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.

SENSOR PERFORMANCE					
Mass Flow Accuracy at Calibration Conditions ¹	$\pm 0.8\%$ of reading and $\pm 0.2\%$ of full scale				
High Accuracy Option ¹	$\pm 0.4\%$ of reading and $\pm 0.2\%$ of full scale Available for ≥5 SCCM 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: $\pm (0.08\%$ 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	<1s				

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 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 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 Rate⁴	40 Hz at 19200 baud				
Analog Data Update Rate⁴	1 kHz				
Display Update Rate	10 Hz				
Analog Signal Accuracy	±0.1% of full scale additional uncertainty				

 $^{{\}bf 3}$ Analog outputs unavailable on portable devices.

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

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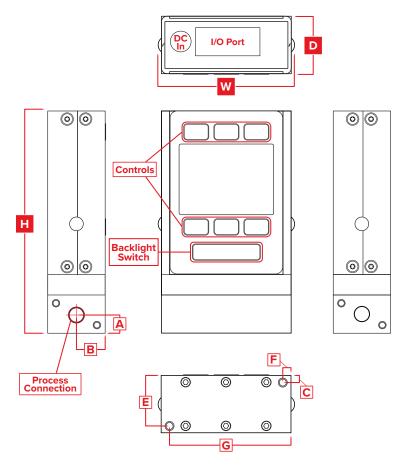
0.5 sccm full scale through **5 sccm** full scale

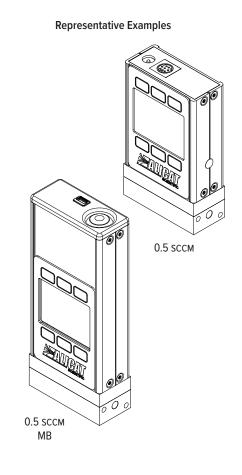
Standard specifications. Consult Alicat for available options.

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			
0.5-5 scсм	1.0 PSID	M5 female thread (10-32 compatible) ⁷	2× 8-32 UNC 0.175 in [4.45 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).
- ${f 7}$ Shipped with Buna-N O-ring face seal to ${f 18}''$ female NPT fittings.





DIMENSIONS ⁸							WEIGHT			
Full scale flow	Height	Width	Depth	А	В	С	E	F	G	
0.5-5 sccм	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

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

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