

# Technical Data for **MC-Series** Mass Flow Controllers

0.5 SCCM full scale through 5 SCCM full scale

Standard specifications. Consult Alicat for available options.



+1 (888) 290-6060  
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SENSOR AND CONTROL PERFORMANCE	
Mass flow accuracy <sup>1</sup>	Standard accuracy: $\pm 0.8\%$ of reading and $\pm 0.2\%$ of full scale High accuracy (5 SCCM models): $\pm 0.4\%$ of reading and $\pm 0.2\%$ of full scale
Repeatability (2 $\sigma$ )	$\pm (0.2\% \text{ of reading} + 0.02\% \text{ of full scale})$
Pressure accuracy <sup>1</sup>	Above 1 atm: $\pm 0.5\%$ of reading Below 1 atm: $\pm 0.07$ PSIA
Steady state control range	0.01 – 100% of full scale (10,000:1 turndown ratio)
Operating pressure full scale	11.5 – 160 PSIA
Pressure sensitivity	Mass flow zero and span shift: $\pm (0.08\% \text{ of reading} + 0.02\% \text{ of full scale})$ per atm from calibration conditions
Temperature sensitivity	Mass flow zero and span shift: 0.02% of full scale per $^{\circ}\text{C}$ from 25 $^{\circ}\text{C}$
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 100 ms (T63), flow rate dependent, user-adjustable
Typical indication response time	$< 10$ ms, flow rate dependent
Typical warm-up time	$< 1$ s

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	2 $\times$ 8-32 UNC threaded $\pm 0.175''$ [4.45 mm]
Process connections <sup>2</sup>	M5 female (10-32 compatible), shipped with Buna O-ring face seal to $\frac{1}{8}$ NPT female fittings

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
Digital data update rate <sup>3</sup>	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 <sup>3</sup>	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 <sup>2</sup>	12 – 24 Vdc, 250 mA (290 mA if equipped with 4 – 20 mA output)

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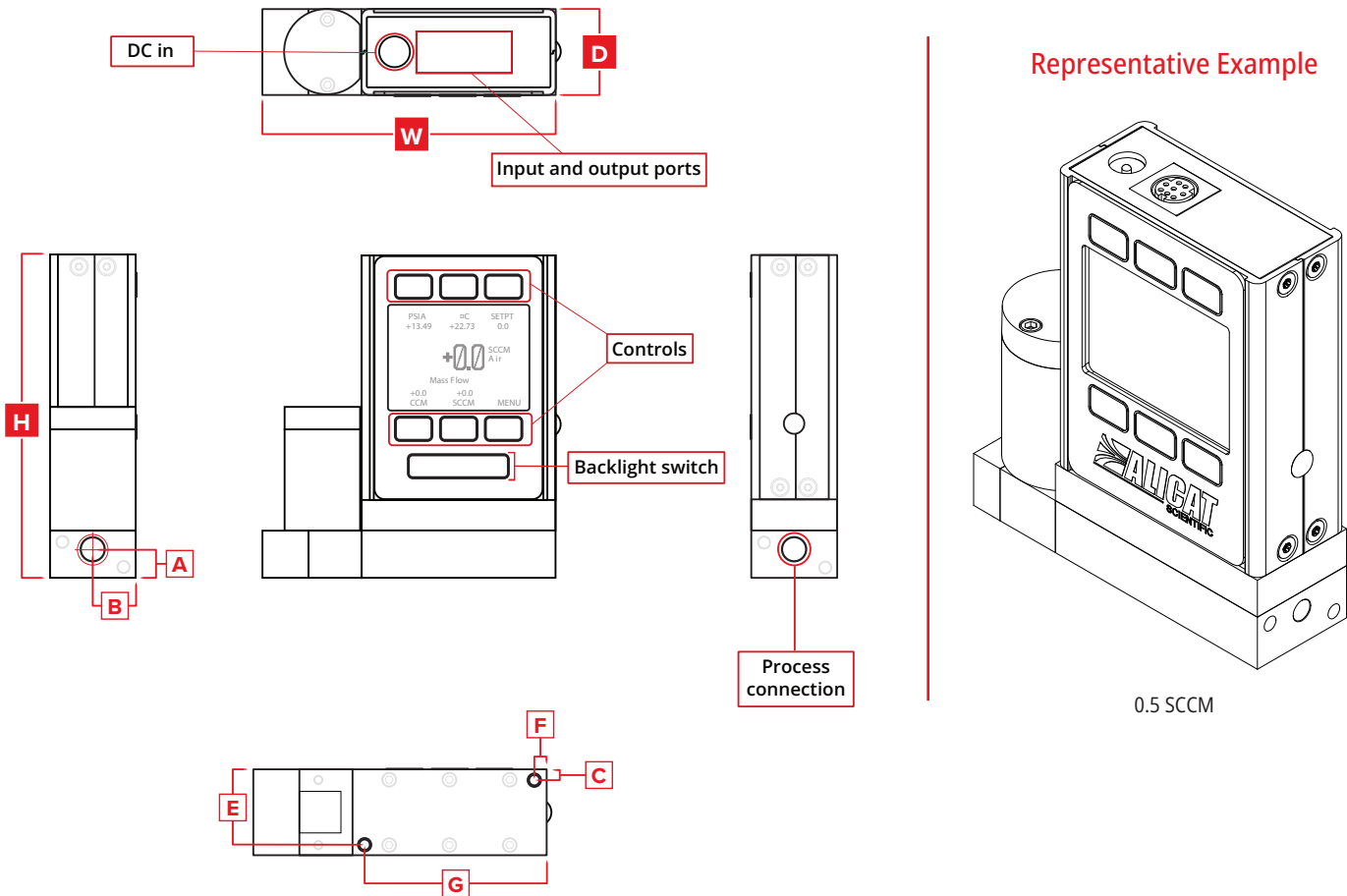


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FEATURES	
STP reference conditions	25°C and 1 atm (default), user-configurable
NTP reference conditions	0°C and 1 atm (default), user-configurable
Gas Select™	98 user-selectable gases stored internally. Each gas optimized to match NIST's REFPROP 10 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 <sup>4</sup>
0.5 SCCM	1.0 PSID
1–5 SCCM	2.0 PSID

- 1 Stated accuracy is after tare (for mass flow), under equilibrium conditions, includes repeatability and linearity.
- 2 Consult Alicat for available process connection options, such as: Compression, face seal, push-to-connect, BSPP, SAE, or Swagelok® (including tube, VCO®, and VCR®).
- 3 Consult the individual operating bulletins for specific industrial protocol power requirements and data transmission specifications.
- 4 Lower pressure drops and other valves available, including our WHISPER™ series mass flow controllers at [alicat.com/mcw](http://alicat.com/mcw).



DIMENSIONS										WEIGHT
Full scale flow	Width	Depth	Height	A	B	C	E	F	G	
0.5–5 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