Passionate about Particulate

PCME

PCME STACK 602

DYNAMICOPACITY™ INSIDE

Particulate Measurement System

TUV Approved
Particulate CEM

TÜV

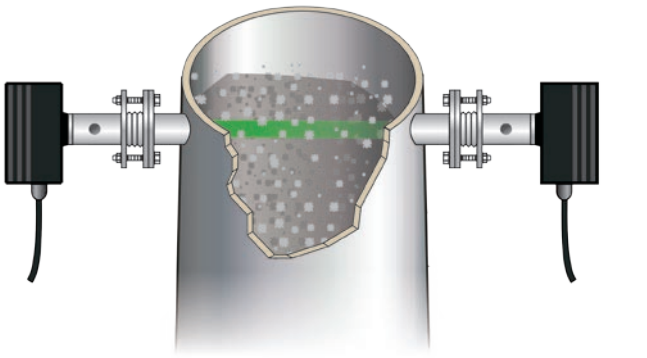
- Extensively used for compliance measurement (mg/m^3) in the Power, Steel and Cement industries
- Advanced sensor design includes zero, span and unique contamination checks
- *DynamicOpacity*™ Ratiometric Opacity technology with both dust concentration (mg/m^3) and Opacity outputs
- Rugged operation with dust concentration measurement unaffected by lens contamination of 90%

THE QUEEN'S AWARDS FOR ENTERPRISE: INNOVATION 2007

nqa. ISO 9001 Registered UKAS QUALITY MANAGEMENT 015

Certificate No: 9389

Instrument Overview



The **PCME STACK 602** is a modbus based cross-stack optical measuring system which uses a dynamic sensing technique to measure the rate of change of light (*DynamicOpacity*™ Ratiometric Opacity technology) as particulates pass through a modulated light beam. This proven optical technique, coupled with advanced design features, offers significant reliability and resolution advantages over traditional Opacity monitors and virtually overcomes lens fouling associated with standard Opacity monitors.

The **PCME STACK 602** is tested by TUV. Tests show identical quality of the **PCME STACK 602** and the SC600T (with TUV/QAL 1 and MCERTS type approvals).

Principles of Operation

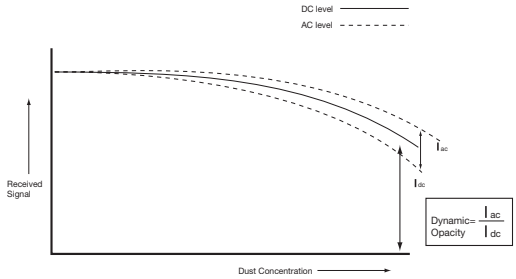
The **PCME STACK 602** measures the effect of particles on a light beam transmitted across the stack. The instrument measures the ratio of the temporal variation in intensity, unlike traditional Opacity instruments in which the beam intensity is simply measured. This intensity variation derives from the statistical variations in the distribution of particles in the air-stream. The higher the concentration of particles, the greater the range of variation. A linear relationship between instrument ouput and dust concentration has been demonstrated in 3rd party independent approvals such as TUV. This permits the instrument to be calibrated in mg/m^3 by comparison to the Standard Reference Method of Iso-kinetic Sampling (ISO 9096) for specific applications (eg fixed load Power Plant and electrostatic Precipitator applications).

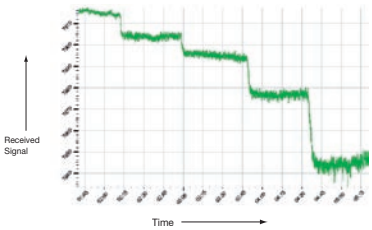
The **PCME STACK 602** is primarily used for applications with Electrostatic Precipitator boilers, calciners and large diameter emission stacks, where dust levels are typically above 10 mg/m^3*. Much higher dust levels can be monitored up to 1,000 mg/m^3* with the same instrument which is TUV approved for combustion type applications+.

The **PCME STACK 602** can also measure Opacity (and extinction) directly and this output is available for processes which are still regulated and controlled in terms of Opacity (Colour impact) rather than dust concentration in mg/m^3.

*Application dependant
+TUV certified against process parameters. Details on request.

Dynamic Opacity Curves





Increasing dust concentration influences Opacity and DynamicOpacity™ Ratiometric Opacity technology

Extended Maintenance Interval

DynamicOpacity™ Ratiometric Opacity technology instruments are often used to replace Opacity instruments which require extensive maintenance and servicing time. In 'dust mode' the **PCME STACK 602** uses a ratiometric measurement method with the significant advantage that this ratio is unaffected by lens contamination. This allows the instrument to operate while the lens contaminination has exceeded 90%. Air purges should be connected to the transmitter and receiver heads to provide a positive displacement of air away from the lens surfaces, however, since air usage is in the order of 30-60 litres/min it is economical to use plant instrument air rather than install specific air blower systems.

The transmitter and receiver heads are designed so that the lens can be accessed and cleaned without the need for disconnecting flanges from the stack ensuring correct alignment even after maintenance intervals.

Lens Condition	Light Intensity	Variation	Scintillation
100% transmission	I	x	x/I
90% transmission	0.9I	0.9x	0.9x/0.9I = x
50% transmission	0.5I	0.5x	0.5x/0.5I = x/I

Automatic Zero and Span Checks

The instrument has automatic zero and span checks which monitor for instrument integrity. These checks simulate the operation of the instrument and permit any internal instrument problems to be self-detected. Span checks for the CEM are implemented automatically and are performed by varying the light intensity in the transmitter head. The zero check involves measuring the variation with no transmitter light present. These checks are carried out automatically over a period of 3 hours.

product features

Monitoring Range

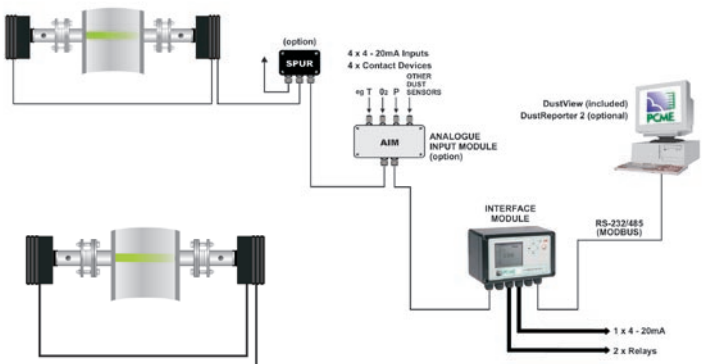
Operational Range	<10 to 1000 mg/m³*
Stack Temperature (option)	up to 400°C, up to 600°C

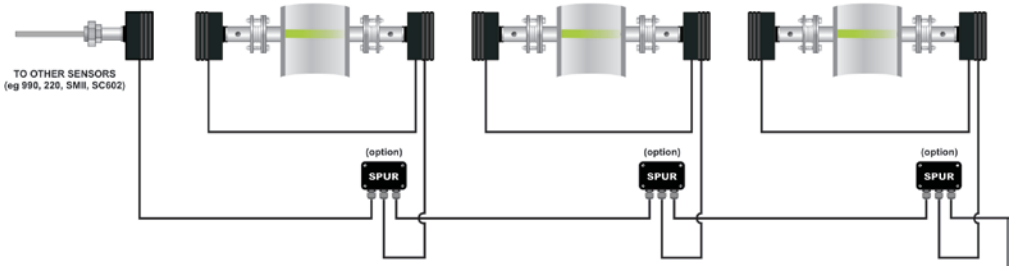
*Application dependant

Stack Sizes	1 to 15 metres
Output Range	User defined over full range

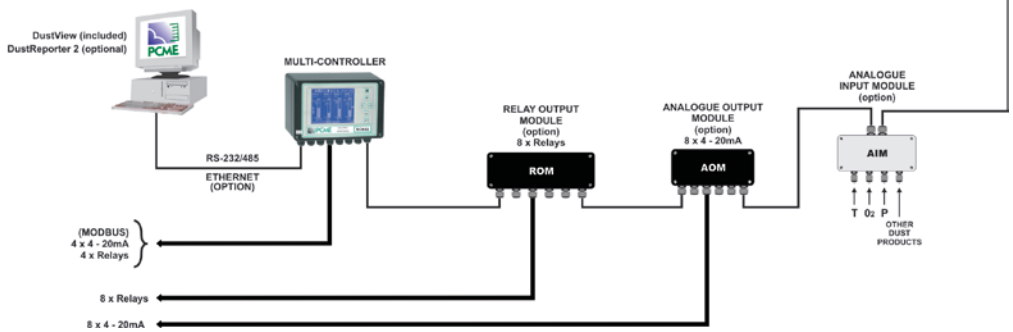
Instrument Specifications

Response Time	2 seconds
Self Checks	Automatic zero, span and light checks
Light Source	Modulated LED (green spectrum)





Single Stack Configuration
(PCME STACK 602)

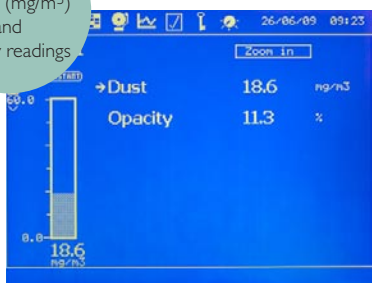


Multi Stack Configuration
(PCME STACK 602 *PLUS*)

Control Unit Options

Long term log used for emissions reporting

Combined display of dust (mg/m³) and opacity readings



ETHERNET CAPABILITY

	Standard System	*PLUS* System
Controller Type	Interface module	MultiController
No of Channels	1	1-16
ICON Driven Multilingual Menus	Emission and Alarm levels Quality Assurance results Calibration screens Review data logs Show graph and bar chart Set up and password Advanced calculations (Mass, normalisation)	Emission and Alarm levels Quality Assurance results Calibration screens Review data logs Show graphs and multi bar charts Set up and password Advanced calculations (Mass, normalisation)
Bagfilter Optimisation Diagnostics	Pulse log review for diagnosing location of leaking bags	Pulse log review for diagnosing location of leaking bags
Emission Data Logs Long (averages for reporting) Short (process trends) Pulse data Alarms	**Capacity stated for 1 sensor** 2 months @ 15 minutes 7 days @ 1 minute 2 hours @ 1 second 500 entries	**Capacity stated for 4 sensors** 2 months @ 15 minutes 7 days @ 1 minute 2 hour @ 1 second 500 entries
Ethernet Enabled Option	None	Ethernet (Modbus TCP) (optional)
Outputs	1 x RS-485 (Modbus RTU) 1 x 4-20mA (500 ohm) 2 x Relay (2A@250V, user selectable)	1 x RS-485 (Modbus RTU) 4 x 4-20mA (500 ohm) 4 x Relay (2A @250V, user selectable)
Inputs	1 input for plant off indication, bag cleaning reference and multiple calibrations	4 inputs for plant off indication, bag cleaning reference and multiple calibrations
Enclosure Size (mm)	220 W x 123 H x 80 D	263 W x 160 H x 91 D
Power Supply	90 to 260 VAC (50/60Hz), 1A	90 to 260 VAC (50/60Hz), 1A

Note: Additional 4-20 mA and Relay output also available from optional accessory components.

specifications

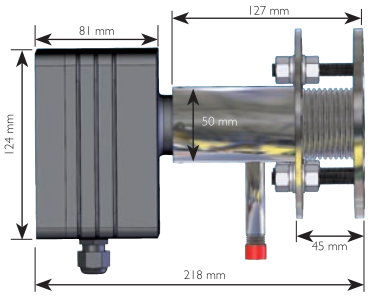
Sensors and Cables

Enclosing Rating	IP65
Cable Type	4 core screened
Cable Length	10 metres standard: 1000 metres max
Sensor Head Material	Die-cast aluminium (epoxy coated) and 316 stainless steel
Coupling Material	Stainless steel
Flange Size	1 ½" ANSI hole pattern

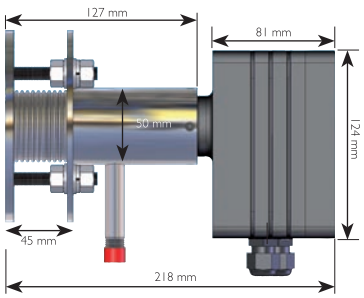
Air Purge: Airline Connection Air Consumption	 ¼" BSP 30-60 litres/min
Sensor Types	-25° to 400°C - optional -25° to 600°C - optional
Transmitter & Receiver Head Weight	1.5kg each

Physical Dimensions

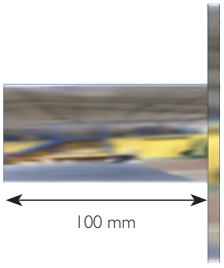
Transmitter



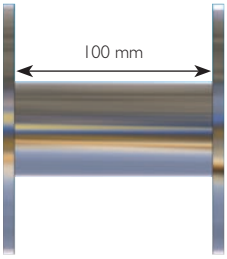
Receiver



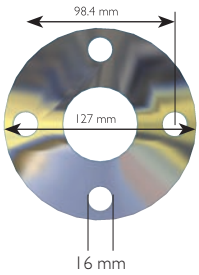
Optional Stack Mounting Stub



Optional High Temperature Stand-off



Flange



Optional Components

Component	Purpose	Specification	Size (mm)
Cables	Power (+24v DC) and communication (RS-485): Cable 1: from control unit to receiver (4-core) Cable 2: from receiver to transmitter (8-core)	4 conductor overall screened cable, diameter <0.8mm (Each conductor <0.5 mm² <50 ohm/km, and suitable for RS-485) Eg. Batt cables 85364	2 x 10m (included). Extendable to > 1000m *
SPUR	Divides cable into 2 branches	3 cable connections	100 w x 66 h x 46 d
PSU/Repeater	Voltage and signal boost for extended cabling runs with multiple sensors	90-260 VAC input (50/60 Hz) 24 V DC output	222 w x 125 h x 81 d
Analogue Input Module (AIM)	Input data from external devices (eg for temperature and 02)	4 x 4-20mA inputs 4 x digital inputs (contact closures)	160 w x 80 h x 65 d
Analogue Output Module (AOM)	Additional 4-20mA	8 x 4-20mA (500 ohms)	175 w x 80 h x 60 d
Relay Output Module (ROM)	Additional Relays	8 x Relay (1 Amp @ 250V)	250 w x 60 h x 80 d
220 Sensor	Broken bag detector (alarm only)	Temperature up to 125°C (250°C option)	½" (or 1 ½" BSP) stack connection
990 Sensor	TUV approved dust monitor for bagfilter	Option to 800°C	1 ½" BSP stack connection
DustReporter2	PC Reporting software	Windows 95, 98, NT, XP	

* Can be extended further by use of additional PSU

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 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.

www.pcme.co.uk

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