DATASHEET GAS FLOW CONTROLLERS FOR CALIBRATING GAS CHROMATOGRAPHS A108

APPLICATION NOTE

Gas flow controllers for calibrating gas chromatographs

Bronkhorst supported a company specialised in gas mixers for gas analysers with a solution to prepare their own gas mixture to calibrate gas chromatographs.

Analysing instruments like gas chromatographs must be calibrated regularly. This way they can accurately determine the chemical composition of compounds. During calibration, the measurement values of the gas chromatographs are compared with a calibration standard that has a known accuracy. The values of the device are adjusted accordingly. For gas chromatographs, such a standard is a gas mixture with an accurately known composition.

For operators of gas chromatographs, there are two ways to generate these gas mixtures:

1. buying cylinders with pre-mixed gas mixtures
2. prepare their own gas mixture

Application requirements

The customer was looking for low-cost mass flow controllers with various flow ranges to create gas mixtures with the option to communicate with the Modbus protocol. Their preparation method of calibration gas mixtures must comply with the ISO 6145-7 standard.

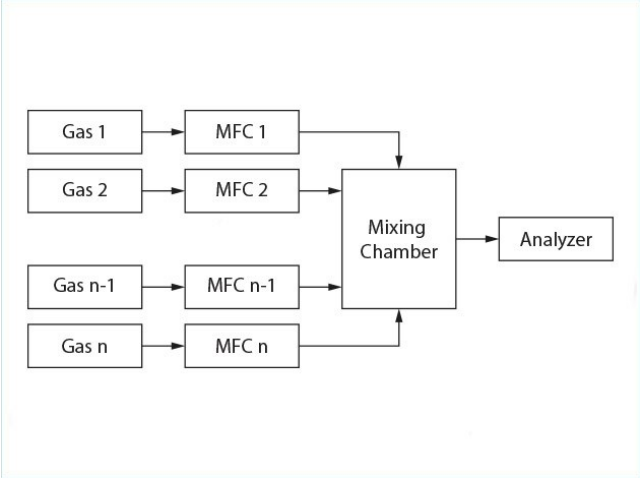
Important topics

- Improved accuracy
- Flexibility

Process solution

In this application gas mass flow controller of the EL-FLOW Base series are used. Up to 12 gas cylinders are connected to an equal amount of mass flow controllers. The accurately controlled gas flows enter a mixing chamber after which the mixture is fed to a gas chromatograph for calibration purposes.

The ISO 6145-7:2009 standard describes a procedure to prepare calibration gas mixtures using commercially available thermal mass flow controllers. The accuracy of the final gas composition that leaves the gas mixers is calculated by dedicated software that considers the uncertainties in the gas flows - due to the used mass flow controllers - as well as uncertainties in the gas composition of the initial gas cylinders.



Flow scheme

Compared to the purchase of gas cylinders with pre-mixed gas mixtures, the preparation of gas mixtures on-site has some advantages. For example, the lifetime of pre-mixed gas mixtures can be limited. The costs for these pre-mixed gas mixtures are quite high, and you are not sure that the concentration of the gas is still good or that the mixture is still homogeneous.

Therefore, it can be interesting for users to prepare gas mixtures on their own with very low concentrations of specific compounds. Which yields the main argument for on-site gas preparation: as an operator you don't have to invest in cylinders of gas mixtures. It gives a lot of flexibility and freedom to calibrate an analyser in your own time.

The entire 'package' of good purchase price, improved accuracy and flexibility as well as the integrated Modbus protocol has been reason for the customer to choose for Bronkhorst devices.

An alternative for the EL-FLOW Base product line is the FLEXI-FLOW product line. If you need advice on the best possible solution for your process, ask our advice.

Response customer

"The entire 'package' of good purchase price, improved accuracy and flexibility as well as the integrated Modbus protocol has been reason for us to choose for Bronkhorst devices."

Recommended Products

EL-FLOW BASE F-201CB

Min. flow 0,16…8 mln/min
Max. flow 0,4…20 ln/min

Pressure rating 10 bar

Standard & straightforward

Cost effective solution

FLEXI-FLOW COMPACT FF-M1X

Min. flow 0…500 mln/min
Max. flow 0…20 ln/min

Pressure rating 16 bar(g)

Multi-parameter (P+T output options)

Fast response (TCS technology)

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