

# CERTIFICATION OF CALIBRATION



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 <sub>4</sub> ) |                        |                 |
|----------------------------|------------------------|-----------------|
| 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 <sub>2</sub> ) |                        |                 |
|-----------------------------------|------------------------|-----------------|
| 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 <sub>2</sub> ) |                        |                 |
|--------------------------|------------------------|-----------------|
| 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<sub>4</sub>, CO<sub>2</sub> readings recorded at : 32.2 °C ± 2.5 °C

O<sub>2</sub> 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.

Calibration Instance:112 IGC Instance:112

Page 1 of 2 | LP015GIUKAS-2.5

**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

# CERTIFICATION OF CALIBRATION



Date Of Calibration: 06-Aug-2021

Certificate Number: G504463\_1/28614

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 |
| 984              | 984                |

| Additional Gas Cells |                     |                          |
|----------------------|---------------------|--------------------------|
| Gas                  | Certified Gas (ppm) | Instrument Reading (ppm) |
| CO                   | 509                 | 509                      |
| H <sub>2</sub> S     | 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

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:112 IGC Instance:112

Page 2 of 2 | LP015GIUKAS-2.5

[www.qedenv.com](http://www.qedenv.com) +44 (0) 333 800 0088 [sales@qedenv.co.uk](mailto: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

# Instrument Service Report

| <b>Unit Type:</b> GA5000                          | <b>Part Number:</b> | <b>Date:</b> | <b>Next Service Due:</b> | <b>Customer Name:</b>          |
|---------------------------------------------------|---------------------|--------------|--------------------------|--------------------------------|
| <b>Serial Number:</b> 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         |                          |                                |

# Instrument Service Report

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

**Part Number:** GA5KB0C0-101  
**Date:** 10-Aug-2021

**Next Service Due:** 06-Feb-2022

**Customer Name:** 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](mailto: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.

|                                        |                                     |                          |                              |                     |                                                                                     |
|----------------------------------------|-------------------------------------|--------------------------|------------------------------|---------------------|-------------------------------------------------------------------------------------|
| <b>Service Details:</b> Service Scheme | <input checked="" type="checkbox"/> | <b>Service Engineer:</b> | <b>Calibration Engineer:</b> | <b>Approved By:</b> | <b>Signature:</b>                                                                   |
| Standard Service                       | <input type="checkbox"/>            | Ricky Cottrill           | Suk Balrey                   | Dawn Hemmings       |  |