

PRODUCT CONFORMITY CERTIFICATE

This is to certify that the

QAL 360

Manufactured by:

PCME Ltd.

60 Edison Road
St Ives
Cambridgeshire
PE27 3GH

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 3.5 dated June 2016
EN15267-3:2007,
& QAL 1 as defined in EN 14181: 2014**

Certification Ranges :

Dust	0 to 7.5 mg/m ³
	0 to 50 SLU
	0 to 100 SLU
	0 to 200 SLU
	0 to 10 SLU

Project No.:	70082460
Certificate No:	Sira MC160306/00
Initial Certification:	12 August 2016
This Certificate issued:	12 August 2016
Renewal Date:	13 August 2021

Emily Alexander
Deputy Certification Manager

MCERTS is operated on behalf of the Environment Agency by

Sira Certification Service

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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

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 IED Chapter III and IED Chapter IV 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 IED Chapter IV applications, and not more than 2.5X the ELV for IED Chapter III and other types of application.

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:

TUV Report 936/21230922/E dated 10th June 2016

Product Certified

The measuring system consists of the following parts:

- Sensor: QAL 360
- Controller: PCME Standard Controller (option)
PCME Plus Controller (option)
PCME ProController (option)
- Air blower

This certificate applies to all instruments fitted with software version 5.0 (serial number 52916 onwards), and controller software version 8.80 (Standard and Plus controllers) or 1.10 (ProController)

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Certified Performance

The instrument was evaluated for use under the following conditions:

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

Results are expressed as error % of certification range, unless otherwise stated.

Test	Results expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Response time						
0 to 7.5 mg/m ³					13 seconds	<200s
0 to 50 SLU					12 seconds	<200s
0 to 100 SLU					11 seconds	<200s
0 to 200 SLU					11 seconds	<200s
0 to 10 SLU					11 seconds	<200s
Repeatability standard deviation at zero point						
0 to 7.5 mg/m ³	0.1					<2.0%
Repeatability standard deviation at reference point						
0 to 7.5 mg/m ³	0.0					<5.0%
Lack-of-fit						
0 to 7.5 mg/m ³	0.33					<3.0%
0 to 50 SLU			1.40			<3.0%
0 to 100 SLU		1.00				<3.0%
0 to 200 SLU		0.90				<3.0%
0 to 10 SLU			-1.50			<3.0%
Influence of ambient temperature zero point (-20°C to +50°C)						
0 to 7.5 mg/m ³	0.3					<5.0%
Influence of ambient temperature reference point (-20°C to +50°C)						
0 to 7.5 mg/m ³			1.3			<5.0%

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Test	Results expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Influence of voltage variations at zero point 0 to 7.5 mg/m ³	-0.3					<2.0%
Influence of voltage variations at reference point 0 to 7.5 mg/m ³	0.1					<2.0%
Influence of vibration at zero point 0 to 7.5 mg/m ³	0.1					To be reported
Influence of vibration at reference point 0 to 7.5 mg/m ³		-1.0				To be reported
Measurement Uncertainty 0 to 7.5 mg/m ³					Guidance - at least 25% below max permissible uncertainty 5.8%	(30%) 22.5%
Calibration function (field) 0 to 7.5 mg/m ³					0.81	>0.90 Note 1
Response time (field) 0 to 7.5 mg/m ³					11 seconds	<200s
Lack of fit (field) 0 to 7.5 mg/m ³		0.67				<3.0%
Maintenance interval					4 weeks	>8 days
Zero and Span drift requirement	<p>In the QAL 360 instrument the zero measurement is done by rotating the span element in front of the laser to block it. The received signal is measured to record a background signal level.</p> <p>The span measurement is done by rotating the span element in place which disperses the laser light and it directs it back to the detector. The laser is then run at two different intensities and the response ratio monitored. Any deviation from normal indicates a problem with the electronics, optical throughput or contamination of the instrument.</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>
Change in zero point over maintenance interval 0 to 7.5 mg/m ³			-1.1			<3.0%

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Test	Results expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Change in reference point over maintenance interval 0 to 7.5 mg/m ³			2.0			<3.0%
Availability 0 to 7.5 mg/m ³					99.7%	>95%
Reproducibility 0 to 7.5 mg/m ³			1.7			<3.3%

Note 1: The calibration-function results (R^2 values) are between 0.8 and 0.9. The CEMS pass the EN14181 criteria, but not the requirement for R^2 specified within EN15267-3. However, this was also due to the low dust levels, where the measurement uncertainty would decrease the value of R^2 . The instruments, however, easily passed the variability tests and acceptance tests specified by EN 14181.

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Description

The QAL 360 sensor is a continuous particulate monitoring instrument suitable for measuring dust concentrations and monitoring filter performance in medium to large stacks for industrial and combustion processes. The ProScatter™ backscatter sensor illuminates particles in the stack/duct with laser light to detect and measure the amount of backscattered light. The measurement of backscattered light is amplified and processed by the onboard electronics.

The instrument can measure very low to high dust concentrations, regardless of flue gas velocity or charge, making it suitable for monitoring filter performance in chemical, metal, and mineral plants, and for continuous emission monitoring in power plants and combustion processes, including refinery boilers and metal-smelting applications.

The QAL 360 system has automatic zero and span checks. The results of these tests are recorded within a separate control unit for QAL3 reporting purposes. The instrument is supported by an optional Pro-scatter Audit unit which is an approved reference material for conducting linearity tests as part of AST or QAL 2 procedures.

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 V00 for certificate No. Sira MC160306/00
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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