# User Guide Wireless Pressure Sensor



#### **A** WARNING

THINK SAFETY FIRST Read this Manual BEFORE using this equipment. Failure to read and follow all safety and use information can result in death, serious personal injury, property damage, or damage to the equipment. Keep this Manual for future reference.

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# **Product Information**

The Wireless Pressure Sensor has a cable with a pressure transducer disposed at the end. The housing of the Sensor comprises a base and a lid made of black ABS plastic that are sealed together with four steel screws coated in black phosphate. Additionally, the Sensor is battery-powered and has a single AA-battery coffin for receipt of a single **AA RAMWAY ER14505M lithium / thionyl chloride battery**.

Apart from the battery coffin, the circuitry for the Wireless Pressure Sensor resides on the underside of the circuit board and within a protective epoxy encapsulant surrounded by the Sensor's housing. The circuitry includes a radio module within the protective, safety encapsulant with an antenna attached and extending out of the encapsulant and the surrounding housing.

The radio module transmits at the following maximum Equivalent, Isometric Radiated Powers for the corresponding frequencies: 50 mW at 900 MHz and 940 MHz; 25 mW at 868 MHz; and 10 mW at 433 MHz, which are well under the threshold power of 6W for Group IIA gases.

The Sensor is supplied with a single **AA RAMWAY ER14505M battery** with a capacity of approximately 2,200 mAh. The AA RAMWAY ER14505M battery is compliant with: (1) Clause 23.2 of IEC 60079-0: 2011 and EN 60079-0: 2012; (2) Clauses 10.4, 10.5.2, 10.5.a, and 10.5.3b of IEC 60079-11 2011 and EN 60079-11: 2012; and (3) Clauses 5 through 9 of EN-60086-4: 2015. As long as the integrity of the battery is maintained, the battery is self-contained and non-reactive. However, care should be taken to prevent thermal, electrical, or mechanical damage, and battery contacts should be protected to prevent premature discharge.

Even when the cell is discharged, the battery may present a hazard. The battery should be stored in a clean, dry environment not to exceed  $303^{\circ}$ K ( $30^{\circ}$ C), when not in active use within the Sensor.



#### **WARNING**

The Wireless Pressure Sensor **MUST USE** and **MUST ONLY** use a single **AA RAMWAY ER14505M lithium / thionyl chloride battery**. The Sensor has ONLY been certified for use with a single AA RAMWAY ER14505M battery. Use of ANY other battery, or modification of the Sensor to use multiple batteries, and other power source(s) MAY result in sparking and thermal events that could lead to ignition and explosion in the environments for which the Wireless Pressure Sensor has been otherwise designed to be deployed. Furthermore, use of a single AA RAMWAY ER14505M battery that has been thermally, electrically, or mechanically compromised may also lead to ignition and explosions. As discussed below, the single AA RAMWAY ER14505M lithium / thionyl chloride battery **MUST ONLY be inserted in and removed** from the battery coffin of the Wireless Pressure Sensor **outside of any hazardous location** and in an area free of potentially explosive dust or gases.

DO NOT attempt to recharge the RAMWAY ER14505M battery. DO NOT incinerate the battery, place it near heating equipment, expose it to direct sunlight for long periods, or subject the RAMWAY ER14505M battery to temperatures in excess of 343°K (70°C). DO NOT short circuit the RAMWAY ER14505M. DO NOT drop, crush, or puncture the battery. DO NOT immerse the battery in liquids. DO NOT install the RAMWAY ER14505M battery with an incorrect polarity. The battery coffin of the Wireless Pressure Sensor has a raised plus sign and a raised negative sign to indicate correct polarity.

The pressure transducer and cable of the Wireless Pressure Sensor MUST NOT be deployed in any location where voltage and current may be injected on any exposed wires arising from accidental melting of insulation, severing, cutting, or cap removal of the antenna.

The housing of the Wireless Pressure Sensor must be maintained within an ambient process temperature between 253°K to 313°K (-20°C to 40°C).

The pressure transducer at the end of the cable may be exposed to process temperatures ranging from 253°K to 343°K (-20°C to 70°C), as long as the housing is kept within an ambient temperature between 253°K to 313°K (-20°C to 40°C). The pressure transducer MUST NOT be exposed to process temperatures above 343°K (70°C).

#### NOTICE

In determining a surface to which to affix the Sensor, consider again that the Sensor did not go through an impact test. DO NOT affix the Wireless Pressure Sensor higher than two meters above a surface it would strike in the event of a fall. DO NOT affix the Wireless Pressure Sensor where it is likely to be bumped by personnel. DO NOT affix the Sensor anywhere where moving parts of machinery may strike it.

#### NOTICE

The Wireless Pressure Sensor MUST be installed in a location where it will be protected and sheltered from ALL sunlight and other luminaries emitting light at UV wavelengths. Additionally, the housing of the Wireless Pressure Sensor is made of ABS plastic with two nylon adhesive labels adhering to it, which may present a potential for electrostatic discharge. Do NOT affix the Sensor anywhere where personnel are likely to rub against it. Also, the Wireless Pressure Sensor MUST be installed 1,000 mm distance from a potential electrostatic source, such as a conveyor belt, moving machinery, pipe, or the like.

#### **WARNING**

### Use Only Ramway ER14505M Batteries

A single **AA RAMWAY ER14505M lithium / thionyl chloride battery** is the ONLY battery that can be used with the Wireless Pressure Sensor. Any other battery, or combinations of batteries, may result in a thermal ignition or a spark ignition event causing an explosion.

#### **A** WARNING

#### Do Not Replace the Battery When an Explosive Atmosphere Is Present

The Wireless Pressure Sensor **MUST NOT be opened** and the single **AA RAMWAY ER14505M lithium / thionyl chloride battery MUST NOT be removed, reinserted or replaced** when an explosive atmosphere, comprised of either gas or dust, is either present or potentially present. Qualified personnel MUST EITHER remove the Sensor from a hazardous location where an explosive atmosphere is either present or potentially present, OR the qualified personnel MUST clear the area where the Wireless Pressure Sensor is located of any explosive atmosphere and ensure its absence.

#### **A** WARNING

The Wireless Pressure Sensor must only be installed, operated, serviced, maintained, and decommissioned by qualified personnel involved in the aforementioned activities must meet the following requirements.

- 1. All qualified personnel involved in any of the foregoing activities must first familiarize themselves with the Wireless Pressure Sensor, its functionality, and components before attempting to engage in any such activities.
- 2. All qualified personnel must be familiar with and adhere to the relevant laws, regulations, and or other rules promulgated by any legal authorities with jurisdiction where the Wireless Pressure Sensor is to be installed, operated, serviced, maintained, and decommissioned.

#### **A** WARNING

The Wireless Pressure Sensor must be installed, operated, serviced, maintained, and decommissioned in accordance with the following standards, instructions, and requirements.

- 1. The Wireless Pressure Sensormust be installed, operated, serviced, maintained, and decommissioned in accordance with relevant laws, regulations, and other rules promulgated by any legal authorities with jurisdiction where the Wireless Pressure Sensor is to be installed, operated, serviced, maintained, and decommissioned.
- 2. The Wireless Pressure Sensor must be installed, operated, serviced, maintained, and decommissioned in accordance with ALL instructions, guidance, conditions, and requirements appearing in these safety instructions herein below.

### Installation and Setup

To install the Wireless Pressure Sensor, slide the face top of the Sensor around the axis of the single screw holding the top lid in place to expose the single AA battery coffin within the housing. Remove the battery notice sticker, making sure to take note of the information thereon. Insert the **RAMWAY ER14505M battery**, provided with the Sensor, in the battery coffin. Make sure that the battery is inserted with the correct polarity as identified by the molded symbol in the battery coffin. A single **AA RAMWAY ER14505M lithium / thionyl chloride battery** MUST be used and ONLY the RAMWAY ER14505 battery. Additionally, **take note of the Sensor ID and security code** before closing up the unit. They will be needed to network the device later, as set forth in the User Guide. Slide back the face top so that it covers the cavity of the housing and screw the remaining three black screws in place with a standard screw driver.

# Installation, Operation, Servicing, Maintenance, and Decommissioning

#### NOTICE

Because the Sensor did not go through an impact test, the housing MUST be securely affixed to the surface against which it is deployed, to prevent impact from dropping or falling.

In installing the Sensor, qualified personnel MUST follow all applicable rules set forth in IEC 60079-14 and in IEC 60079-17. Before affixing the housing to the surface where it will be deployed, the qualified personnel should wipe clean the surface to which the housing is to be affixed with a **wet rag**. The qualified personnel should then affix the housing to the surface by sandwiching the exposed adhesive membrane between the housing and the surface and applying firm pressure. In the alternative, the qualified personnel may affix the housing to the surface by using screw fasteners screwed through the eyelets provided in the two tabs extending from the two shortest sidewalls of the housing. Because of the lack of impact testing on the Sensor and the potential to become dislodged and drop to the ground, it is NOT recommended to mount the Sensor with a magnet.

### Adjustment and Parameter Setting

The Wireless Pressure Sensor is designed to be adjusted and have its parameters set remotely. All firmware updates are also received remotely. Personnel need NOT interact within a hazardous area to perform these functions, with the exception of power cycling the Sensor. To power cycle the Sensor, the instructions in the Repair section below MUST be followed. Please refer to the User Guide.

# Use and Setup

Again, the Wireless Pressure Sensor is designed to be used and set up remotely. To power cycle the Sensor, the instructions in the Repair section below MUST be followed.

#### Maintenance

Layers of dust should not be allowed to accumulate on the Wireless Pressure Sensor. Clean the Sensor regularly. However, **DO NOT** clean the surfaces of the Sensor with a dry rag. Only clean these surfaces with a **wet rag**.

### Repair

Many repairs may be undertaken remotely by adjusting and setting parameters and updating firmware over the wireless network in which the Wireless Pressure Sensor is embedded. However, if such attempts are unsuccessful, a determination may be made, with or without the assistance of Watts<sup>®</sup> customer support, that the Sensor needs to be power cycled, have its battery replaced, be shipped back to Watts, or decommissioned.

To power cycle the Sensor, the battery is removed and reinserted. Before opening the Sensor to power cycle it, qualified personnel MUST wipe the Sensor with a **wet rag**, and **remove the Sensor from any hazardous location** where explosive atmospheres of gas or dust are OR may be present. Alternatively, qualified personnel MUST wipe the Sensor with a **wet rag** and ensure that the area where the Sensor is located is **free of potentially explosive dust or gas. DO NOT remove, reinsert, or replace the single AA RAMWAY ER14505M lithium / thionyl chloride battery where explosive gas or dust is present or potentially present.** Qualified personnel open the Sensor by removing screws in the top lid of the housing. The battery may then be removed from the battery coffin within the housing. To power cycle, qualified personnel then wait at least ten seconds before reinserting the single **AA RAMWAY ER14505M battery**.

When replacing the battery, qualified personnel MUST ONLY replace the old battery with a new, **single AA RAMWAY ER14505M lithium / thionyl chloride battery**. A single AA RAMWAY ER14505M lithium / thionyl chloride battery is the ONLY battery that can be used with the Wireless Pressure Sensor. Any other battery may result in a thermal ignition or a spark ignition event causing an explosion.

#### **A** WARNING

# Potential Electrostatic Charging Hazard

The Sensor's housing is ABS plastic with two nylon adhesive labels adhered. Electrostatic charging of plastic components can lead to electrostatic discharge events, sparking, and explosions. Whenever the Wireless Pressure Sensor is in a hazardous location where an explosive atmosphere of gas or dust is, or may potentially be, present, the surface of the Wireless Pressure Sensor must first be wiped with a **wet rag** before touching the Sensor to prevent electrostatic discharge.

Avoid friction on the surfaces of the Sensor. Keep ambient relative humidity above 25%. Only clean these surfaces with a **wet rag**. Do NOT dry clean the surfaces. The Wireless Pressure Sensor MUST NOT be used in high-charge generating processes, such as in the presence of mechanical friction, in the presence of separation processes, or mounted in a pneumatic conveying flow. If there is a potential electrostatic source with which a potential difference, relative to the Sensor, of around 30 kV or above may be created, an electrostatic expert MUST be called to evaluate the electrostatic risk and the distance from the electrostatic source to the Sensor.

Notes	

#### **Equipment Warranty**

Watts (the "Company") warrants each product to be free from defects in material and workmanship under normal usage for a period of one year from the date of original shipment. In the event of such

defects within the warranty period, the Company will, at its option, replace or recondition the product without charge. THE WARRANTY SET FORTH HEREIN IS GIVEN EXPRESSLY AND IS THE ONLY WARRANTY GIVEN BY THE COMPANY WITH RESPECT TO THE PRODUCT. THE COMPANY MAKES NO OTHER WARRANTIES, EXPRESS OR IMPLIED. THE COMPANY HEREBY SPECIFICALLY DISCLAIMS ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

The remedy described in the first paragraph of this warranty shall constitute the sole and exclusive remedy for breach of warranty, and the Company shall not be responsible for any incidental, special or consequential damages, including without limitation, lost profits or the cost of repairing or replacing other property which is damaged if this product does not work properly, other costs resulting from labor charges, delays, vandalism, negligence, fouling caused by foreign material, damage from adverse water conditions, chemical, or any other circumstances over which the Company has no control. This warranty shall be invalidated by any abuse, misuse, misapplication, improper installation or improper maintenance or alteration of the product. Some States do not allow limitations on how long an implied warranty lasts, and some States do not allow the exclusion or limitation of incidental or consequential damages. Therefore the above limita-

tions may not apply to you. This Limited Warranty gives you specific legal rights, and you may have other rights that vary from State to State. You should consult applicable state laws to determine your rights. SÓ FAR AS IS CONSISTENT WITH APPLICABLE STATE LAW, ANY IMPLIED WARRANTIES THAT MAY NOT BE DISCLAIMED, INCLUDING THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, ARE LIMITED IN DURATION TO ONE YEAR FROM THE DATE OF ORIGINAL SHIPMENT.

#### **Connected Features Warranty**

Any connected features of the product and any collection of data by or from the product are governed by the Watts Terms of Use available at: https://www.watts.com/terms-of-use



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