

## Alicat Controllers in Gas Mixing Systems

Some industries require custom gas mixes for the proper operation of their production processes.

Typical uses are:      Welding gases                      Furnace atmospheres  
                                 Vacuum process control              Sensor calibration

This requirement is often filled by purchasing pre-mixed gases from a compressed gas supplier. An alternate method of satisfying this need is to create the required mixture from pure source gases with a gas mixing system.

Alicat mass flow controllers are well suited to the creation of custom gas mixing systems. Their inherent flexibility and adaptability may be utilized to great effect in this application. The specific traits that support this assertion are as follows:

1. Alicat mass flow controllers come pre-calibrated for 20 pure gases and 10 common mixtures. Thus a mixer that was initially setup to blend ethane, methane and hydrogen may be quickly reconfigured to blend nitrogen, argon and helium.
2. Alicat mass flow controllers do not change range when you change the gas selected. A controller configured for 1 SLPM full scale of air will remain at 1 SLPM controller whether flowing hydrogen or SF6.
3. Alicat mass flow controllers operate very well over a 200:1 turn-down ratio. Thus a 10 SLPM mass flow controller will delivery 0.05 SLPM accurately.
4. All Alicat instruments are equipped with a multi-drop RS-232 or RS-485 interface. This allows the system developer to read and set all of the mass flow controllers through a common RS-232 or RS-485 serial interface. This eliminates the complex, expensive, and failure-prone analog interfaces that have been the industry norm for control interfaces.
5. An Alicat BB9 multi-drop box, combined with Alicat’s Flow Vision™ MX gas blending software simplifies the system integration process.

One important aspect of preparing gas mixtures is to include an in-line turbulent mixing tube in the flow path after the component gases are brought together. This reduces the possibility of gas separation or stratification. These low cost components are available from third party sources in a variety of materials.

The arrangement of components shown is typical of gas mixing systems flowing to pressures near or above atmospheric pressure. If the application requires exit pressures in the vacuum range, the controllers need to be configured with the control valves between the measurement head and the vacuum chamber.

