



CERTIFICATE OF CALIBRATION

Ricardo Energy and Environment, Gemini Building, Fermi Avenue Harwell, Didcot,



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Approved Signatories:

- | | |
|--|--|
| ☐ S. Eaton | ☐ B Stacey |
| ☐ D Hector | ☐ S Stratton |
| ☐ N Rand | ☐ S Telfer |
| ☐ E Marshall-Padkin | ☐ S Gray |
| ☐ B Davies | ☒ D Lane |

Signed:

Date of issue: 28 Aug 18

Certificate Number: 04196

Customer Name and Address:

ECO2 Ltd
Vision House
Oak Tree Court
Mulberry Drive
Cardiff Gate Business Park
Cardiff
CF23 8RS

Description:

Calibration factors for the air monitoring station at
ECO2 Port Talbot

Ricardo Energy & Environment ID:

ED62187001/July 2018

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

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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ECO2 Port Talbot
Date of audit: 31 Jul 2018

Species	Analyser Serial no	Zero Response ¹	Zero uncertainty ppb	Calibration Factor ²	Factor uncertainty %	Converter eff. (%) ³
NOx	3890	15.6	2.4	0.7874	3.6377	92.5
NO	3890	-0.1	2.4	0.7533	3.6321	n/a

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The gaseous ambient analysers listed above have been tested for zero response, calibration factor, linearity and converter efficiency (NO_x analysers) by documented methods. The factors have been calculated using certified gas standards. The particulate analysers listed above have been tested for sample flow rates and k_0 (where appropriate) by documented methods. Note that the test results are valid on the day of test only, as analyser drift over time cannot be quantified. All results for gaseous species are given in ppb (parts per billion) mole fractions or ppm (parts per million) mole fractions.

¹ The zero response is the zero reading on the data logging system of the analyser when audit zero gas was introduced to the analysers under test.

² The calibration factor is the multiplying factor required to scale the reading on the data logging system of the analyser into reported concentration units (ppb for NO, NO_x, SO₂, O₃ and ppm for CO. Where 1ppm = 1000ppb). It should be used in conjunction with the zero response. A corrected concentration is calculated using the following equation:

Concentration = F(Output - Zero Response)

Where F = Calibration Factor provided on this certificate

Output = Reading on the data logging system of the analyser

Zero Response = Zero Response provided on this certificate

³ Converter eff. is the measured efficiency of the NO₂ to NO converter within the oxides of nitrogen analyser under test.

The calibration results shaded are those that fall within our scope of accreditation, all other results on this certificate are not UKAS accredited, but have been included for completeness.

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