

# WRZ Series Wireless Room Sensors

## Product Bulletin

WRZ-Mxxxxxx-x, WRZ-THxxxxx-x, WRZ-TTxxxxx-x

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The WRZ Series Wireless Room Sensors are designed to sense room or zone temperature and transmit wireless temperature control data. Some models also sense and transmit relative humidity (RH).

Several models include an onboard passive infrared (PIR) occupancy sensor that detects motion to determine if a space is occupied. This feature maximizes up to 30% energy savings in high-energy usage environments such as schools, dormitories, offices, and hospitals by adjusting the temperature of the space based on the occupancy status. In addition, the PIR occupancy sensor facilitates trending of floor space usage in these environments.

In a ZFR1800 Series Wireless Field Bus System application, the sensors communicate with FAC26 Series, FEC16 Series, FEC26 Series, and VMA16 Series Controllers by means of the ZFR18xx Series Router.

In wired field bus applications, the sensors communicate with a WRZ-7860 Wireless Receiver. The WRZ-7860 Receiver transfers data to the controller by means of the Sensor Actuator (SA) communication bus. In a typical application, one WRZ Series Sensor reports to one WRZ-7860 Receiver, but up to five WRZ Series Sensors can be associated with a single WRZ-7860 Receiver for multi-sensor averaging or high/low temperature selection.

The WRZ Series Wireless Room Sensors include models with either a temperature setpoint dial or the setpoint adjustment pushbuttons and LCD that allows occupants to view the zone temperature, Relative Humidity (RH), and view and adjust the zone temperature setpoint. Some temperature and humidity models include a %RH pushbutton to toggle between temperature and RH on the display. These models also have the capability to set the desired default display to either temperature or RH. Some models also include a °F/°C button, which provides a choice between degrees Fahrenheit (F) and degrees Celsius (C).

**Figure 1: WRZ Series Wireless Room Sensors**



Models are available with or without an LCD. Depending on the sensor model, the WRZ Series Sensor can transmit sensed temperature, setpoint temperature, sensed humidity, occupancy status, and low battery conditions to an associated router or receiver. The WRZ Series Sensors are designed for indoor, intra-building applications only.

The WRZ Series Sensors use direct-sequence, spread-spectrum RF technology, and operate on the 2.4 GHz Industrial, Scientific, and Medical (ISM) band. The receiver meets the IEEE 802.15.4 standard for low-power, low-duty cycle RF transmitting systems.

**Table 1: Features and Benefits**

<b>Features</b>	<b>Benefits</b>
<b>Wireless RF Design</b>	Enables quick, economical, and low-maintenance installations, which reduce installation and wiring costs.
<b>Integral Wireless Signal Strength Testing Built into the Sensor</b>	Provides quick and easy visual indication of the wireless RF signal strength between the sensor and its associated receiver, helps locate optimum device positions during installation or relocation, and aids in troubleshooting.
<b>Easy Installation and Relocation</b>	Provided by two mounting options (tape or screws).
<b>Easily Applicable Data Types</b>	Transmit the sensed zone temperature and humidity, temperature setpoint, and low battery condition to a WRZ-7860 Receiver or ZFR1800 Series Router.
<b>Simple, Field-Adjustable DIP Switches</b>	Provide all of the necessary configuration settings for the sensor, simplifying commissioning.
<b>Wireless Signal Strength and Low Battery Condition Mapping</b>	Provides real-time status for proper room sensor operation.
<b>Optional, Battery-Powered WRZ-SST-120 Wireless System Survey Tool</b>	Provides wireless mobility to check for the best RF link, and to determine the optimum receiver mounting locations.
<b>High Resistance to RF Interference from Other Radio Devices or RF Noise Sources</b>	Results from application-based frequency agility, which allows for automatically changing to a different channel to avoid RF interference and missed messages (WRZ-7860 applications).
<b>Onboard PIR Occupancy Sensor Available on Some Models</b>	Maximizes up to 30% energy savings in high-energy usage environments, and facilitates trending of floor space.
<b>User-Selectable Default Display for Humidity Models</b>	Allows users to choose if they want RH or temperature as the default display.
<b>Display Models</b>	Provide an intuitive user experience with a full range of WRZ temperature setpoint range options, RH or fan speed, and occupancy status.
<b>Three Temperature Setpoint Range Options</b>	Allow control by Warmer/Cooler (W/C), Scaled Value (SCALE), or System-Configured (CONFIG) adjustments.
<b>Blinking Red LED Light to Indicate Firmware Version</b>	Flashes 5 seconds after the power is applied to indicate the firmware revision. For example, firmware revision 3 is indicated by the LED flashing three times during the startup process.

## Ordering Information

See Table 2 for a list of models available and accessories designed for use with the WRZ Series Wireless Room Sensor.

**IMPORTANT:** Use the WRZ Series Wireless Room Sensor only to provide an input to equipment under normal operating conditions. Where failure or malfunction of the sensor could lead to personal injury or property damage to the controlled equipment or other property, additional precautions must be designed into the control system. Incorporate and maintain other devices, such as supervisory or alarm systems or safety or limit controls, intended to warn of or protect against failure or malfunction of the sensor.

**IMPORTANT:** The WRZ Series Wireless Room Sensor, used in conjunction with a WRZ-7860 Receiver in a One-to-One wireless room sensing system or a ZFR18xx Series Router in a ZFR1800 Series Wireless Field Bus System, is not designed or intended for use in mission-critical or life/safety applications.

## Dimensions

**Figure 2: WRZ Series Sensor; LCD with Occupancy Sensor and Setpoint Adjustment Buttons Model Shown; Physical Features and Dimensions, in. (mm)**

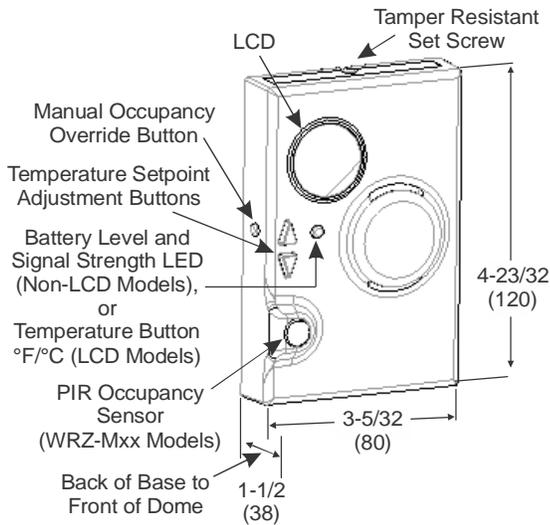


FIG.wrz\_amb\_fm

**Figure 3: WRZ Series Sensor; LCD with Occupancy Sensor and Setpoint Adjustment Dial Model Shown; Physical Features and Dimensions, in. (mm)**

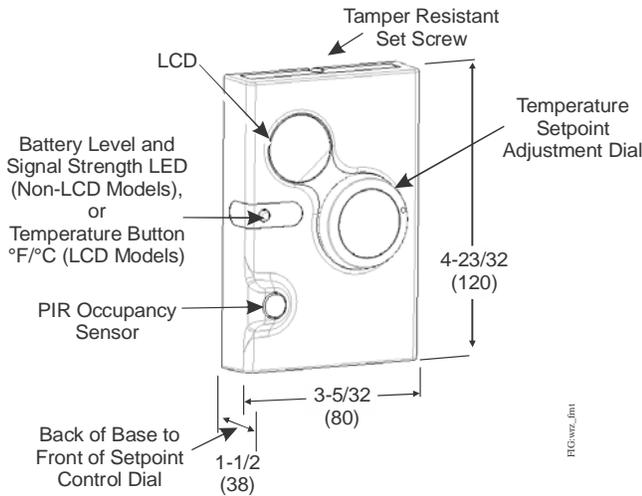


FIG.wrz\_fm

## Repair Information

If the WRZ Series Wireless Room Sensor fails to operate within its specifications, replace the unit. For a replacement sensor, contact the nearest Johnson Controls® representative.

### Batteries

The two 1.5 VDC AA alkaline batteries supplied with the WRZ Series Sensor typically have a life of 48 months. When replacing batteries, replace both batteries at the same time. Batteries removed from this device must be recycled or disposed of in accordance with local, national, and regional regulations. Only certified technicians or qualified building maintenance personnel should service Johnson Controls products. Lithium batteries with a maximum cell voltage of 1.5 volts can be substituted to extend the period between battery replacement. Do not mix lithium and alkaline batteries in this device.

**Table 2: Ordering Information (Part 1 of 2)**

<b>Product Code Number</b>	<b>Description</b>
<b>WRZ-MHN0100-0</b>	Wireless Room Temperature and Humidity Sensor with PIR Occupancy Sensor, Battery Level/Signal Strength LED, and Manual Occupancy Override Button
<b>WRZ-MNN0100-0</b>	Wireless Room Sensor (No Temperature or Humidity Sensing) with PIR Occupancy Sensor, Battery Level/Signal Strength LED, and Manual Occupancy Override Button
<b>WRZ-MTB0100-0</b>	Wireless Room Temperature Sensor with PIR Occupancy Sensor, Display, Setpoint Dial Adjustment Scale: 55 to 85°F (13 to 29°C), °F/°C Button, and Manual Occupancy Override Button
<b>WRZ-MTJ0100-0</b>	Wireless Room Temperature Sensor with PIR Occupancy Sensor, Display, Setpoint Adjustment Buttons for Warmer/Cooler (+/-) Setpoint Adjustment or Scaled Setpoint Adjustment: 55 to 85°F (13 to 29°C), °F/°C Button, and Manual Occupancy Override Button
<b>WRZ-MTN0100-0</b>	Wireless Room Temperature Sensor with PIR Occupancy Sensor, Battery Level/Signal Strength LED, and Manual Occupancy Override Button
<b>WRZ-RMT10K-0</b>	Wireless Room Temperature Sensor for Remote 10K Temperature Probes, Display, °F/°C Button, and Manual Occupancy Override Button
<b>WRZ-STR0000-0 (Non-NIST Certified Model)</b>	Wireless Room Temperature Sensor with Remote 3K Refrigerator/Freezer Temperature Probe, Display, °F/°C Button, and Manual Occupancy Override Button
<b>WRZ-STRNIST-0</b>	Wireless Room Temperature Sensor with NIST Certified Remote 3K Refrigerator/Freezer Temperature Probe, Display, °F/°C Button, and Manual Occupancy Override Button
<b>WRZ-THB0000-0</b>	Wireless Room Temperature and Humidity Sensor with Display, Warmer/Cooler (+/-) Setpoint Dial Adjustment or Scaled Setpoint Dial Adjustment: 55 to 85°F (13 to 29°C), °F/°C Button, RH Button, and Manual Occupancy Override Button
<b>WRZ-THJ0000-0</b>	Wireless Room Temperature/Humidity Sensor with Display, Setpoint Adjustment Buttons for Warmer/Cooler (+/-) Setpoint Adjustment or Scaled Setpoint Adjustment: 55 to 85°F (13 to 29°C), °F/°C Button, Relative Humidity (RH) Button, and Manual Occupancy Override Button
<b>WRZ-THN0000-0</b>	Wireless Room Temperature and Humidity Sensor with Battery Level/Signal Strength LED and Manual Occupancy Override Button
<b>WRZ-THP0000-0</b>	Wireless Room Temperature and Humidity Sensor with Warmer/Cooler (+/-) Setpoint Dial Adjustment, Battery Level/Signal Strength LED, and Manual Occupancy Override Button
<b>WRZ-TTB0000-0</b>	Wireless Room Temperature Sensor with Display, Warmer/Cooler (+/-) Setpoint Dial Adjustment or Scaled Setpoint Dial Adjustment: 55 to 85°F (13 to 29°C), °F/°C Button, and Manual Occupancy Override Button
<b>WRZ-TTB0000-5</b>	Wireless Room Temperature Sensor with Display, Setpoint Adjustment Buttons for Warmer/Cooler (+/-) Setpoint Dial Adjustment or Scaled Setpoint Dial Adjustment: 55 to 85°F (13 to 29°C), Manual Occupancy Override Button, Fully Sealed for Sanitary Hospital Use
<b>WRZ-TTD0000-0</b>	Wireless Room Temperature Sensor with Display, Warmer/Cooler (+/-) Setpoint Dial Adjustment or Scaled Setpoint Dial Adjustment: 55 to 85°F (13 to 29°C), °F/°C Button, Fan Speed Control, and Manual Occupancy Override Button
<b>WRZ-TTJ0000-0</b>	Wireless Room Temperature Sensor with Display, Setpoint Adjustment Buttons for Warmer/Cooler (+/-) Setpoint Adjustment or Scaled Setpoint Adjustment: 55 to 85°F (13 to 29°C), °F/°C Button, and Manual Occupancy Override Button
<b>WRZ-TTK0000-0</b>	Wireless Room Temperature Sensor with Display, Setpoint Adjustment Buttons for Warmer/Cooler (+/-) Setpoint Adjustment or Scaled Setpoint Adjustment: 55 to 85°F (13 to 29°C), °F/°C Button, Fan Speed Control Button, and Manual Occupancy Override Button
<b>WRZ-TTP0000-0</b>	Wireless Room Temperature Sensor with Warmer/Cooler (+/-) Setpoint Dial Adjustment, Battery Level/Signal Strength LED, and Manual Occupancy Override Button

**Table 2: Ordering Information (Part 2 of 2)**

Product Code Number	Description
WRZ-TTR0000-0	Wireless Room Temperature Sensor with Battery Level/Signal Strength LED, Manual Occupancy Override Button, and No Setpoint Dial Adjustment
WRZ-TTS0000-0	Wireless Room Temperature Sensor with Setpoint Dial Adjustment Scale: 55 to 85°F (13 to 29°C), Battery Level/Signal Strength LED, and Manual Occupancy Override Button
WRZ-SST-120	Wireless Sensing System Tool: For Use with a WRZ Series Sensor, to Function as a Site Survey Tool for the WRZ-7860 One-to-One Room Temperature Sensing System, or for the ZFR1800 Series Wireless Field Bus System
T-4000-119	Allen-Head Adjustment Tool: 1/16 in. (1.6 mm), 30 Tools per Bag

**Note:** All sensors with both a dial and a display can have either a W/C or a SCALE setpoint adjustment configuration. Sensors with a W/C configuration show the incremental temperature change from the previous setpoint value. Sensors with a SCALE configuration show the current setpoint value.

**Table 3: WRZ Series Sensor Model Comparison**

Sensor Model	Temperature	3% Humidity	Display	°F/°C Button	Fan Control	Occupancy Override Button	PIR Occupancy Sensor	Setpoint Adjustment <sup>1</sup>
WRZ-MHN0100-0	x	x				x	x	NO DIAL
WRZ-MNN0100-0						x	x	NO DIAL
WRZ-MTB0100-0	x		x	x		x	x	DIAL, CONFIG
WRZ-MTN0100-0	x					x	x	NO DIAL
WRZ-MTJ0100-0	x		x	x		x	x	PUSHBUTTONS, CONFIG
WRZ-RMT10K-0	x		x	x		x		NO DIAL
WRZ-STR0000-0	x		x	x		x		NO DIAL
WRZ-THB0000-0	x	x	x	x		x		DIAL, CONFIG
WRZ-THJ0000-0	x	x	x	x		x		PUSHBUTTONS, CONFIG
WRZ-THN0000-0	x	x				x		NO DIAL
WRZ-THP0000-0	x	x				x		DIAL, W/C
WRZ-TTB0000-0	x		x	x		x		DIAL, CONFIG
WRZ-TTB0000-5	x		x			x		PUSHBUTTONS, CONFIG
WRZ-TTD0000-0	x		x	x	x	x		DIAL, CONFIG
WRZ-TTJ0000-0	x		x	x		x		PUSHBUTTONS, CONFIG
WRZ-TTK0000-0	x		x	x	x	x		PUSHBUTTONS, CONFIG
WRZ-TTP0000-0	x					x		DIAL, W/C
WRZ-TTR0000-0	x					x		NO DIAL
WRZ-TTS0000-0	x					x		DIAL, SCALED

1. Warmer/cooler temperature offset (W/C), single-value in 55 to 85°F (13 to 29°C) range (SCALED), system-configured—available on display models only (CONFIG), temperature setpoint adjustment pushbuttons (PUSHBUTTONS), no setpoint dial (NO DIAL)

## Technical Specifications

### WRZ Series Wireless Room Sensors

<b>Power Requirements</b>	3 VDC Supplied by Two 1.5 VDC AA Alkaline Batteries (Included with Sensor); Typical Battery Life: 48 Months (36 Months Minimum)
<b>Addressing</b>	DIP Switches; Field-Adjustable MS/TP Address, Network Number, and Zone Address
<b>Ambient Conditions</b>	<b>Operating:</b> 32 to 122°F (0 to 50°C), 5 to 95% RH, Noncondensing <b>Storage:</b> -40 to 160°F (-40 to 71°C), 5 to 95% RH, Noncondensing
<b>Wireless Band</b>	Direct-Sequence, Spread-Spectrum, 2.4 GHz ISM Band
<b>Transmission Power</b>	10 mW Maximum
<b>Transmission Range</b>	100 ft (30 m) Maximum Line of Sight; 50 ft (15 m) Recommended
<b>Transmissions</b>	<b>Temperature:</b> Every 60 Seconds ( $\pm 20$ Seconds) <b>Humidity:</b> Every 2 Minutes, or 1 Minute Intervals if Temperature or Humidity Changes
<b>Temperature System Accuracy (Temperature Only Models, and Temperature and Humidity Models)</b>	1.0F°/0.6C° Over the Range of 55 to 85°F (13 to 29°C); 1.5F°/0.9C° Over a Range of 32 to 55°F (0 to 13°C) and 85 to 110°F (29 to 43°C)
<b>Temperature Sensor Type (Temperature Only Models, and Temperature and Humidity Models)</b>	Internal 10k ohm Negative Temperature Coefficient (NTC) Thermistor
<b>Humidity Calibrated Range (Temperature and Humidity Models)</b>	10% to 90% RH at 73°F (23°C)
<b>Humidity Accuracy (Temperature and Humidity Models)</b>	$\pm 3\%$ RH across the Range of 20% to 80% RH, $\pm 6\%$ RH across the Range of 10% to 20% RH and 80% to 90% RH; within the Temperature Range of 55 to 85°F (13 to 29°C)
<b>PIR Occupancy Sensor Motion Detection (Models with PIR Occupancy Sensor)</b>	Minimum 94 Angular Degrees up to a Distance of 15 ft (4.6 m); Based on a Clear Line of Sight
<b>Materials</b>	NEMA 1 White Plastic Housing
<b>Mounting</b>	Screw Mount or Double-Sided Adhesive Foam Tape Mount; Double-Sided Adhesive Foam Tape Included
<b>Compliance</b>	<p><b>United States:</b> Transmission Complies with FCC Part 15.247 Regulations for Low Power Unlicensed Transmitters Transmitter FCC Identification: TFB-MATRIXL or OEJ-WRZRADIO</p> <p><b>Canada:</b> Industry Canada IC: 5969A-MATRIXL or 279A-WRZRADIO</p> <p><b>Europe:</b> CE Mark – Johnson Controls declares that this product is in compliance with the essential requirements and other relevant provisions of the R&amp;TTE Directive.</p> <p><b>Japan:</b> Transmission Complies with Article 38-24 Paragraph 1 of the Radio Law Certification Number: ATCB012834</p> <p><b>Australia and New Zealand:</b> RCM Mark, Australia/NZ Emissions Compliant</p>
<b>Shipping Weight</b>	0.3 lb (0.14 kg)

The performance specifications are nominal and conform to acceptable industry standard. For application at conditions beyond these specifications, consult the local Johnson Controls office. Johnson Controls shall not be liable for damages resulting from misapplication or misuse of its products.

**United States Emissions Compliance**

**Compliance Statement (Part 15.19)**

*This device complies with Part 15 of the FCC Rules. 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.*

**Warning (Part 15.21)**

*Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.*

**RF Exposure (OET Bulletin 65)** *To comply with FCC RF exposure requirements for mobile transmitting devices, this transmitter should only be used or installed at locations where there is at least 20cm separation distance between the antenna and all persons.*

**Canadian Emissions Compliance**

**Industry Canada Statement**

*The term IC before the certification/registration number only signifies that the Industry Canada technical specifications were met.*

*Le terme « IC » précédant le numéro d'accréditation/inscription signifie simplement que le produit est conforme aux spécifications techniques d'Industry Canada.*



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