Calibration of Flow Controllers for Air Canister Sampling

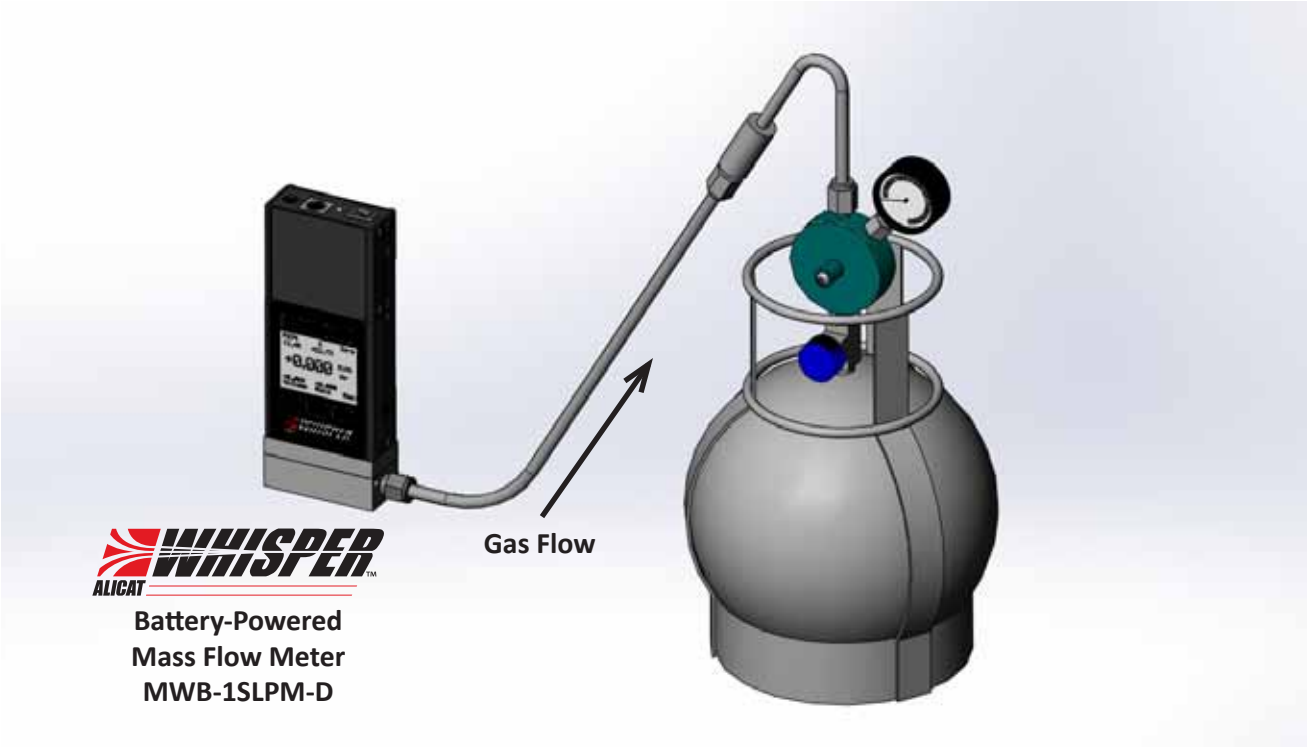
Canisters built for air sampling draw air into them using vacuum and passive flow control. With no more of a user interface than a simple screw adjustment, the integrated flow controllers require connection to a volumetric flow meter to establish their test flow rates. The challenge in this setup is that the desired low flow rates (usually less than 1000 ccm) may be measured inaccurately due to the calibrating meter's own pressure drop.

"Pressure drop" is the amount of delivery pressure that is lost due to the frictional resistance created by an instrument in the gas line. As an instrument's pressure drop increases, the volumetric flow increases. Therefore, a very low pressure drop is desired in setting the air canister flow controller's flow rate.

Alicat Scientific optimized its new line of mass flow meters—the **Whisper** series—to provide a very low pressure drop. At the high end of the air canister sampling range (1000 ccm), the pressure drop is only 4.42 mbar (0.0641 psid) at full scale.

The generous **200:1 turndown ratio** of the meter allows many air canister sampling flow rates to be established using just one flow meter. In the case of a maximum sampling flow of 1000 ccm, the meter would be able to establish flow rates down to 5 ccm at an accuracy of 0.8% of the reading plus 0.2% of the full-scale range.

The battery-powered option then permits users to take the meter from site to site to establish their required flow rates. The **Whisper** series mass flow meters measure mass flow, absolute pressure and temperature in addition to volumetric flow, all of which display simultaneously on the large LCD screen.



From air canister sampling and laboratory gas analysis, to natural gas delivery for a residence or shopping mall food court, Alicat Scientific's **Whisper** series of mass flow meters and controllers provides an excellent solution to mass flow measurement and totalization when system pressure is scarce. With pressure drops as low as 3.59 mbar at full scale, the **Whisper** does what few other instruments can do.