Umwelt 📦 Bundesamt



CERTIFICATE

of Product Conformity (QAL1)

Certificate No.: 0000024158_01

AMS designation:	MIR 9000 for CO, HCI, SO ₂ and NO
Manufacturer:	Environnement S.A. 111 Boulevard Robespierre 78304 Poissy Cedex France
Test Laboratory:	TÜV Rheinland Energy GmbH

This is to certify that the AMS has been tested and certified according to the standards 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 (this certificate contains 9 pages).



Publication in the German Federal Gazette (BAnz) of 05 March 2013

German Federal Environment Agency Dessau, 05 March 2018

Dr. Marcel Langner Head of Section II 4.1

www.umwelt-tuv.eu tre@umwelt-tuv.eu Phone: + 49 221 806-5200 Suitability Tested EN 15267 QAL1 Certified Regular Surveillance

www.tuv.com ID 0000024158

This certificate will expire on: 04 March 2023

TÜV Rheinland Energy GmbH Cologne, 04 March 2018

D. Pit h. 2

ppa. Dr. Peter Wilbring

TÜV Rheinland Energy GmbH Am Grauen Stein 51105 Köln

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.

10/221 2.08





Test Report: Initial certification: Expiry date: Certificate:

Publication:

936/21220780/A dated 05 October 2012 05 March 2013 04 March 2023 Renewal (of previous certificate 0000024158 dated 22 March 2013 valid until 04 March 2018) BAnz AT 05.03.2013 B10, chapter I no. 5.4

Approved application

The tested AMS is suitable for use at combustion plants according to EC Directive 2001/80/EC (13th BImSchV), at waste incineration plants according to EC Directive 2000/76/EC (17th BImSchV), the 27th BImSchV, the 30th BImSchV and TA Luft. The measured ranges have been selected so as to cater for 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 three-months field test at a municipal sewage-sludge incineration plant.

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 limit values 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.

Basis of the certification

This certification is based on:

- Test report 936/21220780/A dated 05 October 2012 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

Umwelt 🎲 Bundesamt

Certificate: 0000024158_01 / 05 March 2018



Publication in the German Federal Gazette: BAnz AT 05.03.2013 B10, chapter I no. 5.4, UBA announcement dated 12 February 2013:

AMS designation:

MIR 9000 for CO, HCI, SO₂ and NO

Manufacturer:

Environnement S.A., Poissy Cedex, France

Field of application:

For plants requiring official approval and for plants according to the 27th BImSchV

Component	Certification range	Supplementary range	Unit
СО	0–75	0–500	mg/m³
HCI	0–15	0–100	mg/m³
SO ₂	0–75	0–200	mg/m³
NO	0–100	0–500	mg/m³

Measuring ranges during performance testing:

Software version:

V6.5

Restrictions:

During performance testing in accordance with EN 15267-3, the requirement for the degree of protection provided by the enclosure was not fulfilled. The measuring system has to be installed in an environment sheltered from dust and precipitation.

Notes:

- 1. The maintenance interval is two weeks.
- 2. Supplementary testing (migration to EN 15267) as regards Federal Environment Agency notice of 19 February 2009 (BAnz p. 899, chapter I no. 2.5).

Test Report:

TÜV Rheinland Energie und Umwelt GmbH, Cologne Report no.: 936/21220780/A dated 5 October 2012





Publication in the German Federal Gazette: BAnz AT 26.08.2015 B4, chapter V notification 25,

UBA announcement dated 22 July 2015:

25 Notification as regards Federal Environment Agency (UBA) notice of 12 February 2013 (BAnz AT 05.03.2013 B10, chapter I number 5.4)

The current software version of the MIR 9000 measuring system for CO, HCl, SO_2 and NO manufactured by Environnement S.A. is:

v1.8.d (Calculation Process) v3.4.d (Display Process)

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

Certified product

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

The MIR 9000 measuring system operates on the basis of infrared spectroscopy and correlation. Polyatomic gases absorb an electromagnetic radiation of a specific wavelength. The qualitative and quantitative analysis based on this phenomenon is known as absorption spectroscopy.

The measuring system comprises the following components:

An "SEC" probe

Unheated line (50 m standard)

Air-conditioned analyser cabinet with

- Processing and distribution unit for pressured air (M.D.S.)
- Junction box
- Automatic switch box for gas (TIG) with ports
- Heater with integrated thermostat
- Air conditioner

The current software version is:

v1.8.d (Calculation Process) v3.4.d (Display Process) February 2015

The current manual version is:





General remarks

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 manufacturing process for 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 document as well as the certification mark remains property of TÜV Rheinland Energy GmbH. Upon revocation of the publication the certificate loses its validity. After the expiration of the certificate and on request of TÜV Rheinland Energy GmbH this document shall be re-turned and the certificate mark must no longer be used.

The relevant version of this certificate and its expiration date are also accessible on the internet at **<u>gal1.de</u>**.

Certification of the MIR 9000 measuring system is based on the documents listed below and the regular, continuous surveillance of the manufacturer's quality management system:

Basic testing

Test report: 936/21206578/F dated 10 October 2008 TÜV Rheinland Immissionsschutz und Energiesysteme GmbH, Cologne Publication: BAnz 11 March 2009 no. 38, p. 899, chapter I no. 2.5 UBA announcement dated 19 February 2009

Initial certification according to EN 15267

Certificate no. 0000024158:	22 March 2013
Expiry date of the certificate:	04 March 2018

Test report: 936/21220780/A dated 05. October 2012 TÜV Rheinland Energie und Umwelt GmbH, Cologne Publication: BAnz AT 05.03.2013 B10, chapter I no. 5.4 UBA announcement dated 12 February 2013

Notification in accordance with EN 15267

Statement issued by TÜV Rheinland Energie und Umwelt GmbH dated 14 March 2015 Publication: BAnz AT 26.08.2015 B4, chapter V notification 25 UBA announcement dated 22 July 2015 (New software version)

Renewal of the certificate

Certificate no. 0000024158_01:	05 March 2018
Expiry date of the certificate:	04 March 2023





ManufacturerEnvironmenent S.A.Name of measuring systemMIR 9000Serial number of the candidates1912 / 1913Measuring principleInfrarotkorrelationTest report936/21220780/ATest laboratoryTÜV RheinlandDate of report2012-10-05Measuring of measured componentCOCertification range0 - 75 mg/m³Evaluation of the cross sensitivity (CS)(system with largest CS)Sum of positive CS at zero point0.00 mg/m³Sum of negative CS at reference point1.40 mg/m³Sum of negative CS at reference point1.40 mg/m³Uncertainty of cross sensitivity0.810 mg/m³Sum of negative CS at reference point0.810 mg/m³Sum of negative CS at reference point1.40 mg/m³Sum of negative CS at reference point0.810 mg/m³Calculation of the combined standard uncertainty0.342 mg/m³Tested parameterus_aStandard deviation from paired measurements under field conditions *upUs_a 0.606 mg/m³0.367 (mg/m³)2Span dift from field testus_aUs_a 0.606 mg/m³0.368 (mg/m³)2Influence of supply voltageupUncertainty of reference material at 70% of certification range0.666 mg/m³One maple gas flowup0.265 mg/m³Uncertainty of reference material at 70% of certification range0.810 mg/m³Combined standard uncertaintyUp $u_c * k = u_c * 1.96$ Case maple gas flowup0.266 mg/m³Combined s		Measuring system						
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Sum of positive CS at reference point1.40mg/m³Sum of negative CS at reference point-1.00mg/m³Maximum sum of cross sensitivities1.40mg/m³Uncertainty of cross sensitivity0.810mg/m³Calculation of the combined standard uncertainty0.810mg/m³Tested parameteru²Standard deviation from paired measurements under field conditions *up0.342mg/m³Lack of fitud, z0.260mg/m³0.117(mg/m³)²Zero drift from field testud, z0.260mg/m³0.368(mg/m³)²Influence of ambient temperature at spanut, s0.551mg/m³0.304(mg/m³)²Influence of sample gas flowub-0.087mg/m³0.008(mg/m³)²Uncertainty of reference material at 70% of certification rangeub-0.087mg/m³0.088(mg/m³)²* The larger value is used :"Repeatability standard deviation at span" or"Standard deviation from paired measurements under field conditions"Uc $\sqrt{\sum (u_{max,j})^2}$ 1.44mg/m³Combined standard uncertainty (uc)Uc = $\sqrt{\sum (u_{max,j})^2}$ 1.44mg/m³2.82mg/m³Total expanded uncertaintyU in % of the ELV 50 mg/m³2.82mg/m³5.6					-			
Sum of negative CS at reference point1.00mg/m³Maximum sum of cross sensitivities1.40mg/m³Uncertainty of cross sensitivity0.810mg/m³Calculation of the combined standard uncertainty Tested parameterStandard deviation from paired measurements under field conditions * Lack of fit u_0 0.342mg/m³2aro drift from field test $u_{d,z}$ 0.260mg/m³0.117(mg/m³)²2aro drift from field test $u_{d,z}$ 0.260mg/m³0.367(mg/m³)²Span drift from field test $u_{d,s}$ 0.606mg/m³0.367(mg/m³)²Influence of ambient temperature at span u_t 0.551mg/m³0.304(mg/m³)²Influence of supply voltage u_v 0.210mg/m³0.066(mg/m³)²Uncertainty of reference material at 70% of certification range u_m 0.606mg/m³0.368(mg/m³)²* The larger value is used : "Repeatability standard deviation at span" or "Standard deviation from paired measurements under field conditions" $U_c = \sqrt{\sum (u_{max,j})^2}$ 1.44mg/m³Combined standard uncertainty (u_c) $U_c = \sqrt{\sum (u_{max,j})^2}$ 1.44mg/m³Total expanded uncertainty U tin % of the ELV 50 mg/m³5.6				1.40	-			
Maximum sum of cross sensitivities 1.40 mg/m³ Uncertainty of cross sensitivity 0.810 mg/m³ Calculation of the combined standard uncertainty u^2 Tested parameter u^2 Standard deviation from paired measurements under field conditions * u_0 $u_{0,c}$ 0.342 mg/m³ 0.117 (mg/m³)² Zero drift from field test $u_{0,c}$ 0.260 mg/m³ 0.068 (mg/m²)² Span drift from field test $u_{d,s}$ 0.606 mg/m³ 0.367 (mg/m²)² Influence of ambient temperature at span u_1 0.551 mg/m³ 0.044 (mg/m²)² Influence of supply voltage u_v 0.210 mg/m³ 0.044 (mg/m²)² Cross sensitivity (interference) u_1 0.810 mg/m³ 0.066 (mg/m³)² Influence of sample gas flow u_o -0.087 mg/m³ 0.008 (mg/m³)² Uncertainty of reference material at 70% of certification range u_{rm} 0.606 mg/m³ 0.368 (mg/m³)² Uncertainty deviation from paired measurements under field conditions* $u_{c} = \sqrt{\sum (u_{max, j})^2}$ 1.44 mg/m³ Combined standard uncertainty (u_C) $U_c = \sqrt{\sum (u_{max, j})^2}$ 1.44 mg/m³ Combined standard uncertainty u_c					-			
Uncertainty of cross sensitivity 0.810 mg/m^3 Calculation of the combined standard uncertainty u^2 Tested parameter u^2 Standard deviation from paired measurements under field conditions * u_D 0.342 mg/m^3 $0.117 \text{ (mg/m}^3)^2$ Lack of fit u_D 0.342 mg/m^3 $0.117 \text{ (mg/m}^3)^2$ Zero drift from field test $u_{d,z}$ 0.260 mg/m^3 $0.068 \text{ (mg/m}^3)^2$ Span drift from field test $u_{d,s}$ 0.606 mg/m^3 $0.367 \text{ (mg/m}^3)^2$ Influence of ambient temperature at span u_t 0.551 mg/m^3 $0.304 \text{ (mg/m}^3)^2$ Influence of supply voltage u_v 0.210 mg/m^3 $0.044 \text{ (mg/m}^3)^2$ Influence of sample gas flow u_v 0.210 mg/m^3 $0.666 \text{ (mg/m}^3)^2$ Uncertainty of reference material at 70% of certification range u_{rm} 0.606 mg/m^3 $0.368 \text{ (mg/m}^3)^2$ * The larger value is used : "Repeatability standard deviation at span" or "Standard deviation from paired measurements under field conditions" $U = u_c * k = u_c * 1.96$ 2.82 mg/m^3 Combined standard uncertainty (u_c) $U = u_c * k = u_c * 1.96$ 2.82 mg/m^3 2								
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Zero drift from field testud.z0.260mg/m³0.068(mg/m³)²Span drift from field testud.s0.606mg/m³0.367(mg/m³)²Influence of ambient temperature at spanut0.551mg/m³0.304(mg/m³)²Influence of supply voltageuv0.210mg/m³0.044(mg/m³)²Cross sensitivity (interference)ui0.810mg/m³0.656(mg/m³)²Influence of sample gas flowuo-0.087mg/m³0.008(mg/m³)²Uncertainty of reference material at 70% of certification rangeuo-0.087mg/m³0.368(mg/m³)²*The larger value is used : "Repeatability standard deviation at span" or "Standard deviation from paired measurements under field conditions"U $u_c = \sqrt{\sum (u_{max,j})^2}$ 1.44mg/m³Combined standard uncertainty (uc)U $u_c * k = u_c * 1.96$ 2.82mg/m³Total expanded uncertaintyUin % of the ELV 50 mg/m³5.6			-		-			
Span drift from field test $u_{d,s}$ 0.606 mg/m^3 $0.367 \text{ (mg/m}^3)^2$ Influence of ambient temperature at span u_t 0.551 mg/m^3 $0.304 \text{ (mg/m}^3)^2$ Influence of supply voltage u_v 0.210 mg/m^3 $0.044 \text{ (mg/m}^3)^2$ Cross sensitivity (interference) u_i 0.810 mg/m^3 $0.656 \text{ (mg/m}^3)^2$ Influence of sample gas flow u_o -0.087 mg/m^3 $0.008 \text{ (mg/m}^3)^2$ Uncertainty of reference material at 70% of certification range u_rm 0.606 mg/m^3 $0.368 \text{ (mg/m}^3)^2$ * The larger value is used : "Repeatability standard deviation at span" or "Standard deviation from paired measurements under field conditions" $U_c = \sqrt{\sum (U_{max,j})^2}$ 1.44 mg/m^3 Combined standard uncertainty (u_c) $U = u_c * k = u_c * 1.96$ 2.82 mg/m^3 Total expanded uncertaintyU in % of the ELV 50 mg/m³ 5.6		Zero drift from field test			-			
Influence of ambient temperature at span u_t 0.551 mg/m^3 $0.304 \text{ (mg/m}^3)^2$ Influence of supply voltage u_v 0.210 mg/m^3 $0.044 \text{ (mg/m}^3)^2$ Cross sensitivity (interference) u_i 0.810 mg/m^3 $0.656 \text{ (mg/m}^3)^2$ Influence of sample gas flow u_p -0.087 mg/m^3 $0.008 \text{ (mg/m}^3)^2$ Uncertainty of reference material at 70% of certification range u_m 0.606 mg/m^3 $0.368 \text{ (mg/m}^3)^2$ * The larger value is used : "Repeatability standard deviation at span" or "Standard deviation from paired measurements under field conditions" $U_c = \sqrt{\sum (u_{max, j})^2}$ 1.44 mg/m^3 Combined standard uncertainty (u_c) $U_c = \sqrt{\sum (u_{max, j})^2}$ 1.44 mg/m^3 2.82 mg/m^3 Total expanded uncertainty U in % of the ELV 50 mg/m³ 5.6					-			
Influence of supply voltage u_v 0.210 mg/m^3 0.044 $(mg/m^3)^2$ Cross sensitivity (interference) u_i 0.810 mg/m^3 0.656 $(mg/m^3)^2$ Influence of sample gas flow u_b -0.087 mg/m^3 0.008 $(mg/m^3)^2$ 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" $U_c = \sqrt{\sum (u_{max,j})^2}$ 1.44 mg/m^3 Combined standard uncertainty (u_c) $U_c = \sqrt{\sum (u_{max,j})^2}$ 1.44 mg/m^3 Total expanded uncertainty $U = u_c * k = u_c * 1.96$ 2.82 mg/m^3 Relative total expanded uncertainty U in % of the ELV 50 mg/m³ 5.6					•			
Cross sensitivity (interference) u_i 0.810 mg/m^3 0.656 $(mg/m^3)^2$ Influence of sample gas flow u_b -0.087 mg/m^3 0.008 $(mg/m^3)^2$ Uncertainty of reference material at 70% of certification range u_m 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" 0.606 mg/m^3 0.368 $(mg/m^3)^2$ Combined standard uncertainty (u_C) $u_c = \sqrt{\sum (u_{max,j})^2}$ 1.44 mg/m^3 Total expanded uncertainty $U = u_c * k = u_c * 1.96$ 2.82 mg/m^3 Relative total expanded uncertaintyU in % of the ELV 50 mg/m^3 5.6								
Influence of sample gas flow u_{o} -0.087 mg/m^{3} $0.008 \text{ (mg/m}^{3})^{2}$ Uncertainty of reference material at 70% of certification range u_{rm} 0.606 mg/m^{3} $0.368 \text{ (mg/m}^{3})^{2}$ * The larger value is used : "Repeatability standard deviation at span" or "Standard deviation from paired measurements under field conditions" $u_{c} = \sqrt{\sum (u_{max, j})^{2}}$ 1.44 mg/m^{3} Combined standard uncertainty (u_{c}) Total expanded uncertainty $U_{c} = \sqrt{\sum (u_{max, j})^{2}}$ 1.44 mg/m^{3} Relative total expanded uncertaintyU in % of the ELV 50 mg/m^{3} 5.6					-			
Uncertainty of reference material at 70% of certification range u_{rm} 0.606 mg/m³0.368 (mg/m³)²* The larger value is used : "Repeatability standard deviation at span" or "Standard deviation from paired measurements under field conditions" $u_{c} = \sqrt{\sum (u_{max, j})^2}$ 1.44 mg/m³Combined standard uncertainty (u_c) Total expanded uncertainty $u_c = \sqrt{\sum (u_{max, j})^2}$ 1.44 mg/m³Relative total expanded uncertaintyU in % of the ELV 50 mg/m³5.6								
* The larger value is used : "Repeatability standard deviation at span" or "Standard deviation from paired measurements under field conditions" Combined standard uncertainty (u _c) Total expanded uncertainty U_c = $\sqrt{\sum (u_{max,j})^2}$ 1.44 mg/m ³ $U = u_c * k = u_c * 1.96$ 2.82 mg/m ³ Relative total expanded uncertainty 5.6			-		-			
"Repeatability standard deviation at span" or "Standard deviation from paired measurements under field conditions"Combined standard uncertainty (u _c) $U_c = \sqrt{\sum (u_{max, j})^2}$ 1.44 mg/m³Total expanded uncertainty $U = u_c * k = u_c * 1.96$ 2.82 mg/m³Relative total expanded uncertaintyU in % of the ELV 50 mg/m³5.6			u _{rm}	0.000	ing/in	0.000	(ing/in)	
"Standard deviation from paired measurements under field conditions"Combined standard uncertainty (u_c) $U_c = \sqrt{\sum (u_{max,j})^2}$ Total expanded uncertainty $U = u_c * k = u_c * 1.96$ Relative total expanded uncertaintyU in % of the ELV 50 mg/m³5.6								
Total expanded uncertainty $U = u_c * k = u_c * 1.96$ 2.82 mg/m³Relative total expanded uncertaintyU in % of the ELV 50 mg/m³5.6			•					
Total expanded uncertainty $U = u_c * k = u_c * 1.96$ 2.82 mg/m³Relative total expanded uncertaintyU in % of the ELV 50 mg/m³5.6)2			
Relative total expanded uncertainty U in % of the ELV 50 mg/m ³ 5.6		Combined standard uncertainty (u _C)	$u_c =$	$\sqrt{\sum} (u_m$	lax, j) ²	1.44	mg/m³	
		Total expanded uncertainty	U = ι	u _c * k = ι	u _c * 1.96	2.82	mg/m³	
Requirement of 2000/76/EC and 2001/80/EC U in % of the ELV 50 mg/m ³ 10.0					-			
		-						
Requirement of EN 15267-3U in % of the ELV 50 mg/m³7.5		Requirement of EN 15267-3	U in '	% of the	ELV 50 mg/m ³		7.5	

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Certificate: 0000024158_01 / 05 March 2018



Measuring system						
Manufacturer	Environnement S.A.					
Name of measuring system	MIR 9000					
Serial number of the candidates	1912 / 1913					
Measuring principle	Infrarotkorrelation					
Test report	936/21220780/A					
Test laboratory	TÜV Rheinland					
Date of report	2012-10-05					
Measured component	HCI					
Certification range	0 - 15 mg/m³					
Evaluation of the cross sensitivity (CS)						
(system with largest CS)	0.07					
Sum of positive CS at zero point	0.07 mg/m³ -0.43 mg/m³					
Sum of negative CS at zero point	0.28 mg/m ³					
Sum of postive CS at reference point						
Sum of negative CS at reference point	-0.32 mg/m ³					
Maximum sum of cross sensitivities	-0.43 mg/m ³					
Uncertainty of cross sensitivity	-0.248 mg/m³					
Calculation of the combined standard uncertainty						
Tested parameter	U ²					
Standard deviation from paired measurements under field conditions *	u _D 0.151 mg/m ³ 0.023 (mg/m ³) ²					
Lack of fit	u_{lof} 0.098 mg/m ³ 0.010 (mg/m ³) ²					
Zero drift from field test	$u_{d,z}$ 0.121 mg/m ³ 0.015 (mg/m ³) ²					
Span drift from field test	$u_{d,s}$ 0.268 mg/m ³ 0.072 (mg/m ³) ²					
Influence of ambient temperature at span	u_t 0.231 mg/m ³ 0.053 (mg/m ³) ²					
Influence of supply voltage	u _v 0.053 mg/m ³ 0.003 (mg/m ³) ²					
Cross sensitivity (interference)	u _i -0.248 mg/m ³ 0.061 (mg/m ³) ²					
Influence of sample gas flow	u _p -0.046 mg/m ³ 0.002 (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.)	$u_{c} = \sqrt{\sum \left(u_{\max_{i}} \right)^{2}} \qquad 0.50 \text{ mg/m}^{3}$					
Combined standard uncertainty (u _C)						
Total expanded uncertainty	$U = u_c * k = u_c * 1.96$ 0.99 mg/m ³					
Relative total expanded uncertainty	U in % of the ELV 10 mg/m ³ 9.9					
Requirement of 2000/76/EC and 2001/80/EC	U in % of the ELV 10 mg/m ³ 40.0					
Requirement of EN 15267-3	U in % of the ELV 10 mg/m ³ 30.0					
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Certificate: 0000024158_01 / 05 March 2018



Measuring system						
Manufacturer	Environnement S.A.					
Name of measuring system	MIR 9000					
Serial number of the candidates	1912 / 1913					
Measuring principle	Infrarotkorrelation					
Test report	936/21220780/A					
Test laboratory	TÜV Rheinland					
Date of report	2012-10-05					
	No. A. Laker a					
Measured component	SO ₂					
Certification range	0 - 75 mg/m³					
Evaluation of the cross sensitivity (CS)						
(system with largest CS)						
Sum of positive CS at zero point	0.50 mg/m ³					
Sum of negative CS at zero point	-1.55 mg/m ³					
Sum of postive CS at reference point	0.90 mg/m ³					
Sum of negative CS at reference point	-1.80 mg/m ³					
Maximum sum of cross sensitivities	-1.80 mg/m ³					
Uncertainty of cross sensitivity	-1.039 mg/m ³					
	5					
Calculation of the combined standard uncertainty						
Tested parameter	U ²					
Standard deviation from paired measurements under field conditions	ns * _{up} 0.667 mg/m ³ 0.445 (mg/m ³) ²					
Lack of fit	u _{lof} -0.403 mg/m³ 0.162 (mg/m³)²					
Zero drift from field test	u _{d.z} 0.476 mg/m ³ 0.227 (mg/m ³) ²					
Span drift from field test	u _{d.s} 0.823 mg/m ³ 0.677 (mg/m ³) ²					
Influence of ambient temperature at span	u _t 0.896 mg/m ³ 0.803 (mg/m ³) ²					
Influence of supply voltage	u _v 0.053 mg/m ³ 0.003 (mg/m ³) ²					
Cross sensitivity (interference)	u _i -1.039 mg/m³ 1.080 (mg/m³)²					
Influence of sample gas flow	u _p -0.069 mg/m ³ 0.005 (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 conditio	ons"					
Combined standard uncertainty (u _C)	$u_{c} = \sqrt{\sum (u_{max, j})^{2}}$ 1.94 mg/m ³					
Total expanded uncertainty	$U = u_c * k = u_c * 1.96$ 3.81 mg/m ³					
Relative total expanded uncertainty	U in % of the ELV 50 mg/m ³ 7.6					
Requirement of 2000/76/EC and 2001/80/EC	U in % of the ELV 50 mg/m ³ 20.0					
Requirement of EN 15267-3	U in % of the ELV 50 mg/m ³ 15.0					

Umwelt 🎧 Bundesamt

Certificate: 0000024158_01 / 05 March 2018



	Measuring system							
Manufacturer		Environnement S.A.						
	Name of measuring system		MIR 9000					
	Serial number of the candidates	1912 / 1913						
	Measuring principle	Infrar	otkorrelat	tion				
	Test report	936/2	1220780	/A				
	Test laboratory	TÜV I	Rheinlan	d				
	Date of report	2012-	10-05					
	Measured component	NO						
	Certification range	0 -	100	mg/m³				
	Evaluation of the cross sensitivity (CS)							
	(system with largest CS)							
	Sum of positive CS at zero point			mg/m³				
	Sum of negative CS at zero point		-1.13	mg/m³				
	Sum of postive CS at reference point		1.70	mg/m³				
	Sum of negative CS at reference point		-2.30	mg/m³				
	Maximum sum of cross sensitivities			mg/m³				
	Uncertainty of cross sensitivity		-1.328	mg/m³				
	Calculation of the combined standard uncertainty							
	Tested parameter				U ²			
	Standard deviation from paired measurements under field conditions *	UD		mg/m³	0.183	(mg/m ³) ²		
	Lack of fit	Ulof	0.346	mg/m³	0.120	(mg/m ³) ²		
	Zero drift from field test	U _{d.z}	0.404	mg/m³	0.163	(mg/m ³) ²		
	Span drift from field test	U _{d.s}	0.693	mg/m³	0.480	(mg/m ³) ²		
	Influence of ambient temperature at span	ut	1.415	mg/m³	2.002	(mg/m ³) ²		
	Influence of supply voltage	u _v	0.097	mg/m³	0.009	(mg/m ³) ²		
	Cross sensitivity (interference)	ui		mg/m³	1.763	(mg/m³)²		
	Influence of sample gas flow	u _p	-0.098	mg/m³	0.010	(mg/m³)²		
	Uncertainty of reference material at 70% of certification range	u _{rm}	0.808	mg/m³	0.653	(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. =.	$\sqrt{\sum (u_m)}$	av 1) ²	2 32	mg/m³		
			v <u> </u>			mg/m ³		
	Total expanded uncertainty	0 - u	ic r – t	uc 1.90	4.55	mg/m		
	Relative total expanded uncertainty	Uin	% of the	ELV 131 mg/m ³		3.5		
	Requirement of 2000/76/EC and 2001/80/EC	U in % of the ELV 131 mg/m ³			20.0			
	Requirement of EN 15267-3			ELV 131 mg/m ³		15.0		
		- ,						