

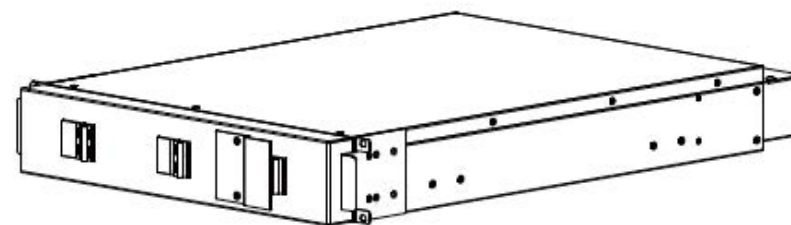


4257-1623 A



## Power Distribution Unit

20kVA



## Operation Manual

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Publish statement

Thank you for purchasing this LK-Series PDU.

It is used in conjunction with 10-20kVA LK-Series single-in-single-out high frequency online UPS, with excellent electrical performance, stylish appearance, and compliance with safety standards.

Read this manual carefully before installation.

This manual provides technical support to the operator of the equipment.

Contact the nearest hazardous waste disposal station when the products or components are discarded.

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# 1. Safety

Important safety instructions - Save these instructions

There exists dangerous voltage and high temperature inside the PDU. During the installation, operation and maintenance, please abide the local safety instructions and relative laws, otherwise it may result in personnel injury or equipment damage. Safety instructions in this manual act as a supplementary for the local safety instructions. Our company will not assume the liability that caused by disobeying safety instructions.

## 1.1 Safety notes

1. Even without connection with utility power, 208~240VAC voltage may still exist at PDU terminal!
2. To reduce the risk of hazardous electric shock, please ensure the PDU is properly grounded before turning on the breaker.
3. Don't disassemble the PDU cover. Service may only be performed by qualified factory technicians.
4. Working environment and storage way will affect the lifetime and reliability of the PDU. Avoid having the PDU working under following environment for extended periods:
  - ◆ Area where the humidity and temperature is out of the specified range (temperature 0 to 40°C, relative humidity 5%-95%)
  - ◆ Direct sunlight or location near heat
  - ◆ High vibration areas
  - ◆ Area with explosive or flammable gas, corrosive chemicals, excessive dust, etc
5. Keep PDU vents and fans in good conditions, otherwise the components inside the PDU may become over-heated, reducing the life of the PDU and voiding the warranty.

## 1.2 Symbols used in this guide



**WARNING!**

**Risk of electric shock**



**CAUTION!**

**Read this information to avoid equipment damage**

## **2. Main Features**

### **2.1 Summarization**

This LK-Series PDU is used in conjunction with 10-20kVA single-in-single-out high frequency online UPS, with excellent electrical performance, stylish appearance, and compliance with safety standards.

This series PDU is equipped with input breakers, output breakers, and maintenance bypass breakers, which can provide more protection for UPS and also allow for the repair or replacement of the UPS and/or batteries. Moreover, the PDU is equipped with additional output sockets to meet the needs of various load devices.

This series PDU can be applied to different applications from computer device, automatic equipment and communication system to industry equipment.

### **2.2 Functions and Features**

#### **◆ Integrated solution for data center**

This series PDU can be integrated with battery cabinet and UPS, offering excellent choice for data center.

#### **◆ More protection**

This series PDU is equipped with input breakers, output breakers, which can provide more protection for UPS.

#### **◆ Maintenance function**

This series PDU is equipped with maintenance bypass breakers, which can provide the function of repairing UPS.

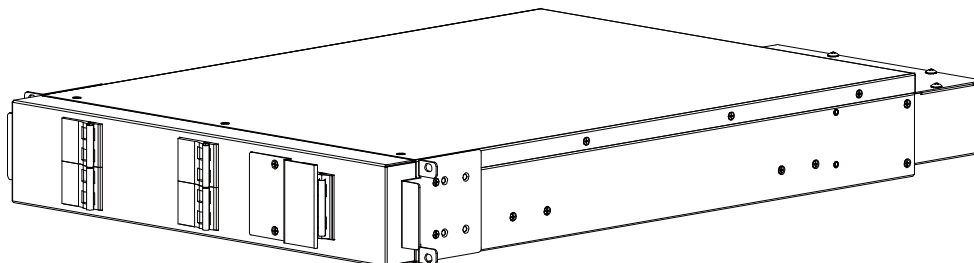
#### **◆ External output sockets**

This series PDU is equipped with more output NEMA sockets to meet the needs of various load devices.

## 3. Installation

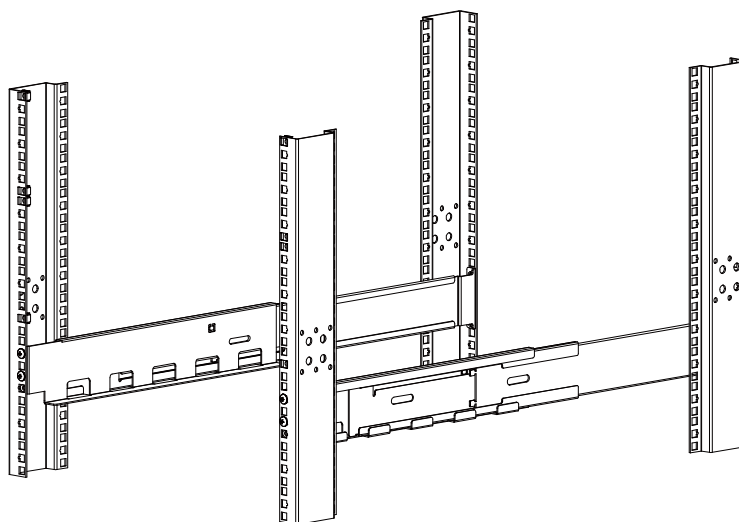
### 3.1 Sub Rack PDU

#### 3.1.1 Appearance of PDU

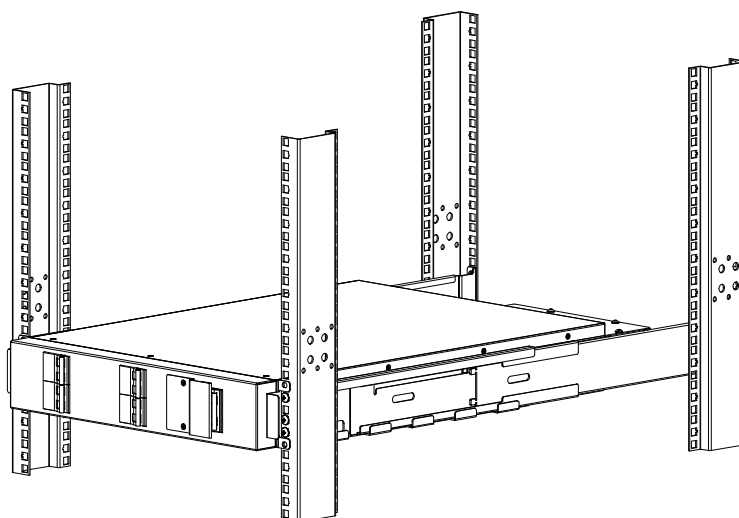


#### 3.1.2 Installation

Fix the rails to the cabinet.



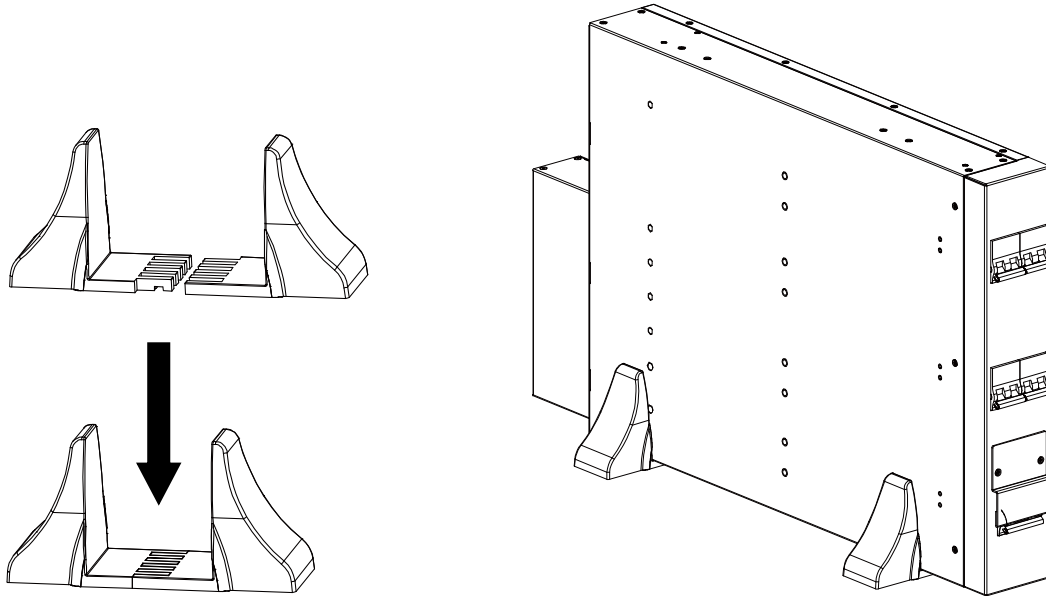
After installing the rails, install the PDU brackets to the front side panels of the PDU, then insert the PDU into the cabinet on the rails and fix the screws to the rack posts.



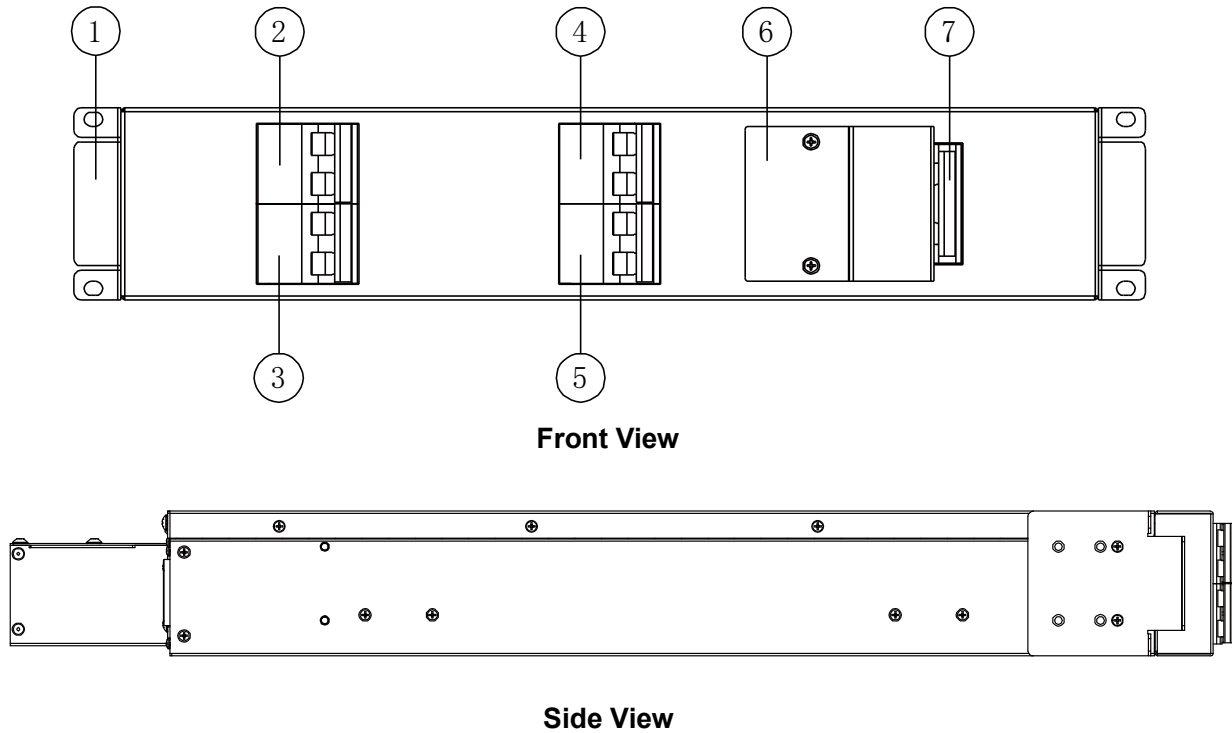
## 3.2 Tower PDU

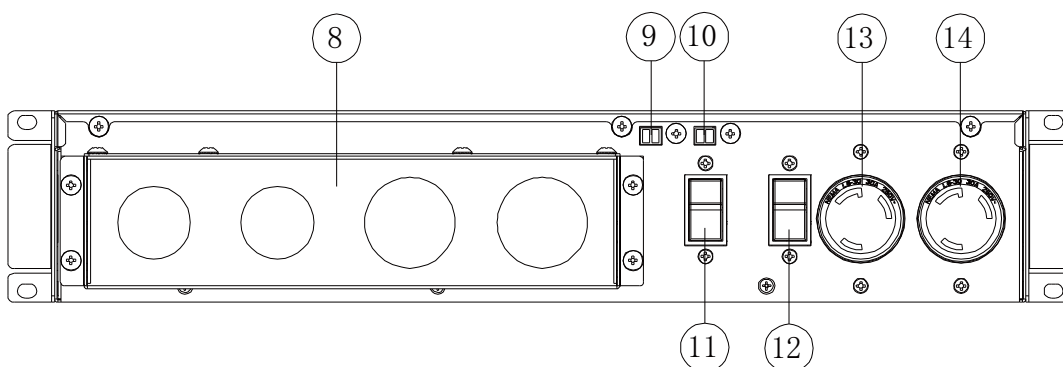
### 3.2.1 Installation

Assemb the bracket, according to the size of the PDU, and then the PDU can be directly placed on the bracket.



## 3.3 Cabinet Outlook





**Rear View**

(1) Rack mounting bracket	(2) UPS1-OUTPUT Breaker
(3) UPS2-OUTPUT Breaker	(4) UPS1-INPUT Breaker
(5) UPS2-INPUT Breaker	(6) Maintenance Bypass Breaker Cover
(7) Maintenance Bypass Breaker	(8) Input & Output Terminal
(9) UPS1 Maintenance Dry Contact	(10) UPS2 Maintenance Dry Contact
(11) AC-Output2 Breaker	(12) AC-Output3 Breaker
(13) AC-Output2 Socket L6-30R	(14) AC-Output3 Socket L6-30R

### 3.4 Installation notes

Note: Consider for the convenience of operation and maintenance, the space in front and back of the cabinet should be left at least 100cm and 80cm, respectively, when installing the cabinet.

◆Please place the PDU in a clean, stable environment. Avoid vibration, dust, humidity, flammable gas and liquid, corrosive chemicals, etc.

◆To avoid from high room temperature, room extractor fans are recommended.

◆The environment temperature around PDU should keep in a range of 0°C~40°C. If the environment temperature exceeds 40°C, the rated load capacity should be reduced by 10% per 4°C. The max temperature can't be higher than 50°C.

◆Equipment should be stored in a temperature-controlled room to protect from excessive heat or humidity.

◆The highest altitude that PDU may work normally with full load is 1000 meters. The load capacity should be reduced when this UPS is installed in place whose altitude is higher than 1000 meters, shown as the following table:

(Load coefficient equals max load in high altitude place divided by nominal power of the PDU)

Altitude (m)	1000	2000	2500	3000
Load coefficient	100%	90%	85%	80%



## 3.5 Power Cables

- ◆ The cable design shall comply with the voltages and currents provided in this section and follow local electrical codes and practices.



### WARNING!

Upon starting, please ensure that you are aware of the location and operation of the external isolators which are connected to the PDU input supply of the mains distribution panel. Check to see if these supplies are electrically isolated. And post and necessary warning signs to prevent any inadvertent operation.

### 3.5.1 Recommended cross-sectional areas for power cables

Model	Cable Dimension					
	AC Input (AWG)	AC Output (AWG)	AC Grounding (AWG)	UPS1/2 Input (AWG)	UPS1/2 Output (AWG)	UPS Grounding (AWG)
20kVA	1	1	1	6	6	6

\*NOTE: 20kVA PDU supports 2x 10kVA UPS units in parallel connection

- ◆ All of power cable must use a temperature rating of 90°C (194°F).
- ◆ When selecting, connecting, and routing power cables, follow local safety regulations and rules.
- ◆ If external conditions such as cable layout or ambient temperatures change, perform verification in accordance with the local regulations.

### 3.5.2 Power cable connector requirements

Model	Connector	Connection Mode	Bolt Type	Bolt Hole Diameter	Torque
20kVA	AC input/output connector	Crimped IT terminals	M5	5mm	5N•m
	UPS1/2 input/output connector	Crimped IT terminals	M4	4.5mm	3N•m
	AC Grounding connector	Crimped IT terminals	M5	5mm	5N•m
	UPS Grounding connector	Crimped IT terminals	M4	4.5mm	3N•m



### CAUTION!

**Protective ground cable:** Connect each cabinet to the main ground system. For Grounding connection, follow the shortest route possible.



### WARNING!

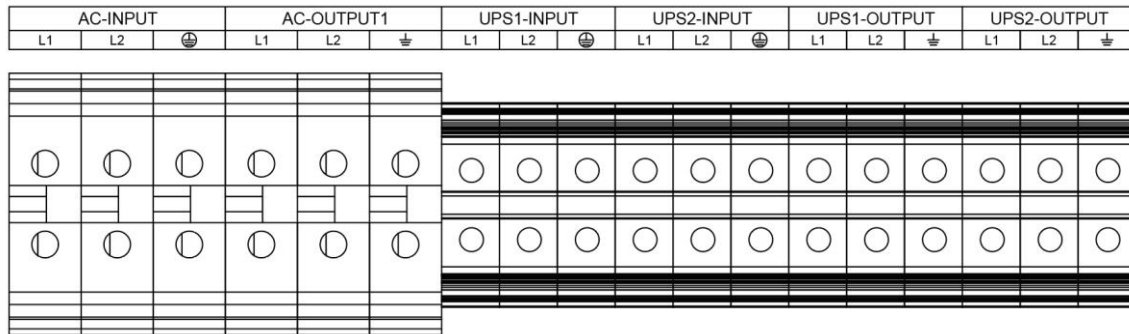
Failure to follow adequate grounding procedures may result in electromagnetic interference or in hazards involving electric shock and fire

## 3.6 PDU connection

Once the equipment has been finally positioned and secured, connect the power cables as described in the following procedure.

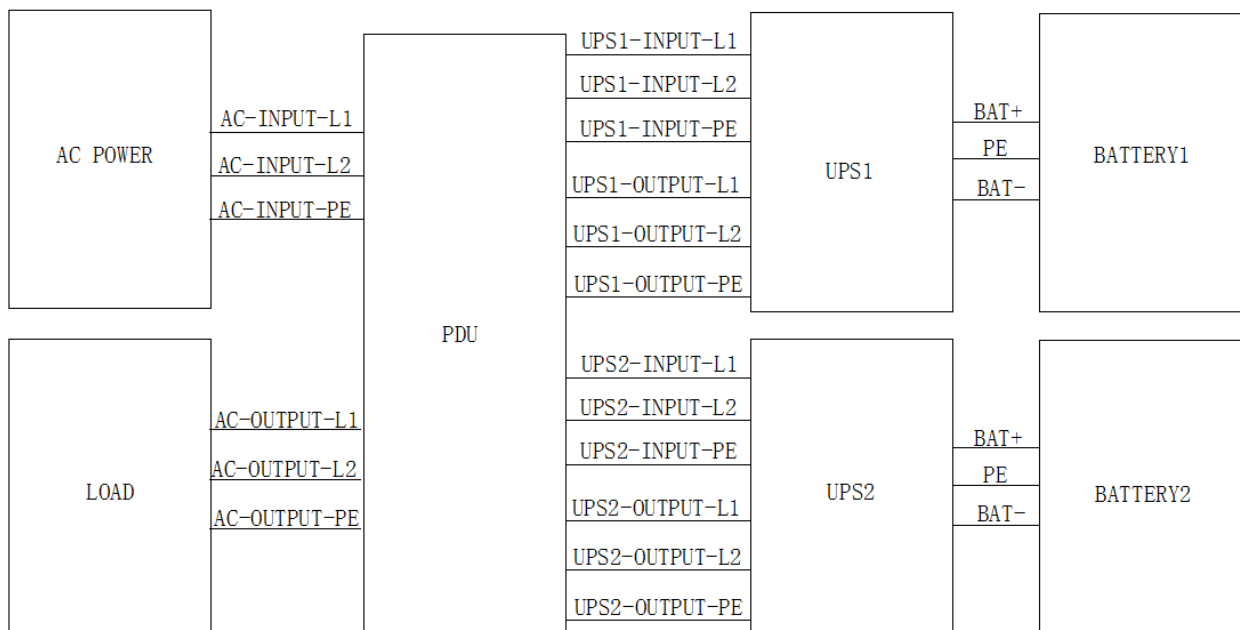
Verify the PDU is totally isolated from its external power source before beginning any work. Post any necessary warning signs to prevent inadvertent operation of PDU unit. Find the PDU rear panel, remove the cover of terminals for access to terminal screws.

### 3.6.1 Power cable connection



<b>AC-INPUT-L1:</b> Primary input Phase L1	<b>AC-INPUT-L2:</b> Primary input Phase L2
<b>AC-OUTPUT1-L1:</b> Output Phase L1	<b>AC-OUTPUT1-L2:</b> Output Phase L2
<b>UPS1-INPUT-L1:</b> UPS1 input Phase L1	<b>UPS1-INPUT-L2:</b> UPS1 input Phase L2
<b>UPS2-INPUT-L1:</b> UPS2 input Phase L1	<b>UPS2-INPUT-L2:</b> UPS2 input Phase L2
<b>UPS1-OUTPUT-L1:</b> UPS1 output Phase L1	<b>UPS1-OUTPUT-L2:</b> UPS1 output Phase L2
<b>UPS2-OUTPUT-L1:</b> UPS2 output Phase L1	<b>UPS2-OUTPUT-L2:</b> UPS2 output Phase L2
⏏: Grounding	

Choose appropriate power cable (refer to the cable dimension table above). Secure cables tightly to the terminal connection block. Keep all wires in phase throughout the connections between utility, PDU, UPS in, UPS out and load.



**WARNING!**

If the load equipment is not ready to accept power, ensure that the system output cables are safely isolated at their ends and there are no short circuits.

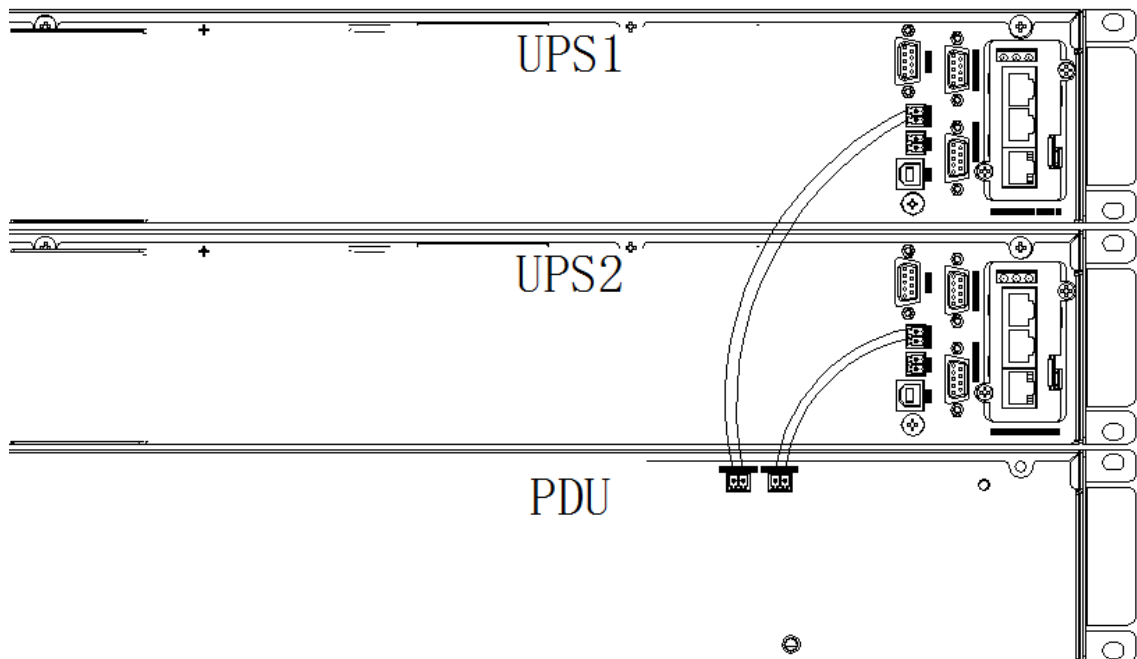
Connect the safety ground and any necessary ground bonding cables to a suitable building ground. All PDU cabinets must be grounded properly.

**CAUTION!**

The grounding and neutral bonding arrangement must be in accordance with local and national codes of practice.

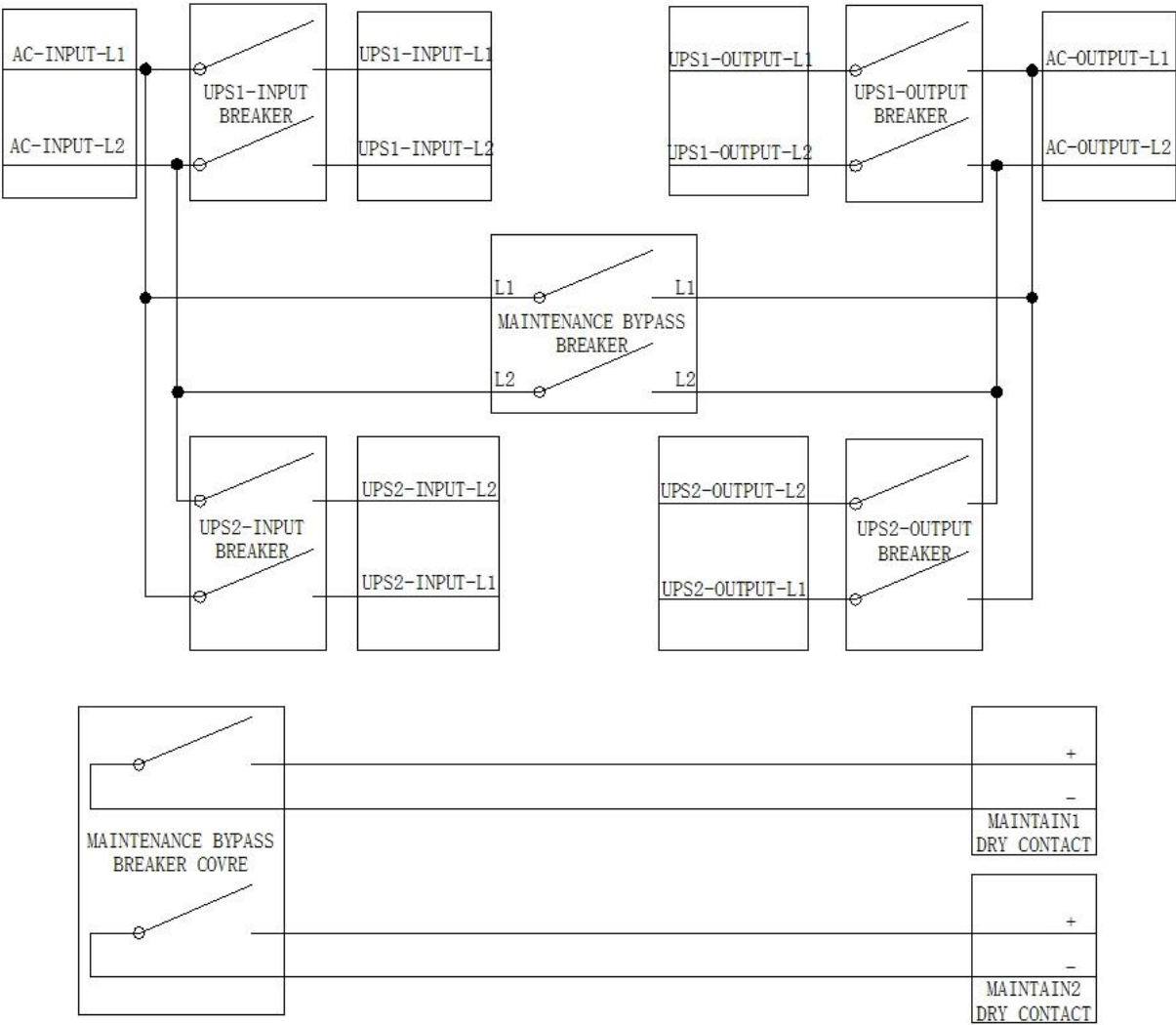
**3.6.2 Maintenance breaker auxiliary signal cable connection**

- ◆ Connect the auxiliary contact interface of the maintenance breaker of the PDU and the dry contact interface of the UPS output dry port with cables. The dry contact of the UPS is normally closed logic and can be enabled when the interface is opened.
- ◆ When the maintenance bypass breaker cover of the PDU is opened, the UPS connected to the breaker will receive the dry contact signal and enter the maintenance bypass state automatically.



3.6.3 Internal connection of PDU

The internal connection diagram of PDU is shown below:



## 4. Operation

### 4.1 MAINTENANCE

To supply the load via Mains, you may simply active the internal mechanical bypass switch.



#### **CAUTION!**

The load is not protected by the UPS when the internal mechanical bypass system is active and the power is not conditioned.

#### 4.1.1 Switch to mechanical bypass



#### **CAUTION!**

The UPS must be in static bypass mode before switching over to mechanical maintenance bypass on the PDU.

- ◆ Open the cover of MAINTENANCE breaker of the PDU, the UPS turns to bypass mode automatically when signal cables are installed properly. If signal cables are not installed, manually switch the UPS to static (electronic) bypass mode via the UPS settings..
- ◆ Turn ON MAINTENANCE breaker of the PDU;
- ◆ Switch OFF BATTERY breaker;
- ◆ Switch OFF UPS INPUT breaker of the PDU;
- ◆ Switch OFF UPS OUTPUT breaker of the PDU;

At this time the input source will supply to the load through the MAINTENANCE breaker.

#### 4.1.2 Switch to normal operation (from mechanical bypass)



#### **CAUTION!**

Never attempt to switch the UPS back to normal operation until you have verified that there are no internal UPS faults.

- ◆ Turn ON OUTPUT breaker of the PDU.
- ◆ Turn ON INPUT breaker of the PDU.
- ◆ Turn ON BATTERY breaker.

The UPS static bypass operates in sync with the maintenance bypass

- ◆ Switch OFF the MAINTENANCE breaker of the PDU, then the output is supplied by the static bypass of the UPS.
- ◆ Replace the cover of the MAINTENANCE breaker of the PDU.

If the PDU to UPS signal cable is installed, the UPS will operate normally after 30 seconds. If the UPS works normally, the system will be transferred from static bypass mode to normal (online) mode. If the signal cable is not installed, manually switch the UPS to normal (online) mode using the UPS menu functions.

## Appendix 1 Specifications

<b>GENERAL</b>	
Model Name	N1C.LK20PDUBP
Cooling	Passive cooling
Rack Height Dimension	2U
Installation Type	Rack / Tower
<b>INPUT</b>	
Nominal Input Voltage	208~240 Vac
Max Input Current	104 A
Input Connection	HW terminal(L1+L2+PE)
<b>OUTPUT</b>	
Nominal Output Voltage	208~240 Vac
Output Connection	Terminal + NEMA L6-30R*2
Output Protection	63A breaker*2 + 30A breaker
Maintenance Bypass	125A Breaker
<b>PHYSICAL</b>	
Dimension WxDxH (mm)	440 * 621.5 * 86.5 mm(2U) / 17.3*24.5*3.4 inch
Net Weight (kg)	13.5 kg / 29.8 lbs
<b>ENVIRONMENTAL</b>	
Operating temperature	0 °C ~ 40 °C (no derating)
Storage temperature	-25 °C ~ 55 °C
Relative humidity	0 ~ 95% (non-condensing)
Operating elevation	0 - 1000 meters Normally operate >1000 meters Derating
<b>CONFORMANCE</b>	
Safety	cTUVus: UL 1778: 2014 R4.23, CSA C22.2 NO. 107.3-14 + GI1
Transportation	ISTA Procedure 2A
Environment	ROHS 2.0