Economical OEM Digital Mass Flow Controller

SmartTrak® 50 Series

Features

- **Industry best off-the-shelf delivery**
- **Accuracy: +/- 1.5% full scale for common gases (Air, Ar, CO_2, CO, CH_4, He, H_2, O_2, N_2)**
- **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 and communication cables 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**

SIERRA

EXPERIENCE OUR PASSION FOR FLOW!

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Description

Sierra 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 Smart-Trak 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 +/- 1.5% 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 Smart-Trak 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.

ISO REGISTERED 9001

Performance Specifications

Accuracy
+/- 1.5% of full scale including linearity over 32° to 122°F (0° to 50°C) and 5 to 145 psig (0.3 to 10 barg) for common gases: Air, Ar, CO2, CO, CH4, He, H2, O2, N2. +/- 3.0% of full scale for other gases.

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)

Operating 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.

For measuring or controlling flows below 5 sccm, please consider Micro-Trak™ Model 101. Above 50 slpm, please consider the Smart-Trak® 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: 15 or 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.

Pressure Drop (1/4" standard fittings)

Designator	slpm	Pressure Drop psid (mbar) (Meter)	Minimum Delta psid (mbar) (Controller)
1	0.20	.45 (31.0)	1 (69)
2	.200	.45 (31.0)	1.5 (103.5)
3	1.00	.50 (34.5)	2 (137.9)
4	5.00	.60 (41.4)	4 (275.9)
5	10.00	.80 (55.2)	7.5 (517.3)
6	20.00	1.2 (82.8)	12.5 (862.1)
7	50.00	3.0 (206.9)	15 (1034.6)

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
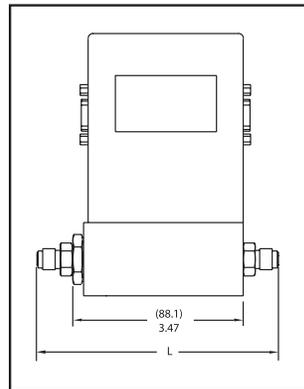
50 Series - Side View
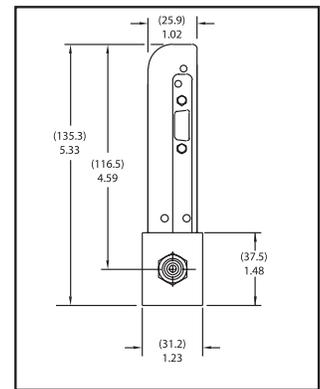
Fittings	Dimension L
1/8 SS compression	5.31 (134.8)
1/4 SS compression	5.49 (139.4)
1/4 VCO	5.03 (127.7)
1/4 VCR	5.35 (135.8)
6mm compression	5.51 (139.9)
1/4 FNPT	5.32 (135.1)
1/8 Brass compression	5.31 (134.8)
1/4 Brass compression	5.49 (139.4)

Note: Units in inches (mm in parenthesis)

50 Series - Bottom View
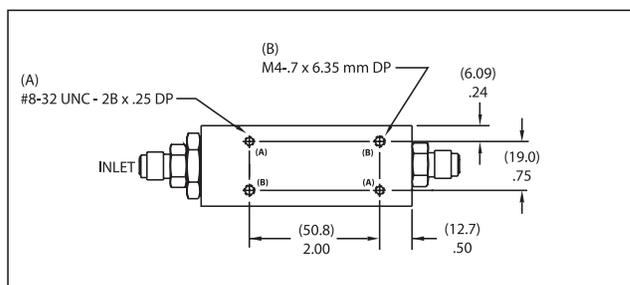
User Program Interface

Communications Setup

50 Series - No Display
Stainless Steel flow body shown

50 Series - With Display
Aluminum flow body shown

PARENT NUMBER
C50L Mass Flow Controller
M50L Mass Flow Meter
(Aluminum body only)

FLOW BODY MATERIAL
AL Aluminum Body (Viton® elastomers only)
SS 316 Stainless Steel Body (Viton® elastomers only)

PILOT MODULE DISPLAY
NR No Display
DD Digital Display (front mounted)
DDB Digital Display (back mounted)

INLET/OUTLET FITTINGS
1 1/8" SS Compression (Max 5 slpm)
2 1/4" SS Compression
5 1/4" VCO
8 1/4" VCR
10 6 mm Compression
13 1/4" FNPT
21 1/4" Brass Compression
20 1/8" Brass Compression

INPUT POWER
PV1M 15 VDC for meters
PV2 24 VDC for all instruments

NOTE: Power supplies are not Included. See accessories to order.

OUTPUT SIGNAL/SETPOINT
V0 RS-232 (no analog output)
V1 0 to 5 VDC linear output signal and setpoint*
V4 4 to 20 mA linear output signal and setpoint*
V6 RS-485 addressable (no analog output)

ELECTRICAL CONNECTIONS
50-C9 ( ) Communication cable. Includes cable with D9 mating connector, fly leads. (Length in parenthesis)
50-C9R232 ( ) Cable with D9 mating connector + D9 serial (Length in parenthesis)

CERTIFICATES
5PC 5 Point Calibration Certificate
MC Material Certificates--US Mill certs on all wetted parts
CC Certificate of Conformance
O2C Oxygen Cleaning (only available for stainless steel flow body)
LT Leak Test Certificate
PT Pressure test Certificate

ACCESSORIES & OPTIONS
50 T8D ( ) 24 VDC Power Supply with D-connector, 110-230 VAC, CE approved. Specify AC plug below: (US) for USA plug, (EU) for Euro plug, (UK) for Great Britain plug.
50 T8F ( ) 24 VDC Power Supply with fly leads, 110-230 VAC, CE approved. Specify AC plug below: (US) for USA plug, (EU) for Euro plug, (UK) for Great Britain plug.
50 T10F ( ) 24 VDC power supply for C50M and C50H controlles. Supplied with fly leads, 1.5 Amps, 110-230 VAC, CE approved. Specify AC plug preference in parentheses: (US) for USA plug, (EU) for Euro plug, (UK) for Great Britain plug.
50 T10D ( ) 24 VDC power supply for C50M and C50H controlles. Supplied with D-connector, 1.5 Amps, 110-230 VAC, CE approved. Specify AC plug preference in parentheses: (US) for USA plug, (EU) for Euro plug, (UK) for Great Britain plug.
IM-50 Printed Instruction Manual (Digital version always included on CD)

* Includes RS-232

Email your questions or request for quote to 50series@sierrainstruments.com TODAY!

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