DASTEC
30 años de soluciones para la industria

envea

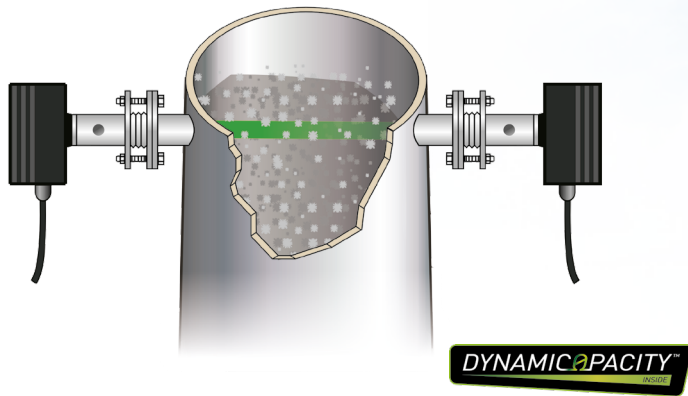# Particulate Measurement System

PROCESS & EMISSIONS MONITORING SYSTEMS

DYNAMICOPACITY™
INSIDE

SPECIFIC FEATURES:

- Extensively used for compliance measurement (mg/m³) 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/m³) and Opacity outputs

- Rugged operation with dust concentration measurement unaffected by lens contamination of 90%

THE QUEEN'S AWARDS
FOR ENTERPRISE:
2017

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.

PRINCIPLE 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 simply the beam intensity is 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.

There is a linear relationship between instrument output and dust. This permits the instrument to be calibrated in mg/m³ by comparison to the Standard Reference Method of isokinetic sampling (e.g. ISO 9096) for specific applications, such as fixed-load Power Plant and Electrostatic Precipitators (ESPs).

The PCME STACK 602 is primarily used for applications* with ESP boilers, Calciners and large-diameter emission stacks, where dust levels are typically above 10 mg/m³. Much higher dust levels, up to 1,000 mg/m³, can be monitored with the same instrument.

The PCME STACK 602 can also measure Opacity (and extinction) directly, and this output is then available for processes which are still regulated and controlled in terms of Opacity (colour impact) rather than dust concentration in mg/m³.
* application dependent

Dynamic Opacity Curves
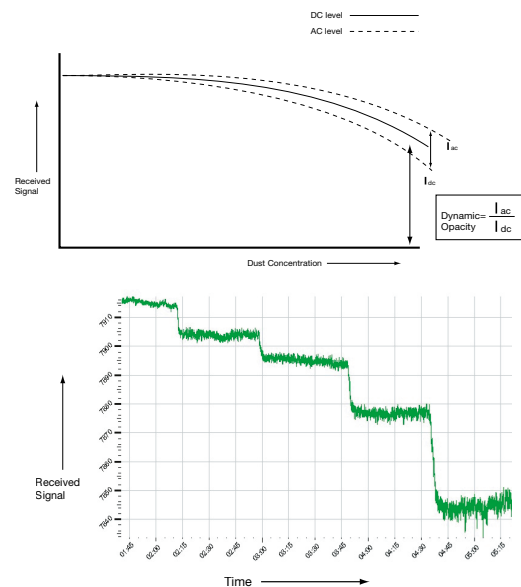
Increasing dust concentration influences Opacity and *DynamicOpacity*® Ratiometric Opacity technology

PRINCIPLE OF OPERATION

DynamicOpacity® Ratiometric Opacity technology instruments are often used to replace Opacity instruments which require extensive mainten-ance 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 contamination 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 l/min, it is economical to use plant instrument air.

The Transmitter and Receiver heads are designed so that the lens can be accessed and cleaned without the need for disconnecting the 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

PRODUCT FEATURES

QUALITY ASSURANCE -SENSOR SELF-CHECKS

The instrument has automatic zero and span checks which monitor for instrument integrity. The sensor self-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 and run consecutively over a period of 3 hours.
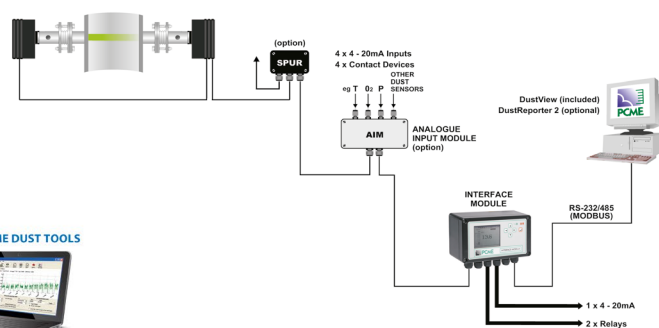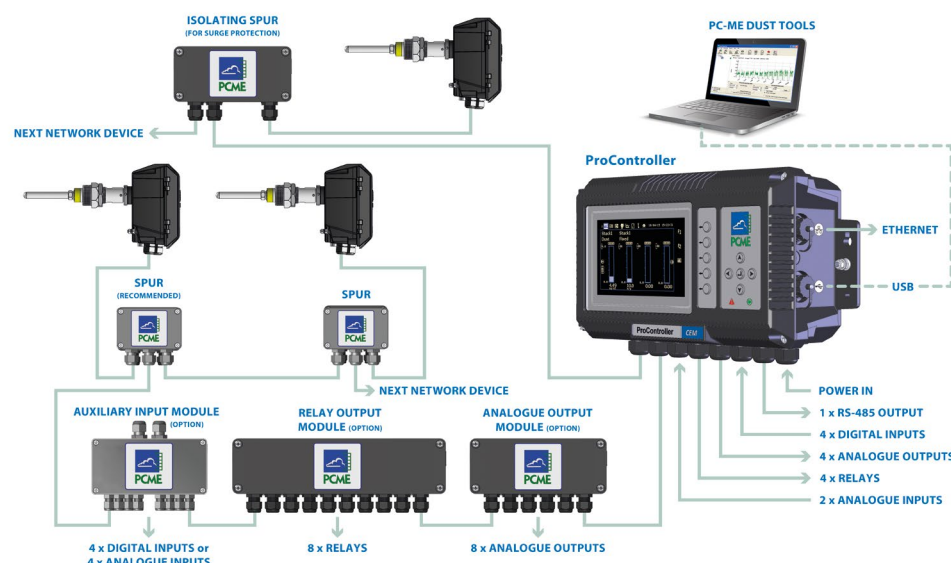
MONITORING RANGE

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

Stack Sizes	1 – 15 m
Output Range	User-defined over full range

*application dependent

SYSTEM CONFIGURATIONS

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

Single-Stack Configuration
(PCME Stack 602 Standard)

Multi-Stack Configuration*
(PCME Stack 602 PRO)

*typical network layout

SENSOR SPECIFICATION AND OPTIONS

Sensor Variants	-20°C to 250°C option: up to 600°C
Sensor Head Weight	1.5 kg each (Transmitter/Receiver)
Enclosure Dimensions	W 147 x H 192 x D 106 mm
Protection Rating	IP65
Enclosure Material	Die-cast aluminium (epoxy coated)
Sensor Body Material	316 Stainless steel
Power Supply Voltage	24V DC (via control unit or network spur)
Local Output	RS-485 connection (to control unit)
Flanges	1½ in. 150 lb ANSI or DN40 PN6
Cable Type	4-core, screened; 10 m supplied as standard, max. length 1,000 m
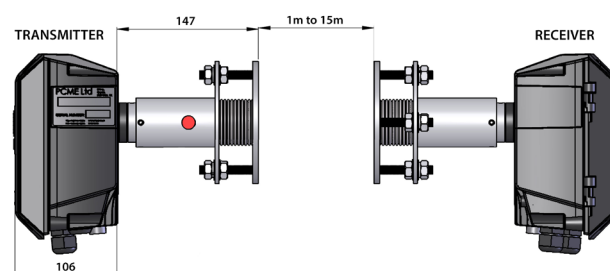
Air Purge Requirements	Application dependent. Requires an external supply of 30–60 litres/minute of dry, clean (instrument) air.
Air Purge Fitting	¼ in. BSP
Purge Air Options	Small Purge Blower or Air Filter Regulator

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 ENVEA for specific data.

PCME Network Accessories		STANDARD CONTROLLER	PROCONTROLLER
Network Accessories *(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 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.

ENVEA UK
Clearview Building 60 Edison Road
St. Ives / Cambs - UK PE27 3GH
☎ +44(0) 1480 468200
✉ contact.gb@envea.global

Part of the ENVEA Group

DASTEC
Representantes / Distribuidores Exclusivos

🏳 Argentina
Tel: (+54 11) 5352 2500
Email: info@dastecsrl.com.ar
Web: www.dastecsrl.com.ar

🏳 Uruguay www.dastecsrl.com.uy

🏳 Paraguay www.dastecsrl.com.py