

MC Series

Digital Mass Flow Control



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Series Overview

Alicat Scientific MC-Series digital mass flow controllers precisely measure and control the mass flow rate, volumetric flow rate and pressure of process gases via customized high-speed proportional control valves. They also measure and display gas temperature.

At the heart of Alicat's MC-Series mass flow controllers is a patented, internally compensated, laminar differential pressure measurement technology that yields linear results over a very wide flow range. This produces volumetric and mass flow data that is fully compensated for changes in pressure and temperature and corrected for the user's STP. All mass flow instruments come with NIST-traceable calibration.

With no internal moving parts or heating elements, the MC Series is electrically efficient and insensitive to bumps or changes in orientation. Alicat backs every mass flow instrument with generous customer support, including free technical phone support, prompt recalibration service and a lifetime warranty.

Alicat MC-Series mass flow controllers feature large integrated displays with touchpad-accessible setpoint control and PID valve tuning. The MC Series comes with 30 selectable gas calibrations and analog and RS-232 digital communications. Extensive customizations are available, including Class 1, Div 2 ATEX/CSA ratings for use in hazardous environments. The Series is available with corrosion-resistant wetted materials (MCS Series) and low pressure drop (MCW Series).



Applications

Alicat Scientific MC-Series digital mass flow controllers are used in a variety of industries, from scientific and analytical testing to manufacturing and metrology. Multi-variable measurement and control functionality, multiple gas calibrations and a low 200:1 turndown ratio allow a single MC-Series controller to replace several application-specific devices. Available 0.4% accuracy, 0.2% full-scale repeatability and <100 ms control response times ensure optimal performance of gas flow processes.

The MC Series is available in full-scale mass flow rates from 0-0.5 sccm to 0-4000 slpm.

Technical Data for Alicat **MC** and **MCR** Mass Flow Controllers

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



Tel: 888-290-6060

www.alicat.com/mc

Standard Specifications (Contact Alicat for available options.)

Performance	MC & MCR 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	MC & MCR 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	MC: None MCR: Mount with valve cylinder vertical & upright
Valve Type	Normally Closed
Ingress Protection	IP40
Wetted Materials	MC: 303 & 302 Stainless Steel, Viton®, Silicone RTV (Rubber), Glass Reinforced Nylon, Aluminum, Brass, 430FR Stainless Steel, Silicon, Glass. MCR: 303 & 302 Stainless Steel, Viton®, Silicone RTV (Rubber), Glass Reinforced Nylon, Aluminum, 416 Stainless Steel, Nickel, Silicon, Glass. If your application demands a different material, please contact Alicat.

Communications / Power	MC & MCR Mass Flow Controller
Monochrome LCD or Color TFT Display with integrated touchpad	Simultaneously displays Mass Flow, Volumetric Flow, Pressure and Temperature
Digital Output Signal ¹ Options	RS-232 Serial / RS-485 Serial / PROFIBUS ³
Analog Output Signal ² Options	0-5 Vdc / 1-5 Vdc / 0-10 Vdc / 4-20 mA
Optional Secondary Analog 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
Supply Voltage	MC: 12 to 30 Vdc (15-30 Vdc for 4-20 mA outputs) MCR: 24 to 30 Vdc
Supply Current	MC: 0.250 Amp MCR: 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)

Features	MC & MCR Mass Flow Controller
30 Gas Select™ 30 On-Board User Selectable Gas Calibrations	Programmed Gases: 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 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. Alicat's MCS and MCRS controllers are also compatible with these aggressive gases: Ammonia, Hydrogen Sulfide, Nitric Oxide, Nitrogen Trifluoride, Propylene, Nitrogen Dioxide to 0.5% in an inert carrier, Refrigerant gases (www.alicat.com/ms)

Range Specific Specifications

Full Scale Flow Mass Controller	Pressure Drop ¹ at FS Flow (psid) venting to atmosphere	Mechanical Dimensions	Process Connections ²
MC 0.5 sccm to 50 sccm	1.0	3.9"H x 3.4"W x 1.1"D	M-5 (10-32) Female Thread ³
MC 100 sccm to 500 sccm	1.0	4.1"H x 3.6"W x 1.1"D	1/8" NPT Female
MC 1 slpm	1.5		
MC 2 slpm	3.0		
MC 5 slpm	2.0		
MC 10 slpm	5.5		
MC 20 slpm	20.0	5.5"H x 7.7"W x 2.3"D	1/4" NPT Female
MCR 50 slpm	2.0		
MCR 100 slpm	3.2	5.5"H x 7.7"W x 2.3"D	1/2" NPT Female
MCR 250 slpm	2.4		
MCR 500 slpm	6.5	5.5"H x 7.4"W x 2.3"D	3/4" NPT Female
MCR 1000 slpm	14.0		
MCR 1500 slpm	17.0		
MCR 2000 slpm	28.6	5.5"H x 8.1" W x 2.9" D	(A 1-1/4" NPT Female process connection is available for 2000 slpm controllers.)
MCR 3000 slpm	16.8	5.5"H x 8.9" W x 2.9" D	1-1/4" NPT Female

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