESPs) or applications with water droplets.

- Stack diameter: Ø100 mm to 6 m (flow-profile dependent for large stacks).

PRINCIPLE OF OPERATION

The instrument uses PCME's unique and patented *ElectroDynamic*® Probe Electrification technology. The sensor electronics measure the current signal created by particles interacting with the grounded sensing rod, which protrudes into the stack.

A specific frequency band of this signal is extracted and the DC current caused by particle collisions is filtered out. This signal may be correlated to dust concentration by comparison to the results of an isokinetic sample.

Core features of the *ElectroDynamic*® Probe Electrification technology are that the generated signal is:

- Unaffected by contamination on the sensor rod (which can cause signal drift issues for other systems).

- Not affected by variations within typical bagfilter velocity ranges.

- Reliable and stable – technology used in the first ever probe-electrification instrument to become TUV and MCERTS approved against the exacting standards of EN 15267-3 for QAL1.
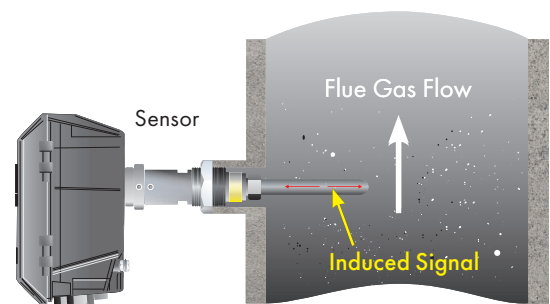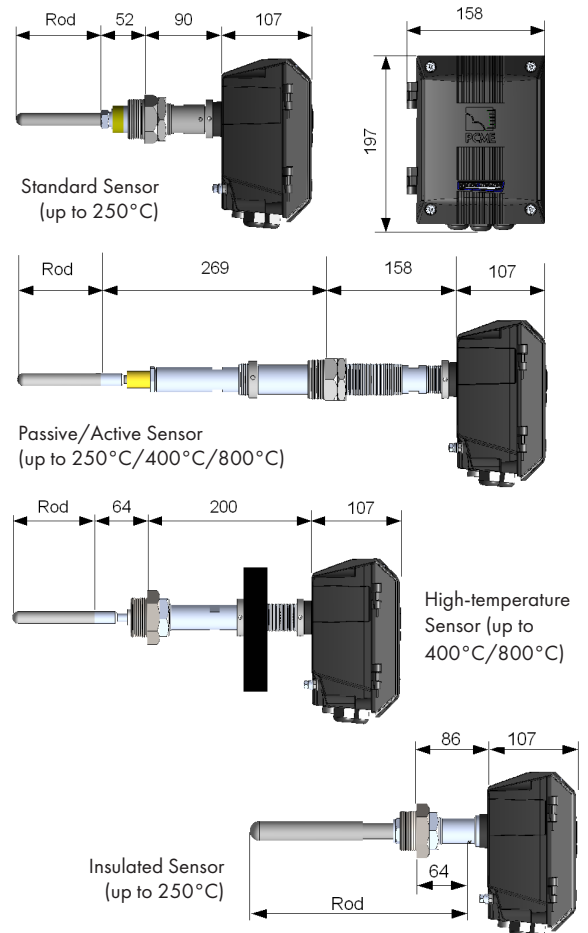
ADDED VALUE FEATURES

CONTROL UNIT

The **PRO** version of the **PCME STACK 990** is powered by PCME's ProController, which provides central communications for analysing emissions data and trends and complicance reporting, as well as data recording for plant networks with multiple sensors (and up to 32 channels) and links the sensors into data acquisition systems (DAHS/DCS). A number of interfaces (including Ethernet and USB 2.0) are available for simultaneous communications to data reporting systems and for temporary service connections. The **Standard** version of the **PCME STACK 990** is for simple, single-sensor systems and is powered by the Standard Controller.
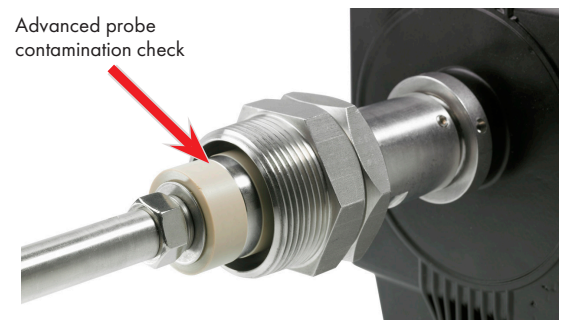
SENSOR

PERFORMANCE SPECIFICATIONS	
Performance Certification	TUV BImSchV 17 and 13
Hazardous Zones Certification (ATEX/IECEx)	Zone 2 (Gas), Zones 20/21 (Dust) up to 400°C Zones 2 and 22 (Gas/Dust) up to 800°C
Certification Range	0 – 15 mg/m³
Measurement Capability	0 – 500 mg/m³
Long-term Zero Drift	<0.1 mg/m³
Velocity Range	>6 m/s
Stack Temperature Ranges	-20°C to 250°C, option: up to 400°C and 800°C
ELECTRICAL SPECIFICATIONS	
Power Supply Voltage	18 – 24V DC (from the control unit)
Cable entries	3x M20 glands
MECHANICAL SPECIFICATIONS	
Enclosure Protection Rating	IP65 (IP66, Ex-rated sensors only)
Enclosure Material	Die-cast aluminium
Standard Process Connections and Sensor Body Material	316 Stainless steel (insulated versions: PTFE coated)
Weight	1.8 kg (standard sensor)
Probe rod lengths	100 – 1000 mm (insulated versions: 200 – 1000 mm)
Stack Connection Options	1.5" BSP 3" ANSI or DN80 PN10/16 combined flange (standard) 2" ANSI Flanged air purge adapter 2" ANSI Flanged Hastelloy® air purge adapter (≤250°C) 2" ANSI Flanged Hastelloy® air purge adapter (≤600°C)

Standard Sensor (up to 250°C)

Passive/Active Sensor (up to 250°C/400°C/800°C)

High-temperature Sensor (up to 400°C/800°C)

Insulated Sensor (up to 250°C)

The **PCME STACK 990** includes advanced automatic functionality checks to provide high quality assurance:

- A probe rod **short-circuit check** enables the operator to know when the sensing rod may be electrically shorted to the stack.

- A patented probe rod **contamination check** provides the operator with an advance warning check of a possible probe short-circuit, enabling predictive sensor maintenance scheduling, thus reducing down times and providing confidence in signal quality.

- Automatic electronic **drift checks** improve measurement reliability and ensure that the instrument is in compliance with regulatory standards. The self-checks ensure the major part of the instrument is challenged during these tests unlike Triboelectric dust monitors.

Advanced probe contamination check

RUGGEDISED SENSOR OPTIONS FOR CHALLENGING STACK APPLICATIONS	
Automatic sensor operation checks	Zero, Span, and Contamination self-checks provided as standard (see also the Sensor description above).
Local sensor outputs	Additional 4-20 mA and Alarm (relay) outputs (non-Ex versions only).
Insulated sensor	Insulated sensor rod for improved signal integrity in high-humidity and condensing applications (e.g. process spray driers).
Active/passive sensor	Eliminates false signals from condensation within the stack mount in high-humidity applications (e.g. boiler, incinerator and drier applications with flue gas containing high levels of water vapour above dew point).
Corrosion protection	Corrosion-resistant materials give extended life in combustion applications with high sulphur content.
High-temperature options	Reliable long-term performance in applications of up to 400°C/800°C (e.g. process reactors or coal gasification plant).
Ex-rated sensor options	Safety in ATEX and IECEx Hazardous Zone applications (certified for Gas zone 2 and Dust zones 20 and 21 up to 400°C, and Gas/Dust zones 2 and 22 for up to 800°C).
Air purge option	Recommended for conductive dust and high-dust applications to yield extended maintenance intervals.

For wet stack applications, see the **PCME QAL 182 WS** datasheet. For Ex Gas zones (Cat. 1, 2, 3), see also the intrinsically safe **PCME VIEW Ex 800/820** instruments.

TECHNICAL SPECIFICATIONS

PCME NETWORK CONTROLLERS		STANDARD CONTROLLER	PROCONTROLLER
Overview	Number of sensors/channels	1	1–32
	Display	Two-tone grey, backlit graphical LCD	High-contrast, anti-glare 7" (viewable) TFT LCD
	Multiple Data Viewing	PC or RS-485	PC/RS-485/Ethernet simultaneously
	Dimensions	W220 x H124 x D80 mm	W390 x H221 x D118 mm
	Power supply voltage	100–240V AC (50/60 Hz)	85–265V AC (50/60 Hz)
	Protection Rating	IP65	IP66
	Ambient Temperature Range	-20°C to 50°C	-20°C to 50°C
Features and Functions	Navigation keys	UP/DOWN/LEFT/RIGHT/ENTER	UP/DOWN/LEFT/RIGHT/ENTER plus 5 function keys: 3x short-cut keys and 2 user-programmable keys
	Icon-driven, multilingual menus	n/a	✓
	Secure password protection	✓	✓
	Sensor system setup and configuration options	✓	✓
	Configurable emission alarm levels	✓	✓
	Sensor calibration screens	✓	✓
	Seamless integration with existing PCME control units and sensors	n/a	✓
Data Logging*	Long-term Log	12 months @ 15 minutes	48 months @ 15 minutes
	Short-term Log	7 days @1 minute	28 days @ 1 minute
	Pulse Log	8 hours @ 1 seconds	32 hours @ 1 second
	Alarm Log	500 entries	500 entries
System Outputs	Ethernet (RJ45)	n/a	✓ Connection type: 100Base-T/Tx 100 Mb/s
	USB 2.0	n/a	✓ Suitable for connecting to a local PC or laptop
	Relays	2 off (programmable)	4 off (programmable)
	4–20mA	1 off (programmable)	4 off (programmable)
	RS-485	1	1
System Inputs	Digital User selectable for: PLANT OFF indication, Bag-filter cleaning sequences, multiple calibrations	1	4
	4–20mA	0	2

*Data logging capacity for one sensor. Data stored varies per sensor type. Please consult PCME for specific data.

PCME NETWORK ACCESSORIES		STANDARD CONTROLLER	PROCONTROLLER
Network Modules (can be connected to Controller Network systems to provide additional Inputs and Outputs)	**Analogue Output Module (AOM)** provides 8 additional 4–20 mA outputs definable to sensors/channels	1	1–8
	Auxiliary Input Module (AIM) provides 4 additional digital inputs, plus 4 additional relay outputs	1	1–8
	Relay Output Module (ROM) provides 8 additional relay outputs	1	1–8
	SPUR provides sensor network connection and local isolation during maintenance	1	1–32
	Power Supply Repeater (PSR) provides voltage and signal boost for extended cable runs and large sensor networks	1	1–8

ABOUT PCME LTD

As a progressive environmental Company, PCME specialises in particulate and flow 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 and sales engineers is always on hand for consultation regarding the selection and usage of the most suitable equipment for any particulate monitoring application.

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