PRODUCT CONFORMITY CERTIFICATE

This is to certify that the

MIR-IS Multi-gas Analyser Type 2 SEC Probe

Manufactured by:

Envea
111 Boulevard Robespierre
78304 Poissy Cedex
France

has been assessed by Sira Certification Service
And for the conditions stated on this certificate complies with:

MCERTS Performance Standards for Continuous Emission Monitoring Systems (CEMS) and T-CEMS, Version 4 dated July 2018
EN15267-3:2007,
& QAL 1 as defined in EN 14181: 2014

Certification Ranges :

CO_2	0-25 Vol.-%		O_2	0-10 Vol.-%	0-25 Vol.-%
N_2O	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 No.	:	674/0371 & 70210654
Certificate No	:	Sira MC040030/09
Initial Certification	:	17 February 2004
This Certificate issued	:	18 February 2019
Renewal Date	:	17 February 2024

Emily Alexander
Environmental Project Engineer

MCERTS is operated on behalf of the Environment Agency by

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Unit 6, Hawarden Industrial Park
Hawarden, Deeside, CH5 3US
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Form 1335
Issue 5

Certificate Contents

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 stack emission monitoring techniques refer to Environment Agency Technical Guidance Note M2: Monitoring of stack emissions to air. Operators with installations falling under the Large Combustion Plant Directive or Waste Incineration Directive must refer to Technical Guidance Note M20: Quality Assurance of Continuous Emission Monitoring Systems, for guidance on the suitability of CEMS for their installations. M2 and M20 are available on the Agency's website at www.mcerts.net

On the basis of the assessment and the ranges required for compliance with EU Directives this instrument is considered suitable for use on waste incineration and large coal-fired combustion plant applications. This CEM 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, for LCPD and WID applications for the ranges specified. The lowest certified range for each determinand shall not be more than 1.5X the emission limit value (ELV) for WID applications, and not more than 2.5X the ELV for LCPD and other types of application.

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 01.08.2008
TÜV Köln	Report Number: 936/21206578/D dated 01.08.2008
Sira Test & Certification	Report Number: N0375 dated June 2001
Sira Test & Certification	Report Number: C124 dated February 2004

Product Certified

The MIR-IS measuring system consists of the following parts:

- MIR9000 Multi-gas analyser
- IP66 enclosure
- Type 2 SEC Probe
- Air conditioned environment (for low ranges)
- Heated 6mm O.D. PTFE sample tube

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.

This certificate applies to all instruments fitted with software version 2.0 (serial number 1891) onwards.

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 (supplied with IP66 enclosure)
IP66 for the SEC probe

Note: 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.

Unless otherwise stated the evaluation was carried out on the lower certification range detailed on the front page of the certificate.

Test	Results expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Response time					Note 1	
CO_2					54s	<200s
O_2					84s	<200s
N_2O					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						
CO_2	0.00					<2%
O_2	0.05					<0.2%
N_2O	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%

Test	Results expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Repeatability standard deviation at reference point						
CO_2	0.13					<2%
O_2	0.14					<0.2%
N_2O	0.09					<2%
CH_4	0.22					<2%
CO	0.13					<2%
HCl		0.83				<2%
SO_2	0.37					<2%
NO	0.13					<2%
Lack-of-fit					Note 1	
CO_2		-0.6				<2%
O_2	0.13					<0.2%
N_2O		-0.6				<2%
CH_4		-0.9				<2%
CO		-0.9				<2%
HCl			-1.5			<2%
SO_2		-0.9				<2%
NO		0.6				<2%
Zero Point Drift (24 hr)						
CO_2	0.01					
O_2	0.03					
N_2O	-0.02					
CH_4	-0.03					To be reported
CO	0.02					
HCl	0.04					
SO_2	0.04					
NO	-0.03					

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Test	Results expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Span Point Drift (24 hr)						
CO_2	-0.01					
O_2	0.03					
N_2O	-0.05					
CH_4	-0.05					To be reported
CO	0.15					
HCl	-0.07					
SO_2	-0.09					
NO	0.05					
Influence of ambient temperature zero point (+5°C to +40°C)						
CO_2	-0.13					<5%
O_2	0.03					<0.5%
N_2O				-3.68		<5%
CH_4				4.02		<5%
CO		-0.81				<5%
HCl			-1.99			<5%
SO_2			-1.58			<5%
NO			-1.74			<5%
Influence of ambient temperature reference point (+5°C to +40°C)						
CO_2			1.51			<5%
O_2	0.13					<0.5%
N_2O				3.08		<5%
CH_4				3.58		<5%
CO				-2.87		<5%
HCl				2.78		<5%
SO_2				-2.31		<5%
NO				2.43		<5%

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Test	Results expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Influence of sample gas pressure					N/A - Note 2	<2.0%
Influence of sample gas flow for extractive CEMS						
CO_2	0.20					<2%
O_2	0.03					<0.2%
N_2O	0.10					<2%
CH_4	0.30					<2%
CO	0.20					<2%
HCl	0.53					<2%
SO_2	0.16					<2%
NO	0.09					<2%
Influence of voltage variations (190V to 250V)						<2.0%
CO_2	0.07					<2%
O_2	0.04					<0.2%
N_2O	-0.28					<2%
CH_4	-0.27					<2%
CO		0.52				<2%
HCl		0.56				<2%
SO_2	0.23					<2%
NO	-0.16					<2%
Influence of vibration (10 to 60Hz (±0.3mm), 60 to 150Hz at 19.6m/s^2)					No effect See note 3	To be reported

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_2O, CO, CO_2, CH_4, N_2O, NO, NO_2, NH_3, SO_2, HCl						
CO_2		0.68				<4%
O_2	0.09					<0.4%
N_2O			-1.95			<4%
CH_4				-2.40		<4%
CO		-0.57				<4%
HCl				-2.87		<4%
SO_2				-3.14		<4%
NO		-0.74				<4%
Cross-sensitivity at reference with interferents: O_2, H_2O, CO, CO_2, CH_4, N_2O, NO, NO_2, NH_3, SO_2, HCl						
CO_2			-2.00			<4%
O_2	-0.27					<0.4%
N_2O				-3.30		<4%
CH_4			-2.00			<4%
CO			1.85			<4%
HCl				-2.93		<4%
SO_2				-2.08		<4%
NO				-2.32		<4%
Converter Efficiency					98.2%	>95%

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	
CO_2					4.4%	<7.5% (10%)
O_2					2.7%	<7.5% (10%)
N_2O					7.7%	<15% (20%)
CH_4					6.7%	<22.5% (30%)
CO					7.9%	<7.5% (10%)
HCl					11.9%	<30% (40%)
SO_2					8.3%	<15% (20%)
NO					3.6%	<15% (20%)
CO_2					4.4%	<7.5% (10%)
Calibration function (field)					Note 4	
CO_2		0.95				>0.90
O_2		0.99				>0.90
N_2O		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
Response time (field)					Note 4	
CO_2					65s	<200s
O_2					78s	<200s
N_2O					79s	<200s
CH_4					76s	<400s
CO					72s	<400s
HCl					151s	<200s
SO_2					81s	<200s
NO					77s	<200s

Test	Results expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Lack of fit (field)					Note 4	
CO_2	0.3					<2.0%
O_2	0.12					<0.2%
N_2O		-0.6				<2.0%
CH_4		-0.6				<2.0%
CO			-1.5			<2.0%
HCl			1.4			<0.2%
SO_2			-1.7			<2.0%
NO			-1.3			<2.0%
Maintenance interval					4 weeks	>8 days
Zero and Span drift requirement	Manufacturer's statement: *'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.'*					Clause 6.13 & 10.13 Manufacturer shall provide a description of the technique to determine and compensate for zero and span drift.
Change in zero point over maintenance interval over 3 month field trial					Note 4	
CO_2		1.0				<3%
O_2	-0.13					<0.2%
N_2O	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%

Test	Results expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Change in reference point over maintenance interval over 3 month field trial					Note 4	
CO_2		1.0				<3%
O_2	0.19					<0.2%
N_2O		0.9				<3%
CH_4				-2.3		<3%
CO			1.4			<3%
HCl				2.7		<3%
SO_2			1.9			<3%
NO			1.2			<3%
Availability					Note 4 98%	>95% (>98% for O_2)
Reproducibility					Note 4	
CO_2			1.7			<3.3%
O_2	0.1					<0.2%
N_2O				3.2		<3.3%
CH_4			1.1			<3.3%
CO		0.9				<3.3%
HCl			2.0			<3.3%
SO_2		1.8				<3.3%
NO	0.8					<3.3%

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

Note 2: This test is not applicable. The MIRIS analyser extracts the gas via a short heated line.

Note 3. Vibration test performed on the SEC sample probe. Certification only applies to the MIR-IS system configured with unit connected to the stack via a short heated line.

Note 4: The field test was conducted over 3 months in the flue gas of a communal clearing sludge Combustion plant.

Description

The MIR-IS system is the stack-mounted version of the MCERTS certified MIR 9000 System with the SEC sampling system. The MIRIS analyser is connected to the stack via a short heated line.

The MIR-IS is a dried multi-gas analyser based on infra-red absorption, utilising gas filter correlation techniques to measure the individual components. The analyser has an auto-zero facility, requiring a supply of dry compressed air, and operating ordinarily every 3 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 Sira Certificates'. The design of the product certified is defined in the Sira Design Schedule for certificate No. Sira MC020010/07

2. If certified product is found not to comply, Sira Certification Service should be notified immediately at the address shown on this certificate.

3. The Certification Marks that can be applied to the product or used in publicity material are defined in 'Regulations Applicable to the Holders of Sira Certificates'.

4. This document remains the property of Sira and shall be returned when requested by the company.