



What Are Residential Indoor and Outdoor Lighting Requirements?

Residential indoor and outdoor lighting technologies regulated by California’s Building Energy Efficiency Standards (Title 24, Part 6 or Energy Code) include luminaires, high-efficacy luminaires, vacancy/occupancy sensors and switching controls. The requirements in this fact sheet apply to residential, single-family buildings and multifamily buildings that are three stories or less. Residential lighting requirements also apply to residential spaces in nonresidential buildings, including dwellings in high-rise residential buildings, guestrooms of hotels/motels, and dwelling spaces of fire stations, dormitories and senior housing.

Know Your Project – Key Terms

- **Additions:** Includes any addition of new conditioned square footage and volume, where new luminaires are installed
- **Alterations:** Includes modifications where luminaires are replaced via a building permit through Authority having Jurisdiction (AHJ)
- **Permanently Installed Lighting:** Includes hard wired ceiling luminaires, chandeliers, vanity lamps, wall sconces, under-cabinet luminaires, luminaires in drawers/cabinets, night lights, step and path lights, and any other luminaire that is attached to the building, or buildings, on the property
- **Vacancy Sensor:** A manual-on/automatic-off lighting control, which includes a manual-off option
- **Occupancy Sensor:** Is allowed when it is programmed to function like a vacancy sensor (manual-on) for final inspection
- **Low-Rise Multifamily:** Residential building with ≥ 3 dwelling units and ≤ 3 habitable stories above grade
- **High-Rise Multifamily:** Residential building with ≥ 3 dwelling units and > 4 habitable stories above grade

Why? The California Energy Commission estimates that in California, lighting accounts for 22% of residential electricity use. The Energy Code for residential lighting is designed to increase the use of efficient technologies in order to decrease this consumption.

Relevant Code Sections

2019 California Building Energy Efficiency Standards, Title 24, Part 6:

- [Section 110.9](#) – Mandatory Requirements for Lighting Controls
- [Section 130.0\(b\)](#) – Nonresidential, High-rise Residential, and Hotel/Motel Occupancies - Functional Areas where Compliance with the Residential Lighting Standards is Required
- [Section 130.0\(c\)](#) – Luminaire Classification and Power
- [Section 130.0\(d\)](#) – Lighting Controls
- [Section 130.0\(e\)](#) – Energy Management Control System (EMCS) (when applicable)
- [Section 150.0\(k\)](#) – Mandatory Features and Devices, Residential Lighting
- [Joint Reference Appendix JA8](#) – Qualification Requirements for High Efficacy Light Sources
- [Joint Reference Appendix JA10](#) – Test Method for Measuring Flicker of Lighting Systems
- [Residential Compliance Manual, Chapter 6](#) – Residential Lighting

Relevant Compliance Forms

Certificate of Installation:

When HERS measures are required, the CF2R must be created on a HERS provider website to be registered. This is required for all forms associated with a project that has any HERS measures.

When HERS measures are NOT required, these forms can be used:

- [CF2R-LTG-01-E](#) – Certificate of Installation, Lighting - Single Family Dwellings
- [CF2R-LTG-02-E](#) – Certificate of Installation, Lighting - Multifamily Dwellings

For more on HERS requirements, see the Energy Code Ace [2019 HERS Fact Sheet](#).

Compliance Requirements

All residential lighting requirements are Mandatory requirements. There are no tradeoffs between lighting and other building features. For compliance with the Energy Code and Title 20, the Energy Commission maintains a database of appliances and other devices which have been certified to the Energy Commission, including qualifying high efficacy luminaires called the [Modernized Appliance Efficiency Database System \(MAEDbS\)](#). You may search the [MAEDbS](#) for certified products.



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Mandatory Requirements

Luminaires: Section 150.0(k)

- All permanently installed lighting, including lighting integral to exhaust fans, unless part of a kitchen exhaust system, must meet these requirements
- Installed luminaires must be classified as high efficacy for compliance per [Table 150.0-A](#)
- Recessed Downlight Luminaires in Ceilings: Luminaires recessed into ceilings must not contain screw base sockets and must meet the following requirements:
 - Use a rated zero clearance insulation contact and airtight can (ICAT) using a gasket or caulk between luminaire housing and ceiling and for all air leak pathways between conditioned and unconditioned spaces
 - Allow ballast or driver maintenance and replacement to be readily accessible from below the ceiling for luminaires with hardwired ballasts or drivers
 - Contain light sources that are [JA8](#) certified
- Night lights, step lights and path lights, and light sources in drawers, cabinets and linen closets:
 - If consuming no more than 5 watts of power and emitting no more than 150 lumens, neither [JA8](#) luminaires nor vacancy/occupancy sensors are required
 - If consuming over 5 watts or emitting more than 150 lumens, [JA8](#) luminaire and vacancy/occupancy sensors are required
- Screw base luminaires must not be recessed and must meet high-efficacy requirements of [JA8](#)
- If separable light sources are installed in an enclosed or recessed application, they must be marked “JA8-2016-E,” indicating they are certified as meeting the elevated temperature requirements of [JA8](#)

Ballasts

- Ballasts for fluorescent lamps ≥ 13 watts must be electronic with an output frequency ≥ 20 kHz

For more information on the [JA8](#) qualification requirements, see the [Energy Code Ace fact sheets on High Efficacy Lighting for Manufacturers](#), and [Title 20 and Title 24, Part 6 JA8: Key Differences and Overlap](#).

Luminaire Efficacy Classification (JA8)

All installed luminaires must meet the requirements in [Table 150.0-A](#). Table 1, below, outlines these requirements.

	Automatically High Efficacy	Using JA8 Certified Lamps (JA8-2016-E must be used for enclosed lamps/luminaires)
Indoor	<ul style="list-style-type: none"> • Pin-based linear fluorescent • Pin-based compact fluorescent • Inseparable SSL luminaires with colored light sources for decorative lighting purpose 	<ul style="list-style-type: none"> • LED luminaires with white integral sources that are not decorative • Screw base LED lamps • Pin-based LED lamps
Outdoor	<ul style="list-style-type: none"> • Pulse-start metal halide light sources • High pressure sodium light sources • Luminaires with hardwired high frequency generator and induction lamp • LED light sources that are installed outdoors 	<ul style="list-style-type: none"> • Recessed/recessed ceiling downlights or enclosed lights that are not screw base, and that use an ICAT-rated can • Any light source not otherwise listed

Table 1: High Efficacy Light Source Classification (derived from [Table 150.0-A](#))

Controls: Sections 110.9(b) and 150.0(k)

In addition to the requirements of Section 150.0(k), the controls must meet the minimum requirements for control functionality of all applicable controls per Section 110.9.

Required Lighting Controls				
All installed luminaires must be high efficacy that are permanently installed or integral to a luminaire exhaust fan or ceiling fan. Portable lighting (plugged in) is not subject to these requirements.				
Location	Control Requirements			Special Considerations
	Vacancy Sensor	Dimmer	On/Off Switch	
Bathroom	At least one luminaire in each of these rooms must be controlled with vacancy/occupancy sensor, no matter the luminaire source type	<ul style="list-style-type: none"> JA8 light sources must be controlled with either dimmer, vacancy sensor or occupancy sensor "Automatically" high efficacy luminaires can be controlled with either on/off switch, vacancy/occupancy sensor or dimmer 	<ul style="list-style-type: none"> On/Off switch must be readily accessible wall-mounted manual controls, allowing occupants easy control of lighting in the space Ceilings fans with integral lighting can be controlled with remote control 	<ul style="list-style-type: none"> Exhaust fans must be controlled separately from lighting Undercabinet lighting must be switched separately from ceiling mounted luminaires in a manor in which only one or the other are on at the same time EMCS can be used if required code control requirements are met, and complies with §130.4 EMCS requirements Dimmers and vacancy/occupancy sensor functions, required by code, must not be bypassed If multiscene programmable controllers are used, they must meet dimmer requirements of §110.9 and §150.0(k)
Laundry/Utility				
Garage (attached or unattached)				
Kitchen	<ul style="list-style-type: none"> JA8 light sources to be controlled with dimmer, vacancy sensor or occupancy sensor "Automatically" high efficacy can be controlled with either on/off switch, dimmer, vacancy sensor or occupancy sensor 	<ul style="list-style-type: none"> JA8 light sources must be controlled with either dimmer, vacancy sensor or occupancy sensor 	<ul style="list-style-type: none"> On/Off switch must be readily accessible wall-mounted manual controls, allowing occupants easy control of lighting in the space Ceilings fans with integral lighting can be controlled with remote control 	<ul style="list-style-type: none"> Exhaust fans must be controlled separately from lighting Undercabinet lighting must be switched separately from ceiling mounted luminaires in a manor in which only one or the other are on at the same time EMCS can be used if required code control requirements are met, and complies with §130.4 EMCS requirements Dimmers and vacancy/occupancy sensor functions, required by code, must not be bypassed If multiscene programmable controllers are used, they must meet dimmer requirements of §110.9 and §150.0(k)
All Other: bedrooms, living rooms, office, dining, attic spaces, closets ≥ 70 ft ² , detached storage buildings				
Closets < 70 ft ²				
Hallways				
Blank Electrical Boxes (more than 5 feet above floor)	Each box to be controlled by either vacancy sensor, occupancy sensor, dimmer or fan speed control			No greater than the number of bedrooms
Light Features: night lights, step lights, path lights, and light sources in drawers, cabinets and linen closets	Vacancy sensor(s) or occupancy sensor(s) (and the JA8 requirements) are not required if the luminaire is ≤ 5 watts and emit ≤ 150 lumens			Light sources in drawers, cabinets and linen closets must be equipped with controls that turn off when applicable drawer, cabinet or linen closet is closed
Single Family Outdoors: Lighting attached to home or any other building on property	<ul style="list-style-type: none"> Sensor types allowed include: <ul style="list-style-type: none"> Photocell and motion sensor OR Photocell and time switch OR Astronomical time clock OR EMCS that works like an any of the above Illuminated signs must meet nonresidential sign lighting power requirements §140.8, or use no more than 5 watts 		On/Off switch that allows all other outdoor control functions to work automatically	<ul style="list-style-type: none"> Controls that override to ON are not allowed unless the override automatically reactivates within 6 hours Landscape lighting exempt Lighting not attached to building(s) is exempt

Table 2: Residential Lighting Controls Requirements

Residential Lighting Requirements for Additions & Alterations	
Will Typically Require Compliance	Will Typically Not Require Compliance
<ul style="list-style-type: none"> When adding onto a home, the new areas of the home must meet the applicable requirements When remodeling a home, only the work being done with a permit must meet the applicable requirements <ul style="list-style-type: none"> Existing recessed ceiling luminaires with screw base sockets do not need to be replaced as long as JA8 trim kits/lamps are used 	<ul style="list-style-type: none"> Changing light bulbs Changing lighting controls Replacing lighting fixtures Moving lighting fixtures Spaces not being renovated in a renovation project

Table 3: Residential Lighting Requirements for Additions & Alterations

Low-Rise Multifamily Occupancies: Sections 150.0(k) and 140.7

Figure 1 illustrates when to apply the residential and nonresidential lighting standards for indoor and outdoor lighting for low-rise multifamily buildings.

Dwelling Units	Common Areas ^A & Nonresidential Occupancies ^B	Other
Indoor Lighting <div style="border: 1px solid black; padding: 5px; text-align: center;"> Residential §150 </div>	<div style="display: flex; justify-content: space-between;"> <div style="border: 1px solid black; padding: 5px; text-align: center;"> Total Non-dwelling CFA <20% of Building CFA Residential §150 </div> <div style="border: 1px solid black; padding: 5px; text-align: center;"> Total Non-dwelling CFA ≥20% of Building CFA Nonresidential §§110.9, 130.1, 130.4, 140.6 </div> </div>	<div style="border: 1px solid black; padding: 5px; text-align: center;"> Parking Garage <div style="display: flex; justify-content: space-around;"> <div style="border: 1px solid black; padding: 5px; text-align: center;"> <8 Parking Spaces Residential §150 </div> <div style="border: 1px solid black; padding: 5px; text-align: center;"> ≥8 Parking Spaces Nonresidential §§110.9, 130.1, 130.4, 140.6 </div> </div> </div>
Outdoor Lighting <div style="border: 1px solid black; padding: 5px; text-align: center;"> Controlled Within Dwelling Unit Residential §150 </div>	<div style="border: 1px solid black; padding: 5px; text-align: center;"> Controlled Outside Dwelling Unit <div style="display: flex; justify-content: space-around;"> <div style="border: 1px solid black; padding: 5px; text-align: center;"> <8 Parking Spaces Residential §150 </div> <div style="border: 1px solid black; padding: 5px; text-align: center;"> ≥8 Parking Spaces Nonresidential §§110.9, 130.2, 140.7 </div> </div> </div>	

Figure 1: Low-Rise Multifamily Lighting Standards Application

- A Common Areas: Areas that directly support the residential occupancy (Occupancy Group R), i.e., areas intended for use by the residents of the dwelling units (e.g., lobby, gym, laundry room and sales office for the multifamily dwelling).
- B Nonresidential Occupancies: Occupancies other than dwelling units and common areas in a mixed-use multifamily building.

For more information on the High-Rise Multifamily and Hotel/Motel Occupancy requirements see the [Energy Code Ace High-Rise and Low-Rise Multifamily fact sheet](#).



Forms – Which & When

During Construction

Single Family Buildings

- **CF2R-LTG-01-E** – Lighting - Single Family Dwellings
 - Completed and signed by the responsible person(s) for the lighting construction projects under Division 3 of the Business and Professions Code (note that one or more forms may be required depending upon the lighting and controls covered by an individual person)
 - Completed after the residential lighting has been installed
 - The responsible person(s) must also provide the homeowner with a lighting schedule of installed products

Multifamily Buildings

- **CF2R-LTG-02-E** – Lighting - Multifamily Dwellings
 - Completed and signed by the responsible person(s) for the lighting construction projects under Division 3 of the Business and Professions Code (note that one or more forms may be required depending upon the lighting and controls covered by an individual person)
 - Completed after the residential lighting has been installed
 - The responsible person(s) must also provide the homeowner with a lighting schedule of installed products
- Additional Forms - When nonresidential code sections are triggered, corresponding NRCC, NRCI and NRCA forms may be required
 - Completed and signed by the responsible person(s) for the lighting construction projects under Division 3 of the Business and Professions Code (note that one or more forms may be required depending upon the lighting and controls covered by an individual person)
 - Completed after the nonresidential lighting has been installed
 - The responsible person(s) must also provide the owner with a lighting schedule of installed products

Inspection

For either single-family or multifamily lighting compliance, the inspector should verify that all luminaires are high efficacy and that the required controls have been installed. If dimmers are installed, inspectors should verify that they work appropriately (especially when controlling LED light sources). In addition, the inspector should confirm a luminaire schedule is provided to the building owner.

Why?: To document compliance with lighting requirements applicable to the project.

Certificates of Installation - Submission Guidelines

- A **Certificate of Installation (CF2R)** must be submitted to the building department for any residential lighting project that is regulated by Title 24, Part 6, whether that lighting project is for only one luminaire or for the lighting of an entire building
- An **NRCI** installation certificate is required when nonresidential forms are used
- If an Acceptance Test is required, an **NRCA** form completed by the Acceptance Test Technician (ATT) is required, as well

For More Information

Primary Documents

- Energy Code Section 110.9 – Mandatory Requirements for Lighting Controls
energycodeace.com/site/custom/public/reference-ace-2019/index.html#!Documents/section1109mandatoryrequirementsforlightingcontrols.htm
- Energy Code Section 130.0(b) – Functional Areas where Compliance with the Residential Lighting Standards is Required
energycodeace.com/site/custom/public/reference-ace-2019/index.html#!Documents/section1300lightingsystemsandequipmentandelectricalpowerdistribu.htm
- Energy Code Section 130.0(c) – Luminaire Classification and Power
energycodeace.com/site/custom/public/reference-ace-2019/index.html#!Documents/section1300lightingsystemsandequipmentandelectricalpowerdistribu.htm
- Energy Code Section 130.0(d) - Lighting Controls
energycodeace.com/site/custom/public/reference-ace-2019/index.html#!Documents/section1300lightingsystemsandequipmentandelectricalpowerdistribu.htm
- Energy Code Section 130.0(e) - Energy Management Control System (EMCS)
energycodeace.com/site/custom/public/reference-ace-2019/index.html#!Documents/section1300lightingsystemsandequipmentandelectricalpowerdistribu.htm
- Energy Code Section 150.0(k) – Mandatory Features and Devices, Residential Lighting
energycodeace.com/site/custom/public/reference-ace-2019/index.html#!Documents/section1500mandatoryfeaturesanddevices.htm
- Energy Code Joint Reference Appendix JA8 – Qualification Requirements for High Efficacy Light Sources
energycodeace.com/site/custom/public/reference-ace-2019/Documents/appendixja8qualificationrequirementsforhighefficacylightsources.htm
- Energy Code Joint Reference Appendix JA10 – Test Method for Measuring Flicker of Lighting Systems
energycodeace.com/site/custom/public/reference-ace-2019/Documents/appendixja10testmethodformeasuringflickeroflightingsystemsandrep.htm
- Energy Code Residential Compliance Manual, Chapter 6 – Residential Lighting
energycodeace.com/site/custom/public/reference-ace-2019/Documents/6residentiallighting.htm
- Title 20 Appliance Efficiency Regulations
energycodeace.com/content/reference-ace-t20-tool

California Energy Commission Information & Services

Title 24, Part 6

- Energy Code Hotline: 1-800-772-3300 (Free) or Title24@energy.ca.gov
- Online Resource Center:
www.energy.ca.gov/programs-and-topics/programs/building-energy-efficiency-standards/online-resource-center
 - The Energy Commission’s main web portal for the Energy Code, including information, documents and historical information

Title 20

- Appliances Hotline: (888) 838-1467 or outside California (916) 651-7100
- Questions may also be emailed to Appliances@energy.ca.gov
- California Appliance Efficiency Standards Site:
www.energy.ca.gov/rules-and-regulations/appliance-efficiency-regulations-title-20
- Modernized Appliance Efficiency Database (MAEDbS):
<https://cacertappliances.energy.ca.gov/Login.aspx>

Additional Resources

- California Lighting Technology Center (CLTC) Guides:
 - Residential Lighting: What’s New in the 2019 Title 24, Part 6 Code?
cltc.ucdavis.edu/publication/residential-lighting-whats-new-2019-title-24-part-6-energy-code
 - What’s New in Title 20 Code? Lighting Appliance Efficiency Regulations
cltc.ucdavis.edu/publication/title-20-lighting-appliance-efficiency
- Energy Code Ace:
EnergyCodeAce.com
 - An online “one-stop-shop” providing free resources and training to help appliance and building industry professionals decode and comply with Title 24, Part 6 and Title 20. The site is administered by California’s investor-owned utilities.
Of special interest: Fact Sheets
energycodeace.com/content/resources-fact-sheets/
 - Title 20 and Title 24, Part 6 JA8: Key Differences and Overlap
 - State-Regulated Lamps - Lighting the Way to Efficiency
 - Title 20 Lighting FAQ
 - Residential High Efficacy Lighting for Manufacturers
 - High-rise and Low-rise Multifamily 2019Please register with the site and select an industry role for your profile in order to receive messages about all our free offerings!



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