INSTALLER AND INSPECTOR QUICK-REFERENCE: 2025 NRCA-LTI-02-A

Occupant Sensing Lighting Controls

Purpose and Scope of the Test

The purpose of the test is to ensure that occupant sensing controls are functioning properly to achieve the desired lighting control.

Occupant sensing controls are used to automatically turn lights on when a space is occupied, and automatically reduce or turn lighting off when the space is vacated after a pre-set time delay. The time delay will prevent lights from rapidly cycling on and off when spaces are entered frequently but temporarily. It also helps avoid false triggering when there is minimal occupant movement. Other types of occupant sensing controls include vacancy, partial-ON, and partial-OFF:

- Vacancy sensing controls automatically turn lighting off when a space is unoccupied but require lights to be turned on manually when the space is occupied.
- Partial-ON occupant sensing controls automatically turn lighting off when a space is unoccupied and automatically turns on part of the lighting load when the space is occupied.
- Partial-OFF occupant sensing controls automatically reduce lighting load when the space is unoccupied and automatically turns lighting on when the space is occupied.

Occupant sensing controls reduce energy waste by ensuring that lighting is off or reduced when not needed.

Test Trigger

This test is required when occupant sensing controls are installed in nonresidential and hotel/motel buildings, and multifamily building common use areas. All installed indoor lighting must be controlled by shut-off controls. Sections 130.1(c)1, 130.1(c)5-130.1(c)6, 130.4(a), 160.5(b)4Ci,160.5(b)4Cv-160.5(b)4Cvi, and 160.5(e)1 require occupant sensing controls for specified space types.

Relevant Energy Code References and Required Compliance Documents

Title 24, Part 6 of the California Building Standards Code, Building Energy Efficiency Standards (Energy Code) sections 130.1(c)1, 130.1(c)5–6, 130.4(a), 160.5(b)4Ci, 160.5(b)4Cv–vi, 160.5(e)1; Reference Nonresidential Appendix NA7.6.2; NRCC-LTI-E, LMCC-LTI-E.

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Who Can Perform the Test

This test must be performed by an Acceptance Test Technician certified by a California Energy Commission approved Acceptance Test Technician Certification Provider, using compliance document NRCA-LTI-02-A.

Required Tools

This test verifies the functionality of installed occupant sensing controls visually and does not require special instrumentation.

Estimated Time to Complete Test

Construction inspection: 0.25 to 0.5 hours (depending on visual and audible inspection requirements).

Functional testing: 0.5 to 1 hours (depending on necessity to adjust time delay or mask sensor to prevent false triggers).

Potential Issues and Cautions

It is important that the test be performed at a time when the acceptance test technician can have full control over the occupancy of the space.

The time delay can be adjusted to minimize test time, but the time delay setting must be reset (to a time not to exceed 20 minutes) upon completion of the test.

Detection of air movement from a heating, ventilation, and air conditioning (HVAC) diffuser or other source can cause the sensor to turn the lights on (especially with ultrasonic sensors). This can be avoided by ensuring that the occupant sensing control is located away from diffusers per applicable manufacturer instructions.

If motion in an adjacent area is causing an unwanted trigger, the technician may adjust the coverage pattern intensity or mask the sensor with an opaque material.

Inspection Enforcement

Required:

- Verify that the construction inspection and functional testing items on NRCA-LTI-02-A are marked with "Complies."
- Verify the contact information of the acceptance test technician is complete with the acceptance test technician certification identification.
- **Verify all control zones in offices greater than 250 square feet are shown on the plans.**

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Inspection Enforcement (cont.)

- Verify that all declaration statements on the last page of the NRCA-LTI-02-A are complete and that the document is signed.
- All NRCA forms for Lighting Controls must have a water mark logo from a certified Lighting Controls ATTCP Provider.

Acceptance Criteria

Occupant sensing lighting control is installed per manufacturer's instructions to minimize false triggering.

Status indicator or annunciator operates correctly.

Occupied Test:

- Occupant sensing control turns controlled lighting on immediately.
- Vacancy sensing control requires the occupant to manually switch controlled lighting on.
- Partial-ON occupant sensing control activates between 50-70 percent of the controlled lighting power and the occupant has the ability to manually activate 100 percent of the controlled lighting power.

Unoccupied Test:

- Occupant sensing control reduces or turns controlled lighting off at the pre-set time delay.
- Partial-OFF occupant sensing controls reduce controlled lighting power by at least 50 percent.
- The programmed maximum time delay is not greater than 20 minutes.
- Occupant sensing lighting control is installed per manufacturer's instructions to minimize false triggering such as to install an occupancy sensor away from HVAC diffusers to avoid probable false triggering.

Multi-zone occupant sensing lighting controls (in offices larger than 250 ft^2):

- The area of control zones are 600 square feet or less.
- When a control zone is unoccupied, the occupant sensor reduces lighting in the controlled zone by at least 80 percent at the pre-set time delay.
- When all control zones are unoccupied, occupant sensing controls turns controlled lighting OFF at the pre-set time delay.

Follow the **Construction Inspection** and **Functional Testing** instruction on NRCA-LTI-02-A.