

# CERTIFICATE

## of Product Conformity (QAL1)

Certificate No.: 0000043106\_02

**Certified AMS:** O342e\* resp. O342e for Ozone

**Manufacturer:** ENVEA  
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 the standards  
VDI 4202-1 (2010), VDI 4203-3 (2010), EN 14625 (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 11 pages).  
The present certificate replaces certificate 0000043106\_01 of 19 August 2016.



Suitability Tested  
Complying with  
2008/50/EC  
EN 15267  
Regular Surveillance  
www.tuv.com  
ID 0000043106

Publication in the German Federal Gazette  
(BAnz.) of 01 August 2016

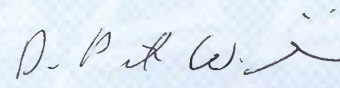
German Federal Environment Agency  
Dessau, 02 April 2020



Dr. Marcel Langner  
Head of Section II 4.1

This certificate will expire on:  
01 April 2025

TÜV Rheinland Energy GmbH  
Cologne, 01 April 2020



ppa. Dr. Peter Wilbring

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Am Grauen Stein  
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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>	936/21225396/B dated 26 February 2016
<b>Initial certification:</b>	30 April 2015
<b>Expiry date:</b>	01 April 2025
<b>Certificate:</b>	renewal (previous certificate 0000043106_01 dated 19 August 2016 valid until 01 April 2020)
<b>Publication:</b>	BAnz AT 01.08.2016 B11, chapter III no. 1.1

### **Approved application**

The tested AMS is suitable for continuous ambient air monitoring of ozone (stationary operation).

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 the 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 valid at the time of performance testing. As changes in legal regulations are possible, any potential user should ensure that this AMS is suitable for monitoring the limit value 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 936/21225396/B dated 26 February 2016 of 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 AT 01.08.2016 B11,  
chapter III number 1.1, Announcement by UBA from 14 July 2016:

**AMS designation:**

O3 42e\* resp. O3 42e for Ozone

**Manufacturer:**

Environnement S.A., Poissy, France

**Field of application:**

The tested AMS is suitable for continuous ambient air monitoring of ozone  
(stationary operation).

**Measuring ranges during the performance test:**

Component	Certification range	Unit
Ozone	0 - 500	µg/m <sup>3</sup>

**Software version:**

O342e Version: 1.0.4

O342e\* Version: 1.0.3

**Restrictions:**

None

**Notes:**

1. Measured values are displayed by means of a connected PC or Laptop.
2. The performance test also includes the O3 42e instrument version with integrated display.
3. The report on the performance test is available online at [www.qal1.de](http://www.qal1.de).
4. Supplementary testing (optimization of the LED's wavelength range as well as pressure compensation) as regards Federal Environment Agency (UBA) notices of 25 February 2015 (BAnz AT 02.04.2015 B5, chapter III number 1.1) and of 22 July 2015 (BAnz AT 26.08.2015 B4, chapter IV 47<sup>th</sup> notification).

**Test report:**

TÜV Rheinland Energie und Umwelt GmbH, Cologne  
Report No.: 936/21225396/B dated 26 February 2016

Publication in the German Federal Gazette: BAnz AT 26.03.2019 B7,  
chapter IV notification 30, UBA announcement dated 27 February 2019:

**30 Notification as regards Federal Environment Agency (UBA) notice  
of 14 July 2016 (BAnz AT 01.08.2016 B11, chapter III number 1.1)**

The current software version of the O342e\*/O342e measuring system for ozone  
manufactured by Environnement S.A. is:

v1.1.a

Statement issued by TÜV Rheinland Energy GmbH dated 27 September 2018

Publication in the German Federal Gazette: BAnz AT 24.03.2020 B7,  
chapter IV notification 35, UBA announcement dated 24 February 2020:

**35 Notification as regards Federal Environment Agency (UBA) notices  
of 14 July 2016 (BAnz AT 01.08.2016 B11, chapter III number 1.1) and  
of 27 February 2019 (BAnz AT 26.03.2019 B7, chapter IV 30<sup>st</sup> notification)**

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

The latest software version of the O342e\*/O342e measuring system for ozone  
manufactured by ENVEA is:

v1.1.b.

Statement issued by TÜV Rheinland Energy GmbH dated 1 October 2019

### Certified product

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

The ambient air monitor O342e\* is a continuous ozone monitor. The measurement principle is based on ultraviolet absorption. The instrument was developed for the continuous measurement of ozone concentrations in ambient air.

The measurement principle of the O342e\* is based on UV photometry according to the Beer-Lambert law. The absorption spectrum of ozone has its maximum in the wavelength range of 250 to 270 nanometres. The monochromatic UV-LED light source of the O342e\* is adjusted to a wavelength of 255 nm and therefore within the maximum absorption range of ozone.

The O342e\* analyser uses non-dispersive ultraviolet (UV) absorption technology to measure ozone concentrations. The sample to be analysed is led to the measurement module via a dust filter. The measurement module consists of the following parts:

- LED for monochromatic UV light with a wavelength of 255 nm, placed under a protective cover, which is fastened with 4 screws. The LED card is directly connected to the card of the reference photodetector.
- two photodetector cards: the reference photodetector card for measuring the energy of the incoming LED light ( $UV_0$ ) and the photodetector card for measuring UV absorption, which enables detection of signals  $i$  and  $i_0$ . Both cards are mounted beneath a protective cover to protect them against interfering light.
- the optical chamber consists of a beam splitter and a convex, flat lens for concentrating the light on the reference photodetector. In the optical chamber, the LED light can be distributed to reference photodetector and measuring chamber.
- a measurement chamber consisting of a glass tube and two mechanical parts at the inlet and outlet where the LED light is absorbed. The optical path length for the sample gas is 400 mm.
- cycle solenoid valve by means of which the sample gas can either cyclically or alternately be changed over to cycle channel  $i$  or cycle channel  $i_0$ .
- a flow restrictor which regulates the sample gas flow to 55 litres/hour. The excess flow valve is mounted at the fluid outlet of the measurement chamber.
- ozone filter which can filter out any trace of ozone from the sample gas
- connection for the pressure sensor
- Type PT1000 temperature sensor
- gas inlet

The AMS is available in two versions:

- The version **O342e** is fitted with a TFT LCD coloured display with backlight and a touch screen function. Signal output as well as operation can also be carried out via the web browser using an external PC connected via Ethernet.
- The version **O342e \*** is not fitted with a display. Signal output as well as operation can only be operated via the web browser on an external PC connected via Ethernet.

Apart from that, both versions of the AMS are of identical design.

### **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 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 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 its expiration is also accessible on the internet: [qal1.de](http://qal1.de).

### **History of documents**

Certification of O342e\* resp. O342e is based on the documents listed below and the regular, continuous monitoring of the Quality Management System of the manufacturer:

#### **Initial certification according to EN 15267**

Certificate No. 0000043106: 30 April 2015  
Expiry date of the certificate: 01 April 2020  
Test report 936/21225396/A dated 01 October 2014  
TÜV Rheinland Energie und Umwelt GmbH, Cologne  
Publication: BAnz AT 02.04.2015 B5, chapter III number 1.1  
Announcement by UBA dated 25 February 2015

#### **Notifications**

Statement of TÜV Rheinland Energy GmbH dated 16 March 2015  
Publication: BAnz AT 26.08.2015 B4, chapter IV notification 47  
Announcement by UBA dated 22 July 2015  
(new software version)

#### **Supplementary testing according to EN 15267**

Certificate No. 0000043106\_01: 19 August 2016  
Expiry date of the certificate: 01 April 2020  
Test report 936/21225396/B dated 26 February 2016  
TÜV Rheinland Energie und Umwelt GmbH, Cologne  
Publication: BAnz AT 01.08.2016 B11, chapter III no. 1.1  
Announcement by UBA dated 14 July 2016

**Notifications**

Statement of TÜV Rheinland Energy GmbH dated 27 September 2018  
Publication: BAnz AT 26.03.2019 B7, chapter IV notification 30  
Announcement by UBA dated 27 February 2019  
(new software version)

Statement of TÜV Rheinland Energy GmbH dated 1 October 2019  
Publication: BAnz AT 24.03.2020 B7, chapter IV notification 35  
Announcement by UBA dated 24 February 2020  
(new software version, manufacturer name)

**Renewal of the certificate**

Certificate No. 0000043106\_02: 02 April 2020  
Expiry date of the certificate: 01 April 2025

Expanded uncertainty, System 1

Measuring device:		SerialNo.:		SN 12 / SN 23	
Measured component:		1h-alert threshold		120	
O <sub>3</sub>				nmol/mol	
No.	Performance characteristic	Performance criterion	Result	Partial uncertainty	Square of partial uncertainty
1	Repeatability standard deviation at zero	≤ 1.0 nmol/mol	0.020	u <sub>r,z</sub>	0.0000
2	Repeatability standard deviation at 1h-alert threshold	≤ 3.0 nmol/mol	0.070	u <sub>r,h</sub>	0.0001
3	"lack of fit" at 1h-alert threshold	≤ 4.0% of measured value	0.880	u <sub>l,h</sub>	0.3717
4	Sensitivity coefficient of sample gas pressure at 1h-alert threshold	≤ 2.0 nmol/mol/kPa	0.130	u <sub>gp</sub>	2.0656
5	Sensitivity coefficient of sample gas temperature at 1h-alert threshold	≤ 1.0 nmol/mol/K	0.010	u <sub>gt</sub>	0.0122
6	Sensitivity coefficient of surrounding temperature at 1h-alert threshold	≤ 1.0 nmol/mol/K	0.392	u <sub>st</sub>	8.5280
7	Sensitivity coefficient of electrical voltage at 1h-alert threshold	≤ 0.30 nmol/mol/V	0.010	u <sub>v</sub>	0.0166
8a	Interferent H <sub>2</sub> O with 21 mmol/mol	≤ 10 nmol/mol (Zero)	0.300	u <sub>H2O</sub>	4.5862
8b	Interferent Toluene with 0.5 µmol/mol	≤ 10 nmol/mol (Span)	-2.870	u <sub>int,pos</sub> or u <sub>int,neg</sub>	0.6533
		≤ 5.0 nmol/mol (Zero)	0.870		
		≤ 5.0 nmol/mol (Span)	0.400		
8c	Interferent Xylene with 0.5 µmol/mol	≤ 5.0 nmol/mol (Zero)	1.760	0.81	0.6533
		≤ 5.0 nmol/mol (Span)	1.000		
9	Averaging effect	≤ 7.0% of measured value	-4.280	u <sub>av</sub>	8.7928
18	Difference sampler/calibration port	≤ 1.0%	-0.350	u <sub>sc</sub>	0.1764
21	Uncertainty of test gas	≤ 3.0%	2.000	u <sub>cg</sub>	1.4400
Combined standard uncertainty				u <sub>c</sub>	5.1617
Expanded uncertainty				U	10.3234
Relative expanded uncertainty				W	8.60
Maximum allowed expanded uncertainty				W <sub>req</sub>	15



Expanded uncertainty, System 2

Measuring device:		Serial-No.:		SN 14 / SN 24		
Measured component:		1h-alert threshold:		120 nmol/mol		
No.	Performance characteristic	Performance criterion	Result	Partial uncertainty	Square of partial uncertainty	
1	Repeatability standard deviation at zero	≤ 1.0 nmol/mol	0.020	$u_{r,z}$	0.0000	
2	Repeatability standard deviation at 1h-alert threshold	≤ 3.0 nmol/mol	0.090	$u_{r,v}$	0.0002	
3	"lack of fit" at 1h-alert threshold	≤ 4.0% of measured value	2.370	$u_{l,v}$	2.6961	
4	Sensitivity coefficient of sample gas pressure at 1h-alert threshold	≤ 2.0 nmol/mol/kPa	0.030	$u_{gp}$	0.1124	
5	Sensitivity coefficient of sample gas temperature at 1h-alert threshold	≤ 1.0 nmol/mol/K	0.020	$u_{gt}$	0.0489	
6	Sensitivity coefficient of surrounding temperature at 1h-alert threshold	≤ 1.0 nmol/mol/K	0.231	$u_{st}$	2.9514	
7	Sensitivity coefficient of electrical voltage at 1h-alert threshold	≤ 0.30 nmol/mol/V	0.020	$u_v$	0.0665	
8a	Interferent H <sub>2</sub> O with 21 mmol/mol	≤ 10 nmol/mol (Zero) ≤ 10 nmol/mol (Span)	0.530 -2.700	$u_{H_2O}$	4.0590	
8b	Interferent Toluene with 0.5 µmol/mol	≤ 5.0 nmol/mol (Zero) ≤ 5.0 nmol/mol (Span)	0.930 0.400	$u_{int, pos}$ or	0.5633	
8c	Interferent Xylene with 0.5 µmol/mol	≤ 5.0 nmol/mol (Zero) ≤ 5.0 nmol/mol (Span)	1.100 0.900	$u_{int, neg}$		
9	Averaging effect	≤ 7.0% of measured value	-4.770	$u_{av}$	10.9214	
18	Difference sample/calibration port	≤ 1.0%	-0.360	$u_{Dsc}$	0.1866	
21	Uncertainty of test gas	≤ 3.0%	2.000	ucg	1.4400	
Combined standard uncertainty				$u_c$	4.8017	nmol/mol
Expanded uncertainty				U	9.6033	nmol/mol
Relative expanded uncertainty				W	8.00	%
Maximum allowed expanded uncertainty				$W_{req}$	15	%

Combined standard uncertainty, System 1

Measuring device:		Serial-No.:		SN 12 / SN 23		nmol/mol	
Measured component:		1h-alert threshold:		120		nmol/mol	
No.	Performance characteristic	Performance criterion	Result	Partial uncertainty	Square of partial uncertainty		
1	Repeatability standard deviation at zero	≤ 1.0 nmol/mol	0.020	$u_{r,z}$	0.000		
2	Repeatability standard deviation at 1h-alert threshold	≤ 3.0 nmol/mol	0.070	$u_{r,th}$	not considered, as $u_{r,th} = 0.01 < u_{r,f}$		
3	"lack of fit" at 1h-alert threshold	≤ 4.0% of measured value	0.880	$u_{l,th}$	0.61	0.3717	
4	Sensitivity coefficient of sample gas pressure at 1h-alert threshold	≤ 2.0 nmol/mol/kPa	0.130	$u_{gp}$	1.44	2.0656	
5	Sensitivity coefficient of sample gas temperature at 1h-alert threshold	≤ 1.0 nmol/mol/K	0.010	$u_{gt}$	0.11	0.0122	
6	Sensitivity coefficient of surrounding temperature at 1h-alert threshold	≤ 1.0 nmol/mol/K	0.392	$u_{st}$	2.92	8.5280	
7	Sensitivity coefficient of electrical voltage at 1h-alert threshold	≤ 0.30 nmol/mol/V	0.010	$u_{v}$	0.13	0.0166	
8a	Interferent H <sub>2</sub> O with 21 mmol/mol	≤ 10 nmol/mol (Zero)	0.300	$u_{H_2O}$	-2.14	4.5862	
		≤ 10 nmol/mol (Span)	-2.870				
8b	Interferent Toluene with 0.5 µmol/mol	≤ 5.0 nmol/mol (Zero)	0.870	$u_{int,pos}$			
		≤ 5.0 nmol/mol (Span)	0.400	or	0.81	0.6533	
8c	Interferent Xylene with 0.5 µmol/mol	≤ 5.0 nmol/mol (Zero)	1.760				
		≤ 5.0 nmol/mol (Span)	1.000	$u_{int,neg}$			
9	Averaging effect	≤ 7.0% of measured value	-4.280	$u_{av}$	-2.97	8.7928	
10	Reproducibility standard deviation under field conditions	≤ 5.0% of average over 3 months	2.590	$u_{r,f}$	3.11	9.6597	
11	Long term drift at zero level	≤ 5.0 nmol/mol	0.590	$u_{d,lz}$	0.34	0.1160	
12	Long term drift at span level	≤ 5.0% of max. of certification range	1.190	$u_{d,lh}$	0.82	0.6797	
18	Difference sample/calibration port	≤ 1.0%	-0.350	$u_{asc}$	-0.42	0.1764	
21	Uncertainty of test gas	≤ 3.0%	2.000	$u_{cg}$	1.20	1.4400	
				Combined standard uncertainty		$u_c$	
				Expanded uncertainty		U	
				Relative expanded uncertainty		W	
				Maximum allowed expanded uncertainty		$W_{req}$	
						nmol/mol	
						nmol/mol	
						%	
						%	

Combined standard uncertainty, System 2

Measuring device:		SN 14 / SN 24		120		nmol/mol	
Measured component:		O <sub>3</sub>		1h-alert threshold:		nmol/mol	
No.	Performance characteristic	Performance criterion	Result	Partial uncertainty	Square of partial uncertainty		
1	Repeatability standard deviation at zero	≤ 1.0 nmol/mol	0.020	u <sub>r,z</sub>	0.00	0.0000	
2	Repeatability standard deviation at 1h-alert threshold	≤ 3.0 nmol/mol	0.090	u <sub>r,th</sub>	not considered, as u <sub>r,th</sub> = 0,01 < u <sub>r,f</sub>	-	
3	"lack of fit" at 1h-alert threshold	≤ 4.0% of measured value	2.370	u <sub>l,th</sub>	1.64	2.6961	
4	Sensitivity coefficient of sample gas pressure at 1h-alert threshold	≤ 2.0 nmol/mol/kPa	0.030	u <sub>sp</sub>	0.34	0.1124	
5	Sensitivity coefficient of sample gas temperature at 1h-alert threshold	≤ 1.0 nmol/mol/K	0.020	u <sub>gt</sub>	0.22	0.0489	
6	Sensitivity coefficient of surrounding temperature at 1h-alert threshold	≤ 1.0 nmol/mol/K	0.231	u <sub>st</sub>	1.72	2.9614	
7	Sensitivity coefficient of electrical voltage at 1h-alert threshold	≤ 0.30 nmol/mol/V	0.020	u <sub>v</sub>	0.26	0.0665	
8a	Interferent H <sub>2</sub> O with 21 nmol/mol	≤ 10 nmol/mol (Zero)	0.530	u <sub>H2O</sub>	-2.01	4.0590	
8b	Interferent Toluene with 0.5 µmol/mol	≤ 10 nmol/mol (Span)	-2.700	u <sub>tol,pos</sub>			
8c	Interferent Xylene with 0.5 µmol/mol	≤ 5.0 nmol/mol (Zero)	0.930	u <sub>int,pos</sub>			
9	Averaging effect	≤ 5.0 nmol/mol (Span)	0.400	or	0.75	0.5633	
10	Reproducibility standard deviation under field conditions	≤ 5.0 nmol/mol (Zero)	1.100	u <sub>int,neg</sub>			
11	Long term drift at zero level	≤ 5.0 nmol/mol (Span)	0.900	u <sub>av</sub>	-3.30	10.9214	
12	Long term drift at span level	≤ 7.0% of measured value	-4.770	u <sub>r,f</sub>	3.11	9.6597	
18	Difference sample/calibration port	≤ 5.0% of max. of certification range	2.590	u <sub>4,l,z</sub>	0.47	0.2187	
21	Uncertainty of test gas	≤ 5.0% of max. of certification range	1.450	u <sub>4,l,th</sub>	1.00	1.0092	
		≤ 1.0%	-0.360	u <sub>acc</sub>	-0.43	0.1866	
		≤ 3.0%	2.000	u <sub>og</sub>	1.20	1.4400	
Combined standard uncertainty						u <sub>c</sub>	5.8261
Expanded uncertainty						U	11.6522
Relative expanded uncertainty						W	9.71
Maximum allowed expanded uncertainty						W <sub>req</sub>	15