



PRODUCT CONFORMITY CERTIFICATE

This is to certify that the

FLOWSIC100 Gas Flowmeter

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 :

Velocity 0 to 20 m/s
0 to 40 m/s

Project No:	674/0373C
Certificate No:	Sira MC040040/03
Initial Certification:	10 August 2004
This Certificate Issued	24 April 2009
Renewal Date:	09 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



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.

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 Rhineland	Report Number 936/21206702/F, dated 05/10/2008
TÜV Rhineland	Report Number 936/2120909A, dated 02/03/2009
TÜV Rhineland	Report Number

Product Certified

The cross-duct measuring system consists of the following basic parts:

- two FLSE100 sender/receiver units
- an MCU control unit
- a connection box
- two connection cables
- two flanges with tube

For one-sided installation, both ultrasonic transducers are installed on a probe with a fixed measuring path, defined as a single FLSE100. This system also uses an MCU control unit, a flange with tube and, optionally, a connection box.

The certificate applies to the following versions:
PR, PR-AC, M, M-AC, H, H-AC, PM, PH, PH-S

This certificate applies to all instruments fitted with software version 1.0.26 (MCU) and 1.4.02 (FLSE100) (serial number 08248727 (MCU) and 08238700 (FLSE) onwards)

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Certified Performance

The instrument was evaluated for use under the following conditions:

Ambient Temperature Range: -40°C to +60°C

Instrument IP rating: >IP65

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 20 m/s. The velocity range was extended to 40 m/s in January 2009, TÜV Rhineland report .936/21210909A.

Test	Results expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Response time					10s	<60s
Repeatability standard deviation at zero point	0.09					<2.0%
Lack-of-fit (linearity) 0-20m/s			-1.4			<3.0%
Lack-of-fit (linearity) 0-40m/s		0.8				<3.0%
Influence of ambient temperature zero point	-0.44					<5.0%
Influence of ambient temperature reference point	-0.44					<5.0%
Influence of voltage variations 190 to 250V	-0.03					<2.0%
Influence of vibration (10 to 60Hz ($\pm 0.3\text{mm}$), 60 to 150Hz at 19.6m/s^2)					0.1%	To be reported
Measurement uncertainty (over range 0 to 20 m/s)					4.4%	Guidance - at least 25% below max permissible uncertainty 7.5%
Calibration function (field – note 1)					0.99	>0.90
Response time (field – note 1)					10s	<60s
Lack of fit (field – note 1)			1.1			<2.0%
Maintenance interval (field – note 1)					6 months See Note 2	>8 days

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Test	Results expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<5		
<p>Zero and Span drift requirement</p> <p>Clause 6.13 & 10.13</p> <p>Manufacturer shall provide a description of the technique to determine and compensate for zero and span drift.</p>	<p><u>Statement from manufacturer:</u></p> <p><i>Zero-point check</i> A special circuit arrangement in the sender/receiver units ensures that the transmission signals from the transducers can be read back instantaneously and with the original shape. These transmission signals are received as reception signals, amplified, demodulated, and evaluated.</p> <p><i>If the device is operating correctly, the result of the evaluation must be the exact zero point.</i></p> <p><i>A warning is output for offsets greater than approx. 0.25 m/s (depending on the measuring distance and gas temperature). This check comprises a full check of all the system components, including the transducers.</i></p> <p><i>Span test</i> At the electronic zero point test, the time difference between both directions of signal transmission is generated. It is calculated with the installation parameters gas temperature, measuring distance and speed of sound and a velocity offset is calculated at the zero point.</p> <p><i>This offset is added to the chosen span value and is output.</i></p> <p><i>The span value can be set to between 50 and 70 % in steps of 1 % using the SOPAS ET operating software (factory setting 70 %). If all of the system components are intact, the entire measuring system will respond in the prescribed manner.</i></p>					
Change in zero point over maintenance interval (field – note 1)		-0.8				<2.0%
Change in reference point over maintenance interval (field – note 1)		-0.8				<2.0%
Availability (field – note 1)					100%	>95% (>98% for O ₂)
Reproducibility (field – note 1)			1.2			<3.3%

Note 1 The FLOWSIC100 was mounted on a waste incinerator for 12months

Note 2 The manufacturer recommends the following maintenance to be conducted every six months:

- Inspection of the measuring system for signs of corrosion and damage
- Cleaning of sender/receiver units
- Maintenance activities for the purge-air unit:
 - Inspection of the entire purge air supply
 - Cleaning of the filter housing
 - Replacement of the filter insert, if necessary.

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Description:

The FLOWSIC100 flowmeter is a 'time of flight' analyser that determines the flue gas velocity by measuring the difference in the transit times of ultrasonic signals at an angle between 45° and 60° to the flow direction. The measuring system consists of two measuring heads that are both transmitter and receiver and a control unit. The single probe version consists of only one sender/receiver unit equipped with two ultrasonic transducers.

FLAWSIC100 Series is available in unpurged, internally cooled and externally purged versions, with high and medium powers for different measuring path lengths.

Name of complete measuring system	Sender-/receiver unit FLSE100 (sensor)		
	Gas temperature	Ambient temperature	Measuring distance
FLAWSIC100 M	-40 ... +260°C	-40 ... +60°C	0.2 – 4m
FLAWSIC100 H	-40 ... +260°C	-40 ... +60°C	2 – 15m
FLAWSIC100 PR	-40 ... +260°C	-40 ... +60°C	0.27 – 0.28m
FLAWSIC100 M-AC	-40 ... +450°C	-40 ... +60°C	0.2 – 4m
FLAWSIC100 H-AC	-40 ... +450°C	-40 ... +60°C	2 – 13m
FLAWSIC100 PR-AC	-40 ... +350°C	-40 ... +60°C	0.245 – 0.255m
FLAWSIC100 PM	-40 ... +450°C	-40 ... +60°C	0.5 – 3m
FLAWSIC100 PH	-40 ... +450°C	-40 ... +60°C	1 – 10m
FLAWSIC100 PH-S	-40 ... +450°C	-40 ... +60°C	2 – 13m

M = medium acoustic power

H = high acoustic power

H-S = extra high acoustic power

PR = probe version

P = purged

AC = air cooled (internal)

Usually the probes are available in stainless steel (SS), titanium (TI) and Hastelloy (HS) while transducers are mostly titanium (TI) or Hastelloy (HS). Other material configurations are possible depending on application conditions.

The manufacturer states that the FLOWSIC100 series is suitable for different active measuring path lengths between 0.2 and 15m. Various configuration options enable measurements to be performed in applications with differing characteristics.

Standard sender/receiver units (unpurged types) can be used without any purge or cooling air in gases at high temperature up to +260°C. Versions with internal cooling of the ultrasonic transducers (FLSE100-MAC, HAC and PRAC), are suitable for higher temperature applications with no risk of interference with the measurement or cooling of the transducer below the dew point by the flow of purge air into the measured medium. Purged transducers (FLSE100-PH, PM and PHS) are intended mainly for applications where wet sticky dust would lead to severe contamination of the transducer surface.

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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 MC040040/02.
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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