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*.

GENERAL

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.

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.

DEFINITIONS

BICSI: Building Industry Consulting Service International.

EIA: Electronic Industries Alliance.

TIA: Telecommunications Industry Association

ANSI: American National Standard Institute

REFERENCES

ANSI/TIA-569-D Telecommunications Pathways and Spaces, 2015

ANSI/TIA-568-D.0 Generic Telecommunications Cabling for Customer Premises, 2015

ANSI/TIA – 568-D.1 Commercial Building Telecommunications Cabling Standard, 2015.

ANSI/NECA/BICSI 568-2006 – Standard for Installing Commercial Building Telecommunications Cabling.

ANSI/TIA-942-A Telecommunications Infrastructure Standard for Data Centers, 2014.

ANSI/TIA – 606-B Administration Standard for Telecommunications Infrastructure, 2012.

TIA – 607-C Generic Telecommunications Bonding and Grounding (Earthing) For Customer Premises, 2015.

ANSI/NFPA 70 – National Electric Code, 2008, 2014.

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.

QUALITY ASSURANCE

The first option below applies to Canada, the second for the European Union.

Product Certifications: UL Listed, [**CSC C22.2**][**CE**]; FCC Part 15, Class A; EN 55022 and RoHS Compliant.

PRODUCTS

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 provides rack level power monitoring and individual outlet control. Switched Pro 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 any hot environment, has click secure locking outlets that accept any standard power cord and Secure Array IP consolidation that allows up to 32 PDUs to connect through a single physical network connection and IP address greatly reducing networking costs.

Product webpage:

<http://www.chatsworth.com/products/power-management/power-distribution-units/econnect-power-distribution-units/>

http://www.chatsworth.com/products/environmental-monitoring-and-security/electronic-locking-systems/econnect-electronic-access-control/

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>

<http://www.chatsworth.com/uploadedfiles/files/36650_eac_datasheet.pdf>

Product AutoDesk Revit BIM model:

https://bimobject.com/en-us/chatsworthproducts/product/cpi-monitored\_vertical\_econnect\_pdu

<https://bimobject.com/en-us/chatsworthproducts/product/cpi-switched_vertical_econnect_pdu>

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:

The first 8 features are standard with all models. Additional features as indicated below.

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.

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 probe.

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.

Temperature and Humidity Sensor Port: Supports up to two external temperature and humidity sensors.

These sensors are sold separately.

When attached, the PDU will display measured temperature and humidity values.

Ethernet Connection: 10/100/1000 Mbps RJ45.

Supports an IPv4 or IPv6 address.

Web authentication.

Multiple user accounts.

Download and export of data logs.

Secure Array IP Consolidation Ports: Two serial PDU Linking ports that allow multiple PDUs to be connected in a continuous secure array of up to 32 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 Port: One USB port for installing firmware upgrades locally.

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

Built-in Web Interface: Accessed through any web browser using the PDU’s assigned IP address. 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, and built-in event logging, notification, and cloning/firmware upgrade through arrayed units.

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

Outlet Monitoring and Grouping: Measure voltage, current and power (kW) at each outlet.

The Built-in web interface shall: Allow the user to name each outlet, to view detailed power readings (voltage, current, kW) for each outlet; to set upper and lower alarm limits for each outlet; to view summarized alarms; and 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: Allows 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.

For assistance defining Description, Breaker and Power Output details below, select a specific eConnect model using the eConnect Selector: http://www.chatsworth.com/econnect-selector/

Description:

Dimensions: [**70.5 inches** **(1791 mm)** high, no more than **2.2** **inches** **(56 mm)** wide by **2.2 inches** **(56 mm)** deep at the outlets and **2.8 inches** **(71 mm)** deep at the breakers; with up to three single-pole or double-pole breakers][**72 inches** **(1829 mm)** high, no more than **2.4 inches** **(61 mm)** wide by **2.2 inches** **(56 mm)** deep at the outlets and **2.8 inches** **(71 mm)** deep at the breakers with up to six single-pole breakers][ **75 inches (1905 mm) high, no more than 2.7 inches (69 mm) wide by 2.2 inches (56 mm) deep at the outlets and 3.2 inches (82 mm) deep at the breakers with up to six double-pole breakers**][**77.9 inches** **(1978 mm)** high, no more than **2.7 inches** **(69 mm)** wide by **2.2 inches** **(56 mm)** deep at the outlets and **3.2 inches** **(82 mm)** deep at the breakers with up to six double-pole breakers][**70.5 inches** **(1791 mm)** high, no more than **4.0 inches** **(102 mm)** wide by **2.2 inches** **(56 mm)** deep at the outlets and **3.2 inches** **(82 mm)** deep at the breakers with up to six double-pole breakers][**Rack-mount 2U high by 19 inches (486.2 mm) EIA wide by 10.1 inches (257 mm) deep**].

Mounting Style:

Vertical PDUs: 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: Include 19 inch (486.2 mm)EIA rack-mount brackets, occupy 2U of rack-mount space.

Power Input:

One single input cord permanently attached; 10 feet (3m) long.

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

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**].

Select plug type from the list below. Coordinate selection with Voltage type above.

Plug:

C20 Inlet – no power cord.

[**L5-20P**][**L5-30P**].

[**L6-20P**][**L6-30P**].

[**IEC 16A 1P+N+E**][**IEC 32A 1P+N+E**].

[**L14-20P**][**L14-30P**].

[**L15-20P**] [**L15-30P**].

[**L21-20P**][**L21-30P**].

50A CS8365C.

60A IEC 3P+E.

[**L22-20P**][**L22-30P**].

[**IEC 16A 3P+N+E**][**IEC 32A 3P+N+E**].

Select breaker number, rating and type below. Must match Dimensions and Voltage (Phase) above.

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.

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.

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

Outlet combinations:

(8) C13, (4) C19.

(10) 5-20R.

(12) 5-20R.

(12) C13.

(12) C13 (12) C19.

(12) C13 (18) C19.

(18) C13 (6) C19.

(24) 5-20R.

(24) C13.

(24) C13 (12) C19.

(24) C13 (6) C19.

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

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

(30) C13 (6) C19.

(36) 5-20R.

(36) C13.

(36) C13 (6) C19.

(48) C13.

(60) C13.

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

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**][**Non-Locking eConnect; outlets will have an attachment point for a tether that can be used with a zip tie to secure cords at each outlet**].

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: Painted black with powder coat paint.

Power outlets: Molded black.

Color coded labels: To identify the breakers and associated outlets.

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: http://www.chatsworth.com/econnect-selector/

Description:

Dimensions: [**70.5 inches** **(1791 mm)** high, no more than **2.2** **inches** **(56 mm)** wide by **2.2 inches** **(56 mm)** deep at the outlets and **2.8 inches** **(71 mm)** deep at the breakers; with up to three single-pole or double-pole breakers][**72 inches** **(1829 mm)** high, no more than **2.4 inches** **(61 mm)** wide by **2.2 inches** **(56 mm)** deep at the outlets and **2.8 inches** **(71 mm)** deep at the breakers with up to six single-pole breakers].

Vertical PDU: 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.

Power Input:

One single input cord permanently attached; 10 feet (3m) long.

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

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**].

Select plug type from the list below. Must match Voltage above.

Plug:

C20 Inlet – no power cord.

[**L5-20P**][**L5-30P**].

[**L6-20P**][**L6-30P**].

[**IEC 16A 1P+N+E**][**IEC 32A 1P+N+E**]

[**L14-20P**][**L14-30P**].

[**L15-20P**][**L15-30P**].

[**L21-20P**][**L21-30P**].

50A CS8365C.

**[L22-20P**][**L22-30P**].

[**IEC 16A 3P+N+E**][**IEC 32A 3P+N+E**].

Select breaker number, rating and type below. Must match Dimensions and Voltage (Phase) above.

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.

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.

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

Outlet combinations:

(24) 5-20R.

(24) C13 (12) C19.

(24) C13 (6) C19.

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

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

(30) C13 (6) C19.

(36) 5-20R.

(36) C13.

(36) C13 (6) C19.

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

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**][**Non-Locking eConnect; outlets will have an attachment point for a tether that can be used with a zip tie to secure cords at each outlet**].

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: Painted black with powder coat paint.

Power outlets: Molded black.

Color coded labels: To identify the breakers and associated outlets.

Metered features include a local meter and 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); MeteredeConnect PDU.

For assistance defining Description, Breaker and Power Output details below, select a specific eConnect model using the eConnect Selector: http://www.chatsworth.com/econnect-selector/

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

Graphical Display: Centrally located LCD display indicating the following:

Input current for each phase on the PDU.

Description:

Dimensions: [**70.5 inches (1791 mm) high, no more than 2.2 inches (56 mm) wide by 2.2 inches (56 mm) deep at the outlets and 2.8 inches (71 mm) deep at the breakers; with up to three single-pole or double-pole breakers**][**72 inches (1829 mm) high, no more than 2.4 inches (61 mm) wide by 2.2 inches (56 mm) deep at the outlets and 2.8 inches (71 mm) deep at the breakers with up to six single-pole breakers**][ **75 inches (1905 mm) high, no more than 2.7 inches (69 mm) wide by 2.2 inches (56 mm) deep at the outlets and 3.2 inches (82 mm) deep at the breakers with up to six double-pole breakers**].

Vertical PDU: 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.

Power Input:

One single input cord permanently attached; 10 feet (3m) long.

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

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**].

Select plug type from the list below. Must match Voltage above.

Plug:

C20 Inlet Ó no power cord.

[**L5-20P**][**L5-30P**].

[**L6-20P**][**L6-30P**].

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

[**L14-30P**].

[**L15-30P**].

[**L21-20P**][**L21-30P**].

[**50A CS8365C**].

[**L22-30P**].

[**IEC 16A 3P+N+E**][**IEC 32A 3P+N+E**].

Select breaker number, rating and type below. Must match Dimensions and Voltage (Phase) above.

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.

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.

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

Outlet combinations:

(24) 5-20R.

(24) C13 (12) C19.

(24) C13 (6) C19.

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

(30) C13 (6) C19.

(36) 5-20R.

(36) C13.

(36) C13 (6) C19.

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

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**][**Non-Locking eConnect; outlets will have an attachment point for a tether that can be used with a zip tie to secure cords at each outlet**].

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 and Finish: Painted black with powder coat paint.

Power outlets: Molded black.

Color coded labels: To identify the breakers and associated outlets.

EXECUTION

INSTALLATION

Vertical PDUs should be installed with separately ordered mounting brackets using the manufacturers’ installation instructions.

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