

# CERTIFICATE

## of Product Conformity (QAL1)

Certificate No.: 0000053814

**AMS designation:** AO2000-Magnos28 for O<sub>2</sub>

**Manufacturer:** ABB Automation GmbH  
Stierstädter Str. 5  
60488 Frankfurt  
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: 2014.

Certification is awarded in respect of the conditions stated in this certificate  
(this certificate contains 6 pages).



Suitability Tested  
EN 15267  
QAL1 Certified  
Regular  
Surveillance

www.tuv.com  
ID 0000053814

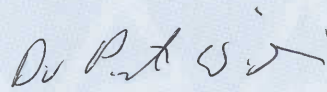
Publication in the German Federal Gazette  
(BAnz) of 17 July 2018

German Federal Environment Agency  
Dessau, 4 September 2018

This certificate will expire on:  
16 July 2023

TÜV Rheinland Energy GmbH  
Cologne, 3 September 2018

  
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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>	936/21236694/C dated 7 March 2018
<b>Initial certification:</b>	17 July 2018
<b>Expiry date:</b>	16 July 2023
<b>Publication:</b>	BAnz AT 17.07.2018 B9, chapter II number 1.1

### **Approved application**

The tested AMS is suitable for use at combustion plants according to Directive 2010/75/EU, chapter III (13<sup>th</sup> BImSchV), at waste incineration plants according to Directive 2010/75/EU, chapter IV (17<sup>th</sup> BImSchV), the 27<sup>th</sup> and 30<sup>th</sup> BImSchV and TA Luft. 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-months field test at a municipal waste 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 oxygen concentrations 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 936/21236694/C dated 7 March 2018 issued by TÜV Rheinland Energy 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 17.07.2018 B9, chapter II number 1.1,  
UBA announcement dated 3 July 2018:

**AMS designation:**

AO2000-Magnos28 for O<sub>2</sub>

**Manufacturer:**

ABB Automation GmbH, Frankfurt am Main

**Field of application:**

For plants requiring official approval and for plants according to the 27<sup>th</sup> BImSchV

**Measuring ranges during performance testing:**

Component	Certification range	Supplementary range	Unit
O <sub>2</sub>	0–25	0–10	vol.-%

**Software versions:**

AMC board: 3.8.6  
Syscon: 5.1.16

**Restrictions:**

None

**Notes:**

1. The maintenance interval is four weeks.
2. It is possible to use the analyser in its versions AO2020 (19" housing for rack mounting) and AO2040 (housing for wall mounting).

**Test Report:**

TÜV Rheinland Energy GmbH, Cologne  
Report no.: 936/21236694/C dated 7 March 2018

### **Certified product**

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

The AMS AO2000-Magnos28 is an extractive AMS and comprises the following parts:

- AO2000-Magnos28 analyser
- Heated probe incl. controller, ABB PFE 3 or PFE2
- Heated sample line (180 °C), (max. 60 m) incl. controller, inner liner made of Teflon
- ABB SCC-F sample pump
- ABB SCC-C sample gas cooler
- Software versions: AMC board: 3.8.6, Syscon: 5.1.16

The Magnos28 analyser is an analyser module integrated in an universal AdvanceOptima AO2000 housing. This housing accommodates the display and control unit, the evaluation unit, the analyser module and the power supply unit. Analogue outputs and data interfaces are also located here.

The housing is available in two different versions.

The AO2020 housing is the 19" version intended for rack mounting.

The AO2040 housing is intended for wall mounting and has a similar size.

Differences between the two versions are limited to the housing. All other components are identical.

### **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 AO2000-Magnos28 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.:0000053814: 4 September 2018  
Expiry date of the certificate: 16 July 2023  
Test report: 936/21236694/C dated 7 March 2018  
TÜV Rheinland Energy GmbH, Cologne  
Publication: BAnz AT 17.07.2018 B9, chapter II number 1.1  
UBA announcement dated 3 July 2018

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

**Measuring system**

Manufacturer	ABB Automation GmbH
AMS designation	AO2000-Magnos28
Serial number of units under test	33633146 / 32679405 / 33633136 / 33633156
Measuring principle	Paramagnetism

**Test report**

Test laboratory	936/21236694/C
Date of report	TÜV Rheinland
	2018-03-07

**Measured component**

Certification range	O <sub>2</sub>	0 - 25 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	0.00	Vol.-%
Sum of negative CS at span point	0.00	Vol.-%
Maximum sum of cross-sensitivities	0.00	Vol.-%
Uncertainty of cross-sensitivity	u <sub>i</sub>	0.000 Vol.-%

**Calculation of the combined standard uncertainty**

**Tested parameter**

				u <sup>2</sup>
Standard deviation from paired measurements under field conditions *	u <sub>D</sub>	0.056	Vol.-%	0.003 (Vol.-%) <sup>2</sup>
Lack of fit	u <sub>lof</sub>	0.017	Vol.-%	0.000 (Vol.-%) <sup>2</sup>
Zero drift from field test	u <sub>d,z</sub>	0.115	Vol.-%	0.013 (Vol.-%) <sup>2</sup>
Span drift from field test	u <sub>d,s</sub>	-0.115	Vol.-%	0.013 (Vol.-%) <sup>2</sup>
Influence of ambient temperature at span	u <sub>t</sub>	0.030	Vol.-%	0.001 (Vol.-%) <sup>2</sup>
Influence of supply voltage	u <sub>v</sub>	0.006	Vol.-%	0.000 (Vol.-%) <sup>2</sup>
Cross-sensitivity (interference)	u <sub>i</sub>	0.000	Vol.-%	0.000 (Vol.-%) <sup>2</sup>
Influence of sample gas flow	u <sub>p</sub>	-0.057	Vol.-%	0.003 (Vol.-%) <sup>2</sup>
Uncertainty of reference material at 70% of certification range	u <sub>rm</sub>	0.202	Vol.-%	0.041 (Vol.-%) <sup>2</sup>

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

Combined standard uncertainty (u <sub>c</sub> )	$u_c = \sqrt{\sum (u_{max, i})^2}$	0.27	Vol.-%
Total expanded uncertainty	$U = u_c * k = u_c * 1.96$	0.54	Vol.-%

**Relative total expanded uncertainty**

<b>Requirement of 2010/75/EU</b>	<b>U in % of the range 25 Vol.-%</b>	<b>2.1</b>
Requirement of EN 15267-3	U in % of the range 25 Vol.-%	10.0 **
	U in % of the range 25 Vol.-%	7.5

\*\* EU Directive 2010/75/EU does not define requirements for this component.  
A value of 10.0% was used instead.