Honeywell

# Limitless™ Wireless Pressure Sensor

**WPS Series**

0 psi to 50 psi, 200 psi, 500 psi, 1000 psi, 1500 psi, 5000 psi, or 10,000 psi

Datasheet

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# WPS Series

Honeywell Wireless Pressure Sensors, WPS Series is WPAN 802.15.4 compliant wireless point-to-point (P2P) device that will easily integrate into new or pre-existing instrumentation systems. It has a variety of remote or built-in antenna options.

It features a rugged plastic enclosure, corrosion-resistant construction, and is suitable for outdoor applications in harsh environments due to its IP67 sealed enclosure. Its 316L stainless steel pressure port has a Hastelloy® C-276 pressure diaphragm, making it resilient to the harshest of process media. The direct- or remote-mount antenna options add flexibility for adaptation to different applications.

The WPS Series is beneficial for remote pressure monitoring applications where wiring or wire maintenance is not physically possible or economically feasible. Combining this greater flexibility with proven harsh-duty packaging can result in increased efficiencies and ease in establishing remote, cost-effective process sensing.

## *What makes our sensors better?*

- Designed to enable control and/or notification in remote parts of applications/machinery/manufacturing plants, where wiring is too costly or not possible
- Ability to reconfigure and network multiple interfaces with personalized addresses that allows for adding, subtracting, and/or relocating wireless devices
- Can reduce installation/maintenance costs due to the elimination of wiring to the pressure sensors, conduit, strain relief, clips, connectors, junction boxes, etc.
- Reduces issues with wire connection integrity on moving equipment
- The sensor's body can be rotated/swiveled 350 degrees about the port axis so that the LCD can be oriented in the desirable reading position after installation

SIMPLIFIES MAINTENANCE • RUGGED, DURABLE
REDUCES TOTAL INSTALLATION COSTS

# Features and Benefits

## WIRELESS DESIGN

Radio (license-free and global): WPAN 802.15.4, 2.4 GHz, point-to-point (P2P) provides increased **reliability, flexibility, and security in wireless transmission**. Up to 305 m [1000 ft] line-of-sight communication range when used with Honeywell's Wireless Multi-Protocol Receiver (WMPR) module, sold separately.

## CONFIGURABLE PLATFORM

**Designed for global availability**, a wide variety of inputs with simple and universal PLC connections are available. The WPS Series provides a Total Error Band (TEB) of ±2.0 % within the operating temperature range. It can measure gage or absolute* pressures from 0 psi to 50 psi through 0 psi to 10,000 psi.

## WELL-SUITED FOR TOUGH ENVIRONMENTS

**IP67 sealed** polycarbonate plastic enclosure ** with 316L Port and Hastelloy® C-276 diaphragm and direct- or remote-mount antenna options. The sensor's body can be **rotated/swiveled 350 degrees about the port axis** so that the LCD can be oriented in the desired reading position after installation.

***Range of 305 m [1000 ft]***

## REMOTE CONTROL AND MONITORING

License-free RF wireless protocol standards allow for remote control and monitoring of processes and equipment.

***Consumes low power to prolong battery life***

## RECONFIGURABLE

**Ability to reconfigure** multiple WPS Series' inputs allows users to easily add, subtract, or relocate the WPS Series sensor. **Reduces issues with wire connection integrity** on moving equipment.

## REDUCES COSTS

**Minimizes installation/maintenance costs** because there are no wires, conduit, strain relief, clips, connectors, connection boxes, etc.

## OFF-THE-SHELF BATTERIES

**Batteries** Readily available batteries can be obtained from electrical supply houses and distributors.

** Absolute pressure devices require longer lead times.*

***Suitability of the device for the operating environment needs to be assessed by the end user.*

# Potential Applications

## INDUSTRIAL APPLICATIONS

- Process monitoring of important pressures
- Gauge placement
- Liquid level sensing (corrosive or non-corrosive)
- Leak detection (detection of pressure drop)
- Process pump failure monitoring
- Well head monitoring
- Irrigation water pressure monitoring
- Equipment health monitoring
- Tank level monitoring (water or corrosive liquids)

**Table 1. Specifications**

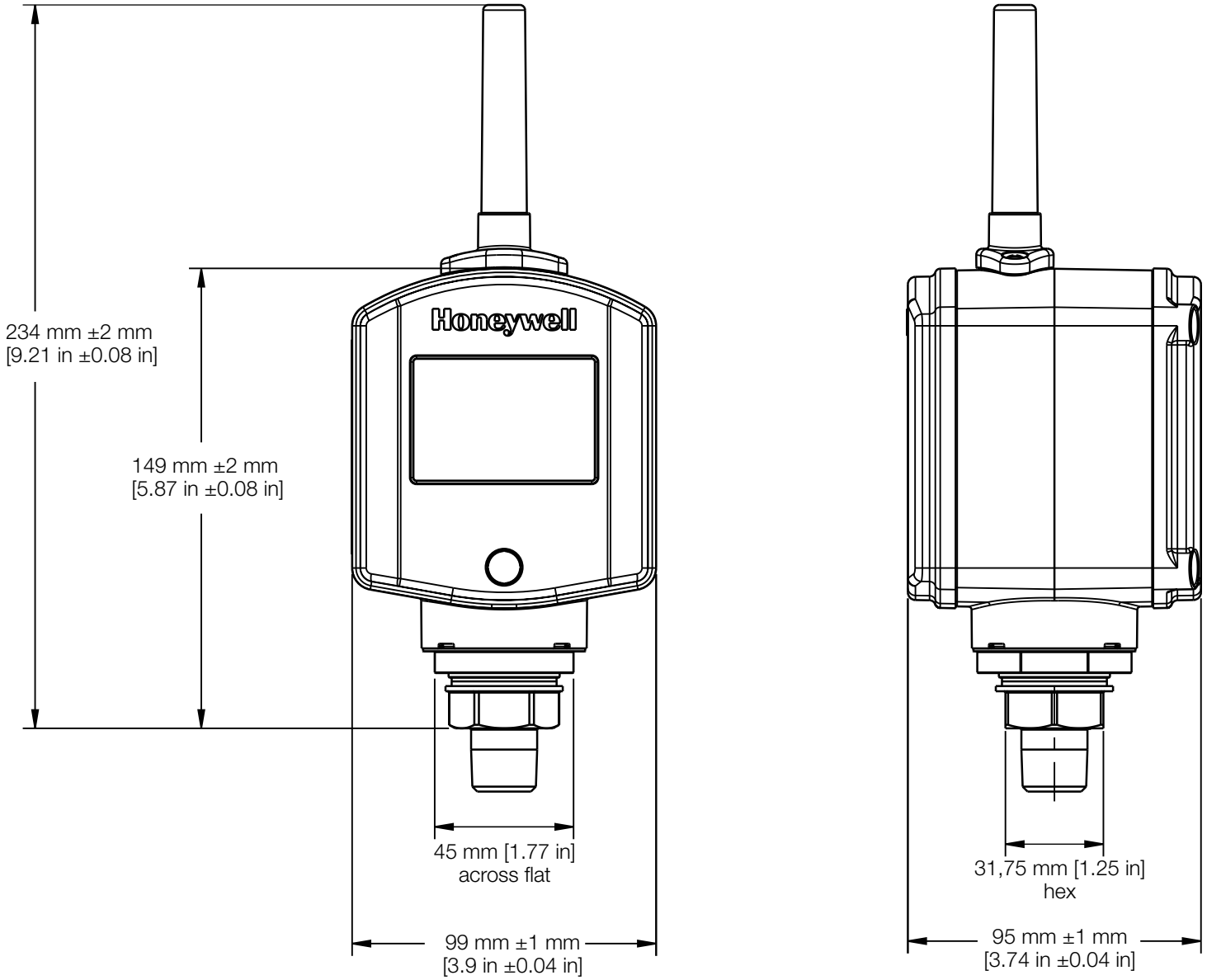
| Characteristic | Parameter |
|---|---|
| Availability | Global, license-free bands |
| Operating and storage temperature range | -40 °C to 70 °C [-40 °F to 158 °F] |
| Process connections | 1/4 in NPT female connection is integral to 1/2 in NPT male or 3/4 in NPT male |
| Pressure ranges | 0 psi to 50 psi, 0 psi to 200 psi, 0 psi to 500 psi, 0 psi to 1000 psi, 0 psi to 1500 psi, 0 psi to 5000 psi, or 0 psi to 10,000 psi; gage or absolute |
| Measurement accuracy | better than ±2.0 % Total Error Band (TEB), full scale, full temperature range. Example 100 psi is ±2 psi |
| Total error band (TEB) | ±2.0 %FSS |
| Output | digital output via wireless, end-user configurable as psi, bar, kPa, and Pa<br>local LCD variant also available |
| Sensor output resolution | 0.04 %FS |
| Housing/wetted parts | polycarbonate plastic enclosure, 316L stainless steel port, Hastelloy® C-276 diaphragm |
| Antenna type | direct mount antenna with radome or remote mount antennas available |
| Housing/radome material | polycarbonate plastic |
| Sealing | IP65, IP67 |
| Media isolated | yes |
| Radio/communication protocol | IEEE 802.15.4, 2.4 GHz radio; WPAN 802.15.4 |
| Signal range* | nominal 305 m [1000 ft] clear line of sight when used with a WMPR |
| Battery | 3.6 Vdc Lithium Thionyl Chloride; D size, quantity: 2; see battery details on page 5 |
| Module transmit power | country code A: 16 dBm max.; country code B: 8 dBm max. |
| Receive sensitivity (typ.) | -98 dBm |
| Shock | 40 g per IEC 60068-2-27 |
| Vibration | 5 Hz to 200 Hz, 4 g, Sinusoidal as per IEC 60068-2-6 |
| Operating humidity | 0 %RH to 100 %RH |
| Overload safe pressure | 4x FS or 3000 psi whichever is less for ≤1000 psi; 4x FS or 15000 psi, whichever is less for >1000 psi |
| Burst pressure | 3000 psi for ≤ 1000 psi; 4x Full Scale or 15000 psi, whichever is less for >1000 psi |
| Antenna options | integrated 2.0 dBi., or remote antenna (see antenna options) |
| Periodic update interval | field programmable rate, 1, 5, 10, 30, or 60 second intervals |
| Data rate | 250 kbps |
| Battery life** | 6.5 years at 60-second interval, 5 years at five-second data interval, 2.5 years at one-second interval |
| Battery location | battery holder inside base unit |
| EMC | latest applicable standards: EN 300 328, V1.8.1; EN 61326-1 (2012);<br>EN 301 489-1, V1.8.1; EN 301 489-17, V2.2.1 |
| Agency approvals and standards | 16 dBm: FCC 15.247 and 15.209, Industry Canada RSS 210 Issue 8, ACMA (C-Tick mark)<br>8 dBm: ETSI EN 300 328 V1.8.1 (CE mark) |

* Actual range will vary depending upon antennas, cables, and site topography.
** Battery life is defined at 25 °C [77 °F]

**Table 2. Battery Specifications**

| Characteristic | Technical Data (typical values @ 23 °C ±2 °C) |
|---|---|
| Honeywell part number | WBT5 (two batteries included) |
| Battery size | Size D (ER32L615) |
| Battery type | Lithium Thionyl Chloride |
| Nominal capacity @ 4 mA, up to 2 V | 19 Ah |
| Nominal voltage | 3.6 V |
| Max. recommended continuous current | 230 mA |
| Max. recommended pulse current | 500 mA |
| Weight | 97 g [3.4 oz] max. |
| Operating temperature | -55 °C to 85 °C [-67 °F to 185 °F] |
| Storage temperature | 30 °C |
| Suggested alternate sources of battery cell supply | Xeno Energy (part number XL-205F)<br>Tadiran (part number TL-5930/S) |

**Figure 1. Honeywell WPS Series dimensions (mm [in]). For reference only.**



# WPS Series

## PRODUCT NOMENCLATURE

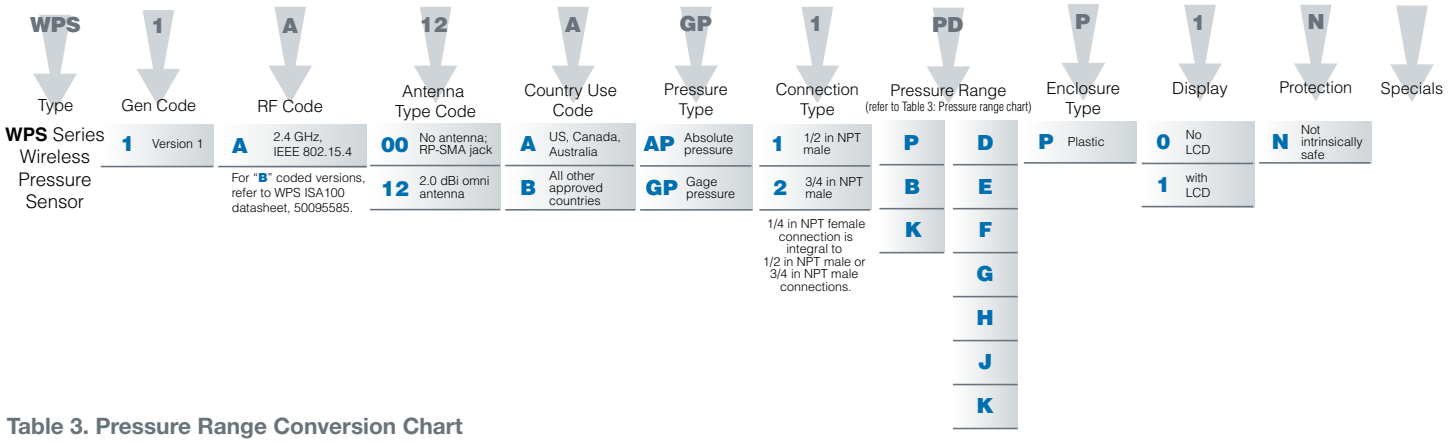



**Table 3. Pressure Range Conversion Chart**

| Unit Code | Description | Pressure Range | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | D | E | F | G | H | J | K |
| P | psi | 0 to 50 | 0 to 200 | 0 to 500 | 0 to 1000 | 0 to 1500 | 0 to 5000 | 0 to 10000 |
| B | Bar | 0 to 3.45 | 0 to 13.8 | 0 to 34.5 | 0 to 68.9 | 0 to 103.4 | 0 to 344.7 | 0 to 689.5 |
| K | Kpa | 0 to 344.7 | 0 to 1379 | 0 to 3447.4 | 0 to 6894.7 | 0 to 10342 | 0 to 34473 | 0 to 68947 |

# Limitless™ Point-to-Point Wireless Pressure Sensor

## ANTENNA OPTIONS FOR USE WITH '00' ANTENNA TYPE CODE

Antennas can be ordered with the WPS Series Sensors by inserting the **Antenna Type Code** into the part number as shown in the nomenclature. Also, sensors can be ordered without antennas, by using the "00" Antenna Type Code in the part number. Antennas may also be ordered separately using the **Part Numbers** below.

**Table 4. Antenna Options - Country Code A**

| Ant. type code | | Part number | Replacement antenna mount or cable | Antenna design | Ant. gain (max.) | Connector/ mounting | Dimensions | Antenna material | Cable material/type | Mount material |
|---|---|---|---|---|---|---|---|---|---|---|
| 00 |  | WAN03RSP | – | flat | 3.0 dBi | RP-SMA plug/adhesive mount | Ø 7,87 mm x 22,1 mm W x 4,57 mm D [Ø 0.31 in x 0.87 in W x 0.18 in D] 3 m [9 ft] cable | UV stable ABS | UV stable PVC/ RG-174 coax | – |
| 00 |  | WAN04RSP | WAMM100RSP-005 base with 1,52 m [5 ft] of cable | tilt/ swivel | 5.5 dBi | RP-SMA plug/direct mount | Ø 12,7 mm x 208,28 mm L [Ø 0.50 in x 8.20 in L] | UV stable molded polyurethane | UV stable PVC/ RG-174 coax | UV stable black ABS |
| 00 | | WAN04RSP | WAMM100RSP-010 base with 3,05 m [10 ft] of cable | tilt/ swivel | 5.5 dBi | RP-SMA plug/direct mount | Ø 12,7 mm x 208,28 mm L [Ø 0.50 in x 8.20 in L] | UV stable molded polyurethane | UV stable PVC/ RG-174 coax | UV stable black ABS |
| 00 |  | WAN05RSP | WAMM100RSP-005 base with 1,52 m [5 ft] of cable | tilt/ swivel | 9.0 dBi | RP-SMA plug/direct mount | Ø 12,7 mm x 384,05 mm L [Ø 0.50 in x 15.12 in L] | UV stable molded polyurethane | UV stable PVC/ RG-174 coax | UV stable black ABS |
| 00 | | WAN05RSP | WAMM100RSP-010 base with 3,05 m [10 ft] of cable | tilt/ swivel | 9.0 dBi | RP-SMA plug/direct mount | Ø 12,7 mm x 384,05 mm L [Ø 0.50 in x 15.12 in L] | UV stable molded polyurethane | UV stable PVC/ RG-174 coax | UV stable black ABS |
| 00 |  | WAN06RNJ | WCA200RN-PRSP-002 coax cable assembly 0,682 m [2 ft] | straight | 8.0 dBi | RP-N jack/ bracket | Ø 33,5 mm x 427,9 mm L [Ø 1.32 in x 16.85 in L] | UV stable fiberglass | UV stable PVC/ RG-316 coax, UV stable Polyethylene/200 Series coax | 300 series SST aluminum alloy |
| 00 | | WAN06RNJ | WCA200RN-PRSP-010 coax cable assembly 3,05 m [10 ft] | straight | 8.0 dBi | RP-N jack/ bracket | IØ 33,5 mm x 427,9 mm L [Ø 1.32 in x 16.85 in L] | UV stable fiberglass | UV stable PVC/ RG-316 coax, UV stable Polyethylene/200 Series coax | 300 series SST aluminum alloy |
| 00 |  | WAN08RSP | – | 90° | 0 dBi | RP-SMA plug/direct mount | Ø 8,0 mm x 29 mm L [Ø 0.34 in x 1.14 in L] | UV stable | – | – |
| 00 |  | WAN09RSP | – | low profile mobile | 3.0 dBi | RP-SMA plug/magnetic | Ø 76,2 mm x 115 mm L [Ø 3.0 in x 4.54 in L] 4,57 m [15 ft] cable | UV stable ABS plastic | UV stable black PVC | Nickel-plated steel |
| 00 |  | WAN10RSP | – | straight | 5.0 dBi | RP-SMA plug/magnetic | Ø 76,2 mm x 230,1 mm L [Ø 3.0 in x 9.06 in L] 4,57 m [15 ft] cable | Nickel-plated steel | UV stable black PVC | Nickel-plated steel |
| 00 |  | WAN11RSP | – | low profile mobile | 4.0 dBi | RP-SMA plug/thru-hole screw | Ø 39 mm x 42,4 mm L [Ø 1.54 in x 1.67 in L ] | UV stable black PVC | UV stable black PVC | Nickel-plated steel |
| 12 |  | WAN12RSP | – | straight | 2.0 dBi | RP-SMA plug/direct mount | Ø 10 mm x 79,5 mm L [Ø 0.39 in. x 3.13 in. L] | UV stable ABS plastic | – | – |

# WPS Series

**Table 5. Antenna Options - Country Code B**

| Ant. type code | | Part number | Replacement antenna mount or cable | Antenna design | Ant. gain (max.) | Connector/ mounting | Dimensions | Antenna material | Cable material/ type | Mount material |
|---|---|---|---|---|---|---|---|---|---|---|
| 00 |  | WAN03RSP | – | flat | 3.0 dBi | RP-SMA plug/adhesive mount | Ø 7,87 mm x 22,1 mm W x 4,57 mm D [Ø 0.31 in x 0.87 in W x 0.18 in D] 3 m [9 ft] cable | UV stable ABS | UV stable PVC/ RG-174 coax | – |
| 00 |  | WAN04RSP | WAMM100RSP-005 base with 1,52 m [5 ft] of cable | tilt/ swivel | 5.5 dBi | RP-SMA plug/direct mount | Ø 12,7 mm x 208,28 mm L [Ø 0.50 in x 8.20 in L] | UV stable molded polyurethane | UV stable PVC/ RG-174 coax | UV stable black ABS |
| 00 | | WAN04RSP | WAMM100RSP-010 base with 3,05 m [10 ft] of cable | tilt/ swivel | 5.5 dBi | RP-SMA plug/direct mount | Ø 12,7 mm x 208,28 mm L [Ø 0.50 in x 8.20 in L] | UV stable molded polyurethane | UV stable PVC/ RG-174 coax | UV stable black ABS |
| 00 |  | WAN08RSP | – | 90° | 0 dBi | RP-SMA plug/direct mount | Ø 8,0 mm x 29 mm L [Ø 0.34 in x 1.14 in L] | UV stable | – | – |
| 00 |  | WAN09RSP | – | low profile mobile | 3.0 dBi | RP-SMA plug/magnetic | Ø 76,2 mm x 115 mm L [Ø 3.0 in x 4.54 in L] 4,57 m [15 ft] cable | UV stable ABS plastic | UV stable black PVC | Nickel-plated steel |
| 00 |  | WAN10RSP | – | straight | 5.0 dBi | RP-SMA plug/magnetic | Ø 76,2 mm x 230,1 mm L [Ø 3.0 in x 9.06 in L] 1,52 m [5 ft] cable | Nickel-plated steel | UV stable black PVC | Nickel-plated steel |
| 00 |  | WAN11RSP | – | low profile mobile | 4.0 dBi | RP-SMA plug/thru-hole screw | Ø 39 mm x 42,4 mm L [Ø 1.54 in x 1.67 in L ] | UV stable black PVC | UV stable black PVC | Nickel-plated steel |
| 12 |  | WAN12RSP | – | straight | 2.0 dBi | RP-SMA plug/direct mount | Ø 10 mm x 79,5 mm L [Ø 0.39 in. x 3.13 in. L] | UV stable ABS plastic | – | – |

# Limitless™ Point-to-Point Wireless Pressure Sensor

**Table 6. Cable and Coax Accessories**

| | Part Number | Description |
|---|---|---|
|  | WCA200RNPRSP-002 | Limitless™ Series wireless cable assembly wth 200 Series cable, 2 ft length, reverse polarity N plug to reverse polarity SMA plug, use only with WAN06RNJ antenna |
|  | WCA200RNPRSP-010 | Limitless™ Series wireless cable assembly wth 200 Series cable, 10 ft length, reverse polarity N plug to reverse polarity SMA plug, use only with WAN06RNJ antenna |
|  | WCA200RNJRSP-002 | Limitless™ Series wireless cable assembly wth 200 Series cable, 2 ft length, reverse polarity SMA jack to reverse polarity SMA plug |
|  | WCA200RNJRSP-005 | Limitless™ Series wireless cable assembly wth 200 Series cable, 5 ft length, reverse polarity SMA jack to reverse polarity SMA plug |
|  | WCA200RNJRSP-010 | Limitless™ Series wireless cable assembly wth 200 Series cable, 10 ft length, reverse polarity SMA jack to reverse polarity SMA plug |
|  | WCA200RNJRSP-015 | Limitless™ Series wireless cable assembly wth 200 Series cable, 15 ft length, reverse polarity SMA jack to reverse polarity SMA plug |
|  | WCA200RNJRSP-020 | Limitless™ Series wireless cable assembly wth 200 Series cable, 20 ft length, reverse polarity SMA jack to reverse polarity SMA plug |

**Table 7. Base Accessories**

| | Part Number | Description |
|---|---|---|
|  | WAMM100RSP-005 | Magnetic antenna base with 1,52 m [5 ft] of cable |
|  | WAMM100RSP-010 | Magnetic antenna base with 3,05 m [10 ft ] of cable |
|  | WPB1 | WPMM Wireless panel mount reciever mounting bracket |
|  | WPR1 | WPMM panel mount retainer |

# WPS Series

**Table 7. Standard Listings • WPS Series Limitless™ Wireless Pressure Sensor**

| | Catalog listing | LCD | Antenna | Use | Pressure Range | Pressure Type | Port |
|---|---|---|---|---|---|---|---|
|  | WPS1A00AGP1PEP1N | yes | RP-SMA jack (no antenna included) | US, Canada, Australia | 0 psi to 200 psi | gage | 1/2 in NPT male port |
| | WPS1A00AGP1PFP1N | yes | RP-SMA jack (no antenna included) | US, Canada, Australia | 0 psi to 500 psi | gage | 1/2 in NPT male port |
| | WPS1A00AGP1PGP1N | yes | RP-SMA jack (no antenna included) | US, Canada, Australia | 0 psi to 1000 psi | gage | 1/2 in NPT male port |
| | WPS1A00AGP2PEP1N | yes | RP-SMA jack (no antenna included) | US, Canada, Australia | 0 psi to 200 psi | gage | 3/4 in NPT male port |
| | WPS1A00AGP2PFP1N | yes | RP-SMA jack (no antenna included) | US, Canada, Australia | 0 psi to 500 psi | gage | 3/4 in NPT male port |
| | WPS1A00AGP2PGP1N | yes | RP-SMA jack (no antenna included) | US, Canada, Australia | 0 psi to 1000 psi | gage | 3/4 in NPT male port |
|  | WPS1A00AGP1PEP0N | no | RP-SMA jack (no antenna included) | US, Canada, Australia | 0 psi to 200 psi | gage | 1/2 in NPT male port |
| | WPS1A00AGP1PFP0N | no | RP-SMA jack (no antenna included) | US, Canada, Australia | 0 psi to 500 psi | gage | 1/2 in NPT male port |
| | WPS1A00AGP1PGP0N | no | RP-SMA jack (no antenna included) | US, Canada, Australia | 0 psi to 1000 psi | gage | 1/2 in NPT male port |
| | WPS1A00AGP2PEP0N | no | RP-SMA jack (no antenna included) | US, Canada, Australia | 0 psi to 200 psi | gage | 3/4 in NPT male port |
| | WPS1A00AGP2PFP0N | no | RP-SMA jack (no antenna included) | US, Canada, Australia | 0 psi to 500 psi | gage | 3/4 in NPT male port |
| | WPS1A00AGP2PGP0N | no | RP-SMA jack (no antenna included) | US, Canada, Australia | 0 psi to 1000 psi | gage | 3/4 in NPT male port |
|  | WPS1A12AGP1PDP1N | yes | 2.0 dBi omni antenna | US, Canada, Australia | 0 psi to 50 psi | gage | 1/2 in NPT male port |
| | WPS1A12AGP1PEP1N | yes | 2.0 dBi omni antenna | US, Canada, Australia | 0 psi to 200 psi | gage | 1/2 in NPT male port |
| | WPS1A12AGP1PFP1N | yes | 2.0 dBi omni antenna | US, Canada, Australia | 0 psi to 500 psi | gage | 1/2 in NPT male port |
| | WPS1A12AGP1PGP1N | yes | 2.0 dBi omni antenna | US, Canada, Australia | 0 psi to 1000 psi | gage | 1/2 in NPT male port |
| | WPS1A12AGP2PEP1N | yes | 2.0 dBi omni antenna | US, Canada, Australia | 0 psi to 200 psi | gage | 3/4 in NPT male port |
| | WPS1A12AGP2PFP1N | yes | 2.0 dBi omni antenna | US, Canada, Australia | 0 psi to 500 psi | gage | 3/4 in NPT male port |
| | WPS1A12AGP2PGP1N | yes | 2.0 dBi omni antenna | US, Canada, Australia | 0 psi to 1000 psi | gage | 3/4 in NPT male port |
|  | WPS1A12AGP1PEP0N | no | 2.0 dBi omni antenna | US, Canada, Australia | 0 psi to 200 psi | gage | 1/2 in NPT male port |
| | WPS1A12AGP1PFP0N | no | 2.0 dBi omni antenna | US, Canada, Australia | 0 psi to 500 psi | gage | 1/2 in NPT male port |
| | WPS1A12AGP1PGP0N | no | 2.0 dBi omni antenna | US, Canada, Australia | 0 psi to 1000 psi | gage | 1/2 in NPT male port |
| | WPS1A12AGP2PEP0N | no | 2.0 dBi omni antenna | US, Canada, Australia | 0 psi to 200 psi | gage | 3/4 in NPT male port |
| | WPS1A12AGP2PFP0N | no | 2.0 dBi omni antenna | US, Canada, Australia | 0 psi to 500 psi | gage | 3/4 in NPT male port |
| | WPS1A12AGP2PGP0N | no | 2.0 dBi omni antenna | US, Canada, Australia | 0 psi to 1000 psi | gage | 3/4 in NPT male port |

## PRESSURE SENSOR GLOSSARY OF TERMS

**Absolute Pressure (a) –** Pressure measured relative to a perfect vacuum (zero pressure) reference.

**Absolute Pressure Sensor –** Product whose output is proportional to the difference between applied pressure and a built-in fixed reference to vacuum (zero pressure). Typically the Minimum Operating Pressure (Pmin.) is set to absolute zero pressure (perfect vacuum).

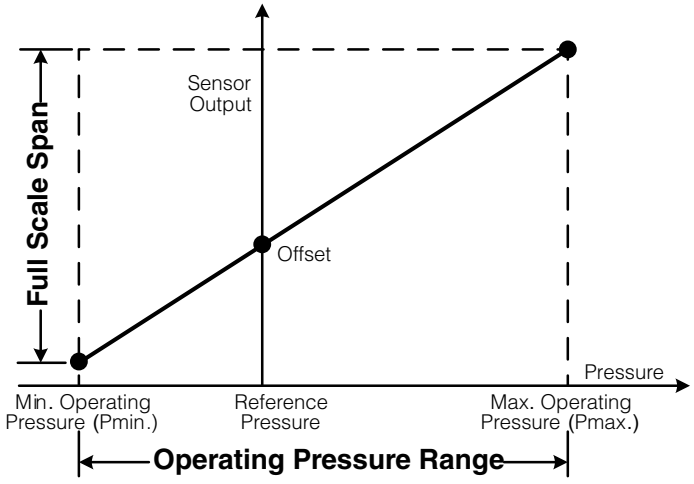
**Accuracy –** The maximum deviation in output from a Best Fit Straight Line (BFSL) fitted to output measured over the Compensated Pressure Range at Reference Temperature. Includes all errors due to: Pressure Non-Linearity, Pressure Hysteresis and Non-Repeatability.

**Best Fit Straight Line (BFSL) –** The straight line fitted through a set of points which minimizes the sum of the square of the deviations of each of the points from the straight line ('least-squares' method). See also Pressure Non-Linearity.

**Burst Pressure –** The maximum pressure that may be applied to any port of the product without causing escape of pressure media. The product should not be expected to function after exposure to any pressure beyond the burst pressure. See also Overpressure.

**Full Scale Span (FSS) –** The algebraic difference between output signal measured at the upper and lower limits of the Operating Pressure Range. Also known as 'Span' or ambiguously as 'Full Scale Output'. (See Figure 2.)

**Figure 2. Illustration of Key Pressure Sensor Terms Relative to Operating Pressure Range**




**Gage Pressure (g) –** Pressure measured relative to the local ambient (atmospheric/barometric) pressure. Also known as 'Gauge'.

**Gage Pressure Sensor –** Product whose output is proportional to difference between applied pressure and local ambient (atmospheric) pressure. Typically the Minimum Operating Pressure (Pmin.) is set to atmospheric pressure.

**Maximum Operating Pressure (Pmax.) –** The upper limit of the Operating Pressure Range. (See Figure 1.)

**Minimum Operating Pressure (Pmin.) –** The lower limit of the Operating Pressure Range. (See Figure 1.)

**Offset –** The output signal obtained when the Reference Pressure is applied to all available pressure ports. Also known as 'null' or 'zero'. (See Figure 1.)

**Offset Error –** The maximum deviation in measured Offset at Reference Temperature relative to the ideal (or target) Offset as determined from the Ideal Transfer Function. See also Thermal Effect on Offset.

**Operating Pressure Range –** The pressure range (or ranges) over which the product will produce an output proportional to pressure within the specified performance limits. (See Figure 1.)

**Operating Temperature Range –** The temperature range over which the product will produce an output proportional to pressure but may not remain within the specified performance limits.

**Output Resolution –** The smallest difference between output signal readings which can be meaningfully distinguished or resolved.

**Overpressure –** The Absolute Maximum Rating for pressure which 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. Also known as 'Proof Pressure'.

**Pressure Hysteresis –** 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.

**Pressure Non-Linearity –** The maximum deviation of product output from a straight line fitted to the output measured over the specified Operating Pressure Range. Standard methods of straight line fit specified for this calculation are either BFSL or TSL.

**Span Error –** The maximum deviation in measured Full Scale Span at Reference Temperature relative to the ideal (or target) Full Scale Span as determined from the Ideal Transfer Function. See also Thermal Effect on Span.

**Thermal Effect on Offset –** The maximum deviation in Offset due to changes in temperature over the Compensated Temperature Range, relative to Offset measured at Reference Temperature.

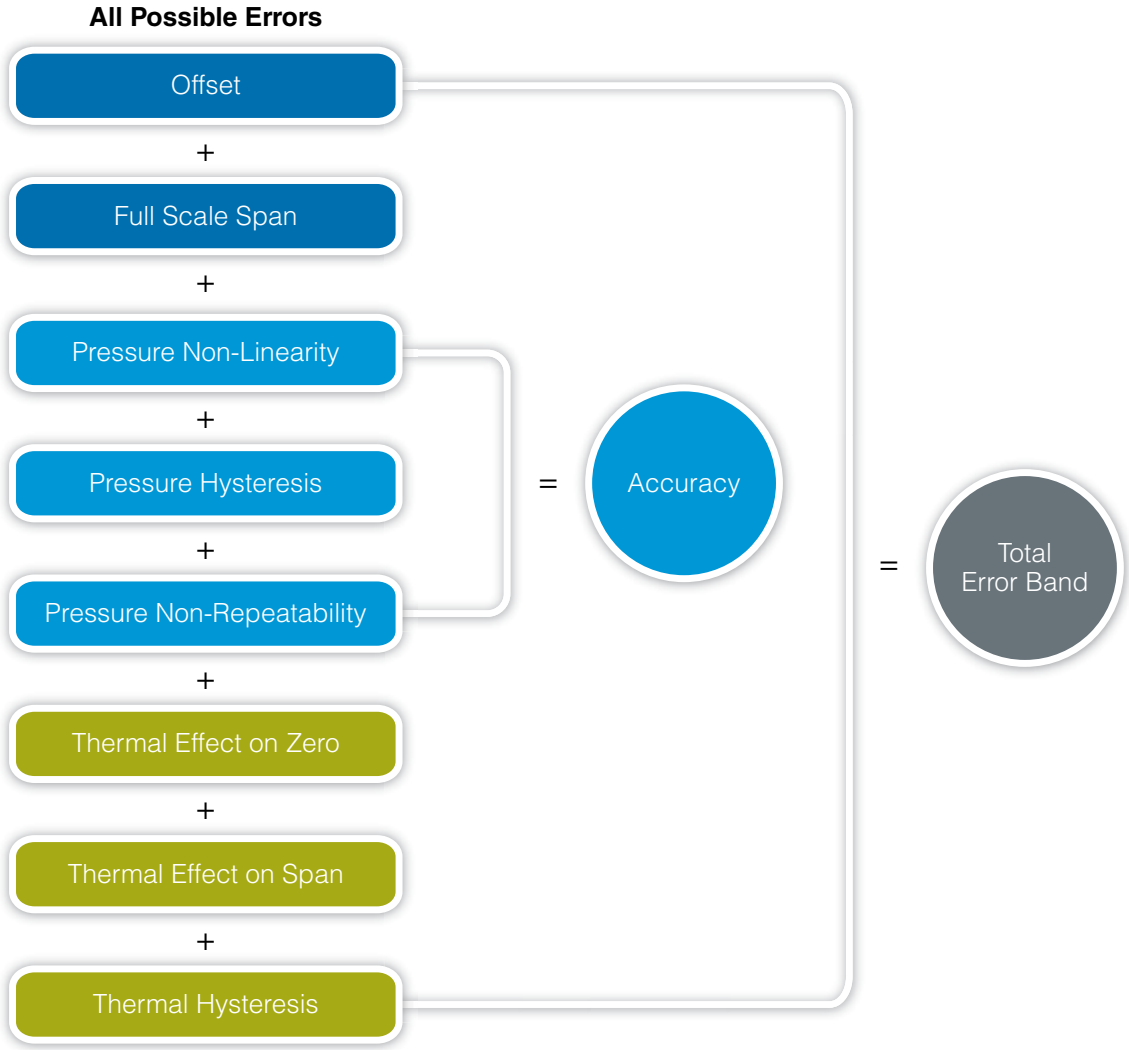
**Thermal Effect on Span –** The maximum deviation in Full Scale Span due to changes in temperature over the Compensated Temperature Range, relative to Full Scale Span measured at Reference Temperature.

**Thermal Hysteresis –** The maximum difference between output readings when the same temperature is reached consecutively, under the same operating conditions, with temperature approaching from opposite directions within the specified temperature range.

**Total Error Band (TEB) –** The maximum deviation in output from the Ideal Transfer Function over the entire Compensated Temperature and Pressure Range. Includes all errors due to: Offset, Full Scale Span, Pressure Non-Linearity, Pressure Hysteresis, Non-Repeatability, Thermal Effect on Offset, Thermal Effect on Span and Thermal Hysteresis. (See Figure 3.)

**Working Pressure –** The maximum pressure that may be applied to the product in continuous use. This pressure may be outside the Operating Pressure Range in which case the product may not provide a valid output until pressure is returned to within the Operating Pressure Range. Unless otherwise specified this applies to all available pressure ports at any temperature with the Operating Temperature Range. Note that the product may be operated continuously at pressures up to the Working Pressure, as compared with Overpressure which is an Absolute Maximum Rating.

**Figure 3. Total Error Band Explanation**



## ADDITIONAL INFORMATION

The following associated literature is available on the Honeywell web site at sensing.honeywell.com:

- Product installation instructions
- Application Note: Pressure Sensing in Process Control and Manufacturing, Particularly Paper Pulp Facilities
- Application Note: Fluid Level Monitoring in Storage Tanks and Reservoirs

**Find out more**

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.

To learn more about Honeywell's wireless products, call **+1-815-235-6847 or 1-800-537-6945**, visit **sensing.honeywell.com,** or e-mail inquiries to **info.sc@honeywell.com**

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### ⚠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.**

## WARRANTY/REMEDY

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 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 we provide application assistance personally, through our literature and the Honeywell website, 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.

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