# 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**
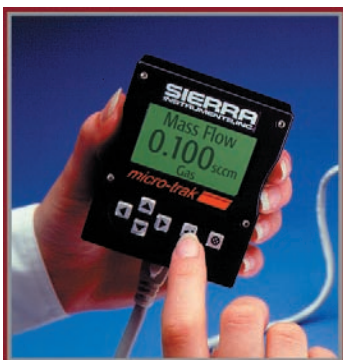
## Description

**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 Micro-Trak 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.

DIAL-A-GAS®    ISO REGISTERED 9001: 2000    C€

# SIERRA® INSTRUMENTS
### THE MASS FLOW COMPANY

# www.sierrainstruments.com

## Performance Specifications

**Accuracy**
± 1.0% of full scale including linearity at operating conditions

**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**
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 - 4.0 |
| Argon | 0.14 - 5.6 |
| $CO_2$ | 0.074 - 2.95 |
| CO | 0.10 - 4.0 |
| Methane | 0.075 - 3.0 |
| Helium | 0.14 - 5.6 |
| Hydrogen | 0.10 - 4.0 |
| Oxygen | 0.10 - 4.0 |
| Nitrogen | 0.10 - 4.0 |
| $N_2O$ | 0.072 - 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 21º 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:15-24 VDC +/- 10% (130 mA MAX)
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 4–20 mA, 500 ohms maximum loop resistance and one of the following: Linear 0–5 VDC, 0–10 VDC, 1–5 VDC, 1000 ohms minimum load resistance
  **Digital:**
    RS-232; Pilot Module Display optional

**Command Signal**
  **Analog (choice of one):**
    Linear 4–20 mA, 0–5 VDC, 0–10 VDC, 1–5 VDC
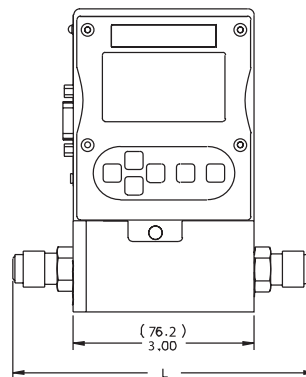  **Digital:**
    RS-232; Pilot Module Display optional

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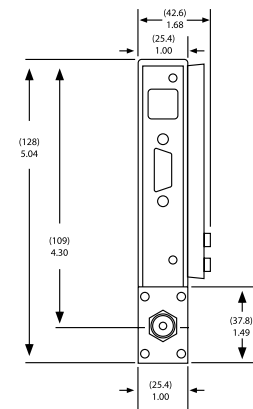
## Physical Dimensions

All dimensions are in inches with mm in brackets. Certified drawings are available on request.
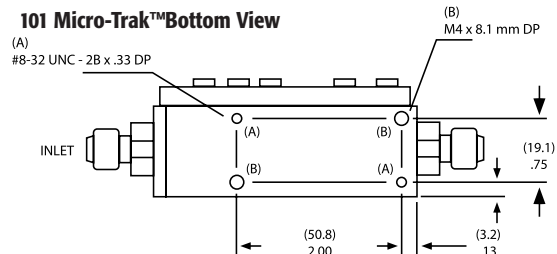
**101 Micro-Trak™ Front View**

**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™

**PARENT NUMBER**
**M101** Micro-Trak Mass Flow Meter
**C101** Micro-Trak Mass Flow Controller

**PILOT MODULE DISPLAY/INTERFACE**
**NR** No Display/Interface
**DD** Pilot Module Display/Interface
**RD** Remote Pilot Module Display/Interface

**INLET/OUTLET FITTINGS**
**1** 1/8 compression (STD)
**2** 1/4 compression
**5** 1/4 VCO
**8** 1/4 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** 12-15 VDC, Linear (Flow Meters)
**PV1C** 15-22 VDC, Linear (Flow Controllers)
**PV2** 24 VDC, Linear **(Standard)**

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

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

**OPTIONS**
**GS** Gas Substitution (Replace up to 9 Dial-A-Gas Gases)

**GAS FLOW RATE**

**FOR ACCESSORIES AND ADDITIONAL CABLES CONSULT SALESPERSON**

**Visit www.sierrainstruments.com/micro to see the Micro-Trak™**
**Controlling gas at an incredible 0.2 sccm (smlm).**