

WIRING DEVICES

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PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following:
  - 1. Single and duplex receptacles
  - 2. Ground-fault circuit interrupter receptacles
  - 3. Single- and double-pole snap switches and dimmer switches.
  - 4. Device wall plates.

1.3 DEFINITIONS

- A. EMI: Electromagnetic interference.
- B. GFCI: Ground-fault circuit interrupter.
- C. PVC: Polyvinyl chloride.
- D. RFI: Radio-frequency interference.
- E. TVSS: Transient voltage surge suppressor.
- F. UTP: Unshielded twisted pair.

#### 1.4 REFERENCES

- A. DSCC W-C-596G: Federal Specification Connector, Electrical, Power, General Specification.
- B. DSCC W-C-896F: Federal Specification Switches, Toggle (Toggle and Lock), Flush Mounted (General Specification).
- C. IEC 309-1, Part 1: General Requirements: Plugs, Socket-Outlets and Couplers for Industrial Purposes
- D. NEMA FB 11: Plugs, Receptacles, and Connectors of the Pin and Sleeve Type for Hazardous Locations.
- E. NEMA WD 1: General Requirements for Wiring Devices.
- F. NEMA WD 6: Wiring Device – Dimensional Requirements.
- G. UL 20: General-Use Snap Switches.
- H. UL 486A: Wire Connectors and Soldering Lugs for Use with Copper Conductors.
- I. UL 486B: Wire Connectors for Use with Aluminum Conductors.
- J. UL 498: Electrical Attachment Plugs and Receptacles.
- K. UL 943: Ground Fault Circuit Interrupters.
- L. NECA 130-2010: Installing and Maintaining Wiring Devices.

#### 1.5 SUBMITTALS

- A. Product Data: Provide manufacturer's catalog information showing dimensions, colors, and configurations for each type of product indicated.

#### 1.6 QUALITY ASSURANCE

- A. Source Limitations: Obtain each type of wiring device through one source from a single manufacturer.
- B. 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.
- C. Comply with NFPA 70.

#### 1.7 COORDINATION

- A. Receptacles for Owner-Furnished Equipment: Match plug configurations.
  - 1. Cord and Plug Sets: Match equipment requirements.

### PART 2 - PRODUCTS

#### 2.1 RECEPTACLES

- A. Straight-Blade-Type Receptacles: Comply with NEMA WD 1, NEMA WD 6, DSCC W-C-596G, and UL 498. Configuration 5-20R duplex receptacle.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

- a. Hubbell Incorporated; Wiring Device-Kellems HBL 5362.
- b. ArrowHart Wiring Devices AH5362.
- c. Bryant 5362.
- d. Pass & Seymour/Legrand; Wiring Devices Division 5362

B. GFCI Receptacles: Straight blade, non-feed-through type, with integral NEMA WD 6, Configuration 5-20R duplex receptacle; complying with UL 498 and UL 943. Design units for installation in a 2-3/4-inch- (70-mm-) deep outlet box without an adapter.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

- a. Hubbell Incorporated; Wiring Device-Kellems GF5352.
- b. Cooper Wiring Devices VGF20.
- c. Leviton 7899.
- d. Pass & Seymour/Legrand; Wiring Devices Division 2084.

## 2.2 WALL SWITCHES

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Hubbell Incorporated; Wiring Device-Kellems 1220 Series.
2. ArrowHart Wiring Devices AH1220 Series.
3. Leviton 1220 Series.
4. Bryant 4900 Series.
5. Pass & Seymour/Legrand; Wiring Devices Division PS20AC Series.
1. Hubbell Incorporated; Wiring Device-Kellems 2100 Series.
2. ArrowHart Wiring Devices 7621.
3. Leviton 5621 "Decora" Specification grade.
4. Bryant Series 99.
5. Pass & Seymour/Legrand; Wiring Devices Division PS880.

B. Device body: Plastic handle.

C. Single- and Double-Pole Switches: Comply with DSCC W-C-896F and UL 20.

D. Snap Switches: Heavy Duty specification grade, quiet type; rated 20A., 120-277 V AC.

E. Provide single-pole, two-pole, three-way and four-way switches as indicated.

F. Provide pilot light where indicated.

G. Provide key type where indicated. Furnish four keys to Owner.

H. Combination Switch and Receptacle: Both devices in a single gang unit with plaster ears and removable tab connector that permit separate or common feed connection.

1. Switch: 20 A, 120/277-V ac.
2. Receptacle: NEMA WD 6, Configuration 5-20R.

## 2.3 WALL PLATES

A. Manufacturers:

1. Provide wall plates and corresponding wiring devices from same manufacturer.

B. 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:
  - a. 0.035-inch- (1-mm-) thick, satin-finished stainless steel
  - b. Smooth, high-impact thermoplastic
  - c. 0.04-inch- (1-mm-) thick, brushed brass with factory polymer finish
  - d. 0.05-inch- (1.2-mm-) thick anodized aluminum
  - e. 0.04-inch- (1-mm-) thick steel with chrome-plated finish
3. Material for Unfinished Spaces:
  - a. Galvanized steel
  - b. Smooth, high-impact thermoplastic.
4. Material for Wet Locations: Gasketed Thermoplastic with spring-loaded cover, and listed and labeled for use in "wet locations."
  - a. Manufacturers:
    - 1) Bryant RB5752-0 (polycarbonate), Hubbell.
    - 2) Pass & Seymour WIUC10C (polycarbonate)
    - 3) ArrowHart WIU-1 (polycarbonate).
    - 4) Red Dot CKNM (polycarbonate).
5. Material for Wet Locations: Gasketed Cast aluminum with spring-loaded cover, and listed and labeled for use in "wet locations."
  - a. Manufacturers:
    - 1) Red Dot Model CKSUV, Thomas & Betts.
    - 2) ArrowHart WIUM-Series.

## 2.4 FINISHES

A. Color:

1. Wiring Devices Connected to Normal Power System: As selected by Architect, unless otherwise indicated or required by NFPA 70.
2. Wall Switches: As selected by Architect, unless otherwise indicated.

3. Dimmer Switches: As selected by Architect, unless otherwise indicated.

### PART 3 - EXECUTION

#### 3.1 INSTALLATION

- A. Install products in accordance with manufacturer's instructions.
- B. Prior to installation of devices, verify wall openings are neatly cut and will be completely covered by wall plates, clean debris from outlet boxes and provide extension rings to bring outlet boxes flush with finished surface.
- C. Install devices and assemblies level, plumb, and square with building lines.
- D. Install wall dimmers to achieve full rating specified and indicated after derating for ganging according to manufacturer's written instructions.
- E. Install unshared neutral conductors on load side of dimmers according to manufacturers' written instructions.
- F. Arrangement of Devices:
  1. Coordinate locations of outlet boxes provided under Division 26 Section "Raceways and Boxes" to obtain mounting heights indicated on Drawings.
  2. Unless otherwise indicated, mount flush, with long dimension vertical, and with grounding terminal of receptacles on top.
  3. Where multiple switches, dimmers, and/or occupancy sensors are adjacent to each other, provide a single cover plate. Custom fabricate, if required, for all combinations. Provide separate boxes or barriers as required for the application.
  4. Install horizontally mounted receptacles with grounding pole on the left.
  5. Install GFCI receptacles so that the "Push To Test" and "Reset" designations can be read correctly. If printed in both directions, install with ground pole on top.
  6. Install switches with OFF position down.
- G. Install cover plates on switch, receptacle, and blank outlets in finished areas.
- H. Use oversized plates for outlets installed in masonry walls.
- I. Install galvanized steel plates on outlet boxes and junction boxes in unfinished areas, above accessible ceilings, and on surface mounted outlets.
- J. Remove wall plates and protect devices and assemblies during painting.
- K. Adjust devices and wall plates to be flush and level. Three corners of wall plates must be in contact with wall surfaces. Devices shall be solidly mounted against the box.

#### 3.2 IDENTIFICATION

- A. Comply with Division 26 Section "Electrical Identification."
  1. Receptacles: Identify panelboard and circuit number from which served. Use adhesive label as specified in Division 26 Section "Electrical Identification" with black-filled lettering on face of wall plate, and durable wire markers or tags inside outlet boxes.

### 3.3 CONNECTIONS

- A. Ground equipment according to Division 26 Section "Grounding and Bonding." Connect wiring device grounding terminal to outlet box with bonding jumper. Use of quick ground strap or screw is not acceptable.
- B. Connect wiring according to Division 26 Section "Conductors and Cables." Connect wiring devices by wrapping conductor around screw terminal or by using back wiring and tightening the screw securely.
- C. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

### 3.4 FIELD QUALITY CONTROL

- A. Perform the following field tests and inspections and prepare test reports:
  - 1. Inspect each wiring device for defects.
  - 2. Operate each wall switch with circuit energized and verify proper operation.
  - 3. After installing wiring devices and after electrical circuitry has been energized, test each receptacle for proper polarity, ground continuity, and compliance with requirements.
  - 4. Test each GFCI receptacle for proper operation with both local and remote fault simulations according to manufacturer's written instructions.
- B. Remove malfunctioning units, replace with new units, and retest as specified above.

### **WIRING DEVICES** **MARCH 17, 2008**

- 1. Design: All wiring devices provided shall be 20A specification grade. New building devices will be ivory, white or brown with stainless steel plates for standard and ground fault interrupter use. Isolated ground devices shall be orange with stainless steel cover plates. Existing building designers shall match existing color scheme that is prevalent throughout building.
  - a. Placement of Receptacles:
    - i. In standard size classrooms (49 students or less) provide a double duplex receptacle at the front of the classroom centered under the chalkboard or marker board. Provide two additional receptacles at the front of the room spaced half way between corners and double duplex receptacles. Back of rooms to be provided with single duplex receptacle at center of wall. Remaining walls to be provided with two duplex receptacles on each wall equally spaced.
    - ii. In classrooms with 50 students or more provide two duplex receptacles for the front wall, centered between the corners and one double duplex receptacle at the center of the wall. Provide two duplex receptacles equally spaced on all remaining walls.
    - iii. Corridors shall be provided with duplex receptacles 35' on center and a maximum of 10' from end of corridor. These receptacles shall have separate circuits from the room circuits. In hallways and corridors adjacent receptacles shall be on alternate circuits.
    - iv. Lecture halls shall be provided with a double duplex receptacle centered on front wall and two additional double duplex receptacles equally spaced between center double duplex and corners. Provide one duplex receptacle in the floor for a podium. Provide additional receptacles throughout for cleaning.

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These receptacles shall be a maximum of 25' on center. If lecture hall is provided with a lab bench, then provide bench with one double duplex for every eight foot of bench.

- v. Computer labs shall be provided with at least two general purpose receptacles equally spaced per wall in addition to all receptacles for computers.
  - vi. Mechanical room shall be provided with at least four duplex receptacles (one per wall) and additional duplex receptacles where walls are 25' or longer. At least one receptacle shall be fed from the emergency panel.
- b. Switches:
- i. Switches provided for all uses shall be 20A specification grade. Color scheme shall match receptacles.
  - ii. Switches provided at roof hatches or where provided outside of rooms they are serving shall be provided with pilot lights.
- c. Cover plates:
- i. Generally cover plates for flush-mounted standard devices shall be stainless steel for interior use in new buildings. Where work is being performed in existing buildings, cover plates shall match the majority of the existing devices. In residential buildings covers shall be unbreakable nylon.
  - ii. Cover plates for exterior use shall be a type which allows NEMA 3R rating to remain while in use. Where exterior device could be exposed to vandalism, provide locking type cover plates.

**\*\*END OF SECTION\*\***