Honeywell



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





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Datasheet

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.	Тур.	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.

	Operating Pressure Range															
Characteristic	0 psi to 0 0.5 psi 1		0 p: 1	psi to 0 psi 1 1 psi 5 ps		si to osi	i to 0 psi to si 15 psi		0 psi to 30 psi		0 psi to 100 psi		0 psi to 250 psi		Unit	Note
	Тур.	Max.	Тур.	Max.	Тур.	Max.	Тур.	Max.	Тур.	Max.	Тур.	Max.	Тур.	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

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

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

NY	Output "A" increases as P2 pressure increases.	Symbol	Description
	Output "B" deceases as P2 pressure increases.	Vcc	supply
12 Nr		OUTPUT A	bridge positive output
		GROUND	ground
		OUTPUT B	bridge negative output
GROUND			

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, 1x 4 SIP/15,2 mm [0.60 in] long termination configuration, normal polarity output, and gage pressure measurement type.

24PC Product Series	Press	B ure Range	E Seal Material		G Pressure Port Type		6G Termination Configuration, Output, Pressure Measurement Type				
24PC Series Miniature Low	Α	1 psi	F	fluorosilicone	G	Small flow-through	6D	1 x 4 SIP, 15,2 mm [0.60 in] long,			
Pressure Flow-Through Sensors, Uncompensated/ Unamplified	В	5 psi	E EPDM			_	normal polarity, anoronala				
	С	15 psi	N neoprene ²		Р	Flow-through, long ends,	2 G	2 x 2 DIP, normal polarity, gage			
	D	D 30 psi			U	Flow-through, short ends	5G	1 x 4 SIP for wire harness ³ , normal polarity, gage			
	E	0.5 psi	.5 psi					1 x 4 SIP 15 2 mm [0 60 in] long			
	F 100 psi						6G	normal polarity, gage			
	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

24PCXXG6D	24PCXXG5G	24PCXXG6G
24PCXXP2G	24PCXXP5G	24PCXXU5G



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24PCXXG6D



24PCXXG5G



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

24PCXXG6G



24PCXXP2G



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



24PCXXU5G



WARNING PERSONAL INJURY

DO NOT USE these products as safety or emergency stop devices or in any other application where failure of the product could result in personal injury.

Failure to comply with these instructions could result in death or serious injury.

WARNING MISUSE OF DOCUMENTATION

- The information presented in this product sheet is for reference only. Do not use this document as a product installation guide.
- Complete installation, operation, and maintenance information is provided in the instructions supplied with each product.

Failure to comply with these instructions could result in death or serious injury.

WARRANTY/REMEDY

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