

PRODUCT CONFORMITY CERTIFICATE

This is to certify that the

LDS 6 HCl Analyser

Manufactured by:

Siemens AG

De-76181
Karlsruhe,
Germany

Has been assessed by Sira Certification Service
And for the conditions stated on this certificate complies with:

**MCERTS Performance Standards for Continuous Emission
Monitoring Systems, Version 3.5 dated June 2016
EN15267-3:2007,
& QAL 1 as defined in EN 14181: 2014**

Certification Ranges*:

HCl	0 to 15 mg/m ³	(0 to 30 mg/m ³ *m)
	0 to 90 mg/m ³	(0 to 180 mg/m ³ *m)
H ₂ O	0 to 30 %vol.	(0 to 37.5 %vol.*m)

*Note: The HCl range is only valid for a path length from 2.0m or higher.
The H₂O range is only valid for a path length from 1.25m or higher.

Project No.: 16A26522
Certificate No: Sira MC 080118/06
Initial Certification: 29 November 2006
This Certificate Issued: 6 November 2017
Renewal Date: 28 November 2021

Emily Alexander
Deputy Certification
Manager

MCERTS is operated on behalf of the Environment Agency by

Sira Certification Service

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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

On the basis of the assessment and the ranges required for compliance with EU Directives this instrument is considered suitable for use on waste incineration and large coal-fired combustion plant applications. This CEM 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, for IED Chapter III and IED Chapter IV applications for the ranges specified. The lowest certified range for each determinand shall not be more than 1.5X the daily average emission limit value (ELV) for IED Chapter IV applications, and not more than 2.5X the ELV for IED Chapter III and other types of application.

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 840754 dated August 2007
TÜV SÜD Industrie Service GmbH	Report Number 840754-E2 dated January 2009
TÜV SÜD Industrie Service GmbH	Report Number 1701628.20 dated October 2012

Product Certified

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

- Central Unit: 7MB6121-xETxx-0xxx (HCl);
7MB6121-xFTxx-0xxx (HCl & H₂O)
- Sensor CD 6: 7MB6122-xWxxx-xxxx
- Hybrid cable and sensor connecting cable (Loop cable)
- Calibration Verification Kit (RC 3009) (Option)

This certificate applies to all instruments fitted with software version R19 onwards (serial number NRN/TN000027 onwards). For compliance with EN 15267-3, software version must be R25 onwards.

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Certified Performance

The instrument was evaluated for use under the following conditions:

Ambient Temperature Range:	Sensor unit	-20°C to +50°C
	Control unit	+5°C to +40°C
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 HCl 0 to 15 mg/m³ or H₂O 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						
HCl					<3 secs	<200s
H ₂ O					< 3 secs	<200s
Repeatability standard deviation at zero point						
HCl	0.1					<2.0%
H ₂ O	0.2					<2.0%
Repeatability standard deviation at reference point						
HCl		0.6				<2.0%
H ₂ O	0.3					<2.0%
Lack-of-fit						
HCl (0 to 15 mg/m ³)			-1.0			<2.0%
HCl (0 to 90 mg/m ³)		-0.9				<2.0%
H ₂ O (0 to 30%vol.)		-0.5				<2.0%
Influence of ambient temperature zero point						
Control unit (+5 to +40°C)						
HCl			-1.2			<5.0%
H ₂ O	-0.2					<5.0%
Sensor unit (-20 to +50°C)						
HCl				-3.3		<5.0%
H ₂ O				2.1		<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)						
HCl			-1.8			<5.0%
H ₂ O	0.5					<5.0%
Sensor unit (-20 to +50°C)						
HCl		-0.9				<5.0%
H ₂ O			-1.6			<5.0%
Influence of sample gas pressure (95.4 to 101.5 kPa)						
HCl			-1.3			<2.0%
H ₂ O	-0.4					<2.0%
Influence of voltage variations (195.5 to 253V)						<2.0%
HCl		-0.6				<2.0%
H ₂ O	0.4					<2.0%
Influence of vibration (10 to 60Hz (±0.3mm), 60 to 160Hz at 2g)						To be reported
HCl		-0.7				<2.0%
H ₂ O		0.5				<2.0%
Cross-sensitivity at zero with interferents: O ₂ , H ₂ O, CO, CO ₂ , CH ₄ , N ₂ O, NO, NO ₂ , NH ₃ , SO ₂ , HCl					Note 1	
HCl	<0.5					<4.0%
H ₂ O			1.7			<4.0%
Cross-sensitivity at reference with interferents: O ₂ , H ₂ O, CO, CO ₂ , CH ₄ , N ₂ O, NO, NO ₂ , NH ₃ , SO ₂ , HCl					Note 1 Note 2	
HCl				-3.9		<4.0%
H ₂ O				3.7		<4.0%
Measurement uncertainty					Guidance - at least 25% below max permissible uncertainty	
HCl					13.4%	<40% (30%)
H ₂ O					9.4%	<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)					Note 3	
HCl					0.76-0.98	>0.90
H ₂ O					0.48-0.64	>0.90
Response time (field)						
HCl					< 3 secs	<200s
H ₂ O					< 3 secs	<200s
Lack of fit (field)						
HCl			-1.98			<2.0%
H ₂ O			-0.78			<2.0%
Maintenance interval					Note 4 Note 5	>8 days
Zero and Span drift requirement	<p>Deviations in zero point and reference point checks are continuously monitored and when they exceed the defined limits they are registered with a disruption report to the status contact. When they exceed the system internal limits the system must be checked or re-adjusted.</p>					<p>Clause 6.13 & 10.13</p> <p>Manufacturer shall provide a description of the technique to determine and compensate for zero and span drift.</p>
Change in zero point over maintenance interval						
HCl				-3.0		<3.0%
H ₂ O			1.3			<3.0%
Change in reference point over maintenance interval						
HCl				2.7		<3.0%
H ₂ O				2.3		<3.0%
Availability					99.5%	>95%
Reproducibility						
HCl				3.1		<3.3%
H ₂ O				2.1		<3.3%

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

Note 2: In the HCl and H₂O measurement, at a methane concentration above 15 mg/m³, the sum of negative influences on interferences (cross sensitivity) exceeds 4% in the measurement range end value.

Note 3: Does not meet the requirements of EN 15267-3. This was due to clustered results rather than the performance of the instrument. Variability tests were passed.

Note 4: There is an interval of 2 weeks for a check of alignment and contamination of optical surfaces. Zero and span point drift for HCl and H₂O should be checked every 12 months using Calibration Verification Kit.

Note 5: General notes on use of LDS HCl analyser:

- The AMS must be operated with air purging.
- The AMS shall be provided with the value of the temperature and pressure of the measured gas either as an analogue signal 4-20 mA or set as a fixed value if there are very stable conditions.
- 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 75 % (transmission disturbance can suggest re-adjustment).

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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 Sira Certificates'. The design of the product certified is defined in the Sira Design Schedule for certificate No. Sira MC080118/04.
2. If certified product is found not to comply, Sira Certification Service should be notified immediately at the address shown on this certificate.
3. The Certification Marks that can be applied to the product or used in publicity material are defined in 'Regulations Applicable to the Holders of Sira Certificates'.
4. This document remains the property of Sira and shall be returned when requested by the company.

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