



Optima™ Power Distribution Units

PDU's for Test, Industry, Defense Support and More

Marway has taken its experience in creating thousands of custom PDU's, and designed standardized systems with the capabilities and options we're most often asked for. With strong enclosures, versatile power options, EMI filtering, remote control, and more, Optima PDU's are well suited to many applications in manufacturing, communications, aerospace, defense, test, and other industries.

Distribution and Protection

Marway's Optima PDU's go beyond the commodity PDU's offered by the vast majority of companies these days. While others chase racks full of easy-to-power computers, Marway continues to focus on the applications where mixed equipment, electrically noisy, and frequently reconfigured environments are the norm.

Fully featured models include circuit breakers, surge suppression, EMI filters, and a remote On/Off/EPO control bus needed for safety in industrial-like settings. Some of these are offered as options allowing a right-sized strategy while maintaining compatibility, familiarity of operation, and consistency in support.

Optima 5: Core Workhorses

This series takes Marway's protective distribution core, and packages it in over 140 horizontal models and 24 vertical models. A wide selection of outlet types, inlet types, and circuit configurations in 15, 20, and 30 Amp capacities for single phase and three phase power.

Optima 8: Networked Workhorses

Take the concepts of the Optima 5 and add Ethernet networking with a rich set of software capabilities, and you get Optima 8. These systems are designed for remote access and automation, but with the equipment protection capabilities not available in data center PDU's.

Optima 3: Essentials

The 3 Series is the most budget conscious line with the fewest options, but still with the key ingredients of a main breaker, surge suppression, and EMI filtering. This is a great solution for electrically noisy environments where basic powerstrips don't provide protection for connected equipment. (Optima 3 are not TAA compliant.)

Note that OU systems do not offer EMI filtering or the remote On/Off/EPO bus as there is no space for them in the narrow enclosures.



520 Series



532 Series



533 Series



820 Series



833 Series

A Sturdy Industrial Chassis

All chassis are 18 gauge steel and finished with a black powder coat. Mounting brackets for all horizontal units are repositionable to allowing for six mounting configurations. Brackets can be flush with, recessed from, or protruding from the front or rear panels.

The brackets can be left off for table-top use, or for custom user-provided mounting. The product manual includes additional details and dimensions.

Brackets for the 2U and 3U models have passthrough holes which can be useful for front mounted power inlets to pass cable back into the rack interior.

Repositionable brackets and tool-less button mounting are available for the vertical 0U units.



Mounting brackets are relocatable to allow for different mounting positions. The 2U and 3U model brackets also feature a passthrough opening to direct a front inlet cable to the interior of the rack when the brackets are mounted for a recessed-chassis position. Brackets can be flipped to allow rear-facing positions as well.

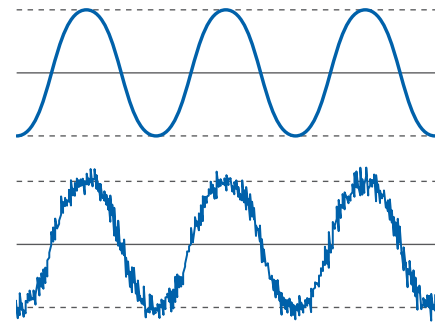
EMI Filter

- Standard on most 320 Series, all 532, 533, 833 Series
- Optional on 520 and 820 Series
- Unavailable on all 0U models (329, 529, 539, 829, 839)

Modern electronic equipment such as computers, security systems, communications hardware, data acquisition systems, and others require stable, clean power free of noise in order to perform their functions optimally and reliably. Electromagnetic interference (EMI) is noise added to power lines in buildings by a variety of commonly used electrical equipment such as air conditioning, office equipment, power tools, factory machinery, and more.

The EMI filter option includes a broad-spectrum EMI filter on the incoming ac power signal. This helps eliminate noise outside of the 60 Hz power signal range. In short, it helps ensure equipment attached to the PDU gets a stable, clean power signal.

Signal conditioning of ac power seeks to ensure as close to a perfect sine wave in the voltage signal as possible. The upper waveform has no noise, where the lower one (conceptual illustration) is quite noisy. An EMI filter helps to significantly reduce noise to the outlets.

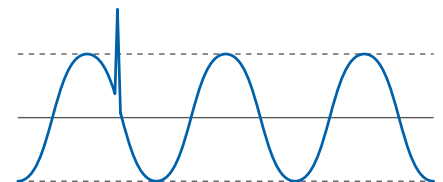


Surge Suppression

- Standard on all 8 Series, 520, 532, 533, most Series

Virtual all electrical environments experience voltage surges (lasting seconds) and spikes (milliseconds). These can come from storms or fluctuating utility lines, but most events come from switching equipment on/off inside the building. Sudden changes in load on the electrical system can create short increases in voltage which travels through wiring between equipment. Surge suppression helps to absorb these surges before they get to equipment, and prevent wear and damage to electrical components leading to downed equipment.

Surges, and spikes, are brief moments where the voltage increases. Large spikes can be damaging by themselves, but over time, many small spikes also weakens electrical components which accelerates their failure.



Remote EPO

- Standard on 532, 533, 833 Series
- Optional on 520 and 820 Series
- Unavailable on 320 and all OU Series

In some applications, particularly those with machinery connected to a PDU, an Emergency Power Off (EPO) may be warranted. An EPO is a large, prominently placed push button used to disconnect power to all devices connected to the PDU. These buttons are intended to be easy to find and press in an emergency scenario.

The EPO button, and On/Off buttons are often located on a remote panel. Marway's Commander UCP products are used exactly for this purpose.

The Optima remote EPO feature is primarily designed for use with Marway's Commander panels. A Commander panel may be connected to one or more PDUs, and thereby provide remote on/off and EPO functionality for several equipment sets in unison. Where the Commander panel provides the on/off/EPO control, the remote connectors of the Optima PDU provide the chassis-to-chassis interfacing to enable that control from the Commander panel.

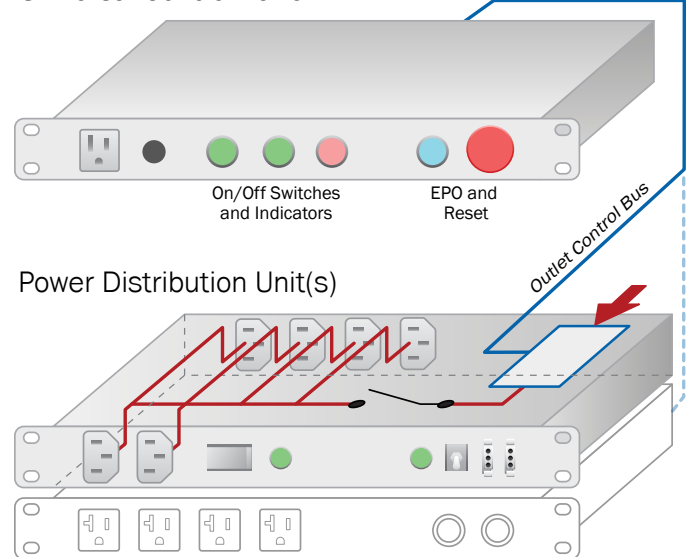
In each Series, the remote EPO covers most outlets, but most models have one or two outlets always powered (unless the main breaker is off).

A mode switch on the PDU allows an operator to choose whether the remote panel On/Off switches are ignored (the EPO button is still effective), whether all outlets are manually forced off, and whether the remote panel is engaged normally.

In systems with software switching of outlets, the EPO system always overrides the software switch state.

Whenever the main circuit breaker is On, the phase power indicators illuminate to indicate that power is *available* to the chassis. However, the remote panel or local mode switch may have the controlled outlets disabled.

Universal Control Panel



The remote EPO option includes control bus connectors to match Marway's Commander UCP remote EPO panel. This bus is compatible with all of Marway's standard Optima products.



Commander UCP Remote EPO Panels



The Commander UCP 5000 (top), 5100, and UCP 4900 (bottom) are standard Marway remote EPO panels suitable for controlling the remote EPO feature of Optima PDUs.

The UCP 5000/5100 features on/off/EPO controls along with status

indicators and a number of connectors to provide flexibility in interfacing to multiple PDUs.

The UCP 4900 includes a basic on/off switch with an EPO mushroom button in a blanking-plate-like open frame chassis.

Outlet Switching

All models have at least one main breaker which can be used to “switch” all outlets either on or off. Many series and models include multiple breakers which can switch a subset of outlets on or off.

Remote Switching with the On/Off/EPO Bus

- Standard on 532, 533, 833 Series
- Optional on 520 and 820 Series
- Unavailable on 320 and all OU Series

For models with the remote EPO bus, the remote panel can be used to switch on/off all outlets (except for the one or two utility outlets which are always powered). Also with this system, the local toggle switch can be used to force outlets off.

Remote Ethernet Switching

- Standard on 820, 833, 829, 839 Series
- Unavailable on all other series

Switching of individual outlets can be manually done through web and command line interfaces, or automated through SNMP, RESTful API, or scripting the CLI.

Each outlet may be labeled to reflect its purpose or what it's connected to. Each outlet includes on/off/cycle control with individually adjustable on delay, off delay, and cycle delay. Each outlet can be set so that during startup of the PDU, the outlet will be on or off, or whatever the last known state was prior to shutdown.

Power Display / Monitoring

A power display or remote monitoring system is a useful option for several purposes. Voltage monitoring provides a basic level of confirmation that the PDU is being supplied with suitable power, and there's no voltage drop in the line.

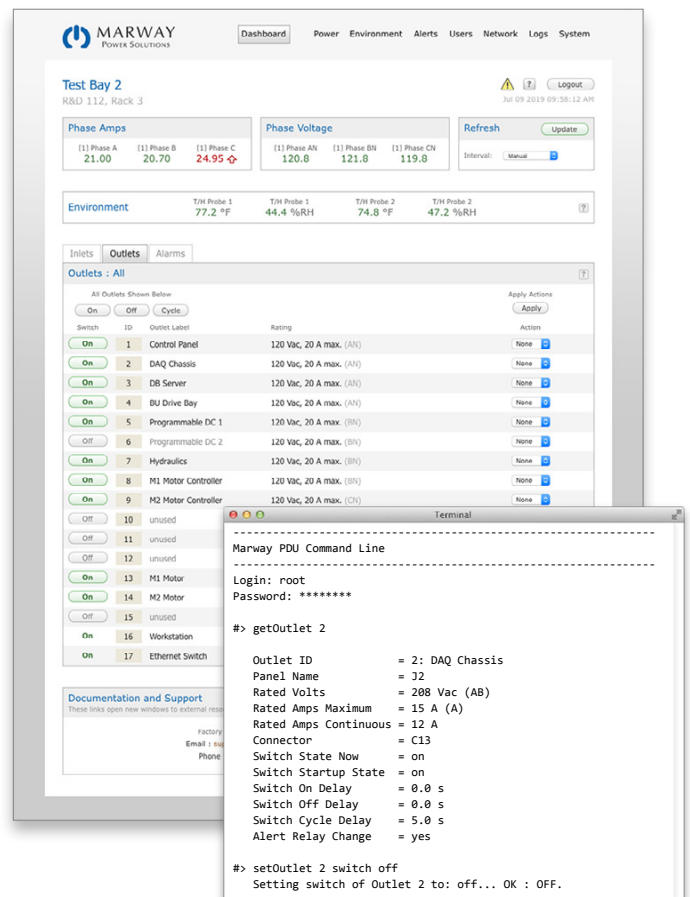
Current monitoring helps measure the consumed capacity of the PDU, and in some cases can be used to monitor the stability of the downstream loads. The built-in circuit breaker will protect wiring from an overload, and a current meter shows how close to that limit the PDU is.

Watts, and VA and VAR if available, are measurements of how much power is actually being used. This can be useful for planning capacity needed from backup battery systems or other off-grid power sources.

Power factor quantifies efficiency. Knowing this value can help with planning (and verifying) the balanced distribution of equipment on a building's electrical system.



Breakers and the remote EPO bus can be used to switch outlets on/off.



User interfaces include web and CLI. Each provides access to outlet control and configuration settings. Web interface above shows a three-phase product with Phase C inlet amps having triggered a high-warning setpoint.

Optima Power Distribution Units

8 Series Ethernet Power Monitoring

- Standard on 833 Series
- Optional on 820, 829, 839 Series

The 8 Series power monitoring option includes internal hardware to measure power consumption at the PDU inlet, and a local display to navigate the measured values of volts, amps, watts, VA, VAR, power factor, and frequency.

The internal monitoring hardware measures power data approximately every three seconds. This can be viewed on the local display, or retrieved over Ethernet using one of the supported networking protocols.

Additionally, the 8 Series software can monitor up to four setpoints (low critical, low warning, high warning, high critical) for both amps and volts. Alerts can be automatically sent to multiple users via email or SMS, and to an SNMP trap server. Setpoint events are also logged in the PDU. Since the measurement is at the inlet (not the internal branch circuits), the current setpoints can be used to warn when the total load is reaching the limit of the upstream breaker.



The power monitoring feature measures and displays V, A, W, VA, VAR, PF, and Hz. It's a useful tool for understanding how much of the PDU's capacity is being used. Additionally, for energy conscious environments, it can be used to measure the power consumption and efficiency of attached equipment. All data is available remotely over Ethernet through the web UI, command line, SNMP, and RESTful API.

5 Series Power Meter

- Optional on 520 Series

The 520 Series power meter option provides digital display of voltage, current, active power, and power factor for the total load on the power inlet. Any measurement can be displayed on demand or set for continuous rotation through all four. Additionally, the display is easily configured to power up with any one of the measurements as the default value, or with continuous rotation as the default mode.

The 520 Series power meter option displays V, A, W, and PF. It's a useful tool for understanding the amount of PDU capacity being used, and net efficiency of the load.



3 Series V/A Display

- Available on some 320 and 329 Series

Several 3 Series models include a basic display for Volts RMS and Amps RMS measured at the inlet. The meter will auto rotate every 5 seconds between the volts and amps values. Volts are shown as whole numbers. Amps are shown with one decimal place. Both values are $\pm 2\%$, and are recalculated every 15 seconds.

The 3 Series digital meter auto-rotates between displaying amps and volts.



8 Series RCM Software Highlights

Networking

Ethernet 10/100T

- IPv4: DHCP, Static

Web Interface

- HTTP, HTTPS

Command Line Interface

- Telnet, SSH, RS-232

SNMP

- Access to power data, alarms, outlet switching

Alerts

- Email over SMTP
- SMS over SMTP
- SNMP v2/v3 Traps

Scriptability

- RESTful API
- Telnet/SSH
- SNMP

Other Protocols

- SNMP, SNMP, FTP

Power Management

Inlet Phases*

- Volts RMS
- Volts Alarm State
- Amps RMS
- Amps Alarm State
- Amps Percent Consumed
- Watts
- Voltamps
- Voltamps Reactive
- Power Factor
- Frequency

Outlets

- On/Off State
- User defined outlet label
- Individual On Delay
- Individual Off Delay
- Individual Cycle Delay
- Individual Startup State

* Power monitoring available for 1φ and 3φ wye units. Current monitoring available for 3φ delta.

Software Features

Dashboard

- Displays all phase currents
- Displays all phase voltages (1φ, 3φ wye)
- Displays alarm state indicators
- Outlet on/off control and state

Power Configuration

- Outlet on / off / cycle delays
- Outlet startup state (on, off, last known)
- Current setpoints for phases
- Voltage setpoints for phases
- User-defined labels for inlets and outlets

Power and Environment Alarm Setpoints

- Low Critical, Low Warning
- High Warning, High Critical
- Adjustable hysteresis and debounce time

Alert Configuration

- Each setpoint alarm can be sent to one or more users as Email and/or SMS notifications
- Adjustable re-alert interval
- Adjustable alert silence duration
- Alerts automatically broadcast on SNMP

User Configuration

- Profile fields for company, job role, and contact information
- Granular authorization permissions control exactly what an individual user can do

Network Configuration

- IPv4: DHCP, Static
- HTTP session duration, SSL, ports
- SNMP servers, GMT and DST settings
- FTP on/off, port
- SMTP server and authentication
- SNMP port, community strings, trap server
- SNMP USM accounts (four)
- Telnet and SSH enabled and ports

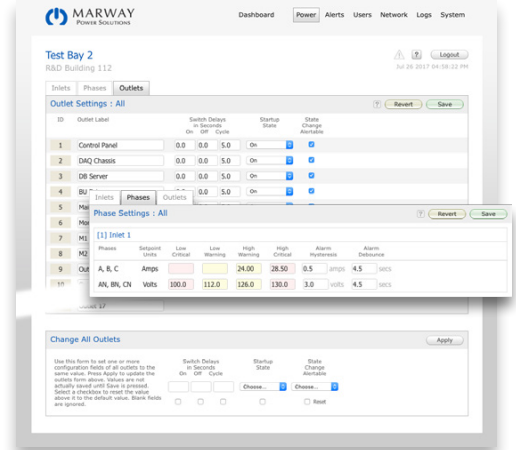
Logged Events

- Startup time, restart requests
- Outlet state changes
- Setpoint trips (amps, volts, temperature, humidity)
- Alert preparation, alert success
- User login
- Configuration and firmware changes
- Log display filtered by severity and category

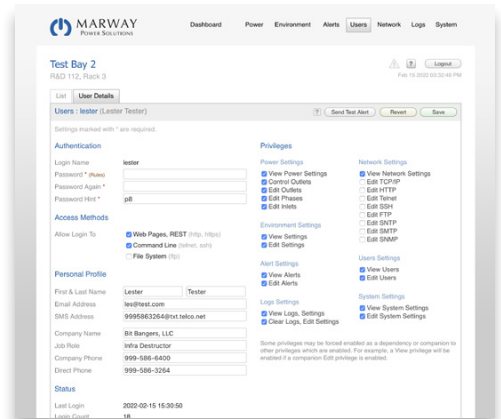
System

- PDU label, location, asset ID, and contact

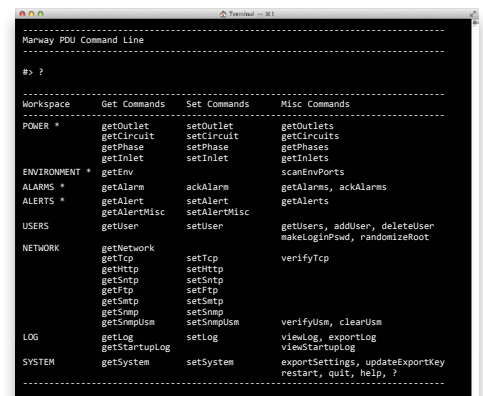
Power configuration includes several outlet switching features, and flexible setpoints for power alarms.



Up to 20 users with independent login and granular permissions provide control over specific protocols, configure outlets, configure networking, and more.



A rich command line interface provides access to all power data, and all configurable settings.



Series Comparison of 1U Models

Use this table to help determine which series has what you need. Use the detailed models lists in the [Standard Products Catalog](#) to determine which exact model has the most appropriate combination of features.

	320 • 1U	520 • 1U	820 • 1U
Ethernet Networking	None	None	Standard
Current Capacities ^[1]	12/15 A 16/20 A 24/30 A	12/15 A 16/20 A 24/30 A	12/15 A 16/20 A 24/30 A
Input Voltages ^[2]	120 Vac 100–240 Vac 1-phase	120 Vac 110–240 Vac 200–240 Vac 1-phase	120 Vac 110–240 Vac 200–240 Vac 1-phase
Inlet Types ^[2]	9 ft. cable with 5-15P, 5-20P L5-30P L6-30P or C20 Rear panel	9 ft. cable with 5-15P, 5-20P L5-20P, L5-30P L6-20P, L6-30P or C20 Rear panel	9 ft. cable with 5-15P, 5-20P L5-20P, L5-30P L6-20P, L6-30P or C20 Rear panel
Outlet Types ^[3]	All 5-15R All 5-20R All C13 Mixed C13, C19	All 5-15R All 5-20R All C13	All 5-15R All 5-20R All C13
Outlet Counts ^[3]	12 or 14 or 16 total	12 total	9 total
Main Breaker	Some models have a single breaker, some have two breakers	Standard	Standard
Main Power Indicator	Standard	Standard	Standard
Branch Breakers ^[1]	(see Main Breaker)	None	None
Surge Suppression	Standard	Standard	Standard
EMI Filter	Standard	Optional	Optional
Remote On/Off/EPO ^[4]	None	Optional	Optional
Staggered Start	None	Optional	Per Outlet Delay
Remote Switching	None	On/Off/EPO Bus	Ethernet, On/Off/EPO Bus
Inlet Metering / Phase	V, A local meter on some models	Optional, Local V, A, W, PF	Optional, Remote V, A, HZ W, VA, VAR, PF
Operating conditions	32–122°F • 5–85% R.H. • < 6,562 ft. altitude		
TAA Compliant	No	Yes	Yes

[1] Current data is shown in Continuous/Maximum Amps where the former is the 80% NEC rating rule.

[2] Where multiple options are shown, only one is applicable to any given unit.

[3] Some series offer a range of pre-defined mixes of outlets. Not all outlets are available in arbitrary combinations.

[4] The remote On/Off/EPO option is a communication bus for the separate Commander UCP product line.

[5] The multiple branch breakers provide inrush overhead instead of staggering the powering of outlets.

Series Comparison of 2U and 3U Models

Use this table to help determine which series has what you need. Use the detailed models lists in the [Standard Products Catalog](#) to determine which exact model has the most appropriate combination of features.

	532 • 2U	533 • 3U	833 • 3U
Ethernet Networking	None	None	Standard
Current Capacities ^[1]	24/30 A	24/30 A	24/30 A
Input Voltages ^[2]	120/208 Vac 3-phase Wye	120/208 Vac 3-phase Wye	120/208 Vac 3-phase Wye
Inlet Types ^[2]	L21-30P/9 ft. cable L21-30 Flanged Rear panel Front Panel	L21-30P/9 ft. cable L21-30 Flanged Rear panel Front Panel	L21-30P/9 ft. cable L21-30 Flanged Rear panel Front Panel
Outlet Types ^[3]	A mixed set from: 5-20R, 6-20R L5-20R, L5-30R L6-20R, L6-30R L21-30	A mixed set from: 5-20R L5-20R, L5-30R L6-20R, L6-30R L21-30	A mixed set from: 5-20R L5-20R, L5-30R L6-20R, L6-30R L21-30
Outlet Counts ^[3]	11 total	16 total or 15 total	22 total or 21 total
Main Breaker	Standard	Standard	Standard
Main Power Indicator	Standard	Standard	Standard
Branch Breakers ^[1]	(4) 16/20 A	(8) 16/20 A	(5) 16/20 A or (6) 16/20 A
Surge Suppression	Standard	Standard	Standard
EMI Filter	Standard	Standard	Standard
Remote On/Off/EPO ^[4]	Standard	Standard	Standard
Staggered Start	None ^[5]	None ^[5]	Per Outlet Delay
Remote Switching	On/Off/EPO Bus	On/Off/EPO Bus	Ethernet, On/Off/EPO Bus
Inlet Metering / Phase	None	None	Standard, Remote V, A, HZ W, VA, VAR, PF
Operating conditions	32–122°F • 5–85% R.H. • < 6,562 ft. altitude		
TAA Compliant	Yes	Yes	Yes

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[5] The multiple branch breakers provide inrush overhead instead of staggering the powering of outlets.

Series Comparison of OU Models

Use this table to help determine which series has what you need. Use the detailed models lists in the [Standard Products Catalog](#) to determine which exact model has the most appropriate combination of features.

	329 • OU	529 • OU	539 • OU	829 • OU	839 • OU
Ethernet Networking	None	None	None	Standard	Standard
Current Capacities ^[1]	12/15 A 16/20 A 24/30 A	12/15 A 16/20 A 24/30 A	16/20 A 24/30 A	12/15 A 16/20 A 24/30 A	16/20 A 24/30 A
Input Voltages ^[2]	120 Vac 100–240 Vac 1-phase	120 Vac 110–240 Vac 200–240 Vac 1-phase	120/208 Vac 3-phase Wye	120 Vac 100–240 Vac 200–240 Vac 1-phase	120/208 Vac 3-phase Wye
Inlet Types ^[2]	9 ft. cable with 5-20P L5-30P L6-30P or C20	9 ft. cable with 5-15P, 5-20P L5-20P, L5-30P L6-20P, L6-30P or C20	L21-20P/9 ft. cable L21-30P/9 ft. cable	9 ft. cable with 5-15P, 5-20P L5-20P, L5-30P L6-20P, L6-30P or C20	L21-20P/9 ft. cable L21-30P/9 ft. cable
Outlet Types ^[3]	All 5-20R Mixed C13/C19	All 5-15R All 5-20R Mixed C13/C19	All 5-20R Mixed C13/C19	All 5-20R Mixed C13/C19	All 5-20R Mixed C13/C19
Outlet Counts ^[3]	15 or 30 total	42, 36, 21, or 18 total	42, 36, 21, or 18 total	16 or 24 total	24 total
Main Breaker	Some models have a single breaker, some have two breakers	Standard	None	Standard	None
Main Power Indicator	Standard	Standard	(3) Phase Indicators	Standard	(3) Phase Indicators
Branch Breakers ^[1]	(see Main Breaker)	None	(3) 16/20 A	None	(3) 16/20 A
Surge Suppression	Standard	None	None	Standard	Standard
EMI Filter	None	None	None	None	None
Remote On/Off/EPO ^[4]	None	None	None	None	None
Staggered Start	None	None	None	Per Outlet Delay	Per Outlet Delay
Remote Switching	None	None	None	Ethernet	Ethernet
Inlet Metering / Phase	Standard V, A	None	None	Optional V, A, HZ, W, VA, VAR, PF	Optional V, A, HZ, W, VA, VAR, PF
Operating conditions	32–122 °F • 5–85% R.H. • < 6,562 ft. altitude				
TAA Compliant	No	Yes	Yes	Yes	Yes

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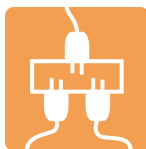
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Optima™ PDUs
Custom and Standard
for Ac, Dc, 400Hz



mPower™ PPSs
Programmable DC
power supplies



TwinPower™ ATs
Auto Transfer Switches
for power redundancy



Commander™ UCPs
Remote and EPO
control panels



PowerPlus™
Turn-key rack
power integration

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