

## SECTION 260923 - LIGHTING CONTROL DEVICES

### PART 1 - GENERAL

#### 1.1 SUMMARY

A. Section Includes:

1. Outdoor photoelectric switches, solid state, flexible mounting.
2. Outdoor photoelectric switches, low voltage.
3. Indoor occupancy and vacancy sensors.
4. Switchbox-mounted occupancy sensors.
5. Conductors and cables.

B. Reference and Industry Standards

Enterprise Green Communities Criteria

1. Mandatory Requirements: See the current edition of the NYC overlay of the EGC reference standard for full specifications.
  - a. NYC New Construction projects must achieve at least 60 optional points, and Substantial and Moderate Rehab projects must also achieve at least 55 optional points.
  - b. Criterion 5.8 Lighting (Mandatory for all lighting within New Construction and Substantial Rehab projects. Mandatory for new lighting in Moderate Rehab projects.)  
Follow the guidance for high-efficacy permanently installed lighting and other characteristics for recessed light fixtures, lighting controls, lighting power density, and exterior lighting.
  - c. Criterion 5.1b Building Performance Standard: Efficient Lighting.

C. Comply with the current edition of the New York City Energy Conservation Code.

D. Related Requirements:

1. Section 260010 "Supplemental Requirements for Electrical" for additional abbreviations, definitions, submittals, qualifications, testing agencies, and other Project requirements applicable to Work specified in this Section.
2. Section 262726 "Wiring Devices" for wall-box dimmers, non-networkable wall-switch occupancy sensors, and manual light switches.

#### 1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings:

1. Show installation details for the following:

- a. Occupancy sensors.
  - b. Vacancy sensors.
- C. Field quality-control reports.

### 1.3 CLOSEOUT SUBMITTALS

- A. Operation and maintenance data

## PART 2 - PRODUCTS

### 2.1 OUTDOOR PHOTOELECTRIC SWITCHES, SOLID STATE, FLEXIBLE MOUNTING

- A. Description: Solid state, with SPST dry contacts rated for 1800 VA inductive, to operate connected relay, contactor coils, or microprocessor input; complying with UL 773A, and compatible with ballasts and LED lamps.
- 1. Listed and labeled in accordance with NFPA 70, by a qualified electrical testing laboratory recognized by authorities having jurisdiction, and marked for intended location and application.
  - 2. Light-Level Monitoring Range: 1.5 to 10 fc (16.14 to 108 lx), with an adjustment for turn-on and turn-off levels within that range.
  - 3. Time Delay: Thirty -second minimum, to prevent false operation.
  - 4. Lightning Arrester: Air-gap type.
- Mounting: Twist lock complies with ANSI C136.10, with adjustable swivel base.

### 2.2 OUTDOOR PHOTOELECTRIC SWITCHES, LOW VOLTAGE

- A. Description: Solid state; one set of NO dry contacts rated for 24 V(dc) at 1 A, to operate connected load, complying with UL 773, and compatible with luminaire or lighting control panelboard.
- 1. Listed and labeled in accordance with NFPA 70, by a qualified electrical testing laboratory recognized by authorities having jurisdiction, and marked for intended location and application.
  - 2. Light-Level Monitoring Range: 1.5 to 10 fc (16.14 to 108 lx), with an adjustment for turn-on and turn-off levels within that range.
  - 3. Time Delay: Thirty-second minimum, to prevent false operation.
  - 4. Mounting: 1/2 inch (13 mm) threaded male conduit.
  - 5. Power Pack:
    - a. Dry contacts rated for 20 A LED load at 120 and 277 V(ac). Sensor has 24 V(dc), 150 mA, Class 2 power source , as defined by NFPA 70.
      - 1) LED status lights to indicate load status.
      - 2) Plenum rated.

- b. Digital controller capable of accepting three or four 8PSJ or RJ45 inputs with one or two outputs rated for 20 A incandescent or LED load at 120 and 277 V(ac),. Sensor has 24 V(dc), Class 2 power source as defined by NFPA 70.
  - 1) With integral current monitoring.
  - 2) Compatible with digital addressable lighting interface.
  - 3) Plenum rated.

## 2.3 INDOOR OCCUPANCY AND VACANCY SENSORS

### A. General Requirements for Sensors:

- 1. Wall or Ceiling-mounted, solid-state indoor occupancy and vacancy sensors.
- 2. Separate power pack.
- 3. Listed and labeled in accordance with NFPA 70, by a qualified electrical testing laboratory recognized by authorities having jurisdiction, and marked for intended location and application.
- 4. Operation:
  - a. Occupancy Sensor: Unless otherwise indicated, turn lights on when coverage area is occupied, and turn them off when unoccupied; with a time delay for turning lights off, adjustable over a minimum range of 1 to 15 minutes.
- 5. Sensor Output: Contacts rated to operate the connected relay, complying with UL 773A ,Sensor is powered from the power pack.
- 6. Power Pack: Dry contacts rated for 20 A ballast load at 120 and 277 V(ac), for 13 A tungsten at 120 V(ac), and for 1 hp at 120 V(ac). Sensor has 24 V(dc), 150 mA, Class 2 power source.
- 7. Mounting:
  - a. Sensor: Suitable for mounting in any position in a standard device box or outlet box.
  - b. Relay: Externally mounted through a 1/2 inch knockout in a standard electrical enclosure.
  - c. Time-Delay and Sensitivity Adjustments: Recessed and concealed behind hinged door.
- 8. Indicator: Digital display, to show when motion is detected during testing and normal operation of sensor.
- 9. Bypass Switch: Override the "on" function in case of sensor failure.
- 10. Automatic Light-Level Sensor: Adjustable from 2 to 200 fc (21.5 to 2152 lx); turn lights off when selected lighting level is present.

### B. PIR Type: Ceiling mounted; detect occupants in coverage area by their heat and movement.

- 1. Detector Sensitivity: Detect occurrences of 6 inch (150 mm) minimum movement of any portion of a human body that presents a target of not less than 36 sq. inch (23 200 sq. mm).
- 2. Detection Coverage (Room, Ceiling Mounted): Detect occupancy anywhere in a circular area of 1000 sq. ft. (93 sq. m) when mounted on a 96 inch (2440 mm) high ceiling.

3. Detection Coverage (Corridor, Ceiling Mounted): Detect occupancy within 90 ft. (27.4 m) when mounted on a 10 ft. (3 m) high ceiling.

## 2.4 SWITCHBOX-MOUNTED OCCUPANCY SENSORS

- A. General Requirements for Sensors: Automatic-wall-switch occupancy sensor, suitable for mounting in a single gang switchbox.
  1. Listed and labeled in accordance with NFPA 70, by a qualified electrical testing laboratory recognized by authorities having jurisdiction, and marked for intended location and application.
  2. Occupancy Sensor Operation: Unless otherwise indicated, turn lights on when coverage area is occupied, and turn lights off when unoccupied; with a time delay for turning lights off, adjustable over a minimum range of 1 to 15 minutes.
  3. Operating Ambient Conditions: Dry interior conditions, 32 to 120 deg F (0 to 49 deg C).
  4. Switch Rating: Not less than 800 VA electronic ballast or LED load at 120 V, 1200 VA ballast or LED load at 277 V, and 800 W incandescent.
- B. Wall-Switch Sensor Tag WS1:
  1. Standard Range: 180-degree field of view, field adjustable from 180 to 40 degrees; with a minimum coverage area of 900 sq. ft. .
  2. Sensing Technology: PIR.
  3. Switch Type: SP, manual "on," automatic "off."
  4. Capable of controlling load in three-way application.
  5. Voltage: Match the circuit voltage 120 V.
  6. Ambient-Light Override: Concealed, field-adjustable, light-level sensor from 10 to 150 fc (108 to 1600 lx). The switch prevents the lights from turning on when the light level is higher than the set point of the sensor.
  7. Concealed, field-adjustable, "off" time-delay selector at up to 30 minutes.
  8. Adaptive Technology: Self-adjusting circuitry detects and memorizes usage patterns of the space and helps eliminate false "off" switching.

## 2.5 CONDUCTORS AND CABLES

- A. Power Wiring to Supply Side of Remote-Control Power Sources: Not smaller than No. 12 AWG. Comply with requirements in Section 260519 "Low-Voltage Electrical Power Conductors and Cables."
- B. Class 1 Control Cable: Multiconductor cable with stranded-copper conductors not smaller than No. 14 AWG. Comply with requirements in Section 260519 "Low-Voltage Electrical Power Conductors and Cables."

## PART 3 - EXECUTION

### 3.1 INSTALLATION OF SENSORS

- A. Coordinate layout and installation of ceiling-mounted devices with other construction that penetrates ceilings or is supported by them, including light fixtures, HVAC equipment, smoke detectors, fire-suppression systems, and partition assemblies.
- B. Install and aim sensors in locations to achieve not less than 90 percent coverage of areas indicated. Do not exceed coverage limits specified in manufacturer's instructions.

### 3.2 INSTALLATION OF WIRING

- A. Wiring Method: Comply with Section 260519 "Low-Voltage Electrical Power Conductors and Cables." Minimum conduit size is 1/2 inch (13 mm).
- B. Size conductors in accordance with lighting control device manufacturer's instructions unless otherwise indicated.

### 3.3 IDENTIFICATION

- A. Identify components and power and control wiring in accordance with Section 260553 "Identification for Electrical Systems.

### 3.4 FIELD QUALITY CONTROL

- A. Tests and Inspections:
  - 1. Operational Test: After installing time switches and sensors, and after electrical circuitry has been energized, start units to confirm proper unit operation.
  - 2. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
- B. Nonconforming Work:
  - 1. Lighting control devices will be considered defective if they do not pass tests and inspections.
  - 2. Remove and replace defective units and retest.
- C. Prepare test and inspection reports.

### 3.5 ADJUSTING

- A. Occupancy Adjustments: When requested within 12 months from date of Substantial Completion, provide on-site assistance in adjusting lighting control devices to suit actual occupied conditions. Provide up to two visits to Project during other-than-normal occupancy hours for this purpose.

1. For occupancy and motion sensors, verify operation at outer limits of detector range. Set time delay to suit Owner's operations.

END OF SECTION 260923