

SECTION 16470

PANELBOARDS

PART 1 - GENERAL

1.01 WORK INCLUDED

- A. Lighting and appliance branch circuit panelboards.
- B. Individually mounted circuit breakers.
- C. Service panelboard
- D. Panel mount transient suppression.

1.02 RELATED SECTIONS

- A. Section 16010: Basic Electrical Requirements.

1.03 REFERENCES

- A. NEMA Standards.
- B. NFPA 70 N.E.C. Latest Edition.
- C. U.L. Standards.

1.04 PERFORMANCE REQUIREMENTS

- A. Conform to requirements of ANSI/NFPA 70 (N.E.C.).
- B. Furnish products listed and classified by Underwriters Laboratories, Inc. (U.L.) as suitable for purpose specified and shown.
- C. Size per Drawings.

1.05 SUBMITTALS

- A. Submit Shop Drawings, Owners' Manuals, and Operating Instructions in accordance with Section 01300 - Submittals.
- B. Include outline and support point dimensions, voltage, main bus ampacity, integrated short circuit ampere rating, circuit breaker and fusible switch arrangement, catalog, specification and sizes, panel dimensions, and gutter space.

1.06 SPARE PARTS

- A. Keys: Furnish to Owner 1 key for each panel. All panels shall be keyed alike or to Owners keying system. Minimum 5 keys.
- B. Fuses: Furnish to Owner three (3) spare fuses for each circuit and each device specified with fuses. Maximum of six (6) spare fuses of each type and rating installed.
- C. Fuse Pullers: Furnish one fuse puller to Owner.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURES - PANELBOARDS

- A. General Electric.
- B. I-T-E Siemens.
- C. Cutler-Hammer/Westinghouse.
- D. Square D.

2.02 MAIN PANELBOARD

- A. Main Panelboard: U.L. labeled for use as service entrance equipment.
- B. Circuit breaker type with mains and circuits as indicated on the Drawings and all designed for three phase, four wire, solid neutral, 60 cycle service rated for 120/208 volt service as scheduled.
- C. Enclosure: NEMA Type 1 except as noted. Code gauge galvanized steel boxes and enameled steel fronts sized for 6" minimum side, top and bottom gutters, or greater as required by NEC.
- D. Surface mounting as indicated by the panel schedule, concealed hinge and flush lock all keyed alike.
- E. Bus: Copper ratings as scheduled on Drawings. Lugs designed for use for both copper and aluminum conductors.
- F. Neutral Bar: Full size grounded to the cabinet and provided with lugs for each branch circuit space in the panel.
- G. Bonding strap securely attached to the cabinet with lugs as required to receive the bonding conductors indicated and specified.
- H. Minimum Integrated Short Circuit Rating: 14,000 amperes rms symmetrical at 240 volt for 120/208v service.
- I. Molded Case Circuit Breakers: Toggle type thermal-magnetic, quick-make, quick-break, with silver-plated contacts, bolt-in type, and with common trip for multiple circuits. Breakers shall have a nominal thickness of 1" per pole. Provide circuit breakers UL listed as Type SWD for switching lighting circuits. Provide UL Class A ground fault interrupter circuit breakers where indicated.
- J. Provide with Panel Mount Transient Surge Suppressors equal to units specified below.

2.03 BRANCH CIRCUIT PANELBOARDS

- A. Lighting and Appliance Branch Circuit Panelboards: Circuit breaker type with mains and circuits as indicated on the Drawings and all designed for three phase, four wire, solid neutral, 60 cycle service rated for 120/208 volt and 277/480 volt service as scheduled.
- B. Enclosure: NEMA Type 1 except as noted. Code gauge galvanized steel boxes and enameled steel fronts sized for 6" minimum side, top and bottom gutters, or greater as required by NEC.
- C. Flush or surface mounting as indicated by the panel schedule, concealed hinge and flush lock all keyed alike.

- D. Bus: Copper ratings as scheduled on Drawings. Provide subfeed and feed-through lugs as required. Lugs designed for use for both copper and aluminum conductors. Subfeed lugs shall mean tapped ahead of buses and feed-through shall mean tapped on load side of main and buses.
- E. Neutral Bar: Full size insulated from the cabinet and provided with lugs for each branch circuit space in the panel.
- F. Bonding strap securely attached to the cabinet with lugs as required to receive the bonding conductors indicated and specified.
- G. Minimum Integrated Short Circuit Rating: 10,000 amperes rms symmetrical at 240 volt for 120/208v service
- H. Molded Case Circuit Breakers: Toggle type thermal-magnetic, quick-make, quick-break, with silver-plated contacts, bolt-in type, and with common trip for multiple circuits. Breakers shall have a nominal thickness of 1" per pole. Provide circuit breakers UL listed as Type SWD for switching lighting circuits. Provide UL Class A ground fault interrupter circuit breakers where indicated.

2.04 INDIVIDUALLY MOUNTED CIRCUIT BREAKERS

- A. As specified above for Main Panelboard: U.L. labeled for use as service entrance equipment.
- B. Molded Case Circuit Breakers: As specified above in item BRANCH CIRCUIT PANELBOARDS.
- C. Enclosure: NEMA Type 1 general purpose except as noted.
- D. Flush or surface mounted as indicated.

2.05 ACCEPTABLE MANUFACTURERS - FUSES

- A. Buss or equal.

2.06 FUSES

- A. See section 16440.

2.07 PANEL MOUNT TRANSIENT SURGE SUPPRESSORS

- A. Leviton or equal TVSS 5700 Series designed for 120/208 VAC 3 phase, 4 wire plus ground.
- B. Suppression Response: ANSI/IEEE C62.41 Category A & B.
- C. UL Standard 1449.
- D. EMI/RFI Noise Filtering.
- E. Provide in the main panel.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Install panelboards plumb and properly secured. Recessed panels shall be flush with wall finishes.
- B. Height: Per N.E.C.

- C. Provide filler plates for unused spaces in panelboards.
- D. Provide typed directory completely filled-in indicating outlets, fixtures, devices, and locations served by the circuit. Revise directory to reflect circuiting changes required to balance phase loads.
- E. Stub 4 empty one inch conduits to accessible location above, ceiling and below floor, from each recessed panelboard that has accessible ceilings above and/or below the panel.
- F. Finish painting of flush panelboards and individually mounted breakers shall be as specified in Section 09900.
- G. Properly support backboards, and panels. Coordinate with Section 06100, Rough Carpentry, to provide blocking as required.

3.02 FIELD QUALITY CONTROL

- A. Measure steady state load currents at each panelboard feeder. Should the difference at any panelboard between phases exceed 20 percent, rearrange circuits in the panelboard to balance the phase loads within 20 percent. Take care to maintain proper phasing for multi-wire branch circuits.
- B. Visual and Mechanical Inspection: Inspect for physical damage, proper alignment, anchorage, and grounding. Check proper installation and tightness of connections for circuit breakers, fusible switches, and fuses.

3.03 PANELBOARD SCHEDULE

- A. See Drawings.

END OF SECTION