



ENVIRONMENT  
AGENCY

# PRODUCT CONFORMITY CERTIFICATE

This is to certify that the

**AR 602Z (UV)**  
**AR 650 (IR)**

**used either independently or in combination**

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 Emission Monitoring Systems, Version 2, Revision 1 (April 2003)

### Certification Ranges:

SO <sub>2</sub>	-	0 to 75 mg/m <sup>3</sup>
CO	-	0 to 75 mg/m <sup>3</sup>
NO	-	0 to 150 mg/m <sup>3</sup>
NO <sub>2</sub>	-	0 to 20 mg/m <sup>3</sup>
HCl	-	0 to 15 mg/m <sup>3</sup>
H <sub>2</sub> O	-	0 to 300 gm <sup>-3</sup>
Hg	-	0 to 100 µg/m <sup>3</sup>
HF	-	0 to 10 mg/m <sup>3</sup>
NH <sub>3</sub>	-	0 to 20 mg/m <sup>3</sup>

Note: The scope of certification for HF and NH<sub>3</sub> is only applicable for 2m path length. The path length for Hg is 1.8m

Project No: 674/0166  
Certificate No: Sira MC 020011/04  
Initial Certification: 01 March 2002  
This Certificate Issued: 22 January 2009  
Renewal Date: 28 February 2012

  
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: 01322 520500 Fax: 01322 520501



## Approved Site Application

On the basis of the assessment and the ranges required for compliance with EU Directives this instrument is considered suitable for use on waste incineration and large coal-fired combustion plant applications.

*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](http://www.mcerts.net)*

## 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: 936/807024/A dated 26/07/99
TÜV Rheinland	Report Ref: 936/800010/2 dated 01/03/93
TÜV Rheinland	Report Ref: 936/806013 dated 25/09/96
TÜV Rheinland	Report Ref: 936/804001 dated 25/04/96
TÜV Rheinland	Report Ref: 936/21201391/A dated 23/06/04
TÜV Rheinland	Report Ref: 936/804002/NH <sub>3</sub> dated 06/06/94
TÜV Rheinland	Report Ref: 936/800010 dated 27/06/92
TÜV Rheinland	Report Ref: 936/804002/Hg dated 06/06/94
Sira Report	Report Ref: N0393 dated Feb 2002
Sira Report	Report Ref: Audit Report 674/0236 dated 28/02/07 & 01/03/07

TÜV reports are accepted on the basis of the Environment Agency's document 'MCERTS – Guidance on the acceptance of German type approval test reports for CEMS' Version 2 (October 2003)

## Product Certified

The AR650/602z measuring system consists of the following parts:

- Receiver unit (Model RE062)
- Transmitter unit (Model EM 062-A)
- Control unit (analyser)

This certificate applies to all instruments fitted with software version 7.21 onwards (serial number 160 onwards).

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Test	Results expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<4		
Temperature dependent zero shift						
SO <sub>2</sub>	0.01					<0.3%/°C
CO	0.07					<0.3%/°C
NO & NO <sub>2</sub>	0.01					<0.3%/°C
HCl	0.17					<0.3%/°C
H <sub>2</sub> O	0.10					<0.3%/°C
Hg	0.20					<0.3%/°C
HF	0.05					<0.3%/°C
NH <sub>3</sub>	<0.1					<0.3%/°C
Temperature dependent upper reference point shift						
SO <sub>2</sub>	0.16					<0.3%/°C
CO	0.15					<0.3%/°C
NO & NO <sub>2</sub>	0.13					<0.3%/°C
HCl	0.11					<0.3%/°C
H <sub>2</sub> O	--				Not measured	<0.3%/°C
Hg	0.30					<0.3%/°C
HF	0.07					<0.3%/°C
NH <sub>3</sub>	0.20					<0.3%/°C
Response time						
SO <sub>2</sub> , CO, NO, NO <sub>2</sub> , H <sub>2</sub> O					<150s	<200s
HCl					<150s	<600s
Hg					90s	<200s
HF					170s	<600s
NH <sub>3</sub>					90s	<200s

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Test	Results expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<4		
Detection Limit						
SO <sub>2</sub>	0.07					<2%
CO		0.7				<2%
NO	0.04					<2%
NO <sub>2</sub>	0.1					<2%
HCl			1.2			<2%
H <sub>2</sub> O	0.5					<2%
Hg			1.6			<2%
HF			2.0			<2%
NH <sub>3</sub>			1.1			<2%
Interference of test gas flow on the measurement signal						<1%
Vibration test (10 to 60Hz (±0.3mm), 60 to 150Hz at 19.6m/s <sup>2</sup> )					No effect	Not specified
Mains voltage (190V to 250V)			0.7			<2%
Excursion of the measurement beam			1.5			<2%
Sample gas pressure					See note 1	To be reported
Sample gas temperature					See note 2	To be reported

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Test	Results expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<4		
Analysis function/Integral Performance (field) <sup>Note 3</sup>						
SO <sub>2</sub>					99.0%	>95%
NO					99.0%	>95%
NO <sub>2</sub>					99.0%	>95%
Hg					92.3% Note 4	>95%
HF					See Note 5	>95%
NH <sub>3</sub>					91.6% Note 6	>95%
Integral Performance (field) <sup>Note 3</sup>						
CO					3.1%	<10%
HCl					2.7%	<10%
H <sub>2</sub> O					0.01%	<10%
Availability <sup>Note 3</sup>					96.6%	>95%
Zero drift during field trial <sup>Note 3</sup>						
SO <sub>2</sub>	0.15					<2%
CO		0.58				<2%
NO	0.15					<2%
NO <sub>2</sub>			0.75			<2%
HCl						<2%
H <sub>2</sub> O		0.18	1.0			<2%
Hg	<0.3					<2%
HF	0.0					<2%
NH <sub>3</sub>	1.0					<2%

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Test	Results expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<4		
Upper reference point drift during field trial <sup>Note 3</sup>						
SO <sub>2</sub>			1.0			<4%
CO	0.25		1.0			<4%
NO			1.5			<4%
NO <sub>2</sub>						<4%
HCl		0.93				<4%
H <sub>2</sub> O	0.35					<4%
Hg			2.0			<4%
HF						<4%
NH <sub>3</sub>	0.0		2.0			<4%
Maintenance Interval <sup>Note 3</sup>						
SO <sub>2</sub> , CO, NO <sub>2</sub> , HCl, H <sub>2</sub> O, NH <sub>3</sub>					6 months	To be reported
NO					3 months	To be reported
HF, Hg					4 weeks	To be reported

Note 1: Test not performed: is a function of partial pressure.

Note 2: Test not performed: depends upon mounting arrangements

Note 3: Field test: The system was evaluated for 11 months on a municipal waste incinerator. The system was evaluated for 9 weeks mounted on a coal fired power station with particulate abatement.

Note 4: Due to low levels of Hg on site (<50µg/m<sup>3</sup>) and that no low level Hg gaseous standard available the test performed was deemed acceptable.

Note 5: Due to low levels of HF on site the analysis function was replaced by a calibration linearity check and the range of 0 to 3.3mg/m<sup>3</sup> was tested.

Note 6: Due to low levels of NH<sub>3</sub> (0-4mg/m<sup>3</sup>) the Certification Committee found this acceptable; other results obtained meet the requirements (98.3%, 99% and 95.2%).

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## Description

The OPSIS CEM system is a cross stack flue gas measurement system that uses either an AR602Z(UV) analyser or a AR650 (IR) or a combination of both depending on the range of pollutants to be measured. A combination system was tested for MCERTS.

The AR 602Z is based upon UV absorption techniques for measuring SO<sub>2</sub>, NO and NO<sub>2</sub>, H<sub>2</sub>O, HCl, NH<sub>3</sub>, Hg and CO<sub>2</sub>.

The AR 650 is based upon IR absorption techniques for measuring CO, HCl, HF and H<sub>2</sub>O.

The transmitter and receiver units are mounted opposite each other on a duct or stack. The receiver is connected to the control units by fibre optic cable. A common transmitter/receiver assembly is used with both control units.

This certificate applies to the AR602Z (UV) and AR650 (IR) either individually or in combination for the gases listed on page 1 of this certificate only.

Other gases can be measured with this system but were not tested as part of MCERTS.

## 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 020011/00.
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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