

SECTION 164XX

FUSED MAIN AND DISTRIBUTION SWITCHBOARDS

PART 1 GENERAL

1.1 SUMMARY

- A. Furnish and install main and distribution switchboards as shown on the drawings. Switchboard shall be free-standing, dead-front, with group mounted overcurrent protective devices.

1.2 RELATED SECTIONS

- A. Section 16491 - Fuses

1.3 REFERENCES

- A. Switchboards shall comply with the following:
 1. NEMA KS 1
 2. NEMA PB 2
 3. UL 98
 4. UL 977
 5. UL 891

1.4 SUBMITTALS

- A. Submit ten copies of items B-D below.
- B. Detail switchboard construction drawings including:
 1. Front, side, and top views with dimensional information
 2. Conduit entrance/exit locations, size, and number/phase
 3. Assembly and component device termination type/size
 4. Assembly and component device nameplate information
 5. One-line diagrams, wiring diagrams, and equipment schedules as needed
 6. Special connection or adjoining equipment information as needed
- C. Assembly ratings including:
 1. Voltage, ampacity, and short-circuit current (bracing) ratings
- D. Component device ratings including:
 1. Voltage, ampacity, and interrupting ratings
 2. Switch and fuse type
 3. Product data sheets or bulletins
 4. Metering and instrumentation device information as needed
 5. Miscellaneous components or features as needed

1.5 CLOSEOUT SUBMITTALS

- A. Submit ten copies of:
 - 1. Final as-built drawings, assembly and component device ratings as required with Section 1.4
 - 2. Assembly and device test reports where available or required
 - 3. Operation and maintenance manuals including replacement parts list.

1.6 QUALIFICATIONS

- A. The equipment manufacturer shall have a minimum five years experience in producing electrical distribution equipment.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Equipment shall be shipped without fuses installed, furnish separately.
- B. Deliver equipment in shipping splits as indicated on approved submittals.
- C. Inspect equipment for possible damage during delivery and prior to installation.
- D. Handle equipment in accordance with NEMA PB 2.1 and manufacturers recommendations.
- E. Store equipment in clean, dry space and protect from dirt, water, debris, and damage.

1.8 MAINTENANCE MATERIALS

- A. Furnish two sets of fuse pullers.
- B. Furnish operating/maintenance tools/key(s) as supplied by manufacturer.

1.9 ADDITIONAL MATERIALS

- A. Furnish three sets of each rating and type of fuse installed and spare fuse cabinet where not already provided.

PART 2 PRODUCTS

2.1 GENERAL

- A. Manufacturers:
 - 1. Square D Model - QED-2
 - 2. Cutler-Hammer Model - PRL-C
 - 3. GE Electrical Model - Spectra Series
 - 4. Siemens Model - Sentron SB1
- B. Ratings
 - 1. Switchboards shall have a voltage and current rating as indicated on the drawings.
 - 2. Switchboards shall have a short-circuit current rating of 200,000A rms symmetrical at the voltage indicated on the drawings.

3. Series ratings are not permitted with main or feeder devices unless supplying lighting and appliance panelboards.

2.2 CONSTRUCTION

- A. Switchboard structures shall be front and rear aligned
- B. Switchboard shall be front and rear accessible
- C. Switchboard shall be service entrance rated where indicated on the drawings.
- D. Switchboard enclosure shall be NEMA 1 for switchboards installed indoors.
- E. Switchboard enclosure shall be NEMA 3R for switchboards installed outdoors. Provide lockable doors. Provide a thermostatically controlled space heater in each section of switchboards installed outdoors. Provide power to space heater(s) from a control power transformer within switchboard.
- F. Switchboard front and side covers shall be bolt-on style and removable with single tool.
- G. Switchboard shall have all exterior surfaces painted with manufacturer's standard painting process.
- H. Future provisions shall be provided as indicated on the drawings with all connector and mounting hardware.
- I. Phase and Neutral Bus shall have:
 1. Full capacity (tapered bus is not permitted), plated copper composition
 2. Ampacity as indicated on drawings and have sufficient cross-section in accordance with listing temperature rise requirements.
 3. Provisions for adding future sections.
- J. Ground bus shall:
 1. Extend the entire length of the switchboard
 2. Be sized in accordance with local and listing requirements.
 3. Have provisions for adding future sections.
- K. Provide mimic bus showing bus connections and devices in single line form on front panels of switchboard if indicated on drawings.

2.3 AUXILIARY SECTION

- A. Provide pull section or box as indicated on drawings.

2.4 UTILITY METERING COMPARTMENT

- A. Provide separate utility metering compartment in compliance with local utility requirements as indicated on drawings.

2.5 CUSTOMER METERING

- A. Where customer metering is indicated on drawings, provide:

1. Separate customer metering compartment with hinged cover.
2. Solid-state customer metering device with accessories as specified on drawings.

2.6 MAIN SECTION DEVICE(S)

- A. Provide main lugs only or main fused device(s) as shown on the drawings.
- B. Main fused device(s) shall comply with the below requirements.
 1. 1200A or less
 - a. Load interrupter knife-blade switch rated up to 200,000A rms symmetrical with Cooper Bussmann LPN-RK/LPS-RK, LPJ, or KRP-C fuses.
 - b. Interlocks to prevent the opening of the cover when the switch is in the ON position. Interlock shall be defeatable for testing purposes.
 - c. Handle lockable in OFF position.
 2. Above 1200A
 - a. Individually mounted bolted pressure switch (100% rated) rated up to 200,000A rms symmetrical with with Cooper Bussmann KRP-C fuses.
 - b. Interlocks to prevent the opening of the cover when the switch is in the ON position. Interlock shall be defeatable for testing purposes.
 - c. Handle lockable in OFF position.
 - d. Provide electrically-tripped switch with open fuse indication
 3. Provide zero sequence, inverse time, ground fault protection if indicated on drawings with:
 - 1) Electrically-tripped switch with solid-state ground fault protection relay and monitor panel with test/reset operators.
 - 2) Adjustable ground fault setting from 100 to 1200A with time-delay settings from 0.1 to 0.5 seconds.
- C. Provide key interlocks if indicated on drawings

2.7 DISTRIBUTION SECTION DEVICES

- A. Provide feeder/branch fused devices 1200A or less as shown on the drawings in accordance with below:
 1. Group mounted
 2. Load interrupter knife-blade switch rated up to 200,000A rms symmetrical with Cooper Bussmann LPN-RK/LPS-RK, LPJ, or KRP-C fuses.
 3. Interlocks to prevent the opening of the cover when the switch is in the ON position. Interlock shall be defeatable for testing purposes.
 4. Handle lockable in OFF position.
 5. Twin mountable switches up to 200A
- B. Provide feeder/branch fused devices above 1200A as shown on the drawings in accordance with below:
 1. Individually mounted
 2. Bolted pressure switch (100% rated) rated up to 200,000A rms symmetrical with with Cooper Bussmann KRP-C fuses.
 3. Interlocks to prevent the opening of the cover when the switch is in the ON position. Interlock shall be defeatable for testing purposes.
 4. Handle lockable in OFF position.

2.8 ACCESSORIES

- A. Provide transient voltage suppression devices as indicated on drawings.

2.9 FACTORY TESTING

- A. Perform factory tests under simulated service conditions to assure proper device operation and wiring. Perform dielectric tests and other standard factory tests prior to shipment.
- B. Provide three copies of factory test reports with equipment.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Inspect area of switchboard installation to assure proper clearance and support.

3.2 INSTALLATION

- A. Equipment shall be installed in accordance with NEMA PB 2.1 and manufacturer's recommendations.
- B. Equipment shall have a nameplate installed and mounted to the front cover and indicate: switchboard type, ampere rating, voltage rating, short-circuit rating, and load served for each disconnect switch.
- C. Verify connected load(s) and selection of all fuse sizes prior to selection and installation. Install fuses in accordance with Section 2.6 and 2.7. Refer to Section 16941 for product requirements. Install labeling that identifies replacement fuse type/class and rating.
- D. Install filler plates or covers for unused spaces in switchboard.
- E. Inspect completed installation for physical damage, alignment, and support.

3.3 FIELD ADJUSTMENTS AND TESTING

- A. Tighten bolted bus connections in accordance with manufacturer's recommendations.
- B. Test bus insulation resistance in accordance with manufacturer's test procedures.
- C. Test all devices for proper operation in accordance with manufacture's instructions.

3.4 CLEANING

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

END OF SECTION