Economical OEM Digital Mass Flow Controller

FEATURES

- Industry best off-the-shelf delivery
- Accuracy: +/- 1.0% full scale for common gases (Air, Ar, CO2, CO, CH4, He, H2, O2, N2)
- Repeatability: +/- 0.25% full scale
- All the performance features of a digital mass flow controller at an OEM price
- Control gas mass flow rates to 50 slpm (nlpm)
- Advanced 316L SS platinum sensor technology and patented LFE provide excellent linear performance
- Available in both aluminum and 316 stainless steel flow bodies with Viton® elastomers
- Local display and digital setpoint control with optional analog setpoint/output signals
- RS-232 interfaces easily with PLC or workstation (user software supplied)
- RS-485 (addressable)
- Dual I/O DB9 comm ports for installation flexibility
- Field adjustable zero and span
- Powerful direct-acting control valve minimizes leak-by
- 300 ms control valve time constant
- Small footprint facilitates replacement of older MFC's
- CE Approved

SmartTrak 50 ®

DESCRIPTION

S ierra Instruments' SmartTrak® 50 Series is a digital gas mass flow controller designed to meet the low-cost budgetary requirements of OEM's while maintaining excellent quality and performance. Inspired by the need for accurate and reliable gas mass flow control at an OEM price, the 50 Series delivers by building on the same core sensor, LFE and valve technology found in our award-winning SmartTrak 100 Series, all backed by industry best off-the-shelf fast product delivery and Sierra's style of personalized customer support. Our 50 Series has a standard accuracy of +/- 1.0% of full scale. The flexible and powerful direct-acting control valve sets it apart from the competition by minimizing leak-by, while offering a 300 ms response time to setpoint changes at +/- 0.25% repeatability.

It is our philosophy that core sensor technology must be of the highest quality and performance to make an excellent MFC. In contrast to the many wetted parts of CMOS and MEMS flow sensors, Sierra uses its most advanced 316L stainless steel platinum-wound capillary sensor technology ensuring the very best mass flow control for nearly any clean gas. As a result, the 50 Series shares the same advanced sensor as the flagship SmartTrak 100 Series, while incorporating a slightly varied valve and laminar flow element design also inspired by the original Smart-Trak. A more efficient manufacturing process, a streamlined design, and our partnership with a very strong supplier base combined to make the 50 Series a reality.

Experience our passion for flow with the 50 Series in your next application.

www.sierrainstruments.com

PERFORMANCE SPECIFICATIONS

Accuracy
+/- 1.0% of full scale including linearity under calibration conditions over 32° to 122°F (0° to 50°C) and 5 to 145 psig (0.3 to 10 barg).

Repeatability
+/- 0.25% of full scale

Temperature Coefficient
0.025% of full scale per °F (0. 05% of full scale per °C), or better

Pressure Coefficient
0.01% of full scale per psi (0.15% of full scale per bar), or better

Response Time
300 ms time constant; two seconds (typical) to within +/- 2% of final value including setting time. May be tuned to be faster or slower (consult factory)

OPERATION SPECIFICATIONS

Gases
All neutral, non-contaminated dry and clean gases compatible with wetted materials aluminum, stainless steel and Viton®

Mass Flow Rates
The 50 Series can be calibrated for any gas compatible with viton, aluminum and stainless steel, using any units, to either normal or standard conditions, for flow rates up to 50 slpm air equivalent. Standard calibrations are available for ranges (slpm air equivalent) from 20 sccm/nccm to 50 slpm/nlpm. Above 50 slpm, please consider the SmartTrak® 100 Series

Gas Pressure:
145 psig (10 barg) maximum, burst tested to 225 psig (15 barg)

Differential Pressure Requirement
15 to 20 psi (1.0 to 1.3 bar) see table

Gas and Ambient Temperature
32°F to 122°F (0 to 50°C)

Leak Integrity
5 X 10-9 atm cc/sec of helium maximum

Power Requirements
Meter: 24 VDC (+/- 10%) 85 mA regulated
Controller: 24 VDC (+/-10%), 315 mA, regulated, RS-485 option adds 130 mA

Control Range
5 to 100% of full scale flow (20:1) at published accuracy. Automatic shut-off off at 4.9% of full scale
Output and Command (Setpoint) Signal
• RS-232

Optional:
• Linear 4-20 mA, 500 ohms maximum load resistance.
• Linear 0-5 VDC
• RS-485 Addressable (no analog outputs)
• Zero, span, and setpoint are field adjustable via supplied user software and RS-232 communications cable
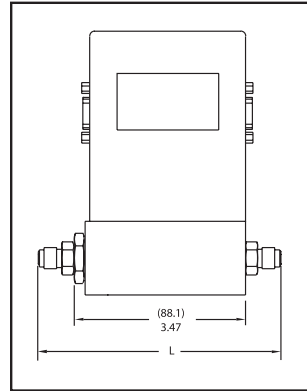
Display
Flow rate, units, full scale, and setpoint. Display may be mounted on the front or back of the unit.
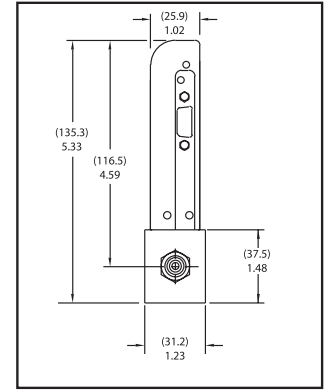
PHYSICAL SPECIFICATIONS & DIMENSIONS

Wetted Material
Anodized aluminum or 316 stainless steel flow body. 316L stainless steel sensor tubes; Viton® O-rings and valve seats.
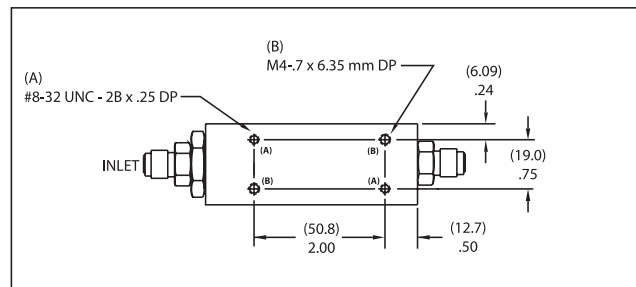
50 Series - Front View

50 Series - Side View

Fittings	Dimension L
1/8-inch SS compression	5.31 (134.8)
1/4-inch SS compression	5.49 (139.4)
1/4-inch VCO	5.03 (127.7)
1/4-inch VCR	5.35 (135.8)
6 mm compression	5.51 (139.9)
1/4-inch NPT	5.32 (135.1)
1/8-inch brass compression	5.31 (134.8)
1/4-inch brass compression	5.49 (139.4)

50 Series - Bottom View

Note: Units in inches (mm in parenthesis)

Pressure Drop

slpm	Pressure Drop psid (mbar) Meter	Minimum Delta psid (mbar) Controller	Pressure Drop psid (mbar) Meter	Minimum Delta psid (mbar) Controller
	1/4-inch Standard Fitting	1/4-inch Standard Fitting	3/8-inch Standard Fitting	3/8-inch Standard Fitting
0.02	.45 (31.0)	1 (68.95)	N/A	N/A
.200	.45 (31.0)	1.5 (103.4)	N/A	N/A
1.00	0.46 (31.7)	1.88 (129.6)	N/A	N/A
5.00	0.54 (37.2)	4.70 (324.1)	N/A	N/A
10.00	0.58 (40.0)	7.5 (517.1)	0.51 (35.2)	4.75 (327.5)
20.00	0.83 (57.2)	15 (1034.3)	0.59 (40.7)	8.25 (568.8)
50.00	2.72 (187.5)	50 (3448)	1.25 (86.2)	18.75 (1292.8)

Software Screenshots

User Program Interface

	Features					Option		
50 -	1	2	3	4	5	1	2	3
Parent								
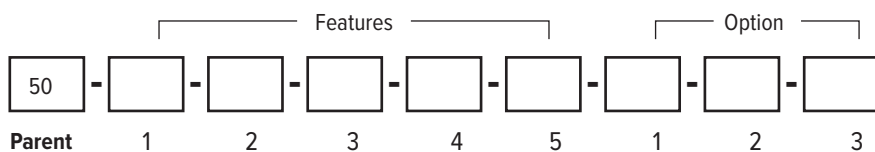
Instructions: To order a 50 please fill in each number block by selecting the codes from the corresponding features below and following pages.

Parent Number	
M50L-AL	Flow meter aluminum (Note: Flow meter is only available in aluminum) to 50 slpm
C50L-AI	Flow controller aluminum to 50 slpm
C50L-SS	Flow controller 316 stainless steel to 50 slpm

Feature 2: Inlet/Outlet Fittings Low Flow	
0	customer supplies fittings
1	1/8-inch stainless steel compression (maximum 5 slpm)
2	1/4-inch stainless steel compressione
3	3/8-inch compression (Standard for 30 to 200 slpm). For low and medium bodies. (maximum 200 slpm)
4	1/2-inch stainless steel compression
5	1/4-inch stainless steel VCO
6	1/2-inch stainless steel VCO
8	1/4-inch stainless steel VCR
9	1/2-inch stainless steel VCR
10	6 mm stainless steel compression
13	1/4-FNPT adapter bushing (maximum 200 slpm). For low and med flow bodies only.
14	3/8-inch stainless steel female NPT

Feature 1: Display	
NR	No display (standard)
DD	Digital display
DDB	Digital display (back mounted); not available on C50M

Feature 3: Input Power	
PV2	24 VDC for all instruments

Feature 4: Output Signal/Setpoint	
V0	RS-232 (no analog out)
V1	0-5 VDC linear output signal (and setpoint if controller); includes RS-232
V4	4-20 mA linear output signal (and setpoint if controller); includes RS-232
V6	RS-485 (no analog out or RS-232)

Feature 5: Low Flow Option	
LF	Flow calibration for C50L and M50L required for 0-20 sccm full scale calibration on less.

Option 1 : Certificates	
MC	Material certificates--US mill certs on all wetted parts
CC	Certificate of conformance
LT	Leak test certificate
PT	Pressure test certificate
OC2	O2 cleaning. Includes certification. Product cleaned for O2 service. Inspected with ultra-violet light and double bagged prior to shipment. O2 cleaning only available for stainless steel bodies.
5PC	5-point calibration certificate
CO	Stamped Certificate of Origin

Option 2 : Electrical Connections			
50-C9(0)	9-pin mating connector with no cable	**50-C9RS232 (10)**	10-foot (3 m) digital/analog communication cable with D9 mating connector, D9 serial computer connector, and fly leads.
50-C9(1)	1-foot (304.8 mm) 50-analog cable. 9 conductor cable with D-connector on one end, fly leads on the other.	**50-C9RS232 (25)**	25-foot (7.62 m) digital/analog communication cable with D9 mating connector, D9 serial computer connector, and fly leads.
50-C9(3)	3-foot (1 m) 50-analog cable. 9 conductor cable with D-connector on one end, fly leads on the other.	**50-C9RS232 (50)**	50-foot (15.24 m) digital/analog communication cable with D9 mating connector, D9 serial computer connector, and fly leads.
50-C9(10)	10-foot (3 m) 50-analog cable. 9 conductor cable with D-connector on one end, fly leads on the other.	**50-SerialUSB**	USB to serial RS-232 converter. Needed for use with CRN. Many users elect to supply their own USB.
50-C9(25)	25-foot (8 m) 50-analog cable. 9 conductor cable with D-connector on one end, fly leads on the other.	**50-CRN**	6-foot (2 m) digital only cable with D9 mating connector and D9 computer connector.

Note: CE and ISO certificates are available for download from www.sierrainstruments.com/downloads