

Technical Data for MC-Series Mass Flow Controllers

10 SCCM full scale through 20 SLPM full scale

Standard specifications. Consult Alicat for available options.



SENSOR AND CONTROL PERFORMANCE	
Mass flow accuracy ¹	Standard accuracy: $\pm 0.6\%$ of reading or $\pm 0.1\%$ of full scale, whichever is greater High accuracy: $\pm 0.5\%$ of reading or $\pm 0.1\%$ of full scale, whichever is greater
Flow repeatability (2σ)	$\pm (0.1\% \text{ of reading} + 0.02\% \text{ of full scale})$
Pressure accuracy ¹	Above 1 atm: $\pm 0.5\%$ of reading Below 1 atm: ± 0.07 PSIA
Steady state control range	0.01 – 100% of full scale (10,000:1 turndown ratio)
Operating pressure	11.5 – 160 PSIA
Pressure sensitivity	Mass flow zero shift: $\pm 0.01\%$ of full scale per atm from tare pressure Mass flow span shift: $\pm 0.1\%$ of reading per atm from calibration conditions
Temperature sensitivity	Mass flow zero shift: $\pm 0.01\%$ of full scale per $^{\circ}\text{C}$ from tare temperature Mass flow span shift: $\pm 0.01\%$ of reading per $^{\circ}\text{C}$ from 25°C
Temperature accuracy	$\pm 0.75^{\circ}\text{C}$
Operating temperature range	$-10 - 60^{\circ}\text{C}$ (ambient and gas)
Valve function	Normally closed
Totalizer volume uncertainty	$\pm 0.1\%$ of reading in additional uncertainty
Sensor response time	< 1 ms
Typical control response time	As fast as 30 ms (T63), flow rate dependent, user-adjustable
Typical indication response time	< 10 ms, flow rate dependent
Typical warm-up time	< 1 s

¹ Stated accuracy is after tare (for mass flow), under equilibrium conditions, includes repeatability and linearity.

MECHANICAL	
Wetted materials	302, 303, 304, 316L, and 430FR stainless steel; FKM, alumina ceramic, brass, glass, gold, heat-cured epoxy, heat-cured silicone rubber, polyamide, silicon
Maximum pressure	Damage possible above 200 PSIA common mode pressure. Damage possible by rapid pressure change above 75 psi differential pressure.
Relative humidity range	0 – 95%, non-condensing
Ingress protection	IP40 (consult Alicat for weatherproofing options)
Mounting orientation sensitivity	None
Mounting holes	10 – 50 sccm: $2 \times 8\text{-}32$ UNC threaded $\nabla 0.175''$ [4.45 mm] 100 sccm – 20 SLPM: $2 \times 8\text{-}32$ UNC threaded $\nabla 0.350''$ [8.89 mm]

POWER AND COMMUNICATIONS	
Digital input and output options	RS-232 Serial and Modbus RTU (default), RS-485 Serial and Modbus RTU, Modbus TCP/IP, DeviceNet, EtherCAT, Ethernet/IP, PROFINET, PROFIBUS, IO-Link
Digital data update rate ²	40 Hz at 19200 baud
Analog input and output options	4 – 20 mA, 0 – 5 Vdc, 1 – 5 Vdc, 0 – 10 Vdc
Analog data update rate ²	1 kHz
Analog signal accuracy	$\pm 0.1\%$ of full scale additional uncertainty
Interactive display	Monochrome LCD or color TFT display with integrated touchpad; simultaneously displays mass flow, volumetric flow, temperature, setpoint, and pressure
Display update rate	10 Hz
Electrical connection options	6-pin locking, 8-pin mini-DIN, 8-pin M12, DB-9, DB-15
Power requirements ²	12 – 24 Vdc, 250 mA (290 mA if equipped with 4 – 20 mA output)

² Consult the individual operating bulletins for specific industrial protocol power requirements and data transmission specifications.

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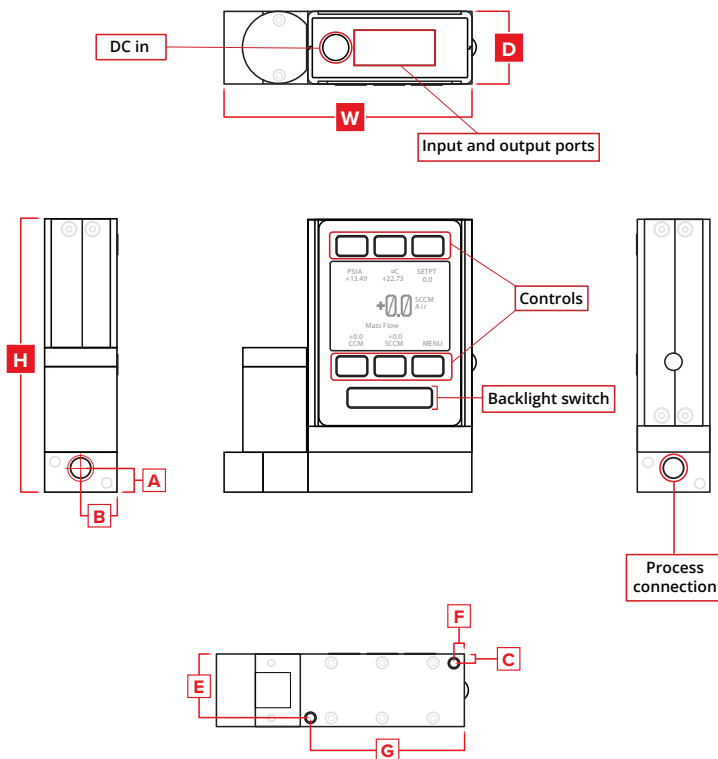
+1 (888) 290-6060
alicat.com/mc

FEATURES	
STP reference conditions	25°C and 1 atm (default), user-configurable
NTP reference conditions	0°C and 1 atm (default), user-configurable
Gas Select™	98 user-selectable gases stored internally. Each gas optimized to match NIST's REFPROP 10 gas property calculations across the operating temperature and pressure ranges for highest accuracy.
COMPOSER™	20 user-definable gas mixes. Each mix may have up to 5 gases with 0.01% composition resolution.

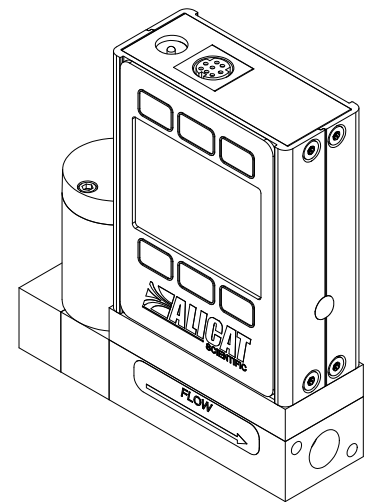
RANGE-SPECIFIC TECHNICAL DATA		
Full scale flow	Pressure drop at full scale when venting air to atmosphere ³	Default process connections ⁴
10 SCCM	2.8 PSID	M5 female (10-32 compatible)
20 – 500 SCCM	1.0 PSID	1/8" NPT female
1 SLPM	1.5 PSID	1/8" NPT female
2 SLPM	3.0 PSID	1/8" NPT female
5 SLPM	2.0 PSID	1/8" NPT female
10 SLPM	5.5 PSID	1/8" NPT female
20 SLPM	12.0 PSID	1/8" NPT female

³ Lower pressure drops and other valves available, including our WHISPER™ series mass flow controllers at alicat.com/mcw.

⁴ Consult Alicat for available process connection options, such as: Compression, face seal, push-to-connect, BSPP, SAE, or Swagelok® (including tube, VCO®, and VCR®).



Representative Example



10 SLPM

Full scale flow	DIMENSIONS									WEIGHT
	Width	Depth	Height	A	B	C	E	F	G	
10 – 50 SCCM	3.34"	1.05"	3.90"	0.34"	0.53"	0.13"	0.93"	0.15"	2.23"	≈ 1.1 lb
	84.8 mm	26.7 mm	99.0 mm	8.5 mm	13.3 mm	3.2 mm	23.5 mm	3.8 mm	56.5 mm	≈ 0.5 kg
100 SCCM – 20 SLPM	3.59"	1.05"	4.07"	0.35"	0.53"	0.13"	0.93"	0.15"	2.23"	≈ 1.2 lb
	91.1 mm	26.7 mm	103.3 mm	8.9 mm	13.3 mm	3.2 mm	23.5 mm	3.8 mm	56.5 mm	≈ 0.5 kg