

CERTIFICATE

on Product Conformity (QAL1)

Certificate No.: 0000038498

Certified AMS: PCME STACK 710 for total dust

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

Test Institute: TÜV Rheinland Energie und Umwelt GmbH

**This is to certify that the AMS has been tested
and found to comply with:**

**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
(see also the following pages).



- EN 15267-3 tested
- QAL1 certified
- TÜV approved
- Annual inspection

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

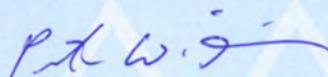
German Federal Environment Agency
Dessau, 22 March 2013



i. A. Dr. Marcel Langner

This certificate will expire on:
04 March 2018

TÜV Rheinland Energie und Umwelt GmbH
Cologne, 21 March 2013



ppa. Dr. Peter Wilbring

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Am Grauen Stein
51105 Cologne

Accreditation according to EN ISO/IEC 17025 and certified according to ISO 9001:2008.

Test report:	936/21220334/C of 12 October 2012
Initial certification:	05 March 2013
Expiry date:	04 March 2018
Publication:	BAnz AT 05 March 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 and at waste incineration plants according to EC Directive 2000/76/EC 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 fifteenmonth field test at a municipal waste incinerator.

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

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 of 12 October 2012 of 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 March 2013 B10, chapter I, No. 1.4

AMS designation:

PCME STACK 710

Manufacturer:

PCME Ltd., St. Ives, United Kingdom

Field of application:

Measurement at plants requiring official approval as well as plants within the scope of 2000/76/EC (waste incineration directive) and 2001/80/EC (large combustion plants directive)

Measuring ranges during the performance test:

Component	Certification range	Supplementary range			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 optical density. $\hat{=}$ 15 mg/m³ dust at a path length of 5 m

Software versions:

Control Software Version: 01.03.01

HI Software Version: 01.02.01

Restrictions:

None

Remarks:

1. Dust concentration is measured in wet exhaust gas under operating conditions.
2. The maintenance interval is six months.
3. The path length of 5 m multiplied by the measured range of 15 mg/m³ determined during calibration results in 75 mg/m³ m at the plant used for the field test.
4. Requirements with regard to the determination coefficient R² of the calibration function in accordance with EN 15267-3 were not satisfied during performance testing.

Test report:

TÜV Rheinland Energie und Umwelt GmbH, Cologne

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

Certified product

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

The measurement device PCME STACK 710 was developed for the determination of the dust concentration at emitting plants. The underlying principle is the measurement of the optical transmission.

The PCME STACK 710 is a further development from the Land Model 4500 MKII+. The main light source uses three green LEDs in a special configuration (patent pending) to ensure homogeneity over the entire transmitted light beam. The light source is modulated at a frequency of 1 kHz, to reduce electrical noise and eliminate errors due to ambient light. A second light source, the (patented) "Flood LED" is used to reduce the effect of temperature drift in the detectors to an almost immeasurable low level.

Electronic modulation eliminates the need for a mechanical chopper and so the only moving parts are the motors used in the calibration system. These motors have a very low duty cycle and are very reliable.

The PCME Ltd. Model PCME STACK 710 Continuous Opacity Monitoring System (COMS) measures opacity by shining a light beam through flue gases. An internal microprocessor calculates dust density and other parameters. The instrument comprises the following parts: The Transceiver which contains all of the optical and electro-optic components; the Retro-Reflector containing a glass reflector and the air purge system.

The air purge system is available in several forms depending upon individual site requirements. Single and dual electric blowers are available, as are compressed-air driven devices. Continuous purge air supply is essential to prevent dust and corrosive gases from affecting the optical system. Automatic fail-safe shutters can also be fitted for temporary protection in the event of a purge air failure.

The analyser is basically composed of the following components:

- Transceiver:** Containing all of the major electronic and electro-optic components.
- Retro-Reflector:** Containing a corner cube reflector.
- Air Purge System:** A continuous supply of purge air is essential to prevent dust and corrosive gases from affecting the optical system. Single and dual electric blowers or compressed-air driven devices are available to suit individual site requirements. Automatic fail-safe shutters can also be fitted for temporary protection in the event of a purge air failure

Measurement path length and concentration:
0 – 0,2 Ext. $\hat{=}$ 15 mg/m³ dust at 5 m measurement path length

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 Energie und Umwelt 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 Energie und Umwelt GmbH. With revocation of the publication the certificate loses its validity. After the expiration of the certificate and on requests of the TÜV Rheinland Energie und Umwelt 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 PCME STACK 710 for total dust 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. 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 March 2013 B10, chapter I, No. 1.4
Announcement by UBA from 12 February 2013

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
Date of report	2012-10-12

Measured component

Certification range	Staub	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 _{inf} -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

Requirement of EN 15267-3

U in % of the ELV 10 mg/m³	6,8
U in % of the ELV 10 mg/m³	30,0
U in % of the ELV 10 mg/m³	22,5

* The performance test and calculation of measurement uncertainties was carried out during the original testing with the 4500 MKIII measuring systems of identical design manufactured by Land Instruments International Ltd.