

# CERTIFICATE

## of Product Conformity (QAL1)

Certificate No.: 0000028754\_04

**AMS designation:** APMA 370 for CO

**Manufacturer:** HORIBA, Ltd.  
2 Miyanohigashi  
Kisshoin Minami-ku  
Kyoto 610-8510  
Japan

**Test Laboratory:** TÜV Rheinland Energy GmbH

This is to certify that the AMS has been tested  
and found to comply with:  
VDI 4202-1 (2002), VDI 4203-3 (2004), EN 14626 (2012),  
EN 15267-1 (2009) and EN 15267-2 (2009).

Certification is awarded in respect of the conditions stated in this certificate  
(this certificate contains 12 pages).  
The present certificate replaces certificate 0000028754\_03 of 21 January 2016.



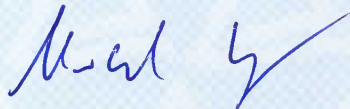
Suitability Tested  
Equivalent to  
2008/50/EC  
EN 15267  
Regular Surveillance  
[www.tuv.com](http://www.tuv.com)  
ID 0000028754

Publication in the German Federal Gazette  
(BAnz) of 08 April 2006

This certificate will expire on:  
25 January 2026

German Federal Environment Agency  
Dessau, 25 January 2021

TÜV Rheinland Energy GmbH  
Cologne, 24 January 2021



Dr. Marcel Langner  
Head of Section II 4.1



ppa. Dr. Peter Wilbring

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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 certificate D-PL-11120-02-00.

<b>Test Report:</b>	936/21204643/B dated 05 January 2006
<b>Initial certification:</b>	26 January 2011
<b>Expiry date:</b>	25 January 2026
<b>Certificate:</b>	Renewal (of previous certificate 0000028754_03 dated 21 January 2016 valid until 25 January 2021)
<b>Publication:</b>	BAnz. 8 April 2006, no. 70, p. 2653, chapter IV number 2.1

### **Approved application**

The certified AMS is suitable for continuous ambient air monitoring of CO (stationary operation).

The suitability of the AMS for this application was assessed on the basis of a laboratory test and a three-months field test.

The AMS is approved for an ambient temperature range of 0 °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 limit values 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. 936/21204643/B dated 05 January 2006 issued by TÜV Rheinland Immissionschutz und Energiesysteme GmbH
- Addenda 936/21204643/B1 dated 27 July 2011 and 936/21222689/B dated 5 October 2013
- 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. 8 April 2006, no. 70, p. 2653, chapter IV number 2.1, UBA announcement dated 21 February 2006:

**AMS designation:**

APMA 370

**Manufacturer:**

HORIBA Ltd., Kyoto 610 - 8510, Japan

**Distribution:**

HORIBA Europe GmbH, 42799 Leichlingen

**Field of application:**

For continuous ambient air monitoring of CO (stationary operation)

**Measuring range during performance testing:**

CO 0–60 mg/m<sup>3</sup>  
0–100 mg/m<sup>3</sup>

**Software:**

Version P1000878001C

**Test Laboratory:**

TÜV Immissionsschutz und Energiesysteme GmbH, Cologne  
TÜV Rheinland Group

**Test Report:**

Report no. 936/21204643/B dated 5 January 2006

Publication in the German Federal Gazette: BAnz. 25 August 2009, no. 125, p. 2929, chapter III notification 1, UBA announcement dated 03 August 2009:

**1 Notification as regards Federal Environment Agency notice of 21 February 2006 (BAnz. p. 2655)**

The latest software version of the APMA 370 ambient air measuring system manufactured by Horiba Europe GmbH is:

P1000878001J

The type GD-6 EH sample gas pump manufactured by Horiba may be used instead of the N 86 KNE sample gas pump manufactured by KNF.

Statement issued by TÜV Rheinland Immissionsschutz und Energiesysteme GmbH dated 31 March 2009

Publication in the German Federal Gazette: BAnz. 26 January 2011, No. 14, p. 294, chapter IV notification 5, UBA announcement dated 10 January 2011:

**5 Notification as regards Federal Environment Agency (UBA) notices of 21 February 2006 (BAnz. p. 2653, chapter IV number 2.1) and of 3 August 2009 (BAnz. p. 2929, chapter III 1<sup>st</sup> notification)**

The APMA 370 measuring system for CO manufactured by Horiba Ltd, Japan, and Horiba Europe GmbH meets the requirements defined in standard EN 14626. Furthermore, the manufacturing process and the quality management for the APMA 370 measuring system meet the requirements of EN 15267. The performance test report is available online at [www.qal1.de](http://www.qal1.de).

Statement issued by TÜV Rheinland Energie und Umwelt GmbH dated 6 October 2010

Publication in the German Federal Gazette: BAnz. 2 March 2012, no. 36, p. 920, chapter V notification 16, UBA announcement dated 23 February 2012:

**16 Notification as regards Federal Environment Agency (UBA) notices of 21 February 2006 (p. 2653, chapter IV number 2.1) and of 10 January 2011 (BAnz. p. 294, chapter IV 5<sup>th</sup> notification)**

There is an addendum to test report no. 936/21204643/B for the APMA 370 measuring system for CO manufactured by Horiba, Ltd., Japan and Horiba Europe GmbH. The addendum is assigned report no. 936/21204643/B1 and after its publication is an integral part of the test report no. 936/21204643/B and is also available online at [www.qal1.de](http://www.qal1.de).

Statement issued by TÜV Rheinland Energie und Umwelt GmbH dated 3 November 2011

Publication in the German Federal Gazette: BAnz AT 05.03.2013 B10, chapter V notification 7, UBA announcement dated 12 February 2013:

**7 Notification as regards Federal Environment Agency (UBA) notices of 21 February 2006 (p. 2653, chapter IV number 2.1) and of 23 February 2012 (BAnz. p. 920, chapter V 16<sup>th</sup> notification)**

The APMA 370 measuring system for CO manufactured by Horiba Ltd, Japan, and Horiba Europe GmbH may optionally be equipped with an additional calibration port. Calibration gas may be fed upstream or downstream of the sample gas filter using a three-way valve.

Statement issued by TÜV Rheinland Energie und Umwelt GmbH dated 11 October 2012

Publication in the German Federal Gazette: BAnz AT 01.04.2014 B12, chapter VI notification 26, UBA announcement dated 27 February 2014:

**26 Notification as regards Federal Environment Agency (UBA) notices of 21 February 2006 (p. 2653, chapter IV number 2.1) and of 12 February 2013 (BAnz AT 05.03.2013 B10, chapter V 7<sup>th</sup> notification)**

The APMA 370 measuring system for CO manufactured by Horiba Ltd, Japan, and Horiba Europe GmbH meets the requirements defined in standard EN 14626 (December 2012 version). An addendum as integral part of test report no. 936/21222689/B is available online at [www.qal1.de](http://www.qal1.de).

Statement issued by TÜV Rheinland Energie und Umwelt GmbH dated 5 October 2013

Publication in the German Federal Gazette: BAnz AT 01.08.2016 B11, chapter V notification 30, UBA announcement dated 14 July 2016:

**30 Notification as regards Federal Environment Agency (UBA) notices of 21 February 2006 (p. 2653, chapter IV number 2.1) and of 27 February 2014 (BAnz AT 01.04.2014 B12, chapter VI 26<sup>th</sup> notification)**

The APMA-370 measuring system for CO manufactured by HORIBA Ltd. is equipped with a new display which, in design and functionality, largely corresponds to its predecessor. In addition, the power supply ZWS-BAF may also be used. The current software version of the measuring system is:  
P1000878001K

Statement issued by TÜV Rheinland Energie und Umwelt GmbH dated 29 February 2016.

Publication in the German Federal Gazette: BAnz AT 22.07.2019 B8, chapter V notification 9, UBA announcement dated 28 June 2019:

**9 Notification as regards Federal Environment Agency (UBA) notices of 21 February 2006 (BAnz. p. 2653, chapter IV number 2.1) and of 14 July 2016 (BAnz AT 01.08.2016 B11, chapter V 30<sup>th</sup> notification)**

The latest software version of the APMA-370 measuring system for CO manufactured by HORIBA Ltd. is:

P1000878001L

The rear of the housing was modified to cater for additional cable connections.

Statement issued by TÜV Rheinland Energy GmbH dated 5 March 2019

Publication in the German Federal Gazette: BAnz AT 24.03.2020 B7, chapter IV notification 53,  
UBA announcement dated 24 February 2020:

**53 Notification as regards Federal Environment Agency (UBA) notices of 21 February 2006 (p. 2653, chapter IV number 2.1) and of 28 June 2019 (BAnz AT 22.07.2019 B8, chapter V 9<sup>th</sup> notification)**

The latest software version of the APMA-370 measuring system for CO manufactured by HORIBA Ltd. is:

P1000878001M

Statement issued by TÜV Rheinland Energy GmbH dated 20 September 2019

**Certified product**

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

The APMA 370 CO-Analyser operates based on the principle of non-dispersal infrared absorption.

The measuring principle complies with the reference measuring method described in section 5.2 of Standard EN 14626 (2012). The attenuation of infrared light is measured after passing through the test cuvette. According to Lambert-Beer law, attenuation is a measure of the concentration of CO within the cuvette.

The APMA-370 measuring system uses the modulation effect of infrared absorption within the test gas itself if zero and test gas are led to the measuring cell at specific flow rates. The switch is made via a solenoid valve which is clocked at a frequency of 1 Hz. As long as the concentration of the measured component within the cell does not change, the output of the detector is practically zero. Thus, no zero drift occurs.

### 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 [gal1.de](http://gal1.de).

### Document history

Certification of the APMA 370 measuring system is based on the documents listed below and the regular, continuous surveillance of the manufacturer's quality management system:

### Basic testing

Test Report: 936/21204643/B dated 05 January 2006  
TÜV Rheinland Immissionsschutz und Energiesysteme GmbH, Cologne  
Publication: BAnz. 8 April 2006, no. 70, p. 2653, chapter IV number 2.1  
UBA announcement dated 21 February 2006

### Notifications

Statement issued by TÜV Rheinland Immissionsschutz und Energiesysteme GmbH dated 31 March 2009  
Publication: 25 August 2009, no. 125, p. 2929, chapter III notification 1  
UBA announcement dated 03 August 2009  
(Changes to software and hardware extension)

### Initial certification according to EN 15267

Certificate no. 0000028754: 09 February 2011  
Expiry date of the certificate: 25 January 2016  
Test report 936/21204643/B dated 05 January 2006  
TÜV Rheinland Immissionsschutz und Energiesysteme GmbH, Cologne  
Statement issued by TÜV Rheinland Energie und Umwelt GmbH dated 6 October 2010  
Publication: BAnz. 26 January 2011, No. 14, p. 294, chapter IV notification 5  
UBA announcement dated 10 January 2011

**Notifications in accordance with EN 15267**

Certificate no. 0000028754\_01: 16 March 2012  
Expiry date of the certificate: 25 January 2016  
Statement issued by TÜV Rheinland Energie und Umwelt GmbH dated 3 November 2011  
and Addendum no. 936/21204643/B1 dated 27 July 2011  
Publication: BAnz. 2 March 2012, no. 36, p. 920, chapter V notification 16  
UBA announcement dated 23 February 2012  
(Supplemented by an addendum)

Statement issued by TÜV Rheinland Energie und Umwelt GmbH dated 11 October 2012  
Publication: BAnz AT 05.03.2013 B10, chapter V notification 7  
UBA announcement dated 12 February 2013  
(Additional hardware)

Certificate no. 0000028754\_02: 29 April 2014  
Expiry date of the certificate: 25 January 2016  
Statement issued by TÜV Rheinland Energie und Umwelt GmbH dated 5 October 2013  
and Addendum No. 936/21222689/B dated 05 October 2013  
Publication: BAnz AT 01.04.2014 B12, chapter VI notification 26  
UBA announcement dated 27 February 2014  
(EN 14626 (2012))

**Renewal of the certificate**

Certificate no. 0000028754\_03: 21 January 2016  
Expiry date of the certificate: 25 January 2021

**Notifications in accordance with EN 15267**

Statement issued by TÜV Rheinland Energie und Umwelt GmbH dated 29 February 2016  
Publication: BAnz AT 01.08.2016 B11, chapter V notification 30  
UBA announcement dated 14 July 2016  
(Changes to the display)

Statement issued by TÜV Rheinland Energie und Umwelt GmbH dated 5 March 2019  
Publication: BAnz AT 22.07.2019 B8, chapter V notification 9  
UBA announcement dated 5 March 2019  
(software updates)

Statement issued by TÜV Rheinland Energie und Umwelt GmbH dated 20 September 2019  
Publication: BAnz AT 24.03.2020 B7, chapter IV notification 53  
UBA announcement dated 24 February 2020  
(software updates)

**Renewal of the certificate**

Certificate no. 0000028754\_04: 25 January 2021  
Expiry date of the certificate: 25 January 2026



Expanded uncertainty from the results obtained in the laboratory tests for analyser 1

Measuring device:		Serial-No.:		SN 10031	
Horiba APMA 370		8h-limit value:		8.62	
Measured component:				µmol/mol	
CO					
No.	Performance characteristic	Performance criterion	Result	Partial uncertainty	Square of partial uncertainty
1	Repeatability standard deviation at zero	≤ 0.3 µmol/mol	0.035	u <sub>r,z</sub>	0.0001
2	Repeatability standard deviation at 8h-limit value	≤ 0.4 µmol/mol	0.064	u <sub>r</sub>	0.0000
3	"lack of fit" at 8h-limit value	≤ 4.0% of measured value	0.700	u <sub>f</sub>	0.0012
4	Sensitivity coefficient of sample gas pressure at 8h-limit value	≤ 0.7 µmol/mol/kPa	0.006	u <sub>gp</sub>	0.0002
5	Sensitivity coefficient of sample gas temperature at 8h-limit value	≤ 0.3 µmol/mol/K	0.005	u <sub>gt</sub>	0.0002
6	Sensitivity coefficient of surrounding temperature at 8h-limit value	≤ 0.3 µmol/mol/K	0.077	u <sub>st</sub>	0.0398
7	Sensitivity coefficient of electrical voltage at 8h-limit value	≤ 0.3 µmol/mol/V	0.006	u <sub>v</sub>	0.0030
8a	Interferent H <sub>2</sub> O with 21 mmol/mol	≤ 1.0 µmol/mol (Zero)	0.233	u <sub>H2O</sub>	0.0003
8b	Interferent CO <sub>2</sub> with 500 µmol/mol	≤ 1.0 µmol/mol (Span)	-0.009	u <sub>int,pos</sub>	
8c	Interferent NO with 1 µmol/mol	≤ 0.5 µmol/mol (Zero)	0.017		
		≤ 0.5 µmol/mol (Span)	-0.164		
		≤ 0.5 µmol/mol (Zero)	-0.026		
		≤ 0.5 µmol/mol (Span)	-0.353	0.10	0.0105
8d	Interferent N <sub>2</sub> O with 50 mmol/mol	≤ 0.5 µmol/mol (Zero)	0.009	or	
		≤ 0.5 µmol/mol (Span)	-0.164	u <sub>int,neg</sub>	
9	Averaging effect	≤ 7.0% of measured value	1.250	u <sub>av</sub>	0.0039
18	Difference sample/calibration port	≤ 1.0%	0.000	u <sub>sc</sub>	0.0000
21	Uncertainty of test gas	≤ 3.0%	2.000	u <sub>cg</sub>	0.0074
				u <sub>c</sub>	0.2582
				U	0.5165
				W	5.99
				W <sub>req</sub>	15

Expanded uncertainty from the results obtained in the laboratory tests for analyser 2

Measuring device:		Horiba APMA 370		Serial-No.:		SN 10032	
Measured component:		CO		8h-limit value:		8.62	
No.	Performance characteristic	Performance criterion	Result	Partial uncertainty	Square of partial uncertainty	µmol/mol	
1	Repeatability standard deviation at zero	≤ 0.3 µmol/mol	0.028	u <sub>r,z</sub> 0.01	0.0000		
2	Repeatability standard deviation at 8h-limit value	≤ 0.4 µmol/mol	0.070	u <sub>r</sub> 0.00	0.0000		
3	"lack of fit" at 8h-limit value	≤ 4.0% of measured value	0.800	u <sub>l</sub> 0.04	0.0016		
4	Sensitivity coefficient of sample gas pressure at 8h-limit value	≤ 0.7 µmol/mol/kPa	0.009	u <sub>gp</sub> 0.02	0.0005		
5	Sensitivity coefficient of sample gas temperature at 8h-limit value	≤ 0.3 µmol/mol/K	0.004	u <sub>gt</sub> 0.01	0.0001		
6	Sensitivity coefficient of surrounding temperature at 8h-limit value	≤ 0.3 µmol/mol/K	0.067	u <sub>st</sub> 0.17	0.0304		
7	Sensitivity coefficient of electrical voltage at 8h-limit value	≤ 0.3 µmol/mol/V	-0.007	u <sub>v</sub> -0.06	0.0041		
8a	Interferent H <sub>2</sub> O with 21 mmol/mol	≤ 1.0 µmol/mol (Zero)	0.181	u <sub>H2O</sub> 0.01	0.0001		
		≤ 1.0 µmol/mol (Span)	-0.009				
8b	Interferent CO <sub>2</sub> with 500 µmol/mol	≤ 0.5 µmol/mol (Zero)	0.017	u <sub>CO2,pos</sub>			
		≤ 0.5 µmol/mol (Span)	-0.086				
8c	Interferent NO with 1 µmol/mol	≤ 0.5 µmol/mol (Zero)	-0.009	0.01	0.0000		
		≤ 0.5 µmol/mol (Span)	0.017	or			
8d	Interferent N <sub>2</sub> O with 50 nmol/mol	≤ 0.5 µmol/mol (Zero)	0.009	u <sub>NO2,neg</sub>			
		≤ 0.5 µmol/mol (Span)	-0.017				
9	Averaging effect	≤ 7.0% of measured value	-1.100	u <sub>av</sub> -0.05	0.0030		
18	Difference sample/calibration port	≤ 1.0%	0.000	u <sub>asc</sub> 0.00	0.0000		
21	Uncertainty of test gas	≤ 3.0%	2.000	u <sub>cg</sub> 0.09	0.0074		
Combined standard uncertainty						u <sub>c</sub>	0.2176
Expanded uncertainty						U	0.4353
Relative expanded uncertainty						W	5.05
Maximum allowed expanded uncertainty						W <sub>req</sub>	15

Expanded uncertainty from the results obtained in the laboratory and field tests for an-  
alyser 1

Measuring device:		Serial No.:		µmol/mol		
Horiba APMA 370		SN 10031		8.62		
Measured component:		8h-limit value:				
CO						
No.	Performance characteristic	Performance criterion	Result	Partial uncertainty	Square of partial uncertainty	
1	Repeatability standard deviation at zero	≤ 0.3 µmol/mol	0.035	U <sub>r,z</sub> 0.01	0.0001	
2	Repeatability standard deviation at 8h-limit value	≤ 0.4 µmol/mol	0.064	U <sub>r</sub> not considered, as U <sub>r</sub> = 0 < U <sub>r,f</sub>	-	
3	"lack of fit" at 8h-limit value	≤ 4.0% of measured value	0.700	U <sub>i</sub> 0.03	0.0012	
4	Sensitivity coefficient of sample gas pressure at 8h-limit value	≤ 0.7 µmol/mol/kPa	0.006	U <sub>sp</sub> 0.02	0.0002	
5	Sensitivity coefficient of sample gas temperature at 8h-limit value	≤ 0.3 µmol/mol/K	0.005	U <sub>gt</sub> 0.01	0.0002	
6	Sensitivity coefficient of surrounding temperature at 8h-limit value	≤ 0.3 µmol/mol/K	0.077	U <sub>st</sub> 0.20	0.0398	
7	Sensitivity coefficient of electrical voltage at 8h-limit value	≤ 0.3 µmol/mol/V	0.006	U <sub>v</sub> 0.06	0.0030	
8a	Interferent H <sub>2</sub> O with 21 mmol/mol	≤ 1.0 µmol/mol (Zero)	-0.009	U <sub>H2O</sub> 0.02	0.0003	
8b	Interferent CO <sub>2</sub> with 500 µmol/mol	≤ 1.0 µmol/mol (Span)	0.233	U <sub>int,pos</sub>	0.10105	
		≤ 0.5 µmol/mol (Zero)	0.017			
8c	Interferent NO with 1 µmol/mol	≤ 0.5 µmol/mol (Span)	-0.164	or	0.10105	
		≤ -0.026	-0.026			
8d	Interferent N <sub>2</sub> O with 50 mmol/mol	≤ 0.5 µmol/mol (Span)	-0.353	U <sub>int,neg</sub>	0.0039	
		≤ 0.5 µmol/mol (Zero)	0.009			
9	Averaging effect	≤ 7.0% of measured value	1.250	U <sub>av</sub> 0.06	0.0039	
10	Reproducibility standard deviation under field conditions	≤ 5.0% of average over 3 months	3.420	U <sub>r,f</sub> 0.29	0.0869	
11	Long term drift at zero level	≤ 0.5 µmol/mol	-0.172	U <sub>d,t,z</sub> -0.10	0.0099	
12	Long term drift at span level	≤ 5.0% of max. of certification range	-1.750	U <sub>d,t,sh</sub> -0.09	0.0076	
18	Difference sample/calibration port	≤ 1.0%	0.000	U <sub>asc</sub> 0.00	0.0000	
21	Uncertainty of test gas	≤ 3.0%	2.000	U <sub>cg</sub> 0.09	0.0074	
Combined standard uncertainty				U <sub>c</sub>	0.4136	µmol/mol
Expanded uncertainty				U	0.8271	µmol/mol
Relative expanded uncertainty				W	9.60	%
Maximum allowed expanded uncertainty				W <sub>req</sub>	15	%

Expanded uncertainty from the results obtained in the laboratory and field tests for analyser 2

Measuring device:		Serial-No.:		SN 10032		
Measured component:		8h-limit value:		8.62		
Horiba APMA 370		CO		µmol/mol		
No.	Performance characteristic	Performance criterion	Result	Partial uncertainty	Square of partial uncertainty	
1	Repeatability standard deviation at zero	≤ 0.3 µmol/mol	0.028	U <sub>r,z</sub> 0.01	0.0000	
2	Repeatability standard deviation at 8h-limit value	≤ 0.4 µmol/mol	0.070	U <sub>r</sub> not considered, as $u_r = 0 < u_{r,f}$	-	
3	"lack of fit" at 8h-limit value	≤ 4.0% of measured value	0.800	U <sub>i</sub> 0.04	0.0016	
4	Sensitivity coefficient of sample gas pressure at 8h-limit value	≤ 0.7 µmol/mol/kPa	0.009	U <sub>gp</sub> 0.02	0.0005	
5	Sensitivity coefficient of sample gas temperature at 8h-limit value	≤ 0.3 µmol/mol/K	0.004	U <sub>gt</sub> 0.01	0.0001	
6	Sensitivity coefficient of surrounding temperature at 8h-limit value	≤ 0.3 µmol/mol/K	0.067	U <sub>st</sub> 0.17	0.0304	
7	Sensitivity coefficient of electrical voltage at 8h-limit value	≤ 0.3 µmol/mol/V	-0.007	U <sub>v</sub> -0.06	0.0041	
8a	Interferent H <sub>2</sub> O with 21 mmol/mol	≤ 1.0 µmol/mol (Zero)	-0.009	U <sub>H2O</sub> 0.01	0.0001	
8b	Interferent CO <sub>2</sub> with 500 µmol/mol	≤ 1.0 µmol/mol (Span)	0.181			
8c	Interferent NO with 1 µmol/mol	≤ 0.5 µmol/mol (Zero)	0.017	U <sub>int,pos</sub>		
8d	Interferent N <sub>2</sub> O with 50 nmol/mol	≤ 0.5 µmol/mol (Span)	-0.086			
9	Averaging effect	≤ 7.0% of measured value	-1.100	U <sub>av</sub> -0.05	0.0030	
10	Reproducibility standard deviation under field conditions	≤ 5.0% of average over 3 months	3.420	U <sub>r,f</sub> 0.29	0.0869	
11	Long term drift at zero level	≤ 0.5 µmol/mol	-0.164	U <sub>l,z</sub> -0.09	0.0090	
12	Long term drift at span level	≤ 5.0% of max. of certification range	-1.610	U <sub>l,sh</sub> -0.08	0.0064	
18	Difference sample/calibration port	≤ 1.0%	0.000	U <sub>sc</sub> 0.00	0.0000	
21	Uncertainty of test gas	≤ 3.0%	2.000	U <sub>cg</sub> 0.09	0.0074	
Combined standard uncertainty				U <sub>c</sub>	0.3869	µmol/mol
Expanded uncertainty				U	0.7737	µmol/mol
Relative expanded uncertainty				W	8.98	%
Maximum allowed expanded uncertainty				W <sub>req</sub>	15	%