

MicroTrak™ 101

Technical Data Sheet

Ultra Low Flow

High Performance Digital

Gas Mass Flow Meters and Controllers

Features

- Measure and Control Flow of Gas from 4 sccm (smlm) down to 0.08 sccm (smlm)
- Digital performance
- Includes Dial-A-Gas® multi-gas capability that enables use with 10 different gases
- Digital communications protocols supported
 - MODBUS
 - Profibus DP
 - Foundation Fieldbus (pending)
 - Device Net (pending)
- Optional Compod Control Module for programming of flow systems and process controls
- All control functions are also available from your PC or workstation
- 316 stainless steel construction suitable for any clean gas, even corrosives and toxics
- Small footprint makes installation easy
- Single-sided power input reduces installation cost and complexity
- Every Micro-Trak Instrument includes:
 - RS-232 Communication
 - Analog communication
 - Software for Windows OS
 - Source code
 - Calibration certificate
 - Electrical Connector or Cable



Description

MicroTrak™ measures and controls micro mass flows of gas previously thought to be too low for a reliable reading. MicroTrak™ is specifically designed for flow ranges under 4 sccm (smlm) with a minimum controllable mass flow rate of 0.08 sccm (smlm).

The Model 101 is a specialized and highly engineered instrument for those who need accurate and reliable micro mass flow control of clean gases including corrosives and toxics. MicroTrak™ is based on Sierra's award-winning family of digital instruments. As a result, ease of operation, field configuration, multi-gas capability and application flexibility are standard features.



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Performance Specifications

Accuracy

+/- 1% of Full Scale including linearity under calibration conditions

Dial-A-Gas

+/- 1% 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

Governed by total volume of installation. Contact Sierra for suggestions on optimized installation.

Operating Specifications

Gases

All clean gases including corrosives & toxics; specify when ordering. The following ten gases make up the Dial-A-Gas® feature of every Micro-Trak™ instrument; up to nine alternate gases may be substituted.

DIAL-A-GAS RATES	
Gas	Micro-Trak Flow Range (scfm)
Air	0.10 to 4.0
Argon	0.14 to 5.6
CO ₂	0.074 to 2.95
CO	0.10 to 4.0
Methane	0.075 to 3.0
Helium	0.14 to 5.6
Hydrogen	0.10 to 4.0
Oxygen	0.10 to 4.0
Nitrogen	0.10 to 4.0
N ₂ O	0.072 to 2.9



Flow ranges specified are for an equivalent flow of nitrogen at 760 mm Hg and 21°C (70°F); other ranges in other units are available (e.g., nlpm, scfh, nm³/h, kg/h)

Gas Pressure

500 psig (34.5 barg) maximum, burst tested to 750 psig (52 barg)

Pressure Drop Across a Meter

0.36 psi (24.5 mbar)

Differential Pressure Requirement For Controllers

30 psi (2040 mbar) optimum

1 psi (68 mbar) minimum at 21°C with outlet at ambient pressure

Gas & Ambient Temperature

32°F to 122°F (0°C to 50°C)

Leak Integrity

5 X 10⁻⁹ standard cc/sec of helium maximum

Operating Specifications (Continued)

Power Requirements (Ripple noise not to exceed 100mV peak-to-peak)

For Mass Flow Meters: 15 to 24 VDC +/- 10% (130 mA maximum)

For Mass Flow Controllers: 24 VDC +/- 10% (400 mA, regulated) for C101

Control Range For Controllers

2–100% of Full Scale flow; automatic shut-off at 1.9%

Output Signal

Analog:

Linear 4 to 20 mA, 500 ohms maximum loop resistance and one of the following: Linear 0 to 5 VDC, 0 to 10 VDC, 1 to 5 VDC, 1000 ohms minimum

load resistance

Digital:

RS-232; Pilot Module Display optional

Command Signal

Analog (choice of one):

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

Digital:

RS-232; Pilot Module Display optional

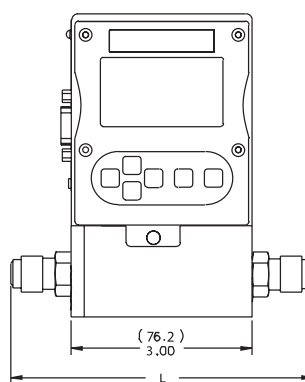
Wetted Material

316 stainless steel, 416 stainless steel; synthetic ruby, Viton® "O"-rings and valve seat standard; other elastomers are available (consult factory)

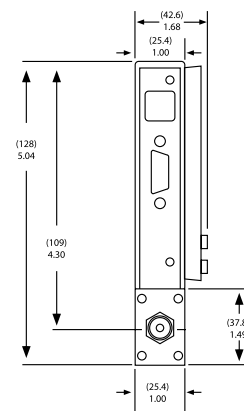
Physical Dimensions

All dimensions are in inches with mm in brackets. Certified drawings are available on request.

101 MicroTrak™ Front View

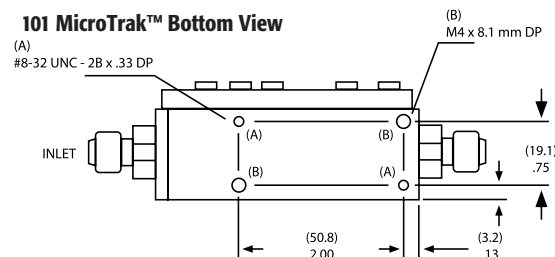


101 MicroTrak™ Inlet View



L dimension ranges from 4.6" [117] to 5.2" [132] depending on fittings used.

101 MicroTrak™ Bottom View



Digital Communications

RS-232 standard, RS-485 optional

Profibus DP

Modbus

Foundation Fieldbus (pending)

DeviceNet (pending)

Ordering the MicroTrak™

PARENT NUMBER M101 MicroTrak™ Mass Flow Meter C101 MicroTrak™ Mass Flow Controller													
FEATURE 2: PILOT MODULE DISPLAY/INTERFACE NR No display/interface DD No display/interface. If option 2 digital communications are selected, NR must be selected. RD Pilot Module Display/Interface mounted on the enclosure CMNR Compod with RS-485 Modbus communication mounted on the enclosure CMDD Compod with RS-485 Modbus communication and Display mounted on the enclosure CMNRRelays CMNR with 2 analog relays; installed in the Compod CMDDRelays CMDD with 2 analog relays; installed in the Compod													
FEATURE 3: INLET/OUTLET FITTINGS 1 1/8-inch compression. For low flow bodies and 101. (maximum 5 slpm) 2 1/4-inch compression (standard up to 30 slpm). For low flow bodies and 101 (maximum 50 slpm) 5 1/4-inch VCO. For low flow bodies and 101. (maximum 50 slpm) 8 1/4-inch VCR. For low flow bodies and 101. (maximum 50 slpm) 10 6 mm Compression. For low flow bodies and 101. (maximum 50 slpm)													
FEATURE 4: FLOW BODY ELASTOMERS OV1 Viton® (standard) ON1 Neoprene®													
FEATURE 5: VALVE SEAT (MFC) SV1 Viton® SN1 Neoprene (or equivalent) SK1 Kalrez® (or equivalent)		VX1 (low flow only) ValFlex™ required for CO2 above 50% concentration or 250 psi on C100L; available for low flow body up to 20 slpm only.											
FEATURE 6: INPUT POWER PV1M 15-24 VDC for meters (optional) PV2 24 VDC for all instruments (standard)													
FEATURE 7: OUTPUT SIGNAL V1 0-5 VDC and 0/4-20 mA linear output signals V2 1-5 VDC and 0/4-20 mA linear output signals V3 0-10 VDC and 0/4-20 mA linear output signals													
FEATURE 8: EXTERNAL SETPOINT SIGNAL (MFC Only) S0 Pilot Module/RS-232 (standard for Pilot Module/digital operation) S1 0-5 VDC, linear, standard for analog operation S2 1-5 VDC, linear S3 0-10 VDC, linear S4 0/4-20 mA, linear S5 0-20 mA, linear													
FEATURE 9: ELECTRICAL CONNECTION C0 15-pin mating connector with no cable C1 100-Analog Cable (1 foot): 15 conductor cable with D-connector on one end, fly leads on the other. 1 foot length (300 mm) C3 100-Analog Cable (3 foot): 15 conductor cable with D-connector on one end, fly leads on the other. 3 foot length (1 m) C10 100-Analog Cable (10 foot): 15 conductor cable with D-connector on one end, fly leads on the other. 10 foot length (3 m) C25 100-Analog Cable (25 foot): 15 conductor cable with D-connector on one end, fly leads on the other. 25 foot length (8 m) C () 100-Analog Cable (): Custom length communication cable. Specify cable length in feet in parenthesis. Maximum length 50 feet (16 meters). Fixed price any length. Note: Longer lengths available for analog models.													
OPTION 1: SPECIAL CALS A1 High accuracy calibration, +/- 0.5% of FS 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: DIGITAL COMMUNICATIONS MB Modbus RTU (NR only) FF Foundation Fieldbus full device description (DD) (NR only) DP Profibus DP (NR only) DN Device Net (pending)													
GAS FLOW RATE													

FOR ACCESSORIES AND ADDITIONAL CABLES CONSULT SALESPERSON



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