Honeywell



Miniature Low Pressure Flow-Through Sensors

24PC Series, Uncompensated/Unamplified

0.5 psi to 250 psi



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.

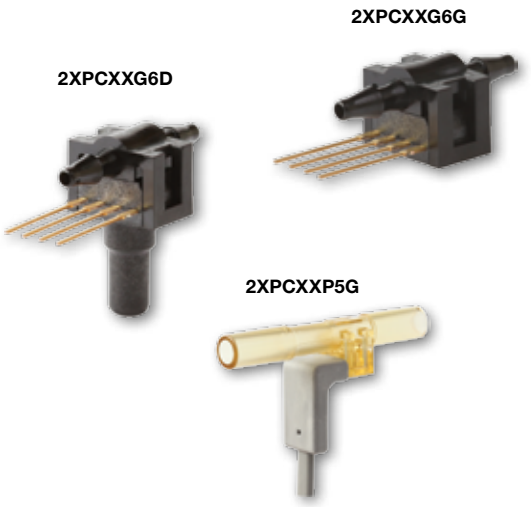
Each sensor contains four active piezoresistive elements in a Wheatstone bridge configuration. When pressure is applied, the resistance changes and provides an output signal in mV proportional to the input pressure. The pressure sensor is typically excited by constant current. When driven by a constant 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.

MINIMAL DEAD SPACE • CABLE HARNESS AVAILABLE • SELECTABLE SEALS

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 Ratings[1]

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]

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

[2]Time 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.

24PC Series, Uncompensated/Unamplified

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

[1]Span 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).

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

[3]The 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),

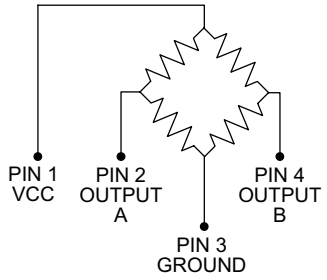
[4]The maximum deviation in offset due to changes in temperature over the compensated temperature range, relative to offset measured at a reference temperature of 25 °C.

[5]The 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.

[6]Repeatability 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.

[7]Overpressure 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" deceases 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 Guide[1]

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	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 **B** 5 psi **C** 15 psi **D** 30 psi **E** 0.5 psi **F** 100 psi **G** 250 psi	**F** fluorosilicone **E** EPDM **N** neoprene[2]	**G** Small flow-through **P** Flow-through, long ends, **U** Flow-through, short ends	**6D** 1 x 4 SIP, 15,2 mm [0.60 in] long, normal polarity, differential **2G** 2 x 2 DIP, normal polarity, gage **5G** 1 x 4 SIP for wire harness[3], normal polarity, gage **6G** 1 x 4 SIP, 15,2 mm [0.60 in] long, normal polarity, gage

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

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

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

Figure 3. All Available Configurations

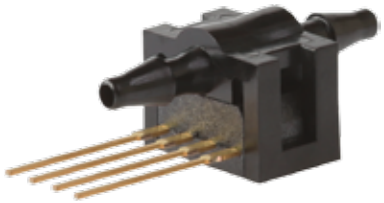
24PCXXG6D



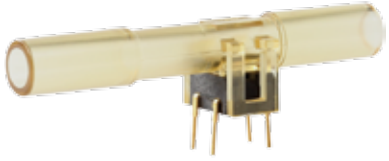
24PCXXG5G



24PCXXG6G



24PCXXP2G



24PCXXP5G

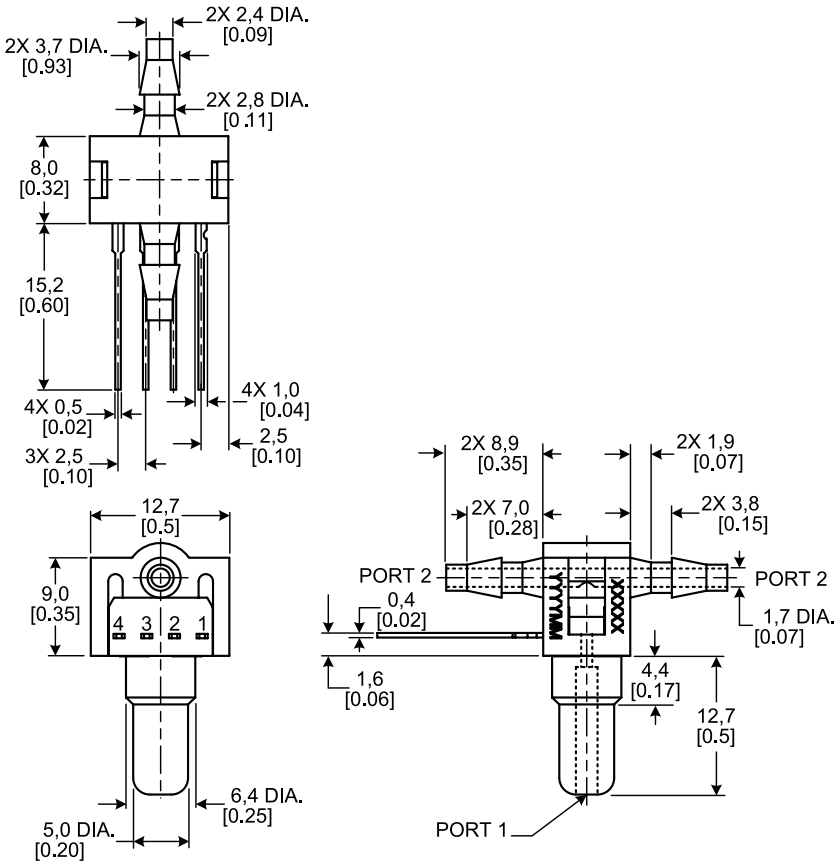


24PCXXU5G



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

24PCXXG6D



24PCXXG5G

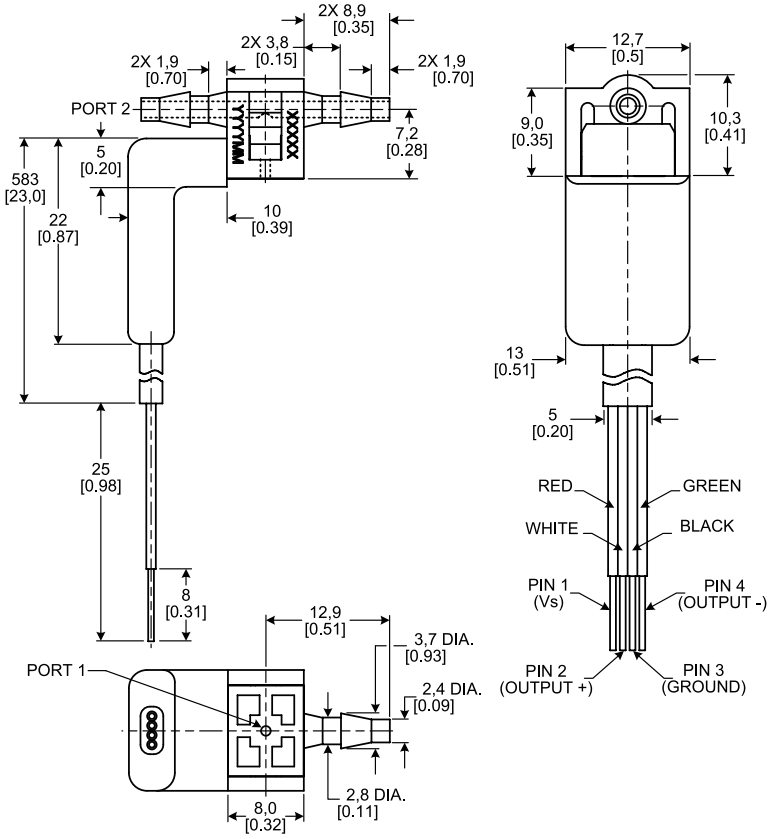
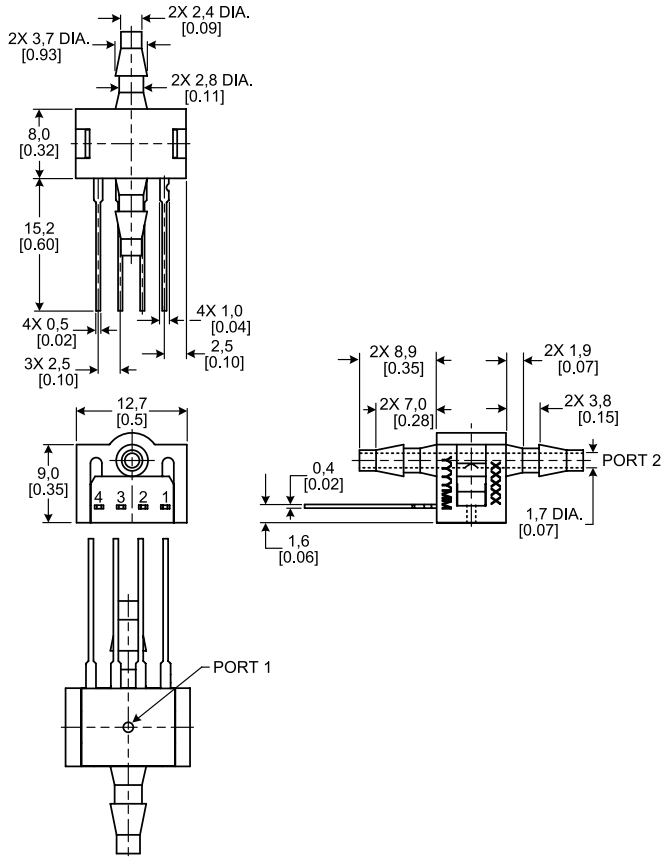


Figure 4. Pressure Port Types and Termination Configuration Dimensions (continued)

24PCXXG6G



24PCXXP2G

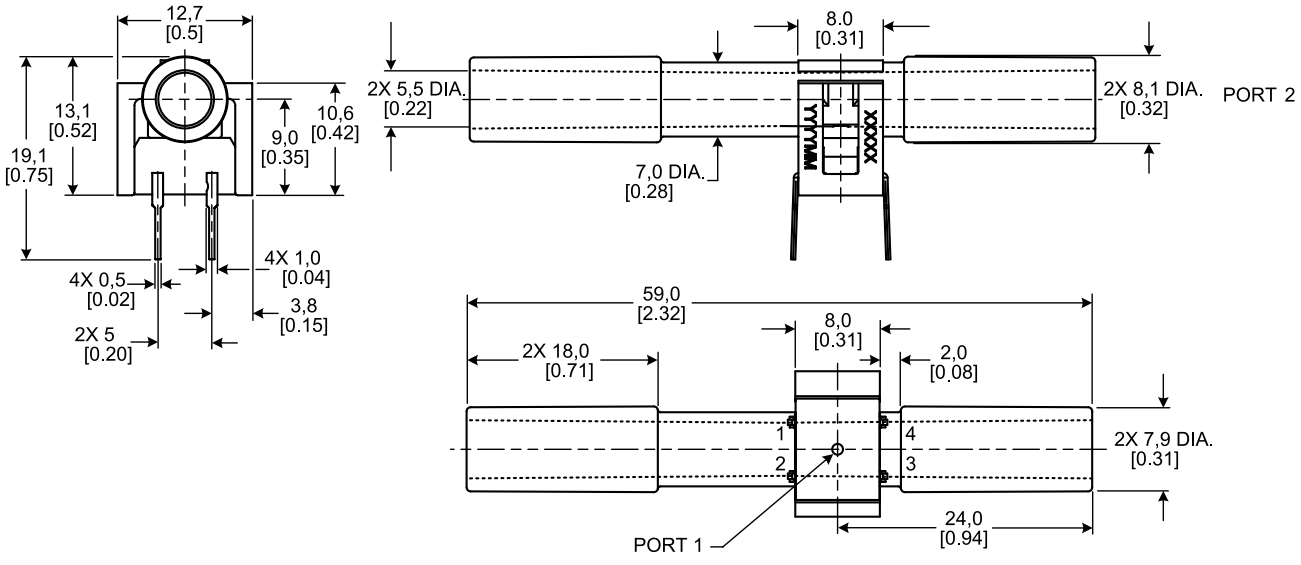
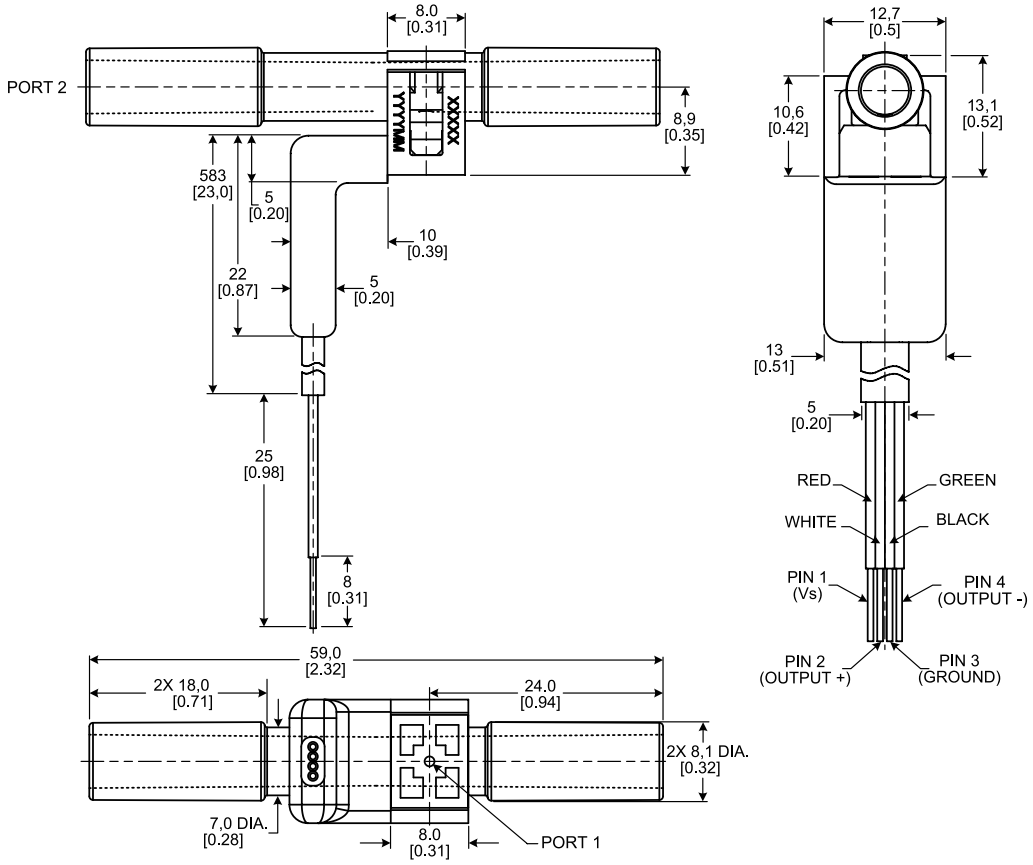
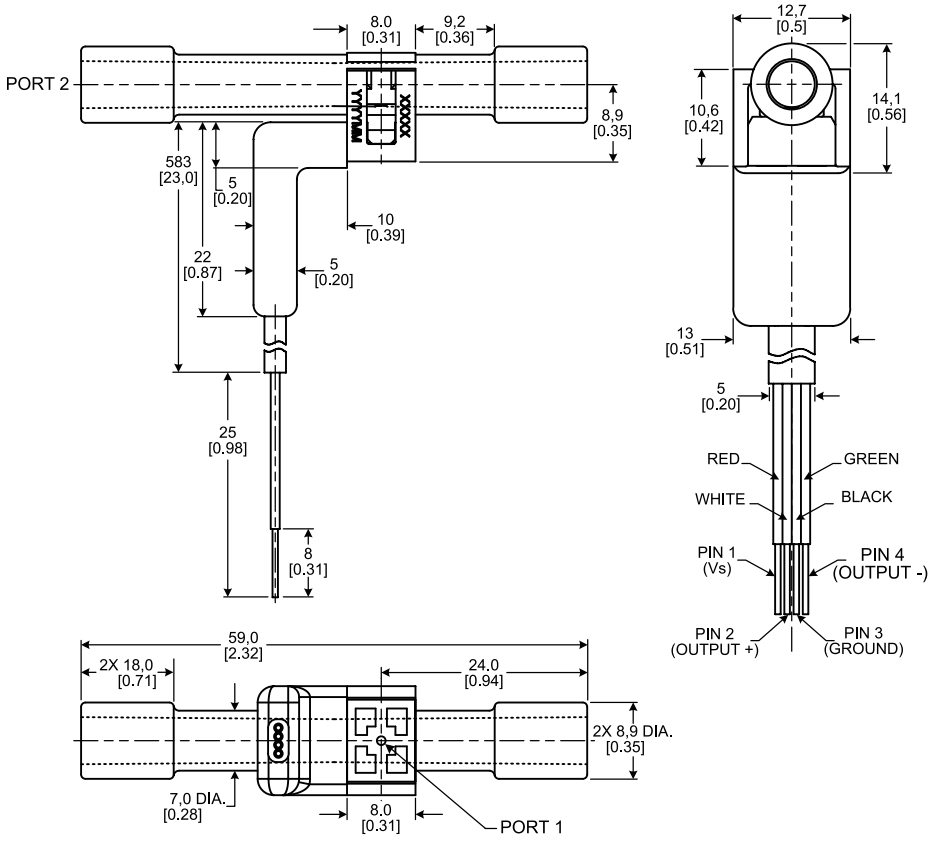


Figure 4. Pressure Port Types and Termination Configuration Dimensions (continued)

24PCXXP5G



24PCXXU5G



ADDITIONAL INFORMATION

The following associated literature is available at sensing.honeywell.com:

- Product Line Guide
- Product Range Guide
- Product Installation Instructions
- Application-Specific Information
- Technical Information

⚠ 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.

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