PRODUCT CONFORMITY CERTIFICATE

This is to certify that the

SM200 Particulate Analyser with $PM_{2.5}$ & PM_{10} Head

manufactured by:

OPSIS AB
P.O. Box 244
S-244 02 Furulund
Sweden

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 (October 2010)

Certification Range :

Particulate matter ($PM_{2.5}$)	0 to 200 $\mu g/m^3$
(PM_{10})	0 to 200 $\mu g/m^3$

Project No:	674/0167
Certificate No:	Sira MC 070109/01
Initial Certification:	21 May 2007
This Certificate Issued	15 May 2012
Renewal Date:	14 May 2017

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: +44 (0)1322 520500 Fax: +44 (0)1322 520501

Approved Site Application

Any potential user should ensure, in consultation with the manufacturer, that the emission monitoring system is suitable for the process on which it will be installed. For general guidance on stack emission monitoring techniques refer to Environment Agency Technical Guidance Note M2: Monitoring of stack emissions to air. This is available on the Agency's website 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 Sira's assessment and ongoing surveillance of the product and the manufacturing process:

TÜV Rheinland	Report ref: 936/801013 dated 29/01/03
DEFRA	Report ref: BV/AQ/AD202209/DH/2396 dated 05/06/06
TÜV Rheinland	Report ref: 936/21205849/A dated 29/03/09
DEFRA	Report ref: AGG04003328/BV/AQ/DH/2657 dated 28/09/10

Product Certified

The SM200 measuring system consists of the following parts:

- SM200 analyser
- Pump module
- PM_{10} / $PM_{2.5}$ inlet head

This certificate applies to all $PM_{2.5}$ instruments fitted with software version 1.04.10 onwards (serial number 1236 onwards) and PM_{10} instruments fitted with software version 1.04 onwards (serial number 1001 onwards).

Certified Performance

Unless otherwise stated the evaluation was carried out on the certification range 0 to 200 μg/m^3 for both $PM_{2.5}$ and PM_{10} heads.

SM200 Particulate Analyser with $PM_{2.5}$ and PM_{10} Heads

Test	Results	MCERTS specification
Constancy of the sampling volumetric flow $PM_{2.5}$ PM_{10}	 1.70% 1.59%	 <3% Averaged sample volumetric flow
Tightness of the sampling system $PM_{2.5}$ PM_{10}	 0.37% 0.82%	 <1% Leakage <1% Leakage
Between sampler/instrument uncertainty for the standard method **$PM_{2.5}$** Full data set >18μg/m^3	Note 1 Note 2 Note 3 0.52 μg/m^3 0.50μg/m^3	 <2μg/m^3 <2μg/m^3
Between sampler/instrument uncertainty for the candidate method **$PM_{2.5}$** Full data set >18μg/m^3	 0.94μg/m^3 1.22μg/m^3	 <2.5μg/m^3 <2.5μg/m^3
Between sampler/instrument uncertainty for the standard method **PM_{10}** Full data set >30μg/m^3	 1.11μg/m^3 1.12μg/m^3	 <2μg/m^3 <2μg/m^3
Between sampler/instrument uncertainty for the candidate method **PM_{10}** Full data set >30μg/m^3	 2.06μg/m^3 1.59μg/m^3	 <2.5μg/m^3 <2.5μg/m^3

Certificate No: Sira MC 070109/01
This Certificate Issued: 15 May 2012

Test	Results	MCERTS specification
Expanded uncertainty calculated at 30μg/m^3 **$PM_{2.5}$**		
Cologne – Frankfurter Str.	17.46%	<25%
Cologne – Parking lot	13.21%	<25%
Furulund – Summer	16.38%	<25%
Furulund – Winter	15.81%	<25%
Expanded uncertainty calculated at 50μg/m^3 **PM_{10}**		
Teddington – Summer	22.32%	<25%
Birmingham – Summer	11.46%	<25%
Bristol – Summer	9.99%	<25%
Bristol - Winter	15.24%	<25%
East Kilbride – Summer	17.85%	<25%
East Kilbride – Winter	10.30%	<25%

Test	Results	MCERTS specification
Highest resulting uncertainty estimate comparison against data quality objective (**$PM_{2.5}$** at 30μg/m^3 - combined datasets) All Data >18μg/m^3	 13.11% 15.35% Note 1	 $W_{cm}<W_{dqo}$ $W_{cm}<W_{dqo}$
Highest resulting uncertainty estimate comparison against data quality objective (**PM_{10}** at 50μg/m^3 - combined datasets) All Data >30μg/m^3	 17.83% 14.81%	 $W_{cm}<W_{dqo}$ $W_{cm}<W_{dqo}$
Maintenance Interval $PM_{2.5}$ PM_{10}	 4 Weeks 4 Weeks	 Two weeks (defined as filter exchange inlet cleaning frequency)

Note 1: Data for East Kilbride omitted due to concentrations at site being too low to count.

Note 2: The field tests on the OPSIS SM200 $PM_{2.5}$ resulted in between 42 and 94 paired measurements per site being obtained. Field tests on the OPSIS SM200 PM_{10} resulted in between 17 and 66 paired measurements per site being obtained. The requirement is for a minimum of 40 measurement results per site.

Note 3: Test results were subjected to correction coefficients for slope, intercept or both.

Description:

The SM200 measures the attenuation of beta radiation through an un-sampled filter, and then takes a 24-hour sample before again measuring the beta attenuation.

The SM200 samples the particulate matter onto a 47mm filter. By use of beta attenuation of sampled and unsampled filters, the mass of the particulate matter can be measured. The sampling time is 24 hours.

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 070109/01.

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.