

Technical Data for **M-Series** Mass Flow Meters

50 SLPM full scale through **5000 SLPM** full scale

Standard specifications. Consult Alicat for available options.

SENSOR PERFORMANCE	
Mass Flow Accuracy at Calibration Conditions ¹	±0.8% of reading and ±0.2% of full scale
High Accuracy Option ¹	±0.4% of reading and ±0.2% of full scale Available for ≤500 SLPM models
Bidirectional Option ¹	±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 ²	<10 ms, flow rate dependent
Typical Warm-Up Time	<1 s

1 Stated accuracy is after tare under equilibrium conditions, includes repeatability and linearity.

2 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 model pressure drop, see below for details
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 ³	4–20 mA, 0–5 VDC, 1–5 VDC, 0–10 VDC
Digital I/O Options ³	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 ⁴	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 ⁴	40 Hz at 19200 baud
Analog Data Update Rate ⁴	1 kHz
Display Update Rate	10 Hz
Analog Signal Accuracy	±0.1% of full scale additional uncertainty

3 Analog outputs unavailable on portable devices.

4 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 ⁵	Process connections ⁶	Mount tap size
50 SLPM	2.0 PSID	¼" NPT female	4× 8-32UNC 0.375 in [9.53 mm]
100 SLPM	2.5 PSID	¼" NPT female	4× 8-32UNC 0.375 in [9.53 mm]
250 SLPM	2.1 PSID	½" NPT female	4× 8-32UNC 0.375 in [9.53 mm]
500 SLPM	4.0 PSID	¾" NPT female	4× 8-32UNC 0.375 in [9.53 mm]
1000 SLPM	6.0 PSID	¾" NPT female	4× 8-32UNC 0.375 in [9.53 mm]
2000 SLPM	5.0 PSID	¾" NPT female	4× 8-32UNC 0.330 in [8.38 mm]
3000 SLPM	7.1 PSID	1¼" NPT female	4× 8-32UNC 0.330 in [8.38 mm]
5000 SLPM	3.4 PSID	1½" NPT female	4× 8-32UNC 0.330 in [8.38 mm]

⁵ Lower pressure drops available, please see our WHISPER™ series mass flow controllers at www.alicat.com/whisper.

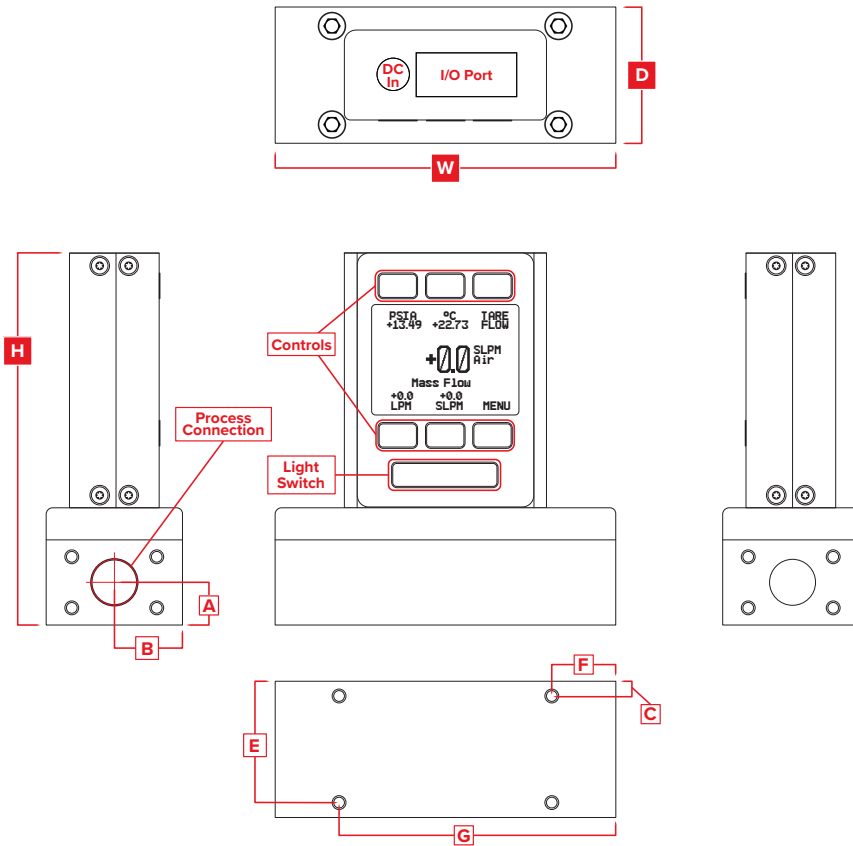
⁶ Consult Alicat for available process connection options, such as:

Compression, face seal, push-to-connect, BSPP, SAE, or Swagelok® (including tube, VCO®, and VCR®-compatible).

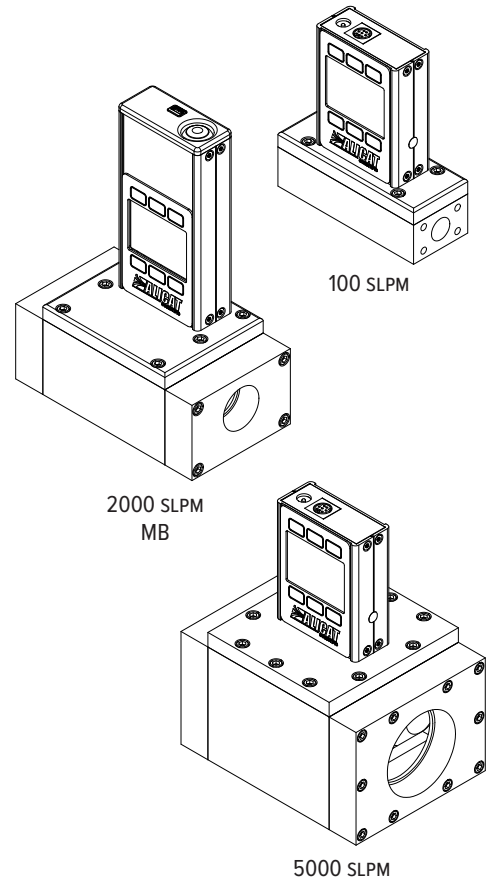
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Representative Examples



Full scale flow	DIMENSIONS ⁷									WEIGHT
	Height	Width	Depth	A	B	C	E	F	G	
50 SLPM	4.367 in	4.000 in	1.600 in	0.500 in	0.800 in	0.175 in	1.425 in	0.750 in	3.250 in	≈ 2.4 lb
	110.92 mm	101.60 mm	40.64 mm	12.70 mm	20.32 mm	4.45 mm	36.20 mm	19.05 mm	82.55 mm	≈ 1.1 kg
100 SLPM	4.367 in	4.000 in	1.600 in	0.500 in	0.800 in	0.175 in	1.425 in	0.750 in	3.250 in	≈ 2.4 lb
	110.92 mm	101.60 mm	40.64 mm	12.70 mm	20.32 mm	4.45 mm	36.20 mm	19.05 mm	82.55 mm	≈ 1.1 kg
250 SLPM	4.967 in	4.000 in	1.600 in	0.800 in	0.800 in	0.175 in	1.425 in	0.750 in	3.250 in	≈ 2.4 lb
	126.16 mm	101.60 mm	40.64 mm	20.32 mm	20.32 mm	4.45 mm	36.20 mm	19.05 mm	82.55 mm	≈ 1.1 kg
500 SLPM	4.967 in	4.000 in	1.600 in	0.800 in	0.800 in	0.175 in	1.425 in	0.750 in	3.250 in	≈ 3.5 lb
	126.16 mm	101.60 mm	40.64 mm	20.32 mm	20.32 mm	4.45 mm	36.20 mm	19.05 mm	82.55 mm	≈ 1.6 kg
1000 SLPM	4.967 in	4.000 in	1.600 in	0.800 in	0.800 in	0.175 in	1.425 in	0.750 in	3.250 in	≈ 3.5 lb
	126.16 mm	101.60 mm	40.64 mm	20.32 mm	20.32 mm	4.45 mm	36.20 mm	19.05 mm	82.55 mm	≈ 1.6 kg
2000 SLPM	5.287 in	5.200 in	2.900 in	1.120 in	1.450 in	0.200 in	2.700 in	1.350 in	3.850 in	≈ 4.5 lb
	134.29 mm	132.08 mm	73.66 mm	28.45 mm	36.83 mm	5.08 mm	68.58 mm	34.29 mm	97.79 mm	≈ 2.0 kg
3000 SLPM	5.287 in	5.200 in	2.900 in	0.960 in	1.450 in	0.200 in	2.700 in	1.350 in	3.850 in	≈ 4.5 lb
	134.29 mm	132.08 mm	73.66 mm	24.38 mm	36.83 mm	5.08 mm	68.58 mm	34.29 mm	97.79 mm	≈ 2.0 kg
5000 SLPM	6.267 in	5.200 in	3.840 in	1.450 in	1.920 in	0.295 in	3.545 in	1.350 in	3.850 in	≈ 14.0 lb
	159.18 mm	132.08 mm	97.54 mm	36.83 mm	48.77 mm	7.49 mm	90.04 mm	34.29 mm	97.79 mm	≈ 6.4 kg

⁷ Portable devices (MB Series) add 1.646" [41.81 mm] to height, and 0.2 lb. [90.72 g] to weight.