

# CERTIFICATE

## of Product Conformity (QAL1)

Certificate No.: 0000053804\_01

**AMS designation:** Oxitec 5000+ for O<sub>2</sub>

**Manufacturer:** ENOTEC GmbH  
Höher Birken 6  
51709 Marienheide  
Germany

**Test Laboratory:** 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 (2014).**

Certification is awarded in respect of the conditions stated in this certificate  
(this certificate contains 8 pages).  
The present certificate replaces certificate 0000053804\_00 of 25 April 2017.



Suitability Tested  
EN 15267  
QAL1 Certified  
Regular  
Surveillance

www.tuv.com  
ID 0000053804

Publication in the German Federal Gazette  
(BAnz) of 15 March 2017

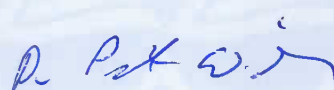
German Federal Environment Agency  
Dessau, 02 March 2022

This certificate will expire on:  
14 March 2027

TÜV Rheinland Energy GmbH  
Cologne, 01 March 2022



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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 certificate D-PL-11120-02-00.

**Certificate:**  
0000053804\_01 / 02 March 2022

**Test report:** 936/21228221/A of 04 October 2016  
**Initial certification:** 25 April 2017  
**Expiry date:** 14 March 2027  
**Certificate:** Renewal (of previous certificate 0000053804\_00 of 25 February 2017 valid until 14 March 2022)  
**Publication:** BAnz AT 15.03.2017 B6, 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), chapter IV (17<sup>th</sup> BImSchV), 30<sup>th</sup> BImSchV, plants in compliance with TA Luft, plants according to the 27<sup>th</sup> BImSchV and other plants requiring official approval. 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 twelve-month 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 limit values and oxygen concentrations relevant to the application.

Any potential user should ensure, in consultation with the manufacturer, that this AMS is suitable for the intended purpose.

### **Basis of the certification**

This certification is based on:

- Test report 936/21228221/A of 04 October 2016 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 15.03.2017 B6, chapter II number 1.1,  
UBA announcement dated 22 February 2017:

**AMS designation:**

Oxitec 5000+ for O<sub>2</sub>

**Manufacturer:**

ENOTEC GmbH, Marienheide

**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	Unit
Oxygen	0 - 25	Vol.-%

**Software version:**

4.10

**Restrictions:**

None

**Notes:**

1. The maintenance interval is six months.
2. The measuring system may only be operated with active drift check (every three days).

**Test Report:**

TÜV Rheinland Energy GmbH, Cologne

Report no.: 936/21228221/A of 04 October 2016



Publication in the German Federal Gazette: BAnz AT 31.07.2017 B12, chapter II  
14<sup>th</sup> notification, UBA announcement dated 13 July 2017:

**14 Notification as regards Federal Environment Agency (UBA) notice  
of 22 February 2017 (BAnz AT 15.03.2017 B6, chapter II number 1.1)**

The OXITEC 5000+ measuring system for O<sub>2</sub>, manufactured by ENOTEC GmbH, can alternatively be operated with the new housing variants ATEX housing (SME-5D), GRP housing (SME-56) and 19" housing (SME-54) for wall mounting. The SME-54 variant requires installation in a protected rack with a protection class of at least IP 40. In the configuration with the ATEX housing, the probe bears the designation KEX-500X (X=1 (probe length 1 m) or X=2 (probe length 2 m)). The 19" variant does not meet the requirements for the protection class, as it only has a protection class of IP 20.

Statement issued by TÜV Rheinland Energy GmbH dated 10 March 2017

Publication in the German Federal Gazette: BAnz AT 26.03.2018 B8, chapter IV  
1<sup>st</sup> correction, UBA announcement dated 21 February 2018:

**1 Correction to the notification as regards Federal Environment Agency (UBA)  
notice of 13<sup>th</sup> July 2017 (BAnz AT 15.07.2017 B12, chapter II 14th notification)**

In the above-mentioned announcement concerning the measuring device OXITEC 5000+ of the company Enotec GmbH, the indicated probe lengths are incorrect and must read correctly as follows: In the configuration with the ATEX housing, the probe bears the designation KEX-500X (X = 1 [probe length 0.5 m] or X = 2 [probe length 1 m]).

Statement issued by TÜV Rheinland Energy GmbH dated December 8, 2017.

Publication in the German Federal Gazette: BAnz AT 22.07.2019 B8, chapter V  
2<sup>nd</sup> notification, UBA announcement dated 28 June 2019:

**2 Notification as regards Federal Environment Agency (UBA) notices  
of 22 February 2017 (BAnz AT 15.03.2017 B6, chapter II number 1.1) and  
of 13 July 2017 (BAnz AT 31.07.2017 B12, chapter II 14<sup>th</sup> notification)**

The current software version of the OXITEC 5000+ measuring system manufactured by ENOTEC GmbH is version 4.13.

The measuring system may also be equipped with the circuit board rev. 10.

Statement issued by TÜV Rheinland Energy GmbH dated 5 March 2019

Publication in the German Federal Gazette: BAnz AT 24.03.2020 B7, chapter IV  
23<sup>rd</sup> notification, UBA announcement dated 24 February 2020:

**23 Notification as regards Federal Environment Agency (UBA) notices of 22 February 2017 (BAnz AT 15.03.2017 B6, chapter II number 1.1) and of 28 June 2019 (BAnz AT 22.07.2019 B8, chapter V 2<sup>nd</sup> notification)**

The OXITEC 5000+ measuring system manufactured by ENOTEC GmbH may now be equipped with the new Rev. 10d display chip.

For the KES-2002 to KES-2005 probes, the distance between the spacers has been increased to ensure easier insertion in and removal of the probe tube from the protection tube.

Statement issued by TÜV Rheinland Energy GmbH dated 2 October 2019

Publication in the German Federal Gazette: BAnz AT 31.07.2020 B10, chapter II  
2<sup>nd</sup> notification, UBA announcement of 27 May 2020:

**2 Notification as regards Federal Environment Agency (UBA) notices of 22 February 2017 (BAnz AT 15.03.2017 B6, chapter II number 1.1) and of 24 February 2020 (BAnz AT 24.03.2020 B7, chapter IV, 23<sup>rd</sup> notification)**

The OXITEC 5000+ measuring system manufactured by ENOTEC GmbH may now be equipped with an additional displacer inside the filter head.

A bigger version of the outer tube of the filter head is available for improved thermal insulation.

Statement issued by TÜV Rheinland Energy GmbH dated 26 February 2020

Publication in the German Federal Gazette: BAnz AT 05.08.2021 B5, chapter IV  
31<sup>st</sup> notification, UBA announcement dated 29 June 2021:

**31 Notification as regards Federal Environment Agency (UBA) notices of 22 February 2017 (BAnz AT 15.03.2017 B6, chapter II number 1.1) and of 27 May 2020 (BAnz AT 31.07.2020 B10, chapter II 2<sup>nd</sup> notification)**

The OXITEC 5000+ measuring system manufactured by ENOTEC GmbH for the O<sub>2</sub> component can now also be used with a shortened feed-through pipe.

Statement issued by TÜV Rheinland Energy GmbH dated 22 February 2021



**Certified product**

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

The OXITEC 5000+ measuring system determines the oxygen content in exhaust gas. The measuring system consists of an in-situ probe which is mounted at the waste gas duct in the gas flow to be monitored. Furthermore, it comes with evaluation electronics (SME 5) for voltage and gas supply as well as signal processing. A pneumatic cable (FEP-0002) and a probe cable (FEP-0001) connect the measuring probe to the evaluation electronics (SME 5).

The probe consists of a cladding tube in which the zirconium dioxide probe – heated to 800 °C – is situated downstream of a sintered metal filter. A V-shaped plate protects the filter head from coarse contamination. For the purpose of measuring the O<sub>2</sub> concentration or for 1-point determination the OXITEC 5000+ requires reference air with 20.95 vol.-% O<sub>2</sub>. Instrument air from a gas bottle or compressed air may be used for this purpose. It is also possible to connect another reference gas with a different concentration for the purpose of 2-point adjustment. The 1-point adjustment should be carried out for the measuring system every three days; this can be pre-set in the menu. Regular drift checks in the maintenance interval need to be carried out as 2-point adjustments.

**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).

### **Document history**

Certification of the Oxitec 5000+ 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. 0000053804\_00: 25 April 2017  
Expiry date of the certificate: 14 March 2022  
Test report: 936/21228221/A of 04 October 2016  
TÜV Rheinland Energy GmbH  
Publication: BAnz AT 15.03.2017 B6, chapter II number 1.1  
UBA announcement dated 22 February 2017

#### **Notifications according to EN15267**

Statement issued by TÜV Rheinland Energy GmbH dated 10 March 2017  
Publication: BAnz AT 31.07.2017 B12, chapter II notification 14  
UBA announcement dated 13 July 2017  
(Design changes)

Statement issued by TÜV Rheinland Energy GmbH dated 08 December 2017  
Publication: BAnz AT 26.03.2018 B8, chapter IV correction 1  
UBA announcement dated 21 February 2018  
(Probe length correction)

Statement issued by TÜV Rheinland Energy GmbH dated 05 March 2019  
Publication: BAnz AT 22.07.2019 B8, chapter V notification 2  
UBA announcement dated 28 June 2019  
(Design and software changes)

Statement issued by TÜV Rheinland Energy GmbH dated 02 October 2019  
Publication: BAnz AT 24.03.2020 B7, chapter IV notification 23  
UBA announcement dated 24 February 2020  
(Hardware changes)

Statement issued by TÜV Rheinland Energy GmbH dated 26 February 2020  
Publication: BAnz AT 31.07.2020 B10, chapter II notification 2  
UBA announcement of 27 May 2020  
(Hardware changes)

Statement issued by TÜV Rheinland Energy GmbH dated 22 February 2021  
Publication: BAnz AT 05.08.2021 B5, chapter IV notification 31  
UBA announcement dated 29 June 2021  
(Design changes)

#### **Renewal of the certificate**

Certificate no. 0000053804\_01: 02 March 2022  
Expiry date of the certificate: 14 March 2027



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

#### Measuring system

Manufacturer	Enotec GmbH
AMS designation	Oxitec 5000+
Serial number of units under test	11549192SE / 11549292SE / 11631892SS
Measuring principle	Circonium dioxide

#### Test report

Test laboratory	936/21228221/A TÜV Rheinland
Date of report	2016-10-04

#### 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	0.19 Vol.-%
Sum of negative CS at zero point	0.00 Vol.-%
Sum of positive CS at span point	0.37 Vol.-%
Sum of negative CS at span point	0.00 Vol.-%
Maximum sum of cross-sensitivities	0.37 Vol.-%
Uncertainty of cross-sensitivity	$u_i$ 0.214 Vol.-%

#### Calculation of the combined standard uncertainty

##### Tested parameter

				$u^2$
Standard deviation from paired measurements under field conditions *	$u_D$	0.036 Vol.-%		0.001 (Vol.-%) <sup>2</sup>
Lack of fit	$u_{lof}$	0.058 Vol.-%		0.003 (Vol.-%) <sup>2</sup>
Zero drift from field test	$u_{d,z}$	0.029 Vol.-%		0.001 (Vol.-%) <sup>2</sup>
Span drift from field test	$u_{d,s}$	-0.023 Vol.-%		0.001 (Vol.-%) <sup>2</sup>
Influence of ambient temperature at span	$u_t$	0.138 Vol.-%		0.019 (Vol.-%) <sup>2</sup>
Influence of supply voltage	$u_v$	0.017 Vol.-%		0.000 (Vol.-%) <sup>2</sup>
Cross-sensitivity (interference)	$u_i$	0.214 Vol.-%		0.046 (Vol.-%) <sup>2</sup>
Influence of sample gas pressure	$u_b$	0.095 Vol.-%		0.009 (Vol.-%) <sup>2</sup>
Uncertainty of reference material at 70% of certification range	$u_{rm}$	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 ( $u_c$ )	$u_c = \sqrt{\sum (u_{max,i})^2}$	0.35 Vol.-%
Total expanded uncertainty	$U = u_c * k = u_c * 1.96$	0.68 Vol.-%

#### Relative total expanded uncertainty

Requirement of 2010/75/EU	<b>U in % of the range 25 Vol.-%</b>	<b>2.7</b>
Requirement of EN 15267-3	<b>U in % of the range 25 Vol.-%</b>	<b>10.0 **</b>
	<b>U in % of the range 25 Vol.-%</b>	<b>7.5</b>

\*\* The EU-directive 2010/75/EU on industrial emissions provides no requirements for this component.  
A value of 10.0 % was used for this.