**Product guide specification**

**Cyberex® Remote Power Panel**

**RPP 100A – 400A**

Document ID: SPE-RPP-MK-0057  
Revision: B00

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# General

## Summary and scope

The following technical specification describes the requirements of self-contained enclosure with a grouping of power panels for distribution of computer grade power to data processing equipment and other critical loads. The system shall be known as a Remote Power Panel (RPP).

## Standards

The RPP shall be designed, tested (or certified) and manufactured to the following standards:

* ETL listed to UL 508A
* cETL listed to CSA C22.2 No. 14-1
* National Electric Code (NEC – NFPA 70)
* Institute of Electrical and Electronic Engineers (IEEE)
* National Electrical Manufacturers Association (NEMA)
* ANSI/NEMA C12.1 - 2014
* Federal Information Processing Standards (FIPS 94)

## Definitions

The following definitions shall apply throughout this specification:

* Owner, User or Buyer – the owner; or the owner’s designated representative(s).
* Manufacturer – the firm or corporation who will manufacture and deliver the RPP equipment specified herein.
* Specifications – the technical instructions described or portions of standards referenced herein, and any addenda thereto.

## System description

### Environmental requirements

The RPP shall be capable of withstanding any combinations of the following environmental conditions without mechanical or electrical damage or degradation of operation.

* Operating ambient temperature: 0 to 40°C.
* Non-operating storage temperature: -40 to 60°C.
* Relative humidity: 10 to 95% non-condensing.
* Maximum operating altitude: 2500m (8202ft) above sea level.
* Non-operating altitude: 15,000m

### Electrical characteristics

The RPP shall have a full load continuous capacity of 64.8 KVA or 180 amps per panel board.

* The input voltage to the RPP shall be 208/120 VAC, 3 phase, 4 wire plus ground @ 60 Hz.
* The output voltage from the RPP shall be 208/120 VAC, 3 phase, 4 wire plus ground @ 60 Hz.

## Warranty

The RPP manufacturer shall guarantee the entire system against defective material and workmanship for a period of one (1) year from date of shipment.

With purchase of factory start-up services and used in the continental United States, the manufacturer shall include labor and expenses for a period of one (1) year from date of the factory start-up, not to exceed eighteen (18) months from date of factory shipment.

# Product

## Manufactured units

2.1.1 RPP manufacturers: Subject to compliance with requirements, provide products by ABB (Cyberex®).

## Components

### Cabinet construction:

* The RPP cabinet enclosure shall be designed for free standing placement on a raised floor, allowing for wire access from the bottom. The cabinet enclosure shall not exceed 24”W x 26”D x 77.75H”. *(Specifier’s Note: some 400A configurations may require larger 24”W x 38”D frame.)*
* The RPP cabinet enclosure frame shall be of welded and constructed of 14 gage steel. Use of pop-rivets or bolted fasteners for the frame assembly shall be prohibited.
* The enclosure shall be a single bay vertical cabinet using natural air convection for cooling. Forced air-cooling shall not be used in this design.
* The RPP enclosure shall include four exterior access doors. Two doors for access to the panel boards, panel main breaker and monitoring shall be on the front and rear; and shall be hinged on the frame corners and removable using lift-off hinges. Two side doors for installation and maintenance access shall not be hinged and shall be removable. The exterior doors shall be constructed of 14 gage steel.
* The front and rear doors for operational access shall have key-lockable rotatable handle. The latching mechanism shall engage at three points: at the top, side and bottom edges of the unhinged side of the door.
* The side doors shall each hook at the bottom and latch at the top using a cylindrical lock requiring a special tool.
* The RPP shall include internal dead-front covers for each pair of panel boards on the front and rear of the cabinet. Each panel board cover shall be attached using lift-off hinges to allow additional access to the panel boards. The panel board covers shall be secured using fast thread screws and be constructed of 16 gage steel.
* The external doors on the front and back faces of the RPP shall match the type of distribution provided as follows*: (Specifier’s Note: front and back doors may be different. Choose as many of the following as needed.)*
  + [Solid door] [on front] [on back] [on front and back]
  + [Window for panel boards] [on front] [on back] [on front and back]
  + [Window for metering] [on front] [on back] [on front and back]
  + [Windows for panel boards and metering] [on front] [on back] [on front and back]
* The RPP shall provide an input/output gland plate (cable tray) for the purpose of terminating input conduits or cables and branch circuit cabling. Each punched hole for branch circuits shall contain a factory-installed air-tight plastic plug that can be removed by the customer before use. (Holes are sized to accept standard trade size fittings; dimensions given correspond to inside diameters of those fittings.) *(Specifier’s Note: choose a configuration)*
  + [(186) 0.75” & (4) 2.5”] (standard)
  + [blank (un-punched)]
  + [(165) 0.5” & (2) 2.5”] (optional)
  + [(88) 0.75” & (4) 2.5”] (optional)
  + [(173) 0.5” & (2) 2”] (optional)
  + [(90) 0.5” & (9) 0.75” & (5) 1” & (2) 2”] (optional)
  + [(137) 0.5” & (8) 0.75” & (4) 1” & (2) 2”] (optional)
  + [(165) 0.5” & (4) 2”] (optional)
  + [(151) 0.5” & (2) 4”] (optional)
  + [(151) 0.5” & (2) 3.5”] (optional)
* The RPP cabinet enclosures shall be finished in manufacturer’s standard black textured power coat epoxy to complement the data processing equipment in this facility.

### Input sources

* The RPP shall accept input from [1] [2] [3] [4] separate sources. Separate xxx amp rated terminal blocks with mechanical lugs shall be provided for each source to accept customer’s wiring.

### Input main circuit breaker(s)

* The RPP shall include quantity [1] [2] [3] [4], [100] [150] [225] [400] amp ABB fixed-mount input main circuit breaker(s) to provide both system protection and a means of disconnecting power from the system.
* Each input main circuit breaker shall be a line voltage rated, 3-pole thermal-magnetic molded-case circuit breaker, sized for 125% of the RPP full load current rating.
* Each input main circuit breaker shall have an interrupting rating of 65 kAIC (ABB) @ 240 VAC.

### Output distribution panel boards

* The RPP shall contain quantity [1] [2] [3] [4], 42-pole, [225A] [400A], 240V, 3 phase distribution panel boards with a short circuit rating of 22 kAIC.
* The RPP shall be available with [ABB ProLine, 42 circuit panel boards with their branch circuits arranged in two opposing columns] [standard GE 42 circuit panel boards with their branch circuits arranged in two opposing columns].
  + *Specifier’s Notes: Maximum of (2) GE 42 circuit panel boards can be accommodated per RPP. One panel on the front and one on the rear.*
* Each distribution panel board shall employ copper buss bars and shall be capable of accepting 1 pole, 2 pole, and 3 pole circuit breakers rated at up to 100 amps.
* Each distribution panel board shall feature a 42 position 200% rated neutral bus assembly and a 42 position ground bus kit to provide sufficient output neutral and ground termination space. The ground and neutral bus kits shall be mounted to facilitate optimum spacing for ease of installation and expansion purposes.
* Each neutral bus kit associated with each 42 pole distribution panel board shall be fed by two (2) 1/0 AWG THHN/THWN copper conductors. This will provide 450 amps of conductor to each neutral bus kit.

### Branch circuit breakers

* Each output branch circuit shall be protected by a separate branch circuit breaker.
* Each distribution panel board shall be capable of accepting [snap-on] [bolt-on] branch circuit breakers into the same panel board interior.
* Each branch circuit breaker protective device shall have 3 toggle positions: “ON”, “OFF”, and “TRIPPED”.
* Branch circuit breakers shall have a [10] [22] kAIC rating.

*Specifier’s Notes: There are a multitude of configurations available with up to 4 sources, up to 4 panel main breakers and up to 4 panel boards. The follow rules apply:*

* *The number of sources must be less than or equal to the number of panel board main breakers.*
* *The number of panel board main breakers must be less than or equal to the number of panel boards.*

## Metering and monitoring options

The RPP shall offer the following metering and monitoring options:

### Cyberex® PowerView Branch Circuit Management (BCM) [optional]

*(Specifier’s Note: See complete Cyberex® PowerView Core or PowerView Pro guide specifications for details. The following is a summary.)*

PowerView BCM shall provide the capability of measuring individual currents (true RMS amperes) for each of 168 branch circuits residing in up to four, 42 circuit panel boards.

PowerView BCM (current) shall provide the following:

* Real time true RMS current, peak current (resettable), minimum current (resettable) for each branch circuit
* Panel board phase current
* Voltage, power, energy, power factor and THD (current) for each branch circuit
* Voltage, power, energy, power factor and THD (current) at the panel board level
* User configurable warning and alarm thresholds for each circuit
* User configurable warning and alarm statuses for each circuit
* PC-based set up software capable of global or individual circuit setup
* Modbus RTU over RS485 to connect to users building management system (BMS)
* Individually replaceable 60A solid core CTs bracket-mounted on each side of each panel shall be standard
* Individual 100A solid core CTs shall be available as factory or field-installed options.

### Cyberex® PowerView Main Feed Circuit Management (MFCM) [optional]

*(Specifier’s Note: See complete Cyberex® PowerView Core or PowerView Pro guide specifications for details. The following is a summary.)*

PowerView MFCM shall provide the capability of providing phase current, metering at the panel board main or source level with the following functionality:

* Real time true RMS current, peak current (resettable), minimum current (resettable) for each main feed circuit
* Voltage, power, energy, power factor and THD (current) for panel board main or source
* User configurable warning and alarm thresholds for each main feed circuit
* User configurable warning and alarm statuses for each main feed circuit
* PC-based set up software capable of global or individual circuit setup
* Modbus RTU over RS485 to connect to users building management system (BMS)

### Local display [optional]

The RPP shall be equipped with an industrial use, long life, color touchscreen, liquid crystal display (LCD) for the graphical user interface (GUI). The LCD shall measure at least 6.5 inches. The display shall contain all normal operating controls, metering and status indication via an integrated LED ring-light. Additionally, the GUI shall also be able to display an event log containing the condition/alarm, time, and date of the event.

### The display panel shall become an integral part of the RPP and shall indicate the following system information:

* Serial number
* Software version
* Modbus ID
* Board temperature
* Date of last upgrade
* Date of last service
* Date of initial installation

The monitoring panel shall employ an audible alarm to annunciate fault conditions that require acknowledgment and shall be silenced by acknowledging the condition on the display panel.

The local display for RPP shall also provide the following functionality:

* Ethernet gateway to enable the BCM to communicate using standard network protocols or Modbus TCP to read or configure the monitoring system
* Local high resolutions LCD display and local user interface to provide ability to read and configure the monitoring system
* Interconnection of up to 16 BCM systems in remote RPPs or PDMs to channel up to 2,688 individual branch circuits through the display’s Ethernet connection for access by the user’s network or BMS.
* Web server function allows access to up to 16 interconnected BCMs via the internet or intranet using a PC with standard web browsers.
* Event logging of up to 5,000 time-stamped warning or alarm events.

## Equipment options

The RPP shall be available with the following options:

* Concurrent numbering on panel boards
* SPD (one per source) (40kA per modes)
* Isolated grounds
* Seismic-rated floorstands
* NEMA 2-hole inputs

# Execution

## Overview

Factory start-up and user training, preventive maintenance service, and full service for the above specified system shall be included upon request. The manufacturer shall nationally employ service organizations of factory-trained field service personnel dedicated to the start-up, maintenance, and repair of the manufacturer’s power equipment.

The manufacturer shall maintain (24 hours per day, 365 days per year) an answering service to facilitate in providing technical support and emergency service dispatching.

### Installation, inspection and factory authorized start-up

Installation and start up shall include the following:

* Ensure removal of temporary shipping bracing.
* Verify all electrical connections for tightness as specified.
* Review the field assembly and connection of components.
* Inspect accessible components for cleanliness, for mechanical and electrical integrity, and for evidence of damage or deterioration.
* Pretest and adjust all monitoring and/or control parameters as required.
* Correct all deficiencies before proceeding with tests. Correct deficiencies identified by tests and retests.
* Record circuit monitors set-ups, if applicable.
* Measure output voltage of branch circuit panel board, if applicable. Verify proper operation of equipment, including circuit monitor and input and output control circuits.
* Submit test reports.

### Training (optional)

Concurrent with factory authorized system startup the manufacturer’s field service engineer shall train the owner’s operating personnel in the proper operation of the system. Training shall last a minimum of two hours and shall include:

* Safety precautions
* Features and construction of project equipment
* Voltage adjustment procedures, if applicable
* Routine inspection and test procedures
* Routine cleaning
* Interpretation of reading of warnings and alarms

**End of specification**