

Technical Data for Alicat **BIOC-Series** Mass Flow Controllers

10 sccm of Full Scale through 20 slpm of Full Scale



Tel: 888-290-6060

www.alicat.com/bioc

Standard Specifications (Contact Alicat for available options.)

| SENSOR PERFORMANCE | | |
|---|---|----------------------------------|
| Mass Flow Accuracy at calibration conditions ¹ | ± 0.6% of Reading | 16.7% - 100% of Full Scale Range |
| | ± 0.1% of Full Scale | 0% - 16.7% of Full Scale Range |
| Repeatability (2σ) | ± (0.1% of Reading + 0.02% of Full Scale) | |
| Steady State Control Range ² | 0.01% - 100% of Full Scale | |
| Temperature Sensitivity | Mass Flow Zero Shift: ± 0.01% of Full Scale per °C from tare temperature 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 Mass Flow Span Shift: ± 0.1% of Reading per atm from 1 atm | |
| Operating Temperature Range | -10 to 60°C (consult Alicat for expanded range) | |
| Temperature Accuracy | ± 0.75°C | |
| Operating Pressure Full Scale | 160 PSIA (consult Alicat for additional options) | |
| Pressure Accuracy | Above 1 atm: ± 0.5% of Reading | Below 1 atm: ± 0.07 PSIA |
| Typical Sensor Response Time | < 10 ms (Adjustable) | |
| Typical Warm-Up Time | < 1 s | |

1 Stated accuracy is after tare under equilibrium conditions. Extreme gas behavior (especially near state boundaries) can introduce additional flow uncertainties. Consult Alicat if higher accuracy is required.

2 Achievable steady state control may be limited by user-configurable PID tuning and process conditions. Dynamic control performance is also limited by control response time, which may vary with the flow rate.

| MECHANICAL | |
|---|---|
| Minimum Operating Pressure | 11.5 PSIA common mode pressure (consult Alicat for lower operating pressures) Differential pressure must exceed model pressure drop, see below for details |
| Maximum Operating Pressure | Damage possible above 175 PSIA common mode pressure Damage possible above 75 PSID differential pressure |
| Ingress Protection | IP40 (consult Alicat for additional options) |
| Humidity Range | 0 to 95% non-condensing |
| Dimensions, pressure drop, weight, and process connection specifications are listed on mechanical drawing pages | |

| CONTROL AND COMMUNICATIONS | | |
|---------------------------------|---|-----------------|
| Analog I/O | 0-5 VDC (Serial and Modbus RTU only) | |
| Digital I/O Options | DeviceNet, EtherCAT, EtherNet/IP, Modbus RTU over RS-232, Modbus RTU over RS-485, Modbus TCP/IP, Profibus, RS-232 Serial, RS-485 Serial | |
| Electrical Connection | 8 pin M12 or Protocol Dependent | |
| Power Requirements ³ | 12-24 VDC, 550 mA min. | |
| Data Update Rate ³ | Serial: 40 Hz at 19200 baud | Analog: 1000 Hz |
| Display Update Rate | 10 Hz | |
| Analog Signal Accuracy | ± 0.1% of Full Scale additional uncertainty | |
| Typical Control Response Time | 30 ms to 63% of step change (T63) | |
| Valve Function | Normally Closed | |

3 Consult the individual operating bulletins for specific industrial protocol power requirements and data transmission specifications.

| FEATURES | |
|--|--|
| STP Reference Conditions | 25°C and 1 atm (Default), user configurable |
| NTP Reference Conditions | 0°C and 1 atm (Default), user configurable |
| Color TFT Display with integrated touchpad | Simultaneously displays Mass Flow, Volumetric Flow, Pressure and Temperature |
| 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™ | Allows 20 user definable gas mixes. Up to 5 constituent gases per mix, down to percentages of 0.01% |

Wetted Materials

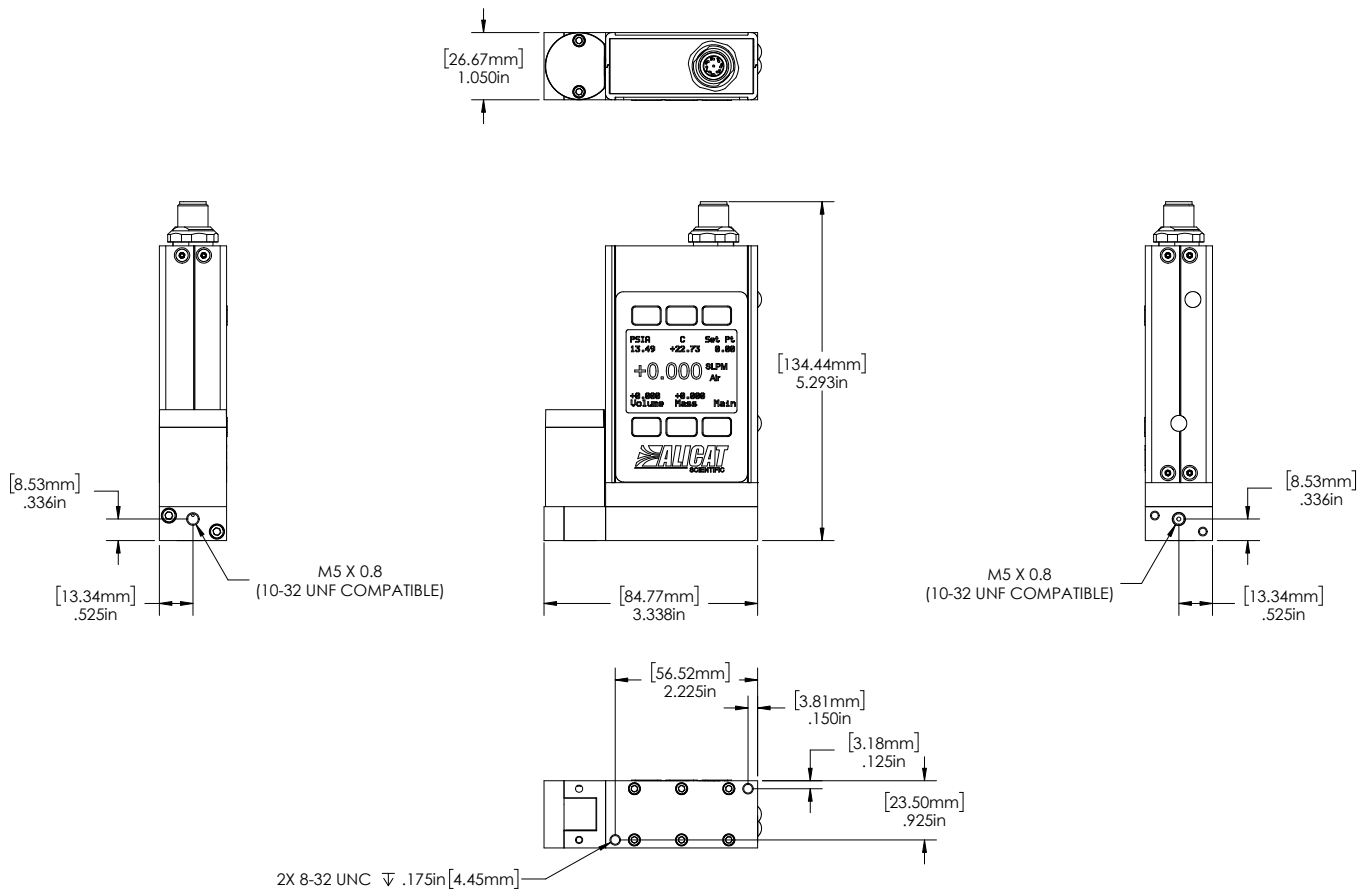
| | | |
|--|---------------|---|
| FLOW BODY WETTED MATERIALS | OPTION | VALVE WETTED MATERIALS |
| 316L Stainless Steel, USP VI FDA Certified Viton Elastomers | A | FFKM, 316L Stainless Steel, Elgiloy Super Alloy, Sandvik Super Alloy |
| | B | 302/303/430FR Stainless Steel, Brass, Viton |
| Each controller has 3 parts: Flow body · Sensor · Valve | OPTION | SENSOR WETTED MATERIALS |
| | A | 316L Stainless Steel |
| ASME BPE-2016 Compliance Requires both Valve A and Sensor A | B | Polyamide, Alumina, Ceramic, Glass, Gold, Silicon, Nylon, Delrin, Heat Cured Epoxy, RTV, Silicone |

BIOC-Series

0 – 10 sccm

0 – 20 sccm

0 – 50 sccm



Flow Range Specific Specifications

| FULL SCALE FLOW MASS CONTROLLER | PRESSURE DROP AT FS FLOW (PSID) VENTING TO ATMOSPHERE ⁵ | APPROXIMATE WEIGHT | MECHANICAL DIMENSIONS ⁶ | PROCESS CONNECTIONS ⁷ |
|---------------------------------|--|--------------------|------------------------------------|----------------------------------|
| 10 sccm – 50 sccm | 1.0 | 0.8 lb | 5.3"H x 3.4"W x 1.1"D | M-5 (10-32) Female |

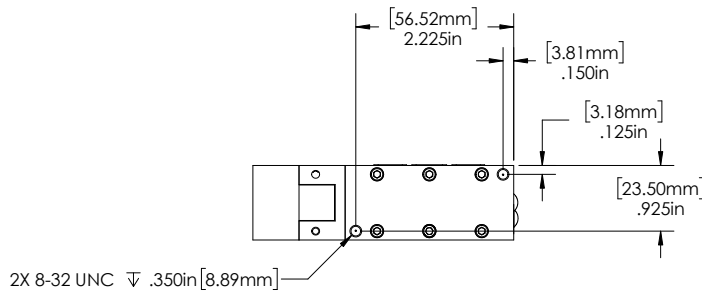
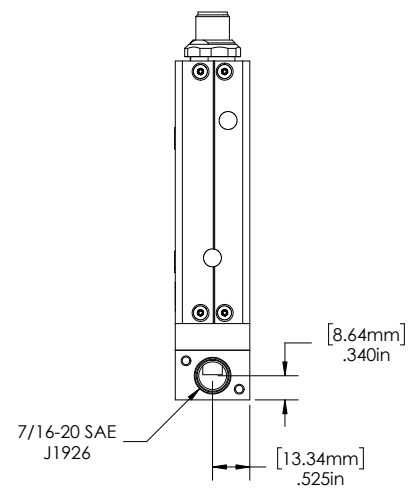
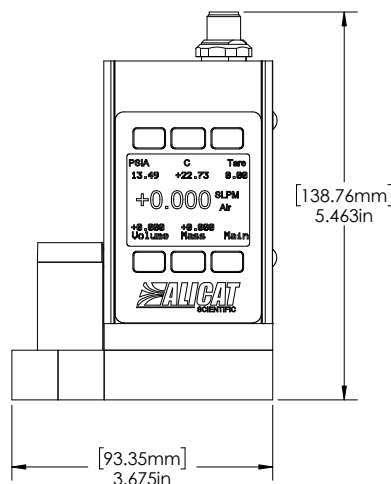
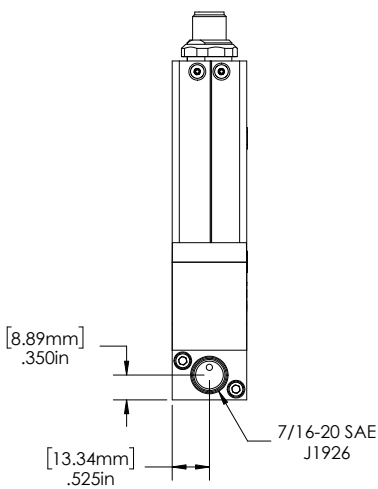
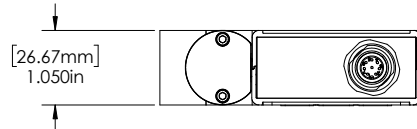
5 Lower pressure drops available, please see our WHISPER-Series mass flow controllers at www.alicat.com/whisper.

6 See drawings for metric equivalents.

7 Additional process connections available on request. Consult Alicat for more information.

BIOC-Series

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



Flow Range Specific Specifications

| FULL SCALE FLOW MASS CONTROLLER | PRESSURE DROP AT FS FLOW (PSID) VENTING TO ATMOSPHERE ⁵ | APPROXIMATE WEIGHT | MECHANICAL DIMENSIONS ⁶ | PROCESS CONNECTIONS ⁷ |
|---------------------------------|--|--------------------|------------------------------------|----------------------------------|
| 100 sccm – 500 sccm | 1.0 | 1.0 lb | 5.5"H x 3.7"W x 1.1"D | 7/16-20 SAE4 Female |
| 1 slpm | 1.5 | | | |
| 2 slpm | 3.0 | | | |
| 5 slpm | 2.0 | | | |
| 10 slpm | 5.5 | | | |
| 20 slpm | 20.0 | | | |

5 Lower pressure drops available, please see our WHISPER-Series mass flow controllers at www.alicat.com/whisper.

6 See drawings for metric equivalents.

7 Additional process connections available on request. Consult Alicat for more information.

