PRODUCT CONFORMITY CERTIFICATE

This is to certify that the

MCS 100E PD Multi-Component Analyser

Manufactured by:

SICK MAIHAK GmbH

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 10 mg/m^3
NO	0 to 50 mg/m^3
NO_2	0 to 80 mg/m^3
CO	0 to 50 mg/m^3
HCl	0 to 10 mg/m^3
O_2	0 to 21 % vol
CO_2	0 to 25 % vol

Project No.	:	674/0373F/80006359
Certificate No	:	Sira MC040045/07
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

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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 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 PD 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/B dated 30th September 1999

Sira Report Report number 674/0373B dated 17th October 2009

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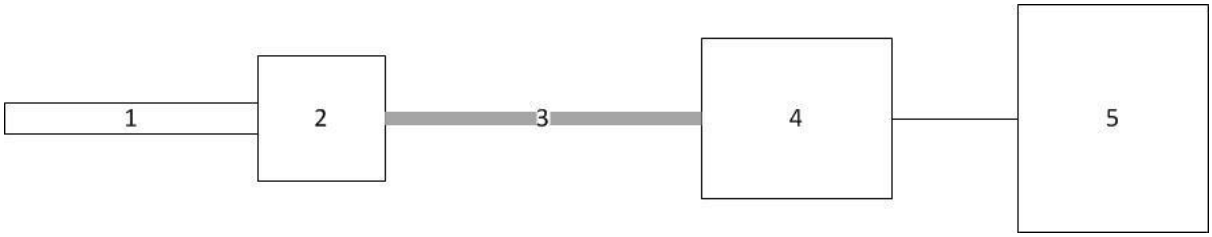
Product Certified

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: Permapure Drier, multi-strand 24” length.	Model: MCS 100EMulti-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_21 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: 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.

Unless otherwise stated the evaluation was carried out on the certification range SO_2 0 to 10mg/m3, NO 0 to 50mg/m3, NO 0 to 80mg/m3, CO 0 to 50mg/m3, HCl 0 to 10mg/m3, O_2 0 to 21%vol, and CO_2 0 to 25%vol

Test	Results expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Response time						
SO_2					64s	<200s
NO					64s	<200s
NO_2					64s	<200s
CO					64s	<200s
HCl					350s	<400s
O_2					48s	<200s
CO_2					64s	<200s
Repeatability standard deviation at zero point					Note 1	
SO_2	0.47					<2.0%
NO	0.21					<2.0%
NO_2	0.27					<2.0%
CO	0.29					<2.0%
HCl		0.50				<2.0%
O_2	0.03					<0.2%
CO_2	0.02					<2.0%

Certificate No : Sira MC040045/06
This Certificate issued : 09 August 2019

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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	0.24					<2.0%
NO	0.12					<2.0%
NO_2	0.28					<2.0%
CO	0.15					<2.0%
HCl		0.67				<2.0%
O_2	0.02					<0.2%
CO_2	0.10					<2.0%
Lack-of-fit						
SO_2		-0.60				<2.0%
NO		-0.55				<2.0%
NO_2			-1.4			<2.0%
CO			-1.1			<2.0%
HCl			-1.0			<2.0%
O_2	0.19					<0.2%
CO_2			-1.2			<2.0%
Influence of ambient temperature zero point						
SO_2				3.1		<5.0%
NO			1.4			<5.0%
NO_2	0.3					<5.0%
CO		-0.9				<5.0%
HCl			1.6			<5.0%
O_2	0.0					<0.50%
CO_2	0.3					<5.0%

Test	Results expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Influence of ambient temperature reference point						
SO_2				2.8		<5.0%
NO		0.9				<5.0%
NO_2				-2.3		<5.0%
CO		-0.8				<5.0%
HCl				-2.8		<5.0%
O_2		0.5				<0.50%
CO_2				3.5		<5.0%
Influence of sample gas flow for extractive CEMS						
SO_2		<1				<2.0%
NO		<1				<2.0%
NO_2		<1				<2.0%
CO		<1				<2.0%
HCl		<1				<2.0%
O_2	<0.2					<0.2%
CO_2		<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_2O, CO, CO_2, CH_4, N_2O, NO, NO_2, NH_3, SO_2, HCl						
SO_2			1.3			<4.0%
NO	0.2					<4.0%
NO_2	0.3					<4.0%
CO	0.5					<4.0%
HCl		0.7				<4.0%
O_2	0.0					<0.40%
CO_2	0.0					<4.0%
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						
SO_2			1.7			<4.0%
NO			1.3			<4.0%
NO_2		0.9				<4.0%
CO			1.8			<4.0%
HCl			1.8			<4.0%
O_2	0.0					<0.40%
CO_2	0.2					<4.0%
Measurement uncertainty					Guidance - at least 25% below max permissible uncertainty	
SO_2 (For and ELV of 50 mg/m^3)					9%	<15% (20%)
NO (For and ELV of 130 mg/m^3)					6%	<15% (20%)
NO_2 (For and ELV of 200 mg/m^3)					3%	<15% (20%)
CO (For and ELV of 50 mg/m^3)					6%	<7.5% (10%)
HCl (For and ELV of 10 mg/m^3)					10%	<30% (40%)
O_2 (For a range of 10 Vol.-%)					3%	--
CO_2 (For and ELV of 10 mg/m^3)					4%	<7.5% (10%)

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Test	Results expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Calibration function (field)					Note 2	
SO_2					0.99	>0.90
NO					0.99	>0.90
NO_2					0.99	>0.90
CO					0.99	>0.90
HCl					0.98	>0.90
O_2					0.99	>0.90
CO_2					0.99	>0.90
Response time (field)					Note 3	
SO_2					64s	<200s
NO					64s	<200s
NO_2					64s	<200s
CO					64s	<400s
HCl					350s	<400s
O_2					48s	<200s
CO_2					64s	<200s
Lack of fit (field)						
SO_2			<2.0			<2.0%
NO			<2.0			<2.0%
NO_2			<2.0			<2.0%
CO			<2.0			<2.0%
HCl			<2.0			<2.0%
O_2			<2.0			<0.2%
CO_2			<2.0			<2.0%
Maintenance interval					3 Months	>8 days

Test	Results expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Zero and Span drift requirement	*Statement from Manufacturer:* *Zero drift is checked by the use of instrument air. Span drift is checked by using test gas or an optional internal calibration filter.*					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						
SO_2				<3.0		<3.0%
NO			<2.0			<3.0%
NO_2			<2.0			<3.0%
CO			<2.0			<3.0%
HCl				<3.0		<3.0%
O_2	0.09					<0.2%
CO_2			<2.0			<3.0%
Change in reference point over maintenance interval						
SO_2				<3.0		<3.0%
NO			<2.0			<3.0%
NO_2			<2.0			<3.0%
CO			<2.0			<3.0%
HCl				<3.0		<3.0%
O_2	0.12					<0.2%
CO_2			<2.0			<3.0%

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Test	Results expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Availability					98.6%	>95% (>98% for O_2)
Reproducibility						
SO_2				3.13		<3.3%
NO				2.13		<3.3%
NO_2				2.38		<3.3%
CO				2.22		<3.3%
HCl				2.56		<3.3%
O_2	0.13					<0.20%
CO_2			1.11			<3.3%

Note 1: Repeatability at zero data is based on 30 readings
Note 2: Data derived from calibration function test.
Note 3: Results stated are from the laboratory tests.

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Description

MCS 100 E PD is an extractive multi component gas analyser. It is an IR analyser with permeation drier for applications at waste incineration plants and power plants. The manufacturer states that by using the permeation drier, which is integrated into the analyzer housing it is possible to realise small measuring ranges for the control of low limit values. 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 MC040045/03

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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