

An introduction to...

Gas mixers

When it comes to the use of mixed gases, gas mixers are a very common and proven solution. Whether it be for welding applications, for modified atmosphere packaging, for burner supply or for medical applications, gas mixers provide a precise, flexible and reliable gas supply. Various different gas mixing technologies are available on the market.

Choosing gas mixers over pre-mixed gases offers some clear benefits:

- **Quality/Homogeneity** – Gas mixers provide the highest mixture quality. The user always receives homogeneous mixtures.
- **Flexibility** – Gas mixers offer the highest flexibility for required mixing ratios, gas volumes and application location. The gas mixture settings can be changed at any time. Even mobile use is possible.
- **Profitability** – With gas mixers, users benefit from lower purchasing prices for standard products. At the same time there is no need for expensive storage of the numerous required gases, and cylinder handling is minimised.

There is more than one way to mix gases properly. Different technologies are available. The user can choose from mechanical, electronic, pneumatic or mass flow versions.

Gas mixers with mechanical or electric mixing valve

Mechanical gas mixers with mixing valves form the cornerstone of gas mixing technology, having proven their merit in countless installations over many decades. Mixtures can be produced reliably from almost all gases – precisely and with long-term stability.

A proportional mixing valve is generally used for two-gas mixtures. The valve has two gas inlets and an outlet for

the mixing gas. The flow rates of the individual gases are regulated proportionally in an interaction of orifices and pistons by turning the valve to create the required gas mixture. If mixtures comprising three or more gases are required, individual mixing valves are used instead of proportional valves.

Uniformity of the individual gases' inlet pressures is crucial for the perfect functioning of these gas mixers; for WITT-made devices, for example, the company's in-built dome-loaded pressure regulators provide this uniformity. Gas mixers with a mechanical mixing valve are suited for continuous or batch supply (with a gas tank). They are sturdy and require only a low level of maintenance.

Electrical mixing valves are similar to their mechanical counterparts in that they use a moving piston in conjunction with different orifices to control the flow rate of the gases, thereby producing the desired mixture. But the electrical mixing valves are operated via small electric motors instead of manually via a rotating dial. In this way, the mixers can be regulated more finely than by hand, thus resulting in a more exact gas mixture. The electronic control also allows easy reproducibility of gas mixtures. They can be operated remotely, and integrated into a wider control system/network.

Gas mixers with pneumatic flow rate controller

Besides conventional mixing valves, WITT offers a further, innovative gas mixing process. With this patented design, the continuous mixing occurs purely pneumatically via a porous mass. Depending on the required mixing ratio, a specific proportion of surface area of the sintered mass is made available to each individual gas.

The process is essentially unaffected



by fluctuations in gas pressure and extraction volume. Nor does the user need a power supply or pressure vessel for the mixing gas. Users gain a high-quality stable mixing process, while benefiting from a very cost-efficient gas supply. This design provides sturdy, compact and low-maintenance mixing systems for two or three gases, and for a broad range of mixing gas volumes.

Gas mixers with mass flow controllers

Gas mixers with mass flow controller (MFC) technology produce gas mixtures by regulating the mass flow of each individual gas involved. A separate MFC is used on each gas. The volumetric flow rate of the gases is measured and regulated by thermal conductivity. The volumetric flow rates of the individual gases are then combined into a mixture.

The storage and easy reproducibility of product-specific flow rate parameters result in minimum turnaround times when switching to a different mixture. Precise logging of the flow rates of the individual gases enables effective quality and cost control. Exact gas mixing and dosing is ensured by MFC technology. MFC gas mixers are suitable for mixtures comprising two or more gases. 

WITH THANKS

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