Chapter 9 – Precision Rack Cabinets

Cubix designed Precision Rack cabinets to provide a stable, fault-tolerant platform for BladeStation enclosures. Precision Rack (PR) is available in three models: PR1100 supports three BladeStation enclosures, PR2000 supports four and PR3000 supports six. PR cabinets provide two 190-264VAC outlets for each BladeStation.

PR1100	**PR2000**	**PR3000**

Although the Cubix Precision Racks can support any third-party rack mount equipment, the cabinets provide only 190-264VAC power. The Cubix cabinets do not provide 100-120VAC power.

Technical Specifications

Dimensions	Shipping
PR1100	56.00" (142.24cm) H x 34.00" (86.36 cm) D x 34.00" (86.36 cm) W
PR2000	70.00" (177.80cm) H x 34.00" (86.36 cm) D x 34.00" (86.36 cm) W
PR3000	98.00" (248.92cm) H x 34.00" (86.36 cm) D x 34.00" (86.36 cm) W
Dimensions	External
PR1100	50.55" (124.4cm) H x 31.80" (80.77 cm) D x 26.90" (68.33 cm) W
PR2000	63.00" (160.02cm) H x 31.80" (80.77 cm) D x 26.90" (68.33 cm) W
PR3000	92.25" (234.32cm) H x 31.80" (80.77 cm) D x 26.90" (68.33 cm) W
Dimensions	Internal Useable
PR1100	40.25" (102.24 cm) H or 23U RETMA
PR2000	54.25" (138.30 cm) H or 31U RETMA
PR3000	82.25" (209.00 cm) H or 47U RETMA

Weight	Empty
PR1100	135 lbs (61.00kg)
PR2000	165 lbs (75.00kg)
PR3000	253 lbs (115.00kg)
Weight	Shipping
PR1100	246 lbs (112.00kg)
PR2000	306 lbs (139.00kg)
PR3000	381 lbs (173.00kg)
Power	External Maximum
PR1100	190-264VAC at 30Amps, NEMA L6-30P
PR2000	190-264VAC at 30Amps, NEMA L6-30P
PR3000	190-264VAC at 50Amps, NEMA L6-50P
Custom	An electrician can connect the terminal blocks to facility power
Power	External Cable Length
Factory Default	2 cables approximately 1 foot (30.48cm) from the cabinet rear
Custom	Longer cables are available (Call Cubix Sales 800.829.0550)
Power	Internal Receptacles
PR1100	3 pairs of IEC60320-C13
PR2000	4 pairs of IEC60320-C13
PR3000	6 pairs of IEC60320-C13
Cooling	Cubix Enclosure Fans
BladeStation	Airflow is front to rear using two, hot-swap 300 cfm fans (total 600 cfm) at the rear
BladePoint	Airflow is front to rear using four 53 cfm fans (total 212 cfm) at the rear
PR Cabinet	None necessary since each enclosure provides its own cooling
Door Style	Screen, both front and rear doors are available
Surrounding Space	Leave enough space to open the doors if installed

Site Preparation

Before installing any Precision Rack, prepare the site.

1. Measure for adequate space. All PR cabinets require the same floor space: 26.9 inches (68.33cm) across the front and 31.8 inches (80.77cm) from front to back. From bottom to top, PR cabinets have the following height: PR1100 is 50.55 (124.4cm) inches, PR2000 is 63.00 inches (160.02cm) and PR3000 is 92.25 inches (234.32cm).
2. Allow at least 30 inches (76.20cm) of space at the front of Precision Rack to allow the front door, if installed, to open and to access the cable connections and controls at the front of each blade. Allow at least 30 inches (76.20cm) of space at the rear to allow the rear door to open and so that the fans can exit the air from the BladeStation enclosures.
3. Allow at least six inches (15.24cm) at the top of Precision Rack to allow cables to exit the roof panel. If the cables do not exit the roof, this is not necessary.
4. Allow access to Precision Rack terminal blocks which are located on the floor of the cabinet. Access panels are available in the floor, rear and roof of the cabinet.
5. Provide two, separate 190-264VAC electrical circuits for any Precision Rack cabinet. Two circuits assure fault-tolerant operation for the BladeStation enclosures inside.
6. If you plan to run the external power cables through the Precision Rack cabinet floor access panel and through a hole in a floor panel, make sure the hole is large enough for the plug on each cable.

Inspection and Installation

When you have received the Precision Rack, perform the following inspection:

1. Conduct a visual inspection of the shipping container for damage. If damage exists, do not discard the container until you have assessed the condition of the contents.
2. Remove the shipping container.
3. Verify the contents against the order. If any contents are missing, call Cubix Support at 800.829.0551 or send an email to customerservice@cubix.com.
4. Examine the cabinet for shipping damage. If damage exists, contact your carrier immediately.

After inspecting the cabinet, install it as follows:

1. Position the Precision Rack in the desired location.
2. Using a level and a ½-inch open-end wrench, adjust the cabinet levelers to level the cabinet, if necessary.
3. If you run the external power cables through the Precision Rack cabinet floor access panel and through a hole in a floor panel, make sure to center the cabinet floor access hole over the hole in the floor panel.

Electrical Installation

AC Power Input

Precision Racks provide two AC distribution circuits. Each circuit supports 190-240VAC. By default, Cubix installs two power cords at the factory. Connect each circuit to a separate electrical source to assure fault-tolerant operation.

If you wish to connect your own AC power to the Precision Rack cabinet, you can. Connect power to the two terminal blocks located in the base of the cabinet according to the illustration at the right. Follow the torque guidelines in the table below.

Terminal Block 1

Phase 1   Ground
Phase 2

Terminal Block 2

Phase 1   Ground
Phase 2
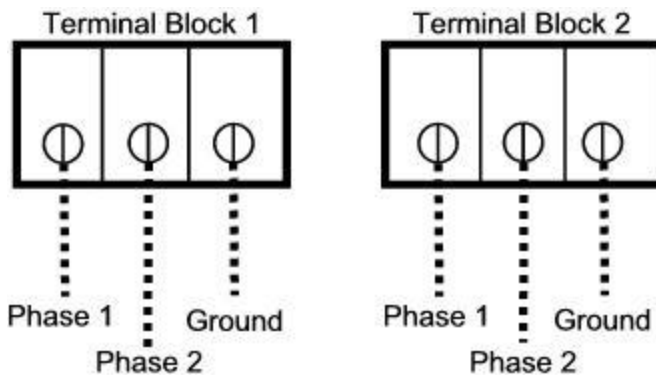
Within the Precision Rack cabinets, Cubix distributes 190-240VAC power using a pair of IEC 60320-C13 connectors for each BladeStation. Cubix provides a pair of power cords with IEC 60320-C14 connectors for each BladeStation.

Tightening Torque	
Gauge	Torque
08	40 lb – in
14 - 10	35 lb - in

Three BladeStation enclosures in PR1100, could draw a minimum of 3.3Amps and a maximum of 24Amps, but would typically draw an average of 15.5Amps. Four BladeStation enclosures in PR2000 could draw a minimum of 4.4Amps and a maximum of 32Amps, but would typically draw an average of 22.0Amps. Six BladeStation enclosures in PR3000 can draw a minimum of 6.6Amps and a maximum of 48Amps, but would typically draw an average of 33Amps. Please contact Cubix Sales at 800.829.0550 to determine how much amperage to provide for each circuit.

<u>Cables and Plugs</u>
Cubix provides two power cords with NEMA L6-30P locking plugs (see the illustration below) for connecting most Precision Rack cabinets to *external* power. If electrical requirements exceed 30Amps, Cubix may provide two power cords, each with NEMA L6-50P plugs.

For *internal* power, Cubix provides two power cords for each BladeStation. The power cords plug into the power supply at the IEC 60320-C13 end and the cabinet power at the IEC 60320-C14 end. See the illustration below.

NEMA L6-30P

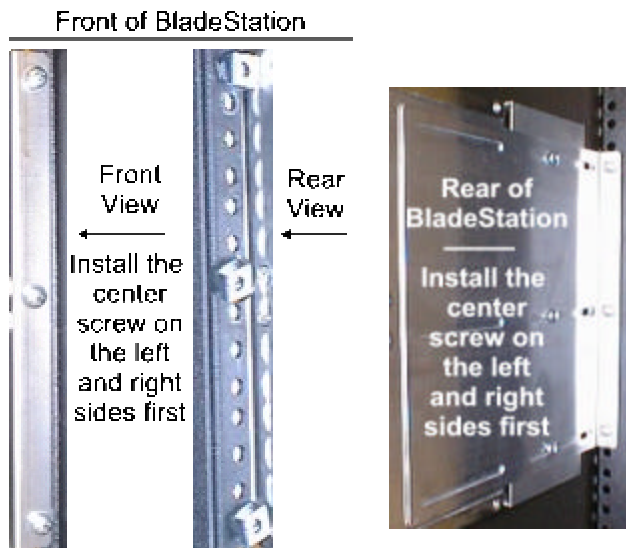IEC 60320-C14   IEC 60320-C13
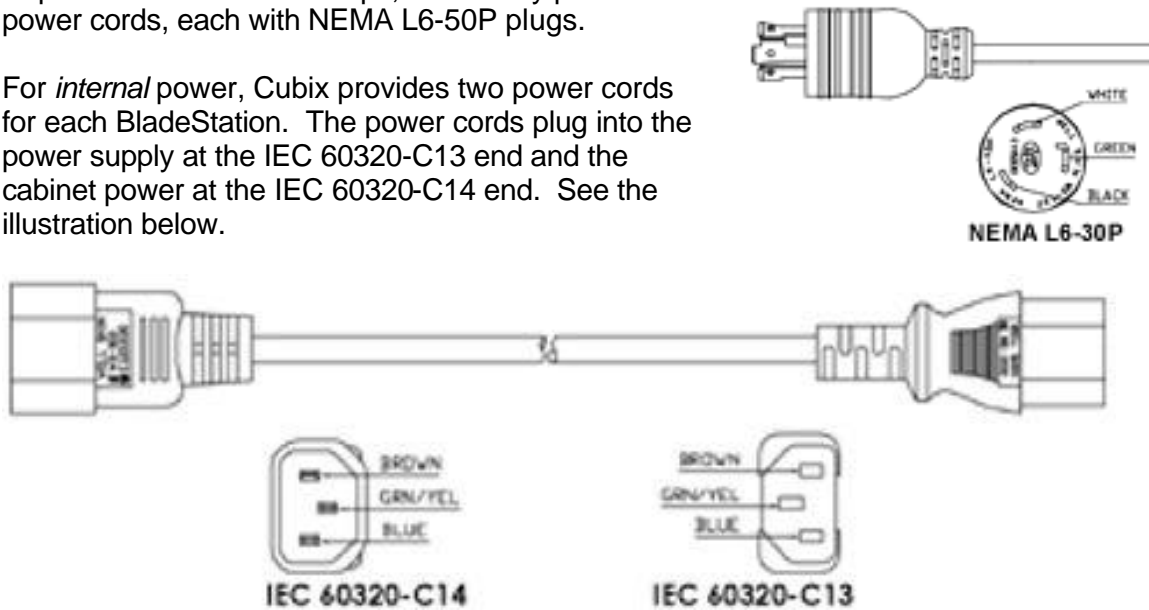
<u>Access</u>
Cubix Precision Racks provide access panels at the rear, floor and ceiling. Each access panel is held in place with two Phillips-head screws. Remove the screws and the panel to provide access.

Mount Equipment

<u>BladeStation</u>
1. Install the mounting plates on the left and right side at the rear of the cabinet before attempting to mount BladeStation in the rack mount cabinet.

> **Note**
> Do not mount either power supplies or blades in BladeStation until after you have securely mounted BladeStation within the Precision Rack cabinet.

Front of BladeStation

Front View   Rear View

Install the center screw on the left and right sides first

Rear of BladeStation

Install the center screw on the left and right sides first

2. Mount BladeStation in the rack mount cabinet by installing the center screw first on both the left and right sides at the front of BladeStation. The illustration at the right shows only the front of BladeStation mounted properly in the rack mount cabinet.
3. Once you have mounted the front of BladeStation, you can attach the rear brackets to the enclosure. Again, install the left and right center screws first. The illustration above shows the rear of BladeStation installed properly in the cabinet.

BladePoint
1. Install the mounting bracket on the left and right side at the rear of the cabinet before attempting to mount BladePoint in the rack mount cabinet.
2. Install the left and right sides at the front of BladePoint.
3. Once you have mounted the front of BladePoint, you can connect the rear brackets to the enclosure. Again, install both the left and right screws. The illustration below shows the mounting bracket installed on the rear of BladePoint.

Connect Internal Cables
BladeStation Cable Tunnel Option
The cable tunnel is at the bottom of BladeStation and allows the power cords, which are plugged into the power supplies, to run to the rear of the enclosure. You can run data and other cables through the cable tunnel as well. See the illustration at the right.

Wiring Diagram
All three Precision Racks (1100, 2000 and 3000) have the same wiring. All three use 190 – 264VAC power from two separate circuits to assure fault-tolerant operation. If you prefer, you may have an electrician wire all three types of cabinets to facility wiring. The illustration at the right is a PR2000 that provides an example of Precision Rack wiring.

If you prefer locking plugs, the PR1100 and 2000 use 30Amp locking plugs. The PR3000 may use either 30A or 50A locking plugs, depending upon the power requirement of the BladeStation units mounted within the cabinet. To determine this requirement, call Cubix Sales at 800.829.0550.