

Section 16620
Remote Power Panel Specification

1.0 General Requirements

1.01 Scope

- A. Furnish factory assembled Remote Power Panel (RPP) system in accordance with the contract documents and the following specification with all elements to conform to all relevant standards of manufacturing and construction, including but not limited to, NFPA, IEEE 519-1991, UL67, UL50, NEMA AB-1, NEMA PB-1, NEC, and all relevant local codes.
- B. Work of this section, as shown or specified shall be in accordance with the requirements of the contract documents.
- C. The bidder shall participate in determining of the means available for receiving and handling the equipment.
- D. Off loading, installation, interconnecting cables and lugs and all associated costs are the responsibility of the contractor. Installation shall be in accordance with the manufacturer's recommendations.

1.02 Work Included

- A. Furnish components for Remote Power Panel (RPP) units as herein specified for installation under another contract.
- B. Provide all materials and services for manufacturing, testing, and delivery to a designated jobsite. The work required under this contract shall include the following:
 - 1. Furnishing Remote Power Panel (RPP) system as herein specified.
 - 2. Complete configuration drawings and installation drawings.
 - 3. Factory tests as herein specified.

1.03 Submittal Requirements

- A. The information with the bid shall include, but are not limited to, the following items:
 - 1. Technical proposal, including specification and description of all components, lug sizes, frame sizes and current ratings of circuit breakers and operation.
 - 2. Outline and installation drawings showing dimensions and weight of the equipment, along with external power cable connections and recommended cable entrances and exits.
 - 3. Proposed fabrication schedule, factory test dates and delivery date per contract documents.
 - 4. Warranty schedule
- B. Bidders shall provide a compliance review of all specifications and addenda. The review will be a paragraph-by-paragraph designating Compliance ("C"), Deviation ("D"), Exception ("E") and a numbered footnote with reasons for the proposed deviation or exceptions and how the intent of the specification will be satisfied.

1.04 Shop Drawings

- A. Prepare and submit for review detailed shop drawings for the equipment furnished hereunder. Upon receipt of purchase order, four (4) sets of shop drawings shall be submitted within two weeks of accepted purchase order, prior to proceeding with any fabrication or assembly of equipment.
- B. All submittals shall be a complete package properly indexed and cross referenced. Submittals shall contain all required and detailed information.

1.05 Operating and Maintenance Instructions and Manuals

- A. The seller shall submit one (1) set of operating and maintenance instructions and manuals, covering completely the operation and maintenance of the equipment furnished hereunder to the owner. One (1) set of the parts list and manual for each item of equipment shall be furnished to the owner. Maintenance manuals shall include but not limited to trouble shooting charts, schematics and wiring diagrams.
- B. Provide sufficient operation and maintenance instruction for building operators, with on-the-job factory trained engineers representing the manufacturers. The instruction shall be scheduled at time(s) convenient to the Owner's personnel.

1.06 Installation

- A. Installation shall be in compliance with all the manufacturer's recommendations and local codes. All warranty troubleshooting shall be performed by the manufacturer or an authorized representative. Site testing shall be done by the authorized electrician at the jobsite.

1.07 Guarantee

- A. The Remote Power Panel (RPP) system shall be warranted by the manufacturer to be free from defects in workmanship and material for a period of (12) twelve months from shipment. Warranty shall include all costs of repair, parts, labor, travel and living expenses for the service personnel.

1.08 Standards

- A. The RPP shall be listed to UL Standards.

2.0 Product Specification

2.01 General

- A. The Remote Power Panel (RPP) is a NEMA 12 freestanding enclosure measuring only 24"W x 24"D, and 83"H. (Optional Server Cabinet Line and Match 24"W x 38"D, and 83"h.) (Optional Wall Mounted RPP measuring 26"W x 9"D x 80.5"H) The system requires front access only for routine service (two panelboard unit) (front, rear, and one side for four (4) panelboards) for all operations including infrared Scanning of bussing and breakers. All breakers and switches shall be mounted behind a dead front door while still allowing for operation without having to open the door. The exterior doors shall be secured by single point locking latch when closed.
- B. Each RPP cabinet is designed for the data center environment. Once the system is placed in its final position, the unit shall be secured to the floor.
- C. The cabinet enclosure also includes a pre-punched output computer power cable landing panel for both immediate and future cabling requirements.
- D. The input to the Remote Power Panel system shall be fed from a **plug-in**, three (3) phase, 225 amperes 240 volt rated molded case switch (Optional - circuit breaker) and shall feed two (2) 42-pole distribution panelboards. The input to the three (3) or four (4) panelboard Remote Power Panel system shall be fed from two (2) **plug-in**, three (3) phase, 225 amperes 240 volt rated molded case (Optional - circuit breakers). One (1) molded case switch shall feed two (2) 42-pole distribution panelboards in the unit front and the second molded case switch shall feed the third and fourth panelboards in the back of the unit. Each panelboard is rated 225 amperes and contains all copper busbars. Each panelboard is provided with a 42-position ground bus kit and a 200% rated neutral assembly. Each panelboard bus structure is designed to accept either snap-in or bolt-on branch circuit breaker protective devices. All wiring, cables shall be copper or plated copper.
- E. All bus shall be rated per the National Electric Code.
- F. The Remote Power Panel system shall include a computer grade single point ground in accordance with FIPS Pub 94 and all requirements of NEC.
- G. **OPTIONAL** - Input Junction Box(es)
 - 1. Each Remote Power Panel system shall include () screw-covered, NEMA 12 power junction box. The box shall contain five (5) mechanical power terminal blocks accommodating copper/aluminum wire for the connection of the Wye configured incoming power feeds to the distribution system.
 - 2. Each power junction box is equipped with a ten foot (10') long system main input power cable is provided with each system. The cable consists of liquid-tight flexible metal conduit and contains the appropriate size and number of copper conductors to comply with 1993 NEC standards. This field-installed cable contains two (2) box connectors thus allowing ease of installation onto the power junction box and RPP.
- H. **OPTIONAL** - Transient Suppression Network
 - 1. The transient Suppression Network provides an integrated system designed and engineered to meet ANSI/IEEE category C transient voltages and surge currents. The TSN shall operate on the secondary side of the Secondary Main Switch and is designed for 120/208V. The TSN consists of a high speed M.O.V. (metal oxide varistor) connected to the output of the unit to further suppress

any transients levels which may have passed through the unit capability. The TSN is a solid state, bipolar, clamping device designed to suppress both positive and negative transients from either the line or the critical load, and integral capacitors for noise attenuation. The TSN shall be a high energy solid state component designed to turn on in less than 5 nanoseconds. The line to neutral suppression levels equivalent to 160 volts rms (nominal rms of 120 volts) and line to line suppression limit to 300 volts rms (120 v nominal line to line) The total surge capacitance is 40,000 amperes.

- I. **OPTIONAL** - Three Phase Current Monitor (*Note: Not available with the BCMS option.*)
This current monitoring system displays the three system phase currents utilizing a digital display and a rotary switch.
- J. **OPTIONAL** - Branch Circuit Monitoring System (*Note: Not available with the Three Phase Current Monitor option.*)

1. General. Complete Branch Circuit Current Measurement & Communication System. The 'BCMS' measures and monitors the electric current on each panel circuit throughout the RPP.

The 'BCMS' utilizes the required number of Branch Circuit Sensor Modules to collect and report this data through a single communications port. A customer supplied Communication Cable can access up to 10 Daisy Chained 'BCMS' Modules, simplifying customer interconnection and information access, even more.

2. Customer Monitoring System Interface Specifications:
- ModBus RTU Compatible
 - 4 wire, RS 422 connection
 - 9600 Baud
 - 6 Conductor, Silver Satin Communication Cable (Recommended, supplied by others)
3. Branch Circuit Sensor Module Ratings (2 req. for each 42 circuit panels):
(21) - 1000/ 1 ratio CT's;
- 200amp @30deg. C
 - 50/400hz
 - Current Range: 2-100 amperes

- K. **OPTIONAL** – Local PDI 8212 Branch Circuit Monitor (*Note: Not available with the Three Phase Current Monitor option. Must purchase Branch Circuit Monitoring with PDI 8212.*)

1. PDI 8212 Monitor is designed to provide local information on current. Allows you to:
- Manage your server loads locally
 - Set and manage alarms for current locally
 - Monitor current per panelboard and per circuit

Note: System needs to be powered up within six (6) weeks of site delivery.

2.02 Electrical Characteristics

- A. RPP Input Source voltage: 208Vac nominal three-phase, four-wire plus ground.
- B. RPP Frequency: 60 Hz, 50 Hz optional

2.03 **Environmental Requirements**

- A. Storage temperature shall be between -36°C to +70°C (-33°F to 158°F).
- B. Operating temperature shall be between 0°C to +40°C (32°F to 104°F).
- C. Relative humidity from 0% to 95% non-condensing.
- D. Altitude to a maximum of 10,000 feet.

3.0 **Execution**

3.01 **Packaging and Shipping**

- A. The manufacturer shall provide adequate packaging to ensure there is not damage to the unit(s) while in transport.
- B. The manufacturer shall provide adequate notice to the contractor of shipping and arrival times
- C. The contractor shall provide for receiving and storage of any units prior to installation. Unit storage should be provided in accordance to the environmental conditions outline in this specification.

3.02 **Field Service**

- A. All field service work shall be performed by the manufacturer's trained and certified personnel.
- B. A 24 -hour telephone service organization shall be provided and the phone numbers displayed on the door of each enclosure.

3.03 **Installation**

- A. The contractor shall provide labor for the installation of the new equipment in accordance to the manufacturer. All rigging for unloading and installation shall be the responsibility of the contractor. The manufacturer shall assist the contractor as required in interpreting the installation instructions.
- B. The manufacturer shall provide all inter-cabinet wiring as required.
- C. The contractor shall install the equipment as shown on the drawings and insure all required working clearances are maintained.
- D. Following installation, the manufacturer shall verify the correct installation of the RPP.

3.04 **Acceptance**

- A. Final Acceptance shall occur when the units are shipped and received with no damage to the jobsite.