PRODUCT CONFORMITY CERTIFICATE

This is to certify that the

Protoc 300 TOC Analyser

Manufactured by:

Pollution & Process Monitoring Ltd

Bourne Enterprise Centre
Borough Green
Sevenoaks
TN15 8DG
Kent
UK

has been assessed by CSA Group
and for the conditions stated on this certificate complies with:

Performance Standards and Test Procedures for Continuous Water Monitoring Equipment, Part 2: Performance standards and test procedures for on-line monitors, Environment Agency, version 3.1, August 2010

Certification ranges:

TOC	0 to 20 mg/L
	0 to 4000 mg/L

Project No.:	80306756
Certificate No:	CSA MC 060077/07
Initial Certification:	11 August 2006
This Certificate issued:	28 July 2026
Renewal Date:	10 August 2031

Andrew Young
Environmental Project Engineer

MCERTS is operated on behalf of the Environment Agency by

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Form 3005
Issue 7

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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 general guidance on monitoring techniques refer to the Environment Agency guidance available at www.mcerts.net

On the basis of the assessment this instrument is considered suitable for use on treated wastewater, untreated wastewater and receiving water applications.

For the field test, the Protoc 300 analyser was assessed on the basis of a three-month field trial installed on an urban river application.

Chloride levels of less than 2000ppm are desirable to prevent corrosion problems, for levels above 2000ppm, follow manufacturer's guidelines.

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:

Environment Agency Warrington	Report Ref: EA-MCERTS-001 dated December 2005
Environment Agency Warrington	Report Ref: EA-MCERTS-002 dated December 2005
Environment Agency Warrington	Report Ref: EA-MCERTS-003 dated April 2006
Sira Laboratory	Report Ref: N51D12061B dated 26/07/05

Product Certified

The measuring system consists of the following parts:

- Analyser section
- Power supply and terminal box

This certificate applies to all instruments fitted with software version 05 onwards (i.e. serial number 29041324 onwards)

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Certified Performance

The instrument was evaluated for use under the following conditions:
Ambient Temperature Range: +2°C to +40°C

Results are expressed as expanded uncertainties as a percentage of the certification range 0 to 20mg/L, unless otherwise stated.

Test	Results expressed as expanded uncertainties as a percentage of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Combined performance characteristic, U_C					2.46%	12%
Mean error					-3.70%	10%
Mean error (0 to 4000mg/L range)					7.1%	10%
Linearity		-0.92			Note 1	5%
Linearity (0 to 4000mg/L range)				-3.41	Note 1	5%
Repeatability		0.64				5%
Repeatability (0 to 4000mg/L range)			1.24			5%
Drift				-2.91		5%
Response time in the lab (0 to 20mg/L range)					4min 49s	To be reported
Interference due to inorganic carbon	0.89					3% span
Output impedance		-0.69				2.5%
Supply voltage	-0.26					2.5%
Loss of supply					Pass	Data shall be correctly retained
Sample flow rate					Note 2	2.5%
Sample pressure					Note 2	2.5%
Sample temperature	-0.2					5%
Ambient temperature				4.10		5%
Relative humidity				3.03		5%

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Test	Results expressed as expanded uncertainties as a percentage of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<4		
Up-time					97.6%	>95%
Response time in the field: Initial at average reading of 4.3mg/L (start of field test) Final at average reading of 4.06mg/L (end of field test)					 5 min 8min 30s	 To be reported To be reported
Response time in the field: Initial at average reading of 15mg/L (start of field test) Final at average reading of 16.88mg/L (end of field test)					 6min 15s 6min 45s	 To be reported To be reported
Field test error					95% Note 3	>90%

Note 1: Method of calculation is terminal based linearity.

Note 2: Tests not applicable as a pump controls the sample flow-rate and sample pressure.

Note 3: Uncertainty of the test method has been included.

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Description

The Protoc 300 TOC analyser measures a sample stream continuously for organic carbon content. Sample is mixed with an acidified reagent containing sodium persulfate. The mixture of sample and reagent is sparged with a carrier gas (usually compressed air) to remove inorganic carbon and dissolved carbon dioxide. The remaining liquid, which now contains only organic carbon compounds, is pumped into the reaction vessel. A strong source of ultra-violet light promotes an oxidation reaction between the organic and persulfate, producing carbon dioxide. A stream of carrier gas diffusing at the bottom of the reaction vessel, transfers the carbon dioxide through a gas drying system into a non-dispersive infrared detector. The amount of carbon dioxide produced is directly proportional to the organic carbon content of the sample over a specific measuring range determined by the application.

The analyser may be set up to measure total organic carbon (TOC) or total carbon (TC). In the latter case the sparging of the sample is omitted.

The analyser is calibrated by passing a standard test solution through the analyser. The standard contains a known level of carbon and the detector is adjusted to display the correct reading. Solenoids are used to switch either the sample or the standard solution through the analyser.

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 Certificates'.

2. The design of the product certified is defined in the CSA design schedule for certificate No. CSA MC060077.

3. If the 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 Certificates'.

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

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