

APPENDIX G - CALIBRATION CERTIFICATES

- (i) SPT Calibration Records
- (ii) Gas Analyser Calibration

CERTIFICATION OF CALIBRATION



Date Of Calibration: 28-Jun-2019

Certificate Number: G503221_2/23460

Issued by: QED Environmental Systems Ltd.

Customer: Structural Soils Limited
Spring Lodge 172 Chester Road Helsby
Frodsham Cheshire WA6 0AR UNITED KINGDOM

Description: Gas Analyser

Model: GA5000

Serial Number: G503221

UKAS Accredited results:

Results after adjustment :

Methane (CH ₄)		
Certified Gas (%)	Instrument Reading (%)	Uncertainty (%)
5.0	4.9	0.41
15.0	14.9	0.64
50.0	49.3	0.94

Carbon Dioxide (CO ₂)		
Certified Gas (%)	Instrument Reading (%)	Uncertainty (%)
5.0	5.0	0.43
15.0	15.0	0.70
50.0	50.3	1.1

Oxygen (O ₂)		
Certified Gas (%)	Instrument Reading (%)	Uncertainty (%)
21.3	21.4	0.31

The inwards assessment was carried out 18-Jun-2019.

The maximum adjustment is larger than the inwards assessment uncertainty.

Inwards assessment data is available if requested.

All concentrations are molar.

CH₄, CO₂ readings recorded at : 34.5 °C ± 2.5 °C

O₂ readings recorded at : 24.0 °C ± 2.5 °C

Barometric Pressure : 1017 mbar ± 4 mbar

Method of Test : The analyser is calibrated in a temperature controlled chamber using a series of reference gases, in compliance with procedure LP004.

This certificate is issued in accordance with the laboratory accreditation requirements of the United Kingdom Accreditation Service. It provides traceability of measurement to the SI system of units and/or to units of measurement realised at the National Physical Laboratory or other recognised national metrology institutes. This certificate may not be reproduced other than in full, except with the prior written approval of the issuing laboratory.

Calibration Instance:103 IGC Instance:102

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QED Environmental Systems Ltd. Cyan Park - Unit 3, Jimmy Hill Way, Coventry, CV2 4QP, UNITED KINGDOM

Registered in England and Wales 1898734

CERTIFICATION OF CALIBRATION



Date Of Calibration: 28-Jun-2019

Certificate Number: G503221_2/23460

Issued by: QED Environmental Systems Ltd.

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately 95%. The uncertainty evaluation has been carried out in accordance with UKAS requirements.

Calibrations marked 'Non-UKAS Accredited results' on this certificate have been included for completeness.

Non-UKAS accredited results after adjustment:

Barometer (mbar)	
Reference	Instrument Reading
1017	1018

Additional Gas Cells		
Gas	Certified Gas (ppm)	Instrument Reading (ppm)
CO	519	519
H ₂ S	53.5	54

Internal Flow	
Applied (l/hr)	Instrument Reading (l/hr)
5.0	5.2
10.0	10.1

Date of Issue : 01-Jul-2019

Approved by Signatory

Graham Ingles

Laboratory Inspection

This certificate is issued in accordance with the laboratory accreditation requirements of the United Kingdom Accreditation Service. It provides traceability of measurement to the SI system of units and/or to units of measurement realised at the National Physical Laboratory or other recognised national metrology institutes. This certificate may not be reproduced other than in full, except with the prior written approval of the issuing laboratory.

Calibration Instance:103 IGC Instance:102

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CERTIFICATION OF CALIBRATION



Date Of Calibration: 17-Jul-2019

Certificate Number: G503522_2/23572

Issued by: QED Environmental Systems Ltd.

Customer: Structural Soils Limited
Spring Lodge 172 Chester Road Helsby
Frodsham Cheshire WA6 0AR UNITED KINGDOM

Description: Gas Analyser

Model: GA5000

Serial Number: G503522

UKAS Accredited results:

Results after adjustment :

Methane (CH ₄)		
Certified Gas (%)	Instrument Reading (%)	Uncertainty (%)
5.0	4.9	0.41
15.0	14.9	0.64
50.0	49.5	0.94

Carbon Dioxide (CO ₂)		
Certified Gas (%)	Instrument Reading (%)	Uncertainty (%)
5.0	4.9	0.43
15.0	14.9	0.70
50.0	50.1	1.1

Oxygen (O ₂)		
Certified Gas (%)	Instrument Reading (%)	Uncertainty (%)
21.3	21.3	0.31

The inwards assessment was carried out 03-Jul-2019.

The maximum adjustment is larger than the inwards assessment uncertainty.

Inwards assessment data is available if requested.

All concentrations are molar.

CH₄, CO₂ readings recorded at : 32.2 °C ± 2.5 °C

O₂ readings recorded at : 23.6 °C ± 2.5 °C

Barometric Pressure : 1003 mbar ± 4 mbar

Method of Test : The analyser is calibrated in a temperature controlled chamber using a series of reference gases, in compliance with procedure LP004.

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Calibration Instance: 103 IGC Instance: 103

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CERTIFICATION OF CALIBRATION



Date Of Calibration: 17-Jul-2019

Certificate Number: G503522_2/23572

Issued by: QED Environmental Systems Ltd.

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately 95%. The uncertainty evaluation has been carried out in accordance with UKAS requirements.

Calibrations marked 'Non-UKAS Accredited results' on this certificate have been included for completeness.

Non-UKAS accredited results after adjustment:

Barometer (mbar)	
Reference	Instrument Reading
1003	1003

Additional Gas Cells		
Gas	Certified Gas (ppm)	Instrument Reading (ppm)
CO	519	519
H ₂ S	53.5	54

Internal Flow	
Applied (l/hr)	Instrument Reading (l/hr)
5.0	4.9
10.0	9.9

Date of Issue : 18-Jul-2019

Approved by Signatory

Graham Ingles

Laboratory Inspection

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QED Environmental Systems Ltd. Cyan Park - Unit 3, Jimmy Hill Way, Coventry, CV2 4QP, UNITED KINGDOM

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SERVICE REPORT



Issued by: QED Environmental Systems Ltd.

Customer Name: Structural Soils Limited

Model: GA5000

Date of Service: 18-Jul-2019

Part Number: GA5KB0B0-101

Service Engineer: Suk Balrey

Serial Number: G503522

Calibration Engineer: Suk Balrey

Verification / Approved By: Graham Ingles

Signature:

Reason for Return (inc. Customer Comments):

Investigation required. In Cal but has developed a fault. Pump runs continually at start, Cells reporting odd results

Service Comments/Feedback:

Thank you for returning your gas analyser to the Geotech Service Centre for full service and calibration. We are pleased to inform you that the analyser was received and fully assessed by one of our experienced Service Engineers.

We have replaced the sensor printed circuit board due to faults developing as a result of corrosion due to water ingress, despite our significant effort to repair or resolve the fault.

Our extensive service was carried out, and any necessary components replaced. The gas analyser has successfully passed all of our rigorous testing and quality checks and has been calibrated using our bespoke, state of the art calibration facility.

For further information about how to get the best use from your instrument please visit our YouTube channel <http://www.youtube.com/GeotechTV> and on our Website <http://www.geotechuk.com>

If you require any further assistance with your instrument please email our Technical Support Team at technical@geotech.co.uk or call us on +44 1926 338111 (Monday to Thursday 08.30 - 17.00 & Friday 08.30 - 15.30) UK time zone.

Next Service Due: 17-Jan-2020

17025

Our ISO accreditation for our customised auto-calibration facilities

5

Number of days we aim to complete your service within

50

Number of checks instruments are subject to when serviced

65

Number of countries from which we service instruments /accessories each year

7,384

Number of calibrations completed in last 12 months

340

Minimum number of service instruments we process each month

25

Cost (in £) of fully insured analyser collection for our UK customers

www.qedenv.com

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Registered in England and Wales 1898734

SERVICE REPORT



Issued by: QED Environmental Systems Ltd.

17025

Our ISO accreditation
for our customised
auto-calibration facilities

5

Number of days we
aim to complete
your service within

50

Number of checks
instruments are subject
to when serviced

65

Number of countries from
which we service instruments
/accessories each year

7,384

Number of calibrations
completed in last
12 months

340

Minimum number
of service instruments
we process each month

25

Cost (in £) of fully insured
analyser collection for
our UK customers

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Environmental Calibration Services Ltd

CERTIFICATE OF CALIBRATION

Calibration Data For Landfill Analyse

Customer	RSK	Job Ref Number	ECS239191
Instrument	Geotechnical GA5000	Certificate Number	23919-1
Serial Number	G503316	Calibration Date	23 September 2019
		Calibration Due	23 March 2020

Ambient Temperature	20.0°C (+/-2°C)	Ambient Pressure	1002mbar
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Method:

Gas calibrations - The unit under test (UUT) was calibrated by applying a known concentration of calibration gas/gases at set flow rates. The results are recorded below after adjustment has been made and a constant reading has been obtained.

Test Reference	Cert Tracability	Instrument Reading	PASS/FAIL
O2 18.0%	WO20018-1	18.3%	PASS
CO 100ppm	WO20018-1	99ppm	PASS
CO2 4.997%	WO20018-1	5.1%	PASS
CH4 2.5%	WO20018-1	2.5%	PASS
H2S 25ppm	WO20018-1	25ppm	PASS

Filter Condition:	OK	Pump Operates:	YES
Data Logger Works:	YES	Batteries OK:	YES
Overall Result:	PASS		