PRODUCT CONFORMITY CERTIFICATE

This is to certify that the

MGA 20

Manufactured by:

Dr. Födisch Umweltmesstechnik AG

Zwenkauer Str. 159
04420 Markranstädt
Germany

has been assessed by CSA Group
and for the conditions stated on this certificate complies with:
Environment Agency Guidance
"MCERTS for stack emissions monitoring equipment at industrial installations"
- **Continuous emissions monitoring systems (CEMS)**
Updated 28 August 2024
EN 15267-1:2023, EN15267-2:2023, EN 15267-3:2023
& QAL 1 as defined in EN 14181: 2014

Component	*Units*	*Certification range*	*Supplementary range 1*	*Supplementary range 2*
CO	mg/m^3	0-75	0-5,000	-
NO	mg/m^3	0-50	0-80	0-3,000
NO_2	mg/m^3	0-50	0-1,000	-
*NO_X	mg/m^3	0-80	0-3,000	-
N_2O	mg/m^3	0-50	0-2,000	-
SO_2	mg/m^3	0-45	0-75	0-2,000
CH_4	mg/m^3	0-50	0-1,500	-
CO_2	Vol. %	0-25	0-50	-
O_2	Vol. %	0-25	-	-

* NOx as NO_2, and calculates from NO and NO_2 values

Project number: 80228400
Certificate number: CSA MC250443/00
Initial certification: 18 March 2025
This certificate issued: 18 March 2025
Renewal date: 17 March 2030

Andrew Young
Environmental Team Manager

MCERTS is operated on behalf of the Environment Agency by

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

Form 1335
Issue 12

Certificate Contents

Approved Site Application

Any potential user should make sure, in consultation with the manufacturer, that the monitoring system is suitable for the intended application. For further information on stack emissions monitoring refer to the Environment Agency's guidance available at www.mcerts.net

This instrument is considered suitable for use on waste incineration and large combustion plants. This CEMS 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. The lowest certified range for each determinand shall not be more than 1.5 times the daily average emission limit value (ELV) for incineration plants, and not more than 2.5 times the ELV for other types of applications.

The field test took place between 3rd August 2023 and 3rd May 2024 and was performed using two complete measuring systems (ref. No. 1: EP1 MGA 20 Ser.-Nr. 101 and No. 2: EP1 MGA 20 Ser.-Nr. 102) at a waste combustion plant.

Basis of Certification

This certification is based on the following test report(s) and on CSA Group's assessment and ongoing surveillance of the product and the manufacturing process:

TÜV SÜD Industrie Service GmbH, Report-No: 3610685_V2, München, March 2024

Product Certified

The MGA 20 measuring system consists of the following parts:

- Sampling probe: HSP 12 self-regulating heated to maximum of 200°C with ceramic filter
- Heated sample gas line: Winkler, Standard 100 W/m DN4/6, 4mm diameter, 190oC
- Measuring cabinet, main components of the cabinet are as follows:
  - Multi-component analyser: MGA 20
  - NH_3 adsorber: Bühler ADF – 300 KG
  - Gas cooler: JCT - JCS 101.303A50XY/345 VA
  - Gas pump: MGP 12

This certificate applies to all instruments with serial numbers MGA 20 Ser.-Nr. 101 onwards with software version "V 3.30/2.40".

Certified Performance

The instrument was evaluated for use under the following conditions:

Ambient temperature range: 5°C to +40°C
Instrument IP rating: IP54

Results are expressed as error % of certification range, unless otherwise stated.

Test	*Result expressed as % of the certification range*				*Other results*	*MCERTS specification*
	<0.5	*<1*	*<2*	*<5*		
LABORATORY TESTS						
Response time						
CO (0 - 75 mg/m^3)					153 s	≤200 s
CO (0 - 5,000 mg/m^3)					149 s	≤200 s
NO (0 - 50 mg/m^3)					184 s	≤200 s
NO (0 - 80 mg/m^3)					164 s	≤200 s
NO (0 - 3,000 mg/m^3)					153 s	≤200 s
NO_2 (0 - 50 mg/m^3)					159 s	≤200 s
NO_2 (0 - 1,000 mg/m^3)					157 s	≤200 s
NO_x (0 - 80 mg/m^3)					186 s	≤200 s
NO_x (0 - 3,000 mg/m^3)					156 s	≤200 s
N_2O (0 - 50 mg/m^3)					156 s	≤200 s
N_2O (0 - 2,000 mg/m^3)					167 s	≤200 s
SO_2 (0 - 45 mg/m^3)					182 s	≤200 s
SO_2 (0 - 75 mg/m^3)					175 s	≤200 s
SO_2 (0 - 2,000 mg/m^3)					173 s	≤200 s
CH_4 (0 - 50 mg/m^3)					155 s	≤200 s
CH_4 (0 - 1,500 mg/m^3)					162 s	≤200 s
CO_2 (0 - 25 Vol. %)					148 s	≤200 s
CO_2 (0 - 50 Vol. %)					156 s	≤200 s
O_2 (0 - 25 Vol. %)					94 s	≤200 s

Test	Result expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Repeatability standard deviation at zero point						
CO (0 - 75 mg/m^3)	0.3					≤2.0 %
NO (0 - 50 mg/m^3)		0.5				≤2.0 %
NO_2 (0 - 50 mg/m^3)	0.1					≤2.0 %
NO_x (0 - 80 mg/m^3)		0.5				≤2.0 %
N_2O (0 - 50 mg/m^3)	0.1					≤2.0 %
SO_2 (0 - 45 mg/m^3)	0.4					≤2.0 %
CH_4 (0 - 50 mg/m^3)		0.6				≤2.0 %
CO_2 (0 - 25 Vol. %)	0.0					≤2.0 %
O_2 (0 - 25 Vol. %)	0.01					≤0.2 %
Repeatability standard deviation at span point						
CO (0 - 75 mg/m^3)		0.6				≤2.0 %
NO (0 - 50 mg/m^3)		1.0				≤2.0 %
NO_2 (0 - 50 mg/m^3)	0.4					≤2.0 %
NO_x (0 - 80 mg/m^3)		0.5				≤2.0 %
N_2O (0 - 50 mg/m^3)	0.4					≤2.0 %
SO_2 (0 - 45 mg/m^3)	0.3					≤2.0 %
CH_4 (0 - 50 mg/m^3)		0.8				≤2.0 %
CO_2 (0 - 25 Vol. %)	0.2					≤2.0 %
O_2 (0 - 25 Vol. %)	0.03					≤0.2 %

Test	Result expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Lack of fit						
CO (0 - 75 mg/m³)			-1.93			≤2.0 %
CO (0 - 5,000 mg/m³)		0.81				≤2.0 %
NO (0 - 50 mg/m³)			-1.95			≤2.0 %
NO (0 - 80 mg/m³)				-2.00		≤2.0 %
NO (0 - 3,000 mg/m³)		0.78				≤2.0 %
NO_2 (0 - 50 mg/m³)			-1.54			≤2.0 %
NO_2 (0 - 1,000 mg/m³)		0.59				≤2.0 %
NO_x (0 - 80 mg/m³)			-1.54			≤2.0 %
NO_x (0 - 3,000 mg/m³)					Note 10	≤2.0 %
N_2O (0 - 50 mg/m³)			1.95			≤2.0 %
N_2O (0 - 2,000 mg/m³)			1.42			≤2.0 %
SO_2 (0 - 45 mg/m³)			1.30			≤2.0 %
SO_2 (0 - 75 mg/m³)			1.48			≤2.0 %
SO_2 (0 - 2,000 mg/m³)			1.22			≤2.0 %
CH_4 (0 - 50 mg/m³)				-2.01		≤2.0 %
CH_4 (0 - 1,500 mg/m³)		0.71				≤2.0 %
CO_2 (0 - 25 Vol. %)			1.89			≤2.0 %
CO_2 (0 - 50 Vol. %)		-0.80				≤2.0 %
O_2 (0 - 25 Vol. %)	0.18					≤2.0 %
Influence of ambient temperature zero point (+5°C to +40°C)						
CO (0 - 75 mg/m³)	-0.38					≤5.0 %
NO (0 - 50 mg/m³)			1.46			≤5.0 %
NO_2 (0 - 50 mg/m³)				2.49		≤5.0 %
NO_x (0 - 80 mg/m³)				2.39		≤5.0 %
N_2O (0 - 50 mg/m³)	-0.08					≤5.0 %
SO_2 (0 - 45 mg/m³)		0.59				≤5.0 %
CH_4 (0 - 50 mg/m³)	-0.47					≤5.0 %
CO_2 (0 - 25 Vol. %)	0.04					≤5.0 %
O_2 (0 - 25 Vol. %)	-0.01					≤0.5 %

Test	Result expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Influence of ambient temperature span point (+5°C to +40°C)						
CO (0 - 75 mg/m^3)			-1.55			≤5.0 %
NO (0 - 50 mg/m^3)				2.44		≤5.0 %
NO_2 (0 - 50 mg/m^3)				2.10		≤5.0 %
NO_x (0 - 80 mg/m^3)				3.52		≤5.0 %
N_2O (0 - 50 mg/m^3)				-4.76		≤5.0 %
SO_2 (0 - 45 mg/m^3)			1.18			≤5.0 %
CH_4 (0 - 50 mg/m^3)				-4.35		≤5.0 %
CO_2 (0 - 25 Vol. %)			1.34			≤5.0 %
O_2 (0 - 25 Vol. %)	0.19					≤0.5 %
Short-term zero drift						
CO (0 - 75 mg/m^3)	0.3					≤2.0 %
NO (0 - 50 mg/m^3)		0.7				≤2.0 %
NO_2 (0 - 50 mg/m^3)		0.8				≤2.0 %
NO_x (0 - 80 mg/m^3)			1.1			≤2.0 %
N_2O (0 - 50 mg/m^3)	0.1					≤2.0 %
SO_2 (0 - 45 mg/m^3)	-0.1					≤2.0 %
CH_4 (0 - 50 mg/m^3)	0.2					≤2.0 %
CO_2 (0 - 25 Vol. %)	0.0					≤2.0 %
O_2 (0 - 25 Vol. %)	0.0					≤0.2 %
Short-term span drift						
CO (0 - 75 mg/m^3)		-0.9				≤2.0 %
NO (0 - 50 mg/m^3)		-0.7				≤2.0 %
NO_2 (0 - 50 mg/m^3)			1.5			≤2.0 %
NO_x (0 - 80 mg/m^3)		-0.8				≤2.0 %
N_2O (0 - 50 mg/m^3)		-0.6				≤2.0 %
SO_2 (0 - 45 mg/m^3)		-0.8				≤2.0 %
CH_4 (0 - 50 mg/m^3)			-1.2			≤2.0 %
CO_2 (0 - 25 Vol. %)			-1.4			≤2.0 %
O_2 (0 - 25 Vol. %)	0.02					≤0.2 %

Test	Result expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Influence of sample gas flow for extractive CEMS - zero						
CO (0 - 75 mg/m^3)	0.1					≤2.0 %
NO (0 - 50 mg/m^3)	0.4					≤2.0 %
NO_2 (0 - 50 mg/m^3)	0.2					≤2.0 %
NO_x (0 - 80 mg/m^3)		0.6				≤2.0 %
N_2O (0 - 50 mg/m^3)	0.0					≤2.0 %
SO_2 (0 - 45 mg/m^3)	0.2					≤2.0 %
CH_4 (0 - 50 mg/m^3)	0.2					≤2.0 %
CO_2 (0 - 25 Vol. %)	0.0					≤2.0 %
O_2 (0 - 25 Vol. %)	0.01					≤0.2 %
Influence of sample gas flow for extractive CEMS - span						
CO (0 - 75 mg/m^3)		-0.6				≤2.0 %
NO (0 - 50 mg/m^3)		-0.6				≤2.0 %
NO_2 (0 - 50 mg/m^3)			-1.6			≤2.0 %
NO_x (0 - 80 mg/m^3)			-1.3			≤2.0 %
N_2O (0 - 50 mg/m^3)		-0.5				≤2.0 %
SO_2 (0 - 45 mg/m^3)	-0.4					≤2.0 %
CH_4 (0 - 50 mg/m^3)		-0.7				≤2.0 %
CO_2 (0 - 25 Vol. %)	-0.4					≤2.0 %
O_2 (0 - 25 Vol. %)	-0.02					≤0.2 %
Influence of voltage variations (196V to 230V) - zero						
CO (0 - 75 mg/m^3)	0.26					≤2.0 %
NO (0 - 50 mg/m^3)	-0.26					≤2.0 %
NO_2 (0 - 50 mg/m^3)	0.32					≤2.0 %
NO_x (0 - 80 mg/m^3)	0.38					≤2.0 %
N_2O (0 - 50 mg/m^3)	0.12					≤2.0 %
SO_2 (0 - 45 mg/m^3)	0.27					≤2.0 %
CH_4 (0 - 50 mg/m^3)	-0.21					≤2.0 %
CO_2 (0 - 25 Vol. %)	-0.06					≤2.0 %
O_2 (0 - 25 Vol. %)	-0.04					≤0.2 %

Test	Result expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Influence of voltage variations (196V to 230V) - span						
CO (0 - 75 mg/m^3)		-0.98				≤2.0 %
NO (0 - 50 mg/m^3)			-1.00			≤2.0 %
NO_2 (0 - 50 mg/m^3)		-0.76				≤2.0 %
NO_x (0 - 80 mg/m^3)		0.50				≤2.0 %
N_2O (0 - 50 mg/m^3)	-0.33					≤2.0 %
SO_2 (0 - 45 mg/m^3)	-0.42					≤2.0 %
CH_4 (0 - 50 mg/m^3)		-0.82				≤2.0 %
CO_2 (0 - 25 Vol. %)	0.14					≤2.0 %
O_2 (0 - 25 Vol. %)	0.03					≤0.2 %
Cross-sensitivity at zero with interferents: O_2, H_2O, CH_4, CO_2, CO, N_2O, NO, NO_2, NH_3, SO_2, HCl						
CO (0 - 75 mg/m^3)	0.00					≤4.0 %
NO (0 - 50 mg/m^3)			-1.63			≤4.0 %
NO_2 (0 - 50 mg/m^3)		0.99				≤4.0 %
NO_x (0 - 80 mg/m^3)				-2.02		≤4.0 %
N_2O (0 - 50 mg/m^3)		-0.55				≤4.0 %
SO_2 (0 - 45 mg/m^3)		-0.77				≤4.0 %
CH_4 (0 - 50 mg/m^3)	0.00					≤4.0 %
CO_2 (0 - 25 Vol. %)	0.00					≤4.0 %
O_2 (0 - 25 Vol. %)	0.00					≤0.4 %
Cross-sensitivity at span with interferents: O_2, H_2O, CH_4, CO_2, CO, N_2O, NO, NO_2, NH_3, SO_2, HCl						
CO (0 - 75 mg/m^3)			1.68			≤4.0 %
NO (0 - 50 mg/m^3)				-2.68		≤4.0 %
NO_2 (0 - 50 mg/m^3)		-0.69				≤4.0 %
NO_x (0 - 80 mg/m^3)				2.75		≤4.0 %
N_2O (0 - 50 mg/m^3)			-1.85			≤4.0 %
SO_2 (0 - 45 mg/m^3)			-1.87			≤4.0 %
CH_4 (0 - 50 mg/m^3)			-1.77			≤4.0 %
CO_2 (0 - 25 Vol. %)			1.36			≤4.0 %
O_2 (0 - 25 Vol. %)	0.28					≤0.4 %

Test	Result expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Measurement uncertainty					*Guidance - at least 25% below max permissible uncertainty*	
CO (0 - 50 mg/m3) - for an ELV of 50mg/m^3					**7.5%**	7.5%
NO (0 - 50 mg/m3) - for an ELV of 33.3mg/m^3					**9.1%**	15%
NO_2 (0 - 50 mg/m3) - for an ELV of 33.3mg/m^3					**9.4%**	15%
NO_x (0 - 50 mg/m3) - for an ELV of 80mg/m^3					**12.3%**	15%
N_2O (0 - 50 mg/m3) - for an ELV of 50mg/m^3					**7.1%**	15%
SO_2 (0 - 70 mg/m3) - for an ELV of 50mg/m^3					**7.5%**	15%
CH_4 (0 - 70 mg/m3) - for an ELV of 50mg/m^3					**6.6%**	15%
CO_2 (0 - 25 Vol. %) - for an ELV of 25Vol. %					**4.0%**	7.5%
O_2 (0 - 25 Vol. %) - for an ELV of 25 Vol. %					**1.9%**	7.5%

Test	Result expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<5		
FIELD TESTS						
Coefficient of determination of calibration function, R^2						
CO (0 - 75 mg/m³)					0.993	≥0.85
NO (0 - 50 mg/m³)					0.996	≥0.85
NO_2 (0 - 50 mg/m³)					0.997	≥0.85
NO_x (0 - 80 mg/m³)					0.896	≥0.85
N_2O (0 - 50 mg/m³)					0.994	≥0.85
SO_2 (0 - 45 mg/m³)					0.946	≥0.85
CH_4 (0 - 50 mg/m³)					0.996	≥0.85
CO_2 (0 - 25 Vol. %)					0.994	≥0.85
O_2 (0 - 25 Vol. %)					0.991	≥0.85
Response time						
CO (0 - 75 mg/m³)					148 s	≤200 s
NO (0 - 50 mg/m³)					167 s	≤200 s
NO_2 (0 - 50 mg/m³)					179 s	≤200 s
NO_x (0 - 80 mg/m³)					171 s	≤200 s
N_2O (0 - 50 mg/m³)					166 s	≤200 s
SO_2 (0 - 45 mg/m³)					553 s (Note 9)	≤200 s
CH_4 (0 - 50 mg/m³)					161 s	≤200 s
CO_2 (0 - 25 Vol. %)					161 s	≤200 s
O_2 (0 - 25 Vol. %)					99 s	≤200 s
Lack of fit						
CO (0 - 75 mg/m³)			-1.98			≤2.0 %
NO (0 - 50 mg/m³)			1.38			≤2.0 %
NO_2 (0 - 50 mg/m³)			-1.89			≤2.0 %
NO_x (0 - 80 mg/m³)			1.99			≤2.0 %
N_2O (0 - 50 mg/m³)			-1.00			≤2.0 %
SO_2 (0 - 45 mg/m³)			1.66			≤2.0 %
CH_4 (0 - 50 mg/m³)			-1.91			≤2.0 %
CO_2 (0 - 25 Vol. %)		0.99				≤2.0 %
O_2 (0 - 25 Vol. %)	0.05					≤0.2 %

Test	Result expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Minimum maintenance interval						
for all parameters (minimum)					4 weeks	8 days
Drift at zero point within maintenance interval						
CO (0 - 75 mg/m^3)		0.6				≤3.0 %
NO (0 - 50 mg/m^3)		0.8				≤3.0 %
NO_2 (0 - 50 mg/m^3)				3.0		≤3.0 %
NO_x (0 - 80 mg/m^3)				3.0		≤3.0 %
N_2O (0 - 50 mg/m^3)				2.7		≤3.0 %
SO_2 (0 - 45 mg/m^3)		0.7				≤3.0 %
CH_4 (0 - 50 mg/m^3)			1.8			≤3.0 %
CO_2 (0 - 25 Vol. %)	0.1					≤3.0 %
O_2 (0 - 25 Vol. %)	0.04					≤0.2 %
Drift at span point within maintenance interval						
CO (0 - 75 mg/m^3)				2.6		≤3.0 %
NO (0 - 50 mg/m^3)				-2.5		≤3.0 %
NO_2 (0 - 50 mg/m^3)				-2.9		≤3.0 %
NO_x (0 - 80 mg/m^3)				3.0		≤3.0 %
N_2O (0 - 50 mg/m^3)				-3.0		≤3.0 %
SO_2 (0 - 45 mg/m^3)			-1.8			≤3.0 %
CH_4 (0 - 50 mg/m^3)				-2.7		≤3.0 %
CO_2 (0 - 25 Vol. %)				-2.3		≤3.0 %
O_2 (0 - 25 Vol. %)	-0.09					≤0.2 %

Test	Result expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Availability						
All gases (except O_2)					95.4	≥95%
O_2 (0 - 25 Vol. %)					98.3	≥98%
Reproducibility, Rf						
CO (0 - 75 mg/m^3)		0.97				≤3.3 %
NO (0 - 50 mg/m^3)				2.32		≤3.3 %
NO_2 (0 - 50 mg/m^3)			1.89			≤3.3 %
NO_x (0 - 80 mg/m^3)				3.21		≤3.3 %
N_2O (0 - 50 mg/m^3)			1.39			≤3.3 %
SO_2 (0 - 45 mg/m^3)				3.13		≤3.3 %
CH_4 (0 - 50 mg/m^3)			1.11			≤3.3 %
CO_2 (0 - 25 Vol. %)	0.40					≤3.3 %
O_2 (0 - 25 Vol. %)	0.12					≤0.2 %

Note 1: - the analyser should be operated with the active Thermo-AUTOCAL function.

- The CEMS should be operated with an interval of 12 hours for automatic zero-point adjustment or O_2 span point adjustment.
- In order to satisfy the requirement for CO uncertainty at a limit value of 50 mg/m^3 the alignment should be conducted using a test gas with a tolerance of 1%. If the temperature at the site of installation of the analysis cabinet is less than 20°C the analysis cabinet should be fitted with an additional heating element.
- When checking and adjusting spans points for CO, NO, NO_2, SO_2, NOx, N_2O, CH_4 and CO_2 the addition of test gas with moisture is conducted locally on the 3-way value in front of the measurement gas cooler or via the test gas entry on the sample probe.
- The transfer of analogue and digital signals can alternatively be conducted using the digital interface Modbus TCP/IP according to VDI 4201 (pages 1 and 3).
- The service life of the NH3 filter specified by the manufacturer should be noted.

Note 2: - the maintenance interval is four weeks.

- Regular visual check of the measuring system
- Regular check of the instrument air supply
- Check of the diagnostic values (flow, temperatures)
- Check of the logbook entries
- Check of the consumables NH3 filter cassette
- Check and if necessary, emptying of the condensation container.
- Check of the consumables (test gases)
- Addition of flowing nitrogen for testing and if necessary, readjustment of zero point at an interval of 4 months
- Addition of wet flowing test gases for testing and if necessary, readjustment of span point at the O_2, CO, NO, NO_2, N_2O, CH_4 and CO_2 channel at an interval of 4 months, and for SO_2 at an interval of 4 weeks.

Note 3: - the following procedure is recommended for the functional test:
- Visual test of the entire system including sampling system.
- Check of the diagnostic values (flow, temperature).
- Testing of impermeability by adding zero and test gas at the appropriate connection on the probe.
- Check of adherence to the service time of the NH3 filter.
- Check of alignment only using moist span gas.
- Testing of cross-sensitivity with regard to the compensation table in chapter 3.3 in the MGA 20 system description.
- Check on documentation 90 logbook entries, maintenance book).

Note 4: The analyser should be operated with the active Thermo-AUTOCAL function.

Note 5: The CEMS should be operated with an interval of 12 hours for automatic zero-point adjustment or O_2 span point adjustment.

Note 6: To adhere to the required CO total measurement uncertainty at a limit of 50 mg/m^3 the alignment should be conducted using a test gas with a tolerance of 1%.

Note 7: If the measuring system is exposed to NH_3 concentrations greater than 10 mg/m^3 for longer than 4 days, the gas sampling probe and heating line must be cleaned with demineralized water. **Cleaning the system is necessary in order to be able to comply with the required response time for the SO_2 component.**

Note 8: for NO_X, calculated from the measurement components NO and NO_2 as per formula $NO_X = NO*1.53 + NO_2$

Note 9: During the field test it was noted that regeneration of the heat exchanger had been carried out and this had an impact on the accuracy of the end point SO_2 response time. This was due to the interaction of ammonium salts with SO_2 resulting in an extended response time. The response times for SO_2 at the start of the field test were 199 s and 172 s for each system, less than the specification of 200 s.

Note 10: This test was omitted as test of the measurement range using the test gas in the range over 1,000 mg/m^3 NO_2 is not permitted (due to the nature of the measurement cell). The NO_X channel is calculated from NO and NO_2. In the case of both measurement channels in the ranges 0 - 1,000 mg/m^3 and 0 - 3,000 mg/m^3 for NO_2 the requirement with regard to lack of fit was fulfilled with a factor <2 of the maximum permissible deviation.

Description

The MGA 20 cold gas multi-component system is an absorption spectrometric multi-gas sensor for exhaust gas measurement and can measure up to 8 components.

The MGA 20 analyzer takes the gas sample from the chimney via the heated probe and the heated line and passes it through a cooler before it reaches the IR analyzer.

The analyzer itself is constantly heated to 60°C. The MGA 20 analyzer uses a gas filter correlation and a dual-frequency measuring principle, depending on the components to be measured.

A zirconium dioxide sensor is used for oxygen measurement.

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 CSA Group Testing UK Ltd Certificates'.

2. The design of the product certified is held and maintained by TÜV Rheinland for certificate No. CSA MC250443.

3. If a certified product is found not to comply, CSA Group should be notified immediately at the address shown on this certificate.

4. The certification marks that can be applied to the product or used in publicity material are defined in 'Regulations Applicable to the Holders of CSA Group Testing UK Ltd Certificates'.

5. This document remains the property of CSA Group and shall be returned when requested by CSA Group.