

# DATASHEET APPLICATION NOTE A049-GP06 SAFETY TEST FOR GAS COUPLINGS

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## APPLICATION NOTE A049-GP06

### Pressure control for leakage test of gas couplings

In this application note you can read about a flow-pressure solution supplied to a coupling manufacturer in the US. The flow-pressure solution is used to conduct a leakage test as part of the quality control of the gas couplings. These gas couplings need to be gas tight during a certain minimum period in the occasion of fire.

#### Leak test of gas couplings

During the test the gas coupling is mounted at the end of a tube, which is put in a furnace that is heated to a certain constant temperature. Then the setup is subjected to 10 bars (139.5 psi) of air overpressure. A coupling passes the test when the air leakage during a certain amount of time is below a prescribed value.



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#### Application requirements

In the original setup (a flow meter based on the pressure drop principle), the pressure sensor malfunctioned often, because of the high flow. With the Bronkhorst flow-pressure solution the flow cannot be higher than the full-scale range of the mass flow controller.

The coupling manufacturer needed a compact plug & play system, which is easy to operate with only one input and one output for the air flow and the rest 'out of sight'. Furthermore, a filter is necessary to prevent soot from the furnace entering the measuring device.

#### Important topics

- Pressure management with flow control
  - Plug & Play system
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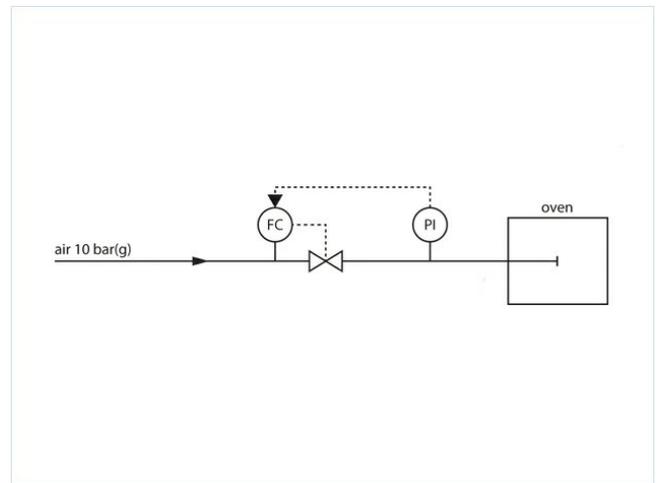
## Process solution

Bronkhorst's Flow-Pressure Solution comprises a pressure meter, which is a pressure sensor that controls a flow controller upstream. The pressure sensor and flow controller are special built-in units which can be used in the E-8000 control systems. When the gas coupling fails during testing, the pressure meter detects a pressure that is lower than the initial 10 bars, after which it forces the flow controller to generate an air flow into the system. At that point, when this flow has a non-zero value, a leakage is detected. According to the coupling manufacturer, the system is robust with reliable pressure sensing.

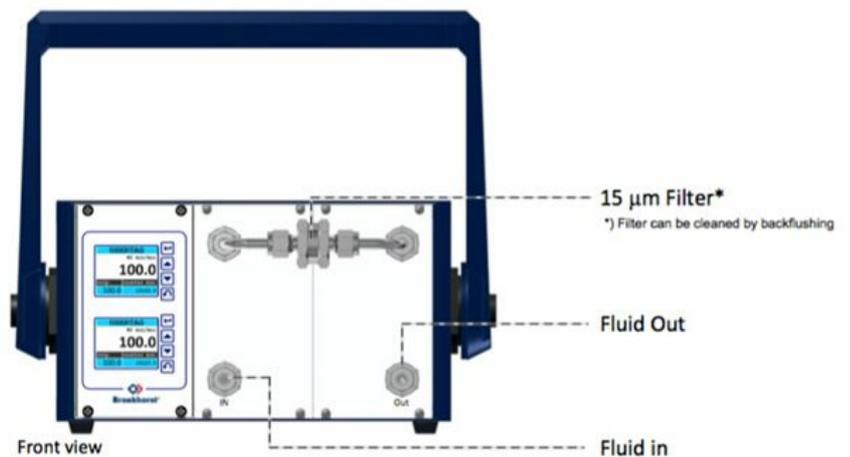
For this leakage testing application, a combination of a *pressure meter/flow controller* is better than a traditional combination of a *pressure controller/flow meter*. In the latter case, there may be a risk of losing signal in the initial period when a pressure controller wants to reach its setpoint very fast. The advantage of Bronkhorst's setup is that the generated flow can never be too high.

The setup comprises a 15 µm filter to prevent soot particles from the furnace to enter the flow controller, which is detrimental for this device. In case of blockage, this filter can be cleaned by back-flushing of air, so there is no need for disassembling the setup to clean the filter.

By default, the setup is delivered with a digital control panel to control and display the settings. Via an RS-232 serial port the control panel can be connected to a computer system using Bronkhorst's own software. If desired a modification can be made where a potentiometer is incorporated to adjust the settings manually. This modification includes analog-to-digital switch.



Flow scheme



## Recommended Products



**EL-FLOW METAL SEALED F-201CM**

Min. flow 0,12...6 mln/min  
Max. flow 1... 50 ln/min  
Pressure rating 64 bar  
Metal-to-metal outer seals  
Cleanroom assembled



**EL-FLOW SELECT F-201CV**

Min. flow 0,16...8 mln/min  
Max. flow 0,5...25 ln/min  
Pressure rating 64 bar  
Compact design  
High accuracy and repeatability



**EL-PRESS P-502C**

Min. pressure 2...100 mbar  
Max. pressure 1,28...64 bar  
Absolute or gauge pressure  
High accuracy



**E-8000 SERIES**

### Digital Readout / Control Systems

Bright, wide angle, 1.8" display (TFT technology)  
User friendly operation, menu driven with 4 push buttons



**BRONKHORST HIGH-TECH B.V.**

Nijverheidsstraat 1A  
NL-7261 AK Ruurlo (NL)  
Tel. [+31 573 45 88 00](tel:+31573458800)  
[info@bronkhorst.com](mailto:info@bronkhorst.com)

