

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

0.5 sccm full scale through 5 sccm full scale

Standard specifications. Consult Alicat for available options.



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SENSOR AND CONTROL PERFORMANCE	
Mass flow accuracy ¹	Standard accuracy: $\pm 0.8\%$ of reading and $\pm 0.2\%$ of full scale High accuracy (≥ 5 SCCM models): $\pm 0.4\%$ of reading and $\pm 0.2\%$ of full scale
Flow repeatability (2σ)	$\pm (0.2\% \text{ of reading} + 0.02\% \text{ of full scale})$
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 and span shift: $\pm (0.08\% \text{ of reading} + 0.02\% \text{ of full scale})$ 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	30 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, 316L and 430FR stainless steel; FKM, alumina ceramic, glass, glass-reinforced polyphenylene sulfide, gold, heat-cured epoxy, heat-cured silicone rubber, silicon, brass
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	None
Mounting holes	2× 8-32 UNC threaded $\downarrow 0.175"$ [4.45mm]

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	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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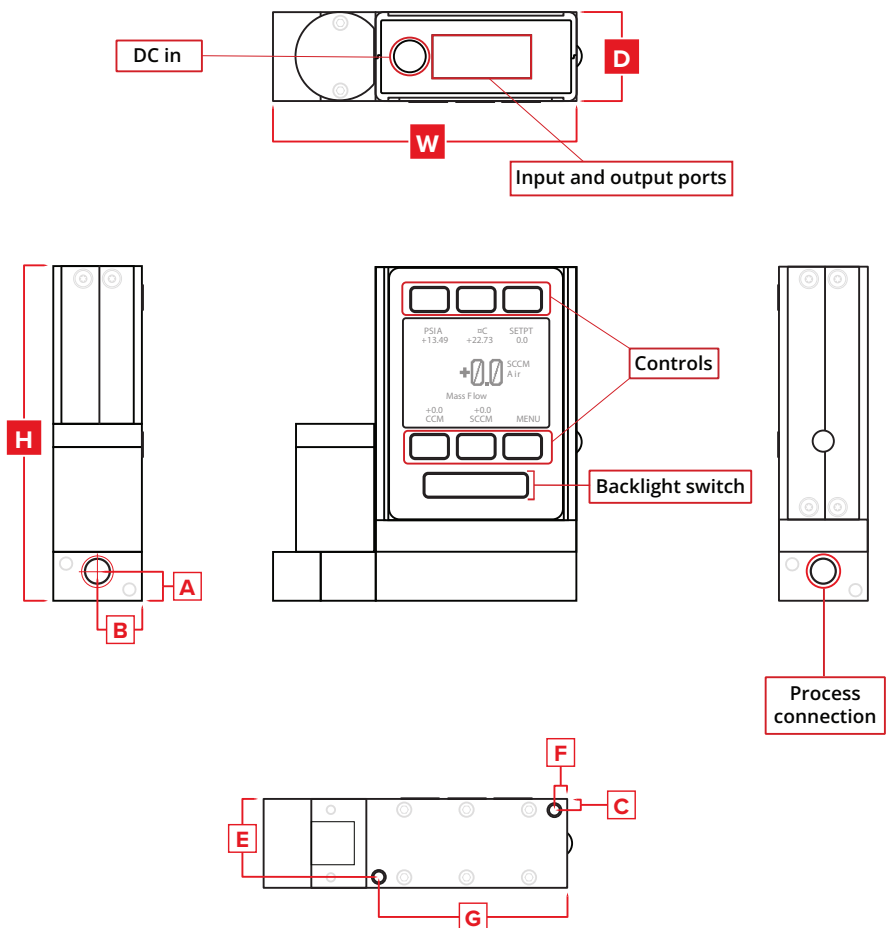


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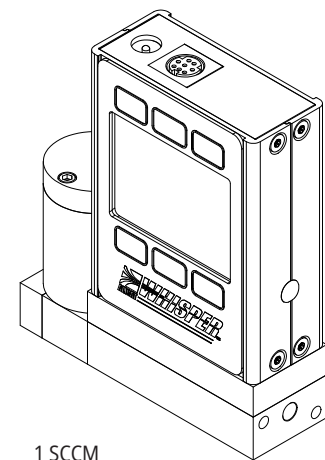
FEATURES	
STP reference conditions	25°C and 1 atm (default), user-configurable
NTP reference conditions	0°C and 1 atm (default), user-configurable
Gas Select™	98 user-selectable gases stored internally. Each gas optimized to match NIST's REFPROP 10 gas property calculations across the operating temperature 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.

FLOW AND PROCESS DATA		
Full scale flow	Pressure drop at full scale flow venting air to atmosphere	Default process connection ³
0.5 – 5 sccm	0.07 PSID	M5 female thread (10-32 compatible)

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 Example



DIMENSIONS										WEIGHT
Full scale flow	Width	Depth	Height	A	B	C	E	F	G	
0.5 – 5 sccm	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