FlowStream®

FD Series

CSA Certified
CE Marked

TYPICAL APPLICATIONS
- Burner Management
- Leak Tests
- Gas Consumption
- Gas Blending
- Shielding Gas
- Laboratory R & D
- Laser Cutting
- Die Casting

Features
- Mass flow measurement with integrated temperature and pressure correction
- Visual readout of flow rate or total, pressure, and temperature
- Programmable set points
- No moving parts reduces maintenance
- Wide turndown for precision measurement at low or high flow
- 10-point calibration (NIST Traceable certificate available)

General Description
Laminar Flow Element differential pressure flowmeters are good for clean, dry, non-corrosive, non-condensing gasses. Corrected for temperature and pressure, it has a mass flow output. The USB serial data output makes the meters suitable for laboratory and the internal lithium-polymer rechargeable battery is useful for portable measurement applications. NIST traceable and CSA units are Type 1 weatherproof. The accuracy is less than 1% of reading subject to limitations described in the Specifications section.

The integrated LCD display can indicate flow rate or total as well as gas temperature and pressure.

Calibration is done on air with empirically derived conversion factors. Oxygen cleaning optional.

Sizes range from 1/8 to 3/4 inch threaded connections. Anodized aluminum is the standard material for the meter body and 316 Stainless Steel is available for use where external corrosion is a factor.
**Principles of Operation**

**Differential Pressure**

**TEMPERATURE SENSOR**

**ABSOLUTE PRESSURE**

**DOWNSTREAM PRESSURE**

**INPUT FLOW**

**OUTPUT FLOW**

**Laminar Flow Elements**

**PRINCIPLES OF OPERATION:** Flow of gas through a Laminar Flow Element generates a differential pressure between the absolute and downstream pressure sensors. This differential pressure is proportional to the flow velocity and viscosity of the gas. Mass flow rate is determined by utilizing the temperature and absolute pressure sensor to compensate for density variations of the gas.

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**General Specifications**

**Flow Ranges**

- **High Pressure Drop (2.6 psi)**: 2 SLPM/5 SCFH F.S. to 1300 SLPM/2600 SCFH F.S.
- **Turndown Ratio**: 400:1 (100:1 Turndown ratio available for units ranged under 20 SLPM/40 SCFH F.S.)
- **Accuracy**: < +/- 1% of reading
- **Repeatability**: 0.2% of full scale
- **Response Time**: 100 msec
- **Gases**: Air, Argon, Nitrogen, CO2, Oxygen, Helium, Hydrogen, Methane, and user selectable
- **Gas Compatibility**: Non-corrosive, non-condensing
- **Maximum Operating Pressure**: 150 PSIG
- **Burst Pressure**: 200 PSIG
- **Maximum Operating Temperature**: 104 °F (40 °C)
- **Minimum Operating Temperature**: 32 °F (0 °C)
- **Process Connections**: 1/8"-1/4"-3/8"-1/2"-3/4" NPT female (SAE, BSPT, BSPP available also)
- **Display**: Rate, total, pressure, temperature, multi-gas, alarms, multiple engineering units, battery status
- **Wetted Parts**: Ceramic, silicon, gold, epoxy, RTV
- **Flow Body Internals**: Stainless steel, anodized aluminum, Viton®
- **Enclosure Rating**: Type 1

**Note 1:** Port to Port pressure drop at full-scale flow

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**Electrical Specifications**

**Supply Voltage**: Direct USB powered, and Internal Lithium-Polymer rechargeable battery

**Output**: Direct USB serial data to PC, or USB memory stick data-logging (16GB Flash Drive included)

**Electrical Connection**: Type A USB Receptacle

**Battery Life**: 40 hours of operation on full battery charge, 10 hours of operation when logging data to USB memory

**Recharge Time**: 2 hours to full charge (5 VDC/ 1A)
Installation Dimensions of FD Series

<table>
<thead>
<tr>
<th>MODEL</th>
<th>DIM &quot;A&quot;</th>
<th>DIM &quot;B&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>100 slpm</td>
<td>3.00 Inches</td>
<td>0.38 Inches</td>
</tr>
<tr>
<td>250 slpm</td>
<td>3.25 Inches</td>
<td>0.50 Inches</td>
</tr>
<tr>
<td>500 slpm</td>
<td>3.50 Inches</td>
<td>0.63 Inches</td>
</tr>
<tr>
<td>1000 slpm</td>
<td>4.00 Inches</td>
<td>0.88 Inches</td>
</tr>
</tbody>
</table>

USB cable sold separately
How To Order Flowstream for a Single Gas
Select the appropriate symbols to build a model code:

Example: FD-  E  F-2 N- 360 SCFH- CO2- USB

SERIES = FD

MATERIAL FOR METER BODY
Anodized Aluminum = E
316 Stainless Steel = I

SEALS
Viton® = F

THREAD TYPE FOR THREADED PORT
NPT = N
SAE = T
BSPT = B
BSPP = P

FLOW RANGE IN SLPM | FLOW RANGE IN SCFH
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MIN FLOW | MIN/Max F.S. | MIN FLOW | MIN/Max F.S.
0.005 | 2.0 | 0.0125 | 5
0.075 | 30 | 0.15 | 60
0.05 | 5 | 0.1 | 10
0.45 | 180 | 0.9 | 360

PIPE SIZE IN INCHES

FLOW TYPE
NPT SAE BSPT BSPP
1/8 = 1 2
1/4 = 2 4
3/8 = 3 6
1/2 = 4 8
3/4 = 6 12

* Argon flow rates are 75% of the above values (multiply by 0.75) due to higher viscosity

GAS TYPE
Air = A
Argon* = R
Carbon Dioxide = CO2
Helium = HE
Nitrogen = N
Oxygen = O
Hydrogen = H
Methane = M

OUTPUT
USB Serial Data Link = USB

SPECIAL OPTIONS
CLEAN FOR OXYGEN SERVICE = C1
VACUUM USE = ZVAC
SPECIFIC PRESSURE (L.E. P10) = P___
ACTUAL GAS CALIBRATION = GAS