Technical Data for Alicat BIOC-Series Mass Flow Controllers

1 sccm of Full Scale through 5 sccm 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]	± (0.8% of Reading + 0.2% of Full Scale)	
Repeatability (2σ)	± (0.2% of Reading + 0.02% of Full Scale)	
Steady State Control Range[2]	0.01% - 100% of Full Scale	
Temperature Sensitivity	Mass Flow Zero and Span Shift: 0.02% Full Scale / °C	
Pressure Sensitivity	Mass Flow Zero and Span Shift: ± (0.08% of Reading + 0.02% Full Scale) / 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	100 - 1000 ms (flow rate dependent)	
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 weatherproofing 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	100 - 4000 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
316L Stainless Steel, USP VI FDA Certified Viton Elastomers

Each controller has 3 parts:
Flow body · Sensor · Valve

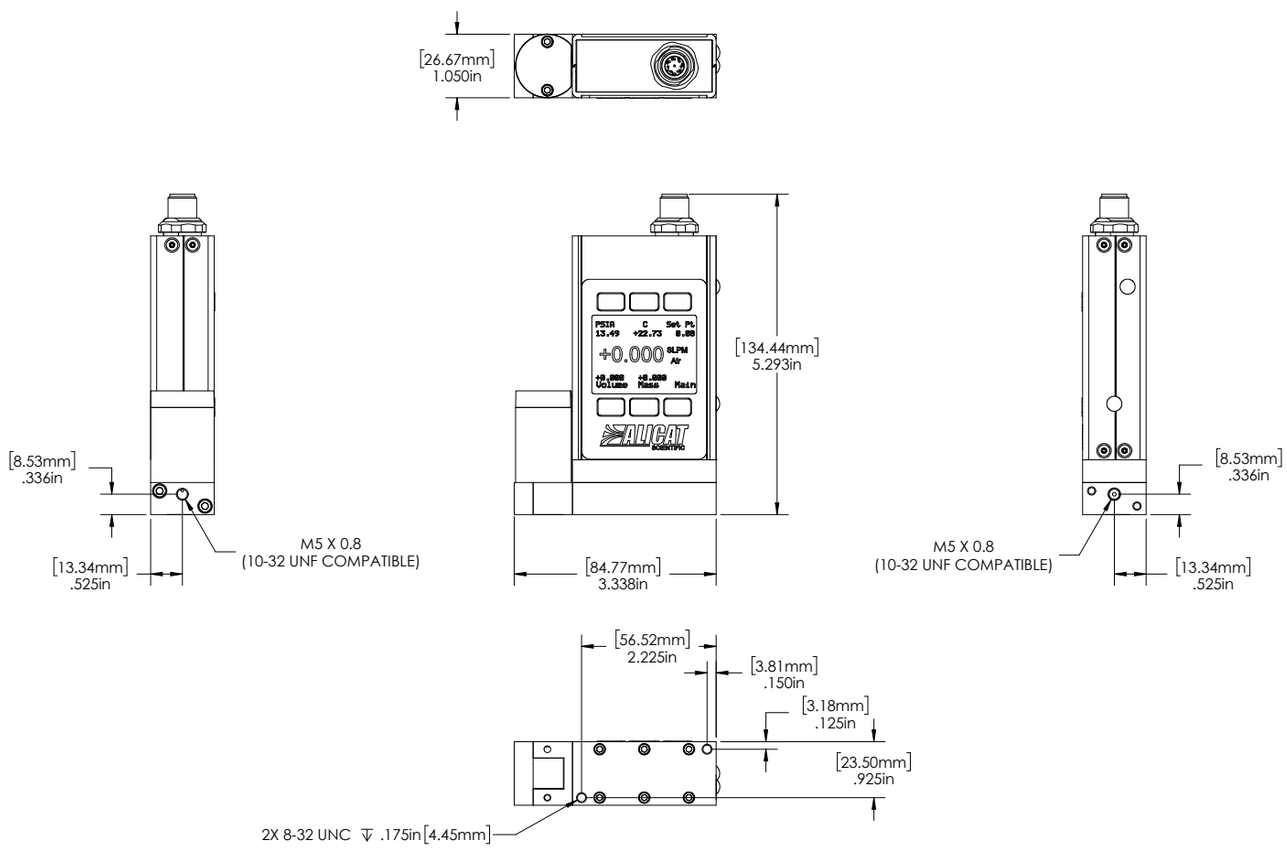
ASME BPE-2016 Compliance Requires both Valve A and Sensor A

OPTION	VALVE WETTED MATERIALS
A	FFKM, 316L Stainless Steel, Elgiloy Super Alloy, Sandvik Super Alloy
B	302/303/430FR Stainless Steel, Brass, Viton

OPTION	SENSOR WETTED MATERIALS
A	316L Stainless Steel
B	Polyamide, Alumina, Ceramic, Glass, Gold, Silicon, Nylon, Delrin, Heat Cured Epoxy, RTV, Silicone

BIOC-Series

0 – 1 sccm
0 – 2 sccm
0 – 5 sccm



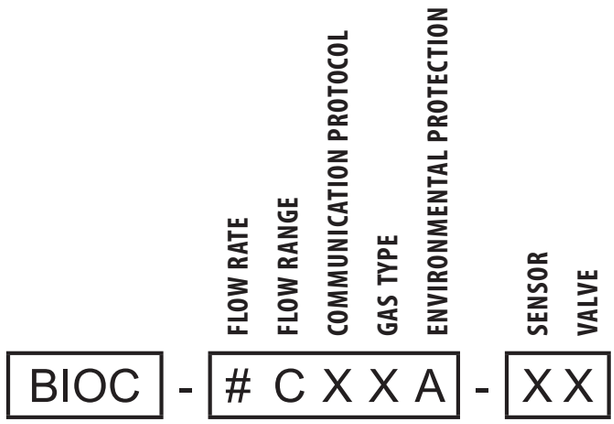
Flow Range Specific Specifications

FULL SCALE FLOW MASS METER	RECOMMENDED INLET PRESSURE[4]	APPROXIMATE WEIGHT	MECHANICAL DIMENSIONS[5]	PROCESS CONNECTIONS[6]
1 sccm to 5 sccm	20 to 80 PSIG	1.0 lb	5.3"H x 3.4"W x 1.1"D	M-5 (10-32) Female

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

5 See drawings for metric equvalents.

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



FLOW RATE
1
2
5

FLOW RANGE	
C	sccm

COMMUNICATION PROTOCOL	
A	RS-232 Serial/Analog[1]
B	RS-485 Serial/Analog[1]
C	Modbus RTU over RS-232/Analog[1]
D	Modbus RTU over RS-485/Analog[1]
E	Profibus
F	EtherNet/IP[1]
G	DeviceNet
H	Modbus TCP/IP[1]
I	EtherCAT[1]

1 Includes TFT display

GAS TYPE		ADDED COST
A	O_2	Yes
B	CO_2	No
C	N_2	No
D	Air	No

INGRESS PROTECTION		ADDED COST
A	IP40	No

Wetted Materials

SENSOR MATERIALS		ADDED COST
A	316L Stainless Steel	Yes
B	Polyamide, Alumina, Ceramic, Glass, Gold, Silicon, Nylon, Delrin, Heat Cured Epoxy, RTV, Silicone	No

VALVE MATERIALS		ADDED COST
A	FFKM, 316L Stainless Steel, Elgiloy Super Alloy, Sandvik Super Alloy	Yes
B	302/303/430FR Stainless Steel, Brass, Viton	No