PRODUCT CONFORMITY CERTIFICATE

This is to certify that the

ZRE and ZRE/ZFK7 for CO, NO, SO_2 and O_2

Manufactured by:

Fuji Electric Co Ltd

No 1 Fuji-machi, Hino-City, Tokyo 91-8502
Japan

Distributed in the UK and Ireland by: ***DRM Technic Ltd***
4 Cherry Orchard, Newcastle-under-Lyme, Staffordshire, ST5 2UB. United Kingdom

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 3.4 dated July 2012
EN15267-3:2007,
& QAL 1 as defined in EN 14181: 2004

Certification Ranges :

CO	0-125 mg/m^3	0-1250 mg/m^3
NO	0-268 mg/m^3	0-2680 mg/m^3
SO_2	0-571 mg/m^3	0-5710 mg/m^3
O_2 (PA*)	0-25 Vol.-%	0-10Vol.-%
O_2 (ZI**)	0-25 Vol.-%	0-10 Vol.-%

PA*- Paramagnetic ZI** - Zirconium Oxide

Project No.	:	16A29860/0059683
Certificate No	:	Sira MC130224/03
Initial Certification	:	25 February 2013
This Certificate issued	:	23 February 2018
Renewal Date	:	24 February 2023

Joe Prince MSc MInstMC
Certification Manager

MCERTS is operated on behalf of the Environment Agency by

Sira Certification Service
Unit 6, Hawarden Industrial Park
Hawarden, Deeside, CH5 3US
Tel: +44 (0)1244 670 900

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 LCPD and WID 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 WID applications, and not more than 2.5X the ELV for LCPD and other types of application.

Basis of Certification

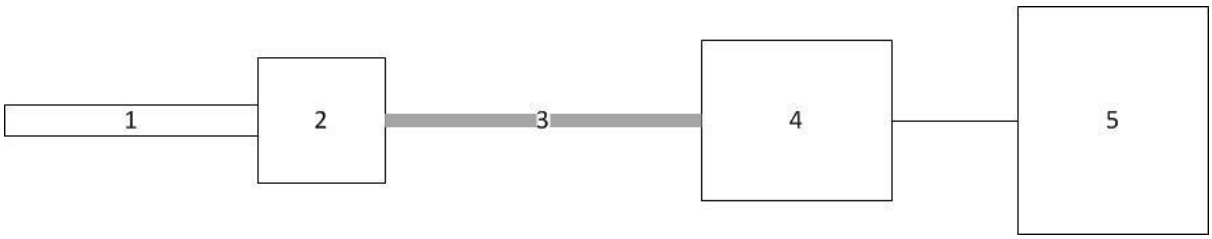
This certification is based on the following Test Report(s) and on Sira's assessment and ongoing surveillance of the product and the manufacturing process:

Report on the suitability test of ZRE and ZRE/ZFK7 measuring system by Fuji Electric Co. Ltd. For the components NO, SO_2, CO and O_2.

TÜV Report No.: 936/21210059/A. Köln, October 21 2009.

Product Certified

The ZRE and ZRE/ZFK7 measuring system consists of the following parts:



1. Sample Probe	2. Heated Filter	3. Heated Sample Line	4. Gas Conditioning	5. Analyser
Model: TECHNOVA HT PERO-MI AGP04 heated to 180°C	N/A - Intergrated with Sample probe	Model: 10m PTFE line heated to 180°C	Model: M&C ECM-2 G/SR 25.2 gas cooler & Permapure AS series scrubber.	Model: ZRE and ZRE/ZFK7 Analyser

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 1.02 (serial number LR0020 for ZRE analysers and LR0023 for ZFK7 analysers onwards).

Certified Performance

The instrument was evaluated for use under the following conditions:

Ambient Temperature Range: +5°C to +40°C
Instrument IP rating: IP55

Results are expressed as error % reading, unless otherwise stated.

Test	Results expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Response time						
CO					70s	<200s
NO					83s	<200s
SO_2					99s	<200s
O_2 (Zirconia)					90s	<200s
O_2 (Paramagnetic)					57s	<200s
Repeatability standard deviation at zero point						
CO	0.03					<2.0%
NO	0.06					<2.0%
SO_2	0.02					<2.0%
O_2 (Zirconia)	0.02					<0.2%
O_2 (Paramagnetic)	0.00					<0.2%
Repeatability standard deviation at reference point						
CO	0.03					<2.0%
NO	0.03					<2.0%
SO_2	0.11					<2.0%
O_2 (Zirconia)	0.00					<0.2%
O_2 (Paramagnetic)	0.00					<0.2%
Lack-of-fit						
CO	0.40					<2.0%
NO	-0.16					<2.0%
SO_2	0.19					<2.0%
O_2 (Zirconia)	0.07					<0.2%
O_2 (Paramagnetic)	0.07					<0.2%

Certificate No : Sira MC130224/03
This Certificate issued : 23 February 2018

Test	Results expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Influence of ambient temperature zero point						
CO				-2.90		<5.0%
NO				4.10		<5.0%
SO_2				3.50		<5.0%
O_2 (Zirconia)	0.06					<0.5%
O_2 (Paramagnetic)	0.10					<0.5%
Influence of ambient temperature reference point						
CO				3.80		<5.0%
NO				4.20		<5.0%
SO_2				2.90		<5.0%
O_2 (Zirconia)	0.46					<0.5%
O_2 (Paramagnetic)	0.34					<0.5%
Influence of sample gas flow for extractive CEMS						
CO	-0.50					<2.0%
NO	-0.10					<2.0%
SO_2	-0.50					<2.0%
O_2 (Zirconia)	0.11					<0.2%
O_2 (Paramagnetic)	0.13					<0.2%
Influence of voltage variations 190 to 250V						
CO	-0.50					<2.0%
NO	-0.30					<2.0%
SO_2	-0.20					<2.0%
O_2 (Zirconia)	-0.05					<0.2%
O_2 (Paramagnetic)	-0.03					<0.2%

Test	Results expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Cross-sensitivity at zero with interferents: O_2, H_20, CO, CO_2, CH_4, N_2O, NO, NO_2, NH_3, SO_2, HCl, H_2S						
CO			1.73			<4.0%
NO			1.34			<4.0%
SO_2		0.73				<4.0%
O_2 (Zirconia)	0.00					<0.4%
O_2 (Paramagnetic)	0.00					<0.4%
Cross-sensitivity at reference with interferents: O_2, H_20, CO, CO_2, CH_4, N_2O, NO, NO_2, NH_3, SO_2, HCl, H_2S						
CO				3.09		<4.0%
NO		0.87				<4.0%
SO_2				3.48		<4.0%
O_2 (Zirconia)	0.25					<4.0%
O_2 (Paramagnetic)	0.14					<4.0%
Converter Efficiency					Not Applicable	>95%
Measurement uncertainty						
CO					12.5%	Guidance - at least 25% below max permissible uncertainty
NO					14.7%	
SO_2					6.9%	
O_2 (Zirconia)					2.9%	
O_2 (Paramagnetic)					2.6%	

Test	Results expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Calibration function (field)						
CO					0.99	>0.90
NO					0.99	>0.90
SO_2					0.99	>0.90
O_2 (Zirconia)					0.99	>0.90
O_2 (Paramagnetic)					0.99	>0.90
Response time (field)						
CO					93s	<200s
NO					96s	<200s
SO_2					98s	<200s
O_2 (Zirconia)					98s	<200s
O_2 (Paramagnetic)					68s	<200s
Lack of fit (field)						
CO		0.88				<2.0%
NO		-0.63				<2.0%
SO_2		0.93				<2.0%
O_2 (Zirconia)	-0.15					<0.2%
O_2 (Paramagnetic)	-0.09					<0.2%
Maintenance interval					4 weeks Note 1	>8 days

Test	Results expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Zero and Span drift requirement	The AMS is able to perform automated calibrations. The automated adjustment of zero point was carried out during the field test. No problems occurred throughout the field test period. A status signal is set, if the automated calibration should not work.					Clause 6.13 & 10.13 Manufacturer shall provide a description of the technique to determine and compensate for zero and span drift.
Change in zero point over maintenance interval						
CO	-0.38					<3.0%
NO		0.69				<3.0%
SO_2		0.81				<3.0%
O_2 (Zirconia)	-0.09					<0.2%
O_2 (Paramagnetic)	-0.11					<0.2%

Test	Results expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Change in reference point over maintenance interval						
CO				-2.31		<3.0%
NO				2.81		<3.0%
SO_2				-2.37		<3.0%
O_2 (Zirconia)	-0.17					<0.2%
O_2 (Paramagnetic)	0.19					<0.2%
Availability All Components					98.4%	>95% (>98% for O_2)
Reproducibility						
CO				2.50		<3.3%
NO			1.00			<3.3%
SO_2		0.70				<3.3%
O_2 (Zirconia)	0.10					<0.2%
O_2 (Paramagnetic)	0.11					<0.2%

Note 1: The ZRE / ZFK7 has a maintenance interval of 4 weeks. The work detailed below has to be carried out at regular intervals, depending on local conditions:

Check of zero and span point with the help of test gasses and visual inspection of the system including tubings, flow meter, temperature controller and pumps.

Annual Maintenance works: Replacement of the filter element within the heated probe.

Test gasses shall be fed via the dynamic injector at least once every three months.

Description

The FUJI ZRE & ZRE/ZFK7 gas analyser is a multi-component analyser based on the absorption of non-dispersive infrared radiation (NDIR). The attenuation in the radiation that depends on the wavelength is a measure of the respective concentration of the gas. The analyser measures O_2 with a paramagnetic sensor or, alternatively, a zirconia cell.

The FUJI ZRE & ZRE/ZFK7 can measure up to 4 gas components simultaneously and continuously, 3 being infrared sensitive gases such as CO, NO, or SO_2 and the other O_2.

The FUJI ZRE & ZRE/ZFK7 is a 19-inch rack mounted analyser for use in process monitoring applications or continuous emissions monitoring.

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 MC130224/03

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.