Economical OEM Digital Mass Flow Controller (up to 200 slpm)

FEATURES

- All the performance features of a digital mass flow controller at an OEM price
- Control gas mass flow rates to 200 slpm (nlpm)
- Stability and reliability optimized for long-term process control
- Ideal for control of carrier gases used in wafer cleaning and polishing operations
- Wide utility in chamber purge operations for Physical Vapor Deposition (PVD) and other semiconductor process applications
- Accuracy: +/- 1.0% full scale for common gases (Air, Ar, CO2, CO, CH4, He, H2, O2, N2)
- Repeatability: +/- 0.25% full scale
- Advanced 316L SS platinum sensor technology and patented LFE provide excellent linear performance
- Aluminum or 316 SS 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 and communication cables available)
- Field adjustable zero and span
- RS-485 (addressable) enables networking within complex semiconductor tools
- Powerful direct-acting control valve minimizes leak-by
- CE Approved

SmartTrak 50 Medium

www.sierrainstruments.com

DESCRIPTION

Optimized to feature the stability, reliability and simplicity of operation required in long-term process control applications, Sierra's SmartTrak® 50 Series Medium Flow Controller offers high accuracy and reliable gas mass flow control at an economical price. This makes it an ideal choice for OEMs who require exceptional performance at a price point that meets their budgetary constraints.

Sierra's new medium flow controller increases the maximum flow range of the award-winning SmartTrak 50 Series from 50 slpm to 200 slpm. This makes it a perfect fit for controlling the carrier gases used in wafer cleaning and polishing operations or for purge control in PVD and other semiconductor operations. It also excels in the mass flow control of common gases in general applications.

The 50 Series builds on the same core sensor, LFE and valve technology found in Sierra's flagship Smart-Trak 100 Series, all backed by Sierra's trademark personalized customer support. A flexible and powerful direct-acting frictionless-hovering control valve sets it apart from the competition by minimizing leak-by, while offering +/- 0.25% repeatability.

It is Sierra's philosophy that only the highest performing core sensor technology can produce an excellent MFC. In contrast to the many wetted parts of CMOS and MEMS flow sensors, Sierra uses its advanced 316L stainless steel platinum-wound capillary sensor technology to deliver the highest reliability, repeatability and stable accuracy.

The SmartTrak 50 Series offers flexibility and simplicity of operation. Both analog and digital inputs and outputs are available, enabling the 50 Series to work with older analog systems or the newest multi-drop digital tools. Field adjustment of zero and span enable small adjustments in calibration to align with on-site process conditions.

Experience our passion for flow with the SmartTrak 50 Series Medium Flow Controller and enjoy the peace of mind gained from unparalleled stability, reliability and simplicity in your next application.

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) for common gases: Air, Ar, CO_2, CO, CH_4, He, H_2, O_2, N_2.

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
Two seconds (typical) to within +/- 2% of final value including setting time. 50 Series 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 200 slpm air equivalent.

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

Minimum Differential Pressure Requirement
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
24 VDC (+/-10%), 850 mA, regulated, RS-485 option adds 130 mA

Control Range
5 to 100% of full scale flow (20:1) at published accuracy. Automatic valve shut-off with setpoints below 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 optional RS-232 communications cable

Display
Flow rate, units, full scale, and setpoint

PRESSURE DROP

Minimum Pressure Drop for Air, Mass Flow Controller	
Flow Rate (slpm)	Medium Flow 3/8 or 1/2 inch fittings Pressure Drop in PSI (mbar)
20	1 (68)
30	1.2 (82)
40	1.6 (110)
50	2 (136)
100	5 (340)
150	10 (680)
200	15 (1020)

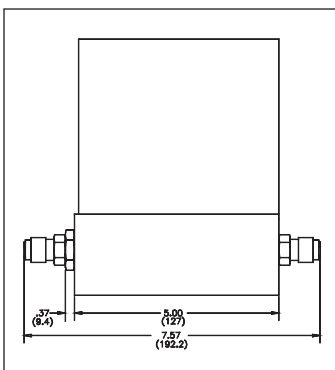## PHYSICAL SPECIFICATIONS & DIMENSIONS

Wetted Material
Anodized aluminum or 316 stainless steel flow body. 316L stainless steel sensor tubes; Viton® O-rings and valve seats.
Note: All dimensions are in inches with mm in brackets.
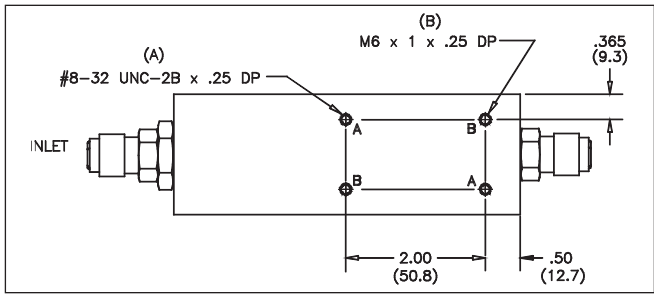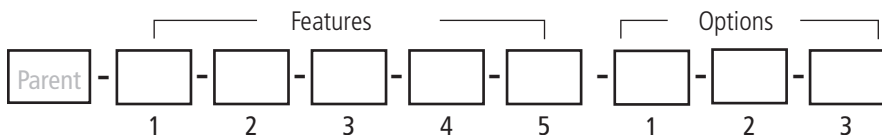   Certified drawings are availabe upon request.

50 Series - Front View

50 Series - Side View

50 Series - Bottom View

Features — Options

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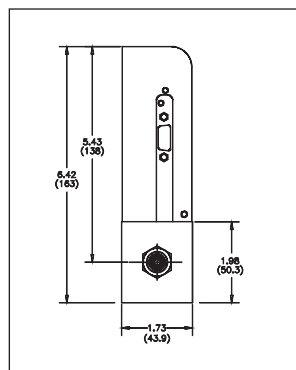
Instructions: To order a 50 please fill in each number block by selecting the codes from the corresponding features below and following pages.

Parent Number	
C50M-AL (Med Flow)	SmartTrak® 50 OEM mass flow controller aluminum to 200 slpm
C50M-SS (Med Flow)	SmartTrak® 50 OEM mass flow controller stainless steel to 200 slpm

Feature 1: Display	
NR	No display (standard)
DD	Digital display
DDB	Digital display (back mounted)

Feature 2: Inlet/Outlet Fittings Medium Flow	
3	3/8-inch stainless steel compression
4	1/2-inch stainless steel compression
6	1/2-inch stainless steel VCO
9	1/2-inch stainless steel VCR
11	10 mm stainless steel compression
12	12 mm stainless steel compression
13	1/4-FNPT adapter bushing (maximum 200 slpm). Low & Med only
14	3/8-inch stainless steel female NPT

Feature 3: Input Power	
PV1M	12-15 VDC for M50L-AL meters only
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)

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
O2C	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.
5POINTCAL	5-point calibration certificate (ISO 17025 compliant)

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-C9RS232 ()**	50-foot (15.24 m) digital/analog communication cable with D9 mating connector, D9 serial computer connector, and fly leads.
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-SerialUSB**	USB to serial RS-232 converter. Needed for use with CRN. Many users elect to supply their own USB.
50-C9 ()	Custom length analog communication cable with D9 mating connector and fly leads. Maximum length 50 feet (15 m). Same price any length.	**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

Option 3 : Accessories & Options	
50 T8D ( )	Low flow controllers and all size meters. 24 VDC power supply with D-connector, 110-230 VAC, CE approved. Specify plug preference in parentheses: (US) for USA plug, (EU) for Euro plug, (UK) for Great Britain plug. Includes 2 x 9-pin connectors.
50 T8F ( )	Low flow controllers and all size meters. 24 VDC power supply with fly leads, 110-230 VAC, CE approved. Specify plug preference in parentheses: (US) for USA plug, (EU) for Euro plug, (UK) for Great Britain plug. Includes 2 x 9-pin connectors.
50 -T10D ( )	Medium and high flow controllers. 24 VDC power supply for C50M and C50H controllers. Supplied with D-connector, 1.25 Amps, 110-230 VAC, CE approved. Specify plug preference in parentheses: (US) for USA plug, (EU) for Euro plug, (UK) for Great Britain plug. Includes 1 x 9-pin connectors.
50- T10F ( )	Medium and high flow controllers. 24 VDC power supply for C50M and C50H controllers. Supplied with fly leads, 1.25 Amps, 110-230 VAC, CE approved. Specify plug preference in parentheses: (US) for USA plug, (EU) for Euro plug, (UK) for Great Britain plug. Includes 1 x 9 pin connectors.
100L Filter	10 micron-gas filter for use with C50L or M50L. 1/4 NPT inlet, auto drain, max pressure 150 psig (10.3 barg), max temp 125°F (52°C). Wetted materials: aluminum, ABS, polycarbonate cover, buna rubber seals. Includes mounting bracket.