Fact Sheet

Title 24, Part 6 Nonresidential Mandatory Lighting Controls

Mandatory Measures

The following is the list of Mandatory Measures all lighting controls (indoor and outdoor) are required to comply with regardless of the compliance approach chosen for the project:

- Certification of manufactured lighting control devices and systems.
- Compliance with Title 20 (California Appliance Efficiency) regulations. Refer: http://www.energy.ca.gov/appliances/
- Installation of the following lighting controls in the spaces that require them (See "Mandatory Indoor Lighting Controls")
- Meet lighting control installation requirements.
- Fill out all required forms for certificates of compliance and installation.

The designer should specify lighting controls and luminaires that meet these requirements and the installer should confirm that installed products are approved for use by the Energy Commission by filling out the required installation certificates.

Certification Requirements

Lighting control devices (consisting of a single component) are regulated by the Appliance Standards (California Code of regulations, Title 20). Approved stand-alone lighting controls are listed in the Appliance Regulation database.

Lighting systems (consisting of two or more components) are not regulated by Title 20. These are regulated by Title 24, Part 6 and manufacturers are required to certify such lighting products by the Energy Commission. Only those products certified either by Title 20 or the Energy Commission should be installed.

The following lighting controls should be certified by the manufacturer as compliant with Title 20:

Time-Switch controls	• Automatic time-switch control • Astronomical time-switch control • Multi-level Astronomical time-switch control • Outdoor Astronomical time-switch control
Daylighting controls	• Automatic daylighting control • Photo control
Occupant Sensing Controls	• Occupant sensors • Vacancy Sensors • Motion Sensors
Dimmers	--

The following lighting controls are regulated by Title 24, Part 6:

- Part Night outdoor lighting control
- Track lighting integral current limiter
- Track lighting supplementary overcurrent protection panel

Mandatory Indoor Lighting Controls

The following lighting controls must be installed:

1. **Area Controls**- Manual On and Off light switches are required for every enclosed area. Each enclosed space should be independently controlled and the switch should be readily accessible. *Exception: Egress lighting up to 0.2 W/sq. ft.*
2. **Multi-level Controls**- General lighting in enclosed spaces > 100 sq. ft. with more than one luminaire with more than 2 lamps and LPD > 0.5 W/sq. ft. should have multi-level controls enabling occupants to control all or some of the lights. The number of control steps depends on the type of light source and should meet the multi-level lighting control and uniformity requirements in Table 130.1-A of the standards. *Exception: Classrooms < 0.7 W/ square foot and bi-level lighting with step between 30% and 70% of rated power.*
3. Shut-Off Controls- All indoor lighting should have Shut-off controls that automatically shuts off or reduces light output when the space is typically unoccupied.
   - All installed indoor lighting should be controlled by an occupancy sensor, automatic time-switch, signal from another building or other control such that all lights can be automatically shut off when the space is unoccupied.
   - Separate controls are required for each enclosed space, lighting in each floor and for general, display, ornamental and display case lighting.

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- Exception: Emergency egress lighting, continuous use lighting and electric rooms
- Countdown timers are permissible only in Public bathrooms < 70 sq. ft. and Server rooms.
- All automatic time switch control other than occupancy sensors used to meet Shut-off control requirements should have functionality for manual override such that lights can remain on for no more than 2 hrs. Malls, auditoriums, single tenant retail, industrial and arenas can use captive key override instead of manual override.
- All automatic time switch control other than occupancy sensors in spaces except malls, restaurants, grocery stores, churches, theatres should incorporate an automatic holiday shut- off feature.
- Occupancy sensors are required in Offices ≤ 250 sq. ft., multipurpose rooms < 1000 sq. ft., classrooms and conference rooms of any size. These should be able to Shut-off lights when the space is unoccupied. In addition manual controls are required in these spaces.
- Partial on/off occupant sensing controls are required in Aisle ways and open areas in warehouses, library book stack aisles, corridors and stairwells.
- Partial on/off occupant sensing controls are required in stairwells and common area corridors that provide access to guestrooms and dwelling units in high-rise residential buildings and hotel/motels, parking garages, parking areas, loading and unloading areas.

4. **Automatic Daylighting Controls**- Daylit areas require separate automatic controls controlling lights in the daylit zones. There are three types of daylit zones- Skylit daylit zone, Primary Sidelit daylit zone and Secondary Sidelit daylit zone. (Refer Daylighting fact sheet for detailed definitions)
   - Mandatory automatic daylight controls are required for Skylit and Primary daylit zones:
   - For all spaces other than parking garage with glazing and opening area less than 36 sq. ft. or interior spaces with glazing area > less than 24 sq. ft.-, General the general lighting in the Skylit daylit zone and Primary sidelit daylit zones with lighting power of > 120 Watts or greater should shall have automatic daylighting controls
   - Separate controls are required for the luminaires controlling skylit and primary sidlit zones. If a luminaire falls in both these zones, it must be controlled as part of the Skylit daylit zone.
   - Photo sensors shall not be accessible to unauthorized personnel. If lighting power of the controlled lighting is greater than 0.3 W/sq. ft., automatic daylighting controls should have the number of control steps as per Table 130.1-A of the Standards and shall achieve lighting power reductions as per § 130.1 (d).
   - Parking garages with opening area > 36 sq. ft. that do not fall in the daylight transition zone or dedicated ramps with lighting power in primary sidelit zone > 60 Watts: General lighting in combined Primary and Secondary sidelit daylit zone should have automatic daylighting controls.
   - Separate automatic controls are required for the luminaires controlling primary and secondary sidlit zones.
   - Photo sensors should not be accessible to unauthorized personnel. Automatic daylighting controls should be either multi-level, continuous dimming or On/Off.
5. **Demand Responsive Lighting Controls**- All indoor lighting shall have controls that can receive and automatically respond to a demand response signal.

All buildings greater than 10,000 sq. ft. with habitable spaces LPD greater than 0.5 W/sq. ft. should be capable of automatically reducing lighting power in response to a Demand Response Signal, such that total lighting power can be reduced by at least 15%. Lighting reduction should meet requirements in table 130.1-A.

Mandatory Sign Lighting Controls

- **Indoor sign lighting**- All indoor sign lighting should be controlled with an automatic time-switch control or an astronomical time-switch control.
- **Outdoor sign lighting**- All outdoor sign lighting should be controlled with a photo sensor and an automatic time-switch or astronomical time switch control.
- Outdoor sign lights that have to remain on 24 hours a day should have dimmers capable of dimming light output by 65% during night hours. *Exception: Outdoor signs in tunnels and signs in large covered areas that are meant to be lit 24 hours for 365 days.*
- **Demand responsive EMC control**- Electronic Message Center (EMC) with > 15 kW of new connected lighting power should have controls capable of reducing lighting power by 30% in response to a demand signal. *Exception: Lighting for EMC not allowed due health or safety regulations.*

Mandatory Outdoor Lighting Controls

- All outdoor incandescent lights > 100 W shall have a motion sensor installed.
- All outdoor lighting shall be capable of automatically shutting off lights when daylight is available using photo control or an astronomical time switch.
- Outdoor lighting shall be controlled independently from other electric loads.
- Outdoor luminaires mounted at a height ≤ 24 feet from the ground shall have motion sensors or other automatic lighting controls capable of reducing light output between 40 % and 80% when the area is unoccupied and should have auto-on functionality when the space becomes occupied.
- Exceptions: Lighting for outdoor sales lots, sales canopies, building façade, ornamental hardscape, outdoor dining, pole mounted luminaires < 75 W and non-pole mounted luminaire < 30 W.
- Specific applications listed below shall be controlled as described:
- Lighting for outdoor sales frontage, outdoor sales lots and sales canopies should have a part-night outdoor lighting control or motion sensor capable of reducing light by at least 40% but not more than 80% with an Auto-On function.

Lighting for building façade, ornamental hardscape, outdoor dining should have a part-night outdoor lighting control or motion sensor capable of reducing light by at least 40% but not more than 80% with an Auto-On function or a centralized time-based zone lighting control that can reduce light by 50%.

Compliance Documents

The following forms are required to be submitted to the building department by the applicant for Non-Res lighting controls:

- **Permit**
- **NRCC-LTI-02-E**— Certificate of Compliance, Lighting Controls
- **NRCI-LTI-02-E**— Certificate of Installation, EMC system or Lighting Controls
- **NRCC-LTO-02-E**— Certificate of Compliance, Outdoor Lighting Controls
- **NRCA-LTI-02-E**— Certificate of Installation, EMC system or Outdoor Lighting Controls
- **NRCA-LTO-02-A**— Certificate of Acceptance, Outdoor Lighting Controls
- **NRCC-LTS-01-E** – Certificate for Compliance, Sign Lighting.
- **Certificates of Acceptance**- Applicable only for Automatic daylighting controls, Occupancy sensors and Automatic time-switch controls.

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