

# Technical Data for M-Series Mass Flow Meters

0.5 sccm full scale through 5 sccm full scale

Standard specifications. Consult Alicat for available options.



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

SENSOR PERFORMANCE	
Mass Flow Accuracy at Calibration Conditions <sup>1</sup>	±0.8% of reading and ±0.2% of full scale
High Accuracy Option <sup>1</sup>	±0.4% of reading and ±0.2% of full scale Available for ≥5 SCCM models
Bidirectional Option <sup>1</sup>	±0.2% of full scale in addition to base accuracy (above)
Repeatability (2σ)	±(0.2% of reading + 0.02% of full scale)
Flow Measurement Range	0.01–100% of full scale
Temperature Sensitivity	Mass flow zero shift and span shift: 0.02% of full scale per °C from 25°C
Pressure Sensitivity	Mass flow zero shift and span shift: ±(0.08% of reading + 0.02% of full scale) per atmosphere from calibration conditions
Operating Temperature Range	–10–60°C
Temperature Accuracy	±0.75°C
Operating Pressure Full Scale	160 PSIA
Pressure Accuracy above 1 atm	±0.5% of reading
Pressure Accuracy below 1 atm	±0.07 PSIA
Totalizer Volume Uncertainty	±0.5% of reading additional uncertainty
Sensor Response Time	<1 ms
Typical Indication Response Time <sup>2</sup>	<10 ms, flow rate dependent
Typical Warm-Up Time	<1 s

<sup>1</sup> Stated accuracy is after tare under equilibrium conditions, includes repeatability and linearity.

<sup>2</sup> Indication response time includes user adjustable averaging up to 255 ms.

MECHANICAL	
Minimum Operating Pressure	11.5 PSIA common mode pressure (consult Alicat for lower operating pressures) Differential pressure must exceed 1 PSID
Maximum Operating Pressure	Damage possible above 200 PSIA common mode pressure Damage possible above 75 PSI differential pressure
Ingress Protection	IP40 (consult Alicat for weatherproofing options)
Humidity Range	0–95%, non-condensing
Wetted Materials	302, 303, 304, and 316L stainless steel; FKM, alumina ceramic, glass, gold, heat-cured epoxy, heat-cured silicone rubber, polyamide, silicon

COMMUNICATIONS	
Analog I/O Options <sup>3</sup>	4–20 mA, 0–5 VDC, 1–5 VDC, 0–10 VDC
Digital I/O Options <sup>3</sup>	RS-232 Serial by default RS-485 Serial, Modbus RTU (over RS-232 or RS-485), Modbus TCP/IP, DeviceNet, EtherCAT, EtherNet/IP, Profibus Portable devices (MB models): Serial over Micro-USB
Electrical Connection Options	6 pin locking, 8 pin mini-DIN, 8 pin M12, DB-9, DB-15 (contact Alicat for custom pinouts) Portable devices (MB models): Power over Micro-USB Type B
Power Requirements <sup>4</sup>	9–24 VDC, 40 mA (12–24 VDC, 80 mA if equipped with 4–20 mA or 0–10 VDC output) Portable devices (MB models): 5 VDC, 1 A recommended via an outlet adapter to USB.
Battery Life (MB Series)	Monochrome screen: 18 hours, user configurable, contrast dependent Color TFT screen: 8 hours, user configurable, contrast dependent
Digital Data Update Rate <sup>4</sup>	40 Hz at 19200 baud
Analog Data Update Rate <sup>4</sup>	1 kHz
Display Update Rate	10 Hz
Analog Signal Accuracy	±0.1% of full scale additional uncertainty

<sup>3</sup> Analog outputs unavailable on portable devices.

<sup>4</sup> Consult the individual operating bulletins for specific industrial protocol power requirements and data transmission specifications.

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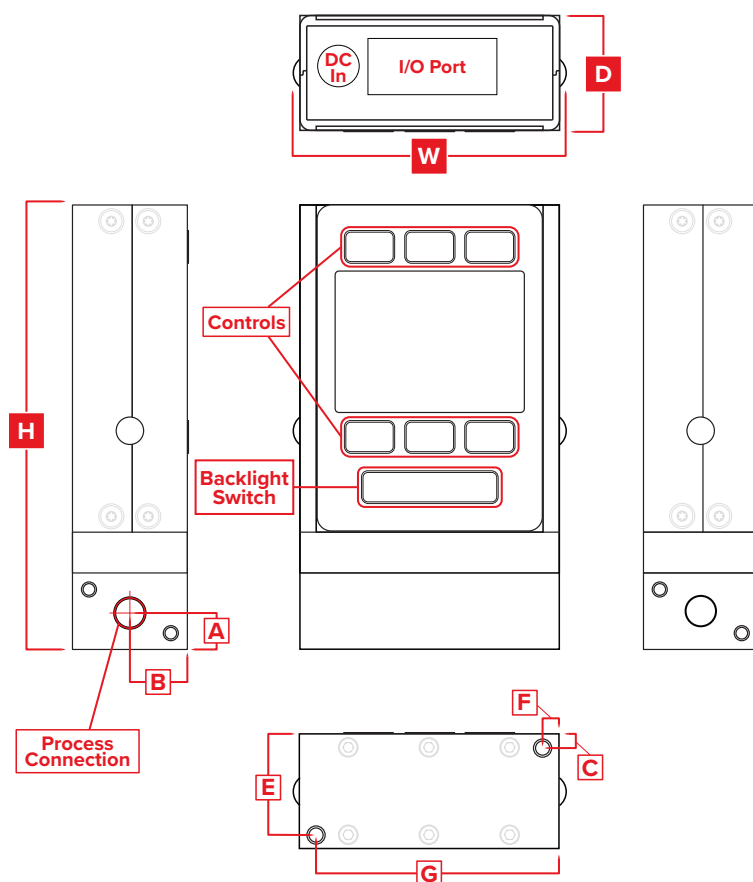
FEATURES	
STP Reference Conditions	25°C and 1 atm (default), user configurable
NTP Reference Conditions	0°C and 1 atm (default), user configurable
Monochrome LCD or Color TFT Display with Integrated Touchpad	Simultaneously displays mass flow, volumetric flow, temperature, and pressure
Gas Select™	98 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 precision.

RANGE-SPECIFIC TECHNICAL DATA			
Full scale flow	Pressure drop at full scale flow venting to atmosphere <sup>5</sup>	Process connections <sup>6</sup>	Mount tap size
0.5–5 sccm	1.0 PSID	M5 female thread (10-32 compatible) <sup>7</sup>	2× 8-32 UNC 0.175 in [4.45 mm]

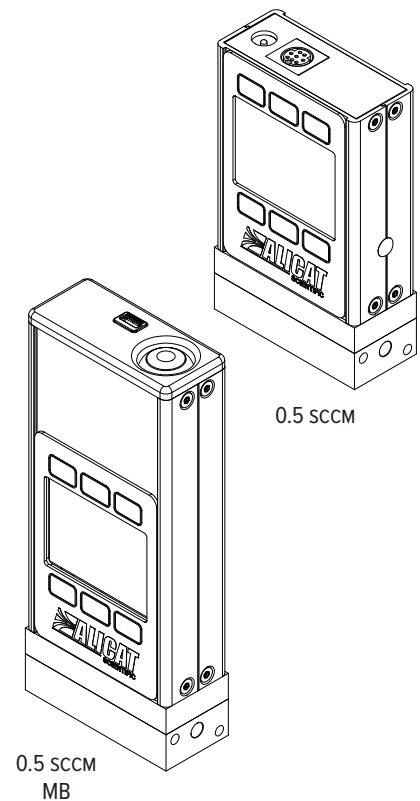
<sup>5</sup> Lower pressure drops available, please see our WHISPER™ series mass flow controllers at [www.alicat.com/whisper](http://www.alicat.com/whisper).

<sup>6</sup> Consult Alicat for available process connection options, such as: Compression, face seal, push-to-connect, BSPP, SAE, or Swagelok® (including tube, VCO®, and VCR®-compatible).

<sup>7</sup> Shipped with Buna-N O-ring face seal to 1/8" female NPT fittings.



## Representative Examples



DIMENSIONS <sup>8</sup>										WEIGHT
Full scale flow	Height	Width	Depth	A	B	C	E	F	G	
0.5–5 sccm	3.897 in	2.375 in	1.050 in	0.336 in	0.525 in	0.125 in	0.925 in	0.150 in	2.225 in	≈ 0.8 lb
	98.98 mm	60.33 mm	26.67 mm	8.53 mm	13.34 mm	3.18 mm	23.50 mm	3.81 mm	56.52 mm	≈ 0.4 kg

<sup>8</sup> Portable devices (MB Series) add 1.646" [41.81 mm] to height, and 0.2 lb. [90.72 g] to weight.