

PRODUCT CONFORMITY CERTIFICATE

This is to certify that the

Eco Physics CLD 82Mh & 822Mh chemiluminescence NO/NOx analyser

Manufactured by:

Eco Physics AG

Bubikonerstrasse 45
8635 Duernten
Switzerland

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 (CEMS) and T-CEMS, Version 4 dated July 2018
EN15267-3:2007,
& QAL 1 as defined in EN 14181: 2014**

Certification Ranges :

NO/NOx 0 to 90mg/m³ to 0 to 200 mg/m³

Project No. : 674/0300 /70212656
Certificate No : Sira MC060139/03
Initial Certification : 09 January 2009
This Certificate issued : 16 January 2019
Renewal Date : 08 January 2024

Emily Alexander
Environmental Project Engineer

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.

The field test was performed on waste incinerator application for 3 months.

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:

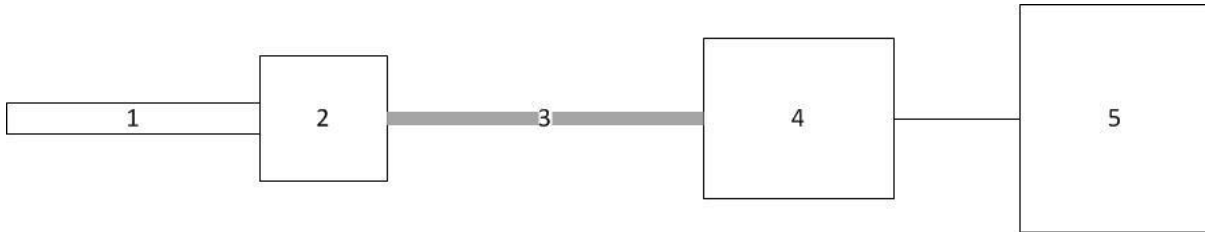
TÜV Süd Report Number: 555720 dated December 2005

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Product Certified

The CLD 82Mh & 822Mh measuring system consists of the following parts:



1. Sample Probe	2. Heated Filter	3. Heated Sample Line	4. Gas Conditioning	5. Analyser
Model: ABB sample probe with heated ceramic filter	Model: N/A – Heated filter is part of ABB sample probe	Model: Winkler Heated line PTFE Length: 20m	Model: M&C Gas Cooler ECM2	Model: CLD 822 M / CLD 82 M

Allowable variations could include:

- A different brand or model of sampling system of the same type, provided that there is evidence the alternative system works with similar types of CEM.
- Additional manifolds and heated valves used to allow more than one analyser to share a sampling system.
- ABB sample probe with ceramic filter
- Heated line Winkler 20m, PTFE ID 4mm
- M&C Gas Cooler, ECM2, regulated at 50C with condensate pump
- Neuberger Pump (Vacuubrand MD1 Vario)

This certificate applies to all instruments fitted with software version CLD8XXV1.32 (serial number 82Mh 0463 onwards and 822Mh 0392 onwards).

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Certified Performance

The instrument was evaluated for use under the following conditions:

Ambient Temperature Range: +5°C to +40°C
Instrument IP rating: IP21

Note: The requirement for the protection class of the enclosure is not fulfilled. For outdoor installations the analyser needs to be mounted into an IP65 environment. If the instrument is supplied with an enclosure, then the ambient temperature shall be monitored inside the enclosure to ensure that it stays within the above ambient temperature range.

Results are expressed as error % of certification range, unless otherwise stated.

Test	Results expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Response time					<u>Note 1</u>	
NO (CLD 822 Mh)					158s	<200s
NO (CLD 82 Mh)					140s	<200s
Repeatability standard deviation at zero point					<u>Note 2</u>	
NO (CLD 822 Mh)	0.18					<2.0%
NO _x (CLD 822 Mh)	0.20					<2.0%
NO _x (CLD 82 Mh)	0.22					<2.0%
Repeatability standard deviation at reference point					<u>Note 2</u>	
NO (CLD 822 Mh)	0.30					<2.0%
NO _x (CLD 822 Mh)	0.0					<2.0%
NO (CLD 82 Mh)	0.0					<2.0%
NO _x (CLD 82 Mh)	0.0					<2.0%
Lack-of-fit						
NO (CLD 822 Mh)		0.70				<2.0%
NO _x (CLD 822 Mh)		0.80				<2.0%
NO/NO _x (CLD 82 Mh)		0.50				<2.0%

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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 zero point						
NO (CLD 822 Mh)				2.0		<5.0%
NO _x (CLD 822 Mh)				4.0		<5.0%
NO _x (CLD 82 Mh)			-1.0			<5.0%
Influence of ambient temperature reference point						
NO (CLD 822 Mh)				3.5		<5.0%
NO _x (CLD 822 Mh)				4.5		<5.0%
NO _x (CLD 82 Mh)				-3.8		<5.0%
Influence of sample gas flow for extractive CEMS					<u>Note 3</u>	<2.0%
Influence of voltage variations 190 to 250V						
NO (CLD 822 Mh)	-0.30					<2.0%
NO _x (CLD 822 Mh)	-0.40					<2.0%
NO _x (CLD 82 Mh)	-0.20					<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						
NO _x (CLD 822 Mh)	-0.13					<4.0%
NO _x (CLD 82 Mh)	-0.13					<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						
NO _x (CLD 822 Mh)				-2.7		<4.0%
NO _x (CLD 82 Mh)				-2.6		<4.0%
Converter Efficiency					96.9%	>95%

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Test	Results expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Measurement uncertainty NO _x (For and ELV of 33 mg/m ³)					Guidance - at least 25% below max permissible uncertainty <u>Note 4</u> 19%	<15% (20%)
Calibration function (field) NO NO _x					0.99 0.99	>0.90 >0.90
Response time (field) CLD 822 Mh CLD 82 Mh					158s 140s	<200s <200s
Lack of fit (field) NO/NO _x (CLD 822 Mh) NO _x (CLD 82 Mh)					<u>Note 5</u> 158s 140s	<2.0% <2.0%
Maintenance interval					3 weeks	>8 days
Zero and Span drift requirement	Zero and Span gas are introduced into the analyser via the sample port; Zero and Span functions can be initiated locally at the analyser, automatically by the analyser or externally triggered. On each function the standardising gas now flowing is compared to the locally set value within the analyser and a correction to the analysers zero or span point is made. The analyser does not log these events; however the analogue output is not held at last reading and will reflect the Zero and Span values.				Clause 6.13 & 10.13 Manufacturer shall provide a description of the technique to determine and compensate for zero and span drift.	

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Test	Results expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Change in zero point over maintenance interval						
NO (CLD 822 Mh)			1.0			<3.0%
NOx (CLD 822 Mh)		0.90				<3.0%
NOx (CLD 82 Mh)		0.80				<3.0%
Change in reference point over maintenance interval						
NO (CLD 822 Mh)				3.0		<3.0%
NOx (CLD 822 Mh)				-2.7		<3.0%
NO (CLD 82 Mh)				2.9		<3.0%
Availability					98.7%	>95%
Reproducibility						
NO (CLD 822 Mh)			1.6			<3.3%
NOx (CLD 822 Mh)			1.4			<3.3%
NO (CLD 82 Mh)				2.2		<3.3%

Note 1: Response time data taken from the field trial.

Note 2: Result taken from one measurement instead of 20 repeat measurements as stated in the MCERTS standard.

Note 3: No influence was observed when tested at zero, but a significant effect on the upper reference point readings was observed. However, the measuring system has a status signal to show if the flow rate deviates from the setting.

Note 4: The measurement uncertainty results for NOx meet the requirements of EN14181 (20% of ELV for NOx), but do not meet the recommendations of EN15267-3 (15% of ELV for NOx).

Note 5: Test data derived from calibration function test.

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Description

Chemiluminescent detection is an extremely selective and robust method for the precise accurate measurement of Nitrogen Oxides. This technique is inherently linear and demonstrates excellent reproducibility over a wide concentration range.

Regardless of the range or application the principle of measurement is the same, NO is reacted with Ozone producing O₂ and NO₂* in an electrically excited state, a further almost instantaneous reaction reverts the excited NO₂* to the ground state, this is the chemiluminescent reaction that produces light detected by the photo multiplier. For optimum results the continuous sample and ozone reaction is managed under vacuum and flow within a temperature controlled chamber.

Eco Physics CLD analysers are compact rack mounted or bench standing units that do not require Oxygen for the production of Ozone, or in many cases additional sample pumps. They are designed to cope with clean hot samples from a heated sample line or for inclusion in a system after sample conditioning. They are IP 21 rated for internal or protected environments. A full range of options adds to the adaptability of the analyser, ensuring that it can be upgraded to match your changing needs.

The CLD 82Mh is a single reaction chamber with an internal change over solenoid valve, the display will report NO or NO_x continuously with a single output for each.

The CLD 822Mh is a dual reaction chamber analyser that will display NO, NO_x and NO₂ with a simultaneous and continuous output for each.

Both will draw fresh air for zero, and use a wide range of NO values for setting span. Calibration can be initiated automatically by the analyser, manually at the analyser or remotely initiated via RS232 or digital input. External software or the digital output will be required to log these events.

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 V00 for certificate No. Sira MC090139/00
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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