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SECTION 26 09 23

LIGHTING CONTROL DEVICES

occupancy sensor lighting Controls

This specification is dated **June 27, 2023**. It replaces any and all previous commercial occupancy sensor and vacancy sensor specifications.

1. GENERAL
   1. related documents
      1. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 specification Sections.
      2. All contract documents and addenda.
   2. SUMMARY
      1. Section includes all OD & OS sensors including multi-technology, ultrasonic, and passive infrared (PIR) technologies. This includes self-contained PIR sensors that are switch-mounted and ceiling-mounted, as well as a low voltage line, which works with a power pack and add-a-relay units.

* Self-contained wall switch with infrared: ODS10-ID, ODS0D-ID
* Self-contained Smart wall switch with infrared and LED night light: ODS15-ID, ODD10-ID, ODD24-ID, ODP10-I1
* Self-contained wall switch with multi-technology: OSSMT-MD, OSSMD-XX
* Self-contained Provolt™ line voltage infrared ceiling-mount: ODCXX-ID, O2CXX-ID, O3CXX-ID, O4CXX-ID
* Self-Contained Provolt™ line voltage ultrasonic ceiling-mount: ODCXX-UD, O2CXX-UD
* Self-Contained Provolt™ line voltage multi-technology ceiling-mount: ODCXX-MD, O2CXX-MD, O3CXX-MD, O4CXX-MD
* Self-Contained Provolt™ Room Controller (PRC) line voltage infrared ceiling-mount: O5C04-ID, O6C04-ID
* Self-Contained Provolt™ Room Controller (PRC) line voltage multi-technology ceiling-mount: O5C20-MD, O6C20-MD
* Self-contained infrared ceiling-mount: ODC0S-I1, ODC0S-I7
* Self-contained infrared external fixture mount: OSFHU-XX, OSFHW-XX, OSFHP-XX, OSFHS-XX, HB011-XX
* Self-Contained infrared in-fixture mount: OSF20-XX
* Self-Contained infrared in-fixture mount: OSF10-XX
* Low-voltage multi-technology ceiling-mount: OSC20-MXW, OSC10-MXW, OSC05-MXW, OSC20-RMW, OSC10-RMW
* Low-voltage ultrasonic ceiling-mount: OSC20-U, OSC10-U, OSC05-U
* Low-voltage infrared ceiling-mount: OSC15-I, OSC04-I
* Low-voltage multi-technology wall/corner wide view: OSW12-MXW, OSW12-RMW
* Low-voltage infrared wall/corner wide view: OSWWV-I
* Low-voltage infrared wall/corner high bay: OSWHB-I
* Low-voltage wall/corner long range: OSWLR-I
* Power pack for low voltage sensors: OSP20-0D0, OSP20-RDH, OPB15-0DW, OPP20-0D1, OPP20-0D2, OPP20-RD3, OPP20-RD4
* Add-A-Relay power pack - OSA20-000
* High frequency microwave sensors: OSM3D-DDW
* High frequency microwave external fixture mount sensor: OSMHB-VDW
* Self-contained Smart infrared in-fixture mount sensor: ZLD1Z-I0W, ZLDUZ-I0W
* Self-contained Smart infrared external fixture mount sensor: OFD1Z-IXX, OFDUZ-IXX
* Self-contained Solo infrared in-fixture mount sensor: ZLS05-ILW
* Self-contained Solo infrared in-fixture mount sensor: ZLS10-IXX
  + 1. Related Sections: Section(s) related to this section include:
       1. Division 16, Lighting Accessories, Lighting Restoration and Repair Sections.
       2. Division 16, Wiring Methods, Wiring Devices Section.
       3. Division 16, Wiring Methods, Special Purpose Lighting.
       4. Division 13, Special Lighting Control.
  1. SYSTEM DESCRIPTION
     1. Performance Requirements: Provide occupancy sensor lighting controls and power packs that have been manufactured, assembled, and installed to maintain performance criteria stated by manufacturer without defects, damage, or failure.
     2. Performance Testing Requirements
        1. Manufacturer shall 100% test all equipment prior to shipment. Sample testing is not acceptable.
     3. Code Requirements
        1. All occupancy sensor lighting controls and power packs shall be UL listed and either CSA or CUL/US listed.
        2. All sensors shall be FCC compliant where applicable.
        3. All sensors shall be California Title 24 compliant and listed.
        4. Building Codes: All units shall comply with applicable, local building codes.
  2. SUBMITTALS
     1. General: Submit listed submittals in accordance with Conditions of the Contract and Division 1 Submittal Procedures Section.
     2. Bill of Materials: Complete list of all parts needed to fully install selected occupancy sensors.
     3. Product Data: Submit product data, including catalog cut sheets for specified products.
     4. Shop and Wiring Drawings: Submit shop drawings detailing all mechanical and electrical equipment including one-linediagrams, wire counts, coverage patterns, and physical dimensions of each item.
     5. Fixture Compatibility: List of ballasts and lamp combinations compatible with occupancy sensors, by manufacturer and catalog number.
     6. Samples: Submit samples for finish, color, and texture.
     7. Installation Instructions: Manufacturer’s installation instructions.
     8. Maintenance Instructions: To remove dust and grime, wipe down units with damp cloth and mild detergent solution. Do not touch the surface of the lens.
     9. Closeout Submittals: Warranty documents specified herein.
  3. QUALITY ASSURANCE
     1. Installer Qualifications: Installer shall be one who is experienced in performing the work of this section, and who has specialized in installation of work similar to that required for this project.
     2. Source Limitations: To assure compatibility, obtain occupancy sensors from a single source with complete responsibility over all lighting controls, including accessory products. The use of subcontracted component assemblers is not acceptable.
     3. Manufacturer Requirements: The manufacturer will be one who has been continuously engaged in the manufacture of commercial lighting controls and occupancy sensors for no less than 10 years.
     4. ISO Certification: Manufacturer shall be ISO-9001 certified.
  4. DELIVERY, STORAGE & HANDLING
     1. General: Comply with Division 1 Product Requirements Sections.
     2. Ordering: Comply with manufacturer’s ordering instructions and lead-time requirements to avoid construction delays.
     3. Delivery: Deliver materials in manufacturer’s original, unopened, undamaged packages with intact identification labels.
     4. Storage and Protection: Store materials away from exposure to harmful weather conditions and at temperature and humidity conditions recommended by manufacturer.
  5. WARRANTY
     1. Manufacturer’s Warranty: All equipment shall be warranted free of defects in materials and workmanship.
        1. Warranty Period: Five years from date of purchase.
        2. Owner Rights: Manufacturer’s warranty is in addition to, not a limitation of other rights the Owner may have under contract documents.

1. PRODUCTS
   1. ACCEPTABLE MANUFACTURERS
2. Acceptable Manufacturer: Leviton Manufacturing Co. Inc.
3. Basis of design product: Leviton Manufacturing Co. Inc. or subject to compliance and prior approval with specified requirements of this section, one of the following:
   * + 1. Leviton Manufacturing Co. Inc.
       2. <<To specify an alternate manufacturer and product, insert the names here. Otherwise, delete this entire line.>>
4. Substitutions: [Not permitted.] [Permitted.]
   * + 1. Show all substitutions as an add or deduct from the base bid price.
          1. All substitutions subject to provisions of [Section 00 26 00] [Section 01 25 00] [Section 01 62 00] [Division 1]
       2. Clearly delineate all proposed substitutions as such and submit in writing for approval by the design professional a minimum of 10 working days prior to the bid date.
          1. Proposed substitutions must be made available to all bidders.
          2. Proposed substitutes must be accompanied by a review of the specification noting compliance on a line-by-line basis.
       3. Prior to rough-in, provide complete engineered shop drawings, including power wiring, with deviations from the original design highlighted in an alternate color, to the engineer for review and approval.
       4. By using pre-approved substitutions, the contractor accepts responsibility and associated costs for all required modifications to circuitry, devices, and wiring.
   1. Self-contained units
      1. General to Wall Switches with Infrared: ODSXX-ID, ODDXX-ID, ODP10-I1, and OSSXX-ID
         1. Shall use passive infrared motion detection with tamper resistant PIR lens.
         2. Shall be compatible with incandescent, magnetic or electronic low voltage, and magnetic or electronic fluorescent, as well as motor loads.
         3. Switch shall be microprocessor controlled.
         4. Shall be capable of detecting occupancy with true, 180º field of view.
         5. Shall utilize zero crossing circuitry, which increases relay life, protects from the effects of inrush current, and increases sensor longevity.
         6. Wall switch shall have integral shutters that narrow the field of view from 180º.
         7. Shall feature pushbutton for manual on and off, which times out based upon occupancy detection.
         8. An LED shall indicate occupancy status.
         9. Manual range, photocell, and time settings shall be user-configurable.
         10. Switch shall be rated at 120/277V in one unit.
         11. Unit shall fit in a standard box and use a standard wallplate, which is gangable.
         12. Wall switch shall not protrude more than .4 inches from box.
         13. Shall be a Decora style unit with a matching wallplate available.
         14. Wall switch must be available in white, ivory, and almond (or equivalent colors).
      2. ODS10-ID
         1. Sensor shall have four, selectable manual timer settings from 30sec to 30min.
         2. Rating: 800W @ 120V, 1200VA @120V, 2700VA @ 277V, and 1/4HP @ 120VAC
      3. ODS15-ID
         1. No manual adjustment shall be required at the time of installation or during operation.
         2. Rating: 10A LED, Electronic Ballast @ 120V/277V; 20A General Purpose @ 120V/277V; 6.67A Tungsten @ 120/277V; 1/4HP @ 120V; 1/3HP @ 277V.
         3. Sensor shall provide approximately 1,110 square feet of total coverage, 400 square feet of minor motion detection.
         4. Advanced configuration can be performed using the Leviton Smart Sensor App on any Bluetooth-enabled Android or iOS device, or pushbutton configuration for up to 8 preset options.
         5. Sensor shall provide adjustable timeouts of 30sec to 60min.
         6. Sensor shall allow multi-way system for up to 5 devices.
         7. Sensor shall have an LED night light that illuminates when ambient light levels are below 1 footcandle and turn off when ambient light exceeds 5 footcandles present at the device; Nightlight feature shall be turned on using Smart Sensor App with 12 night light color options available.
         8. Shall provide daylighting hold-off calibration using Smart Sensor App.
      4. ODD10-ID
         1. No manual adjustment shall be required at the time of installation or during operation.
         2. Designed for use with 0-10V drivers and ballast and provides 0-10V dimming control.
         3. Rating: 8A LED, Electronic Ballast @ 120V; 5A LED, Electronic Ballast @ 277V; 10A General Purpose @ 120/277V; 6.67A Tungsten @ 120/277V; 1/4HP @ 120V; 1/3HP @ 277V.
         4. Sensor shall provide approximately 1,110 square feet of total coverage, 400 square feet of minor motion detection.
         5. Advanced configuration can be performed using the Leviton Smart Sensor App on any Bluetooth-enabled Android or iOS device, or pushbutton configuration for up to 8 preset options.
         6. Sensor shall provide adjustable timeouts of 30sec to 60min.
         7. Sensor shall provide capability to program partial-ON levels (1-99%), partial-OFF levels (1-99%) and partial-OFF timeouts from 30sec to infinity using Smart Sensor App.
         8. Sensor shall allow multi-way system for up to 5 devices.
         9. Sensor shall have an LED night light that illuminates when ambient light levels are below 1 footcandle and turn off when ambient light exceeds 5 footcandles present at the device; Nightlight feature shall be turned on using Smart Sensor App with 12 night light color options available.
         10. Shall provide daylighting hold-off calibration using Smart Sensor App.
      5. ODD24-ID
         1. No manual adjustment shall be required at the time of installation or during operation.
         2. 24V dimming wallbox sensor designed for use with Leviton Power Packs (i.e.OPP20) and provides 0-10V dimming control when used with 0-10V drivers or ballasts.
         3. Rating: 12-24VDC input; 0.02A input current @ 24VDC.
         4. Sensor shall provide approximately 1,110 square feet of total coverage, 400 square feet of minor motion detection.
         5. Advanced configuration can be performed using the Leviton Smart Sensor App on any Bluetooth-enabled Android or iOS device, or pushbutton configuration for up to 8 preset options.
         6. Sensor shall provide adjustable timeouts of 30sec to 60min.
         7. Sensor shall provide capability to program partial-ON levels (1-99%), partial-OFF levels (1-99%) and partial-OFF timeouts from 30sec to infinity using Smart Sensor App.
         8. Sensor shall allow multi-way system for up to 5 devices.
         9. Sensor shall have an LED night light that illuminates when ambient light levels are below 1 footcandle and turn off when ambient light exceeds 5 footcandles present at the device; Nightlight feature shall be turned on using Smart Sensor App with 12 night light color options available.
         10. Shall provide daylighting hold-off calibration using Smart Sensor App
      6. ODP10-I1
         1. No manual adjustment shall be required at the time of installation or during operation.
         2. Designed for use with dimmable incandescent, LED, or CFL bulbs up to 1000W and provides phase control dimming.
         3. Rating: 1000W LED, CFL, Electronic Ballasts, Resistive Tungsten, and Motor @ 120V.
         4. Sensor shall provide approximately 1,110 square feet of total coverage, 400 square feet of minor motion detection.
         5. Advanced configuration can be performed using the Leviton Smart Sensor App on any Bluetooth-enabled Android or iOS device, or pushbutton configuration for up to 8 preset options.
         6. Sensor shall provide adjustable timeouts of 30sec to 60min.
         7. Sensor shall provide capability to program partial-ON levels (1-99%), partial-OFF levels (1-99%) and partial-OFF timeouts from 30sec to infinity using Smart Sensor App.
         8. Sensor shall allow multi-way system for up to 5 devices.
         9. Sensor shall have an LED night light that illuminates when ambient light levels are below 1 footcandle and turn off when ambient light exceeds 5 footcandles present at the device; Nightlight feature shall be turned on using Smart Sensor App with 12 night light color options available.
         10. Shall provide daylighting hold-off calibration using Smart Sensor App.
      7. ODS0D-ID and ODS0D-T (Title 24 Version)
         1. Shall provide switching for 2 separate banks from a single unit.
         2. Shall use microprocessor for motion signal analysis and internal, adaptive self-adjustment.
         3. Shall save learned and adjusted settings in non-volatile memory that retains all settings during power outages.
         4. No manual adjustment shall be required at the time of installation or during operation.
         5. Shall automatically adapt to changing room conditions—with the ability to disable adaptive features.
         6. Maximum adapted time-out shall not exceed 30 minutes.
         7. Walk through feature shall shut off lights within 2.5 minutes after momentary occupancy.
         8. Shall offer two modes of operation:
            1. Only one relay responds to photocell.
            2. Both relays respond to photocell and lights return to the previous state on the next cycle (ODS0D-ID).
         9. Shall beep before load is automatically switched off.
         10. Shall have a 3-position service switch: off, auto, and on (ODS0D-ID).
         11. Four, selectable manual timer settings shall be available from 30sec to 20min.
         12. Secondary relay shall be manual-on/automatic-off (ODS0D-TD).
         13. Ratings: Primary Relay - 800W @ 120V, 1200VA @120V, 2700VA @ 277V @ 120VAC; Secondary Relay - 800W @ 120V, 800VA @120V, 1200VA @ 277V.
      8. General to Wall Switches with Multi-Technology: OSSMX-XX
         1. Shall incorporate Doppler shift ultrasonic and passive infrared motion detection technologies with tamper resistant PIR lens.
         2. Shall use passive infrared to turn on and either technology to stay on.
         3. Shall be compatible with incandescent, magnetic or electronic low voltage, and magnetic or electronic fluorescent, as well as motor loads.
         4. Switch shall be microprocessor controlled.
         5. Shall be capable of detecting occupancy with true 180º field of view.
         6. Shall utilize zero crossing circuitry, which increases relay life, protects from the effects of inrush current, and increases sensor longevity.
         7. Wall switch shall have integral shutters that narrow the field of view from 180º.
         8. Shall feature pushbutton for manual on and off, which times out based upon occupancy detection.
         9. An LED shall indicate occupancy status.
         10. Manual range, ultrasonic sensitivity, photocell, and time settings shall be user configurable.
         11. Switch shall be rated at 120/277V in one unit.
         12. Unit shall fit in a standard box and use a standard wallplate, which is gangable.
         13. Wall switch shall not protrude more than .4 inches from box.
         14. Shall be a Decora style unit with a matching wallplate available.
         15. Wall switch must be available in white, ivory, and almond (or equivalent colors).
         16. Shall be available in 40kHz ultrasonic frequencies.
         17. Shall have “vacancy confirmation” where if a false off occurs, the sensor shall wait for 45 seconds to determine if space is vacant or not. If occupancy is detected within the 45 second period, either ultrasonic or passive infrared technology can immediately turn the lights back on. If no occupancy is detected within the 45 second period, the sensor will turn off and reset to normal operation of passive infrared on only.
      9. OSSMT-XX
         1. Shall use microprocessor for motion signal analysis and internal, adaptive self-adjustment.
         2. No manual adjustment shall be required at the time of installation or during operation.
         3. Shall automatically adapt to changing room conditions—with the ability to disable adaptive features.
         4. Shall save learned and adjusted settings in non-volatile memory that retains all settings during power outages.
         5. Maximum adapted time-out shall not exceed 30 minutes.
         6. Walk through feature shall shut off lights within 2.5 minutes after momentary occupancy.
         7. Sensor shall have four, selectable manual timer settings from 30sec to 30min.
         8. Rating: 800W @ 120V, 1200VA @120V, 2700VA @ 277V, and 1/4HP @ 120VAC.
      10. OSSMD-XX
          1. Shall use microprocessor for motion signal analysis and internal, adaptive self-adjustment.
          2. No manual adjustment shall be required at the time of installation or during operation.
          3. Shall automatically adapt to changing room conditions—with the ability to disable adaptive features.
          4. Shall save learned and adjusted settings in non-volatile memory that retains all settings during power outages.
          5. Maximum adapted time-out shall not exceed 30 minutes.
          6. Walk through feature shall shut off lights within 2.5 minutes after momentary occupancy.
          7. Sensor shall have four, selectable manual timer settings from 30sec to 30min.
          8. Rating: Primary Relay - 800W @ 120V, 1200VA @120V, 2700VA @ 277V; Secondary Relay - 800W @ 120V, 800VA @120V, 1200VA @ 277V; and 1/4HP @ 120VAC.
      11. Self-Contained Provolt™ Line Voltage Infrared Ceiling-Mount: ODCXX-ID, O2CXX-ID, O3CXX-ID, O4CXX-ID
          1. Shall use passive infrared motion detection technology with tamper resistant PIR lens.
          2. Shall mount on the ceiling.
          3. Shall incorporate a real-time motion indicator LED, which is visible from the front of unit.
          4. Shall feature manual timer settings between 30 seconds and 30 minutes.
          5. Infrared lenses shall have 360º field of view for up to 12’ mounting heights.
          6. Shall include Leviton-exclusive screw guides, coasters, and terminal blocks.
          7. Shall be equipped with tamper resistant cover.
          8. All controls shall be accessible from front of unit.
          9. Rugged, plastic housing shall be available in white.
          10. Shall include BMS/emergency interface.
          11. Models include occupancy sensors with integrated light sensor (ODCXX-ID, O2CXX-ID), vacancy sensors (O3CXX-ID, O4CXX-ID), and dual relay (O2CXX-ID, O4CXX-ID).
          12. Ratings: ODCXX-ID, O2CXX-ID, O3CXX-ID, O4CXX-ID – 800VA @ 120V, 1200VA @ 230V, 1200VA @ 277V.
      12. Self-Contained Provolt™ Line Voltage Ultrasonic Ceiling-Mount: ODCXX-UD, O2CXX-UD
          1. Shall incorporate Doppler shift ultrasonic and passive infrared motion detection technologies with tamper resistant PIR lens.
          2. Shall use Doppler shift ultrasonic detection technology.
          3. Shall mount on the ceiling.
          4. Shall incorporate a real-time motion indicator LED, which is visible from the front of unit.
          5. Shall include integrated light sensor.
          6. Shall feature manual timer settings between 30 seconds and 30 minutes.
          7. Infrared lenses shall have 360º field of view for up to 12’ mounting heights.
          8. Shall include Leviton-exclusive screw guides, coasters, and terminal blocks.
          9. Shall be equipped with tamper resistant cover.
          10. All controls shall be accessible from front of unit.
          11. Rugged, plastic housing shall be available in white.
          12. Shall include BMS/emergency interface.
          13. Ratings: ODCXX-UD, O2CXX-UD – 800VA @ 120V, 1200VA @ 230V, 1200VA @ 277V.
      13. Self-Contained Provolt™ Line Voltage Multi-Technology Ceiling-Mount: ODCXX-MD, O2CXX-MD, O3CXX-MD, O4CXX-MD
          1. Shall incorporate Doppler shift ultrasonic and passive infrared motion detection technologies with tamper resistant PIR lens.
          2. Shall use passive infrared to turn on and either technology to stay on.
          3. Shall mount on the ceiling.
          4. Shall incorporate a real-time motion indicator LED, which is visible from the front of unit.
          5. Shall feature manual timer settings between 30 seconds and 30 minutes.
          6. Infrared lenses shall have 360º field of view for up to 12’ mounting heights.
          7. Shall include Leviton-exclusive screw guides, coasters, and terminal blocks.
          8. Shall be equipped with tamper resistant cover.
          9. All controls shall be accessible from front of unit.
          10. Rugged, plastic housing shall be available in white.
          11. Shall include BMS/emergency interface.
          12. Models include occupancy sensors with integrated light sensor (ODCXX-MD, O2CXX-MD), vacancy sensors (O3CXX-MD, O4CXX-MD), and dual relay (O2CXX-MD, O4CXX-MD).
          13. Ratings: ODCXX-ID, O2CXX-ID, O3CXX-ID, O4CXX-ID – 800VA @ 120V, 1200VA @ 230V, 1200VA @ 277V.
      14. Self-Contained Provolt™ Room Controller (PRC) Line Voltage Infrared Ceiling-Mount: O5C04-ID, O6C04-ID
          1. Shall use passive infrared motion detection technology with tamper resistant PIR lens.
          2. Shall mount on the ceiling.
          3. Sensor shall incorporate occupancy/vacancy sensing technology, power pack, and integrated light sensor.
          4. Shall incorporate a real-time motion indicator LED, which is visible from the front of unit.
          5. Shall feature manual timer settings between 30 seconds and 30 minutes.
          6. Infrared lenses shall have 360º field of view for up to 12’ mounting heights.
          7. Shall include Leviton-exclusive screw guides, coasters, and terminal blocks.
          8. Shall be equipped with tamper resistant cover.
          9. All controls shall be accessible from front of unit.
          10. Advanced configuration shall be performed using the Leviton Provolt App to include settings for timeouts, partial-ON and partial-OFF, daylight zones, and receptacle/HVAC control for secondary relay (O6C04-ID).
          11. Rugged, plastic housing shall be available in white.
          12. Shall include BMS/emergency interface.
          13. Models include primary daylighting control (O5C04-ID) and primary and secondary daylighting control (O6C04-ID).
          14. Ratings: O5C04-ID, O6C04-ID – 800VA @ 120V, 1200VA @ 277V.
      15. Self-Contained Provolt™ Room Controller (PRC) Line Voltage Multi-Technology Ceiling-Mount: O5C20-MD, O6C20-MD
          1. Shall incorporate Doppler shift ultrasonic and passive infrared motion detection technologies with tamper resistant PIR lens.
          2. Shall use passive infrared to turn on and either technology to stay on.
          3. Shall mount on the ceiling.
          4. Sensor shall incorporate occupancy/vacancy sensing technology, power pack, and integrated light sensor.
          5. Shall incorporate a real-time motion indicator LED, which is visible from the front of unit.
          6. Shall feature manual timer settings between 30 seconds and 30 minutes.
          7. Infrared lenses shall have 360º field of view for up to 12’ mounting heights.
          8. Shall include Leviton-exclusive screw guides, coasters, and terminal blocks.
          9. Shall be equipped with tamper resistant cover.
          10. All controls shall be accessible from front of unit.
          11. Advanced configuration shall be performed using the Leviton Provolt App to include settings for timeouts, detection technology selection, partial-ON and partial-OFF, daylight zones, and receptacle/HVAC control for secondary relay (O6C04-ID).
          12. Rugged, plastic housing shall be available in white.
          13. Shall include BMS/emergency interface.
          14. Models include primary daylighting control (O5C20-MD) and primary and secondary daylighting control (O6C20-MD).
          15. Ratings: O5C04-ID, O6C04-ID – 800VA @ 120V, 1200VA @ 277V.
      16. Self-Contained Infrared Ceiling-Mount: ODC0S-IXW
          1. Shall mount on the ceiling.
          2. Shall incorporate a real-time motion indicator LED, which is visible from the front of unit.
          3. Shall feature manual timer settings between 20 seconds and 15 minutes.
          4. Infrared lenses shall have 360º field of view.
          5. Shall be equipped with tamper resistant cover.
          6. All controls shall be accessible from front of unit.
          7. Rugged, plastic housing shall be available in white.
          8. Ratings: ODCOS-I1 – 1000W/VA @ 120V, and ODC0S-I7 – 2700W/VA @ 277V.
      17. Self-Contained Infrared Fixture-Mount: OSFHU-XX, OSFHW-XX, OSFHP-XX, OSFHS-XX, HB011-XX
          1. Shall mount on the fixture through a standard ½” knockout or to an electrical junction box.
          2. Shall incorporate a real-time motion indicator LED, which is visible from the front of unit.
          3. Shall feature manual timer settings between 30 seconds and 30 minutes.
          4. Infrared lenses shall include two lenses for up to 40’ mounting heights, a 360º high bay and 360º low bay lens, and include a mask for aisle way.
          5. Shall be equipped with tamper resistant cover.
          6. All controls shall be accessible on unit.
          7. Rugged, plastic housing shall be available in white.
          8. Models include cold storage (OSFHU-CX), IP65 rated (OSFHW-XX), integrated light sensor (OSFHP-XX), 24V (OSFHW-IL), surface/recess mount (OSFHS-XX), and 0-10V dimming (HB011-XX).
          9. Ratings: OSFHU-XX – 800VA @ 120V, 1200VA @ 277V, 1500VA @ 347V, 2000VA @ 480V, and 1/4HP @ 120V. OSFHW-XX – 800VA @ 120V, 1200VA @ 277V, 1500VA @ 347V, and 1/4HP @ 120V. OSFHP-XX – 800VA @ 120V, 1000VA @ 230V, 1200VA @ 277V, 1500VA @ 347V, 2000VA @ 480V, and 1/4HP @ 120V. OSFHP-IL – 20mA input, 120mA output, and 1A, 30VDC HVAC. OSFHS-XX – 800VA @ 120V, 1200VA @ 277V, 1500VA @ 347V, and 1/4HP @ 120V. HB011-XX – 800VA @ 120V, 1000VA @ 230V, 1200VA @ 277V, and 1/4HP @ 120V
      18. Self-Contained Infrared In-Fixture Mount: OSF20-XX
          1. Shall mount directly in the fixture.
          2. Shall incorporate a real-time motion indicator LED, which is visible from the front of unit.
          3. Shall feature manual timer settings between 30 seconds and 30 minutes.
          4. Infrared lenses shall include two lenses for up to 40’ mounting heights, a 360º high bay and 360º low bay lens, and include a mask for aisle way.
          5. Shall be equipped with tamper resistant cover.
          6. All controls shall be accessible on unit.
          7. Rugged, plastic housing shall be available in white.
          8. Shall be IP65 rated.
          9. Ratings: OSF20-IU – 800VA @ 120V, 1200VA @ 277V, 800W @ 120V, and 1/4HP @ 120V. OSF20-IL – 20mA input, 120mA output, and 1A, 30VDC HVAC.
      19. Self-Contained Infrared In-Fixture Mount: OSF10-XX
          1. Shall mount directly in the fixture.
          2. Shall incorporate a real-time motion indicator LED, which is visible from the front of unit.
          3. Shall feature manual timer settings between 30 seconds and 30 minutes.
          4. Infrared lens shall include lens for up to 8’ mounting heights.
          5. Shall be equipped with tamper resistant cover.
          6. All controls shall be accessible on unit.
          7. Rugged, plastic housing shall be available in white.
          8. Ratings: OSF10-XX – 800VA @ 120V, 1200VA @ 277V, 800W @ 120V, and 1/6HP @ 120V.
      20. General to Low Voltage Sensors and Accessories: OSCXX, OSWXX
          1. Shall use microprocessor for motion signal analysis and internal, adaptive self-adjustment.
          2. No manual adjustment shall be required at the time of installation or during operation.
          3. Shall automatically adapt to changing room conditions.
          4. Shall identify, record, and learn a room’s normal occupancy cycles to automatically adjust the sensitivity threshold.
          5. Shall save learned and adjusted settings in non-volatile memory that retains all settings during power outages.
          6. Shall recognize motion detected within 20 seconds of turning off lighting, as a false off. In response to a false off, the microprocessor shall increase sensitivity, and increase the time-off setting.
          7. Sensor shall recognize as a false on the failure. The sensor shall decrease the sensitivity in response to a false on.
          8. Sensor shall feature a 6-second time-out install test mode, which will automatically revert to standard time-out no longer than one hour after test mode is initiated. Sensor shall have manual controls and override switches to force manual adjustments.
          9. Shall provide a concealed bypass switch to force on lighting.
          10. Sensitivity shall be adjustable from 0% to 100%.
          11. Control knobs shall set the initial settings for automatic sensitivity adjustments.
          12. Shall have a switch for restoring factory settings.
          13. Timer shall be manually selectable between 30 sec. and 30 minutes.
          14. Photocell shall be available. Photocell shall prevent lighting from coming on when the ambient light levels are above the set point.
          15. Shall be equipped with tamper resistant cover.
          16. All controls shall be accessible from front of unit.
          17. Rugged, plastic housing shall be available white
          18. Shall accept Class 2 wiring.
      21. Low-Voltage Multi-Technology Ceiling-Mount: OSC20-MXW, OSC10-MXW, OSC05-MXW, OSC20-RMW, OSC10-RMW
          1. Shall incorporate Doppler shift ultrasonic and passive infrared motion detection technologies.
          2. Shall mount on the ceiling.
          3. Shall be available in 180º and 360º coverage patterns.
          4. Infrared lenses shall have a 360º field of view.
          5. Shall be available in 40kHz ultrasonic frequencies.
          6. Shall automatically adapt to changing room conditions—including background PIR levels and continuous airflow.
          7. Sensor shall have two modes of operation:
             1. Multi-technology mode: where the sensors send infrared signal to the microprocessor, which makes the decision to turn on lighting based on the level of the signal.
             2. Single technology mode: where the user chooses technology that will turn on lighting.
          8. Shall incorporate a real-time motion indicator LED, which is visible from the front of unit.
          9. Shall have mask inserts for PIR rejection to prevent false tripping.
          10. Models OSCXX-RXX includes isolated relay.
      22. Low-Voltage Ultrasonic Ceiling-Mount: OSC20-UXW, OSC10-UXW, OSC05-UXW
          1. Shall utilize Doppler shift ultrasonic detection technology.
          2. Shall mount on the ceiling.
          3. Shall be available in 180º and 360º coverage patterns.
          4. Shall be available in 40kHz ultrasonic frequencies.
          5. Shall automatically adapt to continuous airflow conditions.
          6. Shall incorporate a real-time motion indicator LED, which is visible from the front of unit.
          7. Operating status and setting confirmation shall be available via LED motion indicators.
          8. Models OSCXX-RXX includes isolated relay.
      23. Low-Voltage Infrared Ceiling-Mount: OSC04-I, OSC15-I*.*
   2. Shall utilize passive infrared motion detection.
   3. Shall mount on the ceiling.
   4. Shall automatically adapt to changing background PIR levels.
   5. Shall incorporate a real-time motion indicator LED, which is visible from the front of unit.
   6. Infrared lenses shall have 360º field of view.
   7. Shall have mask inserts for PIR rejection to prevent false tripping.
      1. Low-Voltage Multi-Technology Wall/Corner Mount Sensors: OSW12-MXW, OSW12-RMW
5. Shall incorporate Doppler shift ultrasonic and passive infrared motion detection technologies.
6. Shall mount on ceiling or wall via supplied mounting bracket.
   1. Mounting bracket shall have a place to conceal the wiring connections.
7. Shall automatically adapt to changing room conditions—including background PIR levels and continuous airflow.
8. Sensor shall have two modes of operation:
   1. Multi-technology mode: where the sensors send infrared and ultrasonic signals to the microprocessor, which makes the decision to turn on lighting based on the level of each signal.
   2. Single tech mode: where the user chooses technology which will turn on lighting.
9. Shall incorporate a real-time motion indicator LED, which is visible from the front of unit.
10. Shall have at least a 110° coverage pattern.
11. Shall utilize 40kHz ultrasonic frequency.
12. Models OSWXX-RXX includes isolated relay.
    * 1. Low-Voltage Infrared Wall/Corner Mount Sensors: OSWWV-IXW, OSWHB-IXW, OSWLR-IXW, OSWWV-RIW, OSWHB-RIW, OSWLR-RIW
         1. Shall utilize passive infrared motion detection.
         2. Shall be available in wide view, long range, and high bay infrared lenses.
         3. Shall mount on ceiling or wall via supplied mounting bracket.
            1. Mounting bracket shall have a place to conceal the wiring connections and provide knockout for surface wire raceway.
         4. Shall automatically adapt to changing background PIR levels.
         5. Shall incorporate a real-time motion indicator LED, which is visible from the front of unit.
         6. High bay sensor shall have a linear range of at least 60 feet.
         7. Models OSWXX-RXX includes isolated relay.
      2. Power Pack: OSP20-ODO, OSP20-RDH
13. Shall be compatible with incandescent, magnetic or electronic low voltage, and magnetic or electronic fluorescent, as well as motor loads.
14. Ratings: OSP20-XD0 – 20A incandescent, 20A fluorescent; OSP20-XD0 – 20A fluorescent @ 50Hz or 60Hz; OSP20-070 – 20A fluorescent; and ODP15-030/OPB15-0DW – 15A fluorescent. Shall utilize normally open, silver alloy dry contacts rated for a 20A-ballast load at 120V, 230V, 277V, and 15A at 347V.
15. Relay function shall not require more than 5-ma control current to operate.
16. Power Pack shall allow for separation of Class 1 and Class 2 wiring.
17. Power Pack shall provide Manual ON, HOLD-ON, and HOLD-OFF functions and be compatible with low-voltage switches. (OSP20-RDH)
18. Power Pack Mounting Specifications (OSPXX-XXX)
    1. Shall fit inside the ballast cavity of a fluorescent fixture and shall be qualified for installation in a ballast cavity.
    2. Shall be sized to fit inside a standard, 4” x 4” junction box.
    3. Shall be mountable to a 1/2in. knockout within a ballast cavity on the line voltage end, such that it may be mounted to the outside of a junction box with the line voltage wiring internal to the box and the low voltage wiring external.
    4. Shall be mountable to a 1/2in. knockout within a ballast cavity on the low voltage end, such that it may be mounted to the inside of a ballast cavity with the box and line voltage wiring internal to the cavity and the low voltage wiring external.
19. Power Pack Mounting Specifications (OP15-0DW)
    1. Shall fit inside a 4” x 2.125” deep octagon or a 4” x 2.125” deep square with mud ring electrical junction box.
20. Models OSPXX-RXX includes HVAC relay in power pack.
21. HVAC Relay – SPDT 500ma@24VDC three-wire isolated. Ratings: .5A, 125VAC; 1A, 30VDC.
    * 1. Add-A-Relay: OSA20-R00
         1. Relay shall be compatible with incandescent, magnetic or electronic low voltage, and magnetic or electronic fluorescent, as well as motor loads.
         2. Control module shall interface with and control two- and three-wire relays from GE, Reliant and Douglas.
         3. Add-A-Relay shall accept 24VAC full-wave or half-wave rectified power.
         4. Control Module Output
            1. Output for relay control shall be dry contact closure, not solid state switching.
            2. Shall be an “ON” dry contact closure of at least 150ms when blue wire transitions from low to high.
            3. Shall be an “OFF” dry contract closure of at least 150ms when blue wire transitions from high to low.
         5. Add-A-Relay Mounting Specifications
            1. Shall fit inside the ballast cavity of a fluorescent fixture and shall be qualified for installation in a ballast cavity.
            2. Shall be sized to fit inside a standard, 4” x 4” junction box.
            3. Shall be mountable to a 1/2in. knockout within a ballast cavity on the line voltage end, such that it may be mounted to the outside of a junction box with the line voltage wiring internal to the box and the low voltage wiring external.
            4. Shall be mountable to a 1/2in. knockout within a ballast cavity on the low voltage end, such that it may be mounted to the inside of a ballast cavity with the box and line voltage wiring internal to the cavity and the low voltage wiring external.
22. Models OSPXX-RXX includes HVAC Relay in power pack.
23. HVAC Relay – SPDT 500ma@24VDC three-wire isolated. Ratings: .5A, 125VAC; 1A, 30VDC.
    * 1. High Frequency Microwave Sensors: OSM3D-DDW
         1. Shall utilize high frequency electromagnetic microwave detection technology.
         2. Shall include 0-10V dimming technology.
         3. Shall mount behind low-density fixture materials, in fixture, or behind objects made of plastic or glass.
         4. Shall include integrated light sensor.
         5. Shall be available in 150º wall and 360º ceiling coverage patterns for up to 49’ mounting heights.
         6. Shall feature manual timer settings between 5 seconds and infinity.
         7. All controls shall be accessible on unit.
         8. Shall be IP20 rated.
         9. Ratings: OSM3D-DDW – 400W @ 120VAC, 800W @ 220-240VAC, 1000W @ 277VAC.
      2. High Frequency Microwave Fixture-Mount: OSMHB-VDW
         1. Shall utilize high frequency electromagnetic microwave detection.
         2. Shall include 0-10V dimming technology.
         3. Shall mount on the fixture through a standard ½” knockout or to an electrical junction box.
         4. Shall include integrated light sensor.
         5. Shall feature 360º ceiling coverage patterns for up to 50’ mounting heights.
         6. Shall feature manual timer settings between 10 seconds and 15 minutes.
         7. All controls shall be accessible on unit or adjustable with optional IR remote (ZLS0R).
         8. Shall be IP20 rated.
         9. Ratings: OSMHB-VDW – 660W @ 120VAC, 800W @ 120VAC, 1200W @ 277VAC.
      3. Self-Contained Smart Infrared In-Fixture Mount Sensor: ZLD1Z-I0W, ZLDUZ-I0W
         1. Shall mount directly in the fixture.
         2. Shall integrate 0-10V dimming control.
         3. Shall feature manual timer settings between 30 seconds and 30 minutes.
         4. Infrared lenses shall include two lenses for up to 40’ mounting heights, a 360º high bay and 360º low bay lens, and include a mask for aisle way.
         5. Advanced configuration shall be performed using the Leviton Smart Sensor App to include settings for sensitivity, timeouts, mesh grouping, partial-ON and partial-OFF, daylight control, and scheduling (ZLDUZ-I0W).
         6. Shall be equipped with tamper resistant cover.
         7. Rugged, plastic housing shall be available in white.
         8. Shall be IP66 rated.
         9. Ratings: ZLD1Z-I0W, ZLDUZ-I0W – 800W @ 120V, 1150W @ 230V, 1400W @ 277V, 1700W @ 347V, and 2400W @ 480V
      4. Self-Contained Smart Infrared External Fixture Mount Sensor: OFD1Z-IXX, OFDUZ-IXX
         1. Shall mount on the fixture through a standard ½” knockout
         2. Shall integrate 0-10V dimming control.
         3. Shall feature manual timer settings between 30 seconds and 30 minutes.
         4. Infrared lenses shall include two lenses for up to 40’ mounting heights, a 360º high bay and 360º low bay lens, and include a mask for aisle way.
         5. Advanced configuration shall be performed using the Leviton Smart Sensor App to include settings for sensitivity, timeouts, mesh grouping, partial-ON and partial-OFF, daylight control, and scheduling (OFDUZ-IXX).
         6. Shall be equipped with tamper resistant cover.
         7. Rugged, plastic housing shall be available in white.
         8. Shall be IP66 rated.
         9. Ratings: OFD1Z-IXX, OFDUZ-IXX – 800W @ 120V, 1150W @ 230V, 1400W @ 277V, 1700W @ 347V, and 2400W @ 480V.
      5. Self-Contained Solo Infrared In-Fixture Mount Sensor: ZLS05-ILW
         1. Shall mount directly in the fixture.
         2. Shall integrate 0-10V dimming control and light sensor.
         3. Shall feature manual timer settings between 30 seconds and 30 minutes.
         4. Infrared lens shall include a 360º coverage pattern for up to 10’ mounting heights.
         5. Shall be configurable with DIP switches on the device or remote control (ZLS0R-RA1) to include settings for task levels, timeouts, partial-ON and partial-OFF, and daylight control.
         6. Shall be IP20 rated.
      6. Self-Contained Solo Infrared In-Fixture Mount Sensor: ZLS10-IXX
         1. Shall mount directly in the fixture.
         2. Shall integrate 0-10V dimming control and light sensor.
         3. Shall feature manual timer settings between 30 seconds and 30 minutes.
         4. Infrared lens shall include a 360º coverage pattern for up to 40’ mounting heights.
         5. Shall be configurable with DIP switches on the device or remote control (ZLS0R-RC1) to include settings for sensitivity, timeouts, partial-ON and partial-OFF, and daylight control.
         6. Shall be IP65 rated.
         7. Ratings: ZLS10-IXX – 800W @ 120V, 1200W @ 277V, 660W @ 120V, and 1200W @ 277V.
24. EXECUTION
    1. PREPARATION
25. Site Verification: Verify that wiring conditions, which have been previously installed under other sections or at a previous time, are acceptable for product installation in accordance with manufacturer’s instructions.
26. Inspection: Inspect all material included in this contract prior to installation. Manufacturer shall be notified of unacceptable material prior to installation.
    1. INSTALLATION
27. The Electrical Contractor, as part of the work of this section, shall coordinate, receive, mount, connect, and place into operation all equipment. The Electrical Contractor shall furnish all conduit, wire, connectors, hardware, and other incidental items necessary for properly functioning lighting control and occupancy sensors as described herein and shown on the plans. The Electrical Contractor shall maintain performance criteria stated by manufacturer without defects, damage, or failure.
    * + 1. Compliance: Contractor shall comply with manufacturer’s product data, including shop drawings, technical bulletins, product catalog installation instructions, and product carton instructions for installation.
28. Power: The contractor shall test that all branch load circuits are operational before connecting loads to sensor system load terminals, and then de-energize all circuits before installation.
29. Related Product Installation: Refer to other sections listed in Related Sections for related products’ installation.
    1. TESTING
30. Upon completion of all line, load and interconnection wiring, and after all fixtures are installed and lamped, a qualified factory representative shall completely check the installation prior to energizing the system. Each installed occupancy sensor shall be tested in the test mode to see that lights turn off and on based on occupancy.
31. At the time of checkout and testing, the owner’s representative shall be thoroughly instructed in the proper operation of the system.
    1. PROTECTION
32. Contractor shall protect installed product and finished surfaces from damage during all phases of installation including preparation, testing, and cleanup.

END OF SECTION