

Limitless™ Intrinsicly Safe Wireless Pressure Sensor

IS-WPS Series

32317841

Issue 1

Datasheet



DESCRIPTION

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

It features an aluminum alloy metal enclosure finished with green epoxy paint, corrosion-resistant construction, and is suitable for outdoor applications in harsh environments due to its IP65 and IP67 sealed enclosure. Its pressure port and pressure diaphragm are made with corrosion-resistant material making it resilient to harsh process media. The direct or remote-mount antenna options add flexibility for adaptation to different applications.

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

VALUE TO CUSTOMERS

- **Hazardous location protection:** Intrinsicly safe design allows for use in certified atmospheres containing flammable gases and vapors
- **Can save time and money:** Wireless operation and signal transmission minimizes the need to physically send maintenance engineers into the field
- **Reliable:** Reliable sensing option that meets the harsh environments

FEATURES

- 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
- Configurable platform: Designed for global availability
- Provides a Total Error Band (TEB) of $\pm 2.0\%$ within the operating temperature range
- Measures gage or absolute pressure ranging from 0 psi to 500 psi through 0 psi to 15,000 psi
- Ability to reconfigure multiple IS-WPS series sensors allows users to easily add, subtract, or relocate the IS-WPS Series sensor
- Can reduce costs: Minimizes installation/maintenance costs because there are no wires, conduit, clips, junction boxes etc.
- IP65 and IP67 sealing
- Designed to support direct mount or using bracket assembly for installation ease
- Readily available batteries can be obtained from electrical supply houses and distributors

POTENTIAL APPLICATIONS

- Process monitoring of important pressures
- Gauge replacement
- 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)

DIFFERENTIATION

- Standalone network doesn't require expensive installation and peripheral costs as compared with traditional wired networks.

PORTFOLIO

The IS-WPS Series is part of the Limitless™ Series of switches, sensors, receivers, and monitors, including the WMPR Multi-Protocol Receiver.

Limitless™ Intrinsicly Safe Wireless Pressure Sensor, IS-WPS Series

Table 1. Specifications

Characteristic	Parameter
Series name	IS-WPS Series
Product type	Limitless™ Intrinsicly Safe Wireless Pressure Sensor
Pressure ranges#	0 psi to 500 psi, 0 psi to 5000 psi, 0 psi to 10000 psi, 0 psi to 15000 psi (gage or absolute)
Housing material	Aluminum alloy, finished with green epoxy paint
Housing type	Metal, Intrinsicly Safe, with process port connections
Operating frequency	2.4 GHz radio (ISM)
Wireless standard	RF Code A: IEEE 802.15.4 Compliant; 2.4 GHz global license free band
Communication agency approvals/certificates*	16 dBm: FCC 15.247, Industry Canada RSS 210 Issue 8, ETSI, ACMA, C-Tick Mark Conformity 8 dBm: ETSI EN 300 328 V1.8.1 (CE Mark)
Antenna connection/type	RP-SMA jack for direct mount or remote antenna options; omni-directional antenna standard
Weight	1,75 kg ±100 g
Signal range	1000 ft** [305 m]** clear line of sight between sensor and receiver when using 2.0 dBi integral field sensor antenna
Battery type	3.6 Vdc Lithium Thionyl Chloride; D Size, Quantity: 2; Recommended manufacturers: XENO Energy (P/N XL-205F), Honeywell (P/N: WBT5)
Data rate	250 kbps
RF module transmit power	Country Code A: 16 dBm max.; Country Code B: 8 dBm max.
Receive sensitivity	-98 dBm
Radome material	Polybutylene Terephthalate (PBT), Color: Black
Pressure port material	Stainless Steel 316L or 15-5PH SS or Crucible A-286
Process connection	1/2 in NPT male and 1/4 in NPT female 3/4 in NPT male and 1/4 in NPT female 1/4 in NPT female, 9/16-18 UNF female
Diaphragm material	Hastelloy® C276 or 15-5PH SS or Crucible A-286
Housing/wetted parts	Aluminum alloy metal enclosure/ Hastelloy® C276 or 15-5PH SS or Crucible A-286 diaphragm
Intrinsicly safe battery pack	Honeywell P/N: WBT8
Sealing	IP65, IP67 (self certified by Honeywell)
cULus listing	Class I, Div I, Groups A, B, C, D T4 Class I, Zone 1 AEx ia IIC T4 Ga Class I, Zone 0 AEx ia IIC T4 Ga Class I, Zone 1 Ex ia IIC T4 Ga Class I, Zone 0 Ex ia IIC T4 Ga Tambient -40° C to +70 C°
ATEX certification	Zone 1 Ex ia IIC T4 Ga; Zone 0 Ex ia IIC T4 Ga
IEC Ex certification	Zone 1 Ex ia IIC T4 Ga; Zone 0 Ex ia IIC T4 Ga
EMC	Applicable standards: EN 300 328, V1.8.1; EN 61326-1 (2006); EN 301 489-1, EN301 489-17, V2.1.1
Shock	40 g per IEC 60068-2-27
Vibration	5 Hz to 200 Hz, 4 g, Sinusoidal per IEC 60068-2-6
Operating temperature	-40 °C to 70 °C [-40 °F to 158 °F]
Operating humidity	0 %RH to 100 %RH
Total Error Band (TEB)	±2 %FSS for ≥ 50 psi
Sensor output resolution	0.04 %FS
Periodic update interval	Field programmable rate; 0.1, 0.25, 0.5, 1, 5, 30, or 90 second intervals
Battery life (P2P protocol)	6.5 years at 30 sec interval, 5 years at 5 sec interval, 2.5 years at 1 sec interval (At 25 °C [77 °F])
Battery location	Intrinsicly safe battery pack inside base unit
Output	Digital output via wireless, end user configurable as psi, bar, kPa and Pa, local LCD variant also available
Measurement accuracy	Better than ±2.0 % Total Error Band (TEB), full scale, full temperature range. Example 100 psi is ±2 psi
Media isolated	Yes
Overload safe pressure	4X FS for 500 psi; 15,000 psi for 5K psi; 1.5X for ≥10,000 psi
Burst pressure	3000 psi for < 1000 psi; 15000 psi for 5000 psi; 26000 psi for 10,000 psi; 40000 psi for 15,000 psi

* Honeywell is continuing to add new Country Communication Agency Approvals as opportunities and requirements are established.

**Actual range will vary depending upon antennas, cables, and site topography.

Pressure ranges >1000 psi support only gage variant.

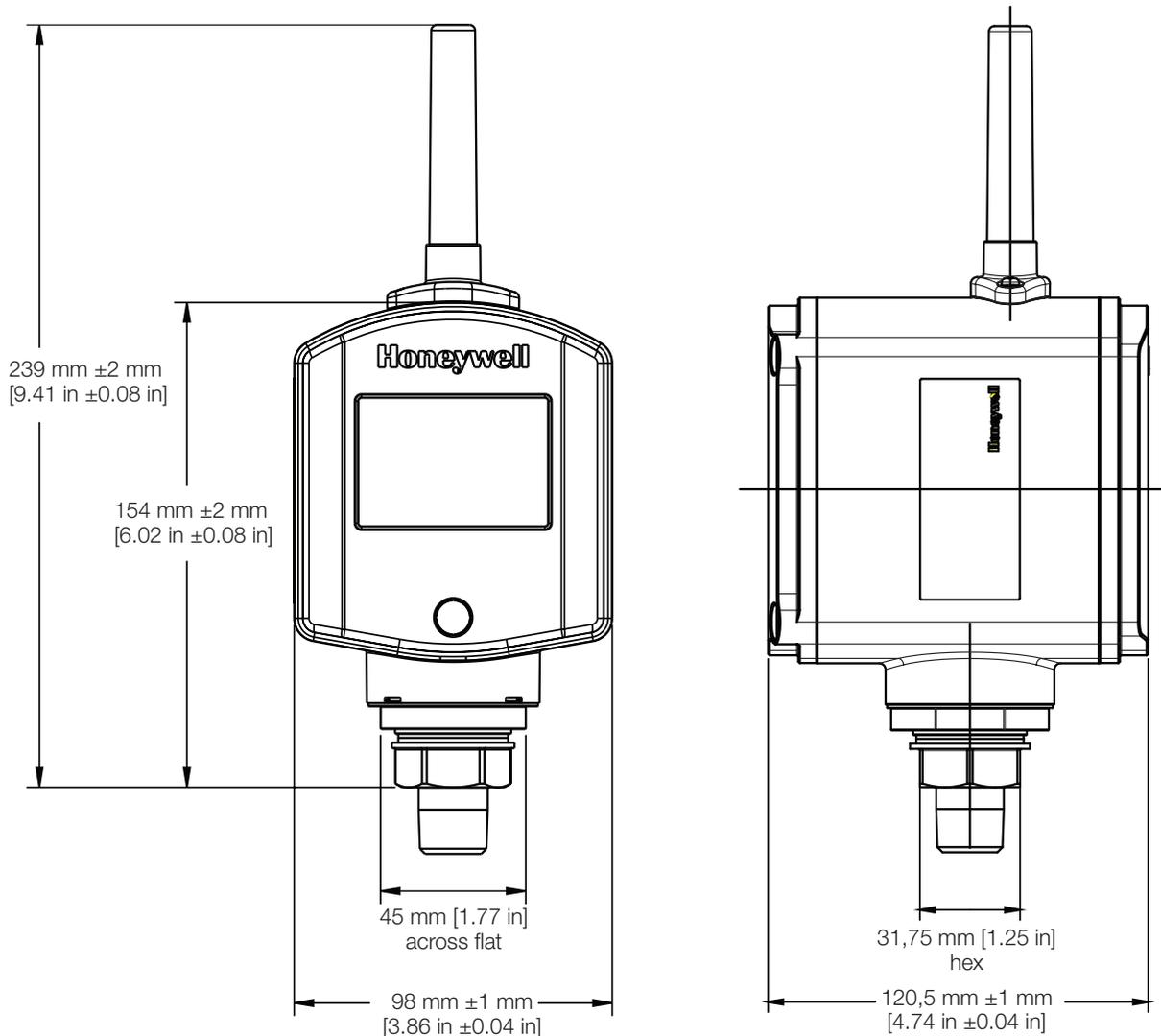
Limitless™ Intrinsicly Safe Wireless Pressure Sensor, IS-WPS Series

Table 2. Battery Pack Specifications

Characteristic	Parameter
Intrinsicly Safe Battery Pack part number	WBT8
Non IS 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)

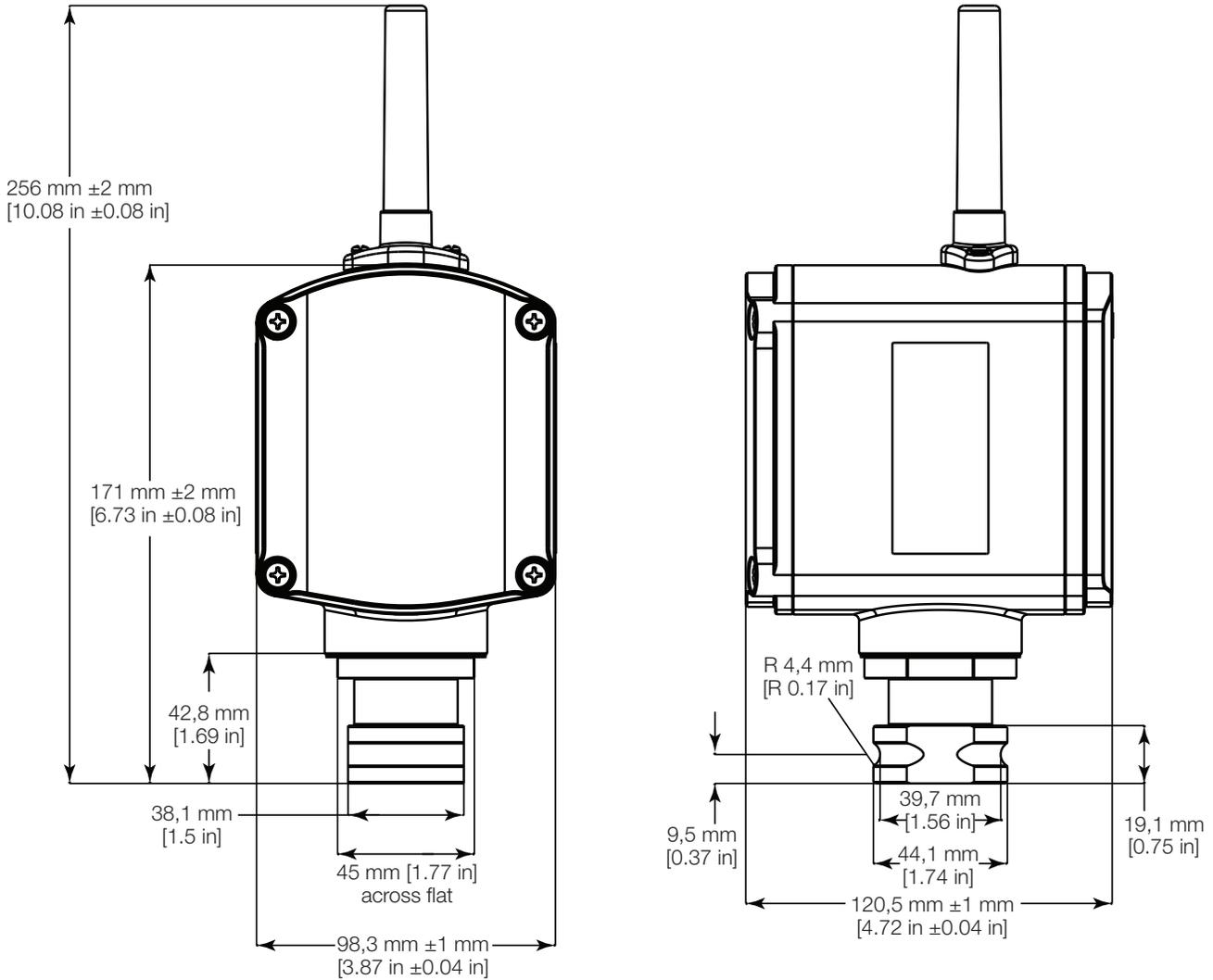
Note: For shipping purposes, two "D" sized Lithium Thionyl Chloride cells contain approximately 10 grams of lithium.

Figure 1. Limitless™ Wireless Pressure Sensor, IS-WPS Series, Connection Type 1 & 2 Dimensions



Limitless™ Intrinsically Safe Wireless Pressure Sensor, IS-WPS Series

Figure 2. Limitless™ Wireless Pressure Sensor, IS-WPS Series, Connection Type 3 & 4 Dimensions



Limitless™ Intrinsically Safe Wireless Pressure Sensor, IS-WPS Series

PRODUCT NOMENCLATURE

Figure 3. Limitless™ IS-WPS Product Nomenclature

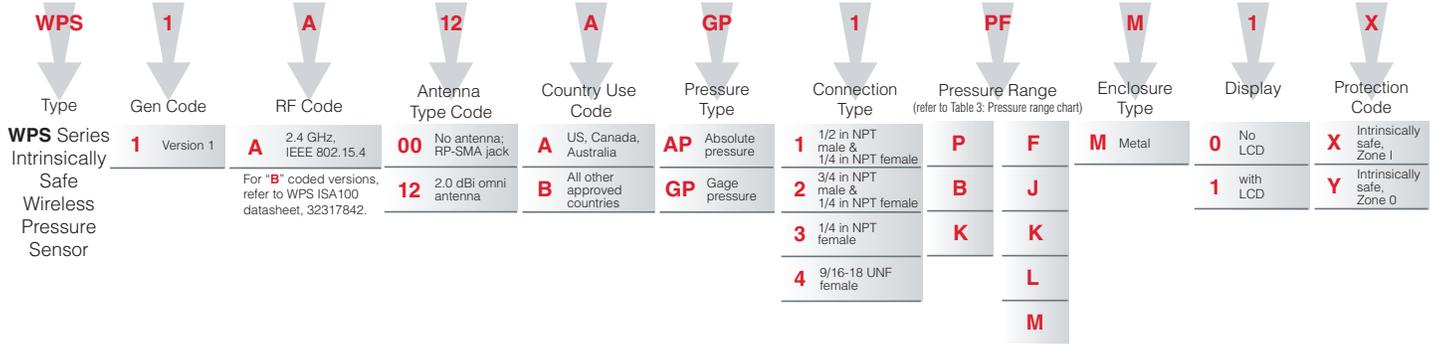


Table 3. Pressure Range Conversion Chart

		Pressure Range				
Port Material		316L SST	316L SST	15-5 PH SST	15-5 PH SST	Crucible A-286
Diaphragm Material		Hastelloy®	Hastelloy®	15-5 PH SST	15-5 PH SST	Crucible A-286
Unit Code	Description	F	J	K	L	M
P	psi	0 to 500	0 to 5000	0 to 10000	0 to 15000	0 to 15000
B	bar	0 to 34.5	0 to 344.7	0 to 689.5	0 to 1034.2	0 to 1034.2
K	kPa	0 to 3447.4	0 to 34473	0 to 68947	0 to 103421 ^A	0 to 103421 ^A

^AValues >99999 kPa will be displayed in MPa on LCD screen

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Table 4. Antenna Options For Use with '00' Antenna Type Code

Antennas can be ordered with the IS-WPS Series Sensors by inserting the **Antenna Type Code** into the part number as shown in the nomenclature. Also, switches 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	115 mm L x 22,1 mm W x 4,57 mm D [4.53 in L x 0.87 in W x 0.18 in D] 3 m [9.8 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		WAN-06RNJ	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		WAN-06RNJ	WCA200RN-PRSP-010 coax cable assembly 3,05 m [10 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		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	-	-

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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	115 mm L x 22,1 mm W x 4,57 mm D [4.53 in L x 0.87 in W x 0.18 in D] 3 m [9.8 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] 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	-	-

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ACCESSORIES

Table 6. Replacement Parts

	Part Number	Description
	WAN12RSP	2.4 GHz, 2.0 dBi RP-SMA WLAN antenna
	WAN22RAD	Replacement WPS radome

Table 7. Cable and Coax Accessories

	Part Number	Description
	WCA200RN-PRSP-002	Limitless™ Series wireless cable assembly with 200 Series cable, 2 ft length, reverse polarity N plug to reverse polarity SMA plug, use only with WAN06RNJ antenna
	WCA200RN-PRSP-010	Limitless™ Series wireless cable assembly with 200 Series cable, 10 ft length, reverse polarity N plug to reverse polarity SMA plug, use only with WAN06RNJ antenna
	WCA200RNJR-SP-002	Limitless™ Series wireless cable assembly with 200 Series cable, 2 ft length, reverse polarity SMA jack to reverse polarity SMA plug
	WCA200RNJR-SP-005	Limitless™ Series wireless cable assembly with 200 Series cable, 5 ft length, reverse polarity SMA jack to reverse polarity SMA plug
	WCA200RNJR-SP-010	Limitless™ Series wireless cable assembly with 200 Series cable, 10 ft length, reverse polarity SMA jack to reverse polarity SMA plug
	WCA200RNJR-SP-015	Limitless™ Series wireless cable assembly with 200 Series cable, 15 ft length, reverse polarity SMA jack to reverse polarity SMA plug
	WCA200RNJR-SP-020	Limitless™ Series wireless cable assembly with 200 Series cable, 20 ft length, reverse polarity SMA jack to reverse polarity SMA plug

Table 8. 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

Table 9. Brackets

Photo	Catalog Listing	Description
	WPB2	Angle mounting bracket for IS-WPS Series wireless pressure sensor. May be mounted vertically or horizontally.
	WPB3	Straight mounting bracket for IS-WPS Series wireless pressure sensor.

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Table 10. Order Guide

	Part Number	Description
	WPS1A00AGP1PJM1X	Limitless™ WPS P2P Intrinsically Safe Wireless Pressure Sensor; 2.4 GHz; no antenna; RP-SMA connector jack; United States, Canada, Australia; Gage pressure; 1/2 in NPT, male; 0 psi to 5000 psi; Metal; with LCD; Intrinsically Safe, Zone 1
	WPS1A00AGP3PKM1X	Limitless™ WPS P2P Intrinsically Safe Wireless Pressure Sensor; 2.4 GHz; no antenna; RP-SMA connector jack; United States, Canada, Australia; Gage pressure; 1/4 in NPT female; 0 psi to 10000 psi; Metal; with LCD; Intrinsically Safe, Zone 1
	WPS1A00AGP4PLM1X	Limitless™ WPS P2P Intrinsically Safe Wireless Pressure Sensor; 2.4 GHz; no antenna; RP-SMA connector jack; United States, Canada, Australia; Gage pressure; 9/16-20 UNF female (Autoclave); 0 psi to 15000 psi (15-5 PH); Metal; with LCD; Intrinsically Safe, Zone 1
	WPS1A00AGP4PMM1X	Limitless™ WPS P2P Intrinsically Safe Wireless Pressure Sensor; 2.4 GHz; no antenna; RP-SMA connector jack; United States, Canada, Australia; Gage pressure; 9/16-20 UNF female (Autoclave); 0 psi to 15000 psi (A-286); Metal; with LCD; Intrinsically Safe, Zone 1
	WPS1A12AGP1PFM1X	Limitless™ WPS P2P Intrinsically Safe Wireless Pressure Sensor; 2.4 GHz; 2.0 dBI Omni antenna; United States, Canada, Australia; Gage pressure; 1/2 in NPT male; 0 psi to 500 psi; Metal; with LCD; Intrinsically Safe, Zone 1
	WPS1A12AGP3PKM1X	Limitless™ WPS P2P Intrinsically Safe Wireless Pressure Sensor; 2.4 GHz; 2.0 dBI Omni antenna; United States, Canada, Australia; Gage pressure; 1/4 in NPT female; 0 psi to 10000 psi; Metal; with LCD; Intrinsically Safe, Zone 1
	WPS1A12AGP4PLM1X	Limitless™ WPS P2P Intrinsically Safe Wireless Pressure Sensor; 2.4 GHz; 2.0 dBI Omni antenna; United States, Canada, Australia; Gage pressure; 9/16-20 UNF female (Autoclave); 0 psi to 15000 psi (15-5 PH); Metal; with LCD; Intrinsically Safe, Zone 1
	WPS1A12AGP4PMM1X	Limitless™ WPS P2P Intrinsically Safe Wireless Pressure Sensor; 2.4 GHz; 2.0 dBI Omni antenna; United States, Canada, Australia; Gage pressure; 9/16-20 UNF female (Autoclave); 0 psi to 15000 psi (A-286); Metal; with LCD; Intrinsically Safe, Zone 1
	WPS1A12AGP1PJM1X	Limitless™ WPS P2P Intrinsically Safe Wireless Pressure Sensor; 2.4 GHz; 2.0 dBI Omni antenna; United States, Canada, Australia; Gage pressure; 1/2 in NPT male; 0 psi to 5000 psi; Metal; with LCD; Intrinsically Safe, Zone 1
	WPS1A12AGP1PJM0X	Limitless™ WPS P2P Intrinsically Safe Wireless Pressure Sensor; 2.4 GHz; 2.0 dBI Omni antenna; United States, Canada, Australia; Gage pressure; 1/2 in NPT male; 0 psi to 5000 psi; Metal; without LCD; Intrinsically Safe, Zone 1
	WPS1A12AGP3PKM0X	Limitless™ WPS P2P Intrinsically Safe Wireless Pressure Sensor; 2.4 GHz; 2.0 dBI Omni antenna; United States, Canada, Australia; Gage pressure; 1/4 in NPT female; 0 psi to 10000 psi; Metal; without LCD; Intrinsically Safe, Zone 1
	WPS1A12AGP4PLM0X	Limitless™ WPS P2P Intrinsically Safe Wireless Pressure Sensor; 2.4 GHz; 2.0 dBI Omni antenna; United States, Canada, Australia; Gage pressure; 9/16-20 UNF female (Autoclave); 0 psi to 15000 psi (15-5 PH); Metal; without LCD; Intrinsically Safe, Zone 1
	WPS1A00AGP4PMM0X	Limitless™ WPS P2P Intrinsically Safe Wireless Pressure Sensor; 2.4 GHz; no antenna; RP-SMA connector jack; United States, Canada, Australia; Gage pressure; 9/16-20 UNF female (Autoclave); 0 psi to 15000 psi (Inconel); Metal; without LCD; Intrinsically Safe, Zone 1
	WPS1A12BAP1BFM1X	Limitless™ WPS P2P Intrinsically Safe Wireless Pressure Sensor; 2.4 GHz; 2.0 dBI Omni antenna; Other approved countries; Absolute pressure; 1/2 in NPT male; 0 bar to 34.5 bar; Metal; with LCD; Intrinsically Safe, Zone 1
	WPS1A12BGP1BFM1X	Limitless™ WPS P2P Intrinsically Safe Wireless Pressure Sensor; 2.4 GHz; 2.0 dBI Omni antenna; Other approved countries; Gage pressure; 1/2 in NPT male; 0 bar to 34.5 bar; Metal; with LCD; Intrinsically Safe, Zone 1
	WPS1A12BGP2BJM1X	Limitless™ WPS P2P Intrinsically Safe Wireless Pressure Sensor; 2.4 GHz; 2.0 dBI Omni antenna; Other approved countries; Gage pressure; 3/4 in NPT male; 0 bar to 344.7 bar; Metal; with LCD; Intrinsically Safe, Zone 1
	WPS1A12BGP3BKM1X	Limitless™ WPS P2P Intrinsically Safe Wireless Pressure Sensor; 2.4 GHz; 2.0 dBI Omni antenna; Other approved countries; Gage pressure; 1/4 in NPT female; 0 bar to 689.5 bar; Metal; with LCD; Intrinsically Safe, Zone 1
	WPS1A12BGP4BLM1X	Limitless™ WPS P2P Intrinsically Safe Wireless Pressure Sensor; 2.4 GHz; 2.0 dBI Omni antenna; Other approved countries; Gage pressure; 9/16 in UNF female; 0 bar to 1034 bar; Metal; with LCD; Intrinsically Safe, Zone 1

Limitless™ Inherently Safe Wireless Pressure Sensor, IS-WPS Series

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).

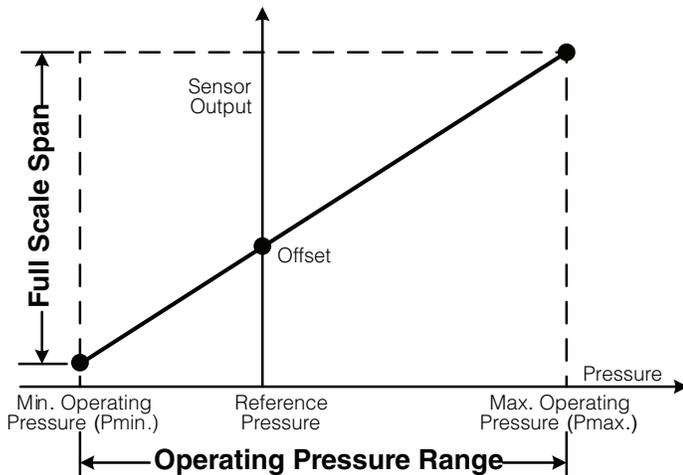
Accuracy – The maximum deviation in output from a Best Fit Straight Line (BFSL) fitted to output measured over the Compensated Pressure Range at Reference Temperature. Includes all errors due to: Pressure Non-Linearity, Pressure Hysteresis and Non-Repeatability.

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 4.)

Figure 4. 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 4.)

Minimum Operating Pressure (Pmin.) – The lower limit of the Operating Pressure Range. (See Figure 4.)

Offset – The output signal obtained when the Reference Pressure is applied to all available pressure ports. Also known as 'null' or 'zero'. (See Figure 4.)

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 4.)

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.

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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.

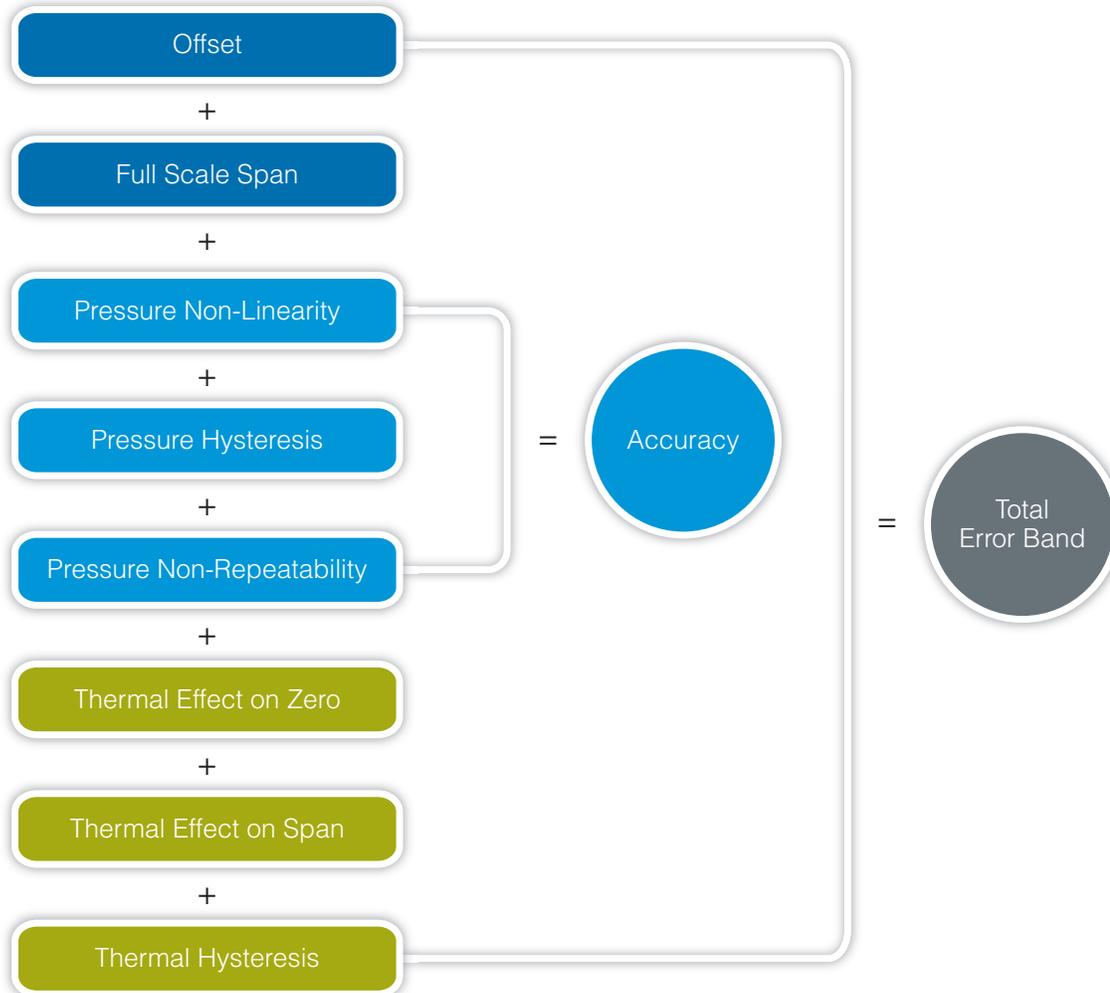
Thermal Effect on Span – The maximum deviation in Full Scale Span due to changes in temperature over the Compensated Temperature Range, relative to Full Scale Span measured at Reference Temperature.

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 5.)

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 5. Total Error Band Explanation
All Possible Errors



Limitless™ Intrinsically Safe Wireless Pressure Sensor, IS-WPS Series

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ADDITIONAL MATERIALS

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

- Installation and technical manual
- Installation instructions
- Limitless™ product range guide
- Application note

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.

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Failure to comply with these instructions could result in death or serious injury.

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