

SECTION 26 24 00 - PANELBOARDS

PART 1 - GENERAL

1.1. SUMMARY:

- A. This section includes design and performance requirements for electrical distribution panelboards and enclosed circuit breakers for use on secondary distribution systems rated 600 VAC and below.
- B. Related Sections:
 - 1. Section 01701 - Building Systems Identification and Labeling

1.2. QUALITY ASSURANCE:

- A. Panelboards shall be Underwriters' Laboratories (UL) Labeled.

1.3. SUBMITTALS:

- A. Product Data: Submit product literature detailing electrical ratings, dimensions, materials of construction, mounting and installation details, applicable wiring diagrams, enclosure type and accessories.

1.4. PANELBOARDS:

- A. Panelboards shall be of the dead-front type, with bolt-on, molded case circuit breakers, of the type, quantity and ratings as required.
- B. Panelboards scheduled to have main circuit breakers shall be configured with vertically mounted main breakers.
- C. Panelboards scheduled for use as Service Entrance equipment shall be UL- labeled for this duty.
- D. Load center-type Panelboards: Load center-type Panelboards are not acceptable except for residential or apartment use. Load centers shall generally comply with the requirements for circuit breaker type Panelboards, except that plug-in type breakers are acceptable, and panel door latches are acceptable in lieu of lockable doors. Circuit breakers shall be of the full-size type: half-size or twin circuit breakers are not acceptable. Where required, load centers shall be rated for service entrance use.
- E. Panelboards shall be fully rated, versus series rated.
- F. BUSSING:
 - 1. Bussing shall be bare or tin-plated copper. Bussing shall be full rated throughout the height of the panel.
 - 2. Neutral bussing shall be full rated, and electrically isolated from the cabinet. Neutrals shall be 200% rated for all K-rated panel applications.
 - 3. Panelboards shall be provided with a copper ground bus equal to a minimum of 1/2 the capacity of the phase bus. Ground bus shall be electrically bonded to the cabinet.
 - 4. Where isolated ground bus is required, provide an additional, full-rated ground bus in the panel, electrically isolated from both the neutral and panel ground bus.
- G. BRANCH CIRCUIT OVER-CURRENT PROTECTIVE DEVICES:
 - 1. Tandem mounted breakers are not acceptable.

2. All circuit breakers shall be clearly and visibly marked on the handles for their ampere trip rating. Panel and breaker designs where the panel trim must be removed to determine trip rating are not acceptable.
3. Panelboards designated for use as lighting panelboards with circuit breakers as the source of switch control shall have branch circuit breakers U.L. listed as type SWD for lighting circuits.
4. Provide circuit breakers with switched neutral, ground-fault trip, arc-fault trip or shunt trip capacity where required.
5. Provide circuit breakers with handle locking devices to prevent manual breaker operation where required.
6. Where new circuit breakers are to be installed within existing panelboards, they shall be listed for use with the existing panelboard type, and of sufficient short circuit rating for the application.
7. Circuit breakers for frame sizes less than 250 amps shall be thermal-magnetic type trip units.
8. Circuit breakers in frame sizes 250A and larger shall have adjustable, electronic trip units with long time, short time, instantaneous and time delay settings.

H. INTERRUPTING CAPACITY:

1. Panel board bussing, main and branch circuit breakers shall be rated for the minimum fault current level available on the system. Where fault current information is not readily available, the following ratings shall apply:
 - a. 120-208/240 VAC panels rated 225 amps and less shall be rated for 10,000 AIC minimum.
 - b. 120-208/240 VAC panels rated over 225 amps shall be rated for 22,000 AIC minimum.
 - c. 277/480 VAC panels rated 225 amps and less shall be rated for 14,000 AIC minimum.
 - d. 277/480 VAC panels rated over 225 amps shall be rated for 25,000 AIC minimum.

I. CABINETS AND TRIM:

1. Panelboards shall be furnished with lockable or screw-type, hinged, door-in door type cabinet trims.
2. Provide panels with auxiliary gutters where panels are of the feed-through type.
3. Cabinets shall be rated NEMA type-1 for dry interior areas, and type-4x for wet and exterior areas.
4. Provide panelboards with a hinged door, combination spring lock and catch, directory frame and two (2) keys. Panels over 48 inches high shall be provided with 3-point type latches or multiple latches. All panel locks shall be keyed alike and a neatly typed directory identifying each circuit shall be provided in the frame.
5. Trim clamps, locks and hinges shall be of the concealed type.

1.5. SEPARATELY ENCLOSED MOLDED CASE CIRCUIT BREAKERS:

- A. Where separately enclosed molded case circuit breakers are required, provide circuit breakers in accordance with the requirements noted for panelboards.
- B. Enclosed circuit breakers scheduled for use as Service Entrance equipment shall be UL-labeled for this duty.

- C. Enclosed circuit breaker cabinets shall be rated NEMA type-1 for dry interior areas, and type-4x for wet and exterior areas, unless otherwise directed.

PART 2 - PRODUCTS

2.1. MANUFACTURERS:

- A. Panelboard and circuit breaker manufacturer shall generally match the brand of installed building electrical distribution equipment.
- B. Manufacturers:
 - 1. Square D
 - 2. Siemens

PART 3 - EXECUTION

3.1. INSTALLATION – GENERAL:

- A. Installation of switchboards shall be per the NEC, the manufacturer's instructions and applicable NECA installation requirements.
- B. Where new circuit breakers are installed or added to existing switchboards, update the existing circuit directory with a new typewritten label(s) to clearly identify the load(s) served.
- C. Where new panelboard interiors are installed within existing panel backboxes, the existing backboxes shall be thoroughly cleaned of rust and scale. The interiors shall then be painted with a white, rust-inhibiting paint before the new interior is installed. New exterior panel trims, doors and locks shall then be provided for these panels. Provide new, typewritten panelboard circuit directories for all panelboard replacements to clearly identify the loads served.

3.2. INSTALLATION – DETAILED:

- A. All terminations shall be properly and accurately torqued per manufacturer's specifications using the appropriate torque screw driver or torque wrench.
- B. Calibrate adjustable-trip circuit breakers per Engineer's instructions.
- C. All unused spaces shall have filler plates installed.
- D. Measure steady state load currents at each panelboard feeder; rearrange circuits in the panelboard to balance the phase loads to within 20 percent of each other. Maintain proper phasing for multi-wire branch circuits.
- E. Each panel board shall have a neatly-typed circuit directory installed, clearly identifying the loads served by each branch circuit breaker.
- F. Provide and install a plastic engraved nameplate for each panelboard detailing the following: Panel designation; Panel operating voltage; Source and circuit number of Panelboard supply (for disconnection and isolation).
- G. Visual and Mechanical Inspection: Inspect completed panelboards for physical damage, proper alignment, anchorage and grounding. Recheck proper installation and tightness of connections.

- H. All Panelboards shall be left clean, with all debris removed from gutters and enclosures.
- I. All scratches and digs shall be repainted to match the finish paint color.

END OF SECTION