Technical Data for Alicat BIO-Series Mass Flow Meters

1 sccm of Full Scale through 5 sccm of Full Scale

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)	
Flow Measurement Range	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% of 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.

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 Requirements2	12-24 VDC, 325 mA min.	
Data Update Rate2	Serial: 40 Hz at 19200 baud	Analog: 1000 Hz
Display Update Rate	10 Hz	
Analog Signal Accuracy	± 0.1% of Full Scale additional uncertainty	

2 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

ASME BPE-2016 Compliance Requires Sensor A
Each meter has 2 parts: Flow body and Sensor

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

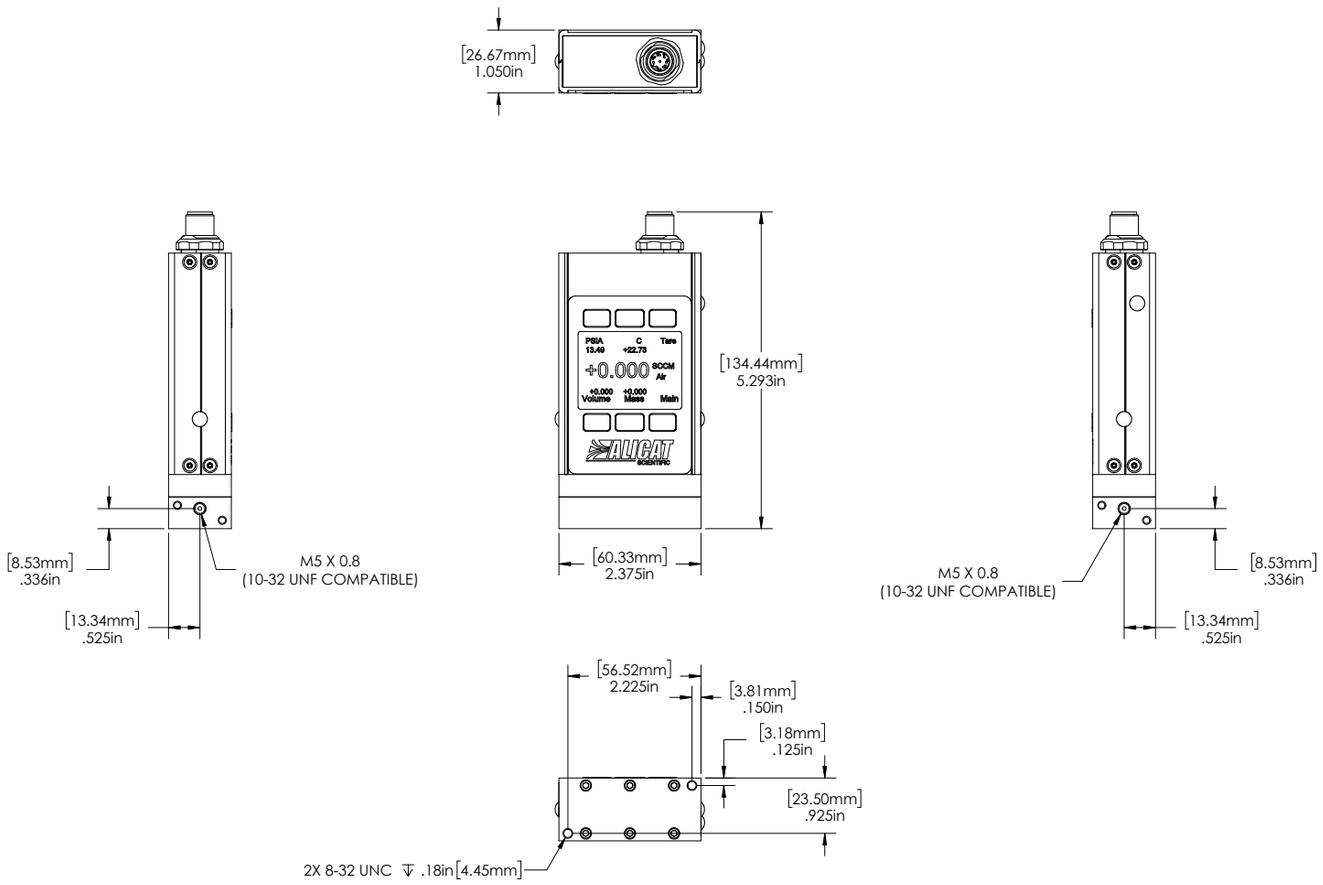
Product Mechanical Drawings and Dimensions

BIO-Series

0 – 1 sccm

0 – 2 sccm

0 – 5 sccm



Flow Range Specific Specifications

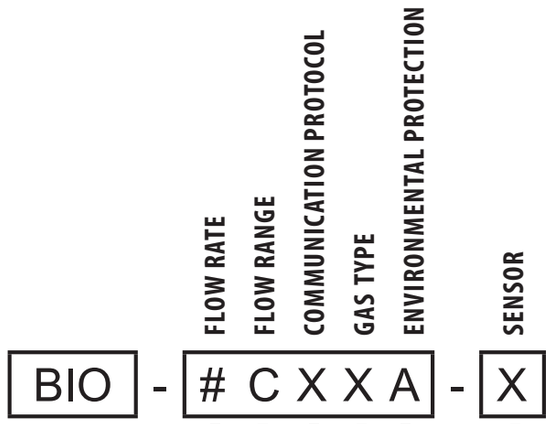
FULL SCALE FLOW MASS METER	PRESSURE DROP AT FS FLOW (PSID) VENTING TO ATMOSPHERE[3]	PHYSICAL DIMENSIONS[4]	APPROXIMATE WEIGHT	PROCESS CONNECTIONS[5]
1 sccm to 5 sccm	1.0	5.3”H x 2.4”W x 1.1”D	0.8 lb	M-5 (10-32) Female

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

4 See drawings for metric equivalents

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

Product Model Number Configuration



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