

CERTIFICATE

on Product Conformity (QAL1)

Number of Certificate: 0000001012_01

Certified AMS: GMS810-FIDOR for TOC

Manufacturer: SICK MAIHAK GmbH
Poppenbütteler Bogen 9 b
22399 Hamburg
Germany

Test Institute: TÜV Rheinland Energie und Umwelt GmbH

**This is to certify that the AMS has been tested
and found to comply with:**

**EN 15267-1: 2009, EN 15267-2: 2009, EN 15267-3: 2008
and EN 14181: 2004**

Certification is awarded in respect of the conditions stated in this certificate
(see also the following pages).

The present certificate replaces Certificate No. 0000001012 dated 19 August 2011



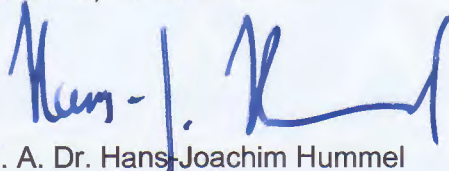
- EN 15267-3 tested
- QAL1 certified
- TUV approved
- Annual inspection

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

The certificate is valid until:
28 July 2016

Umweltbundesamt
Dessau, 16 March 2012

TÜV Rheinland Energie und Umwelt GmbH
Köln, 15 March 2012



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51105 Köln

Accreditation according to EN ISO/IEC 17025 and certified according to ISO 9001:2008.

Test report:	936/21216085/B of 10 October 2011
First certification:	29 July 2011
Validity ends:	28 July 2016
Publication:	BAnz. 02 March 2012, No. 36, p. 920, chapter I, No. 2.1 and chapter V, notification 24

Approved application

The tested AMS is suitable for use at combustion plants according to EC directive 2001-80-EC, at waste incineration plants according to EC directive 2000-76-EC and other plants requiring official approval. The tested ranges have been chosen with respect to the wide application range of the AMS.

The suitability of the AMS for this application was assessed on the basis of a laboratory test and a seven months field test at a municipal waste incinerator.

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

Any potential user should ensure, in consultation with the manufacturer, that this AMS is suitable for the installation at which it will be installed.

Basis of the certification

This certification is based on:

- test report 936/21216085/A dated 25 March 2011 of TÜV Rheinland Energie und Umwelt GmbH
- test report 936/21216085/B dated 10 October 2011 of TÜV Rheinland Energie und Umwelt GmbH
- suitability announced by the German Environmental 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, No. 2.1, as well as chapter V, notification 24, announcement by UBA from 23 February 2012)

AMS name:

GMS810-FIDOR for TOC

Manufacturer:

SICK MAIHAK GmbH, Hamburg

Field of application:

For measurements at plants requiring official approval (i. e. plants in 2000-76-EC, waste incineration directive and 2001-80-EC large combustion plants directive)

Measuring ranges during the suitability test:

Component	Certification range	Supplementary measurement ranges			Unit
TOC	0 - 15	0 - 50	0 - 150	0 - 500	mg/m ³

Software version:

2.00a

Restrictions:

None

Notes:

1. The measurement system may be operated at supply voltages of 230 V as well as 110 V.
2. A three months period has been specified as maintenance interval.
3. In addition to the operation via an internal control and operating unit the AMS can also be operated by an external control and operating unit and is then labelled 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. Additional testing (extension of maintenance interval, optional use of external control and operating units, optional probe and an optional gas cleaner) publication of Umweltbundesamt from 15 July 2011 (BAZ. p. 2725, chapter I, No. 2.1).

Test report:

TÜV Rheinland Energie und Umwelt GmbH, Köln
Report-No.: 936/21216085/B dated 10 October 2011

24 Notification on announcements of the Federal Environment Agency of 15 July 2011 (Federal Gazette (BAnz.) p. 2725, chapter I, number 2.1) and with regard to chapter I, number 2.1 of this notification

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 by TÜV Rheinland Energie und Umwelt GmbH dated 26 September 2011

Certified product

This certificate applies to automated measurement systems confirming 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 extractive; 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 35 m, in the laboratory test the t_{90} time was determined for a length of 2 m and 70 m.
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,
2. Gas cleaner 6027504,
3. Operation via external BCU (labeling in this case GMS 811-FIDOR),
4. Operation via external SCU (labeling in this case GMS 811-FIDOR).

The system operates with a 24 hour zero point adjustment.

General notes

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 manufacture of 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 Energie und Umwelt 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 can be applied to the product or used in publicity material for the certified product.

This document as well as the certification mark remains property of TÜV Rheinland Energie und Umwelt GmbH. With revocation of the publication the certificate loses its validity. After the expiration of the validity of the certificate and on requests of the TÜV Rheinland Energie und Umwelt GmbH this document shall be returned and the certificate mark must not be employed anymore.

The relevant version of this certificate and the validity is also accessible on the internet Address: **qal1.de**.

Certification of GMS810-FIDOR for TOC is based on the documents listed below and the regular, continuous monitoring of the Quality Management System of the manufacturer:

Initial certification according to EN 15267:

Certificate No. 0000001012: 19 August 2011

Validity of the certificate until: 28 July 2016

Test report: 936/21216085/A of 25 March 2011,
TÜV Rheinland Energie und Umwelt GmbH, Köln

Publication: BAnz. 29 July 2011, No. 113, p. 2725, Chapter I No. 2.1:
Announcement by UBA from 15 July 2011

Supplementary testing according to EN 15267:

Certificate No. 0000001012_01:16 March 2012

Validity of certificate until: 28 July 2016

Test report: 936/21216085/B of 10 October 2011,
TÜV Rheinland Energie und Umwelt GmbH, Köln

Publication: BAnz. 02 March 2012, No. 36, p. 920, chapter I, No. 2.1, as well as chapter V,
notification 24: Announcement by UBA from 23 February 2012

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
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Editor	Steinhagen
Date	2011-08-03

Measurement Component

Certificated range	TOC 15 mg/m ³
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Evaluation of the cross sensitivity (CS)

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

Calculation of the combined standard uncertainty

Test Value

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

* 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 ³
Total expanded uncertainty	$U = u_c * k = u_c * 1.96$	0.86 mg/m ³

Relative total expanded uncertainty

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