

## **SECTION 26 27 26 - WIRING DEVICES**

### **PART 1 - GENERAL**

#### **1.1 SUMMARY**

- A. This Section includes the following:
  - 1. Receptacles, receptacles with integral GFCI, and associated device plates.
  - 2. Wall-box motion sensors.
  - 3. Snap switches and wall-box dimmers.
  - 4. Solid-state fan speed controls.
  - 5. Wall-switch and exterior occupancy sensors.
  - 6. Communications outlets.
- B. See Division 27 Section "Communications Horizontal Cabling" for workstation outlets.

#### **1.2 SUBMITTALS**

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: List of legends and description of materials and process used for premarking wall plates.

#### **1.3 QUALITY ASSURANCE**

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- B. Comply with NFPA 70.

### **PART 2 - PRODUCTS**

#### **2.1 MANUFACTURERS**

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following or approved equal:
  - 1. Wiring Devices:
    - a. Bryant Electric, Inc./Hubbell Subsidiary.
    - b. Eagle Electric Manufacturing Co., Inc.
    - c. Hubbell Incorporated; Wiring Device-Kellems.

- d. Leviton Mfg. Company Inc.
  - e. Pass & Seymour/Legrand; Wiring Devices Div.
2. Wiring Devices for Hazardous (Classified) Locations:
- a. Crouse-Hinds/Cooper Industries, Inc.; Arrow Hart Wiring Devices.
  - b. EGS/Appleton Electric Company.
  - c. Killark Electric Manufacturing Co./Hubbell Incorporated.
3. Multioutlet Assemblies:
- a. Hubbell Incorporated; Wiring Device-Kellems.
  - b. Wiremold Company (The).
4. Poke-Through, Floor Service Outlets and Telephone/Power Poles:
- a. Hubbell Incorporated; Wiring Device-Kellems.
  - b. Pass & Seymour/Legrand; Wiring Devices Div.
  - c. Square D/Groupe Schneider NA.
  - d. Thomas & Betts Corporation.
  - e. Wiremold Company (The).

## 2.2 STRAIGHT BLADE RECEPTACLES

- A. Convenience Receptacles, 125 V, 20 A: Comply with NEMA WD 1, NEMA WD 6 configuration 5-20R, and UL 498.
1. Products: Convenience receptacles in general areas. Subject to compliance with requirements, provide one of the following:
- a. Cooper; 5351 (single), 5352 (duplex).
  - b. Hubbell; HBL5351 (single), CR5352 (duplex).
  - c. Leviton; 5891 (single), 5352 (duplex).
  - d. Pass & Seymour; 5381 (single), 5352 (duplex).
2. Health care facilities and laboratories shall utilize hospital grade receptacles. All laboratories shall have hospital grade receptacles.

## 2.3 GFCI RECEPTACLES

- A. General Description: Straight blade, Hospital or Heavy-Duty grade, feed-through or non feed-through type. Comply with NEMA WD 1, NEMA WD 6, UL 498, and UL 943, Class A.
- B. Duplex GFCI Convenience Receptacles, 125 V, 20 A:

## 2.4 ISOLATED GROUND RECEPTACLES

- A. General Description: Straight blade, Hospital grade, duplex receptacle, with equipment grounding contacts connected only to the green grounding screw terminal of the device and with inherent electrical isolation from mounting strap.
  - 1. Devices: Listed and labeled as isolated-ground receptacles.
  - 2. Isolation Method: Integral to receptacle construction and not dependent on removable parts.

## 2.5 TVSS RECEPTACLES

- A. Straight blade, NEMA WD 6, Configuration 5-20R, with integral TVSS in line to ground, line to neutral, and neutral to ground.
  - 1. TVSS Components: Multiple metal-oxide varistors; with a nominal clamp level rating of 500 volts and minimum single transient pulse energy dissipation of 140 J line to neutral, and 70 J line to ground and neutral to ground.
  - 2. Active TVSS Indication: Visual and audible with light visible in face of device to indicate device is "active" or "no longer in service."
  - 3. Receptacle Type: Hospital, Heavy-Duty or General-Duty grade as appropriate.
  - 4. Identification: Distinctive marking on face of device to denote TVSS-type unit.

## 2.6 SNAP SWITCHES

- A. Comply with NEMA WD 1 and UL 20.
- B. Switches, 120/277 V, 20 A:
  - 1. Products: Subject to compliance with requirements, provide one of the following or approved equal:
    - a. Cooper; 2221 (single pole), 2222 (two pole), 2223 (three way), 2224 (four way).
    - b. Hubbell; CS1221 (single pole), CS1222 (two pole), CS1223 (three way), CS1224 (four way).
    - c. Leviton; 1221-2 (single pole), 1222-2 (two pole), 1223-2 (three way), 1224-2 (four way).
    - d. Pass & Seymour; 20AC1 (single pole), 20AC2 (two pole), 20AC3 (three way), 20AC4 (four way).
- C. Pilot Light Switches, 20 A:
  - 1. Products: Subject to compliance with requirements, provide one of the following or approved equal:
    - a. Cooper; 2221PL for 120 V and 277 V.
    - b. Hubbell; HPL1221PL for 120 V and 277 V.
    - c. Leviton; 1221-PLR for 120 V, 1221-7PLR for 277 V.
    - d. Pass & Seymour; PS20AC1-PLR for 120 V.

2. Description: Single pole, with neon-lighted handle, illuminated when switch is "ON."

D. Key-Operated Switches, 120/277 V, 20 A:

1. Products: Subject to compliance with requirements, provide one of the following or approved equal:
  - a. Cooper; 2221L.
  - b. Hubbell; HBL1221L.
  - c. Leviton; 1221-2L.
  - d. Pass & Seymour; PS20AC1-L.
2. Description: Single pole, with factory-supplied key in lieu of switch handle.

2.7 DIMMER SWITCHES

- A. Dimmer Switches: Modular, full-wave, solid-state units with integral, quiet on-off switches, with audible frequency and EMI/RFI suppression filters.
- B. Control: Continuously adjustable slider; with single-pole or three-way switching to suit connections.
- C. Incandescent Lamp Dimmers: Modular, 120 V, 60 Hz with continuously adjustable rotary knob, toggle switch, or slider; single pole with soft tap or other quiet switch; EMI/RFI filter to eliminate interference; and 5-inch (130-mm) wire connecting leads.
- D. Fluorescent Lamp Dimmer Switches: Modular; compatible with dimmer ballasts; trim potentiometer to adjust low-end dimming; dimmer-ballast combination capable of consistent dimming with low end not greater than 20 percent of full brightness.

2.8 FAN SPEED CONTROLS

- A. Modular, 120-V, full-wave, solid-state units with integral, quiet on-off switches and audible frequency and EMI/RFI filters. Comply with UL 1917.
  1. Continuously adjustable slider, toggle switch or rotary knob, ampere rating to match application.
  2. Three-speed adjustable slider or rotary knob, ampere rating to match application.

## 2.9 OCCUPANCY SENSORS

### A. Wall-Switch Sensors:

1. Products: Subject to compliance with requirements, provide one of the following or approved equal:
  - a. Cooper; 6111 for 120 V, 6117 for 277 V.
  - b. Hubbell; WS1277.
  - c. Leviton; ODS 10-ID.
  - d. Pass & Seymour; WS3000.
  - e. Watt Stopper (The); WS-200.
2. Description: Passive-infrared type, 120/277 V, adjustable time delay up to 30 minutes, 180-degree field of view, with a minimum coverage area of 900 sq. ft. (84 sq. m).

### B. Long-Range Wall-Switch Sensors:

1. Products: Subject to compliance with requirements, provide one of the following or approved equal:
  - a. Hubbell; ATD1600WRP.
  - b. Leviton; ODW12-MRW.
  - c. Watt Stopper (The); DT-200.
2. Description: Dual technology, with both passive-infrared- and ultrasonic-type sensing, 120/277 V, adjustable time delay up to 30 minutes, 110-degree field of view, and a minimum coverage area of 1200 sq. ft. (111 sq. m).

### C. Wide-Range Wall-Switch Sensors:

1. Products: Subject to compliance with requirements, provide one of the following or approved equal:
  - a. Hubbell; ATP120HBRP.
  - b. Leviton; ODWHB-IRW.
  - c. Pass & Seymour; HS1001.
  - d. Watt Stopper (The); CX-100-3.
2. Description: Passive-infrared type, 120/277 V, adjustable time delay up to 30 minutes, 150-degree field of view, with a minimum coverage area of 1200 sq. ft. (111 sq. m).

## 2.10 WALL PLATES

### A. Single and combination types to match corresponding wiring devices.

1. Plate-Securing Screws: Metal with head color to match plate finish.
2. Material for Finished Spaces: Type SS302 0.035-inch- (1-mm-) thick, satin-finished stainless steel.

3. Material for Unfinished Spaces: Galvanized or cast to suit boxes where exposed raceways are permitted.
4. Material for Wet Locations: Cast aluminum with spring-loaded lift cover, and listed and labeled for use in "wet locations."

#### 2.11 MULTI OUTLET ASSEMBLIES

- A. Components of Assemblies: Products from a single manufacturer designed for use as a complete, matching assembly of raceways and receptacles.
- B. Raceway Material: Metal, with manufacturer's standard finish.
- C. Wire: No. 12 AWG.

#### 2.12 FLOOR SERVICE FITTINGS

- A. Type: Modular, flush-type, dual-service units suitable for wiring method used.
- B. Compartments: Barrier separates power from voice and data communication cabling.
- C. Service Plate: solid brass with satin finish.
- D. Power Receptacle: NEMA WD 6, Configuration 5-20R, gray finish, unless otherwise indicated.

#### 2.13 POKE-THROUGH ASSEMBLIES

- A. Description: Factory-fabricated and -wired assembly of below-floor junction box with multichanneled, through-floor raceway/firestop unit and detachable matching floor service outlet assembly.
  1. Service Outlet Assembly: Pedestal type with services indicated, flush type with two simplex receptacles and space for two RJ-45 jacks or flush type with four simplex receptacles and space for four RJ-45 jacks, as appropriate.
  2. Size: Selected to fit nominal 3-inch (75-mm) cored holes in floor and matched to floor thickness.
  3. Fire Rating: Unit is listed and labeled for fire rating of floor-ceiling assembly.
  4. Closure Plug: Arranged to close unused 3-inch (75-mm) cored openings and reestablish fire rating of floor.
  5. Wiring Raceways and Compartments: For a minimum of four No. 12 AWG conductors; and a minimum of four, 4-pair, Category 6 voice and data communication cables.

## 2.14 SERVICE POLES

- A. Description: Factory-assembled and -wired units to extend power and voice and data communication from distribution wiring concealed in ceiling to devices or outlets in pole near floor.
1. Poles: Nominal 2.5-inch- (65-mm-) square cross section, with height adequate to extend from floor to at least 6 inches (150 mm) above ceiling, and with separate channels for power wiring and voice and data communication cabling.
  2. Mounting: Ceiling trim flange with concealed bracing arranged for positive connection to ceiling supports; with pole foot and carpet pad attachment.
  3. Finishes: Manufacturer's standard painted finish and trim combination.
  4. Wiring: Sized for minimum of five No. 12 AWG power and ground conductors; and a minimum of four, 4-pair, Category 3 or 5 voice and data communication cables.
  5. Power Receptacles: Two duplex, 20-A, heavy-duty, NEMA WD 6, Configuration 5-20R units.
  6. Voice and Data Communication Outlets: Blank insert with bushed cable opening or jacks as appropriate for design.

## 2.15 FINISHES

- A. Color: Wiring device catalog numbers in Section Text do not designate device color.
1. Wiring Devices Connected to Normal Power System: Ivory or as selected by Architect, unless otherwise indicated or required by NFPA 70.
  2. Wiring Devices Connected to Emergency Power System: Red.
  3. TVSS Devices: Blue.
  4. Isolated-Ground Receptacles: Orange.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Comply with NECA 1, including the mounting heights listed in that standard, unless otherwise noted.
- B. Coordination with Other Trades:
1. Take steps to insure that devices and their boxes are protected. Do not place wall finish materials over device boxes and do not cut holes for boxes with routers that are guided by riding against outside of the boxes.
  2. Keep outlet boxes free of plaster, drywall joint compound, mortar, cement, concrete, dust, paint, and other material that may contaminate the raceway system, conductors, and cables.
  3. Install device boxes in brick or block walls so that the cover plate does not cross a joint unless the joint is troweled flush with the face of the wall.
  4. Install wiring devices after all wall preparation, including painting, is complete.

C. Conductors:

1. Do not strip insulation from conductors until just before they are spliced or terminated on devices.
2. Strip insulation evenly around the conductor using tools designed for the purpose. Avoid scoring or nicking of solid wire or cutting strands from stranded wire.
3. The length of free conductors at outlets for devices shall meet provisions of NFPA 70, Article 300, without pigtails.
4. Existing Conductors:
  - a. Cut back and pigtail, or replace all damaged conductors.
  - b. Straighten conductors that remain and remove corrosion and foreign matter.
  - c. Pigtailling existing conductors is permitted provided the outlet box is large enough.

D. Device Installation:

1. Replace all devices that have been in temporary use during construction or that show signs that they were installed before building finishing operations were complete.
2. Keep each wiring device in its package or otherwise protected until it is time to connect conductors.
3. Do not remove surface protection, such as plastic film and smudge covers, until the last possible moment.
4. Connect devices to branch circuits using pigtails that are not less than 6 inches (152 mm) in length.
5. When there is a choice, use side wiring with binding-head screw terminals. Wrap solid conductor tightly clockwise, 2/3 to 3/4 of the way around terminal screw.
6. Use a torque screwdriver when a torque is recommended or required by the manufacturer.
7. When conductors larger than No. 12 AWG are installed on 15- or 20-A circuits, splice No. 12 AWG pigtails for device connections.
8. Tighten unused terminal screws on the device.
9. When mounting into metal boxes, remove the fiber or plastic washers used to hold device mounting screws in yokes, allowing metal-to-metal contact.
10. Install devices and assemblies level, plumb, and square with building lines.
11. Install wall dimmers to achieve indicated rating after derating for ganging according to manufacturer's written instructions.
12. Install unshared neutral conductors on line and load side of dimmers according to manufacturers' written instructions.
13. Arrangement of Devices: Unless otherwise indicated, mount flush, with long dimension vertical, and with grounding terminal of receptacles on top. Group adjacent switches under single, multigang wall plates.
14. Remove wall plates and protect devices and assemblies during painting.
15. Adjust locations of floor service outlets and service poles to suit arrangement of partitions and furnishings.

- E. Device Plates: Do not use oversized or extra-deep plates. Repair wall finishes and remount outlet boxes when standard device plates do not fit flush or do not cover rough wall opening.



3.2 IDENTIFICATION

- A. Comply with Division 26 Section "Identification for Electrical Systems."

3.3 FIELD QUALITY CONTROL

- A. Perform tests and inspections and prepare test reports in accordance with Division 26, Section "Electrical Testing".

**END OF SECTION 26 27 26**