

SECTION 262416 – POWER PANELBOARDS - CIRCUIT BREAKER TYPE

PART 1 - GENERAL

1.1 GENERAL

- A. The work under this section includes but is not limited to the following:
 - 1. Power Panelboards
 - 2. Power Circuit Breakers

PART 2 - PRODUCTS

2.1 PANELBOARDS - GENERAL

- A. Panelboards shall be dead front type, having lugs only or circuit breaker in mains as shown in panelboard schedule with circuit breaker branches.
- B. Panelboard bus structure and main lugs or main breaker shall have current ratings as shown on plans. Such rating shall be established by heat rise test with Maximum hot spot temperature on any connector or bus bar not to exceed 50 degrees C rise above ambient at full rated load. Heat rise test shall be conducted in accordance with UL Standard UL67. Bus structure shall be tin-plated aluminum or tin-plated copper. All neutral busses shall be full size. All panelboards shall contain ground buss.
- C. Entire panelboard assembly, including all bussing, shall have SCCR ratings meeting or exceeding the minimum AIC ratings listed on the plans for the panel. All ratings shall be full ratings. Series ratings will not be allowed unless shown otherwise on drawings.
- D. Panelboards shall be listed by Underwriters Laboratories and shall bear the UL label. Panelboards shall be suitable for use as service equipment when required.
- E. Top/bottom feed arrangement and lug sizes/quantities shall be coordinated by the contractor.
- F. Service entrance panelboards shall be provided with barrier such that no uninsulated, ungrounded service busbar or service terminal is exposed to inadvertent contact by persons or maintenance equipment while servicing load terminations.

2.2 CIRCUIT BREAKERS

- A. Where the highest continuous current trip setting for which the actual overcurrent device installed in a circuit breaker is rated (or can be adjusted to is 1200A or higher, breakers shall be electronic trip and shall be provided with arc energy-reducing maintenance switching (with local status indicator) to reduce arc flash energy per NEC 240.87 requirements.
- B. Circuit breakers shall be quick-make and quick-break, whether actuated automatically or manually. Circuit breakers shall have inverse time tripping characteristics with automatic release which shall trip free of the handle. Circuit breaker handles shall be three distinct positions—"OFF", "ON", and "TRIPPED". When a circuit breaker opens on overload or short circuit, the operating handle shall automatically assume the "TRIPPED" position.
- C. Multipole breakers shall be internal common trip with single operating handle. External handle ties are not acceptable, unless specifically noted otherwise (such as for multi-wire branch circuits described below).

- D. Circuit breakers feeding multiwire branch circuits (as defined by NEC) consisting of separate single phase loads sharing a common neutral shall be provided with handle ties to simultaneously disconnect all ungrounded conductors per NEC Article 210.4(B). The necessary locations of these handle ties shall be coordinated by the contractor. Where necessary, the contractor may rearrange circuit breakers (as minimally as possible) as required to meet this requirement.
- E. Circuit breakers shall be of the bolt-on type.
- F. Circuit breakers shall be "FA" frame and larger.
- G. All breakers shall meet the minimum RMS symmetrical interrupting capacity ratings shown on plans for the associated panel. All interrupting ratings shall be full ratings. Series ratings will not be allowed unless shown otherwise on drawings.
- H. The front face of all circuit breakers shall be flush with each other. Breaker numbers shall be permanently attached to trim.
- I. All branch circuit breakers shall be listed to UL489 or shall be specially-tested to be HACR listed.

2.3 CABINETS, TRIM AND WIREWAY SPACE

- A. Clear space from bottom of lugs to bottom of wireway shall be not less than 6 inches for 400 amps and below, 10 inches for 600 amps, 12 inches for 800 amps and above.
- B. Panelboard interiors shall be fastened to cabinets by adjustable aligning supports.
- C. Panelboard assembly shall be enclosed in a steel cabinet. The rigidity and gauge of steel to be as specified in UL Standard 50 for cabinets.
- D. Fronts of cabinets shall be made from a single sheet of full finished steel having the door cut out. Doors shall have flush hinges, and lock utilizing all metal construction (with all locks keyed alike). Front shall be attached to cabinets with hinged trim with piano-hinge down full length of one side to allow access to wiring without complete removal of outer trim. Front shall be provided with a metal directory and holder with clear plastic covering welded to the inside of the door. Fronts shall be code gauge full-finished steel with rust inhibiting primer and baked enamel finished in ASA #49 gray. Panelboards installed in exterior or wet locations shall have NEMA 3R enclosures.
- E. Each section of multi-section panelboards shall be of matching heights and depths.
- F. Panelboard enclosures shall be furnished as shown on panel schedule on plans for surface, flush or motor control center mounting.

2.4 MANUFACTURER

- A. Panelboards shall be as manufactured by Square 'D', G.E., Siemens or Cutler Hammer.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. All panelboard dimensions and clearances shall be carefully checked and coordinated with the proper trades to ensure proper mounting space and support prior to roughing in equipment. In no case shall any circuit breaker be located above 6'-7" A.F.F..

- B. Wiring in panelboard gutters shall be done in a neat and workmanlike manner. Wiring shall be grouped into neat bundles and secured with approved tie wraps.

3.2 PERFORMANCE TESTING

- A. The ground-fault protection system when provided shall be performance tested after installation by a qualified person(s) using primary current injection in accordance with the instructions provided with the equipment and NEC requirements. A written record of the testing shall be provided.
- B. The arc energy reduction protection system when provided shall be performance tested after installation by a qualified person(s) using primary current injection in accordance with the instructions provided with the equipment and NEC requirements. A written record of the testing shall be provided.

3.3 PANEL IDENTIFICATION

- A. Refer to Specification Section 260553.

END OF SECTION 262416