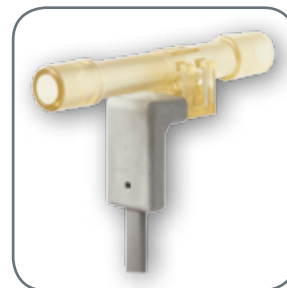




Miniature Low Pressure
Flow-Through Sensors
24PC Series, Uncompensated/Unamplified
0.5 psi to 250 psi



Miniature Low Pressure Flow-Through Sensors

The 24PC Series Miniature Low Pressure Flow-Through Sensors feature proven sensing technology that uses a specialized piezoresistive micromachined sensing element to offer high performance, reliability, and accuracy.

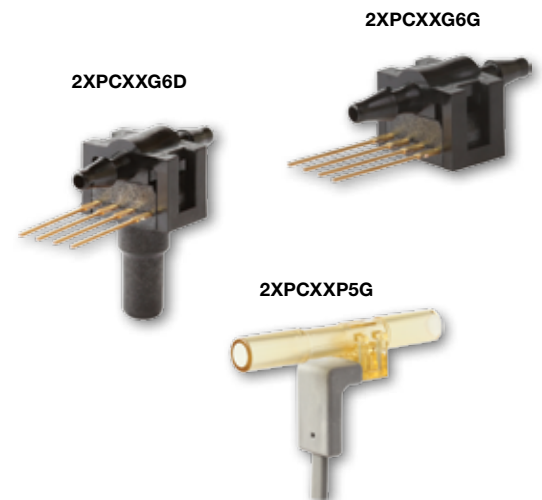
Each sensor contains four active piezoresistive elements in a Wheatstone bridge configuration. When pressure is applied, the resistance changes and provides an output signal in mV proportional to the input pressure. The pressure sensor is typically excited by constant current. When driven by a constant current source, a silicon pressure sensor's terminal voltage will rise with increased temperature. The rise in voltage not only compensates for the span but also provides an indication of sensor temperature.

The low power, uncompensated, unamplified Wheatstone bridge circuit design offers 0.5 psi through 250 psi sensing ranges in a variety of pressure port types and termination configurations. The mV output is available in both negative and positive voltage.

These sensors are intended for use with media compatible with plastics and media seals specified in the Nomenclature and Order Guide (see Figure 2). They are designed and manufactured according to ISO 9001 standards.

What makes our sensors better?

- Selectable seals available to match media used
- Higher pressure ranges for use in high pressure applications
- Minimal dead space inhibits bacterial growth
- Available in both SIP and DIP packages
- Available with cable harness to allow off-board sensing



For all available configurations, see Figure 3.

Features and Benefits

In-line use minimizes the number of pneumatic connections and helps reduce system dead space.

FLOW THROUGH DESIGN IN MINIATURE, PLASTIC PACKAGE

Provides a reduced-cost alternative (versus stainless steel package)

INTEGRATED FLOW THROUGH DESIGN

Eliminates the need for many additional connections and parts

By matching pressure ranges to the application, we optimize resolution and improve system accuracy.

VARIETY OF PRESSURE RANGES FROM 0.5 PSI TO 250 PSI

Allows use in a wide variety of applications

ABSOLUTE, DIFFERENTIAL, WET-WET DIFFERENTIAL, GAGE AND VACUUM GAGE MEASUREMENT TYPES

Allow customers to choose the sensor that fits their applications

ROBUST MEDIA COMPATIBILITY

Requires no gel coating

DURABLE

Operable after exposure to frozen conditions

ALSO AVAILABLE IN DIP, SIP, AND SMT PACKAGES

Provides added design flexibility

Potential Applications



MEDICAL

HEMODIALYSIS

May be used to monitor the correct pressure to help ensure optimal blood filtration

Table 1. Absolute Maximum Ratings¹

Characteristic	Min.	Typ.	Max.	Unit	Note
Supply voltage	2.5	10	12	Vdc	–
Input resistance	4	5	6	kOhm	–
Output resistance	4	5	6	kOhm	–
Time response	–	–	1	ms	²

¹Absolute maximum ratings are the extreme limits the device will withstand without damage.

²Time required for the output to increase from 10% to 90% of span in response to a step change in input pressure from the specified min. to max. operating pressure.

Table 2. Technical Specifications

Characteristic	Parameter
Operating temperature range: without EPDM seals with EPDM seals	-40 °C to 85 °C [-40 °F to 185 °F] -20 °C to 85 °C [-4 °F to 185 °F]
Storage temperature range	-55 °C to 100 °C [-67 °F to 212 °F]
Soldering terminal temperature/time	315 °C [599 °F] max./10 s max.
Vibration	10 G at 20 Hz to 2000 Hz
Shock	100 G for 11 ms
Life	1 million cycles min.

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Table 3. Performance Characteristics (Vcc = 10.00 ± 0.01 Vdc; Ta = 25 °C [77 °F])

Characteristic	Operating Pressure Range														Unit	Note
	0 psi to 0.5 psi		0 psi to 1 psi		0 psi to 5 psi		0 psi to 15 psi		0 psi to 30 psi		0 psi to 100 psi		0 psi to 250 psi			
	Typ.	Max.	Typ.	Max.	Typ.	Max.	Typ.	Max.	Typ.	Max.	Typ.	Max.	Typ.	Max.		
Span	–	35 ±10	–	45 ±15	–	115 ±30	–	225 ±60	–	330 ±90	–	225 ±69	–	212 ±68	mV	1
Null offset	–	0 ±30	–	0 ±30	–	0 ±30	–	0 ±30	–	0 ±30	–	0 ±30	–	0 ±30	mV	2
Linearity (Best Fit Straight Line, P2>P1)	±0.2	±1.0	±0.2	±1.0	±0.2	±1.0	±0.2	±1.0	±0.2	±1.0	±0.2	±1.0	±0.2	±1.0	%span	3
Null shift (0 °C to 25 °C; 25 °C to 50 °C)	±1.0	–	±1.0	–	±1.0	–	±1.0	–	±1.0	–	±1.0	–	±1.0	–	mV	4
Span shift (0 °C to 25 °C; 25 °C to 50 °C)	±5.0	–	±5.0	–	±5.0	–	±5.0	–	±5.0	–	±5.0	–	±5.0	–	%span	5
Repeatability and hysteresis	±0.5	–	±0.5	–	±0.5	–	±0.5	–	±0.5	–	±0.5	–	±0.5	–	mV	6
Overpressure	–	20	–	20	–	20	–	45	–	60	–	200	–	250	psi	7

¹Span is the algebraic difference between the output signal measured at the upper and lower limits of the operating pressure range, where Port 2 (P2) > Port 1 (P1).

²The output signal obtained when zero pressure is applied to all available ports.

³The maximum deviation of product output from a straight line fitted to the output measured over the specified operating pressure range, calculated according to BFSL. The straight line is fitted along a set of points that minimizes the sum of the square of the deviations of each of the points (“least-squares” method),

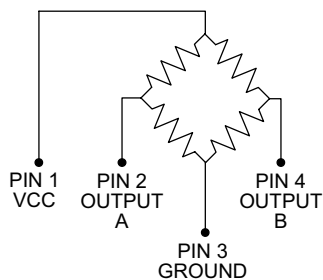
⁴The maximum deviation in offset due to changes in temperature over the compensated temperature range, relative to offset measured at a reference temperature of 25 °C.

⁵The maximum deviation in span due to changes in temperature over the compensated temperature range, relative to full-scale span measured at a reference temperature of 25 °C.

⁶Repeatability is the maximum difference between the output readings when the same pressure is applied consecutively, under the same operating conditions, with pressure approaching from the same direction within the specified operating pressure range. Hysteresis is the maximum difference between output readings when the same pressure is applied consecutively, under the same operating conditions, with pressure approaching from opposite directions within the specified operating pressure range.

⁷Overpressure is the maximum pressure that may safely be applied to the product for it to remain in specification once pressure is returned to the operating pressure range. Exposure to higher pressures may cause permanent damage to the product. Unless otherwise specified, this applies to all available pressure ports at any temperature within the operating temperature range.

Figure 1. Circuit Diagram



Output “A” increases as P2 pressure increases.

Output “B” decreases as P2 pressure increases.

Symbol	Description
Vcc	supply
OUTPUT A	bridge positive output
GROUND	ground
OUTPUT B	bridge negative output

Miniature Low Pressure Flow-Through Sensors

Figure 2. Nomenclature and Order Guide¹

For example, a **24PCBEG6G** catalog listing defines a 24PC Series Miniature Low Pressure Flow-Through Sensor, Uncompensated/Unamplified 5 psi pressure range, EPDM seal material, small flow-through pressure port type, 1 x 4 SIP/15,2 mm [0.60 in] long termination configuration, normal polarity output, and gage pressure measurement type.

24PC	B	E	G	6G
Product Series	Pressure Range	Seal Material	Pressure Port Type	Termination Configuration, Output, Pressure Measurement Type
24PC Series Miniature Low Pressure Flow-Through Sensors, Uncompensated/Unamplified	A 1 psi	F fluorosilicone	G Small flow-through	6D 1 x 4 SIP, 15,2 mm [0.60 in] long, normal polarity, differential
	B 5 psi	E EPDM	P Flow-through, long ends,	2G 2 x 2 DIP, normal polarity, gage
	C 15 psi	N neoprene ²	U Flow-through, short ends	5G 1 x 4 SIP for wire harness ³ , normal polarity, gage
	D 30 psi			6G 1 x 4 SIP, 15,2 mm [0.60 in] long, normal polarity, gage
	E 0.5 psi			
	F 100 psi			
	G 250 psi			

¹Every combination may not be possible. Contact customer service.

²Available in 0.5 psi, 1 psi, 5 psi and 15 psi pressure ranges only.

³Various wire harnesses with end connector options are available. Contact customer service.

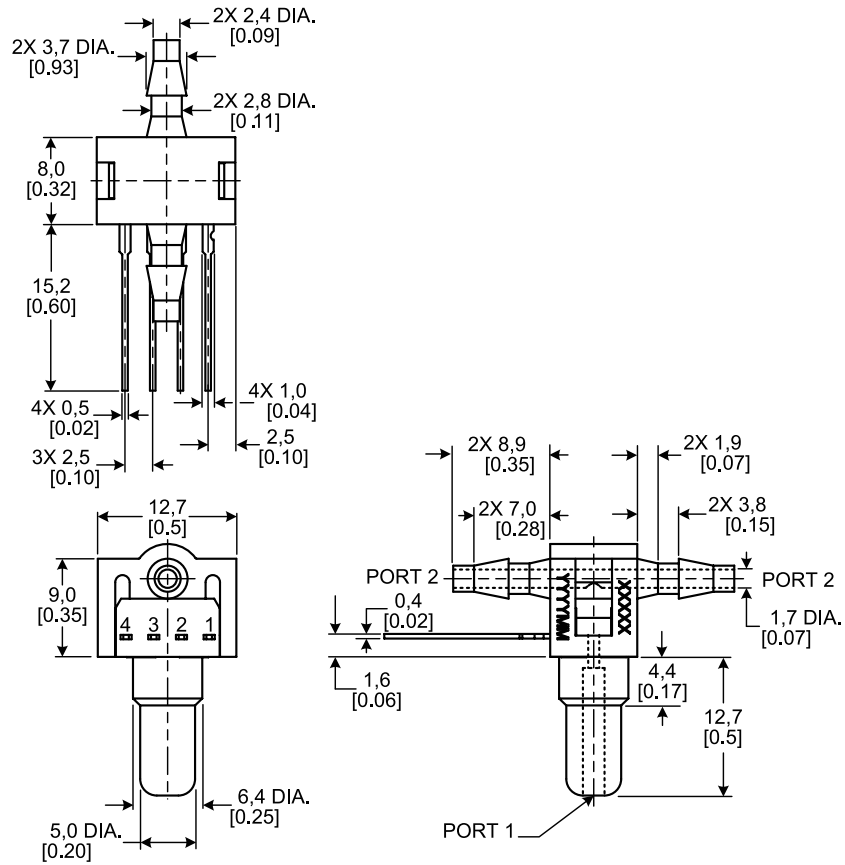
Figure 3. All Available Configurations



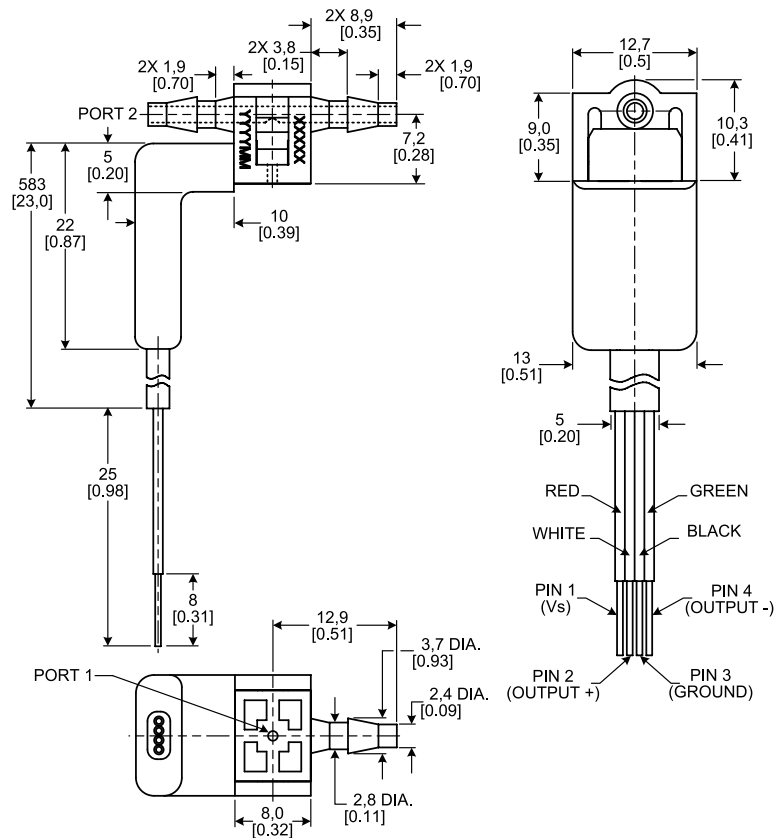
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Figure 4. Pressure Port Types and Termination Configuration Dimensions (For reference only: mm)

24PCXXG6D



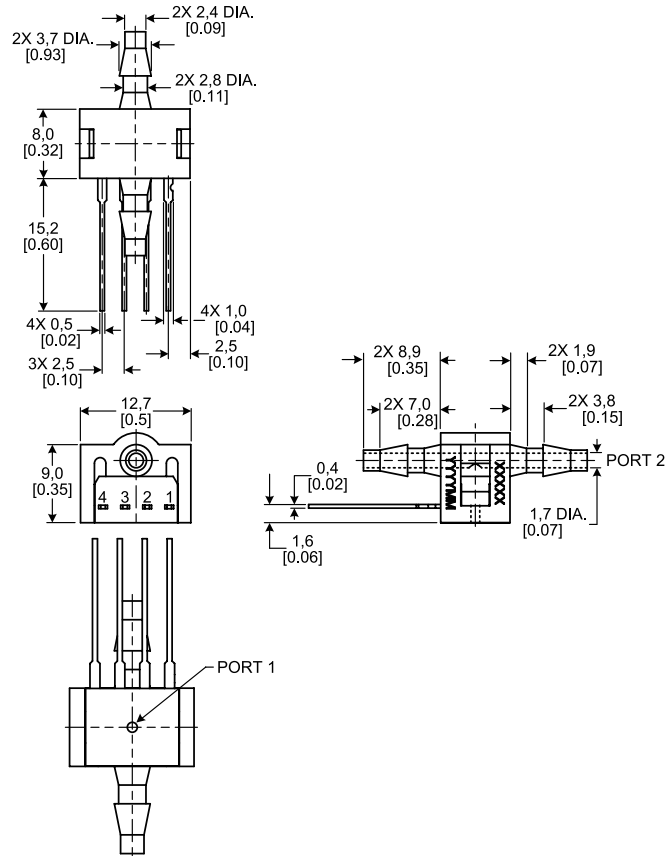
24PCXXG5G



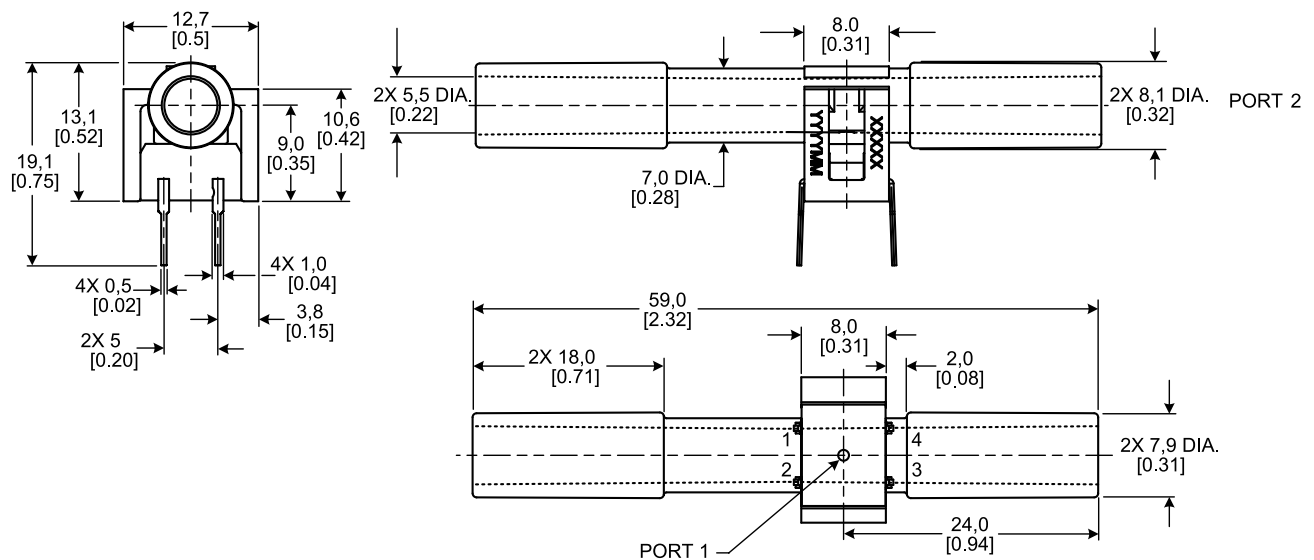
Miniature Low Pressure Flow-Through Sensors

Figure 4. Pressure Port Types and Termination Configuration Dimensions (continued)

24PCXXG6G



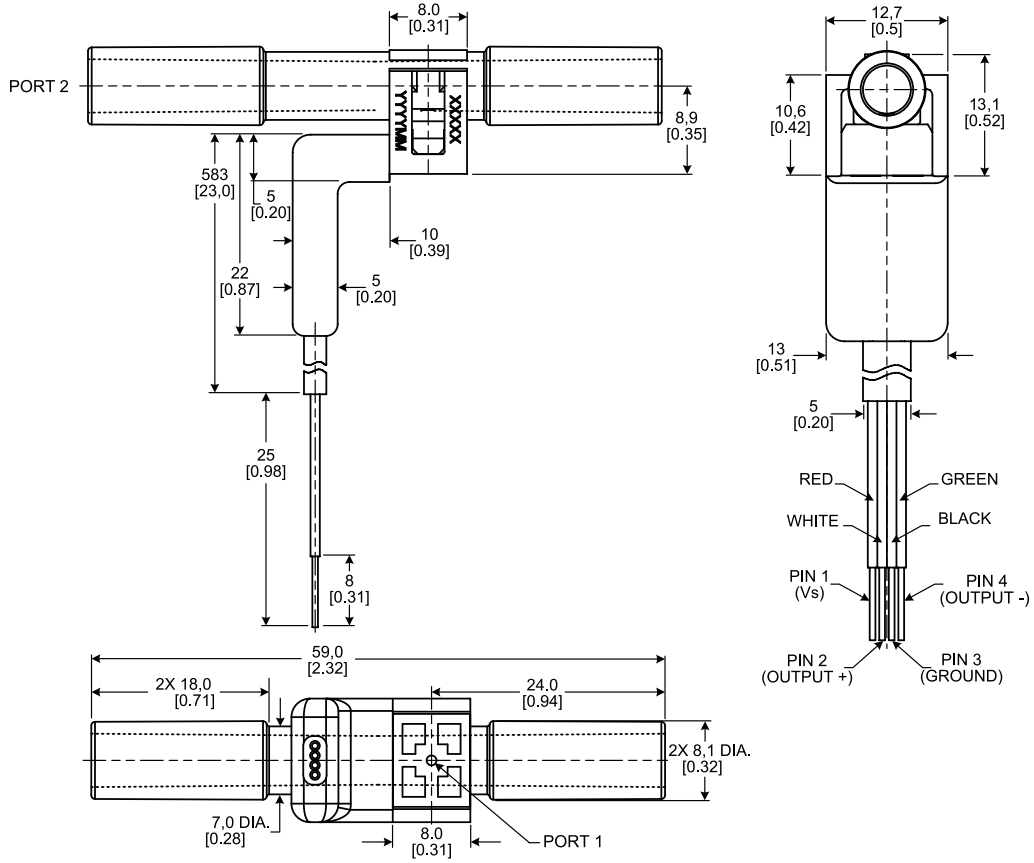
24PCXXP2G



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Figure 4. Pressure Port Types and Termination Configuration Dimensions (continued)

24PCXXP5G



24PCXXU5G

