Overview

Line voltage wall switch occupancy sensors are electronic devices. As such, they require a power source. In a typical line voltage powered device, such as an Ultrasonic or Dual Technology Sensor, the power source is derived from the potential voltage and current available between line (hot) and neutral conductors. In some wall switch applications a neutral conductor is not always available.

Technical Details

A typical line voltage wall switch occupancy sensor contains electronic circuitry. Sensing circuitry is required to perform passive infrared (PIR) or ultrasonic sensing functions to detect motion. In dual technology sensors both sets of circuitry are present. Sensors also contain microprocessor based control circuitry to govern operation of the sensor as well as relays and their associated coil driver circuitry to switch loads on and off. All of these electronic circuits require a power source to function. In a line voltage application the power for this system can be derived from line and neutral. The power required for the sensor electronics is negligible relative to the power consumed by the load. Use of a neutral conductor provides the most flexibility in terms of sensor system design and functionality as this approach yields ample power for the sensor. A neutral conductor is not always available, especially in retrofit applications. For these applications wall switch sensors are available that are able to function without the use of a neutral conductor. These sensors derive their power source from the potential between line and earth ground.

Wiring Examples

ONW-D-1001-DMV-N-*, 120 to 277 VAC dual level single circuit with neutral

ONW-D-1001-DMV-*, 120 to 277 VAC dual level single circuit no neutral

Conclusion

For new construction or locations with a neutral, the standard, neutral versions should be selected. In instances where existing sites do not provide access to neutral conductors, select sensors that do not require a neutral.