

# Technical Data for **Whisper MW/MWB-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/mw

SENSOR PERFORMANCE	
Mass flow accuracy <sup>1</sup>	± 0.8% of reading and ± 0.2% of full scale
Flow repeatability (2σ)	± (0.2% of reading ± 0.02% of full scale)
Pressure accuracy <sup>1</sup>	Available for ≥ 5 sccm models
Flow measurement range	0.01 – 100% of full scale
Operating pressure range	11.5 – 60 PSIA
Pressure sensitivity	Mass flow zero shift and span shift: ± (0.08% of reading + 0.02% of full scale) per atmosphere from tare pressure
Temperature sensitivity	Mass flow zero shift and span shift: 0.03% of full scale per °C from 25° C
Temperature accuracy	± 0.75 °C
Operating temperature range	–10 – 60 °C
Totalizer volume uncertainty	± 0.5% of reading additional uncertainty
Sensor response time	< 1 ms
Typical indication response time	127 ms (user-adjustable)
Typical warm-up time	< 1 s

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

MECHANICAL	
Wetted materials	302, 303 stainless steel; Viton®, glass-reinforced polyphenylene sulfide, alumina, glass, gold, silicon, heat-cured epoxy, heat-cured silicone rubber
Maximum pressure	Damage possible above 80 PSIA common mode pressure Damage possible above 10 PSID differential pressure
Relative humidity range	0 – 95%, non-condensing
Ingress protection	IP40 (consult Alicat for weatherproofing options)
Mounting orientation sensitivity	None
Mounting holes	2× 8-32 UNC threaded ⌀ 0.175" [4.45 mm]
Default process connection <sup>2</sup>	M5 female thread (10-32 compatible) <sup>5</sup>

<sup>2</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®).

<sup>3</sup> Shipped with Buna-N O-ring face seal to ½" female NPT fittings.

POWER AND COMMUNICATIONS	
Digital output options <sup>4</sup>	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 <sup>5</sup>	40 Hz at 19200 baud
Analog output options	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	10 Hz
Electrical connection options <sup>4</sup>	6-pin locking, 8-pin mini-DIN, 8-pin M12, DB-9, DB-15
Power requirements <sup>4,5</sup>	0–5 Vdc output: 9–24 Vdc, 40 mA 0–10 Vdc output: 12–28 Vdc, 40 mA 4–20 mA output: 12–28 Vdc, 80 mA

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

<sup>5</sup> See Portable Devices table for MWB-Series specifications and options.

Technical Data for **Whisper MW/MWB-Series** Mass Flow Meters

0.5 sccm full scale through 5 sccm full scale

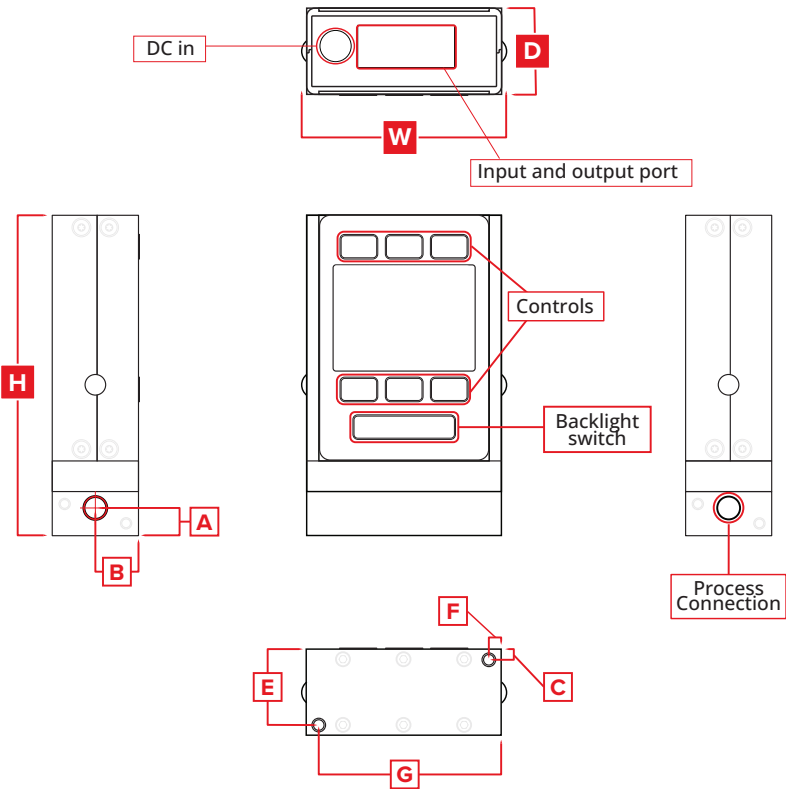
Standard specifications. Consult Alicat for available options.

FEATURES	
STP reference conditions	25 °C and 1 atm (default), user-configurable
NTP reference conditions	0 °C and 1 atm (default), user-configurable
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.

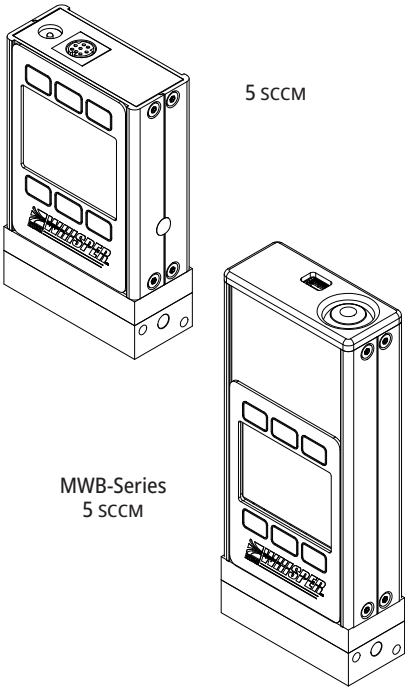
FLOW AND PROCESS DATA	
Full scale flow	Pressure drop at full scale flow venting air to atmosphere
0.5 – 5 sccm	0.07 PSID

PORTABLE DEVICES (MWB-SERIES) <sup>6</sup>	
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 Bluetooth® Low Energy (requires the Alicat Connect app and a compatible Android or iOS mobile device)
Charging temperature	0 – 45 °C
Dimensions	Portable devices (MWB-Series) add 1.646" [41.81 mm] to height, and 0.2 lb. [90.72 g] to weight.

<sup>6</sup> More information about our MWB-Series portable mass flow meters at [alicat.com/mwb](http://alicat.com/mwb).



Representative Examples



DIMENSIONS										WEIGHT
Full scale flow	Width	Depth	Height	A	B	C	E	F	G	
0.5 – 5 sccm	2.38"	1.05"	3.90"	0.34"	0.53"	0.13"	0.93"	0.15"	2.23"	≈ 0.8 lb
	60.3 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	≈ 0.4 kg

# Technical Data for **Whisper MW/MWB-Series** Mass Flow Meters

10 sccm full scale through 100 SLPM full scale

Standard specifications. Consult Alicat for available options.



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SENSOR PERFORMANCE	
Mass flow accuracy <sup>1</sup>	Standard accuracy: $\pm 0.75\%$ of reading or $\pm 0.1\%$ of full scale, whichever is greater High accuracy: $\pm 0.6\%$ of reading or $\pm 0.1\%$ of full scale, whichever is greater
Flow repeatability (2 $\sigma$ )	$\pm (0.1\% \text{ of reading} + 0.02\% \text{ of full scale})$
Pressure accuracy <sup>1</sup>	Above 1 atm: $\pm 0.75\%$ of reading Below 1 atm: $\pm 0.1$ PSIA
Flow measurement range	0.01 – 100% of full scale (1:10,000 turndown ratio)
Operating pressure range	11.5 – 60 PSIA
Pressure sensitivity	Mass flow zero shift and span shift: $\pm 0.1\%$ of reading per atmosphere from tare pressure
Temperature sensitivity	Mass flow zero shift: $\pm 0.03\%$ of full scale per $^{\circ}\text{C}$ from tare temperature Mass flow span shift: $\pm 0.01\%$ of reading per $^{\circ}\text{C}$ from 25 $^{\circ}\text{C}$
Temperature accuracy	$\pm 0.75$ $^{\circ}\text{C}$
Operating temperature range	-10 – 60 $^{\circ}\text{C}$
Totalizer volume uncertainty	$\pm 0.5\%$ of reading additional uncertainty
Sensor response time	< 1 ms
Typical indication response time	127 ms (user-adjustable)
Typical warm-up time	< 1 s

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

MECHANICAL	
Wetted materials	302, 303 stainless steel; Viton®, glass-reinforced polyphenylene sulfide, alumina, glass, gold, silicon, heat-cured epoxy, heat-cured silicone rubber
Maximum pressure	Damage possible above 80 PSIA common mode pressure. Damage possible above 10 PSID differential pressure.
Relative humidity range	0 – 95%, non-condensing
Ingress protection	IP40 (consult Alicat for weatherproofing options)
Mounting orientation sensitivity	None
Mounting holes	10 – 20 sccm: 2× 8-32 UNC threaded $\mp 0.175"$ [4.45 mm] 50 sccm – 5 SLPM: 2× 8-32 UNC threaded $\mp 0.300"$ [7.62 mm] 10 SLPM: 2× 8-32 UNC threaded $\mp 0.350"$ [8.89 mm] 20 – 100 SLPM: 4× 8-32 UNC threaded $\mp 0.375"$ [9.53 mm]

POWER AND COMMUNICATIONS	
Digital output options <sup>2</sup>	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 <sup>3</sup>	40 Hz at 19200 baud
Analog output options	4 – 20 mA, 0 – 5 Vdc, 1 – 5 Vdc, 0 – 10 Vdc
Analog data update rate	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, and pressure.
Display update rate	10 Hz
Electrical connection options <sup>2</sup>	6-pin locking, 8-pin mini-DIN, 8-pin M12, 9-pin DB-9, 15-pin DB-15
Power requirements <sup>2,3</sup>	0–5 Vdc output: 9–24 Vdc, 40 mA 0–10 Vdc output: 12–28 Vdc, 40 mA 4–20 mA output: 12–28 Vdc, 80 mA

<sup>2</sup> See Portable Devices table for MWB-Series specifications and options.

<sup>3</sup> Consult the individual operating bulletins for specific industrial protocol power requirements and data transmission specifications.

# Technical Data for **Whisper MW/MWB-Series** Mass Flow Meters

10 sccm full scale through 100 SLPM full scale

Standard specifications. Consult Alicat for available 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.

FLOW AND PROCESS DATA		
Full scale flow	Pressure drop at full scale flow venting air to atmosphere	Default process connections <sup>4</sup>
10 – 20 sccm	0.07 PSID	M5 female thread (10-32 compatible) <sup>5</sup>
50 sccm – 5 SLPM	0.07 PSID	1/8" NPT Female
10 SLPM	0.08 PSID	1/4" NPT Female
20 SLPM	0.25 PSID	1/4" NPT Female
40 SLPM	0.12 PSID	1/2" NPT Female
50 SLPM	0.14 PSID	3/4" NPT Female
100 SLPM	0.24 PSID	3/4" NPT Female

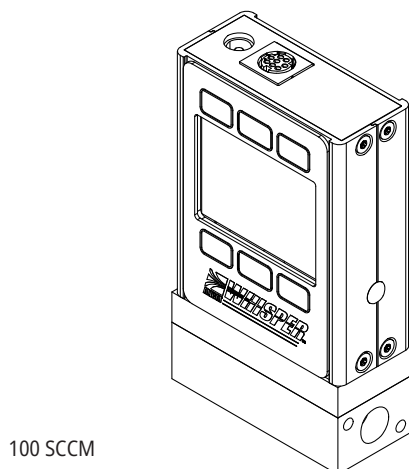
<sup>4</sup> Consult Alicat for available process connection options, such as: Compression, face seal, push-to-connect, BSPP, SAE, or Swagelok®-compatible (including tube, VCO®, and VCR®).

<sup>5</sup> Shipped with Buna-N O-ring face seal to 1/8" female NPT fittings. (including tube, VCO, and VCR).

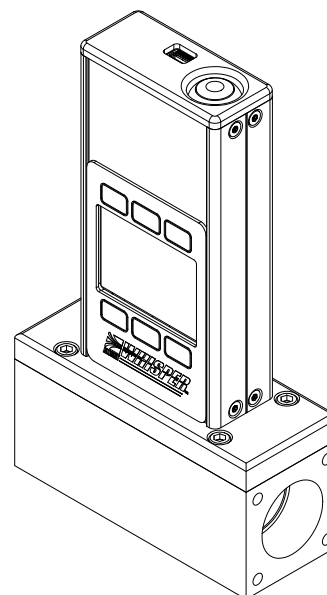
PORTABLE DEVICES (MWB-SERIES) <sup>6</sup>	
Power requirements	5 Vdc, 1 A recommended via an outlet adapter to USB
Battery life	Monochrome screen: 18 hours, user-configurable, contrast dependent Color TFT screen: 8 hours, user-configurable, contrast dependent
Electrical connection	Digital output: Serial over Micro-USB Power over Micro-USB Type B Bluetooth® Low Energy (requires the Alicat Connect app and a compatible Android or iOS mobile device)
Charging temperature	0 – 45°C
Dimensions	Add 1.646" [41.81 mm] to height, and 0.2 lb. [90.72 g] to weight

<sup>6</sup> More information about our MWB-Series portable mass flow meters at [alicat.com/mwb](http://alicat.com/mwb).

## Representative Examples



100 SCCM



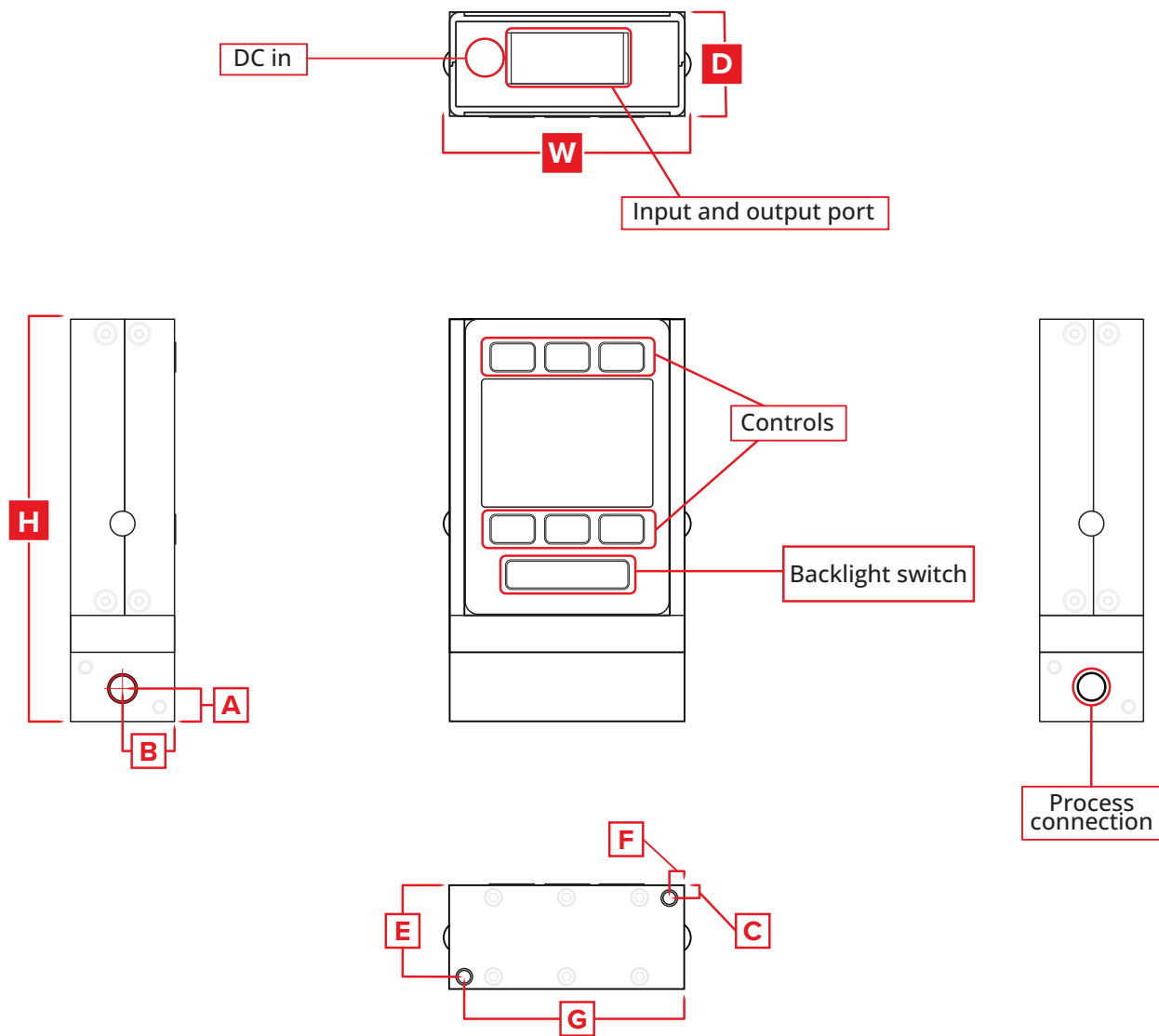
MWB-Series  
50 SLPM

Technical Data for **Whisper MW/MWB-Series** Mass Flow Meters  
10 sccm full scale through 100 SLPM full scale

Standard specifications. Consult Alicat for available options.



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DIMENSIONS										WEIGHT
Full scale flow	Width	Depth	Height	A	B	C	E	F	G	
10 – 20 sccm	2.38"	1.05"	3.90"	0.34"	0.53"	0.13"	0.93"	0.15"	2.23"	≈ 0.8 lb
	60.3 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	≈ 0.4 kg
50 sccm – 2 SLPM	2.38"	1.05"	4.07"	0.35"	0.53"	0.13"	0.93"	0.15"	2.23"	≈ 1.0 lb
	60.3 mm	26.7 mm	103.3 mm	8.9 mm	13.3 mm	3.2 mm	23.5 mm	3.8 mm	56.5 mm	≈ 0.5 kg
5 SLPM	2.38"	1.05"	4.17"	0.35"	0.53"	0.13"	0.93"	0.15"	2.23"	≈ 1.4 lb
	60.3 mm	26.7 mm	105.8 mm	8.9 mm	13.3 mm	3.2 mm	23.5 mm	3.8 mm	56.5 mm	≈ 0.6 kg
10 SLPM	2.63"	1.05"	4.21"	0.36"	0.53"	0.13"	0.93"	0.28"	2.35"	≈ 2.4 lb
	66.7 mm	26.7 mm	106.9 mm	9.1 mm	13.3 mm	3.2 mm	23.5 mm	7.0 mm	59.7 mm	≈ 1.1 kg
20 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
40 – 100 SLPM	4.00"	1.60"	1.60"	0.80"	0.80"	0.18"	1.43"	0.75"	3.25"	≈ 3.5 lb
	101.6 mm	40.6 mm	40.6 mm	20.3 mm	20.3 mm	4.4 mm	36.2 mm	19.1 mm	82.6 mm	≈ 1.5 kg

# Technical Data for **Whisper MW/MWB-Series** Mass Flow Meters

**250 SLPM full scale through 1000 SLPM full scale**

Standard specifications. Consult Alicat for available options.



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SENSOR PERFORMANCE	
Mass flow accuracy <sup>1</sup>	Standard accuracy: $\pm 0.8\%$ of reading and $\pm 0.2\%$ of full scale High accuracy (available for $\leq 1000$ SLPM models): $\pm (0.4\%$ of reading $\pm 0.2\%$ of full scale)
Flow repeatability ( $2\sigma$ )	$\pm (0.2\%$ of reading $\pm 0.02\%$ of full scale)
Pressure accuracy <sup>1</sup>	Above 1 atm: $\pm 0.75\%$ of reading Below 1 atm: $\pm 0.1$ PSIA
Flow measurement range	0.01 – 100% of full scale
Operating pressure range	11.5 – 60 PSIA
Pressure sensitivity	Mass flow zero shift and span shift: $\pm (0.08\%$ of reading + $0.02\%$ of full scale) per atmosphere from tare pressure
Temperature sensitivity	Mass flow zero shift and span shift: $0.03\%$ of full scale per $^{\circ}\text{C}$ from $25^{\circ}\text{C}$
Temperature accuracy	$\pm 0.75^{\circ}\text{C}$
Operating temperature range	$-10$ – $60^{\circ}\text{C}$
Totalizer volume uncertainty	$\pm 0.5\%$ of reading additional uncertainty
Sensor response time	$< 1$ ms
Typical indication response time <sup>2</sup>	127 ms (user-adjustable)
Typical warm-up time	$< 1$ s

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

MECHANICAL	
Wetted materials	302, 303 stainless steel; Viton®, glass-reinforced polyphenylene sulfide, alumina, glass, gold, silicon, heat-cured epoxy, heat-cured silicone rubber
Maximum pressure	Damage possible above 80 PSIA common mode pressure. Damage possible above 10 PSID differential pressure.
Relative humidity range	0 – 95%, non-condensing
Ingress protection	IP40 (consult Alicat for weatherproofing options)
Mounting orientation sensitivity	None
Mounting holes	250 – 500 SLPM: $4 \times 8\text{-}32$ UNC threaded $\nabla 0.375''$ [9.53 mm] 1000 SLPM: $4 \times 8\text{-}32$ UNC threaded $\nabla 0.300''$ [7.62 mm]

POWER AND COMMUNICATIONS	
Digital output options <sup>2</sup>	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 <sup>3</sup>	40 Hz at 19200 baud
Analog output options	4 – 20 mA, 0 – 5 Vdc, 1 – 5 Vdc, 0 – 10 Vdc
Analog data update rate	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, and pressure.
Display update rate	10 Hz
Electrical connection options <sup>2</sup>	6-pin locking, 8-pin mini-DIN, 8-pin M12, 9-pin DB-9, 15-pin DB-15
Power requirements <sup>2,3</sup>	0 – 5 Vdc output: 9 – 24 Vdc, 40 mA 0 – 10 Vdc output: 12 – 28 Vdc, 40 mA 4 – 20 mA output: 12 – 28 Vdc, 80 mA

<sup>2</sup> See Portable Devices table for MWB-Series specifications and options.

<sup>3</sup> Consult the individual operating bulletins for specific industrial protocol power requirements and data transmission specifications.

Technical Data for **Whisper MW/MWB-Series** Mass Flow Meters  
250 SLPM full scale through 1000 SLPM full scale

Standard specifications. Consult Alicat for available options.



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alicat.com/mw

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.

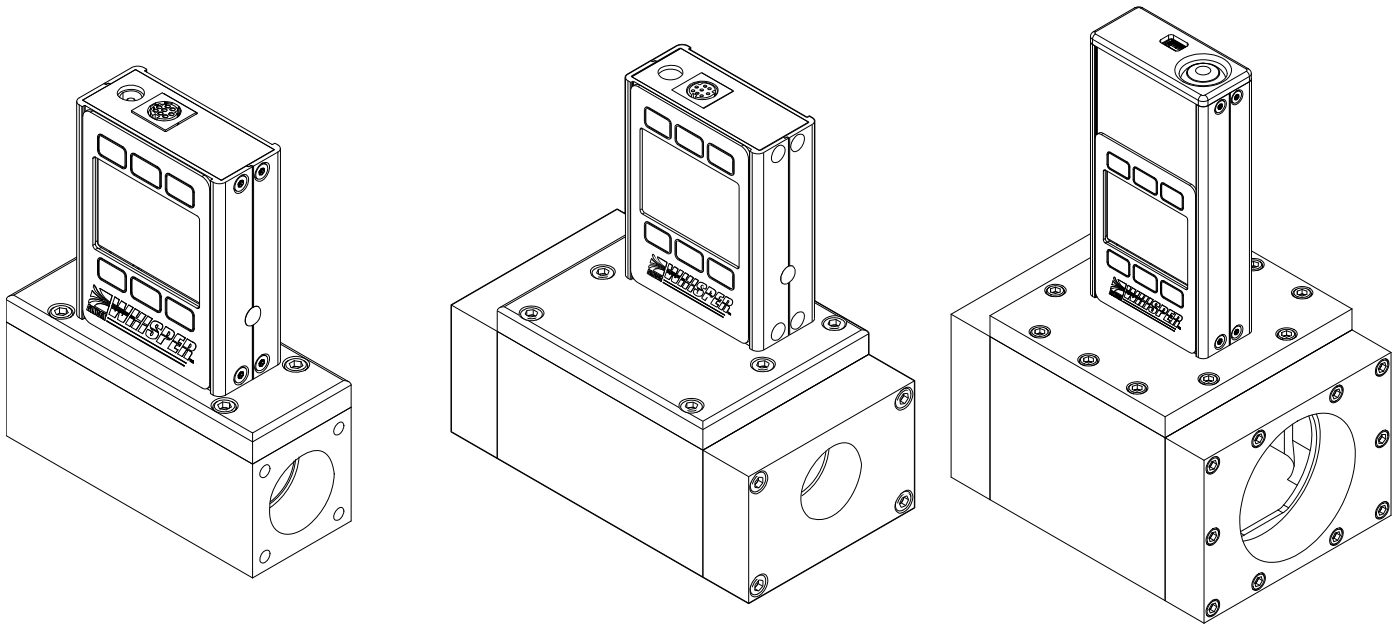
RANGE-SPECIFIC TECHNICAL DATA		
Full scale flow	Pressure drop at full scale flow venting air to atmosphere	Default process connections <sup>4</sup>
250 SLPM	0.60 PSID	¾" NPT Female
500 SLPM	0.39 PSID	¾" NPT Female
1000 SLPM	0.24 PSID	2" NPT Female

<sup>4</sup> 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 (MWB-SERIES) <sup>5</sup>	
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 Bluetooth® Low Energy (requires the Alicat Connect app and a compatible Android or iOS mobile device)
Charging temperature	0 – 45 °C
Dimensions	Portable devices (MWB-Series) add 1.646" [41.81 mm] to height, and 0.2 lb. [90.72 g] to weight

<sup>5</sup> More information about our MWB-Series portable mass flow meters at [alicat.com/mwb](http://alicat.com/mwb).

Representative Examples



250 SLPM

500 SLPM

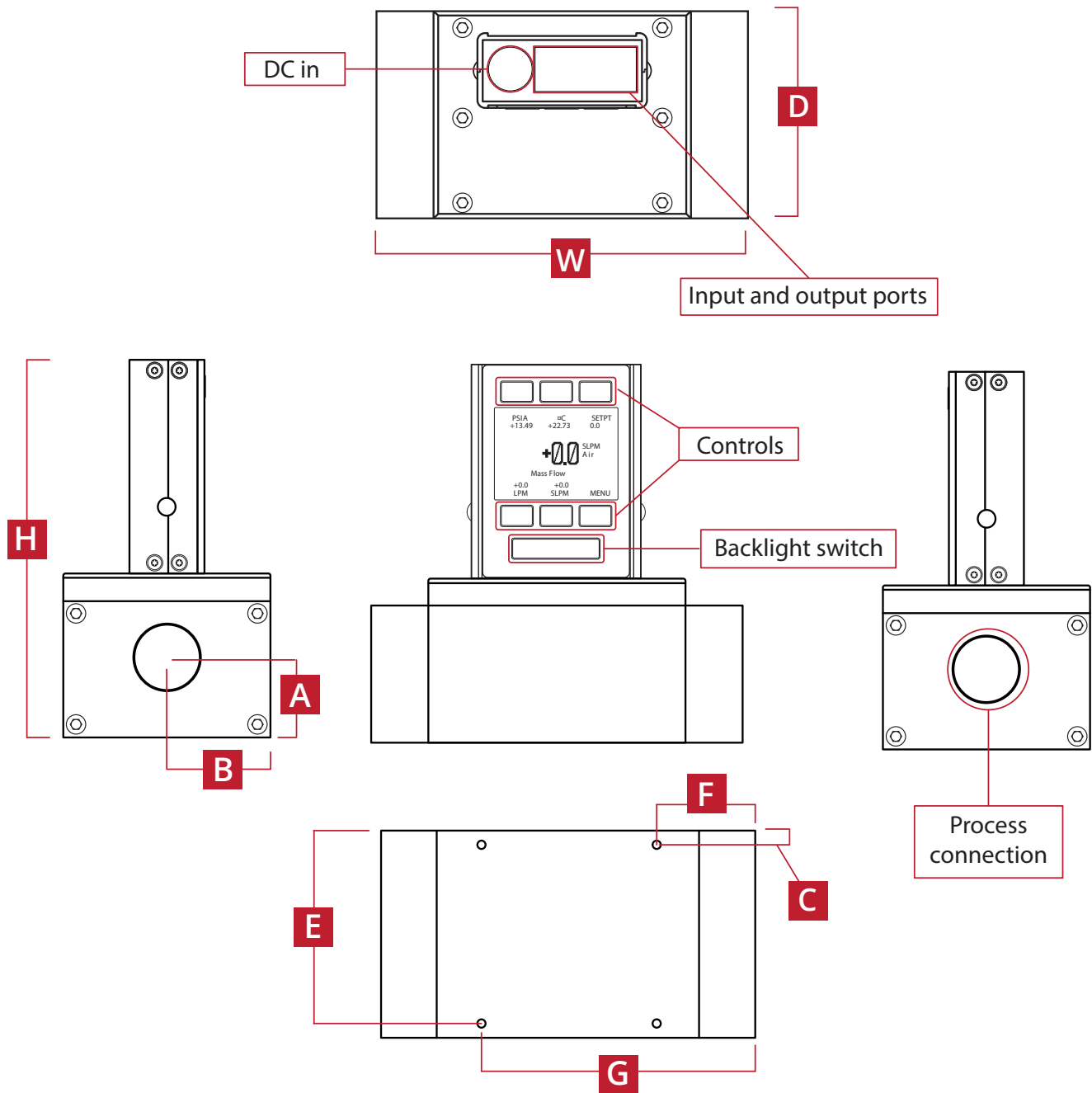
MWB-Series 1000 SLPM

Technical Data for **Whisper MW/MWB-Series** Mass Flow Meters  
250 SLPM full scale through 1000 SLPM full scale

Standard specifications. Consult Alicat for available options.



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DIMENSIONS										WEIGHT
Full scale flow	Width	Depth	Height	A	B	C	E	F	G	
250 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	≈ 1.5 kg
500 SLPM	5.20"	2.90"	5.29"	1.45"	1.45"	0.20"	2.70"	1.35"	3.85"	≈ 4.5 lb
	132.1 mm	73.7 mm	134.3 mm	36.8 mm	36.8 mm	5.1 mm	68.6 mm	34.3 mm	97.8 mm	≈ 2.0 kg
1000 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	159.2 mm	36.8 mm	48.8 mm	7.5 mm	90.0 mm	34.3 mm	97.8 mm	≈ 6.4 kg