

APPLICATION NOTE A092-GP99 - CALIBRATION SETUP FOR MASS FLOW DEVICES

APPLICATION NOTE

MOBILE CALIBRATION SETUP FOR FLOW METERS

How do you know for sure that the gas flow that you measure or set is the right one? The answer is quite simple: make sure that the flow instrument you are using to measure the gas flow gives the real value. Therefore, calibration (and adjusting) of the flow meter once a while is necessary.

What is calibration?

Calibration is comparing the measurement value of a device under test - DUT - with a known (reference) quantity. Results of a calibration are stored in a calibration certificate.

In this particular case, Bronkhorst has developed a **mobile calibration setup** for a customer in the chemical industry who uses a lot of mass flow meters and flow controllers. This customer was interested in **in-house calibration** equipment for his flow meters, because it would reduce the downtime of his installation and he would be more flexible in choosing the moment for this performance check.



Application requirements

In order to calibrate mass flow meters **on site** by the end user, they need to have a **mobile calibration setup** with a set of calibrated reference mass flow devices with the right flow capacity. In this particular setup the customer preferred an open, mechanical and compact design without any electronic control or power adapters.

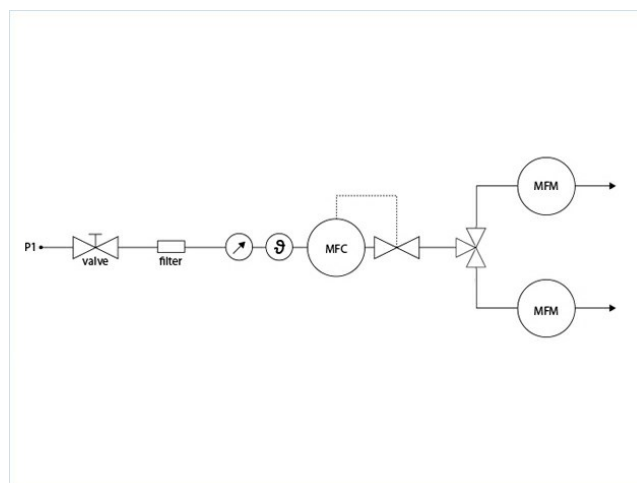
Important topics

- Accurate calibration of large series
- Fast, time-saving calibration

Process solution

At the gas inlet of this setup, a shut-off valve and a filter are used to prevent dust or other particles from passing. Next is a pressure meter to set and read out the correct pressure. Then we have a thermometer followed by the mass flow **device under test - DUT**-, which can be a mass flow meter or flow controller. Finally, the setup consists of **two reference mass flow meters in parallel**. In this case one for small gas flows up to 20 l_n/min of air (EL-FLOW Prestige or EL-FLOW Select series) and one for large gas flows up to 1200 l_n/min of air (EL-FLOW Select series), that have been calibrated to national standards.

This setup is a way to test whether the mass flow device is suitable and good enough in terms of **accuracy** and **function**. When the deviation between the test device (DUT) and the reference device is within the permissible tolerance, no further action is required. When the deviation is outside the permissible tolerance, it is recommended that you send the mass flow meter to Bronkhorst in order to have the deviation corrected.



Flow scheme

Bronkhorst can train the users of calibration setups at its [training centre](#) or even on-site (on request).

In order to check the performance of the reference mass flow meters, we recommend to send them at regular intervals – every year - to Bronkhorst for [calibration and adjustment](#).

In addition to companies that use many flow meters, a similar **mobile calibration setup** can be of interest for (governmental) institutes and companies in many different industries, that need to be sure to have highly accurate flow meters at all times. If the calibration intervals are to be short or for companies that have to carry out many projects under time pressure, a mobile calibration setup can be a good solution. Bronkhorst can offer you a calibration setup which will be tailored to your needs.

We have learned that about 90% of the calibration setups are used for calibration only. Adjustment however, is also possible using our [FLUICAL software](#). FLUICAL® is developed by Bronkhorst for use by our customers.

Recommended Products



EL-FLOW PRESTIGE FG-111B

Min. flow 0,14...7 mln/min
Max. flow 0,4...20 ln/min
Pressure rating 100 bar
100 selectable gases
Customized I/O configurations



EL-FLOW SELECT F-111AC

Min. flow 0,4...20 lln/min
Max. flow 0,6...100 lln/min
Pressure rating 100 bar
Compact design
High accuracy



EL-FLOW SELECT F-113AC

Min. flow 4...200 lln/min
Max. flow 8...1670 lln/min
Pressure rating 100 bar
Compact design
High accuracy

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