Umwelt Bundesamt

TÜVRheinland®
Precisely Right.

CERTIFICATE

of Product Conformity (QAL1)

Certificate No.: 0000053808

Certified AMS:	QAL 360 for dust
Manufacturer:	PCME Ltd. 60 Edison Road St. Ives, Chambs, PE27 3GH United Kingdom
Test Institute:	TÜV Rheinland Energy GmbH

This is to certify that the AMS has been tested and certified according to the standards

EN 15267-1 (2009), EN 15267-2 (2009), EN 15267-3 (2007) and EN 14181 (2014)

Certification is awarded in respect of the conditions stated in this certificate (this certificate contains 6 pages).

TÜVRheinland®
CERTIFIED

Suitability Tested
EN 15267
QAL1 Certified
Regular
Surveillance

www.tuv.com
ID 0000053808

Publication in the German Federal Gazette (BAnz.) of 15 March 2017

This certificate will expire on:
14 March 2022

German Federal Environment Agency
Dessau, 25 April 2017

Dr. Marcel Langner
Head of Section II 4.1

TÜV Rheinland Energy GmbH
Cologne, 24 April 2017

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Test institute accredited to EN ISO/IEC 17025:2005 by DAkkS (German Accreditation Body).
This accreditation is limited to the accreditation scope defined in the enclosure to the certificate D-PL-11120-02-00.

Test report:	936/21230922/A dated 10 June 2016
Initial certification:	15 March 2017
Expiry date:	14 March 2022
Publication:	BAnz AT 15.03.2017 B6, chapter I no. 2.2

Approved application
The tested AMS is suitable for use at combustion plants according to Directive 2010/75/EU, chapter III (13. BImSchV), at waste incineration plants according to Directive 2010/75/EU, chapter IV (17. BImSchV), at plants according to the 27. BImSchV and other plants requiring official approval. The measured ranges have been selected considering the wide application range of the AMS.

The suitability of the AMS for this application was assessed on the basis of a laboratory test and a three-month field test at a waste incineration plant.

The AMS is approved for an ambient temperature range of -20 °C to +50 °C.

The notification of suitability of the AMS, performance testing, and the uncertainty calculation have been effected on the basis of the regulations valid at the time of performance testing. As changes in legal regulations are possible, any potential user should ensure that this AMS is suitable for monitoring the limit value relevant to the application.

Any potential user should ensure, in consultation with the manufacturer, that this AMS is suitable for the installation at which it will be installed.

Basis of the certification
This certification is based on:

- Test report 936/21230922/A dated 10 June 2016 of TÜV Rheinland Energy GmbH
- Suitability announced by the German Federal Environment Agency (UBA) as the relevant body
- The ongoing surveillance of the product and the manufacturing process

Publication in the German Federal Gazette: BAnz AT 15.03.2017 B6, chapter I no. 2.2, Announcement by UBA of 22 February 2017:

AMS designation:

QAL 360 for dust

Manufacturer:

PCME Ltd., St. Ives, United Kingdom

Field of application:

For measurements at plants requiring official approval and plants according to the 27th BImSchV

Measuring ranges during the performance test:

Component	Certification range	Unit
Dust	0 – 7.5*	mg/m³

* correspond to 0 - 30 SLU (scattered light units)

Component	Supplementary measurement ranges			Unit
Dust	0 – 50	0 – 100	0 – 200	SLU

Software versions:

Sensor: 5.0
Optional control units:
Interface Modul: 8.70
MultiController: 8.70
ProController: 1.02

Restrictions:

None

Notes:

1. The maintenance interval is four weeks.
2. The QAL 360 measuring system is available in various configurations:

Product name:	Configuration:
Sensor	
QAL 360c	independent
QAL 360s Standard	with Interface module
QAL 360s Plus	with MultiController
QAL 360s Pro	with ProController

3. During performance testing in accordance with EN 15267-3, the requirement for the determination coefficient R^2 of the calibration function was not satisfied.
4. The measuring system also meets the requirements in the voltage range 126 V to 98 V.

Test report:

TÜV Rheinland Energy GmbH, Cologne
Report No.: 936/21230922/A dated 10 June 2016

Certified product
This certificate applies to automated measurement systems conforming to the following description:

The QAL 360 is a particle monitor which uses the scattered light principle (backward scattering). Measurement is contactless and continuous without extraction of a sample in the flue gas flow above the dew point. The red light of a laser diode beams through the measurement channel and illuminates dust particles in the measurement volume. The particles present in the measurement volume scatter this light. A photodiode then detects the backscattered light. The ratio of the scattered light intensity measured to the total light intensity emitted corresponds to the particle density in the measurement volume.

The basic version of the QAL 360 measuring system only consists of the measurement head itself, a flange connection including a purge air connection and the purge air unit. The complete measurement technology is located inside the sensor head. The measuring system is operated via the keypad on the sensor head or via an external PC connected via USB. The measured value is displayed via the measuring head or alternatively via the optional control unit.

The measuring system comprises the following components:

- Measurement head QAL 360
- Duct flange for the measurement head
- Blower purge
- Reference filter
- Manual
- OPTIONAL: Control unit (ProController, MultiController or interface module) for easier parametrisation and visualisation of the measurement data for performing AST and QAL3.

The current software versions are:
Sensor: 5.0
Optional control units:
Interface Modul: 8.70
MultiController: 8.70
ProController: 1.02

The current version of the operation manual is version 2 (pre-version) dated September 2016.

General notes

This certificate is based upon the equipment tested. The manufacturer is responsible for ensuring that on-going production complies with the requirements of the EN 15267. 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 systems shall be subject to regular surveillance.

If a product of the current production does not conform to the certified product, TÜV Rheinland Energy GmbH must be notified at the address given on page 1.

A certification mark with an ID-Number that is specific to the certified product is presented on page 1 of this certificate. This can be applied to the product or used in publicity material for the certified product.

This document as well as the certification mark remains property of TÜV Rheinland Energy GmbH. With revocation of the publication the certificate loses its validity. After the expiration of the certificate and on requests of the TÜV Rheinland Energy GmbH this document shall be returned and the certificate mark must not be employed anymore.

The relevant version of this certificate and its expiration is also accessible on the internet: **qal1.de**.

Certification of QAL 360 is based on the documents listed below and the regular, continuous monitoring of the Quality Management System of the manufacturer:

Initial certification according to EN 15267

Certificate No. 0000053808: 25 April 2017
Expiry date of the certificate: 14 March 2022

Test report: 936/21230922/A dated 10 June 2016
TÜV Rheinland Energy GmbH, Cologne
Publication: BAnz AT 15.03.2017 B6, chapter I no. 2.2
Announcement by UBA dated 22 February 2017

Calculation of overall uncertainty according to EN 14181 and EN 15267-3

Measuring system					
Manufacturer			PCME Ltd.		
AMS designation			QAL 360		
Serial number of units under test			54244 / 54245 / 52979 / 52916		
Measuring principle			Lightscatter (Backscatter)		
Test report			936/21230922/A		
Test laboratory			TÜV Rheinland		
Date of report			2016-06-10		
Measured component			Dust		
Certification range			0 - 7.5 mg/m³		

Calculation of the combined standard uncertainty

Tested parameter				u^2	
Standard deviation from paired measurements under field conditions *	u_D	0.066	mg/m³	0.004	(mg/m³)²
Lack of fit	u_{lof}	0.012	mg/m³	0.000	(mg/m³)²
Zero drift from field test	$u_{d,z}$	-0.048	mg/m³	0.002	(mg/m³)²
Span drift from field test	$u_{d,s}$	0.087	mg/m³	0.008	(mg/m³)²
Influence of ambient temperature at span	u_t	0.058	mg/m³	0.003	(mg/m³)²
Influence of supply voltage	u_v	0.015	mg/m³	0.000	(mg/m³)²
Uncertainty of reference material at 70% of certification range	u_{rm}	0.061	mg/m³	0.004	(mg/m³)²

* The larger value is used :
"Repeatability standard deviation at set point" or
"Standard deviation from paired measurements under field conditions"

Combined standard uncertainty (u_C)	$u_c = \sqrt{\sum (u_{max,j})^2}$	0.15	mg/m³
Total expanded uncertainty	$U = u_c * k = u_c * 1.96$	0.29	mg/m³

Relative total expanded uncertainty	**U in % of the ELV 5 mg/m³**	**5.8**
Requirement of 2010/75/EU	**U in % of the ELV 5 mg/m³**	**30.0**
Requirement of EN 15267-3	U in % of the ELV 5 mg/m³	22.5