

SECTION 26 2726 - SWITCHES AND RECEPTACLES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Hospital-grade receptacles, 125 V, 20 A.
 - 2. Hospital Grade GFCI receptacles, 125 V, 20 A.
 - 3. Twist-locking receptacles.
 - 4. Cord and plug sets.
 - 5. Toggle switches, 120/277 V, **20A**.
 - 6. Occupancy sensors.
 - 7. Digital timer light switches.
 - 8. Wall-box dimmers.
 - 9. Wall plates.
 - 10. Floor service fittings.
 - 11. Prefabricated multioutlet assemblies.

1.3 DEFINITIONS

- A. EMI: Electromagnetic interference.
- B. GFCI: Ground-fault circuit interrupter.
- C. Pigtail: Short lead used to connect a device to a branch-circuit conductor.
- D. RFI: Radio-frequency interference.
- E. UTP: Unshielded twisted pair.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Coordination:
 - 1. Receptacles for Owner-Furnished Equipment: Match plug configurations.

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product.

1.6 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For wiring devices to include in all manufacturers' packing-label warnings and instruction manuals that include labeling conditions.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers' Names: Shortened versions (shown in parentheses) of the following manufacturers' names are used in other Part 2 articles:
 - 1. Cooper Wiring Devices; Division of Cooper Industries, Inc. (Cooper).
 - 2. Hubbell Incorporated; Wiring Device-Kellems (Hubbell).

3. Leviton Mfg. Company Inc. (Leviton).
4. Pass & Seymour/Legrand (Pass & Seymour)
5. Legrand (Wiremold)

- B. Source Limitations: Obtain each type of wiring device and associated wall plate from single source from single manufacturer.

2.2 GENERAL WIRING-DEVICE REQUIREMENTS

- A. Wiring Devices, Components, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. Comply with NFPA 70.
- C. Devices that are manufactured for use with modular plug-in connectors may be substituted under the following conditions:
1. Connectors shall comply with UL 2459 and shall be made with stranding building wire.
 2. Devices shall comply with the requirements in this Section.

2.3 SPECIFICATION-GRADE RECEPTACLES, 125 V, 20 A

- A. Weather-Resistant Duplex Receptacle, 125 V, 20 A:
1. Products: Subject to compliance with requirements, provide device noted in TABLE 1 by Hubbell or equal by one of the following:
 - a. Manufacturer Equals:
 - 1) Hubbell
 - 2) Cooper
 - 3) Leviton
 - 4) Pass & Seymour
 2. Description: Two pole, three wire, and self-grounding. Integral shutters that operate only when a plug is inserted in the receptacle. Square face.
 3. Configuration: NEMA WD 6, Configuration 5-20R.
 4. Standards: Comply with UL 498.
 5. Marking: Listed and labeled as complying with NFPA 70, "Receptacles in Damp or Wet Locations" Article.
- B. Tamper- and Weather-Resistant Duplex Receptacles, 125 V, 20 A:
1. Products: Subject to compliance with requirements, provide device noted in TABLE 1 by Hubbell or equal by one of the following:
 - a. Manufacturer Equals:
 - 1) Hubbell
 - 2) Cooper
 - 3) Leviton
 - 4) Pass & Seymour
 2. Description: Two pole, three wire, and self-grounding. Integral shutters that operate only when a plug is inserted in the receptacle. Square face.
 3. Configuration: NEMA WD 6, Configuration 5-20R.
 4. Standards: Comply with UL 498.
 5. Marking: Listed and labeled as complying with NFPA 70, "Tamper-Resistant Receptacles" and "Receptacles in Damp or Wet Locations" articles.

2.4 HOSPITAL-GRADE RECEPTACLES

- A. Hospital-Grade, Receptacles, 125 V, 20 A:
1. Products: Subject to compliance with requirements, provide device noted in TABLE 1 by Hubbell or equal by one of the following:
 - a. Manufacturer Equals:
 - 1) Hubbell
 - 2) Cooper
 - 3) Leviton
 - 4) Pass & Seymour

2. Description: Single-piece, rivetless, nickel-plated, all-brass grounding system. Nickel-plated, brass mounting strap. Two pole, three wire, and self-grounding.
 3. Configuration: NEMA WD 6, Configuration 5-20R.
 4. Standards: Comply with UL 498 Supplement sd and FS W-C-596.
 5. Marking: Listed and labeled as complying with NFPA 70, "Health Care Facilities" Article.
- B. Hospital-Grade, Tamper-Resistant, Receptacles, 125 V, 20 A:
1. Products: Subject to compliance with requirements, provide device noted in TABLE 1 by Hubbell or equal by one of the following:
 - a. Manufacturer Equals:
 - 1) Hubbell
 - 2) Cooper
 - 3) Leviton
 - 4) Pass & Seymour
 2. Description: Two pole, three wire, and self-grounding. Integral shutters that operate only when a plug is inserted in the receptacle.
 3. Configuration: NEMA WD 6, Configuration 5-20R.
 4. Standards: Comply with NEMA WD 1, UL 498 Supplement sd, and FS W-C-596.
 5. Marking: Listed and labeled as complying with NFPA 70, "Health Care Facilities" Article.
- C. Hospital-Grade, Duplex GFCI Receptacles, 125 V, 20 A:
1. Products: Subject to compliance with requirements, provide device noted in TABLE 1 by Hubbell or equal by one of the following:
 - a. Manufacturer Equals:
 - 1) Hubbell
 - 2) Cooper
 - 3) Leviton
 - 4) Pass & Seymour
 2. Description: Integral GFCI with "Test" and "Reset" buttons and LED indicator light. Two pole, three wire, and self-grounding. Single-piece, rivetless, nickel-plated, all-brass grounding system.
 3. Configuration: NEMA WD 6, Configuration 5-20R.
 4. Type: **Non-feed** through.
 5. Standards: Comply with UL 498 supplement sd, UL 943 Class A, and FS W-C-596.
 6. Marking: Listed and labeled as complying with NFPA 70, "Health Care Facilities" Article.
- D. Hospital-Grade, Tamper-Resistant, Duplex GFCI Receptacles, 125 V, 20 A:
1. Products: Subject to compliance with requirements, provide device noted in TABLE 1 by Hubbell or equal by one of the following:
 - a. Manufacturer Equals:
 - 1) Hubbell
 - 2) Cooper
 - 3) Leviton
 - 4) Pass & Seymour
 2. Description: Integral GFCI with "Test" and "Reset" buttons and LED indicator light. Two pole, three wire, and self-grounding. Integral shutters that operate only when a plug is inserted in the receptacle. Single-piece, rivetless, nickel-plated, all-brass grounding system.
 3. Configuration: NEMA WD 6, Configuration 5-20R.
 4. Type: **Non-feed** through.
 5. Standards: Comply with UL 498 supplement sd, UL 943 Class A, and FS W-C-596.
 6. Marking: Listed and labeled as complying with NFPA 70, "Health Care Facilities" Article.

2.5 TOGGLE SWITCHES

- A. Comply with NEMA WD 1, UL 20, and FS W-S-896.
- B. Switches, 120/277 V, 20 A:
1. Products: Subject to compliance with requirements, provide device noted in TABLE 1 by Hubbell or equal by one of the following:
 - a. Manufacturer Equals:
 - 1) Hubbell
 - 2) Cooper

- 3) Leviton
- 4) Pass & Seymour

2.6 WALL-BOX DIMMERS

- A. Dimmer Switches: Compatible with LED drivers being controlled, generally 0-10 volt.
- B. Control: Continuously adjustable slider; with single-pole on/off push-button. Comply with UL 1472.

2.7 WALL PLATES

- A. Single and combination types shall match corresponding wiring devices.
 - 1. Plate-Securing Screws: Metal with head color to match plate finish.
 - 2. Material for Finished Spaces: .04" thick Type 302 stainless steel with brushed finish.
 - 3. Material for Unfinished Spaces: Galvanized steel.
 - 4. Material for Damp Locations: Cast aluminum with spring-loaded lift cover, and listed and labeled for use in wet and damp locations.
 - 5. Wet-Location, Weatherproof U.L. listed for while-in-use Cover Plates: NEMA 250, complying with Type 3R, weather-resistant, die-cast aluminum with lockable cover.
- B. Furnish configuration of device plates required for multi-gang installations.
- C. Device plates with different color in special areas to match device color.

2.8 PREFABRICATED MULTIOUTLET ASSEMBLIES

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Wiremold/Legrand 3000 Series
 - 2. Hubbell
- B. Description:
 - 1. Two-piece surface metal raceway, with factory-wired multi-outlet harness.
 - 2. Components shall be products from single manufacturer designed for use as a complete, matching assembly of raceways and receptacles.
 - 3. Refer to power plans for requirements.
- C. Raceway Material: Steel, with manufacturer's standard finish.
- D. Multi-outlet Harness:
 - 1. Receptacles: 20-A, 125-V, NEMA WD 6 Configuration Hospital-Grade 5-20R receptacles complying with NEMA WD 1, UL 498, and FS W-C-596.
 - 2. Receptacle Spacing: 1'-0".
 - 3. Wiring: No. 12 AWG solid, Type THHN copper, two circuit, connecting alternating receptacles as noted on drawings.

2.9 FINISHES

- A. Device Color:
 - 1. Wiring Devices Connected to Normal Power System: gray color unless otherwise indicated or required by NFPA 70 or device listing.
 - 2. Wiring Devices Connected to Essential Power System: Red

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Comply with NECA 1, including mounting heights listed in that standard, unless otherwise indicated.
- B. Coordination with Other Trades:
 - 1. Protect installed devices and their boxes. 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 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 right 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. Pigtail existing conductors is permitted, provided the outlet box is large enough.
- D. Device Installation:
1. Replace devices that have been in temporary use during construction and that 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, two-thirds to three-fourths of the way around terminal screw.
 6. Use a torque screwdriver when a torque is recommended or required by 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.
- E. Receptacle Orientation:
1. Install receptacles with ground wire from ground screw connected to outlet box.
 2. Install hospital-grade receptacles with the ground pin or neutral blade at the top.
 3. Install devices vertical unless shown otherwise.
- F. 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.
- G. Dimmers:
1. Install dimmers within terms of their listing.
- H. Arrangement of Devices:
1. Unless otherwise indicated, mount flush, with long dimension vertical and with grounding terminal of receptacles on top.
 2. Group adjacent switches fed from the same system branch under a single, multigang wall plates. Provide the required electrical separation on adjacent switches, on different branches, in accordance with local requirements; use multigang boxes with dividers where allowed.
- 3.2 GFCI RECEPTACLES
- A. Install non-feed-through-type GFCI receptacles only.
- 3.3 IDENTIFICATION
- A. Comply with Division 16 Section "Identification for Electrical Systems."
1. Receptacles: All receptacles on essential/emergency power system shall have device plate engraved indicated the branch (Life Safety, Critical, or Equipment) from which it is served. Use

- laser engraved machine printing with filled lettering on face of plate, and durable wire markers or tags inside outlet boxes.
- 2. Engraving shall be 1/4" high letters.
- 3. Color of letter fill corresponding to branch of electrical system:
 - a. Black for Normal
 - b. Red for Essential/Emergency
- 4. Laser engrave all device plates for receptacles dedicated for utilization by specific equipment with name of equipment served ("X-ray", "Bed", Copier", etc.)

3.4 FIELD QUALITY CONTROL

- A. Perform the following tests and inspections:
 - 1. In healthcare facilities, prepare reports that comply with recommendations in NFPA 99.
 - 2. Test Instruments: Use instruments that comply with UL 1436.
 - 3. Test Instrument for Convenience Receptacles: Digital wiring analyzer with digital readout or illuminated digital-display indicators of measurement.
- B. Tests for Convenience Receptacles:
 - 1. Line Voltage: Acceptable range is 105 to 132 V.
 - 2. Percent Voltage Drop under 15-A Load: A value of 6 percent or higher is unacceptable.
 - 3. Ground Impedance: Values of up to 2 ohms are acceptable.
 - 4. GFCI Trip: Test for tripping values specified in UL 1436 and UL 943.
 - 5. Using the test plug, verify that the device and its outlet box are securely mounted.
 - 6. Tests shall be diagnostic, indicating damaged conductors, high resistance at the circuit breaker, poor connections, inadequate fault current path, defective devices, or similar problems. Correct circuit conditions, remove malfunctioning units and replace with new ones, and retest as specified above.
 - 7. Test straight blade hospital-grade convenience outlets for the retention force of the grounding blade according to NFPA 99. Retention force shall be not less than **4 oz.**
- C. Wiring device will be considered defective if it does not pass tests and inspections.
- D. Prepare test and inspection reports.

TABLE 1 - APPROVED WIRING DEVICES

DEVICE	NEMA CONF.	MANUFACTURER	CATALOG # HEAVY DUTY SPEC GRADE	CATALOG # HOSPITAL GRADE
Single Receptacle	6-20R	Hubbell	N/A	HBL5461
Single Receptacle	14-20R	Hubbell	N/A	HBL8410
Single Receptacle	15-20R	Hubbell	N/A	HBL8420
Single Receptacle	5-30R	Hubbell	N/A	HBL9308
Single Receptacle	6-30R	Hubbell	N/A	HBL9330
Single Receptacle	14-30R	Hubbell	N/A	HBL9430A with 6ft. rubber cord set
Single Receptacle	6-50R	Hubbell	N/A	HBL9367 w/9368 plug
Single Receptacle	14-50R	Hubbell	N/A	HBL9450A w/ cord set
Single Receptacle	15-50R	Hubbell	N/A	HBL8450A w/ cord set
Single Receptacle	L5-20R	Hubbell	N/A	HBL2310
Single Receptacle, Portable X-ray	X-Ray 60A, 250V (2P,3W)	Hubbell	N/A	HBL25605 w/ 25615 plug
Duplex Receptacle	5-20R	Hubbell	N/A	HBL8300H
Duplex Receptacle, GFCI,	5-20R GF	Hubbell	GF5362 w/ WP26M	HGF8300 w/ WP26M

Weatherproof			cover	cover
Duplex Receptacle, Tamper-Proof	5-20R TP	Hubbell	N/A	HBL8300SG
Duplex Receptacle, GFCI	5-20R GF	Hubbell	N/A	HGF8300
Floor Outlet with Equipment Connection	¾" NPT	Wiremold	881/881ADP-896	881/881ADP-896
Floor Outlet with Duplex Receptacle	5-20R	Wiremold	881/881ADP-895/ HBL5362	881/881ADP-895/ HBL8300H
Floor Outlet Double Duplex Receptacle	5-20R	Wiremold	880MP-827-(2)828R/ HBL5362	880MP-827-(2)828R/ HBL8300H
Wall Switch 1-Pole	20A,120/277V	Hubbell	CS1221	N/A
Wall Switch 2-Pole	20A,120/277V	Hubbell	CS1222	N/A
Wall Switch 3-Way	20A,120/277V	Hubbell	CS1223	N/A
Wall Switch 4-Way	20A,120/277V	Hubbell	CS1224	N/A
Wall Switch, SPDT Momentary Contact, Center OFF	20A,120/277V	Hubbell	HBL1557	N/A
Wall Switch 1-Pole, Locking Key	20A,120/277V	Hubbell	HBL1221L	N/A
Wall Switch 1-Pole, Pilot	20A,120/277V	Hubbell	HBL1221PL	N/A
Wall Switch 1-Pole Lighted Handle	20A,120/277V	Hubbell	HBL1221ILC	N/A

END OF SECTION

