

CERTIFICATE

of Product Conformity (QAL1)

Certificate No.: 000038497_01

AMS designation: PCME QAL 991 for total dust

Manufacturer: PCME Ltd.
60 Edison Road
St. Ives
Cambs
PE273 GH
United Kingdom

Test Laboratory: 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: 2004

Certification is awarded in respect of the conditions stated in this certificate
(this certificate contains 7 pages).




Suitability Tested
EN 15267
QAL1 Certified
Regular
Surveillance

www.tuv.com
ID 000038497

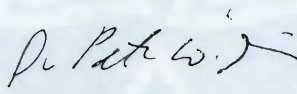
Publication in the German Federal Gazette
(BAZ) of 05 March 2013

German Federal Environment Agency
Dessau, 05 March 2018


Dr. Marcel Langner
Head of Section II 4.1

This certificate will expire on:
04 March 2023

TÜV Rheinland Energy GmbH
Cologne, 04 March 2018


ppa. Dr. Peter Wilbring

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51105 Köln

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: | 936/21220334/B dated 28 September 2012 |
| Initial certification: | 05 March 2013 |
| Expiry date: | 04 March 2023 |
| Certificate: | Renewal (of previous certificate 0000038497 dated 22 March 2013 valid until 04 March 2018) |
| Publication: | BAnz AT 05.03.2013 B10, chapter I no. 1.2 |

Approved application

The tested AMS is suitable for use at combustion plants according to EC Directive 2001/80/EC (13th BImSchV), at waste incineration plants according to EC Directive 2000/76/EC (17th BImSchV), the 27th BImSchV, the 30th BImSchV and TA Luft. The measured ranges have been selected so as to cater for as broad a field of application as possible.

The suitability of the AMS for this application was assessed on the basis of a laboratory test and a six-months field test in the waste gas of a spray tower used for drying materials processed for manufacturing ceramic flooring.

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 applicable at the time of testing. As changes in legal provisions are possible, any potential user should ensure that this AMS is suitable for monitoring the limit values 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 936/21220334/B dated 28 September 2012 issued by TÜV Rheinland Energie und Umwelt 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 05.03.2013 B10, chapter I no. 1.2, UBA announcement dated 12 February 2013:

AMS designation:

PCME QAL 991 for total dust

Manufacturer:

PCME Ltd., St. Ives, United Kingdom

Field of application:

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

Measuring ranges during performance testing:

| Component | Certification range | Supplementary range | Unit |
|-----------|---------------------|---------------------|-------|
| Dust | 0–50* | 0–200* | Units |

* 0–50 units corresponded to 0–15 mg/m³ dust in the wind tunnel test.

* 0–200 units corresponded to 0–15 mg/m³ dust during the field test.

Software versions:

Controller Software: 7.90

Sensor software: 4.4

Restrictions:

1. The measuring system may not be used downstream of an electronic precipitator.
2. At flow velocities < 8.8 m/s, the measuring system may only be used if a constant flow velocity can be ensured.

Notes:

1. The maintenance interval is three months.
2. Correct operation of the measuring system was demonstrated for flow velocities of 5.2 m/s and higher.
3. The dust concentration is determined in wet flue gas under operational conditions.
4. In the dust channel, the measuring system was unable to measure heavy metal coated dusts.
5. During performance testing in accordance with EN 15267-3, the requirement for the determination coefficient R^2 of the calibration function was not fulfilled.
6. Supplementary testing (migration to standard EN 15267) as regards Federal Environment Agency (UBA) notices of 14 February 2008 (BAnz p. 901, chapter I no. 1.1) and of 23 February 2012 (BAnz p. 920, chapter V notification 10).

Test Report:

TÜV Rheinland Energie und Umwelt GmbH, Cologne

Report no.: 936/21220334/B dated 28 September 2012

Publication in the German Federal Gazette: BAnz AT 14.03.2016 B7, chapter V notification 27, UBA announcement dated 18 February 2016:

27 Notification as regards Federal Environment Agency (UBA) notice of 12 February 2013 (BAnz AT 05.03.2013 B10, chapter I number 1.2)

The current software versions of the PCME QAL 991 measuring system for total dust manufactured by PCME Ltd. are:

Controller Software: 8.41

Sensor Software: 4.4

Statement issued by TÜV Rheinland Energie und Umwelt GmbH of 22 October 2015

Certified product

This certification applies to automated measurement systems conforming to the following description:

The measuring system comprises a sensor and a control unit. The electrodynamic signal detected by the probe rod is converted into uniform "units" by the electronic unit. Data output at the display and the outlets of the QAL 991 measuring system takes place in the form of these uniform units which are representative for the dust concentration measured.

The QAL 991 uses the electrodynamic method as a measuring principle. The technology electronically filters out the DC signal caused by particle collision with the measurement head in the duct. As a result of the charged particles, an AC signal is produced which pass by the sensor rod and cause an interaction. Given the specific optimisation of the frequency signal (electrodynamic method) the instrument is rather insensitive to fluctuations in the flow velocity; it operates with increased stability even with dust deposited on the sensor rod. The dust signal is amplified, digitised and further processed at the measurement head. In constant processes with bag filters (at which characteristics of particle charges are normally constant), the processed signal is proportional to the dust concentration.

The current software version is: Controller software: 8.41
Sensor software: 4.4

The current manual version is: Version 4.1, dated 11/2015

General remarks

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 manufacturing process for 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 document as well as the certification mark remains property of TÜV Rheinland Energy GmbH. Upon revocation of the publication the certificate loses its validity. After the expiration of the certificate and on request of TÜV Rheinland Energy GmbH this document shall be returned and the certificate mark must no longer be used.

The relevant version of this certificate and its expiration date are also accessible on the internet at qal1.de.

Certification of the PCME QAL 991 measuring system is based on the documents listed below and the regular, continuous surveillance of the manufacturer's quality management system:

Basic testing:

Test report: 936/21206365/A dated 09 July 2007
TÜV Rheinland Immissionsschutz und Energiesysteme GmbH, Cologne
Publication: BAnz. 06 November 2007 no. 206, p. 7925, chapter I no. 1.1
UBA announcement dated 23 September 2007

Supplementary testing:

Test report: 936/21206365/B dated 09 November 2007
TÜV Rheinland Immissionsschutz und Energiesysteme GmbH, Cologne
Publication: BAnz. 07 March 2008 no. 38, p. 901, chapter I no. 1.1
UBA announcement dated 14 February 2008

Notifications:

Statement issued by TÜV Rheinland Immissionsschutz und Energiesysteme GmbH dated 10 October 2008
Publication: BAnz. 11 March 2009 no. 38, p. 899, chapter IV notification 10
UBA announcement dated 19 February 2009
(Name changed for QAL 991)

Statement issued by TÜV Rheinland Energie und Umwelt GmbH dated 12 October 2011
Publication: BAnz. 02 March 2012 no. 36, p. 920, chapter V notification 10
UBA announcement dated 23 February 2012
(Software and optics)

Initial certification according to EN 15267

Certificate no. 0000038497: 22 March 2013
Expiry date of the certificate: 04 March 2018

Test report: 936/21220334/B dated 28 September 2012
TÜV Rheinland Energie und Umwelt GmbH, Cologne
Publication: BAnz AT 05.03.2013 B10, chapter I no. 1.2
UBA announcement dated 12 February 2013

Notifications in accordance with EN 15267

Statement issued by TÜV Rheinland Energie und Umwelt GmbH dated 22 October 2015
Publication: BAnz AT 14.03.2016 B7, chapter V notification 27
UBA announcement dated 18 February 2016
(New software version)

Renewal of the certificate

Certificate no. 0000038497_01: 05 March 2018
Expiry date of the certificate: 04 March 2023

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

Measuring system

| | |
|---------------------------------|---------------|
| Manufacturer | PCME Ltd. |
| Name of measuring system | QAL 991 |
| Serial number of the candidates | 26206 / 26207 |
| Measuring principle | Tribodynamic |

Test report

| | |
|-----------------|---------------|
| Test laboratory | TÜV Rheinland |
| Date of report | 2012-09-28 |

Measured component

| | |
|---------------------|-----------------------------------|
| Certification range | Staub 0 - 15 mg/m ³ |
|---------------------|-----------------------------------|

Calculation of the combined standard uncertainty

Tested parameter

| | u | u ² |
|--|--|---|
| Standard deviation from paired measurements under field conditions * | u _D 0.110 mg/m ³ | 0.012 (mg/m ³) ² |
| Lack of fit | u _{inf} 0.058 mg/m ³ | 0.003 (mg/m ³) ² |
| Zero drift from field test | u _{d,z} 0.017 mg/m ³ | 0.000 (mg/m ³) ² |
| Span drift from field test | u _{dr,s} -0.017 mg/m ³ | 0.000 (mg/m ³) ² |
| Influence of ambient temperature at span | u _t 0.058 mg/m ³ | 0.003 (mg/m ³) ² |
| Influence of supply voltage | u _v 0.035 mg/m ³ | 0.001 (mg/m ³) ² |
| Uncertainty of reference material at 70% of certification range | u _{rm} 0.121 mg/m ³ | 0.015 (mg/m ³) ² |

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

| | | |
|---|--|------------------------|
| Combined standard uncertainty (u _c) | $u_c = \sqrt{\sum (u_{max,i})^2}$ | 0.19 mg/m ³ |
| Total expanded uncertainty | U = u _c * k = u _c * 1.96 | 0.37 mg/m ³ |

| | | |
|---|--|-------------|
| Relative total expanded uncertainty | U in % of the ELV 10 mg/m³ | 3.7 |
| Requirement of 2000/76/EC and 2001/80/EC | U in % of the ELV 10 mg/m³ | 30.0 |
| Requirement of EN 15267-3 | U in % of the ELV 10 mg/m³ | 22.5 |