

IN3XP Series

Performance mass flow controllers and meters

- » Pressure Insensitivity
- » Wide Control Range
- » High Accuracy
- » Fast Control Time
- » Gas and Range Configurability



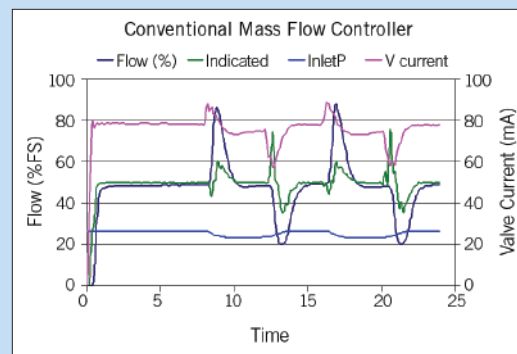
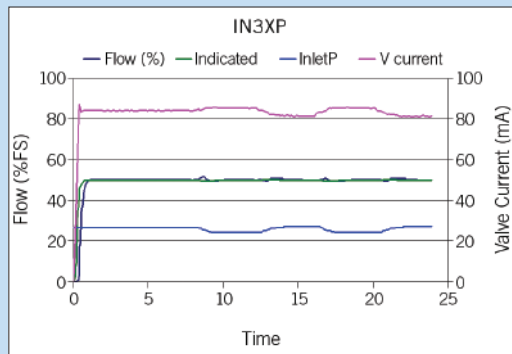
Performance Characteristics

IN3XP utilizes a low pressure drop orifice and large stroke valve design, which enables a wider pressure operating range (up to 60% larger) for high flow applications; these ranges are commonly associated with deposition and thermal processes. In addition, the IN3XP is built upon a modular design and may be ordered with or without a pressure transducer or control valve allowing more flexibility with gas delivery system designs.

IN3XP seamlessly integrates critical gas delivery technologies such as flow control, pressure measurement and display into a single platform to provide industry leading performance.

Applications

- Subatmospheric deposition
- Plasma enhanced deposition
- Low pressure deposition
- High temperature annealing
- Metal oxide deposition
- Vacuum coating applications



Pressure Insensitivity Advancements

Optimizing gas delivery requires close alignment between numerous gas system components and technologies. A critical interaction is that of inlet pressure dynamics on mass flow controllers.

Pressure perturbations from faulty regulators, improper valve sequencing or cross-talk between various mass flow controller inlet pressures can lead to unstable flow dynamics and loss of control during wafer processing.

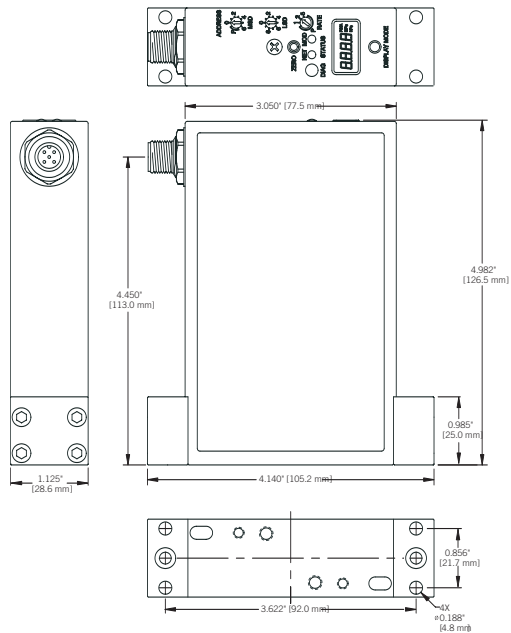
IN3XP uniquely incorporates ultra-high accuracy pressure sensing and advanced fluid mechanics with state-of-the-art mass flow controller control systems to eliminate the negative effects from pressure perturbations.

The graphs above highlight IN3XP's superior control during these dynamic pressure changes compared to non-pressure insensitive technology.

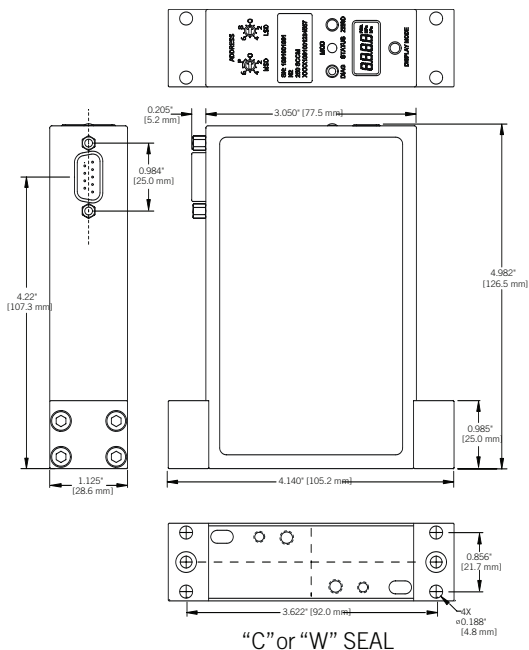
IN3XP provides additional benefits for cost reduction or gas panel flexibility by eliminating the need for discrete pressure regulators, transducers, displays, and redundant valves.

Product Dimensions

DeviceNet™



Surface Mount Digital / Analog



IN3XP Series Specifications

Performance¹

Full Scale Flow (N ₂ equivalent)	5 sccm–100 slm
Turndown Ratio	≥50:1 ²
Response/Settling time	≤750 msec. (typical)
Accuracy	
5 sccm–30 slm	±0.5% SP for >50–100% FS range
>30 slm	±1% SP for 10–50% FS range
>30 slm	±0.1% FS for <10% range
Repeatability	±1% SP plus ±0.5% FS
	±0.25% SP for 10–100% FS range
	±1% SP for <10% range
Ambient Temp Coefficient	±0.05% FS/°C maximum (zero and span)
Inlet Pressure Coefficient	±0.007% FS/psi with autozero disabled
Inlet Pressure Perturbation Sensitivity	±5% SP for up to 5psi/sec. upsteam pressure spike
Pressure Transducer Accuracy	±0.25% FS
Display Resolution	±0.1 psi

Mechanical

Control Valve Type	Normally closed solenoid valve, diaphragm isolated.
Material Exposed to Process Gas	Stainless Steel per SEMI F-20, sapphire, ruby, Hasteloy® C-22, Inconel® 718, Monel®
Leak Integrity	<1 X 10 ⁻¹⁰ atm.cc/sec
Valve Leakthrough	<0.5% FS
Surface Finish	5µin. Ra

Electrical

Input Voltage Requirement	DeviceNet™: +11–25 VDC
	Analog: ±15 VDC (±20%)
Power Supply Sensitivity	±0.05% FS maximum
Power Consumption	DeviceNet: 7 watt maximum
	Analog: 5 watt maximum
Digital Communications	DeviceNet or RS-485
Analog I/O Signal	0–5 VDC

Environmental

Operating Temperature Range (ambient and gas)	0–50°C
Humidity	10–95% RH non-condensing
Maximum Overrange Pressure	140 psig
Differential Pressure (vacuum outlet)	7–40 psid (<11 slm)
	15–40 psid (11–30 slm)
	25–60 psid (>30 slm)

Regulatory Compliance

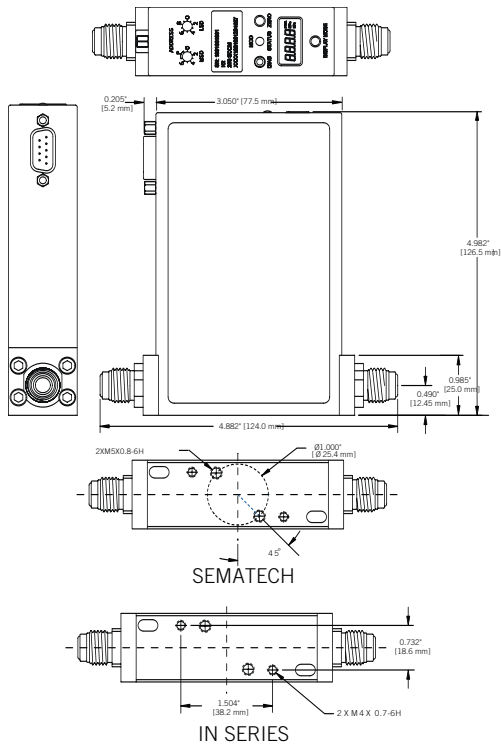
CE Mark	Compliant to EMC Directive 89/336/EEC, EN 61326 and SEMI F53
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Notes

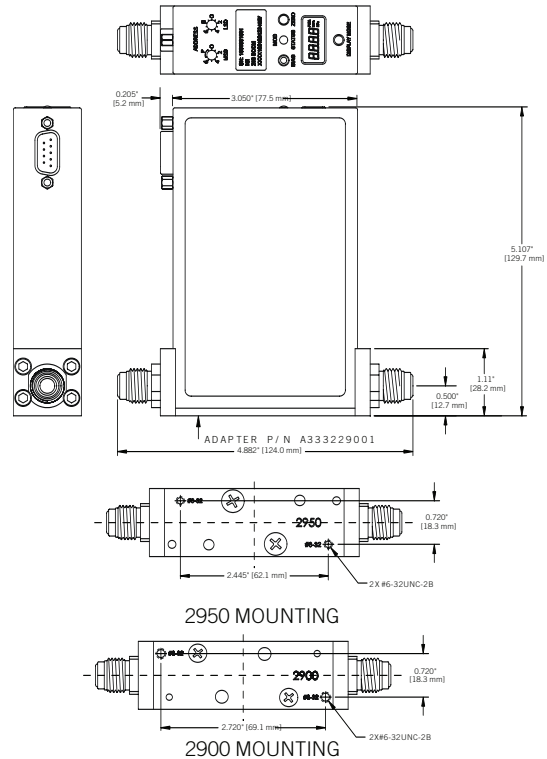
1. Based on factory calibration, N₂. Contact factory for other gases.
2. Configurable, contact factory for details.

Product Dimensions

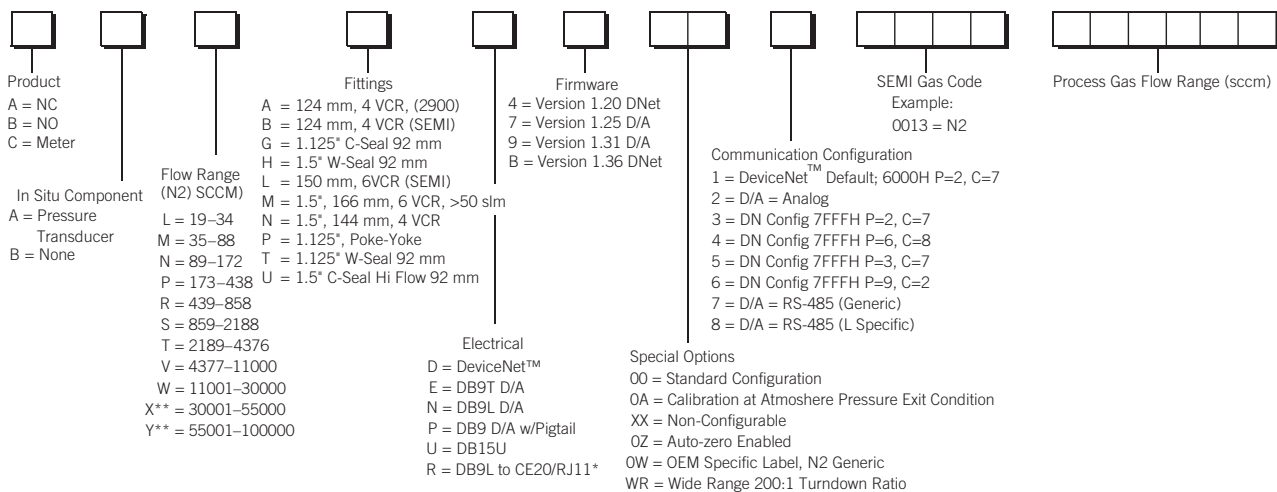
4VCR 2900 Digital / Analog



4VCR 2900 Digital / Analog



Product Configurations



* R option interfaces 9pinD to 20pinCardEdge/RJ11 (x2) adapter

** Please contact factory for available gases



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For technical assistance, contact Celerity Technical Support at 972.359.4000.



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