

PRODUCT CONFORMITY CERTIFICATE

This is to certify that the

Gasmet Continuous Mercury Monitoring System (CMM)

Manufactured by:

Gasmet Technologies Oy

Pultitie 8 A 1
FI-00880 Helsinki,
Finland

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 3.5 dated June 2016
EN15267-3:2007,
& QAL 1 as defined in EN 14181: 2014**

Certification Ranges :

Hg 0 to 5 $\mu\text{g}/\text{m}^3$
 0 to 10 $\mu\text{g}/\text{m}^3$
 0 to 45 $\mu\text{g}/\text{m}^3$
 0 to 100 $\mu\text{g}/\text{m}^3$
 0 to 1000 $\mu\text{g}/\text{m}^3$

Project No.: 70164783 & 70176571
Certificate No: Sira MC170332/01
Initial Certification: 04 January 2018
This Certificate issued: 20 March 2018
Renewal Date: 03 January 2023

Joe Prince MSc, MInst MC
Certification Manager

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 IED Chapter III and IED Chapter IV 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 IED Chapter IV applications, and not more than 2.5X the ELV for IED Chapter III and other types of application.

The field test took place over a period of six months in the exhaust gas of a coal-fired power 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 Rheinland Energy GmbH Report no. 936/21238865/AE dated October 2017

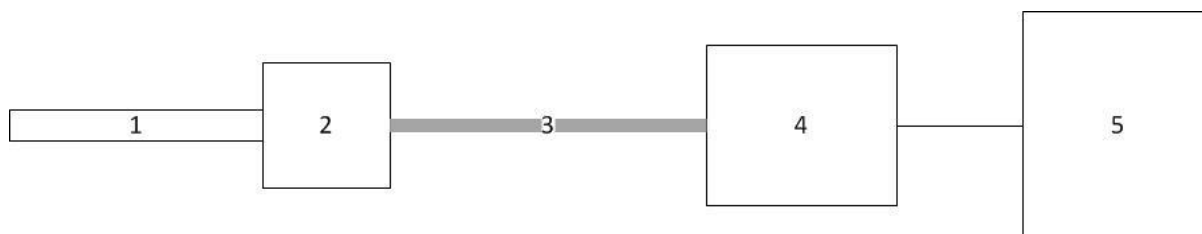
TÜV Rheinland Energy Supplementary Report no. 936/21238865/BE dated February 2018

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Product Certified

The CMM measuring system consists of the following parts:



1. Sample Probe	2. Heated Filter	3. Heated Sample Line	4. Gas Conditioning	5. Analyser
Model: Quarz, beheizt to 180°C	Model: Quaezwatte im Filtergehäuse aus Quarz	Model: Gasmet CMM heated line	Model: Compressed air-conditioning	Model: Mercury analyser with integrated high temperature converter

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.

This certificate applies to all instruments fitted with software version 1.189 (serial number 17010) onwards.

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Certified Performance

The instrument was evaluated for use under the following conditions:

Ambient Temperature Range: +5°C to +40°C
Instrument IP rating: IP56

Note: For outdoor installations the analyser needs to be mounted into an IP65 environment. 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.

Results are expressed as error % of certification range 0 to 5 µg/m³, unless otherwise stated.

Test	Results expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Response time					Note 1	
Hg 0 to 5 µg/m ³					120s	<200s
0 to 10 µg/m ³					107s	<200s
0 to 45 µg/m ³					89s	<200s
0 to 100 µg/m ³					109s	<400s
0 to 1000 µg/m ³					97s	<400s
Repeatability standard deviation at zero point						
Hg	0.2					<2.0%
Repeatability standard deviation at reference point						
Hg		0.5				<2.0%
Lack-of-fit						
Hg 0 to 5 µg/m ³			-1.04			<2.0%
0 to 10 µg/m ³			-1.01			<2.0%
0 to 45 µg/m ³			-1.29			<2.0%
0 to 100 µg/m ³		0.85				<2.0%
0 to 1000 µg/m ³		0.92				<2.0%

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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 zero point (+5°C to +40°C) Hg		0.6				<5.0%
Influence of ambient temperature reference point (+5°C to +40°C) Hg			1.4			<5.0%
Influence of sample gas flow for extractive CEMS Hg		-0.7				<2.0%
Influence of voltage variations (196V to 253V) All gases	0.9					<2.0%
Influence of vibration (10 to 60Hz (±0.3mm), 60 to 150Hz at 19.6m/s ²)		-0.8				To be reported
Cross-sensitivity at zero with interferents: O ₂ , H ₂ O, CO, CO ₂ , CH ₄ , N ₂ O, NO, NO ₂ , NH ₃ , SO ₂ , HCl, Hg	0.46					<4.0%
Cross-sensitivity at reference with interferents: O ₂ , H ₂ O, CO, CO ₂ , CH ₄ , N ₂ O, NO, NO ₂ , NH ₃ , SO ₂ , HCl, Hg				3.14		<4.0%

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Test	Results expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Measurement uncertainty Hg (For an ELV of 2 µg/m ³)					Guidance - at least 25% below max permissible uncertainty 15.6	<30% (40%)
Calibration function (field) Hg					0.9093	>0.90
Response time (field) Hg					114s	<200s
Lack of fit (field) Hg 0 to 5 µg/m ³ 0 to 10 µg/m ³			1.52 1.85			<2.0% <2.0%
Maintenance interval					Note 2 3 months	>8 days
Zero and Span drift requirement	It is possible to record zero and span drift. This complies with the requirement for QAL3 according to EN 14181. It is possible to check zero and span point using a test gas generator.					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			1.7			<3.0%
Change in reference point over maintenance interval Hg				-2.8		<3.0%
Availability					99.0	>95%
Reproducibility Hg				2.2		<3.3%

Note 1: Wet test gases must be used for measuring Hg when performing the functional tests.

Note 2: The CMM has a maintenance interval of 3 months. The work details below has to be carried out at regular intervals, depending on local conditions (quote TUV maintenance work, functional check and calibration (QAL2) information).

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Description

Gasmet CMM is an automatic emission monitoring system designed to meet the regulations for continuous mercury measurement standards in different kind of flue gas emitting plants.

Gasmet CMM employs atomic fluorescence spectroscopy and thermal conversion of ionic mercury compounds to atomic mercury. It measures hot, wet and corrosive gas streams. No wet chemistry or gold amalgamation trap is needed. High inherent sensitivity of the atomic fluorescence spectroscopy enables extensive dilution of the sample gas. The diluted sample gas is transported to the analyser. Directly after thermal reduction of the mercury compounds the dry gas containing only atomic mercury is led to low pressure sample cell for cross sensitivity free measurement. Automatic calibration and adjustment of the whole system as well as span checks are performed with an internal automatic test gas generator, capable of producing constant flow of atomic and (as an option) oxidized mercury.

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 V00 for certificate No. Sira MC170332/01
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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