# PRODUCT CONFORMITY CERTIFICATE

This is to certify that the

## *Servomex 4900 Multigas Analyser*

Manufactured by:

## *Servomex Group Ltd*

*Jarvis Brook*
*Crowborough*
*East Sussex*
*TN6 3DU*
*UK*

*Technical and Service Center*
*4 Constitution Way*
*Woburn*
*MA 01801-1087*
*USA*

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 3.5 dated June 2016**
**EN15267-3:2007 & QAL 1**
as defined in EN 14181: 2014

Certification Ranges :

| | | | |
|---|---|---|---|
| $SO_2$ | 0 to 572 mg/m$^3$ | CO | 0 to 75 mg/m$^3$ |
| NO | 0 to 268 mg/m$^3$ | $O_2$ | 0 to 25 % vol. |

*Certification is awarded in respect of the conditions stated in this certificate*

| | | |
|---|---|---|
| Project No. | : | 674/0336 |
| Certificate No: | | Sira MC030013/11 |
| Initial Certification: | | 03 July 2003 |
| This Certificate issued | : | 06 March 2018 |
| Renewal Date: | | 05 March 2023 |

Emily Alexander BSc (Hons)
Deputy 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





Form 1335
Issue 3

**Certificate Contents**



## 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](http://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 manufacturer states that the Servomex 4900 is not suitable for use with corrosive samples and consequently must always be used with an appropriate sample system. Potential interference's are site specific and may vary from stack to stack.

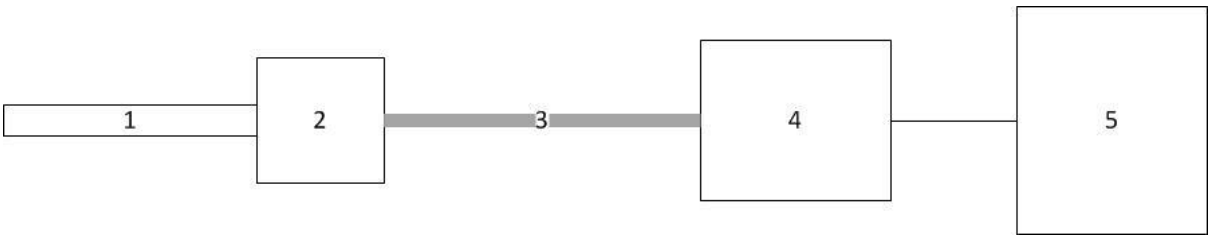
## Basis of Certification

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 Essen Report: | Report number RWTÜV-3.5.2/0784/95//674377/01 dated 1997 |
| | Report number RWTÜV-3.5.2/0784/95//597632/01 dated 1996 |
| | Report number RWTÜV-5.0.2/0784/94//20363886 dated 1999 |
| SIRA Report: | Report number N 0415 dated November 2002 |
| TÜV Köln Report | Report number 936/21209718/A dated July 2008 |
| SIRA Report | Report number 70142124 dated August 2017 |

**Product Certified**

The measuring system consists of the following parts:




| 1. Sample Probe | 2. Heated Filter | 3. Heated Sample Line | 4. Gas Conditioning | 5. Analyser |
|---|---|---|---|---|
| Model:<br>JCT-JES 301 / Buhler 222.20 Heated filter Probe | Model:<br>N/A – Integrated with sample probe | Model:<br>JCT-JH3F<br>Length: To suit application | Model:<br>Bespoke system with JCT / Universal Analyser coolers | Model:<br>4900 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 4X00/CP0_08 onwards (serial number 653043 onwards).

## Certified Performance

The instrument was evaluated for use under the following conditions:

| | | |
|---|---|---|
| Ambient Temperature Range: | Stack mounted components | -10°C to +55°C |
| | Control Unit | +5°C to +45°C |
| Instrument IP rating: | IP20 | |

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.

Results are expressed as error % of certification ranges CO 0 to 75mg/m$^3$, NO 0 to 268mg/m$^3$, $SO_2$ 0 to 572 mg/m$^3$ and $O_2$ 0 to 25%vol, unless otherwise stated.

| Test | Results expressed as % of the certification range | | | | Other results | MCERTS specification |
|---|---|---|---|---|---|---|
| | <0.5 | <1 | <2 | <5 | | |
| Response time | | | | | | |
| CO | | | | | 34s | <200s |
| NO | | | | | 35s | <200s |
| $SO_2$ | | | | | 48s | <200s |
| $O_2$ | | | | | 26s | <200s |
| Repeatability standard deviation at zero point | | | | | | |
| CO | | 0.93 | | | | <2.0% |
| NO | 0.07 | | | | | <2.0% |
| $SO_2$ | 0.13 | | | | | <2.0% |
| $O_2$ | 0.00 | | | | | <0.2% |
| Repeatability standard deviation at reference point | | | | | | |
| CO | 0.07 | | | | | <2.0% |
| NO | 0.22 | | | | | <2.0% |
| $SO_2$ | 0.13 | | | | | <2.0% |
| $O_2$ | 0.08 | | | | | <0.2% |
| Lack-of-fit | | | | | | |
| CO | 0.4 | | | | | <2.0% |
| NO | 0.4 | | | | | <2.0% |
| $SO_2$ | 0.5 | | | | | <2.0% |
| $O_2$ | 0.1 | | | | | <0.2% |

| Test | Results expressed as % of the certification range | | | | Other results | MCERTS specification |
|---|---|---|---|---|---|---|
| | <0.5 | <1 | <2 | <5 | | |
| Influence of ambient temperature zero point | | | | | | |
| -10°C to +55°C | | | | | | |
| CO | | | -1.5 | | | <5.0% |
| NO | | -0.8 | | | | <5.0% |
| $SO_2$ | | | 1.6 | | | <5.0% |
| $O_2$ | 0.01 | | | | | <0.50% |
| Influence of ambient temperature reference point | | | | | | |
| -10°C to +55°C | | | | | | |
| CO | | | 1.31 | | | <5.0% |
| NO | | | -1.8 | | | <5.0% |
| $SO_2$ | | | -1.7 | | | <5.0% |
| $O_2$ | -0.04 | | | | | <0.50% |
| Influence of sample gas flow for extractive CEMS | | | | | | |
| CO | | 0.66 | | | | <2.0% |
| NO | -0.25 | | | | | <2.0% |
| $SO_2$ | 0.31 | | | | | <2.0% |
| $O_2$ | -0.17 | | | | | <0.2% |
| Influence of voltage variations | | | | | | |
| 190V to 250V | | | | | | |
| CO | 0.15 | | | | | <2.0% |
| NO | 0.00 | | | | | <2.0% |
| $SO_2$ | 0.19 | | | | | <2.0% |
| $O_2$ | 0.07 | | | | | <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: $O_2$, $H_2O$, CO, $CO_2$, $CH_4$, $N_2O$, NO, $NO_2$, $NH_3$, $SO_2$, HCl, | | | | | | |
| CO | | | 1.80 | | | <4.0% |
| NO | | | | 3.30 | | <4.0% |
| $SO_2$ | | | 1.30 | | | <4.0% |
| $O_2$ | 0.00 | | | | | <0.40% |
| Cross-sensitivity at reference with interferents: $O_2$, $H_2O$, CO, $CO_2$, $CH_4$, $N_2O$, NO, $NO_2$, $NH_3$, $SO_2$, HCl, | | | | | | |
| CO | | | 1.80 | | | <4.0% |
| NO | | 0.60 | | | | <4.0% |
| $SO_2$ | | | | 2.70 | | <4.0% |
| $O_2$ | 0.00 | | | | | <0.40% |
| Measurement uncertainty | | | | | Guidance - at least 25% below max permissible uncertainty | |
| CO | | | | | 5.5% | <7.5% (10%) |
| NO | | | | | 7.3% | <15% (20%) |
| $SO_2$ | | | | | 13.7% | <15% (20%) |
| $O_2$ | | | | | 2.3% | <30% (40%) |
| Calibration function (field) | | | | | | |
| CO | | | | | >0.999 | >0.90 |
| NO | | | | | >0.999 | >0.90 |
| $SO_2$ | | | | | >0.999 | >0.90 |
| $O_2$ | | | | | >0.999 | >0.90 |
| Response time (field) | | | | | Note1 | |
| CO | | | | | 34s | <200s |
| NO | | | | | 35s | <200s |
| $SO_2$ | | | | | 48s | <200s |
| $O_2$ | | | | | 26s | <200s |

| Test | Results expressed as % of the certification range | | | | Other results | MCERTS specification |
|---|---|---|---|---|---|---|
| | <0.5 | <1 | <2 | <5 | | |
| Lack of fit (field) | | | | | Note 2 | |
| CO | | | <2 | | | <2.0% |
| NO | | | <2 | | | <2.0% |
| $SO_2$ | | | <2 | | | <2.0% |
| $O_2$ | | | <2 | | | <0.2% |
| Maintenance interval | With $SO_2$ = 2 weeks<br>Without $SO_2$ = 3 weeks | | | | | >8 days |
| Zero and Span drift requirement | Compensation for zero and span drift is performed by introducing suitable zero and span gases as described in the 4900 analyser manual | | | | | Clause 6.13 & 10.13<br>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 | | | <2.0 | | 2 weeks | <3.0% |
| NO | | | 1.2 | | 2 weeks | <3.0% |
| $SO_2$ | | | | 2.1 | 3 weeks | <3.0% |
| $O_2$ | | | | 2.8 | 2 weeks | <0.2% |
| Change in reference point over maintenance interval | | | | | | |
| CO | | | | | | <3.0% |
| NO | 0.4 | | | | 2 weeks | <3.0% |
| $SO_2$ | 0.4 | | | | 3 weeks | <3.0% |
| $O_2$ | | | 1.2 | | 2 weeks | <0.2% |
| Availability | | | | | 98.9% | >95%<br>(>98% for $O_2$) |

| Test | Results expressed as % of the certification range | | | | Other results | MCERTS specification |
|---|---|---|---|---|---|---|
| | <0.5 | <1 | <2 | <5 | | |
| Reproducibility | | | | | | |
| CO | | | 1.34 | | | <3.3% |
| NO | | 1.0 | | | | <3.3% |
| $SO_2$ | | | 1.32 | | | <3.3% |
| $O_2$ | 0.41 | | | | | <0.20% |

Note 1. Response time stated is from the lab test.
Note 2. Data derived from the calibration function test (field)

## Description

The Servomex 4900 samples flue gas via an extractive process. The analyser measures oxygen by a magnetodynamic paramagnetic sensor and NO, CO and $SO_2$ by infrared gas filter correlation technology.

The Servomex 4900 series system tested consisted of a Servomex 4995 Sample Conditioning System and two Servomex 4900 analysers to both measure NO, CO, $SO_2$ and $O_2$. The system also included a heated filter probe model JES 300 (located within the stack) and a heated line model JH3F, both are manufactured by JCT Consulting & Trading GmbH. The configuration of analysers and sample conditioning system can be varied depending upon the application and customer requirements.

## 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 V06 for certificate No. Sira MC130013/11.

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.