

# PRODUCT CONFORMITY CERTIFICATE

This is to certify that the

## ***Aeris AE9841 & AE2041 NOx Analyser***

Manufactured by:

### ***We Care 4 Air Ltd***

Thremhall Park,  
Start Hill,  
Bishops Stortford,  
Hertfordshire  
CM22 7WE

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 9.1 dated February 2016**

Certification Range :

|                 |  |
|-----------------|--|
| NO              | 0 to 1200 µg/m <sup>3</sup> (0 - 962 nmol/mol) |
| NO <sub>2</sub> | 0 to 500 µg/m <sup>3</sup> (0 - 261 nmol/mol)  |

|                         |   |                  |
|-------------------------|---|------------------|
| Project No.             | : | 70037981         |
| Certificate No          | : | Sira MC170299/00 |
| Initial Certification   | : | 28 April 2017    |
| This Certificate issued | : | 28 April 2017    |
| Renewal Date            | : | 27 April 2022    |

Joe Prince MSc, MInst MC  
Deputy Certification Manager

MCERTS is operated on behalf of the Environment Agency by

## **Sira Certification Service**

Unit 6, Hawarden Industrial Park  
Hawarden, Deeside, CH5 3US  
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**sira**  
CERTIFICATION

*The MCERTS certificate consists of this document in its entirety.*

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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)*

All tests have been conducted in accordance with BS EN 14211. 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:

|                             |   |
|-----------------------------|---|
| Umwelt Bundes Amt Frankfurt | Report No. 428/96 dated 19/03/96        |
| US EPA Report               | dated June 1992                         |
| Sira                        | Report Number 16A24048 dated 06/01/2010 |
| Sira                        | Report number 70037981 dated March 2017 |

## Product Certified

The measuring system consists of the following parts:

- Aeris AE9841 & AE2041 NOx Analyser

This certificate applies to all instruments described by part numbers 98417000-1, 98417000-2, 98413000-104, 98413000-105 and 98415200-100 manufactured from 01 January 2006 onwards (serial number M2306-00 onwards and software version B1.32.2 and 3.19 onwards).

All CM2041 instruments described by part numbers 204XXXC, 204XXXC (where 'XXX' are model options) manufactured from 01 December 2010 onwards (serial number 4701925 onwards and software version 1.723 onwards).

All AE2041 instruments described by part numbers 204XXXC, 204XXXC (where 'XXX' are model options) manufactured from 01 April 2017 onwards (serial number AE17170100 onwards and software version 1.723 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 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  |  |    |    |      | 0.072 nmol/mol           | <1 nmol/mol          |
| Repeatability at hourly limit value                                |  |    |    |      | 2.5 nmol/mol             | <3 nmol/mol          |
| Residual lack of fit at zero                                       |  |    |    |      | 4.5 nmol/mol             | <5 nmol/mol          |
| Lack of fit (largest residual from the linear regression line)     |  |    |    | 0.31 |                          | <4%                  |
| Sensitivity coefficient to sample gas pressure                     |  |    |    |      | 0.15 nmol/mol/kPa        | <8 nmol/mol/kPa      |
| Sensitivity coefficient to sample gas temperature                  |  |    |    |      | No effect observed       | <3 nmol/mol/K        |
| Sensitivity coefficient to surrounding air temperature             |  |    |    |      | Span:<br>0.36 nmol/mol/K | <3 nmol/mol/K        |
| Sensitivity coefficient to electrical supply voltage               |  |    |    |      | No effect observed       | <0.3 nmol/mol/V      |
| Converter efficiency   |  |    |    |      | 98%                      | >98%                 |
| Interference by H <sub>2</sub> O (at concentration of 19 nmol/mol) |  |    |    |      | 1.0 nmol/mol             | <5 nmol/mol          |

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| Test   | Results expressed as % of measured value |    |    |      | Other results | MCERTS specification                              |
|--|--|----|----|------|---------------|---|
|  | <0.5                                     | <1 | <2 | <5   |               |   |
| Interference by NH <sub>3</sub> (at concentration of 200 nmol/mol) |  |    |    |      | 0.29 nmol/mol | <5 nmol/mol                                       |
| Interference by CO <sub>2</sub> at concentration of 500µmol/mol    |  |    |    |      | 0.02 nmol/mol | <5 nmol/mol                                       |
| Interference by Ozone at concentration of 200 nmol/mol             |  |    |    |      | 0.20 nmol/mol | <2 nmol/mol                                       |
| Averaging effect   |  |    |    | 3.08 |               | <7%   |
| Short term zero drift (over 12h)                                   |  |    |    |      | 0.06 nmol/mol | <2 nmol/mol                                       |
| Short term span drift (over 12h)                                   |  |    |    |      | 0.30 nmol/mol | <6 nmol/mol                                       |
| Response time (rise)   |  |    |    |      | 91 s          | 180 s   |
| Response time (fall)   |  |    |    |      | 97 s          | 180 s   |
| Difference between rise and fall time                              |  |    |    |      | 6.48 s        | <10 s   |
| Residence time in the analyser                                     |  |    |    |      | 2.87 s        | <3 s  |
| Reproducibility under field conditions<br>Note 1                   |  |    |    | 2.65 |               | <5% averaged over three month period              |
| Long term zero drift (over 3 months)<br>Note 1                     |  |    |    |      | 0.05 nmol/mol | <5 nmol/mol                                       |
| Long term span drift (over 3 months)<br>Note 1                     |  |    |    | 4.25 |               | <5% of the max of certification range             |
| Period of unattended operation Note 1                              |  |    |    |      | 30 days       | 3 months or less if indicated by the manufacturer |
| Availability (data capture) Note 1                                 |  |    |    |      | 98%           | >90%  |
| Total expanded uncertainty   |  |    |    |      | 12.37%        | <15%  |

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

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## Description

The 9841 & 2041 Chemiluminescence analyser consists of a low volume single reaction chamber and single detector. A photomultiplier tube measures the chemiluminescence produced when NO is mixed with Ozone. The air sample is fed via a flow block and bypass loop to ensure that the analyser measures Nitrogen Dioxide accurately in fast changing environments such as roadside applications. The flow block also allows a reference for the measurement system to be checked every 69 seconds providing additional stability. A microprocessor is used for controlling the various temperature zones and control loops and in addition compensates for temperature and pressure fluctuations. The microprocessor also stores a minimum of 1 years worth of 15 minute time and status stamped data for NO/NO<sub>x</sub> and NO<sub>2</sub> 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 9841 & 2041 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 V00 for certificate No. Sira MC170299/00
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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