

Technical Data for **Whisper** Mass Flow Controllers

10 sccm full scale through **100 SLPM** full scale

Standard specifications. Consult Alicat for available options.



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SENSOR AND CONTROL PERFORMANCE	
Mass flow accuracy ¹	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 (2σ)	$\pm (0.2\%$ of reading + 0.02% of full scale)
Pressure accuracy ¹	Above 1 atm: $\pm 0.75\%$ of reading Below 1 atm: ± 0.1 PSIA
Steady state control range	0.5 – 100% of full scale (200:1 turndown ratio)
Operating pressure range	11.5 – 60 PSIA
Pressure sensitivity	Mass flow zero shift: $\pm 0.01\%$ of full scale per atmosphere from tare pressure Mass flow span shift: $\pm 0.1\%$ of reading per atmosphere from calibration conditions
Temperature sensitivity	Mass flow zero shift: $\pm 0.03\%$ of full scale per °C from tare temperature Mass flow span shift: $\pm 0.01\%$ of reading per °C from 25°C
Temperature accuracy	$\pm 0.75^\circ\text{C}$
Operating temperature range	-10 – 60°C (ambient and gas)
Valve function	Normally closed
Totalizer volume uncertainty	$\pm 0.1\%$ of reading additional uncertainty
Sensor response time	< 1 ms
Typical control response time	MCW: 30 ms to 63% of step change (T63), user-adjustable MCRW: 150 ms to 63% of step change (T63), user-adjustable
Typical indication response time	As fast as 100 ms (T63), flow rate dependent, user-adjustable
Typical warm-up time	< 1 s

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, glass-reinforced polyphenylene sulfide, gold, heat-cured epoxy, heat-cured silicone rubber, silicon MCW: Add 430FR stainless steel and brass MCRW: Add 410 stainless steel, Delrin®, and nylon
Maximum pressure	Damage possible above 80 PSIA common mode pressure Damage possible above 15 PSI differential pressure
Relative humidity range	0 – 95%, non-condensing
Ingress protection	IP40 (consult Alicat for weatherproofing options)
Mounting orientation sensitivity	MCW-Series: None MCRW-Series: Rolamite valves must be upright
Mounting holes	10 – 20 sccm: 2× 8-32 UNC threaded $\nabla 0.175''$ [4.45mm] 50 sccm – 20 SLPM: 2× 8-32 UNC threaded $\nabla 0.300''$ [7.62mm] 5 – 20 SLPM: 4× 8-32 UNC threaded $\nabla 0.375''$ [9.53 mm] 40 – 100 SLPM: 4× 8-32 UNC threaded $\nabla 0.328''$ [8.33 mm]

POWER AND COMMUNICATIONS	
Digital input and output options	RS-232 Serial and Modbus RTU (default) RS-485 Serial and Modbus RTU, Modbus TCP/IP, DeviceNet, EtherCAT, EtherNet/IP®, Profibus, PROFINET®, IO-Link
Digital data update rate ²	40 Hz at 19200 baud
Analog input and 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, setpoint, and pressure.
Display update rate	10 Hz
Electrical connection options	6-pin locking, 8-pin mini-DIN, 8-pin M12, 9-pin DB-9, 15-pin DB-15
Power requirements ²	MCW: 12 – 24 Vdc, 250 mA MCRW: 24 Vdc, 1 A Add 40 mA if equipped with 4 – 20 mA output

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

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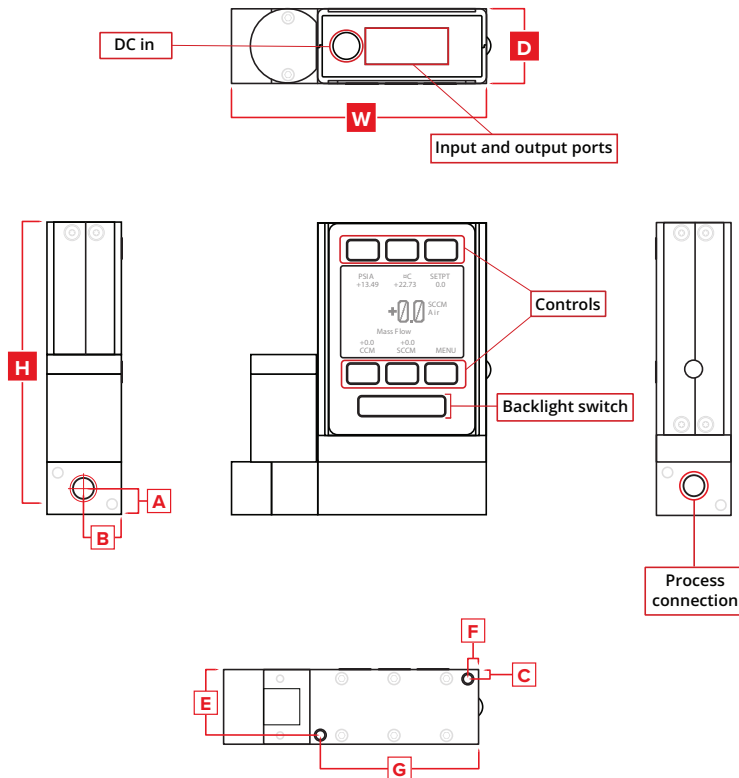


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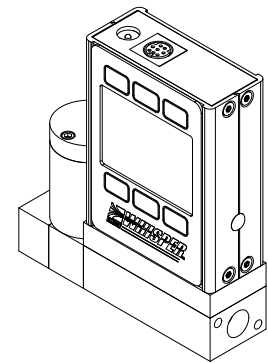
FEATURES	
STP reference conditions	25°C and 1 atm (default), user-configurable
NTP reference conditions	0°C and 1 atm (default), user-configurable
Gas Select™	98 user-selectable gases stored internally. Each gas optimized to match NIST's REFPROP 10 gas property calculations across the operating temperature 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 SPECIFICATIONS			
Full scale flow	Type	Pressure drop at full scale flow venting to atmosphere	Default process connections ³
10–20 sccm	MCW	0.07 PSID	M5 female thread (10-32 compatible) ⁵
50–500 sccm	MCW	0.07 PSID	1/8" NPT Female
1 SLPM	MCW	0.10 PSID	1/8" NPT Female
2 SLPM	MCW	0.18 PSID	1/8" NPT Female
5 SLPM	MCRW	0.10 PSID	1/4" NPT Female
10 SLPM	MCRW	0.12 PSID	1/4" NPT Female
20 SLPM	MCRW	0.26 PSID	1/4" NPT Female
40 SLPM	MCRW	0.14 PSID	1/2" NPT Female
50 SLPM	MCRW	0.17 PSID	3/4" NPT Female
100 SLPM	MCRW	0.30 PSID	3/4" NPT Female

³ 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®)



Representative Examples



2 SLPM

DIMENSIONS										WEIGHT	
Full scale flow	Type	Width	Depth	Height	A	B	C	E	F	G	
10 – 20 sccm	MCW	3.34"	1.05"	3.90"	0.34"	0.53"	0.13"	0.93"	0.15"	2.23"	≈ 1.1 lb
		84.8 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	≈ 0.5 kg
50 sccm – 2 SLPM	MCW	3.59"	1.05"	4.07"	0.35"	0.53"	0.13"	0.93"	0.15"	2.23"	≈ 1.2 lb
		91.1 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

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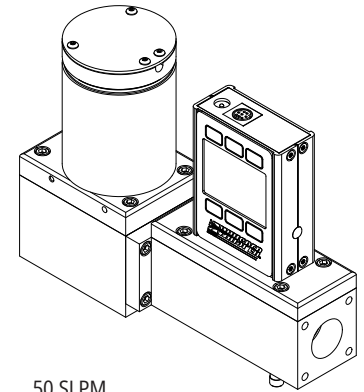
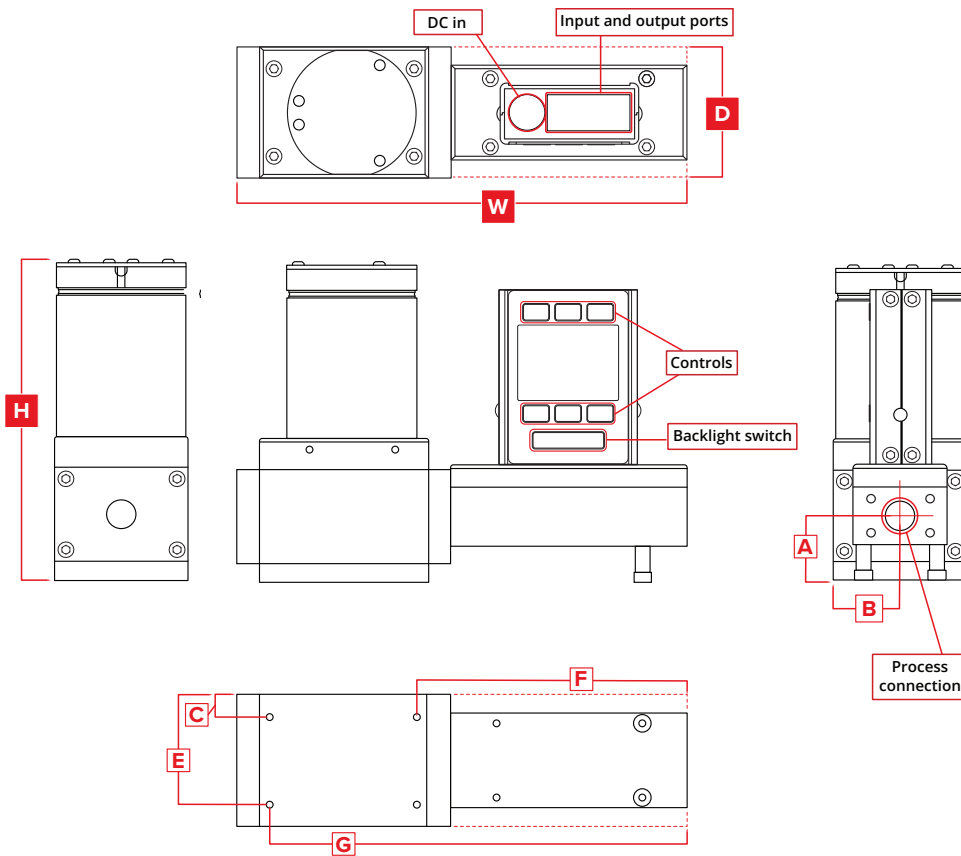
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Representative Examples



DIMENSIONS											WEIGHT
Full scale flow	Type	Width	Depth	Height	A	B	C	E	F	G	
5 SLPM	MCRW	7.65"	2.25"	5.50"	1.12"	1.13"	0.38"	1.88"	4.58"	7.08"	≈ 9.0 lb
		194.3 mm	57.2 mm	139.6 mm	28.4 mm	28.6 mm	9.5 mm	47.6 mm	116.2 mm	179.7 mm	≈ 4.1 kg
10 SLPM	MCRW	7.65"	2.25"	5.50"	1.12"	1.13"	0.38"	1.88"	4.58"	7.08"	≈ 9.0 lb
		194.3 mm	57.2 mm	139.6 mm	28.4 mm	28.6 mm	9.5 mm	47.6 mm	116.2 mm	179.7 mm	≈ 4.1 kg
20 SLPM	MCRW	7.65"	2.25"	5.50"	1.12"	1.13"	0.38"	1.88"	4.58"	7.08"	≈ 9.0 lb
		194.3 mm	57.2 mm	139.6 mm	28.4 mm	28.6 mm	9.5 mm	47.6 mm	116.2 mm	179.7 mm	≈ 4.1 kg
40 SLPM	MCRW	7.65"	2.25"	5.50"	1.12"	1.13"	0.38"	1.88"	4.58"	7.08"	≈ 9.0 lb
		194.3 mm	57.2 mm	139.6 mm	28.4 mm	28.6 mm	9.5 mm	47.6 mm	116.2 mm	179.7 mm	≈ 4.1 kg
50 SLPM – 100 SLPM	MCRW	7.28"	2.25"	5.50"	1.12"	1.13"	0.38"	1.88"	4.58"	7.08"	≈ 9.0 lb
		184.8 mm	57.2 mm	139.6 mm	28.4 mm	28.6 mm	9.5 mm	47.6 mm	116.2 mm	179.7 mm	≈ 4.1 kg