

Outdoor Lighting Controls

Draft Code Language

Last Updated: March 2017

1. INTRODUCTION

The California Statewide Utility Codes and Standards Team actively supports the California Energy Commission in developing revisions to the 2019 California Building Energy Efficiency Standards (Title 24, Part 6). Our joint intent is to achieve significant energy savings through the development of reasonable, responsible, and cost-effective code change proposals for the 2019 Title 24 code change cycle.

The Statewide Utility Team is proposing code change for Outdoor Controls.

The Statewide Utility Team is requesting feedback on the draft code language presented in this document. Input we receive will inform the code change proposal that the Statewide Utility Team will be proposing to the California Energy Commission in April 2017.

To provide feedback, please email us at info@title24stakeholders.com or contact the measure lead at:

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For more information about the California Statewide Utility Codes and Standards Team's 2019 Title 24, Part 6 advocacy efforts, and the latest information on this code change proposal please visit: www.title24stakeholders.com.

2. DRAFT CODE LANGUAGE

The proposed changes to the Standards, Reference Appendices, and the ACM Reference Manuals are provided below. Changes to the 2016 documents are marked with [underlining](#) (new language) and ~~strikethroughs~~ (deletions).

2.1 Standards

SECTION 100.1 – DEFINITIONS AND RULES OF CONSTRUCTION

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(b) **Definitions.** Terms, phrases, words and their derivatives in Part 6 shall be defined as specified in Section 100.1. Terms, phrases, words and their derivatives not found in Section 100.1 shall be defined as specified in the “Definitions” chapters of Title 24, Parts 1 through 5 of the California Code of Regulations. Where terms, phrases, words and their derivatives are not defined in any of the references above, they shall be defined as specified in *Webster's Third New International Dictionary of the English Language, Unabridged* (1961 edition, through the 2002 addenda), unless the context requires otherwise.

LIGHTING CONTROLS consist of the following:

ASTRONOMICAL TIME-SWITCH CONTROL is an Automatic Time-Switch Control that controls lighting based on the time of day and astronomical events such as sunset and sunrise, accounting for geographic location and calendar date.

AUTOMATIC SCHEDULING CONTROL is a time-based lighting control device or system that is capable of being programmed to [reduce or](#) turn off outdoor luminaire power for a portion of the night and the day.

AUTOMATIC TIME SWITCH CONTROL [is an automatic scheduling control that](#) controls lighting based on the time of day.

OCCUPANT SENSING CONTROLS automatically control levels of illumination, allow for manual operation, and consist of the following types:

MOTION SENSOR is used outdoors, automatically turns lights OFF after an area is vacated of occupants, and automatically turns the lights ON when the area is occupied.

OCCUPANT SENSOR is used indoors and automatically turns lights OFF after an area is vacated of occupants and is capable of automatically turning the lighting load ON when an area is occupied.

PARTIAL-ON OCCUPANT/MOTION SENSOR automatically turns lights OFF after an area is vacated of occupants and is capable of automatically or manually turning ON part of the lighting load when an area is occupied.

PARTIAL-OFF OCCUPANT/MOTION SENSOR automatically turns OFF part of the lighting load after an area is vacated of occupants and is capable of automatically turning ON the lighting load when an area is occupied.

VACANCY SENSOR automatically turns lights OFF after an area is vacated of occupants but requires lights to be turned ON manually.

PART-NIGHT OUTDOOR LIGHTING CONTROL is a light sensing and time-based [lighting automatic scheduling control](#) device or system that is programmed to reduce or turn off the lighting power to an outdoor luminaire for a portion of the night.

PHOTO CONTROL automatically turns lights ON and OFF, or automatically adjusts lighting levels, in response to the amount of daylight that is available. A Photo Control may also be one component of a field assembled lighting system, the component having the capability to provide a signal proportional to the amount of daylight to a Lighting Control System to dim or brighten the electric lights in response.

SECTION 130.2 – OUTDOOR LIGHTING CONTROLS AND EQUIPMENT

Nonresidential, high-rise residential and hotel/motel buildings shall comply with the applicable requirements of Sections 130.2(a) through 130.2(c).

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(c) **Controls for Outdoor Lighting.** Outdoor lighting controls shall be installed that meet [all](#) the following requirements as applicable:

EXCEPTION 1 to Section 130.2(c): Outdoor lighting not permitted by a health or life safety statute, ordinance, or regulation to be turned OFF.

EXCEPTION 2 to Section 130.2(c): Lighting in tunnels required to be illuminated 24 hours per day and 365 days per year.

1. All installed outdoor lighting shall be controlled by a *photocontrol* ~~or outdoor astronomical time-switch control, or other control~~ capable of automatically shutting OFF the outdoor lighting when daylight is available.

2. All installed outdoor lighting shall be independently controlled from other electrical loads by [at least one of the following](#): ~~an automatic scheduling control~~

[A. Automatic scheduling controls shall reduce lighting power by at least 80 percent or turn lights completely OFF during normally unoccupied periods; or](#)

[B. Partial-off motion sensor or other control shall reduce lighting power by at least 50 percent in response to the area being vacated of occupants and shall bring lighting ON to full light output when the area becomes occupied; or](#)

[C. Full-off motion sensor or other control shall turn lights OFF in response to the area being vacated of occupants and shall turn lights ON when the area becomes occupied.](#)

[EXCEPTION to Section 130.2\(c\)2:](#) Outdoor lighting controls complying with the requirements of Section 130.2(c)3 without the use of any exceptions.

3. All installed outdoor lighting where the bottom of the luminaire is mounted 24 feet or less above the ground, shall be controlled ~~with automatic lighting controls~~ [by combined automatic scheduling controls and motion sensors or other automatic controls responding to both schedule and occupancy](#) that meet all of the following requirements:

[A. During normally scheduled operating hours](#)

[i. When the area is vacated of occupants, controls shall automatically reduce the lighting power of each luminaire by at least 50 percent but not exceeding 90 percent; and](#)

[ii. When the area becomes occupied, controls shall turn lights ON or increase power to at least 80 percent of full power; and](#)

[B. During after-hours schedule](#)

[i. When the area is vacated of occupants, controls shall reduce lighting power by at least 80 percent or turn lights completely OFF; and](#)

C. Motion controls or other controls responding to occupancy shall control no more than 1,500 watts of lighting power per occupancy sensing device

- ~~A. Shall be motion sensors or other lighting control systems that automatically controls lighting in accordance with Item B in response to the area being vacated of occupants; and~~
- ~~B. Shall be capable of automatically reducing the lighting power of each luminaire by at least 40 percent but not exceeding 90 percent, or provide continuous dimming through a range that includes 40 percent through 90 percent, and~~
- ~~C. Shall employ auto-ON functionality when the area becomes occupied; and~~
- ~~D. No more than 1,500 watts of lighting power shall be controlled together.~~

EXCEPTION 1 to Section 130.2(c)3: Lighting for Outdoor Sales Frontage complying with Section 130.2(c)4.

EXCEPTION 2 to Section 130.2(c)3: Lighting for Building Facades, Ornamental Hardscape and Outdoor Dining complying with Section 130.2(c)5.

EXCEPTION 3 to Section 130.2(c)3: Outdoor lighting, in compliance with Sections 130.2(c)1 and 130.2(c)2, where luminaire rated wattage, ~~is~~ determined in accordance with Section 130.0(c), is 30 Watts or less. ~~and which meet one of the following conditions:~~

- ~~A. Pole mounted luminaires with a maximum rated wattage of 75 watts; or~~
- ~~B. Non pole mounted luminaires with a maximum rated wattage of 30 watts each; or~~
- ~~C. Linear lighting with a maximum wattage of 4 watts per linear foot of luminaire.~~

EXCEPTION 4 to Section 130.2(c)3: Applications listed as Exceptions to Section 140.7(a) shall not be required to meet the requirements of Section 130.2(c)3.

4. For Outdoor Sales Frontage lighting, an automatic lighting control shall be installed that meets the following requirements:

- A. A part-night outdoor lighting control as defined in Section 100.1; or
- B. Motion sensors capable of automatically reducing lighting power by at least ~~40~~ 50 percent but not exceeding 90 percent, and which have auto-ON functionality.

5. For Building Facade, Ornamental Hardscape and Outdoor Dining lighting, an automatic lighting control shall be installed that meets one or more of the following requirements:

- A. A part-night outdoor lighting control as defined in Section 100.1; or
- B. Motion sensors capable of automatically reducing lighting power by at least ~~40~~ 50 percent but not exceeding 90 percent, and which have auto-ON functionality; or
- C. A centralized time-based zone lighting control capable of automatically reducing lighting power by at least 50 percent.

D. Outdoor wall mounted luminaires having a bilaterally symmetric distribution as described in the IES Handbook (typically referred to as "wall packs") where the bottom of the luminaire is mounted 24 feet or less above the ground shall comply with the applicable requirements in Section 130.2(c)3.

Table 1: Section 130.2(c)2 Controls State Diagram

Control Type	Occupied	Unoccupied
Scheduling Controls (Period)	ON	≥ 80% dimming, OFF
Partial Off Motion Sensor (Occupancy)	ON	≥ 50% dimming, OFF
Full OFF Motion Sensor (Occupancy)	ON	OFF

Table 2: Section 130.2(c)3 Controls State Diagram

Automatic Scheduling Control	Motion Controls	
	Occupied	Vacant
Normally Occupied	ON	50% - 90% dimmed (10% - 50% power)
Normally Unoccupied	NR	≥80% dimmed, OFF (20% - 0% power)

2.2 Reference Appendices

Include marked up language for all relevant sections of the Appendices, including the glossary.

If there are no propose changes state “There are no proposed changes to the Reference Appendices.”