# 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
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| SENSOR AND CONTROL PERFORMANCE | |
|---|---|
| Mass flow accuracy[1] | **Standard accuracy:** ± 0.6% of reading or ± 0.1% of full scale, whichever is greater<br>**High accuracy**: ± 0.5% of reading or ± 0.1% of full scale, whichever is greater |
| Flow repeatability (2σ) | ± (0.1% of reading + 0.02% of full scale) |
| Pressure accuracy[1] | **Above 1 atm:** ± 0.5% of reading<br>**Below 1 atm:** ± 0.07 PSIA |
| Steady state control range | 0.01 – 100% of full scale (10,000:1 turndown ratio) |
| Operating pressure | 11.5 – 160 PSIA |
| 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 |
| 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 |
| Temperature accuracy | ± 0.75°C |
| Operating temperature range | −10 – 60°C (ambient and gas) |
| Valve function | Normally closed |
| Totalizer volume uncertainty | ± 0.1% of reading in additional uncertainty |
| Sensor response time | < 1 ms |
| Typical control response time | As fast as 30 ms (T63), flow rate dependent, user-adjustable |
| Typical indication response time | < 10 ms, flow rate dependent |
| 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, brass, glass, gold, heat-cured epoxy, heat-cured silicone rubber, polyamide, silicon |
| Maximum pressure | Damage possible above 200 PSIA common mode pressure.<br>Damage possible by rapid pressure change above 75 PSI differential pressure. |
| Relative humidity range | 0 – 95%, non-condensing |
| Ingress protection | IP40 (consult Alicat for weatherproofing options) |
| Mounting orientation sensitivity | None |
| Mounting holes | **10 – 50 SCCM:** 2× 8-32 UNC threaded ↧ 0.175" [4.45 mm]<br>**100 SCCM – 20 SLPM:** 2× 8-32 UNC threaded ↧ 0.350" [8.89 mm] |

| POWER AND COMMUNICATIONS | |
|---|---|
| Digital input and output options | RS-232 Serial and Modbus RTU (default),<br>RS-485 Serial and Modbus RTU, Modbus TCP/IP, DeviceNet, EtherCAT, Ethernet/IP, PROFINET, PROFIBUS, 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[2] | 1 kHz |
| Analog signal accuracy | ± 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, DB-9, DB-15 |
| Power requirements[2] | 12 – 24 Vdc, 250 mA (290 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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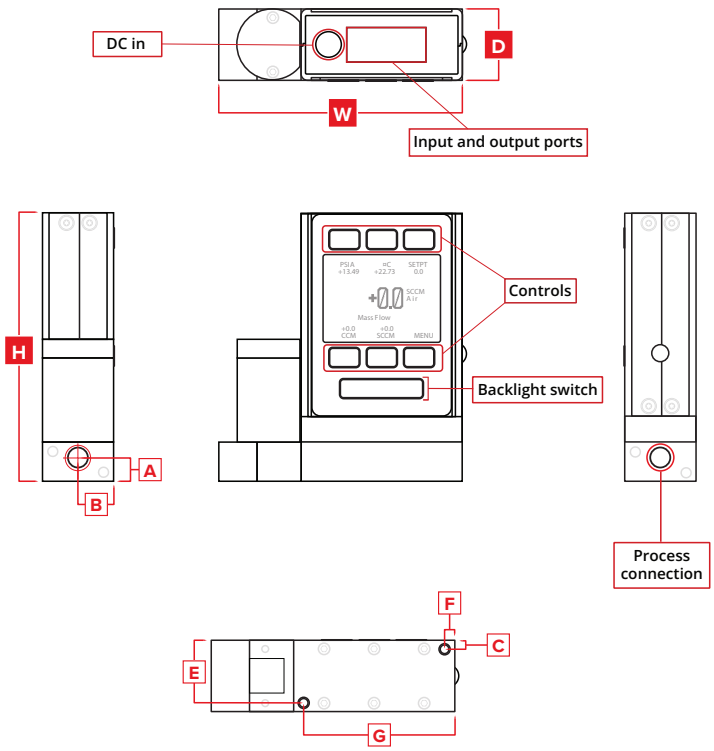
| FEATURES | |
|---|---|
| STP reference conditions | 25°C and 1 atm (default), user-configurable |
| NTP reference conditions | 0°C and 1 atm (default), user-configurable |
| Gas Select™ | 98 user-selectable gases stored internally. Each gas optimized to match NIST's REFPROP 10 gas property calculations 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 | Pressure drop at full scale when venting air to atmosphere[3] | Default process connections[4] |
| 10 SCCM | 2.8 PSID | M5 female (10-32 compatible)[5] |
| 20 – 50 SCCM | 1.0 PSID | M5 female (10-32 compatible)[5] |
| 100 – 500 SCCM | 1.0 PSID | ⅛″ NPT female |
| 1 SLPM | 1.5 PSID | ⅛″ NPT female |
| 2 SLPM | 3.0 PSID | ⅛″ NPT female |
| 5 SLPM | 2.0 PSID | ⅛″ NPT female |
| 10 SLPM | 5.5 PSID | ⅛″ NPT female |
| 20 SLPM | 12.0 PSID | ⅛″ NPT female |

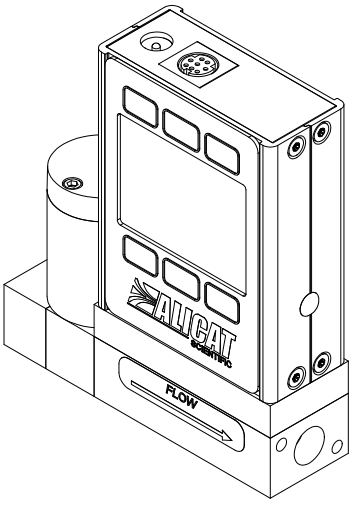
**3** Lower pressure drops and other valves available, including our WHISPER™ series mass flow controllers at alicat.com/mcw.

**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.




Representative Example




10 SLPM

| DIMENSIONS | | | | | | | | | | WEIGHT |
|---|---|---|---|---|---|---|---|---|---|---|
| Full scale flow | Width | Depth | Height | A | B | C | E | F | G | |
| 10 – 50 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 |
| 100 SCCM – 20 SLPM | 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 |