



# PRODUCT CONFORMITY CERTIFICATE

This is to certify that the

**ZETA 5000 Particulate Monitor**

manufactured by:

**ETR-Unidata**

6 Riverside Park,  
Sheaf Gardens,  
Sheffield,  
S2 4BB

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 Range

Particulate concentration: 0 to 15 mg/m<sup>3</sup>

Project No: 674/0304  
Certificate No: Sira MC080128/01  
Initial Certification: 12 August 2008  
This Certificate Issued: 19 January 2012  
Renewal Date: 11 August 2013

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

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## Approved Site Application

*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. Operators with installations falling under the Large Combustion Plant Directive or Waste Incineration Directive must refer to Technical Guidance Note M20: Quality Assurance of Continuous Emission Monitoring Systems, for guidance on the suitability of CEMS for their installations. M2 and M20 are available on the Agency's website at [www.mcerts.net](http://www.mcerts.net)*

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.

## 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:

- R1: Sira Environmental Test report: C 1264 dated July 2008
- R2: AEA Energy & Environment test report: MCERTS Laboratory Testing of Unidata ZETA Dust Monitors dated May 2008.
- R3: Mira Test Report: Zeta head cylinder 3 axes vibration dated January 2007
- R4: Sira Test & Certification Report: N58D15828A dated December 2006.
- R5: AEA Energy & Environment test report. MCERTS Field Evaluation of Unidata ZETA Dust Monitors dated 15 January 2007.

## Product Certified

The ZETA 5000 Particulate Monitor consists of the following parts:

- Zeta 5000 integrated system control unit and data logger
- Zeta 5000 optical transmitter system
- Zeta 5000 optical transceiver system

This certificate applies to all instruments fitted with software version 4.1 and 4.2 (serial numbers 32459 (logger), 30764 (receiver head) and 30765 (source head) onwards).

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### Certified Performance

The instrument was evaluated for use under the following conditions:

Ambient Temperature Range: -20°C to +50°C

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.

The instruments were tested over the range 0-15mg/m<sup>3</sup> unless otherwise stated.

Test	Results expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Mains voltage						
Zero	0.20					<2.0%
Span	0.27					
Vibration					No effect	To be stated
Zero shift due to ambient temperature change of 1° C	0.22					<0.3%
Span shift due to ambient temperature change of 1° C	0.29					<0.3%
Response time					20s	<200s
Linearity			1.8			<2%
Cross sensitivity						
Interfering gases (moisture)					See Note 1	To be stated
Velocity (see Note 2) (2.5 to 15m/s)					up to 37% variation	
Particle size (see Note 2) (6 to 18µm)					-5% to 12% variation	
Stray light					No effect	
Detection Limit			1.4%			<2%
Analysis function (field) (see Note 3)					99.8%	>95%

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Test	Results expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Integral Performance (field)				3.72		<20%
Reproducibility					86	>30
<p>Zero and Span drift requirement</p> <p>The measuring heads check the zero value and then the span value before measuring the value of the dust input signal on each measurement i.e. every 50 ms. This is referred to as the 'heartbeat'. This ensures that the span of the instrument is automatically compensated for any drift.</p> <p>The instrument outputs the zero value and followed by the span value for a duration of 5 s for each value on the 4-20 mA continuous output of the logger. This span/zero signal is outputted hourly.</p> <p>To provide a long term record the logger also generates a span/zero file which logs the two values together with a time date stamp. This file is saved automatically to the loggers' inbuilt SD card memory, and can be accessed by the inbuilt USB connection or removing the SD card for remote data analysis.</p>						<p>Clause 6.13 &amp; 10.13</p> <p>Manufacturer shall provide a description of the technique to determine and compensate for zero and span drift.</p>
Zero and span drift					See Note 4	<3% (weekly)
Short term drift (24hr)			1.55			
Availability					99.93%	>95%
Maintenance Interval					12 weeks	>8 days

- Note 1. Caution should be taken if water droplets are likely to be present in the duct as this can affect the performance of light-based particulate monitoring systems
- Note 2. Particulate monitors may exhibit sensitivity to various in-stack effects. Systems must be calibrated on the process being monitored.
- Note 3. This result is taken from the lab data in a wind tunnel facility, not from the field trial results.
- Note 4. The units undertake internal span and zero checks by means of an electronic 'heartbeat'. It was not possible to evaluate any drift present because the data could not be made available at the time of the field tests. Short term drift over 24 hours has been reported for this requirement.

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### Description:

The Zeta 5000 is an advanced particulate continuous emissions monitor, which measures particulate presence using light scatter. The design utilises a high power Luxon light source combined with a large detector to illuminate a substantial proportion of the duct, creating a large measuring area in the centre of the duct where the particulates are generally concentrated.

The Zeta 5000 continuously monitors its own performance to self-compensate for environmental and component changes, and provides early warning of system deterioration. The system has auto span and zero adjustment and can be supplied with filter failure capability, identifying individual filter failure. The control unit can manage up to four separate sets of heads, allowing for multi-emission point monitoring.

### 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 MC080128/00.
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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