

CERTIFICATE

on Product Conformity (QAL1)

Certificate No.: 0000024161

Certified AMS: MIR9000 CLD Option for NO/NOx, NO₂, CO₂, O₂, N₂O and CH₄

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).



- EN 15267-3 tested
- QAL1 certified
- TUV approved
- Annual inspection

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

This certificate will expire on:
04 March 2018

German Federal Environment Agency
Dessau, 22 March 2013

TÜV Rheinland Energie und Umwelt GmbH
Cologne, 21 March 2013



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Am Grauen Stein
51105 Cologne

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

Test report:	936/21220780/B of 05 October 2012
Initial certification:	05 March 2013
Expiry date:	04 March 2018
Publication:	BAnz AT 05 March 2013 B10, chapter I, No. 5.3

Approved application

The tested AMS is suitable for use at combustion plants according to EC Directive 2001/80/EC, at waste incineration plants according to EC Directive 2000/76/EC and other plants requiring official approval. The measured ranges have been selected considering 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 threemonth field test at a municipal sewage sludge incineration plant.

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 936/21220780/B of 05 October 2012 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 05 March 2013 B10, chapter I, No. 5.3

AMS designation:

MIR 9000 CLD Option for NO/NO_x, NO₂, CO₂, O₂, N₂O and CH₄

Manufacturer:

Environnement S.A., Poissy Cedex, France

Field of application:

Measurement at plants requiring official approval as well as plants within the scope of 2000/76/EC (waste incineration directive) and 2001/80/EC (large combustion plants directive)

Measuring ranges during performance test:

Components	Certification range	Supplementary range	Unit
NO/NO _x	0 - 20	0 - 2000	mg/m ³
NO ₂	0 - 20	0 - 200	mg/m ³
CO ₂	0 - 25	-	Vol.-%
O ₂	0 - 10	0 - 25	Vol.-%
N ₂ O	0 - 20	0 - 200	mg/m ³
CH ₄	0 - 10	0 - 200	mg/m ³

Software version:

V6.5

Restriction:

The requirement of Standard EN 15267-3 for protection provided by enclosures was not met during performance testing. The measuring system shall be installed protected from dust and precipitation.

Notes:

1. The maintenance interval is two weeks.
2. Supplementary testing (implementation of EN 15267) as regards Federal Environmental Agency notice of 19 February 2009 (Federal Gazette (BAnz.) p. 899, Chapter I no. 2.4).

Test report:

TÜV Rheinland Energie und Umwelt GmbH, Cologne
Report No.: 936/21220780/B of 5 October 2012

Certified product

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

MIR9000 CLD Option is a measuring system which operates under the principle of infrared spectroscopy with gas filter correlation (components CO₂, N₂O and CH₄), chemiluminescence (NO/NO_x as NO₂) and paramagnetism (O₂).

Infrared spectroscopy with gas filter correlation

Every polyatomic gas absorbs electromagnetic radiation at a certain wavelength. The qualitative and quantitative analyses based on this phenomenon are called absorption spectroscopy.

Chemiluminescence

The chemiluminescence module analyses the concentration of nitrogen oxide and nitrogen dioxide in exhaust gas. The instrument functions on the basis that nitrogen oxide (NO) emits light when reacting with highly oxidable ozone molecules (chemiluminescence).

Paramagnetism

This method is based on the magnetic susceptibility of oxygen.

The measuring system comprises the following parts:

A SEC-probe

An unheated line (50 m, standard)

An air-conditioned analyser cabinet with:

- unit for processing and distribution of compressed air (M.D.S.)
- junction box
- gas changeover unit (TIG) with electrical connections
- heater with integrated thermostat
- air-conditioning unit

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 MIR9000 CLD Option for NO/NOx, NO₂, CO₂, O₂, N₂O and CH₄ is based on the documents listed below and the regular, continuous monitoring of the Quality Management System of the manufacturer:

Basic test:

Test report: 936/21206578/E of 10 October 2008
TÜV Rheinland Immissionsschutz und Energiesysteme GmbH, Cologne

Publication: BAnz 11 March 2009, No. 38, p. 899, chapter I, No. 2.4
Announcement by UBA from 19 February 2009

Initial certification according to EN 15267:

Certificate No. 0000024161: 22 March 2013

Expiry date of the certificate: 04 March 2018

Test report: 936/21220780/B of 05 October 2012
TÜV Rheinland Energie und Umwelt GmbH, Cologne

Publication: BAnz AT 05 March 2013 B10, chapter I, No. 5.3
Announcement by UBA from 12 February 2013

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

Measuring system

Manufacturer	Environnement S.A.
Name of measuring system	MIR 9000 CLD Option
Serial number of the candidates	1912 / 1913
Measuring principle	CLD

Test report

Test laboratory	936/21220780/B TÜV Rheinland
Date of report	2012-10-05

Measured component

Certification range	NOx 0 - 20 mg/m ³
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Evaluation of the cross sensitivity (CS)

(system with largest CS)

Sum of positive CS at zero point	0.00 mg/m ³
Sum of negative CS at zero point	0.00 mg/m ³
Sum of positive CS at reference point	0.24 mg/m ³
Sum of negative CS at reference point	-0.34 mg/m ³
Maximum sum of cross sensitivities	-0.34 mg/m ³
Uncertainty of cross sensitivity	-0.200 mg/m ³

Calculation of the combined standard uncertainty

Tested parameter

			u^2
Standard deviation from paired measurements under field conditions *	u_D	0.311 mg/m ³	0.097 (mg/m ³) ²
Lack of fit	u_{lof}	-0.064 mg/m ³	0.004 (mg/m ³) ²
Zero drift from field test	$u_{d,z}$	0.094 mg/m ³	0.009 (mg/m ³) ²
Span drift from field test	$u_{d,s}$	0.318 mg/m ³	0.101 (mg/m ³) ²
Influence of ambient temperature at span	u_t	0.265 mg/m ³	0.070 (mg/m ³) ²
Influence of supply voltage	u_v	0.012 mg/m ³	0.000 (mg/m ³) ²
Cross sensitivity (interference)	u_i	-0.200 mg/m ³	0.040 (mg/m ³) ²
Influence of sample gas flow	u_b	-0.040 mg/m ³	0.002 (mg/m ³) ²
Uncertainty of reference material at 70% of certification range	u_{rm}	0.162 mg/m ³	0.026 (mg/m ³) ²
Converter efficiency for AMS measuring NOx	$u_c = \sqrt{\sum (u_{max,j})^2}$	0.208 mg/m ³	0.043 (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)		0.63 mg/m ³
Total expanded uncertainty	$U = u_c * k = u_c * 1.96$	1.23 mg/m ³

Relative total expanded uncertainty

Requirement of 2000/76/EC and 2001/80/EC	U in % of the range 20 mg/m³	6.1
Requirement of EN 15267-3	U in % of the range 20 mg/m³	20.0
	U in % of the range 20 mg/m³	15.0

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

Measuring system

Manufacturer	Environnement S.A.
Name of measuring system	MIR 9000 CLD Option
Serial number of the candidates	1912 / 1913
Measuring principle	CLD

Test report

Test laboratory	936/21220780/B TÜV Rheinland
Date of report	2012-10-05

Measured component

Certification range	NO ₂ 0 - 20 mg/m ³
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Evaluation of the cross sensitivity (CS)

(system with largest CS)

Sum of positive CS at zero point	0.24 mg/m ³
Sum of negative CS at zero point	0.00 mg/m ³
Sum of positive CS at reference point	0.60 mg/m ³
Sum of negative CS at reference point	-0.10 mg/m ³
Maximum sum of cross sensitivities	0.60 mg/m ³
Uncertainty of cross sensitivity	0.346 mg/m ³

Calculation of the combined standard uncertainty

Tested parameter

			u^2
Standard deviation from paired measurements under field conditions *	u_D	0.081 mg/m ³	0.007 (mg/m ³) ²
Lack of fit	u_{lof}	-0.115 mg/m ³	0.013 (mg/m ³) ²
Zero drift from field test	$u_{d,z}$	-0.102 mg/m ³	0.010 (mg/m ³) ²
Span drift from field test	$u_{d,s}$	-0.253 mg/m ³	0.064 (mg/m ³) ²
Influence of ambient temperature at span	u_t	0.100 mg/m ³	0.010 (mg/m ³) ²
Influence of supply voltage	u_v	0.015 mg/m ³	0.000 (mg/m ³) ²
Cross sensitivity (interference)	u_i	0.346 mg/m ³	0.120 (mg/m ³) ²
Influence of sample gas flow	u_b	-0.023 mg/m ³	0.001 (mg/m ³) ²
Uncertainty of reference material at 70% of certification range	u_{rm}	0.162 mg/m ³	0.026 (mg/m ³) ²

* The larger value is used :

"Repeatability standard deviation at span" or

"Standard deviation from paired measurements under field conditions"

$$u_c = \sqrt{\sum (u_{max,j})^2}$$

Combined standard uncertainty (u_c)		0.50 mg/m ³
Total expanded uncertainty	$U = u_c * k = u_c * 1.96$	0.98 mg/m ³

Relative total expanded uncertainty

Requirement of 2000/76/EC and 2001/80/EC

Requirement of EN 15267-3

U in % of the range 20 mg/m³	4.9
U in % of the range 20 mg/m³	20.0
U in % of the range 20 mg/m³	15.0

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

Measuring system

Manufacturer	Environnement S.A.
Name of measuring system	MIR 9000 CLD Option
Serial number of the candidates	1912 / 1913
Measuring principle	NDIR

Test report

Test laboratory	TÜV Rheinland
Date of report	2012-10-05

Measured component

Certification range	CO 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	0.10 Vol.-%
Sum of negative CS at zero point	-0.10 Vol.-%
Sum of positive CS at reference point	0.60 Vol.-%
Sum of negative CS at reference point	-0.40 Vol.-%
Maximum sum of cross sensitivities	0.60 Vol.-%
Uncertainty of cross sensitivity	0.346 Vol.-%

Calculation of the combined standard uncertainty

Tested parameter

Tested parameter				u ²
Standard deviation from paired measurements under field conditions *	u _D	0.222 Vol.-%		0.049 (Vol.-%) ²
Lack of fit	u _{lof}	-0.087 Vol.-%		0.008 (Vol.-%) ²
Zero drift from field test	u _{d,z}	0.144 Vol.-%		0.021 (Vol.-%) ²
Span drift from field test	u _{d,s}	0.144 Vol.-%		0.021 (Vol.-%) ²
Influence of ambient temperature at span	u _t	0.173 Vol.-%		0.030 (Vol.-%) ²
Influence of supply voltage	u _v	0.012 Vol.-%		0.000 (Vol.-%) ²
Cross sensitivity (interference)	u _i	0.346 Vol.-%		0.120 (Vol.-%) ²
Influence of sample gas flow	u _p	-0.035 Vol.-%		0.001 (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"

$$u_c = \sqrt{\sum (u_{\max, j})^2}$$

Combined standard uncertainty (u _c)		0.54 Vol.-%
Total expanded uncertainty	U = u _c * k = u _c * 1.96	1.06 Vol.-%

Relative total expanded uncertainty

Requirement of 2000/76/EC and 2001/80/EC	U in % of the range 25 Vol.-%	4.2
Requirement of EN 15267-3	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.

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

Measuring system

Manufacturer	Environnement S.A.
Name of measuring system	MIR 9000 CLD Option
Serial number of the candidates	1912 / 1913
Measuring principle	Paramagnetismus

Test report

Test laboratory	TÜV Rheinland
Date of report	2012-10-05

Measured component

Certification range	O ₂	0 - 10 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 reference point	0.09	Vol.-%
Sum of negative CS at reference point	-0.24	Vol.-%
Maximum sum of cross sensitivities	-0.24	Vol.-%
Uncertainty of cross sensitivity	-0.139	Vol.-%

Calculation of the combined standard uncertainty

Tested parameter

Tested parameter				u ²
Standard deviation from paired measurements under field conditions *	u _D	0.073	Vol.-%	0.005 (Vol.-%) ²
Lack of fit	u _{lof}	-0.009	Vol.-%	0.000 (Vol.-%) ²
Zero drift from field test	u _{d,z}	-0.075	Vol.-%	0.006 (Vol.-%) ²
Span drift from field test	u _{d,s}	0.110	Vol.-%	0.012 (Vol.-%) ²
Influence of ambient temperature at span	u _t	0.038	Vol.-%	0.001 (Vol.-%) ²
Influence of supply voltage	u _v	0.012	Vol.-%	0.000 (Vol.-%) ²
Cross sensitivity (interference)	u _i	-0.139	Vol.-%	0.019 (Vol.-%) ²
Influence of sample gas flow	u _p	-0.017	Vol.-%	0.000 (Vol.-%) ²
Uncertainty of reference material at 70% of certification range	u _{rm}	0.081	Vol.-%	0.007 (Vol.-%) ²

* The larger value is used :

"Repeatability standard deviation at span" or

"Standard deviation from paired measurements under field conditions"

$$u_c = \sqrt{\sum (u_{\max, j})^2}$$

Combined standard uncertainty (u _c)		0.23	Vol.-%
Total expanded uncertainty	U = u _c * k = u _c * 1.96	0.44	Vol.-%

Relative total expanded uncertainty

Requirement of 2000/76/EC and 2001/80/EC	U in % of the range 10 Vol.-%	4.4
Requirement of EN 15267-3	U in % of the range 10 Vol.-%	10.0**
	U in % of the range 10 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.
Name of measuring system	MIR 9000 CLD Option
Serial number of the candidates	1912 / 1913
Measuring principle	NDIR

Test report

Test laboratory	TÜV Rheinland
Date of report	2012-10-05

Measured component

Certification range	N ₂ O	0 - 20 mg/m ³
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Evaluation of the cross sensitivity (CS)

(system with largest CS)

Sum of positive CS at zero point	0.25 mg/m ³
Sum of negative CS at zero point	-0.27 mg/m ³
Sum of positive CS at reference point	0.19 mg/m ³
Sum of negative CS at reference point	-0.59 mg/m ³
Maximum sum of cross sensitivities	-0.59 mg/m ³
Uncertainty of cross sensitivity	-0.341 mg/m ³

Calculation of the combined standard uncertainty

Tested parameter

Tested parameter			u ²
Standard deviation from paired measurements under field conditions *	u _D	0.321 mg/m ³	0.103 (mg/m ³) ²
Lack of fit	u _{lof}	-0.064 mg/m ³	0.004 (mg/m ³) ²
Zero drift from field test	u _{d,z}	0.007 mg/m ³	0.000 (mg/m ³) ²
Span drift from field test	u _{d,s}	0.102 mg/m ³	0.010 (mg/m ³) ²
Influence of ambient temperature at span	u _t	0.346 mg/m ³	0.120 (mg/m ³) ²
Influence of supply voltage	u _v	0.036 mg/m ³	0.001 (mg/m ³) ²
Cross sensitivity (interference)	u _i	-0.341 mg/m ³	0.116 (mg/m ³) ²
Influence of sample gas flow	u _p	0.017 mg/m ³	0.000 (mg/m ³) ²
Uncertainty of reference material at 70% of certification range	u _{rm}	0.162 mg/m ³	0.026 (mg/m ³) ²

* The larger value is used :

"Repeatability standard deviation at span" or

"Standard deviation from paired measurements under field conditions"

$$u_c = \sqrt{\sum (u_{\max, j})^2}$$

Combined standard uncertainty (u _c)		0.62 mg/m ³
Total expanded uncertainty	U = u _c * k = u _c * 1.96	1.21 mg/m ³

Relative total expanded uncertainty

Requirement of 2000/76/EC and 2001/80/EC	U in % of the range 20 mg/m ³	6.0
Requirement of EN 15267-3	U in % of the range 20 mg/m ³	20.0**
	U in % of the range 20 mg/m ³	15.0

** 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.
Name of measuring system	MIR 9000 CLD Option
Serial number of the candidates	1912 / 1913
Measuring principle	NDIR

Test report

Test laboratory	TÜV Rheinland
Date of report	2012-10-05

Measured component

Certification range	CH ₄ 0 - 10 mg/m ³
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Evaluation of the cross sensitivity (CS)

(system with largest CS)

Sum of positive CS at zero point	0.05 mg/m ³
Sum of negative CS at zero point	-0.29 mg/m ³
Sum of positive CS at reference point	0.12 mg/m ³
Sum of negative CS at reference point	-0.28 mg/m ³
Maximum sum of cross sensitivities	-0.29 mg/m ³
Uncertainty of cross sensitivity	-0.167 mg/m ³

Calculation of the combined standard uncertainty

Tested parameter

Tested parameter			u ²
Standard deviation from paired measurements under field conditions *	u _D	0.085 mg/m ³	0.007 (mg/m ³) ²
Lack of fit	u _{lof}	0.046 mg/m ³	0.002 (mg/m ³) ²
Zero drift from field test	u _{d,z}	-0.094 mg/m ³	0.009 (mg/m ³) ²
Span drift from field test	u _{d,s}	-0.133 mg/m ³	0.018 (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	0.012 mg/m ³	0.000 (mg/m ³) ²
Cross sensitivity (interference)	u _i	-0.167 mg/m ³	0.028 (mg/m ³) ²
Influence of sample gas flow	u _p	0.017 mg/m ³	0.000 (mg/m ³) ²
Uncertainty of reference material at 70% of certification range	u _{rm}	0.081 mg/m ³	0.007 (mg/m ³) ²

* The larger value is used :

"Repeatability standard deviation at span" or

"Standard deviation from paired measurements under field conditions"

$$u_c = \sqrt{\sum (u_{\max, j})^2}$$

Combined standard uncertainty (u _c)		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 2000/76/EC and 2001/80/EC	U in % of the range 10 mg/m ³	6.9
Requirement of EN 15267-3	U in % of the range 10 mg/m ³	30.0**
	U in % of the range 10 mg/m ³	22.5

** 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.