

CERTIFICATE

of Product Conformity (QAL1)

Certificate No.: 0000085398_00

Certified AMS: TDLS8000-S2-A3 for NH₃ and H₂O

Manufacturer: Yokogawa Electric Corporation
2-9-32 Nakacho, Musashino-shi, Tokyo
180-8750 Tokyo
Japan

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 (2009), 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 7 pages).



Suitability Tested
EN 15267
QAL1 Certified
Regular
Surveillance

www.tuv.com
ID 0000085398

Publication in the German Federal Gazette
(BAnz) of 10 May 2024

German Environment Agency

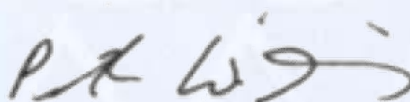
Dessau, 12 June 2024

This certificate will expire on:
9 May 2029

TÜV Rheinland Energy &
Environment GmbH
Cologne, 11 June 2024



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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:	EuL/21232630/B dated 16 August 2023
Initial certification:	10. May 2024
Expiry date:	9 May 2029
Publication:	BAnz AT 10.05.2024 B7, chapter I No. 4.1

Approved application

The tested AMS is suitable for use at plants according to Directive 2010/75/EC, chapter III (combustion plants / 13th BImSchV:2021), chapter IV (waste incineration plants / 17th BImSchV:2021), Directive 2015/2193/EC (44th BImSchV:2022), TA Luft:2021, 30th BImSchV:2019 and 27th BImSchV:2013. 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 seven 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 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 EuL/21232630/B dated 16 August 2023 of 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 10.05.2024 B7, chapter I No. 4.1,
Announcement by UBA dated 19 March 2024:

AMS designation:

TDLS8000-S2-A3 for NH₃ and H₂O

Manufacturer:

Yokogawa Electric Corporation, Tokyo, Japan

Field of application:

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

Measuring ranges during the performance test:

Component	Certification range	supplementary measuring ranges	Unit
NH ₃	0 - 25*	0 - 50*	mg/m ³
H ₂ O	0 - 30*	0 - 40*	Vol.-%

* based on a measuring path length of 1.0 m

Software version:

R2.02.01.A04

Restrictions:

none

Notes:

1. The maintenance interval is three months.
2. The performance test was carried out with the system variant TDLS8000-S2-A3-D8-A1-J-N/SCT. The performance-tested version of the measuring system can be identified on the name plate by the suffix code starting with TDLS8000-S2-A3.

Test institute:

TÜV Rheinland Energy GmbH, Cologne
Report No.: EuL/21232630/B dated 16 August 2023

Certified product

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

The measuring system TDLS8000-S2-A3 tested here consists of the laser unit (LU - transmitter unit) and the sensor control unit (SCU - receiver unit), each with a purge line for the optics and the process window. The purge gas, usually instrument air, is controlled to a specific flow rate by a flow meter. In addition, external pressure and temperature sensors are located on the measuring system for calculation purposes.

For the test gas tasks during the laboratory and field test, a heatable flow cell with a measuring distance of 1.0 m was used. This is temperature controlled.

To maintain the temperature stability of the laser and sensor unit, heat jackets were installed on the device. For the test gas task during the field test, additional fan units were also installed on the flow cell.

The measuring system tested here consists of

- Laser unit LU (transmitter unit)
- Sensor control unit SCU (receiver unit)
- Heated flow cell with control unit (temperature approx. 180 °C)
- Flow meter
- External pressure and temperature sensor
- Fans and heat sleeves
- Operating software YH8000

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 TDLS8000-S2-A3 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. 0000085398_00: 12 June 2024

Expiry date of the certificate: 9 May 2029

Test report: EuL/21232630/B dated 16 August 2023

TÜV Rheinland Energy GmbH

Publication: BANz AT 10.05.2024 B7, chapter I number 4.1

UBA announcement dated 19 March 2024

Berechnung der Gesamtunsicherheit nach DIN EN 14181 und DIN EN 15267-3

Messeinrichtung

Hersteller	Yokogawa Europe B.V.
Bezeichnung der Messeinrichtung	TDLS8000-S2-A3
Seriennummer der Prüflinge	U1S301788 / U1S301789
Messprinzip	Infrarot Laser Spektroskopie

Prüfbericht

Prüfinstitut	EuL/21232630/B
Berichtsdatum	TÜV Rheinland
	16.08.2023

Messkomponente

Zertifizierungsbereich ZB	H2O	0 - 30 Vol.-%
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Bewertung der Querempfindlichkeiten (QE)

(System mit größter QE)

Summe positive QE am Null-Punkt	0,00	Vol.-%
Summe negative QE am Null-Punkt	0,00	Vol.-%
Summe positive QE am Ref.-Punkt	0,14	Vol.-%
Summe negative QE am Ref.-Punkt	-0,25	Vol.-%
Maximale Summe von Querempfindlichkeiten	-0,25	Vol.-%
Messunsicherheit der Querempfindlichkeit	u_i	-0,144 Vol.-%

Berechnung der erweiterten Messunsicherheit

Prüfgröße

			u^2
Standardabweichung aus Doppelbestimmungen *	u_D	0,280 Vol.-%	0,078 (Vol.-%) ²
Linearität / Lack-of-fit	u_{lof}	0,116 Vol.-%	0,013 (Vol.-%) ²
Nullpunktdrift aus Feldtest	$u_{d,z}$	0,191 Vol.-%	0,036 (Vol.-%) ²
Referenzpunktdrift aus Feldtest	$u_{d,s}$	-0,485 Vol.-%	0,235 (Vol.-%) ²
Einfluss der Umgebungstemperatur am Referenzpunkt	u_t	0,823 Vol.-%	0,677 (Vol.-%) ²
Einfluss der Netzspannung	u_v	0,081 Vol.-%	0,007 (Vol.-%) ²
Querempfindlichkeit	u_i	-0,144 Vol.-%	0,021 (Vol.-%) ²
Einfluss des Probengasdruck	u_p	0,202 Vol.-%	0,041 (Vol.-%) ²
Einfluss des Probengasvolumenstrom	u_b	0,000 Vol.-%	0,000 (Vol.-%) ²
Unsicherheit des Referenzmaterials bei 70% des ZB	u_{rm}	0,242 Vol.-%	0,059 (Vol.-%) ²
Auswanderung des Messstrahles	u_{mb}	0,000 Vol.-%	0,000 (Vol.-%) ²
Konverterwirkungsgrad für AMS zur Messung von NOx	u_{ce}	0,000 Vol.-%	0,000 (Vol.-%) ²
Änderung der Responsefaktoren (TOC)	u_{rf}	0,000 Vol.-%	0,000 (Vol.-%) ²

* Der größere der Werte wird verwendet:

"Wiederholstandardabweichung am Referenzpunkt" oder
"Standardabweichung aus Doppelbestimmungen"

Kombinierte Standardunsicherheit (u_c)

$$u_c = \sqrt{\sum (u_{max,i})^2}$$

1,08 Vol.-%

Erweiterte Unsicherheit

$$U = u_c \cdot k = u_c \cdot 1,96$$

2,12 Vol.-%

Relative erweiterte Messunsicherheit

U in % vom Messbereich 30 Vol.-% **7,1**

Anforderung nach 2010/75/EU

U in % vom Messbereich 30 Vol.-% **10,0 ****

Anforderung nach DIN EN 15267-3

U in % vom Messbereich 30 Vol.-% **7,5**

** Für diese Komponente sind keine Anforderungen in der EU-Richtlinie 2010/75/EU über Industrieemissionen enthalten.
Es wurde ein Wert von 10,0 % herangezogen.

Berechnung der Gesamtunsicherheit nach DIN EN 14181 und DIN EN 15267-3

Messeinrichtung

Hersteller	Yokogawa Europe B.V.
Bezeichnung der Messeinrichtung	TDLS8000-S2-A3
Seriennummer der Prüflinge	U1S301788 / U1S301789
Messprinzip	Infrarot Laser Spektroskopie

Prüfbericht

Prüfinstitut	EuL/21232630/B
Berichtsdatum	TÜV Rheinland
	16.08.2023

Messkomponente

Zertifizierungsbereich ZB	NH ₃	0 - 25 mg/m ³
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Bewertung der Querempfindlichkeiten (QE)

(System mit größter QE)

Summe positive QE am Null-Punkt	0,00 mg/m ³
Summe negative QE am Null-Punkt	0,00 mg/m ³
Summe positive QE am Ref.-Punkt	0,58 mg/m ³
Summe negative QE am Ref.-Punkt	-0,16 mg/m ³
Maximale Summe von Querempfindlichkeiten	0,58 mg/m ³
Messunsicherheit der Querempfindlichkeit	u _i 0,335 mg/m ³

Berechnung der erweiterten Messunsicherheit

Prüfgröße

		u ²	
Wiederholstandardabweichung am Referenzpunkt *	u _r 0,200 mg/m ³	0,040	(mg/m ³) ²
Linearität / Lack-of-fit	u _{lof} -0,260 mg/m ³	0,068	(mg/m ³) ²
Nullpunktdrift aus Feldtest	u _{d,z} 0,260 mg/m ³	0,068	(mg/m ³) ²
Referenzpunktdrift aus Feldtest	u _{d,s} -0,346 mg/m ³	0,120	(mg/m ³) ²
Einfluss der Umgebungstemperatur am Referenzpunkt	u _t 0,461 mg/m ³	0,213	(mg/m ³) ²
Einfluss der Netzspannung	u _v 0,123 mg/m ³	0,015	(mg/m ³) ²
Querempfindlichkeit	u _i 0,335 mg/m ³	0,112	(mg/m ³) ²
Einfluss des Probengasdruck	u _p 0,320 mg/m ³	0,102	(mg/m ³) ²
Unsicherheit des Referenzmaterials bei 70% des ZB	u _{rm} 0,202 mg/m ³	0,041	(mg/m ³) ²

* Der größere der Werte wird verwendet:

"Wiederholstandardabweichung am Referenzpunkt" oder
"Standardabweichung aus Doppelbestimmungen"

Kombinierte Standardunsicherheit (u_c)

$$u_c = \sqrt{\sum (u_{\max, j})^2} \quad 0,88 \text{ mg/m}^3$$

Erweiterte Unsicherheit

$$U = u_c * k = u_c * 1,96 \quad 1,73 \text{ mg/m}^3$$

Relative erweiterte Messunsicherheit

Anforderung nach 2010/75/EU

Anforderung nach DIN EN 15267-3

U in % vom Grenzwert 10 mg/m³ 17,3

U in % vom Grenzwert 10 mg/m³ 40,0

U in % vom Grenzwert 10 mg/m³ 30,0