EPS Portable Power Distribution System

User Manual

Version 1.02

12/2022

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Introduction

 The information contained in this document is believed to be accurate at the time of publication, however, Creative Stage Lighting Co., Inc. assumes no responsibility for any errors which may appear here and reserves the right to make changes without notice.

Description

Entertainment Power Systems are power distribution UL Listed for use in portable applications. Cam-Lok style single pole are typical power input connections and various configurations may be used for output power receptacles.

Standard Features

- c**UL**us Listed for use in the USA and Canada under UL1640 Standard for Portable Power Distribution Equipment
- Rugged Northern Case ATA-style rack enclosure with removable doors
- Square D thermal magnetic breakers
- Industrial grade connectors
- Voltage test points
- Neon power indicator lights

Variations

Entertainment Power Systems distribution systems are available in a variety of UL Listed configurations. The EPS Distro you are using may have options, as provided by Creative Stage Lighting Co., Inc., that differ from the features and functions described in this manual. Please contact us if there are any questions regarding the operation of this EPS Portable power distribution system.

Modifications

Unauthorized modifications to this distribution system will void both the UL Listing and the Manufacturer's Warranty.

Safety

Symbols and Definitions

HAZARDOUS VOLTAGE: This symbol indicates hazardous voltage. It calls your attention to items or operations that could be dangerous to you and other persons operating this equipment. Read the message and follow the instructions carefully

CAUTION: Indicates a potentially hazardous situation which, if not avoided, can result in injury, or damage to the product. The situation described in CAUTION may, if not avoided, lead to serious results. Important safety measures are described in CAUTION, so be sure to observe them.

Safety Instructions and Information - Read before use

Connection and energizing of the power distribution system must be performed by qualified personnel only, who follow standard safety precautions through the installation procedures. Those personnel should have appropriate training and experience with hazardous voltage and current devices. Use of appropriate Personal Protective Equipment (PPE) must be observed.

Do NOT connect or disconnect mains (source) power (single pole) connectors when energized. Always connect or disconnect mains (single pole) connectors in correct sequence as noted. Failure to do so may create an arc flash hazard.

Do NOT connect to or disconnect from output circuits when they are energized. Turn off circuit breakers before making or breaking any connection. Failure to do so may create an arc flash hazard.

Do NOT perform Dielectric (HIPOT) tests to any inputs or connections. Applying more than the maximum voltage to the power distribution system and/or its components may permanently damage the system or components.

If this EPS distribution system is used in a manner not specified in this manual, the protection provided by the equipment may be impaired.

This EPS distribution system is suitable for use only in areas not accessible by the general public.

This EPS distribution system is suitable for use in dry locations only - IP20 (NEMA 1)

There are no user serviceable parts inside this unit. Damages resulting from modifications to this EPS distribution system and /or the disregard of safety and user instructions in this user manual void the manufactures warranty and are not subject to any warranty claims and /or repairs.

The manufacturer of this device is not responsible for injury and/or damages resulting from the misuse of this equipment due to the disregard of the information in this manual.

Overview - Front and Rear View of an EPS Distro

Front View - Breakers and Meter

EPS Smart View™ DVA-300
Volt—Amp Frequency meter

Load (output) circuit breakers

208V (amber) neon power indicators

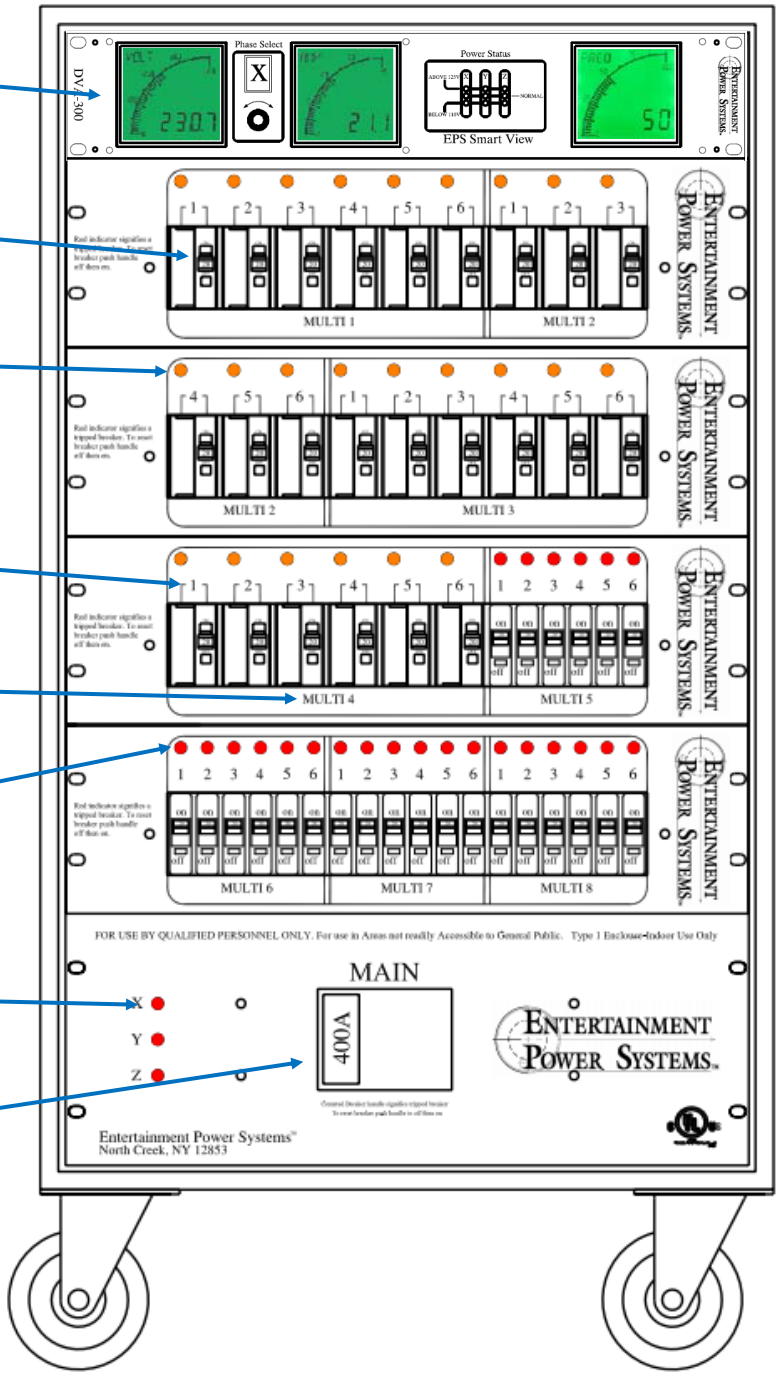
Multi-connector circuit breaker number

Connector number

120V (red) neon power indicators

Mains (source) neon power indicators

Mains (source) power circuit breaker



Please note this in an overview of typical EPS features and components. Configuration and layout of your EPS Distro may be different.

Overview - Front and Rear View of an EPS Distro (continued)

Auxiliary (Aux) panel circuit breakers

Load panel receptacles (see pages 11 & 12 for types)

Red 19-Pin receptacles to indicate 208V

208V (amber) neon circuit power indicators

Multi-connector circuit number

Connector identifier Number

120V (red) neon circuit power indicators

Black 19-Pin receptacles to indicate 120V

Voltage test points on Mains - G, N, X, Y, Z

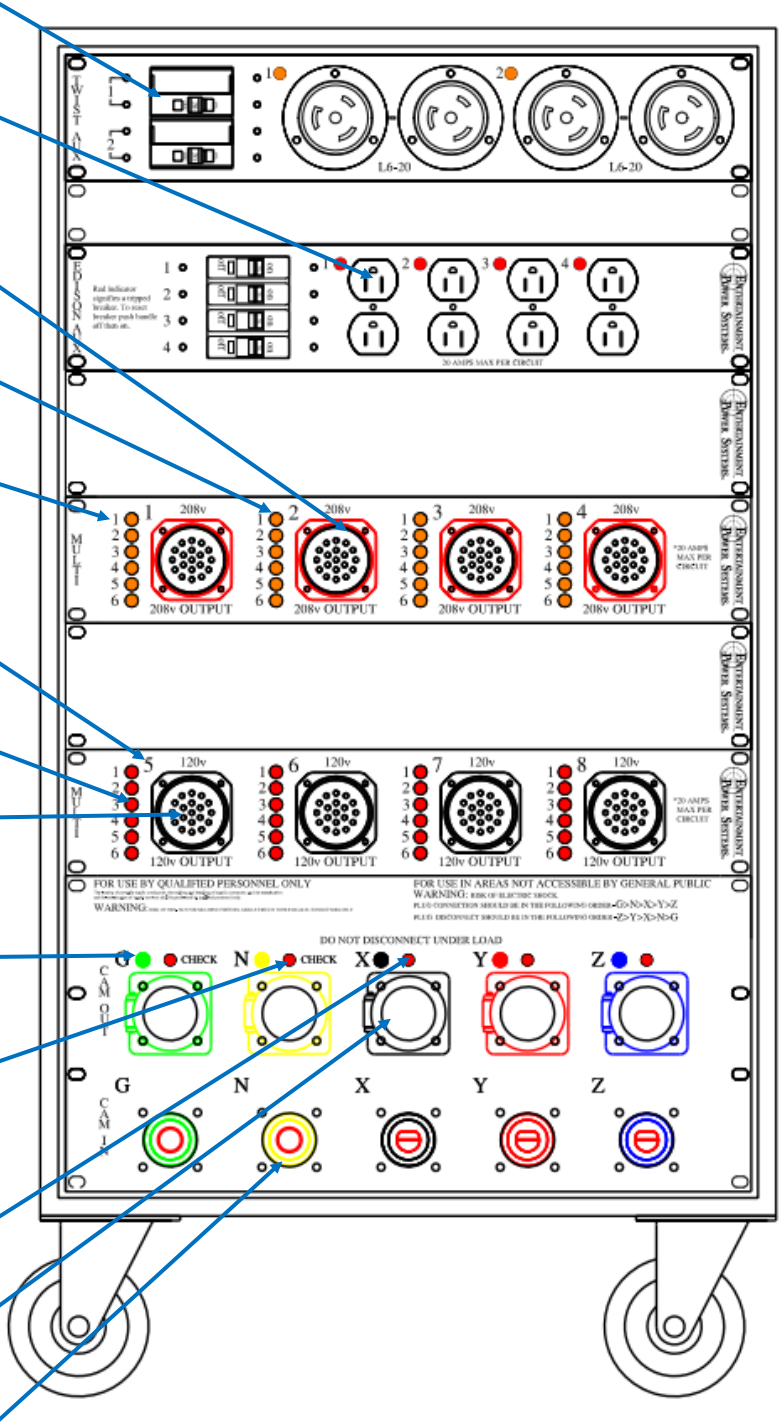
CHECK lights - indicates voltage on Ground or Neutral HAZARD when illuminated

Mains neon power indicators

Mains power (single pole) pass-thru receptacle

Mains power (single pole) input connector

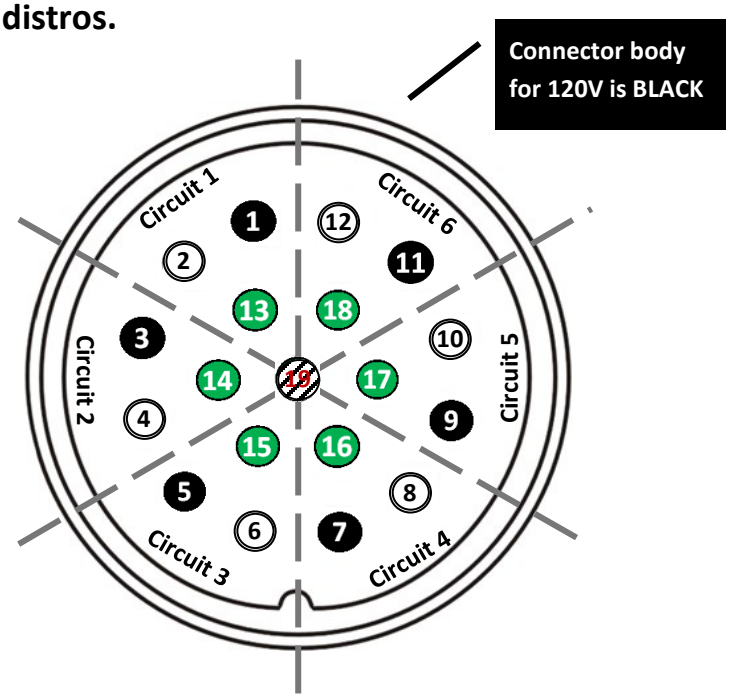
Rear View - Source Power and Load Connections



Please note this in an overview of typical EPS features and components. Configuration and layout of your EPS Distro may be different.

Pin-Out for 19-Pin connectors

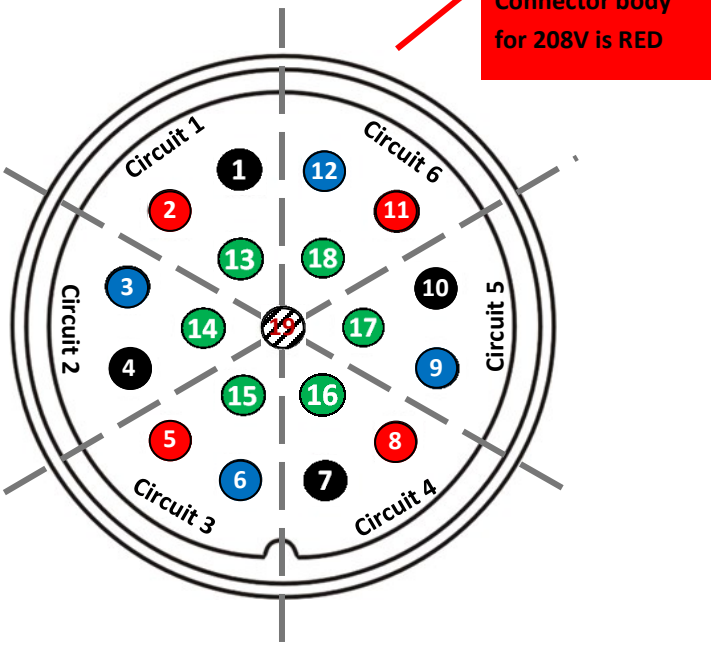
19-Pin receptacle wired for 120V output as viewed on EPS distros.



Circuit	Pin	Function
1	1	Line
	2	Neutral
	13	Ground
2	3	Line
	4	Neutral
	14	Ground
3	5	Line
	6	Neutral
	15	Ground
4	7	Line
	8	Neutral
	16	Ground
5	9	Line
	10	Neutral
	17	Ground
6	11	Line
	12	Neutral
	18	Ground

Pin 19 - Not used

19-Pin receptacle wired for 208V output as viewed on EPS distros.



Circuit	Pin	Function
1	1	X-Phase
	2	Y-Phase
	13	Ground
2	3	Z-Phase
	4	X-Phase
	14	Ground
3	5	Y-Phase
	6	Z-Phase
	15	Ground
4	7	X-Phase
	8	Y-Phase
	16	Ground
5	9	Z-Phase
	10	X-Phase
	17	Ground
6	11	Y-Phase
	12	Z-Phase
	18	Ground

Pin 19 - Not used

Line (source) connections - Single pole cam type connectors

HAZARD OF ELECTRICAL SHOCK or ARC FLASH. Do NOT connect or disconnect mains power cables (single pole) when energized.

HAZARD OF ELECTRICAL SHOCK or ARC FLASH. Mains power connectors (single pole) must be connected and disconnected in correct sequence as noted.

CAUTION: Verify the connected devices do not exceed the rated amperage of cables and connectors.

Connecting to source power

1) Confirm source power is turned off.

2) Confirm cables coming from source power are correctly sized for the **total** load to be connected to the EPS Distro.

3) Confirm correct gender on source ground and neutral cables - Check if the source power ground and neutral single pole cable connectors are reversed gender (male). EPS Distros have input and pass-thru ground and neutral single pole connectors with reversed gender (female) unless otherwise specified by the buyer. If source ground and neutral connectors are female, they are not 'Reverse Ground and Neutral' or 'RGN' and a male to male single pole coupler will be required for both the ground and neutral connections. We suggest carrying the following Male to Male cam 'turn-around' couplers with the EPS Distro.
   Hubbell HBLDMGN - Double Male Coupler, Green, (or compatible brand)
   Hubbell HBLDMW - Double Male Coupler, White, (or compatible brand)

4) Confirm EPS Distro mains breaker is turned off.

5) Connect the single pole cables from the source to the EPS Distro in the following sequence:
   Ground - Green
   Neutral - White
   X-Phase - Black
   Y-Phase - Red
   Z-Phase - Blue

HAZARD OF ELECTRICAL SHOCK or ARC FLASH. The **CHECK** indicator lights next to the **Ground** and **Neutral** single pole pass-thru connectors **SHOULD NOT BE ILLUMINATED** when the distro is energized. **If they are illuminated there is voltage on the ground or neutral circuits.** Immediately disconnect the distro from source power and check all connections.

Line (source) connections - Single pole cam type connectors (continued)

HAZARD OF ELECTRICAL SHOCK or ARC FLASH. Do NOT connect or disconnect mains power cables (single pole) when energized.

HAZARD OF ELECTRICAL SHOCK or ARC FLASH. Mains power connectors (single pole) must be connected and disconnected in correct sequence.

CAUTION: Verify the connected devices do not exceed the rated amperage of cables and connectors.

Connecting additional devices to EPS Distro single pole pass-thru connectors

Some EPS Distros have single pole pass-thru connectors, allowing additional devices to be powered by connecting to the EPS Distro with single pole (cam type) cables.

CAUTION: The single pole pass-thru connectors are NOT protected by the EPS Distro mains breaker. They are directly connected by bus bar to the single pole power input connectors. Any device powered from the single pole pass-thru connectors must have input over-current protection (circuit breakers).

1) Confirm device to be powered by single pole pass-thru connectors on EPS Distro is turned OFF.

2) Confirm cables going to device to be powered via single pole pass-thru connectors are correctly sized for the load requirements of the device being powered.

3) Confirm gender is correct to mate ground and neutral connections. Use a coupler to change gender if needed.

4) Connect the single pole cables to the EPS Distro pass-thru receptacles in the following sequence:
   Ground - Green
   Neutral - White
   X-Phase - Black
   Y-Phase - Red
   Z-Phase - Blue

Line (source) connections - Single pole cam type connectors (continued)

Disconnecting From Source Power

1) Confirm source power is turned OFF.

2) Confirm EPS Distro main breaker is turned OFF, and breakers on any connected devices are turned OFF.

3) Disconnect the single pole cables from the source to the EPS Distro in the following sequence:
   Z-Phase - Blue
   Y-Phase - Red
   X-Phase - Black
   Neutral - White
   Ground - Green

4) Observe the same sequence if disconnecting single pole cables from single pole power pass-thru.

EPS Distro Turn On and Voltage Test points

HAZARD OF ELECTRICAL SHOCK or ARC FLASH. Only use 4mm test plugs with rigid insulation sleeve

HAZARD OF ELECTRICAL SHOCK or ARC FLASH. Only use CAT II rated multi-meter or voltage meter for taking measurements.

Powering On and Using Test Points to Check Source Voltage

1) After verifying all single pole cables are properly connected, and that the EPS Distro mains breaker and all connected device breakers are OFF the source power can be switched ON.

2) Confirm that mains power X, Y, and Z phase neon lights are lit, indicating power on all 3 phases.

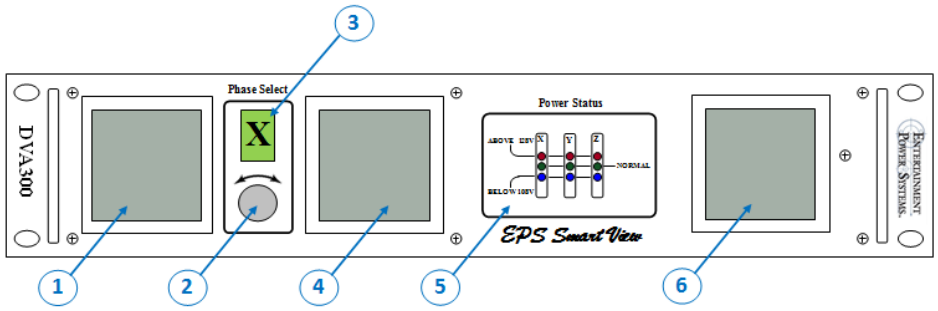
3) Using a suitable voltmeter (CAT II), equipped with test leads with 4mm (banana) plugs (We recommend Staubli XL-410 Series 4mm banana plugs for test leads) with rigid insulation sleeves, confirm voltage between the following test points on the EPS Distro.
   Ground to Neutral - 0 Volts
   Ground to X, Y, or Z phases - 120V nominal*
   Neutral to X, Y, or Z phases - 120V nominal*
   X to Y or Z Phase - 208V nominal*

*Actual voltage readings may vary slightly depending on source voltage.

4) After confirming correct operational voltage the main breaker may be switched to the ON position, energizing the EPS Distro.

DVA300 Volt - Amp - Frequency meter (If Installed)

1) Volt meter
2) Phase selector rotary switch
3) Phase indicator screen
4) Amp meter
5) EPS Smart View™ power monitor
6) Frequency meter



Meter Operation and Use

Power On - The DVA300 is powered on automatically when the EPS Distro mains breaker is turned on. There is no power switch.

Selecting a Phase or Neutral to be monitored - The rotary selector switch allows the user to select a phase or Neutral to be monitored. The phase indicator window shows what phase, or if Neutral is currently selected for monitoring.

Meter display colors - Voltage, amperage and frequency meters all illuminate green when operating conditions are normal. If voltage, amperage or frequency fall out of acceptable range the meter display will change color to red.

Neutral to Ground measurements

- When monitoring Neutral to Ground, the voltage meter will illuminate red. Observe the voltage numeric reading on the display. Under normal conditions there should be Zero voltage between neutral and ground.

- When monitoring Neutral to Ground, the frequency meter will be red under normal conditions. If the frequency meter is green it also indicates there is voltage between ground and neutral.

- When the phase selector is in the N position the ammeter will show current flow thru the neutral .

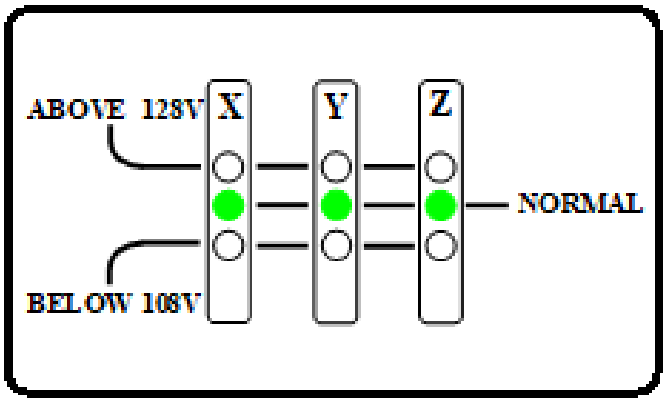
DVA300 Volt - Amp - Frequency meter (continued)

EPS Smart View™

Smart View™ allows users to monitor voltage conditions of all three phases at a glance.

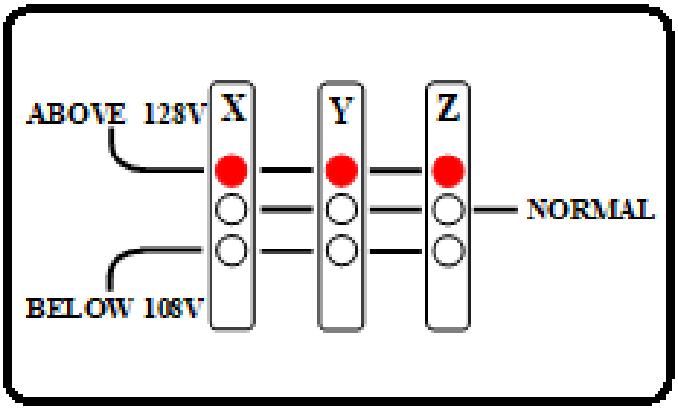
Correct Voltage - Normal Operation

When voltage is within range (108V to 128V), the **Green - Normal** LED will be lit for that phase.



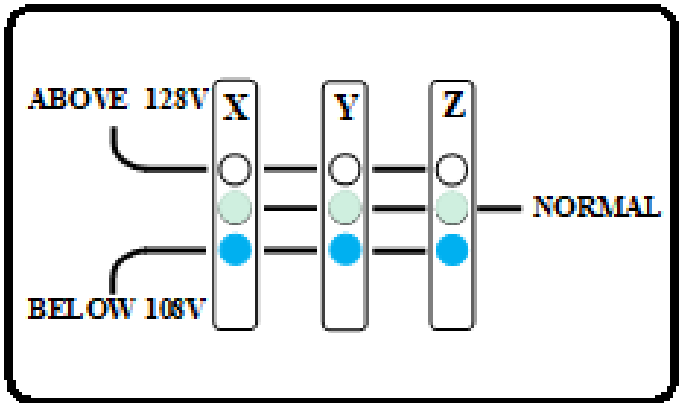
Over-Volt Warning

If an over-volt condition occurs on any phase, the **Red - Above 128V** LED will be lit for that phase.



Under-Volt Warning

If an under-volt condition occurs on any phase the Blue LED for that phase will begin to illuminate at **108.5V** and the green LED will fade out at **105V**.



Load (output) Connections

HAZARD OF ELECTRICAL SHOCK or ARC FLASH. Do NOT connect or disconnect load (output) cables to EPS Distro when circuit is energized.

CAUTION: Verify the devices to be connected do not exceed the rated amperage of cables and connectors.

CAUTION: Verify the devices to be connected match the voltage of the receptacle it will be connected to.

CAUTION: 19-Pin connectors may be 120V or 208V. Red 19-Pin connectors are 208V output and will also be marked 208V. Black 19-Pin connectors are 120V output and will also be marked 120V.

Connecting Loads to the EPS Distro

1) After verifying correct operational voltage, load connections can be made. There are a number of load panel receptacle types available. See page 11 for a list of typical load connectors.

2) Confirm the total connected load on that circuit will not exceed the rating of the cable, connectors, or the breaker.
3) Confirm the voltage of the device to be powered matches the voltage of the receptacle on the EPS Distro.

4) Confirm output breaker and device to be connected are both turned OFF.

5) Connect the cable going to the load device to the selected output receptacle on the EPS Distro, and turn on the breaker for that receptacle.

6) The neon indicator should be lit for than circuit, and the device is ready to be powered on for use .

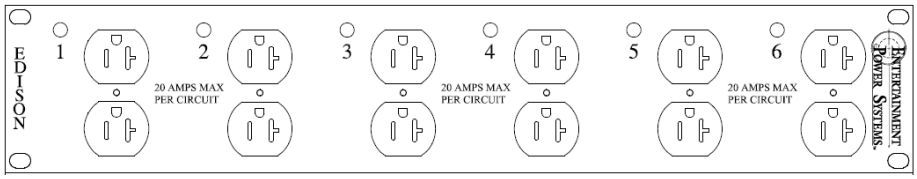
Disconnecting Loads from the EPS Distro

1) Turn OFF the device to be disconnected.

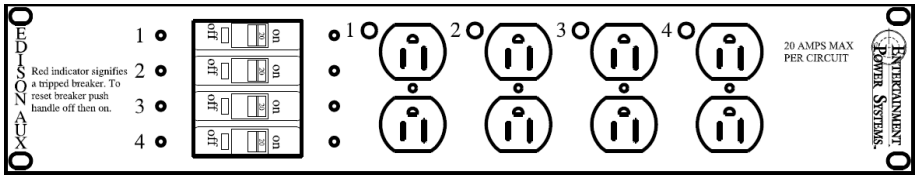
2) Turn OFF the circuit breaker on the EPS Distro for the connected device

2) Disconnect the load cable from the EPS Distro.

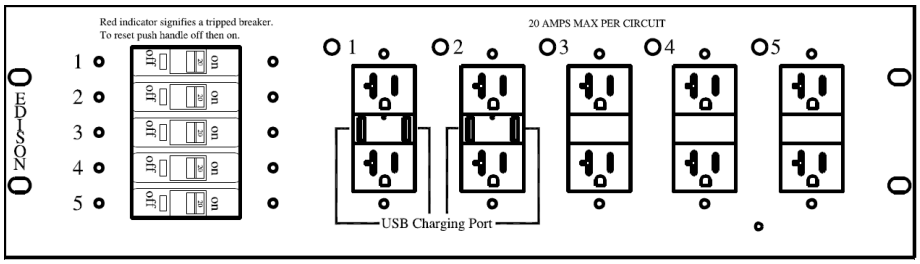
Typical Load Panel Configurations



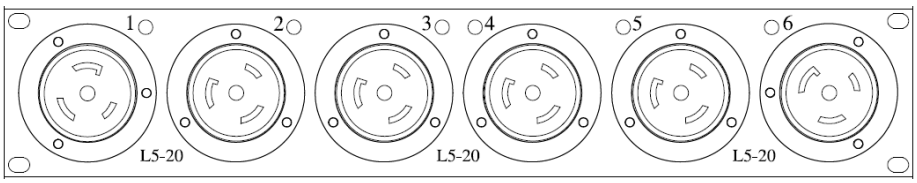
Edison Duplex Panel - (6) NEMA 5-20R Receptacles. 20A Max per Circuit. 2 RU



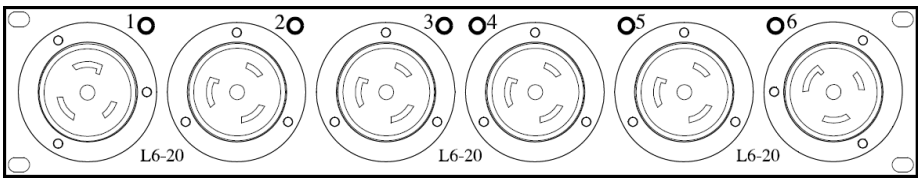
Edison Aux Panel with Breakers - (4) NEMA 5-20R Receptacles. 20A Max per Circuit. 2RU



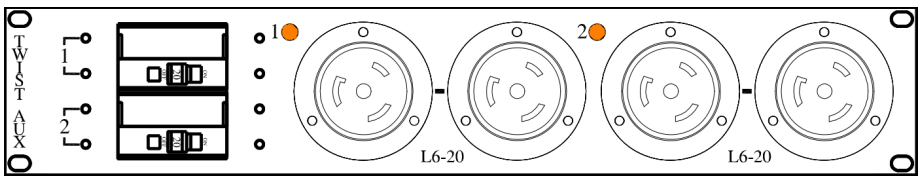
Edison and USB Aux Panel with Breakers - (5) NEMA 5-20R Receptacles and (4) 5A USB ports. 20A Max per Circuit. 3RU



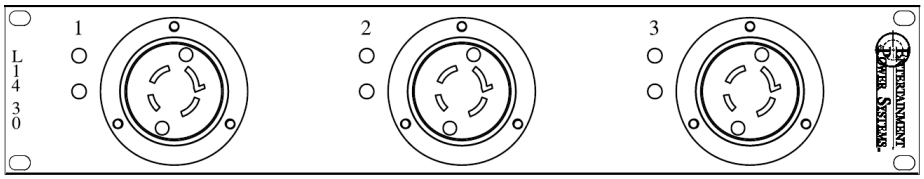
L5-20 Twist-Lock™ panel (6) NEMA L5-20R Receptacles. 20A Max per Circuit. 2RU



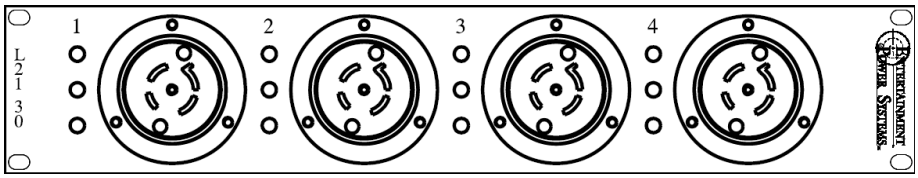
L6-20 Twist-Lock™ panel (6) NEMA L6-20R Receptacles. 20A Max per Circuit. 2RU



L6-20 Twist-Lock™ Aux Panel with Breakers - (4) NEMA L6-20R Receptacles. 20A Max per Circuit. 2RU

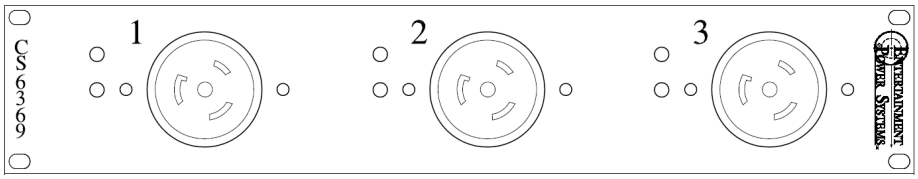


L14-30 Twist-Lock™ Panel (3) NEMA L14-30 Receptacles. 20A Max per Circuit. 2RU

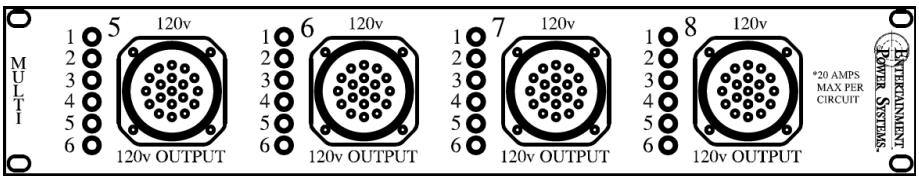


L21-30 Twist-Lock™ panel (4) NEMA L21-30R Receptacles. 30A Max per Circuit. 2RU

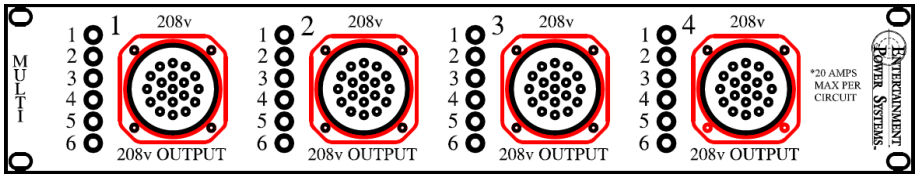
Typical Load Panel Configurations (Continued)



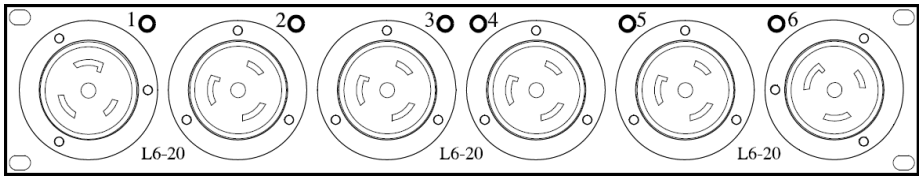
CS6369 50A Twist-Lock™ panel (4) 50A 125/250V 3Pole/4Wire Receptacles. Max 50A per Circuit. 2RU



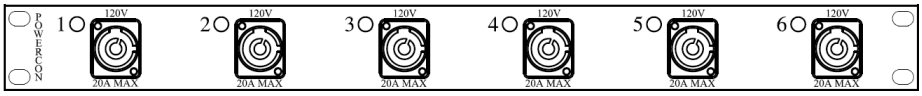
19 Pin Socapex Compatible 120V panel (4) Six-Circuit 19-Pin Receptacles. 20A Max per Circuit. 2RU



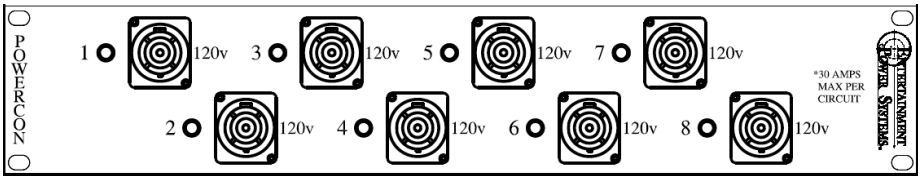
19 Pin Socapex Compatible 208V panel (4) Six-Circuit 19-Pin Receptacles. 20A Max per Circuit. 2RU



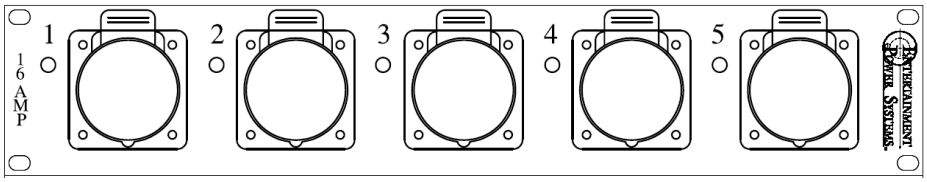
L6-20 Twist-Lock™ panel (6) NEMA L6-20R Receptacles. 20A Max per Circuit. 2RU



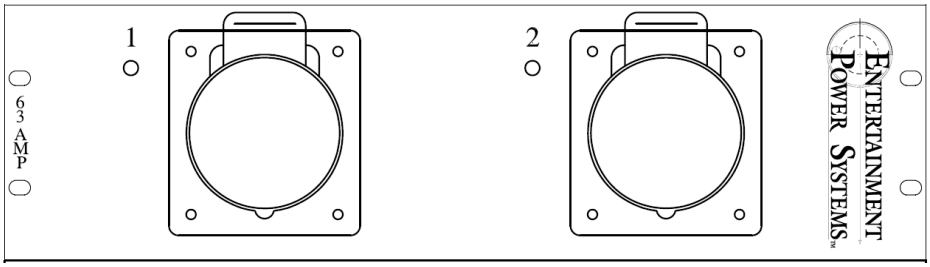
powerCON Panel - (6) powerCON B Receptacles. 20A Max per Circuit. 1RU



powerCON 30A Panel - (8) powerCON 30A Receptacles. 30A Max per Circuit. 2RU



16A IEC Panel (5) IEC 16A Receptacles. 15A Max per Circuit. 2RU



63A IEC Panel (2) IEC 63A Receptacles. 60A Max per Circuit. 3RU

Specifications

Please consult the model specific specification for additional details.

Electrical

Power supply input rating range - 100-135 VAC, 47-63 Hz
Voltage measurement rating: 120/208 VAC 3-phase Wye system, 47-63 Hz, Measurement Category II
Accuracy: Voltage 1%, Frequency 0.5%, Amperage 1%

Dimensions and weight

Dimensions and weight of EPS Distros vary depending on configuration. Please consult the model specific specification sheet as provided for additional details.

Calibration

Not required for the life of the unit.

Certification

cULus Listed - UL1640 Standard for Portable Power Distribution Equipment - E323314

Environmental

IP20 (indoor) rated
Operational Temperature Range: -20° F to 140° F (-29° C to 60° C)
Humidity: 0% to 80% non-condensing humidity
Altitude to 2000 meters (6500')

Warranty

Creative Stage Lighting, Inc. warrants this product to be free from defects in materials or workmanship for a period of one (1) year following delivery. In the event a warranty claim Creative Stage Lighting Co., Inc.'s sole obligation will be, at its election, to repair or replace the product in question. Further details can be found at https://www.creativestagelighting.com/support/warranties/

Contact Us

We'd love to hear from you! Please contact us with any questions, suggestions, or concerns regarding this product.

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eps@creativestagelighting.com