

PRODUCT CONFORMITY CERTIFICATE

This is to certify that the

HM1400 TRX2 Mercury Analyser

Manufactured by:

Durag GmbH

Kollaustraße 105
22453 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 (CEMS), Version 4 dated July 2018
EN15267-3:2007,
& QAL 1 as defined in EN 14181: 2014**

Certification Ranges :

Mercury 0 to 15 µg/m³
0 to 45 µg/m³
0 to 75 µg/m³

Project No.: 70113247
Certificate No: Sira MC120193/07
Initial Certification: 26 January 2012
This Certificate issued: 20 September 2019
Renewal Date: 25 January 2022



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Environmental Project Engineer

MCERTS is operated on behalf of the Environment Agency by

Sira Certification Service

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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 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.

The field trial was undertaken on an exhaust gas of an incinerator. The initial field test duration was from 03/02/2010 to 03/01/2011. Supplementary testing has taken place on 30/10/2017 to 27/07/2018 and again from 24/01/2019 to 25/02/2019.

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 Nord	Report number 109GMT007 / 8000632287 dated 30 th June 2011
TÜV Nord	Report number 212UMP003 / 8000 641 152 dated 7 th April 2014
TÜV Rheinland	Report number 936/21238805/C dated 29 th September 2017
TÜV Rheinland	Report number 936/21245908/AE dated 6 th May 2019

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Product Certified

The HM 1400 TRX2 (previously TRX) measuring system consists of the following parts:

- Thermo-catalytic converter
- Dual Beam CVAAS UV detector (Cold vapour atomic absorption spectrometer)
- Gas Cooler
- Volumetric flow system
- PLC

This certificate applies to all instruments fitted with software version 2.01 (serial number 1512176) onwards. Supplementary field testing conducted with software version 2.02 (Test lab confirmed no performance affecting differences between two software versions).

Please note: HM 1400 TR products with the serial number 10751-11250 and 1512000-1512175 can be upgraded to HM 1400 TRX under certain conditions.

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Certified Performance

The instrument was evaluated for use under the following conditions:

Ambient Temperature Range: 0°C to +50°C
Instrument IP rating: IP54

Note: For outdoor installations the analyser needs to be mounted into an IP65 environment. 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 Hg 0 to 45 µg/m³

Test	Results expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Response time						
Hg 0 to 15 µg/m ³					<138s	<200s
Hg 0 to 45 µg/m ³					<103s	<200s
Hg 0 to 75 µg/m ³					<166s	<200s
Repeatability standard deviation at zero point						
Hg	0.11					<2.0%
Repeatability standard deviation at reference point						
Hg		0.69				<2.0%
Lack-of-fit						
Hg 0 to 15 µg/m ³		-0.93				<2.0%
Hg 0 to 45 µg/m ³	0.44					<2.0%
Hg 0 to 75 µg/m ³			-1.02			<2.0%
Influence of ambient temperature zero point						Note 1
Hg				-2.1		<5.0%
Influence of ambient temperature reference point						Note 1
Hg				2.0		<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 Hg			1.6			<2.0%
Influence of voltage variations (195V to 253V) Hg		0.9				<2.0%
Cross-sensitivity at zero with interferents: O ₂ , H ₂ O, CO, CO ₂ , CH ₄ , N ₂ O, NO, NO ₂ , NH ₃ , SO ₂ , HCl Hg				-2.93		<4.0%
Cross-sensitivity at reference with interferents: O ₂ , H ₂ O, CO, CO ₂ , CH ₄ , N ₂ O, NO, NO ₂ , NH ₃ , SO ₂ , HCl Hg				3.7		<4.0%
Measurement uncertainty Hg (For an ELV of 0.006 mg/m ³)					Guidance - at least 25% below max permissible uncertainty Note 2 17.6%	<30% (40%)
Calibration function (field) Hg					>0.991	>0.90
Response time (field) Hg					<178s	<200s
Lack of fit (field) Hg			1.66			<2.0%
Maintenance interval					Note 2	>8 days
Zero and Span drift requirement	The measuring system performs an automatic zero point correction every 2 hours. During this cycle zero gas (air) flushes the measuring system. The PLC internally detects the reading and adjusts the zero at the end of each of these cycles. If an individual correction is greater than 3% compared to the previous cycle, a 'Fault' status signal is output.					Clause 6.13 & 10.13 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 Hg				2.2		<3.0%
Change in reference point over maintenance interval Hg				2.9		<3.0%
Availability Hg					97.8%	>95%
Reproducibility Hg				2.08		<3.3%

Note 1: The permissible ambient temperature range for the standard version of the HM-1400 TRX measuring device (with walking fan without cabinet heating and without cooling unit) is +5 to +40°C. In the version with built-in radiator and built-in cabinet heating, the permissible ambient temperature range is 0 to +50°C. In the version with built-in radiator and without cabinet heating, the permissible ambient temperature range is +5 to +50°C.

Note 2: The HM 1400 TRX has a maintenance interval of three months provided a continuous condensate removal is guaranteed. An adequate test gas generator must be available for the regular check of the zero point and span point every three months*

The following work should be performed at this interval:

- Visually check the gas paths and condensate paths for contamination;
- Check the temperatures of the sampling probe, measuring gas line, converter and measurement gas cooler.
- The zero point and span point must be checked every 3 months by application of zero gas and HgCl₂ test gas.
- The filling of the thermo-catalytic reactor must be changed every 6 months.
- The filter in the gas sampling probe must be checked every 3 months.

In addition the following visual checks must be performed once a week:

- Read the error messages;
- Check the volumetric flow;
- Check the system pressure.

* At O₂ contents greater than 18%vol., it may be necessary to exchange the filling of the Hg²⁺/Hg⁰ reactor more often than half-yearly. For more information, contact the manufacturer.

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Description

HM-1400 TRX is a sensitive continuous Mercury Monitor (CMM) which operates as an automated measuring system (AMS) for monitoring the total mercury concentration in different types of waste gases. The HM-1400 TRX extracts sample gas from a stack by help of a heated sampling system (>180°C).

HM-1400 TRX operates using cold vapour atomic absorption spectroscopy method (CVAAS). Oxidised Mercury which is part of total Mercury is converted in a thermo-catalytic reactor to elemental Mercury (Hg⁰).

After sample gas conditioning, removal of condensate, moisture and particles the sample gas is analysed by a dual beam UV photometer. .

Using the dual beam detector UV cross interference effects of compounds such as SO₂ or aromatics can be minimised. For adjustment purposes of HM-1400 TRX a manual or alternatively an automated calibration module is available.

HM-1400 TRX is equipped with a heated sampling probe SP 2000 for separating particles from the sample gas. Mercury adsorbed at these particles will be released at 180 °C. The sample gas is piped via heated line (180 °C) from the sampling probe to the analyser housing where the complete sample gas treatment system and the detector is located.

HM-1400 TRX works in real time without any pre-concentration steps in the sample gas treatment system.

A HgCl₂ test gas generator is available. It is located inside the cabinet. An optional module for speciation analysis displays elementary and chemically bound mercury.

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'.
2. The design of the product certified is held and maintained by TUV Rheinland for certificate No. Sira MC120193/00
3. 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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