

SECTION 26 24 16 (CSI MASTERFORMAT™ 2014) REV A

**COMBINATION CIRCUIT BREAKER AND FUSIBLE
BRANCH CIRCUIT PANELBOARDS**

PART 1 GENERAL

1.01 SUMMARY

- A. Furnish and install fusible branch circuit panelboards as specified, and as shown on the associated drawings.

1.02 RELATED SECTIONS

- A. Section 26 28 13 – Fuses.
- B. Section 26 05-73 – Electrical System Selective Coordination Studies.

1.03 REFERENCES

- A. UL 248 – Low-Voltage Fuses.
- B. UL 67 – Panelboards.
- C. UL 50 – Enclosures for Electrical Equipment.
- D. NEMA PB 1 – Panelboards.
- E. NEMA PB 1.1 – Instructions for Safe Installation, Operation and Maintenance of Panelboards Rated 600 Volts or Less.
- F. NEMA FU 1 – Low Voltage Cartridge Fuses.
- G. NFPA-70 – National Electrical Code®.

1.04 SUBMITTALS

- A. Submit product bulletins or data sheets detailing the B-E below.
- B. Construction drawings including:
 - a. Overall, wiring gutter, and interior mounting dimensions
 - b. Conduit entrance/exit locations, size, number/phase, and termination types
 - c. Main/branch device, neutral, and ground locations
 - d. Assembly and component device and nameplate information
- C. Assembly ratings including:
 - a. Voltage, ampacity, and short-circuit current ratings, including any specific lineside overcurrent protection requirements
- D. Main disconnect ratings (if applicable):
 - a. Voltage and ampacity ratings of the disconnect
 - b. Voltage, ampacity, and interrupting ratings of fuses
- E. Branch device ratings including:
 - a. Voltage, ampacity, and interrupting ratings of fused branch devices
- F. Fuses:
 - a. Description and number of each fuse type

1.06 SYSTEM DESCRIPTION

- A. The panelboards shall be UL Listed.
- B. Selective Coordination:
 - a. Panelboards overcurrent protective devices shall be selectively coordinated with all supply side (fed from both the normal and emergency source) Mersen Amp-Trap 2000 family AJT or A6D/A2D fuses sized at a minimum ampere ratio of 2:1. Consult Mersen for coordination ratios with other overcurrent protection devices.

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1.07 QUALIFICATIONS

- A. The equipment manufacturer shall have a minimum three years experience in producing electrical distribution panelboards.
- B. Fusible branch circuit panelboards shall be listed to UL 67.

1.08 DELIVERY, STORAGE AND HANDLING

- A. Equipment shall be shipped with branch circuit fuses installed. Branch circuit fuses shall be shipped preinstalled in the chassis.
- B. Inspect equipment for possible damage during delivery and prior to installation.
- C. Handle and store in accordance with manufacturer's instructions.

1.09 INSTALLATION, OPERATION, AND MAINTENANCE MATERIALS

- A. Furnish operation and maintenance key(s) from the manufacturer.
- B. Manufacturer shall provide copies of installation, operation and maintenance manuals to owner including replacement parts list if available.

1.10 WARRANTY

- A. Manufacturer shall warrant specified equipment free of materials and workmanship defects for 18 months from the date of shipment or 12 months from date of first use, whichever occurs first.

1.11 ADDITIONAL MATERIALS

- A. Furnish [10%] [20%] or minimum of three fuses of each rating and type of fuse installed.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Combination circuit breaker and fusible branch circuit panelboards shall be Mersen Fused Coordination Panelboard type MFPC or approved equal.
- B. Substitutions will be accepted only if the below requirements are met and written approval is provided from the engineer:
 - a. The electrical contractor supplies a written request to the engineer three weeks prior to the project bid date
 - b. The electrical contractor provides product documentation to prove complete compliance with specification and all pertinent codes and standards requirements as specified in this section

2.02 PANELBOARD RATINGS

- A. Panelboards shall be labeled with a short-circuit current rating (SCCR) equal to or greater than that indicated on the associated schedules or drawings.
- B. Non-service and service entrance rated panelboards shall be UL listed.
- C. Panelboards shall be rated 600Vac and have a current rating as indicated on the associated schedules or drawings.
- D. Panelboard overcurrent protective device interrupting ratings shall be UL listed and rated for the maximum available fault current.
- E. Current ratings, configuration of poles and number of circuits shall be indicated on associated schedules or drawings.

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2.03 CONSTRUCTION

- A. Panelboard branch circuits shall incorporate overcurrent protection using fuse types that are manufactured by at least three independent companies to assure replacement availability.
- B. Interiors shall be factory assembled.
- C. Bus bars shall be tin-plated copper with sufficient cross sectional area to meet UL 67 temperature rise requirements.
- D. 200 ampere rated neutral shall be standard, 400 ampere rated neutral shall be provided where indicated in the associated schedules or drawings.
- E. Bonded neutral shall be provided where specified in associated drawings.
- F. Isolated or non-isolated equipment ground bar shall be provided as indicated in the associated schedules or drawings.
- G. Where a service-entrance rated panelboard is indicated in associated schedules or drawings, a bonded neutral and non-isolated equipment ground bar shall be provided by the manufacturer.
- H. Main lug conductor terminations:
 - a. MLO terminations shall be rated for 60/75°C, Cu-Al
 - b. Main disconnect terminations shall be rated for 75°C, Cu Only
- I. Where specified on drawings, NEMA 1 and NEMA 3R panelboards shall be for top or bottom incoming feed.
- J. Where specified on drawings and specifications, the panelboards shall meet seismic zone ratings based upon third party testing.

2.04 MAIN DISCONNECT

- A. Where specified in the drawings, permanently installed lockout means shall be provided on the main disconnect for lock out tag out (LOTO) procedures.
- B. Main disconnect shall be quick-make, quick-break type.

2.05 BRANCH CIRCUIT OVERCURRENT PROTECTION

- A. Both circuit breaker and fuse shall have visible circuit ON/OFF indication.
- B. Fuse holder shall provide open fuse indication via permanently installed neon indicating light where included in the plans and specifications.
- C. Overcurrent protective devices shall be UL Listed, with voltage and short-circuit current ratings meeting the available voltage and short current shown on the drawings. The combination circuit breaker and fuse shall have amperage ratings and number of poles as indicated on the panelboard schedule.
- D. Circuit breakers and fuses shall be finger-safe components with trim installed.
- E. Fuse holder shall be designed so as not to allow fuse removal while fuse terminals are energized.
- F. No special tools shall be required for fuse removal.
- G. Circuit breakers and fuses shall be clearly marked with device amperage.
- H. Where specified on the drawing, permanently installed lockout means shall be provided on the device for lock out tag out procedures.
- J. Branch overcurrent protective devices shall minimize the types and rating of fuses to only 30A, 60A and 100A for simple maintenance.
- K. Branch circuit load terminations shall be UL listed for one and two wires per terminal.

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- L. Multipole branch circuit overcurrent protection devices shall trip on an overcurrent of any pole to prevent single-phasing of the load.
- M. Branch circuit overcurrent protection devices shall be "Bolt In"
- N. Branch circuit overcurrent protection devices shall be resettable without replacing fuses for overcurrents for at least twice their rating
- O. Short circuits shall be cleared within $\frac{1}{2}$ cycle to prevent sensitive equipment disruptions

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2.06 MAIN & BRANCH OVERCURRENT PROTECTION

- A. All fuse protective devices shall have a minimum interrupting rating of 200kA.
- B. Branch circuit overcurrent protection shall be UL Listed for the voltages specified on the drawings.
- C. Main overcurrent protective devices shall be UL Listed for the voltages specified on the drawings.

2.07 ENCLOSURE

- A. NEMA 1 enclosures shall be surface or flush mount as indicated in associated schedules or drawings. NEMA 3R enclosures shall be surface mount only.
- B. Boxes with 60A and less branch circuits shall be a nominal 20 inches wide and 6 inches deep with wire bending space per the National Electrical Code®.
- C. Panelboard trim shall be supplied with lockable door covering all circuit breaker and disconnect handles.
- D. Panelboard trim shall be dead-front construction covering all energized parts.
- E. Enclosures shall be NEMA Type 1 or Type 3R as indicated in associated schedules or drawings.
- F. Door-in-door type trim shall be provided for NEMA 1 enclosures where it is specified in the associated schedules or drawings.
- G. Front trim shall be lockable. All lock assemblies shall be keyed alike.
- F. Surge Protection shall be internally installed as indicated in associated schedules and drawings.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Equipment shall be installed in accordance with NEMA PB1.1 and manufacturer's recommendations.
- B. Equipment shall have a nameplate installed and mounted to the front cover and indicate: panelboard type, ampere rating, voltage rating and short-circuit current rating.
- C. Verify connected load(s) and selection of fuse sizes prior to installation.
- D. Inspect completed installation for physical damage, alignment, and support.

3.02 FIELD ADJUSTMENTS & TESTING

- A. Tighten chassis, device and termination connections in accordance with manufacturer's recommendations.
- B. Measure load currents for each branch device and balance phase loads where possible.

3.03 CLEANING

- A. Touch up scratched or marred surfaces to match original finish.