

PRODUCT CONFORMITY CERTIFICATE

This is to certify that the

**MIR9000 Multi-gas Analyser Type 2 SEC Probe
&
MIR9000 CLD option Type 2 SEC Probe
MDS (Module Dryer System)**

Manufactured by:

Envea

111 Boulevard Robespierre
78304 Poissy Cedex
France

has been assessed by CSA Group
and for the conditions stated on this certificate complies with:

Environment Agency Guidance
“MCERTS for stack emissions monitoring equipment at industrial installations”
- Continuous emissions monitoring systems(CEMS)
Published 20 October 2020
EN 15267-1:2009, EN15267-2:2009, EN 15267-3:2007
& QAL 1 as defined in EN 14181: 2014

Certification ranges:

NO/NO _x (CLD)	0-20 mg/m ³	0-2000 mg/m ³	NO ₂ (CLD)	0-20 mg/m ³	0-2000 mg/m ³
CO ₂	0-25 Vol.-%		O ₂	0-10 Vol.-%	0-25 Vol.-%
N ₂ O	0-20 mg/m ³	0-200 mg/m ³	CH ₄	0-10 mg/m ³	0-200 mg/m ³
CO	0-75 mg/m ³	0-500 mg/m ³	HCl	0-15 mg/m ³	0-100 mg/m ³
SO ₂	0-75 mg/m ³	0-200 mg/m ³	NO	0-100 mg/m ³	0-500 mg/m ³

Project number: 80113205
Certificate number: Sira MC020010/13
Initial certification: 10 January 2002
This certificate issued: 11 January 2022
Renewal date: 09 January 2027



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MCERTS is operated on behalf of the Environment Agency by

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Approved Site Application

Any potential user should ensure, in consultation with the manufacturer, that the monitoring system is suitable for the intended application. For general guidance on monitoring techniques refer to the Environment Agency Monitoring Technical Guidance Notes available at www.mcerts.net

This instrument is considered suitable for use on waste incineration and large combustion plants. This CEMS has been proven suitable for its measuring task (parameter and composition of the flue gas) by use of the QAL 1 procedure specified in EN14181. The lowest certified range for each determinand shall not be more than 1.5 times the daily average emission limit value (ELV) for incineration plants, and not more than 2.5 times the ELV for other types of applications.

Basis of Certification

This certification is based on the following Test Report(s) and on Sira's assessment and ongoing surveillance of the product and the manufacturing process:

TÜV Köln Report Number: 936/21206578/C dated 01 August 2008
TÜV Köln Report Number: 936/21206578/D dated 01 August 2008
TÜV Cologne Report Number: 936/21220780/A dated 05 October 2012

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Product Certified

The MIR 9000 measuring system consists of the following parts:

1. Sample Probe	2. Heated Filter	3. Heated Sample Line	4. Gas Conditioning	5. Analyser
Model: Type 2 SEC Probe	Model: Type 2 SEC probe ceramic filter	Model: N/A	Model: Integrated with Type 2 SEC Probe	Model: MIR 9000 / MIR CLD

Allowable variations could include:

- A different brand or model of sampling system of the same type, provided that there is evidence the alternative system works with similar types of CEM.
- Additional manifolds and heated valves used to allow more than one analyser to share a sampling system.

The certificate applies to all instruments fitted software version 2 onwards (serial number 1891) onwards.

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Certified Performance

The instrument was evaluated for use under the following conditions:

Ambient Temperature Range: +5°C to +40°C
 Instrument IP rating: IP33 for the analyser, IP66 for the SEC probe

Note: For outdoor installations the analyser needs to be mounted into an IP65 environment. If the instrument is supplied with an enclosure, then the ambient temperature shall be monitored inside the enclosure to ensure that it stays within the above ambient temperature range.

Results are expressed as error % of the lower certification range detailed on the front page of the certificate, unless otherwise stated.

Test	Results expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Response time					(Note 1)	
NO/NO _x (CLD)					63s	<200s
NO ₂ (CLD)					72s	<200s
CO ₂					54s	<200s
O ₂					84s	<200s
N ₂ O					76s	<200s
CH ₄					77s	<200s
CO					86s	<200s
HCl					156s	<400s
SO ₂					78s	<200s
NO					71s	<200s
Repeatability standard deviation at zero point						
NO/NO _x (CLD)	0.02					<2%
NO ₂ (CLD)	0.01					<2%
CO ₂	0.00					<2%
O ₂	0.05					<0.2%
N ₂ O	0.01					<2%
CH ₄	0.06					<2%
CO	0.04					<2%
HCl	0.13					<2%
SO ₂	0.09					<2%
NO	0.02					<2%

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Test	Results expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Repeatability standard deviation at span point						
NO/NO _x (CLD)	0.22					<2%
NO ₂ (CLD)	0.25					<2%
CO ₂	0.13					<2%
O ₂	0.14					<0.2%
N ₂ O	0.09					<2%
CH ₄	0.22					<2%
CO	0.16					<2%
HCl		0.97				<2%
SO ₂	0.42					<2%
NO	0.09					<2%
Lack-of-fit (Linearity)					Note 1	
NO/NO _x (CLD)	-0.5					<2%
NO ₂ (CLD)		0.8				<2%
CO ₂		-0.6				<2%
O ₂	0.13					<0.2%
N ₂ O		-0.6				<2%
CH ₄		-0.9				<2%
CO		-0.87				<2%
HCl			1.1			<2%
SO ₂		-0.93				<2%
NO		0.60				<2%

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Test	Results expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Zero Point Drift (24 hr)						To be reported
NO/NOx (CLD)	-0.03					
NO ₂ (CLD)	-0.05					
CO ₂	0.01					
O ₂	0.03					
N ₂ O	-0.02					
CH ₄	-0.03					
CO	0.02					
HCl	0.04					
SO ₂	0.04					
NO	-0.03					
Span Point Drift (24 hr)						To be reported
NO/NOx (CLD)	0.00					
NO ₂ (CLD)	-0.01					
CO ₂	-0.01					
O ₂	0.03					
N ₂ O	-0.06					
CH ₄	-0.05					
CO	0.15					
HCl	-0.07					
SO ₂	-0.09					
NO	0.05					

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Test	Results expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Ambient temperature at zero point						
NO/NO _x (CLD)		0.86				<5%
NO ₂ (CLD)	-0.08					<5%
CO ₂	-0.13					<5%
O ₂	0.03					<0.5%
N ₂ O				-3.68		<5%
CH ₄				4.02		<5%
CO	-0.2					<5%
HCl			-1.9			<5%
SO ₂			-1.6			<5%
NO			-1.0			<5%
Ambient temperature at span point						
NO/NO _x (CLD)				2.41		<5%
NO ₂ (CLD)				-2.48		<5%
CO ₂			1.51			<5%
O ₂	0.13					<0.5%
N ₂ O				3.08		<5%
CH ₄				3.58		<5%
CO			-1.3			<5%
HCl				2.7		<5%
SO ₂				-2.1		<5%
NO				2.5		<5%
Sample gas pressure					N/A – see note 2	<2.0%

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Test	Results expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Sample gas flow						
NO/NO _x (CLD)	0.25					<2%
NO ₂ (CLD)	0.30					<2%
CO ₂	0.20					<2%
O ₂	0.03					<0.2%
N ₂ O	0.10					<2%
CH ₄	0.30					<2%
CO	-0.2					<2%
HCl	-0.5					<2%
SO ₂	-0.2					<2%
NO	-0.2					<2%
Voltage variations 190V to 250V						
NO/NO _x (CLD)	-0.10					<2%
NO ₂ (CLD)	0.13					<2%
CO ₂	0.07					<2%
O ₂	0.04					<0.2%
N ₂ O	-0.28					<2%
CH ₄	-0.27					<2%
CO	0.5					<2%
HCl	0.5					<2%
SO ₂	0.1					<2%
NO	-0.2					<2%
Vibration (10 to 60Hz (±0.3mm), 60 to 150Hz at 19.6m/s ²)					N/A See note 2	To be reported

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Test	Results expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Cross-sensitivity at zero with interferents O ₂ , H ₂ O, CO, CO ₂ , CH ₄ , N ₂ O, NO, NO ₂ , NH ₃ , SO ₂ , and HCl						
NO/NO _x (CLD)	0.00					<4%
NO ₂ (CLD)				2.87		<4%
CO ₂		0.68				<4%
O ₂	0.09					<0.4%
N ₂ O			-1.95			<4%
CH ₄				-2.40		<4%
CO		-0.57				<4%
HCl				-2.86		<4%
SO ₂				-2.06		<4%
NO			-1.17			<4%
Cross-sensitivity at span with interferents O ₂ , H ₂ O, CO, CO ₂ , CH ₄ , N ₂ O, NO, NO ₂ , NH ₃ , SO ₂ , and HCl						
NO/NO _x (CLD)				-2.35		<4%
NO ₂ (CLD)				2.95		<4%
CO ₂			-2.00			<4%
O ₂	-0.27					<0.4%
N ₂ O				-3.30		<4%
CH ₄			-2.00			<4%
CO			1.87			<4%
HCl				-2.13		<4%
SO ₂				-2.40		<4%
NO				-2.30		<4%
Converter Efficiency					98.2%	>95%

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Test	Results expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Measurement uncertainty					Guidance - at least 25% below max permissible uncertainty	
NO/NO _x (CLD) (For an ELV of 20mg/m ³)					7.2%	<15%
NO ₂ (CLD) (For an ELV of 20mg/m ³)					5.7%	<15%
CO ₂ (For an ELV of 25%vol.)					4.4%	<7.5%
O ₂ (For an ELV of 10 %vol.)					2.7%	<7.5%
N ₂ O (For an ELV of 20mg/m ³)					7.7%	<15%
CH ₄ (For an ELV of 10mg/m ³)					6.7%	<22.5%
CO (For an ELV of 50mg/m ³)					5.6%	<7.5%
HCl (For an ELV of 10mg/m ³)					9.9%	<30%
SO ₂ (For an ELV of 50mg/m ³)					7.6%	<15%
NO (For an ELV of 131mg/m ³)					3.5%	<15%
Calibration function (field)					Note 3	
NO/NO _x (CLD)		0.93				>0.90
NO ₂ (CLD)		0.92				>0.90
CO ₂		0.95				>0.90
O ₂		0.99				>0.90
N ₂ O		0.90				>0.90
CH ₄		0.91				>0.90
CO		0.95				>0.90
HCl		0.91				>0.90
SO ₂		0.94				>0.90
NO		0.93				>0.90

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Test	Results expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Response time (Field)					Note 4	
NO/NO _x (CLD)					63s	<200s
NO ₂ (CLD)					61s	<200s
CO ₂					65s	<200s
O ₂					78s	<200s
N ₂ O					79s	<200s
CH ₄					76s	<200s
CO					72s	<200s
HCl					154s	<400s
SO ₂					81s	<200s
NO					77s	<200s
Lack-of-fit (field)					Note 4	
NO/NO _x (CLD)		0.6				<2%
NO ₂ (CLD)		-0.8				<2%
CO ₂	0.3					<2%
O ₂	0.12					<0.2%
N ₂ O		-0.6				<2%
CH ₄		-0.6				<2%
CO			-1.5			<2%
HCl			1.4			<2%
SO ₂			-1.7			<2%
NO			-1.3			<2%
Maintenance interval (field)						
NO/NO _x , NO ₂ , CO ₂ , O ₂ , N ₂ O, CH ₄ , CO, SO ₂ , NO					4 weeks	>8 days
HCl					2 weeks	>8 days

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Test	Results expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Change in zero point over 3 month field trial					Note 4	
NO/NO _x (CLD)		-0.8				<3%
NO ₂ (CLD)		-0.9				<3%
CO ₂		1.0				<3%
O ₂	-0.13					<0.2%
N ₂ O	0.1					<3%
CH ₄			-1.6			<3%
CO		0.6				<3%
HCl			1.4			<3%
SO ₂			1.1			<3%
NO		0.7				<3%
Change in span point over 3 month field trial					Note 4	
NO/NO _x (CLD)				2.7		<3%
NO ₂ (CLD)				-2.2		<3%
CO ₂		1.0				<3%
O ₂	0.19					<0.2%
N ₂ O		0.9				<3%
CH ₄				-2.3		<3%
CO			1.4			<3%
HCl				3.1		<3%
SO ₂			1.9			<3%
NO			1.2			<3%
Availability (field)					98% Note 4	>95% (>98% for O ₂)

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	<0.5	<1	<2	<5		
Reproducibility (field)					Note 4	
NO/NO _x (CLD)				3.0		<3.3%
NO ₂ (CLD)		0.8				<3.3%
CO ₂			1.7			<3.3%
O ₂	0.1					<0.2%
N ₂ O				3.2		<3.3%
CH ₄			1.1			<3.3%
CO		0.9				<3.3%
HCl			1.7			<3.3%
SO ₂		1.8				<3.3%
NO	0.8					<3.3%
Zero and Span drift requirement Manufacturer shall provide a description of the technique to determine and compensate for zero and span drift.	Manufacturer's statement: <i>'An automatic injection of zero gas is realized every 6 hours on the analyzer during 240 seconds interval. By this elapsed time, the analyser is able to set the values found as zero values. The values are recorded within its flash memory each minute average. A status signal ZR is associated with the value during the zero ref sequence. If the Zero ref sequence is not able to bring the analyser within its normal operation a Ctrl status signal is associated to the Infrared measurement. No span drift compensation is performed.'</i>					Clause 6.13 & 10.13

Note 1: The analyser was tested on low and high certification ranges. The worst result has been reported.

Note 2: This test is only applicable to in-situ analysers. The MIR 9000/MIR9000 CLD is an extractive analyser.

Note 3: The field test was conducted over 3 months in the flue gas of a communal clearing sludge combustion plant.

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Description

The analyser system comprises of 3 units, a sample probe, an analyser and a Module dryer system (MDS) unit. The system continuously measures the flue gas.

The stack mounted filter probe (SEC) comprises heated filters and a permeation dryer that reduces water content of the sample gas to less than 1000 ppm. There is provision for injecting calibration gases and a compressed air to feed the MDS unit. An unheated sample line, of length up to 100m, transports the sample gas to the analyser.

The MIR 9000 CLD option is a multi-gas analyser based on infra-red absorption, utilising gas filter correlation techniques to measure the individual components. The CLD option is an additional module based on chemiluminescence effect technique to measure NO and NOx concentrations. The analyser has an auto-zero facility, requiring a supply of dry compressed air, and operating every 6 hours.

General Notes

1. This certificate is based upon the equipment tested. The Manufacturer is responsible for ensuring that on-going production complies with the standard(s) and performance criteria defined in this certificate. 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 system shall be subject to regular surveillance according to 'Regulations Applicable to the Holders of CSA Group Testing UK Ltd Certificates'.
2. The design of the product certified is defined in the CSA Group Design Schedule V00 for certificate No. Sira MC020010/13.
3. If a certified product is found not to comply, CSA Group should be notified immediately at the address shown on this certificate.
4. The certification marks that can be applied to the product or used in publicity material are defined in 'Regulations Applicable to the Holders of CSA Group Testing UK Ltd Certificates'.
5. This document remains the property of CSA Group and shall be returned when requested by CSA Group.

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