

CERTIFICATE

of Product Conformity (QAL1)

Certificate No.: 0000040208

Certified AMS: MIR 9000H for CO, NO, NO₂, SO₂, NH₃, H₂O, CO₂ and O₂

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

Test Institute: TÜV Rheinland Energie und Umwelt GmbH

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

**EN 15267-1: 2009, EN 15267-2: 2009, EN 15267-3: 2007
and EN 14181: 2004**

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



Suitability Tested
EN 15267
QAL1 Certified
Regular
Surveillance

www.tuv.com
ID 0000040208

Publication in the German Federal Gazette
(BAnz.) of 01 April 2014

German Federal Environment Agency
Dessau, 29 April 2014



i. A. Dr. Marcel Langner

This certificate will expire on:
31 March 2019

TÜV Rheinland Energie und Umwelt GmbH
Cologne, 28 April 2014



ppa. Dr. Peter Wilbring

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TÜV Rheinland Energie und Umwelt GmbH
Am Grauen Stein
51105 Cologne

Accreditation according to EN ISO/IEC 17025 and certified according to ISO 9001:2008.

Test report:	936/21217993/A of 04 September 2013
Initial certification:	01 April 2014
Expiry date:	31 March 2019
Publication:	BAnz AT 01 April 2014 B12, chapter I, No. 3.5

Approved application

The tested AMS is suitable for use at combustion plants according to Directive 2010/75/EU, chapter III, at waste incineration plants according to Directive 2010/75/EU, chapter IV and other plants requiring official approval. The tested ranges have been chosen with respect to the wide application range of the AMS.

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 municipal waste incinerator.

The AMS is approved for an ambient temperature range of +5 °C to +40 °C.

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

Basis of the certification

This certification is based on:

- test report 936/21217993/A of 04 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 April 2014 B12, chapter I, No. 3.5, Announcement by UBA from 27 February 2014)

AMS designation:

MIR 9000H for CO, NO, NO₂, SO₂, NH₃, H₂O, CO₂ and O₂

Manufacturer:

Environnement S.A., Poissy, France

Field of application:

For measurements at plants requiring official approval (Directive 2010/75/EU on industrial emissions, chapter III and IV)

Measuring ranges during the performance test:

Components	Certification range	Supplementary range	Units
CO	0 - 75	0 - 1000	mg/m ³
NO	0 - 200	0 - 2000	mg/m ³
NO ₂	0 - 200	0 - 2000	mg/m ³
SO ₂	0 - 500	0 - 2000	mg/m ³
NH ₃	0 - 15	0 - 100	mg/m ³
H ₂ O	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 performance criterion as related to the expanded uncertainty according to EN 15267-3 is not fulfilled for the component CO.
2. The certification range of the measured component SO₂ is not suitable for the monitoring of daily averages at plants according to Directive 2010/75/EU chapter IV.
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 alignment four times per day.

Test report:

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

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 Energie und Umwelt 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.

This document as well as the certification mark remains property of TÜV Rheinland Energie und Umwelt GmbH. With revocation of the publication the certificate loses its validity. After the expiration of the certificate and on requests of the TÜV Rheinland Energie und Umwelt 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.

Certification of MIR 9000H for CO, NO, NO₂, SO₂, NH₃, H₂O, CO₂ and O₂ 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: 29 April 2014

Expiry date of the certificate: 31 March 2019

Test report: 936/21217993/A of 4 September 2013
TÜV Rheinland Energie und Umwelt GmbH, Cologne

Publication: BAnz AT 01 April 2014 B12, chapter I, No. 3.5
Announcement by UBA from 27 February 2014

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

Test laboratory	TÜV Rheinland
Date of report	2013-09-04

Measured component

	CO
Certification range	0 - 75 mg/m ³

Evaluation of the cross-sensitivity (CS)

(system with largest CS)

Sum of positive CS at zero point	0.68 mg/m ³
Sum of negative CS at zero point	0.00 mg/m ³
Sum of positive CS at span point	1.40 mg/m ³
Sum of negative CS at span point	-0.70 mg/m ³
Maximum sum of cross-sensitivities	1.40 mg/m ³
Uncertainty of cross-sensitivity	0.805 mg/m ³

Calculation of the combined standard uncertainty

Tested parameter

			u ²
Standard deviation from paired measurements under field conditions *	u _D	0.834 mg/m ³	0.696 (mg/m ³) ²
Lack of fit	u _{lof}	0.229 mg/m ³	0.052 (mg/m ³) ²
Zero drift from field test	u _{d,z}	0.589 mg/m ³	0.347 (mg/m ³) ²
Span drift from field test	u _{d,s}	1.299 mg/m ³	1.687 (mg/m ³) ²
Influence of ambient temperature at span	u _t	0.458 mg/m ³	0.210 (mg/m ³) ²
Influence of supply voltage	u _v	0.157 mg/m ³	0.025 (mg/m ³) ²
Cross-sensitivity (interference)	u _i	0.805 mg/m ³	0.649 (mg/m ³) ²
Influence of sample gas flow	u _p	-0.334 mg/m ³	0.112 (mg/m ³) ²
Uncertainty of reference material at 70% of certification range	u _{rm}	0.606 mg/m ³	0.368 (mg/m ³) 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/m ³
Total expanded uncertainty	$U = u_c * k = u_c * 1.96$	3.99 mg/m ³

Relative total expanded uncertainty

Requirement of 2010/75/EU	U in % of the ELV 50 mg/m³	8.0
Requirement of EN 15267-3	U in % of the ELV 50 mg/m³	10.0
	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

Test laboratory	TÜV Rheinland
Date of report	2013-09-04

Measured component

Certification range	NO 0 - 200 mg/m ³
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Evaluation of the cross-sensitivity (CS)

(system with largest CS)

Sum of positive CS at zero point	7.08 mg/m ³
Sum of negative CS at zero point	-3.76 mg/m ³
Sum of positive CS at span point	5.60 mg/m ³
Sum of negative CS at span point	-3.30 mg/m ³
Maximum sum of cross-sensitivities	7.08 mg/m ³
Uncertainty of cross-sensitivity	4.088 mg/m ³

Calculation of the combined standard uncertainty

Tested parameter

			u ²	
Standard deviation from paired measurements under field conditions *	u _D	2.022 mg/m ³	4.088	(mg/m ³) ²
Lack of fit	u _{lof}	1.155 mg/m ³	1.334	(mg/m ³) ²
Zero drift from field test	u _{d,z}	1.253 mg/m ³	1.570	(mg/m ³) ²
Span drift from field test	u _{d,s}	3.464 mg/m ³	11.999	(mg/m ³) ²
Influence of ambient temperature at span	u _t	1.041 mg/m ³	1.084	(mg/m ³) ²
Influence of supply voltage	u _v	1.267 mg/m ³	1.605	(mg/m ³) ²
Cross-sensitivity (interference)	u _i	4.088 mg/m ³	16.709	(mg/m ³) ²
Influence of sample gas flow	u _p	-0.265 mg/m ³	0.070	(mg/m ³) ²
Uncertainty of reference material at 70% of certification range	u _{rm}	1.617 mg/m ³	2.613	(mg/m ³) 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)

$$u_c = \sqrt{\sum (u_{max, j})^2} \quad 6.41 \text{ mg/m}^3$$

Total expanded uncertainty

$$U = u_c * k = u_c * 1.96 \quad 12.56 \text{ mg/m}^3$$

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

Test laboratory	TÜV Rheinland
Date of report	2013-09-04

Measured component

Certification range	NO ₂ 0 - 200 mg/m ³
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Evaluation of the cross-sensitivity (CS)

(system with largest CS)

Sum of positive CS at zero point	7.28 mg/m ³
Sum of negative CS at zero point	0.00 mg/m ³
Sum of positive CS at span point	5.00 mg/m ³
Sum of negative CS at span point	-1.00 mg/m ³
Maximum sum of cross-sensitivities	7.28 mg/m ³
Uncertainty of cross-sensitivity	4.203 mg/m ³

Calculation of the combined standard uncertainty

Tested parameter

			u ²	
Repeatability standard deviation at set point *	u _r	1.207 mg/m ³	1.457	(mg/m ³) ²
Lack of fit	u _{lof}	0.808 mg/m ³	0.653	(mg/m ³) ²
Zero drift from field test	u _{d,z}	1.542 mg/m ³	2.378	(mg/m ³) ²
Span drift from field test	u _{d,s}	3.464 mg/m ³	11.999	(mg/m ³) ²
Influence of ambient temperature at span	u _t	1.300 mg/m ³	1.690	(mg/m ³) ²
Influence of supply voltage	u _v	1.349 mg/m ³	1.820	(mg/m ³) ²
Cross-sensitivity (interference)	u _i	4.203 mg/m ³	17.666	(mg/m ³) ²
Influence of sample gas flow	u _p	0.433 mg/m ³	0.187	(mg/m ³) ²
Uncertainty of reference material at 70% of certification range	u _{rm}	1.617 mg/m ³	2.613	(mg/m ³) 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)

$$u_c = \sqrt{\sum (u_{max, j})^2} \quad 6.36 \text{ mg/m}^3$$

Total expanded uncertainty

$$U = u_c * k = u_c * 1.96 \quad 12.47 \text{ mg/m}^3$$

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

Test laboratory	TÜV Rheinland
Date of report	2013-09-04

Measured component

	SO ₂
Certification range	0 - 500 mg/m ³

Evaluation of the cross-sensitivity (CS)

(system with largest CS)

Sum of positive CS at zero point	0.00 mg/m ³
Sum of negative CS at zero point	-5.45 mg/m ³
Sum of positive CS at span point	0.00 mg/m ³
Sum of negative CS at span point	0.00 mg/m ³
Maximum sum of cross-sensitivities	-5.45 mg/m ³
Uncertainty of cross-sensitivity	-3.147 mg/m ³

Calculation of the combined standard uncertainty

Tested parameter

		u ²	
Repeatability standard deviation at set point *	u _r 5.963 mg/m ³	35.557	(mg/m ³) ²
Lack of fit	u _{lof} -2.887 mg/m ³	8.335	(mg/m ³) ²
Zero drift from field test	u _{d,z} 4.030 mg/m ³	16.241	(mg/m ³) ²
Span drift from field test	u _{d,s} 8.660 mg/m ³	74.996	(mg/m ³) ²
Influence of ambient temperature at span	u _t 3.579 mg/m ³	12.809	(mg/m ³) ²
Influence of supply voltage	u _v 2.272 mg/m ³	5.162	(mg/m ³) ²
Cross-sensitivity (interference)	u _i -3.147 mg/m ³	9.901	(mg/m ³) ²
Influence of sample gas flow	u _p -0.902 mg/m ³	0.814	(mg/m ³) ²
Uncertainty of reference material at 70% of certification range	u _{rm} 4.041 mg/m ³	16.333	(mg/m ³) 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)

$$u_c = \sqrt{\sum (u_{\max, j})^2} \quad 13.42 \text{ mg/m}^3$$

Total expanded uncertainty

$$U = u_c \cdot k = u_c \cdot 1.96 \quad 26.31 \text{ mg/m}^3$$

Relative total expanded uncertainty

Requirement of 2010/75/EU

U in % of the ELV 200 mg/m³ **13.2**

Requirement of EN 15267-3

U in % of the ELV 200 mg/m³ **20.0**

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

Test laboratory	TÜV Rheinland
Date of report	2013-09-04

Measured component

Certification range	NH ₃ 0 - 15 mg/m ³
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Evaluation of the cross-sensitivity (CS)

(system with largest CS)

Sum of positive CS at zero point	0.39 mg/m ³
Sum of negative CS at zero point	-0.10 mg/m ³
Sum of positive CS at span point	0.20 mg/m ³
Sum of negative CS at span point	-0.10 mg/m ³
Maximum sum of cross-sensitivities	0.39 mg/m ³
Uncertainty of cross-sensitivity	0.226 mg/m ³

Calculation of the combined standard uncertainty

Tested parameter

			u ²
Standard deviation from paired measurements under field conditions *	u _D	0.070 mg/m ³	0.005 (mg/m ³) ²
Lack of fit	u _{lof}	0.139 mg/m ³	0.019 (mg/m ³) ²
Zero drift from field test	u _{d,z}	0.069 mg/m ³	0.005 (mg/m ³) ²
Span drift from field test	u _{d,s}	0.144 mg/m ³	0.021 (mg/m ³) ²
Influence of ambient temperature at span	u _t	0.058 mg/m ³	0.003 (mg/m ³) ²
Influence of supply voltage	u _v	0.065 mg/m ³	0.004 (mg/m ³) ²
Cross-sensitivity (interference)	u _i	0.226 mg/m ³	0.051 (mg/m ³) ²
Influence of sample gas flow	u _p	0.029 mg/m ³	0.001 (mg/m ³) ²
Uncertainty of reference material at 70% of certification range	u _{rm}	0.121 mg/m ³	0.015 (mg/m ³) 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/m ³
Total expanded uncertainty	$U = u_c * k = u_c * 1.96$	0.69 mg/m ³

Relative total expanded uncertainty

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

**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.

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

Test laboratory	TÜV Rheinland
Date of report	2013-09-04

Measured component

	H ₂ O
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 positive 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_p	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

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

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

Test laboratory	TÜV Rheinland
Date of report	2013-09-04

Measured component

Certification range	CO ₂	0 - 30 Vol.-%
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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 positive 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

* The larger value is used :

"Repeatability standard deviation at span" or

"Standard deviation from paired measurements under field conditions"

Combined standard uncertainty (u _c)	$u_c = \sqrt{\sum (u_{max, j})^2}$	0.91	Vol.-%
Total expanded uncertainty	$U = u_c * k = u_c * 1.96$	1.79	Vol.-%

Relative total expanded uncertainty

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

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

Test laboratory	TÜV Rheinland
Date of report	2013-09-04

Measured component

Certification range	O ₂	0 - 25 Vol.-%
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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 positive 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 _p	-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

Requirement of 2010/75/EU

Requirement of EN 15267-3

U in % of the range 25 Vol.-%	1.8
U in % of the range 25 Vol.-%	10.0**
U in % of the range 25 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.