

Industrial Mass Flow Meters & Controllers

FEATURES

- Industry's only NEMA 6/IP67 rated MFC stands up to dirty applications without the need for secondary enclosures
- Measure & Control gas mass flow rates from 100 to 1000 slpm (3 to 35 scfm); higher flows available upon request.
- Both ANSI and DIN flanges available in various sizes and pressure ratings
- 316 stainless steel construction & flanges are suitable for any clean gas, even corrosives & toxics
- Accuracy: +/- 1.0% of Full Scale for your critical process
- Repeatability: +/- 0.2% Full Scale ensures a stable process even under changing conditions
- Dial-A-Gas[®] lets you select from up to 10 gases in one instrument, creating great flexibility and reducing spares inventory.
- Operation at low differential pressures easy due to Sierra's powerful valve design.
- Both digital and analog communication included

MaxTrak 180 + Flanges



DESCRIPTION

Sierra Instruments' MaxTrak[®] Industrial Flow Meters and Controllers are now available with 316 SS flanges for your most demanding applications.

Winner of numerous awards, the Model 180 gas mass flow meters and controllers are now even easier to install in rugged industrial environments. Because these devices conform to the rigorous water-proof requirements of NEMA 6 and IP67, you can feel confident they will continue to perform for years, even when frequent wash-down / hose-down is required.

Excellent accuracy coupled with unsurpassed instrument stability result from our patented, inherently-linear internal design, our advanced platinum sensor technology and a valve that is strong and forgiving. Based upon Sierra's successful SmartTrak[®] line of digital instruments, MaxTrak offers Dial-A-Gas[®] multi-gas capability, both analog and digital communication and a wide variety of field adjustable parameters.

MaxTrak controls gas mass flow from 100 to 1000 slpm, with higher flows available upon request. In addition to flanged connections, a wide variety of pipe and fitting connections are also available.



www.sierrainstruments.com



The information contained herein is subject to change without notice.

PERFORMANCE SPECIFICATIONS

Accuracy

Standard: +/- 1.0% of full scale including linearity under calibration conditions

High Accuracy Calibration: Contact Sierra

Dial-A-Gas

+/- 1.0% of full scale in all 10 standard gases

Repeatability

+/- 0.2% 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 millisecond time constant; 2 seconds typical to within +/-2% of final value (includes settling time). Faster or slower available upon request.

OPERATING SPECIFICATIONS

Gases

All clean gases including toxics and corrosives; specify when ordering

Mass Flow Rates

The following 10 gases make up the Dial-A-Gas® feature of every MaxTrak® instrument; up to 9 alternate gases may be substituted. Flow range specified is for an equivalent flow of nitrogen at 760 mm Hg and 21°C (70°F); other ranges in other units are available.

Dial-A-Gas®	
Gas	Maximum Flow (slpm)
Air	1000
Argon (Ar)	1450
Carbon Dioxide (CO ₂)	740
Carbon Monoxide (CO)	1000
Methane (CH ₄)	720
Helium (He)	1454
Hydrogen (O ₂)	1000
Oxygen (N ₂)	1000
Nitrogen (N ₂ O)	1000
Nitrous Oxide (N ₂ O)	710

Output Signals - Analog:

Linear 4 to 20 mA, 500 ohms maximum loop resistance and one of the following (user selectable):

Linear 0 to 5 VDC, 1000 ohms minimum load resistance

Linear 0 to 10 VDC, 1000 ohms minimum load resistance

Linear 1 to 5 VDC, 1000 ohms minimum load resistance

Output Signals -Digital:

RS-232 standard

RS-485 MODBUS optional

Command Signal - Analog (choice of one):

Linear 4 to 20 mA, 0 to 5, 0 to 10, 1 to 5 VDC

Command Signal - Digital

RS-232

RS-485 MODBUS optional

OPERATING SPECIFICATIONS (CONTINUED)

Gas & Ambient Temperature

Gas: 32 to 122°F (0 to 50°C)

Ambient: -5 to 122°F (-20 to 50°C)

Gas Pressure

Maximum: 500 psig (34.5 barg) maximum, burst tested to 750 psig (51.7 barg)

Pressure Drop Across a Meter

Pressure must be above the values in the table below. Note that pressure increases with flow rate.

Pressure Drop Across Meter, psi (mbar)	
Flow Rate (slpm)	Insertion Pressure Drop
100	0.5 (34)
200	0.5 (34)
300	0.6 (41)
400	0.9 (61)
500	1.3 (88)
750	3.0 (204)
1000	5.0 (340)

Differential Pressure Requirement for Controllers

Optimum: 30 to 60 psid (2 to 4 barg)

Minimum: See chart below.

Minimum Differential Pressure for Controllers, Air	
Flow Rate (slpm)	Minimum Pressure, psi (mbar)
100	1.0 (68)
200	1.0 (68)
300	2.0 (136)
400	4.0 (272)
500	6.0 (408)
750	15 (1020)
1000	20 (1360)

Note: Tested at 21°C, outlet at 14.7 psia

Leak Integrity

Flanges mounted via 1 inch Swagelok® compression fittings, for convenience.

5 X 10⁻⁹ atm cc/sec of helium maximum

Power Requirements (ripple should not exceed 100 mV peak-to-peak)

For Mass Flow Meters (M180): 15 to 24 VDC +/- 10%, (130 mA, regulated) 1.25 Amps output

For Mass Flow Controllers (C180):

C180H: 24 VDC +/- 10%, (1260 mA, regulated)

Control Range (Mass Flow Controllers)

2 to 100% of full scale flow; automatic shut-off at 1.9%.

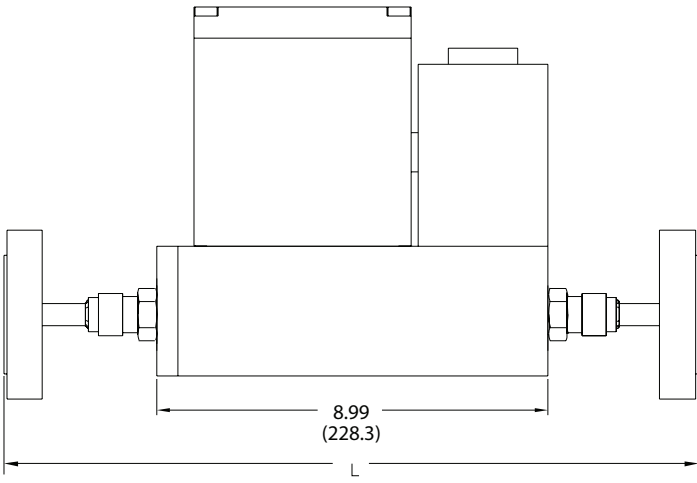
PHYSICAL SPECIFICATIONS

Wetted Material

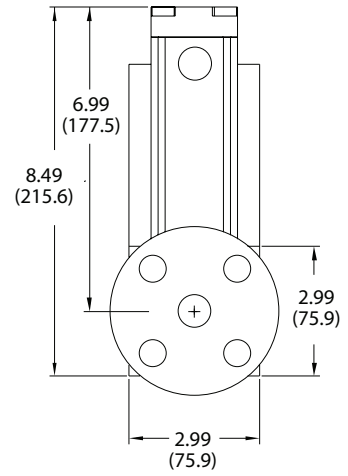
316 stainless steel; 416 stainless steel; Viton® "O"-rings and valve seat standard

Other elastomers are available (consult factory).

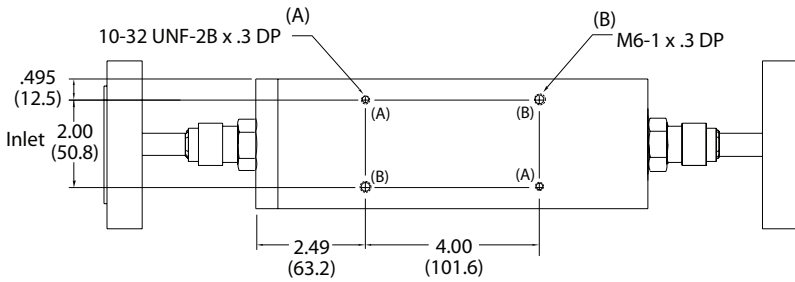
MaxTrak® Flanged - Front View



MaxTrak® Flanged - Side View

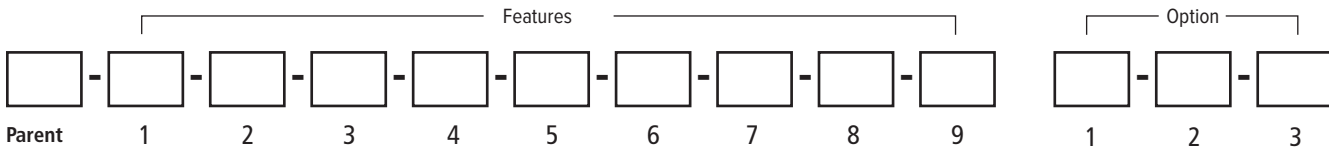


Max-Trak® Flanged - Bottom View



Dimension (L)	
Flange Option	Inches (mm)
1/2" 150#	14.87 (377.6)
3/4" 150#	14.75 (374.6)
1" 150	14.55 (369.5)
1/2" 300#	14.87 (377.6)
3/4" 300#	14.75 (374.6)
1" 300#	14.55 (369.5)
DN20/PN16	14.75 (374.6)
DN25/PN40	14.55 (369.5)
DN20/PN40	14.75 (374.6)
DN25/PN40	14.55 (369.5)





Instructions: To order a MaxTrak please fill in each number block by selecting the codes from the corresponding features below and following pages.

Parent Number	
M180	NEMA 6 / IP67 Compliant Industrial Mass Flow Meter, digital high performance with Dial-A-Gas®
C180	NEMA 6 / IP67 Compliant Industrial Mass Flow Controller, digital high performance with Dial-A-Gas

Feature 1: Flow Body Size*			
M180H1	High flow NEMA 6 meter. 0-501 to 0-800 slpm.	C180H1	High flow NEMA 6 controller. 0-501 to 0-800 slpm.
M180H2	High flow NEMA 6 meter. 0-801 to 0-1000 slpm.	C180H2	High flow NEMA 6 controller. 0-801 to 0-1000 slpm.

Note: All slpm flow ranges also available in nlpm * Flow bodies are sized for nitrogen flow rates. Other gases must be converted to equivalent nitrogen flow. Use K-Factor and size accordingly.

Feature 2: Display	
NR	No display available
MB	RS-485 communication featuring Modbus protocol installed inside the enclosure

Feature 3A: Flanges	
F2	1/2-inch ANSI class 150 flange, 316L
F3	3/4-inch ANSI class 150 flange, 316L
F4	1-inch ANSI class 150 flange, 316L
G2	1/2-inch ANSI class 300 flange, 316L
G3	3/4-inch ANSI class 300 flange, 316L
G4	1-inch ANSI class 300 flange, 316L
FD3	DN20/PN16 flange, 316L
FD4	DN25PN16 flange, 316L
GD3	DN20/PN40 flange, 316L
GD4	DN25PN40 flange, 316L

Feature 4: Pilot Module Display/Interface	
OV1	Viton® (Standard). Note: Consult factory for other elastomers
ON1	Neoprene®

Feature 5: Valve Seat (MFC Only)	
SV1	Viton®
SN1	Neoprene® (or equivalent)
SK1	Kalrez® (or equivalent)
SK2	Kalrez® (or equivalent for high flow bodies)
PA1	ValFlex™ inert, carbon-reinforced Polyamide required for CO2 above 50% concentration or 250 psi

Feature 6: Input Power	
PV2	24 VDC for all instruments (standard)

Feature 7: Output Signal	
V1	0-5 VDC and 4-20 mA linear output signals
V2	1-5 VDC and 4-20 mA linear output signals
V3	0-10 VDC and 4-20 mA linear output signals

Note: Alternate among V1, V2, V3 with Smart-Trak Software

Feature 8: External Setpoint Signal (MFC Only)	
S0	RS-232
S1	0-5 VDC, linear (standard for analog operation)
S2	1-5 VDC, linear
S3	0-10 VDC, linear
S4	4-20 mA, linear

Feature 9: Electrical Connection	
COND	1/2-inch FNPT port for conduit (standard) NOTE: Customer must supply own cable.
GLAND	Cable gland (wire diameter 5-9 mm required) NOTE: Customer must supply own cable.
WT	Water tight quick-connector installed in housing, pre-wired at Sierra. Allows "plug and play" installation. Must select mating cable from accessories below

Option 1: Special Cals	
A1	High Accuracy Calibration, +/- 0.5% of F.S. at calibration conditions
GS	Gas substitution. One or more gases or mixtures may be substituted for 9 of the standard Dial-A-Gas gases. See Application Data Sheet for specifics.

Option 2: Certificates	
MC	Material Certificates--US Mill certs on all wetted flow body parts
CC	Certificate of Conformance

Option 3: O2 Cleaning	
O2C	O2 Cleaning. Includes certification. Product cleaned for O2 service. Inspected with ultra-violet light and double-bagged prior to shipment.