

CERTIFICATE

of Product Conformity (QAL1)

Certificate No.: 0000040209_01

Certified AMS: OPASTOP GP4000H for dust

Manufacturer: FIVES PILLARD
13, rue Raymond Teisseire
13272 Marseille Cedex 8
France

Test Institute: TÜV Rheinland Energy 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).

The present certificate replaces certificate 0000040209 of 29 April 2014.



Suitability Tested
EN 15267
QAL1 Certified
Regular
Surveillance

www.tuv.com
ID 0000040209

Publication in the German Federal Gazette
(BAnz.) of 1 April 2014

German Federal Environment Agency
Dessau, 1 April 2019


Dr. Marcel Langner
Head of Section II 4.1

This certificate will expire on:
30 June 2020

TÜV Rheinland Energy GmbH
Cologne, 31 March 2019


ppa. Dr. Peter Wilbring

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Accreditation according to EN ISO/IEC 17025:2018 and certified according to ISO 9001:2015.

Test report:	936/21217455/A of 10 September 2013
Initial certification:	01 April 2014
Expiry date:	30 June 2020
Publication:	BAnz AT 01 April 2014 B12, chapter I, No. 1.1

Approved application

The tested AMS is suitable for use at combustion plants according to Directive 2010/75/EU, chapter III 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 four-month 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 936/21217455/A of 10 September 2013 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 01 April 2014 B12, chapter I, No. 1.1, Announcement by UBA from 27 February 2014)

AMS designation:

OPASTOP GP4000H for dust

Manufacturer:

FIVES PILLARD, Marseille, France

Field of application:

For measurements at plants requiring official approval (Directive 2010/75/EU, chapter III combustion plants)

Measuring ranges during the performance test:

Component	Certification range	Unit
dust	0 - 20	mg/m ³

Component	Supplementary ranges		Unit
dust	0 - 15 ¹⁾	0 - 100 ²⁾	SE

¹⁾ this corresponds to approx. 0 to 9 mg/m³ dust

²⁾ this corresponds to approx. 0 to 60 mg/m³ dust

Software version:

V 1.3

Restrictions:

None

Notes:

1. The maintenance interval is two weeks.
2. The performance criterion as related to the correlation coefficient R^2 of the calibration function according to EN 15267-3 was not fulfilled.

Test report:

TÜV Rheinland Energie und Umwelt GmbH, Cologne
Report No.: 936/21217455/A of 10 September 2013

Certified product

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

The OPASTOP GP4000H is a dust measuring system based on the principle of optical light scattering (backscattering). The measuring system consists of the following components:

- control box with LED light source, receiving unit, evaluation electronics, and control unit
- two fibre optics for transmitting the emitted and the received light
- sensor for fitting the fibre optics to the flue gas duct including a heating resistor, a heat detector, and a mounting flange
- instrument software and control blocks

Both fibre optics (available lengths: 1.20 m and 2.20 m) are fixated within the sensor. The sensor itself is mounted on a rectangular flange at the flue gas channel.

The light enters the measuring volume at an angle of 45° and is reflected in different directions by the particles. Part of the reflected light reaches the top of the receiving fibre. The intensity of the reflected light as compared to the intensity of the emitted light depends on the angle between sender and receiver as well as on form, colour, and size of the particles. For a given type of dust the quantity of light received is proportional to the quantity of dust.

In order to avoid the influence of interfering light, the light which is transmitted via the emitting fibre is modulated with a frequency of 1000 Hz by means of a generator in the electronic control box.

Data output is via two fixed measuring ranges which can be adjusted separately.

Due to the fibre optics the electronic control box can be mounted separate from the sensor. The control box contains the main board with the logic functions for control and supply. It has a microprocessor which assumes the following functions:

- evaluation of measurement results
- monitoring of emitted light and sensor temperature
- administration of instrument display and analogue outputs 4-20 mA
- administration of warning messages and errors

The measuring system is fitted with a purge air supply at the sensor. In order to avoid condensation, the purge air is heated. The purge air also serves the distribution of thermal heat within the sensor. The sensor can be adjusted to temperatures between 130 °C and 400 °C. The optical fibres are designed for a permanent maximum temperature of 250 °C.

For checking linearity and drift, 3 control or adjustment blocks as well as 1 zero point block per measuring range, which are provided by the manufacturer, are required. In the middle of the adjustment blocks there is hardened and pigmented glass. The thickness of the glasses is proportional to the optical density.

For the purpose of performance testing, the measuring system was operated with a damping time (sliding average) of 10 s.

The measuring system can automatically perform zero point checks every 24 h. Zero point checks can also be performed manually. Span point checks can only be performed manually by use of an adjustment block or, alternatively, by use of a calibration block.

In case of difficult measurement conditions (small channel diameter, reflections at the flue gas channel, etc.), zero point shifts may occur in measurements without dust load. In such cases, the measuring system allows for offset correction.

The measuring system has a means of contamination control. If deviation exceeds 10 %, the calculation of the correction factor may be triggered manually. The following measurements are corrected by this value. The correction factor can be switched on and off.

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 certification 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 OPASTOP GP4000H 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. 0000040209: 29 April 2014
Expiry date of the certificate: 31 March 2019
Test report: 936/21217455/A of 10 September 2013
TÜV Rheinland Energie und Umwelt GmbH, Cologne
Publication: BAnz AT 01 April 2014 B12, chapter I, No. 1.1
Announcement by UBA from 27 February 2014

Renewal of the certificate according to EN 15267

Certificate No. 0000040209_01: 1 April 2019
Expiry date of the certificate: 30 June 2020

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

Measuring system

Manufacturer	FIVES PILLARD
AMS designation	OPASTOP GP4000H
Serial number of units under test	11090001 / 11090002 / 11090016 / 1090017
Measuring principle	scattered light measuring (reverse scattering)

Test report

Test laboratory	TÜV Rheinland
Date of report	2013-09-10

Measured component

Dust	
Certification range	0 - 20 mg/m ³

Calculation of the combined standard uncertainty

Tested parameter

			u^2	
Standard deviation from paired measurements under field conditions *	u_D	0.314 mg/m ³	0.099	(mg/m ³) ²
Lack of fit	u_{lof}	0.035 mg/m ³	0.001	(mg/m ³) ²
Zero drift from field test	$u_{d,z}$	0.000 mg/m ³	0.000	(mg/m ³) ²
Span drift from field test	$u_{d,s}$	-0.346 mg/m ³	0.120	(mg/m ³) ²
Influence of ambient temperature at span	u_t	-0.454 mg/m ³	0.206	(mg/m ³) ²
Influence of supply voltage	u_v	0.114 mg/m ³	0.013	(mg/m ³) ²
Influence of sample gas pressure	u_p	0.000 mg/m ³	0.000	(mg/m ³) ²
Uncertainty of reference material at 70% of certification range	u_{rm}	0.162 mg/m ³	0.026	(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)	$u_c = \sqrt{\sum (u_{max,j})^2}$	0.68 mg/m ³
Total expanded uncertainty	$U = u_c * k = u_c * 1.96$	1.34 mg/m ³

Relative total expanded uncertainty

Requirement of 2010/75/EC

Requirement of EN 15267-3

U in % of the ELV 10 mg/m³	13.4
U in % of the ELV 10 mg/m³	30.0
U in % of the ELV 10 mg/m ³	22.5