Umwelt Bundesamt

TÜVRheinland®
Precisely Right.

CERTIFICATE

of Product Conformity (QAL1)

Certificate No.: 0000074620_01

Certified AMS:	MP101M for suspended particulate matter PM_{10}
Manufacturer:	ENVEA 111, Boulevard Robespierre 78304 Poissy Cedex France
Test Institute:	TÜV Rheinland Energy & Environment GmbH

This is to certify that the AMS has been tested and found to comply with the standards VDI 4202-3 (2019), EN 12341 (2014), EN 16450 (2017), as well as EN 15267-1 (2009) and EN 15267-2 (2023).

Certification is awarded in respect of the conditions stated in this certificate (this certificate contains 11 pages).
The present certificate replaces certificate 0000074620_00 dated 17 June 2020.

TÜVRheinland® CERTIFIED
Suitability Tested
Complying with 2008/50/EC
EN 15267
Regular Surveillance
www.tuv.com
ID 0000074620

Publication in the German Federal Gazette (BAnz) of 7 May 2020

German Environment Agency

Dessau, 5 May 2025

This certificate will expire on:
6 May 2030

TÜV Rheinland Energy & Environment GmbH
Cologne, 4 May 2025

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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:	936/21240384/A dated 15 August 2019
Initial certification:	7 May 2020
Expiry date:	6 May 2030
Certificate:	Renewal (of previous certificate 0000074620_00 of 17 June 2020 valid until 6 May 2025)
Publication:	BAnz AT 07.05.2020 B8, chapter II No. 2.1

Approved application

The tested AMS is suitable for continuous immission measurement of PM_{10} in stationary use.

The suitability of the AMS for this application was assessed on the basis of a laboratory test and a field test at four different locations with different time periods.

The AMS is approved for an ambient temperature range of +5 °C to +40 °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 measured values relevant to the application.

Any potential user should ensure, in consultation with the manufacturer, that this AMS is suitable for the intended use.

Basis of the certification

This certification is based on:

- Test report 936/21240384/A dated 15 August 2019 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 07.05.2020 B8, chapter II No. 2.1, Announcement by UBA dated 31 March 2020:

AMS designation:
MP101M for suspended particulate matter PM_{10}

Manufacturer:
ENVEA, Poissy, France

Field of application:
For continuous ambient air monitoring of suspended particulate matter, PM_{10} (stationary operation)

Measuring ranges during the performance test:

Component	Certification range	Unit
PM_{10}	0 - 10,000	µg/m³

Software version: MP101M 4.0.h

Restrictions:
None

Notes:
1. The maintenance interval is one month.
2. The test report on performance testing is available on the internet at www.qal1.de.

Test institute: TÜV Rheinland Energy GmbH, Cologne
Report No.: 936/21240384/A dated 15 August 2019

Publication in the German Federal Gazette: BAnz AT 11.04.2022 B10, Chap. VI notification 8, Announcement by UBA dated 9 March 2022:

8 Notification as regards Federal Environment Agency (UBA) notice of 31 March 2020 (BAnz AT 07.05.2020 B8, chapter II number 2.1)

The current software version of the measuring device MP101M for suspended particulate matter PM_{10} of the company ENVEA is:
MP101M 4.0.j

Statement issued by TÜV Rheinland Energy GmbH dated 29 December 2021

Publication in the German Federal Gazette: BAnz AT 28.07.2022 B4, Chap. III notification 40, Announcement by UBA dated 28 June 2022:

40 Notification as regards Federal Environment Agency (UBA) notices of 31 March 2020 (BAnz AT 07.05.2020 B8, chapter II number 2.1) and of 9 March 2022 (BAnz AT 11.04.2022 B10, chapter VI notification 8)

The current software of the measuring device MP101M for suspended particulate matter PM_{10} of the company ENVEA reads:
v.4.0.l

The module board in the measuring device can also be used in revision H.

Statement issued by TÜV Rheinland Energy GmbH dated 28 April 2022

Publication in the German Federal Gazette: BAnz AT 10.05.2024 B7, Chap. V notification 49, Announcement by UBA dated 19 March 2024:

49 Notification as regards Federal Environment Agency (UBA) notices of 31 March 2020 (BAnz AT 07.05.2020 B8, chapter II number 2.1) and of 28 June 2022 (BAnz AT 28.07.2022 B4, chapter III notification 40)

The MP101M measuring system for PM_{10} particulate matter from ENVEA can also be equipped with the RCT type C14 source from RC TRITEC AG. Until now, a C14 source of type CFCB18760 from the manufacturer Eckert & Ziegler Nuclitec GmbH has been used.

The measuring system can also be equipped with the Geiger-Müller detector type LND 72423 from the manufacturer LND, INC. Previously, a Geiger-Müller detector of type LND 72412 from the same manufacturer was used.

The current software version for the measuring system is
v.4.0.n

In addition to this version, the following intermediate version is also valid: v.4.0.m

Statement issued by TÜV Rheinland Energy GmbH dated 10 August 2023

Certified product

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

The MP101M measuring system is designed to measure suspended particulate matter in ambient air. The determination of the mass concentration relies on the principle of beta ray attenuation. The sample is first sucked through a PM_{10} pre-separator and then through a glass fibre filter tape in the instrument. Suspended particulate matter is deposited on the filter tape. Every hour, a beta source (14C element) is swivelled in to determine the mass deposited on the filter tape. A Geiger Müller counter measuring beta radiation is situated below the filter tape. The 14C radioelement emits beta rays as it decays. Particles deposited on the filter tape partially absorb the beta radiation. The filter spot is measured before and after loading. The difference in radiation intensity measured by the Geiger Müller counter serves as measure for the deposited amount of particulate matter.

The particulate sample passes the sampling head (USEPA) at a flow rate of 16.67 l/min and enters the sampling tube, which connects the sampling head to the actual measuring instrument. The sampling head separates all particles larger than PM_{10}. The sampling tube can be heated in order to avoid possible condensation effects, especially in situations with high outdoor air humidity. After entering the measuring instrument, the air stream contained in the sample is separated on the filter tape. After leaving the measuring system, the air flow reaches the pump and then exits into the environment via a particle filter.

Every hour (1 period), the sample volumetric flow is stopped and a beta radiation source is swivelled over the filter band. The Geiger Müller counter situated below the filter tape measures the intensity of radiation. Every filter tape is measured before and after filter loading. The absorbed radiation is proportional to the separated particle mass and thus the absorption difference is the measured quantity. One measurement takes 200 seconds. The measured values of 24 periods are the averaged 24 hour value (1 cycle). After 24 hours, the filter tape is transported forward and a new blank spot is sampled.

The volumetric flow is kept constant at 1 m^3/h in the separator head. Since the velocity in the sampling head determines the separation characteristics, the volume flow is controlled by the weather sensors so that the volume flow in the sampling head is constant.

The sampling tube can be heated to avoid condensation effects. Since excessive temperatures in the sampling tube can lead to reduced results due to volatilization, the sampling tube is only heated as much as absolutely necessary. A sensor measuring relative moisture is situated near the Geiger Müller counter. If this sensor detects relative moisture above 50%, the heater will be activated.

The measuring system generally provides results simultaneously via the display and the data records. Measured values are updated hourly after each measurement (periodically, “Per.”) and every 24 hours (cyclically, “Cyc.”).

The tested AMS consists of

- the PM_{10} USEPA sampling head,
- the sampling tube with heater, protective tube made of stainless steel and isolation (2 m long),
- the weather sensor (mounted at the sampling tube below the sample inlet) comprising a temperature sensor and a sensor which determines the relative moisture.
- the analyser,
- the pump unit,
- the required connecting tubes and cables,

The measuring system may be operated either directly via the touch screen at the front of the instrument or remotely via an internet connection or a wireless modem.

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 MP101M PM_{10} 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. 0000074620_00: 17 June 2020
Expiry date of the certificate: 6 May 2025
Test report: 936/21240384/A dated 15 August 2019
TÜV Rheinland Energy GmbH
Publication: BAnz AT 07.05.2020 B8, chapter II number 2.1
UBA announcement dated 31 March 2020

Notifications
Statement issued by TÜV Rheinland Energy GmbH dated 29 December 2021
Publication: BAnz AT 11.04.2022 B10, chapter VI notification 8
UBA announcement dated 9 March 2022
(Software changes)

Statement issued by TÜV Rheinland Energy GmbH dated 28 April 2022
Publication: BAnz AT 28.07.2022 B4, chapter III notification 40
UBA announcement dated 28 June 2022
(Soft- and hardware changes)

Statement issued by TÜV Rheinland Energy GmbH dated 10 August 2023
Publication: BAnz AT 10.05.2024 B7, chapter V notification 49
UBA announcement dated 19 March 2024
(Soft- and hardware changes)

Renewal of certificates
Certificate No. 0000074620_01: 5 May 2025
Expiry date of the certificate: 6 May 2030

Equivalence calculation PM_{10}, cyc., after correction of the axis intercept

Comparison candidate with reference according to Standard EN 16450: 2017					
Candidate	MP101M, PM 10 (Cyc)		SN	SN 6158 & SN 6159	
			Limit value	50	µg/m³
Status of measured values	Raw data		Allowed uncertainty	25	%
All comparisons					
Uncertainty between Reference	**0.62**	**µg/m³**			
Uncertainty between Candidates	**0.94**	**µg/m³**			
	SN 6158 & SN 6159				
Number of data pairs	208				
Slope b	**1.027**	**not significant**			
Uncertainty of b	**0.019**				
Ordinate intercept a	**0.000**	**not significant**			
Uncertainty of a	**0.468**				
Expanded measured uncertainty WCM	**12.56**	**%**			
All comparisons, ≥30 µg/m³					
Uncertainty between Reference	**0.81**	**µg/m³**			
Uncertainty between Candidates	**1.13**	**µg/m³**			
	SN 6158 & SN 6159				
Number of data pairs	**44**				
Slope b	**1.043**				
Uncertainty of b	**0.080**				
Ordinate intercept a	**-1.534**				
Uncertainty of a	**3.018**				
Expanded measured uncertainty WCM	**15.18**	**%**			

Comparison candidate with reference according to Standard EN 16450:2017					
Candidate	MP101M, PM10 (Cyc)		SN	SN 6158 & SN 6159	
			Limit value	50	µg/m³
Status of measured values	Raw data		Allowed uncertainty	25	%
Cologne, Winter					
Uncertainty between Reference	0.40	µg/m³			
Uncertainty between Candidates	0.86	µg/m³			
	SN 6158			SN 6159	
Number of data pairs	57			57	
Slope b	0.967			0.936	
Uncertainty of b	0.026			0.024	
Ordinate intercept a	-0.507			-0.003	
Uncertainty of a	0.572			0.533	
Expanded measured uncertainty W_{CM}	12.47	%		15.39	%
Bonn, Belderberg					
Uncertainty between Reference	0.94	µg/m³			
Uncertainty between Candidates	0.77	µg/m³			
	SN 6158			SN 6159	
Number of data pairs	40			40	
Slope b	1.026			1.028	
Uncertainty of b	0.027			0.032	
Ordinate intercept a	1.385			1.501	
Uncertainty of a	0.703			0.808	
Expanded measured uncertainty W_{CM}	12.13	%		13.38	%
Bulk good handling, Summer					
Uncertainty between Reference	0.60	µg/m³			
Uncertainty between Candidates	1.21	µg/m³			
	SN 6158			SN 6159	
Number of data pairs	66			66	
Slope b	1.116			1.109	
Uncertainty of b	0.045			0.036	
Ordinate intercept a	-0.888			-0.083	
Uncertainty of a	1.111			0.888	
Expanded measured uncertainty W_{CM}	23.09	%		23.57	%
Bulk good handling, Winter					
Uncertainty between Reference	0.50	µg/m³			
Uncertainty between Candidates	0.65	µg/m³			
	SN 6158			SN 6159	
Number of data pairs	45			45	
Slope b	0.931			0.919	
Uncertainty of b	0.033			0.033	
Ordinate intercept a	1.033			1.004	
Uncertainty of a	0.852			0.834	
Expanded measured uncertainty W_{CM}	13.92	%		15.61	%
All comparisons, ≥30 µg/m³					
Uncertainty between Reference	0.81	µg/m³			
Uncertainty between Candidates	1.13	µg/m³			
	SN 6158			SN 6159	
Number of data pairs	44			44	
Slope b	1.046			1.056	
Uncertainty of b	0.080			0.083	
Ordinate intercept a	-1.585			-2.067	
Uncertainty of a	3.019			3.17	
Expanded measured uncertainty W_{CM}	15.25	%		16.06	%
All comparisons					
Uncertainty between Reference	0.62	µg/m³			
Uncertainty between Candidates	0.94	µg/m³			
	SN 6158			SN 6159	
Number of data pairs	208			208	
Slope b	1.032	not significant		1.027	not significant
Uncertainty of b	0.020			0.020	
Ordinate intercept a	-0.182	not significant		0.092	not significant
Uncertainty of a	0.478			0.482	
Expanded measured uncertainty W_{CM}	12.89	%		12.95	%

Equivalence calculation PM_{10}, per, after correction of the axis intercept

Comparison candidate with reference according to Standard EN 16450: 2017					
Candidate	MP101M, PM 10 (Per)		SN	SN 6158 & SN 6159	
			Limit value	50	µg/m³
Status of measured values	Raw data		Allowed uncertainty	25	%
All comparisons					
Uncertainty between Reference	0.62	µg/m³			
Uncertainty between Candidates	0.95	µg/m³			
	SN 6158 & SN 6159				
Number of data pairs	208				
Slope b	1.029	not significant			
Uncertainty of b	0.019				
Ordinate intercept a	0.000	not significant			
Uncertainty of a	0.474				
Expanded measured uncertainty WCM	12.82	%			
All comparisons, ≥30 µg/m³					
Uncertainty between Reference	0.81	µg/m³			
Uncertainty between Candidates	1.14	µg/m³			
	SN 6158 & SN 6159				
Number of data pairs	44				
Slope b	1.047				
Uncertainty of b	0.081				
Ordinate intercept a	-1.649				
Uncertainty of a	3.077				
Expanded measured uncertainty WCM	15.56	%			

Comparison candidate with reference according to Standard EN 16450: 2017					
Candidate	MP101M, PM10 (Per)		SN	SN 6158 & SN 6159	
			Limit value	50	µg/m³
Status of measured values	Raw data		Allowed uncertainty	25	%
Cologne, Winter					
Uncertainty between Reference	0.40	µg/m³			
Uncertainty between Candidates	0.89	µg/m³			
	SN 6158			SN 6159	
Number of data pairs	57			57	
Slope b	0.968			0.936	
Uncertainty of b	0.026			0.024	
Ordinate intercept a	-0.495			0.013	
Uncertainty of a	0.577			0.538	
Expanded measured uncertainty W_{CM}	12.47	%		15.42	%
Bonn, Belderberg					
Uncertainty between Reference	0.94	µg/m³			
Uncertainty between Candidates	0.78	µg/m³			
	SN 6158			SN 6159	
Number of data pairs	40			40	
Slope b	1.033			1.039	
Uncertainty of b	0.029			0.034	
Ordinate intercept a	1.271			1.302	
Uncertainty of a	0.753			0.876	
Expanded measured uncertainty W_{CM}	13.26	%		14.87	%
Bulk good handling, Sommer					
Uncertainty between Reference	0.60	µg/m³			
Uncertainty between Candidates	1.20	µg/m³			
	SN 6158			SN 6159	
Number of data pairs	66			66	
Slope b	1.116			1.109	
Uncertainty of b	0.045			0.036	
Ordinate intercept a	-0.839			-0.052	
Uncertainty of a	1.116			0.894	
Expanded measured uncertainty W_{CM}	23.21	%		23.71	%
Bulk good handling, Winter					
Uncertainty between Reference	0.50	µg/m³			
Uncertainty between Candidates	0.67	µg/m³			
	SN 6158			SN 6159	
Number of data pairs	45			45	
Slope b	0.930			0.918	
Uncertainty of b	0.034			0.033	
Ordinate intercept a	1.090			1.046	
Uncertainty of a	0.858			0.841	
Expanded measured uncertainty W_{CM}	13.96	%		15.66	%
All comparisons, ≥30 µg/m³					
Uncertainty between Reference	0.81	µg/m³			
Uncertainty between Candidates	1.14	µg/m³			
	SN 6158			SN 6159	
Number of data pairs	44			44	
Slope b	1.048			1.062	
Uncertainty of b	0.081			0.085	
Ordinate intercept a	-1.653			-2.244	
Uncertainty of a	3.064			3.24	
Expanded measured uncertainty W_{CM}	15.54	%		16.53	%
All comparisons					
Uncertainty between Reference	0.62	µg/m³			
Uncertainty between Candidates	0.95	µg/m³			
	SN 6158			SN 6159	
Number of data pairs	208			208	
Slope b	1.034	not significant		1.028	not significant
Uncertainty of b	0.020			0.020	
Ordinate intercept a	-0.175	not significant		0.082	not significant
Uncertainty of a	0.483			0.488	
Expanded measured uncertainty W_{CM}	13.14	%		13.23	%