Application Notes

Calibrating the EPA Primary Gas Dilution Calibrator Using the Bios Primary Flow Meter

Introduction

The EPA Primary Gas Dilution Calibrator can be quickly and precisely calibrated by the Bios primary flow meter ML-500 and verified in the field by hand-portable Bios Definer™ 220. EPA – TTN EMC Method 205 states that *"The gas dilution system shall be calibrated once per calendar year using NIST-traceable primary flow standards with an uncertainty ≤0.25%"* The ML-500 and Definer 220 are primary gas flow meters that perform direct volumetric measurement of gas flow with an uncertainty of ±0.25% and ±0.75% of reading respectively. Using Mesa patented Proven Bios DryCal Technology, they both measure the time required to displace a piston through a glass cylinder of known volume (accuracy is dimensional, based upon length and time, two of the primary units of measure, or the SI Base Units).

Background

The gas dilution system produces a known low-level calibration gas from a higher concentration gas with a degree of confidence similar to multiple calibration gases when the gas dilution system is demonstrated to meet the requirement of the method described in 40 CFR Part 60.

Procedure

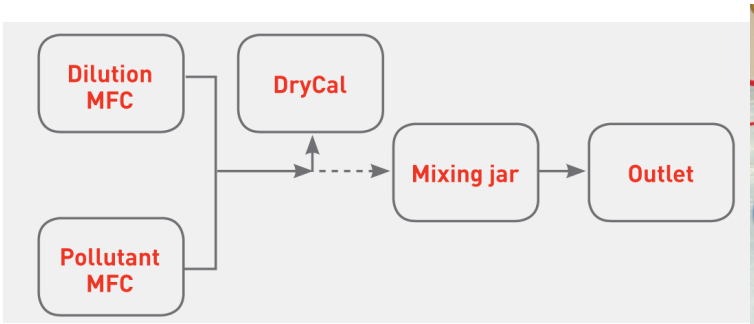

Fig 1: EPA Primary Gas Dilution Calibrator

The gas dilution system produces a known low-level calibration gas from a higher concentration gas with a degree of confidence similar to multiple calibration gases when the gas dilution system is demonstrated to meet the requirement of the method described in 40 CFR Part 60.

- Open up the gas dilution calibrator box and connect tubing from the MFC to the inlet (pressure) port of the DryCal prior to the mixing jar as shown in the connection diagram. Leave the outlet (suction) port of the DryCal open to ambient

Note: It is important to minimize the volume between the MFC and the measurement device for accurate readings.

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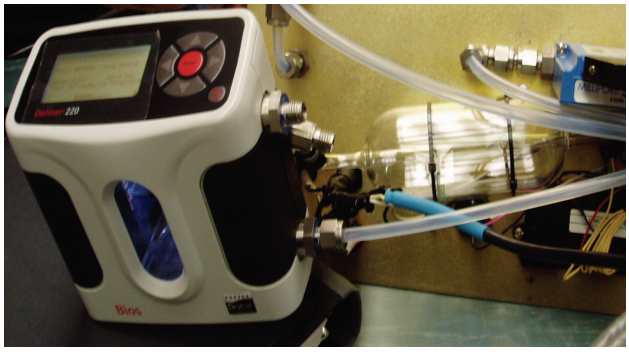

Fig 2: Bios DryCal connected to gas dilution calibrator

- Set the flow reading type in the DryCal to volumetric (Vol) or standardized (Std) depending on the type of flow calibration, and set the number of flow measurement in the average to 10
- Select the MFC to be verified or calibrated using the Output Selector Switch of the gas dilution calibrator
- Set the flow to the MFC using the MFC controller. The 'Zero' and 'Full Scale' of MFC can be adjusted at this point by using the DryCal flow reading.

Mesa's Butler, N.J. manufacturing facility (pictured above) is our NVLAP accredited ISO 17025 laboratory.

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