

CERTIFICATE

of Product Conformity (QAL1)

Certificate No.: 0000043529_01

AMS designation: LaserGas II for NH₃ and H₂O

Manufacturer: NEO Monitors AS
Prost Stabels vei 22
2019 Skedsmokorset
Norway

Test Laboratory: TÜV Rheinland Energy GmbH

**This is to certify that the AMS has been tested
and found to comply with the standards
EN 15267-1 (2009), EN 15267-2 (2009), EN 15267-3 (2007)
and EN 14181 (2014).**

Certification is awarded in respect of the conditions stated in this certificate
(this certificate contains 8 pages).
The present certificate replaces certificate 0000043529_00 of 30 September 2015.



Suitability Tested
EN 15267
QAL1 Certified
Regular
Surveillance

www.tuv.com
ID 0000043529

Publication in the German Federal Gazette
(BAnz) of 26 August 2015


This certificate will expire on:
25 August 2025

German Federal Environment Agency
Dessau, 26 August 2020

TÜV Rheinland Energy GmbH
Cologne, 25 August 2020



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Test institute accredited to EN ISO/IEC 17025 by DAkkS (German Accreditation Body).
This accreditation is limited to the accreditation scope defined in the enclosure to certificate D-PL-11120-02-00.

Test Report:	936/21228113/A dated 12 March 2015
Initial certification:	26 August 2015
Expiry date:	25 August 2025
Certificate:	Renewal (of previous certificate 0000043529_00 dated 30 September 2015 valid until 25 August 2020)
Publication:	BAnz AT 26.08.2015 B4, chapter I number 2.1 and chapter V 17 th notification

Approved application

The tested AMS is suitable for use at combustion plants according to Directive 2010/75/EU, chapter III (13th BImSchV), chapter IV (17th BImSchV), 30th BImSchV, plants in compliance with TA Luft and plants according to the 27th BImSchV. The measured ranges have been selected so as to ensure as broad a field of application as possible.

The suitability of the AMS for these applications was assessed on the basis of a laboratory test and a twelve-months field test at a waste incinerator.

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

The notification of suitability of the AMS, performance testing and the uncertainty calculation have been effected on the basis of the regulations applicable at the time of testing. As changes in legal provisions are possible, any potential user should ensure that this AMS is suitable for monitoring the limit values relevant to the application.

Any potential user should ensure, in consultation with the manufacturer, that this AMS is suitable for the intended purpose.

Basis of the certification

This certification is based on:

- Test report no. 936/21228113/A dated 12 March 2015 issued by 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 26.08.2015 B4, chapter I number 2.1, UBA announcement dated 22 July 2015:

AMS designation:

LaserGas II for NH₃ and H₂O

Manufacturer:

NEO Monitors AS, Skedsmokorset, Norway

Field of application:

For plants requiring official approval and for plants according to the 27th BImSchV

Measuring ranges during performance testing:

Component	Certification range	Supplementary measuring ranges		Unit
NH ₃	0–10*	0–15*		mg/m ³
H ₂ O	0–40*	0–30*	0–50*	Vol.-%

*with reference to a measurement path of 1 m

Software version:

GM 6.1f1-6

Restriction:

None

Notes:

1. The maintenance interval is six months.
2. The active measurement path for the performance test had a length of 0.513 m during the laboratory test and 1.0 m during the field test.
3. Dry test gases can be used with an unheated measuring cell for monitoring NH₃.
4. The measuring system contains an internal cell for the automatic span point check of NH₃.
5. Supplementary testing (transfer into EN 15267 requirements) to Federal Environment Agency notices of 19 February 2009 (BAnz. p. 899, chapter I number 2.3) and of 17 July 2014 (BAnz AT 05.08.2014 B11, chapter V 9th notification).

Test Report:

TÜV Rheinland Energie und Umwelt GmbH, Cologne
Report no.: 936/21228113/A dated 12 March 2015

Publication in the German Federal Gazette: BAnz AT 26.08.2015 B4, chapter V notification 17, UBA announcement dated 22 July 2015:

17 Notification as regards Federal Environment Agency (UBA) notices of 19 February 2009 (BAnz. p. 899, chapter I number 2.3) and of 17 July 2014 (BAnz AT 05.08.2014 B11, chapter IV 9th notification)

The LaserGas II measuring system for H₂O and NH₃ manufactured by NEO Monitors AS may alternatively be equipped with a IG17X3000G1i detector manufactured by Laser Components.

Statement issued by TÜV Rheinland Energie und Umwelt GmbH dated 18 March 2015

Publication in the German Federal Gazette: BAnz AT 17.07.2018 B9, chapter III notification 14, UBA announcement dated 3 July 2018:

14 Notification as regards Federal Environment Agency (UBA) notices of 19 February 2009 (BAnz. p. 899, chapter I number 2.3) and of 22 July 2015 (BAnz AT 26.08.2015 B4, chapter V 17th notification)

The latest software version of the LaserGas II measuring system for H₂O and NH₃ manufactured by NEO Monitors AS is:
6.1f1-10

Statement issued by TÜV Rheinland Energy GmbH dated 21 February 2018

Certified product

This certification 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 gas purging device
- Data cable of 5 m length for connecting the sender and receiver unit
- Voltage supply
- Heated measuring path

General remarks

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 manufacturing process for 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 Energy 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 document as well as the certification mark remains property of TÜV Rheinland Energy GmbH. Upon revocation of the publication the certificate loses its validity. After the expiration of the certificate and on request of TÜV Rheinland Energy GmbH this document shall be returned and the certificate mark must no longer be used.

The relevant version of this certificate and its expiration date are also accessible on the internet at qal1.de.

Document history

Certification of the LaserGas II measuring system is based on the documents listed below and the regular, continuous surveillance of the manufacturer's quality management system:

Basic testing

Test Report: 936/21205655/A dated 9 November 2007
TÜV Rheinland Immissionsschutz und Energiesysteme GmbH, Cologne
Publication: BAnz. 7 March 2008, No. 38, p. 901, chapter I number 2.2
UBA announcement dated 14 February 2008

Supplementary testing

Test Report: 936/21205655/B dated 29 February 2008
TÜV Rheinland Immissionsschutz und Energiesysteme GmbH, Cologne
Publication: BAnz. 03 September 2008, no. 133, p. 3243, chapter III number 2.2
UBA announcement dated 12 August 2008

Test Report: 936/21205655/C dated 1 October 2008
TÜV Rheinland Immissionsschutz und Energiesysteme GmbH, Cologne
Publication: BAnz. 11 March 2009, No. 38, p. 899, chapter I number 2.3
UBA announcement dated 19 February 2009

Notifications

Statement issued by TÜV Rheinland Immissionsschutz und Energiesysteme GmbH
dated 30 April 2009

Publication: BAnz. 12 February 2010 No. 24, p. 552, chapter IV notification 14

UBA announcement dated 25 January 2010:

(Publication as a single-component measuring system)

Statement issued by TÜV Rheinland Energie und Umwelt GmbH dated 20 March 2012

Publication: BAnz AT 20.07.2012 B11, chapter IV notification 8

UBA announcement dated 6 July 2012

(new software version)

Statement issued by TÜV Rheinland Energie und Umwelt GmbH dated 27 March 2013

Publication: BAnz AT 23.07.2013 B4, chapter V notification 8

UBA announcement dated 3 July 2013

(Ex housing)

Statement issued by TÜV Rheinland Energie und Umwelt GmbH dated 2 April 2014

Publication: BAnz AT 05.08.2014 B11, chapter V notification 9

UBA announcement dated 17 July 2014

(new software version)

Initial certification according to EN 15267

Certificate no. 0000043529: 30 September 2015

Expiry date of the certificate: 25 August 2020

Test Report: 936/21228113/A dated 12 March 2015

TÜV Rheinland Energie und Umwelt GmbH, Cologne

Publication: BAnz AT 26.08.2015 B4, chapter I number 2.1 and chapter V 17th notification,

UBA announcement dated 22 July 2015

Notifications in accordance with EN 15267

Statement issued by TÜV Rheinland Energie und Umwelt GmbH dated 18 March 2015

Publication: BAnz AT 26.08.2015 B4, chapter V notification 17

UBA announcement dated 22 July 2015

(new detector)

Statement issued by TÜV Rheinland Energy GmbH dated 21 February 2018

Publication: BAnz AT 17.07.2018 B9, chapter III notification 14

UBA announcement dated 3 July 2018

(software updates)

Renewal of the certificate

Certificate no. 0000043529_01: 26 August 2020

Expiry date of the certificate: 25 August 2025

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

Measuring system

Manufacturer	NEO Monitors AS
AMS designation	LaserGas II
Serial number of units under test	3187 / 32510 / 3188 / 32574
Measuring principle	Laser Spektroskopie

Test report

Test laboratory	TÜV Rheinland
Date of report	2015-03-12

Measured component

Certification range	NH ₃ 0 - 10 mg/m ³
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Evaluation of the cross-sensitivity (CS)

(system with largest CS)

Sum of positive CS at zero point	0.18 mg/m ³
Sum of negative CS at zero point	-0.08 mg/m ³
Sum of positive CS at span point	0.00 mg/m ³
Sum of negative CS at span point	-0.16 mg/m ³
Maximum sum of cross-sensitivities	0.18 mg/m ³
Uncertainty of cross-sensitivity	u_i 0.104 mg/m ³

Calculation of the combined standard uncertainty

Tested parameter

			u^2	
Standard deviation from paired measurements under field conditions *	u_D	0.142 mg/m ³	0.020	(mg/m ³) ²
Lack of fit	u_{lof}	-0.098 mg/m ³	0.010	(mg/m ³) ²
Zero drift from field test	$u_{d,z}$	0.028 mg/m ³	0.001	(mg/m ³) ²
Span drift from field test	$u_{d,s}$	-0.075 mg/m ³	0.006	(mg/m ³) ²
Influence of ambient temperature at span	u_t	0.115 mg/m ³	0.013	(mg/m ³) ²
Influence of supply voltage	u_v	0.015 mg/m ³	0.000	(mg/m ³) ²
Cross-sensitivity (interference)	u_i	0.104 mg/m ³	0.011	(mg/m ³) ²
Influence of sample gas pressure	u_p	0.057 mg/m ³	0.003	(mg/m ³) ²
Uncertainty of reference material at 70% of certification range	u_{rm}	0.081 mg/m ³	0.007	(mg/m ³) ²
Excursion of measurement beam	u_{mb}	0.069 mg/m ³	0.005	(mg/m ³) ²

* The larger value is used :

"Repeatability standard deviation at set point" or

"Standard deviation from paired measurements under field conditions"

Combined standard uncertainty (u_c)

$$u_c = \sqrt{\sum (u_{max,j})^2} \quad 0.27 \text{ mg/m}^3$$

Total expanded uncertainty

$$U = u_c * k = u_c * 1.96 \quad 0.54 \text{ mg/m}^3$$

Relative total expanded uncertainty

U in % of the ELV 10 mg/m³ 5.4

Requirement of 2010/75/EU

U in % of the ELV 10 mg/m³ 40.0

Requirement of EN 15267-3

U in % of the ELV 10 mg/m³ 30.0

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

Measuring system

Manufacturer	NEO Monitors AS
AMS designation	LaserGas II
Serial number of units under test	3187 / 32510 / 3188 / 32574
Measuring principle	Laser Spektroskopie

Test report

Test laboratory	TÜV Rheinland
Date of report	2015-03-12

Measured component

Certification range	H ₂ O	0 - 40 Vol.-%
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Evaluation of the cross-sensitivity (CS)

(system with largest CS)

Sum of positive CS at zero point	0.00	Vol.-%
Sum of negative CS at zero point	0.00	Vol.-%
Sum of positive CS at span point	0.57	Vol.-%
Sum of negative CS at span point	-0.75	Vol.-%
Maximum sum of cross-sensitivities	-0.75	Vol.-%
Uncertainty of cross-sensitivity	u_i	-0.434 Vol.-%

Calculation of the combined standard uncertainty

Tested parameter

			u^2
Standard deviation from paired measurements under field conditions *	u_{Γ}	0.390 Vol.-%	0.152 (Vol.-%) ²
Lack of fit	u_{lof}	-0.323 Vol.-%	0.104 (Vol.-%) ²
Zero drift from field test	u_{dz}	0.023 Vol.-%	0.001 (Vol.-%) ²
Span drift from field test	u_{ds}	-0.092 Vol.-%	0.008 (Vol.-%) ²
Influence of ambient temperature at span	u_t	0.173 Vol.-%	0.030 (Vol.-%) ²
Influence of supply voltage	u_v	0.029 Vol.-%	0.001 (Vol.-%) ²
Cross-sensitivity (interference)	u_i	-0.434 Vol.-%	0.188 (Vol.-%) ²
Influence of sample gas pressure	u_n	0.255 Vol.-%	0.065 (Vol.-%) ²
Uncertainty of reference material at 70% of certification range	u_{rm}	0.323 Vol.-%	0.105 (Vol.-%) ²
Excursion of measurement beam	u_{mb}	0.150 Vol.-%	0.023 (Vol.-%) ²

* The larger value is used:

"Repeatability standard deviation at set point" or

"Standard deviation from paired measurements under field conditions"

Combined standard uncertainty (u_c)	$u_c = \sqrt{\sum (u_{max, j})^2}$	0.82 Vol.-%
Total expanded uncertainty	$U = u_c * k = u_c * 1.96$	1.61 Vol.-% **

Relative total expanded uncertainty

Requirement of 2010/75/EU

Requirement of EN 15267-3

U in % of the range 40 Vol.-%	4.0
U in % of the range 40 Vol.-%	10.0 **
U in % of the range 40 Vol.-%	7.5

** The EU-directive 2010/75/EU on industrial emissions provides no requirements for this component..
A value of 10 % was chosen.