

### C405.2 Mandatory Lighting Controls – shall comply with one of the following:

Lighting Controls Sections C405.2.1 through C405.2.5

Exceptions: Lighting controls are not required in areas:

- Designated as security or emergency areas that require continued lighting
- Interior exit stairways
- Interior exit ramps and passageways
- Emergency egress lighting that is normally off

#### Automatic off controls

##### C405.2.1

###### Occupancy sensor controls

- Auto off within 30 min (C405.2.1.1.1)
- Manual turn off (C405.2.1.1.3)

###### Primary exceptions:

- Dwelling units
- Designated as security or emergency areas that require continued lighting
- Interior exit stairways
- Interior exit ramps and passageways
- Emergency egress lighting that is normally off

###### Required in:

- Classrooms
- Lecture
- Training rooms
- Conference
- Copy / Print rooms
- Meeting
- Multipurpose rooms
- Lounge
- Break rooms
- Private offices
- Restrooms
- Storage rooms
- Janitorial closets
- Locker rooms
- Enclosed spaces 300sq ft or less
- Warehouse

##### C405.2.1.1.2

###### Manual ON or partial Auto ON

- Manual ON or Auto ON to < 50% power

###### Primary exceptions:

- Full auto ON is permitted within these spaces
- Public corridors, stairways, restrooms, primary building entrance, lobbies
- Where manual ON would endanger the safety or security of occupants

##### C405.2.1.2

###### Occupant sensors in warehouses

- Automatically reduce power by > 50% when unoccupied
- Independent aisle controls

##### C405.2.2

###### Time-Switch controls

- Requires manual override (C405.2.2.2)
- Override for less than 2hrs
- Override not larger than 5,000 sq ft

###### Primary exceptions:

- Where manual control provides light reduction per C405.2.2.2
- Sleeping units
- Patient care spaces
- Where auto OFF would endanger safety of occupant
- 24 / 7 Lighting
- Shop and lab classrooms
- Mall concourse, auditoriums sales, areas, manufacturing facilities and sports areas allow override to be > than 2hrs and control of < 20,000 sq ft

###### Required in:

Areas where occupancy sensor is not used, time-switch must be used

#### Manual controls

##### C405.2.2.2

###### Manual Light-reduction controls

- Manually reduce lighting uniformly >50%

###### Primary exceptions:

- Daylight responsive control zones
- Corridors, lobbies, electrical rooms and mechanical rooms
- One luminaire with < 100W
- Spaces <0.6W per sqft

###### Required in:

Areas where occupancy sensor is not used, time-switch must be used

##### C405.2.2.3

###### Manual controls

- Occupants have ready access
- Controlled lighting is visible

###### Primary exceptions:

- None

###### Required in:

All spaces where required by this code

#### Daylight responsive controls

##### C405.2.3

###### Daylight-responsive controls

- Sidelit zones controlled independently of toplit zones
- Continuously dim lighting in offices, classrooms, laboratories, library reading rooms
- Configured to completely shut off controlled lighting
- Zones facing different cardinal orientations shall be controlled independently

###### Primary exceptions:

- Spaces where patient care is directly provided
- Dwelling units and sleeping units
- Specific application lighting (C405.2.4)
- Sidelit zones on 1st floor above grade in Group A-2 and Group M occupancies
- LPW is less than LPA calculated in equation 4-9

###### Required in:

- Spaces with >150W of general lighting within sidelit zone (C405.2.3.2)
- Spaces with >150W of general lighting within toplit zone (C405.2.3.3)

#### Specific application controls

##### C405.2.4

###### Specific application controls

- Controlled separately from general lighting in the space
- Sleeping units automatic off of lighting and plug loads within 20 minutes of unoccupancy

###### Primary exceptions:

- Sleeping units with key card controls do not require automatic off
- Spaces where patient care is directly provided does not require automatic off

###### Required in:

- Display and accent
- Lighting in display cases
- Supplemental task lighting
- Under cabinet / shelf lighting
- Lighting equipment for sales
- Lighting education or demonstration
- Plant growth
- Food warming

## Exterior lighting controls

### C405.2.6

#### Exterior lighting controls

- Exterior lighting automatically turn off when daylight is present
- Façade or landscape lighting shall have automatic off controls based on dawn / dusk and a set open / close time
- All other lighting must be automatically reduced by >30% by
  - No later than midnight to 6AM
  - 1hr after business close to 1hr before open
  - When unoccupied for 15 minutes
- Shall include exterior time-switch control functions

#### Primary exceptions:

- Lighting for covered vehicle entrances / exits and parking structures
- Where required for safety, security or eye adaption

#### Required in:

- Parking lot
- Area lighting
- Site lighting

## Additional efficiency options

### C406.1

#### Additional efficiency packages

Comply with one or more of the following:

- More efficient HVAC (C406.2)
- **Reduce lighting power density (C406.3)**
  - Reduce lighting to 90% of Table C405.2.(1)
- **Enhanced Lighting Controls (C406.4)**
- Onsite supply of renewable energy (C406.5)
- Dedicated outdoor air system (C406.6)
- High-efficiency water heating (C406.7)

### C406.4

#### Enhanced digital lighting controls

- Luminaires shall be continuous dimming
- Luminaires shall be individually addressable
  - Not more than four luminaires in a group allowed
- Not more than eight luminaires in a daylight zone
- Reconfigured by digital addressability
- Load shedding and individual user control in open offices
- Occupancy sensors shall be reconfigured digitally
- Construction documents include sequence of operations
- Functional testing (C408.3)

## Functional testing

### C408.3

#### Functional testing

A registered design professional must provide evidence that the lighting control system has been tested, calibrated, adjusted and is in proper working order with the construction documents.

Test requirements:

- Occupant sensor controls (C408.3.1.1)
- Time-switch controls (C408.3.1.2)
- Daylight responsive controls (C408.3.1.3)
- Documentation requirements (C408.3.2)

## How Eaton control systems help meet IECC 2015:

	DLVP	Room Controller	WaveLinX	iLumin Plus	Fifth Light	LumaWatt Pro
C405.2.1	●	●	●	●	●	●
C405.2.1.1.2	●	●	●	●	●	●
C405.2.1.2			●	●	●	●
C405.2.2			●	●	●	●
C405.2.2.2	●	●	●	●	●	●
C405.2.2.3	●	●	●	●	●	●
C405.2.3	●	●	●	●	●	●
C405.2.4	●	●	●	●	●	●
C405.2.6			●	●	●	●
C406.4	●		●	●	●	●



Powering Business Worldwide

#### Eaton

1121 Highway 74 South  
 Peachtree City, GA 30269  
 P: 770-486-4800  
[www.eaton.com/lighting](http://www.eaton.com/lighting)

#### Canada Sales

5925 McLaughlin Road  
 Mississauga, Ontario L5R 1B8  
 P: 905-501-3000  
 F: 905-501-3172

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