

PRODUCT CONFORMITY CERTIFICATE

This is to certify that the

MCS 100E HW Multi-Component Analyser

Manufactured by:

SICK AG

Rengoldshauser Str. 17 a
88662 Überlingen

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), Version 4 dated July 2018
EN15267-1:2009, EN15267-2:2009, EN15267-3:2007,
& QAL 1 as defined in EN 14181: 2014**

Certification Ranges :

SO ₂	0 to 75 mg/m ³
NO	0 to 200 mg/m ³
CO	0 to 75 mg/m ³
HCl	0 to 15 mg/m ³
NH ₃	0 to 20 mg/m ³
O ₂	0 to 21 % vol
CO ₂	0 to 25 % vol
H ₂ O	0 to 40 % vol

Project No. : 674/0373B/80006359
Certificate No : Sira MC040044/05
Initial Certification : 10 August 2004
This Certificate issued : 09 August 2019
Renewal Date : 09 August 2024

Emily Alexander
Environmental Project Engineer

MCERTS is operated on behalf of the Environment Agency by

Sira Certification Service

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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

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 daily average emission limit value (ELV) for WID applications, and not more than 2.5X the ELV for LCPD and other types of application.

The MCS 100E HW analyser was assessed on the basis of an eight month trial mounted on a waste incinerator

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:

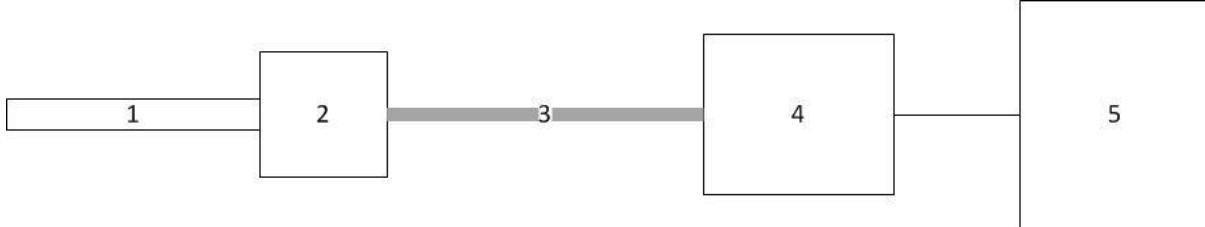
TÜV Rheinland	Report No: 936/808010/A dated 30.09.1999
TÜV Rheinland	Report No: 936/21201591/A dated 07.02.2004
Sira Report	674/0373B dated 17.10.2009

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Product Certified

The measuring system consists of the following parts:



1. Sample Probe	2. Heated Filter	3. Heated Sample Line	4. Gas Conditioning	5. Analyser
Model: SICK probe design	Model: N/A – integrated with sample probe	Model: Eltherm or equivalent Length: 35m+ dependent on site	Model: N/A - Sample gas remains hot throughout.	Model: MCS 100E Multi-component analyser

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 1.38 and serial number SN_19 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: IP43 (only suitable for ventilated rooms unless additional dust ingress control is present)

Note: The requirement for the protection class of the enclosure is not fulfilled. The measuring system needs to be installed with an IP65 enclosure to meet the requirements of EN 15267-3. 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 certification range, unless otherwise stated.

Test	Results expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Response time						
SO ₂					140s	<200s
NO					139s	<200s
CO					137s	<200s
HCl					311s	<400s
NH ₃					167s	<400s
O ₂					140s	<200s
CO ₂					142s	<200s
H ₂ O					140s	<200s
Repeatability standard deviation at zero point					Note 1	
SO ₂	0.26					<2.0%
NO	0.08					<2.0%
CO	0.18					<2.0%
HCl	0.39					<2.0%
NH ₃	0.27					<2.0%
O ₂	0.08					<0.2%
CO ₂	0.01					<2.0%
H ₂ O	0.09					<2.0%

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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 reference point						
SO ₂	0.11					<2.0%
NO	0.06					<2.0%
CO	0.12					<2.0%
HCl			1.37			<2.0%
NH ₃		0.78				<2.0%
O ₂	0.01					<0.2%
CO ₂	0.07					<2.0%
H ₂ O		0.81				<2.0%
Lack-of-fit						
SO ₂		-0.61				<2.0%
NO	0.32					<2.0%
CO		-0.56				<2.0%
HCl		-0.74				<2.0%
NH ₃		-0.92				<2.0%
O ₂	-0.11					<0.2%
CO ₂		0.84				<2.0%
H ₂ O		0.73				<2.0%

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Test	Results expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Influence of ambient temperature zero point						
SO ₂				3.1		<5.0%
NO		0.6				<5.0%
CO			1.8			<5.0%
HCl		0.6				<5.0%
NH ₃		0.9				<5.0%
O ₂	0.0					<0.50%
CO ₂	0.1					<5.0%
H ₂ O	0.1					<5.0%
Influence of ambient temperature reference point						
SO ₂				3.4		<5.0%
NO				3.2		<5.0%
CO			1.3			<5.0%
HCl				3.6		<5.0%
NH ₃				2.9		<5.0%
O ₂	0.3					<0.50%
CO ₂				2.2		<5.0%
H ₂ O		0.9				<5.0%

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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 flow for extractive CEMS						
SO ₂		<1				<2.0%
NO		<1				<2.0%
CO		<1				<2.0%
HCl		<1				<2.0%
NH ₃		<1				<2.0%
O ₂	<0.2					<0.2%
CO ₂		<1				<2.0%
H ₂ O		<1				<2.0%
Influence of voltage variations 190 to 250V						<2.0%
All gases					No influence	<0.2% O ₂
Influence of vibration (10 to 60Hz (±0.3mm), 60 to 150Hz at 19.6m/s ²)					Not tested	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 , HCl						
SO ₂			1.2			<4.0%
NO	0.3					<4.0%
CO		0.6				<4.0%
HCl		0.7				<4.0%
NH ₃		0.6				<4.0%
O ₂	0.0					<0.40%
CO ₂	0.0					<4.0%
H ₂ O	0.0					<4.0%
Cross-sensitivity at reference with interferents: O ₂ , H ₂ O, CO, CO ₂ , CH ₄ , N ₂ O, NO, NO ₂ , NH ₃ , SO ₂ , HCl						
SO ₂			1.5			<4.0%
NO	0.3					<4.0%
CO		1.0				<4.0%
HCl		1.0				<4.0%
NH ₃		0.7				<4.0%
O ₂	0.0					<0.40%
CO ₂	0.0					<4.0%
H ₂ O	0.0					<4.0%

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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	
SO ₂ (For and ELV of 50 mg/m ³)					7.8%	<15% (20%)
NO (For and ELV of 130 mg/m ³)					7.0%	<15% (20%)
CO (For and ELV of 50 mg/m ³)					5.8%	<7.5% (10%)
HCl (For and ELV of 10 mg/m ³)					8.6%	<30% (40%)
NH ₃ (For and ELV of 10 mg/m ³)					12.4%	<30% (40%)
O ₂ (For a range of 10 Vol.-%)					0.53%vol	---
CO ₂ (For and ELV of 10 Vol.-%)					10.3%	<7.5% (10%)
H ₂ O (For and ELV of 20 Vol.-%)					7.2%	<7.5% (10%)
Calibration function (field)						
SO ₂					0.99	>0.90
NO					0.99	>0.90
CO					0.99	>0.90
HCl					0.98	>0.90
NH ₃					0.99	>0.90
O ₂					0.99	>0.90
CO ₂					0.99	>0.90
H ₂ O					0.99	>0.90
Response time (field)					Note 2	
SO ₂					140s	<200s
NO					139s	<200s
CO					137s	<200s
HCl					311s	<400s
NH ₃					167s	<400s
O ₂					140s	<200s
CO ₂					142s	<200s
H ₂ O					140s	<200s

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Test	Results expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Lack of fit (field)					Note 3	
SO ₂				<2.0		<2.0%
NO				<2.0		<2.0%
CO				<2.0		<2.0%
HCl				<2.0		<2.0%
NH ₃				<2.0		<2.0%
O ₂				<2.0		<0.2%
CO ₂				<2.0		<2.0%
H ₂ O				<2.0		<2.0%
Maintenance interval					3 Months	>8 days
Zero and Span drift requirement	<p><u>Statement from Manufacturer:</u></p> <p>Zero drift is checked by the use of instrument air. Span drift is checked by using test gas or an optional internal calibration filter.</p>					<p>Clause 6.13 & 10.13</p> <p>Manufacturer shall provide a description of the technique to determine and compensate for zero and span drift.</p>
Change in zero point over maintenance interval						
SO ₂			<2			<3.0%
NO			<2			<3.0%
CO			<2			<3.0%
HCl				<3		<3.0%
NH ₃				<3		<3.0%
O ₂	0.10					<0.2%
CO ₂			<2			<3.0%
H ₂ O			<2			<3.0%

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Test	Results expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Change in reference point over maintenance interval						
SO ₂			<2			<3.0%
NO			<2			<3.0%
CO			<2			<3.0%
HCl				<3		<3.0%
NH ₃				<3		<3.0%
O ₂	0.12					<0.2%
CO ₂			<2			<3.0%
H ₂ O			<2			<3.0%
Availability All gases					98.6%	>95% (>98% for O ₂)
Reproducibility						
SO ₂			1.20			<3.3%
NO		0.84				<3.3%
CO			1.65			<3.3%
HCl				2.23		<3.3%
NH ₃			1.55			<3.3%
O ₂	0.13					<0.20%
CO ₂			1.61			<3.3%
H ₂ O		0.67				<3.3%

Note 1: Repeatability at zero data is based on 30 readings.

Note 2: Results stated are from the laboratory tests.

Note 3: Data derived from calibration function test.

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Description

MCS 100 E HW is an extractive multi component gas analyser. It is a hot measuring IR analyser especially for applications at waste incineration plants and power plants with high acid dew point. It can be used at raw gas sites for process monitoring and at clean gas applications for emission monitoring.

In MCS 100 E HW all components from the sampling system to the measuring cell are electrically heated to a temperature above the acid dew points. It uses the gas filter correlation principle. For the measurement of oxygen a ZrO₂ probe is used.

The ranges certified are the minimum ranges, consult manufacturer for details of higher ranges.

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 MC040044/03
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.

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