EMAP Gas Delivery Systems

EMAP gas delivery systemsmust be accurate and repeatable hence why expensive pre-mixes are often used. Engineered, on-site custom gas mixers can reduce cost whilst maintaining quality.

Equilibrium modified atmosphere packaging gas delivery systems are used to surround both cooked and uncooked food and natural commodities (for example meat, cheese, fruit and even cut flowers) within a controlled atmosphere. Essentially, food packaging is filled with gas rather than simply air. The reasons for doing so are numerous andobviously includes the prevention and suppression of decay but also to delay ripening or maturation plus the maintenance of appearance, colour and flavour.The “equilibrium” is based upon the process of O2 transmission through the packaging film being matched by the O2 consumption of the packaged commodity and, in the opposite direction, the diffusion of CO2 (a by-product of respiration in living plant tissue) through the packaging depending upon the films CO2 transmission rate.

Historically, packaging plants have used pre-mixed gases delivered in cylinders. This makes complete sense when a single pre-set gas mix is required as the engineering is simple, straight forward and cost effective. However, modern cultivation methods do result in a wider product variation and it is now more desirable to be able to vary the gas mix accordingly. Equally, the modern packaging plant does not cater for just one single product line so again the gas mix must be capable of being changed. If each of these changes results in as different pre-mix then it becomes a very expensive and space-consuming business. In parallel, the piping systems required for multiple pre-mix gas systems can be complex and component-rich thus increasing cost and maintenance whilst also increasing the risk of leaks and cross contamination.

An alternative is to create the required mixture from pure source gases with a gas mixing system. Typical gases include Nitrogen, Oxygen, Carbon Dioxide and Carbon Monoxide.

Alicat mass flow controllers are well suited to the creation of custom gas mixing systems. Their inherent flexibility andadaptability may be utilized to great effect within the food industry. Alicat mass flow controllers are pre-calibrated for 98+ gases and gas mixes. Therefore, a delivery system that was initially setup to blend N2 and O2 can be quickly reconfigured to blend CO2 and CO without any change to hardware.Furthermore, with COMPOSER™, the user can program their own gas mixtures directly from the home screen of the device or via serial communication if that is preferred. It is possible to save up to 20 additional user-made gas mixtures.

Alicat mass flow controllers do not change range when you change the gas selected. A controller configured for1 SLPM full scale of air will remain at 1 SLPM controller whether flowing Nitrogen or Carbon Dioxide.There are no conversion factors (known as k-factors) so the accuracy statement remains valid regardless of the gas type. Alicat mass flow controllers operate superbly over a minimum of 200:1 turn-down ratio and, with a new revision being released imminently, this will be further increased significantly. Thus a 10 SLPM mass flow controller will accurately deliver to 0.05 SLPM and beyond.

All Alicat instruments are equipped with a multi-drop RS-232 or RS-485 interface. This allows the system developerto read and set all of the mass flow controllers through a common RS-232 or RS-485 serial interface. This eliminates thecomplex, expensive, and failure-prone analog interfaces that have been the industry norm for control interfaces.An Alicat BB9 or a BB3 multi-drop box,combined

with Alicat's Flow Vision™ MX gas blending software simplifies thesystem integration process even further.

A summary of the benefits of dynamic gas mixing from Alicat controllers can be seen as :

- Combine elemental gases (including common sub-blends) to be mixed on demand.
- Improved flexibility to change the mix ratio.
- Mix gases at the point of use.
- Save money: using MFCs to mix onsite is typically cheaper than buying pre-mixed blends
- Accommodatewide ranging gas ratios and flow rates.
- Increase flexibility with a long list of gas types per MFC per system.
- Automation of the process.
- The creationof an audit trail for a high level of oversight on the given process.
- Process monitoring via compact, practical solutions for remote desktop or industrial settings.

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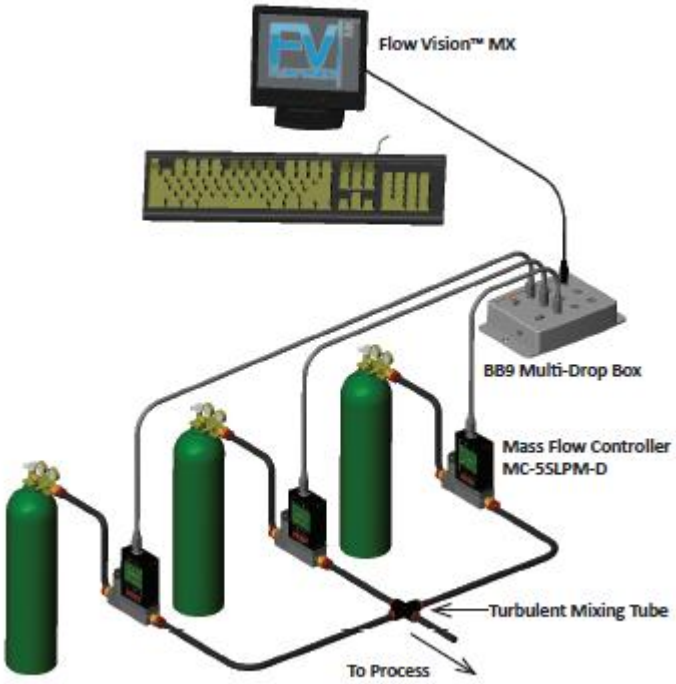
Flow Vision™ MX
BB9 Multi-Drop Box
Mass Flow Controller
MC-5SLPM-D
Turbulent Mixing Tube
To Process


EDIT NAME
ADD GAS
GAS OPTNS
COMPOSER Mix: MyGas
71.35% CH4 Methane
19.25% N2 Nitrogen
9.40% CO2 Carbon Di
100.00% Total
CANCEL
SAVE
ALICAT
SCIENTIFIC
FLOW

Links :

MC Series
www.pctflow.com/our-products/flow-meters/mass-flow-controllers/alicat-mc-series-mass-flow-controller/

FlowVisionMX
www.pctflow.com/our-products/flow-meters/miscellaneous/alicat-flow-vision-mx-software-accessory/

Videos :

Mass Flow Control
https://youtu.be/r49OvLmr8EU

Gas Batching
https://www.youtube.com/watch?v=giNALEDHej4

Turndown Ratio
https://www.youtube.com/watch?v=fx_VY7y3GvE