

Span stability of the Aeroqual VOC Module

Introduction

The Aeroqual VOC module incorporates a PID sensor to monitor a wide range of VOCs in ambient air. It uses Aeroqual's patented baseline correction design to maintain long-term stability. Here we demonstrate the span stability of the Aeroqual VOC module and provide evidence for Aeroqual's recommended span calibration interval of one month for reliable VOC measurements in the field.

Equipment

- Aeroqual AQS 1 containing a VOC module, serial number PDL-2305051-043
- 0-100 cc/min Alicat mass flow controller, serial number 64054
- 0-10 L/min Alicat mass flow controller, serial number 117414
- Isobutylene, 1000 ppm balance air, provided by CAC Gas and Instrumentation, cylinder number W0383882-3
- Zero air generated from a compressed air source with activated carbon and Purafil scrubbers.

The experimental set up is shown in Figure 1.

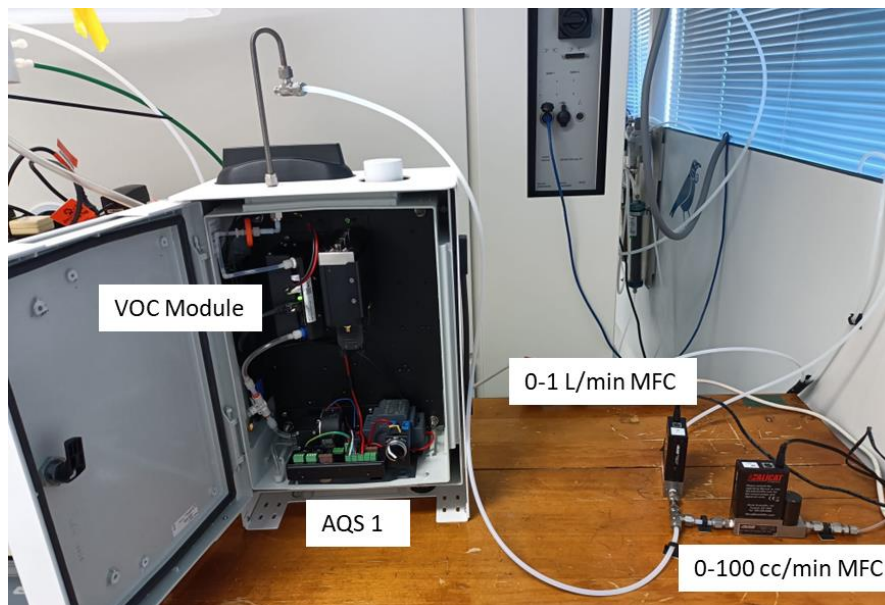


Figure 1: Experimental set up for span stability test of the Aeroqual VOC module.

Test Procedure

The VOC module was installed in an Aeroqual AQS 1, flow rate set at 0.07 LPM and run continuously in the Aeroqual laboratory for the duration of the test, sampling laboratory air. Test gases were periodically injected into the sample inlet via a T fitting.

The test gas injection sequence was:

1. 10 mins zero air (1.0 LPM)
2. 10 mins 19.6ppm isobutylene (0.02LPM isobutylene + 1.0 LPM zero air)
3. 10 minutes zero air (1.0 LPM)

The injection sequence was repeated twice daily.

Results

Figure 2 shows the concentration measured by the VOC module over a 40-day period. Error bands were calculated based on the stated accuracy of the mass flow controllers ($\pm 0.8\%$ of reading + 0.2% full scale) and are shown on the plot.

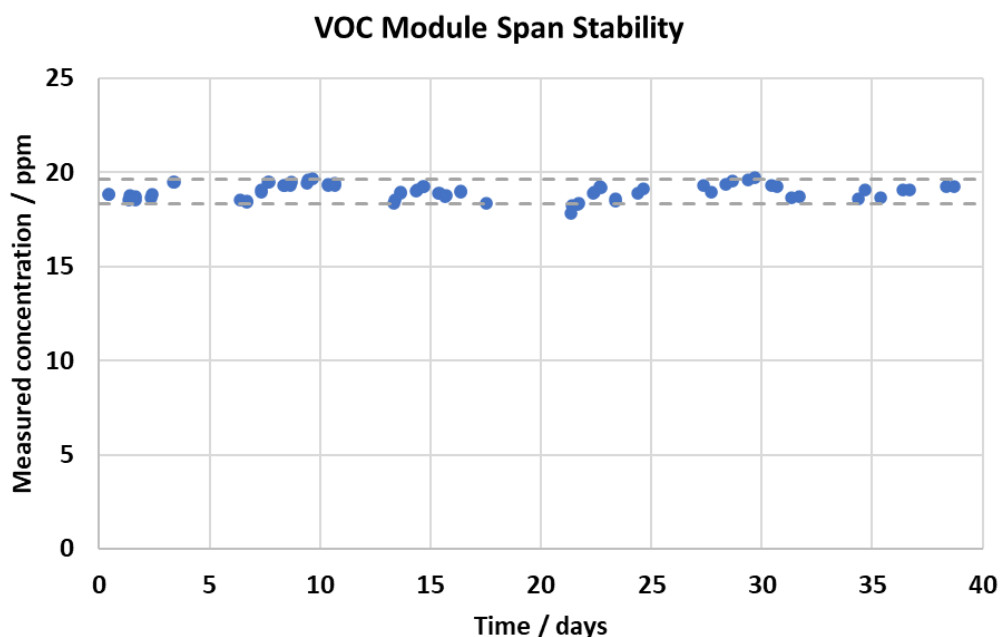


Figure 2: Isobutylene concentration measured by the VOC module over a 40-day measurement period. The grey dotted lines represent the calculated error band for the mass flow controllers.

Conclusion

The Aeroqual VOC module span readings were stable within the mass flow controller accuracy for the period of the test. Based on the test results, and taking a conservative approach, Aeroqual recommends a **span calibration interval of one month** for the VOC module to maintain optimum measurement accuracy.