

PRODUCT CONFORMITY CERTIFICATE

This is to certify that the

Model 910 Hot/Wet Multi-Gas Mass Flow CEM
Model 920 Hot/Wet Multi-Gas CEM
Model 919 Hot/Wet Single-Gas CEM
Model 909 Hot/Wet Single-Gas Mass Flow CEM

manufactured by:

AMETEK Process Instruments

2876 Sunridge Way N.E
Calgary
Alberta
AB T1Y7H9
Canada

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
EN 15267-1 :2009, EN 15267-2 :2009, EN 15267-3 :2007
& QAL 1 as defined in EN 14181: 2014

	Certification ranges:		
NO ₂ :	0-750 ppm	to	0-1500 ppm
NO :	0-500 ppm	to	0-1000 ppm
SO ₂ :	0-200 ppm	to	0-1000 ppm

Project number: 80059647
Certificate number: Sira MC100183/04
Initial certification: 24 December 2010
This certificate issued: 26 February 2021
Renewal date: 23 December 2025



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MCERTS is operated on behalf of the Environment Agency by

Sira Certification Service

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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 technical guidance on monitoring, 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.

The CEM is also suitable for refining, petrochemical and sulfur recovery stack applications.

The CEM is suitable for indoor use and therefore should be installed in a protected location. The ambient temperature range should be adhered to.

The field test was performed for more than three months in the raw gas of a municipal waste incinerator downstream of the electrostatic filter from 23 February 2010 to 30 June 2010. The measuring systems were installed in a vertical exhaust duct.

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-Report No.: 936/21211494/A
Köln, August 17, 2010

Certificate number: Sira MC100183/04
This certificate issued: 26 February 2021

Product certified

Product Certified

The AMETEK 910 model multi-gas CEM analyser has three related systems:

- Model 920 multi-gas analyser
- Model 919 single gas analyser
- Model 909 single gas mass flow CEM

This certificate applies to all instruments fitted with software version EPROM: V 3.12 (910/920) and V2.12 (909/919) and AMETEK 909/910/919/920 Configurator, Version 2.00 (serial number 10100 onwards).

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Certified performance

The instrument was evaluated for use under the following conditions:

Ambient Temperature Range: +5°C to +40°C

Instrument IP rating: *Classified with degree of protection NEMA 3R – Note 4*

Note: 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.

Unless otherwise stated the evaluation was carried out on the certification range NO₂ 0 to 750ppm, NO 0 to 500ppm, SO₂ 0 to 200ppm

Test	Results expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Response time						
NO ₂					59s	<200s
NO					59s	<200s
SO ₂					59s	<200s
NO ₂ (0-1500ppm)					59s	<200s
NO (0-1000ppm)					59s	<200s
SO ₂ (0-1000ppm)					58s	<200s
Repeatability standard deviation at zero point						
NO ₂	0.1					<2.0%
NO	0.1					<2.0%
SO ₂	0.0					<2.0%
Repeatability standard deviation at reference point						
NO ₂	0.1					<2.0%
NO	0.3					<2.0%
SO ₂	0.1					<2.0%

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Test	Results expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Lack-of-fit						
NO ₂	0.40					<2.0%
NO	0.40					<2.0%
SO ₂		-0.75				<2.0%
NO ₂ (0-1500ppm)		0.53				<2.0%
NO (0-1000ppm)		-0.80				<2.0%
SO ₂ (0-1000ppm)	-0.50					<2.0%
Influence of ambient temperature zero point						
NO ₂				-2.40		<5.0%
NO				2.50		<5.0%
SO ₂				-4.10		<5.0%
SO ₂ (+10°C to +30°C)				-2.10	Note 2	<5.0%
Influence of ambient temperature reference point						
NO ₂				-3.70		<5.0%
NO		-1.00				<5.0%
SO ₂				-5.00		<5.0%
SO ₂ (+10°C to +30°C)				3.10	Note 2	<5.0%
Influence of sample gas pressure						
NO ₂					N/A	<2.0%
NO					N/A	<2.0%
SO ₂					N/A	<2.0%
Influence of sample gas flow for extractive CEMS						
NO ₂		-0.6				<2.0%
NO	-0.4					<2.0%
SO ₂		-0.9				<2.0%
Influence of voltage variations 190 to 250V					No influence	<2.0%
Influence of vibration (10 to 60Hz (±0.3mm), 60 to 150Hz at 19.6m/s ²)					N/A	To be reported

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	<0.5	<1	<2	<5		
Influence of vibration (10 to 60Hz (±0.3mm), 60 to 150Hz at 19.6m/s ²)					N/A	To be reported
Cross-sensitivity at zero with interferents: O ₂ , H ₂ O, CO, CO ₂ , CH ₄ , N ₂ O, NO, NH ₃ , SO ₂ , HCl						
NO ₂			-1.06			<4.0%
NO			1.79			<4.0%
SO ₂				2.24		<4.0%
Cross-sensitivity at reference with interferents: O ₂ , H ₂ O, CO, CO ₂ , CH ₄ , N ₂ O, NO, NH ₃ , SO ₂ , HCl,						
NO ₂			1.68			<4.0%
NO				2.84		<4.0%
SO ₂				-2.24		<4.0%
Converter Efficiency					N/A	>95%
Measurement uncertainty					Note 3	Guidance - at least 25% below max permissible uncertainty (<15%)
NO ₂ (Based on ELV of 300ppm)					12.70%	
NO (Based on ELV of 200ppm)					12.10%	
SO ₂ (Based on ELV of 100ppm)					14.00%	
SO ₂ (Based on ELV of 80ppm)					13.50%	
Calibration function (field)						
NO ₂					0.9501	>0.90
NO					0.9648	>0.90
SO ₂					0.9659	>0.90
Response time (field)						
NO ₂					57s	<200s
NO					58s	<200s
SO ₂					57s	<200s
Lack of fit (field)						
NO ₂			1.20			<2.0%
NO			1.40			<2.0%
SO ₂		0.55				<2.0%
Maintenance interval					4-week period	>8 days

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Test	Results expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Zero and Span drift requirement	NO ₂ = -0.63% and -1.25% (zero and span) NO = 0.69% and 1.69% (zero and span) SO ₂ = -0.94% and -2.00% (zero and span) The position of zero and span point were checked 10 times during the field test, and the systems were readjusted as soon as the allowed drift was exceeded. Manufacturer specified maintenance checks were carried out during the test. During the field test of the system, the automatic zero adjustment was activated with a 6 hour interval.					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		-0.63				<3.0%
NO		-0.81				<3.0%
SO ₂		-0.94				<3.0%
Change in reference point over maintenance interval						
NO ₂			-1.25			<3.0%
NO			1.69			<3.0%
SO ₂			-2.00			<3.0%
Availability					99%	>95% (>98% for O ₂)

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Test	Results expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Reproducibility						
NO ₂	0.3					<3.3%
NO			1.4			<3.3%
SO ₂			1.2			<3.3%

Note 1: The CEM has a maintenance interval of 4 weeks. The work detailed below shall be carried out at regular intervals, depending on local conditions:

Monthly maintenance works: test gas offerings. If the response time decreases the filters have to be checked.

All other necessary maintenance works are specified in the manual.

Note 2: For component SO₂, the temperature range is +10°C to +30°C. This is necessary because of problems to meet the measurements uncertainty requirements for limit values <100ppm. This is mainly caused by the high uncertainty contribution for the climate chamber. By calculating the deviations at +10°C to +30°C this contribution decreases. Over the full range of +5°C to +40°C, the SO₂ values were -4.1% and -5% respectively.

Note 3: The requirements on measurement uncertainty in accordance with EN 15267-3 are fulfilled for a daily mean limit value of 300ppm for NO₂.

The requirements on measurement uncertainty in accordance with EN 15267-3 are fulfilled for a daily mean limit value of 200ppm NO.

The requirements on measurement uncertainty in accordance with EN 15267-3 are fulfilled for a daily mean limit value of 100ppm for SO₂.

The requirements on measurement uncertainty in accordance with EN 15267-3 are fulfilled for a daily mean limit value of 80ppm for SO₂ for ambient temperatures between 10°C and 30 °C.

Note 4: NEMA 3R - Defined as; Enclosures constructed for either indoor or outdoor use to provide a degree of protection to personnel against access to hazardous parts; to provide a degree of protection of the equipment inside the enclosure against ingress of foreign objects (falling dirt); to provide a degree of protection with respect to harmful effects on the equipment due to the ingress of water (rain, sleet, snow); and that will be undamaged by the external formation of ice on the enclosure.

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Description

The analyzer integrates an ultraviolet (UV) absorption spectrometer using a heated temperature controlled sample cell and sample handling system, sample and vent line temperature control, online temperature and pressure compensation, and data analysis procedures to provide measurement of stack gases. In the single component versions (Model 909 and 919), one UV absorbing gas may be measured, while in the multi-component versions (Model 910 and 920) up to 5 individual species may be measured. The single component version is commonly used for sulphur dioxide in stack gas analysis, while the multi-component versions are often configured for the simultaneous determination of sulphur dioxide, nitric oxide and nitrogen dioxide. In principle, the devices may be used to measure any chemical which absorbs light in the ultraviolet to visible regions of the spectrum.

The Model 909 and Model 910 also integrate a stack gas velocimeter for measurement of gas flow rate and the calculation of mass emission rates. The measurement of gas phase concentrations is performed using the dual beam ultraviolet absorption spectrometer. The linearity and reproducibility of the analyzer is enhanced by the use of narrow emission lines from hollow cathode lamps. The wavelength precision of such lamps (they are often used as wavelength reference sources) ensures that the absorbance of the gas is always measured at the exact wavelength of interest.

The emission lines are essentially monochromatic, and thus ensure that the Beer Lambert law is followed and that the analyzer response is linear, often over three to four orders of magnitude. This ensures that the analyzer may be used over a wide dynamic range. While the analyzer has been certified for specified ranges and concentrations, other analytical ranges may easily be achieved simply by changing the sample cell length. Since the analyzer follows the Beer-Lambert law, the signal is proportional to the gas density and optical path length, and these parameters may be used to optimize sensitivity and analytical ranges.

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 held and maintained by TUV Rheinland for certificate No. Sira MC100183/04
3. If a certified product is found not to comply, Sira 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 if requested by Sira.

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