

PRODUCT CONFORMITY CERTIFICATE

This is to certify that the

GEM5000 Portable Gas Analyser

Manufactured by:

QED Environmental Systems Ltd

Cyan Park, Unit 3,
Jimmy Hill Way
Coventry
CV2 4QP

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

MCERTS Performance Standard for Handheld Emission Monitoring Systems (HEMS) Version 4 dated September 2018

Certification Ranges :

CH ₄	0 to 70% vol
CO ₂	0 to 60% vol
O ₂	0 to 21% vol
CO	0 to 2000ppm
H ₂ S	0 to 200ppm

Project No. : 16A27549/70181046
Certificate No : Sira MC130239/05
Initial Certification : 22 October 2013
This Certificate issued : 25 October 2018
Renewal Date : 21 October 2023

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

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:

Sira Report 16A27549 dated 25/09/2013

Product Certified

The GEM5000 portable gas analyser measuring system consists of the following parts:

- Dual wavelength infra-red cell with reference channel for the detection of CO₂ and CH₄.
- Internal electrochemical cell for the detection of O₂, CO and H₂S.

This certificate applies to all instruments fitted with software/firmware version V1.10.6 (serial number G500020 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

Unless otherwise stated the evaluation was carried out on the following certification ranges : CH₄ 0 to 70% vol, CO₂ 0 to 60% vol, O₂ 0 to 21% vol, CO 0 to 2000ppm, H₂S 0 to 200ppm.

Results are expressed as error % of certification range, unless otherwise stated (note 1).

Test	Results expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Warm up time					63s	Clause 5.2.2 To be reported
Response time						Clause 5.2.3
CH ₄					10s	<60s
CO ₂					10s	<60s
O ₂					23s	<200s
CO					51s	<60s
H ₂ S					28s	<90s
Repeatability at zero point						Clause 5.2.4
CH ₄	0.03					<±5%
CO ₂	0.02					<±5%
O ₂ (note 1)	0.02					<±0.4% vol
CO	0.03					<±5%
H ₂ S	0.2					<±5%
Repeatability at span point						Clause 5.2.5
CH ₄	0.04					<±5%
CO ₂	0.17					<±5%
O ₂ (note 1)	0.1					<±0.4% vol
CO	0.27					<±5%
H ₂ S		1.28				<±5%

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Test	Results expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Lack-of-fit (linearity)						Clause 5.2.6
CH ₄			1.27			<±5%
CO ₂		-0.72				<±5%
O ₂ (note 1)	0.09					<±0.4% vol
CO		-0.63				<±5%
H ₂ S			1.45			<±5%
Influence of ambient temperature zero point +5°C to +40°C						Clause 5.2.7
CH ₄	0.11					<±10%
CO ₂	0.17					<±10%
O ₂ (note 1)	-0.12					<±1.5% vol
CO	0.18					<±10%
H ₂ S				-2.36		<±10%
Influence of ambient temperature span point +5°C to +40°C						Clause 5.2.7
CH ₄			-1.24			<±10%
CO ₂		0.55				<±10%
O ₂ (note 1)	0.3					<±1.5% vol
CO					7.07	<±10%
H ₂ S					5.38	<±10%

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Test	Results expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Cross-sensitivity at zero						Clause 5.2.8
CH ₄	0.0					<±5%
CO ₂	0.0					<±5%
O ₂ (note 1)	-0.14					<±0.8% vol
CO	0.0					<±5%
H ₂ S			1.63			<±5%
Cross-sensitivity at span						Clause 5.2.8
CH ₄				4.25		<±5%
CO ₂				-4.07		<±5%
O ₂ (note 1)		-0.53				<±0.8% vol
CO		0.86				<±5%
H ₂ S			1.93			<±5%
Zero drift – 1 hour						Clause 5.2.9
CH ₄	0.06					<±3%
CO ₂	0.03					<±3%
O ₂ (note 1)	0.0					<±0.3% vol
CO	0.04					<±3%
H ₂ S	0.47					<±3%
Span drift – 1 hour						
CH ₄	0.03					<±3%
CO ₂	0.39					<±3%
O ₂ (note 1)	0.15					<±0.3% vol
CO	-0.19					<±3%
H ₂ S			-1.78			<±3%

Note 1 The performance specifications for oxygen are expressed as a percentage of volume concentration of oxygen

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Description

The GEM5000 portable gas analyser operates on the principle of infra-red absorption for the measurement of CO₂ and CH₄. The radiation from a broad band IR source is passed through filters to select only the wavelengths that will be absorbed by CO₂ and CH₄. A gas sample is pumped into the measurement cell where the IR radiation is passed through the gas onto a detector. The IR source is pulsed to improve signal to noise ratio. A separate reference beam is used to compensate for any instrumental drift. The measurement is compensated for temperature and pressure changes.

O₂, CO and H₂S are measured by electrochemical cells.

All data is digitised and manipulated, displayed and stored digitally. Readings can be stored and downloaded for further analysis.

The GEM5000 Portable Gas Analyser can measure other gases and parameters that are not included in the certification.

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 V03 for certificate No. Sira MC130239/03
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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