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 0.1 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 0.1 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 (sccm)**
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_2O	0.072 to 2.9

DIAL-A-GAS®

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, nm^3/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

5×10^{-9} standard cc/sec of helium maximum

Digital Communications

RS-232 standard, RS-485 optional
Profibus DP
Modbus
Foundation Fieldbus (pending)
DeviceNet (pending)

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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
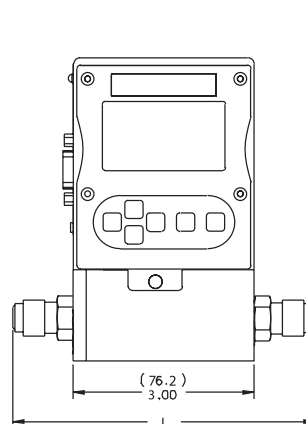 **Digital:**
    RS-232; Pilot Module Display optional

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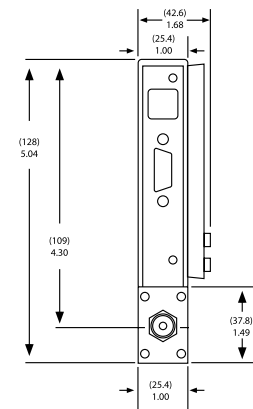
Physical Dimensions

All dimensions are in inches with mm in brackets. Certified drawings are available on request.
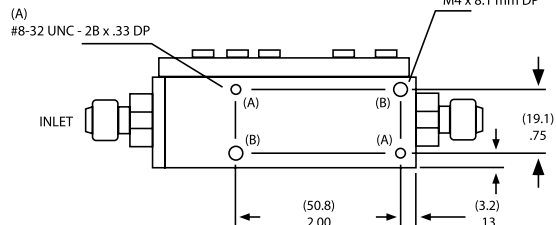
101 MicroTrak™ Front View   **101 MicroTrak™ Inlet View**

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

101 MicroTrak™ Bottom View

Ordering the MicroTrak™

PARENT NUMBER
M101 MicroTrak™ Mass Flow Meter
C101 MicroTrak™ Mass Flow Controller

PILOT MODULE DISPLAY/INTERFACE
NR No display/interface
DD Pilot module display/interface
RD Remote pilot module display/interface
CMNR Compod Control Module (No Display)
CMDD Compod Control Module (With Display)
CMNRRelays CMNR with 2 analog relays
CMDDRelays CMDD with 2 analog relays

INLET/OUTLET FITTINGS
1 1/8-inch compression (STD)
2 1/4-inch compression
5 1/4-inch VCO
8 1/4-inch VCR
10 6 mm compression

FLOW BODY ELASTOMERS
OV1 Viton or equivalent
ON1 Neoprene or equivalent

VALVE SEAT (C101 Flow Controllers Only)
SV1 Viton® or equivalent
SN1 Neoprene or equivalent
SK1 Kalrez® or equivalent

INPUT POWER
PV1M 12 to 15 VDC, Linear (Flow Meters Only)
PV2 24 VDC, Linear **(Standard)**

OUTPUT SIGNAL
V1 4 to 20 mA and 0 to 5 VDC, Linear
V2 4 to 20 mA and 1 to 5 VDC, Linear
V3 4 to 20 mA and 0 to 10 VDC, Linear

EXTERNAL SETPOINT SIGNAL (Flow Controllers Only)
S0 Pilot Module/RS-232 **(Standard for DD, RD)**
S1 0 to 5 VDC **(Standard for NR)**
S2 1 to 5 VDC
S3 0 to 10 VDC
S4 4 to 20 mA

ELECTRICAL CONNECTION
C0 15 Pin Mating Connector with No Cable **(Standard)**
C1 6-inch (150 mm) Communications Cable
C3 3-foot (1 m) Communications Cable
C10 10-foot (3 m) Communications Cable
C ( ) Custom Length Communication Cable

OPTION 1: DIGITAL COMMUNICATIONS
MB Modbus RTU **FF** Foundation Fieldbus (pending)
DP Profibus DP **DN** Device Net (pending)

OPTIONS 2: GAS SUBSTITUTION
GS Replace up to 9 Dial-A-Gas® Gases

GAS FLOW RATE

FOR ACCESSORIES AND ADDITIONAL CABLES CONSULT SALESPERSON

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