

CERTIFICATE

of Product Conformity (QAL1)

Certificate No. : 0000043526

Certified AMS: STACKFLØW 400 for velocity

Manufacturer: PCME Ltd.
60 Edison Road
St. Ives
Cams
PE273 GH
England

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
EN ISO 16911-2: 2013 and EN 14181: 2004**

Certification is awarded in respect of the conditions stated in this certificate
(see also the following pages).



Suitability Tested
EN 15267
QAL1 Certified
Regular
Surveillance

www.tuv.com
ID 0000043526

Publication in the German Federal Gazette
(BAnz.) of 2 April 2015

This certificate will expire on:
1 April 2020

German Federal Environment Agency
Dessau, 30 April 2015

TÜV Rheinland Energie und Umwelt GmbH
Cologne, 29 April 2015



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51105 Cologne

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

Test report:	936/21225290/A of 18 September 2014
Initial certification:	2 April 2015
Expiry date:	1 April 2020
Publication:	BAnz AT 2 April 2015 B5, chapter II number 1.3

Approved application

The tested AMS is suitable for use at combustion plants according to Directive 2010/75/EU, chapter III, at waste incineration plants according to Directive 2010/75/EU, chapter IV 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 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 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 flow 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 936/21225290/A of 18 September 2014 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 2 April 2015 B5, chapter II number 1.3: Announcement by UBA from 25 February 2015)

AMS designation:

STACKFLØW 400 for velocity

Manufacturer:

PCME Ltd., St. Ives, England

Field of application:

For measurements at plants requiring official approval (Directive 2010/75/EU on industrial emissions, chapters III and IV)

Measuring ranges during the performance test:

Component	Certification range	Supplementary ranges	Unit
velocity	0 - 30	0 - 50	m/s

Software versions:

Sensor: 1.25

Control unit: 8.23

PC-ME DUST TOOLS: 2.31

Restrictions:

None

Notes:

1. The maintenance interval is four weeks.
2. The measuring system STACKFLØW 400 is available in various configurations:

Product description	Configuration
Sensor – straight	
STACKFLØW 400	standalone configuration
STACKFLØW 400 Standard	with Interface Module
STACKFLØW 400 Plus	with MultiController
Sensor – bent	
STACKFLØW 400A	standalone configuration
STACKFLØW 400A Standard	with Interface Module
STACKFLØW 400A Plus	with MultiController

Test report:

TÜV Rheinland Energie und Umwelt GmbH, Cologne
Report no.: 936/21225290/A of 18 September 2014

Certified product

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

The AMS STACKFLØW 400 is a measuring system for the continuous measurement of waste gas velocity in waste gas ducts. As an in-situ flow meter it determines the measured values directly in the waste gas duct.

The measuring system basically consists of the following components:

- adjustable chimney flange for ultrasound probe
- ultrasound probe with sensor housing and fixed sensor measurement path
- 24 V voltage transformer
- software PCME-ME DUST TOOLS
- **OPTIONAL:** control unit (MultiController or Interface Module) for easier parameterisation, and visualisation of measurement data and implementation of AST and QAL3

The STACKFLØW 400 uses a flow measurement technology based on ultrasound for measuring waste gas velocity. The sensor probe is equipped with two sensor elements. Each flow transducer emits an ultrasonic pulse which is detected by the other sensor element. In the waste gas duct, the sensor is usually installed at an angle (α) of 45° in the direction of flow so that the sensor elements are situated above and below the other in the waste gas flow.

The motion time (t) of an ultrasonic pulse moving between the two sensor elements depends on the distance between them (L), the speed of sound within the gas and the gas velocity (v). The motion time of an ultrasonic pulse moving in the direction of the gas flow is shorter than the motion time of a pulse moving against the direction of flow. The difference between the motion times is directly proportional to the waste gas velocity.

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 STACKFLØW 400 for velocity 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. 0000043526: 30. April 2015

Expiry date of the certificate: 1. April 2020

Test report: 936/21225290/A of 18 September 2014
TÜV Rheinland Energie und Umwelt GmbH, Cologne

Publication: BAnz AT 2 April 2015 B5, chapter II number 1.3
Announcement by UBA from 25 February 2015

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

Measuring system

Manufacturer	PCME Ltd.
AMS designation	STACKFLØW 400
Serial number of units under test	46098 / 46099 / 46910 / 47404
Measuring principle	Ultrasound

Test report

Test laboratory	TÜV Rheinland
Date of report	2014-09-18

Measured component

Certification range	Velocity	0 - 30 m/s
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Calculation of the combined standard uncertainty

Tested parameter

			u^2
Standard deviation from paired measurements under field conditions *	u_D	0.133 m/s	0.018 (m/s) ²
Lack of fit	u_{lof}	0.116 m/s	0.013 (m/s) ²
Zero drift from field test	$u_{d,z}$	0.208 m/s	0.043 (m/s) ²
Span drift from field test	$u_{d,s}$	-0.104 m/s	0.011 (m/s) ²
Influence of ambient temperature at span	u_t	0.026 m/s	0.001 (m/s) ²
Influence of supply voltage	u_v	0.012 m/s	0.000 (m/s) ²
Uncertainty of reference material at 70% of certification range	u_{rm}	0.242 m/s	0.059 (m/s) 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)	$u_c = \sqrt{\sum (u_{max,j})^2}$	0.38 m/s
Total expanded uncertainty	$U = u_c * k = u_c * 1.96$	0.75 m/s

Relative total expanded uncertainty

Requirement of 2010/75/EU	U in % of the range 30 m/s	2.5
Requirement of EN 15267-3	U in % of the range 30 m/s	10.0 **
	U in % of the range 30 m/s	7.5

** For this component no requirements in the EC-directives 2010/75/EU on industrial emissions are given.
A value of 10 % was used for this.