

CERTIFICATE

of Product Conformity (QAL1)

Certificate No.: 0000038498_01

AMS designation: PCME STACK 710 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 6 pages).



Suitability Tested
EN 15267
QAL1 Certified
Regular
Surveillance


www.tuv.com
ID 0000038498

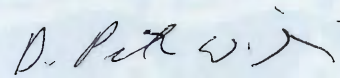
Publication in the German Federal Gazette
(BAnz) of 05 March 2013

This certificate will expire on:
04 March 2023

German Federal Environment Agency
Dessau, 05 March 2018

TÜV Rheinland Energy GmbH
Cologne, 04 March 2018


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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:	936/21220334/C dated 12 October 2012
Initial certification:	05 March 2013
Expiry date:	04 March 2023
Certificate:	Renewal (of previous certificate 0000038498 dated 22 March 2013 valid until 04 March 2018)
Publication:	BAnz AT 05.03.2013 B10, chapter I no. 1.4

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 fifteen-months field test at a municipal waste incinerator.

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/C dated 12 October 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. 1.4,
UBA announcement dated 12 February 2013:

AMS designation:

PCME STACK 710

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 measuring ranges			Unit
		0-0.1	0-0.4	0-1.2	
Dust	0-0.2	0-0.1	0-0.4	0-1.2	Ext.

0-0.2 Ext. $\hat{=}$ 15 mg/m³ dust at a measurement path length of 5 m

Software versions:

Control software version: 01.03.01

HI software version: 01.02.01

Restrictions:

None

Notes:

1. The dust concentration is determined in wet flue gas under operational conditions.
2. The maintenance interval is six months.
3. The length of the measurement path (5 m) and the measuring range of 15 mg/m³ determined during the calibration result in a product of 75 mg/m³ x m at the field test plant.
4. During performance testing in accordance with EN 15267-3, the requirement for the determination coefficient R² of the calibration function was not fulfilled.

Test Report:

TÜV Rheinland Energie und Umwelt GmbH, Cologne

Report no.: 936/21220334/C dated 12 October 2012

Certified product

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

The PCME STACK 710 is designed to determine dust concentrations at emitting plants. It is based on the principle of optical transmission.

The PCME STACK 710 manufactured by PCME Ltd. is an advancement of the 4500 MKII+ measuring system. Three green LEDs in a specific configuration (patent filed) serve as the main light source to achieve the highest degree of homogeneity over the entire emitted light beam. The light beam is modulated at a frequency of 1 kHz to minimise electrical interference and avoid errors caused by ambient light. A second light source, the patented "Flood LED" serves to reduce the effect of temperature drift on the detectors to negligible levels.

Electronic modulation dispenses with a mechanical chopper which leaves the engines of the calibration system as the only moving parts. These engines have an extremely low duty cycle and operated very reliably.

The PCME STACK 710 continuous opacity monitoring system (COMS) manufactured by PCME Ltd. measures opacity with the help of a light beam passing through flue gases. An internal microprocessor calculates dust density and other parameters. The system comprises the following components: The transceiver containing all optical and electro-optical components, the retro reflector with a glass reflector and an air purging system.

The air purging system is available in several specifications to adapt it to local conditions. There are electrical blowers in single or double version as well as instruments operated with compressed air. In order to prevent dust and corrosive gases from affecting optical systems, a continuous supply of purge air is required. In the event of a failure in the purge air system, automatic quick action flaps may be used for temporary protection.

The measuring system essentially comprises the following components.

Transceiver:	contains all relevant electronic and electro-optical components.
Retro retro reflector:	contains a corner reflector.
Air purging:	In order to prevent dust and corrosive gases from affecting optical systems, a continuous supply of purge air is required. Single or double fans or instruments operated with compressed air are available depending on the specific requirements. In the event of a failure in the purge air system, automatic quick action flaps may be used for temporary protection.

Measurement path length and concentration:

0–0.2 Ext. \triangleq 15 mg/m³ dust at a measurement path length of 5 m

The current software version is: control software version: 01.03.01

HI software version: 01.02.01

The current manual version is: Version 1d, dated 05/2013

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 STACK 710 measuring system is based on the documents listed below and the regular, continuous surveillance of the manufacturer's quality management system:

Initial certification according to EN 15267

Certificate no. 0000038498: 22 March 2013
Expiry date of the certificate: 04 March 2018

Test report: 936/21220334/C dated 12 October 2012
TÜV Rheinland Energie und Umwelt GmbH, Cologne
Publication: BAnz AT 05.03.2013 B10, chapter I no. 1.4
UBA announcement dated 12 February 2013

Renewal of the certificate

Certificate no. 0000038498_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	PCME STACK 710
Serial number of the candidates	150854 83 / 154891 91
Measuring principle	Transmission

Test report

Test laboratory	TÜV Rheinland Energie und Umwelt GmbH
Date of report	2012-10-12

Measured component

Certification range	dust	0 - 15 mg/m ³
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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 _{lof} -0.081 mg/m ³	0.007 (mg/m ³) ²
Zero drift from field test	u _{d.z} 0.095 mg/m ³	0.009 (mg/m ³) ²
Span drift from field test	u _{d.s} -0.219 mg/m ³	0.048 (mg/m ³) ²
Influence of ambient temperature at span	u _t 0.030 mg/m ³	0.001 (mg/m ³) ²
Influence of supply voltage	u _v 0.023 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
Excursion of measurement beam	u _{mb} 0.173 mg/m ³	0.030 (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)	$u_c = \sqrt{\sum (u_{max,j})^2}$	0.35 mg/m ³
Total expanded uncertainty	$U = u_c * k = u_c * 1.96$	0.68 mg/m ³

Relative total expanded uncertainty

Requirement of 2000/76/EC and 2001/80/EC	U in % of the ELV 10 mg/m ³	6.8
Requirement of EN 15267-3	U in % of the ELV 10 mg/m ³	30.0
	U in % of the ELV 10 mg/m ³	22.5

Performance testing and uncertainty calculations were carried out as part of the original test of the 4500 MKIII measuring system manufactured by Land Instruments International Ltd which is identical in design.