

CERTIFICATE

of Product Conformity (QAL1)

Certificate No.: 0000035014_01

Certified AMS: PFM 06 ED for dust

Manufacturer: Dr. Födisch Umweltmesstechnik AG
Zwenkauer Straße 159
04420 Markranstädt
Germany

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 6 pages).



Suitability Tested
EN 15267
QAL1 Certified
Regular
Surveillance

www.tuv.com
ID 0000035014

Publication in the German Federal Gazette
(BAnz.) of 20 July 2012

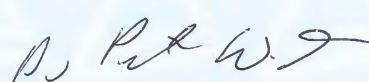
This certificate will expire on:
19 July 2022

German Federal Environment Agency
Dessau, 18 July 2017

TÜV Rheinland Energy GmbH
Cologne, 17 July 2017



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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.

Certificate:
0000035014_01 / 18 July 2017

Test report: 936/21218036/A of 23 March 2012
Initial certification: 20 July 2012
Expiry date: 19 July 2022
Certificate: renewal (previous certificate 0000035014 dated from 20 August 2012 with validity up to the 19 July 2017)
Publication: BAnz AT 20.07.2012 B11, chapter I no. 1.2

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), at plants according to the 27. 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 two three months field test at a municipal waste incinerator and a municipal heat and power plant (lignite-fired).

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 936/21218036/A of 23 March 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 20.07.2012 B11, chapter I number 1.2,
Announcement by UBA from 06 July 2012:

AMS name:

PFM 06 ED for dust

Manufacturer:

Dr. Födisch Umweltmesstechnik AG, Markranstädt

Approval:

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

Measuring ranges during the suitability test:

Component	Certification range	supplementary measurement ranges	Unit
Total dust	0 - 15	0 – 100	mg/m ³

Software version:

1.15h

Restrictions:

None

Remarks:

1. The maintenance interval is four weeks.
2. The requirement of the EN 15267-3 for the correlation coefficient R^2 of the calibration function was not met during the suitability test.

Test report:

TÜV Rheinland Energie und Umwelt GmbH, Cologne
Report No.: 936/21218036/A of 23 March 2012

Publication in the German Federal Gazette: BAnz AT 26.08.2015 B4, chapter V
notification 33,
Announcement by UBA from 22 July 2015:

33 Notification as regards Federal Environment Agency (UBA) notice of 6 July 2012 (Federal Gazette (BAnz.) AT 20.07.2012 B11, chapter I number 1.2)

The current software version for the PFM 06 ED measuring system for dust, manufactured by Dr. Födisch Umweltmesstechnik AG, is: 1.15j.

Statement of TÜV Rheinland Energie und Umwelt GmbH of 18 February 2015

Certified product

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

The PFM 06 ED measuring system is an optical, extractive instrument intended for the continuous measurement of dust concentrations. A defined sample flow is extracted from the gas flow. This partial flow is continuously heated and diluted with purged, heated ambient air (35 to 70%). The partial flow is optically measured in the measurement chamber.

The PFM 06 ED measuring system operates on basis of the scattered light measuring principle (forward scattering). A focused and modulated light beam of a laser diode travels through the gas flow. Via optical fibres, the scattered light is led to the receiver diode, where it is processed.

The tested measuring system PFM 06 ED consists of the following components:

- a special sampling probe;
- a laser-based dust measuring system (scattered light principle);
- Gas conditioning unit (dilution, heating);
- an injector for transporting gas;
- two blower systems (for injected air and diluting air);
- an electronic evaluation unit (software version 1.15j) and
- a manual, version 2.1

The sampling probe and the measuring chamber form an assembly. The probe i.e. the extracting tube is heated and double walled with an integrated dilution. Dilution is realized via a mixing nozzle. Processing of the extracted measuring gas and logging of the measured data takes place in the probe. The latter is integrated in a two-piece protecting enclosure made of glass-fibre amplified synthetic material. The protection enclosure is mounted directly to the flange.

The PFM 06 ED measuring system continuously extracts a partial sample flow from the gas flow. Test gas is diluted as defined. Simultaneously, the gas mixture is heated. Subsequently, the extracted, diluted and heated test gas passes through the measuring cell and is finally led out of the measuring system.

For diagnosis and cleaning purposes, the PFM 06 ED carries out cleaning activities automatically. Zero and span point checks as well as the cleaning of gas carrying parts are carried out. Moreover, the scattered light value of the optical sensor without dust is determined. In the event of excessive deviations, a warning signal is set.

Reference filters are available for QAL3 and AST activities.

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 PFM 06 ED for 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. 0000035014: 20 August 2012
Expiry date of the certificate: 19 July 2017

Test report: 936/21218036/A of 23 March 2012
TÜV Rheinland Energie und Umwelt GmbH, Cologne
Publication: BAnz AT 20.07.2012 B11, chapter I no. 1.2
Announcement by UBA from 06 July 2012

Notifications according to EN 15267

Statement of TÜV Rheinland Energie und Umwelt GmbH of 18 February 2015
Publication: BAnz AT 26.08.2015 B4, chapter V notification 33
Announcement by UBA dated 22 July 2015
(new software version)

Renewal of the certificate

Certificate No. 0000035014_01: 18 July 2017
Expiry date of the certificate: 19 July 2022

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

Measuring system

Manufacturer	Dr. Födisch Umweltmesstechnik AG
Name of measuring system	PFM 06 ED
Serial number of the candidates	EP 1 7196 / EP 2 7197
Measuring principle	Scattered light (extractive sampling)

Test report

Test laboratory	936/21218036/A
Date of report	TÜV Rheinland
	2012-03-23

Measured component

Certification range	Dust
	0 - 15 mg/m ³

Calculation of the combined standard uncertainty

Tested parameter

			u^2
Repeatability standard deviation at set point *	u_r	mg/m ³	0.250 (mg/m ³) ²
Lack of fit	u_{lof}	mg/m ³	0.065 (mg/m ³) ²
Zero drift from field test	$u_{d,z}$	mg/m ³	0.003 (mg/m ³) ²
Span drift from field test	$u_{d,s}$	-0.140 mg/m ³	0.020 (mg/m ³) ²
Influence of ambient temperature at span	u_t	0.015 mg/m ³	0.000 (mg/m ³) ²
Influence of supply voltage	u_v	0.015 mg/m ³	0.000 (mg/m ³) ²
Influence of sample gas flow	u_p	mg/m ³	0.043 (mg/m ³) ²
Uncertainty of reference material at 70% of certification range	u_{rm}	mg/m ³	0.015 (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)	$u_c = \sqrt{\sum (u_{max,j})^2}$	0.63 mg/m ³
Total expanded uncertainty	$U = u_c * k = u_c * 1.96$	1.23 mg/m ³

Relative total expanded uncertainty

Requirement of 2000/76/EC and 2001/80/EC	U in % of the ELV 10 mg/m³	12.3
Requirement of EN 15267-3	U in % of the ELV 10 mg/m³	30.0
	U in % of the ELV 10 mg/m³	22.5