

Wing Union / Hammer Union Pressure Sensor Applications

BACKGROUND

Pressure sensors are an essential element in today's oil and gas industry, used for many types of upstream applications such as exploration, well development, and production. They need to be built tough to survive some of the world's most demanding environmental conditions, both on land and offshore while providing accurate and reliable performance.

Well stimulation (fracturing and acidizing), mud logging, and well development (casing and cementing) are vital oil and gas processes that utilize pressure sensors for measurement and monitoring functions.

SOLUTION

Honeywell's Wing Union pressure sensors (also known as Hammer Union pressure sensors outside of the United States) are widely used by oil and gas companies to measure pressure level changes in media circulation systems.

Mud Logging Applications

For example, mud logging applications require a series of pressure sensors to be connected to the drilling apparatus and installed in specialized equipment to monitor or "log" the drill's activity. Logging While Drilling (LWD) and Measurement While Drilling (MWD) require pressure sensors designed to constantly measure drilling fluid pressure/flow along with the ability to adjust mixture or pressure levels to keep drills operating and prevent damage or equipment failures. This includes the circulation system's stand pipe (for pressure monitoring of mud from the pump into the well), mud pumps (for pressure monitoring of incoming and outgoing media to protect the mud pump and drill bit), and return line choke manifold (for pressure monitoring of the return line carrying the mud plus cuttings).

During the mud logging process, pumps send drilling media throughout the circulation system, down to the drilling bit, and then bring back up the bit's cuttings to the surface for analysis and disposal. Honeywell's pressure sensors help detect pressure level changes in the media circulation system, which can indicate changing conditions being encountered downhole by the drill bit, thus allowing the operator to quickly make adjustments to the drilling mixture pressure or drilling process as needed.

Fracturing, Acidizing, and Cementing Applications

Honeywell's Wing Union sensors are also used during fracturing, acidizing, and cementing applications for similar pressure monitoring and control purposes.

Figure 1. Oil Mud Logging Application



MODELS 424, 425, 427 WING UNION PRESSURE SENSORS

Durable Construction

Models 424, 425, and 427 are constructed on Honeywell's time proven all-welded, one piece design, with the sensor diaphragm and Weco® 1502 Wing Union compatible fitting form factor machined as one part. This one piece design provides a hermetically sealed unit, reducing the chance of media leakage into the sensitive electronic components, and increasing overall reliability. The isolated, pressure sensing diaphragm minimizes zero-shift during hammer up and also eliminates long term, signal drift in the field, making it easier to install and providing reliable pressure readings over time.

The sensor diaphragm is machined from Inconel® X-750, which provides additional durability with highly abrasive and corrosive media, and is welded to the main stainless steel body. The stainless steel electrical connection delivers enhanced secondary pressure containment, with multiple electrical connector options to choose from.

Optional 1-Wire or 2-Wire Shunt Calibration


Another option for the Models 424, 425, and 427 is the use of 1-wire or 2-wire Shunt Calibration. When a customer sends a signal to the Wing Union from their instrumentation, another signal will be returned to validate the functionality of the unit. This gives a degree of confidence in the pressure readings during normal operation.


Various Accuracy Levels Available


Model 424 is available with one accuracy level: 0.2 % accuracy. Model 425 is available in two accuracy levels: High accuracy: ± 0.1 % BFS; Standard: ± 0.2 % BFS. Model 427 features a wider aperture design for customers using more viscous media in certain applications and is available with a standard accuracy of ± 0.2 % BFS (BFS = Best Fit Straight Line).

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Table 1. Honeywell Models 424 / 425 / 427

Model 424	Features	Benefits
	<ul style="list-style-type: none"> Quick delivery service 0.2 % accuracy One-piece all-welded design featuring Inconel® X-750 wetted parts RFI/EMI protected Optional on-board temperature sensor Optional one wire (with IS approval) or two-wire (without IS approval) shunt calibration Intrinsically safe CE approved 	<ul style="list-style-type: none"> Reliability / Durability: All-welded, hermetically sealed, stainless steel construction with Inconel® X-750 wetted parts isolates corrosive or abrasive drilling media from sensitive internal electronics. Materials retain strength in higher temperatures to provide rugged and reliable performance under demanding conditions. Shock and vibration tested, intrinsically safe rating Easy Installation / Serviceability: Designed for quick field installation, including horizontal or vertical mounting. Field-repairable connectors. Zero and span adjustments can be accessed by removing the electrical connector, thus preventing ingress failures and deterring tampering. The use of one-wire or two-wire shunt calibration allows the user to determine if the wing union is still functional in the field, or if it has to be removed for service/calibration Quick Shipment: Many popular configurations readily available through Honeywell's Quick Shipment program

Model 425	Features	Benefits
	<ul style="list-style-type: none"> Available with either ± 0.1 % high accuracy, or ± 0.2 % standard accuracy BFSL (Best Fit Straight Line) One-piece all-welded design featuring Inconel® X-750 wetted parts Overload, burst pressure rating at 300 % rated pressure Multiple electrical connections RFI/EMI protected Intrinsically safe CE approved; FM/CSA/ATEX certification Optional one-wire (with IS approval) or two-wire (without IS approval) shunt calibration 	<ul style="list-style-type: none"> Higher Accuracy: More confidence in the actual measured pressure value, particularly for smaller changes in pressure, thus allowing the operator to make quicker adjustments to drilling operations for more precise control and increased efficiency during extraction Reliability / Durability: All-welded, hermetically sealed, stainless steel construction with Inconel® X-750 wetted parts isolates corrosive or abrasive drilling media from sensitive internal electronics. Materials retain strength in higher temperatures to provide rugged and reliable performance under demanding conditions. Shock and vibration tested, intrinsically safe rating Easy Installation / Serviceability: Designed for quick field installation, including horizontal or vertical mounting. Field-repairable connectors. Zero and span adjustments can be accessed by removing the electrical connector, thus preventing ingress failures and deterring tampering. The use of one-wire or two-wire shunt calibration allows the user to determine if the wing union is still functional in the field, or if it has to be removed for service/calibration Quick Shipment: Many popular configurations readily available through Honeywell's Quick Shipment program

Model 427	Features	Benefits
	<ul style="list-style-type: none"> Available with ± 0.2 % standard accuracy BFSL (Best Fit Straight Line) Free flow pressure port with wide aperture design One-piece all-welded design featuring Inconel® X-750 wetted parts Overload, burst pressure rating at 300 % rated pressure Multiple electrical connections RFI/EMI protected Intrinsically safe CE approved; FM/CSA/ATEX certification Optional one-wire (with IS approval) or two-wire (without IS approval) shunt calibration 	<ul style="list-style-type: none"> Wider Aperture Design: Wider than Models 424 & 425, helping to prevent media clogging when using more viscous media blends Reliability / Durability: All welded, hermetically sealed, stainless steel construction with Inconel® X-750 wetted parts isolates corrosive or abrasive drilling media from sensitive internal electronics. Materials retain strength in higher temperatures to provide rugged and reliable performance under demanding conditions. Shock and vibration tested, intrinsically safe rating Easy Installation / Serviceability: Designed for quick field installation, including horizontal or vertical mounting. Field-repairable connectors. Zero and span adjustments can be accessed by removing the electrical connector, thus preventing ingress failures and deterring tampering. The use of one-wire or two-wire shunt calibration allows the user to determine if the wing union is still functional in the field, or if it has to be removed for service/calibration Quick Shipment: Many popular configurations readily available through Honeywell's Quick Shipment program

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Figure 2. Honeywell Wing Union Pressure Transducers



WARRANTY/REMEDY

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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.

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Honeywell serves its customers through a worldwide network of sales offices, representatives and distributors. For application assistance, current specifications, pricing or name of the nearest Authorized Distributor, contact your local sales office or:

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008875-2-EN IL50 GLO

November 2012

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