SECTION 262416 - PANELBOARDS

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes all panelboards.

1.2 SUBMITTALS

A. Product Data: For each type of panelboard, overcurrent protective device, accessory, and component indicated. Include dimensions and manufacturers’ technical data on features, performance, electrical characteristics, ratings, and finishes.

B. Shop Drawings: For each panelboard and related equipment.
   1. Dimensioned plans, elevations, sections, and details. Show tabulations of installed devices, equipment features, and ratings. Include the following:
      a. Enclosure types and details for types other than NEMA 250, Type 1.
      b. Bus configuration, current, and voltage ratings.
      c. Short-circuit current rating of panelboards and overcurrent protective devices.
      d. L listing for series rating of installed devices.
      e. Features, characteristics, ratings, and factory settings of individual overcurrent protective devices and auxiliary components.
   2. Wiring Diagrams: Power, signal, and control wiring.
   3. Field quality-control test reports.
   4. Operation and maintenance data.

C. Panelboard Schedules (directory) showing installed circuit uses.

1.3 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a qualified testing agency, and marked for intended use.

B. Comply with NEMA PB 1.

C. Comply with NFPA 70.
1.4 WARRANTY

A. Warranty Period: Two years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 GENERAL REQUIREMENTS FOR PANELBOARDS

A. Enclosures: Flush- and surface-mounted cabinets.

1. Rated for environmental conditions at installed location.
   a. Outdoor Locations: NEMA 250, Type 3R.
   c. Other Wet or Damp Indoor Locations: NEMA 250, Type 4.
   d. Hazardous Areas Indicated on Drawings: NEMA 250, Type 7C.

2. Front: Secured to box with concealed side hinges. For surface-mounted fronts, match box dimensions; for flush-mounted fronts, overlap box.

3. Hinged Front Cover: Entire front trim hinged to box and with standard door within hinged trim cover.
   a. Square D products, require “door in door” panel option.


B. Incoming Mains Location: Top and bottom.

C. Phase and Ground Buses: Hard-drawn copper, 98 percent conductivity.

D. Conductor Connectors: Suitable for use with conductor material.

1. Ground Lugs and Bus Configured Terminators: Compression type.
3. Main and Neutral Lugs: Compression type.
4. Ground Lugs and Bus Configured Terminators: Compression type.
5. Feed-Through Lugs: Compression type, suitable for use with conductor material. Locate at opposite end of bus from incoming lugs or main device.
6. Subfeed (Double) Lugs: Compression type suitable for use with conductor material. Locate at same end of bus as incoming lugs or main device.

E. Service Equipment Label: UL labeled for use as service equipment for panelboards with main service disconnect switches.

F. Future Devices: Mounting brackets, bus connections, and necessary appurtenances required for future installation of devices.

G. Panelboard Short-Circuit Rating:
1. UL label indicating series-connected rating with integral or remote upstream overcurrent protective devices. Include size and type of upstream device allowable, branch devices allowable, and UL series-connected short-circuit rating.
2. Fully rated to interrupt symmetrical short-circuit current available at terminals.

2.2 DISTRIBUTION, LIGHTING, AND APPLIANCE PANELBOARDS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. Square D; a brand of Schneider Electric.

B. Doors: Secured with vault-type latch with tumbler lock; using manufacturer’s standard key. Omit for fused-switch panelboards.

C. Main Overcurrent Protective Devices: Circuit breaker, unless otherwise indicated.

D. Branch Overcurrent Protective Devices:
   1. For Circuit-Breaker Frame Sizes 125 A and Smaller: Bolt-on circuit breakers.
   2. For Circuit-Breaker Frame Sizes Larger Than 125 A: Bolt-on circuit breakers.
   3. Fused switches.

2.3 DISCONNECTING AND OVERCURRENT PROTECTIVE DEVICES

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

   1. Square D; a brand of Schneider Electric.

B. Molded-Case Circuit Breaker: UL 489, with series-connected rating or interrupting capacity as shown on the design to meet available fault currents.

   3. Electronic trip circuit breakers with rms sensing; field-replaceable rating plug or field-replicable electronic trip; and the following field-adjustable settings:
      a. Instantaneous trip.
      b. Long- and short-time pickup levels.
      c. Long- and short-time time adjustments.
4. Current-Limiting Circuit Breakers: Frame sizes 400 A and smaller; let-through ratings less than NEMA FU 1, RK-5.
5. GFCI Circuit Breakers: Single- and two-pole configurations with Class A ground-fault protection (6-mA trip).
8. Molded-Case Circuit-Breaker (MCCB) Features and Accessories:
   a. Standard frame sizes, trip ratings, and number of poles.
   b. Lugs: Mechanical style, suitable for number, size, trip ratings, and conductor materials.
   c. Application Listing: Appropriate for application; Type SWD for switching fluorescent lighting loads; Type HID for feeding fluorescent and high-intensity discharge (HID) lighting circuits.
   d. Ground-Fault Protection: Integ rally mounted relay and trip unit with adjustable pickup and time-delay settings, push-to-test feature, and ground-fault indicator.
   e. Communication Capability: Circuit-breaker-mounted communication module with functions and features compatible with power monitoring and control system specified in Division 26 Section "Electrical Power Monitoring and Control."
   f. Shunt Trip: 120 or 240-V trip coil energized from separate circuit, set to trip at 55 or 75 percent of rated voltage.
   g. Handle Padlocking Device: Fixed attachment, for locking circuit-breaker handle in off position.
   h. Handle Clamp: Loose attachment, for holding circuit-breaker handle in on position.

C. Fused Switch: NEMA KS 1, Type HD; clips to accommodate specified fuses; lockable handle.
   1. Fuses are specified in Division 26 Section "Fuses."

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install panelboards and accessories according to NEMA PB 1.1.
B. Mount top of trim 90 inches above finished floor, unless otherwise indicated.
C. Mount plumb and rigid without distortion of box. Mount recessed panelboards with fronts uniformly flush with wall finish.
D. Install overcurrent protective devices and controllers.
   1. Set field-adjustable switches and circuit-breaker trip ranges.
E. Install filler plates in unused spaces.

F. Identify field-installed conductors and components. Bundle and wrap with tie wires, mark with identification as specified in Section 260553 Identification for Electrical Systems.

G. Panelboard Nameplates: Label as specified in Division 260553 Identification for Electrical Systems.

H. Create a printed panel schedule (directory) to indicate installed circuit loads and spares. Obtain approval before installing. Handwritten schedules are not acceptable.

I. Ground equipment according to Division 260526 Section "Grounding and Bonding."

J. Connect wiring according to Division 260519 Section "Low-Voltage Conductors and Cables."

3.2 QUALITY CONTROL

A. Perform acceptance tests as follows:

1. Test insulation resistance for each panelboard bus, component, connecting supply, feeder, and control circuit
   a. Perform insulation-resistance tests on each bus section, phase-to-phase, and phase-to-ground for one minute. Applied potential shall be 500V for 300V equipment and 1000V for 600V equipment.

2. Perform Phase Rotation test of each three-phase circuit.

3. Perform Voltage Checks of all circuits.

B. Prepare test reports:

C. Panelboards will be considered defective if they do not pass tests and inspections.

END OF SECTION