PRODUCT CONFORMITY CERTIFICATE

This is to certify that the

LDS 6 Ammonia Analyser

Manufactured by:

Siemens AG

DE - 76181
Karlsruhe,
Germany

has been assessed by CSA Group
and for the conditions stated on this certificate complies with:

Environment Agency Guidance
"MCERTS for stack emissions monitoring equipment at industrial installations"
- Continuous emissions monitoring systems(CEMS)
Published 20 October 2020
EN 15267-1:2009, EN15267-2:2009, EN 15267-3:2007
& QAL 1 as defined in EN 14181: 2014

Certification ranges:

NH_3	0 to 20 mg/m^3	(0 to 25 mg/m^3*m)
	0 to 76 mg/m^3	(0 to 95 mg/m^3*m)
	0 to 380 mg/m^3	(0 to 475 mg/m^3*m)
H_2O	0 to 30 %vol.	(0 to 37.5 %vol.*m)
	0 to 40 %vol.	(0 to 50 %vol.*m)

*Valid for a path length of 1.25m or higher

Project number:	80103832
Certificate number:	Sira MC060088/09
Initial certification:	26 November 2006
This certificate issued:	22 November 2021
Renewal date:	25 November 2026

Andrew Young
Environmental Team Manager

MCERTS is operated on behalf of the Environment Agency by

CSA Group Testing UK Ltd
Unit 6, Hawarden Industrial Park
Hawarden, Deeside, CH5 3US
Tel: +44 (0)1244 670 900

Form 1335
Issue 10

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Approved Site Application

Any potential user should ensure, in consultation with the manufacturer, that the monitoring system is suitable for the intended application. For general guidance on monitoring techniques refer to the Environment Agency Monitoring Technical Guidance Notes available at www.mcerts.net

This instrument is considered suitable for use on waste incineration and large combustion plants. This CEMS has been proven suitable for its measuring task (parameter and composition of the flue gas) by use of the QAL 1 procedure specified in EN14181. The lowest certified range for each determinand shall not be more than 1.5 times the daily average emission limit value (ELV) for incineration plants, and not more than 2.5 times the ELV for other types of applications.

Basis of Certification

This certification is based on the following Test Report(s) and on Sira's assessment and ongoing surveillance of the product and the manufacturing process:

TÜV SÜD Industrie Service GmbH	Report Number 751376 dated January 2005
TÜV SÜD Industrie Service GmbH	Report Number 819683 dated February 2008
TÜV SÜD Industrie Service GmbH	Report Number 840754-E2 dated January 2009
TÜV SÜD Industrie Service GmbH	Report Number 1701628.10 dated October 2012

Product Certified

The LDS 6 Ammonia measuring system consists of the following parts:

- Central Unit: 7MB6121-xCT0x-0xxx (NH3)
  7MB6121-xDT0x-0xxx (NH3 & H2O)
  7MB6121-xMT0x-0xxx (H2O)
- Sensor CD 6: 7MB6122-xWxxx-xxxx
- Hybrid cable and sensor connecting cable (Loop cable)
- Calibration Verification Kit (RC3009)

This certificate applies to all instruments fitted with software version R19 onwards (serial number N1V1100070 onwards). For compliance with EN 15267-3, software version R25 onwards.

Certified Performance

The instrument was evaluated for use under the following conditions:

Ambient Temperature Range:	Sensor unit	-20ºC to +50ºC
	Control unit	+5ºC to +40ºC
Instrument IP rating:	Sensor unit	IP65
	Control unit	IP20 (Note)

Note: The protection provided by the central unit is only IP 20. If the operating conditions require a higher class the central unit shall be incorporated into an analysis cabinet with the relevant protection class (IP 40 for EN 15267-3).

Results are expressed as % of the certification range NH_3 0 to 20 mg/m^3 or H_2O 0 to 30 %$^{vol.}$, unless otherwise stated.

Test	Results expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Response time						
NH_3					<3 secs	<200s
H_2O					< 3 secs	<200s
Repeatability standard deviation at zero point						
NH_3			1.1			<2.0%
H_2O	0.3					<2.0%
Repeatability standard deviation at reference point						
NH_3		0.9				<2.0%
H_2O		0.5				<2.0%
Lack-of-fit						
NH_3 (0 to 20 mg/m^3)		0.98				<2.0%
NH_3 (0 to 100 ppm)		0.56				<2.0%
NH_3 (0 to 500 ppm)			1.09			<2.0%
H_2O (0 to 30%vol.)		-0.71				<2.0%
H_2O (0 to 40%vol.)		0.57				<2.0%
Influence of ambient temperature zero point						
Control unit (+5 to +40°C)						
NH_3		-0.7				<5.0%
H_2O		-0.5				<5.0%
Sensor unit (-20 to +50°C)						
NH_3				-3.7		<5.0%
H_2O			-1.0			<5.0%

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Test	Results expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Influence of ambient temperature reference point						
Control unit (+5 to +40°C)						
NH_3			-1.2			<5.0%
H_2O			-1.0			<5.0%
Sensor unit (-20 to +50°C)						
NH_3				-3.0		<5.0%
H_2O			-1.0			<5.0%
Influence of sample gas pressure (94.7 to 102.2 kPa)						
NH_3			-1.2			<2.0%
H_2O		-0.9				<2.0%
Influence of voltage variations (190 to 253V)						<2.0%
NH_3		0.7				<2.0%
H_2O			-1.0			<2.0%
Influence of vibration (10 to 60Hz (±0.3mm), 60 to 160Hz at 2g)						
NH_3		-0.8				<2.0%
H_2O		0.7				<2.0%
Cross-sensitivity at zero with interferents: O_2, H_2O, CO, CO_2, CH_4, N_2O, NO, NO_2, NH_3, SO_2, HCl					Note 1	
NH_3 (0 to 20 mg/m^3)				2.0		<4.0%
H_2O (0 to 30%$^{vol.}$)	<0.5					<4.0%
Cross-sensitivity at reference with interferents: O_2, H_2O, CO, CO_2, CH_4, N_2O, NO, NO_2, NH_3, SO_2, HCl					Note 1	
NH_3 (0 to 20 mg/m^3)				-3.6		<4.0%
H_2O (0 to 30%$^{vol.}$)			1.2			<4.0%
Measurement uncertainty					Guidance - at least 25% below max permissible uncertainty	
NH_3					19.7%	<40% (30%)
H_2O					8.7%	<30% (22.5%)

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Test	Results expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Calibration function (field)						
NH_3					0.95-0.99	>0.90
H_2O					0.98-0.99	>0.90
Response time (field)						
NH_3					< 3 secs	<200s
H_2O					< 3 secs	<200s
Lack of fit (field)						
NH_3			-1.98			<2.0%
H_2O			-0.72			<2.0%
Maintenance interval					Note 2 Note 3	>8 days
Zero and Span drift requirement	The AMS performs a permanent check on zero and reference point. The consistency of the reference value is monitored by comparing it to the original value and is confirmed through proof of drift behaviour for the entire test period (without re-alignment of zero and reference point). Deviations in zero point and reference point checks are continuously monitored and when they exceed the defined limits will register with a disruption report to the status contact. When they exceed the system internal limits the system must be checked or re-adjusted.					Clause 6.13 & 10.13 Manufacturer shall provide a description of the technique to determine and compensate for zero and span drift.
Change in zero point over maintenance interval						
NH_3				-2.5		<3.0%
H_2O			1.2			<3.0%
Change in reference point over maintenance interval						
NH_3				-2.23		<3.0%
H_2O				-2.93		<3.0%
Availability					96.2%	>95%
Reproducibility						
NH_3				3.2		<3.3%
H_2O				1.3		<3.3%

Note 1: Due to the chemical reaction of the cross-sensitivity component NH_3 the presentation of cross-sensitivity at span point was not possible.

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Note 2: There is an interval of 2 weeks for a check of alignment and contamination of optical surfaces. Zero and span point drift for NH_3 and H_2O should be checked every 9 months using Calibration Verification Kit.

Note 3: General notes on use of LDS NH_3 analyser:

- Parameters to compensate for cross-sensitivity of NH_3 measurements with O_2 and CO_2 will have to be adjusted appropriately for the instrument.
- When using the RC 3009 calibration kit, the dynamic moisture compensation will have to be deactivated.
- The analyser has to be operated with an air purging kit.
- Information on sample gas pressure and temperature will have to be provided to the instrument. Information ca be provided as a 4-20 mA analogue signal or, if conditions are fairly stable, as a fixed parameter.
- The alarm threshold for relative transmission, when interference is reported due to contamination or re-alignment of the sensor heads, should be set at least at 85% (transmission disturbance can indicate re-adjustment).

Description

The LDS 6 is a system for on-line in-situ analysis providing continuous presentation of real-time measurements. The gas concentration is measured using single line absorption spectroscopy. Cross sensitivities to other gases are eliminated in the measurements due to the frequency purity of the laser enabling selective detection of individual absorption lines.

The LDS 6 consists of a sensor pair (measuring heads) and a central unit interconnected using optical fibre cables. The light source is a diode laser with a wavelength that can be tuned within a narrow spectral range. An optical fibre guides the light from the central unit to the sensor, where it is directed into the measuring section. The laser beam passes through the gas in the measuring section and is partially absorbed there. The light attenuated in this way is detected by the receiver and is returned to the central unit. The variation in the intensity of the laser light in the vicinity of the absorption line is measured, and the concentration of the gas being measured is calculated using the second harmonic of the detected signal. The LDS 6 can measure at three locations simultaneously. Each measurement point needs a receiver board in the central unit as well as a sensor with cabling. The gas concentration is indicated on the numerical display and given as an analogue 4-20 mA output.

General Notes

1. This certificate is based upon the equipment tested. The Manufacturer is responsible for ensuring that on-going production complies with the standard(s) and performance criteria defined in this certificate. 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 system shall be subject to regular surveillance according to 'Regulations Applicable to the Holders of CSA Group Testing UK Ltd Certificates'.

2. The design of the product certified is held and maintained by TUV Rheinland for certificate No. Sira MC060088/09.

3. If a certified product is found not to comply, CSA Group should be notified immediately at the address shown on this certificate.

4. The certification marks that can be applied to the product or used in publicity material are defined in 'Regulations Applicable to the Holders of CSA Group Testing UK Ltd Certificates'.

5. This document remains the property of CSA Group and shall be returned when requested by CSA Group.

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