PRODUCT CONFORMITY CERTIFICATE

This is to certify that the

MERCEM300Z Mercury Monitoring System

manufactured by:

SICK MAIHAK GmbH
Dr.- Zimmermann-Straße 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 3.4 dated July 2012
EN15267-1:2009, EN15267-2:2009, EN15267-3:2007
& QAL 1 as defined in EN 14181: 2004

Certification Ranges :

Hg 0 to 10µg/m^3
Hg 0 to 45µg/m^3

Supplementary ranges:

Hg 0 to 100µg/m^3
Hg 0 to 1000µg/m^3

Project No:	16A26284
Certificate No:	Sira MC120216/01
Initial Certification:	30 October 2012
This Certificate Issued	12 January 2015
Renewal Date:	29 October 2017

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: +44 (0)1322 520500 Fax: +44 (0)1322 520501

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 determinant 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 conducted at a municipal household waste incineration plant using a 35m sampling line.

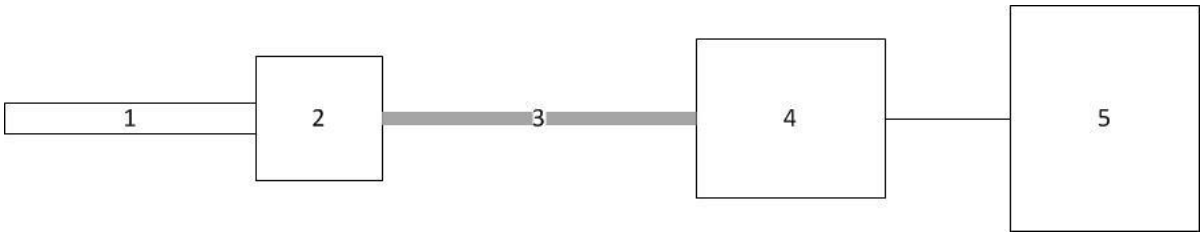
Basis of Certification

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: 936/21216054/A Dated 19/11/2011
TÜV Rheinland	Report no: 936/21216054/B Dated 19/03/2011
TÜV Rheinland	Report no: 936/21216054/C Dated 30/09/2012

Product Certified

The MERCEM300Z measuring system consists of the following parts:



Sample Probe	Heated Filter	Heated Sample Line	Gas Conditioning	Analyser
Heated metal sample probe	Heated sampling unit with integrated sintered metal filter. Possibility for test gas feeding at probe. (SFU-3F)	Heated measuring gas line with 2 inner cores. (35m applied during type approval)	High temperature converter inside analyzer housing	Patented Direct Measurement within heated cell. Hg – Detection via Zeeman Atomic Absorption Spectroscopy

This certificate applies to all instruments fitted with software version 9162140 VL27 (serial number 1104 0001 (N001) onwards).

Certified Performance

The instrument was evaluated for use under the following conditions:

Ambient Temperature Range: -20°C to +50°C
Instrument IP rating: IP55

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 range Hg 0 to 10 µg/m^3

Test	Results expressed as % of the certification range				Other results	MCERTS Specification
	<0.5	<1	<2	<5		
Response time Hg					106s	<200s
Repeatability standard deviation at zero point Hg	0.2					<2.0%
Repeatability standard deviation at reference point Hg		0.6				<2.0%
Lack-of-fit Hg		0.8				<2.0%
Influence of ambient temperature zero point Hg		-0.7				<5.0%
Influence of ambient temperature reference point Hg				2.0		<5.0%

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 Hg			1.9			<2.0%
Influence of voltage variations 190 to 250V Hg Zero Span		0.8	1.0			<2.0%
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 Hg			1.8			<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 Hg				-2.2		<4.0%
Measurement uncertainty Hg				2.3	Guidance - at least 25% below max permissible uncertainty Note 1	<30%
Calibration function (field) Hg					0.975	>0.90
Response time (field) Hg					131s	<200s

Test	Results expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Lack of fit (field) Hg			1.1			<2.0%
Maintenance interval Hg 0 to 10µg/m^3 Hg 0 to 45µg/m^3					1 Month 6 Months	Note 1 Note 2 >8 days
Zero and Span drift requirement	Recording of zero and span drift is possible and complies with QAL3 of EN 14181. The system is equipped with an automatic drift control. A status signal is set when zero and span point reach a certain limit.					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 Hg			-1.0			Note 1 <3.0%
Change in reference point over maintenance interval Hg				3.0		Note 1 <3.0%
Availability					97.5%	>95%
Reproducibility Hg				2.7		<3.3%

Note 1 During maintenance tests, a wet test gas is to be used. For the reference point tests, a suitable Hg test gas is to be used (e.g. HovaCAL). Optionally, it is possible for the measuring device to be equipped with an internal test gas generator, therefore using an external test gas is no longer necessary. For short-term internal system checks an integrated test cell may be used. This technique may not be used for major QAL3 data purposes.

Note 2 The change in zero point and reference point over maintenance interval tests (drift tests) were conducted at two certification ranges. At the 0 to 10µg/m^3 range, the instrument remained within the drift limits for 5 months allowing for a maintenance interval of 1 month. At the 0 to 45µg/m^3 range, the instrument remained within the drift limits for 12 months allowing for a maintenance interval of 6 months.

Description:

The MERCEM300Z is an extractive analyzer for monitoring total mercury in different types of flue gases.

A special designed gas sampling system extracts flue gas from the stack. The heated measuring gas line has two inlet cores. The first core is used to transport stack gas to the analyzer. The second core serves as feeding for zero and test gas - the test gas feeding into the system is within the gas sampling system.

The sample gas is delivered by an ejector pump. Constant gas flow is controlled via an integrated pressure sensor module.

Oxidized mercury components in the flue gas are converted into elemental mercury (Hg0) within a high temperature analysis cell – no converter or chemical solution is needed. The temperature is high enough to convert all mercury compounds within the flue gas into elemental mercury.

The analysis is performed via Zeeman cold vapour atomic absorption spectroscopy within the high temperature cell. The Zeeman correction directly compensates the influence of potential cross sensitivity components like SO2.

MERCEM300Z can be controlled via an integrated control panel

For drift checks an integrated test cell may be used. For adjustment purposes (QAL3) the system can be equipped with an integrated test gas generator.

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 120216/00.

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.