PRODUCT CONFORMITY CERTIFICATE

This is to certify that the

LaserGas II Monitor

Manufactured by:

NEO Monitors AS

Solheimveien 62A
N-1473 Lørenskog
Norway

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 :

HCl	0 to 15 mg/m^3	0 to 90 mg/m^3
H_2O	0 to 40 Vol.-%	0 to 30 Vol.-%

Project No.	16A28949
Certificate No:	Sira MC120206/01
Initial Certification:	01 October 2012
This Certificate issued:	04 October 2017
Renewal Date:	30 September 2022

Technical Director

MCERTS is operated on behalf of the Environment Agency by

Sira Certification Service
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Form 1335
Issue 3

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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.

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:

TUV Report Report Number: 936/21212540/B dated 09/09/11

Product Certified

The LaserGas II measuring system for HCl and H_2O consists of the following parts:

- Transmitter with purge gas device and evaluation system
- Receiver unit with purge gas device and internal reference cuvette
- Signal cable for connecting the sender and receiver unit
- Voltage supply
- System software version GM6.1d5
- Evaluation software gmw61, version 1.2.5.1 onwards

This certificate applies to all instruments fitted with software version GM6.1d5 onwards (serial number 4266 onwards).

Certified Performance

The instrument was evaluated for use under the following conditions:

Ambient Temperature Range: -20°C to +50°C
Instrument IP rating: IP 66

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 HCl 0 to 15 mg/m^3 and H_2O 0 to 40 %vol

Test	Results expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Response time						
HCl					<2s	<400s
H_2O					<2s	<200s
Repeatability standard deviation at zero point						
HCl	0.10					<2.0%
H_2O	0.10					<2.0%
Repeatability standard deviation at reference point						
HCl			1.20			<2.0%
H_2O	0.50					<2.0%
Lack-of-fit						
HCl		0.93				<2.0%
H_2O	-0.25					<2.0%
Influence of ambient temperature zero point						
HCl	0.10					<5.0%
H_2O	0.00					<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						
HCl			-1.30			<5.0%
H_2O		0.50				<5.0%
Influence of sample gas pressure						
HCl			1.13			<2.0%
H_2O		-0.7				<2.0%
Influence of voltage variations 190 to 250V						
HCl	-0.30					<2.0%
H_2O		-0.70				<2.0%
Influence of vibration (10 to 60Hz (±0.3mm), 60 to 150Hz at 19.6m/s^2)					No effect	To be reported
Cross-sensitivity at zero with interferents: O_2, H_2O, CO, CO_2, CH_4, N_2O, NO, NO_2, NH_3, SO_2	<0.5					<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	<0.5					<4.0%
Excursion of measurement beam of cross-stack in-situ CEMS						
HCl			1.69			<2.0%
H_2O		0.79				<2.0%

Test	Results expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Measurement uncertainty HCl H_2O					 7.7% 4.2%	Guidance - at least 25% below max permissible uncertainty
Calibration function (field) HCl H_2O					 0.91 0.95	 >0.90 >0.90
Response time (field) HCl H_2O					 2s 2s	 <400s <200s
Lack of fit (field) HCl H_2O			 1.00			 <2.0% <2.0%
Maintenance interval					6 months Note 1	>8 days
Zero and Span drift requirement	The CEMS comprises an internal zero check for HCl and H_2O and an internal span check for HCl. This allows zero and span check of the mounted system without dismounting from the duct. The measured signal is frozen and subtracted from the measured values for the check of zero point. An HCl-loaded, sealed cell is introduced to the beam path for the span check of HCl. The cell is mounted in the receiver unit. Prior to span check, the CEM calculated the absorption signal of the gas concentration during normal operation, which is then continuously subtracted from the absorption signal during span check. The resulting signal corresponds to the constant gas concentration multiplied with a factory-set Span-reference-constant within the internal cell. Temperature and pressure conditions are continuously checked by the internal sensors and included in the calculation.					Clause 6.13 & 10.13 Manufacturer shall provide a description of the technique to determine and compensate for zero and span drift.

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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 over maintenance interval						
HCl			1.10			<3.0%
H_2O		0.80				<3.0%
Change in reference point over maintenance interval						
HCl			-1.70			<3.0%
H_2O			-1.40			<3.0%
Availability					99.5%	>95%
Reproducibility						
HCl			1.60			<3.3%
H_2O			1.60			<3.3%
Contamination check of in-situ systems					No effect	<2.0%

Note 1: The LaserGas II monitor has a maintenance interval of 6 months. The work detailed below has to be carried out at regular intervals, depending on local conditions:

- Regular monitoring of the light transmission rate and misalignment.
- Zero and Span checks.
- Checks of the optical windows for pollution and debris.

Description

The LaserGas II monitor is an optical instrument based on transmitting infrared laser light from a transmitter unit on one side of the stack to a receiver unit on the diametrically opposite side of the stack.

The measuring technique is called infrared single-line spectroscopy and is based on measuring the absorption of light by the gas molecules present in the stack and the fact that most gases absorb light at certain wavelengths.

The absorption is a direct function of the gas concentration in the stack.

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 120206/00.

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.