

# Technical Data for **Whisper** Series Mass Flow Controllers

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

Standard specifications. Consult Alicat for available options.



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

SENSOR AND CONTROL PERFORMANCE	
Mass flow accuracy <sup>1</sup>	Standard accuracy: $\pm 0.8\%$ of reading and $+ 0.2\%$ of full scale High accuracy ( $\leq 1000$ SLPM models): $\pm 0.4\%$ of reading and $\pm 0.2\%$ of full scale
Flow repeatability ( $2\sigma$ )	$\pm (0.2\%$ of reading $+ 0.02\%$ of full scale)
Pressure accuracy <sup>1</sup>	Above 1 atm: $\pm 0.75\%$ of reading Below 1 atm: $\pm 0.1$ PSIA
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 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 °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	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

<sup>1</sup> 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- and MCRHW-Series: Rolamite valves must be upright
Mounting holes	250 – 500 SLPM: 4× 8-32 UNC threaded $\nabla 0.328''$ [8.33 mm] 1000 SLPM: 4× 8-32 UNC threaded $\nabla 0.300''$ [7.62 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 <sup>2</sup>	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 <sup>2</sup>	MCRW: 24 Vdc, 1 A MCRWH: 24 – 30 Vdc, 2 A Add 40 mA if equipped with 4 – 20 mA output

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

# Technical Data for **Whisper** Series Mass Flow Controllers

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

Standard specifications. Consult Alicat for available options.

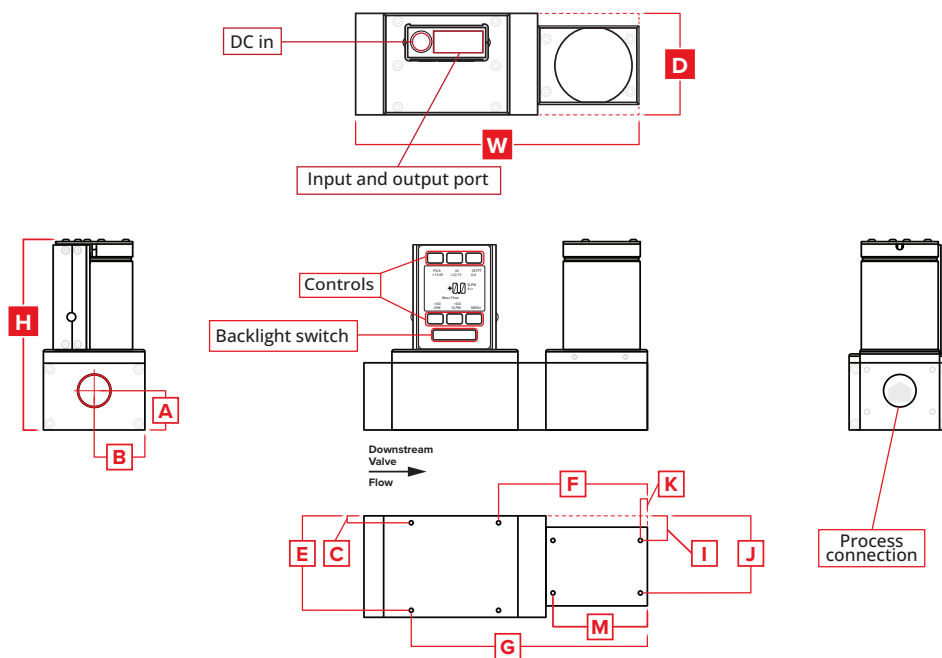


+1 (888) 290-6060  
alicat.com/mcw

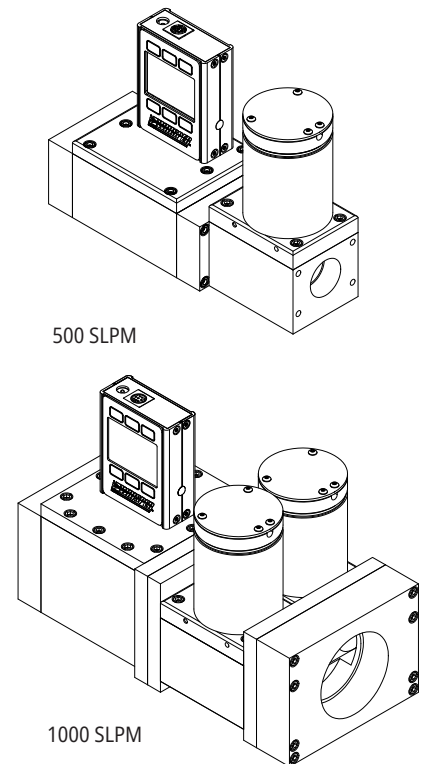
FEATURES	
STP reference conditions	25°C and 1 atm (default), user-configurable
NTP reference conditions	0°C and 1 atm (default), user-configurable
Gas Select™	98 user-selectable gases stored internally. Each gas optimized to match NIST's REFPROP 10 gas property calculations across the operating temperature 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	Type	Pressure drop at full scale flow venting air to atmosphere	Default process connections <sup>3</sup>
250 – 500 SLPM	MCRW	0.69 PSID	¾" NPT Female
1000 SLPM	MCRWH	1.65 PSID	2" NPT Female

<sup>3</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®)



## Representative Examples



DIMENSIONS														WEIGHT	
Full scale flow	Type	Width	Depth	Height	A	B	C	E	F	G	I	J	K	M	
250 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
500 SLPM	MCRW	8.10"	2.90"	5.50"	1.12"	1.45"	0.20"	2.70"	4.25"	6.75"	0.70"	2.20"	0.20"	2.70"	≈ 12.0 lb
		205.7 mm	73.7 mm	139.6 mm	28.4 mm	36.8 mm	5.1 mm	68.6 mm	108.0 mm	171.5 mm	17.8 mm	55.9 mm	5.1 mm	68.6 mm	≈ 5.4 kg
1000 SLPM	MCRWH	9.80"	4.50"	6.27"	1.45"	2.25"	0.63"	3.88"	5.95"	8.45"	—	—	—	—	≈ 28.0 lb
		248.9 mm	114.3 mm	159.2 mm	36.8 mm	57.2 mm	15.9 mm	98.4 mm	151.1 mm	214.6 mm	—	—	—	—	≈ 12.7 kg