

CERTIFICATE

of Product Conformity (QAL1)

Certificate No.: 0000039317_02

AMS designation: APDA-371 with PM₁₀ pre-separator for suspended particulate matter PM₁₀

Manufacturer: HORIBA Europe GmbH
Hans-Mess-Str. 6
61440 Oberursel/Ts.
Germany

Test Laboratory: TÜV Rheinland Energy GmbH

**This is to certify that the AMS has been tested
and found to comply with:**
VDI 4202-1 (2010); VDI 4203-3 (2010), EN 12341 (1998), EN 16450 (2017),
Guide to the Demonstration of Equivalence of Ambient Air Monitoring Methods (2010)
EN 15267-1 (2009) and EN 15267-2 (2009).

Certification is awarded in respect of the conditions stated in this certificate
(this certificate contains 9 pages).

The present certificate replaces certificate 0000039317_01 of 22 July 2018.



Suitability Tested
Equivalent to
2008/50/EC
EN 15267
Regular Surveillance


www.tuv.com
ID 0000039317

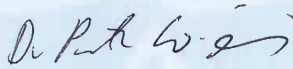
Publication in the German Federal Gazette
(BAnz) of 24 March 2020

This certificate will expire on:
23 March 2025

German Federal Environment Agency
Dessau, 04 June 2020

TÜV Rheinland Energy GmbH
Cologne, 03 June 2020


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51105 Köln

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 certificate D-PL-11120-02-00.

Test Report:	936/21221789/A dated 19 March 2013 and addendum 936/21246946/A dated 7 September 2019
Initial certification:	23 July 2013
Expiry date:	23 March 2025
Publication:	BAnz AT 24.03.2020 B7, chapter IV notification 50

Approved application

The certified AMS is suitable for continuous ambient air monitoring of suspended particulate matter, PM₁₀ (stationary operation).

The suitability of the AMS for this application was assessed on the basis of a laboratory test and field tests (initial testing) at three different locations and/or periods as well as equivalence assessments taking into account seven different locations/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, in consultation with the manufacturer, that this AMS is suitable for monitoring the AMS readings relevant to the application.

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

Basis of the certification

This certification is based on:

- Test report no. 936/21221789/A dated 19 March 2013 and addendum 936/21246946/A dated 7 September 2019 issued by TÜV Rheinland Energie und Umwelt GmbH and TÜV Rheinland Energy GmbH respectively.
- 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 23.07.2013 B4, chapter III number 3.1, UBA announcement dated 3 July 2013:

AMS designation: APDA-371 with PM₁₀ pre-separator

Manufacturer: HORIBA Europe GmbH, Oberursel

Field of application:

For continuous ambient air monitoring of suspended particulate matter, PM₁₀ (stationary operation)

Measuring ranges during performance testing:

Component	Certification range	Unit
PM ₁₀	0–1000	µg/m ³

Software version: Version 3236-07 5.1.1

Restrictions: None

Notes:

1. For monitoring PM₁₀, the instrument must be fitted with the following options at least: Sample heater (BX-830), sampling inlet (BX-802) and ambient temperature sensor (BX-592) or combined pressure and temperature sensor (BX-596).
2. The heater may only be used in the manner it was used during performance testing.
3. Flow control must be related to operational flow considering ambient conditions (operating mode: ACTUAL).
4. During the performance test, the cycle time was 1 h, i.e. the filter was automatically changed once an hour. Every filter spot was sampled only once.
5. The measuring system must be operated inside a lockable measurement container.
6. The measuring system must be calibrated on site at regular intervals by using the gravimetric PM₁₀ reference method according to EN 12341.
7. The measuring system may also be operated with the BX-125 pump (optional).
8. Since January 2012, the measuring system has been distributed with a re-engineered rear plate which accommodates additional interfaces such as the optional BX-965 reporting processor.
9. The measuring system complies with the requirements of standard EN 12341 and the guide to the "Demonstration of Equivalence of Ambient Air Monitoring Methods" in its January 2010 version. Furthermore, the manufacturing process and the quality management for the APDA-371 measuring system meet the requirements of EN 15267.
10. The instrument was first publically announced by the Federal Environment Agency on 25 January 2010 (BAnz. p. 552, chapter IV, 11th notification). Most recently, the Federal Environment Agency made an announcement regarding the instrument on 6 July 2012 (BAnz AT 20.07.2012 B11, chapter IV 3rd notification).
11. Test report no. 936/21221789/A is available online at www.qal1.de.

Test Report:

TÜV Rheinland Energie und Umwelt GmbH, Cologne
Report no.: 936/21221789/A dated 19 March 2013

Publication in the German Federal Gazette: BAnz AT 02.04.2015 B5, chapter IV notification 9,
UBA announcement dated 25 February 2015:

9 Notification as regards Federal Environment Agency (UBA) notice of 3 July 2013 (BAnz AT 23.07.2013 B4, chapter III number 3.1)

The 970603 pressure sensor (MICROSWITCH #185PC15AT) of the APDA-371 measuring system with PM₁₀ pre-separator manufactured by HORIBA Europe GmbH, is no longer produced and has been replaced by the 970595 pressure sensor (HONEYWELL SSCDANN015PAAA5).

Statement issued by TÜV Rheinland Energie und Umwelt GmbH dated 20 September 2014

Publication in the German Federal Gazette: BAnz AT 26.08.2015 B4, chapter V notification 42,
UBA announcement dated 22 July 2015:

42 Notification as regards Federal Environment Agency (UBA) notices of 3 July 2013 (BAnz AT 23.07.2013 B4, chapter III number 3.1) and of 25 February 2015 (BAnz AT 02.04.2015 B5, chapter IV 9th notification)

The APDA-371 air quality monitor with PM₁₀ pre-separator manufactured by HORIBA Europe GmbH may also be operated with the BECKER VT 4.4 vacuum pump.

Statement issued by TÜV Rheinland Energie und Umwelt GmbH dated 23 March 2015

Publication in the German Federal Gazette: BAnz AT 31.07.2017 B12, chapter II notification 33,
UBA announcement dated 13 July 2017:

33 Notification as regards Federal Environment Agency (UBA) notices of 3 July 2013 (BAnz AT 23.07.2013 B4, chapter III number 3.1) and of 22 July 2015 (BAnz AT 26.08.2015 B4, chapter V 42nd notification)

The current software version of the APDA-371 air quality monitor with PM₁₀ pre-separator for suspended particulate matter, PM₁₀ fraction, manufactured by HORIBA Europe GmbH is:
3236-7 V 5.5.0.

Statement issued by TÜV Rheinland Energy GmbH dated 8 March 2017

Publication in the German Federal Gazette: BAnz AT 24.03.2020 B7, chapter IV notification 51,
UBA announcement dated 24 February 2020:

51 Notification as regards Federal Environment Agency (UBA) notices of 3 July 2013 (BAnz AT 23.07.2013 B4, chapter III number 3.1) and of 13 July 2017 (BAnz AT 31.07.2017 B12, chapter II 33rd notification)

The APDA-371 measuring system with PM₁₀ pre-separator for suspended particulate matter, PM₁₀ fraction, manufactured by HORIBA Europe GmbH satisfies the requirements defined in standard EN 16450. An addendum to test report No. 936/21221789/A is available online at www.qal1.de.

The current software version is: 3236-05 3.14.3

Statement issued by TÜV Rheinland Energy GmbH dated 6 December 2019

Certified product

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

With the exception of a modified front design, the APDA-371 measuring system with PM₁₀ pre-separator exactly corresponds to the BAM-1020 developed and entirely manufactured by Met One Instruments, Inc.

The APDA-371 measuring system with PM₁₀-pre-separator consists of the PM₁₀-sampling inlet BX-802, the sampling tube, the sample heater BX-830, the ambient temperature sensor BX-592 (incl. radiation protection shield) or the combined pressure and temperature sensor BX-596, the vacuum pump BX-127 or optionally the BX-125, the measuring instrument APDA-371 (incl. glass-fibre filter tape), the respective connecting tubes and lines as well as adapters, the roof flange as well as the manual in German.

The measuring system uses beta-attenuation as a measurement principle.

The particle sample passes the PM₁₀-sampling inlet at a flow rate of 1 m³/h and reaches the APDA-371 analyser via the sampling tube.

During performance testing, the measuring system was operated with the BX-830 sample heater.

Particles arrive at the measuring instrument and will be separated by the glass fibre filter tape.

During the performance test, the cycle time was set to 60 min, radiometric measurement taking 4 min.

Thus, the cycle time consists of 2 x 4 min for the radiometric measurement (I₀ & I₃) as well as approximately 1–2 min for filter tape movements. Consequently, the effective sampling time is around 50 min.

Furthermore, the measuring system allows an extension of the measuring time to 6 or 8 min in order to increase the precision of the radiometric measurement. Effective sampling time in that case decreases to 46 or 42 min.

The radiometric determination of mass is calibrated in the factory and is checked hourly during operation as part of internal quality assurance at the zero point (clean filter spot) and at the span point (built-in reference foil). Measured values at zero and span points are easily derived from the data generated. These can then be compared to stability criteria (drift) or target values for span (factory settings).

General remarks

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 manufacturing process for 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 document as well as the certification mark remains property of TÜV Rheinland Energy GmbH. Upon revocation of the publication the certificate loses its validity. After the expiration of the certificate and on request of TÜV Rheinland Energy GmbH this document shall be returned and the certificate mark must no longer be used.

The relevant version of this certificate and its expiration date are also accessible on the internet at qal1.de.

Document history

Certification of the APDA-371 with PM₁₀ pre-separator is based on the documents listed below and the regular, continuous surveillance of the manufacturer's quality management system:

Notifications

Statement issued by TÜV Rheinland Immissionsschutz und Energiesysteme GmbH dated 30 March 2009

Publication: 25 August 2009, no. 125, p. 2929, chapter III notification 6

UBA announcement dated 3 August 2009
(Design and software changes)

Statement issued by TÜV Rheinland Immissionsschutz und Energiesysteme GmbH dated 9 October 2009

Publication: BAnz. 12 February 2010 no. 24, p. 553, chapter IV notification 11

UBA announcement dated 25 January 2010:
(OEM: BAM1020 as APDA371)

Statement issued by TÜV Rheinland Immissionsschutz und Energiesysteme GmbH dated 10 May 2010

Publication: BAnz. 28 July 2010, no. 111, p. 2597, chapter III notification 8

UBA announcement dated 12 July 2010
(AMS designation changed)

Statement issued by TÜV Rheinland Energie und Umwelt GmbH dated 22 March 2012

Publication: BAnz AT 20.07.2012 B11, chapter IV notification 3

UBA announcement dated 6 July 2012
(Various changes)

Initial certification according to EN 15267

Certificate no.0000039317_00: 20 August 2013
Expiry date: 22 July 2018

Test Report: 936/21221789/A dated 19 March 2013
TÜV Rheinland Energie und Umwelt GmbH
Publication: BAnz AT 23.07.2013 B4, chapter III number 3.1
UBA announcement dated 3 July 2013

Notifications

Statement issued by TÜV Rheinland Energie und Umwelt GmbH dated 20 September 2014
Publication: BAnz AT 02.04.2015 B5, chapter IV notification 9
UBA announcement dated 25 February 2015
(Design changes)

Statement issued by TÜV Rheinland Energie und Umwelt GmbH dated 23 March 2015
Publication: BAnz AT 26.08.2015 B4, chapter V notification 42
UBA announcement dated 22 July 2015
(Design changes)

Statement issued by TÜV Rheinland Energy GmbH dated 8 March 2017
Publication: BAnz AT 31.07.2017 B12, chapter II notification 33
UBA announcement dated 13 July 2017
(software updates)

Renewal of the certificate

Certificate no.0000039317_01: 22 July 2018
Expiry date: 22 July 2023

Certificate based on a notification

Certificate no. 0000039317_02: 04 June 2020
Expiry date of the certificate: 23 March 2025
Test report: 936/21221789/A dated 19 March 2013 and addendum 936/21246946/A dated 7 September 2019
TÜV Rheinland Energy GmbH, Cologne
Publication: BAnz AT 24.03.2020 B7, chapter IV notification 50
UBA announcement dated 24 February 2020

Comparison candidate with reference according to Standard EN 16450:2017			
Candidate	APDA-371	SN	SN 4924 / Ö1 / J7860 / SN 17022 & SN 4925 / Ö2 / J7863 / SN 17011
Status of measured values	Slope and offset corrected	Limit value	50 $\mu\text{g}/\text{m}^3$
		Allowed uncertainty	25 %
All comparisons			
Uncertainty between Reference	0.67	$\mu\text{g}/\text{m}^3$	
Uncertainty between Candidates	1.18	$\mu\text{g}/\text{m}^3$	
	SN 4924 / Ö1 / J7860 / SN 17022 & SN 4925 / Ö2 / J7863 / SN 17011		
Number of data pairs	320		
Slope b	1.000	not significant	
Uncertainty of b	0.008		
Ordinate intercept a	0.009	not significant	
Uncertainty of a	0.280		
Expanded measured uncertainty WCM	12.27	%	
All comparisons, $\geq 30 \mu\text{g}/\text{m}^3$			
Uncertainty between Reference	0.91	$\mu\text{g}/\text{m}^3$	
Uncertainty between Candidates	1.44	$\mu\text{g}/\text{m}^3$	
	SN 4924 / Ö1 / J7860 / SN 17022 & SN 4925 / Ö2 / J7863 / SN 17011		
Number of data pairs	105		
Slope b	1.007		
Uncertainty of b	0.017		
Ordinate intercept a	-0.652		
Uncertainty of a	0.997		
Expanded measured uncertainty WCM	15.09	%	
All comparisons, $< 30 \mu\text{g}/\text{m}^3$			
Uncertainty between Reference	0.53	$\mu\text{g}/\text{m}^3$	
Uncertainty between Candidates	1.06	$\mu\text{g}/\text{m}^3$	
	SN 4924 / Ö1 / J7860 / SN 17022 & SN 4925 / Ö2 / J7863 / SN 17011		
Number of data pairs	215		
Slope b	1.079		
Uncertainty of b	0.031		
Ordinate intercept a	-1.187		
Uncertainty of a	0.538		
Expanded measured uncertainty WCM	15.57	%	

Comparison candidate with reference according to Standard EN 16450:2017				
Candidate	APDA-371	SN	SN 4924 / Ö1 / J7860 / SN 17022 & SN 4925 / Ö2 / J7863 / SN 17011	µg/m³
Status of measured values	Slope and offset corrected	Limit value	50	%
Allowed uncertainty				
25				
Cologne, parking lot				
Uncertainty between Reference	0.55	µg/m³		
Uncertainty between Candidates	1.18	µg/m³		
	SN 4924		SN 4925	
Number of data pairs	29		29	
Slope b	0.917		0.957	
Uncertainty of b	0.035		0.032	
Ordinate intercept a	1.329		1.789	
Uncertainty of a	0.919		0.834	
Expanded measured uncertainty W _{CM}	15.13	%	9.18	%
Titz-Rödingen				
Uncertainty between Reference	0.65	µg/m³		
Uncertainty between Candidates	0.83	µg/m³		
	SN 4924		SN 4925	
Number of data pairs	37		37	
Slope b	1.023		1.021	
Uncertainty of b	0.034		0.034	
Ordinate intercept a	-0.438		0.417	
Uncertainty of a	0.756		0.760	
Expanded measured uncertainty W _{CM}	7.56	%	9.10	%
Cologne, Frankf. Str.				
Uncertainty between Reference	1.02	µg/m³		
Uncertainty between Candidates	0.96	µg/m³		
	SN 4924		SN 4925	
Number of data pairs	28		28	
Slope b	0.990		0.988	
Uncertainty of b	0.037		0.034	
Ordinate intercept a	-2.050		-0.951	
Uncertainty of a	1.048		0.962	
Expanded measured uncertainty W _{CM}	13.19	%	9.97	%
Steyregg				
Uncertainty between Reference	0.53	µg/m³		
Uncertainty between Candidates	0.73	µg/m³		
	Ö1		Ö2	
Number of data pairs	45		45	
Slope b	1.012		0.997	
Uncertainty of b	0.065		0.069	
Ordinate intercept a	-2.439		-2.347	
Uncertainty of a	1.347		1.441	
Expanded measured uncertainty W _{CM}	11.58	%	13.77	%
Graz				
Uncertainty between Reference	0.81	µg/m³		
Uncertainty between Candidates	1.90	µg/m³		
	Ö1		Ö2	
Number of data pairs	45		45	
Slope b	0.991		0.998	
Uncertainty of b	0.027		0.028	
Ordinate intercept a	-0.979		1.105	
Uncertainty of a	1.787		1.898	
Expanded measured uncertainty W _{CM}	20.77	%	21.63	%
Tusimice				
Uncertainty between Reference	0.95	µg/m³		
Uncertainty between Candidates	1.15	µg/m³		
	J7860		J7863	
Number of data pairs	97		96	
Slope b	0.966		1.001	
Uncertainty of b	0.012		0.012	
Ordinate intercept a	2.809		1.160	
Uncertainty of a	0.476		0.446	
Expanded measured uncertainty W _{CM}	11.73	%	11.08	%
Teddington				
Uncertainty between Reference	0.25	µg/m³		
Uncertainty between Candidates	0.97	µg/m³		
	SN 17022		SN 17011	
Number of data pairs	40		40	
Slope b	1.073		1.123	
Uncertainty of b	0.033		0.041	
Ordinate intercept a	-0.856		-1.544	
Uncertainty of a	0.473		0.583	
Expanded measured uncertainty W _{CM}	12.31	%	19.52	%
All comparisons, ≥30 µg/m³				
Uncertainty between Reference	0.91	µg/m³		
Uncertainty between Candidates	1.44	µg/m³		
	SN 4924 / Ö1 / J7860 / SN 17022		SN 4925 / Ö2 / J7863 / SN 17011	
Number of data pairs	67		67	
Slope b	1.001		1.032	
Uncertainty of b	0.021		0.022	
Ordinate intercept a	-1.821		-1.648	
Uncertainty of a	1.266		1.34	
Expanded measured uncertainty W _{CM}	17.71	%	17.26	%
All comparisons, <30 µg/m³				
Uncertainty between Reference	0.53	µg/m³		
Uncertainty between Candidates	1.06	µg/m³		
	SN 4924 / Ö1 / J7860 / SN 17022		SN 4925 / Ö2 / J7863 / SN 17011	
Number of data pairs	157		157	
Slope b	1.006		1.055	
Uncertainty of b	0.035		0.039	
Ordinate intercept a	-0.892		-1.223	
Uncertainty of a	0.605		0.675	
Expanded measured uncertainty W _{CM}	9.99	%	12.48	%
All comparisons				
Uncertainty between Reference	0.67	µg/m³		
Uncertainty between Candidates	1.18	µg/m³		
	SN 4924 / Ö1 / J7860 / SN 17022		SN 4925 / Ö2 / J7863 / SN 17011	
Number of data pairs	224		224	
Slope b	0.985	not significant	1.019	significant
Uncertainty of b	0.009		0.010	
Ordinate intercept a	-0.655	significant	-0.729	significant
Uncertainty of a	0.319		0.346	
Expanded measured uncertainty W _{CM}	13.17	%	12.96	%