

CERTIFICATE

of Product Conformity (QAL1)

Certificate No: 0000074622_01

Certified AMS: EM-D 5100A for dust

Manufacturer: Horiba GmbH
Kaplanstrasse 5
A-3430 Tulln
Austria

Test Institute: TÜV Rheinland Energy & Environment GmbH

**This is to certify that the AMS has been tested
and found to comply with the standards
EN 15267-1 (2009), EN 15267-2 (2023), EN 15267-3 (2007)
as well as EN 14181 (2014).**

Certification is awarded in respect of the conditions stated in this certificate
(this certificate contains 7 pages).
The present certificate replaces certificate 0000074622_00 dated 2 June 2021.



Suitability Tested
EN 15267
QAL1 Certified
Regular
Surveillance

www.tuv.com
ID 0000074622

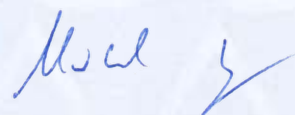
Publication in the German Federal Gazette
(BAnz) of 3 May 2021

German Environment Agency

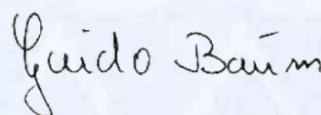
Dessau, 3 May 2026

This certificate will expire on:
2 May 2031

TÜV Rheinland
Energy & Environment GmbH
Cologne, 2 May 2026



Dr. Marcel Langner
Head of Section II 4



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Test institute accredited to EN ISO/IEC 17025 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.

Test report:	936/21250511/A dated 22 August 2020
Initial certification:	3 May 2021
Expiry date:	2 May 2031
Certificate:	Renewal (of previous certificate 0000074622_00 of 2 June 2021 valid until 2 May 2026)
Publication:	BAnz AT 03.05.2021 B9, chapter I No. 1.2

Approved application

The tested AMS is suitable for use at plants according to Directive 2010/75/EC, chapter III (combustion plants / 13th BImSchV:2020), chapter IV (waste incineration plants / 17th BImSchV:2013), Directive 2015/2193/EC (44th BImSchV:2019), TA Luft:2002, 30th BImSchV:2019 and 27th BImSchV:2013. The measured ranges have been selected so as to ensure as broad a field of application as possible.

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 incineration plant.

The AMS is approved for an ambient temperature range of -40 °C to +60 °C.

The notification of suitability of the AMS, performance testing and the uncertainty calculation have been effected on the basis of the regulations applicable at the time of testing. As changes in legal provisions are possible, any potential user should ensure that this AMS is suitable for monitoring the emission limit values 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.

Note

The legal regulations mentioned correspond to the current state of legislation during certification. Each user should, if necessary, in consultation with the competent authority, ensure that this AMS meets the legal requirements for the intended use. In addition, it cannot be ruled out that legal regulations governing the use of a measuring device for emission monitoring may change during the lifetime of the certificate.

Basis of the certification

This certification is based on:

- Test report 936/21250511/A dated 22 August 2020 of TÜV Rheinland Energy 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 03.05.2021 B9, chapter I No. 1.2,
Announcement by UBA dated 31 March 2021:

AMS designation:

EM-D5100A for dust

Manufacturer:

Horiba GmbH, Tulln, Austria

Field of application:

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

Measuring ranges during the performance test:

Component	Certification range	Unit
Dust	0 – 15*	mg/m ³

* 0 – 0.1 Ext. equals 0 – 16 mg/m³ with an optical length of 5 m

Component	Supplementary ranges			Unit
Dust	0 – 0.2	0 – 0.5	0 – 1.6	Ext.
Dust	0 - 100			Opac.

Software versions:

EM-D5100A: 05.10R004

EM 5800CU: 02.02R0066

D-ESI 100: 01.11R0018

Restrictions:

1. The measuring system may only be employed if the temperature does not fall below dew point.
2. The requirement for the correlation coefficient R^2 of the calibration function in accordance with EN 15267-3 was not satisfied.

Notes:

1. The dust concentration is determined in wet flue gas under operational conditions.
2. The maintenance interval is four weeks.
3. The measuring path length of 5 m and the measuring range of 16 mg/m³ determined during the calibration results in a product of 80 mg*m/m³ for the field test plant.
4. The measuring system can be operated with the EM5800CU control unit or the EM-D5100TB connection box.
5. The EM5800CU control unit is equipped with the digital interfaces Modbus RTU and Modbus TCP according to VDI 4201 sheets 1 and 3 (EIA-485, serial and TCP / IP, Ethernet).
6. The EM-D5100A measuring device is equipped with an digital Modbus RTU Interface in accordance with VDI 4201 sheets 1 and 3 (EIA-485, serial).

7. When combining the EM-D5100A measuring device with the EM5800CU control unit, the Modbus interface of the EM-D5100A measuring device cannot be used. Instead, the digital Modbus interface of the EM5800CU control unit is used.
8. If the measuring device is not equipped with the EM5800CU control unit, the measuring device is operated with the D-ESI 100 software on a commercially available PC / notebook / tablet.
9. The allowed ambient temperature range for the measuring device is -40 °C to +60 °C.
10. The EM5800CU control unit is available in the following designs:

EM5800CU M	(standard)
EM5800CU C	(compact housing)
EM5800CU P	(with purging air fan)
EM5800CU R	(housing for 19 " rack installation).

Test Report: TÜV Rheinland Energy GmbH, Cologne
Report No.: 936/21250511/A dated 22 August 2020

Publication in the German Federal Gazette: BAnz AT 02.08.2023 B7, Chap. III
notification 10,
Announcement by UBA dated 5 July 2023:

**10 Notification as regards Federal Environment Agency (UBA) notice
of 31 March 2021 (BAnz AT 03.05.2021 B9, chapter I number 1.2)**

The current software versions of the EM-D5100A measuring system for dust
from HORIBA GmbH are:

EM-D5100A: 05.10R004
EM5800CU: 02.02R0073
D-ESI 100: 01.11R0018

Statement issued by TÜV Rheinland Energy GmbH dated 2 February 2023

Certified product

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

The EM-D5100A measuring system uses the two-beam alternate light method, based on the auto collimation principle. The measuring light crosses the measuring path twice. The attenuation of the measuring light beam caused by the dust concentration is measured.

A photo sensor receives the measuring and comparison light beams alternately. The changeover between measuring light and comparison light is performed using a step motor every 2 min for 2 s. There is a common amplifier for signal processing of measuring and comparison light, temperature influences and longterm drift effects of the amplifier are compensated. The measuring light beam is generated by a Super Wide Band Diode (SWBD) without any influence of d.c. light (daylight). With the Wide Band performance of the SWBD the measuring result is independent of temperature and other influences and provides a very stable measurement.

The measurement system EM-D5100A has two analogue outputs. Each of these outputs has two freely selectable extinction and opacity measuring ranges, which are externally changeable. The ranges are freely adjustable from 0.1 to 1.6 Extinction and from 20 to 100% Opacity.

To check proper functioning of the EM-D5100A, a control cycle is performed at adjustable periodic intervals. In this cycle, the contamination of the optical interfaces, the span and the zero point are automatically measured and displayed. The results of the following measurements are corrected by the magnitude of the measured difference (contamination). If the contamination exceeds 6% a status signal is produced. By heating the optical discs, condensation and contamination are reduced as far as possible.

The measuring device consist of the following components:

- Measuring head EM-D5100MH100
- Reflector EM-D5100R100
- Blower unit EM-D5100BL
- Electric connection box EM-D5100TB

or

- Control unit EM5800CU

When using the EM-D5100TB connection box, the EM-D5100A measuring device is operated using a commercially available PC / notebook / tablet with the D-ESI 100 control software. The EM5800CU control unit enables the measuring device to be operated without a PC and can provide additional data outputs. If the EM-D5100A measuring device is combined with the EM5800CU electronic control unit, the digital interface of the EM5800CU electronic control unit must be used. The EM5800CU control unit is available in the following designs:

- EM5800CU M (standard)
- EM5800CU C (compact housing)
- EM5800CU P (with purge air fan)
- EM5800CU R (housing for 19 " rack installation).

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 & Environment 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 certification mark may be applied to the product or used in advertising materials for the certified product.

This document as well as the certification mark remains property of TÜV Rheinland Energy & Environment 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 & Environment 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: gal1.de.

History of documents

Certification of EM-D 5100A 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. 0000074622_00: 2 June 2021
Expiry date of the certificate: 2 May 2026
Test report: 936/21250511/A dated 22 August 2020
TÜV Rheinland Energy GmbH
Publication: BAnz AT 03.05.2021 B9, chapter I number 1.2
UBA announcement dated 31 March 2021

Notifications

Statement issued by TÜV Rheinland Energy GmbH dated 2 February 2023
Publication: BAnz AT 02.08.2023 B7, chapter III notification 10
UBA announcement dated 5 July 2023
(Software changes)

Renewal of certificates

Certificate No. 0000074622_01: 3 May 2026
Expiry date of the certificate: 2 May 2031

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

Measuring system

Manufacturer	HORIBA GmbH
AMS designation	EM-D5100A
Serial number of units under test	406752 (142) / 406753 (158) / 1214444 / 1214434
Measuring principle	optical transmission

Test report

Test laboratory	936/21250511/A
Date of report	TÜV Rheinland
	2020-08-22

Measured component

Certification range	Dust	0 - 15 mg/m ³
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Calculation of the combined standard uncertainty

Tested parameter

			u^2
Standard deviation from paired measurements under field conditions *	u_D	0.143 mg/m ³	0.020 (mg/m ³) ²
Lack of fit	u_{lof}	0.058 mg/m ³	0.003 (mg/m ³) ²
Zero drift from field test	$u_{d,z}$	0.012 mg/m ³	0.000 (mg/m ³) ²
Span drift from field test	$u_{d,s}$	0.017 mg/m ³	0.000 (mg/m ³) ²
Influence of ambient temperature at span	u_t	0.052 mg/m ³	0.003 (mg/m ³) ²
Influence of supply voltage	u_v	0.040 mg/m ³	0.002 (mg/m ³) ²
Uncertainty of reference material at 70% of certification range	u_{rm}	0.121 mg/m ³	0.015 (mg/m ³) ²
Excursion of measurement beam	u_{mb}	0.167 mg/m ³	0.028 (mg/m ³) ²

* The larger value is used :
"Repeatability standard deviation at set point" or
"Standard deviation from paired measurements under field conditions"

Combined standard uncertainty (u_c)	$u_c = \sqrt{\sum (u_{max,j})^2}$	0.27 mg/m ³
Total expanded uncertainty	$U = u_c * k = u_c * 1.96$	0.52 mg/m ³

Relative total expanded uncertainty

Requirement of 2010/75/EU	U in % of the ELV 10 mg/m³	5.2
Requirement of EN 15267-3	U in % of the ELV 10 mg/m ³	30.0
	U in % of the ELV 10 mg/m ³	22.5