PRODUCT CONFORMITY CERTIFICATE

This is to certify that the

AR500 Open Path Monitor

Manufactured by:

Opsis AB
PO Box 244
5-244 02 Furulund
Sweden

has been assessed by CSA Group
and for the conditions stated on this certificate complies with:

MCERTS: "Performance Standards for Open Path Ambient Air Quality Monitoring Systems using Differential Optical Absorption Spectrometry (DOAS) and FTIR Spectroscopy" Version 3, August 2017

Certification range:

C_6H_6 (Benzene)	0 to 10 μg/m3 at 300m equivalent to 0 to 1 ppm.metres

Project No.:	80228364
Certificate No:	CSA MC040048/04
Initial Certification:	05 November 2004
This Certificate issued:	25 October 2024
Renewal Date:	04 November 2029

Andrew Young
Environmental Team Manager

MCERTS is operated on behalf of the Environment Agency by

CSA Group Testing UK Ltd
Unit 6, Hawarden Industrial Park
Hawarden, Deeside, CH5 3US
Tel: +44 (0)1244 670 900

Form 1335
Issue 11

Certificate Contents

Approved Site Application

Any potential user should make sure, 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 guidance available at www.mcerts.net

On the basis of these tests this certificate is valid when the instrument is used for urban air quality monitoring and similar applications.

Basis of Certification

This certification is based on the following test report(s) and on CSA Group's assessment and ongoing surveillance of the product and the manufacturing process:

TÜV Rheinland Report ref: 936/807014/A dated 11th February 2000
TÜV Rheinland Report ref: 936/807014/B dated 12th February 1999
TÜV Rheinland Report ref: 936/807014/C dated 26th January 2001
UMEG Karlsruhe Report ref: 33-01/93 dated 1993

Product Certified

The AR500 measuring system consists of the following parts:

- AR500 analyser
- Emitter and receiver ER110 (EM110 emitter and RE110 receiver)
- Emitter and receiver ER150 (EM150 emitter and RE150 receiver)

This certificate applies to all instruments fitted with software version 7.21 onwards (serial number E091 onwards).

Certified Performance

The instrument was evaluated for use under the following conditions:

Ambient Temperature Range: +5°C to +40°C
Instrument IP rating: IP20

Note: The requirement for the protection class of the enclosure is not fulfilled. The measuring system needs to be installed with an IP65 enclosure to meet the requirements of EN 15267-3. 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.

Performance values are expressed as a percentage of the certification range, except for availability and analysis function.

Test	Results expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Drift (24 hours)						
Zero: Benzene	-0.01					<2.0%
Span: Benzene	-0.03					<2.0%
Repeatability (detection limit)						
Zero: Benzene				3.80		<5.0%
Span: Benzene			1.12			<2.0%
Linearity						
Benzene			1.60			<2.0%
Cross sensitivity to individual interferents						
Benzene			<2.0			<2.0%
Cross sensitivity to all interferents						
Benzene				<5.00		<5.0% of limit value
Effect of ambient temperature (+5°C to +40°C)						
Zero: Benzene			1.10			<2.0%
Span: Benzene				2.00		<2.0%
Dependence on line voltage (220-245V)						
Benzene					No voltage dependence observed	<2.0%
Combined performance characteristic						
Benzene					14%	<20%

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Test	Results expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Response times in single components mode Benzene					30s	<60s
Long term drift (over the 30 days maintenance interval test) Zero: Benzene Span: Benzene	0.00			<5.0		<5.0% of limit value <5.0% of limit value
Field repeatability Benzene			1.32			<8% of the average of three months period
Maintenance Interval Benzene					30 days	30 days
Availability (data capture) Benzene					95%	>90%
Maximum path length for consistence with point analyser Benzene					Note 1 300m	<300m

Note 1: The maximum path length for consistence with a point analyser is indicative only and will depend on the mode of application. Longer lengths can be expected at well-mixed background locations, whereas in street canyons greater non-homogeneity of concentrations will occur. For this reason site specific investigations are recommended for each application if the results are to be interpreted in terms of Air Quality Guidelines.

Note 2: The combined performance was calculated using the methodology specified in ISO Guide to Uncertainty in Measurements (GUM).

Description

The system is an open path ambient air gas measurement system that uses an AR500 (UV) analyser and a transmitter and receiver. The AR500 analyser is based upon UV absorption techniques for measuring Benzene (C_6H_6). The transmitter and receiver units are mounted opposite each other typically 200-800 metres apart. The receiver is connected to the control unit by a fiber optic cable. The AR500 analyser system can measure other gases but these are not included under the certification, please contact the manufacturer for details.

The ER110 (EM110 emitter and RE110 receiver) can be used on path up to approximately 500 metres and the ER150 (EM150 emitter and RE150 receiver) up to approximately 1000 metres. The difference is the diameter of the two mirror options, the ER110 mirror is 100mm and the ER150 mirror is 150mm. The emitter contains a xenon lamp and a mirror.

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 CSA Group Testing UK Ltd Certificates'.

2. The design of the product certified is held and maintained by TÜV Rheinland for certificate No. CSA MC040048.

3. If a certified product is found not to comply, CSA Group 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 CSA Group Testing UK Ltd Certificates'.

5. This document remains the property of CSA Group and shall be returned when requested by CSA Group.