

# CERTIFICATE

## of Product Conformity (QAL1)

Certificate No.: 0000032299\_02

**AMS designation:** NGA 2000 MLT 2 for N<sub>2</sub>O

**Manufacturer:** Emerson Process Management GmbH & Co. OHG  
Industriestrasse 1  
63594 Hasselroth  
Germany

**Test Laboratory:** TÜV Rheinland Energy GmbH

This is to certify that the AMS has been tested and certified  
according to the standards

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  
(this certificate contains 7 pages).



Suitability Tested  
EN 15267  
QAL1 Certified  
Regular  
Surveillance

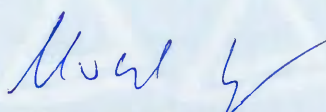
www.tuv.com  
ID 0000032299

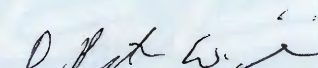
Publication in the German Federal Gazette  
(BAnz) of 05 March 2018

German Federal Environment Agency  
Dessau, 05 March 2018

This certificate will expire on:  
04 March 2023

TÜV Rheinland Energy GmbH  
Cologne, 04 March 2018

  
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Head of Section II 4.1

  
ppa. Dr. Peter Wilbring

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Test institute accredited to EN ISO/IEC 17025:2005 by DAkkS (German Accreditation Body).  
This accreditation is limited to the accreditation scope defined in the enclosure to the certificate D-PL-11120-02-00.

<b>Test Report:</b>	936/21219398/A dated 11 October 2012
<b>Initial certification:</b>	05 March 2013
<b>Expiry date:</b>	04 March 2023
<b>Certificate:</b>	Renewal (of previous certificate 0000032299_01 dated 20 August 2013 valid until 04 March 2018)
<b>Publication:</b>	BAnz AT 05.03.2013 B10, chapter I no. 4.1

### **Approved application**

The tested AMS is suitable for use at combustion plants according to EC Directive 2001/80/EC (13<sup>th</sup> BImSchV), at waste incineration plants according to EC Directive 2000/76/EC (17<sup>th</sup> BImSchV), the 27<sup>th</sup> BImSchV, the 30<sup>th</sup> BImSchV and TA Luft. The measured ranges have been selected so as to cater for as broad a field of application as possible.

The suitability of the AMS for this application was assessed on the basis of a laboratory test and a three-months field test at a nitric acid incineration plant.

The AMS is approved for an ambient temperature range of +5 °C to +40 °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 installation at which it will be installed.

### **Basis of the certification**

This certification is based on:

- Test report 936/21219398/A dated 11 October 2012 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 05.03.2013 B10, chapter I no. 4.1,  
UBA announcement dated 12 February 2013:

**AMS designation:**

Emerson NGA 2000 MLT 2 for N<sub>2</sub>O

**Manufacturer:**

Emerson Process Management Manufacturing GmbH & Co. OHG, Hasselroth

**Field of application:**

For plants requiring official approval

**Measuring ranges during performance testing:**

Component	Certification range	Supplementary range	Unit
N <sub>2</sub> O	0–196	0–5880	mg/m <sup>3</sup>

**Software version:**

3.9.4

**Restrictions:**

1. The measuring system may only be operated at plants at which waste gas moisture does not exceed 3 vol.-%.
2. The measuring system may only be operated at plants at which CO<sub>2</sub> concentrations do not exceed 10 vol.-%.

**Note:**

The maintenance interval is four weeks.

**Test Report:**

TÜV Rheinland Energie und Umwelt GmbH, Cologne  
Report no.: 936/21219398/A dated 11 October 2012

Publication in the German Federal Gazette: BAnz AT 23.07.2013 B4, chapter IV correction 2, UBA announcement dated 03 July 2013:

**2 Correction of Federal Environment Agency notice of 12 February 2013 (BAnz AT 05.03.2013 B10, chapter I no. 4.1)**

The correct company name of the manufacturer of the NGA2000 MLT2 measuring system for N<sub>2</sub>O reads as follows:

Emerson Process Management GmbH & Co. OHG

Statement issued by TÜV Rheinland Energie und Umwelt GmbH dated 9 April 2013

Publication in the German Federal Gazette: BAnz AT 26.08.2015 B4, chapter V notification 27, UBA announcement dated 22 July 2015:

**27 Notification as regards Federal Environment Agency notices of 12 February 2013 (BAnz AT 05.03.2013 B10, chapter I number 4.1) and of 3 July 2013 (BAnz AT 23.07.2013 B4 chapter IV 2<sup>nd</sup> correction)**

In addition to the chopper with UCC speed control used so far, the NGA 2000 MLT 2 measuring system for N<sub>2</sub>O manufactured by Emerson Process Management GmbH & Co. OHG may also be equipped with the new chopper with FAMOS speed control.

Statement issued by TÜV Rheinland Energie und Umwelt GmbH dated 24 March 2015.

Publication in the German Federal Gazette: BAnz AT 14.03.2016 B7, chapter V notification 22, UBA announcement dated 18 February 2016:

**22 Notification as regards Federal Environment Agency notices of 12 February 2013 (BAnz AT 05.03.2013 B10, chapter I number 4.1) and of 22 July 2015 (BAnz AT 26.08.2015 B4 chapter V 27<sup>th</sup> notification)**

In addition to the pre-amplification board, type VVS03, used so far, the NGA 2000 MLT 2 measuring system for N<sub>2</sub>O manufactured by Emerson Process Management GmbH & Co. OHG may also be equipped with an alternative pre-amplification board, type NVVS01, in the future.

Statement issued by TÜV Rheinland Energie und Umwelt GmbH dated 19 October 2015

### Certified product

This certification applies to automated measurement systems conforming to the following description:

The tested measuring system is an extractive IR spectrometer used to determine N<sub>2</sub>O. Sample gas is extracted using a stainless steel probe and then transported via a heated sample gas line (stainless steel) to a heated pressure regulator. From here, gas is led to a mounting plate via another heated sample gas line made of stainless steel on which it is then transported to the analyser via a pump and a vortex cooler.

The system can alternatively be operated in processes with or without pressure. For a process with pressure, the pre-pressure for the analyser is set at the heated pressure regulator and the gas is led through a pump by-pass. For processes without pressure, the heated pressure regulator is released and gas is extracted with the help of a pump.

In addition, the mounting plate provides ports for zero and span gas. It is possible to perform automatic zero and span point calibrations via the analyser and solenoid valves. Gas paths, pump and valves on the mounting plate are unheated.

The current software version is: 3.9.4  
The current manual version is: 6<sup>th</sup> edition 04/2008

### 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](http://qal1.de).

Certification of the NGA 2000 MLT 2 measuring system is based on the documents listed below and the regular, continuous surveillance of the manufacturer's quality management system:

**Initial certification according to EN 15267**

Certificate no. 0000032299: 22 March 2013  
Expiry date of the certificate: 04 March 2018

Test report: 936/21219398/A dated 11 October 2012  
TÜV Rheinland Energie und Umwelt GmbH, Cologne  
Publication: BAnz AT 05.03.2013 B10, chapter I no. 4.1  
UBA announcement dated 12 February 2013

**Corrected certificate for 0000032299 dated 22 March 2013**

Certificate no. 0000032299\_01: 20 August 2013  
Expiry date of the certificate: 04 March 2018

Statement issued by TÜV Rheinland Energie und Umwelt GmbH dated 9 April 2013  
Publication: BAnz AT 23.07.2013 B4, chapter IV correction 2  
UBA announcement dated 03 July 2013  
(Correction of company name)

**Notifications in accordance with EN 15267**

Statement issued by TÜV Rheinland Energie und Umwelt GmbH dated 24 March 2015  
Publication: BAnz AT 26.08.2015 B4, chapter V notification 27  
UBA announcement dated 22 July 2015  
(Alternative chopper)

Statement issued by TÜV Rheinland Energie und Umwelt GmbH dated 19 October 2015  
Publication: BAnz AT 14.03.2016 B7, chapter V notification 22  
UBA announcement dated 18 February 2016  
(Alternative pre-amplification board)

**Renewal of the certificate**

Certificate no. 0000032299\_02: 05 March 2018  
Expiry date of the certificate: 04 March 2023

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

**Measuring system**

Manufacturer	Emerson Process Management GmbH & Co. OHG
Name of measuring system	NGA 2000 MLT 2
Serial number of the candidates	3601203135496 / 3601203136462
Measuring principle	IR

**Test report**

Test laboratory	TÜV Rheinland
Date of report	2012-10-11

**Measured component**

Certification range	N <sub>2</sub> O 0 - 196 mg/m <sup>3</sup>
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**Evaluation of the cross sensitivity (CS)**

(system with largest CS)

Sum of positive CS at zero point	6.68 mg/m <sup>3</sup>
Sum of negative CS at zero point	0.00 mg/m <sup>3</sup>
Sum of positive CS at reference point	5.59 mg/m <sup>3</sup>
Sum of negative CS at reference point	0.00 mg/m <sup>3</sup>
Maximum sum of cross sensitivities	6.68 mg/m <sup>3</sup>
Uncertainty of cross sensitivity	3.859 mg/m <sup>3</sup>

**Calculation of the combined standard uncertainty**

**Tested parameter**

	u	u <sup>2</sup>
Standard deviation from paired measurements under field conditions *	u <sub>D</sub> 0.722 mg/m <sup>3</sup>	0.521 (mg/m <sup>3</sup> ) <sup>2</sup>
Lack of fit	u <sub>lof</sub> 0.294 mg/m <sup>3</sup>	0.086 (mg/m <sup>3</sup> ) <sup>2</sup>
Zero drift from field test	u <sub>d,z</sub> -0.453 mg/m <sup>3</sup>	0.205 (mg/m <sup>3</sup> ) <sup>2</sup>
Span drift from field test	u <sub>d,s</sub> -2.150 mg/m <sup>3</sup>	4.623 (mg/m <sup>3</sup> ) <sup>2</sup>
Influence of ambient temperature at span	u <sub>t</sub> 2.234 mg/m <sup>3</sup>	4.991 (mg/m <sup>3</sup> ) <sup>2</sup>
Influence of supply voltage	u <sub>v</sub> 0.522 mg/m <sup>3</sup>	0.272 (mg/m <sup>3</sup> ) <sup>2</sup>
Cross sensitivity (interference)	u <sub>i</sub> 3.859 mg/m <sup>3</sup>	14.890 (mg/m <sup>3</sup> ) <sup>2</sup>
Influence of sample gas flow	u <sub>p</sub> 0.377 mg/m <sup>3</sup>	0.142 (mg/m <sup>3</sup> ) <sup>2</sup>
Uncertainty of reference material at 70% of certification range	u <sub>rm</sub> 1.584 mg/m <sup>3</sup>	2.510 (mg/m <sup>3</sup> ) <sup>2</sup>

\* The larger value is used :

"Repeatability standard deviation at span" or

"Standard deviation from paired measurements under field conditions"

Combined standard uncertainty (u <sub>c</sub> )	$u_c = \sqrt{\sum (u_{max,j})^2}$	5.31 mg/m <sup>3</sup>
Total expanded uncertainty	$U = u_c * k = u_c * 1.96$	10.42 mg/m <sup>3</sup>

**Relative total expanded uncertainty**

Requirement of 2000/76/EC and 2001/80/EC	<b>U in % of the range 196 mg/m<sup>3</sup></b>	<b>5.3</b>
Requirement of EN 15267-3	<b>U in % of the range 196 mg/m<sup>3</sup></b>	<b>20.0 **</b>
	<b>U in % of the range 196 mg/m<sup>3</sup></b>	<b>15.0</b>

\*\* EU Directives 2001/80/EG and 2000/76/EG do not define requirements for this component.

A value of 20.0% was used for this.