PRODUCT CONFORMITY CERTIFICATE

This is to certify that the

Model Pulsi 200 Series Gas Analyser (previously known as Pulsi 200LR) & ACWn Control Unit

manufactured by:

Procal Analytics Ltd

5 Maxwell Road
Woodston
Peterborough
PE2 7HU
UK

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 2 Revision 1 (April 2003)

Certification Ranges :

CO	0 to 200 ppm	0 to 700 ppm	0 to 3500 ppm
SO_2	0 to 200 ppm	0 to 700 ppm	0 to 2500 ppm
NO	0 to 300 ppm	0 to 1000 ppm	0 to 3500 ppm
N_2O*	0 to 300 ppm	0 to 5000 ppm	
NO_2*	0 to 300 ppm	0 to 5000 ppm	
CO_2	0 to 15% vol	0 to 25% vol	
H_2O	0 to 25% vol		

(*maximum H_2O vapour 5%, maximum CO_2 4000 ppm)

Project No:	674/0095 & 674/0
Certificate No:	Sira MC 050060/04
Initial Certification:	22 July 2005
This Certificate Issued:	13 June 2008
Renewal Date:	19 December 2010

Technical Director

MCERTS is operated on behalf of the Environment Agency by

Sira Certification Service
12 Acorn Industrial Park, Crayford Road, Crayford
Dartford, Kent, UK, DA1 4AL
Tel: 01322 520500 Fax: 01322 520501

Approved Site Application

On the basis of these tests and the ranges required for compliance with EU Directives this instrument is considered suitable for use on waste incineration and large combustion plant applications.

The N_2O and NO_2 ranges are based on the gas matrix commonly found in nitric acid processes.

Any potential user should ensure, in consultation with the manufacturer, that the emission monitoring system is suitable for the process on which it will be installed. For general guidance on stack emission monitoring techniques refer to Environment Agency Technical Guidance Note M2: Monitoring of stack emissions to air. This is available on the Agency's website at www.environment-agency.gov.uk

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:

QE21/97/003	(NPL) dated March 1999
QE21/N00/1022	(NPL) dated 16 October 2000
MCT/ESTC/B.01/SO6	(AEAT) dated August 1999
MCERTS Audit Report	Report Ref: 674/0095 dated 10 March 2005 for assessment of Procal report ref: D 205
N 0328	(Sira) dated March 2000
N 1234	(Sira) dated December 2005
MCERTS Audit Report	Report Ref: 674/0271 dated March 2007 for assessment of Procal report ref: D 0235
MCERTS Audit Report	Report Ref: 674/0321 dated 30 April 2008 for assessment of Procal report ref: D 0239

Product Certified

This certificate applies to all instruments fitted with software version 2.2.2 onwards.

Certified Performance

The instrument was evaluated for use under the following conditions:
Ambient Temperature Range

Stack Components -10°C to +45°C
5 to 95% (including condensation)
Control Unit 5°C to +40°C

Notes: Ambient temperature test on the ACWn control unit is not applicable as it is a stand-alone software package.

Unless otherwise stated the evaluation was carried out on the certification range CO 0 to 200 ppm, SO_2 0 to 200 ppm, NO 0 to 300 ppm, CO_2 0 to 15% vol, H_2O 0 to 25% vol.

Test		Results expressed as % of max of certification range				Other results	MCERTS specification
		<0.5	<1	<2	<5		
Linearity	CO			1.16			<±2%
	SO_2		0.99				<±2%
	NO			1.49			<±2%
	H_2O	<0.3					<±2%
	CO_2	0.43					<±2%
Linearity	CO			1.2			<±2%
	SO_2		-0.9				<±2%
	NO			1.2		Note 1	<±2%
	CO_2		1.0				<±2%
Linearity	CO, NO			-1.4			<±2%
	SO_2			-1.1		Note 2	<±2%
Linearity	NO_2			1.14			<±2%
	N_2O		0.5			Note 3	<±2%
Cross Sensitivity to: NO, CO, H_2O (25%), CO_2, & Cocktail of NO, CO, CO_2.							
	CO			-1.54			<±4%
	SO_2		0.92				<±4%
	NO	0.27					<±4%
	H_2O				2.8		<±4%
	CO_2				2		<±4%

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Test	Results expressed as % of certification range				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Cross sensitivity to: H_2O (5%) and CO_2						
NO_2		0.84				<±4%
N_2O			-1.52		Note 4	<±4%
Temperature dependent zero shift						
CO	0.25					<±0.3%/°C
SO_2	0.17					<±0.3%/°C
NO	0.26					<±0.3%/°C
H_2O	0.065					<±0.3%/°C
CO_2	0.01					<±0.3%/°C
Temperature dependent upper reference point shift						
CO	0.28					<±0.3%/°C
SO_2	0.10					<±0.3%/°C
NO	0.19					<±0.3%/°C
H_2O	0.065					<±0.3%/°C
CO_2	0.13					<±0.3%/°C
Response time					137s	<200s

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Test	Results expressed as % of certification range				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Detection limit						
CO	0.53					<±2%
SO_2	0.44					<±2%
NO		0.69				<±2%
H_2O	0.00					<±2%
CO_2	0.002					<±2%
NO_2	0.00					
N_2O		0.91				
Integral Performance [Note 5]						
CO	0.29					<10%
SO_2	0.39					<10%
NO			1.33			<10%
H_2O				4.91		<10%
CO_2		0.71				<10%
Availability [Note 5]					100%	>95%
Maintenance interval [Note 5]					>12 weeks	To be reported
Zero drift during field trial [Note 5]						
CO	0.08					<±2%/week
SO_2	0.0					<±2%/week
NO		0.83				<±2%/week
H_2O					Not tested	<±2%/week
CO_2	0.03					<±2%/week

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Test	Results expressed as % of certification range				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Upper reference point drift during field trial [Note 3]						
CO	0.33					<±4%/week
SO_2	0.11					<±4%/week
NO			1.08			<±4%/week
H_2O					Not tested	<±4%/week
CO_2		0.71				<±4%/week
Vibration test: (10 to 60Hz (0.3mm), 60Hz to 150Hz at 19.6m/s^2)					No effect	To be reported

Note1: Linearity test performed on the following ranges CO 0 to 3500 ppm, SO_2 0 to 2500 ppm, NO 0 to 3500 ppm.

Note 2: Linearity test performed on the following ranges CO 0 to 700 ppm, SO_2 0 to 700 ppm, NO 0 to 1000 ppm, CO_2 0 to 25% vol.

Note 3: Linearity test performed on the following ranges: N_2O 0-300ppm and 0-5000ppm, NO_2 0-300ppm and 0-3500ppm

Note 4: Cross sensitivity test performed on the following ranges; H_2O 0 to 5% and CO_2 0 to 4000ppm

Note 5: Field Test: The system with the ACU control unit was evaluated for 3 months on a municipal waste incinerator. The ACWn control unit has been evaluated and proved to be equivalent to the ACU control unit. Fuel capacity of the incinerator was 11 tonnes/hour. Abatement techniques were carbon and lime injection, and bag filters. The system complied with the performance requirements stated in the above standard for the certification ranges tested.

Effect of a sample pressure change (%/kPa)

CO	SO_2	NO	CO_2	H_2O
0.90%	-0.16%	-0.64%	0.23%	0.23%

Effect of sample temperature change (per 10°C)

CO	SO_2	NO	CO_2	H_2O	
0.03%	0.01%	0.06%	-1.40%	-0.08%	(120°C to 160°C)
0.93%	0.88%	0.95%	-0.24%	0.002%	(160°C to 190°C)

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Description:

The Pulsi 200 analyser (previously known as Pulsi 200LR) comprises a stack mounted probe and a separate control unit. The analyser performs measurements of the components of stack gases and operates by using the infrared absorption of the gases being measured.

Selected infrared wavelengths signals are periodically measured by the analyser, each corresponding to an absorption feature of the individual gas.

Both measurement and reference wavelength filters are used together with gas filter correlation cells to determine changes in absorption. These changes are mapped to concentration using a mathematical algorithm, which also corrects for the influence of pressure, temperature and interfering gases. Sample pressure change compensation must be enabled.

The output of the separate analyser control unit can be configured by the user to display transmitted and concentration in various units.

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 MC 050060/00.

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.

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