

PRODUCT CONFORMITY CERTIFICATE

This is to certify that the

SM200 Particulate Analyser with PM_{2.5} & PM₁₀ 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 10 (June 2016)**

Certification Ranges :

Particulate matter (PM _{2.5})	0 to 200 µg/m ³
(PM ₁₀)	0 to 200 µg/m ³

Project No.: 674/0167 & 70130912
Certificate No: Sira MC070109/02
Initial Certification: 21 May 2007
This Certificate issued: 22 May 2017
Renewal Date: 20 May 2022

Emily Alexander
Deputy Certification Manager

MCERTS is operated on behalf of the Environment Agency by

Sira Certification Service

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Certificate Contents

Approved Site Application	2
Basis of Certification	2
Product Certified.....	2
Certified Performance	3
Description.....	5
General Notes	5

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

On the basis of these tests this certificate is valid when the instrument is used for urban air quality monitoring and similar applications. (sometimes rural as well depending on data)

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
TÜV Rheinland	Report ref: 936/21205849/A dated 23/12/2011

Product Certified

The SM200 measuring system consists of the following parts:

- SM200 analyser
- Pump module
- PM₁₀ / 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 PM₁₀ instruments fitted with software version 1.04 onwards (serial number 1001 onwards).

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Certified Performance

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

SM200 Particulate Analyser with $\text{PM}_{2.5}$ and PM_{10} Heads

Test	Results	MCERTS specification
Constancy of the sampling volumetric flow $\text{PM}_{2.5}$ PM_{10}	1.70% 1.59% <5%	To remain constant within $\pm 3\%$ of the rated value All instantaneous values to remain within $\pm 5\%$ of the rated value
Tightness of the sampling system $\text{PM}_{2.5}$ PM_{10}	0.37% 0.82%	<1% Leakage <1% Leakage
Between sampler/instrument uncertainty for the standard method $\text{PM}_{2.5}$ Full data set >18 $\mu\text{g}/\text{m}^3$	Note 1 Note 2 Note 3 0.52 $\mu\text{g}/\text{m}^3$ 0.50 $\mu\text{g}/\text{m}^3$	 <2 $\mu\text{g}/\text{m}^3$ <2 $\mu\text{g}/\text{m}^3$
Between sampler/instrument uncertainty for the candidate method $\text{PM}_{2.5}$ Full data set >18 $\mu\text{g}/\text{m}^3$	 0.94 $\mu\text{g}/\text{m}^3$ 1.22 $\mu\text{g}/\text{m}^3$	 <2.5 $\mu\text{g}/\text{m}^3$ <2.5 $\mu\text{g}/\text{m}^3$
Between sampler/instrument uncertainty for the standard method PM_{10} Full data set >30 $\mu\text{g}/\text{m}^3$	 1.11 $\mu\text{g}/\text{m}^3$ 1.12 $\mu\text{g}/\text{m}^3$	 <2 $\mu\text{g}/\text{m}^3$ <2 $\mu\text{g}/\text{m}^3$
Between sampler/instrument uncertainty for the candidate method PM_{10} Full data set >30 $\mu\text{g}/\text{m}^3$	 2.06 $\mu\text{g}/\text{m}^3$ 1.59 $\mu\text{g}/\text{m}^3$	 <2.5 $\mu\text{g}/\text{m}^3$ <2.5 $\mu\text{g}/\text{m}^3$

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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 PM₁₀		
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%
Highest resulting uncertainty estimate comparison against data quality objective (PM_{2.5} at 30µg/m ³ - combined datasets)		
All Data	13.11%	$W_{cm} < W_{dco}$
>18µg/m ³	15.35%	$W_{cm} < W_{dco}$
	Note 1	
Highest resulting uncertainty estimate comparison against data quality objective (PM₁₀ at 50µg/m ³ - combined datasets)		
All Data	17.83%	$W_{cm} < W_{dco}$
>30µg/m ³	14.81%	$W_{cm} < W_{dco}$
Maintenance Interval		
PM _{2.5}	4 Weeks	Two weeks (defined as filter exchange inlet cleaning frequency)
PM ₁₀	4 Weeks	

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 PM₁₀ 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.

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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 MC070109/02
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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