CERTIFICATION OF CALIBRATION

4533

Date Of Calibration: 06-Aug-2021

Certificate Number: G504463_1/28614

Issued by: QED Environmental Systems Ltd.

Customer: **Geotechnics Limited (Coventry)**
203 Torrington Avenue Tile Hill COVENTRY
CV4 9UT UNITED KINGDOM

Description: Gas Analyser

Model: GA5000

Serial Number: G504463

UKAS Accredited results:

Results after adjustment :

Methane (CH_4)		
Certified Gas (%)	**Instrument Reading (%)**	**Uncertainty (%)**
5.0	5.0	0.072
14.9	14.9	0.13
59.7	59.4	0.42

Carbon Dioxide (CO_2)		
Certified Gas (%)	**Instrument Reading (%)**	**Uncertainty (%)**
5.0	4.8	0.074
15.1	14.8	0.13
40.3	40.3	0.29

Oxygen (O_2)		
Certified Gas (%)	**Instrument Reading (%)**	**Uncertainty (%)**
21.1	21.2	0.25

The inwards assessment was carried out 22-Jul-2021.
The maximum adjustment is larger than the specification limit.
Inwards assessment data is available if requested.

All concentrations are molar.

CH_4, CO_2 readings recorded at : 32.2 °C ± 2.5 °C

O2 readings recorded at : 22.5 °C ± 2.5 °C

Barometric Pressure : 0984 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.

Instrument has passed calibration as the measurement result is within the specification limit. The specification limit takes into account the measurement uncertainty.
The results relate only to the item calibrated

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.

www.qedenv.com +44 (0) 333 800 0088 sales@qedenv.co.uk

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

Registered in England and Wales 1898734

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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**
984	984

Additional Gas Cells		
Gas	**Certified Gas (ppm)**	**Instrument Reading (ppm)**
CO	509	509
H_2S	250	250

Internal Flow	
Applied (l/hr)	**Instrument Reading (l/hr)**
5	5.1
10	9.9

Date of Issue : 10-Aug-2021 **Approved by Signatory** Dawn Hemings

Laboratory Inspection

End of Certificate

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Calibration Instance:112 IGC Instance:112

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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

Instrument Service Report

Unit Type: GA5000	Part Number:	Date:	Next Service Due:	Customer Name:
Serial Number: G504463	GA5KB0C0-101	10-Aug-2021	06-Feb-2022	Geotechnics Limited (Coventry)

Actions/Investigation Description	Result	Comments
Serial Number Check	Yes	
Battery Requires Replacing	Yes	Battery replaced
Internal Flow Calibrated	Yes	
Full Automatic Calibration	Pass	
Serial Comms Test (USB)	Pass	
Service history of instrument reviewed	Yes	
Inwards gas check data reviewed	Yes	
Instrument turns on	Pass	
Backlight operates correctly	Yes	
External visual inspection performed	Pass	
Internal visual inspection performed	Pass	
All screws tightened to correct torque	Yes	
All connectors are secure	Pass	
Check diagnostic channels	Pass	
Case compression test	Pass	
Impact and stability test	Pass	
Pressure transducer test(s) as per user operation	Pass	

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Instrument Service Report

Unit Type: GA5000	Part Number:	Date:	Next Service Due:	Customer Name:
Serial Number: G504463	GA5KB0C0-101	10-Aug-2021	06-Feb-2022	Geotechnics Limited (Coventry)

Actions/Investigation Description	Result	Comments
Final visual inspection on instrument	Pass	
Case assembly closed and screws tightened to correct torque	Yes	
PTFE filters replaced	Yes	
Pump flow greater than 550 ml/min	Pass	
Automated instrument pressure system test (leak test)	Pass	
Pump vacuum greater than -400 mb and flow fails	Pass	
GPS function test	NA	
Temperature probe tested	Pass	
Anemometer tested	Pass	
Chemical gas sensors calibrated – refer to Calibration Certificate	Retest Passed	
Check main PCB and sensor PCB have the latest software	Yes	
Transducers calibrated	Pass	
As Received Chemical Cell Gas Assessment Performed (CAL16)	Yes	
As Received Gas Assessment Performed (CAL01 or CAL02)	Yes	
Chemical sensor(s) replacement over 2yrs UK and 21mths overseas.	Yes	CO & H2S Cells replaced
O2 sensor replacement over 3yrs UK, 33mths overseas	Pass	

Instrument Service Report

Unit Type: GA5000	Part Number:	Date:	Next Service Due:	Customer Name:
Serial Number: G504463	GA5KB0C0-101	10-Aug-2021	06-Feb-2022	Geotechnics Limited (Coventry)

Customer Comments

Returned for full service and calibration

Accessory Test	Result	Comments
Charger	Pass	Charger output is in spec.
Water Trap	Pass	Replaced PTFE filter. Replaced tubing, Replaced hose barb, Tested ok.

General Comments/Feedback

Thank you for returning your gas analyser to the QED 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 and no significant faults or issues were observed during the assessment. Our extensive service was carried out, and any necessary components replaced. The 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 https://qedenv.com
We have replaced the battery because it is over 2 years old. This is in accordance to the battery cell manufacturer's recommendation.
The CO & H2S electrochemical sensor has been replaced due it being over 2 years old in accordance with the manufacturer's recommendations, and also as a proactive measure based on our experience of the typical lifetime of this type of sensor.

If you require any further assistance with your instrument please email our Technical Support Team at technical@qedenv.co.uk or call us on +44 (0) 333 800 0088 (Monday to Thursday 08.30 - 17.00 & Friday 08.30 - 15.30) UK time zone.

Service Details:		Service Engineer:	Calibration Engineer:	Approved By:	Signature:
Service Scheme	√	Ricky Cottrill	Suk Balrey	Dawn Hemings	
Standard Service					