

CERTIFICATE

of Product Conformity (QAL1)

Certificate No.: 0000035006_03

Certified AMS: V-CEM5100 for waste gas velocity

Manufacturer: CODEL International Ltd.
Station Road, Bakewell
DE45 1GE GB Derbyshire
Great Britain

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 (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 0000035006

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

German Federal Environment Agency
Dessau, 28 February 2017



Dr. Marcel Langner
Head of Section II 4.1

This certificate will expire on:
01 March 2022

TÜV Rheinland Energy GmbH
Cologne, 27 February 2017



ppa. Dr. Peter Wilbring

www.umwelt-tuv.eu
tre@umwelt-tuv.eu
Tel. + 49 221 806-5200

TÜV Rheinland Energy GmbH
Am Grauen Stein
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.
qal1.de info@qal1.de page 1 of 7

Certificate:
0000035006_03 / 28 February 2017

Test report: 936/21216334/D of 17 September 2012
Initial certification: 02 March 2012
Expiry date: 01 March 2022
Certificate renewal (previous certificate 0000035006_02 dated from
22 March 2013 with validity up to the 01 March 2017)
Publication: BAnz AT 05.03.2013 B10, chapter II No. 2.1

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) 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 twelvemonth field test at a coal fired power 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 936/21216334/D of 17 September 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 05.03.2013 B10, chapter II number 2.1,
Announcement by UBA from 12 February 2013:

AMS designation:

V-CEM5100 for velocity

Manufacturer:

CODEL International Ltd., Bakewell, Derbyshire, United Kingdom

Field of application:

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

Measuring ranges during the suitability test:

Component	Certification range	Unit
waste gas velocity	3 - 50	m/s

Software version:

507.105B

Restriction:

The lower limit of the velocity measuring range is 3 m/s.

Notes:

1. The maintenance interval is six months.
2. The AMS may be used under the following peripheral conditions:
moisture content > 2 %, temperature > 40 °C, duct diameter > 0.5 m.
3. Supplementary testing (extension of the maintenance interval) as regards Federal
Environmental Agency notice of 6 July 2012 (Federal Gazette BAnz AT 20 July
2012 B11, chapter II no. 2.1).

Test report:

TÜV Rheinland Energie und Umwelt GmbH, Cologne
Report No.: 936/21216334/D of 17 September 2012

Publication in the German Federal Gazette: BAnz AT 23.07.2013 B4, chapter V notification 1,
Announcement by UBA from 03 July 2013:

1 Notification as regards Federal Environment Agency (UBA) notice of 12 February 2013 Federal Gazette (BAnz AT 05.03.2013 B10, chapter II No. 2.1)

The current software version of the V-CEM5100 measuring system for monitoring velocity manufactured by Codel International Ltd. is:

507.105 C.

Statement of TÜV Rheinland Energie und Umwelt GmbH of 5 March 2013.

Publication in the German Federal Gazette: BAnz AT 01.04.2014 B12, chapter VI notification 8,
Announcement by UBA from 27 February 2014:

8 Notification as regards Federal Environment Agency (UBA) notices of 12 February 2013 (BAnz AT 05.03.2013 B10, Chapter II No. 2.1) and of 3 July 2013 (BAnz AT 23.07.2013 B4, Chapter V notification 1)

The keypad of the display unit (DDU) of the V-CEM5100 measuring system for exhaust gas velocity by Codel International Ltd. is to be redesigned.

Statement of TÜV Rheinland Energie und Umwelt GmbH of 30 September 2013

Publication in the German Federal Gazette: BAnz AT 05.08.2014 B11, chapter V notification 5,
Announcement by UBA from 17 July 2014:

5 Notification as regards Federal Environment Agency (UBA) notices of 12 February 2013 (BAnz AT 05.03.2013 B10, chapter II No. 2.1) and of 27 February 2014 (BAnz AT 01.04.2014 B12, chapter VI notification 8)

The V-CEM5100 measuring system for monitoring velocity manufactured by Codel International Ltd. can be fitted with an RS485 interface.

The software versions for the measuring system are:

507-105C (display unit DDU)
507-031A (signal processing unit SPU, Master)
507-030A (signal processing unit SPU, Slave)

Statement of TÜV Rheinland Energie und Umwelt GmbH of 28 March 2014.

Certified product

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

Flow monitoring system CODEL Model V-CEM5100 is using a cross correlation principle to determine the velocity in gas flows.

Series of vortexes caused by turbulences in the gas flow are transported by the gas flow. The infrared radiation of hot waste gas is characterized by special flickering caused by the gas vortexes. These characteristic infrared signals are detected by two infrared detectors mounted at the duct wall in flow direction with a defined distance to determine the time delay between the two sensors to calculate the gas velocity.

The flow monitor V-CEM5100 consists of the following parts:

- two transducer units consisting of a broadband infrared detector, a lens to focus the radiation on to the sensor and a preamplifier. These parts are mounted inside a sealed epoxy-coated aluminium housing.
- a power supply unit (PSU)
- a signal processor unit (SPU) for signal processing, for submission of diagnostic data and for adjustment
- a data display unit (DDU) for the presentation of measuring results and diagnostic values in the display and for editing of input values. Also the analogue output values and the digital status signals of the flow monitor are transmitted by the DDU. DDU is connected with the SPU via wire of max. 1 km length.
- the instrument software version 507.105B
- The software versions for the measuring system are:
 - 507-105C (display unit DDU)
 - 507-031A (signal processing unit SPU, Master)
 - 507-030A (signal processing unit SPU, Slave)

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 V-CEM5100 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. 0000035006: 16 March 2012
Expiry date of the certificate: 01 March 2017

Test report: 936/21216334/A of 14 October 2011
TÜV Rheinland Energie und Umwelt GmbH, Cologne
Publication: BAnz. 02 March 2012, No. 36, p. 920, chapter II, No. 2.2
Announcement by UBA from 23 February 2012

Supplementary testing according to EN 15267:

Certificate No. 0000035006_01: 20 August 2012
Expiry date of the certificate: 01 March 2017

Test report: 936/21216334/C of 20 March 2012
TÜV Rheinland Energie und Umwelt GmbH, Cologne
Publication: BAnz AT 20.07.2012 B11, chapter II, No. 2.1
Announcement by UBA from 06 July 2012

Certificate No. 0000035006_02: 22 March 2013
Expiry date of the certificate: 01 March 2017

Test report: 936/21216334/D of 17 September 2012
TÜV Rheinland Energie und Umwelt GmbH, Cologne
Publication: BAnz AT 05.03.2013 B10, chapter II, No. 2.1
Announcement by UBA from 12 February 2013

Notifications according to EN 15267

Statement of TÜV Rheinland Energie und Umwelt GmbH, Cologne of 5 March 2013
Publication: BAnz AT 23.07.2013 B4, chapter V notification 1,
Announcement by UBA from 03 July 2013
(new software version)

Statement of TÜV Rheinland Energie und Umwelt GmbH, Cologne of 30 September 2013
Publication: BAnz AT 01.04.2014 B12, chapter VI notification 8,
Announcement by UBA from 27 February 2014
(hardware changes)

Statement of TÜV Rheinland Energie und Umwelt GmbH, Cologne of 28 March 2014
Publication: BAnz AT 5.08.2014 B11, chapter V notification 5,
Announcement by UBA from 17 July 2014
(soft- and hardware extension)

Renewal of the certificate

Certificate No. 0000035006_03: 28 February 2017
Expiry date of the certificate: 01 March 2022

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

Measuring system

Manufacturer	Codel International Ltd.
Name of measuring system	V-CEM5100
Serial number of the candidates	M 5100-0314 / M 5100-0315
Measuring principle	cross correlation

Test report

Test laboratory	936/21216334/D TÜV Rheinland
Date of report	2012-09-17

Measured component

Certification range	Velocity 3 - 50 m/s
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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 0.507 m/s	0.257 (m/s) ²
Lack of fit	u _{lof} 0.115 m/s	0.013 (m/s) ²
Zero drift from field test	u _{d,z} 0.106 m/s	0.011 (m/s) ²
Span drift from field test	u _{d,s} -0.199 m/s	0.040 (m/s) ²
Influence of ambient temperature at span	u _t 0.306 m/s	0.094 (m/s) ²
Influence of supply voltage	u _v 0.240 m/s	0.058 (m/s) ²
Uncertainty of reference material at 70% of certification range	u _{rm} 0.404 m/s	0.163 (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)	$u_c = \sqrt{\sum (u_{max,j})^2}$	0.80 m/s
Total expanded uncertainty	$U = u_c * k = u_c * 1.96$	1.56 m/s

Relative total expanded uncertainty

Requirement of 2000/76/EC and 2001/80/EC	U in % of the range 50 m/s	3.1
Requirement of EN 15267-3	U in % of the range 50 m/s	10.0 **
		7.5

** For this component no requirements in the EC-directives 2001/80/EG und 2000/76/EG are given.
A value of 10.0 % was used for this.