

CERTIFICATION OF CALIBRATION



Date Of Calibration: 02-Dec-2021

Certificate Number: G501278_1/29398

Issued by: QED Environmental Systems Ltd.

Customer: BAM Ritchies
Glasgow Road Kilsyth Glasgow
Lanarkshire G65 9BL UNITED KINGDOM

Description: Gas Analyser

Model: GA5000

Serial Number: G501278

UKAS Accredited results:

Results after adjustment :

Methane (CH ₄)		
Certified Gas (%)	Instrument Reading (%)	Uncertainty (%)
5.0	4.9	0.072
14.9	14.7	0.13
59.7	59.4	0.42

Carbon Dioxide (CO ₂)		
Certified Gas (%)	Instrument Reading (%)	Uncertainty (%)
5.0	4.9	0.074
15.1	14.9	0.13
40.3	40.5	0.29

Oxygen (O ₂)		
Certified Gas (%)	Instrument Reading (%)	Uncertainty (%)
21.2	21.3	0.25

The inwards assessment was carried out 29-Nov-2021.

The maximum adjustment is larger than the specification limit.

Inwards assessment data is available if requested.

All concentrations are molar.

CH₄, CO₂ readings recorded at : 32.3 °C ± 2.5 °C

O₂ readings recorded at : 23.9 °C ± 2.5 °C

Barometric Pressure : 1002 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.

Calibration Instance:114 IGC Instance:114

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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 1398734

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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	
1002	1002	

Additional Gas Cells		
Gas	Certified Gas (ppm)	Instrument Reading (ppm)
CO	500	500
H ₂ S	259	259

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

Date of Issue : 06-Dec-2021

Approved by Signatory

Dawn Hemings

Laboratory Inspection

End of Certificate

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Instrument Service Report

Unit Type: GA5000	Part Number: GA5KB0C0-101	Date: 06-Dec-2021	Next Service Due: 02-Jun-2022	Customer Name: BAM Ritchies
Serial Number: G501278				
Actions / Investigation Description		Result		Comments
Serial Number Check		Yes		
Battery Requires Replacing		No		
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		

Instrument Service Report

<u>Unit Type:</u> GA5000	<u>Part Number:</u> GA5KB0C0-101	<u>Date:</u> 06-Dec-2021	<u>Next Service Due:</u> 02-Jun-2022	<u>Customer Name:</u> BAM Ritchies
<u>Serial Number:</u> G501278				
<u>Actions / Investigation Description</u>		<u>Result</u>	<u>Comments</u>	
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		Pass		
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.		No		
O2 sensor replacement over 3yrs UK, 33mths overseas		Pass		

Instrument Service Report

Unit Type: GA5000 **Part Number:** GA5KB0C0-101 **Date:** 06-Dec-2021 **Next Service Due:** 02-Jun-2022 **Customer Name:** BAM Ritchies

Serial Number: G501278

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>

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 Scheme	☒	Service Engineer: Ricky Cottrill	Calibration Engineer: Suk Balrey	Approved By: Dawn Hemings	Signature: 
Standard Service	☐				

