

Installation Instructions for the Intrinsically Safe Wireless Pressure Sensor, IS-WPS Series

⚠️ 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

Honeywell does not recommend using devices for critical control applications where there is, or may be, a single point of failure or where single points of failure may result in an unsafe condition. It is up to the end-user to weigh the risks and benefits to determine if the products are appropriate for the application based on security, safety and performance. Additionally, it is up to the end-user to ensure that the control strategy results in a safe operating condition if any crucial segment of the control solution fails. Honeywell customers assume full responsibility for learning and meeting the required Declaration of Conformity, Regulations, Guidelines, etc. for each country in their distribution market.

⚠️ WARNING **POTENTIAL ELECTROSTATIC CHARGING HAZARD**

When the IS-WPS is installed in potentially hazardous locations, care should be taken not to electrostatically charge the surface of the antenna shroud by rubbing the surface with a cloth, or cleaning the surface with a solvent. If electrostatically charged, discharge of the antenna shroud to a person or a tool could possibly ignite a surrounding hazardous atmosphere.

⚠️ WARNING **POTENTIAL IMPACT HAZARD**

Care should be taken during installation of the IS-WPS Pressure Sensor to not apply an impact force to the device. (i.e. dropping the IS-WPS Pressure Sensor on a hard surface, impact with a hammer/wrench, etc.).

Failure to comply with these instructions could cause damage to the internal components, housing, and/or antenna.

⚠️ WARNING **RF EXPOSURE**

To satisfy FCC RF exposure requirements for mobile transmitting devices, a separation distance of 20 cm [7.87 in] or more should be maintained between the antenna of this device and persons during device operation. To ensure compliance, operation at closer than this distance is not recommended. The antenna used for this transmission must not be co-located in conjunction with any other antenna or transmitter.

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

⚠️ WARNING

The IS-WPS must be installed in accordance with the requirements specified in this document in order to comply with the specific Country Communication Agency requirements (i.e., FCC, IC, ETSI, ACMA, etc.). See Section 2.2 as this requires choosing the correct Country Use Code and thus allowable antenna and/or cable usage.

⚠️ WARNING **RISK OF DEATH OR SERIOUS INJURY FROM EXPLOSION OR FIRE**

Connection and disconnection of the antennas should only be performed in a non-hazardous area and with **no battery power** applied to the IS-WPS. This is due to the risk of possibly damaging the internal IS-WPS electronics and/or igniting the surrounding hazardous atmosphere.

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

⚠️ WARNING **RISK OF DEATH OR SERIOUS INJURY FROM EXPLOSION OR FIRE**

Connection and disconnection of only the Intrinsically Safe battery pack can be performed in a hazardous environment. Connection and disconnection of the non-IS batteries should only be performed in a non-hazardous area. The batteries used in this device may present a risk of fire or chemical burn if mistreated.

Do not recharge, disassemble, heat above 100 °C [212 °F], or incinerate.

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

⚠️ WARNING

Enclosure contains aluminum. Care must be taken to avoid ignition hazard due to impact.

Impact could potentially cause ignition in the surrounding hazardous atmosphere that could result in death or serious injury.

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1 | **PRODUCT DESCRIPTION**

1.1 | **General**

The WPS Pressure Sensor features a rugged metal enclosure, corrosion-resistant construction, and is suitable for outdoor applications in harsh environments due to its IP67 sealed enclosure. Its pressure port and pressure diaphragm are made with corrosion-resistant material 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 is especially 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.

The WPS Pressure Sensor is capable of supporting multiple communication protocols –

- Limitless™ P2P Wireless Network – This system uses a standard WPAN 802.15.4 protocol for Point-to-Point (P2P) communication.
- ISA100 Wireless™ Network – This system is an all-digital, serial, two-way communication mesh network that interconnects industrial field sensors to a central system.

This document will provide installation instructions to properly install a WPS Pressure Sensor.

1.2 | **Principle of Operation**

The WPS Pressure Sensor supports one input channel. This channel is available as gage pressure.

The sensor measures this analog pressure and transmits a digital output signal proportional to the measured value. The WPS Pressure Sensor supports no electrical signal inputs and is powered by an Intrinsically Safe Battery Pack that uses standard replaceable, non-rechargeable batteries.

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1.3 | Abbreviations and Definitions

Table 1. Table of Abbreviations and Definitions

ACMA	Australian Communications and Media Authority
AD	Authentication Device
ANATEL	National Agency of Telecommunication (Agência Nacional de Telecomunicação)
AWG	American Wire Gauge
Co-located	Two or more radios transmitting simultaneously and with less than 20 cm [7.87 in] of separation distance.
CSA	Canadian Standards Association
dB	Decibel
dB_i	Decibel Isotropic
dBm	Decibel above or below 1 milliwatt
DCS	Distributed Control System
DSSS	Direct Sequence Spread Spectrum
EIRP	Equivalent isotropic radiated power
EMC	Electromagnetic Compatibility
ETSI	European Telecommunications Standards Institute
EU	European Union
FCC	Federal Communications Committee
ft-lbs	Foot-pounds
GHz	GigaHertz
IC	Industry Canada
ICES	Industry Canada Electrical Specification
IEEE	Institute of Electrical and Electronics Engineers
I.S.	Intrinsically Safe
ISA100	International Society of Automation open-standard wireless networking technology
kbps	KiloBits Per Second
LED	Light Emitting Diode

LR-WPAN	Low Rate Wireless Personal Area Network
MHz	MegaHertz
MPE	Maximum Permissible Exposure
MSG	Honeywell Model Selection Guide
NA	North America – United States of America and Canada
N-m	Newton meter
NEMA	National Electrical Manufacturers Association
OQPSK	Offset Quadrature Phase-Shift Keying
PCBa	Printed Circuit Board Assembly
PER	Packet Error Rate - a measurement of data not received correctly (may be caused by interference or very low signal levels)
R&TTE	Radio and Telecommunications Terminal Equipment
R.F.	Radio Frequency
RP-SMA	Reverse Polarity SMA connector
SNR	Signal to Noise Ratio - a measurement of signal received
TX	Transmit
WDM	Wireless Device Manager
Wi-Fi	Wireless Local Area Network based on IEEE 802.11 Specifications
WLAN	Wireless Local Area Network (aka WIFI)
WMPR	Wireless Multi-Protocol Receiver
WNSIA	Wireless Network for Secure Industrial Application
WPS	Wireless Process Sensor Series



















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1.4 | Symbol Definitions

The following table lists those symbols used in this document to denote certain conditions.

Table 2. Table Symbol Definitions

Symbol	Definition
	ATTENTION: Identifies information that requires special consideration.
	TIP: Identifies advice or hints for the user, often in terms of performing a task.
CAUTION	Indicates a situation which, if not avoided, may result in equipment or work (data) on the system being damaged or lost, or may result in the inability to properly operate the process.
	CAUTION: Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.
	CAUTION symbol on the equipment refers the user to the product manual for additional information. The symbol appears next to required information in the manual.
	WARNING: Indicates a potentially hazardous situation, which, if not avoided, could result in serious injury or death.
	WARNING symbol on the equipment refers the user to the product manual for additional information. The symbol appears next to required information in the manual.
	WARNING, Risk of electrical shock: Potential shock hazard where HAZARDOUS LIVE voltages greater than 30 Vrms, 42.4 Vpeak, or 60 Vdc may be accessible.
	ESD HAZARD: Danger of an electro-static discharge to which equipment may be sensitive. Observe precautions for handling electrostatic sensitive devices.
	Protective Earth (PE) terminal: Provided for connection of the protective earth (green or green/yellow) supply system conductor.
	Functional earth terminal: Used for non-safety purposes such as noise immunity improvement. NOTE: This connection shall be bonded to Protective Earth at the source of supply in accordance with national local electrical code requirements.
	Earth Ground: Functional earth connection. NOTE: This connection shall be bonded to Protective Earth at the source of supply in accordance with national and local electrical code requirements.
	Chassis Ground: Identifies a connection to the chassis or frame of the equipment shall be bonded to Protective Earth at the source of supply in accordance with national and local electrical code requirements.
	The ISA100 Wireless Compliant logo indicates the device has received ISA100.11a conformance certification and is registered with the Wireless Compliance Institute, assuring device interoperability.
	C-Tick Mark. The C-Tick Mark is a certification trade mark registered to ACMA (Australian Communications and Media Authority) in Australia under the Trade Marks Act 1995 and to RSM in New Zealand under section 47 of the NZ Trade Marks Act. The mark is only to be used in accordance with conditions laid down by ACMA and RSM. This mark is equal to the CE Mark used in the European Union.
	The cULus mark means the equipment was tested to Canadian and US standards by Underwriters' Laboratories. The combination mark indicates compliance with both Canadian and U.S. Requirements. "Listed" means that the product can be operated as sold, in accordance with its inscriptions and operating instructions, without retesting by UL. Products are for use in hazardous locations where explosive atmospheres may be present. Certification covers division and zone area classification systems for the United States and/or Canada.
	The Ex mark means the equipment complies with the requirements of the European standards that are harmonised with the 2014/34/EU Directive, (ATEX Directive named after the French "ATmosphere EXplosible.")
	The IEC Ex mark means the equipment complies with the requirements of the International Electrotechnical Commission Explosive. The objective of the IECEx system is to facilitate international trade in equipment and services for use in explosive atmospheres, while maintaining the required level of safety.
	Notified Body. For radio equipment used in the European Union in accordance with the R&TTE Directive, the CE Mark and the notified body (NB) identification number is used when the NB is involved in the conformity assessment procedure.

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2 | PRODUCT SPECIFICATIONS

2.1 | Certifications and Approvals

Table 3. Radio Module Specifications

Item	Specification
Radio module	Honeywell RF-PCBa
Wireless standard	IEEE Standard: 802.15.4; 2.4 GHz global, license-free bands Protocol: ISA100.11a; Limitless™ Point-to-Point (P2P)
Data rate	250 kbps
Operating frequency	ISM 2.4 GHz
Module transmit power (max.)	Country code A: 16 dBm max; Country code B: 8 dBm max
Receive sensitivity (typ.)	-98 dBm

⚠ WARNING

The IS-WPS must be installed in accordance with the requirements specified in this document in order to comply with the specific Country Communication Agency requirements (i.e., FCC, IC, ETSI, ACMA)

Specific Conditions of Safe Use:

- Aluminum enclosure – Care should be taken to minimize the risk of ignition due to impact or friction.
- Potential electrostatic discharge – Clean product only with a damp cloth.
- Do not replace the batteries within the Battery Pack when an explosive atmosphere is present.
- Use only Honeywell Intrinsically Safe Battery Pack P/N: 50047517-003; Approved battery Manufacturers: Xeno Energy – XL-205F batteries.

⊘ ATTENTION

The following additional previous editions of Standards noted under the “Standards” section of this Certificate where applied to integral Components as itemized below. There are no significant safety related changes between these previous editions and the editions noted under the “Standards” section.

Fuse, Part No. 0259.125 manufactured by Littelfuse
IEC 60079-0:2007-10, IEC 60079-11:2006

2.2 | Battery Specifications

Table 4. Battery Pack Specifications

Item	Specification
Battery pack	Honeywell Intrinsically Safe Battery Pack P/N: WBT8
Battery	3.6 Vdc Lithium Thionyl Chloride; D size, Qty: 2 Approved battery manufacturer: Xeno Energy: XL-205F batteries; Battery P/N: WBT5

⊘ CAUTION

Don't mount or remove the antenna when battery pack is connected and IS-WPS product is powered, as damage could occur to the IS-WPS electronics and/or ignite the surrounding hazardous atmosphere.

2.3 | EMC Specifications

The latest applicable EMC Standards are as follows:

- EN 300 328, V1.8.1
- EN 61326-1 (2013)
- EN 301 489-1, V1.9.2
- EN 301 489-17, V2.2.1

⊘ ATTENTION

The antenna cables should not be modified (i.e. cut short and/or re-terminated) as it may affect Communication Agency approval. Approved antenna (refer to Section 3) are the only antennas allowed for use with the IS-WPS.

2.4 | Functional Specifications

Table 5. Sensor Specifications

Item	Specification
Total error band	±2.0 %FSS max.
Resolution	0.04 %FS
Pressure ranges	0 psi to 500 psi; 0 psi to 5000 psi; 0 psi to 10k psi; 0 psi to 15k psi
Pressure type	gage or absolute
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 500 psi, 15000 psi for 5,000 psi 26000 psi for 10,000 psi; 40000 psi for 15,000 psi
Diaphragm material	Hastelloy® C276: 500 psi and 5,000 psi 15-5PH or A-286: 10,000 psi and 15,000 psi

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ATTENTION

The WPS cannot be used in a portable application. It must be used in a fixed location.

2.5 | Environmental Specifications

Table 6. Environmental Specifications

Item	Specification
Operating temperature	-40 °C to 70 °C [-40 °F to 158 °F]
Storage temperature	-40 °C to 70 °C [-40 °F to 158 °F]
Operating humidity	0 %RH to 100 %RH
Vibration	5 Hz to 200 Hz, 4 g, Sinusoidal as per IEC 60068-2-6
Shock	40 g as per IEC 60068-2-27
Sealing	IP65, IP67 As tested by Honeywell to sealing standards

3 | CERTIFICATIONS AND APPROVALS

Table 7. Safety Approvals

cULus Listing	ATEX Certification	IECEx Certification
Standards: UL913 8th edition; CAN/CSA-C22.2 NO. 157-92 (R2012); UL 60079-0 edition 6.0; UL 60079-11 edition 6.0; CSA C22.2 No. 60079-11: 14 edition 2.0; CSA C22.2 No. 60079-0: 11 edition 2.0	Standards: EN 60079-0: 2012 + A11:2013; EN60079-11: 2012	Standards: IEC60079-0 edition 6.0; IEC60079-11 edition 6.0
Class I, Div 1, Groups A, B, C, D T4 Class I, Zone 1 AEx ia IIC T4 Ga Class I, Zone 1 Ex ia IIC T4 Ga Class I, Zone 0 AEx ia IIC T4 Ga Class I, Zone 0 Ex ia IIC T4 Ga T _{ambient} -40°C to 70°C	Zone 1 Ex ia IIC T4 Ga Zone 0 Ex ia IIC T4 Ga	Zone 1 Ex ia IIC T4 Ga Zone 0 Ex ia IIC T4 Ga



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Table 8. RF Certification

Approval/Item	Ratings/Description	
Communication agency approvals and standards	16 dBm	FCC 15.247 and 15.209
		Industry Canada RSS 210 Issue 8
		ACMA, C-Tick mark
	8 dBm	ETSI, CE mark

FCC ID: XJLWPS001

IC ID: 9832A-WPS001IC

3.1 | FCC Compliance Statements

- This device complies with Part 15 of FCC Rules and Regulations. Operation is subject to the following two conditions: (1) This device may not cause harmful interference; and (2) this device must accept any interference received, including interference that may cause undesired operation.
- This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.
- Intentional or unintentional changes or modifications must not be made to the IS-WPS Series unless under the express consent of the party responsible for compliance. Any such modifications could void the user's authority to operate the equipment and will void the manufacturer's warranty

3.2 | Industry Canada (IC) Compliance Statements

- To reduce potential radio interference to other users, the antenna type and its gain should be chosen so that the equivalent isotropic radiated power (EIRP) is not more than that permitted for successful communication.
- Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.
- This Class A digital apparatus complies with Industry

Canada RSS 210 Issue 8.

- Pour réduire les interférences radio potentielles aux autres utilisateurs, le type d'antenne et son gain doivent être choisis de telle sorte que l'équivalent isotrope puissance rayonnée (PIRE) ne est pas supérieure à celle permise pour une communication réussie.
- Son fonctionnement est soumis aux deux conditions suivantes: (1) ce dispositif ne doit pas causer d'interférences et (2) cet appareil doit accepter toute interférence, y compris les interférences qui peuvent causer un mauvais fonctionnement de l'appareil.
- Cet appareil numérique de classe A est conforme avec Industrie Canada RSS 210 Numéro 8.

3.3 | RF Safety Statements

- To comply with FCC's and Industry Canada's RF exposure requirements, the following antenna installation and device operating configurations must be satisfied.
- Remote point-to-point antenna(s) for this unit must be fixed and mounted on outdoor permanent structures with a separation distance between the antenna(s) of greater than 20 cm [7.87 in] and a separation distance of at least 20 cm [7.87 in] from all persons.
- Furthermore, when using an integral antenna the IS-WPS Series unit must not be co-located with any other antenna or sensor device and have a separation distance of at least 20 cm [7.87 in] from all persons.

⚠ WARNING RF EXPOSURE

To satisfy FCC RF exposure requirements for mobile transmitting devices, a separation distance of 20 cm [7.87 in] or more should be maintained between the antenna of this device and persons during device operation. To ensure compliance, operation at closer than this distance is not recommended. The antenna used for this transmission must not be co-located in conjunction with any other antenna or transmitter.

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

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3.4 | European (CE) Declaration of Conformity (DoC)

Honeywell

Honeywell Control Systems Ltd.,
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Tel.: +44 (0)1698 481000
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A subsidiary of Honeywell Control Systems Ltd.,

Registered Office: Honeywell House,
Arlington Business Park,
Bracknell, Berkshire,
R12 1EB.

Registered No 217808 (England)

EU Declaration of Conformity

Honeywell Control Systems Ltd. hereby declare that the products identified below conform to the essential requirements of the EU Directive(s) listed below and that the products supplied are in conformity with the type described in any EU Type Examination Certificate (EU TEC) identified below.

Manufacturer: Honeywell Sensing & Productivity Solutions (S&PS)
2080 Arlingate Lane
Columbus, OH 43228-4112 USA

Product: Pressure Sensor
WPS Metal Wireless Pressure Sensor

Directive (Amendments)

RoHS 2011/65/EU

LV 2014/35/EU

2014/53/EU and 2014/30/EU

ATEX 2014/34/EU

Conformity Details

Complies

Standards applied: EN 61010-1:2010

Standards applied: EN 61326-1:2013
ETSI EN 300 328 V1.8.1
ETSI EN 301 489-1 V1.9.2 and -17 V2.2.1

Standards applied: EN 60079-0: 2012 + A11: 2013
EN 60079-11:2012

EU TEC No: DEMKO 16ATEX1558 X

Notified Body: Notified Body ID 0539
UL International Demko A/S
Borupvang 5A, 2750 Ballerup, Denmark

ATEX Markings II 1 G Ex ia IIC T4 Ga, Tamb -40C to +70C

Signed on behalf of Honeywell Control Systems Ltd. :


Colin O'Neil, quality Eng. Manager, Newhouse

DoC No: A510

DoC Issue: 1

DoC Date: 20/05/2016

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4 | OUTDOOR INSTALLATION WARNINGS

⚠ WARNING

LIVES MAY BE AT RISK!

Carefully observe these instructions and any special instructions included with the equipment being installed.

⚠ WARNING

CONTACTING POWER LINES COULD BE FATAL

Look over the site before beginning any installation and anticipate possible hazards, especially these:

- Make sure no power lines are near where possible contact can be made. Antennas, masts, towers, guy wires, or cables may lean or fall and contact these lines. People may be injured or killed if they are touching or holding any part of equipment when it contacts electric lines. Make sure there is NO possibility that equipment or personnel can come in contact directly or indirectly with power lines.
- Assume all overhead lines are power lines.
- The horizontal distance from a tower, mast, or antenna to the nearest power line should be at least twice the total length of the mast/antenna combination. This will ensure that the mast will not contact power if it falls during either installation or later.

⚠ WARNING

If a person comes in contact with electrical power, and cannot move

DO NOT TOUCH THAT PERSON OR RISK ELECTROCUTION.

- Use a non-conductive dry board, stick, or rope to push, pull, or drag them so they no longer are in contact with electrical power.
- Once they are no longer contacting electrical power, administer CPR if certified, and make sure emergency medical aid has been requested.

⚠ WARNING

TO AVOID FALLING, USE SAFE PROCEDURES WHEN WORKING AT HEIGHTS ABOVE GROUND

- Select equipment locations that will allow safe, simple equipment installation
- Don't work alone. A friend or co-worker can save a life if an accident happens.
- Use approved, non-conducting ladders and other safety equipment. Make sure all equipment is in good repair.
- If a tower or mast begins falling, don't attempt to catch it. Stand back and let it fall.
- If anything such as a wire or mast does come in contact with a power line, **DON'T TOUCH IT OR ATTEMPT TO MOVE IT.** Instead, save a life by calling the power company.
- Don't attempt to erect antennas or towers on windy days.

⚠ WARNING

MAKE SURE ALL TOWERS AND MASTS ARE SECURELY GROUNDED, AND ELECTRICAL CABLES CONNECTED TO ANTENNAS HAVE LIGHTNING ARRESTORS.

This will help prevent fire damage or human injury in case of lightning, static build up, or short circuit within equipment connected to antenna.

- The base of the antenna mast or tower must be connected directly to the building protective ground or to one-or-more approved grounding rods, using 1 AWG ground wire and corrosion-resistant connectors.
- Refer to the National Electrical Code for grounding details.
- Lightning arrestors for antenna feed coaxial cables are available from electrical supply houses.

⚠ WARNING

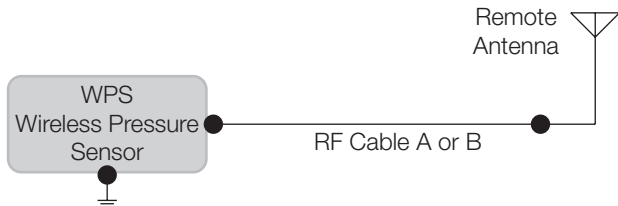
When the IS-WPS sensor is being installed or operating in a hazardous environment, the end customer/user should issue a work permit to a trained professional installer prior to any work performed on the IS-WPS Series Pressure Sensor. This includes the following actions:

- Installation and/or operation of the IS-WPS Series Pressure Sensor
- Installation and/or adjustment of a remote antenna for the IS-WPS Series Pressure Sensor
- Maintenance on the IS-WPS Series Pressure Sensor, including battery replacement, pairing, purging, etc.

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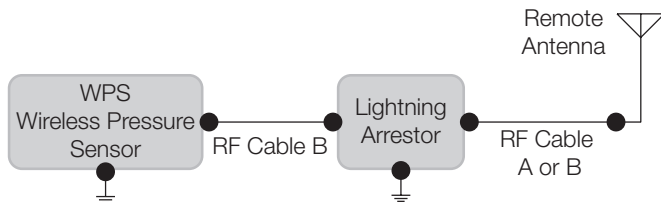
4.1 | Connection Diagrams for Remote Antenna Configuration

Figure 1. IS-WPS Connected to Remote Antenna² Directly



Zones 0/1, IIC Ga Class I, Div. 1, Groups A, B, C, D
 $U_o = 5.0\text{ V}$ $V_{oc} = 5.0\text{ V}$
 $I_o = 0.406\text{ A}$ $I_{sc} = 0.406\text{ A}$
 $P_o = 0.506\text{ W}$ $P_o = 0.506\text{ W}$
 $L_o = 3.12\text{ }\mu\text{H}$ $L_a = 3.12\text{ }\mu\text{H}$
 $C_o = 40\text{ }\mu\text{F}$ $C_a = 40\text{ }\mu\text{F}$

Figure 2. IS-WPS Connected to Remote Antenna² Via Lightning Arrestor



Zones 0/1, IIC Ga Class I, Div. 1, Groups A, B, C, D
 $U_o = 5.0\text{ V}$ $V_{oc} = 5.0\text{ V}$
 $I_o = 0.406\text{ A}$ $I_{sc} = 0.406\text{ A}$
 $P_o = 0.506\text{ W}$ $P_o = 0.506\text{ W}$
 $L_o = 3.12\text{ }\mu\text{H}$ $L_a = 3.12\text{ }\mu\text{H}$
 $C_o = 40\text{ }\mu\text{F}$ $C_a = 40\text{ }\mu\text{F}$

¹Only lightning surge arrestors determined to be simple apparatus with no discrete inductors or capacitors may be installed as defined in the National Electrical Code or other local codes, as applicable.

²Refer to the chart in Section 4.3 that captures the approved antenna to be used with the IS-WPS product as remote connection.

³Only where all externally connected inductance and capacitance is contained in cabling, i.e. no discrete inductors or capacitors in any externally connected device. No reduction of L_o or C_o are necessary.

IMPORTANT:

Capacitance and inductance of the field wiring from the WPS to the simple apparatus and antenna shall be calculated and must be included in the system calculations as shown in Table 3.

Cable capacitance, C_{cable} , must be less than the marked capacitance, C_a (or C_o), shown on the WPS. The same applies for inductance (L_{cable} and L_a or L_o , respectively).

C_i and L_i of the simple apparatus must be 0.

Table 9. Simple Apparatus

Simple Apparatus		IS-WPS
V_{max} (or U_i)	\geq	V_{oc} or V_t (or U_o)
I_{max} (or I_i)	\geq	I_{sc} or I_t (or I_o)
P_{max} (or P_i)	\geq	P_o
$C_i + C_{cable}$	\leq	C_a (or C_o)
$L_i + L_{cable}$	\leq	L_a (or L_o)

4.2 | Intrinsically Safe Device Entity Parameters for Remote Antenna Cables

Table 10. Intrinsically Safe Device Entity Parameters for Remote Antenna Cables

Honeywell Part Number	Cable Length	Total Capacitance	Total Inductance
RF Cable A			
WCA200RNPRSP-002	0,61 m [2 ft]	50 pF	0.2 μH
WCA200RNPRSP-010	3,05 m [10 ft]	246 pF	0.7 μH
RF Cable B			
WCA200RNJRSP-002	0,61 m [2 ft]	50 pF	0.2 μH
WCA200RNJRSP-005	1,52 m [5 ft]	123 pF	0.4 μH
WCA200RNJRSP-010	3,05 m [10 ft]	246 pF	0.7 μH
WCA200RNJRSP-015	4,57 m [15 ft]	368 pF	1.0 μH
WCA200RNJRSP-020	6,09 m [20 ft]	491 pF	1.3 μH

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4.3 | Approved Antennas for Remote Connection with IS-WPS

Table 11. Antenna and Accessories Allowed for Use (United States, Canada, Australia)

United States, Canada, Australia (Note: all columns are independent of each other)				
Antenna Type Code (antenna provided with product)	Antennas (allowed for use)	Magnetic Remote Mount Assemblies/ Antennas WAMM100RSP-005 WAMM100RSP-010 (allowed for use)	Extension Cable Assemblies/Antennas for Remote Mount WCA200RSJRSP-002 WCA200RSJRSP-005 WCA200RSJRSP-010 WCA200RSJRSP-015 WCA200RSJRSP-020 (allowed for use)	Extension Cable Assemblies/Antennas for Remote Mount WCA200RNPRSP-002 WCA200RNPRSP-010 (allowed for use)
00	WAN03RSP	WAN04RSP	WAN03RSP	WAN06RNJ
12	WAN04RSP	WAN05RSP	WAN04RSP	
	WAN05RSP	WAN08RSP	WAN05RSP	
	WAN08RSP		WAN08RSP	
	WAN09RSP		WAN09RSP	
	WAN10RSP		WAN10RSP	
	WAN11RSP			
	WAN12RSP			

Note:

Direct mount: Antennas have an RP-SMA plug that connects directly to the IS-WPS RP-SMA jack

Remote mount: Remote mount antenna uses a cable with a RP-SMA plug that connects directly to the IS-WPS RP-SMA jack

Table 12. Antenna and Accessories Allowed for Use In All Other Approved Countries

All Other Approved Countries (Note: all columns are independent of each other)				
Antenna Type Code (antenna provided with product)	Antennas (allowed for use)	Magnetic Remote Mount Assemblies/ Antennas WAMM100RSP-005 (allowed for use)	Magnetic Remote Mount Assemblies/ Antennas WAMM100RSP-010 (allowed for use)	Extension Cable Assemblies/Antennas for Remote Mount WCA200RSJRSP-002 WCA200RSJRSP-005 WCA200RSJRSP-010 WCA200RSJRSP-015 WCA200RSJRSP-020 (allowed for use)
00	WAN03RSP	WAN08RSP	WAN04RSP	WAN03RSP
12	WAN09RSP		WAN08RSP	WAN08RSP
	WAN10RSP			WAN09RSP
	WAN12RSP			WAN10RSP
				WAN11RSP

Note:

Direct mount: Antennas have an RP-SMA plug that connects directly to the IS-WPS RP-SMA jack

Remote mount: Remote mount antenna uses a cable with a RP-SMA plug that connects directly to the IS-WPS RP-SMA jack

Installation Instructions for the Intrinsically Safe Wireless Pressure Sensor, IS-WPS Series

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5 | BATTERY REPLACEMENT

When to replace:

- The IS-WPS Series Pressure Sensor, displays “E2” error on LCD variant and/or “Low Battery” is registered for that particular Wireless node on the Wireless Receiver. Upon this indication, proceed with replacing the battery pack in the IS-WPS as per below.
- Battery Pack may be replaced while the sensor remains connected to the pressure being measured.

Tools required

- M5 Hexagon Socket Head Screwdriver
- M4 Phillips Screwdriver

⚠ WARNING

RISK OF DEATH OR SERIOUS INJURY FROM EXPLOSION OR FIRE

Connection and disconnection of only the Intrinsically Safe Battery Pack, WBT8, can be performed in a hazardous environment. Connection and disconnection of the batteries should only be performed in a non-hazardous area. The batteries used in this device may present a risk of fire or chemical burn if mistreated.

Do not recharge, disassemble, heat above 100 °C [212 °F], or incinerate.

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

⚠ WARNING

RISK OF DEATH OR SERIOUS INJURY FROM EXPLOSION OR FIRE

If the IS-WPS is to be returned to Honeywell for any reason, the battery **MUST** be removed prior to shipping. Dispose of used batteries promptly per local regulations or the battery manufacturer’s recommendations. Keep away from children. Do not disassemble and do not dispose of in fire.

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

⚠ WARNING

RISK OF DEATH OR SERIOUS INJURY FROM EXPLOSION OR FIRE

When installing the battery, do not snag the battery terminal on the clip or the battery may be damaged. Do not apply excessive force. Do not drop. Dropping the battery may cause damage. If a battery is dropped, do not install the dropped battery into the IS-WPS Battery Pack. Dispose of dropped battery promptly per local regulations or per the battery manufacturer’s recommendations.

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

⚠ WARNING

RISK OF DEATH OR SERIOUS INJURY FROM EXPLOSION OR FIRE

Both batteries must be the same model from the same manufacturer. Mixing old and new batteries or different manufacturers is not permitted. Use only the following 3.6 V lithium thionyl chloride (Li-SOCl₂) battery (non-rechargeable), size D. Always replace both batteries at the same time. WBT5 is Honeywell-supplied batteries for use in the IS-WPS Series.

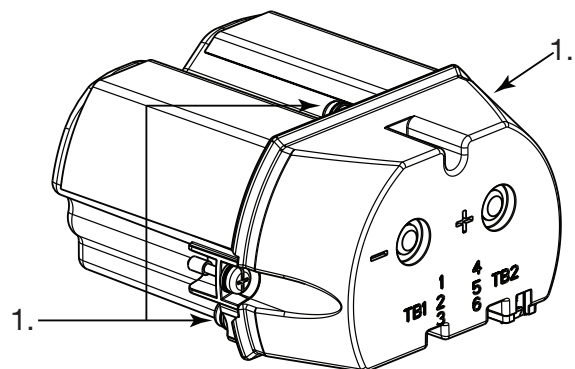
Recommended batteries for use are:

- XENO Energy, part number: XL-205F

Table 13. Battery Replacement Procedure

Step	Action
1	Follow instructions in Table 14 for battery pack removal. Please note, batteries must be replaced in a non-hazardous location.
2	Remove the drained batteries and dispose of them promptly according to local regulations of the battery manufacturer’s recommendations.
3	Install the batteries following the polarity as noted on the lid.
4	Follow instructions in Table 14 for re-inserting the battery pack.

Figure 3. IS-WPS Intrinsically Safe Battery Pack Housing



Installation Instructions for the Intrinsically Safe Wireless Pressure Sensor, IS-WPS Series

6 | BATTERY PACK REPLACEMENT

When to replace:

- The IS-WPS Series Pressure Sensor, displays “E2” error on LCD variant and/or “Low Battery” is registered for that particular Wireless node on the Wireless Receiver. Upon this indication, proceed with replacing the battery pack in the IS-WPS as per below.
- Battery Pack may be replaced while the sensor remains connected to the pressure being measured.

Tools required

- M5 Hexagon Socket Head Screwdriver
- M4 Phillips Screwdriver

<p>⚠ WARNING</p> <p>RISK OF DEATH OR SERIOUS INJURY FROM EXPLOSION OR FIRE</p> <p>Connection and disconnection of only the Intrinsically Safe Battery Pack, WBT8, can be performed in a hazardous environment. Connection and disconnection of the batteries should only be performed in a non-hazardous area. The batteries used in this device may present a risk of fire or chemical burn if mistreated. Do not recharge, disassemble, heat above 100 °C [212 °F], or incinerate.</p> <p>Failure to comply with these instructions could result in death or serious injury.</p>
--

<p>⚠ WARNING</p> <p>RISK OF DEATH OR SERIOUS INJURY FROM EXPLOSION OR FIRE</p> <p>If the IS-WPS is to be returned to Honeywell for any reason, the battery MUST be removed prior to shipping. Dispose of used batteries promptly per local regulations or the battery manufacturer’s recommendations. Keep away from children. Do not disassemble and do not dispose of in fire.</p> <p>Failure to comply with these instructions could result in death or serious injury.</p>
--

<p>⚠ WARNING</p> <p>RISK OF DEATH OR SERIOUS INJURY FROM EXPLOSION OR FIRE</p> <p>When installing the battery, do not snag the battery terminal on the clip or the battery may be damaged. Do not apply excessive force. Do not drop. Dropping the battery may cause damage. If a battery is dropped, do not install the dropped battery into the IS-WPS Battery Pack. Dispose of dropped battery promptly per local regulations or per the battery manufacturer’s recommendations.</p> <p>Failure to comply with these instructions could result in death or serious injury.</p>
--

Table 14. Battery Park Replacement Procedure

Step	Action
1	Remove the rear cover of the IS-WPS product by unthreading the four screws shown in Figure 4a, using a M5 hexagon socket head screwdriver, to expose the battery pack compartment of the product.
2	Disconnect the power cable, at #1 shown in Figure 4b, before unthreading the screw, #2 shown in Figure 4b. Swivel the latch open to access the battery pack.
3	Support the battery pack on the left side with one or two fingers and thumb on the right side, swivel the battery pack outwards, #1 shown in Figure 4c. Pull it outwards in direction, #2 shown in Figure 4c.
4	Install the new battery pack (containing fresh or good batteries) at an angle to seat inside the bracket, #1 shown in Figure 4d. Then, push it inwards till it is located fully inside the bracket, #2 shown in Figure 4d.
5	Close the bracket lid and tighten the screw, #2 in Figure 4b, using M4 Phillips screwdriver to 0,8 Nm [7.1 in-lb]. The battery pack is now secured in position within the product.
6	Connect the power cable at #1 shown in Figure 4b.
7	Replace the rear cover and tighten the 4 screws, #1 in Figure 4a, using M5 hexagon socket head screwdriver to 4,5 N-m [40 in-lb]

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Figure 4. Battery Replacement Procedure

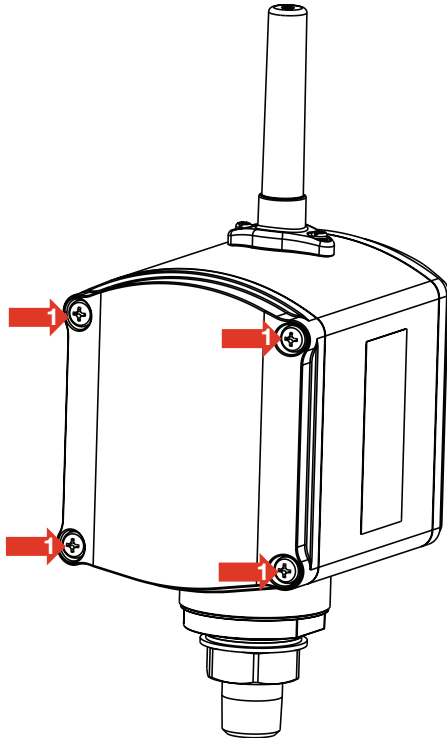


Figure A. Battery Pack Compartment

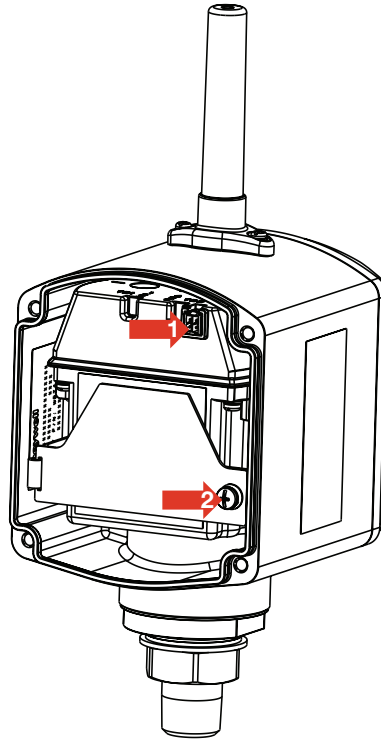


Figure B. Battery Pack Access

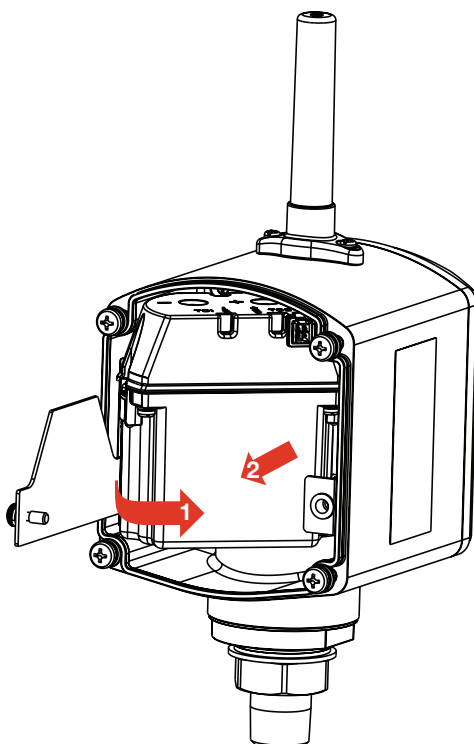


Figure C. Battery Pack Removal

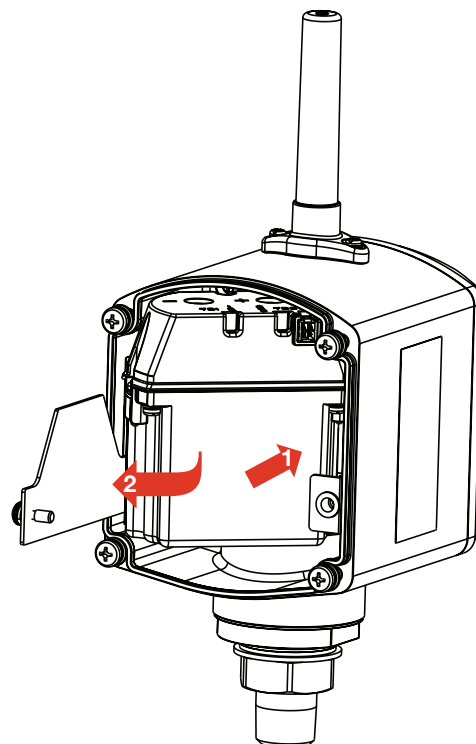


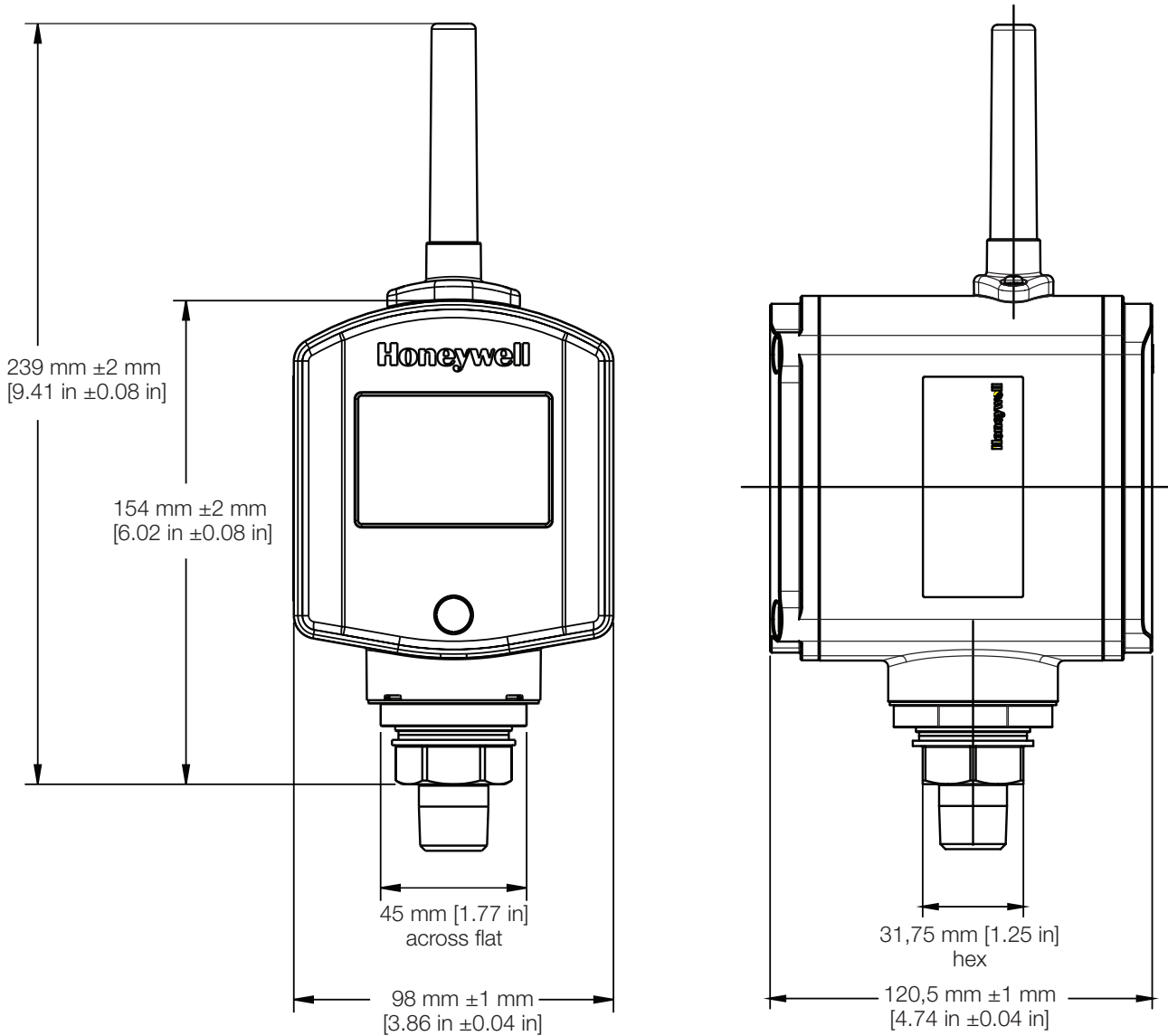
Figure D. Battery Pack Installation

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MOUNTING DRAWING

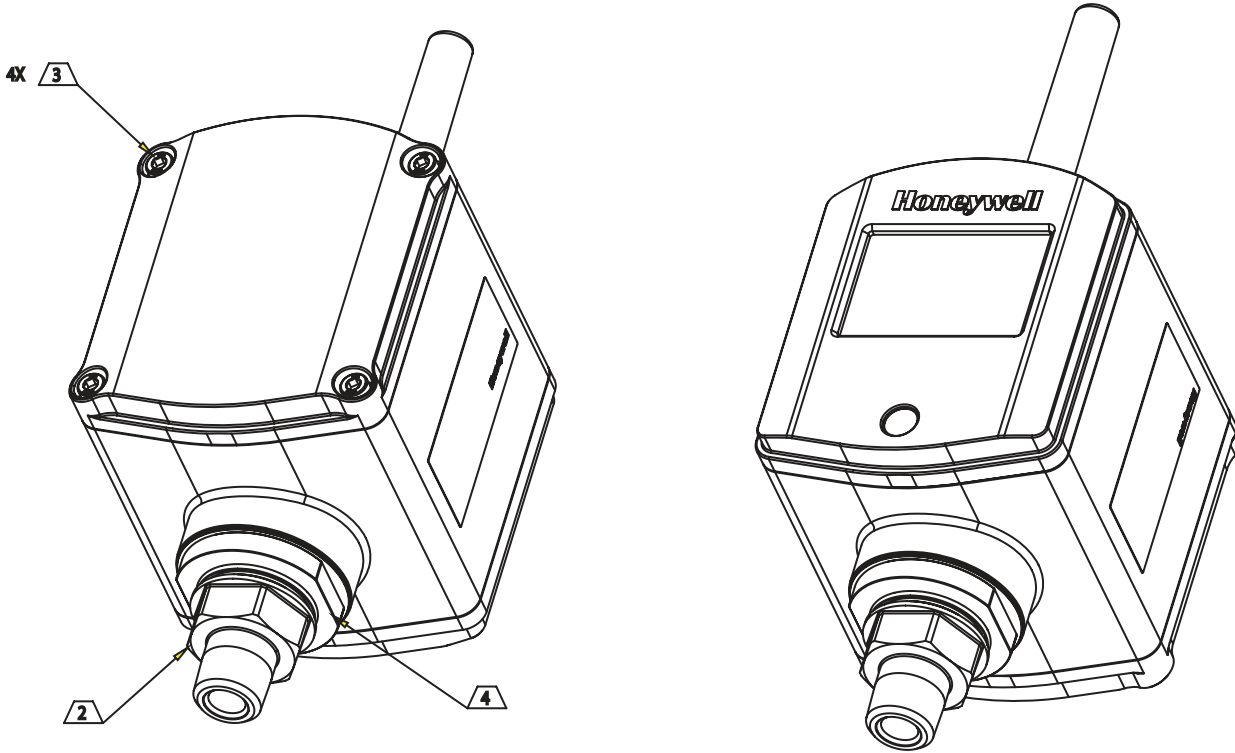
Figure 5. Dimensions of Wireless Pressure Sensor, IS-WPS Series, Connection Type 1 & 2



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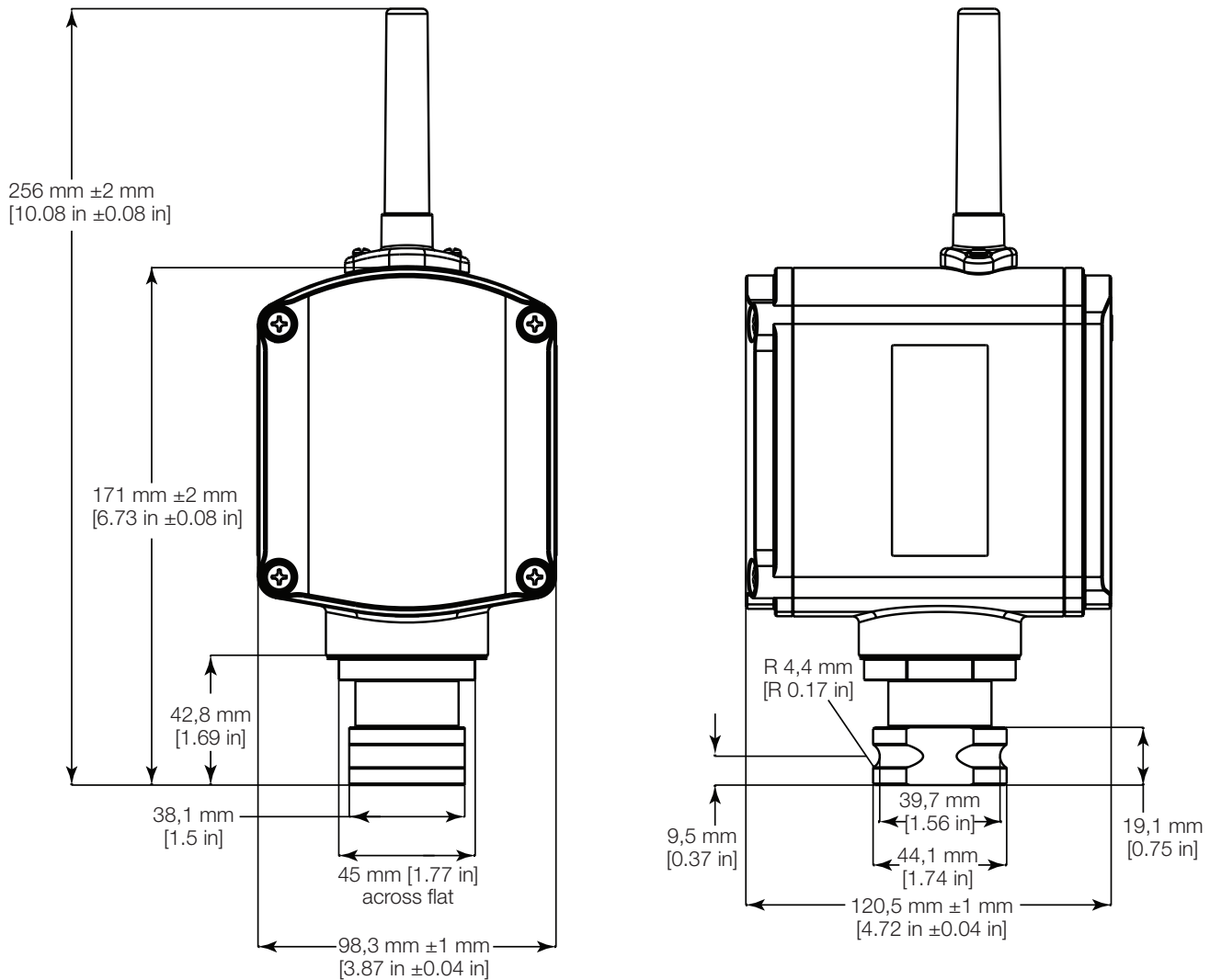
Figure 6. Wireless Pressure Sensor, IS-WPS Series, Connection Type 1 & 2 (Male NPT)



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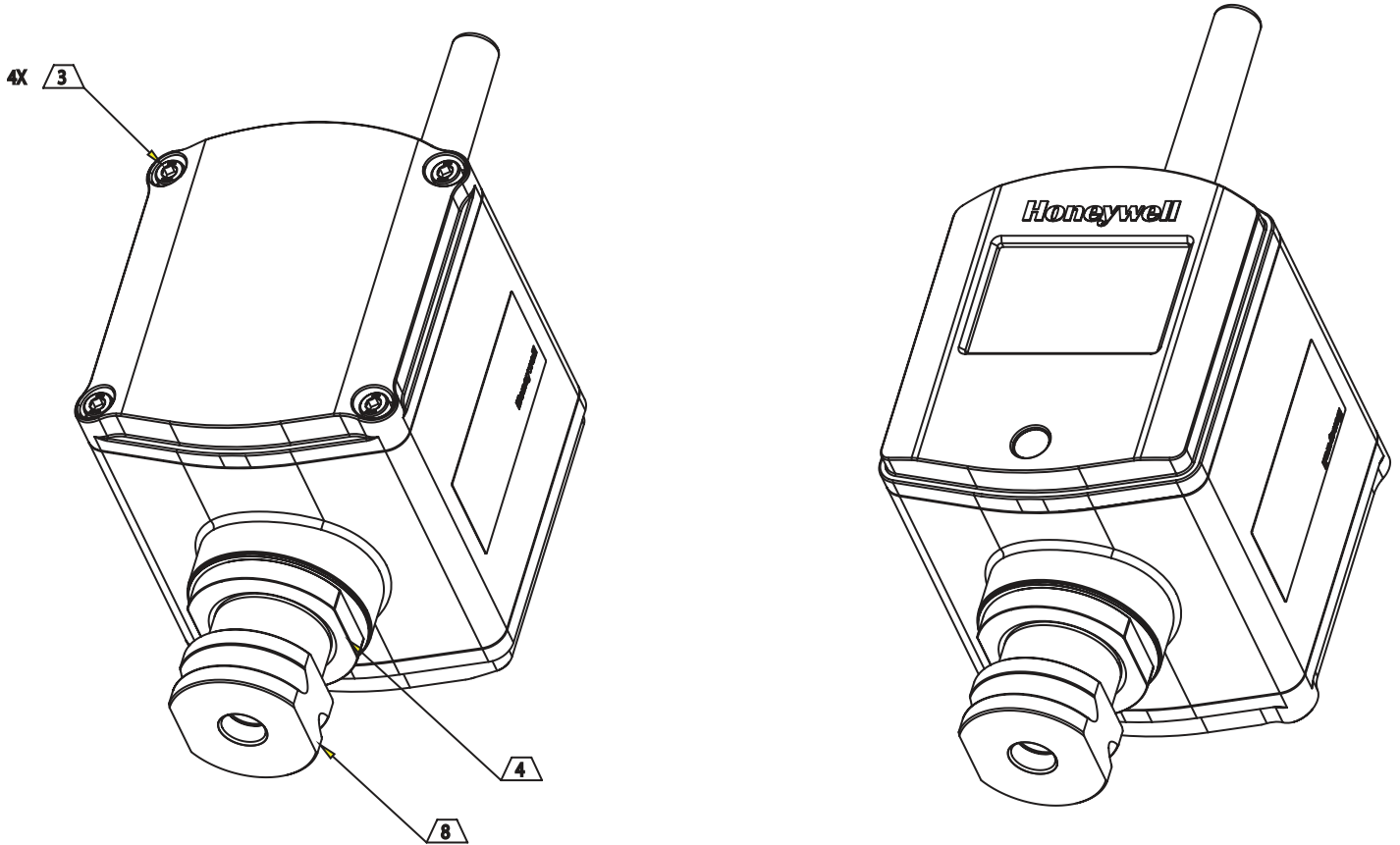
Figure 7. Dimensions of Wireless Pressure Sensor, IS-WPS Series, Connection Type 3 & 4



Installation Instructions for the Intrinsically Safe Wireless Pressure Sensor, IS-WPS Series

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Figure 8. Wireless Pressure Sensor, IS-WPS Series, Connection Type 3 & 4 (U-Clamp)



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For the latest IS-WPS Series installation information, please see the Installation and Technical Manual, as well as other documents at the following website:

1. Go to sensing.honeywell.com/limitless.
2. Click on the **Documentation tab** at the top of the page.
3. Click on the **Related Product Information**.

Multiple language versions of installation instructions and other documents are available on Honeywell's website. To access:

1. Go to sensing.honeywell.com/limitless
2. Select the product's instructions from the installation instruction section.

Installationsanweisungen und andere Dokumente stehen in mehreren Sprachen auf der Honeywell-Website zur Verfügung. So greifen Sie darauf zu:

1. Gehen Sie auf die Webseite sensing.honeywell.de/limitless
2. Wählen Sie im Bereich "Installationsanweisungen" die zum entsprechenden Produkt gehörenden Anweisungen aus.

Versiones de las instrucciones de instalación y otros documentos se encuentran disponibles en el sitio de internet de Honeywell en múltiples idiomas. Para acceder:

1. Vaya a sensing.honeywell.com/limitless
2. Seleccione las instrucciones del producto en la sección de instrucciones de instalación.

Les instructions d'installation et d'autres documents sont disponibles dans plusieurs langues sur le site Web d'Honeywell.

Procédure d'accès :

1. Accédez à la page sensing.honeywell.com/limitless
2. Sélectionnez les instructions relatives au produit qui vous intéresse dans la section « Installation Instructions

Sul sito Web di Honeywell sono disponibili istruzioni per l'installazione in più lingue e altra documentazione. Per accedere:

1. Andare a sensing.honeywell.com/limitless
2. Selezionare le istruzioni per il prodotto nella sezione istruzioni per l'installazione.

As versões em diversos idiomas das instruções de instalação e outros documentos estão disponíveis no site da Honeywell. Para acessar:

1. Vá para sensing.honeywell.com/limitless
2. Selecione as instruções do produto na seção de instruções de instalação.

多语种安装指南和其他文档均可从霍尼韦尔的网站上获取。访问网站：

1. 前往 sensing.honeywell.com/limitless
2. 从安装指南部分选择具体的产品指南。

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