

# CERTIFICATE

## of Product Conformity (QAL1)

Certificate No.: 00000038503\_02

**AMS designation:** 300E / T300 for CO

**Manufacturer:** Teledyne Advanced Pollution Instrumentation  
9480 Carroll Park Drive  
San Diego  
CA 92121-5201  
USA

**Test Laboratory:** TÜV Rheinland Energy GmbH

This is to certify that the AMS has been tested and certified  
according to the standards  
VDI 4202-1 (2002), VDI 4203-3 (2004), EN 14626 (2012),  
EN 15267-1 (2009) and DIN EN 15267-2 (2009).

Certification is awarded in respect of the conditions stated in this certificate  
(this certificate contains 11 pages).

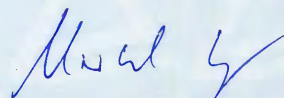


Suitability Tested  
Complying with  
2008/50/EC  
EN 15267  
Regular  
Surveillance

www.tuv.com  
ID 00000038503

Publication in the German Federal Gazette  
(BAnz) of 29 October 2005

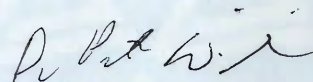
German Federal Environment Agency  
Dessau, 05 March 2018



Dr. Marcel Langner  
Head of Section II 4.1

This certificate will expire on:  
04 March 2023

TÜV Rheinland Energy GmbH  
Cologne, 04 March 2018



ppa. Dr. Peter Wilbring

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TÜV Rheinland Energy GmbH  
Am Grauen Stein  
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 the certificate D-PL-11120-02-00.

<b>Test Report:</b>	936/21207124/B1_DE dated 22 August 2007 Addendum 936/21219874/C dated 31 October 2012 Addendum 936/21221556/C dated 16 March 2013
<b>Initial certification:</b>	05 March 2013
<b>Expiry date:</b>	04 March 2023
<b>Certificate:</b>	Renewal (of previous certificate 00000038503_01 dated 20 August 2013 valid until 04 March 2018)
<b>Publication:</b>	BAnz 29 October 2005, no. 206, p. 15700, chapter IV no. 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 +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 limit values relevant to the application.

Any potential user should ensure, in consultation with the manufacturer, that this AMS is suitable for ambient air applications at which it will be installed.

### Basis of the certification

This certification is based on:

- Test report 936/21207124/B1\_DE dated 22 August 2007 issued by TÜV Rheinland Immissionsschutz und Energiesysteme GmbH, addendum 936/21219874/C dated 31 October 2012 issued by TÜV Rheinland Energie und Umwelt GmbH and addendum 936/21221556/C dated 16 March 2013 issued by TÜV Rheinland Energie und Umwelt 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 29 October 2005, no. 206, p. 15700, chapter IV no. 2.1,  
UBA announcement dated 25 July 2005:

**AMS designation:**

Model 300E for CO

**Manufacturer:**

Teledyne Advanced Pollution Instrumentation, San Diego, USA / EAS GmbH, Brunn, Austria

**Field of application:**

For continuous ambient air monitoring of CO (stationary operation)

**Measuring ranges during performance testing:**

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

**Software:**

Version F.3b

**Test Laboratory:**

TÜV Rheinland Immissionsschutz und Energiesysteme GmbH, Cologne  
TÜV Rheinland Group, Cologne  
Report no.: 936/21201601/B of 10 July 2005

Publication in the German Federal Gazette: BAnz. 20 April 2007, no. 75, p. 4139, chapter IV notification 7,  
UBA announcement dated 12 April 2007:

**7 Notification as regards Federal Environment Agency notice of 25 July 2005 (BAnz p. 15700)**

The model 300E measuring system for carbon monoxide and the model 400E for ozone manufactured by Teledyne Instruments, San Diego, USA, will no longer be distributed by the company named in the announcement, MLU-Monitoring für Leben und Umwelt Ges.m.b.H. in A-2340 Mödling, Austria. In the future, they will be exclusively distributed by EAS Envimet Analytical Systems Ges.m.b.H., Brunn, Austria.

Statement issued by TÜV Rheinland Immissionsschutz und Energiesysteme GmbH, 51105 Cologne, Dr. Peter Wilbring, dated 14 October 2006

Publication in the German Federal Gazette: BAnz. 26 January 2011, no. 14, p. 295, chapter IV notification 23,  
UBA announcement dated 10 January 2011:

**23 Notification as regards Federal Environment Agency notices of 25 July 2005 (BAnz p. 15700, chapter IV no. 2.1) and of 12 April 2007 (BAnz p. 4139, chapter IV, 7<sup>th</sup> notification)**

The current software version of the ambient air measuring system Modell 300E (=M300E) for CO manufactured by Teledyne Advanced Pollution Instrumentation is:

L.8 incl. Library Version 6.3

Statement issued by TÜV Rheinland Energie und Umwelt GmbH dated 29 September 2010

Publication in the German Federal Gazette: BAnz. 26 January 2011, no. 14, p. 295, chapter IV notification 24,  
UBA announcement dated 10 January 2011:

**24 Notification as regards Federal Environment Agency notices of 25 July 2005 (BAnz p. 15700, chapter IV no. 2.1) and of 12 April 2007 (BAnz p. 4139, chapter IV, 7<sup>th</sup> notification)**

The measuring system 300E for CO manufactured by Teledyne Advanced Pollution Instrumentation is manufactured both in its old design M300E and in its new design Model T300. The new design differs from the old design only in that it has a new display, a new front plate and offers extended possibilities for communication.

The current name of the new design of the measuring system is:

Model T300

The current software version of the new design of the measuring system is:

1.0.0 bld 54 incl. Library Version 7.0.0 bld 57

Statement issued by TÜV Rheinland Energie und Umwelt GmbH dated 29 September 2010



Publication in the German Federal Gazette: BAnz AT 05.03.2013 B10, chapter V notification 5,  
UBA announcement dated 12 February 2013:

**5 Notification as regards Federal Environment Agency (UBA) notices of 25 July 2005 (BAnz p. 15700, chapter IV no. 2.1) and of 10 January 2011 (BAnz p. 294, chapter IV, 23<sup>rd</sup> and 24<sup>th</sup> notification)**

The M300E and T300 versions of the measuring system for CO manufactured by Teledyne Advanced Pollution Instrumentation meet the requirements of EN 14626 (Issue July 2005). Furthermore the manufacturing process and the quality management for the M300E and T300 versions of the measuring system for CO meet the requirements of EN 15267.

The test report on performance testing, report no. 936/21207124/B1\_DE, and addendum to the test report, no. 936/21219874/C, which is an integral part of the test report, are available on the internet at [www.qal1.de](http://www.qal1.de).

The current software version of the M300E measuring system is:

M.0 incl. Library Version 6.4

The current software version of the T300 measuring system is:

1.0.4 incl. Library Version 7.0.3

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

Publication in the German Federal Gazette: BAnz AT 23.07.2013 B4, chapter V notification 17,  
UBA announcement dated 03 July 2013:

**17 Notification as regards Federal Environment Agency (UBA) notices of 25 July 2005 (BAnz p. 15700, chapter IV no. 2.1) and of 12 February 2013 (BAnz AT 05.03.2013 B10, chapter V 5<sup>th</sup> notification)**

The M300E and T300 versions of the measuring system for CO manufactured by Teledyne Advanced Pollution Instrumentation meet the requirements of EN 14626 (Issue December 2012). An addendum as integral part of test report no. 936/21221556/C is available online at [www.qal1.de](http://www.qal1.de).

The new designation of the M300E measuring system for CO is 300E.

Statement issued by TÜV Rheinland Energie und Umwelt GmbH dated 16 March 2013

Publication in the German Federal Gazette: BAnz AT 05.08.2014 B11, chapter V notification 18,  
UBA announcement dated 17 July 2014:

**18 Notification as regards Federal Environment Agency (UBA) notices of 25 July 2005 (BAnz p. 15 700, chapter IV no 2.1) and of 3 July 2013 (BAnz AT 23.07.2013 B4, chapter V 17<sup>th</sup> notification)**

The 300E and T300 measuring systems for monitoring CO manufactured by Teledyne Advanced Pollution Instrumentation will be equipped with the PU3060-N811 (115/230V) vacuum pump manufactured by KNF in the future.

Statement issued by TÜV Rheinland Energie und Umwelt GmbH dated 27 March 2014

Publication in the German Federal Gazette: BAnz AT 14.03.2016 B7, chapter V notification 9,  
UBA announcement dated 18 February 2016:

**9 Notification as regards Federal Environment Agency (UBA) notices of 25 July 2005 (BAnz p. 15700, chapter IV no 2.1) and of 17 July 2014 (BAnz AT 05.08.2014 B11, chapter V 18<sup>th</sup> notification)**

The current software versions of the 300E/T300 measuring system for CO manufactured by Teledyne Advanced Pollution Instrumentation are:

Package Version: 1.0.1  
Driver Version: 1.0.6

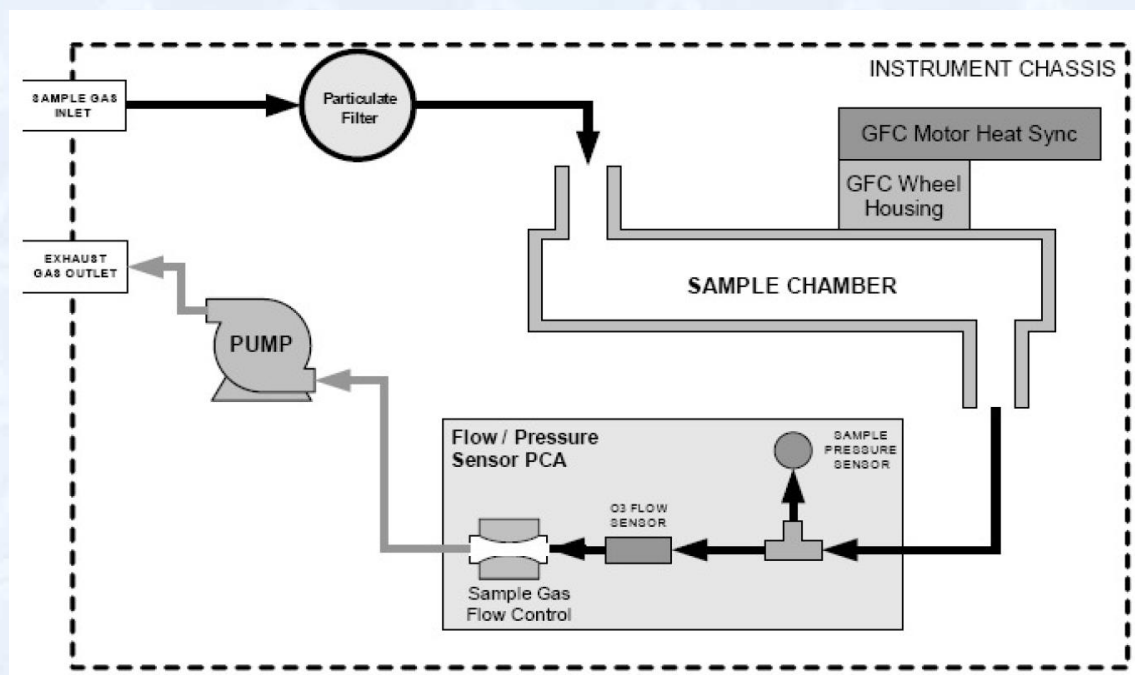
Statement issued by TÜV Rheinland Energie und Umwelt GmbH dated 19 October 2015

### Certified product

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

To measure CO concentrations, the 300E and T300 versions of the measuring system rely on the determination of IR light absorbed by the gas to be measured in the range of wavelength which is characteristic for that gas. This corresponds to the reference method described in standard EN 14626.

The schematic set-up / flow diagram of the 300E and T300 versions of the measuring system is as follows:



The current software version is:      Package version:      1.0.1  
    Driver Version:      1.0.6

The current manual version is:      6864 Rev. B, 14 February 2012



### **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](http://qal1.de).

Certification of the 300E / T300 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: 936/21201601/B dated 10 July 2005  
TÜV Rheinland Immissionsschutz und Energiesysteme GmbH, Cologne  
Publication: BAnz 29 October 2005, no. 206, p. 15700, chapter IV no. 2.1  
UBA announcement dated 25 July 2005

### **Notifications**

Statement issued by TÜV Rheinland Immissionsschutz und Energiesysteme GmbH dated 14 December 2006  
Publication: BAnz 20 April 2007, No. 75, p. 4139, chapter IV notification 7  
UBA announcement dated 12 April 2007  
(Name changed)

Statement issued by TÜV Rheinland Energie und Umwelt GmbH dated 29 September 2010  
Publication: BAnz 26 January 2011, no. 14, p. 294, chapter IV notification 23 and 24,  
UBA announcement dated 10 January 2011  
(Software & design changes)



**Initial certification according to EN 15267**

Certificate no. 0000038503: 22 March 2013  
Expiry date of the certificate: 04 March 2018

Test report: 936/21207124/B1\_DE dated 22 August 2007  
TÜV Rheinland Immissionsschutz und Energiesysteme GmbH, Cologne  
Addendum: 936/21219874/C dated 31 October 2012  
TÜV Rheinland Energie und Umwelt GmbH, Cologne  
Statement issued by TÜV Rheinland Energie und Umwelt GmbH dated 11 October 2012  
Publication: BAnz AT 05.03.2013 B10, chapter V notification 5  
UBA announcement dated 12 February 2013

**Supplementary testing according to EN 15267**

Certificate no. 0000038503\_01: 20 August 2013  
Expiry date of the certificate: 04 March 2018  
Test report: 936/21207124/B1\_DE dated 22 August 2007  
TÜV Rheinland Immissionsschutz und Energiesysteme GmbH, Cologne  
Addendum: 936/21219874/C dated 31 October 2012 issued by TÜV Rheinland Energie und Umwelt GmbH  
Addendum: 936/21221556/C dated 16 March 2013 der TÜV Rheinland Energie und Umwelt GmbH  
Publication: BAnz AT 23.07.2013 B4, chapter V notification 17  
UBA announcement dated 03 July 2013

**Notifications in accordance with EN 15267**

Statement issued by TÜV Rheinland Energie und Umwelt GmbH dated 27 March 2014  
Publication: BAnz AT 05.08.2014 B11, chapter V notification 18  
UBA announcement dated 17 July 2014  
(New vacuum pump)

Statement issued by TÜV Rheinland Energie und Umwelt GmbH dated 19 October 2015  
Publication: BAnz AT 14.03.2016 B7, chapter V notification 9  
UBA announcement dated 18 February 2016  
(New software version)

**Renewal of the certificate**

Certificate no. 00000038503\_02: 05 March 2018  
Expiry date of the certificate: 04 March 2023

**Calculation of overall uncertainty (device 1)**

Measuring device:		Teledyne API M300E / T300			Serial number:		SN 370	
Measured component:		CO			8h-Limit value:		8.62 $\mu\text{mol/mol}$	
No.	Performance characteristic	Performance criterion	Result	Partial uncertainty		Square of partial uncertainty		
1	Repeatability standard deviation at zero	$\leq 1.0 \mu\text{mol/mol}$	0.100	$u_{r,z}$	0.02	0.0006		
2	Repeatability standard deviation at 8h-limit value	$\leq 3.0 \mu\text{mol/mol}$	0.100	$u_r$	0.02	0.0005		
3	"lack of fit" at 8h-limit value	$\leq 4.0\%$ of meas. value	0.300	$u_l$	0.01	0.0002		
4	Sensitivity coefficient of sample gas pressure at 8h-limit value	$\leq 0.7 \mu\text{mol/mol/kPa}$	0.150	$u_{gp}$	0.16	0.0252		
5	Sensitivity coefficient of sample gas temperature at 8h-limit value	$\leq 0.3 \mu\text{mol/mol/K}$	0.010	$u_{gt}$	0.02	0.0006		
6	Sensitivity coefficient of surrounding temperature at 8h-limit value	$\leq 0.3 \mu\text{mol/mol/K}$	0.030	$u_{st}$	0.07	0.0056		
7	Sensitivity coefficient of electrical voltage at 8h-limit value	$\leq 0.3 \mu\text{mol/mol/V}$	0.000	$u_v$	0.00	0.0000		
8a	Interferent H <sub>2</sub> O with 21 mmol/mol	$\leq 1.0 \mu\text{mol/mol}$ (Zero)	-0.160	$u_{H_2O}$	-0.11	0.0114		
		$\leq 1.0 \mu\text{mol/mol}$ (Span)	-0.140					
8b	Interferent CO <sub>2</sub> with 500 $\mu\text{mol/mol}$	$\leq 0.5 \mu\text{mol/mol}$ (Zero)	-0.030	$u_{\text{int, pos}}$	0.07	0.0043		
		$\leq 0.5 \mu\text{mol/mol}$ (Span)	0.100					
8c	Interferent NO with 1 $\mu\text{mol/mol}$	$\leq 0.5 \mu\text{mol/mol}$ (Zero)	0.010	or	0.07	0.0043		
		$\leq 0.5 \mu\text{mol/mol}$ (Span)	0.020					
8d	Interferent N <sub>2</sub> O with 50 nmol/mol	$\leq 0.5 \mu\text{mol/mol}$ (Zero)	-0.030	$u_{\text{int, neg}}$	0.07	0.0043		
		$\leq 0.5 \mu\text{mol/mol}$ (Span)	-0.020					
9	Averaging effect	$\leq 7.0\%$ of meas. value	0.800	$u_{av}$	0.04	0.0016		
18	Difference sample/calibration port	$\leq 1\%$	-0.020	$u_{asc}$	0.00	0.0000		
21	Uncertainty of test gas	$\leq 3\%$	2.000	$u_{cg}$	0.09	0.0074		
Combined standard uncertainty				$u_c$		0.2396	$\mu\text{mol/mol}$	
Expanded uncertainty				U		0.4793	$\mu\text{mol/mol}$	
Relative expanded uncertainty				W		5.56	%	
Maximum allowed expanded uncertainty				$W_{req}$		15	%	

Measuring device:		Teledyne API M300E / T300			Serial number:		SN 370	
Measured component:		CO			8h-Limit value:		8.62 $\mu\text{mol/mol}$	
No.	Performance characteristic	Performance criterion	Result	Partial uncertainty		Square of partial uncertainty		
1	Repeatability standard deviation at zero	$\leq 1.0 \mu\text{mol/mol}$	0.100	$u_{r,z}$	0.02	0.0006		
2	Repeatability standard deviation at 8h-limit value	$\leq 3.0 \mu\text{mol/mol}$	0.100	$u_r$	not considered, as $u_r = 0.02 < u_{r,f}$	-		
3	"lack of fit" at 8h-limit value	$\leq 4.0\%$ of meas. value	0.300	$u_l$	0.01	0.0002		
4	Sensitivity coefficient of sample gas pressure at 8h-limit value	$\leq 0.7 \mu\text{mol/mol/kPa}$	0.150	$u_{gp}$	0.16	0.0252		
5	Sensitivity coefficient of sample gas temperature at 8h-limit value	$\leq 0.3 \mu\text{mol/mol/K}$	0.010	$u_{gt}$	0.02	0.0006		
6	Sensitivity coefficient of surrounding temperature at 8h-limit value	$\leq 0.3 \mu\text{mol/mol/K}$	0.030	$u_{st}$	0.07	0.0056		
7	Sensitivity coefficient of electrical voltage at 8h-limit value	$\leq 0.3 \mu\text{mol/mol/V}$	0.000	$u_v$	0.00	0.0000		
8a	Interferent H <sub>2</sub> O with 21 mmol/mol	$\leq 1.0 \mu\text{mol/mol}$ (Zero)	-0.140	$u_{H_2O}$	-0.11	0.0114		
		$\leq 1.0 \mu\text{mol/mol}$ (Span)	-0.160					
8b	Interferent CO <sub>2</sub> with 500 $\mu\text{mol/mol}$	$\leq 0.5 \mu\text{mol/mol}$ (Zero)	-0.030	$u_{\text{int, pos}}$	0.07	0.0043		
		$\leq 0.5 \mu\text{mol/mol}$ (Span)	0.100					
8c	Interferent NO with 1 $\mu\text{mol/mol}$	$\leq 0.5 \mu\text{mol/mol}$ (Zero)	0.010	or	0.07	0.0043		
		$\leq 0.5 \mu\text{mol/mol}$ (Span)	0.020					
8d	Interferent N <sub>2</sub> O with 50 nmol/mol	$\leq 0.5 \mu\text{mol/mol}$ (Zero)	-0.030	$u_{\text{int, neg}}$	0.07	0.0043		
		$\leq 0.5 \mu\text{mol/mol}$ (Span)	-0.020					
9	Averaging effect	$\leq 7.0\%$ of meas. value	0.800	$u_{av}$	0.04	0.0016		
10	Reproducibility standard deviation under field conditions	$\leq 5.0\%$ of 3 month average	3.470	$u_{r,f}$	0.30	0.0895		
11	Long term drift at zero level	$\leq 0.5 \mu\text{mol/mol}$	0.340	$u_{d1,z}$	0.20	0.0385		
12	Long term drift at 8h-limit value	$\leq 5.0\%$ of max. of cert. range	-2.320	$u_{d1,8h}$	-0.12	0.0133		
18	Difference sample/calibration port	$\leq 1\%$	-0.020	$u_{asc}$	0.00	0.0000		
21	Uncertainty of test gas	$\leq 3\%$	2.000	$u_{cg}$	0.09	0.0074		
Combined standard uncertainty				$u_c$		0.4452	$\mu\text{mol/mol}$	
Expanded uncertainty				U		0.8904	$\mu\text{mol/mol}$	
Relative expanded uncertainty				W		10.33	%	
Maximum allowed expanded uncertainty				$W_{req}$		15	%	



**Calculation of overall uncertainty (device 2)**

Measuring device:		Teledyne API M300E / T300			Serial number:		SN 512 / 1385	
Measured component:		CO			8h-Limit value:		8.62 $\mu\text{mol/mol}$	
No.	Performance characteristic	Performance criterion	Result	Partial uncertainty		Square of partial uncertainty		
1	Repeatability standard deviation at zero	$\leq 1.0 \mu\text{mol/mol}$	0.100	$u_{r,z}$	0.02	0.0006		
2	Repeatability standard deviation at 8h-limit value	$\leq 3.0 \mu\text{mol/mol}$	0.000	$u_r$	0.00	0.0000		
3	"lack of fit" at 8h-limit value	$\leq 4.0\%$ of meas. value	1.200	$u_l$	0.06	0.0036		
4	Sensitivity coefficient of sample gas pressure at 8h-limit value	$\leq 0.7 \mu\text{mol/mol/kPa}$	0.180	$u_{gp}$	0.19	0.0362		
5	Sensitivity coefficient of sample gas temperature at 8h-limit value	$\leq 0.3 \mu\text{mol/mol/K}$	0.010	$u_{gt}$	0.02	0.0006		
6	Sensitivity coefficient of surrounding temperature at 8h-limit value	$\leq 0.3 \mu\text{mol/mol/K}$	0.030	$u_{st}$	0.07	0.0056		
7	Sensitivity coefficient of electrical voltage at 8h-limit value	$\leq 0.3 \mu\text{mol/mol/V}$	0.010	$u_v$	0.03	0.0011		
8a	Interferent H <sub>2</sub> O with 21 mmol/mol	$\leq 1.0 \mu\text{mol/mol (Zero)}$	-0.040	$u_{H_2O}$	-0.07	0.0056		
		$\leq 1.0 \mu\text{mol/mol (Span)}$	-0.110					
8b	Interferent CO <sub>2</sub> with 500 $\mu\text{mol/mol}$	$\leq 0.5 \mu\text{mol/mol (Zero)}$	0.010	$u_{int,pos}$	0.05	0.0020		
		$\leq 0.5 \mu\text{mol/mol (Span)}$	0.070					
8c	Interferent NO with 1 $\mu\text{mol/mol}$	$\leq 0.5 \mu\text{mol/mol (Zero)}$	0.030	or	0.05	0.0020		
		$\leq 0.5 \mu\text{mol/mol (Span)}$	0.010					
8d	Interferent N <sub>2</sub> O with 50 nmol/mol	$\leq 0.5 \mu\text{mol/mol (Zero)}$	0.020	$u_{int,neg}$	-0.03	0.0012		
		$\leq 0.5 \mu\text{mol/mol (Span)}$	-0.020					
9	Averaging effect	$\leq 7.0\%$ of meas. value	-0.700	$u_{av}$	-0.03	0.0012		
18	Difference sample/calibration port	$\leq 1\%$	-0.050	$u_{asc}$	0.00	0.0000		
21	Uncertainty of test gas	$\leq 3\%$	2.000	$u_{cg}$	0.09	0.0074		
Combined standard uncertainty				$u_c$	0.2529	$\mu\text{mol/mol}$		
Expanded uncertainty				U	0.5058	$\mu\text{mol/mol}$		
Relative expanded uncertainty				W	5.87	%		
Maximum allowed expanded uncertainty				$W_{req}$	15	%		

Measuring device:		Teledyne API M300E / T300			Serial number:		SN 512 / 1385	
Measured component:		CO			8h-Limit value:		8.62 $\mu\text{mol/mol}$	
No.	Performance characteristic	Performance criterion	Result	Partial uncertainty		Square of partial uncertainty		
1	Repeatability standard deviation at zero	$\leq 1.0 \mu\text{mol/mol}$	0.100	$u_{r,z}$	0.02	0.0006		
2	Repeatability standard deviation at 8h-limit value	$\leq 3.0 \mu\text{mol/mol}$	0.000	$u_r$	not considered, as $u_r = 0 < u_{r,f}$	-		
3	"lack of fit" at 8h-limit value	$\leq 4.0\%$ of meas. value	1.200	$u_l$	0.06	0.0036		
4	Sensitivity coefficient of sample gas pressure at 8h-limit value	$\leq 0.7 \mu\text{mol/mol/kPa}$	0.180	$u_{gp}$	0.19	0.0362		
5	Sensitivity coefficient of sample gas temperature at 8h-limit value	$\leq 0.3 \mu\text{mol/mol/K}$	0.010	$u_{gt}$	0.02	0.0006		
6	Sensitivity coefficient of surrounding temperature at 8h-limit value	$\leq 0.3 \mu\text{mol/mol/K}$	0.030	$u_{st}$	0.07	0.0056		
7	Sensitivity coefficient of electrical voltage at 8h-limit value	$\leq 0.3 \mu\text{mol/mol/V}$	0.010	$u_v$	0.03	0.0011		
8a	Interferent H <sub>2</sub> O with 21 mmol/mol	$\leq 1.0 \mu\text{mol/mol (Zero)}$	-0.110	$u_{H_2O}$	-0.07	0.0056		
		$\leq 1.0 \mu\text{mol/mol (Span)}$	-0.040					
8b	Interferent CO <sub>2</sub> with 500 $\mu\text{mol/mol}$	$\leq 0.5 \mu\text{mol/mol (Zero)}$	0.010	$u_{int,pos}$	0.05	0.0020		
		$\leq 0.5 \mu\text{mol/mol (Span)}$	0.070					
8c	Interferent NO with 1 $\mu\text{mol/mol}$	$\leq 0.5 \mu\text{mol/mol (Zero)}$	0.030	or	0.05	0.0020		
		$\leq 0.5 \mu\text{mol/mol (Span)}$	0.010					
8d	Interferent N <sub>2</sub> O with 50 nmol/mol	$\leq 0.5 \mu\text{mol/mol (Zero)}$	0.020	$u_{int,neg}$	-0.03	0.0012		
		$\leq 0.5 \mu\text{mol/mol (Span)}$	-0.020					
9	Averaging effect	$\leq 7.0\%$ of meas. value	-0.700	$u_{av}$	-0.03	0.0012		
10	Reproducibility standard deviation under field conditions	$\leq 5.0\%$ of 3 month average	3.470	$u_{r,f}$	0.30	0.0895		
11	Long term drift at zero level	$\leq 0.5 \mu\text{mol/mol}$	0.710	$u_{d,l,z}$	0.41	0.1680		
12	Long term drift at 8h-limit value	$\leq 5.0\%$ of max. of cert. range	-4.960	$u_{d,l,8h}$	-0.25	0.0609		
18	Difference sample/calibration port	$\leq 1\%$	-0.050	$u_{asc}$	0.00	0.0000		
21	Uncertainty of test gas	$\leq 3\%$	2.000	$u_{cg}$	0.09	0.0074		
Combined standard uncertainty				$u_c$	0.6184	$\mu\text{mol/mol}$		
Expanded uncertainty				U	1.2368	$\mu\text{mol/mol}$		
Relative expanded uncertainty				W	14.35	%		
Maximum allowed expanded uncertainty				$W_{req}$	15	%		