

CERTIFICATE

of Product Conformity (QAL1)

Certificate No.: 0000062063

AMS designation: O2000N for oxygen

Manufacturer: Opsis AB
Skytteskogsvägen 16
24402 Furulund
Sweden

Test Laboratory: TÜV Rheinland Energy GmbH

This is to certify that the AMS has been tested
and found to comply with:

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

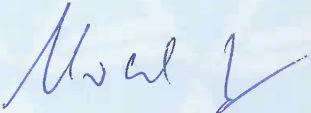
www.tuv.com
ID 0000062063

Publication in the German Federal Gazette
(BAnz) of 26 March 2019

German Federal Environment Agency
Dessau, 12 June 2019

This certificate will expire on:
25 March 2024

TÜV Rheinland Energy GmbH
Cologne, 11 June 2019



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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.

Test Report:	936/21241138/A dated 14 September 2018
Initial certification:	26 March 2019
Expiry date:	31 March 2024
Publication:	BAnz AT 26.03.2019 B7, 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 (13th BImSchV), at waste incineration plants according to Directive 2010/75/EU, chapter IV (17th BImSchV), the 27th and 30th 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 waste incineration plant.

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 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 no. 936/21241138/A dated 14 September 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 26.03.2019 B7, chapter II number 1.1
UBA announcement dated 27 February 2019:

AMS designation:

O2000N for oxygen

Manufacturer:

Opsis AB, Furulund, Sweden

Field of application:

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

Measuring range during performance testing:

Component	Certification range	supplementary range	Unit
O ₂	0–25	-	vol.-%

Software version: Firmware 1.09

Restrictions:

None

Note:

1. The maintenance interval is four weeks.
2. The measuring system determines gas concentrations in wet stack gas.

Test Report:

TÜV Rheinland Energy GmbH, Cologne
Report no.: 936/21241138/A dated 14 September 2018

Certified product

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

The O2000N is an oxygen analyser which uses zirconium dioxide as its measuring principle.

Since zirconium dioxide measurement cells are only conductible for oxygen ions for temperatures above 600 °C, the voltage generated between the electrodes (cell output) is a function of the relationship between the oxygen partial pressure between the reference electrode and the measuring electrode. A change in oxygen partial pressure of the flue gas and the corresponding electrode according to the Nernst equation therefore result in change of the output voltage.

The O2000N measuring system certified here consists of two components. The analyser (O2000N) which processes measured signals and provides control and adjustment functions; and a measurement probe (model 502) c/w zirconium dioxide cell. This is where the signal is produced on the basis of the oxygen content.

The model 502 zirconium dioxide measurement probe is used to measure the oxygen content of flue gas in-situ without extracting sample gas. The oxygen content is measured in wet stack gas.

The model 502 measurement probe operates in combination with the O2000N analyser. The analyser comprises a metal box (degree of protection IP 66), which contains in OLED display, alarm functions, a micro controller for calculating signals and operation, a reference air pump as well as solenoid valves and connections for the purpose of automatic functional checks. An integrated pump supplies the reference air required for operation.

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 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. 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 O2000N 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.:0000062063 12 June 2019
Expiry date of the certificate: 25 March 2024
Test report no. 936/21241138/A dated 14 September 2018
TÜV Rheinland Energy GmbH, Cologne
Publication: BAnz AT 26.03.2019 B7, chapter II number 1.1
UBA announcement dated 27 February 2019

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

Measuring system

Manufacturer	Opsis AB
AMS designation	O2000N
Serial number of units under test	17-001 / 17-002
Measuring principle	zirconiadiioxide principle

Test report

Test laboratory	TÜV Rheinland
Date of report	2018-09-14

Measured component

Certification range	O ₂	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 _i	0.000 Vol.-%

Calculation of the combined standard uncertainty

Tested parameter

				u ²
Standard deviation from paired measurements under field conditions *	u _D	0.056	Vol.-%	0.003 (Vol.-%) ²
Lack of fit	u _{lof}	-0.058	Vol.-%	0.003 (Vol.-%) ²
Zero drift from field test	u _{d,z}	0.023	Vol.-%	0.001 (Vol.-%) ²
Span drift from field test	u _{d,s}	0.087	Vol.-%	0.008 (Vol.-%) ²
Influence of ambient temperature at span	u _t	0.055	Vol.-%	0.003 (Vol.-%) ²
Influence of supply voltage	u _v	0.006	Vol.-%	0.000 (Vol.-%) ²
Cross-sensitivity (interference)	u _i	0.000	Vol.-%	0.000 (Vol.-%) ²
Influence of sample gas pressure	u _p	0.015	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 set point" or

"Standard deviation from paired measurements under field conditions"

Combined standard uncertainty (u _c)	$u_c = \sqrt{\sum (u_{max,j})^2}$	0.24	Vol.-%
Total expanded uncertainty	$U = u_c * k = u_c * 1.96$	0.47	Vol.-%

Relative total expanded uncertainty

Requirement of 2010/75/EU	U in % of the range 25 Vol.-%	1.9
Requirement of EN 15267-3	U in % of the range 25 Vol.-%	10.0 **
	U in % of the range 25 Vol.-%	7.5

** The EU-directive 2010/75/EC on industrial emissions does not define requirements for this component.

A value of 10.0 % was used instead.