PCME QAL 360

Backscatter Particulate Emission Monitor

PROCESS & EMISSIONS MONITORING SYSTEMS

PROSCATTER™ INSIDE

patent pending

SPECIFIC FEATURES:

- *ProScatter®* Backscatter sensor technology with superior minimum detection <1 mg/m³
- Certified to 7.5 mg/m³ for processes with low typical emission limits
- Manual and remote Zero and Span (reference) checks available to ensure optimal instrument performance and compliance with EN 15267 to meet the QAL1 requirements of EN 14181
- Automatic Contamination Check – fully interrogates the optical system
- Purge Flow Fail Sensor option with inbuilt automatic optical shield activation

COMPLIANCE WITH:

EN 15267 and EN 14181

THE QUEEN'S AWARDS FOR ENTERPRISE: 2017

MCERTS Sira MC090152

EN 15267-3 certified

www.envea.global

TECHNOLOGY / APPLICATION

SYSTEM DESCRIPTION

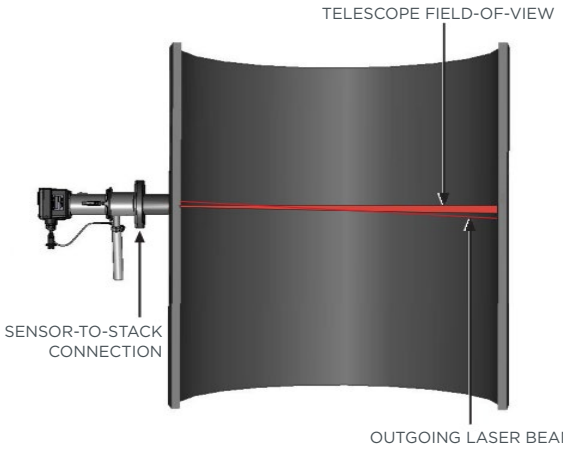
The PCME QAL 360 sensor series is suitable for measuring dust concentrations in Incineration, Combustion and other industrial stacks and is compliant with EN 15267 meeting the QAL1 requirements of EN 14181. Having a 0–7.5 mg/m³ certification range, the PCME QAL 360 can be used at low or high dust levels, meeting the tightened minimum emission limit value of 5 mg/m³ for Large Combustion Plant specified in the Industrial Emissions Directive. Due to dynamic ranging the sensor is also suitable for much higher dust levels found in Power, Cement and Metals smelting processes.

Conveniently mounted on one side of the stack, with no secondary light absorber or beam dump requirement, the PCME QAL 360 sensor series is non-intrusive and has no measurement components protruding into the stack, so process gases are not disturbed.

As critical optical components remain outside the stack, the risk of contamination is reduced. Contamination reduction is managed by an optical shield, which is automatically activated when the Purge air flow greatly reduces or fails. In addition, a Flue gas blocker is fitted to ensure flue gases do not escape when the unit is opened for auditing or maintenance purposes.

The PCME QAL 360 is ideal for medium to larger stacks that require high accuracy, low maintenance, flexible system configuration and compliance with International Standards. As an alternative to opacity monitors, the PCME QAL 360 offers a more reliable PM dust measurement as it is calibrated as a PM monitor (and not as a smoke or opacity monitor), where emissions are to be reported in mg/m³ and early indication of increased dust emissions is required at lower dust concentrations.

PRINCIPLE OF OPERATION



The PCME QAL 360 is based on ENVEA UK's class-leading *ProScatter*® Backscatter technology. Particles in the stack are illuminated by a laser and the amount of laser light scattered back from the particles is measured by a detector. Stray scattering and ambient light are eliminated by tuning the instrument's field-of-view and by use of a modulated laser source.

The instrument response is proportional to dust concentration. It is calibrated to provide a mg/m³ measurement by comparison to results of a standard reference (isokinetic) test.

The PCME QAL 360 sensor is able to measure dust levels of less than 1 mg/m³, and so can be used in applications where emissions are well below the sensitivity limit of traditional opacity instruments.

TYPICAL USE AND APPLICATIONS

The PCME QAL 360 is well-suited for use in medium to larger stacks and is suitable for low to high dust concentration measurements, regardless of dust velocity or charge. It is a reliable alternative to Opacity in Power and combustion applications, where emissions are to be reported in mg/m³ and early indication of increases in dust emissions is required.

COMPLIANCE AND QUALITY ASSURANCE

To comply with EN 14181, the PCME QAL 360 is supported with optional manual reference materials (audit unit or filters) for convenient linearity and functionality tests that are required at the time of the QAL 2 and Annual Surveillance Test (AST) or drift and calibration Relative Accuracy Test Audit (RATA) tests.

The automatic contamination check system (patent pending) ensures that any optical variances are measured, defined and adjusted to ensure zero and span drift is kept to a minimum.

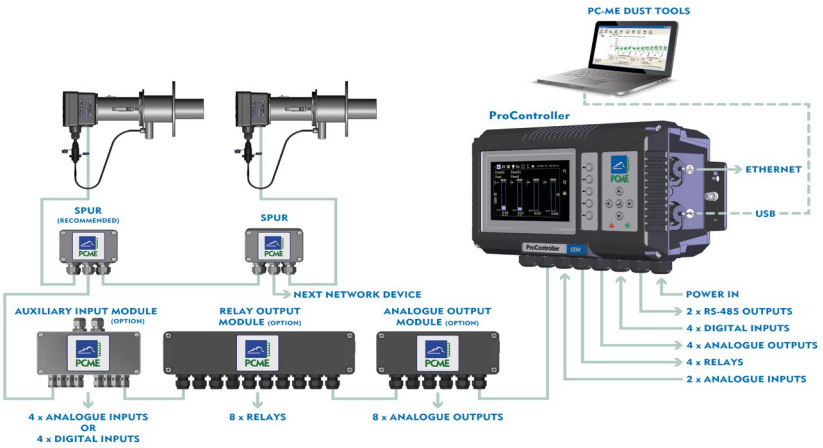
PCME QAL 360 shown with a multi-value Manual Audit Unit and attenuator

PRODUCT FEATURES

STANDALONE SENSOR OR MULTI-SENSOR SYSTEM OPTIONS

The sensor is available as a standalone version, the compact PCME QAL 360c, or the PCME QAL 360s, which is combined with a control unit to provide either a standard, single-channel system or a multi-channel PRO system for an extensible network (for up to 32 sensors).

Using a Multiple-Sensor System based on a ProController allows other sensors from the PCME range to be added (including Gas Flow, Temperature and Pressure sensors) for Mass Emissions Monitoring, Bagfilter Management (using ENVEA's Baghouse Performance sensors) or as part of a CEM system, including gas analysers.



PCME QAL 360s sensors used in a network system

CONTROL UNITS

The PCME QAL 360s PRO system is powered by the ProController, which provides central communications for analysing emissions data and trends, compliance reporting as well as data recording for plant networks with multiple sensors (up to 32) and links the sensors into data acquisition systems (DAHS/DCS).

Alternatively, the PCME QAL 360s Standard system is for simple, single-sensor systems and is powered by the Standard Controller.

ProController

Standard Controller

PCME QAL 360s	ProController	Standard Controller
Performance Specifications		
Number of Sensors/Channels	1–32	1
Display	High-contrast, anti-glare 7" (viewable) TFT LCD	Two-tone grey, backlit grapical LCD
Screen Resolution	800 x 480 pixels, WVGA	320 x 240 pixels
Network Modules	Suitable for use with all PCME network modules	n/a
Electrical Specifications		
Power Supply Voltage	85–265 V AC (50/60 Hz)	100–240 V AC (50/60 Hz)
Standard I/O*	1x RS-485 (Modbus RTU), 1x RS-232 4x Relay outputs (3A @ 250 V AC/24V DC, configurable) 4x 4-20mA outputs (500 Ω) 4x Digital inputs (voltage free) 2x 4-20 mA inputs	1x RS-485 (Modbus RTU), 1x RS-232 2x Relay outputs (2A @ 250 V, configurable) 1x 4-20 mA output (isolated, 500 Ω) 2x Digital inputs (for Plant OFF indication)
Advanced I/O	Ethernet (100 Mb/s) USB 2.0 (type A)	none
Network Modules (optional)	**Auxiliary Input Module (AIM)**: 4x 4-20 mA (500 Ω) inputs or 4x Digital inputs **Analog Output Module (AOM):** 8x 4-20 mA outputs (500 Ω) **Relay Output Module (ROM)**: 8x Relays (1A @ 250 V)	n/a
Operating Specifications		
Protection Rating	IP66	IP65
Ambient Temperature	-20°C to 50°C	-20°C to 50°C
Mechanical Specifications		
Weight	5.7 kg	1.6 kg
Enclosure Dimensions	W 390 x H 221 x D 118 mm	W 220 x H 124 x D 80 mm

** in addition to the sensor outputs*

SPECIFICATIONS

PROCESS/APPLICATION CONDITIONS

Application Suitability	Suitable for measurement in non-condensing flue gases
Location Suitability	This equipment is for outdoor or sheltered use; safe for use in an ambient temperature of -20 to 50°C (-4°F to 122°F)
Flue Gas Temperature (at monitoring point)	-20°C to 250°C (-4°F to 482°F) option: up to 400°C (752°F)
Stack Pressure	±20 mbarg
Stack Diameter*	1–15 m (3.3–50 ft.) **application specific*
Flue Gas Composition	Non-condensing
Hazardous Zone Classification**	Zone 2 ***available shortly*
Stack Connections	• 3" 150 lb ANSI flange • DN80 PN10 / PN16 flanges • JIS 100-5k, -10k flanges

MEASUREMENT INFORMATION

Measurement Type	Light scattering
Resolution	0.01 mg
Response Time	2 seconds
Certification Range	0–7.5 mg/m³
Dust Levels	<1 to 500 mg/m³

PURGE OPTIONS

		QAL 360c	QAL 360s
Blower (medium)	Purge Blower	option	option

Warning!
Class 3R laser product: AVOID EYE EXPOSURE!

SENSOR OPTIONS

Sensor Variants	PCME QAL 360c – compact standalone PCME QAL 360s – with a Standard Controller or a ProController
Sensor Material	316 Stainless Steel
Sensor Dimensions	L 454 x H 217 x D 204 mm, incl. flange (18 x 8.5 x 8 in.)
Zero/Span Sensor Checks	Automatic, also manual and remote initiation of inbuilt check mechanism
Protection Rating	IP65
Power Supply Voltage	100–240V AC or 24V DC (via control unit or from local source)
I/O	1x RS-485 Modbus, 2x Relay outputs 1x 4-20 mA output, 1x Digital input
Manual Audit Capability	Single, compact unit or manual unit with 5 attenuators
Air Purge Flow Sensor	Option, standard for high-temperature sensors
Filter Display Module (FDM)	Remote graphical display unit (option)

NETWORK MODULES (available only with the PCME QAL 360s)

		PCME QAL 360s Standard or PRO network systems
AOM	Analogue Output Module: 8x 4-20 mA	Option
ROM	Relay Output Module: 8x Relays	Option
AIM	Auxiliary Input Module: 4x 4-20 mA or 4x digital inputs	Option
Network Spur	For 'spur-linked' sensor networks	Option
Interconnecting Cable	From sensor to control unit	10 m supplied as standard, max. length 500 m

PC-ME DUST TOOLS SOFTWARE

PC-ME DUST TOOLS is a powerful and customisable software suite for downloading, displaying, analysing and reporting data from the control units and sensors to PCs, enabling ease of access to emissions data from plant-wide sources.	
PCME QAL 360c	
Device Set	Configuration of settings in standalone sensor devices with integrated user setup and display
Online	Access to real-time data from both control units and standalone integrated sensor systems
Predict	Analysis tool for the location of failing and faulty bag-filter media before gross filter failure occurs
PCME QAL 360s	
Predict View	Full Predict module functionality for real-time and historical logged data
System Set	Full configuration of advanced systems and convenient access to control unit settings for multi-channel networked systems
Data Downloader	Automatic data transfer at configurable, timed intervals
Auto Download	Automated downloading between control units and PCs
Data Viewer	Instantaneous and long-term trend analysis of emissions data

Note: for detailed information relating to product options and ordering, please consult the Specification Guide, 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.

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Publication Part No. 496020 V4 (1/19)

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