PRODUCT CONFORMITY CERTIFICATE

This is to certify that the

AO2000-Limas21 UV

Manufactured by:

ABB Automation GmbH

Stierstäder Straße 5
D-60488 Frankfurt
Germany

has been assessed by Sira Certification Service
and for the conditions stated on this certificate complies with:

Environment Agency Guidance
"MCERTS for stack emissions monitoring equipment at industrial installations" -
Continuous emissions monitoring systems(CEMS),
Published 20 October 2020
15267-1:2009, EN 15267-2:2009, EN15267-3:2007
& QAL 1 as defined in EN 14181

Certification Ranges:

NO	0 to 25 mg/m^3	0 to 200 mg/m^3
NO_2	0 to 50 mg/m^3	0 to 500 mg/m^3
SO_2	0 to 75 mg/m^3	0 to 300 mg/m^3
O_2	0 to 25 Vol.-%	

Project number:	80071815
Certificate number:	Sira MC160293/03
Initial certification:	29 April 2016
This certificate issued:	01 April 2021
Renewal date:	28 April 2026

Andrew Young
Environmental Team Manager

MCERTS is operated on behalf of the Environment Agency by

Sira Certification Service
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UKAS PRODUCT CERTIFICATION 0011

Form 1335
Issue 9

Certificate Contents

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

This instrument is considered suitable for use on waste incineration and large combustion plant applications. This CEMS has been proven suitable for its measuring task (parameter and composition of the flue gas) by use of the QAL 1 procedure specified in EN14181. The lowest certified range for each determinand shall not be more than 1.5 times the daily average emission limit value (ELV) for incineration plants, and not more than 2.5 times the ELV for other types of application.

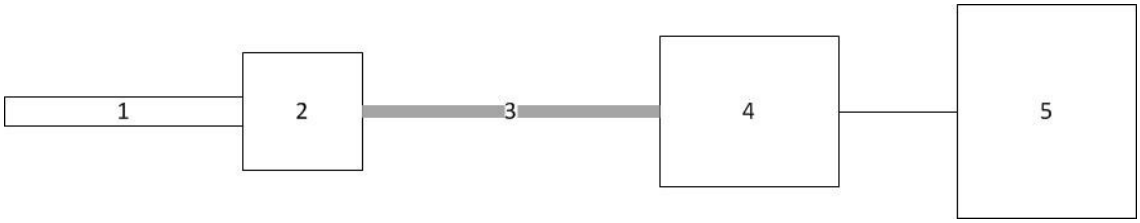
Basis of Certification

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 Süd report number 2231669.1 dated August 2015

Product Certified

The AO2000-Limas21 UV measuring system consists of the following parts:



1. Sample Probe	2. Heated Filter	3. Heated Sample Line	4. Gas Conditioning	5. Analyser
Model: ABB Type 40 or 42 Heated probe with ceramic filter	Model: N/A Integrated in probe	Model: ABB 180°C (30m in field trial) 6mmID	Model: ABB Advance SCC-C/SCC-F	Model: AO2020-Limas21 UV, Electrochemical Oxygen Sensor (CEM236Q)

Allowable variations could include:

- A different brand or model of sampling system of the same type, provided that there is evidence the alternative system works with similar types of CEM.
- Additional manifolds and heated valves used to allow more than one analyser to share a sampling system.

This certificate applies to all instruments fitted with software 3.4.5 onwards (Analyser software) and software version 5.1.4 onwards (Syscon III system software) and serial number 3.343604.2 onwards

Certified Performance

The instrument was evaluated for use under the following conditions:

Ambient Temperature Range: +5°C to +40°C
Instrument IP rating: IP40

Note: For outdoor installations the analyser needs to be mounted into an IP65 environment. 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.

Results are expressed as error % of certification range, unless otherwise stated.

Test	Results expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Response time						
NO					62s	<200s
NO_2					88s	<200s
SO_2					99s	<200s
O_2					57s	<200s
Repeatability standard deviation at zero point						
NO	0.10					<2.0%
NO_2	0.14					<2.0%
SO_2	0.13					<2.0%
O_2	0.07					<0.20%
Repeatability standard deviation at reference point						
NO	0.27					<2.0%
NO_2	0.11					<2.0%
SO_2	0.28					<2.0%
O_2	0.13					<0.20%
Lack-of-fit						
NO	-0.40					<2.0%
NO_2		0.93				<2.0%
SO_2		0.86				<2.0%
O_2	-0.16					<0.20%

Certificate No: Sira MC160293/03
This Certificate issued: 01 April 2021

Test	Results expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Influence of ambient temperature zero point (+5°C to +40°C)						
NO		0.97				<5.0%
NO_2				-2.68		<5.0%
SO_2			1.02			<5.0%
O_2	0.23					<0.50%
Influence of ambient temperature reference point (+5°C to +40°C)						
NO			-1.37			<5.0%
NO_2				-3.06		<5.0%
SO_2			1.24			<5.0%
O_2	0.47					<0.50%
Influence of sample gas flow for extractive CEMS						
NO	-0.20					<2.0%
NO_2		-0.67				<2.0%
SO_2	-0.29					<2.0%
O_2	-0.04					<0.2%
Influence of voltage variations (196V to 230V)						
NO	0.42					<2.0%
NO_2	0.46					<2.0%
SO_2		0.60				<2.0%
O_2	0.02					<0.2%

Test	Results expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Cross-sensitivity at zero with interferents: O_2, H_2O, CO, CO_2, CH_4, N_2O, NO, NO_2, NH_3, SO_2, HCl						
NO		-0.50				<4.0%
NO_2			1.69			<4.0%
SO_2			1.94			<4.0%
O_2	0.05					<0.4%
Cross-sensitivity at reference with interferents: O_2, H_2O, CO, CO_2, CH_4, N_2O, NO, NO_2, NH_3, SO_2, HCl						
NO				2.71		<4.0%
NO_2				3.98		<4.0%
SO_2				2.90		<4.0%
O_2	0.34					<0.4%
Measurement uncertainty					Guidance - at least 25% below max permissible uncertainty	
NO (For an ELV of 36.2 mg/m^3)					4.5%	<15% (20%)
NO_2 (For an ELV of 50 mg/m^3)					6.6%	<15% (20%)
SO_2 (For an ELV of 50 mg/m^3)					9.6%	<15% (20%)
O_2 (For an ELV of 25 Vol.-%)					2.8%	<7.5% (10%)
Calibration function (field)						
NO					0.9361	>0.90
NO_2					0.9459	>0.90
SO_2					0.9050	>0.90
O_2					0.9752	>0.90
Response time (field)						
NO					93s	<200s
NO_2					158s	<200s
SO_2					165s	<200s
O_2					78s	<200s

Test	Results expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Lack of fit (field)						
NO	0.40					<2.0%
NO_2	-0.42					<2.0%
SO_2	-0.37					<2.0%
O_2	-0.06					<0.2%
Maintenance interval					Note 1 4 Weeks	>8 days
Zero and Span drift requirement	The AMS has a means of manually checking and as necessary re-adjustment of zero point. The deviations are recorded; a status signal is set should the level exceed the permissible limit. The deviations in the indicative drift tests in the laboratory were within the permissible tolerance limits. Limas21 UV The analyser is equipped with an internal span auto-adjustment facility (option), operating with gas filled cells. A verification of the gas filled cells is required once a year with external reference gas. A weekly zeros calibration is varied out automatically using ambient air. Oxygen sensor The analyser is equipped with automatic single-point adjustment during the maintenance interval, using ambient air. A verification of the analyser at the zero point is required once a year.					Clause 6.13 & 10.13 Manufacturer shall provide a description of the technique to determine and compensate for zero and span drift.
Change in zero point over maintenance interval						
NO				2.3		<3.0%
NO_2			-1.7			<3.0%
SO_2				-2.9		<3.0%
O_2	-0.19					<0.2%
Change in reference point over maintenance interval						
NO			1.7			<3.0%
NO_2			-1.7			<3.0%
SO_2				<3.0		<3.0%
O_2	0.06					<0.2%

Test	Results expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Availability					98.1%	>95% (>98% for O_2)
Reproducibility						
NO				3.1		<3.3%
NO_2			1.0			<3.3%
SO_2			1.4			<3.3%
O_2	0.05					<0.2%

Note 1: The AO2000 has a maintenance interval of four weeks. The work details below has to be carried out at regular intervals, depending on local conditions (quote TUV maintenance work, functional check and calibration (QAL2) information).

- Visual check of the measuring system
- Heating check
- Gas flow check
- Condensation drainage check
- Addition of test gases for testing and if necessary realignment of span point or zero point for oxygen in the maintenance interval

Description

The Advance Optima AO2000-Limas21 UV Continuous Gas Analyser, consisting of the model line AO2020 (19 inch rack mount) and AO2040 (Wall Mount), equipped with the following modules:

- Limas21 UV:
- CEM236Q (quartz glas cuvettes) or
- CEM236A (aluminium cuvettes)

Electrochemical Oxygen Sensor (optional)

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'.

2. The design of the product certified is defined in the Sira Design Schedule for certificate No. Sira MC160293/02.

3. If certified product is found not to comply, Sira Certification Service 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 Sira Certificates'.

5. This document remains the property of Sira and shall be returned when requested by the company.