

PRODUCT CONFORMITY CERTIFICATE

This is to certify that the

**FGA950E, FGA950, FGA940E, FGA940, FGA930E, FGA930,
FGA900E, & FGA900 Flue Gas Analyser**

Manufactured by:

Land Instruments International Ltd

Stubley Lane
Dronfield
Derbyshire
S18 1DJ
England

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

Certification Ranges :

CO	0 to 150mg/m ³	to	0 to 2500 mg/m ³
NO	0 to 200 mg/m ³	to	0 to 1500 mg/m ³
O ₂	0 to 12 %Vol	to	0 to 25 % Vol

Project No. : 16A0372B/ 70213150
Certificate No : Sira MC040019/07
Initial Certification : 16 February 2004
This Certificate issued : 15 February 2019
Renewal Date : 15 February 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. However, see Note 1 regarding the measurement of CO on WID 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 LCPD and WID 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 WID applications, and not more than 2.5X the ELV for LCPD 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:

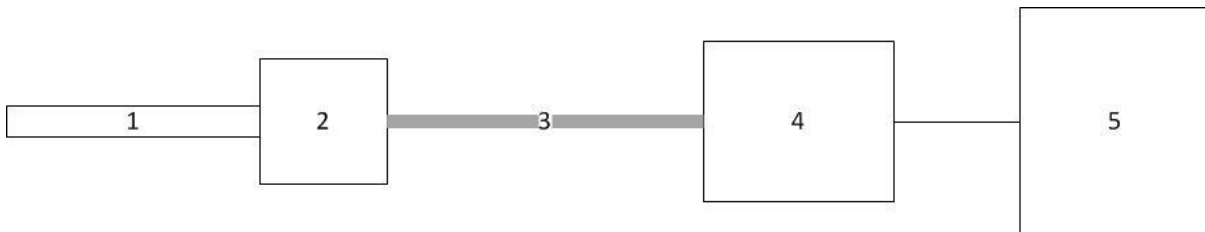
TÜV Rheinland	Report Number: 936/808003/A dated 14.08.1998
TÜV Rheinland	Report Number: 936/21216419/B dated 10.08.2011

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Product Certified

The measuring system consists of the following parts:



1. Sample Probe	2. Heated Filter	3. Heated Sample Line	4. Gas Conditioning	5. Analyser
Model: M&C Heated Probe	Model: SP-2000-H/R	Model: PTFE sample line, either unheated or freeze-protected Length:15m	Model: Integrated with analyser	Model: FGA950E, FGA950, FGA940E, FGA940, FGA930E, FGA930, FGA900E &FGA900

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.

This certificate applies to all instruments fitted with software version 1.23 onwards (serial number FGA 98 92 269 onwards).

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Certified Performance

The instrument was evaluated for use under the following conditions:

Ambient Temperature Range: -20°C to +50°C
Instrument IP rating: IP65

Note: 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.

Unless otherwise stated the evaluation was carried out on the certification range CO 0 to 150mg/m³, NO 0 to 200mg/m³ and O₂ 0 to 25%vol

Test	Results expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Response time						
CO (0-150mg/m ³)					91s	<200s
CO (0-2500mg/m ³)					85s	<200s
NO (0-200mg/m ³)					55s	<200s
NO (0-1500mg/m ³)					83s	<200s
O ₂ (0-25%vol)					55s	<200s
Repeatability standard deviation at zero point						
CO		0.60				<2.0%
NO	0.26					<2.0%
O ₂	0.03					<0.2%
Repeatability standard deviation at reference point						
CO			1.1			<2.0%
NO			1.7			<2.0%
O ₂	0.01					<0.2%
Lack-of-fit						
CO (0-150mg/m ³)		0.80				<2.0%
CO (0-2500mg/m ³)	-0.48					<2.0%
NO (0-200mg/m ³)			-1.93			<2.0%
NO (0-1500mg/m ³)		0.93				<2.0%
O ₂ (0-25%vol)	-0.18					<0.2%

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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						
CO			1.9			<5.0%
NO	0.1					<5.0%
O ₂	0.06					<0.50%
Influence of ambient temperature reference point						
CO				-3.6		<5.0%
NO				2.6		<5.0%
O ₂	0.13					<0.50%
Influence of sample gas flow for extractive CEMS						
CO		<1.0				<2.0%
NO		<1.0				<2.0%
O ₂	<0.2					<0.2%
Influence of voltage variations 190 to 250V						<2.0%
All gases					No influence	<0.2% O ₂
Influence of vibration (10 to 60Hz (±0.3mm), 60 to 150Hz at 19.6m/s ²)					Not tested	To be reported
Cross-sensitivity at zero with interferents: H ₂ O, CO, CO ₂ , CH ₄ , N ₂ O, NO, NO ₂ , NH ₃ , SO ₂ , HCl					Note 1	
CO			1.1			<4.0%
NO				2.7		<4.0%
O ₂	-0.12					<0.40%

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Test	Results expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Cross-sensitivity at reference with interferents: H ₂ O, CO, CO ₂ , CH ₄ , N ₂ O, NO, NO ₂ , NH ₃ , SO ₂ , HCl						
CO			-2.0			<4.0%
NO				3.6		<4.0%
O ₂	0.18					<0.40%
Measurement uncertainty					Guidance - at least 25% below max permissible uncertainty	
CO (Based on ELV 50mg/m ³)					20.59% Note 1	<7.5%
CO (Based on range 150mg/m ³)					6.86% Note 1	<7.5%
NO (Based on ELV 130mg/m ³)					12.66%	<15%
O ₂ (Based on ELV 25%vol)					3.11%	<7.5%
Calibration function (field)						
CO					0.985	>0.90
NO					0.995	>0.90
O ₂					0.999	>0.90
Response time (field)						
CO					91s	<200s
NO					55s	<200s
O ₂					55s	<200s
Lack of fit (field)					Note 2	
CO			<2.0			<2.0%
NO			<2.0			<2.0%
O ₂	<0.2					<0.2%
Maintenance interval					4 weeks	>8 days

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Test	Results expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Zero and Span drift requirement	Zero and reference drift data may be collected by an external DAS during the calibration sequence; synchronisation relays are provided for this purpose. The instrument monitors zero drift every 30 minutes by measuring ambient air; if excessive drift is detected, an alarm is raised. Every 30 minutes a comparison is made between the readings from the duplicated sensors; if they disagree by more than a preset amount, an alarm is raised. These are a feature of the system. Automatic self-calibration to correct for span drift is available, but switched off during these tests.					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						
CO		0.7				<3.0%
NO		-0.5				<3.0%
O ₂	-0.08					<0.2%
Change in reference point over maintenance interval						
CO			-1.1			<3.0%
NO			-2.0			<3.0%
O ₂	-1.9					<0.2%
Availability					98.4%	>95% (>98% for O ₂)
Reproducibility						
CO				2.27		<3.3%
NO			1.75			<3.3%
O ₂			0.18			<0.20%

Note 1: CO has a measurement uncertainty of 20.59% at an ELV of 50mg/m³, which exceeds the permissible uncertainties of 7.5% and 10% in EN15267-3 and EN14181 respectively. Over the certified range of 150mg/m³ the measurement uncertainty is 6.86% which meets the requirements of EN14181 and EN15267-3.

Note 2: Data derived from the analysis function / calibration function test

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Description

The FGA 900 Series Flue Gas Analyser (comprising of Flue Gas Analyser model FGA950E, FGA950, FGA940E, FGA940, FGA930E, FGA930, FGA900E, & FGA900) is intended for measuring the concentrations of carbon monoxide, nitric oxide, and oxygen in the exhaust gases produced by combustion processes. The measurement technique uses pairs of electrochemical cells using the Land Instruments Dual Sensor Technology (DST). The analyser contains pumps to provide a flow of sample gas, and a gas cooler to condense and remove water vapour.

The analyser requires that gas from the sample probe is free of solid particles greater than 5 µm diameter and acid aerosols.

Auto-calibration is performed automatically at regular intervals or when requested.

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 MC040019/01
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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