

# PRODUCT CONFORMITY CERTIFICATE

This is to certify that the

**4650-PM**

Manufactured by:

**AMETEK Land**

Stubley Lane  
Dronfield, S18 1DJ  
UK


has been assessed by CSA Group  
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, EN15267-2:2009, EN 15267-3:2007**  
**& QAL 1 as defined in EN 14181: 2014**

Certification ranges:

Particulate concentration	0 to 7.5mg/m <sup>3</sup>
	0 to 15mg/m <sup>3</sup>
	0 to 100mg/m <sup>3</sup>
	0 to 200mg/m <sup>3</sup>

Project number: 80222130  
Certificate number: CSA MC200369/01  
Initial certification: 22 December 2020  
This certificate issued: 13 August 2024  
Renewal date: 16 August 2029



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MCERTS is operated on behalf of the Environment Agency by

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## Approved Site Application

Any potential user should make sure, 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 guidance available at [www.mcerts.net](http://www.mcerts.net)

This instrument is considered suitable for use on waste incineration and large combustion plants. 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 the 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 applications.

The field test was performed using two complete measuring systems over a total period of six months in the waste gas of a waste incineration plant.

## Basis of Certification

This certification is based on the following test report(s) and on CSA Group's assessment and ongoing surveillance of the product and the manufacturing process:

TÜV Rheinland	Report ref: 936/21204255/B, dated 19/11/06
TÜV Rheinland	Report ref: 936/21209450/A, dated 04/03/09
TÜV Rheinland	Report ref: 936/21247872/E, dated 30/06/20

## Product Certified

The 4650-PM particle monitor measuring system consists of the following parts:

- Sensor 4650-PM
- Blower purge
- *Optional:* Control unit (netController, Procontroller, MultiController or Interface Module)

This certificate applies to all instruments fitted with sensor software version 3.4 with optional control units with software versions as follows - Interface module/Multicontroller: 9.04, Procontroller: 2.26 and netController: 1.04

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## Certified Performance

The instrument was evaluated for use under the following conditions:

Ambient temperature range: -20°C to +50°C  
 Instrument IP rating: IP65

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 (0 to 7.5mg/m<sup>3</sup>), unless otherwise stated.

Test	Results expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Response time Dust - 0 to 7.5mg/m <sup>3</sup> 0 to 15mg/m <sup>3</sup> 0 to 100mg/m <sup>3</sup> 0 to 200mg/m <sup>3</sup>					12s 11s 11s 11s	<200s
Repeatability standard deviation at zero point Dust	0					<2.0%
Repeatability standard deviation at reference point Dust	0.6					<3.0%
Lack-of-fit Dust - 0 to 7.5mg/m <sup>3</sup> 0 to 15mg/m <sup>3</sup> 0 to 100mg/m <sup>3</sup> 0 to 200mg/m <sup>3</sup>		-0.93				<3.0%
Influence of ambient temperature zero point (-20°C to +50°C) Dust	0.3					<5.0%
Influence of ambient temperature reference point (-20°C to +50°C) Dust	1.3					<5.0%

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Test	Results expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Influence of voltage variations (196V to 253V) Dust	0.1					<2.0%
Influence of vibration (10 to 60Hz ( $\pm 0.3\text{mm}$ ), 60 to 150Hz at $19.6\text{m/s}^2$ ) Dust		0.8				To be reported
Measurement uncertainty Dust (For an ELV of $5\text{ mg/m}^3$ )					Guidance - at least 25% below max permissible uncertainty 5.7%	<22.5% (30%)
Calibration function (field) Dust					0.98	>0.90
Response time (field) Dust					12s	<200s
Lack of fit (field) Dust		0.53				<3.0%
Maintenance interval Dust					4 weeks Note1	>8 days
Zero and span drift requirement	The instrument is equipped with an automatic zero and span point control to check the zero and span drift. In the event of a value outside the permissible range, a status signal is issued. The results of the automatic control of zero point, span point and contamination can also be output and recorded via the analogue or digital output of the measuring system. Manual drift checks can be performed by removing the instrument from the channel and using zero and reference filters.					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 Dust			1.1			<3.0%

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Test	Results expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Change in reference point over maintenance interval Dust			1.7			<3.0%
Availability Dust					99%	>95%
Reproducibility for concentrations <20mg/m <sup>3</sup>			1.9			<3.3%
Contamination check of in-situ systems Dust			1.1			<2.0%

Note 1: The 4650-PM has a maintenance interval of 4 weeks. The work detailed below should be carried out at regular intervals, depending on local conditions:

- Regular visual inspections
- Perform zero and span point checks with the internal cycle every four weeks
- Checking of the optical surfaces and purge air supply
- Performing the necessary maintenance as per the manufacturers recommendations

Note 2: The following procedure is recommended for functional tests and to be performed before calibration:

- Visual checks of the instrument
- Checking of the optical surfaces and purge air supply
- Check linearly with reference filters (base unit with reference filters)
- Zero and span checks after
- Determination of lag and response time
- Checking of data transmission to the evaluation system (analogue and status signals)

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## Description

The AMETEK Land 4650-PM is a forward light-scattering instrument suitable for measuring dust concentration in industrial stacks.

The sensor probe is installed directly in the flue-gas. Particles in the measuring volume at the end of the probe scatter the laser light in all directions. The forward-scattered light is collected by a concave mirror and transmitted to the detector electronics outside the stack via a heat-tolerant quartz rod.

The instrument is connected to a supply of clean, dry purge air to prevent dust entering the interior of the sensor.

The AMETEK Land 4650-PM has automatic zero, span and contamination checks. The results of these tests are recorded within the separate control unit for QAL3 reporting purposes. In the span check, a scattering body is automatically rotated into the laser beam, to check the response to scattered light directly. The instrument is supported by an optional audit unit which is an approved reference material for conducting linearity tests as part of AST or QAL 2 procedures.

The instrument is designed for measuring the full range of emissions found on clean incinerator and large combustion plant applications.

The AMETEK Land 4650-PM sensor is a standalone PM-CEMS that provides Modbus RS-485 and optional 4-20 mA outputs. It can be connected to a standard or a multi-controller to provide user interface and data acquisition for single or multiple sensors.

The Controllers have a graphic user interface, can diagnose filter performance and maintenance conditions and also record and average data for emissions reporting.

## 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 CSA Group Testing UK Ltd Certificates'.
2. The design of the product certified is held and maintained by TÜV Rheinland for certificate No. CSA MC200369.
3. If a certified product is found not to comply, CSA Group 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 CSA Group Testing UK Ltd Certificates'.
5. This document remains the property of CSA Group and shall be returned when requested by CSA Group.

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