Application Notes

Auditing Met One SASS and SuperSASS Speciation Samplers Using the Bios Definer 220™ Primary Flow Meter

Introduction

Met One SASS/SuperSASS speciation samplers can be quickly and precisely verified in the field by the hand-portable Bios Definer 220™ primary flow meter. The Definer 220 is a primary gas flow meter that performs direct volumetric measurement of gas flow at ±0.75% of reading. Using Bios' patented Proven Bios DryCal® Technology, the Definer 220 measures the time required to displace the 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). As a direct volumetric device, the Definer 220 is not affected by air temperature, barometric pressure, air composition or humidity.

Background

The Met One speciation samplers have independent flow channels, located underneath a rain shield. Each channel contains a spiral impactor and a filter element, and should have a nominal inlet flow of 6.7 liters per minute (LPM). A field flow audit requires the use of the Definer 220 primary flow meter, model 220H (high flow); 3/8" barbed tube fitting (purchased separately, Bios part number 100-411); an 18"-long section of 3/8" flexible tubing; and the flow rate audit canister. The Definer 220 is powered by an internal, rechargeable lead-acid battery, rated for 6 to 8 hours of operation. It does not exhibit memory effect and may be charged continuously. If needed, charge the unit overnight prior to the field audit. Additionally, the Definer 220 has a power-saving Backlight option to enable you to turn the LCD illumination off while the unit is taking flow measurements over an extended period of time (navigate to Setup – Power).

Procedure

- Turn the Definer 220 on by pressing and holding the On/Off button for approximately one second.
- A "splash screen" will appear, indicating the product name, model number and flow range.
- Using the arrows on the control panel, navigate to "SETUP" and press ENTER.
- Once within the Setup menu, navigate to the "Readings" option. Using the arrows as necessary, verify that it is set to read in volumetric (Vol) flow, and set the number of flow measurements in the average to 10.
- Navigate to CONFIRM and press ENTER. The display will flash "Confirmed – New Settings Will be Retained".
- Lower the bottom shield of the sampler by removing the pin, which is located at the base of the sample head.

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- Attach the flow rate audit canister with the attached spiral impactor to the channel being audited.
- Connect the audit canister to the sampler with the 3/8" flexible tubing.
- At the Definer 220's display, navigate to MEASURE and press ENTER. At "Take Measurements" choose "BURST" and press ENTER for a stream of 10 handsfree measurements (based upon the number of flow measurements in the average). The Definer 220 will take 10 consecutive flow readings, and then stop.
- Record the average flow reading, and then repeat this procedure for each of the remaining flow channels.

Mesa's Butler, N.J. manufacturing facility (pictured above) is the only NVLAP accredited ISO 17025 laboratory serving the occupational health and safety industry. With the lowest gas flow measurement uncertainties of any commercial laboratory, Mesa provides you with the legal protections and peace of mind valued in today's litigious business environment.

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