

Fisher™ i2P-100

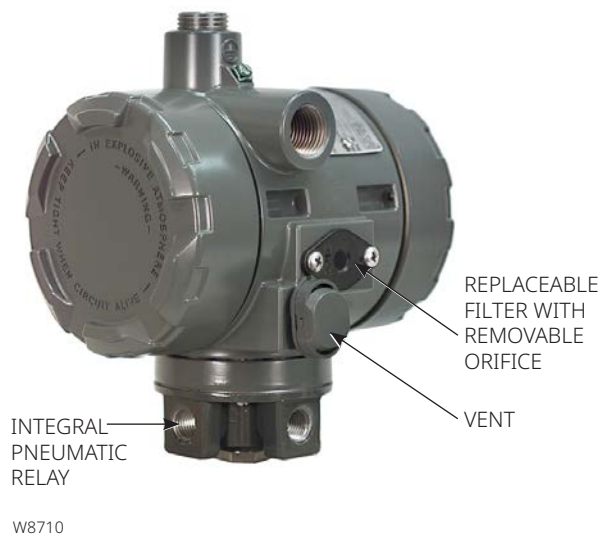
Electro-Pneumatic Transducer



The Fisher i2P-100 electro-pneumatic transducer uses a converter module that converts a milliampere input to a proportional pressure output. Both the current input and pressure output range are user-configurable in the field. The converter module uses small parts of minimum mass, which are balanced symmetrically around a pivot point at the center of the mass. This balanced arrangement results in a high performance instrument that reduces sensitivity to vibration.

An integral pneumatic relay provides the high capacity necessary to drive pneumatic control valve/actuator assemblies without additional boosters or positioners. The transducer also provides stable, accurate operation when its output is transmitted to small volume chambers, such as a pneumatic positioner or other pneumatic instrument. Reduced sensitivity to vibration, combined with high capacity and first order lag characteristics, make the i2P-100 transducer suitable for direct mounting on control valve/actuator combinations.

Figure 1. Fisher I2P-100 Electro-Pneumatic Transducer



Features

- Approved for use with Natural Gas - The i2P-100 is approved for use with natural gas as the pneumatic supply.
- Low Pneumatic Supply Consumption - The transducer has low pneumatic supply consumption which lowers operating costs. Maximum steady state consumption is less than the 6 SCFH requirement set for the oil and gas industry by the US Environmental Protection Agency (New Source Performance Standards Subpart OOOO, EPAHQ-QAR20100505).
- Single Sealed Device - The i2P-100 has been tested in accordance with ANSI/ISA Standard 12.27.01 (Requirements for Process Sealing Between Electrical Systems and Flammable or Combustible Process Fluids) as a single sealed device.
- High Output Capability and Rangeability - The integral output relay volume of the transducer is adequate to drive valve/actuator combinations without requiring a positioner or volume booster. Selectable user field-configurable dip switch setting for output range of 0.14 to 2.3 bar / 2 to 33 psi.
- Split Range - Selectable user field-configurable two-way split range, using either half of the standard input signal.
- Corrosion Resistant - Separate housing compartments isolate the electronics from the pneumatic process. The electronics module is encased in a rugged plastic shell which helps to prevent damage to the electronics. The printed wiring board and dip switches are conformal coated to help prevent corrosion. Converter module coils have corrosion resistant coating and all flexures are gold plated to provide protection from hostile environments.

Figure 2. Fisher i2P-100 Electro-Pneumatic Transducer Mounted on a Rotary Actuator



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Figure 3. Fisher i2P-100 Electro-Pneumatic Transducer Mounted on a Sliding-Stem Actuator



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- Tolerant of Dirty Supply Medium - Free-flow pilot stage design and large internal air passages provide excellent tolerance to dirty pneumatic supply, by reducing the effects of contaminant buildup and erosion. The removable primary orifice and replaceable 5 micrometer filter are easy to remove for service and maintenance.
- Easy Maintenance - Modular electronics and converter modules contained in separate housing compartments, isolating the electronics from the process, allow for easy replacement in the field for reduced maintenance time and costs.
- Vibration Resistance - The transducer, used in a standard valve/actuator mounted application, exhibits an output shift of less than 1 percent of span when tested to ISA S75.13.

Table 1. Specifications

Input Signal			Maximum Steady-State Flow Rate ⁽²⁾⁽³⁾
Available as standard with 4 to 20 mA. User configurable by dip switch for split ranging, see table below.			Refer to Table 3 and 4
Output Signal			Maximum Output Air Capacity ⁽³⁾
Available as standard 0.2 to 1.0 bar / 3 to 15 psig, 0.4 to 2.0 bar / 6 to 30 psig or 0.14 to 2.3 bar / 2 to 33 psig. User configurable by dip switch selection and zero and span potentiometer adjustment, see table below.			8.04 m ³ /hr / 300 scfh at 1.4 bar / 20 psig supply pressure
Input Signal	Output Pressure		Performance ⁽⁴⁾ Reference Accuracy: ±1.0% of full scale output span; includes combined effects of hysteresis, linearity and deadband Independent Linearity: ±0.5% of full scale output span Hysteresis: 0.4% of full scale output span Frequency Response: Gain is attenuated 3 dB at 3 Hz with transducer output signal piped to a typical instrument input Temperature Effect: ±0.14% per degrees celsius / ±0.075% per degrees fahrenheit of span Supply Pressure Effect: 0.2% of full scale output span per psi supply pressure change Vibration Effect: Less than 1% of full scale output span when tested to ISA S75.13 Electromagnetic Compatibility: Meets EN 61326-1:2013 Immunity: Industrial locations per Table 2 of EN 61326-1 Standard. Performance is shown in Table 2 below. Emissions: Class A ISM equipment rating: Group 1, Class A
	Bar	psig	
4 to 20 mA DC	0.2 to 1.0	3 to 15	
	0.4 to 2.0	6 to 30	
	0.14 to 2.3	2 to 33	
4 to 12 mA DC	0.2 to 1.0	3 to 15	
12 to 20 mA DC	0.2 to 1.0	3 to 15	
Equivalent Circuit			
The i2P-100 equivalent circuit is a series circuit consisting of a constant voltage drop (battery) of approximately 4 V DC and a total resistance of 40 ohms. Input is shunted by two 6.8 V zener diodes (see Figure 4).			
Supply Pressure ⁽¹⁾			
Recommended: 0.3 bar / 5 psi higher than upper range limit of output signal Maximum: 3.4 bar / 50 psig Medium: Air or Non-Corrosive Natural Gas Per ISA Standard 7.0.01 A maximum 40 micrometer particle size in the air system is acceptable. Further filtration down to 5 micrometer particle size is recommended. Lubricant content is not to exceed 1 ppm weight (w/w) or volume (v/v) basis. Condensation in the air supply should be minimized. Pressure Dew Point: At least 10 °C less than the lowest ambient temperature expected. Per ISO 8573-1 Maximum particle density size: Class 7 Oil content: Class 3 Pressure Dew Point: Class 3			
			Operating Ambient Temperature Limits ⁽¹⁾
			-40 to +85 °C / -40 to +185 °F
			Electrical Seal
			Single sealed device per ANSI/ISA 12.27.01

-continued-

Table 1. Specifications (continued)

Hazardous Area Approvals and Other Classifications	Adjustments ⁽⁵⁾
CSA: Intrinsically Safe, Explosion-proof, Type n, Dust-Ignition proof (Canada) FM: Intrinsically Safe, Explosion-proof, Type n, Non-incendive, Dust-Ignition proof (United States) ATEX: Intrinsically Safe, Flameproof, Type n IECEX: Intrinsically Safe, Flameproof, Type n CUTR: Customs Union Technical Regulations INMETRO: National Institute of Metrology, Quality and Technology (Brazil) KTL: Korea Testing Laboratory (South Korea) NEPSI: National Supervision and Inspection Centre for Explosion Protection and Safety of Instrumentation (China) UKEx: Intrinsically Safe, Flameproof and Dust, Type n and Dust (United Kingdom) Contact your Emerson sales office or refer to the i2P-100 product page at Fisher.com for approval specific information.	Zero and Span: Trim potentiometers (20 turn) for zero and span adjustments are located under the housing cap Switch: Allows input signal split range and user-configurable 0.14 to 2.3 bar / 2 to 33 psig output.
Electrical Housing	Connections
When Remotely Vented CSA: Type 4X Encl. FM: NEMA 4X ATEX: IP66 IECEX: IP66 No Remote Venting CSA: Type 3 Encl. FM: NEMA 3 ATEX: IP64 IECEX: IP64	Supply and Output Pressure: 1/4 NPT internal connection Vent: 1/4 NPT internal Electrical: Standard 1/2 NPT Wire Size: 18 to 22 AWG
Construction Materials	Mounting Position
Housing: ASTM: A03600 material composition alloy O-rings: Nitrile Diaphragms: Nitrile	■ Actuator ■ pipe stand or ■ surface
	Approximate Weight
	2.5 kg / 5.5 lbs
	Options
	■ Output pressure gauge ■ M20 or PG13 conduit adapter
NOTE: Specialized instrument terms are defined in ANSI/ISA Standard 51.1 - Process Instrument Terminology 1. The pressure and temperature limits in this document and any applicable standard or code limitation should not be exceeded. 2. Average flow rate determined at 12 mA and 0.6 bar / 9 psig output. 3. Normal m3/hour--Normal cubic meters per hour (0 °C and 1.01325 bar, absolute). Scfh--Standard cubic feet per hour (60 °F and 14.7 psig). 4. Performance values are obtained using a transducer with a 4 to 20 mA DC input signal and a 0.2 to 1.0 bar / 3 to 15 psig output signal at an ambient temperature of 24 °C / 75 °F. 5. For other ranges, zero and span adjustments needed.	

Table 2. EMC Summary Results — Immunity

Port	Phenomenon	Basic Standard	Test Level	Performance Criteria ⁽¹⁾
Enclosure	Electrostatic discharge (ESD)	IEC 61000-4-2	4kV Contact 8kV Air	A
	Radiated EM field	IEC 61000-4-3	80 to 1000 MHz @ 10 V/m with 1 kHz AM at 80% 1400 to 2000 MHz @ 3 V/m with 1 kHz AM at 80% 2000 to 2700 MHz @ 1 V/m with 1 kHz AM at 80%	A
I/O signal/ control	Burst (fast transients)	IEC 61000-4-4	1 kV	A
	Surge	IEC 61000-4-5	1 kV (line to ground only, each)	A
	Conducted RF	IEC 61000-4-6	150 kHz to 80 MHz at 3 Vrms	A

Specification limit = $\pm 1\%$ of span

1. A = No degradation during testing. B = Temporary degradation during testing, but is self-recovering.

Table 3. Maximum Steady-State Flow Rate (Air)

SUPPLY PRESSURE		OUTPUT PRESSURE		STEADY STATE FLOW RATE ⁽¹⁾	
Bar	Psi	Bar	Psi	m ³ /hr	Scfh
1.4	20	0.2 to 1.0	3 to 15		
		0.2	3	0.04	1.5
		0.62	9	0.06	2.0
		1.0	15	0.07	2.6
2.4	35	0.4 to 2.0	6 to 30		
		0.4	6	0.05	1.7
		1.2	18	0.08	2.9
		2	30	0.12	4.1
2.6	38	0.1 to 2.3	2 to 33		
		0.1	2	0.04	1.5
		1.2	17.5	0.08	2.9
		2.3	33	0.12	4.3

1. Normal m³/hour - Normal cubic meters per hour (0 °C and 1.0135 bar, absolute).

Scfh - Standard cubic feet per hour (60 °F and 14.7 psig).

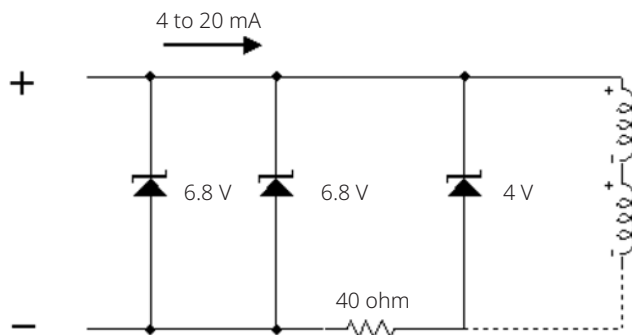
Figure 4. Equivalent Circuit

Table 4. Maximum Steady-State Flow Rate (Natural Gas)

SUPPLY PRESSURE		OUTPUT PRESSURE		STEADY STATE FLOW RATE ⁽¹⁾	
Bar	Psi	Bar	Psi	m3/hr	Scfh
1.4	20	0.2 to 1.0	3 to 15		
		0.2	3	0.06	1.95
		0.62	9	0.07	2.6
		1.0	15	0.1	3.38
2.4	35	0.4 to 2.0	6 to 30		
		0.4	6	0.06	2.21
		1.2	18	0.11	3.77
		2	30	0.15	5.33
2.6	38	0.1 to 2.3	2 to 33		
		0.1	2	0.06	1.94
		1.2	17.5	0.11	3.74
		2.3	33	0.18	5.55

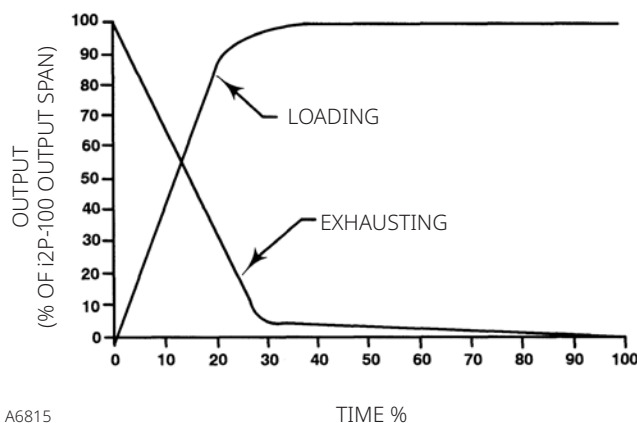
1. Normal m3/hour - Normal cubic meters per hour (0 °C and 1.0135 bar, absolute).

Scfh - Standard cubic feet per hour (60 °F and 14.7 psig).

2. Natural gas steady state flow based on natural gas specific gravity of 0.6. Flow decreases as specific gravity increases.

Valve Stroking Time

Figure 5 shows relative times for loading and exhausting an actuator. Stroking time depends upon the size of the actuator, travel, relay characteristics and the magnitude and rate of change of the input signal. If stroking time is critical, contact your Emerson sales office.

Figure 5. Output-Time Relationships

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Installation

Refer to Figure 6 for location of standard mounting holes in the housing. See Figure 2 and 3 for typical mounting configurations. Standard mounting hardware is provided for mounting on the actuator, a pipestand, or surface mount. Field wiring connections are made to the terminal block accessible under the housing cap, via the 1/2 NPT conduit connection. Dimensions are shown in Figure 6, 7, 8 and 9.

Ordering Information

To determine what ordering information is required, refer to the Specifications table. Carefully review the description of each specification. Specify the desired choice whenever there is a selection available. Also, specify options that are applicable to the application.

Figure 6. Dimensions

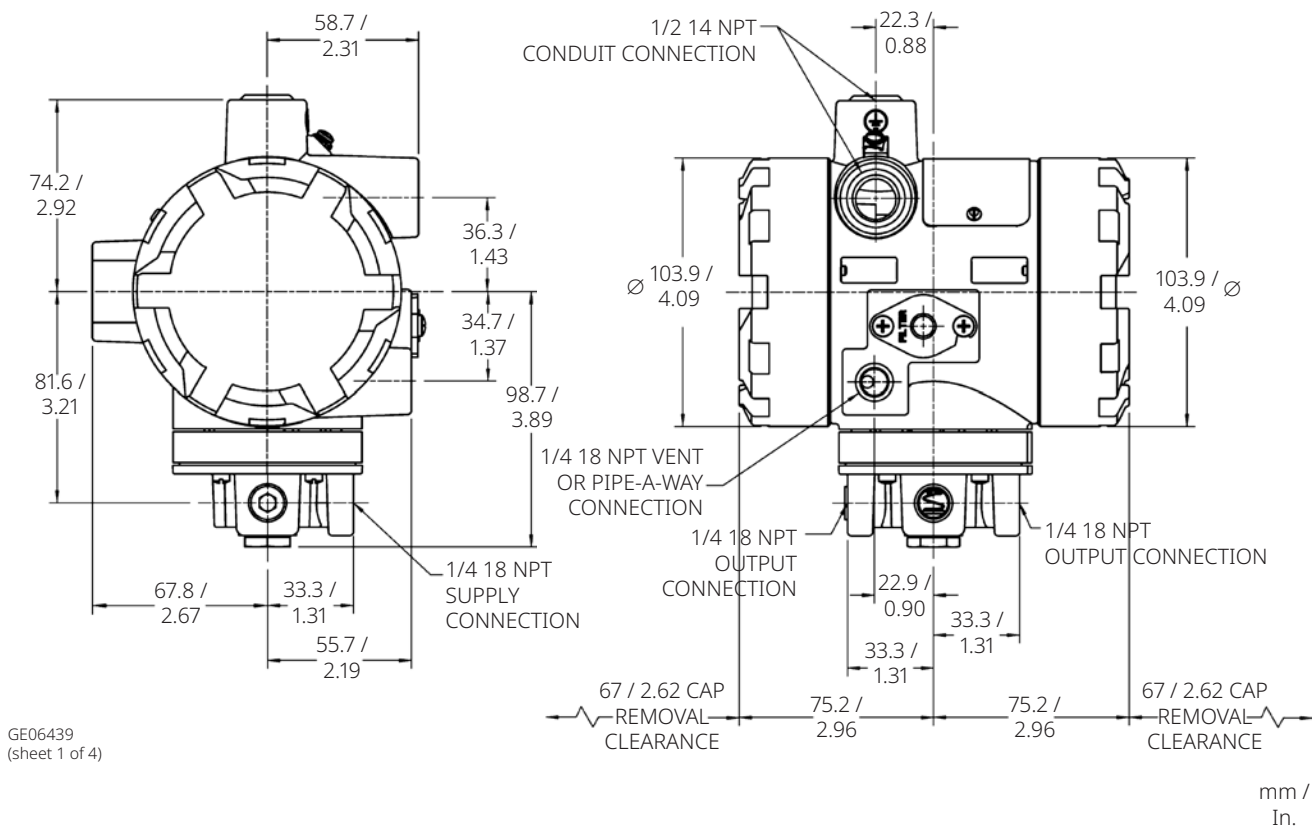


Figure 7. Dimensions with Optional Fisher 67 Filter-Regulator (Yoke/Bracket Mounted)

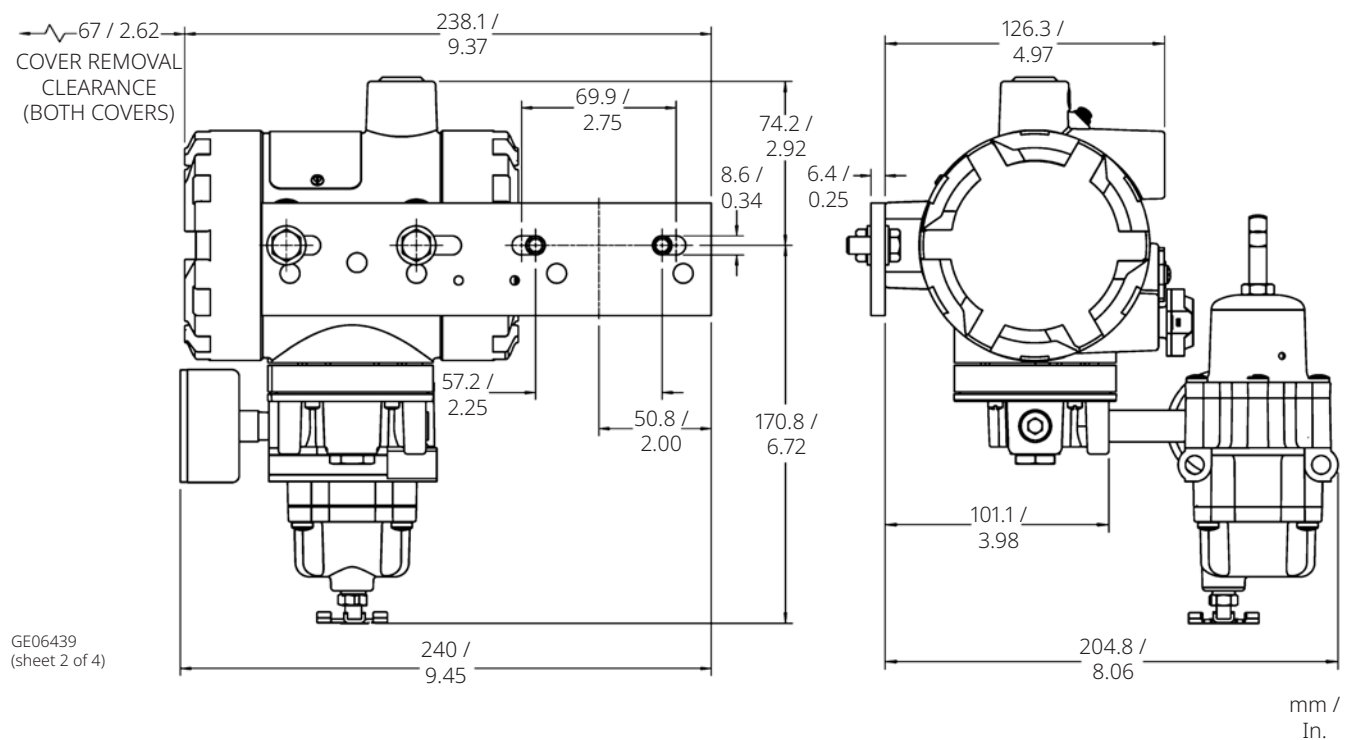


Figure 8. Dimensions with Optional Fisher 67 Filter-Regulator (Surface/Wall Mounted)

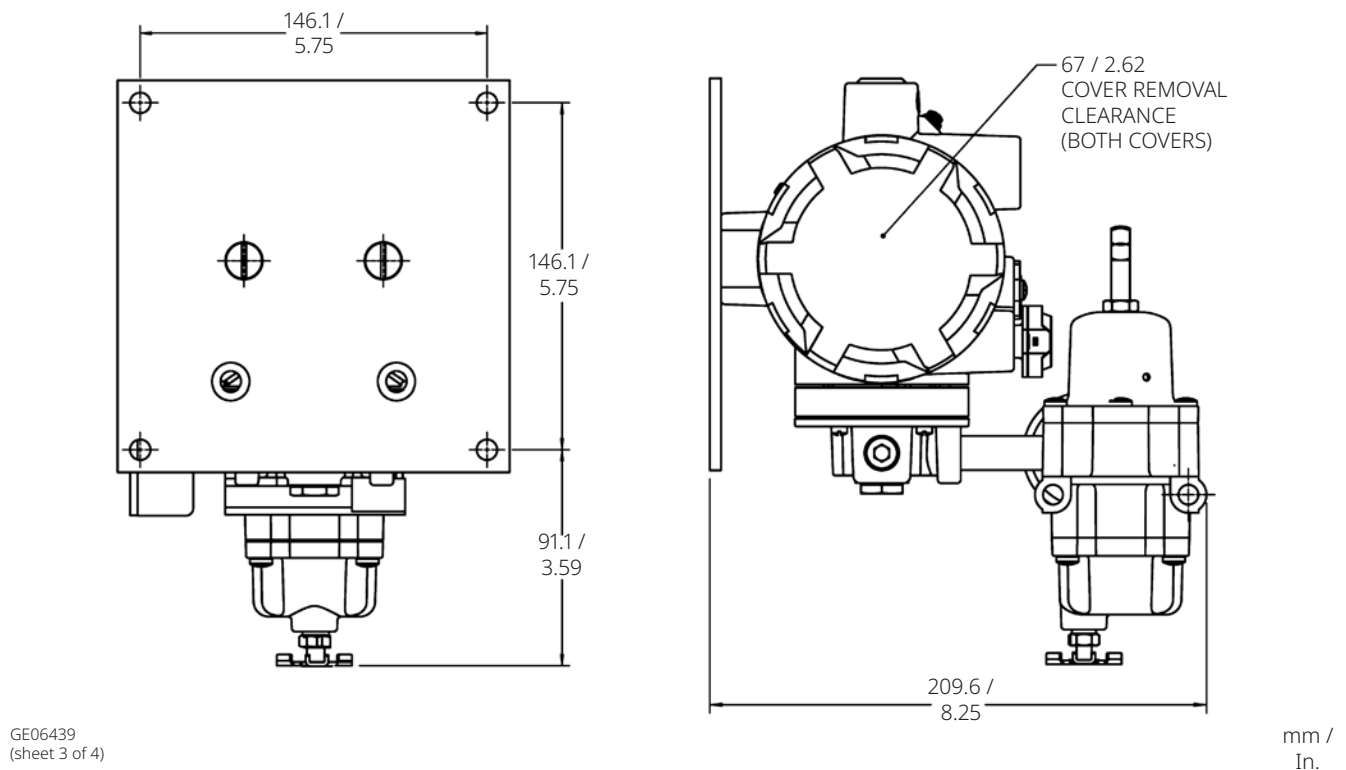
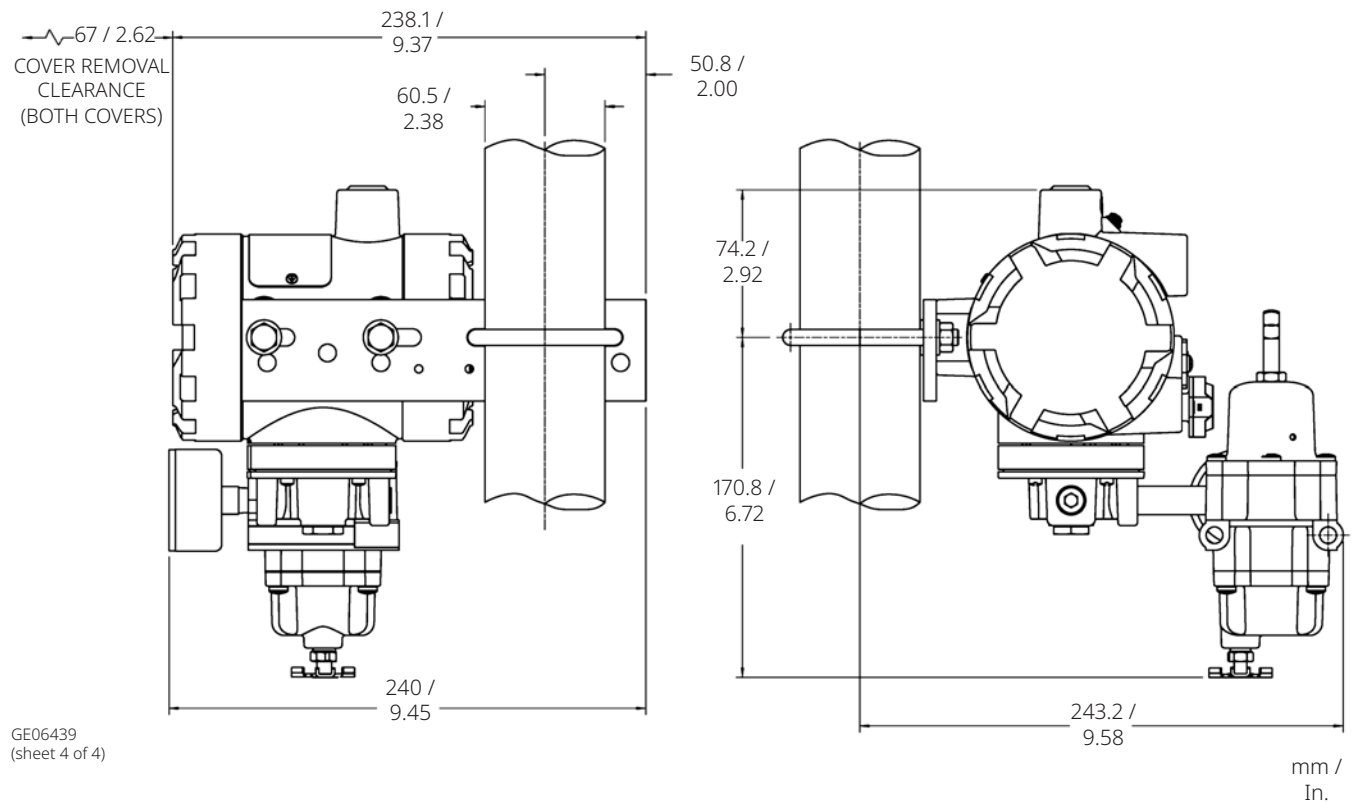


Figure 9. Dimensions with Optional Fisher 67 Filter-Regulator (Pipestand Mounted)

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