

EnergyZero Wireless Motion and Temperature Receiver

Wireless Motion and Temperature Receiver

Thank you for purchasing this device. In order to properly and safely utilize this device, please take a moment to read this manual and keep it in a safe place for future reference.

The primary function of this device is to receive radio signal from the wireless motion and temperature sensor and control the Packaged Terminal Air Conditioner unit (PTAC).

Product Overview

EnergyZero Wireless Motion and Temperature Receiver is designed to receive radio signal from the EnergyZero Wireless Sensor and control the PTAC unit in hotels and motels. The receiver controls the PTAC unit by turning the PTAC "ON" or "OFF" depending on the command from the sensor.

Installation Guide

It is strongly recommended that the installation of the receiver unit be performed by a professional. Most PTAC units use high voltage electricity, and to avoid injury, it is advised that the installation be done by licensed expert.

Plug In Type PTAC:

Prior to installation, make certain that the plug and receptacle combination of the cord of the PTAC unit matches with EnergyZero Wireless Receiver. For example, if the PTAC is 208/230V, 20Amp, then the plug and receptacle combination of the cord is NEMA6-20P.R. Use NEMA6-20 type receiver (EnergyZero Wireless Receivers have various cords to match any cords). Please refer to table 1 for different types of cords.

| | |
|--------------|--------------|
| NEMA6-15P.R. | NEMA7-15P.R. |
| NEMA6-20P.R. | NEMA7-20P.R. |
| NEMA6-30P.R. | NEMA7-30P.R. |

Table 1 (NEMA cord configuration Compatible with Wireless Receiver)

Once the cords of the PTAC unit and EnergyZero Wireless Receiver are matched, cut the power supply to the PTAC unit. Locate the plug from the PTAC unit and unplug it. Attach the EnergyZero Wireless Receiver inside the PTAC unit, if there is enough space. If there is no space inside the PTAC unit, then attach the PTAC unit underneath the PTAC unit. Insert the plug of the EnergyZero Wireless Receiver into

the receptacle in the wall. Then, insert the plug of the PTAC unit into the receptacle of the EnergyZero Wireless Receiver. The installation of the receiver unit is now complete. (See Figure 1)

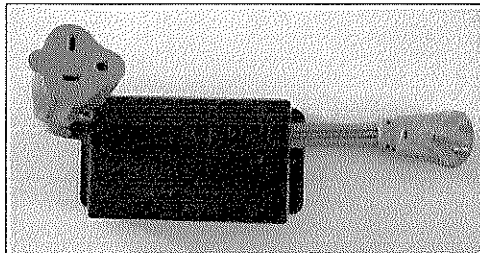


Figure 1 (Plug In Type Wireless Receiver)

Hardwire Type PTAC:

Prior to installing the EnergyZero Wireless Receiver unit to a hardwire type PTAC unit, make certain to cut off power supply to the PTAC unit. Once power supply is cut off, locate the main power line to the PTAC unit and cut it. Then, attach the hardwire type EnergyZero Wireless Receiver (see Figure) to the main power line to the PTAC unit. Resume the power supply to the PTAC unit. The installation is complete. (See Figure 2)

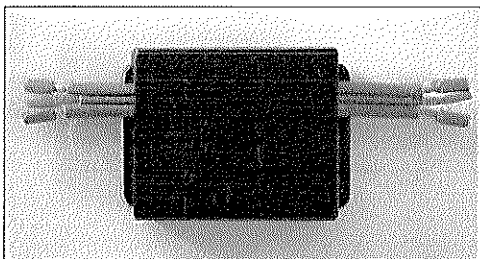


Figure 2 (Hardwire Type Wireless Receiver)

Communicating with EnergyZero Wireless Sensor

Once installation of the EnergyZero wireless receiver is complete, resume power supply to the PTAC unit. This will automatically turn the receiver on. Once power supply is resumed, the green LED lamp on the receiver will blink continuously (during this stage, turn the power of the EnergyZero Wireless Sensor on as well). When EnergyZero wireless receiver locates the EnergyZero Wireless Sensor, the green LED lamp will then become solid and stay lit. The proper communication with the EnergyZero Wireless Sensor has been established. The EnergyZero Wireless Receiver is ready to receive radio signal from the EnergyZero Wireless Sensor.

Device Specification

Operational Voltage: 180 – 280 VAC

Switched Current: 30 Amp

Dimensions: 2.8 X 4.9 X 1.2 (Length X Width X Profile)

EnergyZero Wireless Motion and Temperature Sensor

Wireless Motion and Temperature Sensor

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The primary function of this device is to detect motion in the area within its detection range. The device also reads temperature in a given space.

Product Overview

EnergyZero Wireless Motion and Temperature Sensor unit is a device designed to save energy in hotels and motels. EnergyZero Wireless Sensor, once installed properly, will constantly monitor the occupancy of the room as well as the temperature of the room. The sensor essentially keeps the room in comfortable condition, while eliminating unnecessary use of air conditioner and/or heater, ultimately saving electricity.

Product Components (See Figure 1)

Wireless Sensor – 1 each

Base – 1 each

Screw – 2 each

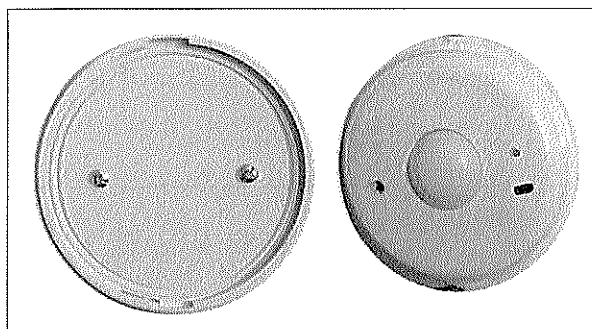


Figure 1 (Components)

Communication with EnergyZero Wireless Receiver

To establish proper communication between EnergyZero Wireless Sensor and EnergyZero Wireless Receiver, the EnergyZero Wireless Receiver must be installed first. Please refer to the Receiver Manual for installation guide.

Once EnergyZero Wireless Receiver is properly installed and turned on, turn the EnergyZero Wireless Sensor on by setting the power switch (located inside of the sensor) to the "ON" position.

The red LED lamp will blink continuously (this is normal because the sensor is trying to locate the receiver in this stage). Once the EnergyZero Wireless Sensor locates the EnergyZero Wireless Receiver, the red LED will turn solid and stay lit. The communication with the EnergyZero Wireless Receiver is now complete.

Installation Guide

It is recommended that this device be installed on the ceiling. Installing on the ceiling ensures maximum range of detection in all directions.

Once communication with the EnergyZero Wireless Receiver is established, detach the sensor from its base. Attach the base to the ceiling using the two screws provided. (See Figure 2)

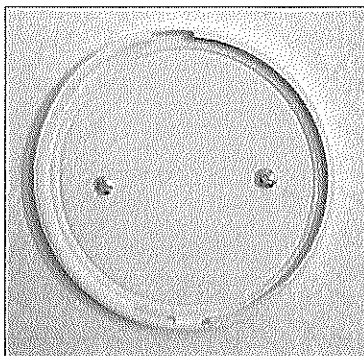


Figure 2 (Base attached to the ceiling)

After the base is firmly attached to the ceiling, attach the sensor to the base. Installation of the sensor unit is complete (See Figure 3)

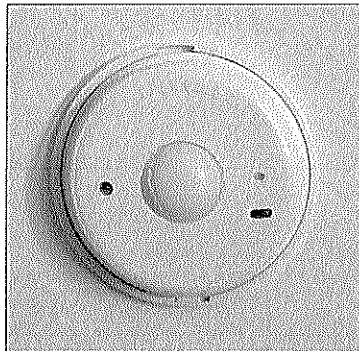


Figure 3 (Sensor attached to the Base)

Changing Battery

This device operates on 1 Lithium CR123A battery. Under normal operating condition, this battery will last approximately 5 years.

When the device is running under low battery power, the red LED will blink 10 times. First, detach the sensor from the base. Locate the power switch inside the sensor, then turn the switch to "OFF" position. Once the power is turned off, remove the battery and replace with a new one. Turn the power switch back to "ON" position and attach the sensor to the base. The red LED will blink until the device successfully communicates with the EnergyZero Wireless Receiver. Once communication with the EnergyZero Wireless Receiver is properly established, the red LED will turn solid and remain lit. Changing battery is now complete.

Device Specification

Sensor Detection Range: 30 feet in diameter

Temperature Reading Range: 32 to 122 degrees Fahrenheit

Sensor Detection in Degrees: 120

Battery: CR123A

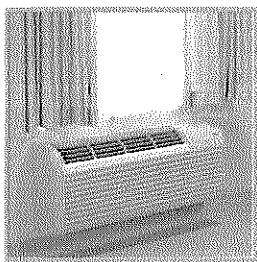
Size: 4.5 X 4.5 X 1.3 inches (Diameter X Diameter X Profile)

EnergyZEROTM

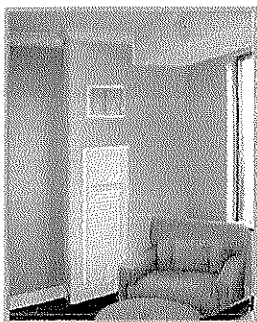
Dedicated to Saving Energy in Life

● Overview

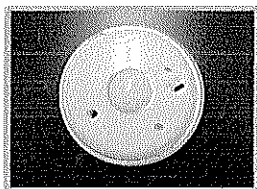
The newly designed EnergyZERO by Green Technology Solutions, Inc. is an advanced controller for use in rooms with packaged terminal air conditioner (PTAC) units. EnergyZERO controls a PTAC unit based upon a room's occupancy as well as temperature, using a wireless radio link to communicate with the EnergyZERO's own occupancy sensor to determine whether or not a room is occupied.



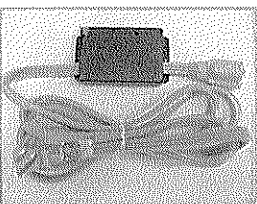
EnergyZERO represents significant advances in versatility, durability, and overall performance. The technologically advanced EnergyZERO incorporates key design innovations, including compatibility with a wide range of PTAC equipment and radically enhanced battery life.



EnergyZERO comes with both the sensor and the receiver, which could easily be mounted on a variety of PTAC units. During occupancy, the sensor detects movement and sends radio signal to receiver every 10 minutes. The receiver then controls PTAC unit to maintain the set temperature in the room. During vacancy, the sensor sends a power off signal to the receiver every 50 minutes.



EnergyZERO also has temperature sensing ability. The sensor is set to send radio signal to the receiver every 10 minutes if the temperature of the room is below 64 degrees Fahrenheit or above 86 degrees Fahrenheit. This will trigger the PTAC unit to operate to bring the temperature within optimal range. When the temperature of the room is between 64 and 86 degrees Fahrenheit, EnergyZERO sends signal every 50 minutes to halt the operation of the PTAC unit, limiting unwanted usage.

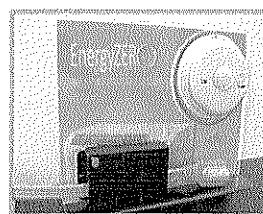


● Technological Advances

EnergyZERO boasts powerful technological advantages against today's controllers. EnergyZERO controller's communications have been radically enhanced with a dedicated port for high speed communication. Flexible mounting options provide easy installation and free of obstruction.

Users can also access more run-time statistical data for enhanced performance analysis, spanning a wide range of parameters, such as heating and cooling status, room occupancy patterns, and the status of the wireless communications with the sensors.

EnergyZERO is above and beyond what conventional occupancy sensors do. EnergyZERO senses both occupancy and temperature of the room, thus greatly upgrading the effectiveness and increasing the energy saving. In addition, EnergyZERO has the longest battery life than any other similar controllers in the market today. The need to change battery won't occur until approximately 5 years after the initial use of the controllers.

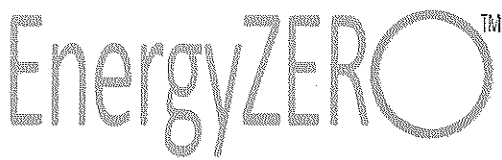


● Maintaining Optimal Condition

The most frequent issues encountered by the user is the recovery time from vacancy. Most controllers shuts the PTAC unit if sensors pick up no movement in the room. This leaves the temperature of the room to freely rise in the summer and drop in the winter. When the occupant returns and the PTAC is turned on again, it still requires unnecessarily long time to bring the temperature into the optimal range.

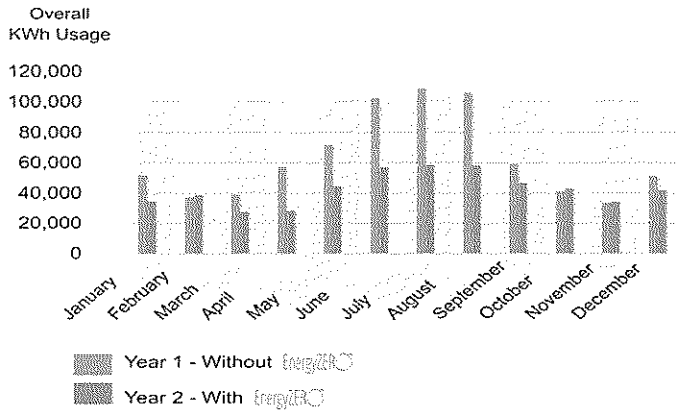
EnergyZERO solves this problem by maintaining the room temperature within the optimal range while using far less energy to do so. The technology to control both the occupancy and temperature gives the user peace of mind that there is no more need for recovery time.

The studies continuously indicate that the number one culprit in energy consumption is the PTAC units in commercial buildings, including hotels and motels. The occupants do not usually care to turn off air conditioner or heater during their time outside. The burden rests solely on the owners to pay the high costs of energy. EnergyZERO drastically reduces the energy needed to maintain comfortable environment for the occupants.



Dedicated to Saving Energy in Life

Energy Savings with EnergyZERO



The above graph shows the energy usage in dollars for a mid-sized hotel room in Las Vegas, NV for a typical year.

The savings reflected by installation of EnergyZERO is based on the savings rate of \$0.12 per Kwh.

The savings in February, October, and November varied due to increased loads and yearly temperature fluctuations.

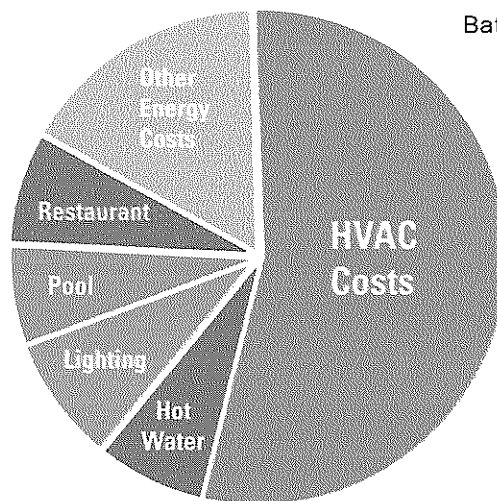
This circle graph illustrates the energy usage breakdown by contributing factors.

The HVAC/PTAC by far contributes the most to the total energy use in a typical setting, much of which is wasted on unoccupied rooms.

EnergyZERO provides several cost effective strategies including preventing excess heating and cooling of unoccupied rooms.

With installation of EnergyZERO controllers and occupancy sensors in 200 guest rooms, anticipated energy savings could be more than \$40,000 annually.

Calculation based on a rate of \$0.12 per Kwh. Actual savings may vary depending on occupancy rates, local climate, and other factors.



Key Features and Tangible Benefits

Features

Compatible with a wide range of HVAC/PTAC equipment

Field Programmable

Humidity Control

Optional setpoint limits

Simple, non-disruptive installation

Wireless feature eliminates need for complicated wiring

Longest battery life of any similar devices

One year standard warranty

Benefits

Energy savings of typically 30% or more in HVAC/PTAC runtime

Ensures comfortable temperature in the room without the required Recovery Time

Battery life of 5 years or longer

Quick, simple wireless installation

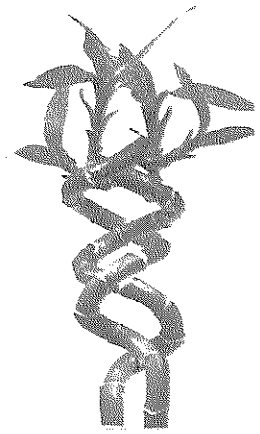
Minimum maintenance, if at all

Reduced wear and tear on HVAC/PTAC

EnergyZERO is an in-room energy management system that saves energy usage, minimizing the energy footprint of buildings.

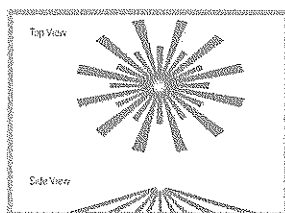
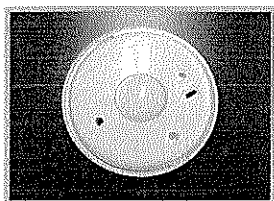
EnergyZERO uses sophisticated occupancy detection, along with equally sophisticated temperature detection, to reduce the amount of wasted HVAC/PTAC usage in rooms when they are not occupied.

The temperature sensor function allows the rooms to stay comfortable during vacancy, thus eliminating the possible discomfort by the guests upon their return.



EnergyZERO™

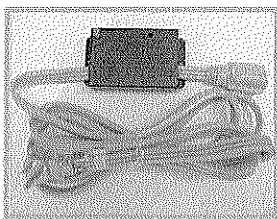
Dedicated to Saving Energy in Life



• Technical Specifications

| Parameter | Limits | Unit | Comments |
|-----------------------------|-----------------|----------|-------------------------|
| Operational Voltages | 3 | VDC | |
| Input Current | 28 | uAmp | |
| Output Power | 1 | mW ERP | FCC part 15 |
| Frequency | 311 | MHz | AM Modulation |
| BAUD Rate | 1,000 | BPS | |
| Detection Range | 30 | Feet | Sensing Area's Diameter |
| Radio Range | 40 | Feet | |
| Battery | 1 | CR123A | Lithium-ion |
| Battery Life Time | 5 | Year | Diameter x Profile |
| Temperature Detection Range | 32 ~ 122 | Degree F | |
| Operational Range | 64 ~ 86 | Degree F | |
| Dimensions | 4.5 x 4.5 x 1.3 | Inches | |

* Technical specifications are subject to change at any time



• Technical Specifications

| Parameter | Limits | Unit | Comments |
|----------------------|-----------------|--------|-----------------|
| Operational Voltages | 90 ~ 240 | VAC | |
| Switched Current | 30 | Amp | |
| Dimensions | 2.8 x 4.9 x 1.2 | Inches | L x W x Profile |

* Technical specifications are subject to change at any time

FCC Information

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 interface, and
- (2) This device must accept any interference received, including interference that may cause undesired operation.

Note: This equipment has been tested and found to comply with the limits for CLASS B digital device, pursuant to Part 15 of 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 instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try correct the interference by one or more of the following measures:

- 1.1. Reorient or relocate the receiving antenna.
- 1.2. Increase the separation between the equipment and receiver.
- 1.3. Connect the equipment into an outlet on a circuit different from that to which receiver is connected.
- 1.4. Consult the dealer or experienced radio/TV technician for help.

WARNING

Changes or modifications not expressly approved by the manufacturer could void the user's authority to operate the equipment.