SECTION 271126 - CPI: COMMUNICATIONS RACK MOUNTED POWER PROTECTION AND POWER STRIPS

Chatsworth Products (CPI)

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Specifier Notes: This product guide specification is written according to the Construction Specifications Institute (CSI) 3-Part Format, including *MasterFormat, SectionFormat,* and *PageFormat,* as described in *The Project Resource Manual—CSI Manual of Practice, Fifth Edition.*

This section must be carefully reviewed and edited by the Architect or Engineer to meet the requirements of the project and local building code. Coordinate this section with other specification sections and the Drawings. Delete all “Specifier Notes” after editing this section.

Section numbers are from *MasterFormat 2016 Edition*.

1. GENERAL
	* + 1. RELATED DOCUMENTS

Retain or delete this article in all Sections of Project Manual.

Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

* + - 1. SUMMARY

Section Includes:

Rack-Mounted Power Distribution Units (PDUs).

Related Requirements:

Section 271116 “Communications Cabinets, Racks, Frames, and Enclosures” for cabinets, racks, frames, enclosures and accessories.

* + - 1. DEFINITIONS

BICSI: Building Industry Consulting Service International.

* + - * 1. EIA: Electronic Industries Alliance.
				2. TIA: Telecommunications Industry Association
				3. ANSI: American National Standard Institute
				4. NFPA: National Fire Protection Association
				5. NEC: National Electrical Code
			1. REFERENCES
				1. ANSI/TIA-569-E Telecommunications Pathways and Spaces, 2019
				2. ANSI/TIA-568.0-D Generic Telecommunications Cabling for Customer Premises, 2015
				3. ANSI/TIA – 568.1-D Commercial Building Telecommunications Cabling Standard, 2015.
				4. ANSI/TIA-942-B Telecommunications Infrastructure Standard for Data Centers, 2017.
				5. ANSI/TIA – 606-C Administration Standard for Telecommunications Infrastructure, 2017.
				6. ANSI/TIA – 607-D Generic Telecommunications Bonding and Grounding (Earthing) For Customer Premises, 2019.
				7. ANSI/TIA-862-B Structured Cabling Infrastructure Standard for Intelligent Building Systems, 2016
				8. ANSI/NFPA 70 – National Electric Code, 2014, 2017, 2020.
			2. ACTION SUBMITTALS

Product Data: For each type of product.

Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for rack-mounted power protection and power strips.

Include rated capacities, operating characteristics, electrical characteristics, and furnished specialties and accessories.

Shop Drawings: For communications equipment room fittings. Include plans, elevations, sections, details, and attachments to other work.

Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.

Include workspace requirements and access for cable connections.

Grounding: Indicate any chassis bonding requirements.

Network Connection and Programming: Indicate networking and configuration requirements and connections.

* + - 1. QUALITY ASSURANCE

Product Certifications: UL & cUL 62368; IEC 62368; CE; FCC Part 15, Class A; EN 55022 and RoHS Compliant.

1. PRODUCTS
	* + 1. POWER DISTRIBUTION UNITS (PDUs)

eConnect intelligent PDUs combines remote rack-level (cabinet-level) power monitoring and control, environmental monitoring and access control via a single appliance, software and network Ethernet connection. eConnect Monitored PDU provides rack-level power monitoring. Monitored Pro PDU provides rack and device (outlet) level power monitoring. Switched PDU provides rack level power monitoring and individual outlet control. Switched Pro PDU provides rack level power monitoring, outlet level power monitoring and outlet level control.

Monitoring power at the rack and device level provides the data needed to optimize power utilization in the data center. eConnect features +/- 1% metering accuracy, is rated for use in 65°C ambient air for use in hot aisle environments, has locking outlets that accept any standard power cord and Secure Array IP consolidation that allows up to 48 PDUs (or 32 PDUs when used with integrated electronic locks) to connect through a single physical network connection and IP address greatly reducing networking costs.

Product webpage:

<https://www.chatsworth.com/en-us/products/power-monitoring-security/power-distribution-units-power-strips/monitored/monitored-pro-econnect-pdu>

<https://www.chatsworth.com/en-us/products/power-monitoring-security/power-distribution-units-power-strips/monitored/monitored-econnect-pdu>

<https://www.chatsworth.com/en-us/products/power-monitoring-security/power-distribution-units-power-strips/switched/switched-pro-econnect-pdu>

<https://www.chatsworth.com/en-us/products/power-monitoring-security/power-distribution-units-power-strips/switched/switched-econnect-pdu>

Product Data Sheet:

<http://www.chatsworth.com/uploadedfiles/files/econnect_pdu_monitored_datasheet.pdf>

<http://www.chatsworth.com/uploadedfiles/files/econnect_pdu_monitored-pro_datasheet.pdf>

<http://www.chatsworth.com/uploadedfiles/files/econnect_pdu_switched_datasheet.pdf>

<http://www.chatsworth.com/uploadedfiles/files/econnect_pdu_switched-pro_datasheet.pdf>

Select one of the models below.

[Basis-of-Design Product](http://www.specagent.com/LookUp/?ulid=2336&mf=04&src=wd): Subject to compliance with requirements, provide Chatsworth Products (CPI); [**Monitored eConnect PDU**] [**Monitored Pro eConnect PDU**] [**Switched eConnect PDU**][**Switched Pro eConnect PDU**] with the following features:

Field-replaceable controller with the following connections:

Ethernet Connection (RJ45): 10/100/1000 Mbps

Serial Port (RJ45): For serial connection and console bench configuration

Serial Port (USB-Mini Type B): For serial connection and console bench configuration

Two Secure Array IP Consolidation Ports (RJ45) for linking PDUs through a shared Ethernet connection

Two Electronic Access Control Auxiliary Ports (RJ45) for attaching front and rear electronic door locks

Power Measurement: Built-in power meter with ±1 percent metering accuracy. Power (kW), Energy (kWh), Voltage (V), Current (A) and Power Factor (PF) will be measured at each breaker.

Secure Array IP Consolidation Ports (RJ45): Two serial PDU linking ports that allow multiple PDUs to be connected in a continuous Secure Array of up to 48 PDUs for IP consolidation through one physical network connection. Maintains connection across the array even if an individual unit within the array stops reporting. Allows a second network connection for redundancy.

USB Type-A Port: Two USB Type-A ports for attaching Temperature and Humidity Sensors and for installing firmware upgrades locally. When attached, the PDU will display measured temperature and humidity values.

Built-in Web Interface: Accessed through any web browser using the PDU’s assigned IP address. Supports IPv4 or IPv6, Zero Touch Provisioning (ZTP), web authentication, multiple user accounts, data logging, and download and export of data logs. Displays a list of PDUs that are linked using Secure Array IP Consolidation, a power summary for each unit, an alarm summary for all units, cabinet access control and monitoring, built-in event logging, notification, and cloning/firmware upgrade through arrayed units.

Software Integration to Third-Party Software: Communication with any third-party Data Center Infrastructure Management (DCIM) software, power/facility monitoring software or building management system through SNMP protocol, or RESTful API using the Ethernet connection.

Electronic Lock Integration: Allows attachment of electronic locks to the PDU for power and network connection. Monitor and control locks attached to a single PDU or up to 32 PDUs on a Secure Array through a single built-in web interface or DCIM software integration. Assign individual user access rights in the PDU or from a RADIUS or LDAP database. Log each access attempt, including unauthorized attempts. Record user, date/time and access event for each authorized user. Condition of swinghandle opened or closed. Condition of door opened or closed. Set lock open time. Alarms for badge scan, door open/closed, lock open/closed, door open longer than alarm period. Open locks remotely.

Feature below included on Monitored Pro eConnect PDU and Switched Pro eConnect PDU models.

Outlet Monitoring and Grouping: Measure voltage, current, power (kW) and energy (kWh) at each outlet. The Built-in web interface shall: Allow the user to name each outlet, to view detailed power readings (voltage, current, kW and kWh) for each outlet; to set upper and lower alarm limits for each outlet; to view summarized alarms; to group monitored outlets on individual and linked PDUs to see combined power usage for redundantly powered or multiple pieces of equipment.

Feature below included on Switched eConnect PDU and Switched Pro eConnect PDU.

Outlet Control and Grouping: switched outlets that can be turned on, off or cycled remotely. The built-in web interface: Allow the user to name each outlet; to set on and cycle delays for each outlet; and to group switched outlets on individual and linked PDUs to turn redundantly powered or multiple pieces of equipment off or on with a single click. Each outlet shall have an LED indicating if the outlet is ON or OFF. In case of an alarm, the LED should blink to facilitate location of the alarm.

The following feature is only available on vertical PDU models.

Graphical Display: Centrally located LCD display indicating the following:

Combined voltage, current and power (kW) for the PDU.

Voltage, current, power (kW) and power factor values for each breaker on the PDU

Line input current on three-phase units

Current for each outlet on Monitored Pro and Switched Pro units

Temperature and Humidity values for external sensors

Display screens and options shall be navigated with three push buttons located under the display

Alarms will be indicated by a flashing red LED above the display and indicator on screen

The image on the display screen will rotate 180° for easy viewing when the PDU is mounted with the power cord toward the top of the rack/cabinet.

The display can be used to setup PDU Linking settings, fixed IP address and firmware update.

For assistance defining Description, Breaker and Power Output details below, select a specific eConnect model using the eConnect Selector: <https://www.chatsworth.com/en-us/resources/configurators-and-estimators/power-selector>

Description:

Mounting Style:

Vertical PDUs: Shall be capable of being preinstalled in either 42U or 45U CPI ZetaFrame, TeraFrame and GlobalFrame Cabinets. Universal tool-less mounting hardware, a pair of aluminum shoulder washers attached to the back of the PDU chassis that can be spaced **64.8 inches (1645 mm)** or **61.3 inches (1556 mm)** apart to match most rack/cabinet mounting brackets.

Horizontal PDUs: Shall include a pair of mounting brackets compatible with 19”EIA rack-mount systems.

Select voltage/phase; breaker number, rating and type; cord; plug; and outlet below. Breakers; Plug; and Outlets must match Voltage/phase.

For assistance defining Description, Breaker and Power Output details below, select a specific eConnect model using the eConnect Selector: <https://www.chatsworth.com/en-us/resources/configurators-and-estimators/power-selector>

Power Input:

Voltage:

[**100-240V Single-Phase Input**]

[**120V Single-Phase Input**]

[**120/208V Single-Phase Input**]

[**120/208V Three-Phase Input**]

[**208V Single-Phase Input**]

[**208V Three-Phase Input**]

[**220-240V Single-Phase Input**]

[**240/415V Three-Phase**]

[**380-415V Three-Phase Input**].

Breaker(s): [**1**][**2**][**3**][ **or** ][**6**] UL489 hydraulic magnetic breakers fully rated to [**16A**][ **or** ][**20A**] each, [**Single-Pole**][ **or** ][**Double-Pole**] depending on input plug type and UL requirements. Must have 10 kAIC-rated breakers with any 240/415 Volt configurations.

Cord: [Attached cord: One single input cord permanently attached; **3 to** **15 feet (0.9 to 4.6 m)** long.][Detachable cord, with C19 connector for the PDU and plug identified below; 8 ft (2.4 m) long.][No power cord: C20 inlet on PDU].

Plug:

[**C20 Inlet to L5-20P]**

[**L5-30P**]

[**C20 Inlet to L6-20P**]

[**L6-30P**]

[**IEC 16A 1P+N+E**]

[**IEC 32A 1P+N+E**]

[**L14-30P**]

[**L15-30P**]

[**L21-20P**]

[**L21-30P**]

[**50A CS8365**]

[**60A IEC 3P+E**]

[**L22-30P**]

[**IEC 16A 3P+N+E**]

[**IEC 32A 3P+N+E**].

Power Output:

Voltage: The nominal output voltage for 5-20R outlets is 120V and for C13/C19 is 208V. Convenience outlets are not monitored or switched.

Phase-balance outlets on three-phase units: Each outlet in the sequence draws power from a sequential phase-breaker combination in order to facilitate load balancing, wiring and avoid circuit overload

Outlet combination:

[**(8) C13, (4) C19**]

[**(9) C19**]

[**(12) 5-20R]**

[**(12) C13**]

[**(6) C13 (12) C19**]

[**(12) C13 (12) C19**]

[**(12) C13 (18) C19**]

[**(18) C13 (6) C19**]

[**(12) C13 (6) C19 and (4) 5-20 Convenience outlets]**

[**(18) C13 (6) C19 and (3) 5-20 Convenience outlets]**

[**(24) 5-20R]**

**[(24) C13**]

[**(24) C13 (12) C19**]

[**(24) C13 (6) C19 (6) 5-20R**]

[**(24) C13 (9) C19 (3) 5-20R**]

[**(30) C13 (6) C19**]

[**(30) C13 (12) C19**]

[**(36) 5-20R**]

[**(36) C13**]

[**(36) C13 (6) C19**]

[**(48) C13**]

[**(54) C13**]

[**(60) C13**].

Cable Management: Locking eConnect; C13 and C19 outlets shall have an integrated mechanism for securing power cords that will accept any standard power cord with a straight or angled plug. The low-profile locking outlets feature a lever that secures the power cord in place.

PDU Temperature Rating: Rated for use in high ambient air temperatures up to **149°F** **(65°C)** and suitable for use in hot aisle containment and ducted exhaust cabinet applications.

Grounding/Bonding: Grounded inlet/power plug and a separate external M5 threaded ground attachment point.

Color & Finish: Available in black and Glacier White with powder coat paint.

Power outlets: molded black

Field-replaceable controller: black

Color-coded labels printed on metal to associate breakers and outlets

Redundancy Pack – A pack of 2 PDUs; one black PDU and one Glacier White PDU to easily identify A&B feeds

* + - 1. POWER DISTRIBUTION UNITS (PDUs), Local Metered

[Basis-of-Design Product](http://www.specagent.com/LookUp/?ulid=2336&mf=04&src=wd): Subject to compliance with requirements, provide Chatsworth Products (CPI); MeteredeConnect PDU.

For assistance defining Description, Breaker and Power Output details below, select a specific eConnect model using the eConnect Selector: <https://www.chatsworth.com/en-us/resources/configurators-and-estimators/power-selector>

Power Measurement: Built-in ammeter. Input Current (A) will be measured on each phase.

Graphical Display: Centrally located LED display indicating the following:

Input current of reach phase on the PDU.

Description:

Mounting Style:

Vertical PDU: Shall be capable of being preinstalled in either 42U or 45U CPI TeraFrame and GlobalFrame Cabinets. Universal tool-less mounting hardware, a pair of aluminum shoulder washers attached to the back of the PDU chassis that can be spaced **64.8 inches (1645 mm)** or **61.3 inches (1556 mm)** apart to match most rack/cabinet mounting brackets.

Select voltage/phase; breaker number, rating and type; cord and plug below. Breakers and Plug must match Voltage/phase.

Power Input:

Voltage:

[**100-240V Single-Phase Input**]

[**120V Single-Phase Input**]

[**120/208V Single-Phase Input**]

[**120/208V Three-Phase Input**]

[**208V Single-Phase Input**]

[**208V Three-Phase Input**]

[**220-240V Single-Phase Input**]

[**240/415V Three-Phase**]

[**380-415V Three-Phase Input**]

Breakers: [**1**][**2**][**3**][ **or** ][**6**] UL489 hydraulic magnetic breakers fully rated to [**16A**][ **or** ][**20A**] each, [**Single-Pole**][ **or** ][**Double-Pole**] depending on input plug type and UL requirements. Must have 10 kAIC-rated breakers with any 240/415 Volt configurations.

Cord: [Attached cord: One single input cord permanently attached; **3 to** **15 feet (0.9 to 4.6 m)** long.].

Plug:

[**C20 Inlet to L5-20**]

[**L5-30P**]

[**L6-30P**]

[**IEC 16A 1P+N+E**]

[**IEC 32A 1P+N+E**]

[**L15-30P**]

[**L21-20P**]

[**L21-30P**]

[**50A CS8365C**]

[**L22-30P**]

[**IEC 16A 3P+N+E**]

[**IEC 60A 3P+N+E**]

Select outlet combinations from the list below. Must match Voltage above.

Power Output:

A mix of [**NEMA 5-20R**][**IEC C13**][ **and/or** ][**IEC C19**] outlets. The nominal output voltage for 5-20R outlets is 120V and for C13/C19 is 208V.

Alternating of Phases: outlets with alternating phases throughout the PDU to facilitate load balancing, wiring and avoid circuit overload.

Outlet combinations:

**(24)** **5-20R.**

**(12) C13 (18) C19**.

**(24) C13**

**(18) C13 (6) C19**.

**(24) C13 (12) C19.**

(24) C13 (6) C19.

(24) C13 (6) C19 (6) 5-20R.

(24) C13 (9) C19 (3) 5-20R.

**(30) C13 (12) C19**.

**(30) C13 (6) C19 (6) 5-20R**

**(36) C13 (6) C19.**

**(36) C13 (12) C19**

**(54) C13.**

Cable Management: Locking eConnect; C13 and C19 outlets shall have an integrated mechanism for securing power cords that will accept any standard power cord with a straight plug. The mechanism will have an audible click when the cord is inserted and tabs for releasing the power cord.

PDU Temperature Rating: Rated for use in high ambient air temperatures up to **149°F (65°C)** and suitable for use in hot aisle containment and ducted exhaust cabinet applications.

Grounding/Bonding: grounded inlet/power plug and a separate external M5 threaded ground attachment point. The grounding kit includes a **12 inch (300 mm)** long, #12 AWG, stranded copper grounding jumper.

Color & Finish: Available in black and Glacier White with powder coat paint.

Power outlets: molded black

Field-replaceable controller: black

Color-coded labels printed on metal to associate breakers and outlets

Redundancy Pack – A pack of 2 PDUs; one black PDU and one Glacier White PDU to easily identify A&B feeds

* + - 1. POWER DISTRIBUTION UNITS (PDUs), Not-metered

Basic features include no local meter or remote monitoring, optional locking outlets.

[Basis-of-Design Product](http://www.specagent.com/LookUp/?ulid=2336&mf=04&src=wd): Subject to compliance with requirements, provide Chatsworth Products (CPI); BasiceConnect PDU.

For assistance defining Description, Breaker and Power Output details below, select a specific eConnect model using the eConnect Selector: <https://www.chatsworth.com/en-us/resources/configurators-and-estimators/power-selector>

Select voltage/phase; breaker number, rating and type; cord and plug below. Breakers and Plug must match Voltage/phase.

Description:

Mounting Style:

Vertical PDU: Shall be capable of being preinstalled in either 42U or 45U CPI TeraFrame and GlobalFrame Cabinets. Universal tool-less mounting hardware, a pair of aluminum shoulder washers attached to the back of the PDU chassis that can be spaced **64.75 inches (1645 mm)** or **61.25 inches (1556 mm)** apart to match most rack/cabinet mounting brackets.

Horizontal PDUs: Shall include a pair of mounting brackets compatible with 19”EIA rack-mount systems.

Power Input:

Voltage:

[**100-240V Single-Phase Input**]

[**120V Single-Phase Input**]

[**120/208V Single-Phase Input**]

[**120/208V Three-Phase Input**]

[**208V Single-Phase Input**]

[**208V Three-Phase Input**]

[**220-240V Single-Phase Input**]

[**240/415V Three-Phase**]

[**380-415V Three-Phase Input**].

Breakers: [**1**][**2**][**3**][ **or** ][**6**] UL489 hydraulic magnetic breakers fully rated to [**16A**][ **or** ][**20A**] each, [**Single-Pole**][ **or** ][**Double-Pole**] depending on input plug type and UL requirements.

Cord:

One single input cord permanently attached; **3 to 15 feet (0.9 to 4.6 m)** long.

C20 inlet, no attached power cord, accepts a separate power cord with C19 connector for select power connections that are 20A and under.

Plug:

[**C20 Inlet to L5-20**]

[**L5-30P**]

[**C20 Inlet to L6-20**]

[**L6-30P**]

[**IEC 16A 1P+N+E**]

[**IEC 32A 1P+N+E**]

[**L15-30P**]

[**L21-20P**]

[**L21-30P**]

[**50A CS8365C**]

[**L22-30P**]

[**IEC 16A 3P+N+E**]

[**IEC 32A 3P+N+E**]

[**IEC 60A 3P+E**].

Select outlet combinations from the list below. Must match Voltage above.

Power Output:

A mix of [**NEMA 5-20R**][**IEC C13**][ **and/or** ][**IEC C19**] outlets. The nominal output voltage for 5-20R outlets is 120V and for C13/C19 is 208V.

Alternating of Phases: outlets with alternating phases throughout the PDU to facilitate load balancing, wiring and avoid circuit overload.

Outlet combinations:

**(12) 5-20R**

**(12) C13**

**(8) C13 + (4) C19**

**(9) C19**

**(24) 5-20R.**

**(24) C13**

**(6) C13 (12) C19.**

**(12) C13 (6) C19 (4) 5-20R.**

**(12) C13 (18) C19.**

**(30) C13 (12) C19.**

**(30) C13 (6) C19 (6) 5-20R**

**(18) C13 (6) C19.**

**(36) C13 (6) C19.**

**(36) C13 (12) C19.**

**(54) C13**

Cable Management: Locking eConnect; C13 and C19 outlets shall have an integrated mechanism for securing power cords that will accept any standard power cord with a straight plug. The mechanism will have an audible click when the cord is inserted and tabs for releasing the power cord.

PDU Temperature Rating: Rated for use in high ambient air temperatures up to **149°F** **(65°C)** and suitable for use in hot aisle containment and ducted exhaust cabinet applications.

Grounding/Bonding: grounded inlet/power plug and a separate external M5 threaded ground attachment point. The grounding kit includes a **12 inch (300 mm)** long, #12 AWG, stranded copper grounding jumper.

Color & Finish: Available in black and Glacier White with powder coat paint.

Power outlets: molded black

Field-replaceable controller: black

Color-coded labels printed on metal to associate breakers and outlets

Redundancy Pack – A pack of 2 PDUs; one black PDU and one Glacier White PDU to easily identify A&B feeds

* + - 1. WARRANTIES

Minimum of 3 years of standard warranty with ability to extend by at least 2 additional years. Advanced replacement of defective PDUs shall be offered as a standard service.

2.6 MANUFACTURING

Made in the United States with globally sourced components, TAA compliant.

1. EXECUTION
	* + 1. INSTALLATION

PDU shall be capable of being preinstalled by manufacturer in CPI ZetaFrame, GlobalFrame or TeraFrame Cabinets.

Mounting options:

 Two PDUs on the same side of the cabinet using two-piece or full-height brackets. One PDU on either side of the cabinet using two-piece or full-height brackets.

END OF SECTION 271126