



PRODUCT CONFORMITY CERTIFICATE

This is to certify that the

GM32 In-situ Multi-Component Analyser (Cross Duct version)

manufactured by:

SICK Maihak GmbH

*Nimburger Straße 11
79267 Reute
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 :

Measuring path length 1.86m:

NO	0 to 70 mg/m ³	to	0 to 700 mg/m ³
SO ₂	0 to 75 mg/m ³	to	0 to 1000 mg/m ³

Or measuring path length 1.00m:

NO	0 to 130.2 mg/m ³	to	0 to 1302 mg/m ³
SO ₂	0 to 139.5 mg/m ³	to	0 to 1860 mg/m ³

Project No:	674/0391H
Certificate No:	Sira MC090146/01
Initial Certification:	24 April 2009
This Certificate Issued	29 January 2010
Renewal Date:	23 April 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

Tel: 01322 520500 Fax: 01322 520501

This certificate may only be reproduced in its entirety and without change



Approved Site Application

Any potential user should ensure, in consultation with the manufacturer that the emission monitoring system is suitable for the process on which it will be installed.

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.

A field trial was conducted for over 9 months on a fluidised-bed combustion plant.

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 Rhineland Report Number 936/21209185A dated 07/10/2008

TÜV Rhineland Report Number 936/21209185C dated 06/03/2009

Product Certified

The measuring system consists of the following parts:

- Sender/receiver unit (SR-unit)
- Reflector unit
- Connection unit
- Purge air units for SR unit and reflector units
- Purge air fixtures for SR and reflector unit
- 'Flange with tube' for mounting purge air fixtures on the gas duct side
- SOPAS ET software

This certificate applies to all instruments fitted with software version 9125967 S928 (serial number 08158043 onwards).

Certificate No: Sira MC090146/01

This Certificate Issued: 29 January 2010

This certificate may only be reproduced in its entirety and without change



Certified Performance

The instrument was evaluated for use under the following conditions:

Ambient Temperature Range: -20°C to +50°C

Instrument IP rating: IP65 referring to EN60529, and IPX9K referring to ISO 20653

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 NO 0 to 70 mg/m³, SO₂ 0 to 75 mg/m³

Test	Results expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Response time						
SO ₂					38s	<200s
NO					39s	<200s
SO ₂ (0 to 1000mg/m ³)					62s	<200s
NO (0 to 700 mg/m ³)					43s	<200s
Repeatability standard deviation at zero point						
SO ₂	0.26					<2.0%
NO	0.09					<2.0%
Repeatability standard deviation at span point						
SO ₂	0.41					<2.0%
NO	0.32					<2.0%
Lack-of-fit						
SO ₂		0.6				<2.0%
NO		-0.9				<2.0%
SO ₂ (0 to 1000mg/m ³)		0.6				<2.0%
NO (0 to 700 mg/m ³)		0.8				<2.0%

Certificate No: Sira MC090146/01

This Certificate Issued: 29 January 2010

This certificate may only be reproduced in its entirety and without change



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	-0.3					<5.0%
NO	0.2					<5.0%
Influence of ambient temperature span point						
SO ₂	0.5					<5.0%
NO		0.6				<5.0%
Influence of sample gas pressure						
SO ₂		0.8				<2.0%
NO	-0.1					<2.0%
Influence of voltage variations 190 to 250V						
SO ₂		0.7				<2.0%
NO	0.3					<2.0%
Influence of vibration (10 to 60Hz (±0.3mm), 60 to 150Hz at 19.6m/s ²)					-0.9% for NO and SO ₂	To be reported
Cross-sensitivity at zero (Note 1)						
SO ₂				-2.2		<4.0%
NO		1.0				<4.0%
SO ₂ (0 to 1000mg/m ³)	<0.4					<4.0%
NO (0 to 700 mg/m ³)					Note 2	<4.0%
Cross-sensitivity at span (Note 1)						
SO ₂				-3.4		<4.0%
NO				3.6		<4.0%
SO ₂ (0 to 1000mg/m ³)				-2.4		<4.0%
NO (0 to 700 mg/m ³)					Note 2	<4.0%

Certificate No: Sira MC090146/01
This Certificate Issued: 29 January 2010

This certificate may only be reproduced in its entirety and without change



Test	Results expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Excursion of measurement beam						
SO ₂			1.7			<2.0%
NO		-1.0				<2.0%
Measurement uncertainty						Guidance - at least 25% below max permissible uncertainty 15 % in En15267-3
SO ₂ (based on ELV of 30mg/m ³)					13.3	
NO (based on ELV of 40mg/m ³)					11.6	
Calibration function (field)						
SO ₂					0.95	>0.90
NO					0.99	>0.90
Response time (field)						
SO ₂					43s	<200s
NO					43s	<200s
Lack of fit (field)						
SO ₂		0.6				<2.0%
NO			1.5			<2.0%
Maintenance interval					3 months See Note 3	>8 days
Zero and Span drift requirement	<p><u>Statement from manufacturer:</u></p> <p>Zero Point <i>The zero point is determined by creating zero spectrum by swinging in a zero point reflector. This spectrum corresponds to measurement on a gas free measurement path. The relevant measured concentration values are determined by means of the instrument's calibration function. A maintenance request is signalled when one of the zero deviations exceeds a certain limit value.</i></p> <p>Span Point <i>In addition to the zero point reflector, an internal swivel element with 2 grating filters and an NO-filled cell is swung in during the check cycle and the reference value is measured. The control values are scaled to 70% of the measuring range selected.</i></p>					
Clause 6.13 & 10.13						
Manufacturer shall provide a description of the technique to determine and compensate for zero and span drift.						

Certificate No: Sira MC090146/01
This Certificate Issued: 29 January 2010

This certificate may only be reproduced in its entirety and without change



Test	Results expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Change in zero point over maintenance interval						
SO ₂ (90 days)		0.6				<3.0%
NO (90 days)		0.9				<3.0%
SO ₂ (250 days)			-1.9			<3.0%
NO (250 days)		0.6				<3.0%
Change in span point over maintenance interval						
SO ₂ (90 days)			-1.8			<3.0%
NO (90 days)				-2.3		<3.0%
SO ₂ (250 days)				-2.1		<3.0%
NO (250 days)				-2.3		<3.0%
Availability					98.6%	>95%
Reproducibility						
SO ₂			1.8			<3.3%
NO			1.3			<3.3%
SO ₂ (0 to 1000mg/m ³)			1.4			<3.3%
NO (0 to 700 mg/m ³)	0.5					<3.3%

Note 1 – Cross sensitivity test was conducted with the following interferents: O₂, H₂O, CO, CH₄, CO₂, N₂O, NO, NO₂, NH₃, SO₂, HCl

Note 2 – It was not deemed necessary to test NO on the upper certification range for cross sensitivity, as the result on the lower certification range was <1%

Note 3 –The GM32 Cross Duct has a maintenance interval of 3 months. In the case of a new installation the measuring system should be visually inspected at weekly or biweekly intervals.

The work detailed below has to be carried out at regular intervals, depending on local conditions:

- Regular visual checks of the measuring system, cleaning of outside parts
- Check cleaning of optical interfaces on SR unit and reflector
- Check optical alignment
- Check purge air supply, check of intake filter
- Check of desiccant cartridges

Certificate No: Sira MC090146/01

This Certificate Issued: 29 January 2010

This certificate may only be reproduced in its entirety and without change



Description:

The measuring system GM32 in-situ gas analyser (Cross Duct version) works according to the UV-DOAS principle (Differential Optical Absorption Spectroscopy in the UV range). As an in-situ measuring system the system determines the measured values directly in the duct without sampling.

With regards to the measured components the following variations are possible:

Device designation according to type code	NO	SO ₂
C1 or P1		x
C2 or P2	x	x
C4 or P4	x	

'C' = variant comfort

'P' = variant pro

Variant Pro:

- Reference cycle
- Logbook for system messages
- Ethernet interface
- Automatic mirror tracking
- Check cycle (QAL 3) + CUSUM chart
- Operator panel

Variant Comfort:

As variant Pro, but in addition:

- 2 separately calibrated measuring ranges per component

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 MC090146/00.
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.

Certificate No: Sira MC090146/01
 This Certificate Issued: 29 January 2010

This certificate may only be reproduced in its entirety and without change