CERTIFICATE

of Product Conformity (QAL1)

Certificate No.: 0000040330_03

Certified AMS:	CO12M for CO
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 4202-1 (2002), VDI 4203-3 (2004), EN 14626 (2012), 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 10 pages).
The present certificate replaces certificate 0000040330_02 dated 1 July 2020.

TÜVRheinland® CERTIFIED
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

German Environment Agency

Dessau, 27 June 2025

This certificate will expire on:
30 June 2030

TÜV Rheinland Energy & Environment GmbH
Cologne, 26 June 2025

Dr. Marcel Langner
Head of Section II 4

ppa. Dr. Peter Wilbring

www.umwelt-tuv.eu
qal1-info@tuv.com
Tel. + 49 221 806-5200

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

Test report:	936/21206773/B dated 29 February 2008 and Addendum 936/21221709/D dated 28 September 2013
Initial certification:	1 April 2014
Expiry date:	30 June 2030
Certificate:	Renewal (of previous certificate 0000040330_02 of 1 July 2020 valid until 30 June 2025)
Publication:	BAnz. 03 September 2008, No. 133, p. 3243, chapter III No. 1.1 and Banz AT 01.04.2014 B12, capter VI notification 20

Approved application

The tested AMS is suitable for continuous immission measurement of CO in stationary use.

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 an ambient temperature range of 0 °C to 30 °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 936/21206773/B dated 29 February 2008 of TÜV Rheinland Immissionsschutz und Energiesysteme GmbH and Addendum 936/21221709/D dated 28 September 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. 03 September 2008, No. 133, p. 3243, chapter III No. 1.1, Announcement by UBA dated 12 August 2008:

AMS designation:
CO12M for CO

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

Field of application:
For the continuous monitoring of carbon monoxide in ambient air

Measuring ranges during the performance test:

CO	0 - 60	mg/m³
	0 - 100	mg/m³

Software version:
V1.26

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

Publication in the German Federal Gazette: BAnz AT 01.04.2014 B12, Chap. VI notification 20, Announcement by UBA dated 27 February 2014:

20 Notification of announcement by the German Federal Environment Agency of 12 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 28 September 2013

Publication in the German Federal Gazette: BAnz AT 26.08.2015 B4, Chap. V notification 48, Announcement by UBA dated 22 July 2015:

48 Notification as regards Federal Environment Agency (UBA) notices of 12 August 2008 (BAnz. p. 3243, chapter III number 1.1) and of 27 February 2014 (BAnz AT 01.04.2014 B12, chapter VI notification 20)

The current software version for the CO12M measuring system for CO, manufactured by Environnement S.A., is:
v1.0.d (Calculation process)
v3.6.c (Display process)
For additional means of communication, the AMS was equipped with a USB and a TCP/IP interface.
The Maxon DC A-max 22 filter wheel motor was replaced by a brushless filter wheel motor of the type Deltaline 26BC-6A-107.101.

Statement by TÜV Rheinland Energie und Umwelt GmbH of 16 March 2015

Publication in the German Federal Gazette: BAnz AT 26.03.2019 B7, Chap. IV notification 25, Announcement by UBA dated 27 February 2019:

25 Notification as regards Federal Environment Agency notices of 12 August 2008 (BAnz. S. 3243, chapter III number 1.1) and of 22 July 2015 (BAnz AT 26.08.2015 B4, chapter V notification 48)

The current software version of the CO12M measuring system for CO manufactured by Environnement S.A. is:
v1.0.d (calculation process)
v3.6.f (display process)

Statement by TÜV Rheinland Energy GmbH dated 27 September 2018

Publication in the German Federal Gazette: BAnz AT 24.03.2020 B7, Chap. IV notification 30, Announcement by UBA dated 24 February 2020:

30 Notification as regards Federal Environment Agency (UBA) notices of 12 April 2008 (BAnz. p. 3243, chapter III number 1.1) and of 27 February 2019 (BAnz AT 26.03.2019 B7, chapter IV notification 25)

Environnement S.A., Poissy, France have changed their company name to ENVEA.

The latest software version of the CO12M measuring system for CO manufactured by ENVEA is:
v1.0.d (calculation process)
v3.8.a (display process)

Statement by TÜV Rheinland Energy GmbH dated 1 October 2019

Certified product

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

The CO12M analyser measures 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 corresponds to the spectrum 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 interferents caused by gases with similar absorption spectrums to those of CO.

This measuring principle corresponds to the standard reference method as described in 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 & 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 CO12M is based on the documents listed below and the regular, continuous monitoring of the Quality Management System of the manufacturer:

Basic test
Test report: 936/21206773/B dated 29 February 2008
TÜV Rheinland Immissionsschutz und Energiesysteme GmbH
Publication: BAnz. 03 September 2008, No. 133, p. 3243, chapter III number 1.1
UBA announcement dated 12 August 2008

Initial certification according to EN 15267 based on notification
Certificate No. 0000040330_00: 29 April 2014
Expiry date of the certificate: 31 March 2019
Statement issued by TÜV Rheinland Energie und Umwelt GmbH dated 28 September 2013
Test report: 936/21206773/B dated 29 February 2008 and Addendum 936/21221709/D dated 28 September 2013
Publication: BAnz AT 01.04.2014 B12, chapter VI notification 20
UBA announcement dated 27 February 2014

Notifications
Statement issued by TÜV Rheinland Energie und Umwelt GmbH dated 16 March 2015
Publication: BAnz AT 26.08.2015 B4, chapter V notification 48
UBA announcement dated 22 July 2015
(Soft- and hardware changes)

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

Notifications
Statement issued by TÜV Rheinland Energy GmbH dated 27 September 2018
Publication: BAnz AT 26.03.2019 B7, chapter IV notification 25
UBA announcement dated 27 February 2019
(Software changes)

Statement issued by TÜV Rheinland Energy GmbH dated 1 October 2019
Publication: BAnz AT 24.03.2020 B7, chapter IV notification 30
UBA announcement dated 24 February 2020
(Software changes and new producer name formerly Environnement S.A.)

Renewal of certificates
Certificate No. 0000040330_02: 1 July 2020
Expiry date of the certificate: 30 June 2025

Renewal of certificates
Certificate No. 0000040330_03: 27 June 2025
Expiry date of the certificate: 30 June 2030

Expanded uncertainty laboratory, system 1

Measuring device:	Environnement CO12M	Serial-No.:	Gerät 1	
Measured component:	CO	8h-limit value:	8.62	µmol/mol

No.	Performance characteristic	Performance criterion	Result	Partial uncertainty		Square of partial uncertainty
1	Repeatability standard deviation at zero	≤ 0.3 µmol/mol	0.000	$u_{r,z}$	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_2O with 21 mmol/mol	≤ 1.0 µmol/mol (Zero)	0.060	u_{H2O}	0.04	0.0017
		≤ 1.0 µmol/mol (Span)	-0.040			
8b	Interferent CO_2 with 500 µmol/mol	≤ 0.5 µmol/mol (Zero)	-0.090	$u_{int,pos}$	0.15	0.0229
		≤ 0.5 µmol/mol (Span)	-0.100			
8c	Interferent NO with 1 µmol/mol	≤ 0.5 µmol/mol (Zero)	0.020	or		
		≤ 0.5 µmol/mol (Span)	0.130			
8d	Interferent N_2O with 50 nmol/mol	≤ 0.5 µmol/mol (Zero)	0.060	$u_{int,neg}$		
		≤ 0.5 µmol/mol (Span)	0.140			
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_{dsc}	-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	%

Expanded uncertainty laboratory, system 2

Measuring device:	Environnement CO12M	Serial-No.:	Gerät 2		
Measured component:	CO	8h-limit value:	8.62	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_l	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_2O with 21 mmol/mol	≤	1.0 µmol/mol (Zero)	0.030	u_{H2O}	0.02	0.0004	
		≤	1.0 µmol/mol (Span)	-0.070				
8b	Interferent CO_2 with 500 µmol/mol	≤	0.5 µmol/mol (Zero)	0.100	$u_{int,pos}$		0.0056	
		≤	0.5 µmol/mol (Span)	-0.140				
8c	Interferent NO with 1 µmol/mol	≤	0.5 µmol/mol (Zero)	-0.060	or	0.07		
		≤	0.5 µmol/mol (Span)	0.100				
8d	Interferent N_2O with 50 nmol/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}	-0.06	0.0042	
18	Difference sample/calibration port	≤	1.0%	-0.050	$u_{\Delta sc}$	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	µmol/mol
Expanded uncertainty	U	0.3027	µmol/mol
Relative expanded uncertainty	W	3.51	%
Maximum allowed expanded uncertainty	W_{req}	15	%

Combined uncertainty, laboratory and field, system 1

Measuring device: Environnement CO12M — Serial-No.: — Gerät 1

Measured component: CO — 8h-limit value: 8.62 µmol/mol

No.	Performance characteristic		Performance criterion	Result	Partial uncertainty			Square of partial uncertainty	
1	Repeatability standard deviation at zero	≤	0.3 µmol/mol	0.000	$u_{r,z}$	0.00		0.0000	
2	Repeatability standard deviation at 8h-limit value	≤	0.4 µmol/mol	0.200	u_r	not considered, as ur = 0.03 < ur,f		-	
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_20 with 21 mmol/mol	≤	1.0 µmol/mol (Zero)	-0.040	u_{H2O}	0.04		0.0017	
		≤	1.0 µmol/mol (Span)	0.060					
8b	Interferent CO_2 with 500 µmol/mol	≤	0.5 µmol/mol (Zero)	-0.090	$u_{int,pos}$	0.15	or	0.0229	
		≤	0.5 µmol/mol (Span)	-0.100					
8c	Interferent NO with 1 µmol/mol	≤	0.5 µmol/mol (Zero)	0.020					
		≤	0.5 µmol/mol (Span)	0.130					
8d	Interferent N_2O with 50 nmol/mol	≤	0.5 µmol/mol (Zero)	0.060	$u_{int,neg}$				
		≤	0.5 µmol/mol (Span)	0.140					
9	Averaging effect	≤	7.0% of measured value	-3.900	u_{av}	-0.19		0.0377	
10	Reproducibility standard deviation under field conditions	≤	5.0% of average over 3 months	3.270	$u_{r,f}$	0.28		0.0795	
11	Long term drift at zero level	≤	0.5 µmol/mol	0.220	$u_{d,l,z}$	0.13		0.0161	
12	Long term drift at span level	≤	5.0% of max. of certification range	0.940	$u_{d,l,8h}$	0.05		0.0022	
18	Difference sample/calibration port	≤	1.0%	-0.120	$u_{\Delta sc}$	-0.01		0.0001	
21	Uncertainty of test gas	≤	3.0%	2.000	u_{cg}	0.09		0.0074	
					Combined standard uncertainty		u_c	0.4283	µmol/mol
					Expanded uncertainty		U	0.8566	µmol/mol
					Relative expanded uncertainty		W	9.94	%
					Maximum allowed expanded uncertainty		W_{req}	15	%

Combined uncertainty, laboratory and field, system 2

Measuring device:	Environnement CO12M			Serial-No.:	Gerät 2		
Measured component:	CO			8h-limit value:	8.62		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	not considered, as ur = 0.01 < ur,f		-
3	"lack of fit" at 8h-limit value	≤	4.0% of measured value	0.600	u_l	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_2O with 21 mmol/mol	≤	1.0 µmol/mol (Zero)	-0.070	u_{H2O}	0.02		0.0004
		≤	1.0 µmol/mol (Span)	0.030				
8b	Interferent CO_2 with 500 µmol/mol	≤	0.5 µmol/mol (Zero)	0.100	$u_{int,pos}$			0.0056
		≤	0.5 µmol/mol (Span)	-0.140				
8c	Interferent NO with 1 µmol/mol	≤	0.5 µmol/mol (Zero)	-0.060	or	0.07		
		≤	0.5 µmol/mol (Span)	0.100				
8d	Interferent N_2O with 50 nmol/mol	≤	0.5 µmol/mol (Zero)	-0.040				
		≤	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
10	Reproducibility standard deviation under field conditions	≤	5.0% of average over 3 months	3.270	$u_{r,f}$	0.28		0.0795
11	Long term drift at zero level	≤	0.5 µmol/mol	0.380	$u_{d,l,z}$	0.22		0.0481
12	Long term drift at span level	≤	5.0% of max. of certification range	1.380	$u_{d,l,8h}$	0.07		0.0047
18	Difference sample/calibration port	≤	1.0%	-0.050	$u_{\Delta sc}$	0.00		0.0000
21	Uncertainty of test gas	≤	3.0%	2.000	u_{cg}	0.09		0.0074
					Combined standard uncertainty	u_c		0.3936 µmol/mol
					Expanded uncertainty	U		0.7873 µmol/mol
					Relative expanded uncertainty	W		9.13 %
					Maximum allowed expanded uncertainty	W_{req}		15 %