



PRODUCT CONFORMITY CERTIFICATE

This is to certify that the

MCS 100E HW Multi-Component Analyser

manufactured by:

SICK MAIHAK GmbH

*Dr Zimmermann Street 18
88709
Meersburg
Germany*

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, Version 3.1 dated July 2008,
EN15267:2007,
& QAL 1 as defined in EN 14181: 2004**

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
Certificate No: Sira MC040044/03
Initial Certification: 10 August 2004
This Certificate Issued: 13 November 2009
Renewal Date: 09 August 2014

Technical Director

MCERTS is operated on behalf of the Environment Agency by

Sira Certification Service

12 Acorn Industrial Park, Crayford Road, Crayford
Dartford, Kent, UK, DA1 4AL

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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 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 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

Field Trial

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

Product Certified

The tested system MCS100 E consists of the following main components:

- Analyser module
- Heated sampling line
- Sampling probe with heated filter

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 +35°C

Instrument IP rating: IP43 (only suitable for ventilated rooms unless additional dust ingress control is present)

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 certification range SO₂ 0 to 75mg/m³, NO 0 to 200mg/m³, CO 0 to 75mg/m³, HCl 0 to 15 mg/m³, NH₃ 0 to 20 mg/m³, O₂ 0 to 21%vol, CO₂ 0 to 20%vol and H₂O 0 to 40%vol

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 span 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 span 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
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%

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Test	Results expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<5		
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 , 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%
Measurement uncertainty					Guidance - at least 25% below max permissible uncertainty	
SO ₂ (for an ELV of 50mg/m ³)					7.8%	15%
NO (for an ELV of 130mg/m ³)					7.0%	15%
CO (for an ELV of 50mg/m ³)					5.8%	7.5%
HCl (for an ELV of 10mg/m ³)					8.6%	30%
NH ₃ (for an ELV of 10mg/m ³)					12.4%	15%
O ₂ (for a range of 10%vol)					0.53%vol	-
CO ₂ (for an ELV of 10%vol)					10.3%	7.5%
H ₂ O (for an ELV of 20%vol)					7.2%	7.5%
Calibration function (field)						
SO ₂ , NO, CO, NH ₃ , O ₂ , CO ₂ , H ₂ O					0.99	>0.90
HCl					0.98	>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 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
Lack of fit (field)					Note 3	
All gases					<2.0%	<2.0%
Maintenance interval (field)						
All gases					>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>					
Clause 6.13 & 10.13						
Manufacturer shall provide a description of the technique to determine and compensate for zero and span drift.						

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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 maintenance interval (field)						
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%
Change in span point over maintenance interval (field)						
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 (field)					98.6%	>95% (>98% for O ₂)

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Test	Results expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Reproducibility (field)						
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 ZrO_2 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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