

Economical OEM Digital Mass Flow Controller

Features

- Industry best off-the-shelf delivery
- Accuracy: +/- 1.5% full scale for common gases
- 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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Smart-Trak® 50 Series



Description

Sierra Instruments' Smart-Trak® 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.



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)

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 (air, nitrogen, carbon dioxide, argon, methane, hydrogen, helium, etc.) 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)

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 (standard)

Optional:

- Linear 4-20 mA, 500 ohms maximum load resistance.
- Linear 0-5 VDC
- RS-485 (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)

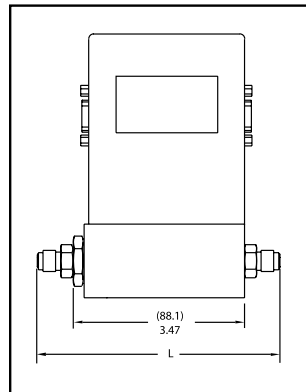
Designator	slpm	Pressure Drop psid (mbar) (Meter)	Minimum Delta psid (mbar) (Controller)
1	0.20	.45 (31.0)	1 (69)
2	.200	.45 (31.0)	1.5 (103.5)
3	1.00	.50 (34.5)	2 (137.9)
4	5.00	.60 (41.4)	4 (275.9)
5	10.00	.80 (55.2)	7.5 (517.3)
6	20.00	1.2 (82.8)	12.5 (862.1)
7	50.00	3.0 (206.9)	15 (1034.6)

Physical Specifications & Dimensions

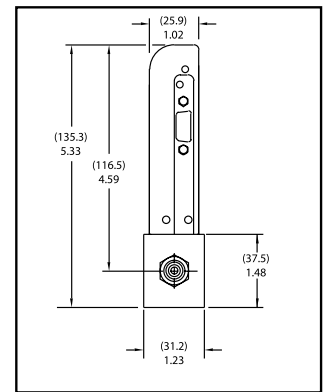
Wetted Material

Anodized aluminum or 316 stainless steel flow body. 316L stainless steel sensor tubes; Viton® O-rings and valve seats.

50 Series - Front View



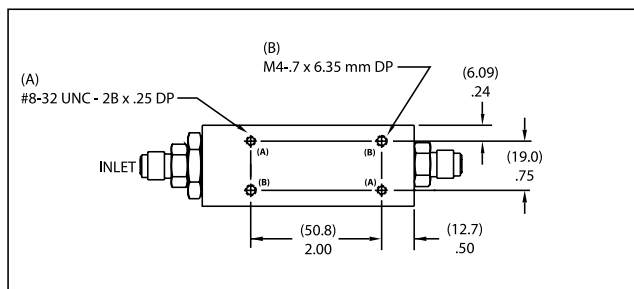
50 Series - Side View



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



Ordering the 50 Series

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 (Optional) PV2 24 VDC for all instruments (Standard)		NOTE: Power supplies are not included. See accessories to order.							
OUTPUT SIGNAL/SETPOINT V0 RS-232 (standard, 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 (no analog output)							
STANDARD CALIBRATION: FULL SCALE FLOW RANGES ("F" = Standard "N" = Normal)									
F1 or N1 20 sccm or nccm F2 or N2 200 sccm or nccm F3 or N3 1.0 slpm or nlpm F4 or N4 5.0 slpm or nlpm		F5 or N5 10 slpm or nlpm F6 or N6 20 slpm or nlpm F7 or N7 50 slpm or nlpm SCR Consult Factory							
NOTE: Minimum flow is zero. You must specify full scale. Must fall within listed range.									
ELECTRICAL CONNECTIONS 50-C9 () Communication cable. Includes cable with D9 mating connector, fly leads. (Length in parenthesis) 50-C9RS323 () Cable with D9 mating connector + D9 serial (length in parenthesis)									
CERTIFICATES MC Material Certificates--US Mill certs on all wetted parts CC Certificate of Conformance O2C Oxygen Cleaning LT Leak Test Certificate PT Pressure test Certificate									