

CERTIFICATION OF CALIBRATION



Date Of Calibration: 23-Jun-2022

Certificate Number: G501278_2/30684

Issued by: QED Environmental Systems Ltd.

Customer: BAM Ritches
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
15.0	14.9	0.13
60.0	59.8	0.42

Carbon Dioxide (CO ₂)		
Certified Gas (%)	Instrument Reading (%)	Uncertainty (%)
5.0	4.8	0.074
15.0	14.7	0.13
40.0	40.2	0.29

Oxygen (O ₂)		
Certified Gas (%)	Instrument Reading (%)	Uncertainty (%)
21.1	21.2	0.25

The inwards assessment was carried out 28-May-2022.

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 : 33.4 °C ± 2.5 °C

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

Barometric Pressure : 1000 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 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
1000	1000

Additional Gas Cells		
Gas	Certified Gas (ppm)	Instrument Reading (ppm)
CO	499	499
H ₂ S	260	260

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

Date of Issue : 24-Jun-2022

Approved by Signatory

Keeley Knight

Laboratory Inspection

End of Certificate

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.

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Instrument Service Report

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Unit Type: GA5000	Part Number: GA5KB0C0-101	Date: 24-Jun-2022	Next Service Due: 23-Dec-2022	Customer Name: BAM Riches
Serial Number: G501278				
Actions/Investigation Description				
Serial Number Check	Yes			
Battery Requires Replacing	Yes			
Internal Flow Calibrated	Yes	Internal flow calibrated – please reference calibration certificate		
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> 24-Jun-2022	<u>Next Service Due:</u> 23-Dec-2022	<u>Customer Name:</u> BAM Ritchies
<u>Serial Number:</u> G501278				
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		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.		Yes	H2S and CO sensors replaced	
O2 sensor replacement over 3yrs UK, 33mths overseas		Pass		

Instrument Service Report

Unit Type: GA5000	Part Number: GA5KB0C0-101	Date: 24-Jun-2022	Next Service Due: 23-Dec-2022	Customer Name: BAM Ritches
Serial Number: G501278				
Actions/Investigation Description		Result	Comments	
Verification of Instrument				

Customer Comments

Returned for full service and calibration

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 CO and H2S electrochemical sensors have been replaced due to 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 these type of sensors. The bulb block was replaced as it failed the gain self test with a low CO2 reading.

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: Suk Balrey	Calibration Engineer: Andy Townsend	Approved By: Keeley Knight	Signature: 
Standard Service	☐				