

# PRODUCT CONFORMITY CERTIFICATE

This is to certify that the

## ***GMS810/811-FIDOR TOC analyser***

Manufactured by:

### **SICK AG**

Poppenbütteler Bogen 9b  
D-22399 Hamburg  
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 3.5 dated June 2016  
EN15267-3:2007,  
& QAL 1 as defined in EN 14181: 2014**

Certification Ranges :

TOC 0 to 15 mg/m<sup>3</sup>  
0 to 50 mg/m<sup>3</sup>  
0 to 150 mg/m<sup>3</sup>  
0 to 500 mg/m<sup>3</sup>

Project No.: 70112725  
Certificate No: Sira MC120192/03  
Initial Certification: 08 February 2012  
This Certificate issued: 08 February 2017  
Renewal Date: 07 February 2022

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  
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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](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. 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 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:

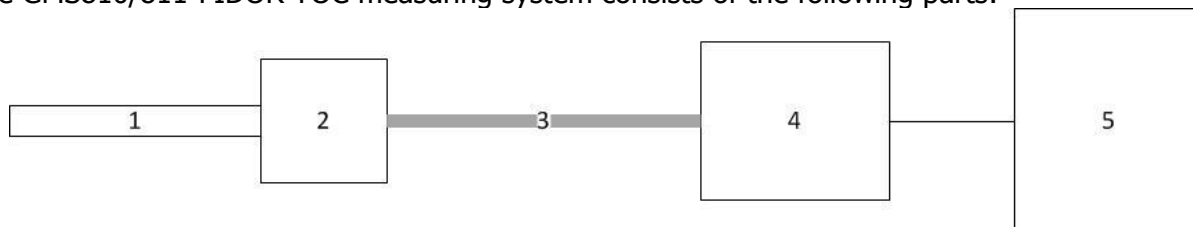
|               |  |
|---------------|--|
| TÜV Rheinland | Report No.: 936/21216085/A dated March 25 2011   |
| TÜV Rheinland | Report No.: 936/21216085/B dated October 10 2011 |

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**Product Certified**

The GMS810/811-FIDOR TOC measuring system consists of the following parts:



| Sample Probe                           | Heated Filter                                   | Heated Sample Line   | Gas Conditioning                 | Analyser  |
|--|---|----------------------|----------------------------------|---|
| Model:<br>M&C SP2000-H &<br>SFU-BF SPB | Model:<br>N/A – Integrated<br>with sample probe | Model:<br>See Note 1 | Model:<br>GR 3010 E &<br>6027504 | Model:<br>GMS810 – FIDOR<br>integrated BCU<br>GMS811- FIDOR<br>external BCU/SCU |

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 2.00a (serial number 00823523 onwards).

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## Certified Performance

The instrument was evaluated for use under the following conditions:

Ambient Temperature Range: +5°C to 40°C  
 Instrument IP rating: IP40 (ventilated rooms)

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 TOC 0 to 15mg/m<sup>3</sup>

| Test   | Results expressed as % of the certification range |     |    |    | Other results   | MCERTS specification |
|--|---|-----|----|----|-----------------|----------------------|
|  | <0.5  | <1  | <2 | <5 |                 |                      |
| Response time<br>TOC<br>0 to 15 mg/m <sup>3</sup>          |   |     |    |    | < 77s<br>Note 2 | <200s                |
| 0 to 50 mg/m <sup>3</sup>                                  |   |     |    |    | < 27s           | <200s                |
| 0 to 150 mg/m <sup>3</sup>                                 |   |     |    |    | < 32s           | <200s                |
| 0 to 500 mg/m <sup>3</sup>                                 |   |     |    |    | < 21s           | <200s                |
| Repeatability standard deviation at zero point<br>TOC      | 0.1   |     |    |    |                 | <2.0%                |
| Repeatability standard deviation at reference point<br>TOC | 0.2   |     |    |    |                 | <2.0%                |
| Lack-of-fit<br>TOC<br>0 to 15 mg/m <sup>3</sup>            | 0.4   |     |    |    | Note 3          | <2.0%                |
| 0 to 50 mg/m <sup>3</sup>                                  |   | 0.6 |    |    |                 | <2.0%                |
| 0 to 150 mg/m <sup>3</sup>                                 | 0.2   |     |    |    |                 | <2.0%                |
| 0 to 500 mg/m <sup>3</sup>                                 | 0.4   |     |    |    |                 | <2.0%                |
| Influence of ambient temperature zero point<br>TOC         |   | 0.7 |    |    |                 | <5.0%                |
| Influence of ambient temperature reference point<br>TOC    |   | 0.6 |    |    |                 | <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 sample gas flow for extractive CEMS<br>TOC   | -0.5  |            |      |                |                             | <2.0%                |
| Influence of voltage variations 190 to 250V<br>TOC (nominal 230V)<br>TOC (additional: nominal 110V)   |   | 0.8<br>0.7 |      |                |                             | <2.0%<br><2.0%       |
| Influence of vibration (10 to 60Hz (±0.3mm), 60 to 150Hz at 19.6m/s <sup>2</sup> )  |   |            |      |                | Not tested – extractive CEM | <2.0%                |
| Cross-sensitivity at zero with interferents: O <sub>2</sub> , H <sub>2</sub> O, CO, CO <sub>2</sub> , CH <sub>4</sub> , N <sub>2</sub> O, NO, NO <sub>2</sub> , NH <sub>3</sub> , SO <sub>2</sub> , HCl.<br>TOC<br>TOC (EN12619)      |   |            | 1.80 | 3.06           | Note 4                      | <4.0%<br><4.0%       |
| Cross-sensitivity at reference with interferents: O <sub>2</sub> , H <sub>2</sub> O, CO, CO <sub>2</sub> , CH <sub>4</sub> , N <sub>2</sub> O, NO, NO <sub>2</sub> , NH <sub>3</sub> , SO <sub>2</sub> , HCl.<br>TOC<br>TOC (EN12619) |   |            |      | -2.93<br>-3.80 | Note 4                      | <4.0%<br><4.0%       |

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| Test                            | Results expressed as % of the certification range  |    |       |    | Other results   | MCERTS specification  |
|---------------------------------|--|----|-------|----|---|---|
|                                 | <0.5   | <1 | <2    | <5 |   |   |
| Effect of Oxygen for TOC CEMS   |  |    | -1.60 |    |   | <2.0%   |
| Response factors for TOC CEMS   |  |    |       |    |   |   |
| Methane                         |  |    |       |    | 1.05  | 0.9 – 1.09  |
| Aliphatic hydrocarbons          |  |    |       |    | 0.9 - 1.09  | 0.9 – 1.1   |
| Aromatic hydrocarbons           |  |    |       |    | 0.81 – 0.99   | 0.8 – 1.1   |
| Dichloromethane                 |  |    |       |    | 1.11 – 1.12   | 0.75 – 1.15   |
| Aliphatic alcohols              |  |    |       |    | 0.79 – 0.83   | 0.7 – 1.0   |
| Ester and ketones               |  |    |       |    | 0.76  | 0.7 – 1.0   |
| Organic acids                   |  |    |       |    | 0.83  | 0.5 – 1.0   |
| Measurement uncertainty         |  |    |       |    | Guidance – at least 25% below max permissible uncertainty |   |
| TOC                             |  |    |       |    | 8.6%  | 22.5%   |
| Calibration function (field)    |  |    |       |    |   |   |
| TOC                             |  |    |       |    | 0.9905  | >0.90   |
| Response time (field)           |  |    |       |    |   |   |
| TOC                             |  |    |       |    | < 51s   | <200s   |
| Lack of fit (field)             |  |    |       |    |   |   |
| TOC                             |  |    | -1.40 |    |   | <2.0%   |
| Maintenance interval            |  |    |       |    | 3 Months<br>Note 5  | >8 days   |
| Zero and Span drift requirement | Automatic recording of span and drift is not available. A warning is displayed for deviations of 2% or more. If the deviation is 3% or more, the CEMS stops operating. The adjustment of zero point takes about 7 minutes to complete and therefore, no half hourly averages need be rejected. |    |       |    |   | Clause 6.13 & 10.13<br>Manufacturer shall provide a description of the technique to determine and compensate for zero and span drift. |

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| Test   | Results expressed as % of the certification range |    |    |       | Other results | MCERTS specification |
|--|---|----|----|-------|---------------|----------------------|
|  | <0.5  | <1 | <2 | <5    |               |                      |
| Change in zero point over maintenance interval<br>TOC      |   |    |    | -2.19 |               | <3.0%                |
| Change in reference point over maintenance interval<br>TOC |   |    |    | -2.87 |               | <3.0%                |
| Availability<br>TOC  |   |    |    |       | 99.5%         | >95%                 |
| Reproducibility<br>TOC                                     | 0.4   |    |    |       |               | <3.3%                |

- Note 1: Heated sample line – 2 to 70m in length; two regulators are necessary for regulating the heater at lengths of 35m or more. The sample line length was 35m during the field test. In the laboratory tests, the  $t_{90}$  time was determined for sample line lengths of 2m and 70m.
- Note 2: Test also conducted at 0-15mg/m<sup>3</sup> with the external SCU and 5m heated line. Response time reported as 17s.
- Note 3: Test also conducted at 0-15mg/m<sup>3</sup> with the external SCU and 5m heated line. Lack of fit reported as 0.33% of certification range.
- Note 4: Additional testing conducted according to EN 12619 - Values of O<sub>2</sub> (10% Vol), H<sub>2</sub>O (25% Vol), CO<sub>2</sub> (18% Vol), CO (430 mg/m<sup>3</sup>), NO (860 mg/m<sup>3</sup>) & NO<sub>2</sub> (150 mg/m<sup>3</sup>)
- Note 5: The GMS810/811 FIDOR TOC analyser has a maintenance interval of 3 months. The work detailed below has to be carried out at regular intervals, depending on local conditions and at an interval not exceeding 3 months:
- Apply test gas at zero and span point, temperature check of the catalyst and temperature check of the heated sample line.

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## Description

FIDOR is a member of the GMS800 analyser family. It is designed for monitoring the emissions of TOC according to regulatory requirements, for example, on waste incinerators and cement plants.

Utilising the flame ionisation principle, FIDOR measures total organic hydrocarbon concentrations in both high and low ranges; and at levels much higher than the certified concentrations.

The design incorporates a maintenance-free ejector pump and, with an availability of 99.5%, FIDOR has a certified maintenance period of 3 months. Hydrogen alone is employed as the burner gas without need for a hydrogen / helium mixture.

FIDOR is controlled by the built-in or external control unit or remotely by SOPAS ET software running on a PC.

Besides emissions monitoring, FIDOR can also be used for process applications and work- place environmental-measurements.

## 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 MC120192/03
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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