

Certificate of calibration

For: Dr Joss Kent
UK Met Office
Jupiter Mezzanine
Fitzroy Road
Exeter
Devon
EX1 3PB
United Kingdom

Date: 16th September 2019

Instrument: UK Meteorological Office CAPS instrument for the
measurement of NO₂, CAES0363 ISS A S/N 001

Results: UKMO NO₂ ppb = 1.1738 NCAS Standard ppb + 0.7444
ppb

Calibration range between 0-200ppbV.

**Carried out and authorised
by:** Dr Katie Read
NCAS Scientist
University of York
York, UK

Signed: 

Description of calibration:

A multi-gas calibrator (EnviroNics, model 6100) was used to dilute high concentration NO standard into PAG 001 zero air at varying levels. Ozone was added such that NO concentration was in excess. The amount of NO₂ is verified from the added Ozone assuming 1 molecule of O₃ gives one molecule of NO₂. The concentration of NO₂ was further verified by the COZI CAPS instrument. Seven concentration levels were performed, 10 minutes at each level with the last 7 minutes of data used for calibration.

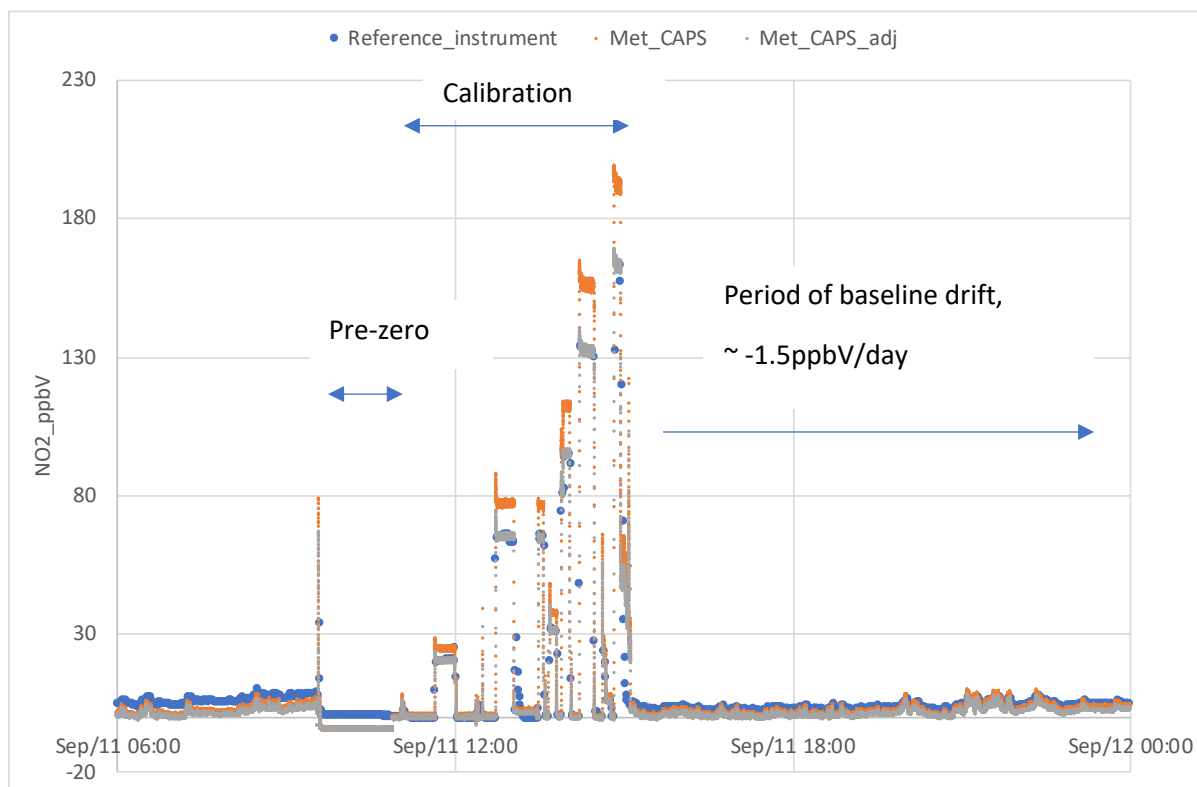
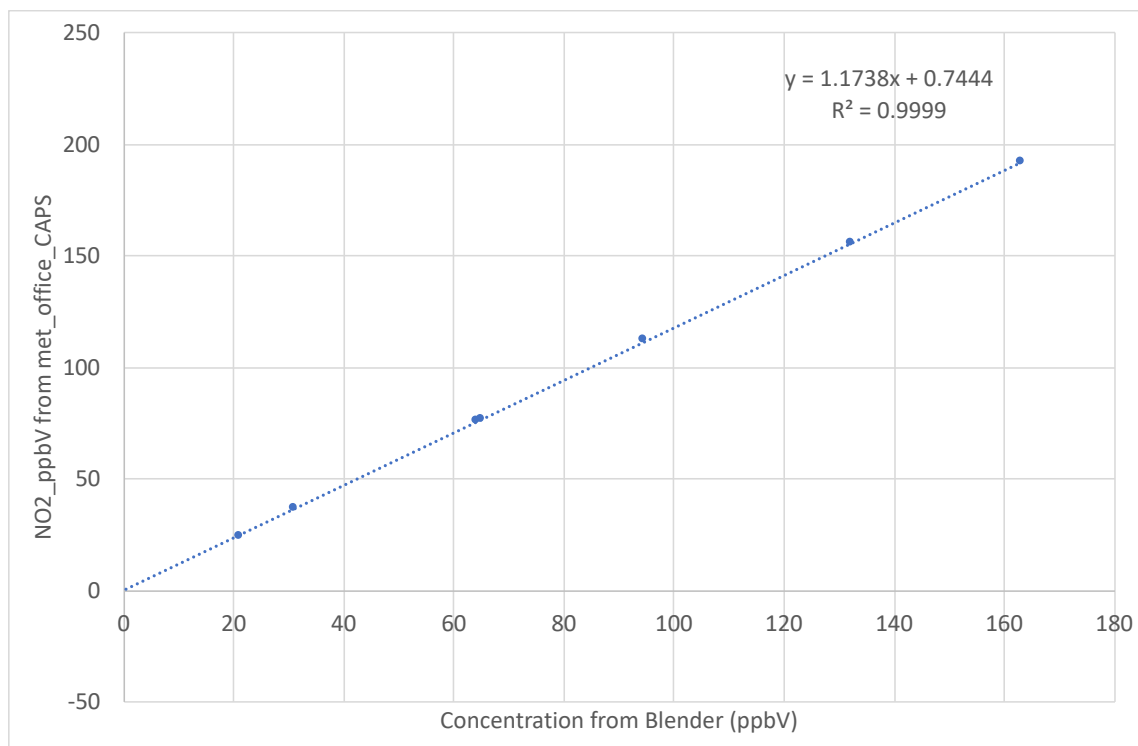
A zero check was carried out using both PAG zero air and also BTCA. A baseline adjustment was made to the visiting CAPS before the calibration.

Cylinder Information

Gas	Concentration	Cylinder #
NO in Nitrogen (BOC)	24.9 ppm	243369SG (6/11/20)
NO in Nitrogen (NPL)	1.002ppm	11288 (12/3/23)

Calibration data

NO ₂ concentration, as calculated from drop in NO/CAPS measurement (ppbV)	Measured concentration (ppbV)	Standard deviation
-0.703	0.395	0.05
21.0	24.5	0.275
-0.657	0.404	0.04
64.2	76.3	2.26
65.1	76.5	0.11
31.1	37.2	0.32
94.6	112.3	0.08
132.2	155.9	0.09
163.0	192	0.25



The analyser was also found to drift downwards at a rate of 1.5ppbV/day. Based on these results we recommend at least an adjustment to the baseline/zero followed by a span adjustment according to the equation above.

We recommend that you carry out baseline/zeros daily and calibrations at least annually to verify the stability of your analyser.

Other Notes

The blender will be returned to the company for its annual check at the end of October 2019. It is very unlikely these results will change but we will let you know of any correction that is needed to these results by the end of November 2019.

This work was carried out in the COZI-Lab in the Wolfson Atmospheric Chemistry laboratories (WACL) at the University of York. The COZI-Lab is principally funded through the National Centre for Atmospheric Science (NCAS).