

# PRODUCT CONFORMITY CERTIFICATE

This is to certify that the

**Code/ GCEM 40**

Manufactured by:

**Code/ International Ltd,**

Station Road  
Bakewell  
Derbyshire  
UK

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 3.4 dated July 2012  
EN15267-3:2007,  
& QAL 1 as defined in EN 14181: 2004**

Certification Ranges :

CO	0 to 500ppm	0 to 1000ppm
NO	0 to 500ppm	0 to 1000ppm
SO <sub>2</sub>	0 to 500ppm	0 to 1000ppm

Project No. : 70075905  
Certificate No : Sira MC160296/00  
Initial Certification : 17 May 2016  
This Certificate issued : 17 May 2016  
Renewal Date : 16 May 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](http://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 LCPD/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 carried out over a period of 4months and 10 days in the exhaust gas of a coal fired power plant upstream of desulphurization.

## 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:

TUV Rheinland Report No: 936/21222744/A

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## Product Certified

The GCEM 40 measuring system consists of the following parts:

1. GCEM 40 Series Transceiver Head
2. GCEM 40 Series Probe
3. GCEM 40 Series Pneumatics Panel
4. Data Display Unit with 4 core comms cable
5. Site Mounting Flange – BS4505 PN16 DN200
6. Site Mounting Flange Gasket with bolts
7. Power Cable

The Data Display Unit (or DDU) is the customer interface providing the following;

1. 5 x 4 to 20ma outputs
2. 5 x volt-free SPCO contacts
3. 1 x volt-free SPCO contact for Data Valid
4. 1 x RS485 Modbus output
5. 1 x 2 line display

This certificate applies to all instruments fitted with software versions;

1. 507-108A DDU
2. 507-066A Transceiver Head Slave
3. 507-067A Transceiver Head Master
4. 507-065A Controller Master

This certificate applies to all instruments with following Serial number onwards;

GCEM40 -1000

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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: IP66

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						
CO (0 to 500ppm)					172s	<200s
CO (0 to 1000ppm)					163s	<200s
NO (0 to 500ppm)					191s	<200s
NO (0 to 1000ppm)					185s	<200s
SO <sub>2</sub> (0 to 500ppm)					186s	<200s
SO <sub>2</sub> (0 to 1000ppm)					177s	<200s
Repeatability standard deviation at zero point						
CO	0.0					<2.0%
NO	0.1					<2.0%
SO <sub>2</sub>	0.4					<2.0%
Repeatability standard deviation at reference point						
CO	0.2					<2.0%
NO	0.3					<2.0%
SO <sub>2</sub>	0.3					<2.0%
Lack-of-fit						
CO (0 to 500ppm)		0.8				<2.0%
CO (0 to 1000ppm)	0.5					<2.0%
NO (0 to 500ppm)		-0.6				<2.0%
NO (0 to 1000ppm)	0.4					<2.0%
SO <sub>2</sub> (0 to 500ppm)	0.4					<2.0%
SO <sub>2</sub> (0 to 1000ppm)	-0.5					<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 (-20°C to +50°C)						
CO	0.2					<5.0%
NO		1.0				<5.0%
SO <sub>2</sub>				3.8		<5.0%
Influence of ambient temperature reference point (-20°C to +50°C)						
CO			1.8			<5.0%
NO			1.6			<5.0%
SO <sub>2</sub>				3.8		<5.0%
Influence of sample gas pressure						
CO	0.37					<2.0%
NO	-0.29					<2.0%
SO <sub>2</sub>		0.71				<2.0%
Influence of voltage variations Zero point (196V to 253V)						
CO	-0.2					<2.0%
NO	0.5					<2.0%
SO <sub>2</sub>		1.0				<2.0%
Influence of voltage variations Span point (196V to 253V)						
CO	0.4					<2.0%
NO	-0.4					<2.0%
O <sub>2</sub>		0.8				<2.0%
Influence of vibration Zero point						To be reported
CO	0.0					
NO	-0.1					
SO <sub>2</sub>	0.1					

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Test	Results expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Influence of vibration Span point						
CO			-1.1			
NO			-1.6			
SO <sub>2</sub>			1.8			
Cross-sensitivity at zero with interferents: O <sub>2</sub> , H <sub>2</sub> O, CO, CO <sub>2</sub> , CH <sub>4</sub> , N <sub>2</sub> O, NO, NO <sub>2</sub> , NH <sub>3</sub> , SO <sub>2</sub> , HCl						
CO	0.0					<4.0%
NO	0.0					<4.0%
SO <sub>2</sub>				-3.58		<4.0%
Cross-sensitivity at reference with interferents: O <sub>2</sub> , H <sub>2</sub> O, CO, CO <sub>2</sub> , CH <sub>4</sub> , N <sub>2</sub> O, NO, NO <sub>2</sub> , NH <sub>3</sub> , SO <sub>2</sub> , HCl						
CO			1.4			<4.0%
NO			-1.8			<4.0%
SO <sub>2</sub>				-3.4		<4.0%
Measurement uncertainty					Guidance - at least 25% below max permissible uncertainty	
CO (For and ELV of 50 mg/m <sup>3</sup> )					7.4%	<7.5% (10%)
NO (For and ELV of 130 mg/m <sup>3</sup> )					15%	<15% (20%)
SO <sub>2</sub> (For and ELV of 50 mg/m <sup>3</sup> )					15%	<15% (20%)
Calibration function (field)						
CO					0.91	>0.90
NO					0.94	>0.90
SO <sub>2</sub>					0.96	>0.90
Response time (field)						
CO					182s	<200s
NO					189s	<200s
SO <sub>2</sub>					195s	<200s

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Test	Results expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Lack of fit (field)						
CO			1.2			<2.0%
NO			-1.4			<2.0%
SO <sub>2</sub>		-0.6				<2.0%
Maintenance interval					4 weeks	>8 days
Zero and Span drift requirement	<p>The probe is designed with inlet ports that allow either a zero gas (typically dry compressed air) or a calibration gas to be injected into the measurement chamber to replace the flue gases. Integral solenoid valves controlled by the sensing head automatically introduce the zero and span gas.</p> <p>The zero point is verified automatically every 24hrs and any drift is compensated for and reported.</p> <p>The span point can be verified when required by injecting calibration gas; this can be done automatically or manually.</p>					<p>Clause 6.13 &amp; 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						
CO			1.4			<3.0%
NO				3.0		<3.0%
SO <sub>2</sub>				3.0		<3.0%
Change in reference point over maintenance interval						
CO				3.0		<3.0%
NO				2.9		<3.0%
SO <sub>2</sub>				3.0		<3.0%
Availability					97.1%	>95%
Reproducibility						
CO		0.8				<3.3%
NO			1.6			<3.3%
SO <sub>2</sub>				2.3		<3.3%

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## Description

The AMS Codel GCEM 40 Series is an IR analyser; it uses an insitu probe set into the flue gas duct or stack to measure the emission levels of the selected gases within the flue gas. The probe includes a measurement cell that allows flue gas to diffuse into the optical measurement path of the analyser.

A transceiver unit mounted on the probe transmits a beam of infrared energy down the probe through the measurement cell to a reflector that directs the beam back to the transceiver. Analysis of the received energy beam by NDIR technology provides a continuous measurement of the levels of the selected emissions within the flue gas.

## 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 MC160296/00
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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