



Mass Flow Controllers for Gases

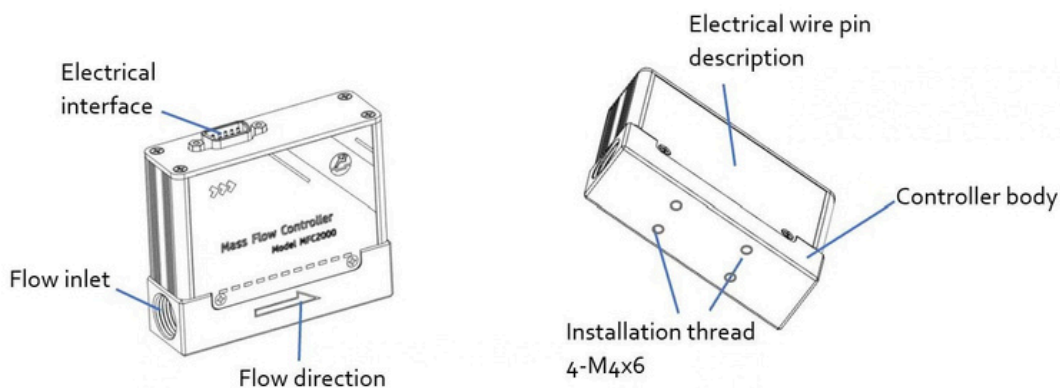
Model MFC2000



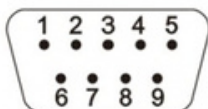
Thermal - D®

The products are designed for general-purpose, non-corrosive gas-flow control applications, with full-scale mass flow rates from 50 sccm to 200 SLPM. It features high accuracy and fast control time. Analog and RS485 Modbus interfaces are both offered. Other interfaces can also be requested.

- Bio-reactors
- Carrier gas
- Thin film deposition
- Gas mixing
- Fermentation
- Fuel efficiency
- Leakage testers
- Packaging process
- Air quality
- Purging and venting
- Anesthesia gas



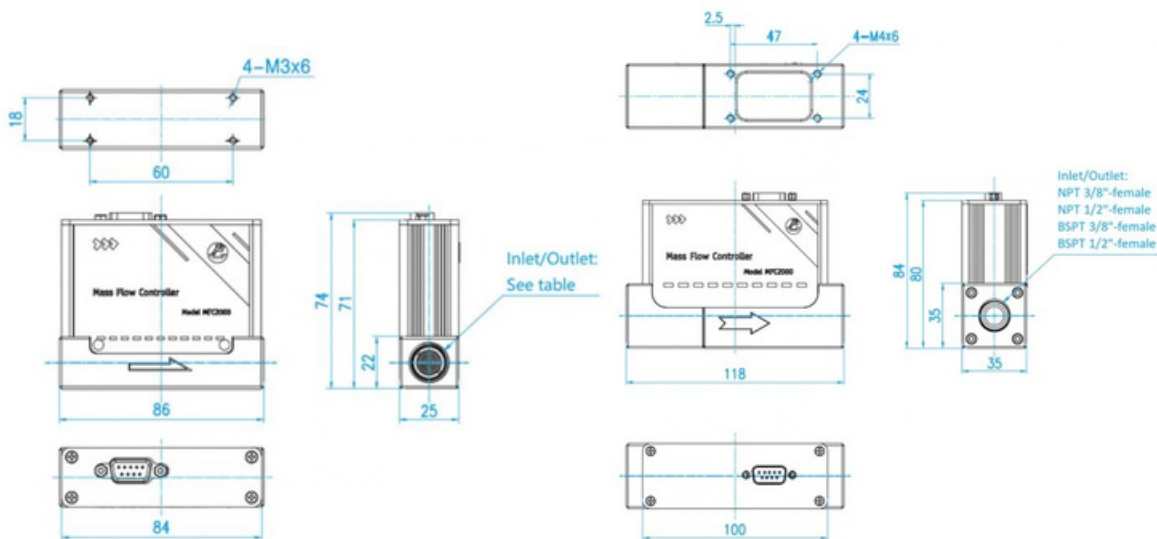
DB9 connector



Wire	Color	Definition
1	Purple	n/c
2	Red	n/c
3	White	RS485B (-)
4	Yellow	Setpoint, analog 0 ~ 5 Vdc or 4 ~ 20 mA
5	Black	RS485A (+)
6	Gray	Flow rate output, 0 ~ 5 Vdc or 4 ~ 20 mA
7	Brown	Power supply, (12 ~ 24) Vdc, 1A
8	Blue	Common
9	Green	Common

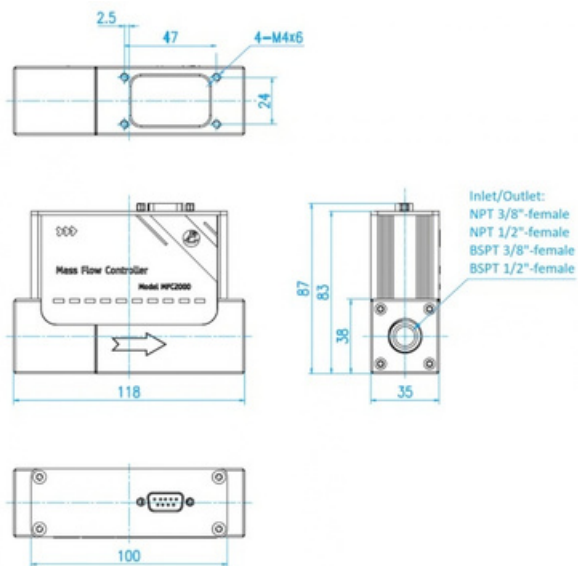


Mechanical dimensions



10 sccm to 20 SLPM

50 SLPM to 100 SLPM



200 SLPM

Mechanical connections

NPT
VCR
UNF
Compressions

Electrical interfaces

Voltage
4~20 mA
RS485 Modbus
Other Bus interfaces

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Specifications

	Value	Unit
Full-scale range	0 ~ 50 mLn/min ... 0 ~ 5000 mLn/min 0 ~ 1 ... 0 ~ 200 Ln/min	
Accuracy	± 1.0% r.d. (20 ~ 100% of full scale) ±0.2% f.s. (<20% of full scale)	
Repeatability	± 0.3% r.d. (20 ~ 100% of full scale) ±0.06% f.s. (<20% of full scale)	
Turn-down ratio	100:1	
Max control range	102	%FS
Control pressure range	0.1~0.8 (<20 Ln/min) 0.1~0.7 (50...200 Ln/min)	MPa
Maximum operating differential pressure	0.4	MPa
Setpoint source (input signal)	Analog: 0~5 Vdc or 4~20 mA; Digital: RS485	
Settling time (typical)	100	msec
Working temperature	0 ~ 55	°C
Humidity	<95, no condensation	%RH
Burst pressure	1.5	MPa
External leakage rate	≤1 x 10 ⁻⁹ (He)	Pa·m ³ /s
Power supply	(12 ~ 24) Vdc, 1A	
Output signal	Analog: 0~5 Vdc or 4~20 mA; Digital: RS485	
Max null shift (analog)	±30	mVdc
Control valve	Normally Closed (NC)	
Electrical connector	DB9	
Mechanical connection	7/16-20UNF...9/16-18 UNF, Compression tube fitting 1/8"~1/2", or VCR 1/4"~1/2"	
Protection	IP40	
Storage temperature	-20 ~ +70	°C
Reference conditions	0 °C, 101.325 kPa, air	
Fluid compatibility	Non-corrosive	
CE	EN61000-2; -3; -4	
Compliance	RoHS, REACH	

*All specifications listed in the following table, unless otherwise noted, apply for calibration conditions at 0 °C and 101.325 kPa absolute pressure with air. The product is horizontally mounted during calibration.

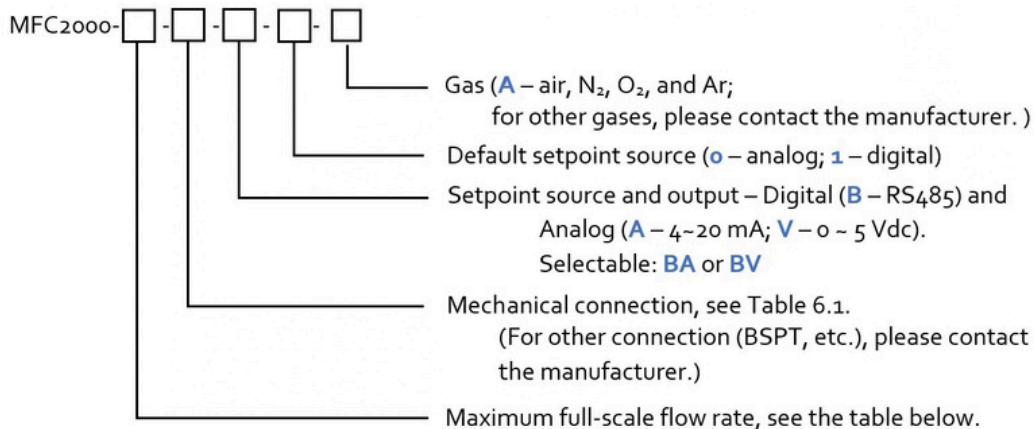
**For other options, please contact the manufacturer.

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Product selection and order

The product part number consists of the product model number and suffixes indicating the full-scale flow rate and other parameters. Refer to the following for details.



Maximum full-scale flow rate and mechanical connection.

Maximum full-scale flow rate		Mechanical connection
0050	0...50 mLn/min	N1F - NPT 1/8-Female
0100	0...100 mLn/min	N2F - NPT 1/4-Female
0200	0...200 mLn/min	U7 - 7/16-20UNF
0500	0...500 mLn/min	K1 - Double ferrule compression tube fitting 1/8"
0750	0...750 mLn/min	K2 - Double ferrule compression tube fitting 1/4"
1000 / 001	0...1000 mLn/min / 0...1 Ln/min	K3M - Double ferrule compression tube fitting φ3mm
		K6M - Double ferrule compression tube fitting φ6mm
		VCR2 - VCR 1/4"
2000 / 002	0...2000 mLn/min / 0...2 Ln/min	N2F - NPT 1/4-Female
5000 / 005	0...5000 mLn/min / 0...5 Ln/min	U7 - 7/16-20UNF
		K1 - Double ferrule compression tube fitting 1/8"
		K2 - Double ferrule compression tube fitting 1/4"
		K3M - Double ferrule compression tube fitting φ3mm
		K6M - Double ferrule compression tube fitting φ6mm
		VCR2 - VCR 1/4"

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Product selection and order

010	0...10 Ln/min	N3F - NPT 3/8-Female U9 - 9/16-18UNF K2 - Double ferrule compression tube fitting 1/4" K3 - Double ferrule compression tube fitting 3/8" K4 - Double ferrule compression tube fitting 1/2" K6M - Double ferrule compression tube fitting $\varnothing$ 6mm K10M - Double ferrule compression tube fitting $\varnothing$ 10mm K12M - Double ferrule compression tube fitting $\varnothing$ 12mm VCR2 - VCR 1/4" VCR4 - VCR 1/2"
020	0...20 Ln/min	
050	0...50 Ln/min	N3F - NPT 3/8-Female N4F - NPT 1/2-Female U9 - 9/16-18UNF K2 - Double ferrule compression tube fitting 1/4" K3 - Double ferrule compression tube fitting 3/8" K4 - Double ferrule compression tube fitting 1/2" K6M - Double ferrule compression tube fitting $\varnothing$ 6mm K10M - Double ferrule compression tube fitting $\varnothing$ 10mm K12M - Double ferrule compression tube fitting $\varnothing$ 12mm VCR2 - VCR 1/4" VCR4 - VCR 1/2"
100	0...100 Ln/min	
200	0...200 Ln/min	

*The four-digit number is for mLn/min, whereas the three-digit number is for Ln/min.

* For other ranges, please specify, for example, 0...50 mLn/min; the full-scale will be 0050; others, please get in touch with the manufacturer.

Setpoint source, output, and default setpoint source.

Setpoint source and output	Default setpoint source	Description
BA	0	The setpoint source and output are 4~20 mA and RS485, respectively, with 4~20 mA as the default setpoint source.
	1	The setpoint source and output are 4~20 mA and RS485, respectively, with RS485 as the default setpoint source.
BV	0	The setpoint source and output are 1~5 Vdc and RS485, respectively, with 1~5 Vdc as the default setpoint source.
	1	The setpoint source and output are 1~5 Vdc and RS485, respectively, with RS485 as the default setpoint source.

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