

# Unit 125 Series Integrated Flow Controller

## Ultra High Purity Pressure Transient Insensitive

- » Step<sup>®</sup> technology improves response time.
- » PTI technology eliminates pressure transient effects.
- » MultiFlo<sup>®</sup> reduces lead times and inventory requirements.
- » CrossChek<sup>™</sup> certified accuracy performance.



### Integrated Flow Control

The Unit 125 integrated flow controller advances mass flow control by integrating a pressure transducer and industry-proven thermal sensor within a standard MFC enclosure. The result is faster response to setpoint commands and elimination of flow variation associated with upstream and downstream pressure transients.

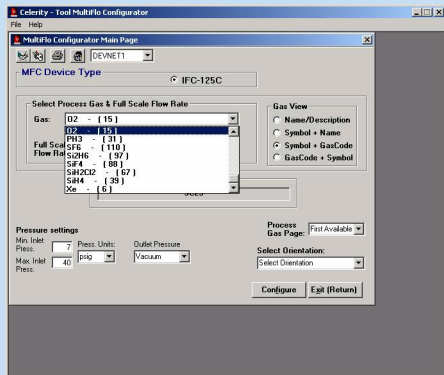
### Standard Features

- Ultra High Purity Construction
  - Surface-passivated stainless steel (SEMI F20-compliant)
  - 4 $\mu$  inch Ra surface finish (electro polished) enables fast dry down
- Advanced User Interface
  - Visual display featuring pressure, flow, and temperature status
  - LED indicators for network status and controller diagnostics
- Popular Configurations Supported
  - Downported C-Seal and W-Seal or 1/4" VCR fitting options
  - 1 1/8" or 1 1/2" Footprint options
  - 9 Pin "D" Analog/RS485 or 5 Pin "M8" DeviceNet<sup>™</sup>
- Gas and Range Configurable
  - Change flow range and run at 25:1 turndown ratio (typical)
  - Select amongst dozens of different process gases

### Applications

- Dielectric etch
- Polysilicon etch
- Metal etch
- Low k deposition
- Subatmospheric deposition
- Plasma enhanced deposition
- High density plasma deposition
- Low pressure deposition
- High temperature annealing
- Metal oxide deposition

## Gas and Range Configurable



Celerity configurator software enables range, gas, and calibration curve configuration to ensure flexibility for any application.

## Step®



Step® technology enables fast set point control via high speed DSP (digital signal processor) and low volume sensor drive circuit. Typical setpoint response is 300 milliseconds from setpoint command to desired flow output per SEMI E17-0600 within the recommended operating range.

- Improve throughput by 4 seconds per run (typical)
- Reduce divert gas consumption and associated abatement costs

## Pressure Transient Insensitive Technology (PTI)



Unit 125 is equipped with PTI technology, which reduces the effect of pressure fluctuations on gas flow. The technology is simple: a signal from an integrated pressure transducer is combined with the standard thermal sensor output. The combined signals allow precise and stable flow even when the line pressure is fluctuating.

Users report stable flow in typically difficult flow management conditions

- Eliminate overshoot/undershoot and first run effect
- Eliminate regulator burst/sag and MFC crosstalk effect
- Reduce impact of valve sequencing issues

## MultiFlo®

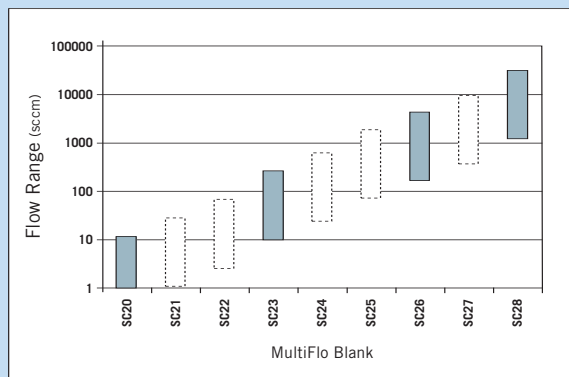


MultiFlo is a technology that allows users to configure 9 standard configurations (“SCs”) or “blanks” for a variety of pure gases and mixtures.

This wide dynamic range and configurable gas options enable users to reduce unique inventory requirements.

- Reduce part numbers
- Reduce typical delivery times

## MultiFlo Turndown Advantage



MultiFlo covers a flow range from 1sccm to 30slm (nitrogen equivalent) with as little as 4 "Blanks."

## CrossChek™ metrology system



CrossChek is a method of ensuring unit-to-unit reproducibility of manufactured flow control products. With CrossChek, a manufacturing transfer standard or "calibrator" is compared against another transfer standard once per day. This "check" ensures that transfer standards operate within a statistical margin of error from calibrator to calibrator. The result: mass flow controllers and meters comply with published accuracy specifications and lot-to-lot variation is eliminated.

## MultiFlo Configurator System

MultiFlo configurator system consists of a PC, configurator software, printer and power supply options. MultiFlo configurator allow users to configure and label MultiFlo blank MFCs with customer part number, serial number, and gas/range data.

## Unit 125 Integrated Flow Controller

### Display / Diagnostics

Diagnostics % Flow, Pressure [psia/kPa], Temp [°C]  
LED Indicators Network and controller status

### Electrical

Certifications - CE Mark EMC 89/336/EEC  
Power 200mA, ±15 VDC or 11 to 25 VDC

### Materials

Gas Path Materials 316L SS/ 7 Mo (SEMI F20)  
Surface Finish 4μ inch Ra (SEMI F19)  
Weight ≤ 2.65 lbs (1.20 kg)

### Options

See next page for ordering options

### Operating Limits\*

	Normally Closed	Normally Open
Burst Pressure	500 psig	500 psig
Proof Pressure	140 psig	140 psig
Transient Pressure	± 2 psid per 0.1 sec	± 2 psid per 0.1 sec
Inlet Pressure		
Atmospheric Exhaust	20 psia to 60 psia	20 psia to 55 psia
Vacuum Exhaust	20 psia to 55 psia	20 psia to 50 psia
Differential Pressure		
≤ 1 L	7 psid to 45 psid	7 psid to 40 psid
≤ 15 L	10 psid to 45 psid	10 psid to 40 psid
≤ 30 L	15 psid to 45 psid	15 psid to 40 psid
Control Valve		
Operating Range	10% to 100%	
Setpoint Range	2% to 100% (2% enables auto shut-off)	
Flow		
Operating Range	30 to 30,000 sccm	30 to 30,000 sccm
Setpoint Range	1 to 30,000 sccm	1 to 30,000 sccm
Turndown Ratio	Up to 25:1	Up to 25:1
Temperature	0 °C to 45 °C	0 °C to 45 °C

### Performance (Accuracy)\*

Flow	
Calibration	
3% to 35%	± 0.35% F.S.
35% to 100%	± 1.0% S.P.
Δ Temp (Span)	0.10% F.S. per °C
Zero (No Flow)	
Drift	≤ 0.60% F.S. per yr
Offset	± 0.20% F.S.
Pressure	± 0.5% F.S.
Temperature	± 2.0% F.S.

### Performance (General)\*

Leak Integrity	
External	≤ 1 x 10 <sup>-10</sup> atm.cc/sec He (SEMI E16)
Internal	≤ 1% F.S. (SEMI F1)
Linearity	± 0.50% F.S. (SEMI E27)
Repeatability	± 0.15% F.S. (SEMI E56)
Settling Time	300 to 400 msec (SEMI E17)

### Factory Calibration Conditions

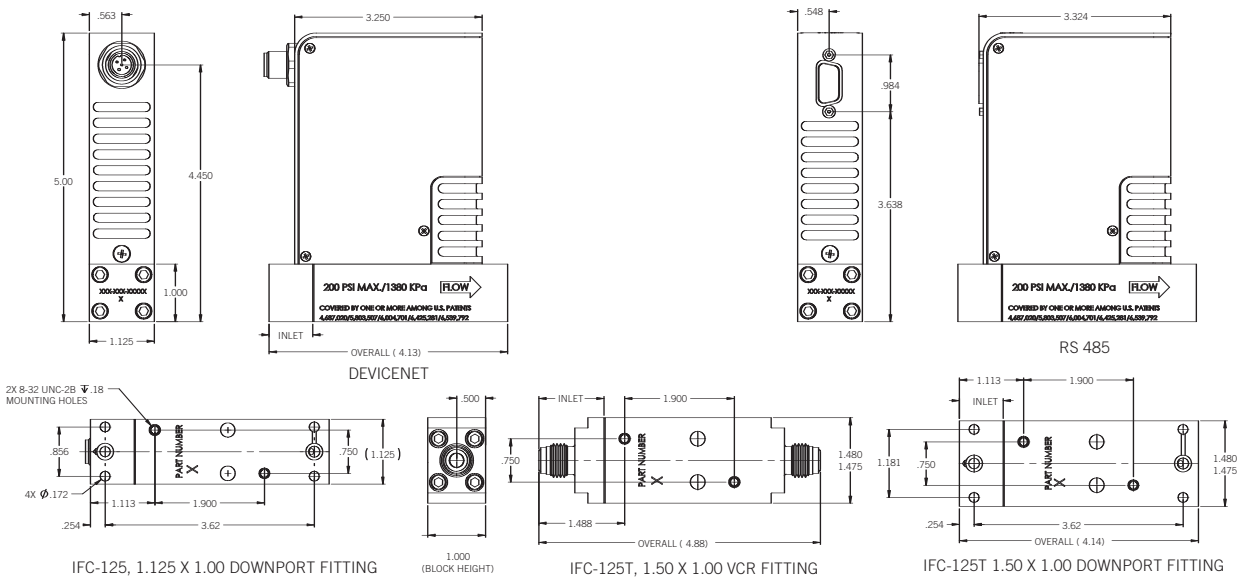
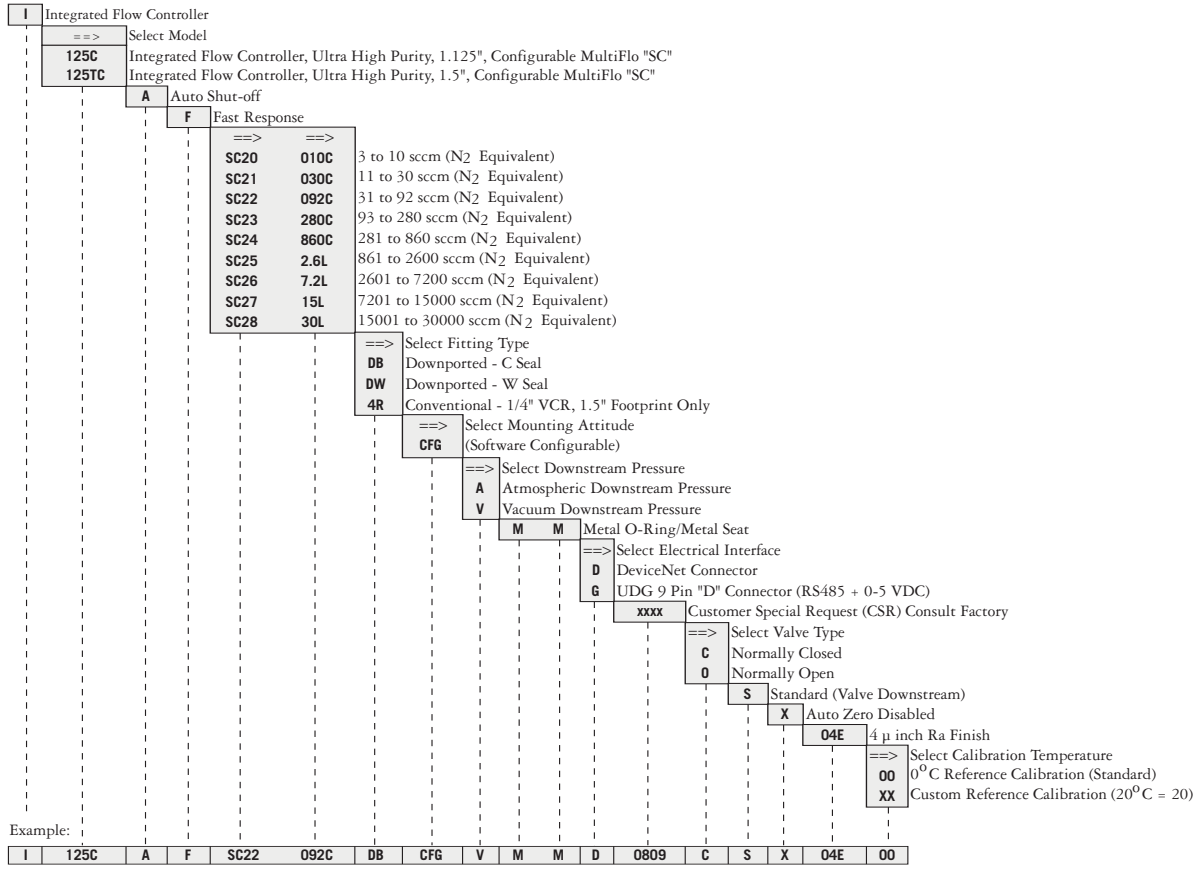
Calibration Gas	Nitrogen
Cardinal Verification Pts	0%, 3%, 10%, 25%, 100%
Downrange Ratio	1:1 (Non-downranged)
Inlet Pressure	30 to 45 psia
Temperature	21°C ± 3°C
Mounting Attitude	Vertical Inlet Up
Warm Up Time	60 minutes (SEMI E68)
Zero Procedure	Contact Factory for Details.

Please contact the factory regarding recommended zeroing procedures and operating practices for actual use conditions.

\*Performance and operating limits comply with Factory Calibration Conditions.

Specifications and features are subject to change without notice.

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