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CERTIFICATE OF CALIBRATION



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South Ayrshire Council NOx analysers

Analyser Serial no Zero Response¹ Zero uncertainty ppb Calibration Factor² Factor uncertainty % 26 June 2023 NOx 22-0933 -3.0 2.6 0.8837 3.55 101.1 (251nmol/mol) South Ayrshire Ayr Harbour 0.8820 100 (146nmol/mol) NO -2.0 2.5 3.50 South Ayrshire Ayr High Street 26 June 2023 NOx 22-0337 1.0 2.5 1.0195 3.50 99.6 (242nmol/mol) 2.5 1.0217 99.3 (150nmol/mol) NO 2.0 3.50

FIDAS analysers

Station	Date of audit	Analyser Serial no	Calculated ko⁵	Uncertainty %	Total flow⁴	Uncertainty %	Main flow	Uncertainty %
South Ayrshire Ayr Harbour	26 June 2023	15672			4.86	2.2		2.2
South Ayrshire Ayr High Street	26 June 2023	15673			4.83	2.2		2.2

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The gaseous ambient analysers listed above have been tested for zero response, calibration factor, linearity and converter efficiency (NOx 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 k0 (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 reported in concentration units of nmol/mol or µmol/mol.

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 (nmol/mol for NO, NOx, SO2, O3 and µmol/mol for CO). 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.

⁴ The measured main flow rate (where this is applicable) is the flow rate through the sensor unit of the TEOM particulate analyser under test. The measured aux flow rate (where this is applicable) is the flow rate through the bypass tubing of the TEOM particulate analyser under test. The measured total flow rate is the total flow rate through the particulate analyser under test. Units of flow are l.min-1, reported at prevailing ambient conditions unless otherwise specified. Where flow rates are highlighted in bold, it indicates that measurements were not made at the analyser sample inlet. These measurements therefore may not accurately reflect analyser performance in normal operation.

⁵ The calculated ko value (specifically for TEOM analysers) is the calculated ko spring constant based on tests undertaken with filters of known weight. The % deviation indicates the closeness of the calculated result to the manufacturer's specified value of ko.

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.

End of certificate

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