CERTIFICATE

of Product Conformity (QAL1)

Certificate No: 0000074623_01

Certified AMS:	EM-F 5000-20 for waste gas velocity
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), EN ISO 16911-2 (2013) 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 0000074623_00 dated 2 June 2021.

TÜVRheinland® CERTIFIED

Suitability Tested
EN 15267
QAL1 Certified
Regular Surveillance

www.tuv.com
ID 0000074623

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

i. V. Guido Baum

www.tuv.com
qal1-info@tuv.com
Tel. + 49 221 806-5200

TÜV Rheinland Energy & Environment GmbH
Am Grauen Stein
51105 Köln

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/B dated 25 August 2020
Initial certification:	3 May 2021
Expiry date:	2 May 2031
Certificate:	Renewal (of previous certificate 0000074623_00 of 2 June 2021 valid until 2 May 2026)
Publication:	BAnz AT 03.05.2021 B9, chapter II No. 3.1

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 twelve-month field test at a waste incineration 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 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 flow gas velocity 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/B dated 25 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 II No. 3.1, Announcement by UBA dated 31 March 2021:

AMS designation:
EM-F 5000-20 for waste gas velocity

Manufacturer:
Horiba GmbH, Tulln, Austria

Field of application:
For plants requiring official approval and for plants according to the 27th BImSchV

Measuring ranges during the performance test:

Component	Certification range	Supplementary range	Unit
Flow velocity	3 – 30	3 – 50	m/s

Software versions:
EM-F 5000-20: 01.01R0000
EM5800CU: 02.02R0066

Restrictions:
1. The measuring system is only fit for use in waste gas which is not saturated with water vapour.
2. The lower limit of measuring the flow velocity is 3 m/s.

Notes:
1. The maintenance interval is six months.
2. The EM-F 5000-CU evaluation unit has no display and no operating option. The control unit EM5800CU must be connected to parameterize the evaluation unit and visualize the data.
3. The EM-F 5000-20 measuring device is equipped with an digital Modbus RTU Interface in accordance with VDI 4201 parts 1 and 3 (EIA-485, serial).
4. The EM5800CU control unit is equipped with the digital interfaces Modbus according to VDI 4201 sheets 1 and 3 (EIA-485, serial and TCP / IP, Ethernet).
5. 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/B dated 25 August 2020

Publication in the German Federal Gazette: BAnz AT 28.07.2022 B4, Chap. III notification 16, Announcement by UBA dated 28 June 2022:

16 Notification as regards Federal Environment Agency (UBA) notice of 31 March 2021 (BAnz AT 03.05.2021 B9, chapter II number 3.1)

The current software versions of the measuring device EM-F5000-20 for the measurement of the exhaust gas velocity of the company HORIBA GmbH are:
EM-F 5000-20: 01.01R0009
EM5800CU: 02.02R0066

Statement issued by TÜV Rheinland Energy GmbH dated 28 April 2022

Publication in the German Federal Gazette: BAnz AT 02.08.2023 B7, Chap. III notification 9, Announcement by UBA dated 5 July 2023:

9 Notification as regards Federal Environment Agency (UBA) notices of 31 March 2021 (BAnz AT 03.05.2021 B9, chapter II number 3.1) and of 28 June 2022 (BAnz AT 28.07.2022 B4, chapter III notification 16)

The current software versions of the EM-F 5000-20 measuring system for the determination of waste gas velocity from HORIBA GmbH are:
EM-F 5000-20: 01.01R0009
EM5800CU: 02.02R0073

Statement issued TÜV Rheinland Energy GmbH dated 2 February 2023

Certified product

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

The EM-F 5000-20 measuring device is based on the differential pressure measuring principle and is designed for continuous measurement of exhaust gas velocity.

The measuring system consists of the following components:

- Pitot tube
- Switchover device for manual zero and span checks and for back purging of the pitot tube
- Differential pressure transmitter 266MST (ABB)
- optional: Temperature and pressure sensor for calculating waste gas density
- EM-F 5000-20 evaluation unit for data evaluation and output
- Control unit EM5800CU for adjusting parameters, presenting data and conducting AST, QAL2 and QAL3 for the EM-F 5000-20

Each EM-F 5000 P dynamic pressure probe is custom made for the respective measuring point. For this purpose, three different cross-section probe sizes are available depending on the intended measuring path length.

- 22 x 24 mm^2 for 0.4 to 2 m probe length
- 50 x 53 mm^2 for 0.4 to 4 m probe length
- 90 x 100 mm^2 for 0.4 to 8 m probe length

The EM-F 5000-CU evaluation unit does not have a display. Signals are output via a 4–20 mA signal outputs. In addition to the 4–20 mA signal output, it provides a Modbus interface for connecting an evaluation system with a digital interface in accordance with the VDI 4201 parts 1 and 3. The front plate has 5 LEDs and a USB port (Mini-B 5–pins). The LEDs serve to signal the current status/operating mode of the system.

Different parameters such as standard density, substitute values for pressure and temperature in the waste gas duct, k-factor and measuring ranges are entered and monitored via the universal control unit EM5800CU. The display provides instant information on the status of connected instruments as well as values currently being measured. In addition, measured values can be presented as bar charts. EM5800CU also allows retrieval of information, control and adjustment of parameters for connected instruments. The universal control unit is fitted with a Modbus digital interface in accordance with VDI 4201 parts 1 and 3 (EIA-485, series and TCP/IP, Ethernet).

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).

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: **qal1.de**.

History of documents

Certification of EM-F 5000-20 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. 0000074623_00: 2 June 2021
Expiry date of the certificate: 2 May 2026
Test report: 936/21250511/B dated 25 August 2020
TÜV Rheinland Energy GmbH
Publication: BAnz AT 03.05.2021 B9, chapter II number 3.1
UBA announcement dated 31 March 2021

Notifications
Statement issued by TÜV Rheinland Energy GmbH dated 28 April 2022
Publication: BAnz AT 28.07.2022 B4, chapter III notification 16
UBA announcement dated 28 June 2022
(Software changes)

Statement issued by TÜV Rheinland Energy GmbH dated 2 February 2023
Publication: BAnz AT 02.08.2023 B7, chapter III notification 9
UBA announcement dated 5 July 2023
(Software changes)

Renewal of certificates
Certificate No. 0000074623_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-F 5000-20		
Serial number of units under test			1226520 / 1227484		
Measuring principle			Dynamic / Differential pressure		
Test report			936/21250511/B		
Test laboratory			TÜV Rheinland		
Date of report			2020-08-25		
Measured component			Velocity		
Certification range			3 - 30 m/s		

Calculation of the combined standard uncertainty

Tested parameter				u^2	
Repeatability standard deviation at set point *	u_r	0.364	m/s	0.132	$(m/s)^2$
Lack of fit	u_{lof}	0.230	m/s	0.053	$(m/s)^2$
Zero drift from field test	$u_{d,z}$	0.316	m/s	0.100	$(m/s)^2$
Span drift from field test	$u_{d,s}$	0.318	m/s	0.101	$(m/s)^2$
Influence of ambient temperature at span	u_t	0.153	m/s	0.023	$(m/s)^2$
Influence of supply voltage	u_v	0.180	m/s	0.032	$(m/s)^2$
Uncertainty of reference material at 70% of certification range	u_{rm}	0.242	m/s	0.059	$(m/s)^2$

* 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)	$u_c = \sqrt{\sum (u_{max,j})^2}$	0.71	m/s
Total expanded uncertainty	$U = u_c * k = u_c * 1.96$	1.39	m/s

Relative total expanded uncertainty	**U in % of the range 30 m/s**	**4.6**
Requirement of 2010/75/EU	**U in % of the range 30 m/s**	**10.0 ****
Requirement of EN 15267-3	U in % of the range 30 m/s	7.5

** The EU-directive 2010/75/EC on industrial emissions does not define requirements for this component.
A value of 10.0 % was used instead.