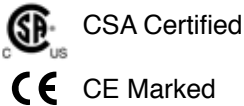


# FlowStream®

## FS Series



### TYPICAL APPLICATIONS

- Burner Management
- Leak Tests
- Gas Consumption
- Gas Blending
- Shielding Gas
- Laser Cutting
- Die Casting
- Robotics



### Features

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

### General Description

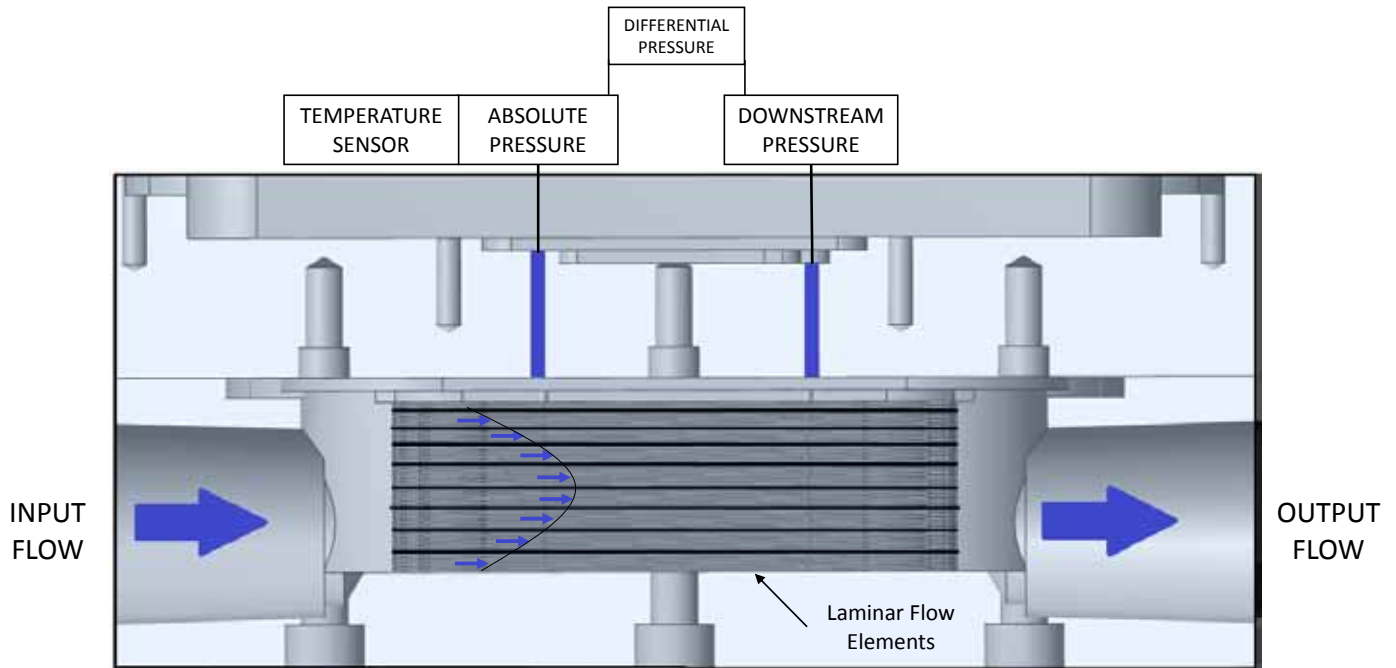
Laminar Flow Element differential pressure flowmeters are good for clean, dry, non-corrosive, non-condensing gasses. Corrected for temperature and pressure, it has a mass flow output. The EMI immunity and fast response (5 ms available) make the meters suitable for robotics' applications (painting or welding). A variety of outputs are available (4-20 mA, 0-5 V, and pulse). 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.

## 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.

## General Specifications

### Flow Ranges

**High Pressure Drop (2.6 psi)<sup>1</sup>** 2 SLPM/ 5 SCFH F.S. to 1300 SLPM/2600 SCFH F.S.

**Turndown Ratio:** 200:1 (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:** 10-100 msec (user selectable)

**Gases:** Air, Argon, Nitrogen, CO<sub>2</sub>, Oxygen, Helium, Hydrogen, Methane and mixtures

**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, 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

## Electrical Specifications

**Supply Voltage:** 10–24 VDC (Intrinsically Safe)

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

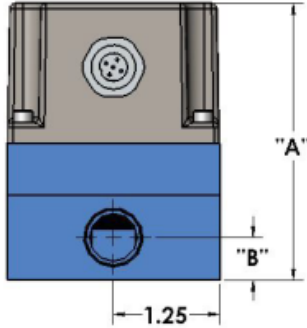
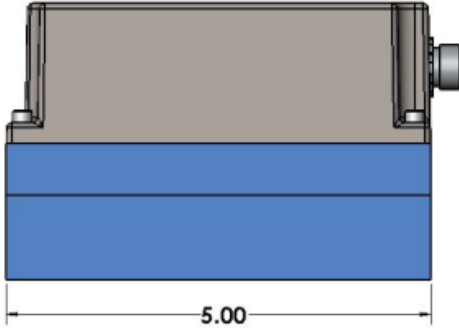
**Output:** 4-20 mA (2-wire loop powered)

0-5 VDC, 0-10 VDC, 1-5 VDC, 2-10 VDC (all w & w/o alarms)

0-1000 Hz, 200-1200 Hz, Pulse Out

**Electrical Connection:** 5-pin or 8-pin connector

# Installation Dimensions of FS Series



Cable shown sold separately

## PIN CONNECTOR PINOUTS

**FS**

**PIN CONFIGURATION:**

- 1: +24VDC
- 2: 0VDC (4-20 mA loop return)
- 3: Signal Output
- 4: Tare
- 5: Alarm 1 +
- 6: Alarm Common
- 7: Alarm 2 +
- 8: Chassis Ground

**PIN CONFIGURATION:**

- 1: +24VDC
- 2: 0VDC (4-20 mA loop return)
- 3: Signal Output
- 4: Tare
- 5: Chassis Ground

## ACCESSORY CABLES AVAILABLE FOR PIN CONNECTOR METERS

Series	Description	Length in Meters	Part Number
FS	5 pin female	1	6241-1M
		3	6241-3M
		10	6241-10M
FS	8 pin female	2	6242-2M
		5	6242-5M
		10	6242-10M

# How To Order Flowstream for a Single Gas

Select the appropriate symbols to build a model code:

**Example:** FS- E F- 2 N- 189 SCFH- CO2- X2A

**SERIES** = FS

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

**SEALS**  
 Viton® = F

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

PIPE SIZE IN INCHES	
NPT	SAE, BSPT, BSPP
1/8 = 1	2
1/4 = 2	4
3/8 = 3	6
1/2 = 4	8
3/4 = 6	12

FLOW RANGE IN SLPM		FLOW RANGE IN SCFH	
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
0.45	180	0.9	360
0.75	300	1.5	600
0.75	300	1.5	600
1.75	700	3.5	1400
1.75	700	3.5	1400
3.25	1300	6.5	2600

\* 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

SPECIAL OPTIONS	
CLEAN FOR OXYGEN SERVICE	= C1
VACUUM USE	= ZVAC
SPECIFIC PRESSURE (I.E. P10)	= P__
ISOLATED CHASSIS GROUND	= ZRC
ACTUAL GAS CALIBRATION	= GAS

OUTPUT	
<b>Digital Visual Display with Output</b>	
X2A	= 4-20mA Intrinsically Safe
X4A	= 0-5 VDC
X4B	= 0-5 VDC with 2 alarms
X5A	= 0-10 VDC
X5B	= 0-10 VDC with 2 alarms
X12A	= 1-5 VDC
X12B	= 1-5 VDC with 2 alarms
X14A	= 2-10 VDC
X14B	= 2-10 VDC with 2 alarms
X19A	= 0-1000 HZ
X20A	= 200-1200 HZ
X22A	= pulse out (rate varies with size)
<b>No Visual Display with Output</b>	
Z1A	= 4-20mA
Z2A	= 4-20mA Intrinsically Safe
Z4A	= 0-5 VDC
Z5A	= 0-10 VDC
Z12A	= 1-5 VDC
Z14A	= 2-10 VDC
Z19A	= 0-1000 HZ
Z20A	= 200-1200 HZ
Z22A	= pulse out (rate varies with size)



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