

CERTIFICATE

of Product Conformity (QAL1)

Certificate No: 0000032299_03

Certified AMS: Emerson NGA 2000 MLT 2 for N₂O

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

Test Institute: 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 (2004).**

Certification is awarded in respect of the conditions stated in this certificate
(this certificate contains 8 pages).
The present certificate replaces certificate 0000032299_02 dated 05 March 2018.



Suitability Tested
EN 15267
QAL1 Certified
Regular
Surveillance

www.tuv.com
ID 0000032299

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

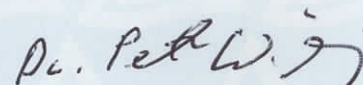
German Environment Agency
Dessau, 02 March 2023

This certificate will expire on:
04 March 2028

TÜV Rheinland Energy GmbH
Cologne, 01 March 2023



Dr. Marcel Langner
Head of Section II 4.1



ppa. Dr. Peter Wilbring

www.umwelt-tuv.eu
tre@umwelt-tuv.eu
Tel. + 49 221 806-5200

TÜV Rheinland Energy GmbH
Am Grauen Stein
51105 Köln

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 the certificate D-PL-11120-02-00.

Test report:	936/21219398/A dated 11 October 2012
Initial certification:	05 March 2013
Expiry date:	04 March 2028
Certificate:	Renewal (of previous certificate 0000032299_02 of 05 March 2018 valid until 04 March 2023)
Publication:	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 (13th BImSchV:2012), at waste incineration plants according to EC Directive 2000/76/EC (17th BImSchV:2009), the 30th BImSchV:2009 and TA Luft:2002. 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 plant.

The AMS is approved for an ambient temperature range of +5° 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 emission 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.

Note:

The legal regulations mentioned correspond to the current state of legislation during certification. Each user should, if necessary, in consultation with the competent authority, ensure that this AMS meets the legal requirements for the intended use. In addition, it cannot be ruled out that legal regulations governing the use of a measuring device for emission monitoring may change during the lifetime of the certificate.

Basis of the certification

This certification is based on:

- Test report 936/21219398/A dated 11 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 05.03.2013 B10, chapter I No. 4.1,
Announcement by UBA dated 12 February 2013:

AMS designation

Emerson NGA 2000 MLT 2 for N₂O

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 ₂ O	0–196	0–5,880	mg/m ³

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 CO₂ 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, Kap. IV correction 2,
Announcement by UBA dated 3 July 2013:

**2 Correction as regards Federal Environment Agency notices
of 12 February 2013 (BAnz AT 05.03.2013 B10, chapter I number 4.1)**

The correct company name of the manufacturer of the Emerson NGA 2000 MLT 2
measuring system for N₂O reads as follows:

Emerson Process Management GmbH & Co. OHG

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

Publication in the German Federal Gazette: BAnz AT 26.08.2015 B4, chap. V notification 27,
Announcement by UBA 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 correction 2)**

In addition to the chopper with UCC speed control used so far,
the Emerson NGA 2000 MLT 2 measuring system for N₂O 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, chap. V notification 22,
Announcement by UBA 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 notification 27)**

In addition to the pre-amplification board, type VVS03, used so far,
the Emerson NGA 2000 MLT 2 measuring system for N₂O 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

Publication in the German Federal Gazette: BAnz AT 22.07.2019 B8, chap. V notification 1,
Announcement by UBA dated 28 June 2019:

**1 Notification as regards Federal Environment Agency (UBA) notices
of 12 February 2013 (BAnz AT 05.03.2013 B10, chapter I number 4.1) and
of 18 February 2016 (BAnz AT 14.03.2016 B7, chapter V notification 22)**

Instead of the quartz used to control the chopper wheel so far and manufactured by Toyocom, a different quartz manufactured by Abracon may also be used for the Emerson NGA 2000 MLT 2 manufactured by Emerson Process Management GmbH & Co. OHG.

The CPU provided by Microchip used to control the chopper wheel may be replaced a different module provided by the same manufacturer.

Statement issued by TÜV Rheinland Energy GmbH dated 26 February 2019

Certified product

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

The tested measuring system is an extractive IR spectrometer used to determine N₂O. 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.

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 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 certification mark may be applied to the product or used in advertising materials for the certified product.

This document as well as the certification mark remains property of TÜV Rheinland Energy GmbH. With revocation of the publication the certificate loses its validity. After the expiration of the certificate and on requests of the TÜV Rheinland Energy 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: gal1.de.

History of documents

Certification of Emerson NGA 2000 MLT 2 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. 0000032299_00: 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
Publication BAnz AT 05.03.2013 B10, chapter I number 4.1
UBA announcement dated 12 February 2013

Certificate correction

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 3 July 2013
(Correction of company name)

Notifications

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 certificate

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

Notifications

Statement issued by TÜV Rheinland Energy GmbH dated 26 February 2019
Publication BAnz AT 22.07.2019 B8, chapter V notification 1
UBA announcement dated 28 June 2019
(Hardware changes)

Renewal of certificate

Certificate No. 0000032299_03: 02 March 2023
Expiry date of the certificate: 04 March 2028

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

	936/21219398/A
Test laboratory	TÜV Rheinland
Date of report	2012-10-11

Measured component

	N ₂ O
Certification range	0 - 196 mg/m ³

Evaluation of the cross sensitivity (CS)

(system with largest CS)

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

Calculation of the combined standard uncertainty

Tested parameter

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

* The larger value is used :

"Repeatability standard deviation at span" or

"Standard deviation from paired measurements under field conditions"

Combined standard uncertainty (u_c)

$$u_c = \sqrt{\sum (u_{\max j})^2} \quad 5.31 \text{ mg/m}^3$$

Total expanded uncertainty

$$U = u_c * k = u_c * 1.96 \quad 10.42 \text{ mg/m}^3$$

Relative total expanded uncertainty

U in % of the range 196 mg/m³ 5.3

Requirement of 2000/76/EC and 2001/80/EC

U in % of the range 196 mg/m³ 20.0 **

Requirement of EN 15267-3

U in % of the range 196 mg/m³ 15.0

** 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.