



PRODUCT CONFORMITY CERTIFICATE

This is to certify that the

9850 & 2050 SO₂ Analyser

manufactured by:

Casella Monitor

*Regent House
Wolseley Road
Bedford
MK42 7JY*

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

**MCERTS Performance Standards for Continuous Ambient Air
Quality Monitoring Systems, Version 7, dated October 2010**

Certification Range :

SO₂ 0 to 1000 µg/m³ (0 to 376 nmol/mol)

Project No: 674/0165C
Certificate No: Sira MC 070104/07
Initial Certification: 15 March 2007
This Certificate Issued: 07 January 2010
Renewal Date: 14 March 2012

Technical Director

MCERTS is operated on behalf of the Environment Agency by

Sira Certification Service

12 Acorn Industrial Park, Crayford Road, Crayford
Dartford, Kent, UK, DA1 4AL
Tel: 01322 520500 Fax: 01322 520501

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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

All tests have been conducted in accordance with BS EN 14212. On the basis of these tests this certificate is valid when the instrument is used for rural or urban air quality monitoring and similar applications; and in dilution systems where the sample concentration delivered to the analyser is within the certification range.

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 Essen Report No. 466140/01 dated 26/10/92
US EPA Report dated July 1992
Sira Report Number 16A24048 dated 06/01/2010

Product Certified

This certificate applies to all instruments described by part numbers 98507000-1, 98507000-2, 98507000-3, 98507000-4 and 98501000-100 manufactured from 01 January 2006 onwards (serial number M2306-000 onwards and software version B1.27.2 and 3.19 onwards).

All 2050 instruments described by part numbers 205XXXC, 205XXXC (where 'XXX' are model options) manufactured from 01 December 2010 onwards. (serial number 4701925 onwards and software version 1.703 onwards)

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Certified Performance

The instrument was evaluated for use under the following conditions:

Ambient Temperature Range: +5 to +40°C

Unless otherwise stated the evaluation was carried out on the certification range 0 to 2000 ppb

Test	Results expressed as % of measured value				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Repeatability at zero					0.98 nmol/mol	<1 nmol/mol
Repeatability at hourly limit value					1.04 nmol/mol	<3 nmol/mol
Residual lack of fit at zero					1.5 nmol/mol	<5 nmol/mol
Lack of fit (largest residual from the linear regression line)			1.11			<4%
Sensitivity coefficient to sample gas pressure					0.1 nmol/mol	<3 nmol/mol/kPa
Sensitivity coefficient to sample gas temperature					Zero: 0.21 nmol/mol/K Span: 0.10 nmol/mol/K	<1 nmol/mol/K <1 nmol/mol/K
Sensitivity coefficient to surrounding air temperature					Zero: 0.30 nmol/mol/K Span: 0.12 nmol/mol/K	<1nmol/mol/K <1 nmol/mol/K
Sensitivity coefficient to electrical supply voltage					0.065 nmol/mol/V	<0.3 nmol/mol/V
Interference by H ₂ O (at concentration of 19 nmol/mol)					2.94 nmol/mol	<10 nmol/mol
Interference by H ₂ S (at concentration of 200nmol/mol)					2.1 nmol/mol	<5nmol/mol

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Test	Results expressed as % of measured value				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Interference by NH ₃ (at concentration of 200 nmol/mol)					0.027 nmol/mol	<5 nmol/mol
Interference by NO (at concentration of 500nmol/mol)					4.5 nmol/mol	<5 nmol/mol
Interference by NO ₂ (at concentration of 200nmol/mol)					2.4 nmol/mol at 124 nmol/mol	<5 nmol/mol
Interference by m-xylene (at concentration of 1µmol/mol)					4.9 nmol/mol	<10 nmol/mol
Averaging effect		1.25				<7%
Short term zero drift (over 12h)					0.021 nmol/mol	<2 nmol/mol
Short term span drift (over 12h)					0.196 nmol/mol	<6 nmol/mol
Response time (rise)					121 s	180 s
Response time (fall)					129 s	180 s
Difference between rise and fall time					6.2%	<10%
Reproducibility under field conditions ^{Note 1}				2.43		<5% averaged over three month period
Long term zero drift (over 3months) ^{Note 1}					0.45 nmol/mol	<5 nmol/mol
Long term span drift (over 3 months) ^{Note 1}				3.05		<5% of the max of certification range
Period of unattended operation ^{Note 1}					36 days	3 months not less than 2 weeks
Availability (data capture) ^{Note 1}					91%	>90%
Combined performance characteristic					10.81%	<15%

Note 1: The field test was performed on an urban site for 3 months.

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Description:

The 9850 & 2050 UV Fluorescence analyser utilises a pulsed lamp to negate the need for mechanical shutters and to compensate for drift within the photomultiplier detector. The air sample passes through a Hydrocarbon kicker to remove Hydrocarbons that interfere with the measuring process. UV wavelength light excites SO₂ molecules causing them to emit light at a specific wavelength as they decay from their excited state. This emitted light is measured by a Photo Multiplier tube after passing through a series of optical filters to improve the measurement performance. A microprocessor is used to control the various temperature zones and control loops and in addition compensates for temperature and pressure fluctuations. The microprocessor also stores a minimum of 1 year of 15 minute time and status stamped data for SO₂ and provides the facility of online remote diagnostics allowing all analyser functions to be controlled from a PC device such as a PDA or desk top PC. The 9850 & 2050 analyser employs a 'KALMAN' adaptive time averaging filter that gives the analyser fast response capability without creating inaccuracies due to fixed averaging.

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 MC 070104/04.
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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