

# Technical Data for Alicat **MCS** and **MCRS** Mass Flow Controllers

## 0 – 0.5 sccm Full Scale through 0 – 3000 slpm Full Scale

Alicat MCS and MCRS instruments are built for use with certain aggressive gases.



Tel: 888-290-6060

[www.alicat.com/ms](http://www.alicat.com/ms)

### Standard Specifications (Contact Alicat for available options.)

Performance	MCS & MCRS 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) High Accuracy option not available for units ranged under 5 sccm or over 500 slpm.
Repeatability	± 0.2% Full Scale
Zero Shift and Span Shift	0.02% Full Scale / °Celsius / Atm
Operating Range / Turndown Ratio	0.5% to 100% Full Scale / 200:1 Turndown
Maximum Controllable Flow Rate	102.4% Full Scale
Typical Response Time	100 ms (Adjustable)
Warm-up Time	< 1 Second

Operating Conditions	MCS & MCRS Mass Flow Controller
Mass Reference Conditions (STP)	25°C & 14.696 psia (standard — others available on request)
Operating Temperature	-10 to +50 °Celsius
Humidity Range (Non-Condensing)	0 to 100%
Maximum Pressure	145 psig
Mounting Attitude Sensitivity	<b>MCS:</b> None <b>MCRS:</b> Mount with valve cylinder vertical & upright
Valve Type	Normally Closed
Ingress Protection	IP40
Wetted Materials	316LSS, 303SS, 430FRSS, FFKM (Kalrez) standard, Viton, EPDM, Buna, Neoprene as needed for some gases. If your application demands a different material, please contact Alicat.

Communications / Power	MCS & MCRS Mass Flow Controller
Monochrome LCD or Color TFT Display with integrated touchpad	Simultaneously displays Mass Flow, Volumetric Flow, Pressure and Temperature
Digital Output Signal <sup>1</sup> Options	RS-232 Serial / RS-485 Serial / PROFIBUS <sup>3</sup>
Analog Output Signal <sup>2</sup> Options	0-5 Vdc / 1-5 Vdc / 0-10 Vdc / 4-20 mA
Optional Secondary Analog Output Signal <sup>2</sup>	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
Supply Voltage	<b>MCS:</b> 12 to 30 Vdc (15-30 Vdc for 4-20 mA outputs) <b>MCRS:</b> 24 to 30 Vdc
Supply Current	<b>MCS:</b> 0.250 Amp <b>MCRS:</b> 0.750 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
3. If selecting **PROFIBUS**, no analog signal is available. PROFIBUS units do not have the display. See PROFIBUS specifications for PROFIBUS supply voltages and currents. ([www.alicat.com/profibus](http://www.alicat.com/profibus))

Features	MCS and MCRS Mass Flow Controller
<b>35 Gas Select™</b> 35 On-Board User Selectable Gas Calibrations	<p><b>Programmed Gases:</b> Acetylene, Air, Argon, Butane, Carbon Dioxide, Carbon Monoxide, Ethane, Ethylene (Ethene), Helium, Hydrogen, Iso-Butane, Krypton, Methane, Neon, Nitrogen, Nitrous Oxide, Oxygen, Propane, Sulfur Hexafluoride, Xenon, A-25, A-75, A1025, C-2, C-8, C-10, C-25, C-75, P-5, Star29, Ammonia, Hydrogen Sulfide, Nitric Oxide, Nitrogen Trifluoride, Propylene.</p> <p><b>Alicat's MCS &amp; MCRS controllers are also compatible with these aggressive gases:</b> Nitrogen Dioxide to 0.5% in an inert carrier, Refrigerant gases (<a href="http://www.alicat.com/ms">www.alicat.com/ms</a>)</p> <p>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.</p>

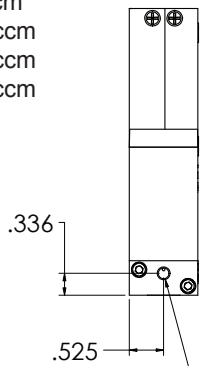
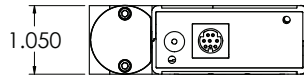
### Range Specific Specifications

Full Scale Flow Mass Controller	Pressure Drop <sup>1</sup> at FS Flow (psid) venting to atmosphere	Mechanical Dimensions	Process Connections <sup>2</sup>
<b>MCS</b> 0.5 sccm to 50 sccm	1.0	4.4"H x 3.4"W x 1.1"D	M-5 (10-32) Female Thread <sup>3</sup>
<b>MCS</b> 100 sccm to 500 sccm	1.0	4.6"H x 3.6"W x 1.1"D	1/8" NPT Female
<b>MCS</b> 1 slpm	1.5		
<b>MCS</b> 2 slpm	3.0		
<b>MCS</b> 5 slpm	2.0		
<b>MCS</b> 10 slpm	5.5		
<b>MCS</b> 20 slpm	20.0		
<b>MCRS</b> 50 slpm	2.0	5.7"H x 7.7"W x 2.3"D	1/4" NPT Female
<b>MCRS</b> 100 slpm	3.2	6.0"H x 7.7"W x 2.3"D	1/2" NPT Female
<b>MCRS</b> 250 slpm	2.4		
<b>MCRS</b> 500 slpm	6.5	6.0"H x 7.3"W x 2.3"D	3/4" NPT Female (A 1-1/4" NPT Female process connection is available for 2000 slpm controllers.)
<b>MCRS</b> 1000 slpm	14.0		
<b>MCRS</b> 1500 slpm	17.0		
<b>MCRS</b> 2000 slpm	28.6	6.0"H x 8.1"W x 2.9"D	1-1/4" NPT Female
<b>MCRS</b> 3000 slpm	16.8	6.0"H x 8.9"W x 2.9"D	

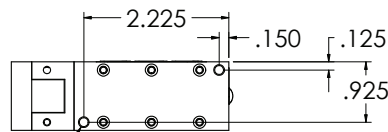
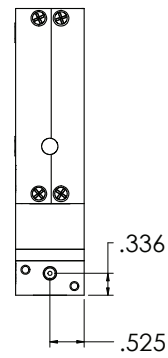
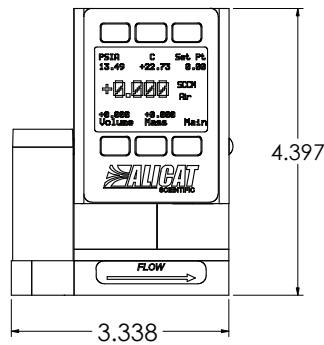
1. Lower Pressure Drops Available, please see our **WHISPER-Series** mass flow controllers at [www.alicat.com/whisper](http://www.alicat.com/whisper).
2. Compatible with Beswick®, Swagelok® tube, Parker®, face seal, push connect and compression adapter fittings. VCR and SAE connections upon request.
3. Shipped with M-5 (10-32) Male Buna-N O-ring face seal to 1/8" Female NPT fittings.

**MCS-Series**

- 0 – 0.5 sccm
- 0 – 1 sccm
- 0 – 2 sccm
- 0 – 5 sccm
- 0 – 10 sccm
- 0 – 20 sccm
- 0 – 50 sccm



M5X0.8 (10-32 UNF)  
Both Sides

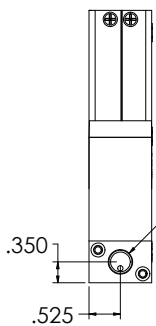
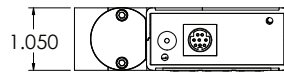


2X 8-32 UNC  $\nabla$  .175

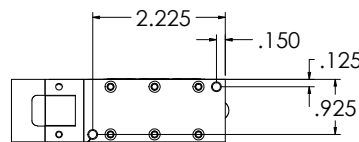
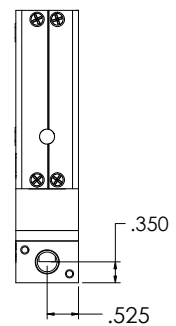
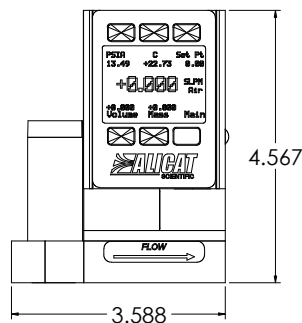
0.5 sccm to 50 sccm approximate shipping weight: 1.1 lb.

**MCS-Series**

- 0 – 100 sccm
- 0 – 200 sccm
- 0 – 500 sccm
- 0 – 1 slpm
- 0 – 2 slpm
- 0 – 5 slpm
- 0 – 10 slpm
- 0 – 20 slpm



1/8 NPT  
Both Sides

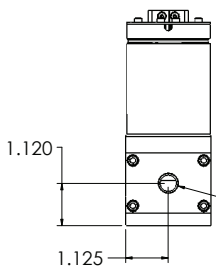
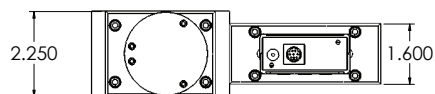


2X 8-32 UNC  $\nabla$  .35

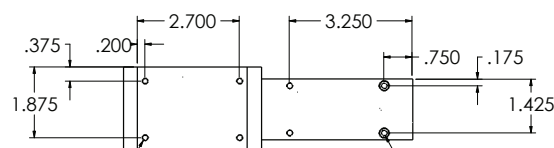
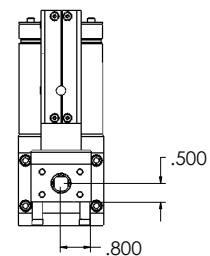
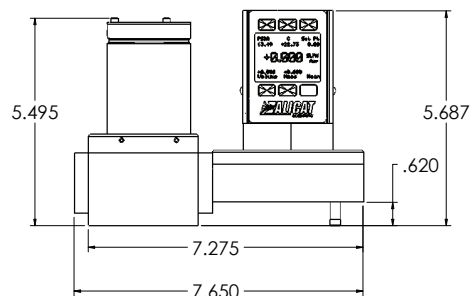
100 sccm to 20 slpm approximate weight: 1.2lb

**MCRS-Series**

- 0 – 50 slpm
- 0 – 100 slpm



1/4 NPT  
Both Sides



4X 8-32 UNC  $\nabla$  .375

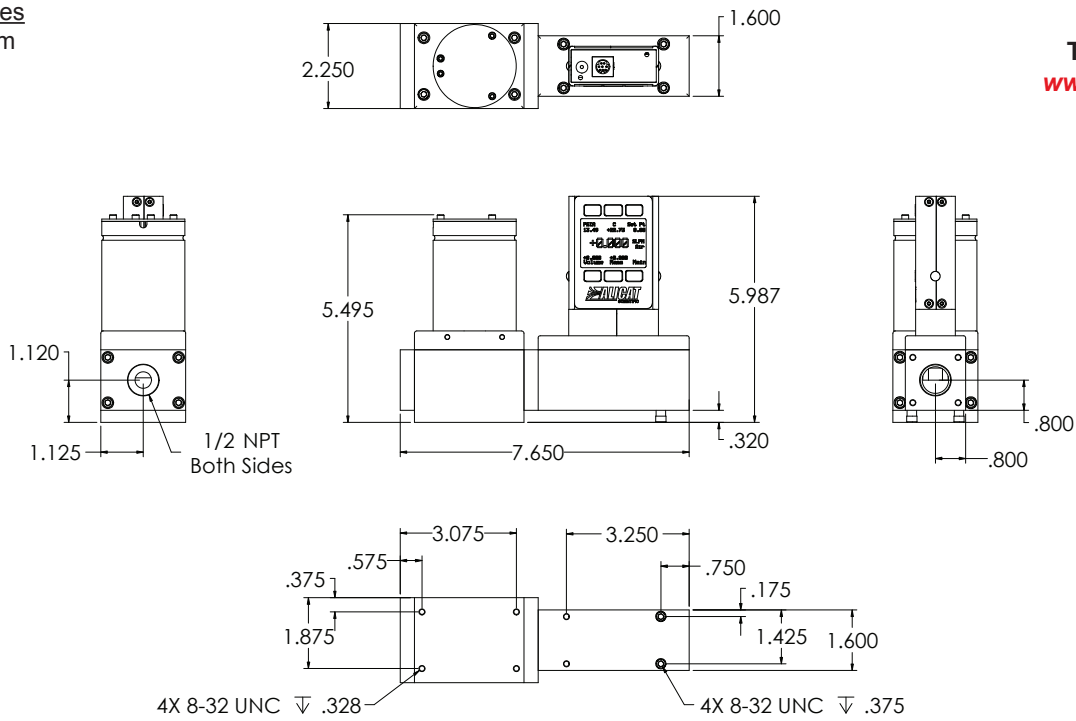
4X 8-32 UNC  $\nabla$  .375

MCRS 50 slpm to 100 slpm approximate weight: 9.0 lb.

MCRS-Series  
0 – 250 slpm

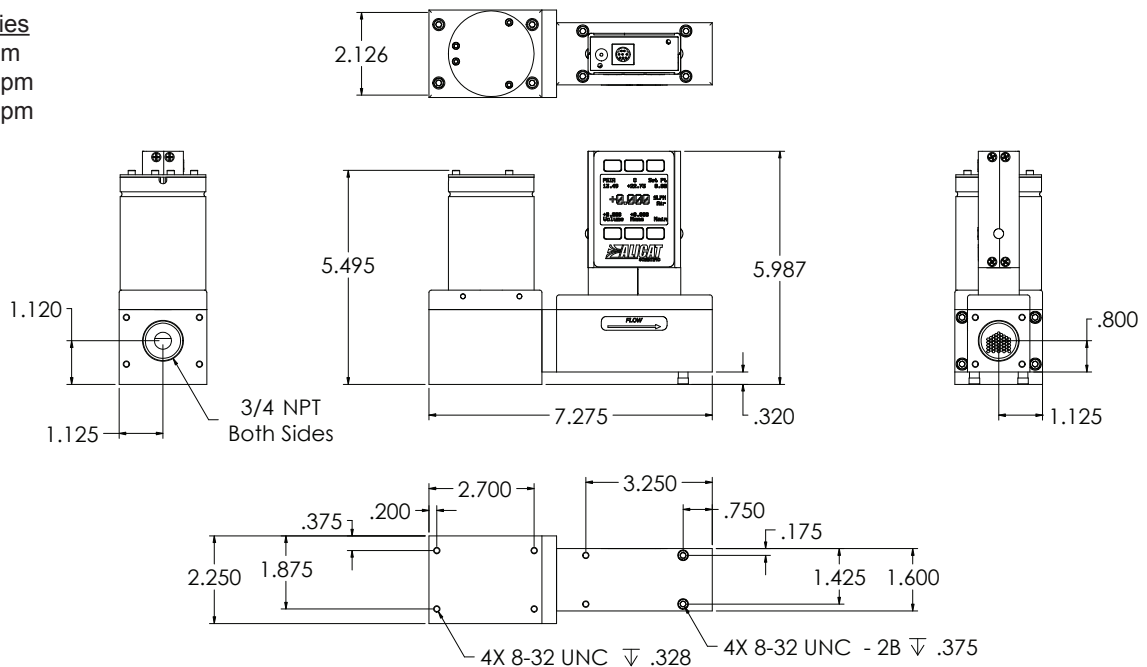


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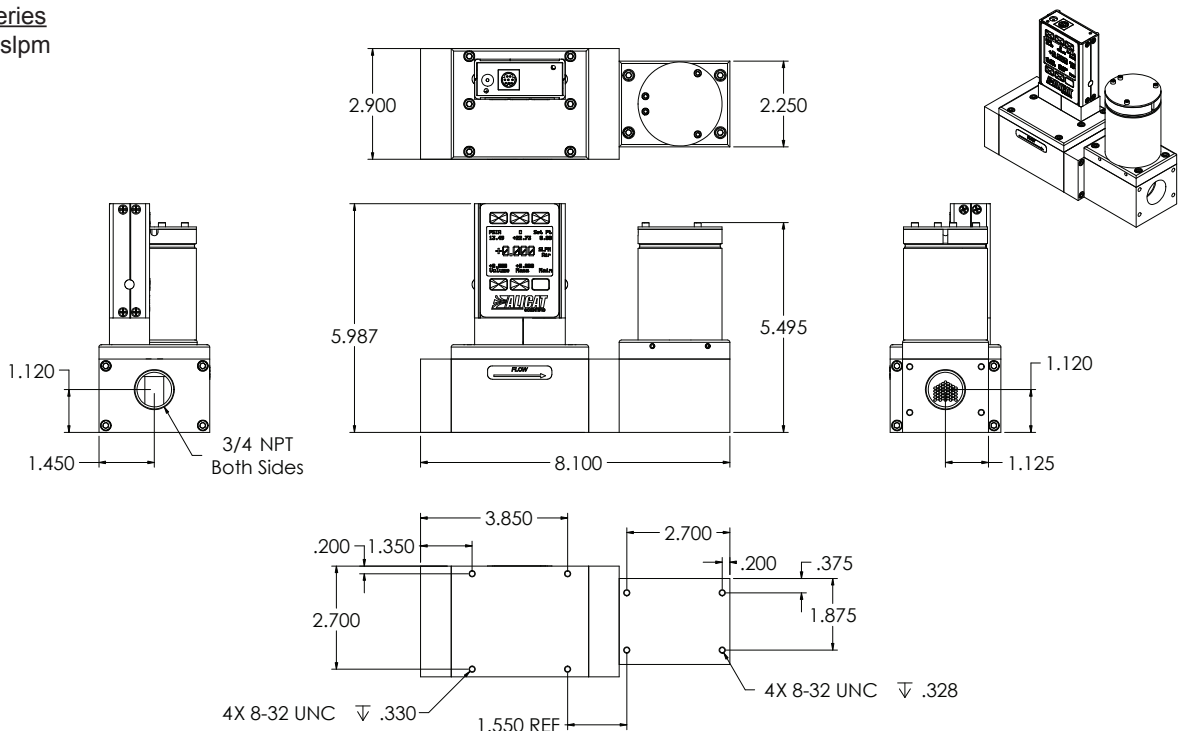
MCRS 250 slpm approximate weight: 9.0 lb.

MCRS-Series  
0 – 500 slpm  
0 – 1000 slpm  
0 – 1500 slpm



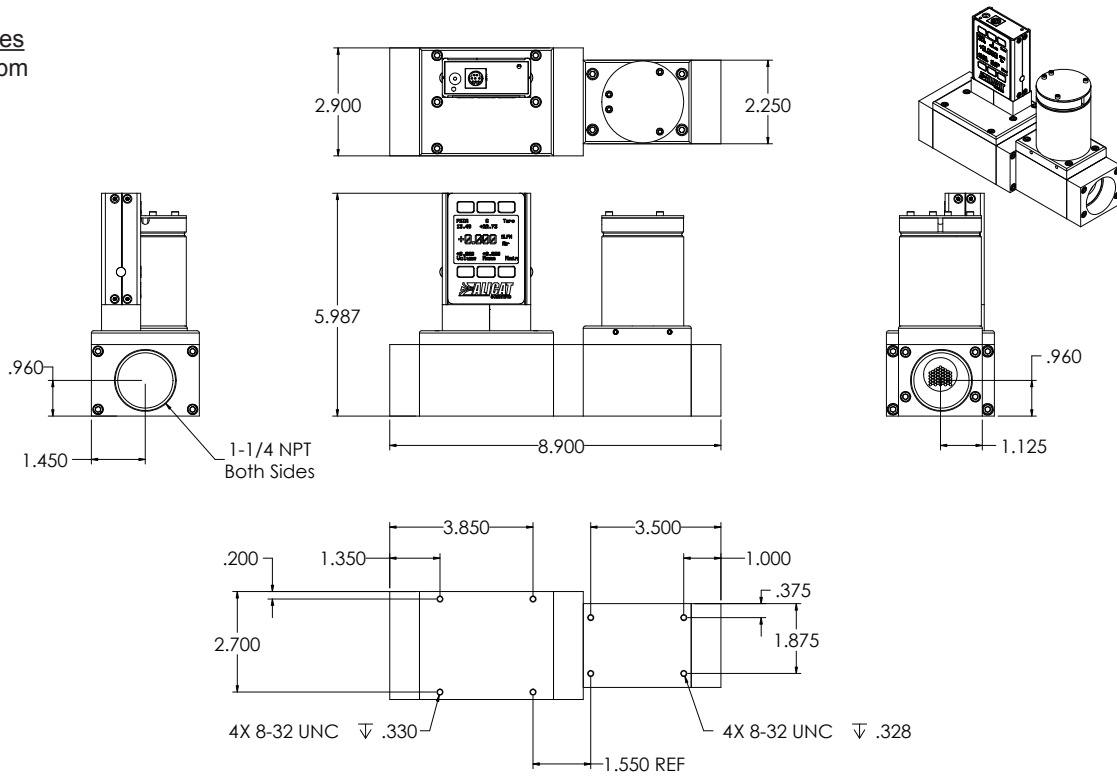
MCRS 500 slpm to 1500 slpm approximate weight: 9.0 lb.

MCRS-Series  
0 – 2000 slpm



MCRS 2000 slpm approximate weight: 12.0 lb.

MCRS-Series  
 0 – 3000 slpm



MCRS 3000 slpm approximate weight: 12.0 lb.