*Data Sheet*
*July 2007*

# *Tyco Compact Power Line Shelves*
## *19-Inch Chassis or Rack-Mount Styles*

***The extra narrow Tyco CP Shelf fits in a frame-mount chassis or directly into a 19-inch frame.***

## *Description*

The standard four slot 1U shelf, only 16.81 inches wide without the mounting ears, is designed to fit inside a 19-inch rack of customer equipment. Shelves can also be mounted directly to the 19-inch frame using the adjustable mounting ears. These adjustments permit positioning of the shelf either flush or extended outward in two steps. Another configuration accommodates three rectifiers across in a 12.7 inch wide shelf.

A derivative splits the standard shelf into two partitions accommodating two input feeds and two independent output buses. Versions for both rectifiers and Power Entry Modules are offered.

The shelves provide lug attachments of output power on either side from the rear. Each lug can carry up to 100 Amperes for a total of 200 Amperes per shelf.

Input power can be delivered by C13 IEC-320, AMP Mate-N-Lok for AC, or AMP Power Blade style connectors for DC.

## *Features*

- 16 inch overall depth
- Extra narrow to fit in frame-mount chassis
- Hot insertion/removal (hot-plug)
- Two output feeds with 2 AWG double-hole lugs
- Single, or dual-feed inputs and outputs
- IEC-320 or AMP Mate-N-Lok ac inputs
- AMP Power Blade dc inputs
- Three different keys for 24/48V rectifiers and Power Entry Modules (PEMs)
- UL and CSA listed
- VDE licensed
- CE mark meets 73/23/EEC and 93/68/EEC directives

**Power Systems**

## *Specifications*

### *Electrical*

| Parameter | Min | Max | Notes |
|---|---|---|---|
| **Input** | | | |
| AC Input Current | | 15A | Per module, either IEC-320 or AMP Mate-N-Lok connectors |
| DC Input Current | | 60A | Per Module |
| Input Terminations – AC | | 4 | |
| Input Terminations – DC | | 2 | Each connector powers 2 modules |
| **Output** | | | |
| Total Output Power | | 10kW | L4, L6, shelves are limited to 8kW. |
| Output Voltage Range | 12Vdc | 60Vdc | |
| Output Current (A and B feeds) | | 200A | Each feed limited to 100A |
| Output Terminations | | 2 pairs | Double-hole lug landings for 2 ga wires. M6 threaded studs on 5/8-inch centers. Nuts provided. Use 90° lug (Burndy YAV2CL2TC14- FX-90) on wireset. |

### *Environmental*

| Parameter | Min | Max | Notes |
|---|---|---|---|
| Storage Temperature | -50°C | +85°C | |
| Operating Temperature | -40°C | +75°C | |
| Operating Thermal Shock | 30°C/hr | | |
| Altitude | -200ft | 13,000ft | |
| Storage Humidity | 5% | 95% | Non-condensing |
| Operating Humidity | 5% | 95% | Non-condensing |

### *Physical*

| | |
|---|---|
| Height | 1.71 in. (43.4 mm) (1U) |
| Width | 16.81 in. (427 mm) |
| Depth | 16.25 in. (413 mm) |
| Weight | 7 lb (3.2 kg) with packaging |

### *Safety / Standards Compliance*

UL Listed to UL60950

UL Listed for Canada (C22.2 No. 60950-1-03

## *Overall Dimension – Standard Platform*

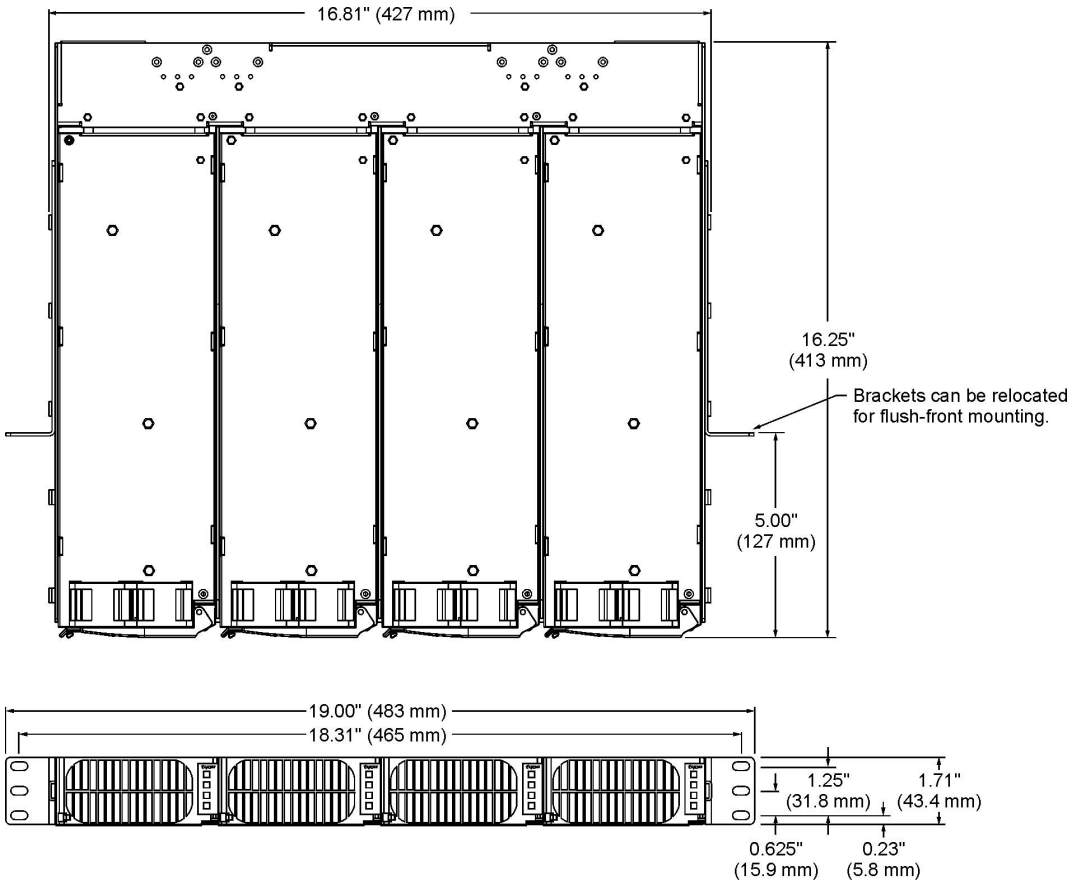



***Figure 1: Overall Dimensions***

## *Slot Keying*

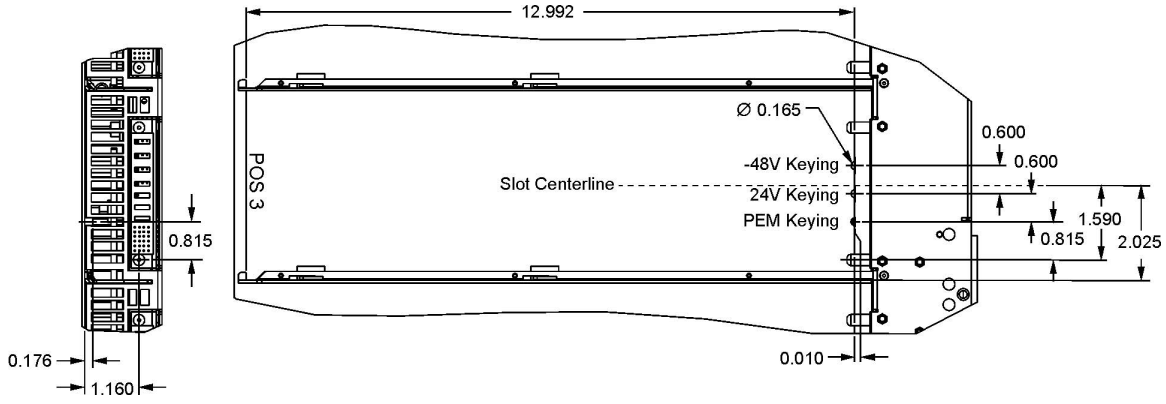



***Figure 2: Mechanical keying ensures that the right part is engaged***

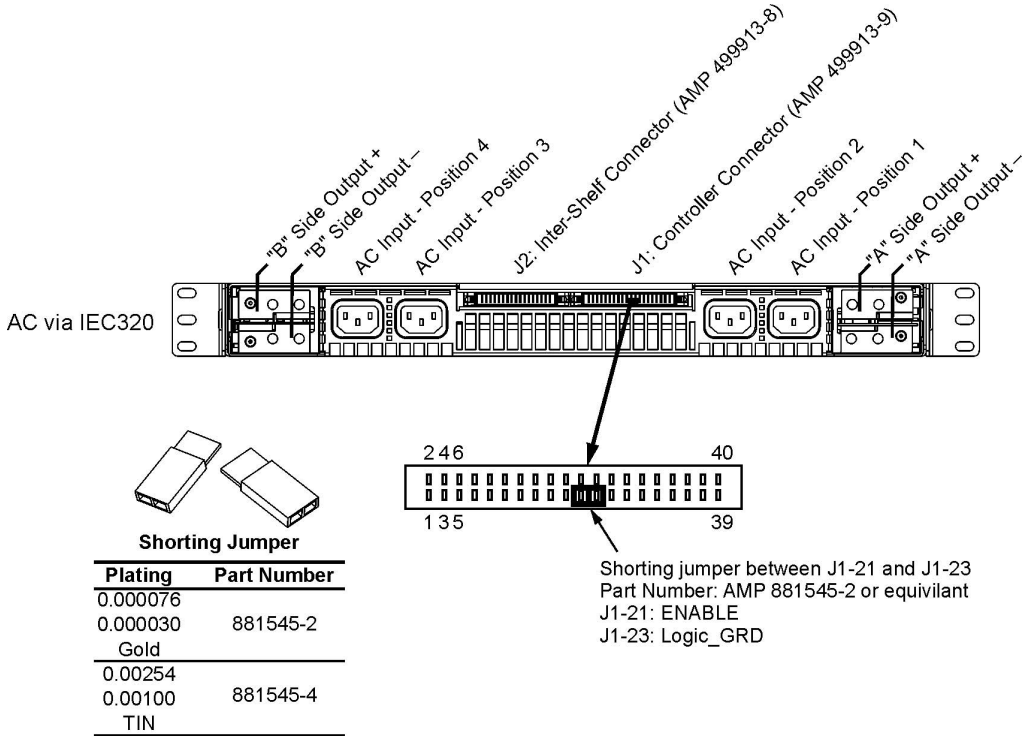
## *Optional Configurations*

- **AC input**
  - IEC-320 or AMP Mate-N-Lok input connectors
  - Analog / $I^2C$ / and RS485 or dedicated to RS485 only
  - Split shelf; Dual feeder inputs and dual isolated outputs, Analog / $I^2C$ / RS485 control
- **DC input**
  - Split shelf; Dual feeder inputs and dual isolated outputs, Analog / $I^2C$ / RS485 control

## *Standard Shelf - Analog Applications*

The standard shelf accommodates four paralleled rectifiers. It is designed to be used either stand-alone, or as part of an integrated system with either $I^2C$ or RS485 communications protocols. For stand-alone applications, the standard shelf is shipped with a jumper in the J1 connector slot, shorting pins ENABLE and Logic_GRD. Without shorting these two pins the power supplies would not turn ON. This jumper needs to be removed before plugging in the mate to the J1 connector.

**Product Code: J85480S1, L-4,** AC input C13 IEC-320 connectors, Analog / $I^2C$ / RS485 control




**Shorting Jumper**

| Plating | Part Number |
|---|---|
| 0.000076<br>0.000030<br>Gold | 881545-2 |
| 0.00254<br>0.00100<br>TIN | 881545-4 |

***Figure 3: Connector Locations (rear view) and ENABLE jumper, IEC-320 inputs***

**Product Code: J85480S1, L-6** AC input with AMP Mate-N-Lok connectors, Analog / $I^2C$ / RS485 control. Same as L4 with the exception of the input connector style.

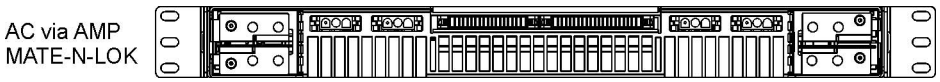



***Figure 4: Rear view connector locations with AMP Mate-N-Lok input connectors***

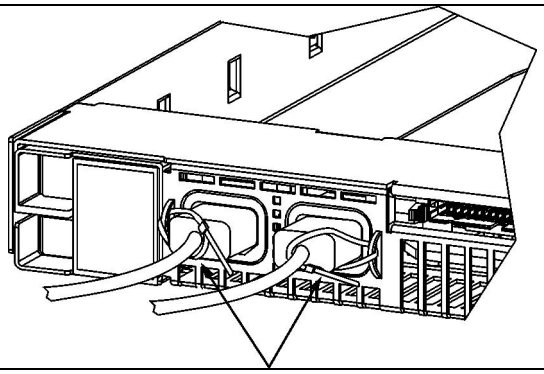


***Figure 5: Securing AC cables for IEC-320 inputs***

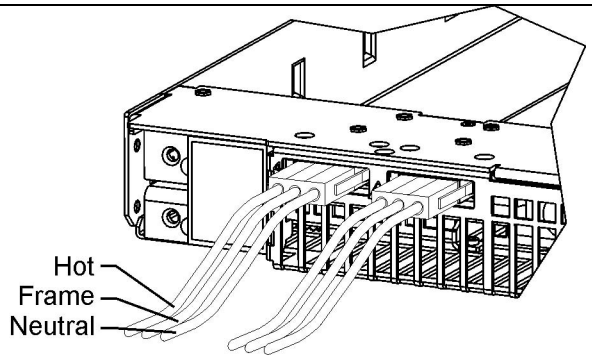



***Figure 6: AMP Mate-N-Lok input connections***

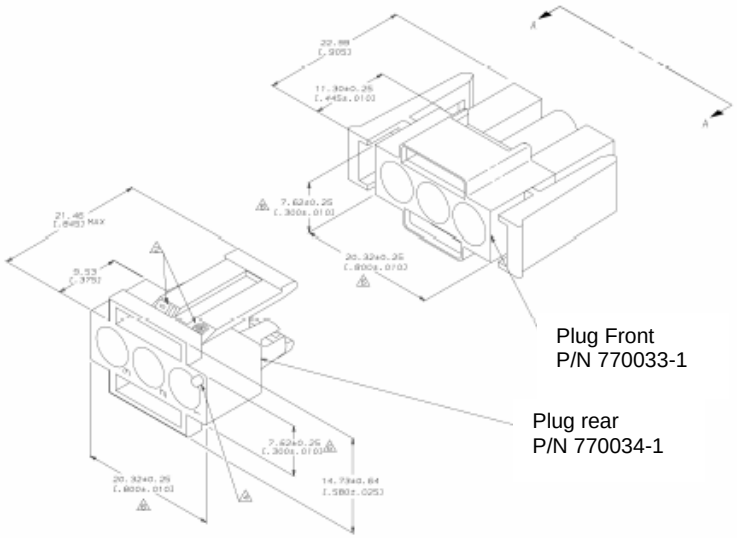
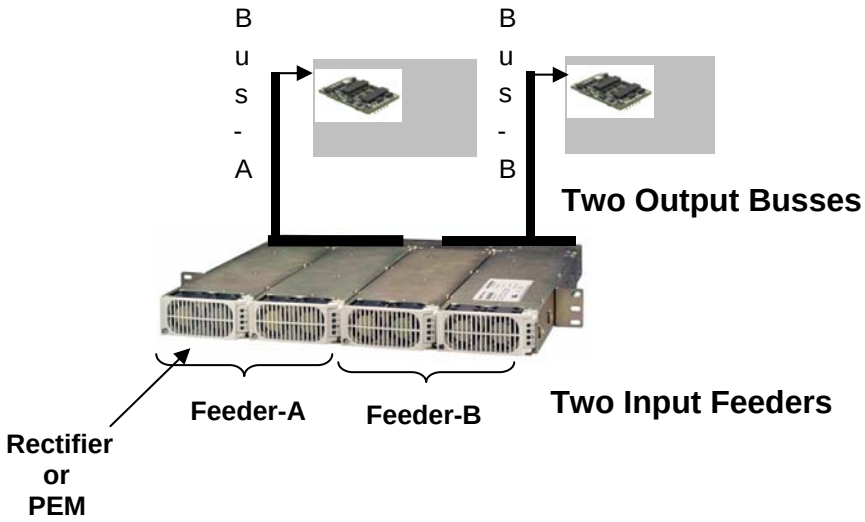



***Figure 7: AMP Mate-N-Lok input connector housing P/N 770018-1***

| Gauge | Part # |
|---|---|
| 10 | AMP 193796-1 |
| 12 – 14 | AMP 193841-1 |

***Figure 8: Pin located in housing***

***Split Shelf – Two feeders and two independent outputs***




- Designed for redundant feeders and outputs, each section is independently controlled.
- Partitioned Vout ( - ) buses on either side of the shelf. Vout ( + ) is common to both sections.
- Common $I^2C$ communications and +5V bias maintains communications even during a feeder fault.
- Separate products are required for rectifiers and PEMs because of input differences.

**Product Code: J85480S1, L-7,** AC Input Split Shelf for Rectifiers with either Analog / $I^2C$ control. RS485 communications is not supported because Vout(-) is partitioned.
Note that this shelf cannot be configured with the shorting jumper because the second ENABLE signal for partition B is not adjacent to a Logic_GRD pin.
The A2 address line for $I^2C$ communications is fixed at logic HI.
J2 shelf – shelf interconnect cable cannot be used.

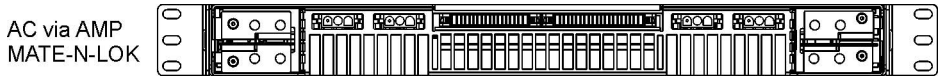



***Figure 9: Rear view of the split shelf with Mate-N-Lok connectors.***

**Product Code: J85480S1, L-14,** DC Input Split shelf for Active Power Entry Module (PEM) with either Analog / $I^2C$ control. RS485 communications is not supported because Vout(-) is partitioned.
Note that this shelf cannot be configured with the shorting jumper because the second ENABLE signal for partition B is not adjacent to a Logic_GRD pin.
The A2 address line for $I^2C$ communications is fixed at logic HI
J2 shelf – shelf interconnect cable cannot be used.

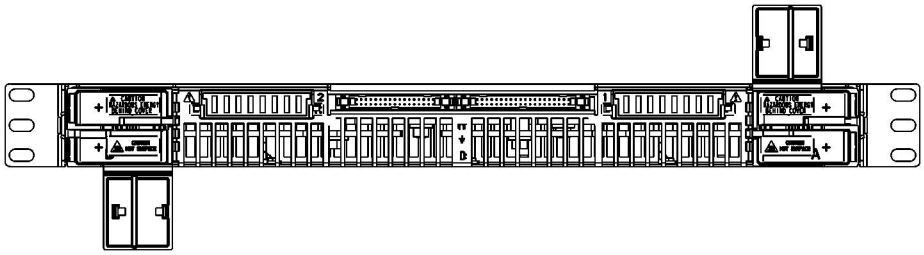


***Figure 10: Rear view of the PEM split shelf with AMP Power-Blade style input connectors***

Wire: 10ga stranded, capable of carrying 30A

| Pins | Color |
|---|---|
| 1 – 2 | Black |
| 3 – 4 | Red |
| 5 – 6 | Black |
| 7 – 8 | Red |

***Figure 11: Input wire set description***

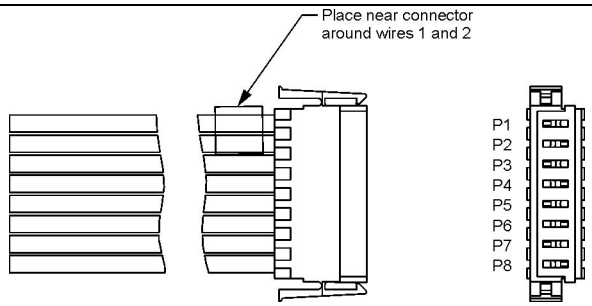



***Figure 12: CC848794908-split_dc_input_cable***

***Controller and shelf-shelf ribbon cable interconnect*** *(J2 shelf-shelf supports only L4 and L6 shelves)*

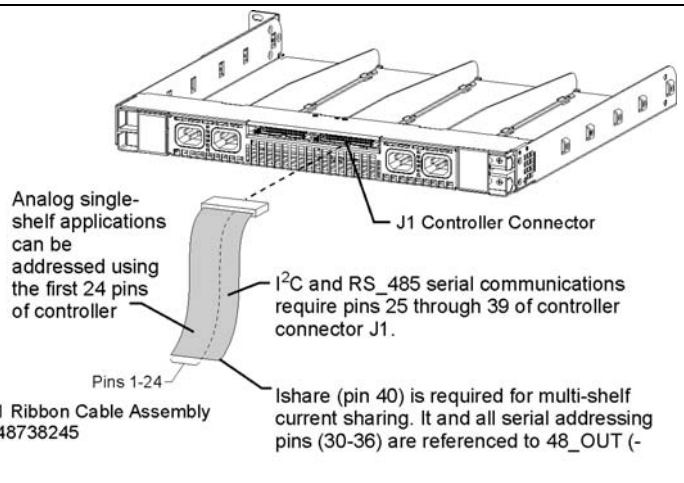



***Figure 13: J1 - Control Interface Connection***

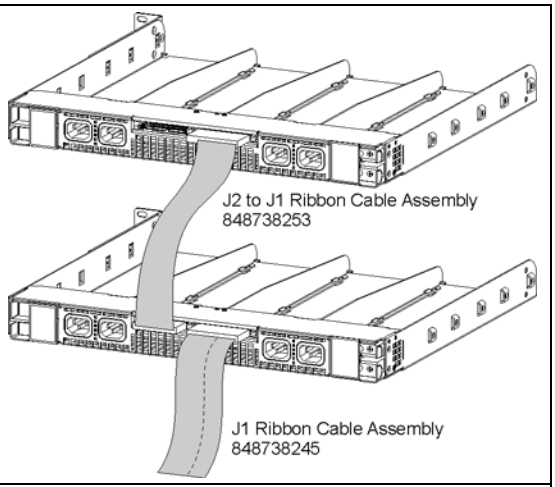



***Figure 14: J2 – Multi-shelf Connection – Max 8 shelves can be interconnected.***

### *J1: Controller Connector (AMP 499913-9)*

For detailed information about control signal operation see CP1800AC52 documentation.

| Pin | Signal | Description |
|---|---|---|
| 1 | POWER_CAP_4 | Power capacity output signal indicating the power capability of each plug-in module. A low level corresponds to de-rated 1200W sourcing capability because of the detection of a 'low' (≤ 130Vrms) input level. |
| 2 | POWER_CAP_3 | |
| 3 | POWER_CAP_2 | |
| 4 | POWER_CAP_1 | |
| 5 | MOD_PRES_4 | Installed modules connect a 500Ω resistor from these pins to Logic_gnd. These pins can be used to detect the mechanical presence of a power supply. |
| 6 | MOD_PRES_3 | |
| 7 | MOD_PRES_2 | |
| 8 | MOD_PRES_1 | |
| 9 | PFW_4 | Output signal asserted (low) five ms before module output goes out of regulation. |
| 10 | PFW_3 | |
| 11 | PFW_2 | |
| 12 | PFW_1 | |
| 13 | SCL_0 | $I^2C$ serial communication pins for two independent channels: 0 and 1. |
| 14 | SCL_1 | |
| 15 | SDA_0 | |
| 16 | SDA_1 | |
| 17 | OTW | asserted (high) indicates that a module is in an over-temperature condition |
| 18 | Margin | Analog signal used to adjust output voltage. Signal must be a voltage source. |
| 19 | Fault | Asserted (low) to indicate an internal fault on one of the modules. |
| 20 | Interrupt_0 | Output alarm signal for systems using $I^2C$ control. |
| 21 | Enable side A | In $I^2C$ mode, must be pulled LO to Logic_GRD for the main output to be ON. |
| 22 | 5VA | 3.75W of 5V power provided per module for auxiliary control. Power always ON. |
| 23 | Logic_GRD | Return for all isolated alarm and control signals. |
| 24 | Interrupt_1 | Output alarm signal for systems using $I^2C$ control. |
| 25 | Reset | Used to restart the internal PCA9542 mux in case of a hang-up. (see Philips Data Sheet) |
| 26 | Enable Side B | In $I^2C$ mode, turns ON the rightmost two power supplies in split input feed applications |
| 27 | Spacing | **All signals above this line are referenced to Logic_GRD** |
| 28 | Spacing | **All signals below this line are referenced to Vout(-)** |
| 29 | RS_485_Select | Connected to Output- through a PTC. Tie to Protocol_S pin to select RS_485. |
| 30 | Shelf_Addr_A | Serial communication shelf addressing pins. Not used with analog control or in single-shelf applications |
| 31 | Shelf_Addr_B | |
| 32 | Shelf_Addr_C | |
| 33 | Shelf_Addr_D | |
| 34 | Shelf_Addr_E | |
| 35 | Shelf_Addr_F | |
| 36 | Shelf_Addr_G | |
| 37 | Protocol_S | Connect to RS_485_Select for RS485, no connect for I2C and analog alarm functions. |
| 38 | RS-485+ | RS-485 communication signal pins. |
| 39 | RS_485- | |
| 40 | Ishare | |

### *J2 Inter-Shelf Connector (AMP 499913-8)*

Connects to J1 of the next shelf in multi-shelf configurations

| Pin | Signal | Description |
|---|---|---|
| 1 | PFW_4 | Output signal asserted (low) five ms before module output goes out of regulation. |
| 2 | PFW_3 | |
| 3 | PFW_2 | |
| 4 | PFW_1 | |
| 5 | SCL_0 | I²C serial communication pins for two independent channels: 0 and 1. |
| 6 | SCL_1 | |
| 7 | SDA_0 | |
| 8 | SDA_1 | |
| 9 | OTW | asserted (high) indicates that a module is in an over-temperature condition |
| 10 | Margin | Analog signal used to adjust output voltage. Signal must be a voltage source. |
| 11 | Fault | Asserted (low) to indicate an internal fault on one of the modules. |
| 12 | Interrupt_0 | Output alarm signal for systems using I²C control. |
| 13 | Enable side A | In I²C mode, must be pulled LO to Logic_GRD for the main output to be ON. |
| 14 | 5VA | 3.75W of 5V power provided per module for auxiliary control. Power always ON. |
| 15 | Logic_GRD | Return for all isolated alarm and control signals. |
| 16 | Interrupt_1 | Output alarm signal for systems using I²C control. |
| 17 | Reset | Used to restart the internal PCA9542 mux in case of a hang-up. (see Philips Data Sheet) |
| 18 | Enable Side B | In I²C mode, turns ON the rightmost two power supplies in split input feed applications |
| 19 | Spacing | **All signals above this line are referenced to Logic_GRD** |
| 20 | Spacing | **All signals below this line are referenced to Vout(-)** |
| 21 | RS_485_Select | Connected to Output- through a PTC. Tie to Protocol_S pin to select RS_485. |
| 22 | Shelf_Addr_B | Serial communication shelf addressing pins. Not used with analog control or in single-shelf applications |
| 23 | Shelf_Addr_C | |
| 24 | Shelf_Addr_D | |
| 25 | Shelf_Addr_E | |
| 26 | Shelf_Addr_F | |
| 27 | Shelf_Addr_G | |
| 28 | Shelf_Addr_H | |
| 29 | Protocol_S | Connect to RS_485_Select for RS485, no connect for I2C and analog alarm functions. |
| 30 | RS-485+ | RS-485 communication signal pins. |
| 31 | RS_485- | |
| 32 | Ishare | |
| 33 | Spare | Not Used |
| 34 | Spare | |

**Product Code: J85480S1, L-8,** AC Input with AMP Mate-N-Lok connectors, for Rectifiers with RS485 control. Up to 8 shelves can be paralleled. Rectifier mate end is same as all 4 position rectifier shelves. Mechanical keying is identical to standard product.

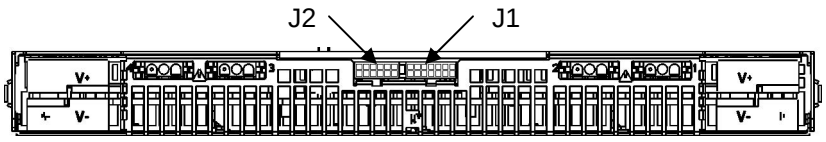



***Figure 15: Rear view Connector Locations – RS485 communications only***

| **J1 Connector -** CC408612881 (4-794678-4) | |
|---|---|
| **Pin** | **Name** |
| 1 | Shelf_Addr_A |
| 2 | Shelf_Addr_B |
| 3 | Shelf_Addr_C |
| 4 | Shelf_Addr_D |
| 5 | Shelf_Addr_E |
| 6 | Shelf_Addr_F |
| 7 | Shelf_Addr_G |
| 8 | RS485+ |
| 9 | RS485- |
| 10 | Ishare |
| 11 | 8V_INT |
| 12 | 8V_INT |
| 13 | Spare |
| 14 | Spare |

| **J2 Connector -** 4-794678-2 | |
|---|---|
| **Pin** | **Name** |
| 1 | Shelf_Addr_B |
| 2 | Shelf_Addr_C |
| 3 | Shelf_Addr_D |
| 4 | Shelf_Addr_E |
| 5 | Shelf_Addr_F |
| 6 | Shelf_Addr_G |
| 7 | Shelf_Addr_H |
| 8 | RS485+ |
| 9 | RS485- |
| 10 | Ishare |
| 11 | 8V_INT |
| 12 | 8V_INT |

**Product Code: J85480S1, L-101,** AC Input, Three Position Shelf for Rectifiers with $I^2C$ control. Note that this shelf does not come with the shorting jumper. Programmed for +48Vdc output. Cannot be paralleled with other shelves.

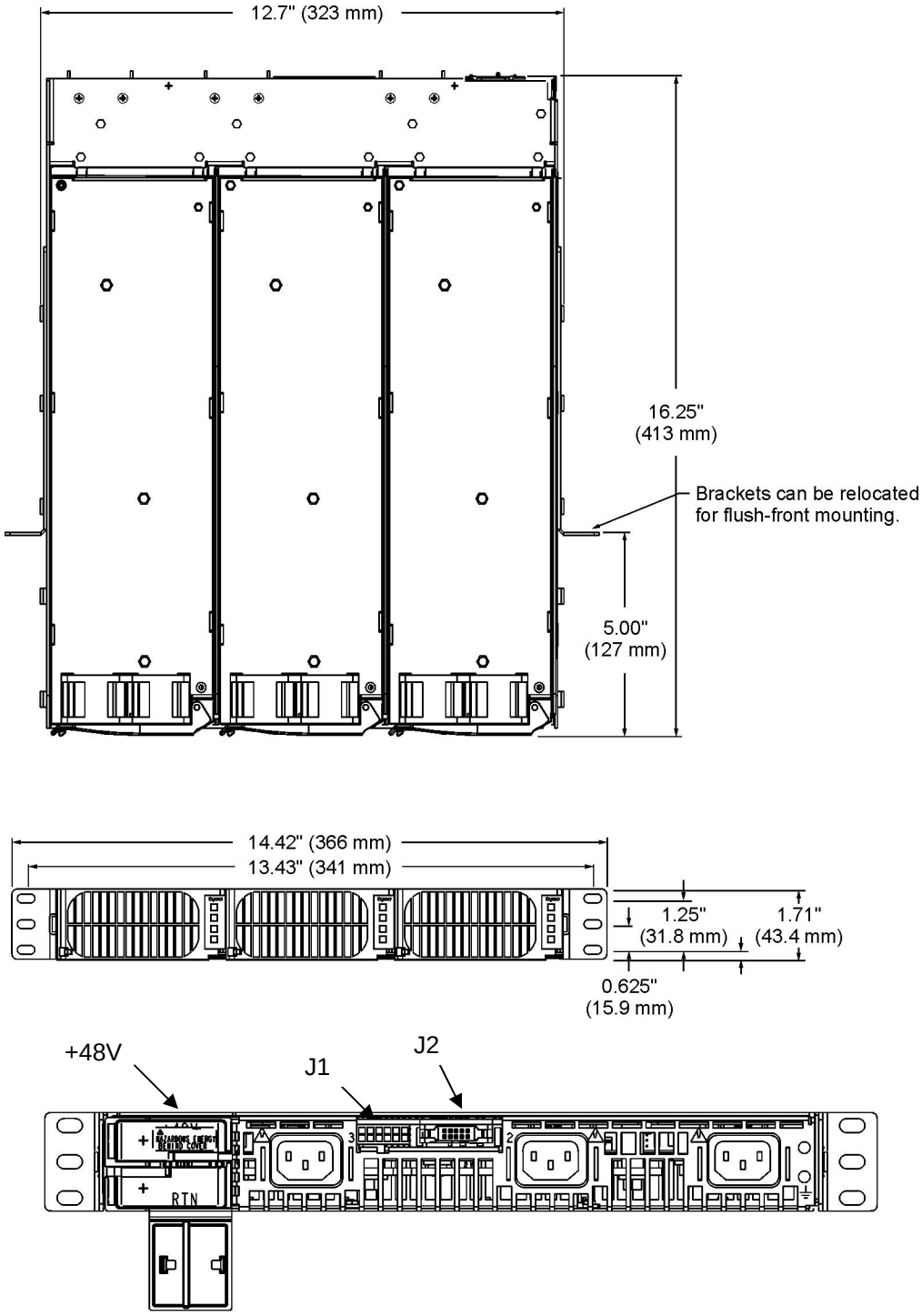
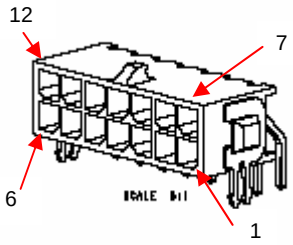
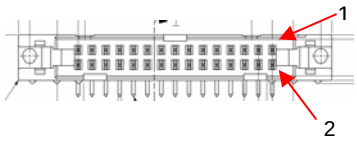



***Figure 16 : 3-position shelf dimensions and rear view connector locations and designations***

## *L101 - Features*

- Three inputs, each rated at 10A @ 200Vac C14 type IEC-320 connectors
- Internally configured for +48Vdc output. This output is isolated from the +5V aux. output.
- Using the J1 connector, an external circuit can verify whether Power is Good or Faulty.

## *L101 – Signal Connectors*

| Connector | Shelf Provided End | Pinout Assignment | Customer Provided Mate |
|---|---|---|---|
| J1 | AMP 1-794678-2 |  | AMP 1-794617-2 |
| J2 | 3M - A3793-53K2UC<br>Or<br>AMP 499786-1 |  <br>Note: The header above is a generic drawing. The actual number of pins is 10 on the part used. | |

| J1 Connector | |
|---|---|
| **Pin** | **Name** |
| 1 | MOD_PRES 3 |
| 2 | MOD_PRES 2 |
| 3 | MOD_PRES 1 |
| 4 | PFW 3 |
| 5 | PFW 2 |
| 6 | PFW 1 |
| 7 | Fault |
| 8 | ENABLE |
| 9 | 5VA |
| 10 | Logic_gnd |
| 11 | Spare |
| 12 | Spare |

| J2 Connector | |
|---|---|
| **Pin** | **Name** |
| 1 | I2c - clock |
| 2 | Logic_gnd |
| 3 | Logic_gnd |
| 4 | I2c - data |
| 5 | Logic_gnd |
| 6 | Logic_gnd |
| 7 | Logic_gnd |
| 8 | Logic_gnd |
| 9 | Logic_gnd |
| 10 | No connection |

### *Rectifier Mating Connector*

| INPUT | | | | | OUTPUT | | SIGNAL | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P1 | P2 | P3 | P4 | P5 | P6 | P7 | 1 | 2 | 3 | 4 | 5 | 6 | |
| LINE-1 (HOT) | LINE-2 (NEUTRAL) | FRAME GRD | Spare (Note) | Spare (Note) | V_OUT ( + ) | V_OUT ( - ) | UNIT_ADDR | RS_485+ | LOGIC_GRD | PFW | MOD_PRES | SCL_0 | A |
| | | | | | | | 8V_INT | RS_485- | Alert#_1 | Alert#_0 | OTW | SCL_1 | B |
| | | | | | | | Protocol | Ishare | Reset | Enable | Margin | SDA_0 | C |
| | | | | | | | SHELF_ADDR | ON/OFF | Power_Cap | 5VA | Fault | SDA_1 | D |

Signal pins columns 1 and 2 are referenced to V_OUT ( - )
Signal pins columns 3 through 6 are referenced to Logic GRD
**Earth** First make-last to break longest pin
Power Pin P4 is V_OUT ( - ) on the split ac shelf accommodating the future 2500 watt rectifier
Power Pin P5 is V_OUT ( + ) on the split ac shelf accommodating the future 2500 watt rectifier

### *PEM Mating Connector*

| INPUT | | | | | OUTPUT | | SIGNAL | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P1 | P2 | P3 | P4 | P5 | P6 | P7 | 1 | 2 | 3 | 4 | 5 | 6 | |
| CO_LINE (-48vDC) | CO_LINE (-48vDC) | FRAME GRD | CO_RTN (GND) | CO_RTN (GND) | V_OUT ( + ) | V_OUT ( - ) | UNIT_ADDR | RS_485+ | LOGIC_GRD | PFW | MOD_PRES | SCL_0 | A |
| | | | | | | | 8V_INT | RS_485- | Alert#_1 | Alert#_0 | OTW | SCL_1 | B |
| | | | | | | | Protocol | Ishare | Reset | Enable | Margin | SDA_0 | C |
| | | | | | | | SHELF_ADDR | ON/OFF | Power_Cap | 5VA | Fault | SDA_1 | D |

Signal pins columns 1 and 2 are referenced to V_OUT ( - )
Signal pins columns 3 through 6 are referenced to Logic GRD
**Earth** First make-last to break longest pin

### *Pin 1A Voltage / Address Map [Unit Addr]*

| **Module** | **1** | **2** | **3** | **4** |
|---|---|---|---|---|
| **Pin 1A**[1] | 2.477V | 1.925V | 1.243V | 0.654V |
| **A1** | 0 | 0 | 1 | 1 |
| **A0** | 0 | 1 | 0 | 1 |

### *Pin 1D Voltage / Address Map [Shelf Addr]*

| **Pin 1D**[1] | 3.300 | 2.86 | 2.4 | 1.96 | 1.50 | 1.10 | 0.60 | 0.01 |
|---|---|---|---|---|---|---|---|---|
| **Shelf ID** | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| **A2**[2] | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 |

[1] With respect to Vout( - )
[2] With respect to Logic_GRD

## *Output Terminations – Power Connections*

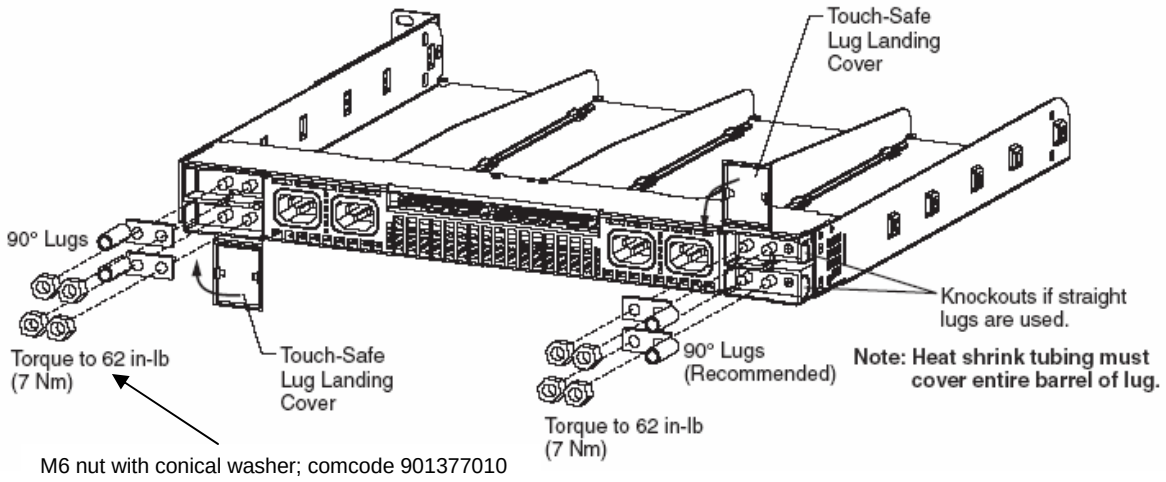



***Figure 17: DC Output Connections***

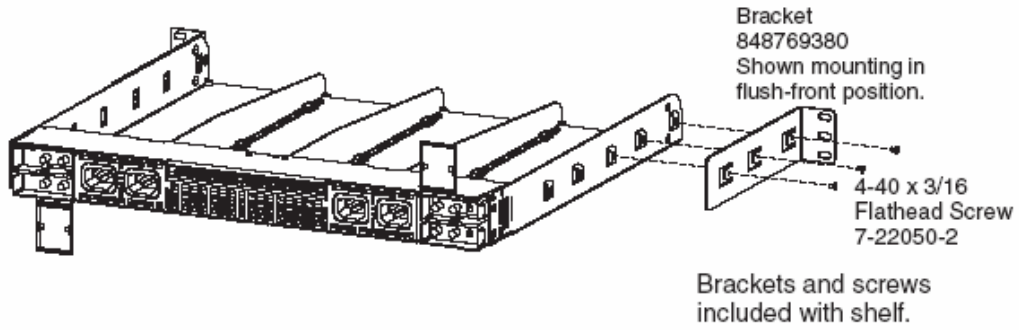



***Figure 18: Supplied Mounting Bracket Installation***

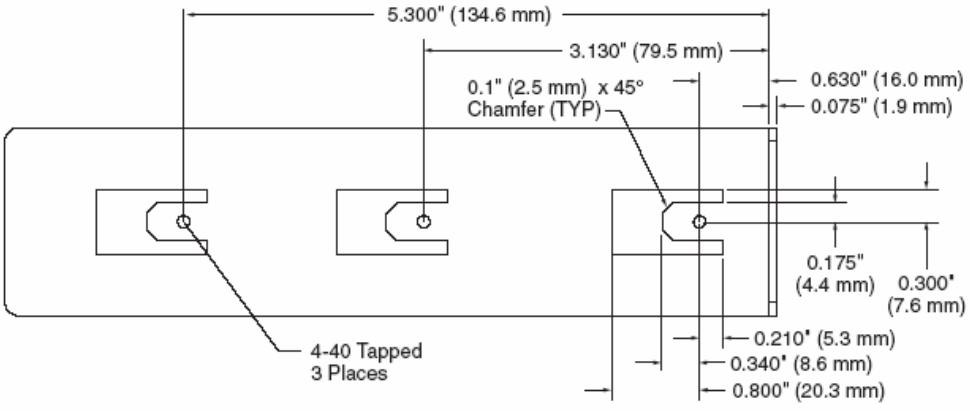



***Figure 19: Detail of Custom Fabricated Brackets***

**Product Code: NX400 -48V Power System** A complete stand-alone power system that accepts a 3-phase 200 – 240Vac input feeder, provides distribution circuit breakers, and a system controller that monitors and controls the rectifiers, battery charging, and low voltage disconnects to protect batteries from being deeply discharged. A remote system interface and remote alarming is also provided. (Note: The NX400 part order does not include the rectifiers).

**Features:**

- The NX400 is a modular -48V power system combining 1U low profile switchmode rectifiers, a microprocessor-based system controller with integrated network capability and battery management features, battery input connections, and modular dc distribution in a 10U tall configuration.
- The assembly can be flush-front mounted in a 19-inch equipment cabinet, or mid-mounted in a 19-inch or 23-inch open framework with up to five battery trays.
- Supports four shelves with up to sixteen rectifiers
- Individual ac feeds are terminated at terminal blocks in an ac enclosure at the back of the system.
- Provides low voltage battery disconnect (LVBD), and three independently controlled and monitored low voltage load disconnects (LVLD).
- Output Distribution: Top row - 16 breakers positions configured for LVD – A, primary loads.
- Output Distribution: Bottom row – 16 breaker positions configured for LVD – B, secondary loads.
- A bus adapter can be used on either row of output distribution to connect LVD-C, critical loads.

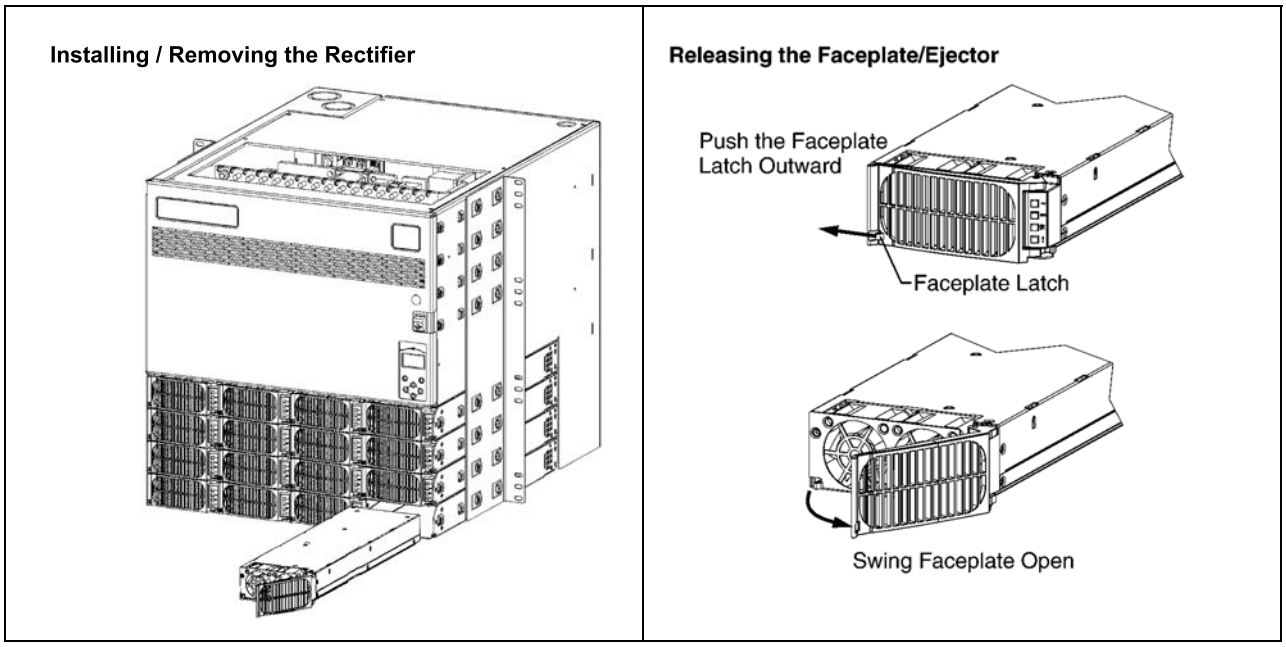



***Figure 20: Front view of system showing rectifier installation***

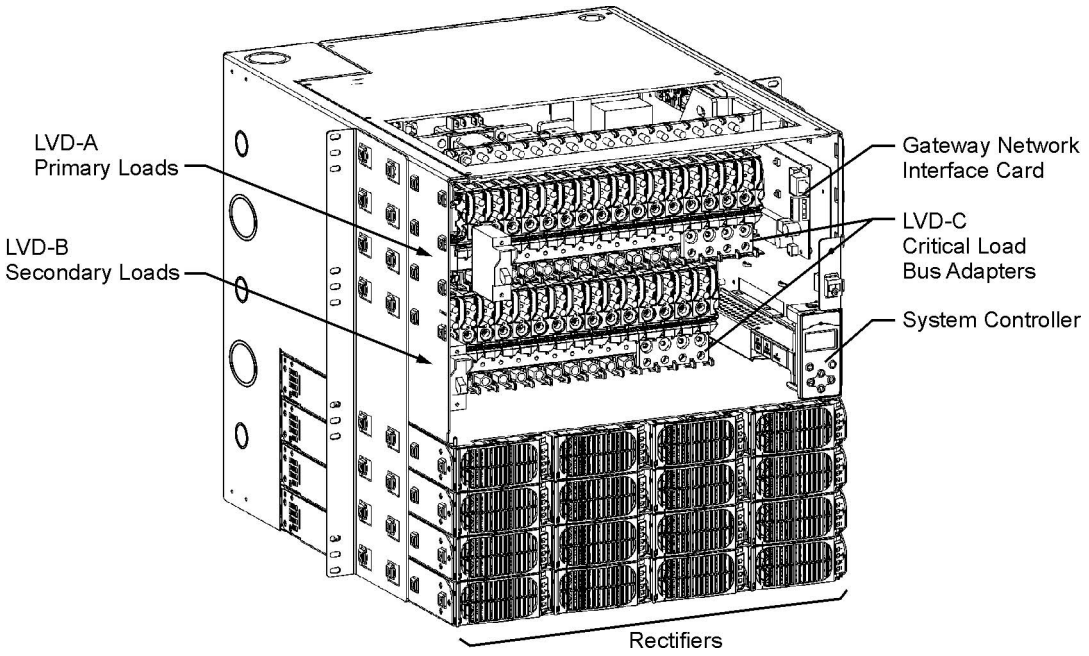



***Figure 21: NX400 - Front view with cover removed***

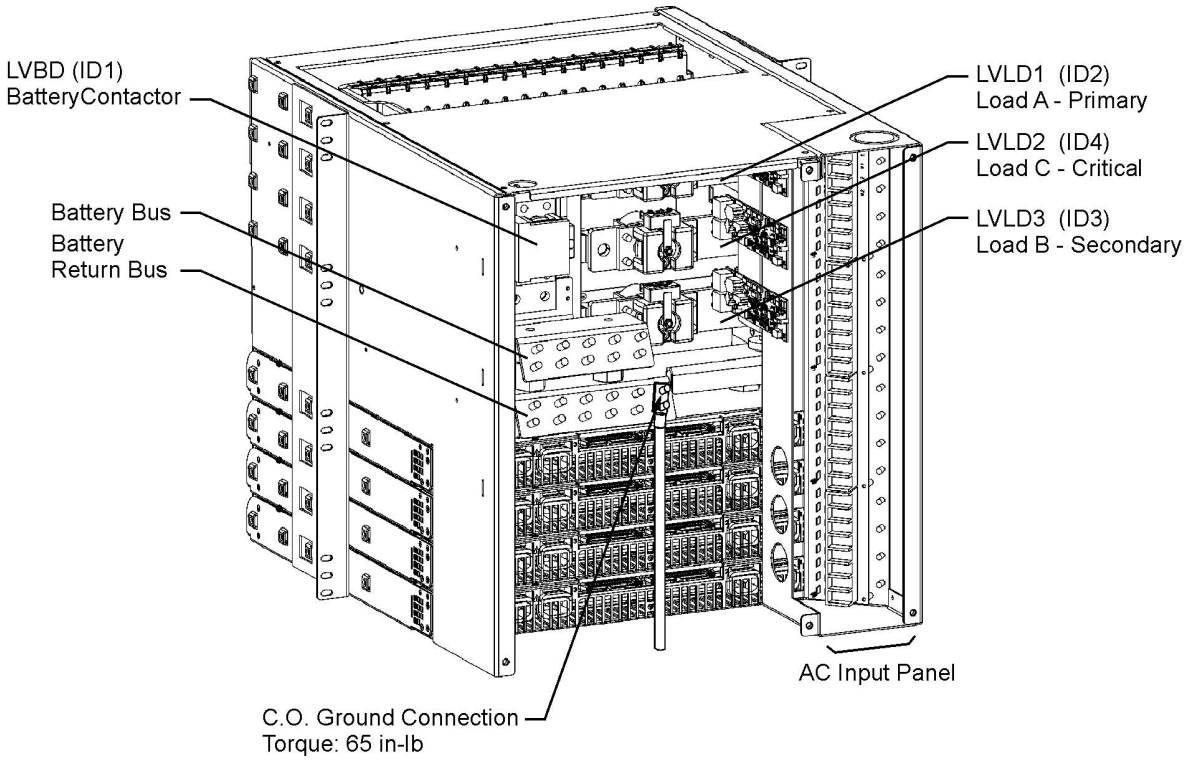



***Figure 22: NX400 - Rear view and location of major components***

## *Ordering Information*

| Part Number | Description | Comcode | Usage |
|---|---|---|---|
| ***Shelves*** | | | |
| J85480S-1,L4 | 4-position shelf with IEC-320 C15 rated ac connectors | 108994538 | |
| J85480S-1,L6 | 4-position shelf with AMP Mate-N-Lok ac connectors | CC109104378 | |
| J85480S-1,L7 | 4-position split shelf with AMP Mate-N-Lok ac connectors | CC109121902 | |
| J85480S-1,L8 | 4-position RS485 only shelf with AMP Mate-N-Lok ac connectors | CC109121506 | |
| J85480S-1,L14 | 4-position split shelf with DC input connectors for PEMs | CC109124764 | |
| J85480S-1,L101 | 3-position shelf with IEC-320 C15 rated ac connectors | CC109105517 | |
| ***Systems*** | | | |
| H5694770 | NX400 System: with<br>G201 - Distribution unit, equipped with 3 load buses, 4 contactors, 4 contactor control cards, 4 rectifier shelves, and (Qty. 20) 50A bullet style circuit breakers<br>G841 - QS841 controller and gateway card | CC109112447 | |
| ***Cable Sets*** | | | |
| | Ribbon cable for attaching a controller to the power shelf – 10 ft | 848738245 | L4, L6, L7, L14 |
| | Inter-shelf connector for daisy-chaining shelves – 9 in | 848738253 | L4, L6 |
| | 2 AWG DC output cable set – 10 ft ( 1 RED and 1 BLACK cable) | 848748987 | All |
| | High temperature IEC60320-1 straight over-mold (one end), NEMA5-15P plug (one end), 14 AWG, 10 ft | CC848776105 | L4, L101 |
| | AC input cable: IEC 320 C13 plug (one end), other end not terminated , 14 AWG, 14 ft, | 847861192 | L4, L101 |
| | AC input cable: AMP 3-pin Mate-N-Lok, 14 AWG, 3 ft, other end not terminated | CC848763301 | L6, L7, L8 |
| | AC input cable: AMP 3-pin Mate-N-Lok, 14 AWG, 10 ft, other end not terminated | CC848793026 | L6, L7, L8 |
| | Inter-shelf cable for RS-485 specific shelf. | CC848786153 | L8 |
| | Office alarm cable for RS-485 specific shelf | CC848786161 | L8 |
| | DC input cable – 4 ft<br>(AMP Housing 1600798-6, contact 1-1600960-8) | CC848794908 | L14 |
| ***Miscellaneous*** | | | |
| | 1U shelf slot filler, white | CC848822263 | |
| | 1U shelf slot filler, black | CC848781534 | |
| 881545-2 | AMP two position shorting jumper | | |
| ***Backplanes*** | | | |
| AC split shelf for L7 | | CC109124896 | |
| DC split shelf for L14 | | CC109126711 | |
| for L4 shelf | | CC109113965 | |
| for L6 shelf | | CC109113973 | |
| for L8 shelf | | CC109114848 | |
| For L101 shelf | Check the factory for orderable status | CC109105995 | |

## *Safety*

### *Safety Symbols and Guidelines*

Read and understand all instructions before attempting any installation of this product. When installing, operating, or maintaining the J85480S1 Power System, basic safety precautions should always be followed to reduce the risk of fire, electric shock, and injury to persons. Such precautions include the following:

### *Product Labeling*

Follow all warnings and instructions marked on the product. Some of the safety symbols used with the CP1800 Rectifier and J85480S1 Shelf may include the following. They may also be accompanied by instructions:

This symbol identifies the need to refer to the equipment instructions for important information.

This symbol is used to identify the presence of hazardous AC or DC voltages. It may also be used to warn of hazardous energy levels. It may be represented by just the lightning bolt in a box with instructions, and the instruction symbol (shown above) with a signal word such as "DANGER" or "WARNING".

- The DC output cables (red and black cables exiting both ends of the shelf) contain electrical energy capable of causing heating and arcing if shorted by metal objects. Make connections with the power to the shelf disconnected.
- **DO NOT ENTER ENCLOSURE OF THE POWER SHELF OR POWER SUPPLY MODULES:**
  Hazardous AC Voltage and DC electrical energy is contained within the enclosure of the power shelf. There are no user or field serviceable parts inside.

This symbol is used to identify other bonding points within the equipment, which are also important to assure safety earth ground is provided to all parts of the equipment.

#### *Safety Guidelines*

The following guidelines are to be considered before using this product in combination with end use equipment.

#### *Mounting and Installation*

• This product shall be installed in compliance with mounting requirements for the ultimate application.

• This product must be installed, serviced, and operated only by skilled and qualified personnel who have the necessary knowledge and practical experience with electrical equipment and who understand the hazards that can arise when working on this type of equipment. This product is intended for use in a Restricted Access Location.

• This equipment is to be used in controlled environments (an area where the humidity is maintained at levels that cannot cause condensation on the equipment, the contaminating dust is controlled, and the steady-state ambient temperature is within the range specified).

• This equipment has been evaluated for use in a continuous ambient temperature of up to 55°C and the application environment should not exceed 55°C.

• The CE mark if provided on the product is applied to show conformance to the requirements outlined in the European Union's Low Voltage Directive {72/73/EEC} and EMC Directive {89/336/EEC}, as amended by the CE Mark Directive {93/68/EEC}.

• The J85480S1 shelf, when used with the CP1800 rectifiers, has been evaluated for hot swapping.

• A separate protective Earthing terminal is provided at the reach of the shelf

– the building installation shall provide a means for connection to protective earth; and

– the equipment is to be connected to that means; and

– a SERVICE PERSON shall check whether or not the socket-outlet from which the equipment is to be powered provides a connection to the building protective earth. If not, the SERVICE PERSON shall arrange for the installation of a PROTECTIVE EARTHING CONDUCTOR from the separate protective Earthing terminal to the protective earth wire in the building.

***Output Connections***

• All field wiring should comply with the U.S. National Electrical Code (NEC) and/or applicable local codes/standards.

• Routing of the DC output cables should guarantee that cables are not in contact with sources of heat and surfaces that may damage the cable insulation.

• The DC output is not provided with a fuse or circuit breaker suitable for branch circuit protection. Therefore, the power shelf should be mounted in the same rack or cabinet as the equipment being powered. Use interconnecting power cables suitable for the application and sized to carry the rated output current. The interconnecting cables should be capable of carrying the overload current and short circuit current without damage or risk of fire.

• The output for the system is SELV and has available power greater than 240VA.

• Insulation on output field-wired conductors should be rated no less than 90°C. Wiring internal to enclosed equipment cabinets should be rated at 105°C (minimum). The provided DC output cords (red and black wires) are rated for 105°C.

• Before opening the insulating cover to gain access to load and ground connections, ensure all power supplies are disconnected from the AC MAINS.

***AC Input Connections***

• AC branch circuits to this equipment must be protected with fuses or circuit breakers sized as required by the U.S. National Electric Code (NEC) and/or local codes. Up to four AC mains power cords are required to power the shelf (one for each rectifier). Each power cord should be connected to a separate AC mains branch circuit with an overcurrent protector rated at no more than 20A.

• The power supply mains inlet may be used as the means to provide AC protective earthing.

• An accessible AC disconnect/protection device to remove AC power from the equipment in the event of an emergency must be provided. An accessible socket-outlet/receptacle installed near the equipment is also acceptable as a disconnect.

• The equipment is powered by multiple AC inputs (one per rectifier). Disconnect all AC sources of power before servicing.

• These units are to be used with TN-S power systems only.

***General Safety Procedures***

• Use **only** properly insulated tools.

• Remove all metallic objects (key chains, glasses, rings, watches, or other jewelry).

• Wear safety glasses.

• Test circuits before touching.

• Lock out and tag circuit breakers/fuses when possible to prevent accidental turn on.

• Be aware of potential hazards before servicing equipment.

• Identify exposed hazardous electrical potentials on connectors, wiring, etc. (note the condition of these circuits, especially wiring).

• Use care when removing or replacing covers; avoid contacting circuits.

***German Safety Guidelines***

Installationsanleitung (Installation Instructions)

• Alle Ausgänge des Gerätes erfüllen die Anforderungen für SELV nach IEC/EN60950-1.
(Outputs meets the requirements for SELV.)

• Die Ausgänge des Gerätes liegen über den Limits für Energiegefahr nach IEC/EN60950-1 (>240 VA). Das Gerät ist zum Einbau in ein Montage-Rack bestimmt. Siehe Einbaubestimmungen in der Montageanleitung, um eine Gefährdung des Benutzers während der Installation zu vermeiden.
(The DC48-56V has available power exceeding 240VA – hazardous energy level. The equipment is intended for rack mounting. Refer to the method of mounting detailed in the installation instruction to reduce the risk of operator access to hazardous energy during installation.)

**ACHTUNG:**

**Hoher Ableitstrom Vor Anschluss an den Versorgungsstromkreis unbedingt Erdungsverbindung herstellen**

• Das Produkt ist zum Gebrauch in einer Umgebungstemperatur von max. 55°C bestimmt.
(This product is acceptable for use in an ambient not to exceed 55°C.)

• Die Gerätestecker des Produktes sind dazu bestimmt, eine sichere Erdung des Gerätes herzustellen.
(The power supply mains inlet may be used as the means to provide protective earthing.)

• Das Produkt ist zum Gebrauch in einer Umgebung mit Verschmutzungsgrad 2 nach IEC/EN60950 bestimmt.
(The equipment has been evaluated for use with Pollution Degree 2 Environment.)

• Die Netzteile des Gerätes können während des Betriebes einzeln ausgetauscht werden (Hot Swapping).
(The subject shelf, when used in combination with CP1800, has been evaluated for hot swapping.)

• Das Gerät wurde zusammen mit den Anschlussleitungen (ohne Anschlussstecker) geprüft. Die Installation eines Steckers des jeweiligen Landes, sollte nur durch geschultes Service Personal durchgeführt werden.Als alternative könnte eine Vorinstallation des Steckers bereits bei der Herstellung erfolgt sein.
(The testing and approval of the subject power shelf include the special use cord delivered without a plug. i.e. The cord tested terminates in tinned leads. Trained installation personnel shall fit certified plugs, approved for wiring to tinned leads and each country of use, prior to AC MAINS connection. Alternative, each individual country plugs may be pre-wired to the tinned leads at the factory.)

tyco / Electronics

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