

## Model 424

## Wing Union/Hammer Union Pressure Sensors



### DESCRIPTION

The Model 424 Wing Union Pressure Sensors are rugged sensors designed for use with 2002 and 2202 wing unions in demanding land-based and off-shore applications.

The isolated pressure sensing diaphragm minimizes zero shift during hammer-up and eliminates long-term signal drift in the field. The sensor diaphragm and wing union fitting are machined as one part. Model 424 is constructed as an all-welded assembly using a deep penetration, proprietary, electron beam welding

process which also ensures hermetic integrity for all field conditions. These sensors incorporate special assembly processes to vibration and shock proof the components to ensure performance is maintained during the rigors of fracturing and cementing applications. The Model 424 Wing Union is machined of Inconel® X-750, providing service with highly abrasive and corrosive media.

### FEATURES

- Quick delivery service
- Inconel® X-750 wetted parts for additional durability with abrasive or corrosive media
- $\pm 0.2$  % accuracy BFS
- Rugged, robust design
- RFI/EMI protected
- Optional on-board temperature sensor
- Optional one wire (with IS approval) or two-wire (without IS approval) shunt calibration allows users the ability to validate the offset signal in the field, ensuring the sensor is actively plugged into the system
- Intrinsically safe
- CE approved; CSA/ATEX certification

### POTENTIAL APPLICATIONS

- Acidizing
- Choke manifold
- Fracturing and cementing
- Mud pumps / mud logging
- New well development and extraction
- Oil and gas drilling
- Service and cement trucks
- Standpipe
- Stimulation
- Well head measurement



# Model 424

## PERFORMANCE SPECIFICATIONS

Characteristic	Measure
Pressure ranges	0 psi to 5000 psi; 0 psi to 6000 psi; 0 psi to 10000 psi; 0 psi to 15000 psi; 0 psi to 20000 psi; 0 bar to 350 bar; 0 bar to 400 bar; 0 bar to 700 bar; 0 bar to 1000 bar; 0 bar to 1350 bar
Accuracy <sup>1</sup>	±0.2 % best fit straight line
Calibration	Standard 5-point calibration: 0 %, 50 %, and 100 % of full scale
Output	4 mA to 20 mA, two-wire
Resolution	Infinite

## ENVIRONMENTAL SPECIFICATIONS

Characteristic	Measure
Temperature, operating	-43 °C to 85 °C [-45 °F to 185 °F]
Temperature, compensating	-34 °C to 82 °C [-30 °F to 180 °F]
Temperature effect, zero	0.018 % full scale/°C [0.01 % full scale/°F]
Temperature effect, span	0.018 % reading/°C [0.01 % reading/°F]
Temperature effect, sealing	Hermetically sealed IP68/NEMA 6P

## ELECTRICAL SPECIFICATIONS

Characteristic	Measure
Supply voltage	9 Vdc to 28 Vdc
Insulation resistance	>100 MOhm @ 50 Vdc
Max. loop resistance	950 ohm @ 28 V decreasing linearly to 0 ohm @ 9 V
Circuit protection	Reverse polarity protection of supply leads
RFI/EMI protection	Noise immunity from 5000 Hz to 1 GHz
Frequency response	Customer specified and factory installed filter for frequency response of min. 10 Hz to max. of 2500 Hz (1.4 x 10 <sup>-4</sup> s)
Electrical termination (std)	Standard electrical termination: MS series compatible, 4 pin, connector designed in stainless steel specifically for the oil and gas industry; offers full hermetic sealing (see pages 3 and 4 for additional electrical terminations)
Shunt calibration	Optional one-wire (with IS approval) or two-wire (without IS approval)

## MECHANICAL SPECIFICATIONS

Characteristic	Measure
Media	Corrosive and abrasive service, Inconel® X-750
Overload, safe	150 % rated full scale pressure or limit of WECO 2002 and 2202 fitting
Overload, burst	250 % rated pressure or limit of WECO 2002 and 2202 fittings
Pressure port	WECO 2002 and 2202 wing union, 51 mm [2 in] pipe, male sub end
Wetted parts material	Inconel® X-750
Weight	2357 g [5.2 lb]
Case material	316L stainless steel (labels are welded stainless steel with embossed characters)

## INTERNAL AMPLIFIERS

Amplifier specifications	Intrinsically safe amp: Option 2n(2N)***
Output signal	4 mA to 20 mA
Input power (voltage)	9 Vdc to 28 Vdc
Input power (current)	4 mA to 24 mA
Frequency response (amp)	2500 Hz
Power supply rejection	60 db
Operating temperature	-43 °C to 85 °C [-45 °F to 185 °F]
Reverse voltage protection	Yes
Short circuit protection	Yes
Wiring code: connector (std)	A No connection B (+) Output C (+) Supply D Case ground

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

## Wing Union/Hammer Union Pressure Sensors

### LISTINGS

Order code	Description
<b>BP424NG,6,1AC,2N,6Z,7AD,10E</b>	Model 424, 350 bar, $\pm 0.2\%$ accuracy BFSL, -35 °C to 80 °C [-30 °F to 180 °F] temperature compensation, 4 mA to 20 mA two-wire intrinsically safe, MS compatible, 4-pin connector, wetted diaphragm
<b>BP424EJ,6,1AC,2N,6Z,7AD,10E</b>	Model 424, 15,000 psi, $\pm 0.2\%$ accuracy BFSL, -35 °C to 80 °C [-30 °F to 180 °F] temperature compensation, 4 mA to 20 mA two-wire intrinsically safe, MS compatible, 4-pin connector, wetted diaphragm
<b>BP424EL,6,1AC,2N,6Z,7AD,10E</b>	Model 424, 20,000 psi, $\pm 0.2\%$ accuracy BFSL, -35 °C to 80 °C [-30 °F to 180 °F] temperature compensation, 4 mA to 20 mA two-wire intrinsically safe, MS compatible, 4-pin connector, wetted diaphragm
<b>BP424NU,6,1AC,2N,6Z,7AD,10E</b>	Model 424, 1350 bar, $\pm 0.2\%$ accuracy BFSL, -35 °C to 80 °C [-30 °F to 180 °F] temperature compensation, 4 mA to 20 mA two-wire intrinsically safe, MS compatible, 4-pin connector, wetted diaphragm

### ORDER CODE NOMENCLATURE

Combine the order code, range code, and options code.

**BP424** **EJ**, **6, 1AC, 2N, 6Z, 7AD, 10E**

Order code Range code Options code

<b>BP424</b>	<b>EJ</b>	<b>6</b>	<b>1AC</b>	<b>2N</b>		<b>6Z</b>	<b>7AD</b>		<b>10E</b>
Pressure Type	Range (Gauge)	Accuracy	Temperature Compensation	Internal Amplifiers	Amplifier Enhancements	Electrical Termination	Wiring Code Options	Calibration Options	Material Type
<b>BP</b> 424	<b>DR</b> 5000 psi	<b>6</b> $\pm 0.2\%$ BFSL	<b>1AC</b> -35 °C to 80 °C [-30 °F to 180 °F]	<b>2N</b> 4 mA to 20 mA two wire, intrinsically safe	None	<b>6A</b> Bendix PT, 6-pin shell size 10 conn PTIH-10-6P	<b>7AD</b> <b>4-Pin Standard</b> A: N/C or Shunt; B: + Out; C: + Supply; D: Case Ground	None	<b>10E</b> Wetted diaphragm
	<b>DS</b> 6000 psi			<b>2Y</b> CE approved, 4 mA to 20 mA two wire	<b>3D</b> Remote buffered one-wire shunt calibration	<b>6Z</b> MS series comp. 4 pin, shell size 14 connector (32A-14S-2P-10-M2)	<b>7AE</b> <b>4-Pin Jupiter</b> A: N/C; B: Case Ground; C: + Out; D: + Supply	<b>9A</b> Special cal., 10 point	
	<b>DV</b> 10000 psi				<b>3J</b> Remote buffered two-wire shunt calibration	<b>6BF</b> Jupiter 4-pin	<b>7AF</b> <b>6-Pin Standard</b> A: + Supply; B: + Out; C: N/C; D: Case Ground; E: N/C or Shunt; F: N/C	<b>9B</b> Special cal., 20 point	
	<b>EJ</b> 15000 psi					<b>6BG</b> Jupiter 7-pin	<b>7AG</b> <b>7-Pin Jupiter</b> A: N/C; B: N/C; C: N/C; D: + Supply; E: + Out; F: Case Ground; G: N/C or Shunt		
	<b>EL</b> 20000 psi					<b>6BH</b> Rota B-Series 4-pin	<b>7AH</b> <b>6-Pin Standard</b> A: + Supply; B: - Supply; C: N/C; D: Case Ground; E: + Shunt Cal; F: - Shunt Cal		
	<b>NG</b> 350 bar								
	<b>NN</b> 400 bar								
	<b>NH</b> 700 bar								
	<b>MN</b> 1000 bar								
	<b>NU</b> 1350 bar								

Exceptions:

Option 7AD can only be used with Options 6Z or 6BF or 6BH

Option 7AE can only be used with Option 6BF

Option 7AF can only be used with Option 6A

Option 7AG can only be used with Option 6BG

Option 3D cannot be used with Options (7AE and 6BF)

Option 3J can only be used with Option 2Y

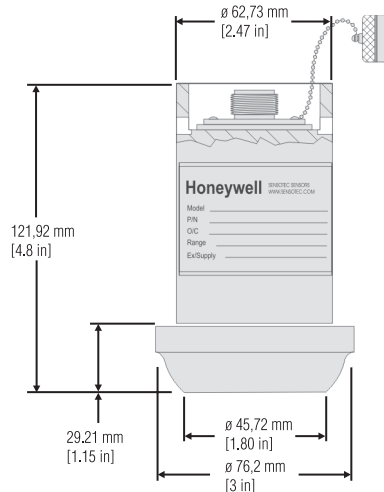
Two-wire shunt cal is not IS approved.

# Model 424

## RANGE CODES

Range Code	Available ranges
<b>DR</b>	0 psi to 5000 psi
<b>DS</b>	0 psi to 6000 psi
<b>DV</b>	0 psi to 10000 psi
<b>EJ</b>	0 psi to 15000 psi
<b>EL</b>	0 psi to 20000 psi
<b>NG</b>	0 bar to 350 bar
<b>NN</b>	0 bar to 400 bar
<b>NH</b>	0 bar to 700 bar
<b>MN</b>	0 bar to 1000 bar
<b>NU</b>	0 bar to 1350 bar

## MOUNTING DIMENSIONS AND CHARACTERISTICS



For reference only

## NOTES

1. Accuracies stated are expected for best fit straight line for all errors including linearity, hysteresis and non-repeatability thru zero.
2. Availability varies with range.



## SPECIAL REQUIREMENTS (CONSULT FACTORY)

Need a special modification or complete custom design to meet your unique requirements? Consult our factory by calling +1 614-850-5000 (800-848-6564) or visit us online at <http://measurementsensors.honeywell.com>.

## OPTION CODES

<b>Pressure Ranges</b>	0 psi to 5000 psi; 0 psi to 6000 psi; 0 psi to 10000 psi; 0 psi to 15000 psi; 0 psi to 20000 psi; 0 bar to 350 bar; 0 bar to 400 bar; 0 bar to 700 bar; 0 bar to 1000 bar; 0 bar to 1350 bar
<b>Temperature Compensation</b>	-34 °C to 82 °C [-30 °F to 180 °F]
<b>Internal Amplifier</b>	<b>2N.</b> 4 mA to 20 mA, two-wire output; intrinsically safe <b>2Y.</b> CE approved 4 mA to 20 mA two-wire
<b>Accuracy</b>	<b>6.</b> ±0.2 % BFSL
<b>Electrical Termination</b>	Standard electrical termination: MS series compatible, 4 pin, connector designed in stainless steel specifically for the oil and gas industry; offers full hermetic sealing <b>6A.</b> Bendix PT, 6-pin shell size 10 conn, PTIH-10-6P (max. 121 °C [250 °F]) <b>6Z.</b> MS series compatible, 4 pin, shell size 14 connector (32A-14S-2P-10-M2) <b>6BF.</b> Jupiter 4-pin connection <b>6BG.</b> Jupiter 7-pin connection <b>6BH.</b> Rota B-Series 4-pin Other connection(s) - By request
<b>Amplifier Enhancements</b>	<b>3D.</b> Remote buffered shunt calibration <b>3J.</b> Remote buffered two-wire shunt calibration
<b>Special Calibration<sup>2</sup></b>	<b>9A.</b> 10 point (5 up/5 down) 20 % increments @ 21 °C [70 °F] <b>9B.</b> 20 point (10 up/10 down) 10 % increments @ 21 °C [70 °F]
<b>Wetted Diaphragm</b>	<b>10E.</b> Inconel® X-750

## WIRING CODE OPTIONS

Order Code	Wiring
<b>7AD</b>	4 Pin Standard A: N/C or Shunt; B: + Out; C: + Supply; D: Case Ground
<b>7AE</b>	4 Pin Jupiter A: N/C; B: Case Ground; C: + Out; D: + Supply
<b>7AF</b>	6 Pin Standard A: + Supply; B: + Out; C: N/C; D: Case Ground E: N/C or Shunt; F: N/C
<b>7AG</b>	7 Pin Standard A: N/C; B: N/C; C: N/C; D: + Supply; E: + Out F: Case Ground; G: N/C or Shunt
<b>7AH</b>	6 Pin Standard A: + Supply; B: - Supply; C: N/C; D: Case Ground E: + Shunt Cal; F: - Shunt Cal

Option 7AD can only be used with Options 6Z or 6BF or 6BH

Option 7AE can only be used with Option 6BF

Option 7AF can only be used with Option 6A

Option 7AG can only be used with Option 6BG

Option 3D cannot be used with Options (7AE and 6BF)

Option 3J can only be used with Option 2Y

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**Warranty.** Honeywell warrants goods of its manufacture as being free of defective materials and faulty workmanship. Honeywell's standard product warranty applies unless agreed to otherwise by Honeywell in writing; please refer to your order acknowledgement 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 it finds defective. **The foregoing is buyer's sole remedy and is in lieu of all 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 we provide application assistance personally, through our literature and the Honeywell web site, it is up to the customer 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 printing. However, we assume no responsibility for its use.

## **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 datasheet is for reference only. DO NOT USE this document as product installation information.
- 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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Sensing and Control  
Honeywell  
1985 Douglas Drive North  
Golden Valley, MN 55422  
**[www.honeywell.com](http://www.honeywell.com)**

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