Umwelt Bundes Amt
For our Environment

TÜVRheinland®
Precisely Right.

CERTIFICATE

on Product Conformity (QAL1)

Number of Certificate: 0000001016_01

Certified AMS:	FMD 09 for velocity
Manufacturer:	Dr. Födisch Umweltmesstechnik AG Zwenkauer Straße 159 04420 Markranstädt Germany
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: 2008 and EN 14181: 2004

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

The present certificate replaces Certificate No. 0000001016 dated 19 August 2011

www.tuv.com TÜVRheinland® ID: 0000001016

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

Publication in the German Federal Gazette (BAnz.) of 02 March 2012

The certificate is valid until: 28 July 2016

Umweltbundesamt
Dessau, 16 March 2012

i. A. Dr. Hans-Joachim Hummel

TÜV Rheinland Energie und Umwelt GmbH
Köln, 15 March 2012

ppa. Dr. Peter Wilbring

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Am Grauen Stein
51105 Köln

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

Test report:	936/21212361/B of 19 October 2011
First certification:	29 July 2011
Validity ends:	28 July 2016
Publication:	BAnz. 02 March 2012, No. 36, p. 920, chapter II, No. 2.1

Approved application
The tested AMS is suitable for use at combustion plants according to EC directive 2001-80-EC, at waste incineration plants according to EC directive 2000-76-EC and other plants requiring official approval. The tested ranges have been chosen with respect to 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 six months field test at a waste incineration plant.

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 on which it will be installed.

Basis of the certification
This certification is based on:

- test report 936/21212361/A dated 23 March 2011 of TÜV Rheinland Energie und Umwelt GmbH
- test report 936/21212361/B dated 19 October 2011 of TÜV Rheinland Energie und Umwelt GmbH
- suitability announced by the German Environmental Agency (UBA) as the relevant body
- the ongoing surveillance of the product and the manufacturing process
- publication in the German Federal Gazette (BAnz. 02 March 2012, No. 36, p. 920, chapter II, No. 2.1, announcement by UBA from 23 February 2012)

AMS name:
FMD 09 for velocity

Manufacturer:
Dr. Födisch Umweltmesstechnik AG, Markranstädt

Field of application:
For measurements at plants requiring official approval (i. e. plants in 2000-76-EC, waste incineration directive and 2001-80-EC large combustion plants directive)

Measuring ranges during the suitability test:

Component	Certification range	Unit
Velocity	2 - 30	m/s

Software versions:
Main Version: 2.0,
I/O Version: 1.1

Restriction:
The lower level of the velocity measuring range is 2 m/s.

Notes:
1. A three month period has been determined as maintenance interval.
2. After a filter disturbance with high dust concentrations the probe has to be checked for contaminations and if necessary it has to be cleaned.
3. It is possible to install the SMAR LD301 pressure transmitter with a range of 0 to 500 Pa or of 0 to 1000 Pa.
4. Additional testing procedure (extension of the measuring range) related to the announcement of the German Federal Environmental Agency (UBA) of 15 July 2011 (BAnz. p. 2725, Chapter II, Number 1.1).

Test report:
TÜV Rheinland Energie und Umwelt GmbH, Köln
Report-No.: 936/21212361/B dated 19 October 2011

Certified product

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

The volumetric flow measurement is based on the determination of the differential pressure in drifty flue gas with help of a back pressure probe and a pressure sensor. The measurement device is an in-situ analyser. The measured values from the pressure transmitter are transferred as 4 - 20 mA measuring signal to the evaluation electronics which are located in the measuring device.

In the evaluation electronics transfers of the differential pressure signal for the boundary conditions and the stack cross section take place. The stack temperature is continuously measured by a temperature sensor (PT100) which is integrated in the back pressure probe. The flow signal can be corrected by the measured temperature in the evaluation electronic.

The output of the volume flow- or rather the velocity signal is carried out by different free selectable 4 – 20 mA analog outputs. The measurement ranges of these outputs can be diversified. In addition the stack temperature can be outputted by the analog outputs. It is possible to show either the actual measurement value or a line chart on the instrument display.

The control- and display unit is integrated into a weather protected housing. The display shows all measured values, the status information and parameters. Using a keyboard it is possible to configure the display and to adapt the parameters specific for the instrument.

Optional the possibility exists to connect an absolute pressure transmitter, through which the absolute pressure at the measurement area can be determined. This one has not been included in the version for the aptitude test. The signal of the absolute pressure transmitter can be used as offset in the emission calculation. An offset of the evaluation electronics of the FMD 09 has not been tested.

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 looses its validity. After the expiration of the validity 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 the validity is also accessible on the internet Address: **qal1.de**.

Certification of FMD 09 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. 0000001016: 19 August 2011

Validity of the certificate: 28 July 2016

Test report: 936/21212361/A of 23 March 2011,
TÜV Rheinland Energie und Umwelt GmbH, Köln,

Publication: BAnz. 29 July 2011, No. 113, p. 2725, chapter II, Nr. 1.1:
Announcement by UBA from 15 July 2011.

Supplementary testing according to EN 15267:

Certificate No. 0000001016_01:16 March 2012

Validity of the certificate: 28 July 2016

Test report: 936/21212361/B of 19 October 2011,
TÜV Rheinland Energie und Umwelt GmbH, Köln,

Publication: BAnz. 02 March 2012, No. 36, p. 920, chapter II, No. 2.1:
Announcement by UBA from 23 February 2012.

Umwelt Bundes Amt
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Certificate:
0000001016_01 / 16 March 2012

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

Measuring system					
Manufacturer			Dr. Födisch Umweltmesstechnik AG		
Name of measuring system			FMD 09		
Serial number of the candidates			09130 / 09131		
Measuring principle			Differential pressure measurement		
Test report			936/21212361/A / 936/21212361/B		
Test laboratory			TÜV Rheinland Energie und Umwelt GmbH		
Date of report			23.03.2011 / 19.10.2011		
Measured component			velocity		
Certification range			2 - 30	m/s	

Calculation of the combined standard uncertainty

Tested parameter		u		u²	
Standard deviation from paired measurements under field conditions *	u_D	0.127	m/s	0.016	(m/s)²
Lack of fit	u_{lof}	-0.196	m/s	0.038	(m/s)²
Zero drift from field test	$u_{d,z}$	0.000	m/s	0.000	(m/s)²
Span drift from field test	$u_{d,s}$	0.173	m/s	0.030	(m/s)²
Influence of ambient temperature at span	u_t	0.058	m/s	0.003	(m/s)²
Influence of supply voltage	u_v	0.059	m/s	0.003	(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)	$u_c = \sqrt{\sum (u_{max,j})^2}$	0.30	m/s
Total expanded uncertainty	$U = u_c * k = u_c * 1.96$	0.59	m/s

Relative total expanded uncertainty	**U in % of the ELV 30 m/s**	**2.0**
Requirement of 2000/76/EC and 2001/80/EC	**U in % of the ELV 30 m/s**	**10.0**
Requirement of EN 15267-3	U in % of the ELV 30 m/s	7.5

** For this component no requirements in the EC-directives 2001/80/EG und 2000/76/EG are given.
The chosen value is recommended by the certification body.