

# MODEL FP2000

008835

Issue 7

## Differential Pressure Transducer

### DESCRIPTION

The FP2000 series is a configurable differential pressure transducer which allows the customer to select the configuration which best fits the needs of the application. Choose from multiple accuracies, outputs, pressure ports, electrical terminations, and pressure ranges.

The FP2000 is available with differential wet/wet and wet/dry configurations.

### DIFFERENTIATION

- Welded stainless steel construction
- Customized specifications available
- Configurable platform enables a sensor to be built to customer requirements
- Bi-directional functionality of pressure measurement
- Optional bi-directional calibration available
- Small package size

### VALUE TO CUSTOMERS

- Built on the Honeywell history of higher-quality pressure sensing technologies
- Configurable platform creates a wide range of standard configurations
- Broad compensated temperature ranges
- Multiple outputs to choose from to meet variety of application needs

### POTENTIAL APPLICATIONS

- Test stands (automotive, aerospace, and industrial)
- R&D test labs
- Hydraulic and pneumatic system monitoring
- Leak detection
- Pump and compressor control
- Tank level measurement
- Monitor pressure changes for preventive maintenance
- Flow rate measurement

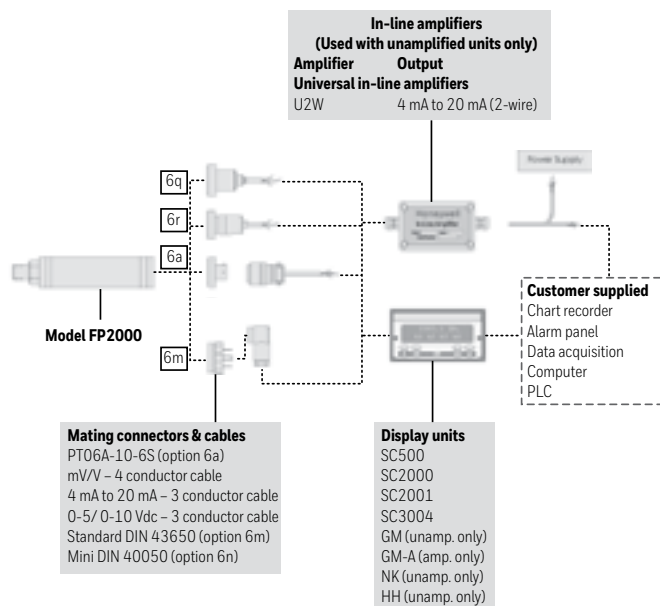


### FEATURES

- mV/V, 4 mA to 20 mA,  $\pm 5$  Vdc,  $\pm 10$  Vdc
- Differential (wet/wet, wet/dry)
- Multiple electrical connector and pressure port offerings
- Intrinsically safe option
- CE available

FP2000 pressure sensors are custom built from stocked components. Please see [sps.honeywell.com/ast](http://sps.honeywell.com/ast) for updated listings

FIGURE 1. TYPICAL SYSTEM DIAGRAM



### PORTFOLIO



From general process pressure transducers to hazardous location pressure products, Honeywell offers a comprehensive selection of gage, absolute, differential, vacuum, and barometric pressure transducers to meet market demands. Each of our transducers can be customized to meet your needs, whatever your application. To view the entire product portfolio, [click here](#).

**Honeywell**

## DIFFERENTIAL PRESSURE TRANSDUCER, MODEL FP2000

**TABLE 1. PERFORMANCE SPECIFICATIONS**

CHARACTERISTIC	MEASURE
Accuracy	see Note 1
Output (selectable)	mV/V, 4 mA to 20 mA (two wire), ±5 Vdc, ±10 Vdc
Resolution	Infinite

**TABLE 2. ELECTRICAL SPECIFICATIONS**

CHARACTERISTIC	MEASURE
Amplified (4 mA to 20 mA; ±5 Vdc)	9 Vdc to 28 Vdc
Amplified (±10 Vdc)	15 Vdc to 28 Vdc
Unamplified (mV/V)	10 Vdc

**Note 1:** Unless otherwise specified on order, amplified units with 4 mA to 20 mA output will provide 4 mA at 0 psid and 20 mA at positive full scale and the unit will not operate in the negative direction. Consult Factory to specify 4 mA at negative full scale and 20 mA at positive full scale.

**Note 2:** All amps add 2 inches to sensor housing length.

**TABLE 4. ENVIRONMENTAL SPECIFICATIONS**

ORDER CODE	RANGE	TEMPERATURE, COMPENSATED	TEMPERATURE, OPERATING <i>Unamplified Output: Option 2U</i>	TEMPERATURE, OPERATING <i>Voltage Output: Option 2D,2E,2F,2G Current Output: Option 2P,2Y,2N</i>
FDD	less than 1 psi	10 °C to 45 °C [50 °F to 110 °F]	-40 °C to 116 °C [-40 °F to 240 °F]	-29 °C to 85 °C [-20 °F to 185 °F]
	1 psi and less than 5 psi	5 °C to 50 °C [40 °F to 120 °F]		
	5 psi and above	5 °C to 60 °C [40 °F to 140 °F]		
FDW	less than 1 psi	10 °C to 45 °C [50 °F to 110 °F]		
	1 psi and less than 5 psi	5 °C to 50 °C [40 °F to 120 °F]		
	5 psi and above	5 °C to 60 °C [40 °F to 140 °F]		
Temperature, error band	0.10 % accuracy	±0.5 % full scale	-	-
	0.25 % accuracy	±1.0 % full scale	-	-

## DIFFERENTIAL PRESSURE TRANSDUCER, MODEL FP2000

**TABLE 5. INTERNAL AMPLIFIERS**

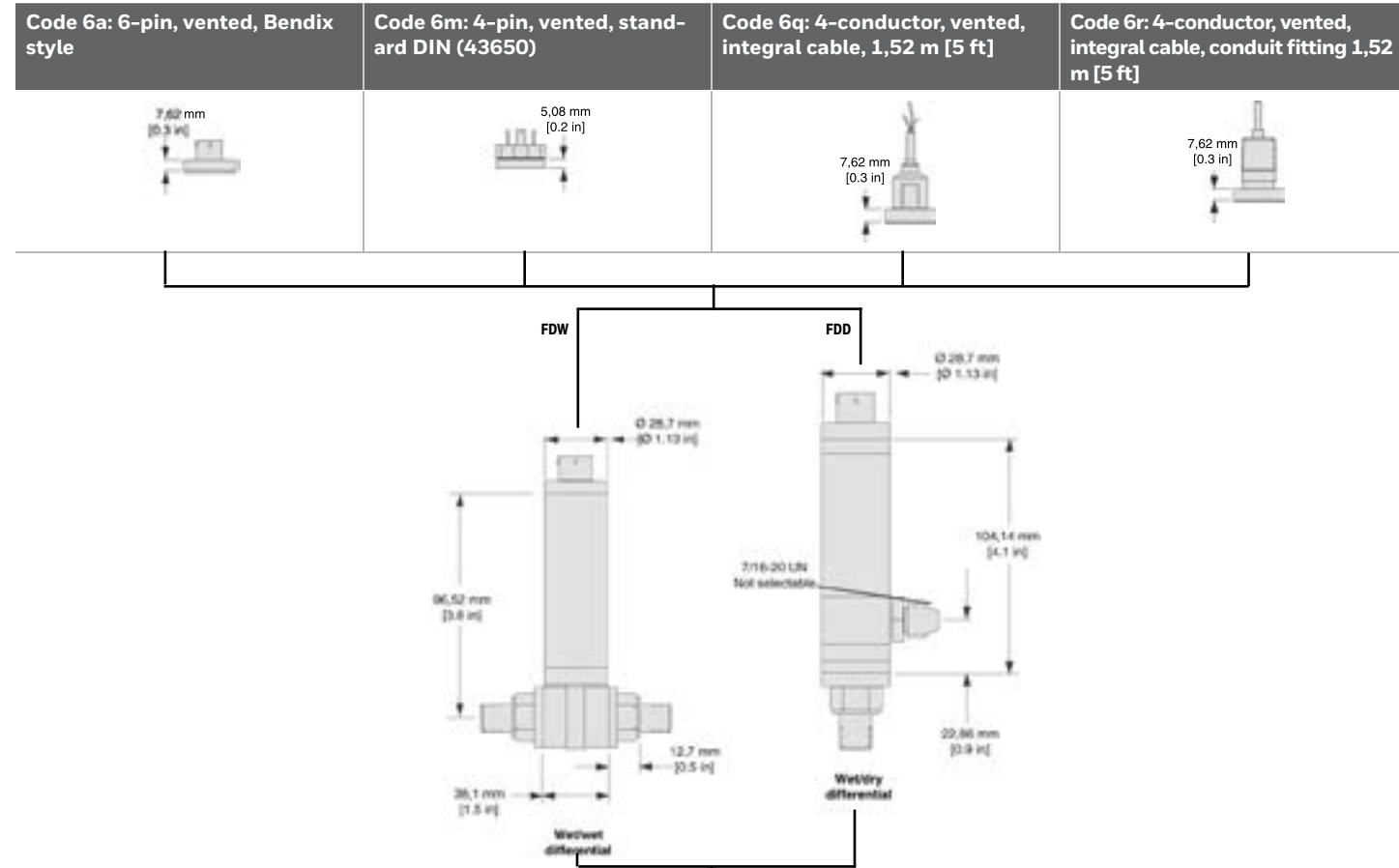
AMPLIFIER SPECIFICATIONS	UNAMPLIFIED OUTPUT: OPTION 2U	VOLTAGE OUTPUT: OPTION 2D	VOLTAGE OUTPUT: OPTION 2G	CURRENT TWO-WIRE: OPTION 2P
Output signal at null	0 Vdc	0 Vdc	0 Vdc	4 mA
Output signal at full scale output	50 mV	5 Vdc	10 Vdc	20 mA
Input power (voltage)	10 Vdc	9 Vdc to 28 Vdc	15 Vdc to 28 Vdc	9 Vdc to 32 Vdc
Input power (current)	2 mA @ 10 Vdc	10 mA	15 mA	4 mA to 24 mA
Frequency response	Natural frequency	300 Hz	300 Hz	300 Hz
Power supply rejection	N/A	60 dB	60 dB	60 dB
Operating temperature	-40 °C to 116 °C [-40 °F to 240 °F]	-29 °C to 85 °C [-20 °F to 185 °F]	-29 °C to 85 °C [-20 °F to 185 °F]	-29 °C to 85 °C [-20 °F to 185 °F]
Reverse voltage protection	N/A	Yes	Yes	Yes
Short circuit protection	N/A	Momentary	Momentary	Yes

AMPLIFIER SPECIFICATIONS	VOLTAGE OUTPUT: OPTION 2E	VOLTAGE OUTPUT: OPTION 2F	INTRINSICALLY SAFE AMP: OPTION 2N (2N)***	CURRENT TWO-WIRE: OPTION 2Y
Output signal at null	0 Vdc	0 Vdc	4 mA	4 mA
Output signal at full scale output	5 Vdc	10 Vdc	20 mA	20 mA
Input power (voltage)	9 Vdc to 28 Vdc	15 Vdc to 28 Vdc	9 Vdc to 28 Vdc	9 Vdc to 32 Vdc
Input power (current)	10 mA	15 mA	4 mA to 24 mA	4 mA to 24 mA
Frequency response	2000 Hz	2000 Hz	2000 Hz	2000 Hz
Power supply rejection	60 dB	60 dB	60 dB	60 dB
Operating temperature	-29 °C to 85 °C [-20 °F to 185 °F]	-29 °C to 85 °C [-20 °F to 185 °F]	-29 °C to 85 °C [-20 °F to 185 °F]	-29 °C to 85 °C [-20 °F to 185 °F]
Reverse voltage protection	Yes	Yes	Yes	Yes
Short circuit protection	Momentary	Momentary	Yes	Yes

# DIFFERENTIAL PRESSURE TRANSDUCER, MODEL FP2000

FIGURE 2. MOUNTING DIMENSIONS

## ELECTRICAL TERMINATION



## PRESSURE PORTS

	Code 5a 1/4-18 NPT female	Code 5b 1/4-18 NPT male	Code 5c 7/16-20 UNF female	Code 5d 7/16-20 UNF male	Code 5f G 1/4 B female	Code 5g G 1/4 B male
<b>Up to 1000 psi</b>	12.7 mm [0.5 in]	28.0 mm [1.1 in]	15.24 mm [0.6 in]	25.4 mm [1.0 in]	17.78 mm [0.7 in]	30.48 mm [1.2 in]
<b>Up to 1000 psi</b>	Code 5h 1/8-27 NPT female	Code 5i 1/8-27 NPT male	Code 5p M12-1.5 male	Code 5q M12-1.5 female	Code 5r 9/16-18 SAE male	Code 5s 9/16-18 SAE female
	13.34 mm [0.525 in]	22.99 mm [0.905 in]	26.04 mm [1.025 in]	12.7 mm [0.5 in]	27.31 mm [1.075 in]	15.88 mm [0.625 in]

# DIFFERENTIAL PRESSURE TRANSDUCER, MODEL FP2000

TABLE 7. WIRING CODES

	UNAMPLIFIED OUT-PUT: OPTION 2U	VOLTAGE OUTPUT: OPTION 2D/2E	VOLTAGE OUTPUT: OPTION 2G/2F	CURRENT TWO-WIRE: OPTION 2P/2Y	INTRINSICALLY SAFE AMP: OPTION 2N (2N)***
<b>BENDIX PTIH-10-6P (OPTION 6A)</b>					
No shunt cal	A (+) Excitation B (+) Excitation C (-) Excitation D (-) Excitation E (-) Output F (+) Output	A (+) Supply B (-) Supply return C (-) Output 0 Vdc to 5 Vdc D (+) Output E No connection F No connection	A (+) Supply B (-) Supply return C (-) Output 0 Vdc to 10 Vdc D (+) Output E No connection F No connection	A (+) Supply B No connection C No connection D (+) Output 4 mA to 20 mA E No connection F No connection	A (+) Supply B No connection C No connection D (+) Output 4 mA to 20 mA E Case ground F No connection
With shunt cal (option 3d)	A (+) Excitation B (-) Excitation C (+) Output D (-) Output E No connection F Shunt Cal	A (+) Supply B (-) Supply return C (-) Output 0 Vdc to 5 Vdc D (+) Output E No connection F Shunt cal	A (+) Supply B (-) Supply return C (-) Output 0 Vdc to 10 Vdc D (+) Output E No connection F Shunt cal	A (+) Supply B No connection C No connection D (+) Output 4 mA to 20 mA E No connection F Shunt cal	A (+) Supply B No connection C No connection D (+) Output 4 mA to 20 mA E No connection F Shunt cal
<b>STD. DIN 43650 (OPTION 6M)</b>					
No shunt cal	1 (+) Excitation 2 (+) Output 3 (-) Output 4 (-) Excitation	1 (+) Supply 2 (+) Output 3 Supply/ output com. GND No connect. to case	1 (+) Supply 2 (+) Output 3 Supply/ output com. GND No connect. to case	1 (+) Supply 2 (+) Output 4 mA to 20 mA 3 No connection GND No connection	1 (+) Supply 2 (+) Output 3 Case ground GND No connection
With shunt cal (option 3d)	Not Applicable	1 (+) Supply 2 (+) Output 3 Supply/output com. GND Shunt cal	1 (+) Supply 2 (+) Output 3 Supply/output com. GND Shunt cal	1 (+) Supply 2 (+) Output 4 mA to 20 mA 3 No connection GND Shunt cal	1 (+) Supply 2 (+) Output 3 Case ground GND Shunt cal
<b>1.83 M [5 FT] INTEGRAL CABLE (OPTION 6Q)</b>					
No shunt cal	R (+) Excitation Bl (-) Excitation G (-) Output W (+) Output	R (+) Supply Bl (-) Supply return G (-) Output W (+) Output 0 Vdc to 5 Vdc	R (+) Supply Bl (-) Supply return G (-) Output W (+) Output 0 Vdc to 10 Vdc	R (+) Supply Bl (+) Output 4 mA to 20 mA	R (+) Supply Bl (+) Output 4 mA to 20 mA W Case ground
With shunt cal (option 3d)	Not Applicable	R (+) Supply Bl (-) Supply return G Shunt cal W (+) Output 0 Vdc to 5 Vdc	R (+) Supply Bl (-) Supply return G Shunt cal W (+) Output 0 Vdc to 10 Vdc	R (+) Supply Bl (+) Output 4 mA to 20 mA G Shunt cal	R (+) Supply Bl (+) Output 4 mA to 20 mA W Case ground G Shunt cal
<b>CONDUIT FITTING (OPTION 6R)</b>					
No shunt cal	R (+) Excitation Bl (-) Excitation G (-) Output W (+) Output	R (+) Supply Bl (-) Supply return G (-) Output W (+) Output 0 Vdc to 5 Vdc	R (+) Supply Bl (-) Supply return G (-) Output W (+) Output 0 Vdc to 10 Vdc	R (+) Supply Bl (+) Output 4 mA to 20 mA	R (+) Supply Bl (+) Output 4 mA to 20 mA W Case ground
With shunt cal (option 3d)	Not Applicable	R (+) Supply Bl (-) Supply return G Shunt cal W (+) Output 0 Vdc to 5 Vdc	R (+) Supply Bl (-) Supply return G Shunt cal W (+) Output 0 Vdc to 10 Vdc	R (+) Supply Bl (+) Output 4 mA to 20 mA G Shunt cal	R (+) Supply Bl (+) Output 4 mA to 20 mA W Case ground G Shunt cal

Note: For wiring codes, R=red; Bl = black; W = white; G = green. Color specifies cable and letter or number specifies connection

\*\*\* See Honeywell's Web site (<http://measurementsensors.honeywell.com>) for most up-to-date information regarding Intrinsically Safe approvals ref. #008-0547-00.

# DIFFERENTIAL PRESSURE TRANSDUCER, MODEL FP2000

## HOW TO ORDER

The **FP2000 Order Code** is an easy way for you to order exactly what you want the factory to build. Simply make one selection in each of the six required categories. Choose adders and accessories only if you require them. By visiting our Web site at [sps.honeywell.com/ast](http://sps.honeywell.com/ast) you can view complete technical specifications for the FP2000.

### Step 1

#### TRANSDUCER TYPE

<input type="checkbox"/> Differential - wet/wet	Type Code FDW
<input type="checkbox"/> Differential - wet/dry	FDD

Unit type

<input type="checkbox"/> psi	<input type="checkbox"/> bar
<input type="checkbox"/> torr	<input type="checkbox"/> in Hg
<input type="checkbox"/> mBar	<input type="checkbox"/> mm Hg
<input type="checkbox"/> kPa	<input type="checkbox"/> in H <sub>2</sub> O

### Step 2

#### PRESSURE RANGE

Differential

<input type="checkbox"/> 0.5 psi	Range code AN	<input type="checkbox"/> 100 psi	Range code BR
<input type="checkbox"/> 1 psi	AP	<input type="checkbox"/> 150 psi	CJ
<input type="checkbox"/> 2 psi	AR	<input type="checkbox"/> 200 psi	CL
<input type="checkbox"/> 2.5 psi	AS	<input type="checkbox"/> 250 psi	CN
<input type="checkbox"/> 5 psi	AT	<input type="checkbox"/> 300 psi	CP
<input type="checkbox"/> 10 psi	AV	<input type="checkbox"/> 400 psi	CQ
<input type="checkbox"/> 15 psi	BJ	<input type="checkbox"/> 500 psi	CR
<input type="checkbox"/> 25 psi	BL	<input type="checkbox"/> 600 psi	CS
<input type="checkbox"/> 30 psi	BM	<input type="checkbox"/> 750 psi	CT
<input type="checkbox"/> 50 psi	BN	<input type="checkbox"/> 1000 psi	CV
<input type="checkbox"/> 75 psi	BP		

### Step 3

#### OUTPUT

<input type="checkbox"/> mV/V	Basic output code 2u	If adding 1y, 3d, 9e or 14c 2u
<input type="checkbox"/> 5 Vdc	2d	2e
<input type="checkbox"/> 10 Vdc	2g	2f
<input type="checkbox"/> 4 mA to 20 mA	2p	2y
<input type="checkbox"/> 4 mA to 20 mA (IS)	2N	2y

NOTE: If any ADDERS are required, the output code must be revised. See step 4.

#### ACCURACY

<input type="checkbox"/> 0.10 %	Accuracy code 1
<input type="checkbox"/> 0.25 %	2

#### PRESSURE PORT

<input type="checkbox"/> 1/4-18 NPT female	Port code 5a
<input type="checkbox"/> 1/4-18 NPT male	5b
<input type="checkbox"/> 7/16-20 UNF female	5c
<input type="checkbox"/> 7/16-20 UNF male	5d
<input type="checkbox"/> G 1/4 B female	5f
<input type="checkbox"/> G 1/4 B male	5g
<input type="checkbox"/> 1/8-27 NPT female	5h
<input type="checkbox"/> 1/8-27 NPT male	5i
<input type="checkbox"/> M12 x 1.5 male	5p
<input type="checkbox"/> M12 x 1.5 female	5q
<input type="checkbox"/> 9/16-18 UNF SAE male	5r
<input type="checkbox"/> 9/16-18 UNF SAE female	5s

#### ELECTRICAL CONNECTOR

<input type="checkbox"/> Bendix PTIH-10-6P	Connector code 6a
<input type="checkbox"/> DIN 43650	6m
<input type="checkbox"/> Mini DIN (40050)	6n
<input type="checkbox"/> Integral polyurethane 5-ft cable	6q
<input type="checkbox"/> 1/2 x 14 NPT conduit 5-ft cable exit	6r

### Step 4

#### ADDERS

<input type="checkbox"/> Enhanced thermals Differential: 0 °F to 180 °F	Adder code 1y
<input type="checkbox"/> Shunt cal	3d
<input type="checkbox"/> CE rating	9e
<input type="checkbox"/> Zero and span adjustments	14c
<input type="checkbox"/> mV/V	2u
<input type="checkbox"/> 5 Vdc	2e
<input type="checkbox"/> 10 Vdc	2f
<input type="checkbox"/> 4 mA to 20 mA (CE only)	2y
<input type="checkbox"/> 4 mA to 20 mA (IS and CE)	2n (2N)

NOTE: If you choose any adder output from step 4, you must revise your output code selection using this output code chart. IS outputs available only on ranges up to 5000 psi.

#### ACCESSORIES

Mating connectors only

<input type="checkbox"/> Mini DIN	Acc. code AA161
<input type="checkbox"/> Bendix	AA111

Mating conn. with 15 ft. cable for Bendix connector (6A)

	Without shunt	With shunt (3d)
<input type="checkbox"/> mV/V	AA113	AA513
<input type="checkbox"/> 4 mA to 20 mA	AA116	AA516
<input type="checkbox"/> 0 to 5/0 to 10 Vdc	AA117	AA517

### Step 5

#### EXAMPLE ORDER CODE

FDW 1 CN 1Y 2Y 5B 6A

<b>Selection</b>	<b>Description</b>	<b>Code</b>
Transducer type	Differential wet/wet	FDW
Accuracy	0.10 %	1
Pressure range	250 psi	CN
Adders	Enhanced temperature range	1y
Output	4 mA to 20 mA	2y
Pressure port	1/4-18 NPT male	5b
Electrical output connections	Bendix PTIH-10-6P	6a

There must be a code in each of the six basic code boxes. If there are no adders or accessories chosen, leave the boxes blank.

DESCRIPTION	BASIC CODE					ADDER CODE (SEE STEP 4)				
	Type	Accuracy	Range	Output	Pressure	Elect. conn.	Extended	Shunt cal.	IS/CE rated	Pots
Order code										
Accessory code										

Zero and span adjustments are located on the side. See drawing for details. No zero and span adjustments are available on mV/V output option.

## NOTES

- Accuracies stated are expected for best-fit straight line for all errors, including linearity, hysteresis, and non-repeatability through zero.
- For low pressure ranges, temperature effects may vary.
- The wet/wet differential pressure transducer has two separate, welded Hastelloy diaphragms. In wet/dry unit, the wet port (high port) has all-welded stainless steel and Hastelloy construction. The dry port (low port) has no isolation diaphragm.
- For differential pressure ranges at 0.10 % accuracy, non-amplified output @ 10 Vdc excitation = 100 mV.

## WARRANTY/REMEDY

Honeywell warrants goods of its manufacture as being free of defective materials and faulty workmanship during the applicable warranty period. Honeywell's standard product warranty applies unless agreed to otherwise by Honeywell in writing; please refer to your order acknowledgment or consult your local sales office for specific warranty details. If warranted goods are returned to Honeywell during the period of coverage, Honeywell will repair or replace, at its option, without charge those items that Honeywell, in its sole discretion, finds defective. **The foregoing is buyer's sole remedy and is in lieu of all other warranties, expressed or implied, including those of merchantability and fitness for a particular purpose. In no event shall Honeywell be liable for consequential, special, or indirect damages.**

While Honeywell may provide application assistance personally, through our literature and the Honeywell web site, it is buyer's sole responsibility to determine the suitability of the product in the application.

Specifications may change without notice. The information we supply is believed to be accurate and reliable as of this writing. However, Honeywell assumes no responsibility for its use.

## FOR MORE INFORMATION

Honeywell Advanced Sensing Technologies services its customers through a worldwide network of sales offices and distributors. For application assistance, current specifications, pricing or the nearest Authorized Distributor, visit [sps.honeywell.com/ast](http://sps.honeywell.com/ast) or call:

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USA/Canada +302 327 8920

**⚠ 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.**