

CERTIFICATE

of Product Conformity (QAL1)

Certificate No.: 0000040330_01

Certified AMS: CO12M for CO

Manufacturer: Environnement S.A.
111 Boulevard Robespierre
78304 Poissy Cedex
France

Test Institute: TÜV Rheinland Energy GmbH

**This is to certify that the AMS has been tested
and found to comply with:**

**VDI 4202-1: 2002, VDI 4203-2: 2004, EN 14626: 2012,
EN 15267-1: 2009, EN 15267-2: 2009**

Certification is awarded in respect of the conditions stated in this certificate
(see also the following pages).

The present certificate replaces certificate 0000040330 of 29 April 2014.



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

www.tuv.com
ID 0000040330

Publication in the German Federal Gazette
(BAnz.) of 3 September 2008

This certificate will expire on:
30 June 2020

German Federal Environment Agency
Dessau, 1 April 2019

TÜV Rheinland Energy GmbH
Cologne, 31 March 2019



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51105 Cologne

Accreditation according to EN ISO/IEC 17025:2018 and certified according to ISO 9001:2015.

Certificate:
0000040330_01 / 1 April 2019

Test report: 936/21206773/B of 29 February 2008
Addendum 936/21221709/D of 28 September 2013

Initial certification: 01 April 2014

Date of expiry: 30 June 2020

Publication: BAnz AT 01 April 2014 B12, chapter VI, notification 20

Approved application

The certified AMS is suitable for continuous monitoring of carbon monoxide in ambient air.

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

The AMS is approved for a temperature range of 0 °C to +30 °C.

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 936/21206773/B of 29 February 2008 of TÜV Rheinland Immissionsschutz und Energiesysteme GmbH and Addendum 936/21221709/D of 28 September 2013 of TÜV Rheinland Energie und Umwelt GmbH
- suitability announced by the German Federal Environment Agency (UBA) as the relevant body
- the on-going surveillance of the product and the manufacturing process

AMS designation:

CO12M for CO

Manufacturer:

Environnement S.A., Poissy Cedex, France
Distribution in Germany:
Ansyco GmbH, Karlsruhe

Field of application:

For continuous monitoring of carbon monoxide

Measuring ranges during the performance test:

CO 0 to 60 mg/m³
0 to 100 mg/m³

Software version:

V1.26

Testing institute:

TÜV Rheinland Immissionsschutz und Energiesysteme GmbH, Cologne
TÜV Rheinland Group
Report No.: 936/21206773/B of 29 February 2008

20 Notification of announcement by the German Federal Environment Agency dated 12th August 2008 (BAnz. p. 3243, Chapter III Number 1.1)

The measuring system CO12M for CO manufactured by Environnement fulfils the requirements of Standard EN 14626 (December 2012). Furthermore, the manufacturing process and quality management system of the measuring system CO12M for CO fulfill the requirements of EN 15267.

The test report for performance testing with report number 936/21206773/B as well as an addendum as an integral part of to the test report with report number 936/21221709/D can be viewed on the internet at www.qal1.de.

Statement by TÜV Rheinland Energie und Umwelt GmbH dated 28th September 2013

Certified product

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

The CO12M analyser measures of carbon monoxide (CO) in ambient air. The measuring principle is based on infra-red absorption according to the Beer-Lambert law. The absorption spectrum of carbon monoxide has a maximum wavelength of 4.67 µm, which complies with the spectrum as selected by the optical filter.

Due to the fact that the absorption spectrum is not continuous, the optical filter is connected to a gas filter correlation wheel which enables highly selective measurement of the gas to be analysed by eliminating interferences caused by gases which have absorption spectrums very similar to those of CO.

The measuring principle conforms with the standard reference method as stipulated by EN 14626.

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 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 can be applied to the product or used in publicity material for 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. With revocation of the publication the certificate loses its validity. After the expiration of the certificate and on requests of the TÜV Rheinland Energy GmbH this document shall be returned and the certificate mark must not be employed anymore.

The relevant version of this certificate and the validity is also accessible on the internet: qal1.de.

Certification of CO12M for CO is based on the documents listed below and the regular, continuous monitoring of the Quality Management System of the manufacturer:

Initial test:

Test report: 936/21206773/B of 29 February 2008
TÜV Rheinland Immissionsschutz und Energiesysteme GmbH, Cologne
Publication: BAnz. 03 September 2008, No. 133, p. 3243, chapter III, No. 1.1
Announcement by UBA from 12 August 2008

Initial certification according to EN 15267:

Certificate No. 0000040330: 29 April 2014
Expiration date of the certificate: 31 March 2019

Test report: 936/21206773/B of 29 February 2008
TÜV Rheinland Immissionsschutz und Energiesysteme GmbH, Cologne
Addendum 936/21221709/D of 28 September 2013
TÜV Rheinland Energie und Umwelt GmbH, Cologne
Publication: BAnz AT 01 April 2014 B12, chapter VI, notification 20
Announcement by UBA from 27 February 2014

Notification:

Publication: BAnz AT 01 April 2014 B12, chapter VI, notification 20
Announcement by UBA from 27 February 2014

Renewal of the certificate according to EN 15267:

Certificate No. 0000040330_01: 1 April 2019
Expiration date of the certificate: 30 June 2020

Calculation of overall uncertainty lab test (Device 1)

Measuring device:		Environment CO12M		Serial-No.:		Gerät 1	
Measured component:		CO		8h-limit value:		8.62	
No.	Performance characteristic	Performance criterion	Result	Partial uncertainty	Square of partial uncertainty		
1	Repeatability standard deviation at zero	≤ 0.3 µmol/mol	0.000	$u_{r,z}$ 0.00	0.0000		
2	Repeatability standard deviation at 8h-limit value	≤ 0.4 µmol/mol	0.200	u_r 0.03	0.0010		
3	"lack of fit" at 8h-limit value	≤ 4.0% of measured value	1.100	u_l 0.05	0.0030		
4	Sensitivity coefficient of sample gas pressure at 8h-limit value	≤ 0.7 µmol/mol/kPa	0.010	u_{gp} 0.02	0.0005		
5	Sensitivity coefficient of sample gas temperature at 8h-limit value	≤ 0.3 µmol/mol/K	0.015	u_{gt} 0.03	0.0010		
6	Sensitivity coefficient of surrounding temperature at 8h-limit value	≤ 0.3 µmol/mol/K	0.050	u_{st} 0.11	0.0114		
7	Sensitivity coefficient of electrical voltage at 8h-limit value	≤ 0.3 µmol/mol/V	0.000	u_v 0.00	0.0000		
8a	Interferent H ₂ O with 21 mmol/mol	≤ 1.0 µmol/mol (Zero) ≤ 1.0 µmol/mol (Span)	0.060 -0.040	u_{H_2O} 0.04	0.0017		
8b	Interferent CO ₂ with 500 µmol/mol	≤ 0.5 µmol/mol (Zero) ≤ 0.5 µmol/mol (Span)	-0.090 -0.100	$u_{int,pos}$	0.0229		
8c	Interferent NO with 1 µmol/mol	≤ 0.5 µmol/mol (Zero) ≤ 0.5 µmol/mol (Span)	0.020 0.130	or			
8d	Interferent N ₂ O with 50 nmol/mol	≤ 0.5 µmol/mol (Zero) ≤ 0.5 µmol/mol (Span)	0.060 0.140	$u_{int,neg}$			
9	Averaging effect	≤ 7.0% of measured value	-3.900	u_{av} -0.19		0.0377	
18	Difference sample/calibration port	≤ 1.0%	-0.120	u_{Asc} -0.01	0.0001		
21	Uncertainty of test gas	≤ 3.0%	2.000	u_{cg} 0.09	0.0074		
				Combined standard uncertainty	u_c	0.2944 µmol/mol	
				Expanded uncertainty	U	0.5889 µmol/mol	
				Relative expanded uncertainty	W	6.83 %	
				Maximum allowed expanded uncertainty	W_{req}	15 %	

Calculation of overall uncertainty lab test (Device 2)

Measuring device:		Serial-No.:		Gerät 2	
Measured component:		8h-limit value:		8.62	
Environment CO12M		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	0.200	u _{r,z} 0.04	0.0014
2	Repeatability standard deviation at 8h-limit value	≤ 0.4 µmol/mol	0.100	u _r 0.02	0.0003
3	"lack of fit" at 8h-limit value	≤ 4.0% of measured value	0.600	u _i 0.03	0.0009
4	Sensitivity coefficient of sample gas pressure at 8h-limit value	≤ 0.7 µmol/mol/kPa	0.010	u _{gp} 0.02	0.0005
5	Sensitivity coefficient of sample gas temperature at 8h-limit value	≤ 0.3 µmol/mol/K	0.010	u _{gt} 0.02	0.0005
6	Sensitivity coefficient of surrounding temperature at 8h-limit value	≤ 0.3 µmol/mol/K	0.020	u _{st} 0.04	0.0018
7	Sensitivity coefficient of electrical voltage at 8h-limit value	≤ 0.3 µmol/mol/V	0.000	u _v 0.00	0.0000
8a	Interferent H ₂ O with 21 mmol/mol	≤ 1.0 µmol/mol (Zero) ≤ 1.0 µmol/mol (Span)	0.030 -0.070	u _{H2O} 0.02	0.0004
8b	Interferent CO ₂ with 500 µmol/mol	≤ 0.5 µmol/mol (Zero)	0.100	u _{int,pos}	
8c	Interferent NO with 1 µmol/mol	≤ 0.5 µmol/mol (Span)	-0.140		
		≤ 0.5 µmol/mol (Zero)	-0.060		
		≤ 0.5 µmol/mol (Span)	0.100	0.07	0.0056
		≤ 0.5 µmol/mol (Zero)	-0.040		
8d	Interferent N ₂ O with 50 nmol/mol	≤ 0.5 µmol/mol (Span)	0.040	u _{int,neg}	
9	Averaging effect	≤ 7.0% of measured value	-1.300	u _{av} -0.06	0.0042
18	Difference sample/calibration port	≤ 1.0%	-0.050	u _{sc} 0.00	0.0000
21	Uncertainty of test gas	≤ 3.0%	2.000	u _{cg} 0.09	0.0074
Combined standard uncertainty				u _c	0.1514
Expanded uncertainty				U	0.3027
Relative expanded uncertainty				W	3.51
Maximum allowed expanded uncertainty				W _{req}	15

Calculation of overall uncertainty lab and field test (Device 1)

Measuring device: Environment CO12M		Serial-No.:		Gerät 1		µmol/mol
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	0.000	$u_{r,z}$	0.0000	
2	Repeatability standard deviation at 8h-limit value	≤ 0.4 µmol/mol	0.200	u_r	not considered, as $u_r = 0.03 < u_{r,f}$	
3	"lack of fit" at 8h-limit value	≤ 4.0% of measured value	1.100	u_l	0.0030	
4	Sensitivity coefficient of sample gas pressure at 8h-limit value	≤ 0.7 µmol/mol/kPa	0.010	u_{gp}	0.0005	
5	Sensitivity coefficient of sample gas temperature at 8h-limit value	≤ 0.3 µmol/mol/K	0.015	u_{gt}	0.0010	
6	Sensitivity coefficient of surrounding temperature at 8h-limit value	≤ 0.3 µmol/mol/K	0.050	u_{st}	0.0114	
7	Sensitivity coefficient of electrical voltage at 8h-limit value	≤ 0.3 µmol/mol/V	0.000	u_v	0.0000	
8a	Interferent H ₂ O with 21 mmol/mol	≤ 1.0 µmol/mol (Zero)	-0.040	u_{H_2O}	0.0017	
8b	Interferent CO ₂ with 500 µmol/mol	≤ 1.0 µmol/mol (Span)	0.060	$u_{int,pos}$		
		≤ 0.5 µmol/mol (Zero)	-0.090			
8c	Interferent NO with 1 µmol/mol	≤ 0.5 µmol/mol (Span)	-0.100	or	0.15	0.0229
		≤ 0.5 µmol/mol (Zero)	0.020			
8d	Interferent N ₂ O with 50 nmol/mol	≤ 0.5 µmol/mol (Span)	0.130	$u_{int,neg}$		
		≤ 0.5 µmol/mol (Zero)	0.060			
9	Averaging effect	≤ 7.0% of measured value	-3.900	u_{av}	0.0377	
10	Reproducibility standard deviation under field conditions	≤ 5.0% of average over 3 months	3.270	$u_{r,f}$	0.0795	
11	Long term drift at zero level	≤ 0.5 µmol/mol	0.220	$u_{l,z}$	0.0161	
12	Long term drift at span level	≤ 5.0% of max. of certification range	0.940	$u_{l,sh}$	0.0022	
18	Difference sample/calibration port	≤ 1.0%	-0.120	u_{ssc}	0.0001	
21	Uncertainty of test gas	≤ 3.0%	2.000	u_{cg}	0.0074	
Combined standard uncertainty				u_c	0.4283	µmol/mol
Expanded uncertainty				U	0.8566	µmol/mol
Relative expanded uncertainty				W	9.94	%
Maximum allowed expanded uncertainty				W_{req}	15	%

Calculation of overall uncertainty lab and field test (Device 2)

Calculation of overall un-

Measuring device:		Serial-No.:		Gerät 2	
Measured component:		8h-limit value:		8.62	
Environment CO12M		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	0.200	u _{r,z}	0.0014
2	Repeatability standard deviation at 8h-limit value	≤ 0.4 µmol/mol	0.100	u _r	-
3	"lack of fit" at 8h-limit value	≤ 4.0% of measured value	0.600	u _l	0.0009
4	Sensitivity coefficient of sample gas pressure at 8h-limit value	≤ 0.7 µmol/mol/kPa	0.010	u _{gp}	0.0005
5	Sensitivity coefficient of sample gas temperature at 8h-limit value	≤ 0.3 µmol/mol/K	0.010	u _{gt}	0.0005
6	Sensitivity coefficient of surrounding temperature at 8h-limit value	≤ 0.3 µmol/mol/K	0.020	u _{st}	0.0018
7	Sensitivity coefficient of electrical voltage at 8h-limit value	≤ 0.3 µmol/mol/V	0.000	u _v	0.0000
8a	Interferent H ₂ O with 21 mmol/mol	≤ 1.0 µmol/mol (Zero)	-0.070	u _{H2O}	0.0004
		≤ 1.0 µmol/mol (Span)	0.030		
8b	Interferent CO ₂ with 500 µmol/mol	≤ 0.5 µmol/mol (Zero)	0.100	u _{int,pos}	
		≤ 0.5 µmol/mol (Span)	-0.140		
8c	Interferent NO with 1 µmol/mol	≤ 0.5 µmol/mol (Zero)	-0.060		
		≤ 0.5 µmol/mol (Span)	0.100	or	0.0056
8d	Interferent N ₂ O with 50 mmol/mol	≤ 0.5 µmol/mol (Zero)	-0.040	u _{int,neg}	
		≤ 0.5 µmol/mol (Span)	0.040		
9	Averaging effect	≤ 7.0% of measured value	-1.300	u _{av}	0.0042
10	Reproducibility standard deviation under field conditions	≤ 5.0% of average over 3 months	3.270	u _{r,f}	0.0795
11	Long term drift at zero level	≤ 0.5 µmol/mol	0.380	u _{l,z}	0.0481
12	Long term drift at span level	≤ 5.0% of max. of certification range	1.380	u _{l,8h}	0.0047
18	Difference sample/calibration port	≤ 1.0%	-0.050	u _{asc}	0.0000
21	Uncertainty of test gas	≤ 3.0%	2.000	u _{cg}	0.0074
Combined standard uncertainty				u _c	µmol/mol
Expanded uncertainty				U	µmol/mol
Relative expanded uncertainty				W	%
Maximum allowed expanded uncertainty				W _{req}	%