

Technical Data for Alicat MCP Moderate Mass Flow Controllers

0 – 10 slpm Full Scale through 0 – 250 slpm Full Scale



Tel: 888-290-6060

www.alicat.com/mc

Alicat MCP mass flow controllers are fitted with a high performance valve for low pressure applications. The following specifications are applicable to Alicat MCP-Series Mass Flow Controllers only.

Standard Specifications (Contact Alicat for available options.)

| Performance | MCP Mass Flow Controller |
|--|--|
| Accuracy at calibration conditions after tare | ± (0.8% of Reading + 0.2% of Full Scale) |
| High Accuracy at calibration conditions after tare | ± (0.4% of Reading + 0.2% of Full Scale) |
| Repeatability | ± 0.2% Full Scale |
| Zero Shift and Span Shift | 0.02% Full Scale / °C / Atm |
| Operating Range / Turndown Ratio | 0.5% to 100% Full Scale / 200:1 Turndown |
| Maximum Controllable Flow Rate | 100% Full Scale |
| Maximum Measurable Flow Rate | up to 128% Full Scale (Gas Dependent) |
| Typical Response Time | 100 ms (Adjustable) |
| Warm-up Time | < 1 Second |

| Operating Conditions | MCP Mass Flow Controller |
|------------------------------------|--|
| Mass Reference Conditions (STP) | Field-selectable, defaults to 25 °C & 14.696 psia unless requested otherwise |
| Operating Temperature | -10 to +60 °C |
| Humidity Range (Non-Condensing) | 0 to 100% |
| Maximum Internal Pressure (Static) | 145 psig |
| Proof Pressure | 175 psig |
| Mounting Attitude Sensitivity | None |
| Valve Type | Normally Closed |
| Ingress Protection | IP40 |
| Wetted Materials | 303 & 302 Stainless Steel, Viton®, Heat Cured Silicone Rubber, Glass Reinforced Polyphenylene Sulfide, Heat Cured Epoxy, Aluminum, Gold, Brass, 430FR Stainless Steel, Silicon, Glass. If your application demands a different material, please contact Alicat. |

| Communications / Power | MCP Mass Flow Controller |
|--|--|
| Monochrome LCD or Color TFT Display with integrated touchpad | Simultaneously displays Mass Flow, Volumetric Flow, Pressure and Temperature |
| Digital Communications Options ¹ | RS-232 Serial / RS-485 Serial / Modbus RTU / PROFIBUS / EtherNet/IP / DeviceNet / Modbus TCP/IP / EtherCAT |
| Analog Signal ² Options | 0-5 Vdc / 1-5 Vdc / 0-10 Vdc / 4-20 mA |
| Optional Secondary Output Signal ² | 0-5 Vdc / 1-5 Vdc / 0-10 Vdc / 4-20 mA |
| Electrical Connection Options | 8-Pin Mini-DIN / 9-pin D-sub (DB9) / 15-pin D-sub (DB15) / 6-pin locking / 8-pin M12 |
| Supply Voltage | 12 to 30 Vdc (15-30 Vdc for 4-20 mA outputs) |
| Supply Current | 0.250 Amp |

1. The **Digital Output Signal** communicates Mass Flow, Volumetric Flow, Pressure and Temperature

2. The **Analog Output Signal** and **Optional Secondary Analog Output Signal** communicate your choice of Mass Flow, Volumetric Flow, Pressure or Temperature

| Features | MCP Mass Flow Controller |
|------------------------|---|
| Gas Select™ 5.0 | Gas Select™ 5.0 provides 98 Preloaded Gas Calibrations: See the following page for a complete list. If your application calls for a gas not on this list, please let us know. We can also calibrate to a wide variety of complex gas mixtures involving up to eight gas constituents. |
| COMPOSER™ | COMPOSER™ is a feature of Gas Select™ 5.0 that allows users to define up to 20 user gas compositions with up to 5 constituent gases per mix (www.alicat.com/composer). |

Range Specific Specifications

| Full Scale Flow Mass Controller | Pressure Drop ¹ at FS Flow (psi) venting to atmosphere | Mechanical Dimensions ² | Process Connections ³ |
|---------------------------------|---|------------------------------------|----------------------------------|
| MCP 10 slpm | 1.1 | 4.1"H x 3.8"W x 1.1"D | 1/8" NPT Female |
| MCP 20 slpm | 1.5 | | |
| MCP 50 slpm | 5.0 | 4.4"H x 5.4"W x 1.6"D | 1/4" NPT Female |
| MCP 100 slpm | 15.5 | | |
| MCP 250 slpm | 57.0 | 5.0"H x 6.3"W x 1.6"D | |

1. Lower Pressure Drops Available, please see our **WHISPER-Series** mass flow controllers at www.alicat.com/whisper.

2. See drawings for metric equivalents.

3. Compatible with Swagelok® tube, Parker®, face seal, push connect and compression adapter fittings. VCR and SAE connections upon request.

Alicat Gas Select™ 5.0 Preloaded Gases

| PURE NON-CORROSIVE GASES | | |
|--------------------------|------------|---------------------|
| Gas Number | Short Name | Long Name |
| 14 | C2H2 | Acetylene |
| 0 | Air | Air |
| 1 | Ar | Argon |
| 16 | i-C4H10 | i-Butane |
| 13 | n-C4H10 | n-Butane |
| 4 | CO2 | Carbon Dioxide |
| 3 | CO | Carbon Monoxide |
| 60 | D2 | Deuterium |
| 5 | C2H6 | Ethane |
| 15 | C2H4 | Ethylene (Ethene) |
| 7 | He | Helium |
| 6 | H2 | Hydrogen |
| 17 | Kr | Krypton |
| 2 | CH4 | Methane |
| 10 | Ne | Neon |
| 8 | N2 | Nitrogen |
| 9 | N2O | Nitrous Oxide |
| 11 | O2 | Oxygen |
| 12 | C3H8 | Propane |
| 19 | SF6 | Sulfur Hexafluoride |
| 18 | Xe | Xenon |

| BREATHING GASES | | |
|-----------------|------------|---|
| Gas Number | Short Name | Long Name |
| 164 | EAN-32 | 32% O2 / 68% N2 |
| 165 | EAN | 36% O2 / 64% N2 |
| 166 | EAN-40 | 40% O2 / 60% N2 |
| 167 | HeOx-20 | 20% O2 / 80% He |
| 168 | HeOx-21 | 21% O2 / 79% He |
| 169 | HeOx-30 | 30% O2 / 70% He |
| 170 | HeOx-40 | 40% O2 / 60% He |
| 171 | HeOx-50 | 50% O2 / 50% He |
| 172 | HeOx-60 | 60% O2 / 40% He |
| 173 | HeOx-80 | 80% O2 / 20% He |
| 174 | HeOx-99 | 99% O2 / 1% He |
| 175 | EA-40 | Enriched Air-40% O2 |
| 176 | EA-60 | Enriched Air-60% O2 |
| 177 | EA-80 | Enriched Air-80% O2 |
| 178 | Metabol | Metabolic Exhalant (16% O2 / 78.04% N2 / 5% CO2 / 0.96% Ar) |

| CHROMATOGRAPHY GASES | | |
|----------------------|------------|-----------------|
| Gas Number | Short Name | Long Name |
| 29 | P-5 | 5% CH4 / 95% Ar |
| 206 | P-10 | 10% CH4 90% Ar |

| WELDING GASES | | |
|---------------|------------|------------------------------------|
| Gas Number | Short Name | Long Name |
| 23 | C-2 | 2% CO2 / 98% Ar |
| 22 | C-8 | 8% CO2 / 92% Ar |
| 21 | C-10 | 10% CO2 / 90% Ar |
| 140 | C-15 | 15% CO2 / 85% Ar |
| 141 | C-20 | 20% CO2 / 80% Ar |
| 20 | C-25 | 25% CO2 / 75% Ar |
| 142 | C-50 | 50% CO2 / 50% Ar |
| 24 | C-75 | 75% CO2 / 25% Ar |
| 25 | He-25 | 25% He / 75% Ar |
| 143 | He-50 | 50% He / 50% Ar |
| 26 | He-75 | 75% He / 25% Ar |
| 144 | He-90 | 90% He / 10% Ar |
| 27 | A1025 | 90%He/7.5%Ar/2.5%CO2 |
| 28 | Star29 | Stargon CS 90% Ar / 8% CO2 / 2% O2 |

| PURE CORROSIVES* | | |
|------------------|------------|----------------------------|
| Gas Number | Short Name | Long Name |
| 32 | NH3 | Ammonia |
| 80 | 1Butene | Butylene (1-Butene) |
| 81 | cButene | Cis-Butene (cis-2-butene) |
| 82 | iButene | Iso-Butene |
| 83 | tButene | Trans-Butene |
| 84 | COS | Carbonyl Sulfide |
| 33 | Cl2 | Chlorine |
| 85 | CH3OCH3 | Dimethylether |
| 34 | H2S | Hydrogen Sulfide (H2S) |
| 31 | NF3 | NF3 (Nitrogen Trifluoride) |
| 30 | NO | NO (Nitric Oxide) |
| 36 | C3H6 | Propylene (Propylene) |
| 86 | SiH4 | Silane (SiH4) |
| 35 | SO2 | Sulfur Dioxide |

*Pure Corrosive gases are only available on S-Series instruments that are compatible with these gases.
Gas numbers 33 and 35 require special valves on controllers. Request at time of order.

| BIOREACTOR GASES | | |
|------------------|------------|-------------------|
| Gas Number | Short Name | Long Name |
| 145 | Bio-5M | 5% CH4 / 95% CO2 |
| 146 | Bio-10M | 10% CH4 / 90% CO2 |
| 147 | Bio-15M | 15% CH4 / 85% CO2 |
| 148 | Bio-20M | 20% CH4 / 80% CO2 |
| 149 | Bio-25M | 25% CH4 / 75% CO2 |
| 150 | Bio-30M | 30% CH4 / 70% CO2 |
| 151 | Bio-35M | 35% CH4 / 65% CO2 |
| 152 | Bio-40M | 40% CH4 / 60% CO2 |
| 153 | Bio-45M | 45% CH4 / 55% CO2 |
| 154 | Bio-50M | 50% CH4 / 50% CO2 |
| 155 | Bio-55M | 55% CH4 / 45% CO2 |
| 156 | Bio-60M | 60% CH4 / 40% CO2 |
| 157 | Bio-65M | 65% CH4 / 35% CO2 |
| 158 | Bio-70M | 70% CH4 / 30% CO2 |
| 159 | Bio-75M | 75% CH4 / 25% CO2 |
| 160 | Bio-80M | 80% CH4 / 20% CO2 |
| 161 | Bio-85M | 85% CH4 / 15% CO2 |
| 162 | Bio-90M | 90% CH4 / 10% CO2 |
| 163 | Bio-95M | 95% CH4 / 5% CO2 |

| LASER GASES | | |
|-------------|------------|----------------------------------|
| Gas Number | Short Name | Long Name |
| 179 | LG-4.5 | 4.5% CO2 / 13.5% N2 / 82% He |
| 180 | LG-6 | 6% CO2 / 14% N2 / 80% He |
| 181 | LG-7 | 7% CO2 / 14% N2 / 79% He |
| 182 | LG-9 | 9% CO2 / 15% N2 / 76% He |
| 183 | HeNe-9 | 9% Ne / 91% He |
| 184 | LG-9.4 | 9.4% CO2 / 19.25% N2 / 71.35% He |

| O2 CONCENTRATOR GASES | | |
|-----------------------|------------|------------------------|
| Gas Number | Short Name | Long Name |
| 197 | OCG-89 | 89% O2 / 7% N2 / 4% Ar |
| 198 | OCG-93 | 93% O2 / 3% N2 / 4% Ar |
| 199 | OCG-95 | 95% O2 / 1% N2 / 4% Ar |

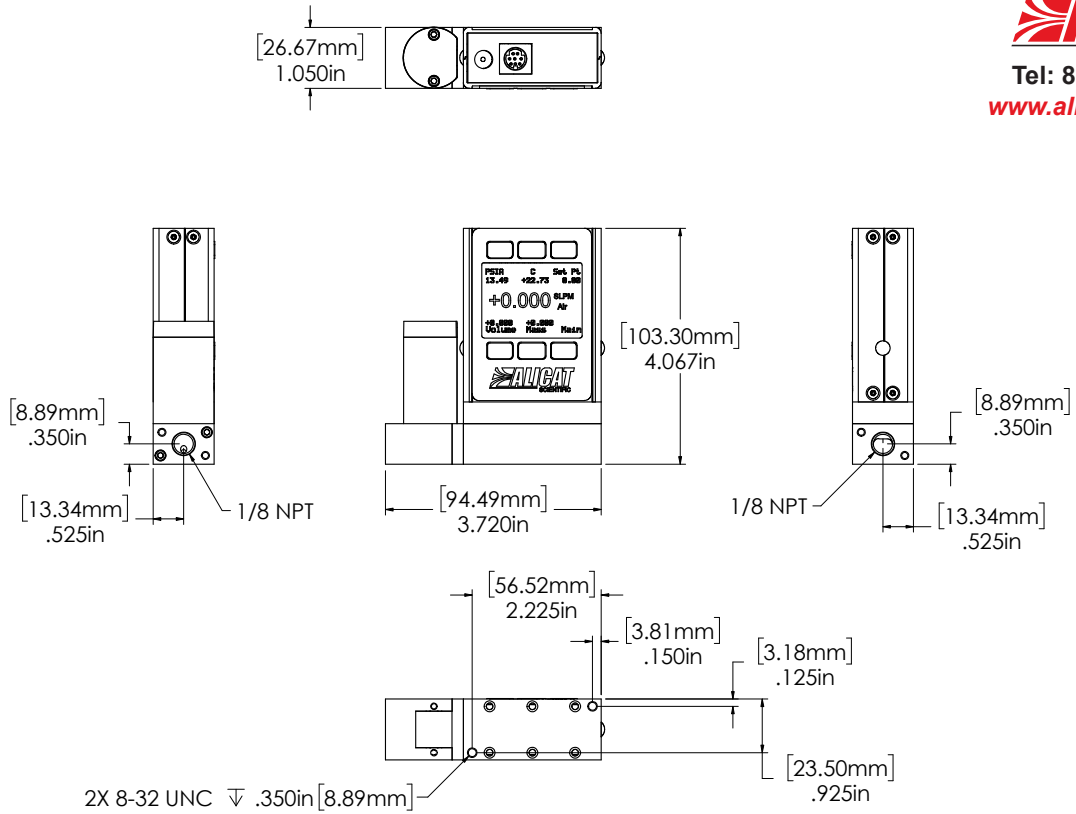
| REFRIGERANTS* | | |
|---------------|------------|------------------------------------|
| Gas Number | Short Name | Long Name |
| 100 | R-11 | Trichlorofluoromethane |
| 101 | R-115 | Chloropentafluoroethane |
| 102 | R-116 | Hexafluoroethane |
| 103 | R-124 | Chlorotetrafluoroethane |
| 104 | R-125 | Pentafluoroethane |
| 105 | R-134A | Tetrafluoroethane |
| 106 | R-14 | Tetrafluoromethane |
| 107 | R-142b | Chlorodifluoroethane |
| 108 | R-143a | Trifluoroethane |
| 109 | R-152a | Difluoroethane |
| 110 | R-22 | Difluoromonochloromethane |
| 111 | R-23 | Trifluoromethane |
| 112 | R-32 | Difluoromethane |
| 113 | RC-318 | Octafluorocyclobutane |
| 114 | R-404A | 44% R-125 / 4% R-134A / 52% R-143A |
| 115 | R-407C | 23% R-32 / 25% R-125 / 52% R-134A |
| 116 | R-410A | 50% R-32 / 50% R-125 |
| 117 | R-507A | 50% R-125 / 50% R-143A |

*Refrigerant gases are only available on S-Series instruments that are compatible with these gases.

| FUEL GASES | | |
|------------|------------|---|
| Gas Number | Short Name | Long Name |
| 185 | Syn Gas-1 | 40% H2 + 29% CO + 20% CO2 + 11% CH4 |
| 186 | Syn Gas-2 | 64% H2 + 28% CO + 1% CO2 + 7% CH4 |
| 187 | Syn Gas-3 | 70% H2 + 4% CO + 25% CO2 + 1% CH4 |
| 188 | Syn Gas-4 | 83% H2 + 14% CO + 3% CH4 |
| 189 | Nat Gas-1 | 93% CH4 / 3% C2H6 / 1% C3H8 / 2% N2 / 1% CO2 |
| 190 | Nat Gas-2 | 95% CH4 / 3% C2H6 / 1% N2 / 1% CO2 |
| 191 | Nat Gas-3 | 95.2% CH4 / 2.5% C2H6 / 0.2% C3H8 / 0.1% C4H10 / 1.3% N2 / 0.7% CO2 |
| 192 | Coal Gas | 50% H2 / 35% CH4 / 10% CO / 5% C2H4 |
| 193 | Endo | 75% H2 + 25% N2 |
| 194 | HHO | 66.67% H2 / 33.33% O2 |
| 195 | HD-5 | LPG 96.1% C3H8 / 1.5% C2H6 / 0.4% C3H6 / 1.9% n-C4H10 |
| 196 | HD-10 | LPG 85% C3H8 / 10% C3H6 / 5% n-C4H10 |

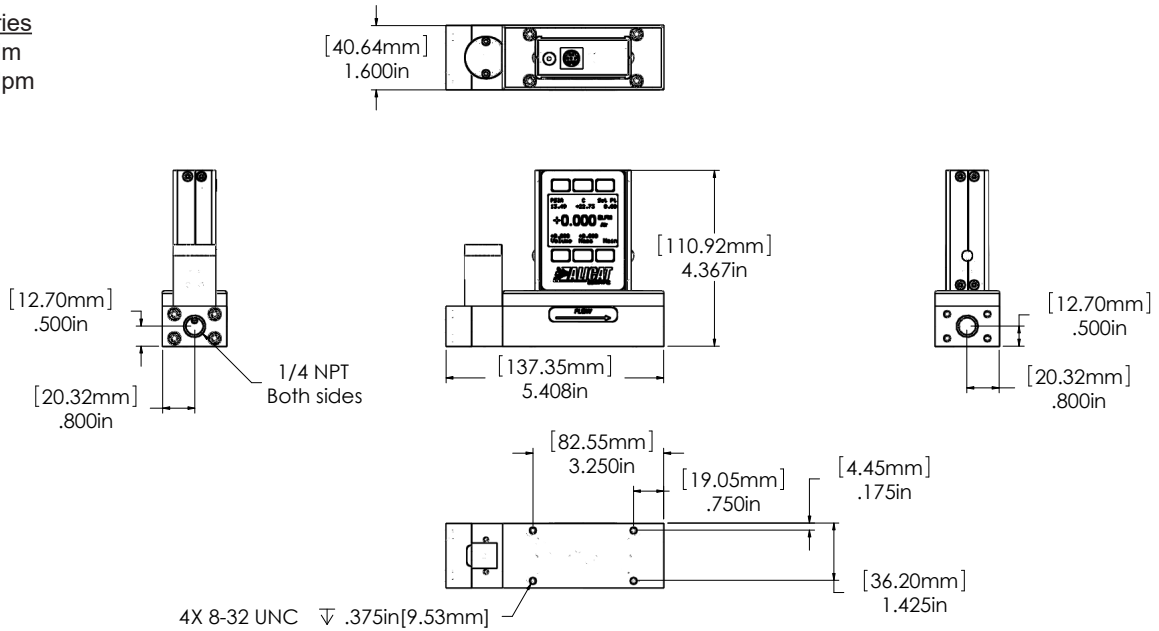
| STACK GASES | | |
|-------------|------------|--|
| Gas Number | Short Name | Long Name |
| 200 | FG-1 | 2.5% O2 / 10.8% CO2 / 85.7% N2 / 1% Ar |
| 201 | FG-2 | 2.9% O2 / 14% CO2 / 82.1% N2 / 1% Ar |
| 202 | FG-3 | 3.7% O2 / 15% CO2 / 80.3% N2 / 1% Ar |
| 203 | FG-4 | 7% O2 / 12% CO2 / 80% N2 / 1% Ar |
| 204 | FG-5 | 10% O2 / 9.5% CO2 / 79.5% N2 / 1% Ar |
| 205 | FG-6 | 13% O2 / 7% CO2 / 79% N2 / 1% Ar |

MCP-Series
 0 - 10 slpm
 0 - 20 slpm



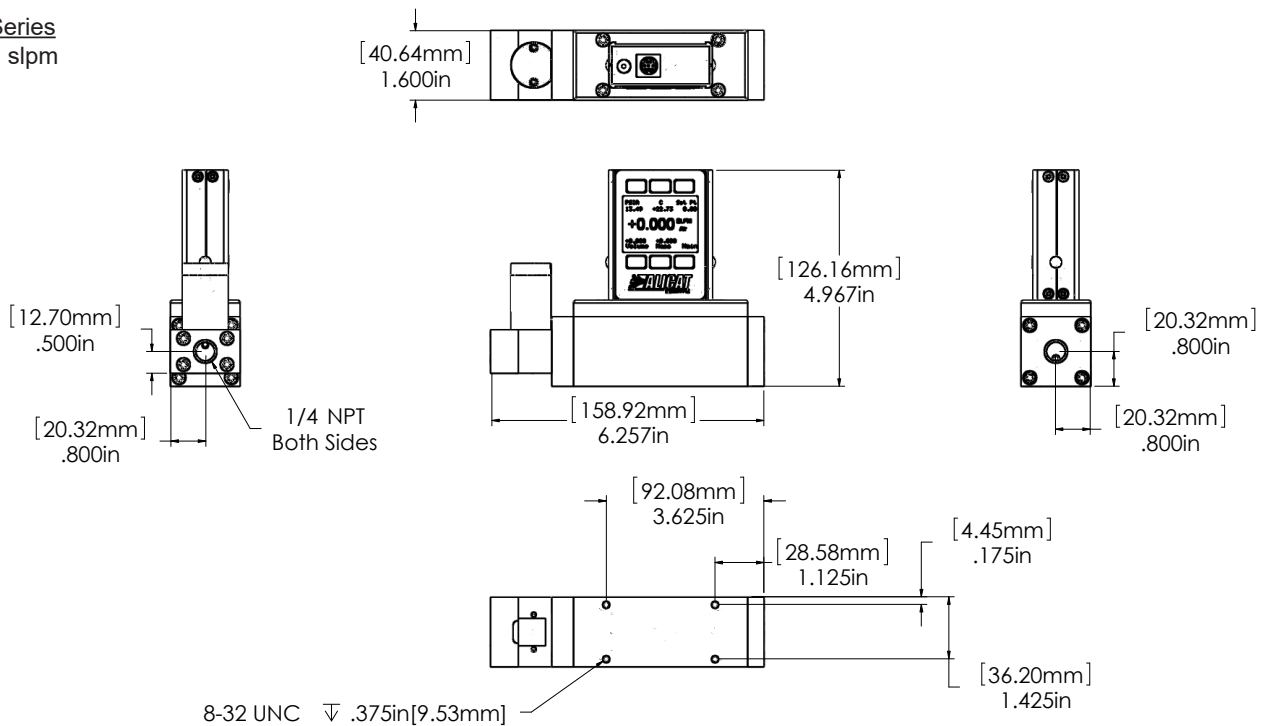
10 slpm to 20 slpm approximate shipping weight: 2.5 lb.

MCP-Series
 0 - 50 slpm
 0 - 100 slpm



50 slpm to 100 slpm approximate shipping weight: 3.0 lb.

MCP-Series
 0 - 250 slpm



250 slpm approximate shipping weight: 4.4 lb.