CERTIFICATE

of Product Conformity (QAL1)

Certificate No: 0000039321_03

Certified AMS:	MGA 12 for CO, NO, SO_2, O_2 and CO_2
Manufacturer:	Dr. Födisch Umweltmesstechnik AG Zwenkauer Str. 159 04420 Markranstädt Germany
Test Institute:	TÜV Rheinland Energy & Environment 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 (2023), EN 15267-3 (2007), as well as EN 14181 (2014).

Certification is awarded in respect of the conditions stated in this certificate (this certificate contains 11 pages).
The present certificate replaces certificate 0000039321_02 dated 1 July 2020.

TÜVRheinland® CERTIFIED
Suitability Tested
EN 15267
QAL1 Certified
Regular Surveillance
www.tuv.com
ID 0000039321

Publication in the German Federal Gazette (BAnz) of 1 April 2014

German Environment Agency

Dessau, 27 June 2025

This certificate will expire on:
30 June 2030

TÜV Rheinland Energy & Environment GmbH
Cologne, 26 June 2025

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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:	936/21219366/A dated 19 September 2013
Initial certification:	1 April 2014
Expiry date:	30 June 2030
Certificate:	Renewal (of previous certificate 0000039321_02 of 1 July 2020 valid until 30 June 2025)
Publication:	BAnz AT 01.04.2014 B12, chapter I No. 3.4

Approved application

The tested AMS is suitable for use at plants according to Directive 2010/75/EC, chapter III (combustion plants / 13th BImSchV:2013), Directive 2015/2193/EC (44th BImSchV:2022) and TA Luft:2002. The measured ranges have been selected so as to ensure 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 Month field test at a power plant.

The AMS is approved for an ambient temperature range of +5 °C to +30 °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 and oxygen concentration 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 936/21219366/A dated 19 September 2013 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 01.04.2014 B12, chapter I No. 3.4, Announcement by UBA dated 27 February 2014:

AMS designation:
MGA12 for CO, NO, SO_2, O_2 and CO_2

Manufacturer:
Dr. Födisch Umweltmesstechnik AG, Markranstädt

Field of application:
For plants according to the 13th BImSchV, 27. BImSchV and TA Luft

Measuring ranges during the performance test:

Component	Certification range	Supplementary measuring range	Unit
CO	0 – 125	0 – 1.000	mg/m³
NO	0 – 300	0 – 1.000	mg/m³
SO_2	0 – 200	0 – 1.000	mg/m³
O_2	0 – 25	-	Vol.-%
CO_2	0 – 20	-	Vol.-%

Software version:
1.47

Restrictions:
1. Ambient temperature must not exceed +30 °C.
2. The measuring system did not meet the requirement for total uncertainty as defined in EN 15267-3 for the component CO.

Note:
The maintenance interval is four Weeks.

Test Institute:
TÜV Rheinland Energie und Umwelt GmbH, Cologne
Report No.: 936/21219366/A dated 19 September 2013

Publication in the German Federal Gazette: BAnz AT 26.08.2015 B4, Chap. V notification 31, Announcement by UBA dated 22 July 2015:

31 Notification as regards Federal Environment Agency (UBA) notice of 27 February 2014 (BAnz AT 01.04.2014 B12, chapter I number 3.4)

The current software version of the MGA12 measuring system for CO, NO, SO_2, O_2, and CO_2 manufactured by Dr. Födisch Umweltmesstechnik AG is:
1.50.

Statement by TÜV Rheinland Energie und Umwelt GmbH of 18 February 2015

Publication in the German Federal Gazette: BAnz AT 01.08.2016 B11, Chap. V notification 5, Announcement by UBA dated 14 July 2016:

5 Notification as regards Federal Environment Agency (UBA) notices of 27 February 2014 (BAnz AT 01.04.2014 B12, chapter I number 3.4) and of 22 July 2015 (BAnz AT 26.08.2015 B4, chapter V notification 31)

The GCU12 test gas cooler, which is used for the MGA12 measuring system for CO, NO, SO_2, O_2 and CO_2 manufactured by Dr. Födisch Umweltmesstechnik AG, has been equipped with new electronics and display units.
The name of the new test gas cooler is GCU16 (as of serial number 17xxx). This version serves as an alternative to its predecessor.

Statement by TÜV Rheinland Energy GmbH of 27 April 2016

Certified product

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

The MGA12 multi-component AMS is a measuring system for continuous monitoring of CO, NO, SO_2, O_2 and CO_2 in waste gases.

The components CO, NO, SO_2 and CO_2 are monitored using infrared absorption; O_2 is measured with an electrochemical cell.

The tested AMS comprises the gas analyser which is positioned in a 19"-rack housing. The analyser is placed in a heated and ventilated system cabinet with the dimensions 2100 x 800 x 600 mm, which also houses the sample gas pump (MGP 12), the sample gas cooler (GCU 12), the connections for transmitting measured values and signals, and other electronic parts for voltage supply. A pump supplies the sample gas cooler with 15% concentration phosphoric acid in order to prevent SO_2 absorption.

The sample gas is fed to gas preparation via a heated sample gas probe (HSP 12) and a heated sample gas pipe (25 m). The sample gas probe is fitted with a ceramic filter which, like the sample gas pipe, is heated to 180 °C.

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 & Environment 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 & Environment 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 & Environment 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**.

History of documents
Certification of MGA 12 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. 0000039321_00: 29 April 2014
Expiry date of the certificate: 31 March 2019
Test report: 936/21219366/A dated 19 September 2013
TÜV Rheinland Energie und Umwelt GmbH
Publication: BAnz AT 01.04.2014 B12, chapter I number 3.4
UBA announcement dated 27 February 2014

Notifications
Statement issued by TÜV Rheinland Energie und Umwelt GmbH dated 18 February 2015
Publication: BAnz AT 26.08.2015 B4, chapter V notification 31
UBA announcement dated 22 July 2015
(Software changes)

Statement issued by TÜV Rheinland Energy GmbH dated 27 April 2016
Publication: BAnz AT 01.08.2016 B11, chapter V notification 5
UBA announcement dated 14 July 2016
(Hardware changes)

Renewal of certificates
Certificate No. 0000039321_01: 1 April 2019
Expiry date of the certificate: 30 June 2020

Renewal of certificates
Certificate No. 0000039321_02: 1 July 2020
Expiry date of the certificate: 30 June 2025

Renewal of certificates
Certificate No. 0000039321_03: 1 July 2025
Expiry date of the certificate: 30 June 2030

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

Measuring system			
Manufacturer		Dr. Födisch Umweltmesstechnik AG	
AMS designation		MGA 12	
Serial number of units under test		12002 / 12003	
Measuring principle		IR	
Test report		936/21219366/A	
Test laboratory		TÜV Rheinland	
Date of report		2013-09-19	
Measured component		CO	
Certification range		0 - 125	mg/m³
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 span point		3.70	mg/m³
Sum of negative CS at span point		-2.50	mg/m³
Maximum sum of cross-sensitivities		3.70	mg/m³
Uncertainty of cross-sensitivity	u_i	2.140	mg/m³

Calculation of the combined standard uncertainty

Tested parameter				u^2	
Standard deviation from paired measurements under field conditions *	u_D	0.690	mg/m³	0.476	(mg/m³)²
Lack of fit	u_{lof}	-0.577	mg/m³	0.333	(mg/m³)²
Zero drift from field test	$u_{d,z}$	-0.144	mg/m³	0.021	(mg/m³)²
Span drift from field test	$u_{d,s}$	-1.588	mg/m³	2.522	(mg/m³)²
Influence of ambient temperature at span	u_t	1.510	mg/m³	2.280	(mg/m³)²
Influence of supply voltage	u_v	0.537	mg/m³	0.288	(mg/m³)²
Cross-sensitivity (interference)	u_i	2.140	mg/m³	4.580	(mg/m³)²
Influence of sample gas flow	u_p	0.346	mg/m³	0.120	(mg/m³)²
Uncertainty of reference material at 70% of certification range	u_{rm}	1.010	mg/m³	1.021	(mg/m³)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)	$u_c = \sqrt{\sum (u_{max,j})^2}$	3.41	mg/m³
Total expanded uncertainty	$U = u_c * k = u_c * 1.96$	6.69	mg/m³

Relative total expanded uncertainty	**U in % of the ELV 80 mg/m³**	**8.4**
Requirement of 2010/75/EU	**U in % of the ELV 80 mg/m³**	**10.0**
Requirement of EN 15267-3	U in % of the ELV 80 mg/m³	7.5

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

Measuring system			
Manufacturer	Dr. Födisch Umweltmesstechnik AG		
Name of measuring system	MGA 12		
Serial number of the candidates	12002 / 12003		
Measuring principle	IR		
Test report	936/21219366/A		
Test laboratory	TÜV Rheinland		
Date of report	2013-09-19		
Measured component	NO		
Certification range	0 - 250	mg/m³	

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	6.30	mg/m³
Sum of negative CS at reference point	0.00	mg/m³
Maximum sum of cross sensitivities	6.30	mg/m³
Uncertainty of cross sensitivity	3.637	mg/m³

Calculation of the combined standard uncertainty

Tested parameter				u^2	
Standard deviation from paired measurements under field conditions *	u_D	3.095	mg/m³	9.579	(mg/m³)²
Lack of fit	u_{lof}	1.155	mg/m³	1.334	(mg/m³)²
Zero drift from field test	$u_{d.z}$	3.320	mg/m³	11.022	(mg/m³)²
Span drift from field test	$u_{d.s}$	3.753	mg/m³	14.085	(mg/m³)²
Influence of ambient temperature at span	u_t	2.468	mg/m³	6.091	(mg/m³)²
Influence of supply voltage	u_v	1.208	mg/m³	1.459	(mg/m³)²
Cross sensitivity (interference)	u_i	3.640	mg/m³	13.250	(mg/m³)²
Influence of sample gas flow	u_p	1.383	mg/m³	1.913	(mg/m³)²
Uncertainty of reference material at 70% of certification range	u_{rm}	2.021	mg/m³	4.083	(mg/m³)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)	$u_c = \sqrt{\sum (u_{max,j})^2}$	7.93	mg/m³
Total expanded uncertainty	$U = u_c * k = u_c * 1.96$	15.53	mg/m³

Relative total expanded uncertainty	**U in % of the ELV 120 mg/m³**	**12.9**
Requirement of 2010/75/EU	**U in % of the ELV 120 mg/m³**	**20.0**
Requirement of EN 15267-3	U in % of the ELV 120 mg/m³	15.0

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

Measuring system			
Manufacturer		Dr. Födisch Umweltmesstechnik AG	
AMS designation		MGA 12	
Serial number of units under test		12002 / 12003	
Measuring principle		IR	
Test report		936/21219366/A	
Test laboratory		TÜV Rheinland	
Date of report		2013-09-19	
Measured component		SO_2	
Certification range		0 - 200	mg/m³

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		-2.64	mg/m³
Sum of postive CS at span point		5.10	mg/m³
Sum of negative CS at span point		-8.00	mg/m³
Maximum sum of cross-sensitivities		-8.00	mg/m³
Uncertainty of cross-sensitivity	u_i	-4.619	mg/m³

Calculation of the combined standard uncertainty

Tested parameter				u^2	
Standard deviation from paired measurements under field conditions *	u_D	3.291	mg/m³	10.831	(mg/m³)²
Lack of fit	u_{lof}	1.155	mg/m³	1.334	(mg/m³)²
Zero drift from field test	$u_{d,z}$	0.346	mg/m³	0.120	(mg/m³)²
Span drift from field test	$u_{d,s}$	-2.656	mg/m³	7.054	(mg/m³)²
Influence of ambient temperature at span	u_t	2.452	mg/m³	6.012	(mg/m³)²
Influence of supply voltage	u_v	0.947	mg/m³	0.897	(mg/m³)²
Cross-sensitivity (interference)	u_i	-4.619	mg/m³	21.333	(mg/m³)²
Influence of sample gas flow	u_p	0.722	mg/m³	0.521	(mg/m³)²
Uncertainty of reference material at 70% of certification range	u_{rm}	1.617	mg/m³	2.613	(mg/m³)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)	$u_c = \sqrt{\sum (u_{max,j})^2}$	7.12	mg/m³
Total expanded uncertainty	$U = u_c * k = u_c * 1.96$	13.96	mg/m³

Relative total expanded uncertainty	**U in % of the ELV 130 mg/m³**	**10.7**
Requirement of 2010/75/EU	**U in % of the ELV 130 mg/m³**	**20.0**
Requirement of EN 15267-3	U in % of the ELV 130 mg/m³	15.0

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

Measuring system			
Manufacturer		Dr. Födisch Umweltmesstechnik AG	
AMS designation		MGA 12	
Serial number of units under test		12002 / 12003	
Measuring principle		electrochemical cell	
Test report		936/21219366/A	
Test laboratory		TÜV Rheinland	
Date of report		2013-09-19	
Measured component		O_2	
Certification range		0 - 25	Vol.-%
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 postive CS at span point		0.00	Vol.-%
Sum of negative CS at span point		0.00	Vol.-%
Maximum sum of cross-sensitivities		0.00	Vol.-%
Uncertainty of cross-sensitivity	u_i	0.000	Vol.-%

Calculation of the combined standard uncertainty

Tested parameter				u^2	
Standard deviation from paired measurements under field conditions *	u_D	0.091	Vol.-%	0.008	(Vol.-%)²
Lack of fit	u_{lof}	0.014	Vol.-%	0.000	(Vol.-%)²
Zero drift from field test	$u_{d,z}$	-0.064	Vol.-%	0.004	(Vol.-%)²
Span drift from field test	$u_{d,s}$	-0.110	Vol.-%	0.012	(Vol.-%)²
Influence of ambient temperature at span	u_t	0.070	Vol.-%	0.005	(Vol.-%)²
Influence of supply voltage	u_v	0.059	Vol.-%	0.003	(Vol.-%)²
Cross-sensitivity (interference)	u_i	0.000	Vol.-%	0.000	(Vol.-%)²
Influence of sample gas flow	u_p	-0.018	Vol.-%	0.000	(Vol.-%)²
Uncertainty of reference material at 70% of certification range	u_{rm}	0.202	Vol.-%	0.041	(Vol.-%)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)	$u_c = \sqrt{\sum (u_{max,j})^2}$	0.27	Vol.-%
Total expanded uncertainty	$U = u_c * k = u_c * 1.96$	0.53	Vol.-%

Relative total expanded uncertainty	**U in % of the range 25 Vol.-%**	**2.1**
Requirement of 2010/75/EU	**U in % of the range 25 Vol.-%**	**10.0 ****
Requirement of EN 15267-3	U in % of the range 25 Vol.-%	7.5

** For this component no requirements in the EC-directives 2010/75/EU on industrial emissions are given.
The chosen value is recommended by the certification body.

Umwelt Bundesamt

Certificate:
0000039321_03 / 27 June 2025

TÜVRheinland®
Precisely Right.

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

Measuring system					
Manufacturer		Dr. Födisch Umweltmesstechnik AG			
AMS designation		MGA 12			
Serial number of units under test		12002 / 12003			
Measuring principle		IR			
Test report		936/21219366/A			
Test laboratory		TÜV Rheinland			
Date of report		2013-09-19			
Measured component		CO_2			
Certification range		0 - 20	Vol.-%		
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 postive CS at span point		0.60	Vol.-%		
Sum of negative CS at span point		-0.20	Vol.-%		
Maximum sum of cross-sensitivities		0.60	Vol.-%		
Uncertainty of cross-sensitivity	u_i	0.346	Vol.-%		

Calculation of the combined standard uncertainty

Tested parameter				u^2	
Standard deviation from paired measurements under field conditions *	u_D	0.142	Vol.-%	0.020	(Vol.-%)²
Lack of fit	u_{lof}	0.058	Vol.-%	0.003	(Vol.-%)²
Zero drift from field test	$u_{d,z}$	-0.012	Vol.-%	0.000	(Vol.-%)²
Span drift from field test	$u_{d,s}$	0.346	Vol.-%	0.120	(Vol.-%)²
Influence of ambient temperature at span	u_t	0.252	Vol.-%	0.064	(Vol.-%)²
Influence of supply voltage	u_v	0.060	Vol.-%	0.004	(Vol.-%)²
Cross-sensitivity (interference)	u_i	0.346	Vol.-%	0.120	(Vol.-%)²
Influence of sample gas flow	u_n	-0.041	Vol.-%	0.002	(Vol.-%)²
Uncertainty of reference material at 70% of certification range	u_{rm}	0.162	Vol.-%	0.026	(Vol.-%)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)	$u_c = \sqrt{\sum (u_{max,j})^2}$	0.60	Vol.-%
Total expanded uncertainty	$U = u_c * k = u_c * 1.96$	1.17	Vol.-%

Relative total expanded uncertainty	**U in % of the range 20 Vol.-%**	**5.9**
Requirement of 2010/75/EU	**U in % of the range 20 Vol.-%**	**10.0**
Requirement of EN 15267-3	U in % of the range 20 Vol.-%	7.5

** For this component no requirements in the EC-directives 2010/75/EU on industrial emissions are given.
The chosen value is recommended by the certification body.