

# Product Overview

Mass flow and pressure measurement & control



**Bronkhorst®**

# About Bronkhorst®



BRONKHORST HEADQUARTERS, THE NETHERLANDS

## > Product range

Bronkhorst High-Tech B.V., established in 1981, offers an extensive range of thermal and coriolis Mass Flow Meters and Controllers. Numerous styles of both standard and customized instruments are offered for applications in laboratory, industrial and hazardous areas. The full scale measuring range for these instruments can be selected between 0...0,7 ml<sub>n</sub>/min (0...0.7 sccm) and 0...11000 m<sup>3</sup><sub>n</sub>/h (0...388,461 scfh) for gases and 0...100 mg/h up to 0...600 kg/h for liquids. Furthermore Bronkhorst offers pressure transducers and controllers with a minimum range of 0...100 mbar (0...75 torr) and a maximum range of 0...400 bar (0...5,880 psi). In addition to the standard, highly accurate factory calibrations, our accredited Calibration Centre can perform ISO/IEC 17025:2017 calibrations.



## > Round-the-clock support

Bronkhorst is a truly worldwide organisation with its Head Office being located in the town of Ruurlo in The Netherlands. Today, in 2024, the company has 15 branches in Europe, Asia and America with a total head count of some 800 employees.

No matter the time zone, you may count on the support of our skilled and well-trained employees at our headquarters, and your local sales or service contacts at one of our international distributor offices. They will gladly provide you with their extensive application know how and answer your pre-/after-sales related questions. Repair and recalibration services can be offered from many different locations around the globe.

## > Sales representation and service

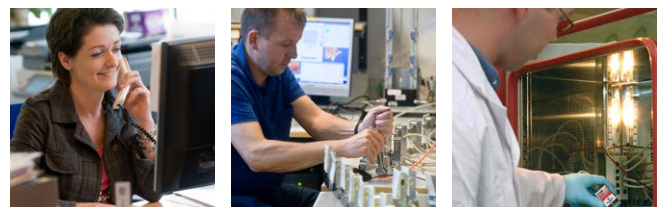
In addition to the sales office in Veenendaal of The Netherlands there are subsidiary offices in Great Britain, France, Switzerland, Northern Germany, Japan, China, Taiwan, South Korea, India and the USA whereby local expertise and service is offered. Bronkhorst has also built up an extensive complimentary network of distributors and service stations across the rest of Europe and, indeed, yet further representation in such countries as Australia, New Zealand, Canada, Israel, Thailand, South Africa, Brazil and Argentina.

## > Quality

Customer satisfaction, innovation and quality of product and service have been the cornerstones of Bronkhorst's success.

In 1987 the company obtained the Koning Willem I Award for a young successful enterprise and in 1992 the company was accredited to ISO 9001 with ISO 14001 (an International Standard for environmental management) following three years later. This ongoing commitment was rewarded by accreditation to the most recent Quality Management System, ISO 9001:2015.

“Round the clock support line,  
24 hours a day, 7 days a week  
+31 859 02 1866 and [support@bronkhorst.com](mailto:support@bronkhorst.com)”



# Laboratory & instrumentation

Mass Flow Meters and Controllers for gas applications with an electronic housing suitable for laboratory conditions. EL-FLOW® series instruments are truly unique in their capability to control flow ranges between 0...0,7 ml<sub>n</sub>/min and 0...1670 l<sub>n</sub>/min with pressure rating ranging between vacuum and 400 bar - all in one range of instruments. This versatility in flow ranges and in operating conditions has ensured that the EL-FLOW® series remains our most popular and field proven of instruments.

## > Features

- ◆ fast response
- ◆ best accuracy: ± 0,5% of reading + ± 0,1% of F.S.
- ◆ analog and digital (fieldbus) communication
- ◆ metal sealed versions available
- ◆ optional Multi-Gas/Multi-Range functionality

## > Flow ranges (based on air)

smallest 0...0,7 ml<sub>n</sub>/min, highest 0...1670 l<sub>n</sub>/min



# Industry

IN-FLOW and MASS-STREAM series Mass Flow Meters / Controllers are thermal Mass Flow Meters for gas applications requiring a rugged design and suitability for industrial environments. The electronics housing is rated to IP65.

## > Features

- ◆ IP65 protection (dust- and weatherproof)
- ◆ analog and digital (fieldbus) communication
- ◆ ATEX approved for Zone 2 (option for IN-FLOW)
- ◆ pressure ranges up to 700 bar
- ◆ integrated display (option for MASS-STREAM)

## > Flow ranges (based on air)

smallest 0...0,7 ml<sub>n</sub>/min, highest 0...11.000 m<sup>3</sup><sub>n</sub>/h



# Ex-protected

EX-FLOW series Mass Flow Meters / Controllers are thermal Mass Flow Meters / Controllers for gas applications requiring rugged design and suitability for hazardous areas. The electronics housing is rated to IP65 and approved according to ATEX Zone 1, IECEx, KCs and TIIS.

## > Features / approvals

- ◆ ATEX approved for Zone 1
- ◆ rugged IP65 housing
- ◆ IECEx DEK14.0060
- ◆ KCs 19-KA4BO-0571 (Korean Ex-certification)
- ◆ TIIS = 検・第TC21584号 (Japanese certification)

## > Flow ranges (based on air)

smallest 0...7,5 ml<sub>n</sub>/min, highest 0...11.000 m<sup>3</sup><sub>n</sub>/h



# Low pressure drop

LOW- $\Delta$ P-FLOW series Mass Flow Meters and Controllers are derived from the EL-FLOW series. The special construction of both sensor and flow restriction makes this series suitable for low pressure drop applications (the sensor only requires 0,5 to 5 mbar). Furthermore the larger flow channels minimize the risks of clogging and facilitate the cleaning and purging of these LOW- $\Delta$ P-FLOW instruments.

## > Features

- ◆ very low pressure drop
- ◆ suitable for corrosive gases
- ◆ all stainless steel construction
- ◆ no moving parts
- ◆ also available with IN-FLOW industrial housing
- ◆ analog and digital (fieldbus) communication

## > Flow ranges (based on air)

smallest 0...10 ml<sub>n</sub>/min, highest 0...200 m<sup>3</sup><sub>n</sub>/h



# (Ultra) compact - chip technology

Equipment builders are looking for compact solutions to monitor or control gas flow or pressure in their system. Due to the use of innovative chip sensor technologies, Bronkhorst has realised two compact series of Mass Flow and Pressure Meters/Controllers: IQ+FLOW® and FLEXI-FLOW™ Compact.

## > Features

- ◆ lightweight and space-efficient (downport options available)
- ◆ high accuracy
- ◆ fast response
- ◆ optional: multi-channel systems
- ◆ optional: additional functionality (shut-off valve, mixing chamber)
- ◆ FLUIDAT® on board gas database (FLEXI-FLOW™ only)

## > Ranges

*Flow ranges:* smallest 0...5 ml<sub>n</sub>/min, highest 0...20 l<sub>n</sub>/min, based on air  
*Pressure ranges:* smallest 0...0,5 bar, highest 0...10 bar



# OEM solutions

In addition to the standard product line, Bronkhorst provides tailor-made, complete fluid control solutions for OEM systems. On a compact manifold or rail system one or more mass flow or pressure sensor modules can be combined with control valves, shut-off valves, mixing chambers, filters or any other functional module as per customer's request.

## > Features

- ◆ compact, modular construction
- ◆ combinations of functions possible
- ◆ pre-tested "plug-and-play" units
- ◆ attractive pricing
- ◆ downported; easy assembly / exchange of modules





## Liquid - thermal mass flow

Mass Flow Meters and Controllers for liquids in ranges between 0...100 mg/h and 0...20 kg/h (water equivalent). The flow meters only require a small differential pressure. Despite utilizing direct measurement (i.e. without a by-pass) the temperature rise of the fluid is minimal; only approx. 1...5 °C. This greatly limits the danger of evaporation or degradation of the fluid.

### > Features

- ◆ fast and accurate measuring signal
- ◆ analog and digital (fieldbus) communication
- ◆ thru-flow measurement (no by-pass)
- ◆ insensitive to mounting position
- ◆ industrial style (IP65) available

### > Flow ranges (based on water)

smallest 0...100 mg/h, highest 0...20 kg/h



## Liquid - ultrasonic volume flow

ES-FLOW® flow meters for very low flow ranges operate on an innovative measuring principle, using ultrasound in a very small, straight tube. A wide range of liquids can be measured independent of fluid density, temperature and viscosity.

### > Features

- ◆ medium independent
- ◆ fast response
- ◆ local display with touchscreen
- ◆ IP67 rating and CIP cleanable
- ◆ dosing with integrated PID controller

### > Flow ranges (based on water)

smallest 2...100 ml/min, highest 4...1500 ml/min



## Liquid / Gas - Coriolis mass flow

For flow ranges up to 0...600 kg/h Bronkhorst designed a series of mass flow metering instruments, offering highest accuracy. These instruments utilize patented, advanced Coriolis type mass flow sensors to achieve unsurpassed performance, even with changing operation conditions in pressure, temperature, density, conductivity and viscosity. (mini) CORI-FLOW™ is offered with or without integral control valve or pump, with both analog and digital communications.

### > Features

- ◆ direct mass flow measurement
- ◆ fast response time
- ◆ high accuracy (up to  $\pm 0,2\%$  of reading)
- ◆ IP65 housing with optional ATEX Zone 2 approval
- ◆ analog plus digital communication

### > Flow ranges

smallest 0...5 g/h, highest 0...600 kg/h



# Evaporation

The CEM-System (Controlled Evaporation and Mixing) is an innovative Liquid Delivery System that can replace traditional Bubbler Systems.

It consists of a liquid flow controller, an MFC for carrier gas and a temperature controlled mixing and evaporation device. The system is suitable for mixing liquid flows of 0,25...1200 g/h resulting in saturated vapor flows of 50 ml<sub>n</sub>/min to 100 l<sub>n</sub>/min.

## > Features

- ◆ accurately controlled gas/liquid mixture (mass flow)
- ◆ fast response
- ◆ very stable vapour flow
- ◆ handles water, solvents, liquid mixtures



# Pressure

The Bronkhorst® electronic pressure meters and controllers have a well-proven compact thru-flow design and are available in pressure ranges for 0...100 mbar up to 0...400 bar. A differential pressure transmitter can also be supplied in the range of 0...15 bar. The pressure controller performs with high accuracy and repeatability and should be specified for forward pressure control or backward pressure control.

## > Features

- ◆ suitable for liquids and gases
- ◆ analog and digital (fieldbus) communication
- ◆ metal sealed versions available
- ◆ IP65 protection (IN-PRESS series)

## > Pressure ranges

smallest 0...100 mbar, highest 0...400 bar



# Power supply / readout

Bronkhorst offers various solutions for powering, readout and control of their Mass Flow and Pressure Meters / Controllers:

- ◆ **E-8000** advanced digital PS/Readouts, both single- and multi-channel configurations.
- ◆ **BRIGHT** series, compact local Readout/Control Modules
- ◆ **PIPS** series, Plug-in Power Supplies

## > Features E-8000 series

- ◆ table top / rack / panel mount housings
- ◆ 1.8" colour displays (TFT technology)
- ◆ User friendly operation, menu driven with 4 push buttons

## > Features BRIGHT series

- ◆ Mounting on instrument, pipework or wall
- ◆ IP40 or IP65 (weatherproof)
- ◆ 1.8" colour display (TFT technology)
- ◆ Push button operation



# Digital 'multibus' instruments

The product series mentioned in this brochure can be supplied with analog or digital communication. Bronkhorst developed their latest digital Mass Flow Meters/Controllers according to the "multibus" principle. The basic pc-board on the instrument contains all of the general functions needed for measurement and control, including alarm, totalization and diagnostic functions. It has analog I/O-signals and also an RS232 connection as a standard feature. In addition to this there is the possibility of integrating an interface board with DeviceNet™, PROFIBUS DP, PROFINET, Modbus-RTU/ASCII, EtherCAT®, CANopen®, EtherNet/IP™, POWERLINK or FLOW-BUS protocol. The latter is an easily accessible fieldbus with excellent price-performance ratio that has been specially designed by Bronkhorst for their mass flow metering and control solutions.

## > General specifications

- ◆ based on a 16-bit micro controller with FLASH memory
- ◆ analog input/output: 0...5 Vdc, 0...10 Vdc, 0...20 mA, 4...20 mA (sourcing)
- ◆ valve output can be monitored
- ◆ 2 LED's for status indication
- ◆ 1 multifunctional switch for digital functions
- ◆ configuration software for operation and service (through RS232)
- ◆ best accuracy +/- 0,5% of reading plus +/- 0,1% full scale (based on actual calibration)
- ◆ up to 8 calibration curves

## > Fieldbus options

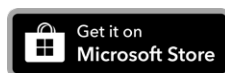


# Bronkhorst FlowSuite software



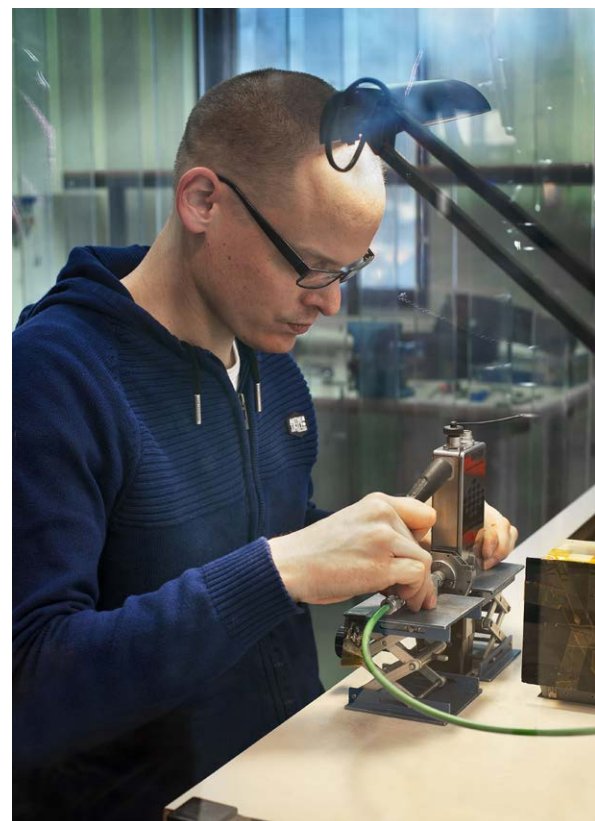
Bronkhorst FlowSuite is a software application for monitoring and configuration purposes on Bronkhorst digital instruments. It gives a good insight into the dynamic behaviour and features and allows you to adjust the controller, alarm, counter and other settings.

The software tool is developed for easy configuration and control of Bronkhorst® products and is available for Android, iOS and Windows.



# Other Bronkhorst® products

In addition to the products mentioned on the previous pages, Bronkhorst offers accessories such as filter assemblies, calibration equipment and gas mixing chambers. Please contact our local representatives (see back of the brochure) for more information or visit our internet site [www.bronkhorst.com](http://www.bronkhorst.com).





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