SECTION 16160

PANELBOARDS

# GENERAL

## DESCRIPTION

### This section describes materials, testing, and installation of panelboards.

## RELATED WORK SPECIFIED ELSEWHERE

### General Electrical Requirements: 16010.

### Power System Study: 16938.

## SUBMITTALS

### Submit shop drawings in accordance with the General Conditions.

### Show ratings and characteristics including voltage ratings, bussing arrangement, continuous current ratings, fault current withstand ratings, neutral bus rating, enclosure type, ratings and arrangement of overcurrent protective devices, and mounting provisions.

## MEASUREMENT AND PAYMENT

### Payment for the work in this section shall be included as part of the lump-sum bid amount stated in the Proposal.

# MATERIALS

## GENERAL

### Conform with NEMA PB 1 (panelboards) and UL 67 (electric panelboards).

### Provide dead front, safety-type panelboards with voltage ratings as scheduled. Panelboards shall be circuit breaker type and suitable for the short circuit ratings specified. Panelboards shall be UL listed and labeled and manufactured by Allen Bradley, General Electric, Cutler Hammer Square D, Siemens, or equal.

## BREAKERS

### Breakers shall be molded-case type and shall comply with NEMA AB3 requirements. Provide quick-make and quick-break toggle mechanism, inverse-time trip characteristics, and trip-free operation on overload or short circuit. Automatic tripping shall be indicated by a handle position between the manual OFF and ON position. Provide trip ratings as indicated in the panelboard schedules.

### Single-pole breakers shall be full module size; two poles shall not be installed in a single module. Multiple circuit breakers shall be of the common-trip type having a single operating handle.

### Provide HACR-type breakers where indicated in the drawings or when protection of HVAC equipment is required.

### Furnish GFI, 5-mA trip, 10,000-ampere interrupting capacity circuit breakers where indicated.

## BREAKER CONNECTIONS

### Circuit breaker current-carrying connections to the bus shall be bolted type.

## BUS BARS

### Bus bars shall be copper. Provide a copper ground bus bar installed on the panelboard frame, bonded to the box, and containing at least 10 terminal screws or a number of terminal screws equal to or greater than the maximum number of branch circuits. For panelboards with neutrals, provide full-size neutral bus bar, unless otherwise noted in the drawings, and suitable lugs to support maximum number of circuits.

## SPACE ONLY

### Where “space only” is noted in the panelboard schedules and on the drawings, provide connectors and mounting brackets for the future insertion of a 20-ampere, single-pole overcurrent device.

## DIRECTORIES

### Provide typed circuit directories on the inside face of the door of each panel. Do not provide handwritten directories. Indicate the load in watts for each circuit in the directory.

## NAMEPLATES

### Provide nameplates as specified in Section 16010. Designate the identifying nomenclature, voltage, and phase of the panel as shown in the drawings; for example, “PANEL A, 120/240-volt, single-phase, 3-wire, 100-ampere bus.”

## Contactors & surge protection

### Provide 30-ampere mechanically held contactors, 100% rated for ballast and tungsten lighting loads, with coil-clearing contacts. Provide quantity of poles as indicated in the drawings.

### Provide surge protection system where shown and or indicated on the drawings.

## Cabinets

### Enclose panelboards in NEMA 1 single sheet metal cabinet with hinged front doors, catches, and locks. Provide holder for the directory on the inside of the door. Panelboard locks shall be keyed alike.

### Where shown as part of a motor control center, panelboard shall be mounted in the motor control center by the motor control center manufacturer.

### Provide space for controls, such as contactors, in a separate compartment with hinged doors within respective panelboards. Where limited by the height of the panels, locate controls in a separate cabinet adjacent to the respective panelboard.

### For outdoors, panelboard shall be in NEMA 4X, stainless steel enclosure.

## SERVICE ENTRANCE EQUIPMENT

### Panelboards shall be suitable as service entrance equipment where noted in the drawings. Provide a factory-installed service-entrance type UL label.

## MINI-POWER CENTER

### Unit shall comprise a main breaker, a dry-type transformer, and a panelboard. Provide interconnecting wiring at the factory.

### Main breaker shall be 600-volt rated.

### Transformer shall be as specified under Section 16460 for 10-kva and below units.

### Panelboard shall have a main breaker with a factory-coordinated rating. For 480V, 3-phase panelboards, 42KA at 480V shall be minimum rating.

# EXECUTION

## ACCESSIBILITY

### Install panelboards so that the top of the highest circuit breaker is not more than 6 feet 6 inches above the floor or working platform.

## TESTS

### Operate each circuit breaker and verify that all phases of each load are disconnected.

### Contactors: Test the operation of each contactor to verify that the control performs its function.

### Verify quantity and rating of each breaker as per the design documents.

### Confirm generic arc flash label, and label produced by the Power System Study be affixed on the panel properly.

**END OF SECTION**