FlowStream®

FP Series

TYPICAL APPLICATIONS
• Burner Management
• Leak Tests
• Gas Consumption
• Gas Blending
• Shielding Gas
• 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 analog (4-20 mA) output along with 2 programmable alarm set points make the meters suitable for process automation systems. NIST traceable and CSA units are Type 4 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.
**General Specifications**

**Flow Ranges**
- High Pressure Drop (2.6 psi)\(^1\) 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:**
- 25 msec

**Gases:**
- Air, Argon, Nitrogen, CO\(_2\), 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:**
- 176 °F (80 °C)

**Minimum Operating Temperature:**
- -13 °F (-25 °C)

**Process Connections:**
- 1/8"-1/4"-3/8"-1/2"-3/4" NPT female (SAE, BSPT, BSPP available also)

**Display:**
- LCD rate/total, pressure, temperature, multi-gas, alarms, multiple engineering units

**Wetted Parts:**
- **Sensors**
  - Ceramic, silicon, gold, epoxy, RTV
- **Flow Body Internals**
  - Stainless steel, anodized aluminum, Viton®
- **Enclosure Rating:**
  - Type 4

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

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**Electrical Specifications**

**Supply Voltage:**
- 10–24 VDC (loop-powered 4-20mA output)

**Supply Current:**
- 22 mA (max) for 4-20 mA loop-powered transmitters

**Output:**
- 4-20 mA (2-wire loop powered) with 2 Alarms

**Electrical Connection:**
- 5-pin connector

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**Principles of Operation**

**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.
Installation Dimensions of FP Series

**OPTIONAL MOUNTING BRACKETS**

<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&quot;</td>
<td>0.38&quot;</td>
</tr>
<tr>
<td>250 SLPM</td>
<td>3.25&quot;</td>
<td>0.58&quot;</td>
</tr>
<tr>
<td>500 SLPM</td>
<td>3.50&quot;</td>
<td>0.63&quot;</td>
</tr>
<tr>
<td>1000 SLPM</td>
<td>4.00&quot;</td>
<td>0.88&quot;</td>
</tr>
</tbody>
</table>

PIN Connector Pinouts

**FP**

- **WHITE**: LOAD
- **BROWN**: +24 VDC
- **GRAY**: Alarm 2
- **BLACK**: Common
- **BLUE**: Alarm 1

0VDC (4-20mA Loop Return)

PIN CONFIGURATION:
- 1: +24VDC
- 2: 0VDC (4-20mA Loop Return)
- 3: Alarm 1
- 4: Common
- 5: Alarm 2

Accessory Cables Available for Pin Connector Meters

<table>
<thead>
<tr>
<th>Series</th>
<th>Description</th>
<th>Length in Meters</th>
<th>Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>FP</td>
<td>5 pin female</td>
<td>1 3 10</td>
<td>6241-1M 6241-3M 6241-10M</td>
</tr>
</tbody>
</table>
How To Order Flowstream for a Single Gas

Select the appropriate symbols to build a model code:

Example: FP- E F- 2 N- 360 SCFH- CO2- X1B

SERIES = FP

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

SEALS
Viton® = F
Buna N = B

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

PIPE SIZE IN INCHES
NPT
1/8 = 1
1/4 = 2
3/8 = 3
1/2 = 4
3/4 = 6

FLOW RANGE IN SLPM
MIN FLOW MIN/MAX F.S.
0.005 2.0
0.075 30
0.45 180
0.45 180
0.75 300
1.75 700
3.25 1300

FLOW RANGE IN SCFH
MIN FLOW MIN/MAX F.S.
0.0125 5
0.15 60
0.9 360
0.9 360
1.5 600
3.5 1400
6.5 2600

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

OUTPUT
4-20 mA with 2 alarms = X1B

SPECIAL OPTIONS
CLEAN FOR OXYGEN SERVICE = C1
VACUUM USE = ZVAC
SPECIFIC PRESSURE (I.E. P10) = P____
ACTUAL GAS CALIBRATION = GAS
(only available for: Helium, Nitrogen, CO2, Argon & Air)

ACCESSORIES
MOUNTING BRACKETS = 8426-ASSY

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