

SECTION 16471100.P01
LOW VOLTAGE POWER PANELBOARDS - Spectra Plug-In™

PART 1 GENERAL

A. The requirements of the Contract, Division 1, and Division 16 apply to work in this Section.

1.01 SECTION INCLUDES

A. Low voltage power panelboards

1.02 RELATED SECTIONS

1.03 REFERENCES

The low voltage power panelboards and protection devices in this specification are designed and manufactured according to latest revision of the following standards (unless otherwise noted).

- A. ANSI/NEMA PB 1, Panelboards
- B. ANSI/NFPA 70, National Electrical Code
- C. Federal Specification W-C-375, Rev. B, Amend. 1, Circuit Breakers, Molded Case; Branch Circuit and Service
- D. Federal Specification W-P 115, Rev. C, Panel, Power Distribution
- E. Federal Specification W-S-865 - Heavy Duty Switches
- F. UL 489, Molded-Case Circuit Breakers and Circuit-Breaker Enclosures
- G. UL 50, Enclosures for Electrical Equipment
- H. UL 67, Panelboards
- I. UL 98, Enclosed and Dead Front Switches

1.04 DEFINITIONS

A. Overcurrent Protective Device - Single pole circuit breaker or single fuse. Example: A 2-pole device is considered 2 protective devices.

1.05 SYSTEM DESCRIPTION

- A. Equipment shall be indoor outdoor deadfront power panelboards for fused-switches and / or molded-case circuit breakers .
- B. Panelboards shall meet service entrance requirements where indicated on the drawings.
- C. Panelboards shall have integrated short circuit rating. Fully rated panel rating is that of lowest rated device in panelboard. Series rating are for the UL tested main-branch combination.

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1.06 SUBMITTALS

A. Manufacturer shall provide copies of following documents to owner for review and evaluation in accordance with general requirements of Division 1 and Division 16:

1. Product Data on specified product;
2. Shop Drawings on specified product;
3. Trip curves for each specified product.

1.07 PROJECT RECORD DOCUMENTS N/A

1.08 INSTALLATION, OPERATION AND MAINTENANCE DATA

A. Manufacturer shall provide copies of installation, operation and maintenance procedures to owner in accordance with general requirements of Division 1 and Division 16.

1.09 QUALITY ASSURANCE (QUALIFICATIONS)

A. Manufacturer shall have specialized in the manufacture and assembly of low voltage power panelboards for [25] years.

B. Low voltage power panelboards shall be listed and/or classified by Underwriters Laboratories in accordance with standards listed in Article 1.03 of this specification.

1.10 REGULATORY REQUIREMENTS N/A

1.11 MOCK-UPS (FIELD SAMPLES) N/A

1.12 DELIVERY, STORAGE, AND HANDLING

A. Contractor shall deliver, store, protect, and handle products in accordance with recommended practices listed in manufacturer's and Maintenance Manuals.

B. Ship each low voltage power panelboard section in individual shipping splits for ease of handling. Each panelboard section shall be mounted on shipping skids and wrapped for protection.

C. Contractor shall inspect and report concealed damage to carrier within specified time.

D. Contractor shall store in a clean, dry space. Maintain factory protection or cover with heavy canvas or plastic to keep out dirt, water, construction debris, and traffic.

E. Contractor shall handle in accordance with manufacturer's written instructions to avoid damaging equipment, installed devices, and finish.

1.13 PROJECT CONDITIONS (SITE ENVIRONMENTAL CONDITIONS)

A. Follow (standards) service conditions before, during and after panelboard installation.

B. Low voltage power panelboards shall be located in well-ventilated areas, free from excess humidity, dust and dirt and away from hazardous materials. Ambient temperature of area will be between minus [30] and plus [25] degrees C. Indoor locations shall be protected to prevent

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moisture from entering enclosure.

1.14 SEQUENCING AND SCHEDULING N/A

1.15 WARRANTY

A. Manufacturer warrants equipment to be free from defects in materials and workmanship for 1 year from date of installation or 18 months from date of purchase, whichever occurs first.

1.16 MAINTENANCE SERVICE N/A

1.17 EXTRA MATERIALS N/A

1.18 FIELD MEASUREMENTS

A. Contractor shall make all necessary field measurements to verify that equipment shall fit in allocated space in full compliance with minimum required clearances specified in National Electrical Code.

PART 2 PRODUCTS

2.01 MANUFACTURER

A. General Electric Company products have been used as the basis for design. Other manufacturers' products of equivalent quality, dimensions and operating features may be acceptable, at the Engineer's discretion, if they comply with all requirements specified or indicated in these Contract documents.

2.02 MANUFACTURED ASSEMBLIES

A. Furnish GE Spectra Series Plug-In™ Low Voltage Power Panelboards (or equal) as indicated in drawings.

2.03 COMPONENTS

Refer to Drawings for: actual layout and location of equipment and components; current ratings of devices, bus bars, and components; voltage ratings of devices, components and assemblies; and other required details.

A. Enclosures

1. Panel box shall be galvanealed code gauge sheet steel with removable end walls.
2. Enclosures shall be surface mounted.

B. Fronts

1. Provide a four piece front to cover wiring gutter and wiring access areas. <{Provide a

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lockable hinged door } with semi-concealed hinges to cover access to circuit breakers.>

<{2. Hinged door fronts, when specified, shall be provided with (select one of the following three options) }{a lockable inner door with leaf hinges. }{door-in-door. }{a front-hinged to box. } An inner door shall cover the circuit protective devices and shall be able to be locked.>

3. Door hinges shall be continuous piano hinges, welded to door(s) and bolted on front.

4. Door locks shall be [{GE slate red, Valox style }{Yale #511 }{Corbin lift latch }{3 point latch }].

C. Interiors

1. Panelboard interior shall be symmetrically designed and assembled such that circuit protective modules (fused switches less than 800 A or circuit breakers) are connected onto bus bar with positive gripping jaw assemblies and locked pressure connections.

2. Circuit-protective modules shall be designed for removal or replacement without disturbing adjacent protective devices and without removing <{main bus }{and / or }{branch circuit }>connections.

3. Interiors shall allow installation of fusible switches and molded-case circuit breakers in same panelboard.

4. Lugs shall be UL listed to accept solid or stranded [{copper }{aluminum}] cables. Lugs shall be bolted in place.

5. Panelboards shall be rated as indicated in drawings. Main devices shall have maximum rating of 1200 amperes.

6. Panelboards shall have flat, stacked, vertically aligned bus bars.

7. Bus bars shall be [{aluminum }{copper}]. The bus bars shall have sufficient cross sectional area to meet UL 67 temperature rise requirements through actual tests. The bus bars shall be [{standard density rated for 1000 amperes per square inch copper }{standard density rated for 750 amperes per square inch aluminum }{reduced density rated for 800 amperes per square inch copper }{reduced density rated for 600 amperes per square inch aluminum }].

8. Bus bars shall be phase-sequenced and rigidly supported by high impact resistant, insulated bus supporting assemblies to prevent vibration or short circuit mechanical damage.

9. Neutral bus shall be fully rated and able to be located in either corner of enclosure at line end to facilitate conductor termination. Furnish 200 percent rated neutral bus, if required by plans.

10. All solderless terminations shall be suitable for [{copper }{aluminum}] UL listed wire or cable and shall be tested and listed in conjunction with appropriate UL standards. Terminations shall be rated for use with conductor ampacity as assigned in the NEC 75 degree C table.

11. Ground wire terminations shall be provided as an optional kit for installation by panelboard installer without voiding UL label.

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D. Main and Branch Devices

1. Circuit breakers

- a. Main and branch circuit breakers shall be quick-make, quick break, and trip indicating, GE Type low voltage molded-case (or equal).
- b. Circuit breaker case shall have ON/OFF and International I/O position indicators.
- c. Breaker faceplate shall list current rating, UL and IEC certification standards, and AIC ratings.
- d. Circuit breakers shall be factory sealed and shall be date coded on breaker case.
- e. Breakers shall be UL listed for reverse connection without restrictive line or load markings. Circuit breakers shall be able to mount in any operating position.
- f. 3-pole breakers with ampere ratings greater than [150] ampere shall have rating plugs.
- g. All circuit protective devices shall have the following minimum symmetrical current interrupting capacity [{"18kA"} {"25kA"} {"35kA"} {"50kA"} {"65kA"} {"100kA"}]. Interrupting rating of breakers shall not be less than maximum short circuit current available at incoming line terminals as shown on plans.
- h. Breakers shall have UL listed series ratings, if specified in drawings.
- i. Main breakers and lugs shall be convertible by installer for top or bottom incoming feed.
- <{j. Where indicated on the drawings, } the main breaker shall be provided with integral ground fault pick-up and delay settings and adjustable long time, {and } {"instantaneous } {"and short time } {"settings.}>

2. Fusible switches

- a. Main and branch-fusible switches shall be positive, quick make, quick break type with double break, over center mechanism, GE Type ADS (or equal).
- b. External handle shall be able to be padlocked in OFF position. Handle shall be interlocked with switch cover to prevent access to switch interior when switch is ON. Interlock shall have an override release.
- c. Fusible switch units shall be fully interchangeable without disturbing units above or below and shall withstand available let-through short-circuit current as shown on plans.

E. Series Ratings

- 1. Panelboard series-connected ratings shall be attached to the panelboard enclosure.

2.04 ACCESSORIES

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- A. <{Dual}{Through-feed}{Compression}> lugs
- B. Padlocks
- C. Non-padlock handle lock devices
- D. Grounding bars. (Neutral bus shall have grounding strap for Service Entrance applications.)
- E. Exterior mounted equipment label
- F. Furnish nameplates for each device as indicated in drawings. Color schemes shall be as indicated on drawings.
- G. Provide a TVSS as specified in Section 16479010.

2.05 TESTING

2.06 FINISH

- A. Standard panelboard boxes shall be galvanealed (zinc finished) or galvanized.
- B. Fronts shall be coated with phosphatized rust inhibitor and finish coated with ANSI 61 light gray baked on powder coat.
- C. Screw fasteners shall be zinc coated to retard corrosion.

PART 3 EXECUTION

3.01 EXAMINATION

- A. The following procedure shall be performed by the contractor.
 - 1. Verify that low voltage panelboards are ready to install.
 - 2. Verify field measurements are as shown on Drawings.
 - 3. Verify that required utilities are available, in proper location and ready for use.
 - 4. Beginning of installation means installer accepts conditions.

3.02 LOCATION

3.03 INSTALLATION

Additional provisions and editing may be required for this part.

- A. Contractor shall install per manufacturer's instructions.
- B. Contractor shall install required safety labels.

3.04 FIELD QUALITY CONTROL N/A

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3.05	ADJUSTING	N/A
3.06	CLEANING	N/A

END OF SECTION