



PRODUCT CONFORMITY CERTIFICATE

This is to certify that the

***GM32 in-situ gas analyser
(GMP measuring probe 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 1.25m:

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 87.5 mg/m ³	to	0 to 875 mg/m ³
SO ₂	0 to 93.8 mg/m ³	to	0 to 1250 mg/m ³

Project No: 674/0391 I
Certificate No: Sira MC100163/01
Initial Certification: 28 January 2010
This Certificate Issued: 29 January 2010
Renewal Date: 27 January 2015

Technical Director

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 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 936/21209185 dated 06 March 2009

Product Certified

The measuring system consists of the following parts:

- Sender/receiver unit (SR-unit)
- GMP measuring probe
- Purge air unit SLV4 and purge air fixture for SR-unit and reflector
- Connection unit with I/O modules
- SOPAS ET software

Please note: Hardware variant 'Comfort' has been tested. The device variant 'Pro' is fully identical in terms of hardware and software. However, it contains only 1 instead of 2 separately adjusted measuring ranges per component.

This certificate applies to all instruments fitted with software version 9125967 SL36, SOPAS ET version 2.20, serial number SN08158043 onwards (for SR-unit and Connection unit) and SN08158038 onwards for GMP measuring probe).

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Certified Performance

The instrument was evaluated for use under the following conditions:

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

Instrument IP rating: IP65

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 70mg/m³, SO₂ 0 to 75mg/m³ with a measuring path length of 1.25m

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 (0-1000 mg/m ³)					62s	<200s
NO (0-700 mg/m ³)					43s	<200s
Repeatability standard deviation at zero point						
SO ₂	0.38					<2.0%
NO	0.13					<2.0%
Repeatability standard deviation at span point						
SO ₂			1.11			<2.0%
NO	0.22					<2.0%
Lack-of-fit						
SO ₂		0.8				<2.0%
NO		-0.9				<2.0%
SO ₂ (0-1000 mg/m ³)		1.0				<2.0%
NO (0-700 mg/m ³)		1.0				<2.0%
Influence of ambient temperature zero point						
SO ₂	-0.3					<5.0%
NO	0.2					<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 ambient temperature reference 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 196 to 253V						<2.0%
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)						
SO ₂	0.4					To be reported
NO	0.3					To be reported
Cross-sensitivity at zero					See Note 1	
SO ₂				-2.2		<4.0%
NO		1.0				<4.0%
Cross-sensitivity at span					See Note 1	
SO ₂				-3.4		<4.0%
NO				3.6		<4.0%
Excursion of measurement beam of cross-stack in-situ CEM / AMS						
SO ₂			1.7			<2.0%
NO		-1.0				<2.0%

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Test	Results expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Measurement uncertainty SO ₂ (based on ELV of 35 mg/m ³) NO (based on ELV of 40 mg/m ³)					13.6% 11.8%	Guidance - at least 25% below max permissible uncertainty 15 % in EN15267-3
Calibration function (field) SO ₂ NO					0.99 1.00	>0.90 >0.90
Response time (field) SO ₂ NO					48s 47s	<200s <200s
Lack of fit (field) SO ₂ NO		-1.0 -1.0				<2.0% <2.0%
Maintenance interval					3 months See Note 2	>8 days
Zero and Span drift requirement Clause 6.13 & 10.13 Manufacturer shall provide a description of the technique to determine and compensate for zero and span drift.	<p><u>Statement from manufacturer:</u></p> <p>Zero Point 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.</p> <p>Span Point 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.</p>					

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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						
SO ₂ (over 3 months)			1.4			<3.0%
NO (over 3 months)	0.4					<3.0%
SO ₂ (over 9 months)			1.9			<3.0%
NO (over 9 months)		0.6				<3.0%
Change in span point						
SO ₂ (over 3 months)			-1.9			<3.0%
NO (over 3 months)			1.6			<3.0%
SO ₂ (over 9 months)				-2.1		<3.0%
NO (over 9 months)				-2.3		<3.0%
Availability						
SO ₂ , NO					99.0%	95%
Reproducibility						
SO ₂				2.5		<3.3%
NO				2.3		<3.3%
Contamination check of in-situ systems						
SO ₂		-0.9				<2.0%
NO		-0.7				<2.0%

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

Note 2 –The GM32 in-situ analyser (GMP version) has a maintenance interval of 3 months. 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 of device as required
- Check, and if necessary clean the optical interfaces on the SR-unit
- Check the optical alignment
- Check the purge air supply and the intake filter
- Check the drying agent cartridge

Visually checking and possibly cleaning the reflector require the de-installation of the complete measuring system including measuring probe from the duct. Since this operation can be very complex and difficult depending on the installation and ambient conditions, they should be performed for practical reasons only during the annual AST or as a consequence of corresponding status/error messages which cannot be corrected by checking the other components (e.g. SR-unit).

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Description:

The measuring system GM32 in-situ gas analyser (Probe 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 MC100163/00
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.

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