

## **SECTION 16470 - POWER DISTRIBUTION UNITS**

### **PART 1 GENERAL**

#### **1.01 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

#### **1.02 SUMMARY**

- A. This Section includes lighting and power panel-boards and associated auxiliary equipment rated 600 V and less.
- B. Related Sections include the following:
  - 1. Division 16 Section "Basic Electrical Materials and Methods" for general materials and installation methods.

#### **1.03 SUBMITTALS**

- A. Product Data: For each type of panel-board, accessory item, and component specified.
- B. Shop Drawings: For panel-boards. Include dimensioned plans, sections, and elevations. Show tabulations of installed devices, major features, and voltage rating. Include the following:
  - 1. Enclosure type with details for types other than NEMA 250, Type 1.
  - 2. Bus configuration and current ratings.
  - 3. Short-circuit current rating of panel-board.
  - 4. Features, characteristics, ratings, and factory settings of individual protective devices and auxiliary components.
  - 5. Wiring Diagrams: Details of schematic diagram including control wiring and differentiating between manufacturer-installed and field-installed wiring.
- C. Maintenance Data: For panel-board components to include in the maintenance manuals specified in Division 1. Include manufacturer's written instructions for testing circuit breakers.

#### **1.04 QUALITY ASSURANCE**

- A. Listing and Labeling: Provide products specified in this Section that are listed and labeled.
  - 1. The Terms "Listed" and "Labeled": As defined in the National Electrical Code, Article 100.
  - 2. Listing and Labeling Agency Qualifications: A "Nationally Recognized Testing Laboratory" as defined in OSHA Regulation 1910.7.
- B. Comply with NFPA 70.
- C. Comply with NEMA PB 1.
- D. Comply with UL-489: Molded-Case Circuit Breakers, Switches, and Circuit Breaker Enclosures, UL-1699: Arc Fault Circuit Interrupters, and UL-1998: Software in Programmable Components

### **PART 2 PRODUCTS**

#### **2.01 MANUFACTURERS**

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
- B. Manufacturers: Subject to compliance with requirements, provide products by the following:
  - 1. Eaton Corp.; Westinghouse & Cutler-Hammer Products.
  - 2. General Electric Co.; Electrical Distribution & Control Div.

3. Siemens Energy & Automation, Inc.

## **2.02 LOAD CENTERS**

- A. Overcurrent Protective Devices: Plug-in, full-module circuit breaker.
  1. Circuit Breakers for Switching Lights at Panelboards: Indicated as Type SWD.
  2. Circuit Breakers for Equipment Marked Type HACR: Indicated as Type HACR.
- B. Conductor Connectors: Mechanical type for main, neutral, and ground lugs and buses.

## **2.03 ARC FAULTS**

- A. Combination Circuit Interrupters: Overvoltage protection and neutral bus terminal; Indicated as Type SWD and Type HACR.

## **2.04 OVERCURRENT PROTECTIVE DEVICES**

- A. Molded-Case Circuit Breaker: NEMA AB 1, handle lockable.

## **PART 3 EXECUTION**

### **3.01 INSTALLATION**

- A. Load Centers:
  1. Install panel-boards and accessory items according to NEMA PB 1.1.
  2. Mounting Heights: Top of trim 74 inches (1880 mm) above finished floor, unless otherwise indicated.
  3. Mounting: Plumb and rigid without distortion of box. Mount flush panel-boards uniformly flush with wall finish.
  4. Circuit Directory: Type directory to indicate installed circuit loads after balancing panel-board loads. Obtain approval before installing.
  5. Install filler plates in unused spaces.
  6. Provision for Future Circuits at Flush Panel-boards: Stub four 1-inch (27-GRC) empty conduits from panel-board into accessible ceiling space or space designated to be ceiling space in the future. Stub four 1-inch (27-GRC) empty conduits into raised floor space or below slab not on grade.
  7. Wiring in Panel-board Gutters: Arrange conductors into groups, and bundle and wrap with wire ties after completing load balancing.
- B. Arc Faults:
  1. Install in compliance with DET-719 "Applying 1-pole Combination AFCI's to Shared Neutral Circuits".
  2. Circuitry: Secure pigtail to neutral bus terminal. Connect hot wire to circuit breaker terminals.
  3. Mounting: Plug in or bolt on circuit breaker into compatible pole positions directed by load center.
4. Testing: Reset circuit breaker to test condition
  - a. If breaker trips with all loads OFF: Check permanent electrical circuit wiring, arcing, poor insulation, shorted wires, wet connections, wet conduit, a neutral lead pinched to a grounded metal box, receptacle leakage, loose connections, or other faults that could

cause safety features in the breaker to open the circuit.

- b. Switch ON one of the original loads. Reset the breaker. If breaker does not trip with this load ON, switch on an additional load. Repeat until breaker trips. Examine last additional load for possible faults.
  5. Loads and/or wiring suspected of having faults should not be installed to service.
  6. Refer to DET-719, "Applying 1-pole Combination AFCIs to Shared Neutral Circuits".
- C. Provide arc faults circuit breaker on any circuit that enters a sleeping room.

### **3.02 IDENTIFICATION**

- A. Identify field-installed wiring and components and provide warning signs as specified in Division 16 Section "Basic Electrical Materials and Methods."

### **3.03 GROUNDING**

- A. Make equipment grounding connections for panel-boards as indicated.
- B. Provide ground continuity to main electrical ground bus as indicated.

### **3.04 CONNECTIONS**

- A. Tighten electrical connectors and terminals, including grounding connections, according to manufacturer's published torque-tightening values. Where manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

### **3.05 FIELD QUALITY CONTROL**

- A. Prepare for acceptance tests as follows:
  1. Make insulation-resistance tests of each panel-board bus, component, and connecting supply, feeder, and control circuits.
  2. Make continuity tests of each circuit.

### **3.06 CLEANING**

- A. On completion of installation, inspect interior and exterior of panel-boards. Remove paint splatters and other spots, dirt, and debris. Touch up scratches and mars of finish to match original finish.

**END OF SECTION 16470**