

# CERTIFICATE

## of Product Conformity (QAL1)

Certificate No.: 0000001012\_03

**AMS designation:** GMS810-FIDOR for TOC

**Manufacturer:** SICK AG  
Poppenbütteler Bogen 9 b  
22399 Hamburg  
Germany

**Test Laboratory:** TÜV Rheinland Energy GmbH

**This is to certify that the AMS has been tested  
and found to comply with the standards  
EN 15267-1 (2009), EN 15267-2 (2009), EN 15267-3 (2007)  
and EN 14181 (2004).**

Certification is awarded in respect of the conditions stated in this certificate  
(this certificate contains 10 pages).  
The present certificate replaces certificate 0000001012\_02 of 22 July 2016.



Suitability Tested  
EN 15267  
QAL1 Certified  
Regular  
Surveillance

www.tuv.com  
ID 0000001012

Publication in the German Federal Gazette  
(BAnz) of 02 March 2012

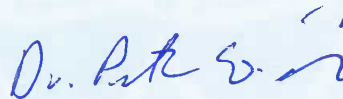
This certificate will expire on:  
28 July 2022

German Federal Environment Agency  
Dessau, 28 July 2021

TÜV Rheinland Energy GmbH  
Cologne, 27 July 2021



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Test institute accredited to EN ISO/IEC 17025 by DAkkS (German Accreditation Body).  
This accreditation is limited to the accreditation scope defined in the enclosure to certificate D-PL-11120-02-00.

**Certificate:**  
0000001012\_03 / 28 July 2021

**Test Report:** 936/21216085/B of 10 October 2011  
**Initial certification:** 29 July 2011  
**Expiry date:** 28 July 2022  
**Certificate:** Renewal (of previous certificate 0000001012\_02 dated 22 July 2016 valid until 28 July 2021)  
**Publication:** BAnz 02 March 2012, no. 36. p. 920, chapter I number 2.1 as well as chapter V 24<sup>th</sup> notification

### **Approved application**

The tested AMS is suitable for use at combustion plants according to Directive 2010/75/EU, chapter III (13<sup>th</sup> BImSchV), chapter IV (17<sup>th</sup> BImSchV), 30<sup>th</sup> BImSchV, plants in compliance with TA Luft and plants according to the 27<sup>th</sup> BImSchV. The measured ranges have been selected so as to ensure as broad a field of application as possible.

The suitability of the AMS for this application was assessed on the basis of a laboratory test and a seven-month field test at a waste incineration plant.

The AMS is approved for an ambient temperature range of +5 °C to +40 °C.

The notification of suitability of the AMS, performance testing and the uncertainty calculation have been effected on the basis of the regulations applicable at the time of testing. As changes in legal provisions are possible, any potential user should ensure that this AMS is suitable for monitoring the limit values relevant to the application.

Any potential user should ensure, in consultation with the manufacturer, that this AMS is suitable for the intended purpose.

### **Basis of the certification**

This certification is based on:

- Test report 936/21216085/B of 10 October 2011 by TÜV Rheinland Energie und Umwelt GmbH
- Suitability announced by the German Federal Environment Agency (UBA) as the relevant body
- The ongoing surveillance of the product and the manufacturing process

Publication in the German Federal Gazette: BAnz 02 March 2012, no. 36. p. 920, chapter I number 2.1, UBA announcement dated 23 February 2012:

**AMS designation:**

GMS810-FIDOR for TOC

**Manufacturer:**

SICK MAIHAK GmbH, Hamburg

**Field of application:**

For plants requiring official approval and for plants according to the 27<sup>th</sup> BImSchV

**Measuring ranges during performance testing:**

Component	Certification range	Supplementary measuring ranges			Unit
		0 - 50	0 - 150	0 - 500	
TOC	0 - 15	0 - 50	0 - 150	0 - 500	mg/m <sup>3</sup>

**Software version:**

2.00a

**Restrictions:**

None

**Notes:**

1. The AMS can be operated with a mains voltage of 230 volts as well as with a mains voltage of 110 volts.
2. The maintenance interval is three months.
3. The AMS can also be operated with external control and operating units as an alternative to the internal control and operating unit and then bears the designation GMS811-FIDOR.
4. As an alternative probe type SFU-BF SPB can be used.
5. As an alternative gas cleaner type 6027504 for air conditioning can be used.
6. The AMS carries out a zero adjustment every 24 hours.
7. Supplementary testing (maintenance interval extension, optional use of external control and operating units, an optional sampling probe and an optional catalyst) announcement of the Federal Environment Agency of 15 July 2011 (BAnz pg. 2725, chapter I number 2.1).

**Test Report:**

TÜV Rheinland Energie und Umwelt GmbH, Cologne  
Report no.: 936/21216085/B of 10 October 2011

Publication in the German Federal Gazette: Banz 02 March 2012, no. 36, p. 920, chapter V 24<sup>th</sup> notification, UBA announcement dated 23 February 2012:

**24 Notification as regards Federal Environment Agency (UBA) notice of 15 July 2011 (BANz 2725, chapter I, number 2.1) and chapter I, number 2.1 of this announcement.**

The construction of the FI-detector of the GMS810-FIDOR measuring system for TOC manufactured by SICK MAIHAK GmbH was optimised. The ceramic insulation is now coated with Teflon.

Statement issued by TÜV Rheinland Energie und Umwelt GmbH dated 26 September 2011

Publication in the German Federal Gazette: BANz AT 23.07.2013 B4, chapter V 12<sup>th</sup> notification [number 13], UBA announcement dated 03 July 2013:

**12 Notification as regards Federal Environment Agency (UBA) notices regarding performance tested AMS manufactured by SICK MAIHAK GmbH**

Se- quence	AMS / Manufacturer	Announcement	Notification	Statement Test Institute
...				
13	GMS810- FIDOR/ SICK MAIHAK GmbH	Dated 23 Febru- ary 2012 (BANz pg. 920, chapter I number 2.1 and chapter V 24 <sup>th</sup> no- tification	SICK MAIHAK GmbH merged with its parent company SICK AG as of 01 January 2013. The manufacturer is now registered as SICK AG.	TÜV Rhein- land Energie und Umwelt GmbH of 25 March 2013
...				

Publication in the German Federal Gazette: BAnz AT 14.03.2016 B7, chapter V 41<sup>st</sup> notification, UBA announcement dated 18 February 2016:

**41 Notification as regards Federal Environment Agency (UBA) notices of 23 February 2012 (BAnz pg. 920, chapter I number 2.1) and of 03 July 2013 (BAnz AT 23 July 2013 B4, chapter V 12<sup>th</sup> notification [number 13])**

The GMS810-FIDOR measuring system for TOC manufactured by SICK AG is marketed under the name GMS810-FIDORi with an internal catalyst for purging the instrument air. This instrument version does not require the use of an external catalyst. The maintenance interval of the measuring system GMS810-FIDORi is four weeks. The measuring systems GMS810-FIDOR and GMS810-FIDORi may alternatively use the SP 180-H sampling probe manufactured by M&C TechGroup Germany GmbH. The results of the verification for the new probe type and the instrument version GMS810-FIDORi with internal catalyst are presented in test report 936/21229847/B of 21 January 2016 by TÜV Rheinland Energie und Umwelt GmbH.

Statement issued by TÜV Rheinland Energie und Umwelt GmbH  
dated 21 January 2016

Publication in the German Federal Gazette: BAnz AT 01.08.2016 B11, chapter V 18<sup>th</sup> notification, UBA announcement dated 14 July 2016:

**18 Notification as regards Federal Environment Agency (UBA) notices of 23 February 2012 (BAnz pg. 920, chapter I number 2.1) and of 18 February 2016 (BAnz AT 14 March 2016 B7, chapter V 41<sup>st</sup> notification)**

The maintenance interval for the GMS810-FIDORi measuring system for total organic carbon manufactured by SICK AG is three months. Test results are detailed in test report number 936/21229847/C of 19 February 2016 issued by TÜV Rheinland Energie und Umwelt GmbH.

Statement issued by TÜV Rheinland Energy GmbH dated 09 May 2016

Publication in the German Federal Gazette: BAnz AT 15.03.2017 B6, chapter V 26<sup>th</sup> notification, UBA announcement dated 22 February 2017:

**26 Notification as regards Federal Environment Agency (UBA) notices of 23 February 2012 (BAnz pg. 920, chapter I number 2.1) and of 14 July 2016 (BAnz AT 01 August 2016 B11, chapter V 18<sup>th</sup> notification)**

The BCU of the GMS810-FIDOR/GMS 810 FIDORi measuring system for TOC from the company SICK AG now has the Modbus digital interface (RTU and TCP/IP) in accordance with VDI 4201 page 1 and page 3. The results of the tests are presented in report 936/21236082/B of 10 October 2016 by TÜV Rheinland Energy GmbH.

The current software version of the BCU is 9150883\_4.003 Aug 22 2016 1449.

The GMS 810 FIDOR/GMS 810 FIDORi measuring system can also be operated with the new housing unit for wall mounting. When using the wall-mounted housing, the measuring device bears the designation GMS 840-FIDOR/GMS-840 FIDORi.

Statement issued by TÜV Rheinland Energy GmbH dated 10 October 2016

Publication in the German Federal Gazette: BAnz AT 26.03.2018 B8, chapter V 40<sup>th</sup> notification, UBA announcement dated 21 February 2018:

**40 Notification as regards Federal Environment Agency (UBA) notices of 23 February 2012 (BAnz pg. 920, chapter I number 2.1) and of 22 February 2017 (BAnz AT 15 March 2017 B6, chapter V 26<sup>th</sup> notification)**

The current software version of the measuring systems GMS 810-FIDOR/GMS 810 FIDORi or GMS 840-FIDOR/GMS 840 FIDORi for TOC from the company SICK AG is:

4.002.

Statement issued by TÜV Rheinland Energy GmbH dated 28 September 2017

Publication in the German Federal Gazette: BAnz AT 03.05.2021 B9, chapter III 52<sup>nd</sup> notification, UBA announcement dated 31 March 2021:

**52 Notification as regards Federal Environment Agency (UBA) notices of 23 February 2012 (BAnz pg. 920, chapter I number 2.1) and of 22 February 2017 (BAnz AT 15 March 2017 B6, chapter V 26<sup>th</sup> notification)**

In the case of the GMS 810-FIDOR/GMS 810 FIDORi or GMS 840-FIDOR/GMS 840 FIDORi measuring systems for TOC manufactured by SICK AG, the load-bearing point for the electrical feed-through of the suction voltage at the FID has so far been made of an Fe/Ni alloy. In the future, this assembly can also be made of stainless steel.

Statement issued by TÜV Rheinland Energy GmbH dated 18 September 2020

**Certified product**

This certification applies to automated measurement systems conforming to the following description:

The GMS810-FIDOR is used to determine TOC. For the determination of the concentration a flame ionisation detector is used

The FIDOR works as an extractive system; this means the measuring gas is taken from the stack through a probe and carried to the AMS through a heated line.

The measuring system consists of:

1. Probe type M&C SP2000-H
2. Heated line, length 2 - 70 m (for a length of > 35 m two control units for the heating have to be used). The length of the heated line during field test was 35m, in the laboratory test the t90 time was determined for a length of 2m and 70m.
3. Gas cleaner GR 3010 E
4. GMS810-FIDOR Analyzer

The following options are available for the AMS as well:

1. Probe type SFU-BF SPB and SP 180-H,
2. Catalyzer 6027504 for gas cleaning,
3. Operation via external BCU (labelling in this case GMS 811-FIDOR),
4. Operation via external SCU (labelling in this case GMS 811-FIDOR).
5. Operation with internal catalyzer (labelling in this case GMS 810-FIDORi).

The system operates with a 24 hour zero point adjustment.

### General remarks

This certificate is based upon the equipment tested. The manufacturer is responsible for ensuring that on-going production complies with the requirements of the EN 15267. The manufacturer is required to maintain an approved quality management system controlling the manufacturing process for the certified product. Both the product and the quality management systems shall be subject to regular surveillance.

If a product of the current production does not conform to the certified product, TÜV Rheinland Energy GmbH must be notified at the address given on page 1.

A certification mark with an ID-Number that is specific to the certified product is presented on page 1 of this certificate.

This document as well as the certification mark remains property of TÜV Rheinland Energy GmbH. Upon revocation of the publication the certificate loses its validity. After the expiration of the certificate and on request of TÜV Rheinland Energy GmbH this document shall be returned and the certificate mark must no longer be used.

The relevant version of this certificate and its expiration date are also accessible on the internet at [qal1.de](http://qal1.de).

### Document history

Certification of the GMS810-FIDOR measuring system is based on the documents listed below and the regular, continuous surveillance of the manufacturer's quality management system:

#### Initial certification according to EN 15267

Certificate no. 0000001012: 19 August 2011  
Expiry date of the certificate: 28 July 2016  
Test Report: 936/21216085/A of 25 March 2011  
TÜV Rheinland Energie und Umwelt GmbH, Cologne  
Publication: BAnz 29 July 2011, no. 113, p. 2725, chapter I number 2.1  
UBA announcement dated 15 July 2011

#### Supplementary testing according to EN 15267

Certificate No. 0000001012\_01: 16 March 2012  
Expiry date of the certificate: 28 July 2016  
Test Report: 936/21216085/B of 10 October 2011  
TÜV Rheinland Energie und Umwelt GmbH, Cologne  
Publication: BAnz 02 March 2012, no. 36, p. 920, chapter I number 2.1  
and chapter V notification 24  
UBA announcement dated 23 February 2012

#### Notifications in accordance with EN 15267

Statement issued by TÜV Rheinland Energie und Umwelt GmbH dated 26 September 2011  
Publication: BAnz 02 March 2012, no. 36, pg. 920, chapter V notification 24,  
UBA announcement dated 23 February 2012  
(Hardware changes)

Statement issued by TÜV Rheinland Energie und Umwelt GmbH dated 25 March 2013  
Publication: BAnz AT 23.07.2013 B4, chapter V notification 12 [number 13]  
UBA announcement dated 03 July 2013  
(Renaming of manufacturer)



Statement and test report 936/21229847/B  
of TÜV Rheinland Energie und Umwelt GmbH dated 21 January 2016  
Publication: BAnz AT 14.03.2016 B7, chapter V notification 41,  
UBA announcement dated 18 February 2016  
(Additional hardware)

**Renewal of the certificate**

Certificate no. 0000001012\_02: 22 July 2016  
Expiry date of the certificate: 28 July 2021

**Notifications in accordance with EN 15267**

Statement issued by TÜV Rheinland Energy GmbH dated 09 May 2016  
Publication: BAnz AT 01.08.2016 B11, chapter V notification 18  
UBA announcement dated 14 July 2016  
(Maintenance interval)

Statement issued by TÜV Rheinland Energy GmbH dated 10 October 2016  
Publication: BAnz AT 15.03.2017 B6, chapter V notification 26  
UBA announcement dated 22 February 2017  
(Digital interface, new housing variant)

Statement issued by TÜV Rheinland Energy GmbH dated 28 September 2017  
Publication: BAnz AT 26.03.2018 B8, chapter V notification 40  
UBA announcement dated 21 February 2018  
(Software updates)

Statement issued by TÜV Rheinland Energy GmbH dated 18 September 2020  
Publication: BAnz AT 03.05.2021 B9, chapter III notification 52  
UBA announcement dated 31 March 2021  
(Hardware updates)

**Renewal of the certificate**

Certificate no. 0000001012\_03: 28 July 2021  
Expiry date of the certificate: 28 July 2022

### Calculation of overall uncertainty for QAL1 in EN 14181 and EN 15267-3

#### Manufacturer data

Manufacturer	SICK MAIHAK GmbH
Name of measuring system	GMS810-FIDOR
Serial Number	00823523 / 00823524
Measuring Principle	FID

#### TÜV Data

Approval Report	936/21216085/B / 2011-08-12
Editor	Steinhagen
Date	2011-08-03

#### Measurement Component

Certificated range	15 mg/m <sup>3</sup>
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#### Evaluation of the cross sensitivity (CS)

Sum of positive CS at zero point	0.17 mg/m <sup>3</sup>
Sum of negative CS at zero point	0.00 mg/m <sup>3</sup>
Sum of positive CS at reference point	0.00 mg/m <sup>3</sup>
Sum of negative CS at reference point	-0.44 mg/m <sup>3</sup>
Maximum sum of cross sensitivities	-0.44 mg/m <sup>3</sup>
Uncertainty of cross sensitivity	-0.25 mg/m <sup>3</sup>

#### Calculation of the combined standard uncertainty

##### Test Value

	u	u <sup>2</sup>
Standard deviation from paired measurements under field conditions *	$u_D$ 0.033 mg/m <sup>3</sup>	0.001 (mg/m <sup>3</sup> ) <sup>2</sup>
Lack of fit	$u_{lof}$ 0.035 mg/m <sup>3</sup>	0.001 (mg/m <sup>3</sup> ) <sup>2</sup>
Zero drift from field test	$u_{d.z}$ -0.190 mg/m <sup>3</sup>	0.036 (mg/m <sup>3</sup> ) <sup>2</sup>
Span drift from field test	$u_{d.s}$ -0.249 mg/m <sup>3</sup>	0.062 (mg/m <sup>3</sup> ) <sup>2</sup>
Influence of ambient temperature at span	$u_t$ 0.046 mg/m <sup>3</sup>	0.002 (mg/m <sup>3</sup> ) <sup>2</sup>
Influence of supply voltage	$u_v$ 0.083 mg/m <sup>3</sup>	0.007 (mg/m <sup>3</sup> ) <sup>2</sup>
Cross sensitivity (interference)	$u_i$ -0.254 mg/m <sup>3</sup>	0.064 (mg/m <sup>3</sup> ) <sup>2</sup>
Influence of sample gas flow	$u_b$ -0.047 mg/m <sup>3</sup>	0.002 (mg/m <sup>3</sup> ) <sup>2</sup>
Uncertainty of reference material at 70% of certification range	$u_{rm}$ 0.121 mg/m <sup>3</sup>	0.015 (mg/m <sup>3</sup> ) <sup>2</sup>
Variation of response factors (TOC)	$u_{rf}$ 0.000 mg/m <sup>3</sup>	0.000 (mg/m <sup>3</sup> ) <sup>2</sup>

\* The bigger value of: "Repeatability standard deviation at span" or "Standard deviation from paired measurements under field conditions"

Combined standard uncertainty ( $u_c$ )	$u_c = \sqrt{\sum (u_{max,j})^2}$	0.44 mg/m <sup>3</sup>
Total expanded uncertainty	$U = u_c * k = u_c * 1.96$	0.86 mg/m <sup>3</sup>

#### Relative total expanded uncertainty

Requirement of 2000/76/EC and 2001/80/EC	U in % of the ELV 10 mg/m <sup>3</sup>	8.6
Requirement of EN 15267-3	U in % of the ELV 10 mg/m <sup>3</sup>	30.0
	U in % of the ELV 10 mg/m <sup>3</sup>	22.5