

Type i2P-100 Electro-Pneumatic Transducer

The Type i2P-100 electro-pneumatic transducer, shown in figure 1 uses a patented 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 ideal for direct mounting on control valve/actuator combinations.

Features

- **Low Pneumatic Supply Consumption**—The transducer has low pneumatic supply consumption which cuts operating costs.

- **Approved for use with Natural Gas**—The i2P-100 is approved for use with natural gas as the pneumatic supply.

- **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 0.2 to 2.0 bar (3 to 30 psi).

- **Split Range**—Selectable user field configurable two-way split range using either half of the standard input signal.

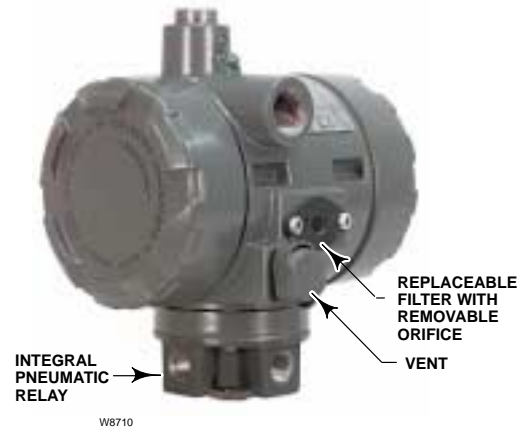


Figure 1. Type i2P-100 Electro-Pneumatic Transducer

- **Corrosion Resistant**—Separate housing compartments isolate the electronics from the pneumatic process. The electronics module is encased in a rugged plastic shell which protects the conformal coated electronics and dip switches from corrosion and damage. Converter module coils have corrosion resistant coating and all flexures are gold plated to provide protection from hostile environments.

- **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 and replaceable 5 micron filter are easy to remove for service and maintenance (see figure 1).

- **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 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 SAMA Standard PMC 31.1, Condition 3.





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



Figure 4. Type i2P-100 Electro-Pneumatic Transducer Mounted on a Sliding Stem Actuator

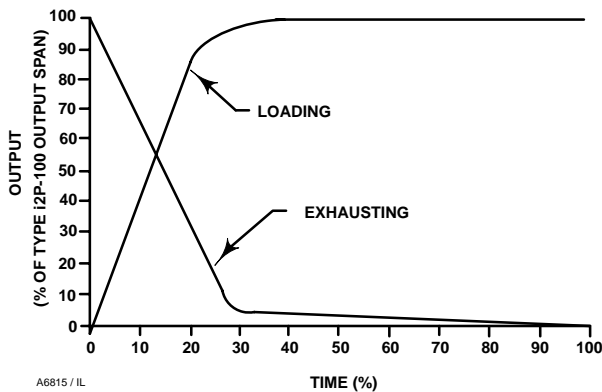


Figure 3. Output-Time Relationships for Type i2P-100 Transducer

Valve Stroking Time

Figure 3 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 Fisher sales office.

Installation

Refer to figure 5 for location of standard mounting holes in the housing. See figures 2 and 4 for typical mounting configurations. Standard mounting hardware is provided for mounting on the actuator, a pipestand, or a panel. Field wiring connections are made to the terminal block accessible under the housing cap. Dimensions are shown in figure 5.

Ordering Information

Note: Fisher does not assume responsibility for the selection, use, or maintenance of any product. Responsibility for the selection, use, or maintenance of any Fisher product remains solely with the purchaser and end-user.

To determine what ordering information is required, refer to the specification 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.

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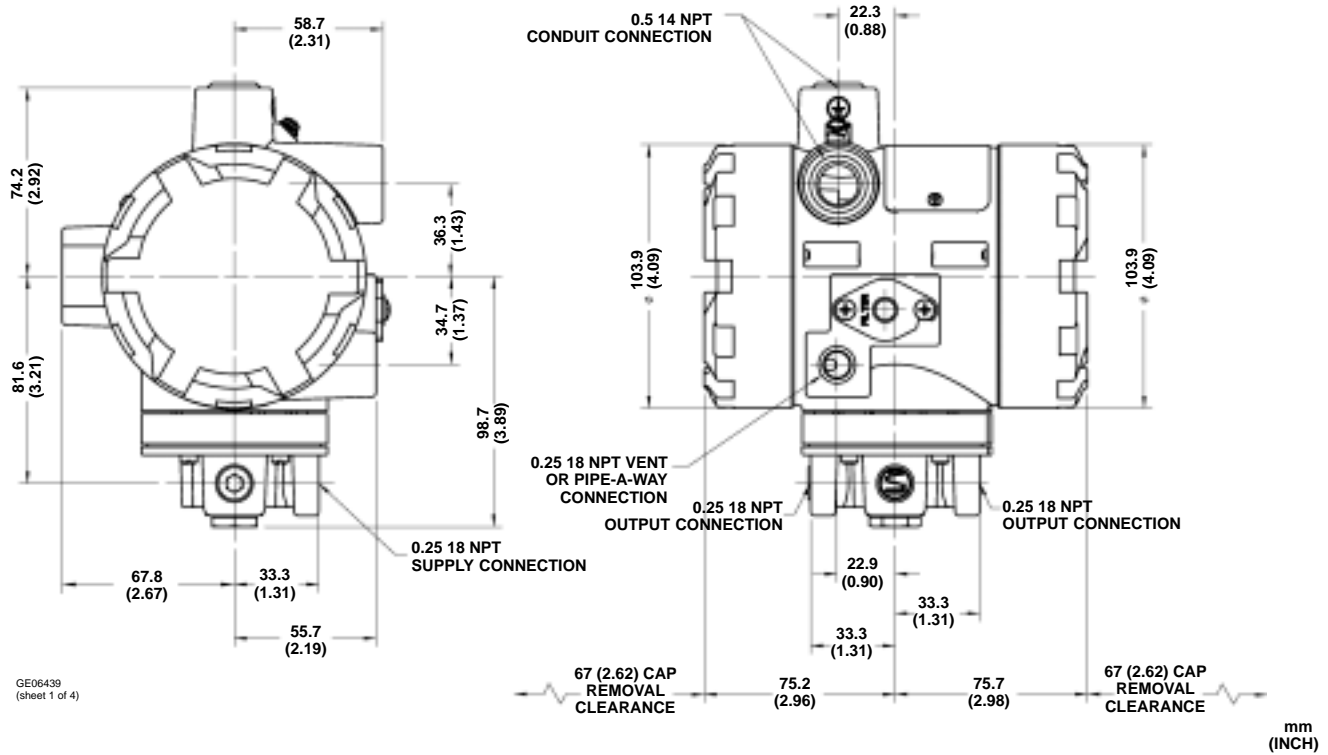


Figure 5. Dimensions

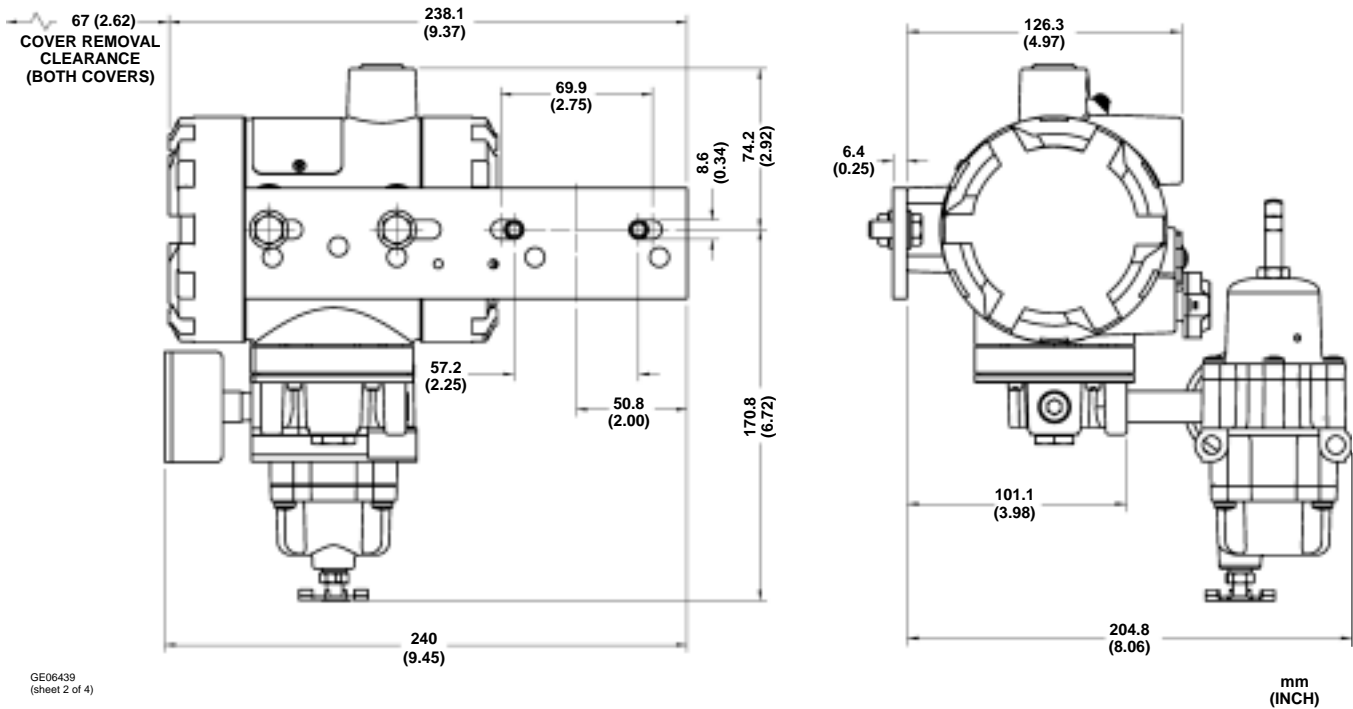
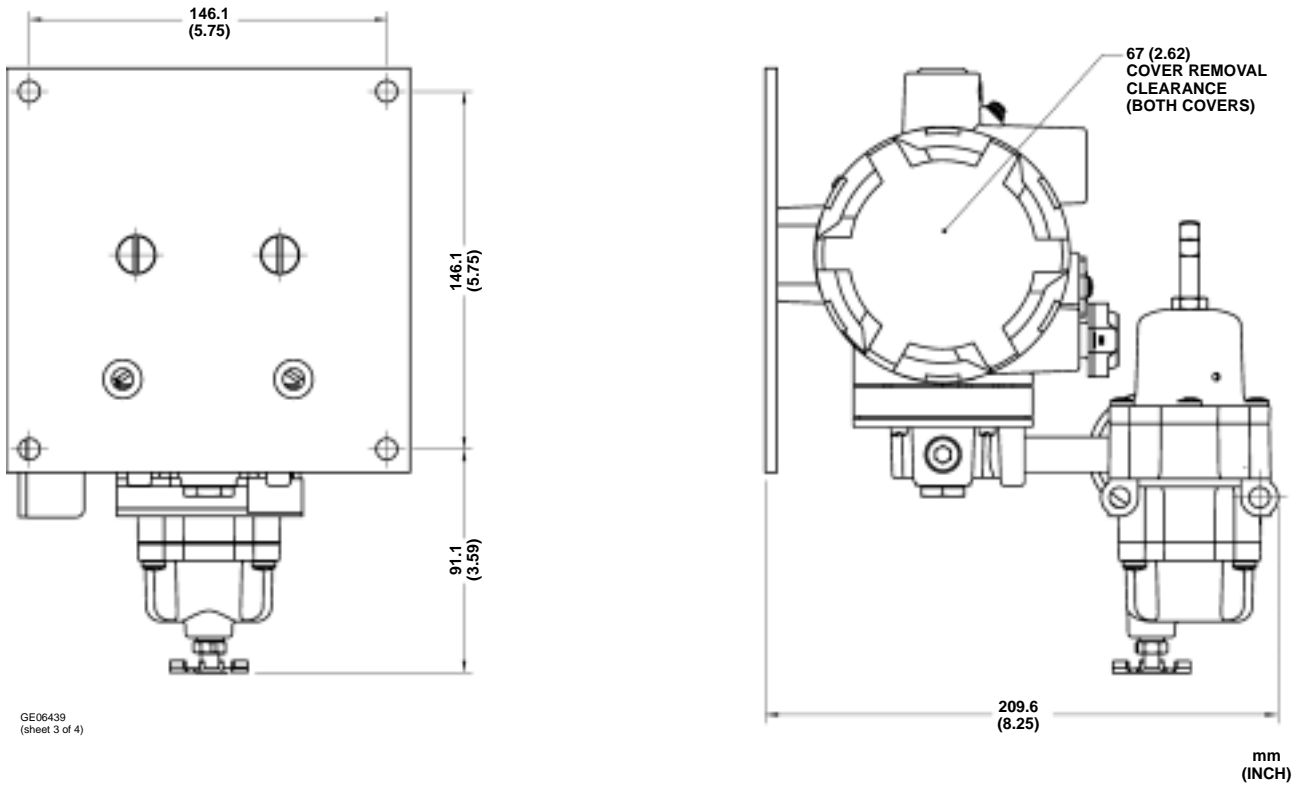
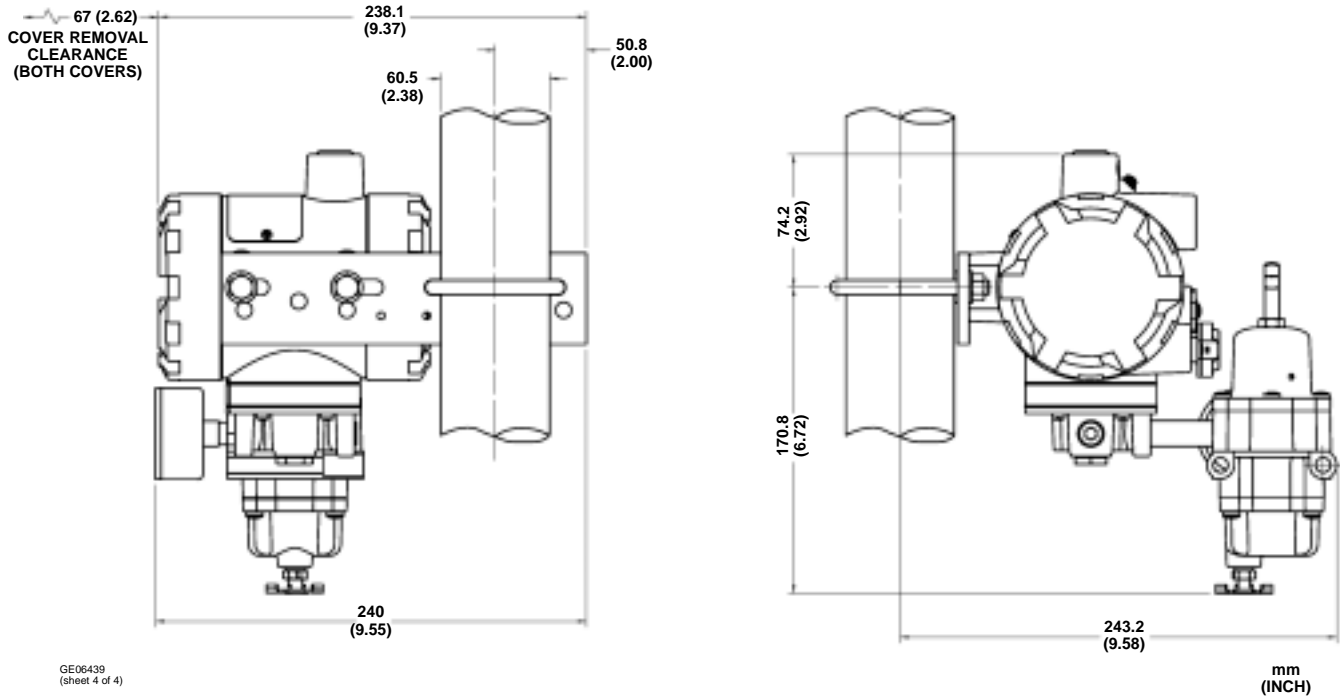


Figure 6. Dimensions with Optional 67 Filter-Regulator (Yoke/Bracket Mounted)



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Figure 7. Dimensions with Optional 67 Filter-Regulator (Surface/Wall Mounted)



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Figure 8. Dimensions with Optional 67 Filter-Regulator (Pipe Stand Mounted)

Specifications

Input Signal⁽¹⁾

Available as standard with 4-20 mA.
User configurable by dip switch for split ranging, see table below.

Output Signal⁽¹⁾

Available as standard 0.2 to 1.0 bar (3 to 15 psig) or 0.4 to 2.0 bar (6 to 30 psig). User configurable by dip switch selection and zero and span potentiometer adjustment, see table below.

INPUT SIGNAL	OUTPUT PRESSURE	
	BAR	PSIG
4 to 20 mA dc	0.2 to 1.0	3 to 15
	0.4 to 2.0	6 to 30
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 Type 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 9).

Supply Pressure^(1,6)

Recommended: 0.3 bar (5 psi) higher than upper range limit of output signal
Maximum: 3.4 bar (50 psig)

Medium: Air or Natural Gas⁽⁴⁾

Average Steady State Flow Rate^(1,2)

OUTPUT RANGE							
0.2 - 1.0 bar (3-15 psig)				0.4-2.0 bar (6-30 psig)			
SUPPLY PRESSURE							
1.5 bar (20 psig)				2.4 bar (35 psig)			
OUTPUT		FLOW RATE		OUTPUT		FLOW RATE	
Bar	Psig	Normal m ³ /h	Scfh	Bar	Psig	Normal m ³ /h	Scfh
0.2	3	0.08	3.0	0.4	6	0.09	3.6
0.6	9	0.12	4.5	1.2	18	0.19	7.0
1.0	15	0.17	6.3	2.1	30	0.27	10.2

Maximum Output Air Capacity⁽²⁾

8.0 normal m³/hr (5.0 scfm) at 1.4 bar (20 psig) supply pressure

Performance⁽³⁾

Reference Accuracy: ±1.0% of full scale output span; includes combined effects of hysteresis, linearity, and deadband

Independent Linearity⁽¹⁾: ±0.75% of full scale output span

Hysteresis⁽¹⁾: 0.4% of full scale output span

Frequency Response⁽¹⁾: Gain is attenuated 3 dB at 6 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 bar supply pressure change (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 SAMA PMC 31.1, Condition 3

Electromagnetic Interference (EMI)⁽¹⁾: Tested per IEC 61326-1 (Edition 1.1). Conforms to the European EMC Directive. Meets emission levels for Class A equipment (industrial locations) and Class B equipment (domestic locations). Meets immunity requirements for industrial locations (Table A.1 in the IEC specification document). Immunity performance shown in table 1.

Operating Ambient Temperature Limits⁽⁶⁾

-40 to 85°C (-40 to +180°F)

Electrical Classification

Hazardous Area⁽⁷⁾:



Explosion proof, Dust-Ignition proof, DIV 2, Intrinsically Safe



Explosion proof, Non-incendive, Dust-Ignition proof, Intrinsically Safe

ATEX Intrinsically Safe, Type n and Flameproof (LCIE)

IECEx Intrinsically Safe, Type n and Flameproof (CSA)

Approved for use with natural gas⁽⁴⁾

Specifications (continued)

Electrical Housing: NEMA 3R, CSA enclosure Type 3R, IP66 per IEC60529

Construction Materials

Housing: ■ Low-Copper aluminum with polyurethane paint
O-rings: Nitrile
Diaphragms: Nitrile

Adjustments⁽⁵⁾

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 0.2 to 2 bar (3 to 30 psig) output.

Connections

Supply and Output Pressure: 0.25 inch NPT female connection
Vent: 0.25 inch NPT female
Electrical: ■ Standard 0.5 inch NPT
Wire Size: 18 to 22 AWG

Mounting Position

■ Actuator ■ pipestand or ■ surface

Approximate Weight

2.5 kg (5.5 lbs)

Options

■ Output pressure gauge ■ M20 or PG13 conduit adapter

1. Defined in ISA Standard S51.1.
2. Normal m³/hour--Normal cubic meters per hour (0°C and 1.01325 bar, absolute). Scfm--Standard cubic feet per hour (60°F and 14.7 psig).
3. 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).
4. This product is approved for use with Natural Gas. Natural gas to contain no more than 20 ppm of H₂S
5. For other ranges, zero and span adjustments needed.
6. The pressure and temperature limits in this bulletin and any applicable standard or code limitation should not be exceeded.
7. Approvals are pending.

Table 1. Immunity Performance

Port	Phenomenon	Basic Standard	Performance Criteria
Enclosure	Electrostatic discharge (ESD)	IEC 61000-4-2	A
	Radiated EM field	IEC 61000-4-3	A
	Rated power frequency magnetic field	IEC 61000-4-8	A
I/O signal/control	Burst (fast transients)	IEC 61000-4-4	A
	Surge	IEC 61000-4-5	A
	Conducted RF	IEC 61000-4-6	A

Specification limit = ±1% of span

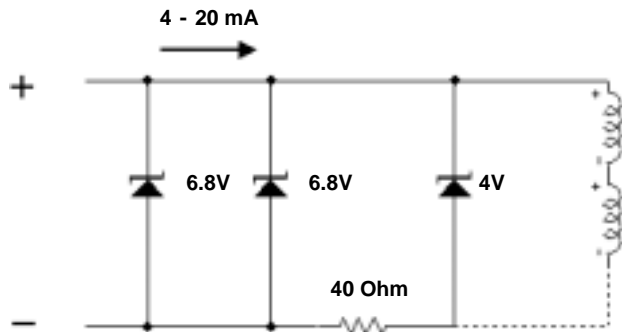


Figure 9. Equivalent Circuit

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