



CERTIFICATE OF CALIBRATION

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Approved Signatories:

- | | | | |
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| <input type="checkbox"/> | S. Eaton | <input type="checkbox"/> | B Stacey |
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| <input type="checkbox"/> | N Rand | <input type="checkbox"/> | S Telfer |
| <input type="checkbox"/> | B Davies | <input checked="" type="checkbox"/> | S Gray |

Signed:

Date of issue:

29 Apr 19

Certificate Number:

4468

Customer Name and Address:

Scottish Government
Water, Air, Soils and Flooding Division
Environmental Quality Directorate
Scottish Government
Victoria Quay
Edinburgh
EH6 6QQ

Description:

Calibration factors for the air monitoring station(s) at
Aberdeen City Council

Ricardo Energy & Environment ID:

ED61598/4468

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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Aberdeen City Council
 NOx analysers

Station	Date of Audit	Species	Analyser Serial no	Zero Response ¹	Zero uncertainty ppb	Calibration Factor ²	Factor uncertainty %	Converter eff. (%) ³
Aberdeen Anderson Drive	11-Feb-19	NOx	697	-3.4	2.5	0.9600	3.50	77.9
		NO		-2.6	2.5	0.9588	3.50	
Aberdeen King St	12-Feb-19	NOx	2640	1.4	2.6	1.1231	3.50	98.1
		NO		0.1	2.6	1.1220	3.50	
Aberdeen Market Street 2	14-Feb-19	NOx	3507	3.8	2.7	1.3198	3.50	100.0
		NO		2.4	2.7	1.3253	3.50	
Aberdeen Union Street Roadside	12-Feb-19	NOx	299	0.9	2.7	1.3447	3.50	98.9
		NO		0.1	2.7	1.3563	3.50	
Aberdeen Wellington Road	11-Feb-19	NOx	3508	0.3	2.6	1.1932	3.50	101.0
		NO		1.7	2.6	1.1978	3.50	

PM10 analysers

Station	Date of audit	Analyser Serial no	Calculated ko	Uncertainty %	Total flow	Uncertainty %	Main flow	Uncertainty %
Aberdeen Anderson Drive	11-Feb-19	1200C175870309	13131	1.0	16.61	2.2	3.09	2.2
Aberdeen King St	12-Feb-19	8374			4.58	2.2		2.2
Aberdeen Market Street 2	14-Feb-19	6653			4.49	2.2		2.2
Aberdeen Union Street Roadside	12-Feb-19	1405A227711402	16775	1.0	15.73	2.2	4.56	2.2
Aberdeen Wellington Road	11-Feb-19	7451			4.48	2.2		2.2

PM2.5 analysers

Station	Date of audit	Analyser Serial no	Calculated ko	Uncertainty %	Total flow	Uncertainty %	Main flow	Uncertainty %
Aberdeen King St	12-Feb-19	8374			4.58	2.2		2.2
Aberdeen Market Street 2	14-Feb-19	6653			4.49	2.2		2.2





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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.

Output = Reading on the data logging system of the analyser
Zero Response = Zero Response provided on this certificate

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 total flow rate is the total flow rate through the particulate analyser under test. Units of flow are $\text{l}\cdot\text{min}^{-1}$, 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 k_0 value (specifically for TEOM analysers) is the calculated k_0 spring constant based on tests undertaken with filters of known weight.

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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