

# Lighting Controls and Automation

2021 VRC/VECC Update Guide



## 2021 Code Requires More Dimmers and Automation for Lighting:

**Summary:** The 2021 Virginia Residential Code introduces requirements for both interior and exterior lighting controls, with some exceptions for safety. Additionally, it modestly increases the requirement for high efficacy light sources from 90% to 100%. Kitchen appliances are not included in that.

**Why:** Having essentially maximized the savings available from light sources, the next area to further improve energy efficiency in this area is lighting controls. Keeping exterior lights from being on during daylight hours and rooms from being illuminated when no one is in them are ways to further reduce energy usage.

### How to Meet N1104.2 (R404.2) Interior Lighting Controls

Any interior permanently installed light fixture will now require a dimmer, occupant sensor, or similar control to help minimize energy usage. The following are exceptions:

- Bathrooms
- Hallways
- Lighting designed for safety or security

### How to Meet N1104.3 (R404.3) Exterior Lighting Controls

While exterior lights are exempt from the dimmer and occupant sensor requirement, these fixtures will require a photocell or a dusk-to-dawn controller if the exterior lighting totals 30 watts or more of permanently installed lamps. Some controllers can be overridden. This is only allowed if the device returns to its normal operations within 24 hours.

If just a porch light or two is installed, there may be less than 30 watts total in exterior lighting power and the home may be exempt from this provision. In most cases, adding a flood light will push the total over 30 watts and these requirements will apply.

## 2021 VRC/VECC Code References:

**N1104.1 (R404.1) Lighting equipment.** All permanently installed lighting fixtures, excluding kitchen appliance lighting fixtures, shall contain only high-efficacy lighting sources.

**N1104.1.1 (R404.1.1) Exterior lighting.** Connected exterior lighting for Group R-2, R-3 and R-4 buildings shall comply with Section C405.4 of the International Energy Conservation Code—Commercial Provisions.

**Exceptions:**

1. Detached one- and two-family dwellings.
2. Townhouses.
3. Solar-powered lamps not connected to any electrical service.
4. Luminaires controlled by a motion sensor.

**N1104.1.2 (R404.1.1) Fuel gas lighting equipment.** Fuel gas lighting systems shall not have continuously burning pilot lights.

**N1104.2 (R404.2) Interior lighting controls.** Permanently installed lighting fixtures shall be controlled with a dimmer, an occupant sensor control or another control that is installed or built into the fixture.

**Exception:** Lighting controls shall not be required for the following:

1. Bathrooms.
2. Hallways.
3. Exterior lighting fixtures.
4. Lighting designed for safety or security.

**N1104.3 (R404.3) Exterior lighting controls.** Where the total permanently installed exterior lighting power is greater than 30 watts, the permanently installed exterior lighting shall comply with the following:

1. Lighting shall be controlled by a manual on and off switch that permits automatic shut-off actions.

**Exception:** Lighting serving multiple dwelling units.

2. Lighting shall be automatically shut off when daylight is present and satisfies the lighting needs.
3. Controls that override automatic shut-off actions shall not be allowed unless the override automatically returns automatic control to its normal operation within 24 hours.

**Definitions:**

**AUTOMATIC.** Self-acting, operating by its own mechanism when actuated by some impersonal influence, as, for example, a change in current strength, pressure, temperature or mechanical configuration (see "Manual").

**DIMMER.** A control device that is capable of continuously varying the light output and energy use of light sources.

**HIGH-EFFICACY LIGHT SOURCES.** Any lamp with an efficacy of not less than 65 lumens per watt, or luminaires with an efficacy of not less than 45 lumens per watt.

**LABELED.** Equipment, materials or products to which have been affixed a label, seal, symbol or other identifying mark of a nationally recognized testing laboratory, approved agency or other organization concerned with product evaluation that maintains periodic inspection of the production of such labeled

items and whose labeling indicates either that the equipment, material or product meets identified standards or has been tested and found suitable for a specified purpose.

**LISTED.** Equipment, materials, products or services included in a list published by an organization acceptable to the code official and concerned with evaluation of products or services that maintains periodic inspection of production of listed equipment or materials or periodic evaluation of services and whose listing states either that the equipment, material, product or service meets identified standards or has been tested and found suitable for a specified purpose.

**MANUAL.** Capable of being operated by personal intervention (see “Automatic”).

**OCCUPANT SENSOR CONTROL.** An automatic control device that detects the presence or absence of people within an area and causes lighting, equipment or appliances to be regulated accordingly.

