

Mechanically Held Relays

Product: Occupancy Sensors, Power Packs, Relays

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Summary: This document defines mechanically held relays found in line voltage occupancy sensors and power packs.

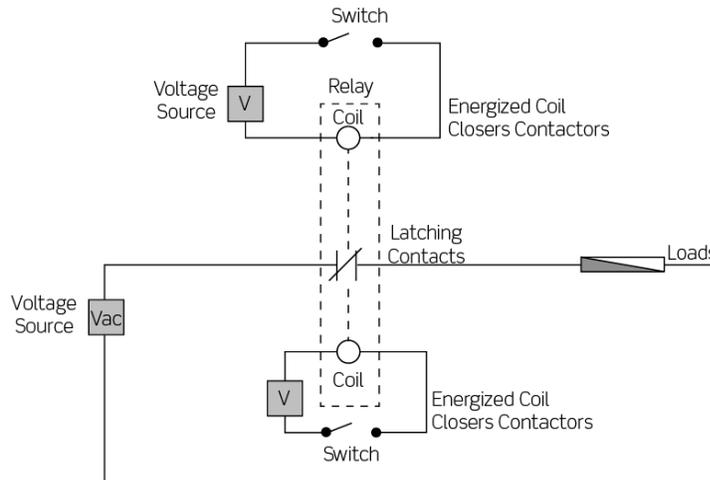
Information: Leviton occupancy sensor and power packs are relay type devices used for automatically turning lights OFF while meeting or exceeding all codes and standards for lighting circuits. When designing emergency lighting, additional requirements or products may be required.

Occupancy sensor systems typically consist of electronic devices with a few mechanical parts that wear out over time. The relay, located in line voltage occupancy sensors, is the primary mechanical device that can potentially degrade over time as it switches line voltage ON and OFF.

Leviton cycle tests its relay devices in excess of UL requirements. Some devices, specifically Provolt™, were tested to over 100,000 cycles which, even under extreme usage conditions of 25+ cycles a day, equating to a minimum 10 years of use, far exceeding warranties and industry standards.

Definition of terms:

- **Fail-Safe:** an engineering term used to describe a fault-tolerant design. A fault-tolerant design enables a system to continue operation, possibly at a reduced level (also known as graceful degradation), rather than failing completely. Fail-safe is also used when discussing power outages and emergency lighting situations and the relay is in a closed state.
- **Fail-to-ON:** a misapplied term with no factual engineering or design use. It is not possible for a manufacturer of a device to assure “fail-to-on” operation to a device as failure modes could come from a variety of factors including: electrical shorts, overcurrents, mechanical failures, tampering, or other component failure modes.
- **Redundant Design:** a system with built-in redundancy to ensure lighting will be ON in cases of expected failure modes. Designing redundant systems is very expensive and only covers the cases designed around. Redundant design practices are rarely necessary nor often applied in lighting systems.
- **Mechanically Held Latching Relays:** electronically operated switches that change state (switch) with a pulsed voltage input to an actuator coil. When the relays have changed state, they remain in that state without continuous application of the actuator voltage. Subsequent return to the original state is caused by additional voltage to the coil. Leviton uses mechanically held latching relays which are more robust than electronically held relays using zero cross technology. This design does not require continuous electrical power to maintain its state and is inherently fault tolerant in the event of power interruption or control circuit failure (as shown below).



Typical Latching – Mechanically Held Relay

Leviton Mechanically Held Relays

- Wall Box Occupancy Sensors: ODS10, ODS0D, ODS15, OSSNL, OSSMT, OSSMD
- Line Voltage Occupancy Sensors/Photocells: Provolt, ODCxx, O3Cxx, O4Cxx, O5Cxx, O6Cxx, PCCxx
- Power Packs: OPP20-xxx, OSP20-RDx
- Fixture Mount Sensors: OSF20, HB011, HBE11, OSFHU, OSFHP, OSFHD
- Relays: RELAY-1Cx, RELAY-2CB
- Power Pack/Control Modules: DRD07, ZL027

The mechanically held latching relay in Leviton devices acts like a standard toggle switch and can “fail” in the ON or OFF positions. When using a low voltage ceiling sensor or corner sensor, the Leviton OPP20 Power Pack uses industry exclusive fail-safe circuitry. In the event of a product failure, the OPP20s return-to-closed capability causes the relay to default to a closed position (ON) for safe operation and alleviates life safety concerns.

Leviton occupancy sensors and power packs have a 5-year warranty, however, the reasonable life of these products under normal use exceeds this warranty period. Leviton adheres to the highest quality and tests the products beyond independent test laboratory (UL/ETL) requirements. Additionally, Leviton sensors and power packs introduced to the market more than 15 years ago are still functioning without issue to this day.

Leviton product life expectancy, under regular usage conditions and approximately 10 cycles per day can exceed the time periods referenced above. However, the useful life of any product is based on numerous factors including, but not limited to, integrity of installation, misuse or abuse, location in branch circuit, location in a facility, environmental factors, etc.

Contact: For more information, contact EMC&A Technical Support at (800) 959-6004.

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