



PRODUCT CONFORMITY CERTIFICATE

This is to certify that the

DUSTHUNTER T100

manufactured by:

SICK Maihak GmbH

*Bergener Ring 27
01458 Ottendorf-Okrilla
Germany*

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 3.1 dated July 2008,
EN15267:2007,
& QAL 1 as defined in EN 14181: 2004**

Certification Ranges :

Dust	0 to 0.1 Ext.*
	0 to 0.05 Ext.
	0 to 0.2 Ext.
	0 to 0.5 Ext.
	0 to 1.0 Ext.

*0 to 0.1 Ext. \equiv 0-15 mg/m³ dust at 5m optical path length

Project No:	674/0391E
Certificate No:	Sira MC090151/00
Initial Certification:	17 August 2009
This Certificate Issued	17 August 2009
Renewal Date:	16 August 2014

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

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. This CEM 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, for LCPD and WID applications for the ranges specified. The lowest certified range for each determinand shall not be more than 1.5X the emission limit value (ELV) for WID applications, and not more than 2.5X the ELV for LCPD and other types of application.

The field trial was conducted over 6 months with the T100 mounted on a municipal waste incinerator.

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 Number 936/21210076/A dated 24.10.2008

Product Certified

The measuring system consists of the following parts:

- Sender/receiver unit DHT-T
- Connection cable to connect the sender/receiver unit to the control unit
- Reflector DHT-R
- Control unit MCU for data control, evaluation and output
 - With integrated purge air supply, for internal duct pressure -50... +2 mbar
 - Without purge air supply, therefore additionally required:
- Optional external purge air unit, for internal duct pressure -50...+30mbar

This certificate applies to all instruments fitted with software version 1.026 (MCU) 1.3.04 (sensor) and 02.16 (SOPAS ET operating software), serial number 08328558 (SR unit) 07478637 (MCU) 08328560 (R/S unit) 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
 Instrument IP rating: IP 66

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 0 to 0.1 Ext.

Test	Results expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Response time					28s (with damping time set to 30s)	<200s
Repeatability standard deviation at zero point	0.1					<2.0%
Repeatability standard deviation at span point	0.1					<5.0%
Lack-of-fit					See Note 1	
0-0.1 Ext.		1.0				<3.0%
0-0.2 Ext.		1.0				<3.0%
0-0.5 Ext.			-1.7			<3.0%
0-1.0 Ext.		-1.0				<3.0%
Influence of ambient temperature zero point		-0.9			See Note 1	<5.0%
Influence of ambient temperature span point	0.1				See Note 1	<5.0%
Influence of voltage variations 190 to 250V		-0.8			See Note 1	<2.0%
Influence of vibration (10 to 60Hz (±0.3mm), 60 to 150Hz at 19.6m/s ²)					0.3% 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	<5		
Measurement uncertainty (for an ELV of 10mg/m ³)					6%	Guidance - at least 25% below max permissible uncertainty 22.5% in EN15267-3
Calibration function (field)					0.72 See Note 3	>0.90
Response time (field)					28s (with damping time set to 30s)	<200s
Lack of fit (field)			1.4			<3.0%
Maintenance interval					3 months See Note 4	>8 days
Zero and Span drift requirement Clause 6.13 & 10.13 Manufacturer shall provide a description of the technique to determine and compensate for zero and span drift.	<p><u>Statement from manufacturer:</u></p> <p>Zero value measurement The sender diode is switched off for zero point control so that no signal is received. This means possible drifts or zero point deviations are detected reliably in the overall system (e.g. due to an electronic defect). An error signal is generated when the 'zero value' is outside the specified range.</p> <p>Control value measurement (Span test) Sender beam intensity changes between 7% and 100% during the determination of the control value. The difference of the light intensity received is compared against the standard value. The AMS generates an error signal for deviations >±2%. The error message is cleared again when the check cycle next runs successfully. The control value is determined with high precision through statistical evaluation of a high number of intensity changes (50 changes with 70 measurements each for scattered light measurement; 50 changes with 70 measurements for each transmission measurement). The control value is calculated with the control reflector swivelled in.</p>					
Change in zero point over maintenance interval	-0.5					<3.0%
Change in span point over maintenance interval				2.9		<3.0%

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Test	Results expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Availability					99.3%	>95%
Reproducibility				2.8		<3.3%

Note 1 – The T100 and T200 measuring systems are almost identical, other than 2 additional functionalities carried by the T200:

- Automatic compensation of optical axis misalignment due to external factors such as temperature fluxuations. adjusting device in the optical head
- Contamination compensation on both sides (T100 has this only on the sender/receiver unit).

The following tests have been conducted on the T200 analyser and are deemed equivalent for the T100: lack-of-fit, influence of ambient temperature and influence of voltage variations

Note 2 – The vibration test was conducted on the C200 model (transmission and scattered light measurement) which contains all functionalities of the T100.

Note 3 – The calibration function result / R² values are between 0.72 and 0.81 is due to low dust levels. The CEMS pass the EN14181 criteria, but not the requirement for EN15267-3, which is an R² value of 0.9. This criterion is based on the premise of wide spread of data over the measurement range. Lower and/or clusters of data would lower the R² value, although a CEM still could be well within the criterion for the variability test given in EN14181.

Note 4 – The T100 has a maintenance interval of 3 months. In the case of a new installation the measuring system should be tested by all means at weekly or biweekly intervals via visual inspection.

The work detailed below has to be carried out at regular intervals, depending on local conditions:

- Visual inspection of the CEM
- Examination of the S/R unit and the reflector by swinging out from the duct visual inspection. The optical surfaces should be cleaned if necessary.
- Determination of zero and span point
- Examination of the purge air supply
- Check cycle operation including a check of zero and span point and of the contamination signal.

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Description:

The DUSTHUNTER T100 uses transmission measurement to determine the mass concentration of dust in flowing gases.

The measuring system utilises a dual pass transmission of light in the visible range through the gas between a sender/receiver unit and reflector. The light source is a high performance LED. While passing through the measurement path, the transmitted light is attenuated by the particles in the beam and the resultant light is captured by the measurement receiver. Continuous monitoring of the sender output registers the smallest changes in brightness of the light beam sent which serves to determine the measurement signal.

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 MC090151/00
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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