# Technical Data for MC-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/mc

| SENSOR AND CONTROL PERFORMANCE | |
|---|---|
| Mass Flow Accuracy at Calibration Conditions[1] | ±0.6% of reading or ±0.1% of full scale, whichever is greater |
| High Accuracy Option[1] | ±0.5% of reading or ±0.1% of full scale, whichever is greater |
| Repeatability (2σ) | ±(0.1% of reading + 0.02% of full scale) |
| Steady State Control Range | 0.01–100% of full scale |
| Typical Control Response Time | As fast as 30 ms, flow rate dependent, user adjustable |
| Valve Function | Normally closed |
| Temperature Sensitivity | Mass flow zero shift: ±0.01% of full scale per °C from tare temperature<br>Mass flow span shift: ±0.01% of reading per °C from 25°C |
| Pressure Sensitivity | Mass flow zero shift: ±0.01% of full scale per atm from tare pressure<br>Mass flow span shift: ±0.1% of reading per atm from calibration conditions |
| Operating Temperature Range | −10–60°C |
| Temperature Accuracy | ±0.75°C |
| Operating Pressure Full Scale | 160 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 in additional uncertainty |
| Sensor Response Time | <1 ms |
| Typical Indication Response Time | <10 ms, flow rate dependent |
| 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).<br>Differential pressure must exceed model pressure drop, see below for details. |
| Maximum Operating Pressure | Damage possible above 175 PSIA common mode pressure.<br>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 |

| 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<br>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 (290 mA if equipped with 4–20 mA output) |
| Digital Data Update Rate[2] | 40 Hz at 19200 baud |
| Analog Data Update Rate[2] | 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.

# Technical Data for MC-Series Mass Flow Controllers

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

Standard specifications. Consult Alicat for available options.

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

| 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] |
| 20–50 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. Lower pressure drops and other valves available, including our WHISPER™ series mass flow controllers at www.alicat.com/mcw.

**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®).

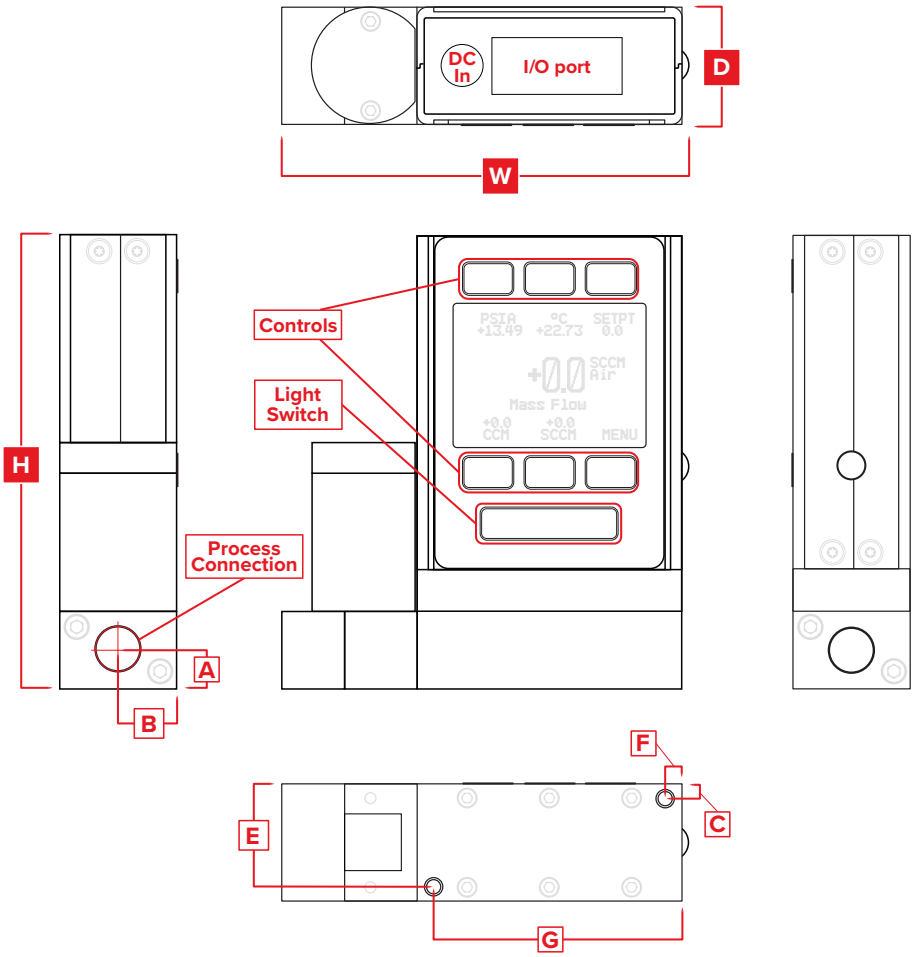
**5** Shipped with Buna-N O-ring face seal to ⅛″ female NPT fittings.

# Technical Data for MC-Series Mass Flow Controllers

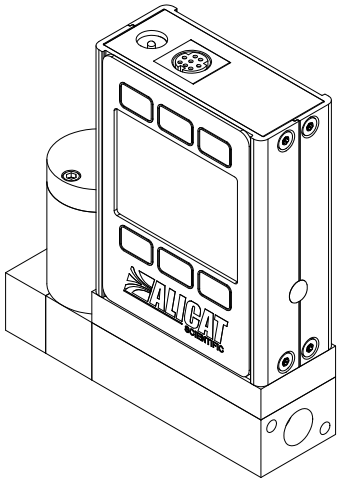
**10 SCCM** full scale through **20 SLPM** full scale

Standard specifications. Consult Alicat for available options.

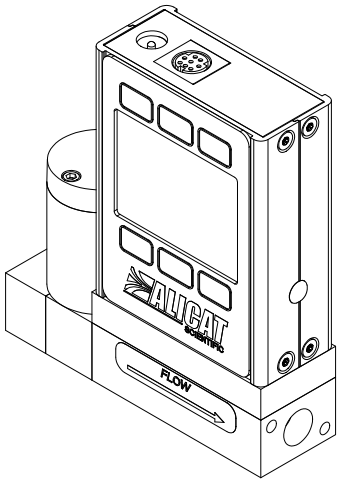
+1 (888) 290-6060
alicat.com/mc




Representative Examples



100 SCCM




10 SLPM

| DIMENSIONS | | | | | | | | | | WEIGHT |
|---|---|---|---|---|---|---|---|---|---|---|
| Full scale flow | Height | Width | Depth | A | B | C | E | F | G | |
| 10–50 SCCM | 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 | 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 |