

PRODUCT CONFORMITY CERTIFICATE

This is to certify that the

***Thermo-FID TOC Analyser
(Model MK, FE, ES, TG, PT or KA)***

Manufactured by:

SK-Elektronik GmbH

*Benzstraße 23 -25
51381 Leverkusen
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 3.4 dated July 2012
EN15267-3:2007,
& QAL 1 as defined in EN 14181: 2004**

Certification Ranges :

TOC	0 to 15 mg/m ³
	0 to 30 mg/m ³
	0 to 2000 mg/m ³

Project No.: 1625648
Certificate No: Sira MC050062/03
Initial Certification: 03 October 2005
This Certificate issued: 05 October 2015
Renewal Date: 03 October 2020

Joe Prince MSc, MInst MC
Deputy Certification Manager

MCERTS is operated on behalf of the Environment Agency by

Sira Certification Service

Unit 6, Hawarden Industrial Park
Hawarden, Deeside, CH5 3US
Tel: +44 (0)1244 670 900



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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 Monitoring Technical Guidance Notes available 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/IED Chapter III and IED Chapter IV applications for the ranges specified. The lowest certified range for each determinand shall not be more than 1.5X the daily average emission limit value (ELV) for IED Chapter IV applications, and not more than 2.5X the ELV for IED Chapter III 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:

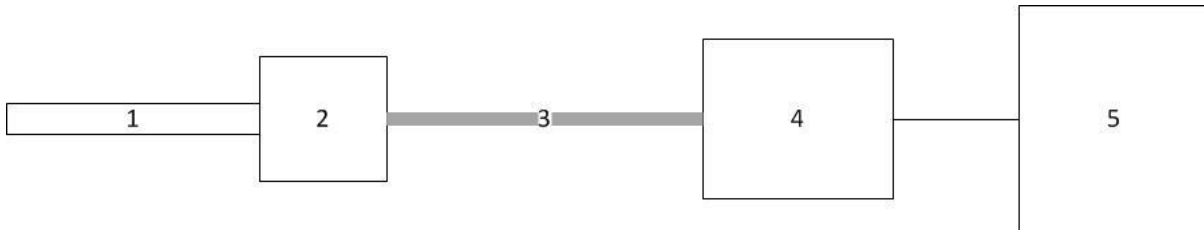
TUV Rheinland Report Number 936/806016 dated 26 February 1997
TUV Rheinland Report Number 936/806016/B dated 23 December 2003
TUV Rheinland Report Number 936/21219522/A dated 21 June 2013
TUV Rheinland Doc number 20150413_936 dated 13 April 2015

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Product Certified

The Thermo-FID TOC measuring system consists of the following parts:



1. Sample Probe	2. Heated Filter	3. Heated Sample Line	4. Gas Conditioning	5. Analyser
Gasy MKA	Gasy MKA	Gasy MKA	n/a	Thermo FID

Note: This only applies to the TG, PT, FE and ES model. The MK consists only of one stack-mountable unit.

Allowable variations could include:

- A different brand or model of sampling system of the same type, provided that there is evidence the alternative system works with similar types of CEM.
- Additional manifolds and heated valves used to allow more than one analyser to share a sampling system.

This certificate applies to all instruments fitted with software version 5.00 onwards (serial number bearing the year '04' onwards).

For EN 15267-3, this certificate applies to all instruments fitted with software version 5.31 onwards (serial number 1803412 onwards).

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Certified Performance

The instrument was evaluated for use under the following conditions:

Ambient Temperature Range: 5°C to 45°C
 Instrument IP rating: IP40 (ES, PT or TG); IP54 (FE or MK (IP65 Version available))

Results are expressed as error in % certification range 0 to 15 mg/m³, unless otherwise stated.

Test	Results expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Response time						
TOC (0 to 15 mg/m ³)					12s	<200s
TOC (0 to 30 mg/m ³)					13s	<200s
TOC (0 to 2000 mg/m ³)					14s	<200s
Repeatability standard deviation at zero point						
TOC	0.2					<2.0%
Repeatability standard deviation at reference point						
TOC	0.2					<2.0%
Lack-of-fit						
TOC (0 to 15 mg/m ³)	0.2					<2.0%
TOC (0 to 30 mg/m ³)	0.3					<2.0%
TOC (0 to 2000 mg/m ³)			1.0			<2.0%
Influence of ambient temperature zero point					Note 1	
TOC				4.8		<5.0%
Influence of ambient temperature reference point					Note 1	
TOC				-2.0		<5.0%
Influence of sample gas flow for extractive CEMS						
TOC	-0.1					<2.0%
Influence of voltage variations 190 to 250V						
TOC			-1.0			<2.0%

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Test	Results expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Influence of vibration (10 to 60Hz (± 0.3 mm), 60 to 150Hz at 19.6m/s ²)		-0.7				To be reported
Cross-sensitivity at zero with interferents: O ₂ , H ₂ O, CO, CO ₂ , N ₂ O, NO, NO ₂ , NH ₃ , SO ₂ , HCl TOC	0.0				Note 2	<4.0%
Cross-sensitivity at reference with interferents: O ₂ , H ₂ O, CO, CO ₂ , N ₂ O, NO, NO ₂ , NH ₃ , SO ₂ , HCl TOC				3.9	Note 2	<4.0%
Effect of oxygen for TOC CEMS			1.3			<2.0%
Response factors for TOC CEMS						
Methane					1.0	0.9 to 1.2
Aliphatic hydrocarbons					1.04 – 1.10	0.9 to 1.1
Aromatic hydrocarbons					0.84-1.08	0.8 to 1.1
Dichloromethane					1.09	0.75 to 1.15
Aliphatic alcohols					0.90-1.04	0.7 to 1.0
Esters and ketones					0.94-0.99	0.7 to 1.0
Organic acids					0.75-0.77	0.5 to 1.0
Test gas mixture					<13.6%	<15%
Measurement uncertainty TOC					Guidance - at least 25% below max permissible uncertainty 11.8%	<22.5% (<30%)
Calibration function (field) TOC					0.9904-0.9929	>0.90
Response time (field) TOC					<170s	<200s
Lack of fit (field) TOC			1.8			<2.0%

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Test	Results expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Maintenance interval					Four weeks	>8 days
Zero and Span drift requirement	<p>The system is equipped with an automatic drift correction. A status signal is triggered when the zero and span points are outside the specified ranges.</p> <p>The system is able to perform an automatic calibration with the supplied test gas. If the deviation is higher than 10%, the instrument triggers the status signal for maintenance. If the deviation is higher than 30%, the instrument needs a basic calibration / adjustment.</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>
Change in zero point over maintenance interval TOC			1.5			<3.0%
Change in reference point over maintenance interval TOC			1.7			<3.0%
Availability					>98%	>95%
Reproducibility TOC				2.6%		<3.3%

Note 1: Ambient temperature data was achieved at the range of 0 to 40 mg/m³ (5°C to 45°C) and at 0 to 15 mg/m³ (5°C to 40°C).

Note 2: Additional ranges for cross sensitivity to O₂ (21 %^{vol.} & 3 %^{vol.}), NO₂ (100 mg/m³) and HCl (200 mg/m³) were tested separately. Cross sensitivity to CH₄ has not been tested.

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Description

Thermo-FID is an extractive gas analyser for the measurement of Total Organic Hydrocarbons (TOC). It uses a Flames Ionisation Detector (FID) for its measurement. The Thermo-FID represents a modular designed instrument using identical plug-in assemblies for easy service. Thermo-FID is available in different versions:

- Thermo-FID PT (Portable Thermo-FID)
- Thermo-FID FE (Thermo-FID model Field Housing),
- Thermo-FID ES (Thermo-FID model 19" Rack Mount),
- Thermo-FID TG (Thermo-FID model Desk Top)
- Thermo-FID MK (Thermo-FID model Close Coupled Probe On Stack)
- Thermo-FID KA (Thermo-FID model Cassette Mount)

All versions of the analyser have the same detector unit, gas piping system and electronics. However the Model PT uses a membrane pump instead of an injector pump. Apart from this the main differences between the models are the different designs of housings.

For further details on higher ranges available please consult the manufacturer.

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 V00 for certificate No. Sira MC 050062/03.
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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