

FLUICAL®

Portable calibrator for gas flow and pressure



> Introduction

Bronkhorst High-Tech B.V., the European market leader in thermal Mass Flow Meters/Controllers and Electronic Pressure Controllers, has 30 years experience in designing and manufacturing precise and reliable measurement and control devices. With a wide range of instruments, Bronkhorst High-Tech offers innovative solutions for many different applications in many different markets. The instruments are made to customers' specification, in various styles, suitable for use in laboratory, industrial environment, hazardous areas, semiconductor processing or analytical equipment.

> Portable calibrator

Bronkhorst High-Tech have developed a portable calibration system to meet the increasing number of demands from users of measurement and control equipment within the ISO-9000 quality control system. The calibrator offers great flexibility thanks to its modular design. Its accuracy is traceable to national standards.

The FLUICAL® portable calibrator is a light weight case with a carrying handle, containing a number of accurately calibrated digital flow or pressure measuring modules. The number of channels and the flow or pressure ranges are on customer's specification.

The portable calibrator enables the user to check the calibration of flow meters/controllers as well as pressure transducers/controllers on site. The instrument to be checked is hooked up to the measuring module selected, and then the actual flow or pressure of the instrument is compared with the results of this module.

The flow modules can be selected from 5 ml_r/min up to 1000 l_r/min N₂-equivalent (Full Scale values). The digital pc-board of each module can store up to 8 calibration curves.

The calibration data are fed into the Bronkhorst High-Tech series E-7000 digital readout and control module. This module has a standard FLOW-BUS connection for digital communication.

As an option, the E-7000 can be equipped with a FLOW-BUS/RS-232 interface ("40"-module), or a FLOW-BUS/PROFIBUS-DP interface ("41"-module).

For calibration of flow meters it may be practical to integrate flow controller modules instead of flow metering modules. For these modules the flow ranges are restricted to a maximum of 50 l_r/min N₂-equivalent (FS).

To protect the calibration modules Bronkhorst High-Tech recommends the use of IN-LINE filters at the inlet port.

> Features

- ◆ Ideal for in-field calibration check
- ◆ Great flexibility due to modular design
- ◆ Best accuracy: $\pm 0,5\%$ Rd plus $\pm 0,1\%$ FS
- ◆ Accuracy traceable to national standards



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> Technical specifications

Material of construction (wetted parts)	: Aluminium and Stainless Steel
Seals	: Viton, other on request
Connections (on front or back)	: $\frac{1}{8}$ ", $\frac{1}{4}$ " or $\frac{1}{2}$ " compression type : 6 mm or 12 mm compression type
Accuracy	: depending on customer's requirements; best accuracy possible $\pm 0,5\%$ of reading plus $\pm 0,1\%$ of FS
Flow ranges	: <i>metering modules</i> smallest 0,1...5 ml _v /min highest 50...1000 l _v /min (based on Air) : <i>controlling modules</i> smallest 0,1...5 ml _v /min highest 1...50 l _v /min For higher capacities separate instruments can be furnished up to a range of 20...1000 m ³ _v /h.
Pressure rating	: max. 10 bar (for flow modules)
Pressure ranges	: smallest 2...100 mbar abs/gauge : highest 1...20 bar abs/gauge
Housing	: $\frac{1}{2}$ 19" or 19" table top housing with carrying handle
Supply voltage	: 100...240 Vac, 24 Vac, 24 Vdc (to be specified)

Technical specifications subject to change without notice.

> FLUICAL[®] calibration software

Bronkhorst High-Tech developed the FLUICAL calibration software for the calibration of Mass Flow Meters and Controllers for gases. The program is basically a Microsoft Excel worksheet with a fixed layout, communicating with FLOW-BUS, using FlowDDE interfacing software. The open structure allows the user to customize the worksheet layout as well as the certificate layout.

There are two options:

Freeware version

It contains a table with fixed conversion factors of nearly 100 gases. Registered users of Fluidat on the Net can use fluid data and/or conversion data provided by this facility in FLUICAL.

Licensed version

This version allows the user to calculate fluid data and/or conversion data for variable operating conditions. To take full advantage of this version it is recommended to follow a 4-hours course at Bronkhorst headquarters.



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