



Zero RU Vertical PDU

DC POWER DISTRIBUTION SYSTEM

FEATURES

- Internal high current copper bussing
- Safe, high current DC power cabling systems — “Plug-and-play”
- Segmentation of power distribution system — reduced “TTTO” (*Time-to-turn-on*)
- Integrated and advanced power monitoring
- Configurable, flexible, scalable, and redundant
- High-power density distribution
- CSI national footprint supply and support
- N+1 Redundancy Monitoring

Industry First —Integrated Vertical DC PDU With High Current Distribution

The CSI Zero Rack Unit DC Vertical PDU (*power distribution unit*) family consists of an innovative and unique vertical power strip configuration to provide high current and high density DC power distribution to high power load network racks and cabinets. The ZRU is an integrated vertical PDU solution that does not require mounting in valuable network rack front panel RU space and instead is designed for vertical rear rack/cabinet mounting.

Internal Copper Bussing

The CSI ZRU Vertical PDU systems include nickel-tin plated high ampacity laminated copper bussing with stainless steel hardware for the maximum possible power distribution capacity in small spaces with low internal conduction losses. Vertical internal bussing rated at 400 amperes provides ability to source high current from CSI PowerBay BDFB distribution cabinets to high power communications network equipment loads such as large routers and switches, CMTS systems, optical transport systems etc. Internal 400A rated hot, return and ground busses provide extremely high power density.

Safe, High Current DC Power Cabling Systems — “Plug-and-play”

The ZRU Vertical PDU is configured with new Telecom grade high reliability polarized pin and sleeve interlocked DC load connectors that provide up to 200A per circuit, breaker protected, modular output interconnect with a variety of pre-configured power cable kits to support popular industry network equipment chassis such as Cisco RF Gateway, 10K, 7600 Series and CRS platforms as well as Arris C4 and Juniper MX series devices. The ZRU Vertical PDU is installed in the network equipment rack, fed from remote BDFB feeders and the load circuit breakers are plugged in and the power cable kit is terminated to the load end and then plugged in to allow similar DC power wiring flexibility and installation speed as AC PDU/outlet strips do. The ZRU Vertical PDU revolutionizes the DC power paradigm to provide the end user with the safety and flexibility to plug in circuit breakers and load cable kits with zero rack unit impact and ability of network staff to do so safely.

Segmentation Of Power Distribution System — Reduced “TTTO” (Time-to-turn-on)

The CSI ZRU Vertical PDU system allows for PDU units to be pre-installed in high power load growth zones in communications facilities with the source power/grounding cabling installed by systems integration technician teams from CSI BDFB systems to ZRU units for the high current cable scope of work that requires qualified power technicians. Later, as communications equipment is installed over time and new load circuits are required, network technicians can simply select the appropriate bullet terminal circuit breaker amperage and pre-connected power cable kit and plug in to the ZRU Vertical PDU and turn-on in minutes. Dramatically improves network operator ability to quickly and with short notice power-up CMTS units, routers or other loads with in-house staff, safely, reliably and quickly. Time is money and network deployment schedules are tight, the ZRU Vertical PDU solves the DC power installation schedule problem and allows communications engineers to focus on other priorities.

Integrated and Advanced Power Monitoring

The ZRU Vertical PDU system includes several advanced monitoring features that add significant value and reliability improvement to critical network device powering.

- **Integrated per-channel load monitoring.** Each circuit breaker is monitored for load current
- **Circuit breaker inventory system.** Each breaker amperage is tracked and the supervisory controller compares measured load current per breaker with the breaker amperage minus a 20% de-rate to provide pre-warning of overloads that could cause circuit breaker trip in the future. This safety feature is industry leading in terms of providing outage protection due to nuisance trips or incorrect breaker selection for load specifications.
- **Patent pending RT Redundancy Tracker™ technology.** The SCM module tracks total PDU load current and calculates redundancy thresholds required for A/B redundant DC power distribution systems. If load current on the A or B distribution channel approaches the non-redundant state, an alert is issued to inform the user to reduce device load per PDU to maintain A/B redundancy.
- **Bright OLED graphics display and user interface provides power metrics** such as local load per circuit, load per PDU, redundancy status, breaker trip pre-alert, power history and other functions. Unique Rocker switch integrated user interface allows for easy scrolling of power data.
- **Internal Ethernet port with Webserver and SNMP remote monitoring feature.** Supports local facility monitoring of multiple CSI Vertical PDUs but also allows for remote access for tracking of critical network device loads as well as to support NOC enterprise monitoring of SNMP alarm traps. See Figure 1.
- **Ground fault current detection.** No other DC distribution system includes this valuable feature. Solid state sensors monitor internal ground bus and detect leakage or fault current from DC powered

devices to the integral ground system. This feature provides advance notice of failing network equipment power supplies and filter capacitors, tracks ground loops and faults caused by incorrect ground wiring, includes peak-hold function to indicate peak fault current as well as accumulated leakage current over time. Provides Telecom grade power protection for critical load devices.

Configurable, Flexible, Scalable and Redundant

The CSI ZRU Vertical PDU system provides several advantages to network facility engineers:

- **Allows for installation of basic PDU assembly without circuit breakers or SCM module or load cable kits** to provide low cost pre-wire of every rack and cabinet where DC power may be required in the future – the high current feeder installation from BDFB source to ZRU Vertical PDU can be performed by qualified staff ONCE without having to return each time a load device needs to be connected. Allows network technicians to populate the ZRU Vertical PDU as load growth and funding justifies to allow the system to scale-up over time.
- **End users/network technicians can safely select the correct circuit breaker amperage,** plug in the circuit breaker for the desired load channel and plug in the appropriate power cable and ground kit for the load device. The polarized, color-coded, pre-terminated cable kits allow for simple connection of two-hole lug connections on the load end and plug-in connection at the ZRU Vertical PDU end as well as chassis ground cable connection. Allows for quick, safe and foolproof installation of power to the load device in minutes.
- **The ZRU Vertical PDU is configured as a single input distribution device** and includes a modular mounting bracket kit that allows flexible and adjustable mounting to network racks and cabinets. CSI’s Vertical PDUs can either mount on opposing rack rails for A/B isolated redundant spacing or can snap together to allow both PDUs to mount on one side of the rack or cabinet for tight spaces or for cable management purposes. Mounting bracket kit provides horizontal and vertical adjustment.
- **Power input top fed or bottom fed.** Universal input configuration allows for installation in top fed rack locations via overhead power ladder rack and power cable drops or via raised floor systems with bottom cable entry. Provides for safe and flexible power feeder routing to the ZRU Vertical PDU input connections.



Figure 1. SCM Supervisory Control Module and Connectivity Ports

High-power Density Distribution

The CSI ZRU Vertical PDU system features 400A internal power bus rating, internal vertical ground bar with leakage-fault current detection and provides 12 AMR Series bullet terminal circuit breaker positions per PDU. Circuit breakers can be selected from a wide range of ampacity choices from CSI national warehouse stock for rapid delivery. Single pole breakers are available from 5A to 125A and two-pole breakers are available for 150A and 200A options. Circuit breakers are standard, bullet terminal plug-in, non-auxiliary contact configuration for low cost and accurate magnetic trip circuit protection.

for BDFB to PDU power installation. CSI provides local tech support for PDU installation and build-out in Communications sites such as Headends, Data Centers, and Telecom facilities. Local emergency 24x7 service dispatch is provided as well. CSI provides communications site operators a total high power distribution solution package with provision of PDU systems, support components, installation, remote status monitoring and service dispatch.

CSI National Footprint ZRU Vertical PDU Supply and Support

CSI has regional local warehouses that stock ZRU Vertical PDUs, circuit breakers and SCM modules, load cable kits and source power kits

Common Specifications for All Models:

- **Dimensions:** 2" wide x 74.25" high x 7" deep
- **Weight:** 50 lbs
- **Rack mount:** via bracket for 19/23" equipment rack
- **Mounting:** Rear of Equipment Rack
- **Plug-in AM circuit breakers**
(select amperage rating and quantity at time of order)

GENERAL SPECIFICATIONS

MODEL #	DESCRIPTION
PN 016-972-10	ZRU Vertical Power Distribution Unit <ul style="list-style-type: none"> ▪ 400A ▪ 12 Position ▪ DP AM Breaker
PN 016-1072-10	ZRU Supervisory Master Module <ul style="list-style-type: none"> ▪ Ethernet ▪ OLED Display
PN 016-1073-10	ZRU Supervisory Slave Module <ul style="list-style-type: none"> ▪ PDU-to-PDU Interface Only

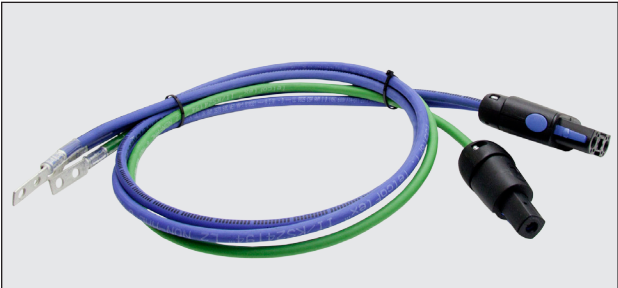
CIRCUIT BREAKERS

PART#	DESCRIPTION	PART#	DESCRIPTION
470-235-10	▪ 10 AMP AM breaker, plug-in type, midtrip (5/16" bullet terminals)	470-406-10	▪ 80 AMP AM breaker, plug-in type, midtrip (5/16" bullet terminals)
470-402-10	▪ 20 AMP AM breaker, plug-in type, midtrip (5/16" bullet terminals)	470-404-10	▪ 100 AMP AM breaker, plug-in type, midtrip (5/16" bullet terminals)
470-403-10	▪ 30 AMP AM breaker, plug-in type, midtrip (5/16" bullet terminals)	470-270-10	▪ 150 AMP AM breaker, plug-in type, midtrip (5/16" bullet terminals)
470-407-10	▪ 40 AMP AM breaker, plug-in type, midtrip (5/16" bullet terminals)	470-271-10	▪ 200 AMP AM breaker*, plug-in type, midtrip (5/16" bullet terminals)
470-400-10	▪ 60 AMP AM breaker, plug-in type, midtrip (5/16" bullet terminals)		

CABLE WHIPS

DESCRIPTION

Please call factory for correct cable and cable whip assembly properly sized for your application/installation.



Straight Cable Whip



Right-Angle Cable Whip



Figure 2. Power Connector Whips



Figure 3. Populated Breaker Channel with quick release hardware and easy service breaker.

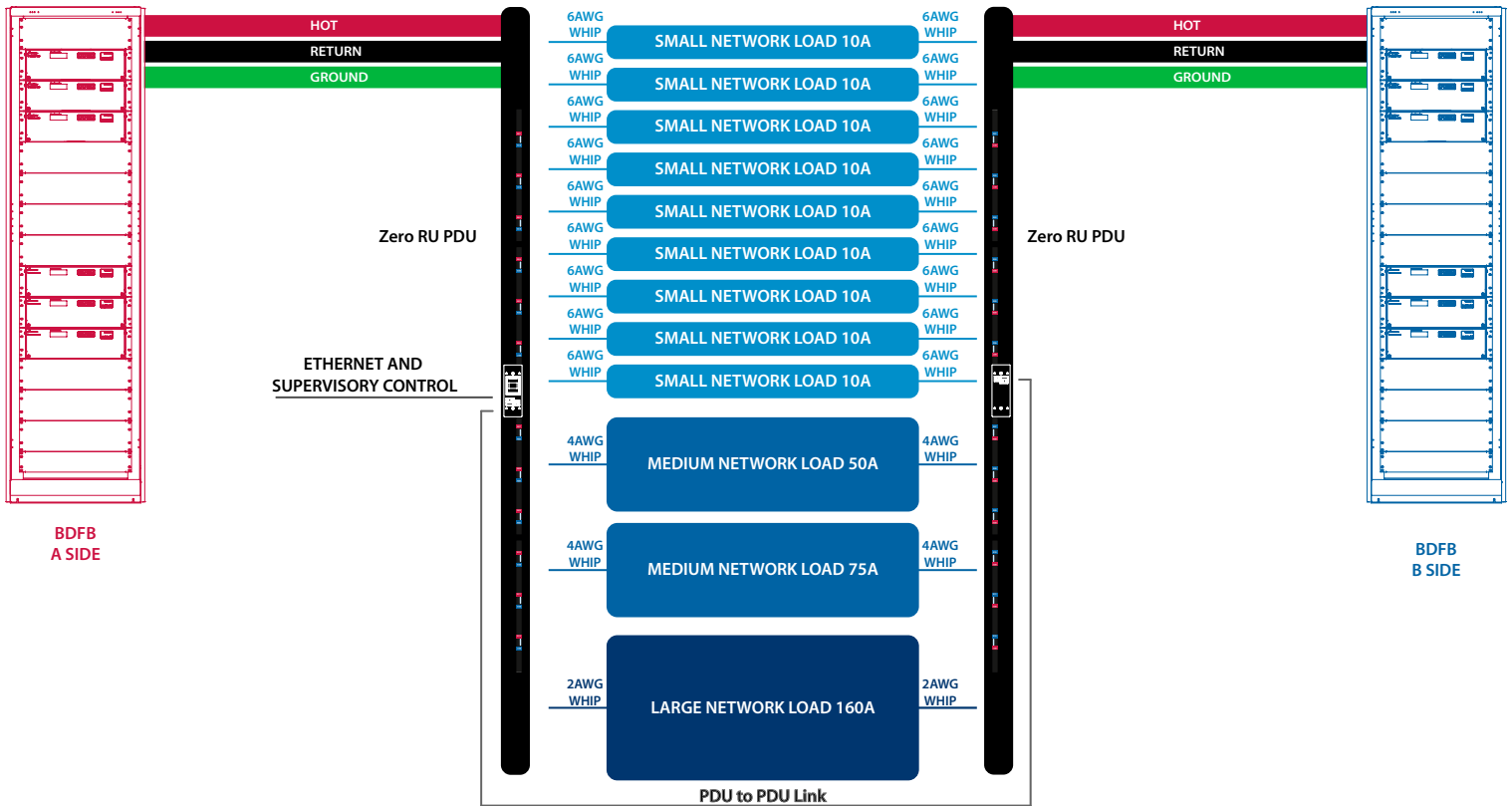


Figure 4. Vertical Powerstrip Application in Equipment Rack

About Comm/net Systems

Comm/net Systems, Inc. (CSI) is the leader in high power density communications power systems. Comm/net offers comprehensive power and communications site systems integration and deployment services via a national footprint of regional branch offices. Additional information can be found at www.commnetsystems.com.

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Order Information

Shipping box is packaged for UPS or FedEx shipment and includes an instruction manual and accessories.

