



PRODUCT CONFORMITY CERTIFICATE

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This is to certify that the

Serinus 40 NOx Analyser

Manufactured by:

Ecotech Pty Ltd

1492 Ferntree Gully Road Knoxville, Victoria, 3180 Australia

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 10 dated June 2016

Certification Ranges:

NO	0 to 1,200 µg/m ³
NO ₂	0 to 500 µg/m ³

Project No.: Certificate No: Initial Certification: This Certificate issued: Renewal Date: 80068776 Sira MC100167/08 25 February 2010 24 February 2021 24 February 2026

Andrew Young Environmental Team 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 <u>www.mcerts.net</u>

All tests have been conducted in accordance with BS EN 14211:2012. On the basis of these tests this certificate is valid when the instrument is used for urban air quality monitoring and similar applications.

The field trial was conducted on an urban background site 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:

Sira (Note 1) Report 674/0362 dated 17th February 2010

Ecotech (Note 2) Report MCERTS Application Serinus 40 Oxides of Nitrogen Analyser dated 29th January 2010

TUV Rheinland Energie und Umwelt GmbH, Cologne, Report no.: 936/21221977/A_EN dated 08 October 2013

Note 1: UKAS accredited for product certification (0011) to EN 45011:1998 for MCERTS Performance Standards for Continuous Ambient Air Quality Monitoring Systems, Version 6, dated December 2008

Note 2: NATA accredited test laboratory from 09/03/2012 to ISO/IEC 17025:2005 for type approval tests according to EN 14211:2005

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Product Certified

The Serinus 40 NOx analyser measuring system consists of the following parts:

- Converter
- Ozone generator
- Sample valve manifold
- Reaction cell
- Photomultiplier tube

This certificate applies to all instruments fitted with software version 1.23.0000 (serial number 08-0762 onwards).

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Certified Performance

The instrument was evaluated for use under the following conditions:

Ambient Temperature Range: 0°C to +30°C

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.

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

Test	Resul	ts expres certificat	sed as %	6 of the	Other results	MCERTS specification
	<0.5	<1	<2	<5		Note nmol/mol = ppb
Repeatability at zero					0.31	≤1.0 nmol/mol
Repeatability at hourly limit value					0.27	≤3.0 nmol/mol
Residual lack of fit at zero					-0.46	≤5.0 nmol/mol
Lack of fit (largest residual from the linear regression line)					0.84	≤4%
Sensitivity coefficient to sample gas pressure					1.97	≤8.0 nmol/mol/kPa
Sensitivity coefficient to sample gas temperature					0.45	≤3.0 nmol/mol
Sensitivity coefficient to surrounding air temperature					0.26	≤3.0 nmol/mol
Sensitivity coefficient to electrical supply voltage					0.028	≤0.3 nmol/mol
Converter Efficiency					98.9	≥98%
Interference by H ₂ O (at concentration of 19 nmol/mol)					-0.57	≤5 nmol/mol
Interference by NH ₃ (concentration of 200 nmol/mol)					1.41	≤5 nmol/mol
Interference by CO_2 (at concentration of 500 μ mol/mol)					1.43	≤5 nmol/mol

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Test	Resu	ts expres certificat	sed as %	6 of the	Other results	MCERTS specification
	<0.5	<1	<2	<5		Note nmol/mol = ppb
Averaging effect			-1.35			≤7%
Reproducibility under field conditions				3.55		≤5%
Long term drift at zero					0.58	≤5 nmol/mol
Long term drift at span level				2.55		≤5%
Short term, zero drift (over 12hr)					0.03	≤2 nmol/mol
Short term, span drift (over 12hr)					-1.11	≤6 nmol/mol
Response time (rise)						
NO					33s	≤180s
NO ₂					25s	
Response time (fall)						
NO					36s	≤180s
NO ₂					33s	
Difference between rise and fall time					-8s	≤10s
Difference between sampling and calibration port					-0.26	≤1%
Residence time in the analyser					2.4s	≤3s
Period of unattended operation					4 weeks	≤3 months Note 1
Availability of analyser					100%	≥90%
Total expanded uncertainty					13.56	≤15%

Note 1: Subject to necessary maintenance tasks

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Description

The measurement of nitric oxide (NO) and nitrogen dioxide (NO₂) is based on classical chemiluminescence; when NO and excess ozone mix, they react emitting light in a broad frequency band with a peak at about 1200 nm. The intensity of the light emitted is linearly proportional to the nitric oxide concentration and is measured by a photomultiplier tube.

Ambient air is drawn into the analyser and is split into two. One channel is drawn directly into the sample valve manifold for measurement of NO gas, whilst the other channel, for measuring NO_X , is drawn through a heated molybdenum converter where NO_2 is converted to NO. Beyond the sample valve manifold the NO molecules (from either channel) are drawn into the reaction cell where they then react with ozone.

Ozone is internally generated with dried air drawn from the "BGnd Air" port. The reaction with ozone in the cell emits light which is detected by a photomultiplier tube housed in a sealed thermoelectrically cooled assembly. After the reaction, sample is exhausted out of the cell and the analyzer through the "Exhaust" port.

The analyzer software automatically corrects for gas temperature and pressure changes and is referenced to 0°C, 20°C or 25°C at 1 atmosphere. The analyser can store 8 years of one minute data of up to twelve analyser parameters.

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'.
- 2. The design of the product certified is held and maintained by TUV Rheinland for certificate No. Sira MC100167/08.
- 3. If certified product is found not to comply, Sira Certification Service should be notified immediately at the address shown on this certificate.
- 4. 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'.
- 5. This document remains the property of Sira and shall be returned when requested by the company.

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