Umwelt Bundes Amt
For our Environment

TÜVRheinland®
Precisely Right.

CERTIFICATE

on Product Conformity (QAL1)

Certificate No.: 0000038494

Certified AMS:	LaserGas II for HF
Manufacturer:	NEO Monitors AS Solheimveien 62A 1473 Lørenskog Norway
Test Institute:	TÜV Rheinland Energie und Umwelt GmbH

This is to certify that the AMS has been tested and found to comply with:

EN 15267-1: 2009, EN 15267-2: 2009, EN 15267-3: 2007 and EN 14181: 2004

Certification is awarded in respect of the conditions stated in this certificate (see also the following pages).

www.tuv.com TÜVRheinland® ID: 0000038494

- EN 15267-3 tested
- QAL1 certified
- TUV approved
- Annual inspection

Publication in the German Federal Gazette (BAnz.) of 05 March 2013

This certificate will expire on: 04 March 2018

German Federal Environment Agency
Dessau, 22 March 2013

i. A. Dr. Marcel Langner

TÜV Rheinland Energie und Umwelt GmbH
Cologne, 21 March 2013

ppa. Dr. Peter Wilbring

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Am Grauen Stein
51105 Cologne

Accreditation according to EN ISO/IEC 17025 and certified according to ISO 9001:2008.

Test report:	936/21212540/C of 02 October 2012
Initial certification:	05 March 2013
Expiry date:	04 March 2018
Publication:	BAnz AT 05 March 2013 B10, chapter I, No. 3.1

Approved application
The tested AMS is suitable for use at combustion plants according to EC Directive 2001/80/EC and at waste incineration plants according to EC Directive 2000/76/EC and other plants requiring official approval. The measured ranges have been selected considering the wide application range of the AMS.

The suitability of the AMS for this application was assessed on the basis of a laboratory test and a threemonth field test at a waste incineration plant.

The AMS is approved for an ambient temperature range of -20 °C to +50 °C.

Any potential user should ensure, in consultation with the manufacturer, that this AMS is suitable for the installation at which it will be installed.

Basis of the certification
This certification is based on:

- test report 936/21212540/C of 02 October 2012 of TÜV Rheinland Energie und Umwelt GmbH
- suitability announced by the German Federal Environment Agency (UBA) as the relevant body
- the ongoing surveillance of the product and the manufacturing process
- publication in the German Federal Gazette: BAnz AT 05 March 2013 B10, chapter I, No. 3.1

AMS name:
LaserGas II for HF

Manufacturer:
NEO Monitors AS, Lørenskog, Norway

Field of application:
Measurement at plants requiring official approval as well as plants within the scope of 2000/76/EC (waste incineration directive) and 2001/80/EC (large combustion plants directive)

Measuring ranges during performance test:

Component	Certification range	Supplementary ranges		Unit
HF	0 - 1*	0 - 1.5*	0 - 10*	mg/m³

*in relation to a measurement path length of 1.0 m

Software version:
GM6.1d5

Restrictions:
None

Notes:
1. Wet test gases shall be employed during testing of component HF.
2. The maintenance interval is four weeks.
3. The instrument was tested with a measurement path length of 0.5 m in the laboratory and the field.
4. The periodic drift checks during maintenance interval can also be carried out with the internal test cell and surrogate gas CH_4.

Test report:
TÜV Rheinland Energie und Umwelt GmbH, Cologne
Report No.: 936/21212540/C of 2 October 2012

Certified product
This certificate applies to automated measurement systems conforming to the following description:

The LaserGas II is an optical instrument based on transmitting infrared laser light from a transmitter unit of one side of the stack to a receiver unit on the diametrically opposite side of the stack. The measuring technique is based on measuring the absorption of light by the gas molecules present in the stack.

The measuring principle is called infrared single-line absorption spectroscopy and is based on the fact that most gases absorb light at certain wavelengths. The absorption is a direct function of the gas concentration in the stack.

The tested system comprises the following parts:

- transmitter with purge gas device and evaluation system
- receiver unit with purge gas device
- data cable of 5 m length for connecting the sender and receiver unit
- voltage supply
- heated measuring path

General notes
This certificate is based upon the equipment tested. The manufacturer is responsible for ensuring that on-going production complies with the requirements of the EN 15267. 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 systems shall be subject to regular surveillance.

If a product of the current production does not conform to the certified product, TÜV Rheinland Energie und Umwelt GmbH must be notified at the address given on page 1.

A certification mark with an ID-Number that is specific to the certified product is presented on page 1 of this certificate. This can be applied to the product or used in publicity material for the certified product.

This document as well as the certification mark remains property of TÜV Rheinland Energie und Umwelt GmbH. With revocation of the publication the certificate loses its validity. After the expiration of the certificate and on requests of the TÜV Rheinland Energie und Umwelt GmbH this document shall be returned and the certificate mark must not be employed anymore.

The relevant version of this certificate and its expiration is also accessible on the internet: **qal1.de**.

Certification of LaserGas II for HF is based on the documents listed below and the regular, continuous monitoring of the Quality Management System of the manufacturer:

Initial certification according to EN 15267:

Certificate No. 0000038494: 22 March 2013

Expiry date of the certificate: 04 March 2018

Test report: 936/21212540/C of 02 October 2012
TÜV Rheinland Energie und Umwelt GmbH, Cologne

Publication: BAnz AT 05 March 2013 B10, chapter I, No. 3.1
Announcement by UBA from 12 February 2013

Umwelt Bundes Amt
For our Environment

Certificate:
0000038494 / 22 March 2013

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Calculation of overall uncertainty according to EN 14181 and EN 15267-3

Measuring system				
Manufacturer	NEO Monitors AS			
Name of measuring system	LaserGas II			
Serial number of the candidates	6319 / 6320			
Measuring principle	Single-line spectroscopy			
Test report	936/21212540/C			
Test laboratory	TÜV Rheinland			
Date of report	2012-10-02			
Measured component	HF			
Certification range	0 -	2	mg/m³	with 0.5 m path length

Evaluation of the cross sensitivity (CS)			
(system with largest CS)			
Sum of positive CS at zero point	0.00	mg/m³	
Sum of negative CS at zero point	0.00	mg/m³	
Sum of postive CS at reference point	0.04	mg/m³	
Sum of negative CS at reference point	0.00	mg/m³	
Maximum sum of cross sensitivities	0.04	mg/m³	
Uncertainty of cross sensitivity	0.020	mg/m³	

Calculation of the combined standard uncertainty

Tested parameter				u^2	
Standard deviation from paired measurements under field conditions *	u_D	0.027	mg/m³	0.001	(mg/m³)²
Lack of fit	u_{lof}	0.017	mg/m³	0.000	(mg/m³)²
Zero drift from field test	$u_{d,z}$	0.007	mg/m³	0.000	(mg/m³)²
Span drift from field test	$u_{d,s}$	0.018	mg/m³	0.000	(mg/m³)²
Influence of ambient temperature at span	u_t	0.021	mg/m³	0.000	(mg/m³)²
Influence of supply voltage	u_v	0.001	mg/m³	0.000	(mg/m³)²
Cross sensitivity (interference)	u_i	0.020	mg/m³	0.000	(mg/m³)²
Influence of sample pressure	u_p	0.000	mg/m³	0.000	(mg/m³)²
Uncertainty of reference material at 70% of certification range	u_{rm}	0.016	mg/m³	0.000	(mg/m³)²
Excursion of measurement beam	u_{mb}	-0.022	mg/m³	0.000	(mg/m³)²

* The larger value is used :
"Repeatability standard deviation at span" or
"Standard deviation from paired measurements under field conditions"

$$u_c = \sqrt{\sum (u_{max\ j})^2}$$

Combined standard uncertainty (u_C)		0.05	mg/m³
Total expanded uncertainty	$U = u_c * k = u_c * 1.96$	0.11	mg/m³

Relative total expanded uncertainty	**U in % of the ELV 1 mg/m³**	**10.7**
Requirement of 2000/76/EC and 2001/80/EC	**U in % of the ELV 1 mg/m³**	**40.0**
Requirement of EN 15267-3	U in % of the ELV 1 mg/m³	30.0