



RACK POWER DISTRIBUTION FOR CRITICAL IT EQUIPMENT

Rack PDU Solutions



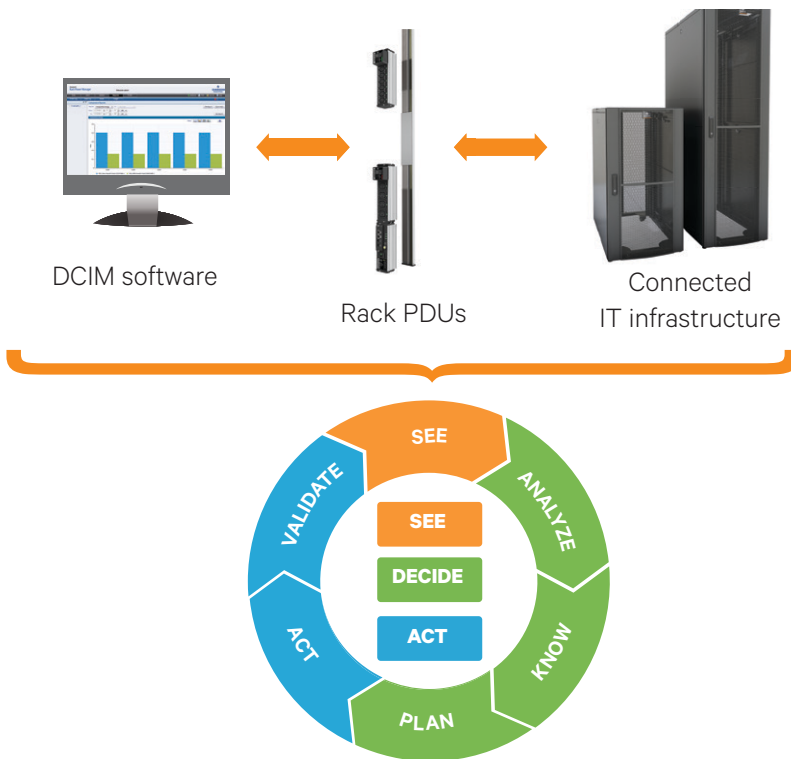
Enhanced Performance And Management Of Dynamic IT Spaces

Enhance Business Agility, Efficiency and Availability with Vertiv™ Rack PDUs.

Data center investments are sizable, and each component of the power chain -from the building entrance to the rack power distribution - is crucial to enabling equipment availability. Enable your IT investment – and your business – to stay protected with Vertiv’s family of rack PDU offerings.

Vertiv’s next generation of rack PDUs provides the industry’s highest availability and most intelligent power metering and distribution – complete with the simplified energy management, modular design and cost savings that ensure your data center – and your business – can operate at peak velocity and resiliency.

Our complete portfolio of rack PDUs offers value beyond power distribution. They easily integrate to your data center infrastructure management systems to make your organization more resilient, enhance your business velocity and provide the technological support you need to grow your company.



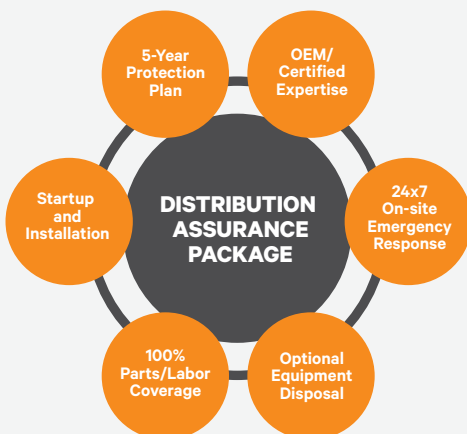
MPX and MPH2 Rack PDUs

Intelligent, real-time infrastructure

- Communicate the status of rack-level power and environmental information to a centralized Data Center Infrastructure Management (DCIM)
- Allow monitoring and control to the receptacle level

Optimized level of visibility and control

- Provides the information needed to make informed decisions and enhance business agility



The exclusive Distribution Assurance Package offers lifecycle service and support from a trusted OEM service partner for your rack PDUs, ensuring system availability.

- Available with Vertiv MPH2™, MPX™, and Knürr DI-STRIP rack PDUs
- Startup and installation services
- OEM expertise
- 5-year protection plan
- 24x7 on-site emergency response
- Parts and labor coverage
- Optional removal and disposal

How You Benefit from Vertiv™ Rack PDUs

DESIGNED FOR HIGH AVAILABILITY

Vertiv rack PDUs are designed specifically to accommodate higher power densities and be resistant to higher temperatures, commonly found in modern data center racks. System is designed to optimize basic power availability. They are easily upgradable to minimize downtime and carry manufacturer-provided support to ensure your own SLAs.

- High temperature rating
- Modular hot swappable controller card
- 100% rated magnetic hydraulic circuit breakers
- MPX™ rack PDU system-modular, adaptive design
- Bistable / normally closed relays

OPTIMIZED ENERGY AND CAPACITY MANAGEMENT

By providing highly accurate and comprehensive energy metering from the aggregate to receptacle levels, MPX and MPH2™ rack PDUs provide visibility to control energy usage by IT equipment, right-size your power infrastructure and eliminate unnecessary capital expense. These rack PDUs also have the lowest energy consumption in this category.

- Metering of key electrical parameters with +/-1% accuracy
- Lowest PDU power consumption in the industry of all switched rack PDU's
- Power and environmental trend reports through several Vertiv DCIM solutions

SIMPLIFIED INTEGRATION WITH MANAGEMENT TOOLS

MPX and MPH2 rack PDUs offer a simplified approach to implementation and change management that translates to real cost savings and operational advantages. They support all major industry-standard management, authentication and encryption standards and protocols, and they fully integrate into Vertiv's industry-leading KVM, serial console and infrastructure management systems. Plus, they integrate rack level power and environmental monitoring information from the rack PDUs with higher level data center management software provided by Vertiv or third parties.

- Up to 4 units sharing an IP address within Rack PDU Array™
- Integration with Vertiv KVM, serial console and infrastructure management appliances and software
- Integration with Vertiv software stack (e.g DSVIEW™, etc.).
- IPv6 support
- Support of remote authentication protocols (LDAP, Active Directory, Radius, Kerberos, TACACS+) and encryption

COMPATIBILITY WITH RACKS AND POWER CHAIN

Deployable in most industry racks, Vertiv rack PDUs are simple to install and move. When Vertiv racks are purchased, the rack PDUs may be pre-installed to save time and cut costs. All major global voltage and amperage combinations typically used in a data center or remote site are available—a Vertiv expert can assist in selecting the right rack PDU for your power chain needs.

- Ability to be preinstalled in Vertiv rack solutions
- Available in popular voltage and amperage combinations

MPX™ - Adaptive Rack PDU: Respond To Change While Watching Your Bottom Line

Confidently take on the uncertain future of connected power requirements with MPX, the most responsive and adaptive rack PDU available. With MPX rack PDU technology, you can respond to rack equipment changes and dynamic capacities by leveraging:

- Hot-swappable modular output power
- Hot-swappable modular communications
- Modular input power

MPX Benefits:

- **Adaptive** capacity, distribution, monitoring, control and management of critical devices
- **Flexibility** to respond to constant change—redeploy modules to suit changing needs
- **Buy only what you need** and build on your investment
- **Secure communication**

Modular Input Power

- May be reconfigured to support changing power needs, single and three phase input
- Can be positioned for top or bottom rack entrance

Reconfigurable Power Capacity & Distribution

The MPX rack PDU has a scalable design that allows onsite configuration to fit immediate IT equipment needs. It is the perfect choice to respond to the needs of a growing data center. Relocate or add IT equipment to support changing needs, by easily reconfiguring the power input and distribution.

Fits Needs Now And Later

The MPX rack PDU provides a wide selection of single phase and three-phase power input configurations—with the ability to field change while maintaining distribution infrastructure.

Designed for Critical Environments

- **Critical rack space operating temperature**—up to 55°C / 131°F to support hot internal rack environments
- **Accurate power metering** of +/-1% voltage & current for assured oversight
- **Energy and power metering** down to the individual receptacle
- **Comprehensive alarming including notification** of overloaded branch circuits
- **Environmental sensing** with threshold and alarm set-points
- **Notification** on the loss or removal of individual rack equipment loads



Hot Swappable Output Power deploy easily to get IT equipment online quickly

Receptacles & Modules may be remotely controlled and metered, providing operator flexibility and allowing increased site security

Branch Receptacle Modules (MPX™ BRM) provide output power and branch circuit over protection. Elementary, branch metered and outlet metered & switched versions available

Power Rail Spacer reserves the unused space until an MPX module is needed

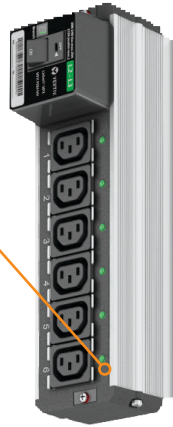


MPX PEM variable capacity module, for 1 or 3 phase applications. Detachable power cord supports changing input power requirements

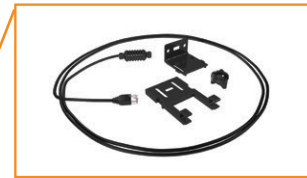


MPX PEM fixed capacity module for 3-phase applications

Power Entry Module (MPX PEM) available in variable capacity and fixed capacity versions



Power Rail Chassis (MPX PRC) distributes power and communications to all of the support modules. Available in two separate heights to accommodate varying rack heights



SN Sensors: consolidate environmental monitoring of temperature and humidity with rack level power



BDM™ local display module, advanced diagnostics, displayed at a location that is convenient for the customer. Features include specific information on alarms, specific labels for outlets



Communications Module (RPC2) mounts in the Power Entry Module and provides upgradable network communications, sensor and local display interface

MPH2™—Managed Rack PDU: Advanced Monitoring And Control Support

MPH2 is the most intelligent, high-availability line of managed rack PDUs. It offers remote monitoring and control capabilities as well as environmental input options, with multiple power input selections and output configurations.

The MPH2 is available in 0U, 1U and 2U form factors. Models are also available in the following four versions:

- Outlet Level Metered and Switched
- Outlet Level Metered
- Rack PDU Metered and Outlet Switched
- Rack PDU Metered

MPH2 Benefits

- **Monitors electrical and environmental parameters** with set threshold and alarm tools
- **Controls and manages individual receptacles** and/or groups of loads and devices
- **Allows you to predict failing conditions** before they occur and proactively manage connected equipment for maximum uptime
- **Energy and power metering** to maximize the data center power and cooling infrastructure
- **Lowest power consumption** of all switched rack PDU designs ensures lower operating costs for datacenter
- **Up to four MPH2 rack PDUs may be interconnected** as a Rack PDU Array™, consolidating user IP connections and device monitoring

Designed for Critical Environments

- **Industry leading operating temperature** —up to 60°C / 140°F to support hot Internal rack environments
- **Bi-stable relays ensure basic power distribution** in the event that intelligence is compromised
- **Accurate power metering** of +/-1% voltage & current for assured oversight
- **Energy and power metering** down to the individual receptacle
- **Comprehensive alarming including notification** of overloaded branch circuits
- **Environmental sensing** with threshold and alarm set-points
- **Notification** on the loss or removal of individual rack equipment loads

MPH2 Savings for a Typical Data Center

	TYPICAL 24 OUTLET RACK PDU	MPH2
Rack PDU power consumption (Watts)	23	75
Rack PDU annual energy consumption (kWh) —24x7x365	202	66
Overall contribution to datacenter energy consumption (kWh)*	383	125
Cost of energy consumption (based on average cost of 10¢/kWh)	\$38	\$13
Annual savings per pdu with MPH2		\$26
Annual savings per rack with MPH2	\$52	
Annual savings within the datacenter with MPH2	\$5,160	

Based on a comparison of switched rack PDU models for a typical 100 rack data center with a PUE of 1.9.
*per Energy Logic calculations



Communications Module (RPC2™):

Provides upgradable network communications, sensor and local display interface



BDM™ local display module:

Advanced diagnostics, displayed at a location that is convenient for the customer. Features include specific information on alarms, specific labels for outlets



Onboard display: Provides easy access to vital information at the rack



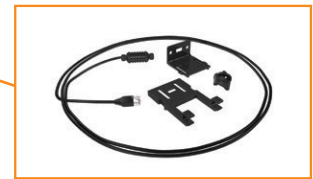
Slim profile breakers: 100% rated hydraulic magnetic slim profile. CB's provide reliable resettable branch circuit protection without nuisance tripping



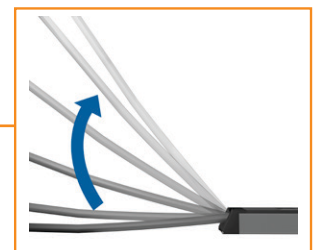
Also available in 1U and 2U models



Locking outlets and locking power cord: Prevents accidental unplugging of IT devices



SN Sensors: consolidate environmental monitoring of temperature and humidity with rack level power



Flexible power cord entry: Simplifies installation of higher amperage units



Corded and hardwired options: provide flexibility of wiring to both overhead and raised floor power distribution

Seamless DCIM Manageability and Integration

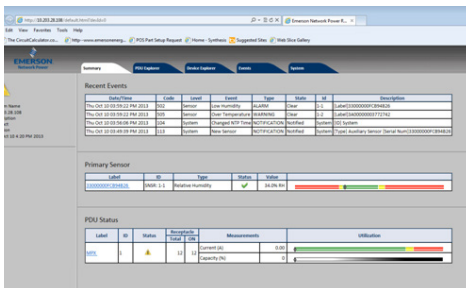
MPH2™ and MPX™ intelligent rack PDUs can be managed both locally and remotely. Metering of all electrical information down to the outlet, phase, bank or rack PDU level as well as integration with environmental sensors makes these rack PDUs the backbone of rack level power consumption and environmental information. Support for all major industry-standard management, authentication and encryption standards and protocols ensures that these products seamlessly fit into any existing network and security architecture.

```

Telnet 10.203.26.100
*****
Emerson Network Power RPC2 CLI
*****
WARNING: Authorized Access Only
*****
Type ? to view the Context Sensitive Help

Username: admin
Please Wait... Retrieving System Information
cli>
cli> sysinfo capabilities
[1]--(A) All Measurements & Control (B) All Measurements & Control (C) All Measurements & Control
[1]--(A) All Measurements & Control (2) All Measurements & Control (3) All Measurements & Control
[1]--(A) All Measurements & Control (4) All Measurements & Control
[1]--(A) All Measurements & Control (2) All Measurements & Control (3) All Measurements & Control
[1]--(A) All Measurements & Control (4) All Measurements & Control
[1]--(A) All Measurements & Control (2) All Measurements & Control (3) All Measurements & Control
[1]--(A) All Measurements & Control (4) All Measurements & Control
cli> sysinfo wiring type
[1]--1-Phase / 3-Wire (L1, N, PE)
cli> sysinfo count
[1]--(B)03 (RECP)12 (T)1 (M)1 (C)1
cli> current
[1]--(L1) 0.12 A (N) 0.12 A
[1]--(A) 0.00 A (B) 0.00 A (C) 0.00 A
[1]--(L2) 0.00 A (S2) 0.00 A (S3) 0.00 A (C4) 0.00 A
    
```

Command Line Interface



Web User Interface

Flexible Local & Remote Management

The MPH2 standard onboard display provides all pertinent information required at the rack. **The optional BDM local display** is available for MPH2 or MPX, and provides flexibility in location of the display for most convenient visibility.

Remote communications at a rack PDU level is enabled by the modular, hot swappable **RPC2™ card**, providing seamless upgradeability and serviceability. RPC2 enables:

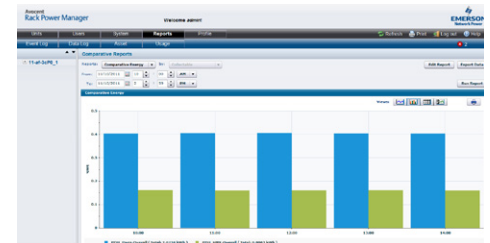
- **Support up to 4 PDUs within a Rack PDU Array™:** Minimizes IP addresses
- **Support up to 10 environmental sensor probes:** Consolidated rack level power and environmental monitoring
- **Support for Web UI, CLI, SSH and Telnet:** Provides Windows, Linux and network administrators their preferred way to interact with the rack PDU
- **Support for all major remote authentication & encryption protocols:** Ensures seamless integration into any corporate security architecture
- **SNMP v1, v2 and v3 support:** Ensures secure communications through network management systems
- **IPv4 and IPv6 support:** Ensures continued IP support for rack PDUs
- **Embedded data log:** Enables equipment or rack level baseline power consumption study
- **Embedded event log:** Easier troubleshooting and auditing

Remote monitoring interface capabilities include:

- Snapshot of all electrical parameters at outlet, branch, phase and aggregate level
- Snapshot of environmental sensor readings and status, including temperature, humidity, and leak detection.
- Threshold configuration, alarm creation and notifications
- Power control of individual or group of outlets
- Status information and configuration of all outlets
- Network management settings

Centralized Management of all rack PDUs within a datacenter is provided by **Avocent® Rack Power Manager**

- Centralized power consumption and environmental reports at all levels within datacenter
- Centralized power control of individual or group of outlets
- Mass configuration capabilities
- Centralized authorization, authentication and auditing of all rack PDUs and pertinent data



Avocent Rack Power Manager

Leveraging Your Rack PDU Investment

MPX™ and MPH2™ rack PDUs fully integrate into Vertiv™’s industry-leading KVM, serial console and infrastructure management systems. Plus they integrate rack level power and environmental monitoring information from the rack PDUs with higher level data center management software provided by Vertiv or third parties. By making the information available through these intelligent rack PDUs easily consumable, Vertiv ensures that customers invest in a comprehensive, easy to use power distribution and management solution.

Integration with **Avocent® Advanced Console Server, MergePoint™ Unity KVM Switches** ensures:

- Out of band management path for rack PDUs
- Rack PDUs are a part of consolidated rack level access and control solution
- Minimize the number of IP addresses required for rack PDU management

Integration with **Avocent DSView4™** software ensures:

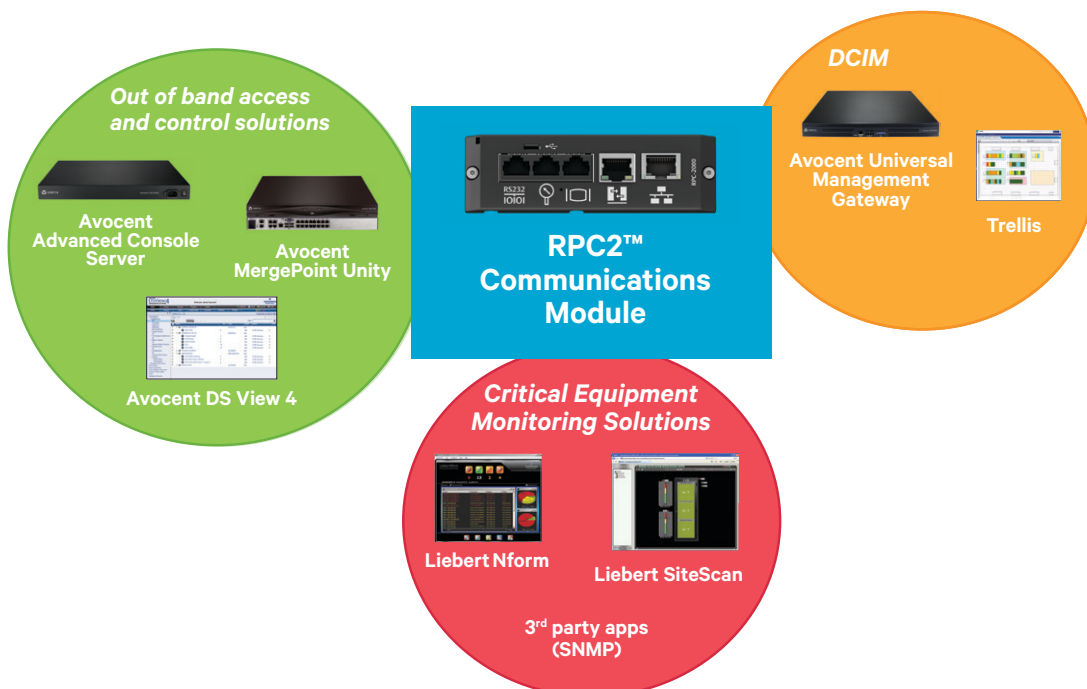
- Rack PDUs are a part of consolidated datacenter level access and control solution
- Easy association of IT equipment with the rack PDU outlets they are connected to
- Rack PDUs are a part of consolidated authentication, authorization and audit solution for datacenters

Integration with **Liebert® Nform™ and Liebert SiteScan®** ensures:

- Rack PDUs are a part of consolidated facilities level monitoring solution for datacenters
- Real-time monitoring and control of virtually any piece of critical support equipment
- Data analysis and trend reporting
- Event management

Integration with the **Trellis™** platform and **Universal Management Gateway appliances** ensures that rack PDUs are a part of a comprehensive DCIM solution that includes:

- Inventory Management of all IT and facilities assets
- Monitoring of all facility critical devices and serviceprocessor-enabled IT devices
- Capacity & Change Management
- Energy Consumption Management
- Power System Management

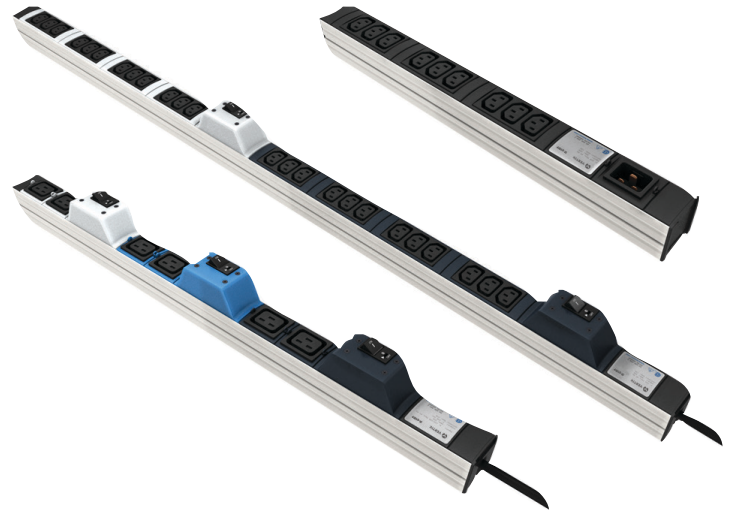


DI-STRIP®: Most robust and comprehensive line of basic rack PDUs in easy to use configurations.

Basic Rack PDUs are the right answer for data center users selecting robust, economical and flexible rack power solutions.

DI-STRIP rack PDUs meet a broad range of power distribution requirements for IT and other applications. Designed especially to handle the growing number of electronic components that can be housed within network cabinets and server racks, the space saving product line is available in a range of configurations.

- Flexibility with multiple configurations and input power options
- Critical rack space operating temperature—up to 55°C / 131°F to support hot Internal rack environments
- Simple and quick installation on the rack's extrusion requires minimal space



Flexibility to meet a broad range of requirements

Available in vertical zero U and rackmount form factors

Input is single or three phase power via single plug connection

Slim form factor allows easy installation



	MPX™	MPH2™	DI-STRIP®
Mounting	Preinstalled Toolless brackets, Universal Mounting bracket, Ability to ship rack PDU preinstalled in Vertiv™ Racks		
Input Power Options North America	100 - 120V 1-ph 20A/30A 200 - 240V 1-ph 20/30A 200 - 240V 3-ph 20/30/50/60A 208/120V 3-ph 20/30A 415V/240V 3-ph 20A/30A		100 - 120V 1-ph 15/20/30A 200 - 240V 1-ph 20A/30A
Input Power Options International	230V 1-ph 16A/32A 230/400V 3-ph 16A/32A/63A		230V 1-ph 16A/32A 230/400V 3-ph 16A/32A
Input Wiring Options	10 ft. pluggable power cord	10 ft. pluggable power cord or Hardwired	8/10 ft. pluggable power cord
Max. Capacity North America	17.2 kW	17.2 kW	4.9 kW
Max. Capacity International	27.7 kW	22.2 kW	22.2 kW
Outlet Options	NEMA 5-20; IEC 320C13; IEC 320 C19; Schuko; French UTE; Schuko; Switzerland CH SEV 1011; GST 18	NEMA 5-20; IEC 320C13 IEC 320 C19 Locking capability on all outlets	NEMA 5-15; NEMA 5-20; IEC 320C13; IEC 320 C19; French UTE; Schuko; Switzerland CH SEV 1011; GST 18
Maximum Outlets	Basic BRM's: 42 Rack PDU Metered BRM's: 36 Outlet Metered & Switched BRM's: 36	Strip Metered: 42 Outlet Metered and / or Switched: 24	Max. 48
Maximum Operating Temp. Range	0°C to 55°C (32°F to 131°F)	0°C to 60°C (32°F to 140°F)	0°C to 45/55°C (32°F to 113/131°F)
Storage Temperature Range	-25°C to 85°C (-13°F to 185°F)	-25°C to 85°C (-13°F to 185°F)	-20°C to - 85°C (-4°F to -121°F)
Relative Humidity	5% to 95%	5% to 95%	5% to 95%
Overcurrent Protection	Software Electronic Overcurrent Protection 100% Rated 20A Branch Overcurrent Protection - Hydraulic Magnetic Circuit Breakers		Hydraulic Magnetic Circuit Breakers
Idle Power Consumption	3 W – 22 W	3W - 5W	N/A
OU Units Width x Depth	75 mm x 104 mm (2.95 in x 4.09 in)	OU Low profile: 56mm x 5mm (2.2in x 1.96in) OU Standard: 56mm x 70mm (2.2in x 2.7in)	45 mm x 46 mm (1.77in x 1.81in) and others
OU units Length	1035 mm / 1880 mm (40.7 in / 74 in)	916 mm / 1004 mm / 1737 mm/ 1827 mm (36 in) / (39.5 in) / (68.4 in) / (72 in)	333 mm - 1833 mm (13 in - 72 in)
1U/2U Units Width x Height x Depth		1U: 482.6mm x 44mm x 250mm (19in x 1.73in x 9.84in) 2U: 482.6mm x 88mm x 250mm (19in x 3.46in x 9.84in)	
Standard Warranty	2 years; Extended Warranties Available		
Agency Approvals	UL, CSA, CE, RoHS, REACH, FCC Class A, CB, WEEE, ISTA*		UL, CSA, CE, BG, CB, RoHS, REACH, WEEE
Metering Levels	Aggregate, Branch, Phase, Outlet		* Agency approvals vary by region, please check with your local sales representative for details
Parameters Measured	Volts, Current, kW, KVA, kWh, Power Factor, Crest Factor, Frequency		
Metering Accuracy	+/-1%		
Switching Capability	On, Off, Recycle, Lock, Unlock, Outlet Grouping Capability		
Modularity	Power Entry Module Branch Receptacle Module RPC2™ communications module	RPC2 communications module	
Local Management	Optional Local Display	Onboard Display, Optional Local Display	
Remote Management	Onboard Web Interface; CLI; SNMP; SSH; Telnet Integration with Avocent® ACS, Avocent Universal Management Gateway & Avocent MergePoint™ Unity Integration with DSView®, Rack Power Manager, Nform™ and the Trellis™ platform		
SNMP version support	v1, v2 and v3		
Authentication	Local Remote: Active Directory, LDAP, TACACS, Radius, Kerberos		
Encryption	MD5, AES, DES		

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