

FLOW CONTROL

High precision, pressure independent manual control valves for low flow gas and liquid applications

> Introduction

Bronkhorst®, the European market leader in thermal Mass Flow Meters/Controllers and Electronic Pressure Controllers, has many years of experience in designing and manufacturing precise and reliable measurement and control devices. With a wide range of instruments, Bronkhorst offers innovative solutions for many different applications in many different markets.

> FLOW-CONTROL series

The new FLOW-CONTROL manual control valves are designed for extremely precise control of a constant flow rate in low flow gas and liquid applications. The desired flow rate is set via the needle valve. Any upstream or discharge pressure variations are automatically compensated by a built-in membrane operated valve to ensure a steady, constant flow. Thanks to its thought-out design and construction, these instrument models do not require any electrical power source.

The manual constant-flow control series is available in 4 different models to control flow capacities in a range from 0.02 l_n/min up to 50 l_n/min (N₂-equivalent). While process connections are optional available, the in-line valve assemblies are equipped with G 1/4" BSPP female in- and outlet ports.



> Features of the FLOW-CONTROL

- ◆ Compact design
- ◆ Ruggedized aluminium housing
- ◆ No power required
- ◆ Leak-free valve
- ◆ Precise flow adjustment
- ◆ Valve pin o-ring guarantees positive shut-off without stem damage
- ◆ Self-lubricating orifice liner assures long life
- ◆ Valve knob included for easy adjustment



Mass Flow
ONLINE

> Technical specifications

Performance

Pressure sensitivity	: Less than 0,5-1% Rd/bar
Rangeability	: up to 1:100
Operating pressure	: 0 .. 10 bar(g) / 0 .. 150 psi(g)
Operating temperature	: 0 .. 70°C (32 .. 158°F)
Min. delta-P	: 1 bar(d) (for model FC-005: 2 bar(d))
Max. delta-P	: 7 bar(d)

Mechanical

Materials (wetted parts)	: Body: Aluminium, Viton®, Stainless Steel Needle valve: FC-001: Brass, SS316, Fluorisint®, Bruna N FC-002 / FC-004 / FC-005: Brass, SS316, Bruna N Membrane: Fiber-reinforced Nitrile
Connections (in/out)	: G 1/4" BSPP female thread (compression fittings optional)
Weight	: 0.85 kg
Closing	: Clockwise

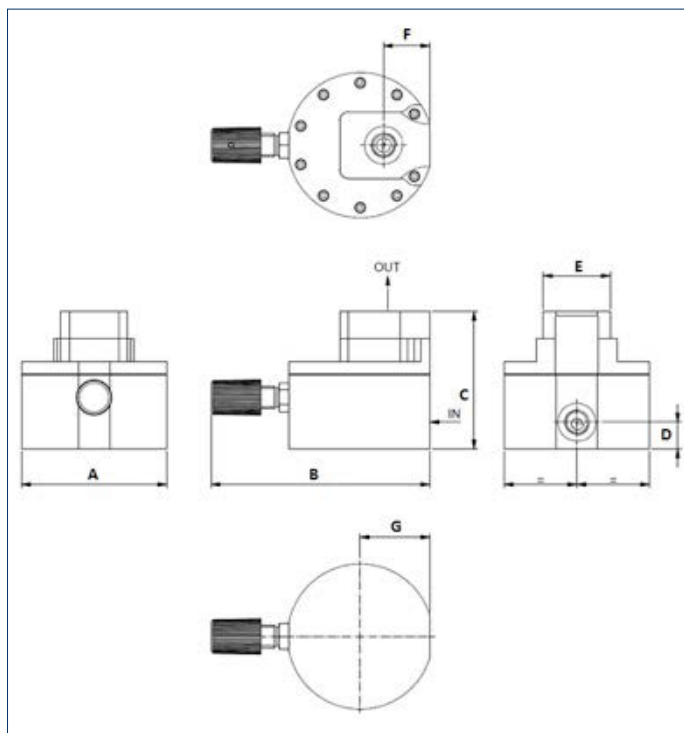
Safety

Test pressure	: 21 bar(a) / 300 psi(a)
Ingress protection	: IP65

Warranty

All instruments and accessories are warranted for a period of 3 years from order date.

> Dimensions



Dimensions in mm.

A	B	C	D	E	F	G
Ø81.5	Max. 123	77.1	15	37.5	26	39

> Capacities

Gas (l _n /min)	FC-001	FC-002	FC-004	FC-005
Air	0.02 ... 0.6	0.02 ... 7	0.02 ... 25	0.02 ... 50
N ₂	0.02 ... 0.6	0.02 ... 7	0.02 ... 25	0.02 ... 50
O ₂	0.02 ... 0.55	0.02 ... 6.5	0.02 ... 23	0.02 ... 47
CO	0.02 ... 0.6	0.02 ... 7	0.02 ... 25	0.02 ... 50
Ar	0.04 ... 0.5	0.04 ... 5.5	0.04 ... 21	0.04 ... 42
CO ₂	0.02 ... 0.45	0.02 ... 5.5	0.02 ... 20	0.02 ... 40
CH ₄	0.01 ... 0.8	0.01 ... 9	0.01 ... 33	0.01 ... 66
C ₃ H ₈	0.01 ... 0.45	0.01 ... 5.5	0.01 ... 20	0.01 ... 40
N ₂ O	0.02 ... 0.45	0.02 ... 5.5	0.02 ... 20	0.02 ... 40
C ₄ H ₁₀	0.01 ... 0.4	0.01 ... 4.5	0.01 ... 17	0.01 ... 34

Liquid (ml/min)	FC-001	FC-002	FC-004	FC-005
H ₂ O (water)	3 ... 20	4 ... 400	10 ... 1000	18 ... 1800

> Optional adapter sets (inlet and outlet)

Metric sizes	Inch sizes
3 mm OD compression type	1/8" OD compression type
6 mm OD compression type	1/4" OD compression type
12 mm OD compression type	1/2" OD compression type

A PERFECT COMBINATION

using a FLOW-CONTROL with a MASS-VIEW meter

MASS-VIEW® series operate on the principle of direct thermal mass flow measurement (no by-pass). An advantage of using this type of sensor is that the instrument measures direct mass flow, without the need of temperature and pressure correction. By combining the FLOW-CONTROL with a MASS-VIEW meter you will get a Mass Flow Controller with a local display (MASS-VIEW series MV-400).

Other benefits, compared to conventional VA meters are:

- > higher accuracy, wider;
- > rangeability (up to 1:100);
- > free of parallax errors;
- > an inherently safer construction, by eliminating glass components in the flow path.

MASS-VIEW® flow controllers can be supplied in full scale ranges from 0.05 up to 50 l_n/min (Air equivalent), with a pressure rating of 10 bar(g) or 150 psi(g). A bright graphical OLED display, clearly visible at wide angles, allows reading of actual flow (value and a bar graph), total flow and type of gas.

