

PRODUCT CONFORMITY CERTIFICATE

This is to certify that the

PCME QAL 991 Particulate Monitor and Sensor

Manufactured by:

PCME Limited

Clearview Building
Edison Road
St Ives
Cambridgeshire
PE27 3GH
UK

Has been assessed by Sira Certification Service
And for the conditions stated on this certificate complies with:

**MCERTS Performance Standards for Continuous Emission
Monitoring Systems, Version 3.4 dated July 2012
EN15267-1:2009, EN15267-2:2009, EN15267-3:2007,
& QAL 1 as defined in EN 14181: 2004**

Certification Ranges :

Particulate Concentration 0-7.5 mg/m³
Particulate Concentration 0-15 mg/m³

Project No.: 674/0201 & 674/036
Certificate No: Sira MC050066/07
Initial Certification: 10 October 2005
This Certificate issued: 09 October 2015
Renewal Date: 09 October 2020

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Deputy Certification Manager

MCERTS is operated on behalf of the Environment Agency by

Sira Certification Service

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sira
CERTIFICATION

The MCERTS certificate consists of this document in its entirety.

For conditions of use, please consider all the information within.

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Approved Site Application

Any potential user should ensure, in consultation with the manufacturer, that the monitoring system is suitable for the intended application. For general guidance on monitoring techniques refer to the Environment Agency Monitoring Technical Guidance Notes available at www.mcerts.net

The manufacturer should be consulted if the instrument is to be mounted upstream of an electrostatic precipitator or after a wet collector. Particulate monitors may exhibit sensitivity to various in-stack effects. Potential interferences are site specific and may vary from stack to stack.

On the basis of the assessment and the ranges required for compliance with EU Directives this instrument is considered suitable for use on waste incineration and large coal-fired combustion plant applications. This CEM has been proven suitable for its measuring task (parameter and composition of the flue gas) by use of the QAL 1 procedure specified in EN14181, for LCPD and WID applications for the ranges specified. The lowest certified range for each determinand shall not be more than 1.5X the daily average emission limit value (ELV) for WID applications, and not more than 2.5X the ELV for LCPD and other types of application.

The field test took place in the flue gas of a natural gas fired spray tower for the production of ceramic floor coverings. The PCME QAL 991 measuring systems were installed for 6 months, in a vertical, round flue gas duct behind the baghouse filter and prior to an induced draught.

Basis of Certification

This certification is based on the following Test Report(s) and on Sira's assessment and ongoing surveillance of the product and the manufacturing process:

TÜV Rheinland report number 936/21206356/C dated 4th September 2008

TÜV Rheinland report number 936/21225714/A dated 30th July 2014

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Product Certified

The measuring system consists of the following parts:

- PCME QAL 991 sensor
- PCME QAL 991 Plus (sensor and multi-controller)
- PCME QAL 991 (sensor and interface module)
(Previously known as DT-991)

This certificate applies to all instruments with the serial number 23712 onwards. Software versions:

- Sensor Version 4.0 onwards
- Multi-controller Version 5.8 onwards

Certified Performance

The instrument was evaluated for use under the following conditions:

Ambient Temperature Range: -20°C to +50°C
Instrument IP rating: IP65

Note: If the instrument is supplied with an enclosure, then the ambient temperature shall be monitored inside the enclosure to ensure that it stays within the above ambient temperature range.

Minimum Stack Gas Velocity: This certificate is only valid for stack gas velocities >5.2m/s. In the case of flow velocities <8.8m/s, the measuring may only be operated at constant flow velocities.

Unless otherwise stated the evaluation was carried out on the certification range 0 to 7.5mg/m³ (0 to 50 units at wind-tunnel and 0-200 units at field test).

Test	Results expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Response time						
Dust					2 secs	<200s
Dust (0 to 15 mg/m ³)					2 secs	<200s
Repeatability standard deviation at zero point						
Dust	0.04					<2.0%
Repeatability standard deviation at reference point						
Dust	0.006					<2.0%
Lack-of-fit						
Dust		0.67				<2.0%
Dust (0 to 15 mg/m ³)			-1.8			<2.0%

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Test	Results expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Influence of ambient temperature zero point Dust	0.1					<5.0%
Influence of ambient temperature reference point Dust			1.3			<5.0%
Influence of voltage variations 190 to 250V Dust		0.8				<2.0%
Influence of vibration (10 to 60Hz ($\pm 0.3\text{mm}$), 60 to 150Hz at 19.6m/s^2)					No effect	To be reported
Measurement uncertainty Dust (For and ELV of 5.0 mg/m^3)					Guidance - at least 25% below max permissible uncertainty 9.5%	<22.5% (30%)
Calibration function (field) Dust					0.8835 to 0.9315	>0.90
Response time (field) Dust					2 secs	<200s
Lack of fit (field) Dust		0.5				<2.0%
Maintenance interval					3 months	>8 days
Zero and Span drift requirement	<p>The Span check is made up of two components: First an electronics span check in which a reference 'electrodynamic' signal is injected into the electronics and the resulting signal is measured. This checks for signal processing errors, electronic offsets and drift.</p> <p>Second, a probe contamination check is made to ensure that the signal measured by the electronics is the same as that created by the particles at the sensor rod. This probe contamination check involves measuring the integrity of the sensor rod insulation and the presence of any leakage current.</p> <p>The Zero check involves injecting an zero electrodynamic signal into the electronics by grounding the input. This checks for electronics drift and any electrical interference.</p> <p>The Zero and Span checks are implemented automatically within the instrument and the results are recorded in the control unit for statistical reporting to satisfy QAL3 requirements</p>				<p>Clause 6.13 & 10.13</p> <p>Manufacturer shall provide a description of the technique to determine and compensate for zero and span drift.</p>	

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Test	Results expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Change in zero point over maintenance interval Dust	0.4					<3.0%
Change in reference point over maintenance interval Dust	-0.4					<3.0%
Availability Dust					99.8%	>95%
Reproducibility Dust				2.9		<3.3%

Note 1: The calibration function/ R^2 values are between 0.88 and 0.93 due to relatively constant dust levels during the field test. The CEMS pass the EN14181 criteria, but not the requirement for EN15267-3 under these circumstances.

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Description

The PCME QAL 991 utilises Electrodynamic Probe electrification technology to continuously monitor emissions of Particulate Matter (PM) from stacks. It is particularly suited for monitoring processes and applications where emissions are abated by bagfilter type arrestment plant. In incinerator, cement and power plant it has specific relevance to continuous monitoring according to EN-14181, since it holds this QAL1 approval against EN 15627-3.

In compliance with EN-15627-3 the PCME QAL 991 has Zero and Span features which automate the QAL3 procedure and may be supplied with an optional reference material (Audit 991) to enable linearity tests to be performed.

The PCME QAL 991 sensor is a standalone AMS that provides Modbus RS-485 and optional 4-20mA outputs. In a PCME QAL 991 Plus configuration, sensors can be connected to a multi-controller (capable of providing user interface and data acquisition for up to thirty two sensors). In a PCME QAL 991 configuration sensors are connected to an interface module (for user interface and data acquisition of single sensor). The sensors and control units are connected by a 4 core cable that provides power and internal communications with the sensors.

The multi-controller and Interface module have graphic screen capability to diagnose filter performance and maintenance conditions and also records and averages data for emissions reporting. Inputs for temperature and oxygen normalisation can be made via an Analogue Input Module (AIM) unit and connections made to PC networks for emission reporting (Ethernet option). QAL Reporter Software is available for transferring stored data and producing reports suitable for EN-14181 compliance.

General Notes

1. This certificate is based upon the equipment tested. The Manufacturer is responsible for ensuring that on-going production complies with the standard(s) and performance criteria defined in this Certificate. The Manufacturer is required to maintain an approved quality management system controlling the manufacture of the certified product. Both the product and the quality management system shall be subject to regular surveillance according to 'Regulations Applicable to the Holders of Sira Certificates'. The design of the product certified is defined in the Sira Design Schedule for certificate No. Sira MC050066/07.
2. If certified product is found not to comply, Sira Certification Service should be notified immediately at the address shown on this certificate.
3. The Certification Marks that can be applied to the product or used in publicity material are defined in 'Regulations Applicable to the Holders of Sira Certificates'.
4. This document remains the property of Sira and shall be returned when requested by the company.

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