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Controlling gas at an incredible 0.2 sccm (smlm).



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# Micro-Trak™ Model 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
- Unique Pilot Module interface (local or remote) allows control and display of the following functions:
  - Gas
  - Setpoint value
  - Setpoint source
  - Engineering units
  - Output signal
  - Valve state
  - Full Scale value
- 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

**M**icro-Trak™ measures and controls micro mass flows of gas previously thought to be too low for a reliable reading. Micro-Trak™ 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. Micro-Trak™ 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 at operating 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.

Gas	DIAL-A-GAS RATES
	Micro-Trak Flow Range (sccm)
Air	0.10 to 4.0
Argon	0.14 to 5.6
CO <sub>2</sub>	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 <sub>2</sub> 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, nm<sup>3</sup>/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<sup>-9</sup> 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

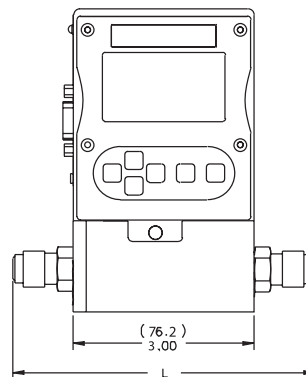
### Wetted Material

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

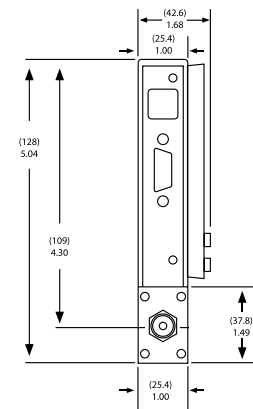
## Physical Dimensions

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

### 101 Micro-Trak™ Front View

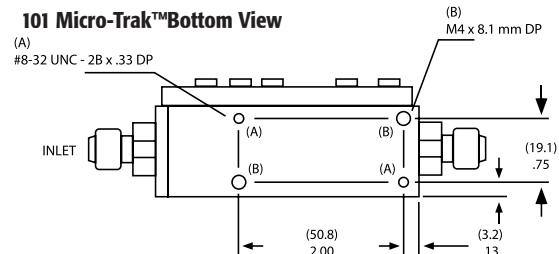


### 101 Micro-Trak™ Inlet View



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

### 101 Micro-Trak™ Bottom View



## Ordering the Micro-Trak™

<b>PARENT NUMBER</b> M101 Micro-Trak™ Mass Flow Meter C101 Micro-Trak™ Mass Flow Controller											
<b>PILOT MODULE DISPLAY/INTERFACE</b> NR No Display/Interface DD Pilot Module Display/Interface RD Remote Pilot Module Display/Interface											
<b>INLET/OUTLET FITTINGS</b> 1 1/8 compression (STD) 2 1/4 compression 5 1/4 VCO 8 1/4 VCR 10 6 mm compression											
<b>FLOW BODY ELASTOMERS</b> OV1 Viton or equivalent ON1 Neoprene or equivalent											
<b>VALVE SEAT (C101 Flow Controllers Only)</b> SV1 Viton® or equivalent SN1 Neoprene or equivalent SK1 Kalrez® or equivalent											
<b>INPUT POWER</b> PV1M 12 to 15 VDC, Linear (Flow Meters Only) PV2 24 VDC, Linear (Standard)											
<b>OUTPUT SIGNAL</b> 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											
<b>EXTERNAL SETPOINT SIGNAL (Flow Controllers Only)</b> 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											
<b>ELECTRICAL CONNECTION</b> 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											
<b>OPTIONS</b> GS Gas Substitution (Replace up to 9 Dial-A-Gas® Gases)											
<b>GAS FLOW RATE</b>											

FOR ACCESSORIES AND ADDITIONAL CABLES CONSULT SALESPERSON