Technical Data for MCQ-Series Mass Flow Controllers

10 SCCM full scale through **20 SLPM** full scale

Standard specifications. Consult Alicat for available options.

ALICAT SCIENTIFIC
+1 (888) 290-6060
alicat.com/mcq

CONTROL AND SENSOR PERFORMANCE	
Mass Flow Accuracy at Calibration Conditions[1]	±0.6% of reading or ±0.1% of full scale, whichever is greater
Repeatability	±0.1% of full scale
Steady State Control Range	0.5–100% of full scale
Valve Function	Normally Closed
Temperature Sensitivity	**Mass flow zero shift:** ±0.01% of full scale per °C from tare temperature, per atm **Mass flow span shift:** ±0.01% of reading per °C from 25°C, per atm
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
Operating Temperature Range	−10–60°C
Temperature Accuracy	±0.75°C
Operating Pressure Full Scale	320 PSIA
Pressure Accuracy above 1 atm	±0.5% of reading
Pressure Accuracy below 1 atm	±0.07 PSIA
Totalizer Volume Uncertainty	±0.5% of reading additional uncertainty
Sensor Response Time	<1 ms
Typical Indication Response Time	<10 ms, flow rate dependent
Typical Control Response Time	As fast as 100 ms (T_{63}), flow rate dependent, user adjustable
Typical Warm-Up Time	<1 s

1 Stated accuracy is after tare under equilibrium conditions, includes repeatability and linearity.

MECHANICAL	
Minimum Operating Pressure	11.5 PSIA common mode pressure (consult Alicat for lower operating pressures) Differential pressure must exceed model pressure drop, see below for details
Maximum Operating Pressure	Damage possible above 400 PSIA common mode pressure Damage possible above 75 PSI differential pressure
Ingress Protection	IP40 (consult Alicat for weatherproofing options)
Humidity Range	0–95%, non-condensing
Wetted Materials	302, 303, 304, 316L, and 430FR stainless steel; FKM, alumina ceramic, brass, glass, gold, heat-cured epoxy, heat-cured silicone rubber, polyamide, silicon

CONTROL AND COMMUNICATIONS	
Analog I/O Options	4–20 mA, 0–5 VDC, 1–5 VDC, 0–10 VDC
Digital I/O Options	RS-232 Serial by default RS-485 Serial, Modbus RTU (over RS-232 or RS-485), Modbus TCP/IP, DeviceNet, EtherCAT, EtherNet/IP, PROFIBUS
Electrical Connection Options	6-pin locking, 8-pin mini-DIN, 8-pin M12, DB-9, DB-15
Power Requirements[2]	12–24 VDC, 250 mA Add 40 mA if equipped with 4–20 mA output
Serial Data Update Rate[2]	40 Hz at 19200 baud
Analog Data Update Rate	1 kHz
Display Update Rate	10 Hz
Analog Signal Accuracy	±0.1% of full scale additional uncertainty

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

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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
Monochrome LCD or Color TFT Display with Integrated Touchpad	Simultaneously displays mass flow, volumetric flow, temperature, setpoint, and pressure
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 precision.

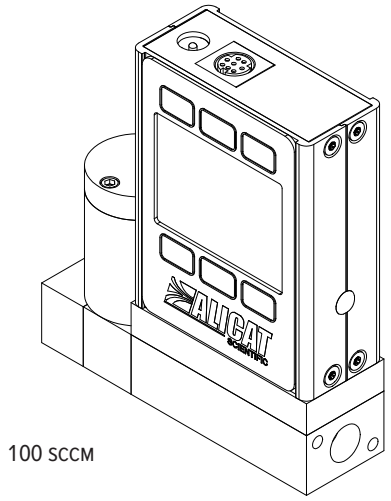
RANGE-SPECIFIC TECHNICAL DATA			
Full scale flow	Pressure drop at full scale flow[3]	Process connections[4]	Mount tap size
10 SCCM	2.8 PSID	M5 female (10-32 compatible)[5]	2× 8-32 UNC 0.175 in [4.45 mm]
50 SCCM	1.0 PSID	M5 female (10-32 compatible)[5]	2× 8-32 UNC 0.175 in [4.45 mm]
100–500 SCCM	1.0 PSID	⅛″ NPT female	2× 8-32 UNC 0.175 in [4.45 mm]
1 SLPM	1.5 PSID	⅛″ NPT female	2× 8-32 UNC 0.175 in [4.45 mm]
2 SLPM	3.0 PSID	⅛″ NPT female	2× 8-32 UNC 0.175 in [4.45 mm]
5 SLPM	2.0 PSID	⅛″ NPT female	2× 8-32 UNC 0.175 in [4.45 mm]
10 SLPM	5.5 PSID	⅛″ NPT female	2× 8-32 UNC 0.175 in [4.45 mm]
20 SLPM	20.0 PSID	⅛″ NPT female	2× 8-32 UNC 0.175 in [4.45 mm]

3 Default valve venting air to atmosphere.

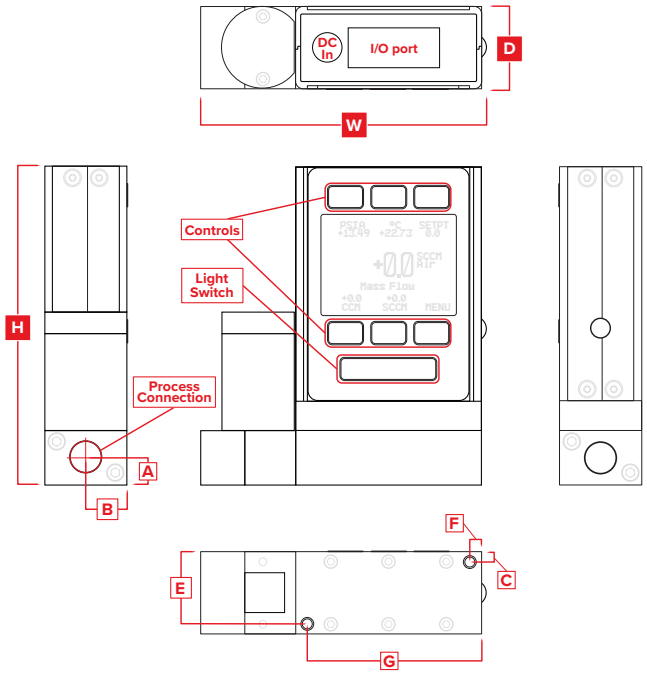
4 Consult Alicat for available process connection options, such as: compression, face seal, push-to-connect, BSPP, SAE, or Swagelok® (including tube, VCO®, and VCR®).

5 Shipped with Buna-N O-ring face seal to ⅛″ female NPT fittings.

Representive Example



100 SCCM



DIMENSIONS											WEIGHT
Full scale	Type	Height	Width	Depth	A	B	C	E	F	G	
10 SCCM–50 SCCM	MCQ	3.897 in	3.338 in	1.050 in	0.336 in	0.525 in	0.125 in	0.925 in	0.150 in	2.225 in	≈ 1.1 lb
		98.98 mm	84.79 mm	26.67 mm	8.53 mm	13.34 mm	3.18 mm	23.50 mm	3.81 mm	56.52 mm	≈ 0.5 kg
100 SCCM–20 SLPM	MCQ	4.067 in	3.588 in	1.050 in	0.350 in	0.525 in	0.125 in	0.925 in	0.150 in	2.225 in	≈ 1.2 lb
		103.30 mm	91.14 mm	26.67 mm	8.89 mm	13.34 mm	3.18 mm	23.50 mm	3.81 mm	56.52 mm	≈ 0.5 kg