

Technical Data for **MQ/MBQ-Series** Mass Flow Meters

50 SLPM full scale through 12,000 SLPM full scale

Standard specifications. Consult Alicat for available options.



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

SENSOR PERFORMANCE	
Mass flow accuracy ¹	± 2% of full scale
Flow repeatability (2σ)	± 0.2% of full scale
Pressure accuracy ¹	Above 1 atm: ± 0.5% of reading Below 1 atm: ± 0.07 PSIA
Flow measurement range	0.2 – 100% of full scale (500:1 turndown ratio)
Operating pressure range	11.5 – 320 PSIA
Pressure sensitivity	Mass flow zero shift: ± 0.01% of full scale per atm from tare pressure Mass flow span shift: ± 0.1% of reading per atmosphere from calibration conditions
Temperature sensitivity	Mass flow zero shift and span shift: ± 0.01% of full scale per °C from 25°C
Temperature accuracy	± 0.75°C
Operating temperature range	–10 – 60°C (ambient and gas)
Totalizer volume uncertainty	± 0.1% of reading in additional uncertainty
Sensor response time	< 1 ms
Typical indication response time	< 10 ms, flow rate dependent

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

MECHANICAL	
Wetted materials	302, 303, 304, and 316L stainless steel; FKM, alumina ceramic, glass, gold, heat-cured epoxy, heat-cured silicone rubber, polyamide, silicon
Maximum pressure	Damage possible above 400 PSIA common mode pressure. Damage possible above 75 PSI differential pressure.
Relative humidity range	0 – 95%, non-condensing
Ingress protection	IP40 (consult Alicat for weatherproofing options)
Mounting holes	4× 8-32 UNC 0.330" [8.38 mm]

POWER AND COMMUNICATION	
Digital output options ²	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	40 Hz at 19200 baud
Analog output options ^{2,3}	4 – 20 mA, 0 – 5 Vdc, 1 – 5 Vdc, 0 – 10 Vdc
Analog data update rate	1 kHz
Analog signal accuracy	± 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, and pressure
Display update rate ³	10 Hz
Electrical connection options ³	6-pin locking, 8-pin mini-DIN, 8-pin M12, 9-pin DB-9, 15-pin DB-15 (contact Alicat for custom pinouts)
Power requirements ^{2,3}	0 – 5 Vdc output: 9 – 24 Vdc, 40 mA 0 – 10 Vdc output: 12 – 24 Vdc, 40 mA 4 – 20 mA output: 12 – 24 Vdc, 80 mA

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

³ Analog outputs unavailable for MBQ-Series. See Portable Devices table for MBQ-Series specifications and options.

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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 flow venting air to atmosphere	Default process connections ⁴
50 SLPM	2.0 PSID	¼" NPT female
100 SLPM	2.5 PSID	¼" NPT female
250 SLPM	2.1 PSID	½" NPT female
500 SLPM	4.0 PSID	¾" NPT female
1000 SLPM	6.0 PSID	¾" NPT female
2000 SLPM	5.0 PSID	¾" NPT female
3000 SLPM	7.1 PSID	1¼" NPT female
5000 SLPM	3.4 PSID	1½" NPT female
10,000 SLPM	12.5 PSID	2" NPT female
12,000 SLPM	15.3 PSID	2" NPT female

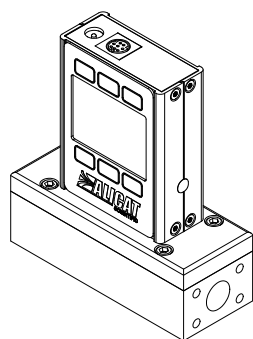
⁴ Consult Alicat for available process connection options, such as: Compression, face seal, push-to-connect, BSPP, SAE, or Swagelok®-compatible (including tube, VCO®, and VCR®).

PORTABLE DEVICES (MBQ-SERIES)⁵

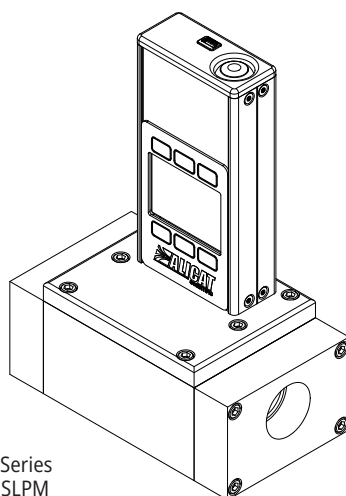
Power requirements	5 Vdc, 1 A recommended via an outlet adapter to USB
Battery life	Monochrome screen: 18 hours, user-configurable, contrast dependent Color TFT screen: 8 hours, user-configurable, contrast dependent
Electrical connection and communication	Digital output: Serial over Micro-USB Power over Micro-USB Type B Optional: Bluetooth® Low Energy (requires the Alicat Connect app and a compatible Android or iOS mobile device)
Charging temperature	0 – 45°C
Dimensions	Portable devices (MBQ-Series) add 1.646" [41.81 mm] to height, and 0.2 lb [90.72 g] to weight

⁵ More information about our MBQ-Series portable mass flow meters at alicat.com/mbq.

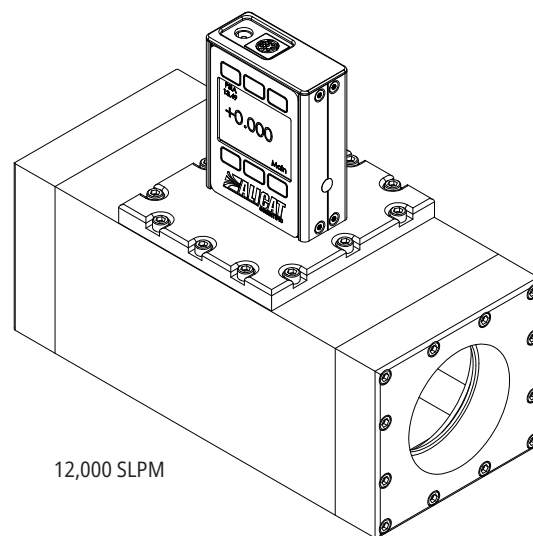
Representative Examples



100 SLPM



MBQ-Series
2000 SLPM

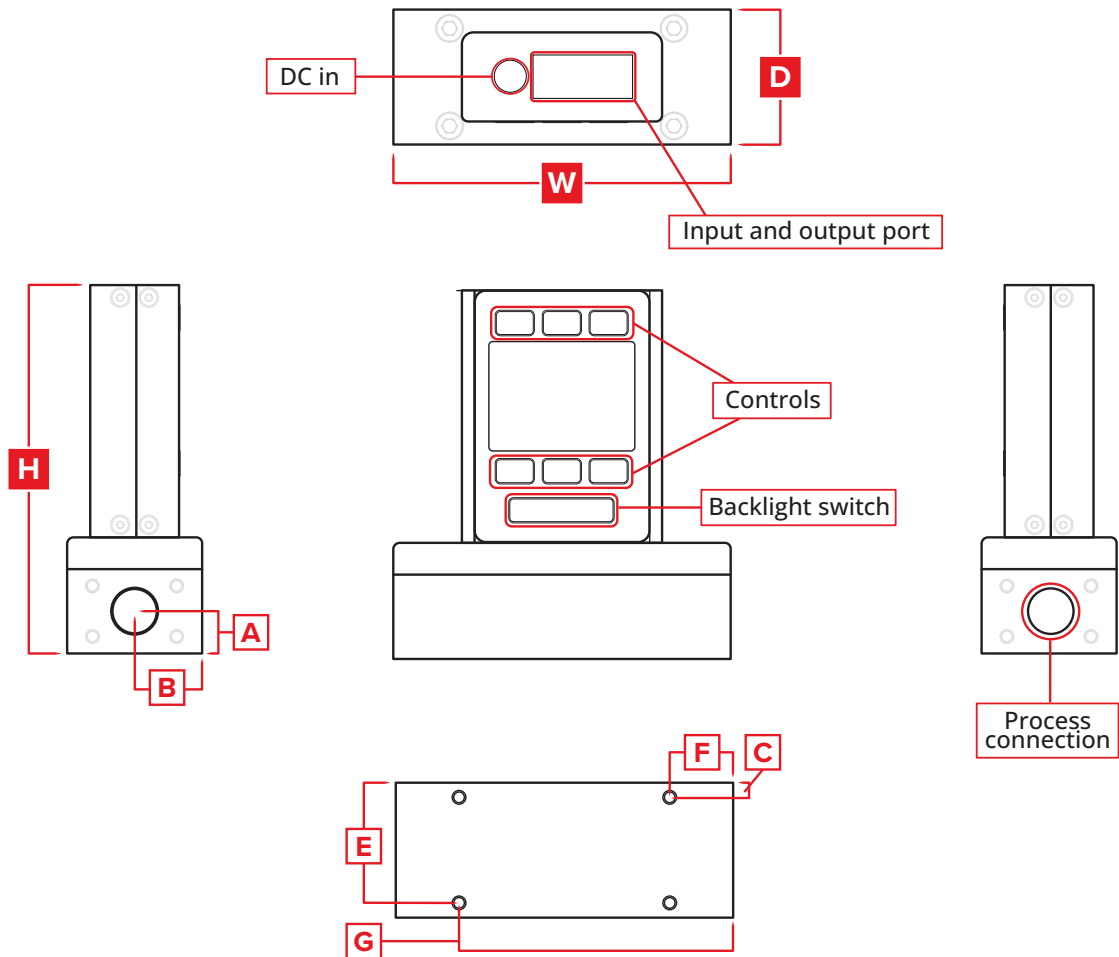


12,000 SLPM

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DIMENSIONS ⁶										WEIGHT
Full scale flow	Width	Depth	Height	A	B	C	E	F	G	
50 – 100 SLPM	4.00"	1.60"	4.37"	0.50"	0.80"	0.18"	1.43"	0.75"	3.25"	≈ 2.4 lb
	101.6 mm	40.6 mm	110.9 mm	12.7 mm	20.3 mm	4.4 mm	36.2 mm	19.1 mm	82.6 mm	≈ 1.1 kg
250 SLPM	4.00"	1.60"	4.97"	0.80"	0.80"	0.18"	1.43"	0.75"	3.25"	≈ 2.4 lb
	101.6 mm	40.6 mm	126.2 mm	20.3 mm	20.3 mm	4.4 mm	36.2 mm	19.1 mm	82.6 mm	≈ 1.1 kg
500 SLPM	4.00"	1.60"	4.97"	0.80"	0.80"	0.18"	1.43"	0.75"	3.25"	≈ 3.5 lb
	101.6 mm	40.6 mm	126.2 mm	20.3 mm	20.3 mm	4.4 mm	36.2 mm	19.1 mm	82.6 mm	≈ 1.6 kg
1000 SLPM	4.00"	1.60"	4.97"	0.80"	0.80"	0.18"	1.43"	0.75"	3.25"	≈ 3.5 lb
	101.6 mm	40.6 mm	126.2 mm	20.3 mm	20.3 mm	4.4 mm	36.2 mm	19.1 mm	82.6 mm	≈ 1.6 kg
2000 SLPM	5.20"	2.90"	5.29"	1.12"	1.45"	0.20"	2.70"	1.35"	3.85"	≈ 4.5 lb
	132.1 mm	73.7 mm	134.3 mm	28.4 mm	36.8 mm	5.1 mm	68.6 mm	34.3 mm	97.8 mm	≈ 2.0 kg
3000 SLPM	5.20"	2.90"	5.29"	0.96"	1.45"	0.20"	2.70"	1.35"	3.85"	≈ 4.5 lb
	132.1 mm	73.7 mm	134.3 mm	24.4 mm	36.8 mm	5.1 mm	68.6 mm	34.3 mm	97.8 mm	≈ 2.0 kg
5000 SLPM	5.20"	3.84"	6.27"	1.45"	1.92"	0.30"	3.55"	1.35"	3.85"	≈ 14.0 lb
	132.1 mm	97.5 mm	159.3 mm	36.8 mm	48.8 mm	7.5 mm	90.0 mm	34.3 mm	97.8 mm	≈ 6.4 kg
10,000 – 12,000 SLPM	8.60"	3.84"	6.84"	1.70"	1.92"	0.30"	3.55"	3.05"	5.55"	≈ 20.0 lb
	218.4 mm	97.5 mm	173.7 mm	43.2 mm	48.8 mm	7.5 mm	90.0 mm	77.5 mm	141.0 mm	≈ 9.1 kg

⁶ Portable devices (MBQ-Series) add 1.646" [41.81 mm] to height, and 0.2 lb [90.72 g] to weight.