

# PRODUCT CONFORMITY CERTIFICATE

This is to certify that the

***SIDOR Multi Gas Analyser  
with  
Modules OXOR-E & OXOR-P***

manufactured by:

**SICK AG**

*Poppenbütteler Bogen 9b  
22399 Hamburg  
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 3.4 dated July 2012  
EN15267-1:2009, EN15267-2:2009, EN15267-3:2007  
& QAL 1 as defined in EN 14181: 2004**

Certification Ranges :

CO	0 to 75 mg/m <sup>3</sup>
NO	0 to 125 mg/m <sup>3</sup>
SO <sub>2</sub>	0 to 150 mg/m <sup>3</sup>
O <sub>2</sub>	0 to 25 %vol
	0 to 10 %vol

Project No: 674/0237  
Certificate No: Sira MC 070107/04  
Initial Certification: 02 April 2007  
This Certificate Issued: 12 January 2015  
Renewal Date: 01 April 2017

Technical Director

MCERTS is operated on behalf of the Environment Agency by

## **Sira Certification Service**

12 Acorn Industrial Park, Crayford Road, Crayford  
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**Registered Office: Rake Lane, Eccleston, Chester, UK CH4 9JN**  
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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](http://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 field test was performed on a coal-fired power station.

## 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 Nord	Report Number: 04CU035/8000607710 dated 30/06/06
TÜV Nord	Report Number: 107GMT005/8000616716 dated 29.02.2008
TÜV Nord	Report Number: 213/UMP001/8000644849 dated 13.09.2013

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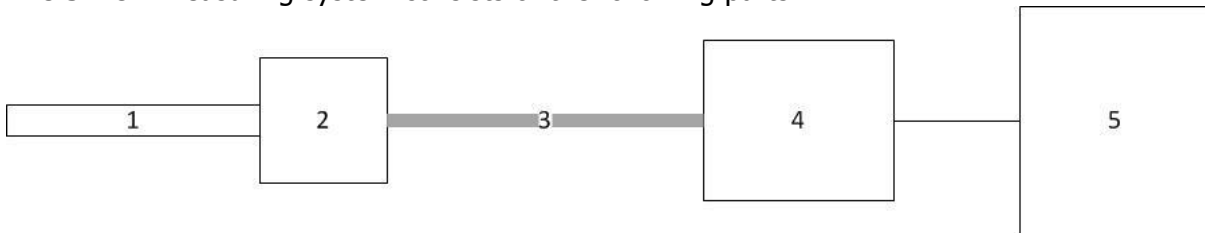
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**Product Certified**

The SIDOR measuring system can consist of a maximum of three analyser modules:

- 1 or 2 SIDOR modules (CO, NO, SO<sub>2</sub>)
- OXOR E or OXOR P

The SIDOR measuring system consists of the following parts:



1. Sample Probe	2. Heated Filter	3. Heated Sample Line	4. Gas Conditioning	5. Analyser
Model: M&C SP 2000/H 20S	Model: Integrated in probe	Model: 31m 120°C heated line	Model: AGT MK10	Model: SIDOR 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 1.6 onwards (serial number 760108 onwards).

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## Certified Performance

The instrument was evaluated for use under the following conditions:

Ambient Temperature Range: +5°C to +45°C

Unless otherwise stated the evaluation was carried out on the certification range CO 0 to 75 mg/m<sup>3</sup>, NO 0 to 125 mg/m<sup>3</sup> and O<sub>2</sub> 0 to 25%vol. For SO<sub>2</sub> evaluation was carried out over the range 0 to 100 mg/m<sup>3</sup>.

Test	Results expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Response time						
CO					131s	<200s
NO					87s	<200s
SO <sub>2</sub>					141s	<200s
O <sub>2</sub> (Elec)					78s	<200s
O <sub>2</sub> (Para)					71s	<200s
Repeatability standard deviation at zero point						
CO	0.43					<2%
NO		0.78				<2%
SO <sub>2</sub>		0.54			Note 1	<2%
O <sub>2</sub> (Elec)	0.12					<0.2%
O <sub>2</sub> (Para)	0.06					<0.2%
Repeatability standard deviation at reference point						
CO		0.79				<2%
NO			1.2			<2%
SO <sub>2</sub>			1.6		Note 1	<2%
O <sub>2</sub> (Elec)	0.07					<0.2%
O <sub>2</sub> (Para)	0.06					<0.2%
Lack-of-fit						
CO			1.8			<2%
NO			1.6			<2%
SO <sub>2</sub>		0.88				<2%
O <sub>2</sub> (Elec)	0.16					<0.2%
O <sub>2</sub> (Para)	0.16					<0.2%

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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						
CO			1.8			<5%
NO				2.1		<5%
SO <sub>2</sub>				3.0		<5%
O <sub>2</sub> (Elec)	0.41					<0.5%
O <sub>2</sub> (Para)	0.01					<0.5%
Influence of ambient temperature reference point						
CO			1.6			<5%
NO				2.0		<5%
SO <sub>2</sub>				2.2		<5%
O <sub>2</sub> (Elec)	0.48					<0.5%
O <sub>2</sub> (Para)	0.18					<0.5%
Influence of sample gas flow for extractive CEMS						
CO		0.70				<2%
NO		0.80				<2%
SO <sub>2</sub>		0.80				<2%
O <sub>2</sub> (Elec)	0.70					<0.2%
O <sub>2</sub> (Para)	0.80					<0.2%
Influence of voltage variations 190 to 250V						
CO		0.60				<2%
NO		0.70				<2%
SO <sub>2</sub>		0.67				<2%
O <sub>2</sub> (Elec)	0.70					<0.2%
O <sub>2</sub> (Para)	0.30					<0.2%
Influence of vibration (10 to 60Hz (±0.3mm), 60 to 150Hz at 19.6m/s <sup>2</sup> )					Not applicable for extractive systems	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 <sub>2</sub> , H <sub>2</sub> O, CO, CO <sub>2</sub> , CH <sub>4</sub> , N <sub>2</sub> O, NO, NO <sub>2</sub> , NH <sub>3</sub> , SO <sub>2</sub> , HCl.						
CO			1.5			<4%
NO				2.2		<4%
SO <sub>2</sub>				3.4		<4%
O <sub>2</sub> (Elec)	0.08					<0.4%
O <sub>2</sub> (Para)	-0.10					<0.4%
Cross-sensitivity at reference with interferents: O <sub>2</sub> , H <sub>2</sub> O, CO, CO <sub>2</sub> , CH <sub>4</sub> , N <sub>2</sub> O, NO, NO <sub>2</sub> , NH <sub>3</sub> , SO <sub>2</sub> , HCl.						
CO				-2.0		<4%
NO			1.4			<4%
SO <sub>2</sub>				3.3		<4%
O <sub>2</sub> (Elec)	0.17					<0.4%
O <sub>2</sub> (Para)	-0.14					<0.4%
Converter efficiency					Not applicable	>95%
Measurement uncertainty					Guidance - at least 25% below max permissible uncertainty	
CO (for an ELV of 50mg/m <sup>3</sup> )					5.2%	<7.5% (10%)
NO (for an ELV of 130mg/m <sup>3</sup> )					6.1%	<15% (20%)
SO <sub>2</sub> (for an ELV of 50mg/m <sup>3</sup> )					7.4%	<15% (20%)
O <sub>2</sub> (Elec) (for a range of 10%vol)					1.4%	-
O <sub>2</sub> (Para) (for a range of 10%vol)					1.1%	-
Calibration function (field)						
CO					0.9980	>0.90
NO					0.9980	>0.90
SO <sub>2</sub>					0.9920	>0.90
O <sub>2</sub> (Elec)					0.9996	>0.90
O <sub>2</sub> (Para)					0.9991	<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)						
CO					131s	<200s
NO					87s	<200s
SO <sub>2</sub>					141s	<200s
O <sub>2</sub> (Elec)					78s	<200s
O <sub>2</sub> (Para)					71s	<200s
Lack of fit (field)						
CO			<2.0		Note 2	<2%
NO			<2.0			<2%
SO <sub>2</sub>			<2.0			<2%
O <sub>2</sub> (Elec)	<0.2					<0.2%
O <sub>2</sub> (Para)	<0.2					<0.2%
Maintenance interval					3 Months Note 3	>8 days
Zero and Span drift requirement	The AMS allows for recording zero and span drifting and thus fulfils the requirements of QAL3 according to EN14181.					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						
CO			1.1			<3%
NO			2.2			<3%
SO <sub>2</sub>			1.7			<3%
O <sub>2</sub> (Elec)	0.18					<0.2%
O <sub>2</sub> (Para)	0.16					<0.2%

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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						
CO			1.9			<3%
NO			1.9			<3%
SO <sub>2</sub>			2.1			<3%
O <sub>2</sub> (Elec)	0.20					<0.2%
O <sub>2</sub> (Para)	0.16					<0.2%
Availability					98.3%	>95%
Reproducibility						
CO		0.73				<3.3%
NO		0.95				<3.3%
SO <sub>2</sub>				2.17		<3.3%
O <sub>2</sub> (Elec)	0.12					<0.2%
O <sub>2</sub> (Para)	0.10					<0.2%

Note 1: Repeatability standard deviation at zero and span was conducted over the range 0 to 150mg/m<sup>3</sup>.

Note 2: Data derived from the calibration function test.

Note 3: CO, NO, SO<sub>2</sub> require weekly single point auto calibration at zero with ambient air or N<sub>2</sub> and O<sub>2</sub> require a single point auto calibration with ambient air every 3 days; gas has to be delivered over the cooler.

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## Description:

The analyser SIDOR is a continuously measuring modular device for the extractive measurement of CO, NO, SO<sub>2</sub> and O<sub>2</sub> in stack gas. The photometric SIDOR analyser for CO, NO and SO<sub>2</sub> is based on the NDIR double beam principle. In addition an electrochemical cell (OXOR-E) or a paramagnetic cell (OXOR-P) is used to measure oxygen.

The SIDOR analyser was designed to establish a high long-term stability of sensitivity in order to avoid the use of calibration cells. At the same time an acceptable zero point stability had to be provided. The solution is a combination of the double-beam-in-space procedure with a special signal processing which is able to compensate sensitivity changes.

The sample gas is extracted by the heated probe and flows through the heated sample line to the analyser cabinet. The cabinet may include valves, sample gas pump, gas cooler, filters, flow meters, needle valves and SIDOR analysers, as required for the specific application.

## 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 MC 070107/02.
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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