CERTIFICATE

of Product Conformity (QAL1)

Certificate No: 0000040208_03

Certified AMS:	MIR 9000H for CO, NO, NO_2, SO_2, NH_3, O_2, H_2O and CO_2
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 EN 15267-1 (2009), EN 15267-2 (2023), EN 15267-3 (2007), as well as EN 14181 (2004).

Certification is awarded in respect of the conditions stated in this certificate (this certificate contains 15 pages).
The present certificate replaces certificate 0000040208_02 dated 1 July 2020.

Suitability Tested
EN 15267
QAL1 Certified
Regular Surveillance

www.tuv.com
ID 0000040208

Publication in the German Federal Gazette (BAnz) of 1 April 2014

German Environment Agency

Dessau, 27 June 2025

This certificate will expire on:
30 June 2030

TÜV Rheinland Energy & Environment GmbH
Cologne, 26 June 2025

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

Test report:	936/21217993/A dated 4 September 2013
Initial certification:	1 April 2014
Expiry date:	30 June 2030
Certificate:	Renewal (of previous certificate 0000040208_02 of 1 July 2020 valid until 30 June 2025)
Publication:	BAnz AT 01.04.2014 B12, chapter I No. 3.5

Approved application

The tested AMS is suitable for use at plants according to Directive 2010/75/EC, chapter III (combustion plants / 13th BImSchV:2013), Directive 2010/75/EC, chapter IV (waste incineration plants / 17th BImSchV:2013), Directive 2015/2193/EC (44th BImSchV:2022), TA Luft:2002 and 30th BImSchV:2009. The measured ranges have been selected so as to ensure as broad a field of application as possible.

The suitability of the AMS for this application was assessed on the basis of a laboratory test and a four month field test at a waste incineration.

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 that this AMS is suitable for monitoring the emission limit values and oxygen concentration relevant to the application.

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

Note

The legal regulations mentioned correspond to the current state of legislation during certification. Each user should, if necessary, in consultation with the competent authority, ensure that this AMS meets the legal requirements for the intended use. In addition, it cannot be ruled out that legal regulations governing the use of a measuring device for emission monitoring may change during the lifetime of the certificate.

Basis of the certification

This certification is based on:

- Test report 936/21217993/A dated 4 September 2013 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 01.04.2014 B12, chapter I No. 3.5, Announcement by UBA dated 27 February 2014:

AMS designation:
MIR 9000H for CO, NO, NO_2, SO_2, NH_3, H_2O, CO_2 and O_2

Manufacturer:
Environnement S.A., Poissy, France

Field of application:
For plants requiring official approval and for plants according to the 27th BImSchV

Measuring ranges during the performance test:

Component	Certification range	Supplementary range	Unit
CO	0 – 75	0 – 1,000	mg/m³
NO	0 – 200	0 - 2,000	mg/m³
NO_2	0 – 200	0 - 2,000	mg/m³
SO_2	0 - 500	0 - 2,000	mg/m³
NH_3	0 – 15	0 – 100	mg/m³
H_2O	0 – 30	0 - 40	Vol.-%
CO_2	0 – 30	0 – 25	Vol.-%
O_2	0 – 25	-	Vol.-%

Software version:
3.4.h

Restrictions:
1. The measuring system did not meet the requirement for total uncertainty as defined in EN 15267-3 for the component CO.
2. The certification range of the measured component SO_2 is unsuitable for the monitoring of daily averages at plants according to Directive 2010/75/EU chapter IV (17th BImSchV).
3. The measuring system must be operated in a lockable measuring room/container.

Notes:
1. The maintenance interval is four weeks.
2. The measuring system performs zero point alignments four times per day.

Test Institute: TÜV Rheinland Energie und Umwelt GmbH, Cologne
Report No.: 936/21217993/A dated 4 September 2013

Publication in the German Federal Gazette: BAnz AT 26.08.2015 B4, Chap. V notification 23, Announcement by UBA dated 22 July 2015:

23 Notification as regards Federal Environment Agency (UBA) notice of 27 February 2014 (BAnz AT 01.04.2014 B12, chapter I number 3.5)

The current software version for the MIR9000H measuring system for CO, NO, NO_2, SO_2, NH_3, H_2O, CO_2 and O_2, manufactured by Environnement S.A., is:
v7.1.d (Calculation process)
v3.4.r (Display process)

Statement by TÜV Rheinland Energie und Umwelt GmbH dated 14 March 2015

Publication in the German Federal Gazette: BAnz AT 26.03.2018 B8, Chap. V notification 27, Announcement by UBA dated 21 February 2018:

27 Notification as regards Federal Environment Agency notices of 27 February 2014 (BAnz AT 01.04.2014 B12, chapter I number 3.5) and of 22 July 2015 (BAnz AT 26.08.2015 B4, chapter V notification 23)

The step engine Sanyo 103H548-0444 used so far for the MIR 9000H measuring system for CO, NO, NO_2, SO_2, NH_3, O_2, CO_2 and H_2O manufactured by Environnement S. A. has been replaced by the successor model Sanyo 103HS5208-0440.

Statement by TÜV Rheinland Energy GmbH dated 18 August 2017

Publication in the German Federal Gazette: BAnz AT 26.03.2019 B7, Chap. IV notification 29, Announcement by UBA dated 27 February 2019:

29 Notification as regards Federal Environment Agency notices of 27 February 2014 (BAnz AT 01.04.2014 B12, chapter I number 3.5) and of 21 February 2018 (BAnz AT 26.03.2018 B8, chapter V notification 27)

The current software version of the MIR 9000H for NO, NO_2, NO_x, CO_2 and O_2 manufactured by Environnement S.A. is:
v7.1.f (calculation process)
v3.8.a (display process)

Statement issued by TÜV Rheinland Energy GmbH dated 27 September 2018

Publication in the German Federal Gazette: BAnz AT 24.03.2020 B7, Chap. IV notification 34, Announcement by UBA dated 24 February 2020:

34 Notification as regards Federal Environment Agency (UBA) notices of 27 February 2014 (BAnz AT 01.04.2014 B12, chapter I number 3.5) and of 27 February 2019 (BAnz AT 26.03.2019 B7, chapter IV notification 29)

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

Other than that, the MIR 9000H measuring system for CO, NO, NO_2, SO_2, NH_3, CO_2, H_2O and O_2 manufactured by ENVEA remains unchanged.

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 measuring system is a continuous emission monitoring system for measuring up to 8 components using infrared spectroscopy with gas filter correlation. Oxygen is measured with a zirconium dioxide sensor positioned in the measuring cell.

The gas sample is fed via the sample probe (HOFI-box) and the heated sample gas pipe from the internal pump into the optical multi-reflection chamber. The signal is sensitized due to the increased measuring path of 6 m. The optical measuring chamber is intersected by an infrared beam which is then measured in a detector. A light beam emitted by the IR source passes through the measuring chamber and is directed to an IR detector. Every gas molecule in the path of the light beam absorbs the light on a specific wavelength range that is characteristic for the particular gas. An interferent filter that surrounds a specific wavelength is positioned on the optical path to the measuring chamber.

The MIR 9000H AMS consists of:

- the MIR 9000H analyser
- a sample probe (HOFI-box) heated to 180 °C
- a sample gas pipe (interior diameter 4 mm, PTFE) heated to 180 °C, 10 m length during the performance test
- a distributor for zero gas and test gases

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 MIR 9000H 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. 0000040208_00: 29 April 2014
Expiry date of the certificate: 31 March 2019
Test report: 936/21217993/A dated 4 September 2013
TÜV Rheinland Energie und Umwelt GmbH
Publication: BAnz AT 01.04.2014 B12, chapter I number 3.5
UBA announcement dated 27 February 2014

Notifications
Statement issued by TÜV Rheinland Energie und Umwelt GmbH dated 14 March 2015
Publication: BAnz AT 26.08.2015 B4, chapter V notification 23
UBA announcement dated 22 July 2015
(Software changes)

Statement issued by TÜV Rheinland Energy GmbH dated 18 August 2017
Publication: BAnz AT 26.03.2018 B8, chapter V notification 27
UBA announcement dated 21 February 2018
(Hardware changes)

Renewal of certificates
Certificate No. 0000040208_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 29
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 34
UBA announcement dated 24 February 2020
(Producer formerly Environnement S.A.)

Renewal of certificates
Certificate No. 0000040208_02: 1 July 2020
Expiry date of the certificate: 30 June 2025

Renewal of certificates
Certificate No. 0000040208_03: 27 June 2025
Expiry date of the certificate: 30 June 2030

Calculation of overall uncertainty according to EN 14181 and EN 15267-3

Measuring system			
Manufacturer		Environnement-S.A.	
AMS designation		MIR 9000H	
Serial number of units under test		2507 / 2508	
Measuring principle		IR- Gasfiltercorrelation	
Test report		936/21217993/A	
Test laboratory		TÜV Rheinland	
Date of report		2013-09-04	
Measured component		CO	
Certification range		0 - 75	mg/m³
Evaluation of the cross-sensitivity (CS)			
(system with largest CS)			
Sum of positive CS at zero point		0.68	mg/m³
Sum of negative CS at zero point		0.00	mg/m³
Sum of postive CS at span point		1.40	mg/m³
Sum of negative CS at span point		-0.70	mg/m³
Maximum sum of cross-sensitivities		1.40	mg/m³
Uncertainty of cross-sensitivity		0.805	mg/m³

Calculation of the combined standard uncertainty

Tested parameter				u^2	
Standard deviation from paired measurements under field conditions *	u_D	0.834	mg/m³	0.696	(mg/m³)²
Lack of fit	u_{lof}	0.229	mg/m³	0.052	(mg/m³)²
Zero drift from field test	$u_{d,z}$	0.589	mg/m³	0.347	(mg/m³)²
Span drift from field test	$u_{d,s}$	1.299	mg/m³	1.687	(mg/m³)²
Influence of ambient temperature at span	u_t	0.458	mg/m³	0.210	(mg/m³)²
Influence of supply voltage	u_v	0.157	mg/m³	0.025	(mg/m³)²
Cross-sensitivity (interference)	u_i	0.805	mg/m³	0.649	(mg/m³)²
Influence of sample gas flow	u_n	-0.334	mg/m³	0.112	(mg/m³)²
Uncertainty of reference material at 70% of certification range	u_{rm}	0.606	mg/m³	0.368	(mg/m³)²

* The larger value is used :
"Repeatability standard deviation at span" or
"Standard deviation from paired measurements under field conditions"

Combined standard uncertainty (u_C)	$u_c = \sqrt{\sum (u_{max,j})^2}$	2.04	mg/m³
Total expanded uncertainty	$U = u_c * k = u_c * 1.96$	3.99	mg/m³

Relative total expanded uncertainty	**U in % of the ELV 50 mg/m³**	**8.0**
Requirement of 2010/75/EU	**U in % of the ELV 50 mg/m³**	**10.0**
Requirement of EN 15267-3	U in % of the ELV 50 mg/m³	7.5

Calculation of overall uncertainty according to EN 14181 and EN 15267-3

Measuring system			
Manufacturer	Environnement-S.A.		
AMS designation	MIR 9000H		
Serial number of units under test	2507 / 2508		
Measuring principle	IR- Gasfiltercorrelation		
Test report	936/21217993/A		
Test laboratory	TÜV Rheinland		
Date of report	2013-09-04		
Measured component	NO		
Certification range	0 - 200	mg/m³	

Evaluation of the cross-sensitivity (CS)

(system with largest CS)		
Sum of positive CS at zero point	7.08	mg/m³
Sum of negative CS at zero point	-3.76	mg/m³
Sum of postive CS at span point	5.60	mg/m³
Sum of negative CS at span point	-3.30	mg/m³
Maximum sum of cross-sensitivities	7.08	mg/m³
Uncertainty of cross-sensitivity	4.088	mg/m³

Calculation of the combined standard uncertainty

Tested parameter				u^2	
Standard deviation from paired measurements under field conditions *	u_D	2.022	mg/m³	4.088	(mg/m³)²
Lack of fit	u_{lof}	1.155	mg/m³	1.334	(mg/m³)²
Zero drift from field test	$u_{d,z}$	1.253	mg/m³	1.570	(mg/m³)²
Span drift from field test	$u_{d,s}$	3.464	mg/m³	11.999	(mg/m³)²
Influence of ambient temperature at span	u_t	1.041	mg/m³	1.084	(mg/m³)²
Influence of supply voltage	u_v	1.267	mg/m³	1.605	(mg/m³)²
Cross-sensitivity (interference)	u_i	4.088	mg/m³	16.709	(mg/m³)²
Influence of sample gas flow	u_n	-0.265	mg/m³	0.070	(mg/m³)²
Uncertainty of reference material at 70% of certification range	u_{rm}	1.617	mg/m³	2.613	(mg/m³)²

* The larger value is used :
"Repeatability standard deviation at span" or
"Standard deviation from paired measurements under field conditions"

Combined standard uncertainty (u_C)	$u_c = \sqrt{\sum (u_{max,j})^2}$	6.41	mg/m³
Total expanded uncertainty	$U = u_c * k = u_c * 1.96$	12.56	mg/m³

Relative total expanded uncertainty	**U in % of the ELV 100 mg/m³**	**12.6**
Requirement of 2010/75/EU	**U in % of the ELV 100 mg/m³**	**20.0**
Requirement of EN 15267-3	U in % of the ELV 100 mg/m³	15.0

Calculation of overall uncertainty according to EN 14181 and EN 15267-3

Measuring system			
Manufacturer			Environnement-S.A.
AMS designation			MIR 9000H
Serial number of units under test			2507 / 2508
Measuring principle			IR- Gasfiltercorrelation
Test report			936/21217993/A
Test laboratory			TÜV Rheinland
Date of report			2013-09-04
Measured component			NO_2
Certification range			0 - 200 mg/m³
Evaluation of the cross-sensitivity (CS)			
(system with largest CS)			
Sum of positive CS at zero point		7.28	mg/m³
Sum of negative CS at zero point		0.00	mg/m³
Sum of postive CS at span point		5.00	mg/m³
Sum of negative CS at span point		-1.00	mg/m³
Maximum sum of cross-sensitivities		7.28	mg/m³
Uncertainty of cross-sensitivity		4.203	mg/m³

Calculation of the combined standard uncertainty

Tested parameter				u^2	
Repeatability standard deviation at set point *	u_r	1.207	mg/m³	1.457	(mg/m³)²
Lack of fit	u_{lof}	0.808	mg/m³	0.653	(mg/m³)²
Zero drift from field test	$u_{fl,z}$	1.542	mg/m³	2.378	(mg/m³)²
Span drift from field test	$u_{fl,s}$	3.464	mg/m³	11.999	(mg/m³)²
Influence of ambient temperature at span	u_t	1.300	mg/m³	1.690	(mg/m³)²
Influence of supply voltage	u_v	1.349	mg/m³	1.820	(mg/m³)²
Cross-sensitivity (interference)	u_i	4.203	mg/m³	17.666	(mg/m³)²
Influence of sample gas flow	u_n	0.433	mg/m³	0.187	(mg/m³)²
Uncertainty of reference material at 70% of certification range	u_{rm}	1.617	mg/m³	2.613	(mg/m³)²

* The larger value is used :
"Repeatability standard deviation at span" or
"Standard deviation from paired measurements under field conditions"

Combined standard uncertainty (u_C)	$u_c = \sqrt{\sum (u_{max,j})^2}$	6.36	mg/m³
Total expanded uncertainty	$U = u_c * k = u_c * 1.96$	12.47	mg/m³

Relative total expanded uncertainty	**U in % of the ELV 200 mg/m³**	**6.2**
Requirement of 2010/75/EU	**U in % of the ELV 200 mg/m³**	**20.0**
Requirement of EN 15267-3	U in % of the ELV 200 mg/m³	15.0

Calculation of overall uncertainty according to EN 14181 and EN 15267-3

Measuring system			
Manufacturer			Environnement-S.A.
AMS designation			MIR 9000H
Serial number of units under test			2507 / 2508
Measuring principle			IR- Gasfiltercorrelation
Test report			936/21217993/A
Test laboratory			TÜV Rheinland
Date of report			2013-09-04
Measured component			SO_2
Certification range			0 - 500 mg/m³
Evaluation of the cross-sensitivity (CS)			
(system with largest CS)			
Sum of positive CS at zero point		0.00	mg/m³
Sum of negative CS at zero point		-5.45	mg/m³
Sum of postive CS at span point		0.00	mg/m³
Sum of negative CS at span point		0.00	mg/m³
Maximum sum of cross-sensitivities		-5.45	mg/m³
Uncertainty of cross-sensitivity		-3.147	mg/m³

Calculation of the combined standard uncertainty

Tested parameter				u^2	
Repeatability standard deviation at set point *	u_r	5.963	mg/m³	35.557	(mg/m³)²
Lack of fit	u_{lof}	-2.887	mg/m³	8.335	(mg/m³)²
Zero drift from field test	$u_{fl,z}$	4.030	mg/m³	16.241	(mg/m³)²
Span drift from field test	$u_{fl,s}$	8.660	mg/m³	74.996	(mg/m³)²
Influence of ambient temperature at span	u_t	3.579	mg/m³	12.809	(mg/m³)²
Influence of supply voltage	u_v	2.272	mg/m³	5.162	(mg/m³)²
Cross-sensitivity (interference)	u_i	-3.147	mg/m³	9.901	(mg/m³)²
Influence of sample gas flow	u_n	-0.902	mg/m³	0.814	(mg/m³)²
Uncertainty of reference material at 70% of certification range	u_{rm}	4.041	mg/m³	16.333	(mg/m³)²

* The larger value is used :
"Repeatability standard deviation at span" or
"Standard deviation from paired measurements under field conditions"

Combined standard uncertainty (u_C)	$u_c = \sqrt{\sum (u_{max,j})^2}$	13.42	mg/m³
Total expanded uncertainty	$U = u_c * k = u_c * 1.96$	26.31	mg/m³

Relative total expanded uncertainty	**U in % of the ELV 200 mg/m³**	**13.2**
Requirement of 2010/75/EU	**U in % of the ELV 200 mg/m³**	**20.0**
Requirement of EN 15267-3	U in % of the ELV 200 mg/m³	15.0

Calculation of overall uncertainty according to EN 14181 and EN 15267-3

Measuring system					
Manufacturer			Environnement-S.A.		
AMS designation			MIR 9000H		
Serial number of units under test			2507 / 2508		
Measuring principle			IR- Gasfiltercorrelation		
Test report			936/21217993/A		
Test laboratory			TÜV Rheinland		
Date of report			2013-09-04		
Measured component			NH_3		
Certification range			0 - 15	mg/m³	
Evaluation of the cross-sensitivity (CS)					
(system with largest CS)					
Sum of positive CS at zero point			0.39	mg/m³	
Sum of negative CS at zero point			-0.10	mg/m³	
Sum of postive CS at span point			0.20	mg/m³	
Sum of negative CS at span point			-0.10	mg/m³	
Maximum sum of cross-sensitivities			0.39	mg/m³	
Uncertainty of cross-sensitivity			0.226	mg/m³	

Calculation of the combined standard uncertainty

Tested parameter				u^2	
Standard deviation from paired measurements under field conditions *	u_D	0.070	mg/m³	0.005	(mg/m³)²
Lack of fit	u_{lof}	0.139	mg/m³	0.019	(mg/m³)²
Zero drift from field test	$u_{d,z}$	0.069	mg/m³	0.005	(mg/m³)²
Span drift from field test	$u_{d,s}$	0.144	mg/m³	0.021	(mg/m³)²
Influence of ambient temperature at span	u_t	0.058	mg/m³	0.003	(mg/m³)²
Influence of supply voltage	u_v	0.065	mg/m³	0.004	(mg/m³)²
Cross-sensitivity (interference)	u_i	0.226	mg/m³	0.051	(mg/m³)²
Influence of sample gas flow	u_n	0.029	mg/m³	0.001	(mg/m³)²
Uncertainty of reference material at 70% of certification range	u_{rm}	0.121	mg/m³	0.015	(mg/m³)²

* The larger value is used :
"Repeatability standard deviation at span" or
"Standard deviation from paired measurements under field conditions"

Combined standard uncertainty (u_C)	$u_c = \sqrt{\sum (u_{max,j})^2}$	0.35	mg/m³
Total expanded uncertainty	$U = u_c * k = u_c * 1.96$	0.69	mg/m³

Relative total expanded uncertainty	**U in % of the ELV 10 mg/m³**	**6.9**
Requirement of 2010/75/EU	**U in % of the ELV 10 mg/m³**	**40.0 ****
Requirement of EN 15267-3	U in % of the ELV 10 mg/m³	30.0

**For this component no requirements in the EC-directive 2010/75/EU is given.
The chosen value is recommended by the certification body.

Calculation of overall uncertainty according to EN 14181 and EN 15267-3

Measuring system					
Manufacturer			Environnement-S.A.		
AMS designation			MIR 9000H		
Serial number of units under test			2507 / 2508		
Measuring principle			IR- Gasfiltercorrelation		
Test report			936/21217993/A		
Test laboratory			TÜV Rheinland		
Date of report			2013-09-04		
Measured component			H_2O		
Certification range			0 - 30	Vol.-%	
Evaluation of the cross-sensitivity (CS)					
(system with largest CS)					
Sum of positive CS at zero point			0.00	Vol.-%	
Sum of negative CS at zero point			-0.21	Vol.-%	
Sum of postive CS at span point			0.00	Vol.-%	
Sum of negative CS at span point			0.00	Vol.-%	
Maximum sum of cross-sensitivities			-0.21	Vol.-%	
Uncertainty of cross-sensitivity			-0.121	Vol.-%	

Calculation of the combined standard uncertainty

Tested parameter				u^2	
Standard deviation from paired measurements under field conditions *	u_D	0.174	Vol.-%	0.030	(Vol.-%)²
Lack of fit	u_{lof}	-0.116	Vol.-%	0.013	(Vol.-%)²
Zero drift from field test	$u_{d,z}$	0.173	Vol.-%	0.030	(Vol.-%)²
Span drift from field test	$u_{d,s}$	0.173	Vol.-%	0.030	(Vol.-%)²
Influence of ambient temperature at span	u_t	0.208	Vol.-%	0.043	(Vol.-%)²
Influence of supply voltage	u_v	0.111	Vol.-%	0.012	(Vol.-%)²
Cross-sensitivity (interference)	u_i	-0.121	Vol.-%	0.015	(Vol.-%)²
Influence of sample gas flow	u_n	0.022	Vol.-%	0.000	(Vol.-%)²
Uncertainty of reference material at 70% of certification range	u_{rm}	0.242	Vol.-%	0.059	(Vol.-%)²

* The larger value is used :
"Repeatability standard deviation at span" or
"Standard deviation from paired measurements under field conditions"

Combined standard uncertainty (u_C)	$u_c = \sqrt{\sum (u_{max,j})^2}$	0.48	Vol.-%
Total expanded uncertainty	$U = u_c * k = u_c * 1.96$	0.95	Vol.-%

Relative total expanded uncertainty	**U in % of the range 30 Vol.-%**	**3.2**
Requirement of 2010/75/EU	**U in % of the range 30 Vol.-%**	**10.0 ****
Requirement of EN 15267-3	U in % of the range 30 Vol.-%	7.5

**For this component no requirements in the EC-directive 2010/75/EU is given.
The chosen value is recommended by the certification body.

Calculation of overall uncertainty according to EN 14181 and EN 15267-3

Measuring system					
Manufacturer		Environnement S.A.			
AMS designation		MIR 9000H			
Serial number of units under test		2507 / 2508			
Measuring principle		IR- Gasfiltercorrelation			
Test report		936/21217993/A			
Test laboratory		TÜV Rheinland			
Date of report		2013-09-04			
Measured component		CO_2			
Certification range		0 - 30	Vol.-%		
Evaluation of the cross-sensitivity (CS)					
(system with largest CS)					
Sum of positive CS at zero point		0.00	Vol.-%		
Sum of negative CS at zero point		0.00	Vol.-%		
Sum of postive CS at span point		0.60	Vol.-%		
Sum of negative CS at span point		-0.20	Vol.-%		
Maximum sum of cross-sensitivities		0.60	Vol.-%		
Uncertainty of cross-sensitivity		0.348	Vol.-%		
Calculation of the combined standard uncertainty					
Tested parameter				u^2	
Standard deviation from paired measurements under field conditions *	u_D	0.435	Vol.-%	0.189	(Vol.-%)²
Lack of fit	u_{lof}	-0.144	Vol.-%	0.021	(Vol.-%)²
Zero drift from field test	$u_{d,z}$	0.387	Vol.-%	0.150	(Vol.-%)²
Span drift from field test	$u_{d,s}$	0.520	Vol.-%	0.270	(Vol.-%)²
Influence of ambient temperature at span	u_t	0.153	Vol.-%	0.023	(Vol.-%)²
Influence of supply voltage	u_v	0.012	Vol.-%	0.000	(Vol.-%)²
Cross-sensitivity (interference)	u_i	0.348	Vol.-%	0.121	(Vol.-%)²
Influence of sample gas flow	u_p	0.047	Vol.-%	0.002	(Vol.-%)²
Uncertainty of reference material at 70% of certification range	u_{rm}	0.242	Vol.-%	0.059	(Vol.-%)²
Combined standard uncertainty (u_C)	$u_c = \sqrt{\sum (u_{max,j})^2}$			0.91	Vol.-%
Total expanded uncertainty	$U = u_c * k = u_c * 1.96$			1.79	Vol.-%

* The larger value is used :
"Repeatability standard deviation at span" or
"Standard deviation from paired measurements under field conditions"

Relative total expanded uncertainty	**U in % of the range 30 Vol.-%**	**6.0**
Requirement of 2010/75/EU	**U in % of the range 30 Vol.-%**	**10.0****
Requirement of EN 15267-3	U in % of the range 30 Vol.-%	7.5

**For this component no requirements in the EC-directives 2001/80/EG und 2000/76/EG are given.
The chosen value is recommended by the certification body.

Umwelt Bundesamt

Certificate:
0000040208_03 / 27 June 2025

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Calculation of overall uncertainty according to EN 14181 and EN 15267-3

Measuring system					
Manufacturer		Environnement-S.A.			
AMS designation		MIR 9000H			
Serial number of units under test		2507 / 2508			
Measuring principle		Zirkoniumdioxide			
Test report		936/21217993/A			
Test laboratory		TÜV Rheinland			
Date of report		2013-09-04			
Measured component		O_2			
Certification range		0 - 25	Vol.-%		
Evaluation of the cross-sensitivity (CS)					
(system with largest CS)					
Sum of positive CS at zero point		0.00	Vol.-%		
Sum of negative CS at zero point		0.00	Vol.-%		
Sum of postive CS at span point		0.00	Vol.-%		
Sum of negative CS at span point		0.00	Vol.-%		
Maximum sum of cross-sensitivities		0.00	Vol.-%		
Uncertainty of cross-sensitivity		0.000	Vol.-%		

Calculation of the combined standard uncertainty

Tested parameter				u^2	
Standard deviation from paired measurements under field conditions *	u_D	0.057	Vol.-%	0.003	(Vol.-%)²
Lack of fit	u_{lof}	0.014	Vol.-%	0.000	(Vol.-%)²
Zero drift from field test	$u_{d,z}$	-0.058	Vol.-%	0.003	(Vol.-%)²
Span drift from field test	$u_{d,s}$	0.058	Vol.-%	0.003	(Vol.-%)²
Influence of ambient temperature at span	u_t	0.040	Vol.-%	0.002	(Vol.-%)²
Influence of supply voltage	u_v	0.031	Vol.-%	0.001	(Vol.-%)²
Cross-sensitivity (interference)	u_i	0.000	Vol.-%	0.000	(Vol.-%)²
Influence of sample gas flow	u_n	-0.012	Vol.-%	0.000	(Vol.-%)²
Uncertainty of reference material at 70% of certification range	u_{rm}	0.202	Vol.-%	0.041	(Vol.-%)²

* The larger value is used :
"Repeatability standard deviation at span" or
"Standard deviation from paired measurements under field conditions"

Combined standard uncertainty (u_C)	$u_c = \sqrt{\sum (u_{max,j})^2}$	0.23	Vol.-%
Total expanded uncertainty	$U = u_c * k = u_c * 1.96$	0.45	Vol.-%

Relative total expanded uncertainty	**U in % of the range 25 Vol.-%**	**1.8**
Requirement of 2010/75/EU	**U in % of the range 25 Vol.-%**	**10.0 ****
Requirement of EN 15267-3	U in % of the range 25 Vol.-%	7.5

**For this component no requirements in the EC-directive 2010/75/EU is given.
The chosen value is recommended by the certification body.