

## Model 427

### Wing Union/Hammer Union Free Flow Pressure Sensors



#### DESCRIPTION

Honeywell's Model 427 Wing Union/Hammer Union Pressure Sensors are rugged devices designed for use with Weeco® 1502 (2 in.) fittings for both offshore and land-based oil and gas applications, such as well stimulation and circulation system monitoring.

Model 427's newly designed aperture has a wide and shallow sensing port to handle more viscous drilling mud blends and enable a seamless flow of media through the sensing area. Available with an accuracy level of  $\pm 0.2$  % BFSL (Best Fit Straight Line), this sensor provides consistent and accurate pressure measurements in challenging drilling applications such as extended reach drilling or heavy crude oil drilling.

#### FEATURES

- Free flow pressure port design with wider aperture for more viscous media blends
- $\pm 0.2$  % accuracy BFSL
- All-welded one-piece, hermetically sealed, stainless-steel construction
- Inconel® X-750 wetted parts for additional durability with abrasive or corrosive media
- Multiple electrical connections
- 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
- RFI/EMI protected
- Intrinsically safe
- CE approved; CSA/ATEX

Model 427 is constructed as an all-welded, stainless steel assembly with the sensor diaphragm and wing union fitting machined as one part. This helps provide hermetic integrity, which lessens the chance of media leakage vs. multi-piece parts, and increases reliability. The isolated, pressure sensing diaphragm minimizes zero-shift during hammer up and eliminates long term, signal drift in the field. The Weeco® 1502 Wing Union compatible fittings are machined of Inconel® X-750, which provides additional durability with highly abrasive and corrosive media, while the Honeywell proprietary stainless steel electrical connection delivers enhanced secondary pressure containment.

Each sensor undergoes special assembly processes to test shock and vibration for reliable performance in the field.

#### 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 427

## 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 <sup>3</sup> ; 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 <sup>3</sup>
Accuracy <sup>1</sup>	±0.2 % (total error) 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

\*Consult the installation guide for T ambient

## 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
Zero and span adjustment	Field adjustable by removing connector
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® wing union 1502 fitting
Overload, burst	250 % rated pressure or limit of Weco® wing union 1502 fitting
Pressure port	Weco® 1502 wing union, 51 mm [2 in] pipe, male sub end
Aperture dimensions	22,86 mm [0.9 in] internal diameter x 10,16 mm [0.4 in] depth 25,4 mm [1.0 in] entry diameter
Wetted parts material	Inconel® X-750
Weight	2722 g [6 lb]
Housing 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 Free Flow Pressure Sensors

### LISTINGS

Order code	Description
<b>BP427DR,6,1AC,2N,6Z,7AD,10E</b>	Model 427, 5,000 psi, ±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>BP427NG,6,1AC,2N,6Z,7AD,10E</b>	Model 427, 350 bar, ±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>BP427DV,6,1AC,2N,6Z,7AD,10E</b>	Model 427, 10,000 psi, ±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>BP427MN,6,1AC,2N,6Z,7AD,10E</b>	Model 427, 1,000 bar, ±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>BP427EJ,6,1AC,2N,6Z,7AD,10E</b>	Model 427, 15,000 psi, ±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.

**BP427** **EJ**, **6, 1AC, 2N, 6Z, 7AD, 10E**

Order code Range code Options code

<b>BP427</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> 427	<b>DR</b> 5000 psi	<b>6</b> ±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 PTH-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>3H</b> 4 mA to 16 mA 2-wire IS with over-range lddbk	<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>3J</b> Remote buffered two-wire shunt calibration	<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 <sup>3</sup>				<b>3K</b> 4 mA to 16 mA 2-wire shunt cal. over-range lddbk	<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 <sup>3</sup>								

#### Exceptions:

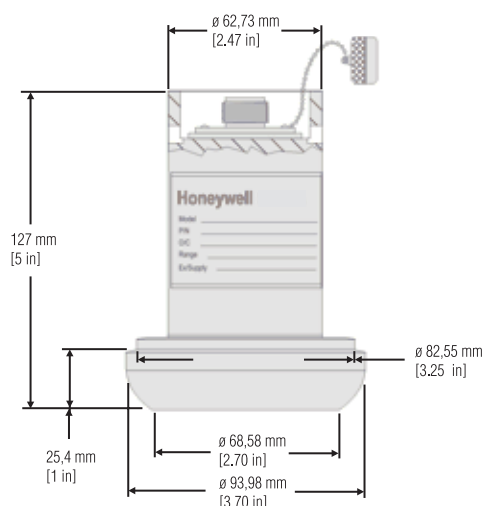
Option 7AD can only be used with Options 6Z or 6BF or 6BH  
 Option 7AE can only be used with Option 6BF  
 Option 7AF can only be used with Option 6A  
 Option 7AG can only be used with Option 6BG  
 Option 3D cannot be used with Options (7AE and 6BF)  
 Option 3J can only be used with Option 2Y  
 Options EJ + 3H can give 20000 psi [1350 bar] pressure reading  
 Two-wire shunt cal is not IS approved.

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## 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>see note#3 on page 4</b>	0 psi to 20000 psi <sup>3</sup>
<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>see note#3 on page 4</b>	0 bar to 1350 bar <sup>3</sup>

## MOUNTING DIMENSIONS



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.
3. Working pressure and approval limited to 15000 psi [1000 bar]. Amplifier enhancement option 3H will allow overpressure reading to 20000 psi [1350 bar]. When ordering, use EJ + 3H or MN + 3H in the order code.



## 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 <sup>3</sup> ; 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 <sup>3</sup>
<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>3H.</b> 4 mA to 16 mA two-wire IS with over-range feedback; will read 20 mA @ 20000 psi <b>3J.</b> Remote buffered two-wire shunt calibration <b>3K.</b> 4 mA to 16 mA two-wire shunt calibration with over-range feedback
<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 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.**

## **Find out more**

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