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# Delta Infrasuite Power Management

Power Distribution Cabinet

User Manual

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Smarter. Greener. Together.

# Save This Manual

This manual contains important instructions and warnings that you should follow during the installation, operation, storage and maintenance of this product. Failure to heed these instructions and warnings will void the warranty.

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# Chapter 1: Important Safety Instructions

## 1.1. Safety Precautions



### **WARNING:**

When the Power Distribution Cabinet is in operation, the voltage in the cabinet may be fatal. Only qualified service personnel can carry out maintenance and installation.

- When operating the Power Distribution Cabinet in an energized state, please use safety devices (such as insulating gloves and shoes) and operate on an insulating rubber cushion to avoid electrical shock. There should be at least one person to give assistance. In case of an accident, you should be adaptable and seek assistance.
- Before actually operating and maintaining the Power Distribution Cabinet, please read all chapters in this manual carefully. To avoid personal injury and equipment damage, please be sure to follow the instructions in the user manual and marks on the cabinet to operate.
- The adjustable levelling feet at the bottom of the Power Distribution Cabinet can only be used to fix and maintain the cabinet level. Please do not use it to lift the cabinet to replace the movable floor, which may result in personal injury or equipment damage.

## 1.2 Installation Precautions

- Please install the Power Distribution Cabinet in indoor environments where humidity, temperature and dust is well controlled without direct sunshine.
- Please maintain a satisfactory clearance around the Power Distribution Cabinet (Please read **3.2 Clearance Scope**) for easy maintenance and operation.
- Please do not install the Power Distribution Cabinet on flammable or unstable ground.

## 1.3 Usage Warnings

- Please do not install and operate the Power Distribution Cabinet in a place with humidity, water, gas and near the electrical heat source.
- To safeguard personal safety and ensure normal operation of the device, please make sure to disconnect the power supply before installation or maintenance.
- Good heat dissipation can ensure stable operation of the Power Distribution Cabinet. Please keep ventilation around the cabinet.
- To avoid electrical leakage endangering personal safety, please ensure sound grounding of the Power Distribution Cabinet before switching on the power.
- When the Power Distribution Cabinet is energized, the voltage in the cabinet may be dangerous. When not in use, please make sure to disconnect the power supply.

- When initially starting up the Power Distribution Cabinet or re-running it after it has been not used for a long time, please ask qualified service personnel to perform a detailed safety check and monitor the start-up procedures.

## 1.4. Introduction to Symbols

No.	Symbol	Description
1	F1: ▲	Cursor up
2	F2: ▼	Cursor down
3	F1: ◀	Cursor to the left
4	F2: ▶	Cursor to the right
5	F1: +	Number increase
6	F2: -	Number decrease
7	·)))	Start the buzzer
8	·)))	Disable the buzzer
9	↶	Goes back to the previous screen or cancels current selection.
10	↷	Goes to the next screen/ column or confirms current selection.
11	✎	When this symbol occurs, it means that you can change your selected item's setting.
12	☐	The circuit breaker is in the <b>OFF</b> status.
13	☑	The circuit breaker is in the <b>ON</b> status.
14	⏚	AC input

## 1.5 Product Standards

This product complies with the following safety standards and EMC test standards:

- **Safety**
  - IEC60950
- **EMC**
  - EN55022 (CISPR22)
  - EN55024 (CISPR24)

# Chapter 2: Introduction

Delta Power Distribution Cabinet provides excellent branch protection and branch monitoring functions. You can flexibly choose different power levels (30kVA, 50kVA, 80kVA, 100kVA or 125kVA) according to your power demands to your system.

The Power Distribution Cabinet can be used with a transformer for voltage conversion, or installed with Transient Voltage Surge Suppressors (TVSS) to protect highly sensitive equipment. With a built-in 4.9-inch LCD monitor, the friendly man-machine interface allows you to easily control the system status and adjust parameters. Various built-in communication interfaces (smart slots, RS232 and dry contacts) allow you to monitor and set the Power Distribution Cabinet through the workstation and external devices.

## 2.1 Functions & Features

### Flexible Configurations

- Choice of 30kVA, 50kVA, 80kVA, 100kVA or 125kVA models.
- Connection to one to three switchboards and up to 126 branch circuit breakers.
- Pair with H-type or K-1, K-13 and K-20 transformers for voltage conversion.
- Pair with optional Transient Voltage Surge Suppressors to protect highly sensitive equipment.

### High Reliability

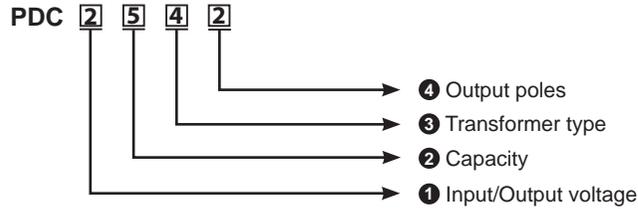
- Automatic power-off mechanism to ensure the security of your system and devices.
- Local and remote emergency power-off functions.
- Detects a single circuit breaker's power value.
- Provides voltage unbalance and phase-lack alarms.
- Provides system, each switchboard, and each branch's current monitoring and alarm functions.

### Multi-function

- Large 4.9-inch LCD monitor.
- Built-in RS232 communication interface & smart slots for remote monitoring.
- Records up to three thousand events.
- Six built-in dry contact interfaces.
- Easy to install; the front and rear doors and side panels can be easily removed for easy maintenance.
- Lockable access doors and panels.

## 2.2 Product Model

You can know about the detailed specifications of the Power Distribution Cabinet according to the product model. Please see the table below:



### NOTE:

1. The standard model's input/ output voltage is 220/380Vac.
2. Any model whose input/ output voltage is not 220/380Vac should be used together with a transformer, and such model must be customized and only available in Taiwan market.

### ① Input/Output voltage

No.	Description	No.	Description
1	Input=380/220Vac Output=380/220Vac	2	Input=380V (three-phase three-wire) Output=208/120Vac
3	Input=380/220Vac Output=208/120Vac	4	Input=480/277Vac Output=208/120Vac
5	Input=208/120Vac Output=208/120Vac	6	Input=480/277Vac Output=380/220Vac
7	Input=480/277Vac Output=400/230Vac	8	Input=400/230Vac Output=400/230Vac
9	Accessory Code	A	Input=400/230Vac Output=208/120Vac

### ② Capacity

No.	Description	No.	Description
1	30kVA	2	50kVA
3	80kVA	4	100kVA
5	125kVA		

### ③ Transformer Type

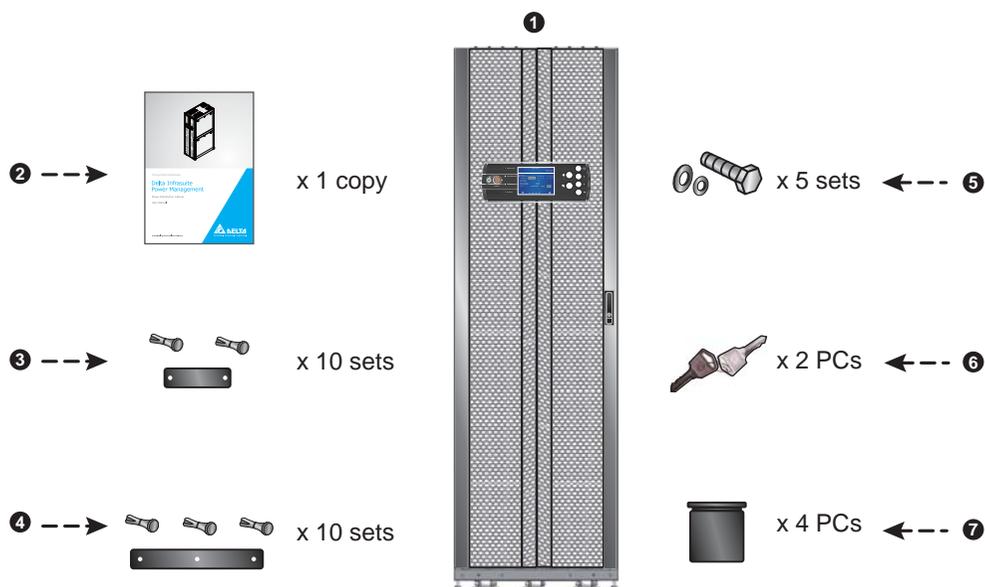
No.	Description	No.	Description
0	Without Transformer	1	K1, 60Hz
2	K13, 60Hz	3	K20, 60Hz
4	H-type, 60Hz	5	K1, 50Hz
6	K13, 50Hz	7	K20, 50Hz
8	H-type, 50Hz		

### ④ Output Poles

No.	Description	No.	Description
1	42 plug-in circuit breakers	2	42 * 2 plug-in circuit breakers
3	42 * 3 plug-in circuit breakers	4	42 * 4 plug-in circuit breakers
5	21 * 1 fixed circuit-breakers, 42 * 1 plug-in circuit breakers	6	21 * 2 fixed circuit breakers

## 2.3 Package Inspection

Please check whether the accessory items and quantities are correct according to the following table. If any item is missing or damaged, please contact the dealer from whom you purchased the product. If the Power Distribution Cabinet needs to be returned, carefully repack it and all of the accessories using the original packing material that came with the unit.



No.	Item	Quantity
①	Power Distribution Cabinet	1 set
②	User Manual	1 PC
③	Short Cover (two screws per piece)	10 sets
④	Long Cover (three screws per piece)	10 sets
⑤	M10 Screw / Washer / Spring Washer	5 sets
⑥	Keys for Front and Rear Doors and Side Panels	2 PCs
⑦	Jumper caps	4 PCs

## 2.4 Optional Accessories

You can purchase the following accessories according to usage requirements.

- **Transient Voltage Surge Suppressors:** Protect highly sensitive equipment from damage of surge impact
- **Communication Card:** You can connect an optional SNMP card via the smart slot.



### NOTE:

To purchase optional accessories, please contact your local dealer or customer service.

## 2.5 System Configurations

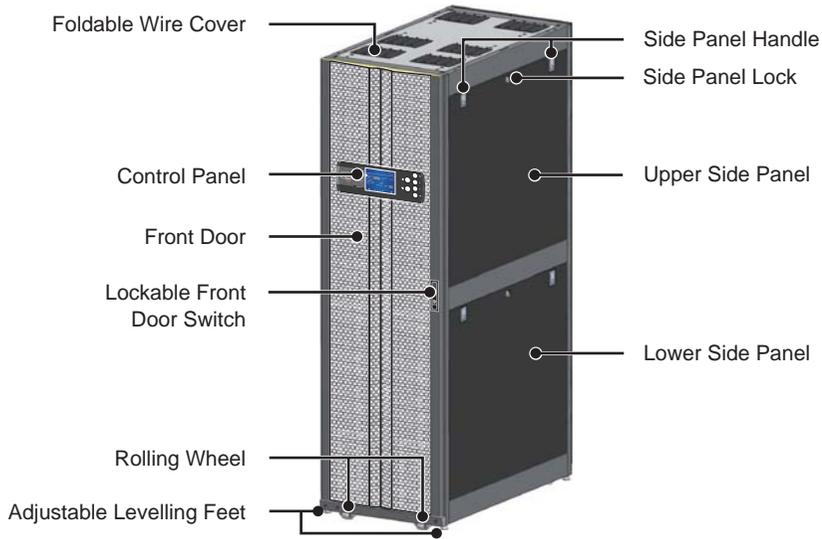
The Power Distribution Cabinet can be used with one to three switchboards, each of which has a 225A switchboard circuit breaker. The cabinet can be used with a transformer to provide voltage conversion function. For the models with a transformer, there are fans for heat dissipation.

Depending on the configurations of the switchboards, you can install plug-in or fixed circuit breakers. Each switchboard can connect 21 or 42 breakers according to the types of installed circuit breakers with independent grounding and neutral busbar. For wiring, the Power Distribution Cabinet allows top wiring and bottom wiring.

The front of the Power Distribution Cabinet features a lockable front door and two protective doors inside; the back features a lockable split rear door and a protective plate inside. The control panel is located in front of the cabinet and its LCD monitor can operate immediately after the input line is properly connected. The Power Distribution Cabinet provides two smart slots that allow you to connect the SNMP card, or use RS232 interface to connect to the workstation. The six built-in dry contacts allow you to connect an external device.

## 2.6 Appearance

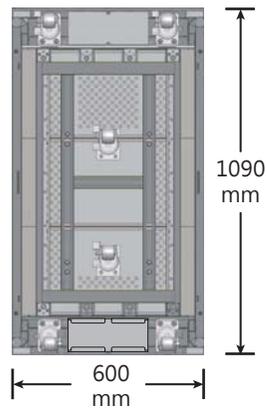
### 2.6.1 Appearance of the Cabinet



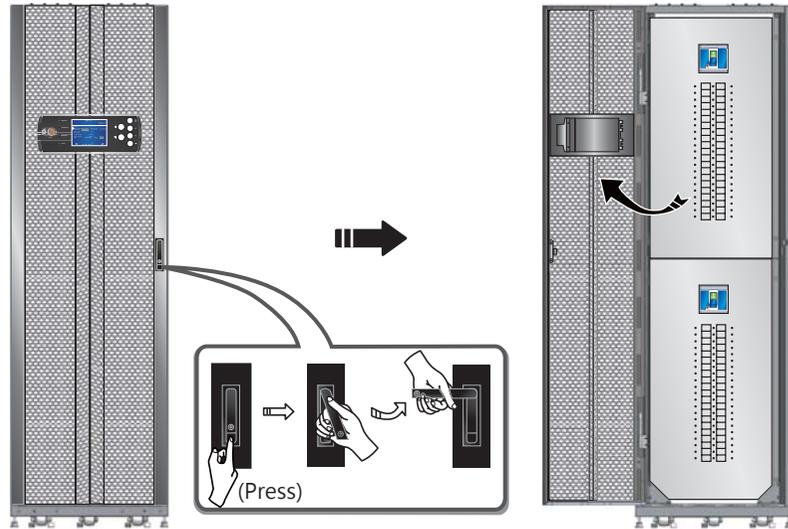
(Figure 2-1: Appearance)



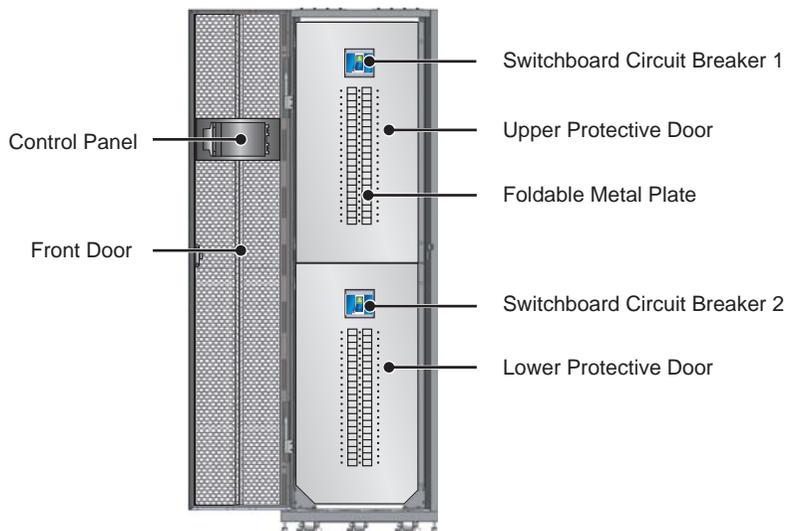
(Figure 2-2: Appearance Dimensions)



(Figure 2-3: Base Dimensions)



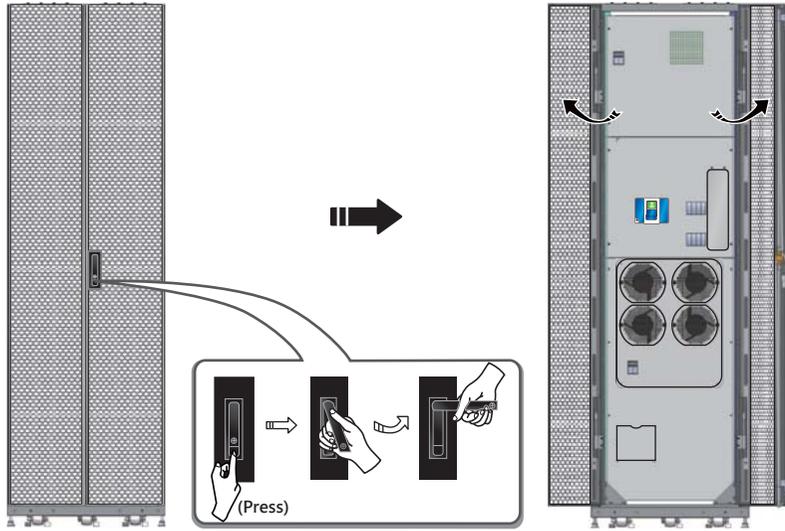
(Figure 2-4: Front Door Open)



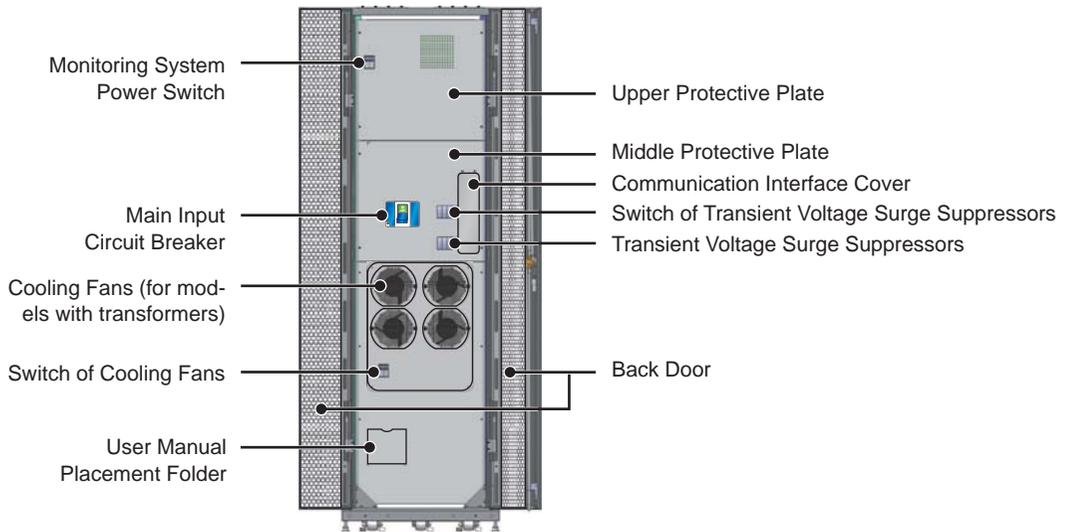
(Figure 2-5: Inside of the Front Door)



**NOTE:** Depending on the model you purchase, the appearance may be different.



(Figure 2-6: Back Door Open)



(Figure 2-7: Inside of the Back Door)

## 2.6.2 Control Panel



(Figure 2-8: Control Panel)

The Power Distribution Cabinet with a large control panel makes it easy for you to know about the system status and adjust the parameters. There are six control buttons on the panel, a LCD monitor, four alarm indicators and an emergency power-off button. For detailed information about the control panel display and operation methods, please see **Chapter 6: Operation**.

# Chapter 3: Installation



## **WARNING:**

1. Only qualified service personnel can install the Power Distribution Cabinet.
2. If the Power Distribution Cabinet is found to be damaged, do not install it and contact your local dealer or service personnel immediately.
3. Removing the Power Distribution Cabinet packaging at low temperatures may cause condensation of water droplets inside the cabinet. There is danger of electrical shock! We recommend that you let the Power Distribution Cabinet dry naturally at room temperature for at least one hour before installing it.
4. Do not step on the Power Distribution Cabinet. Otherwise It may cause the dumping of the cabinet and personal injury. Please do not operate or install the Power Distribution Cabinet before the adjustable levelling feet are stably fixed.
5. In moving the Power Distribution Cabinet on an incline or ramp, the slope cannot exceed fifteen degrees to avoid dumping.

Please find the specification labels on the wooden case first. Then confirm whether the Power Distribution Cabinet is consistent with your ordered specifications. Record the specifications in case you need to provide it to the maintenance personnel for service. If specifications on the labels are different with what you ordered, please contact your dealer immediately.

Please follow "Installation and Disassembly Instruction Card of the Power Distribution Cabinet" attached to the outside of the transportation wooden case to unpack the Power Distribution Cabinet. To maximize its performance, please refer to the following chapters to properly plan the installation site, clearance scope and carrying path.

## **3.1 Installation Site**

Please follow the instructions below to plan the installation site prior to installation:

- The Power Distribution Cabinet should be placed and installed on a floor with concrete structure or made of other solid and non-combustible materials. The interior space should have good ventilation as well as temperature and humidity control, and keep away from gas and corrosive substances.
- Please confirm the bearing capacity of the floor prior to installation, and measure whether the installation site can accommodate the Power Distribution Cabinet and the clearance scope surrounding the cabinet.
- For safety, we recommend that you equip the installation surrounding environment with carbon dioxide or dry powder fire extinguisher.

- The Power Distribution Cabinet should be installed in an engine room built with fire-resistant materials.
- Please do not keep the Power Distribution Cabinet lying or upside down.

Bearing Capacity	
Without Transformer	12 kgf/cm <sup>2</sup>
With Transformer	26/30/35/40/43 kgf/cm <sup>2</sup> for 30/50/80/100/125kVA respectively

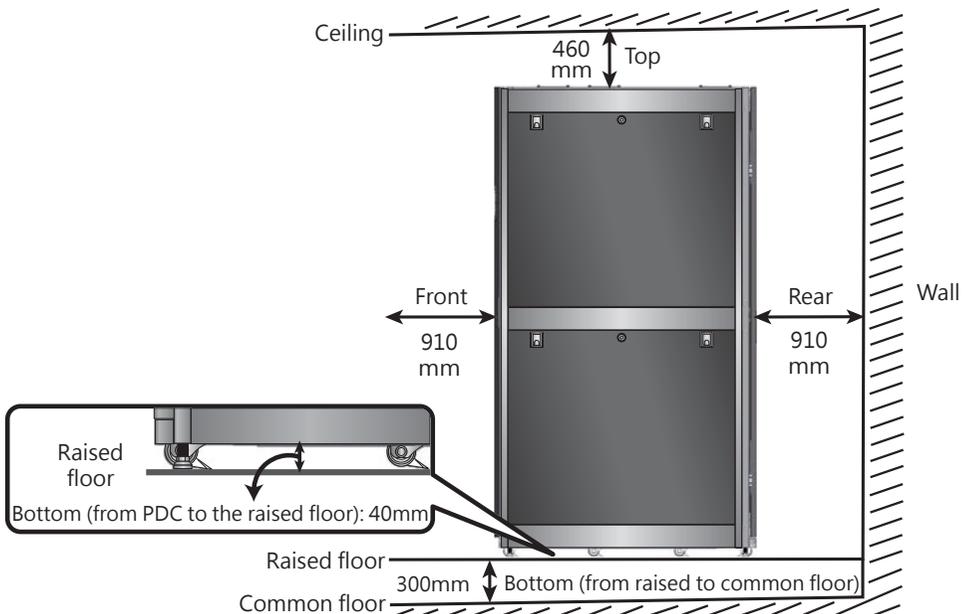


**NOTE:**

To install the Power Distribution Cabinet on a raised floor, we recommend the use of the floor with 500kgf or more to ensure adequate floor support force.

### 3.2 Clearance Scope

The surrounding of the Power Distribution Cabinet should have enough space to facilitate ventilation, installation and operation. Reasonable clearance scope can ensure that the Power Distribution Cabinet runs in a good environment. The recommended values are listed below for your reference:



(Figure 3-1: Clearance Scope)

Check	Location	Clearance Scope
<input type="checkbox"/>	Above the Cabinet	At least 460 mm in order to facilitate the pipeline to go through and promote ventilation.
<input type="checkbox"/>	Below the Cabinet	At least 40 mm in order to facilitate the pipeline to go through and promote ventilation. If wires come in from the bottom side, we recommend using a floor raised at least 300 mm above the ground.
<input type="checkbox"/>	Front Door (Single Door)	At least 910 mm. Easy to adjust the settings through the control panel and open the front door to connect the switchboards, operate the switches and promote ventilation.
<input type="checkbox"/>	Back Door (Double Doors)	At least 910 mm. Easy to open the back door to connect the switchboards and communication devices, operate the switches and promote ventilation.

### 3.3 Carrying Path



#### NOTE:

1. The Power Distribution Cabinet can be moved by a forklift or a truck. If it is moved manually, at least three people are needed to carry it simultaneously.
2. If the Power Distribution Cabinet has been removed from the pallet, or when using a forklift or a truck to move it, please keep an eye on the positions of the four adjustable levelling feet at the bottom of the cabinet and the six rolling wheels in order to avoid crushing and damage.
3. The balance supports and bolts at the bottom of the Power Distribution Cabinet fix the cabinet on the pallet. Please store them properly after disassembly for future use if moving the cabinet is required.

Before moving the Power Distribution Cabinet to the installation site, be sure to plan the carrying path for the Power Distribution Cabinet to avoid personal injury or equipment damage. Please confirm whether the path and the carrying method meet the following conditions:

Check	Precautions
<input type="checkbox"/>	The width and height of the carrying path can allow the Power Distribution Cabinet and the transportation equipment to go through. For detailed information about dimensions and weights, please see the illustration below.

**Check Precautions**

- Confirm the bearing capability of the channels, , floors, elevators or ramps of the carrying path can withstand the weight of the Power Distribution Cabinet and the transportation equipment, and empty the clearance path to avoid collision.

---

- In case of ramp in the carrying path, the slope must not exceed 15 degrees in order to avoid dumping the cabinet.

---

- For moving over a long distance, please use appropriate carrying equipment (e.g. forklift) and do not directly use the rolling wheels of the Power Distribution Cabinet to move.

---

- The rolling wheels at the bottom of the cabinet are only suitable for flat ground. Please avoid falling heavily or moving the Power Distribution Cabinet on a bumpy ground, which may cause the damage of the wheels and even the cabinet dumping.

---




(Figure 3-2: Dimensions)

Weight 225 to 795 kg (Weights are different based on different models and optional accessories. Please refer to **Appendix 1: Technical Specifications**)

## 3.4 Install the Power Distribution Cabinet

### 3.4.1 Tools Required

To install the Power Distribution Cabinet, you need the following tools:

- Standing Ladder
- Sharp-nose Pliers
- 17mm Socket Spanner
- 13mm Open Spanner
- Crosshead Screwdriver

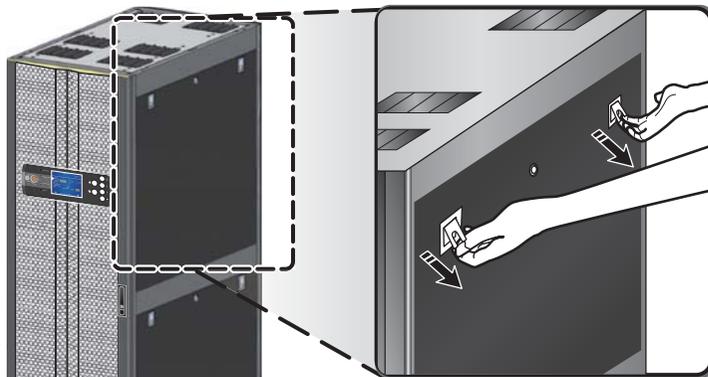
Unless there is an additional mark, appropriate assembly torques should be applied on all the electrical contacts, nuts and bolts to ensure reliable connection. Please follow the specifications of the following table:

Screw Size	Assembly Torque (Kgf.cm)
M6	80±5
M8	150±5
M10	250±5

### 3.4.2 Remove the Side Panels

If the space for installation allows, you can temporarily remove the side panels of the Power Distribution Cabinet for easy installation. Please see the following instructions:

- 1 Remove the key attached to the front door and use it to unlock the side panels.
- 2 To remove a side panel, hold on the handles on both sides, and then pull them up.



(Figure 3-3: Remove the upper side panel)

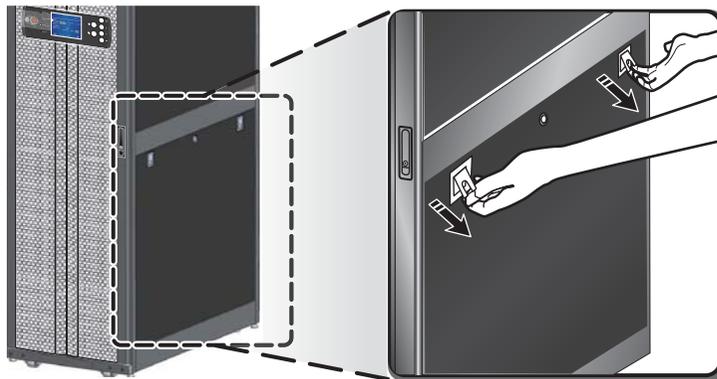
**NOTE:**

Please place the detached side panel in a safe place, and do not lean it beside the cabinet in order to avoid equipment damage or personal injury by collision.

### 3.4.3 Install the Cabinet

If wires come in through the bottom side of the Power Distribution Cabinet and the side panels cannot be removed from the installation site (such as combined cabinets), first remove the wire cover at the bottom before moving the Power Distribution Cabinet to the installation site as follows:

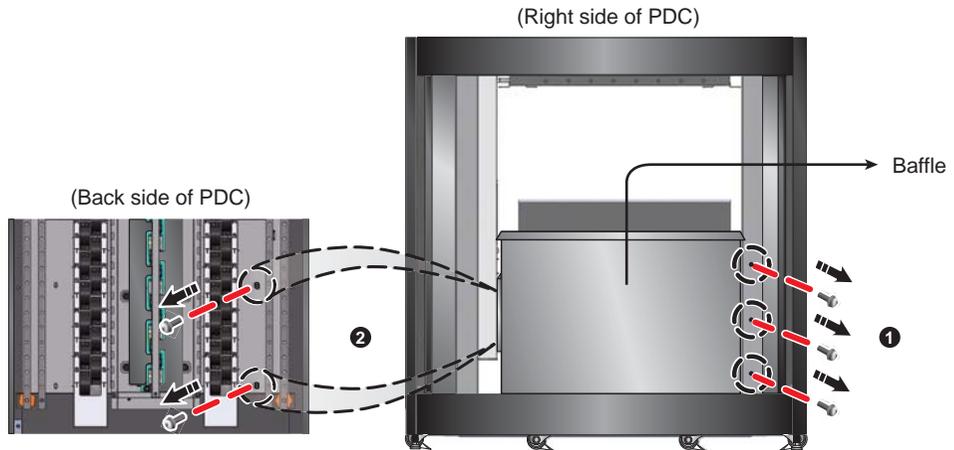
- ① Remove the lower side panel according to the instructions of **3.4.2 Remove the Side Panels**.



(Figure 3-4: Remove the lower side panel)

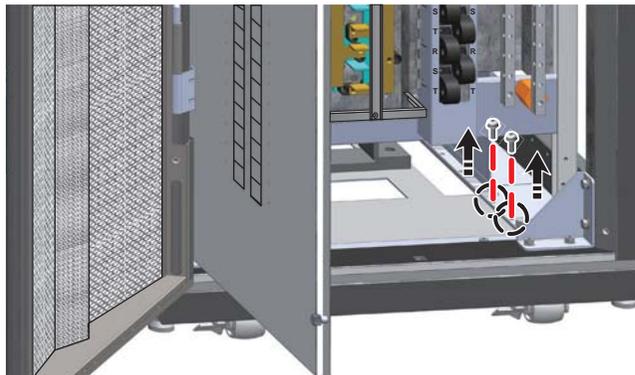
- ② If your Power Distribution Cabinet is equipped with a transformer, you must first remove the baffle to remove the wire cover at the bottom. Please skip the step of removing the baffle if the Power Distribution Cabinet is not equipped with a transformer.

On the baffle, there are five screws fixing it. ① Please first remove the three screws on the side, then open the front door and the lower protective doors. ② And remove the other two screws at the bottom of the front. Thus the baffle can be removed.



(Figure 3-5: Remove the baffle)

- 3 Use a screwdriver to remove the two screws on the wire cover at the bottom of the cabinet and remove appropriate numbers of wire covers depending on the number of the wires.



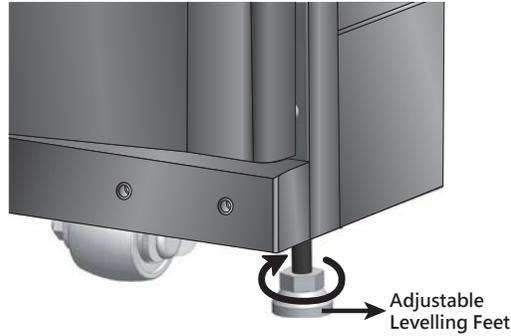
(Figure 3-6: Remove the wire cover at the bottom)

- 4 After locking the baffle, reinstall the lower side panel.



**NOTE:** Please properly keep the detached wire cover for future use.

Please use the six rolling wheels at the bottom of the cabinet to move the cabinet to the installation site. Rotate the four adjustable levelling feet beside the rolling wheels clockwise with a spanner until the lowered adjustable levelling feet stand firmly on the ground and ensure the cabinet will not slip or dump.



(Figure 3-7: Rotate the adjustable levelling feet at the bottom)



**WARNING:**

The adjustable levelling feet can only be used to distribute weight averagely and fix the cabinet. Please do not use them to lift the Power Distribution Cabinet to replace the movable floor, which may result in personal injury or equipment damage.

### 3.4.4 Input Wiring



**WARNING:**

1. When wiring, make sure the input power is off (not energized); otherwise, there is a risk of electrical shock.
2. The high voltage connected to the Power Distribution Cabinet can be fatal! Only qualified service personnel can carry out wiring. Please use safety devices (such as insulating gloves and shoes), and operate with caution.
3. Faulty wiring can cause severe electrical shock or damage to the Power Distribution Cabinet.



**NOTE:**

The following wiring precautions apply to input and output wiring:

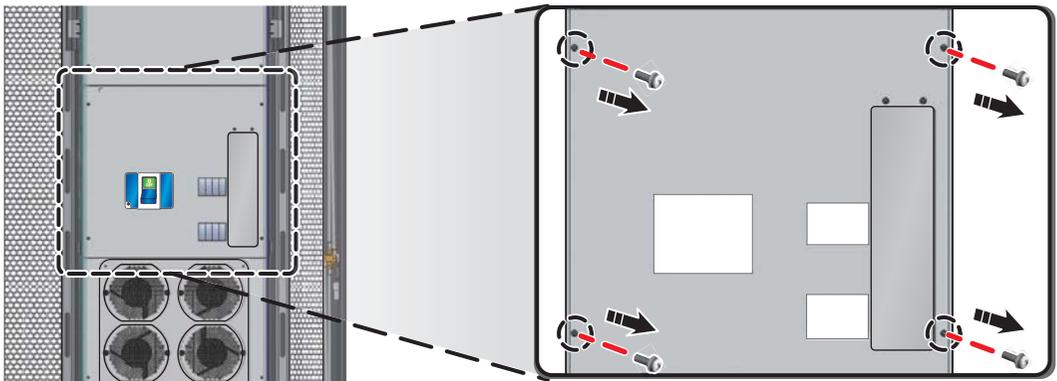
1. Please follow the tables below to select appropriate circuit breakers and wire diameters.

Capacity	30kVA	50 kVA	80 kVA	100 kVA	125 kVA
I/P Cable	AWG #6 * 1PC	AWG #4 * 1PC	AWG #0 * 1PC	AWG #000 * 1PC	AWG #0000 * 1PC

O/P Breaker	15A	20A	30A	50A
O/P Cable	AWG #12 * 1PC	AWG #10 * 1PC	AWG #8 * 1PC	AWG #6 * 1PC

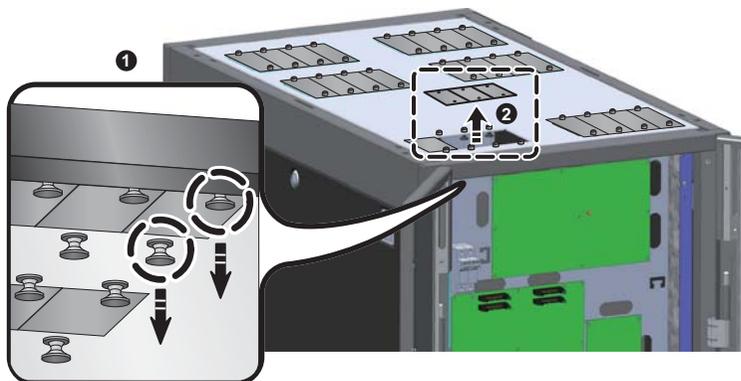
2. Please follow the walkway direction when planning the wiring and make sure the wires are obedient and neat. Use a cable cover or a winder to avoid tripping when necessary.
3. Do not use straight-line distance to estimate the wire length. Please use the orthogonal distance to estimate and set aside appropriate length.

- ① Confirm that input power is off.
- ② Remove the four screws in the middle protective plate with a screwdriver, and then remove the protective panel.



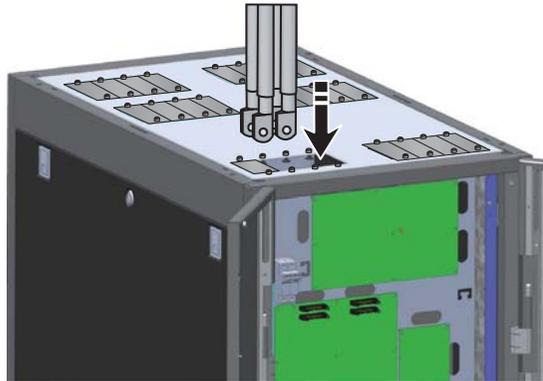
(Figure 3-8: Remove the middle protective plate at the back)

- ③ Based on wire incoming positions on the cabinet, there are two wire incoming methods, i.e., top wiring and bottom wiring. For input wiring, we recommend using the top wiring.
  - ① Please pull down the buttons at both ends of the wire cover on the top of the cabinet, and take down the wire cover from the top.
  - ② Take down the appropriate number of wire covers based on the number of wires and keep them properly.



(Figure 3-9: Remove the wire covers at the top)

- 4 Lead the electric wire in through the upper side of the cabinet.

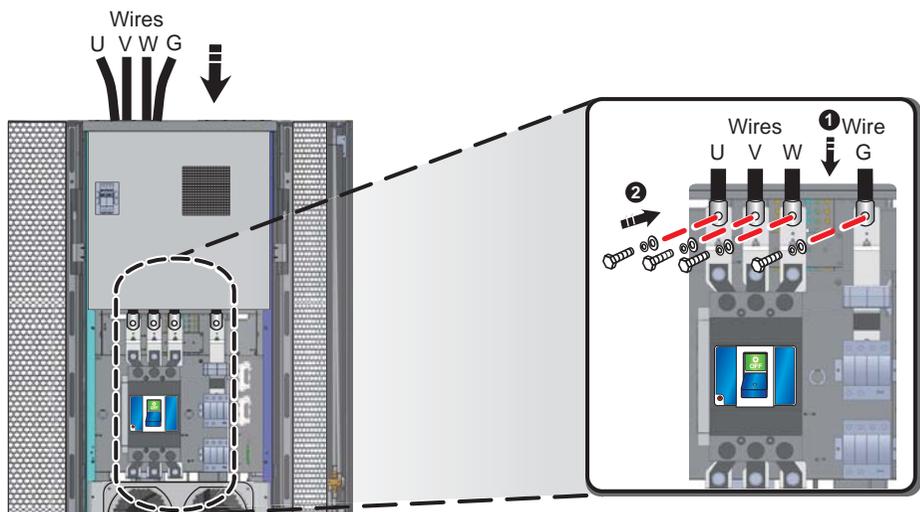


(Figure 3-10: Pass the input wires from the upper side)



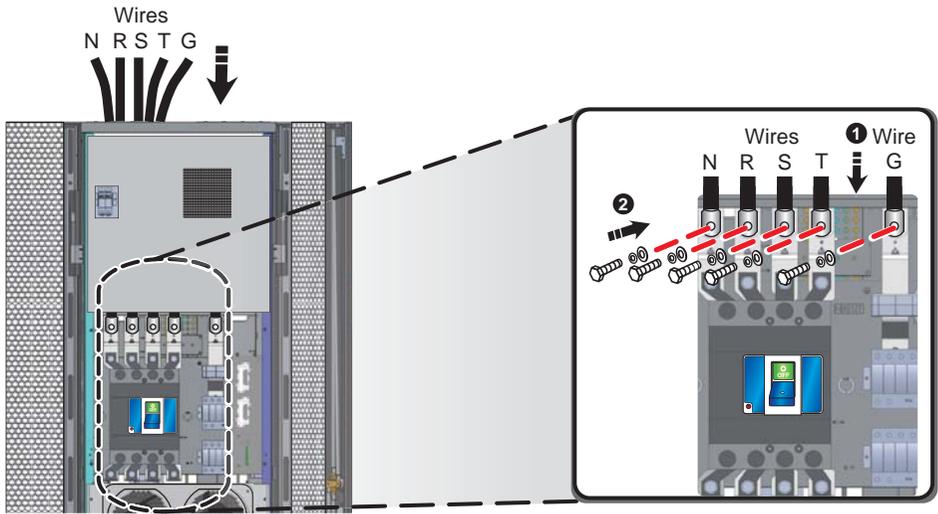
**NOTE:** Please properly keep the detached wire covers for future use.

- 5 If your Power Distribution Cabinet is the three-phase three-wire type with a transformer, ① please connect the U, V, W and G wires to the input copper busbar according to the marks, ② and tighten them with M10 screws in the accessories bag as shown in the figure.



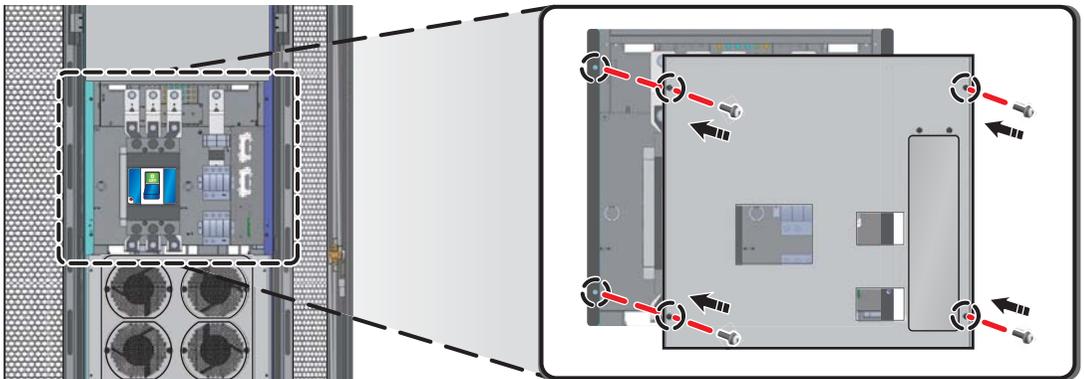
(Figure 3-11: Install the input wires of three-phase three-wire model)

- 6 If your Power Distribution Cabinet is the three-phase four-wire type without a transformer, ① please connect the N, R, S, T and G wires to the input copper busbar according to the marks, ② and tighten them with M10 screws in the accessories bag as shown in the figure.



(Figure 3-12: Install the input wires of three-phase four-wire model)

- 7 After connection, please use a screwdriver to re-lock the middle protective plate.



(Figure 3-13: Lock the middle protective plate at the back)

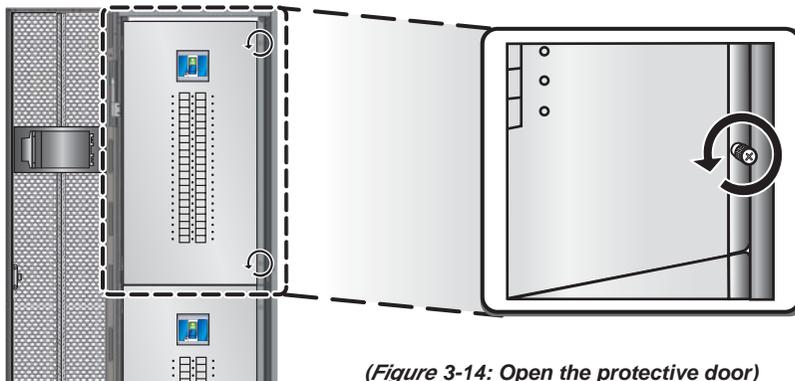
### 3.4.5 Output Wiring

The switchboards of the Power Distribution Cabinet allow you to connect loads and control the output power through the switchboards' circuit breakers. Switchboard configurations and type vary based on different ordered models. The following steps illustrate how to install **plug-in circuit breakers** and **fixed circuit breakers** on the Power Distribution Cabinet.

**WARNING:**

1. Faulty wiring can cause severe electrical shock and damage to the Power Distribution Cabinet.
2. Please make sure that the main breaker is in the OFF status.

- 1 Open the front or back door and confirm each switchboard's position. Loosen the two knobs with a screwdriver or manually and open the protective door as shown in the figure below.

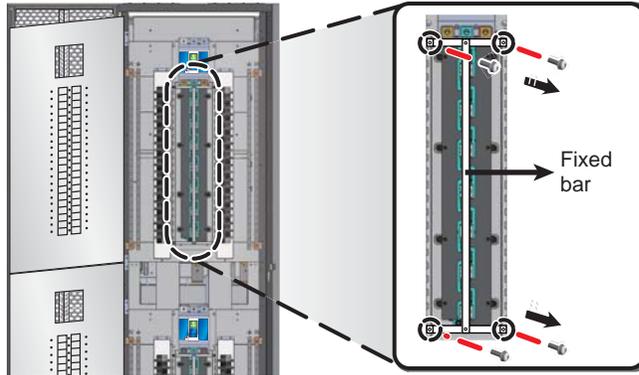


(Figure 3-14: Open the protective door)

2 Circuit breakers vary based on switchboards and include:

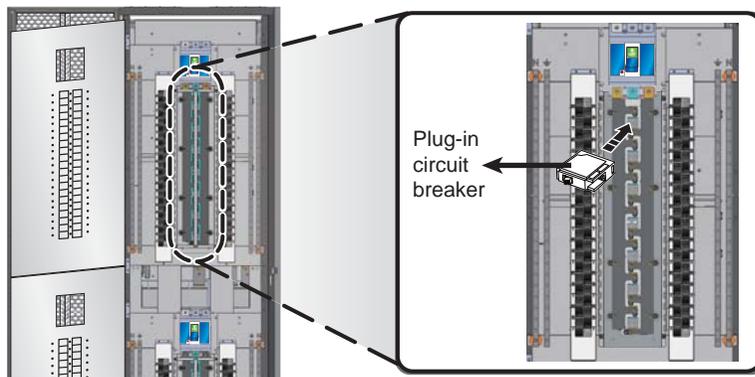
1. **Plug-in circuit breaker:**

1 Please remove the four screws on the fixed bar, and then remove the fixed bar.



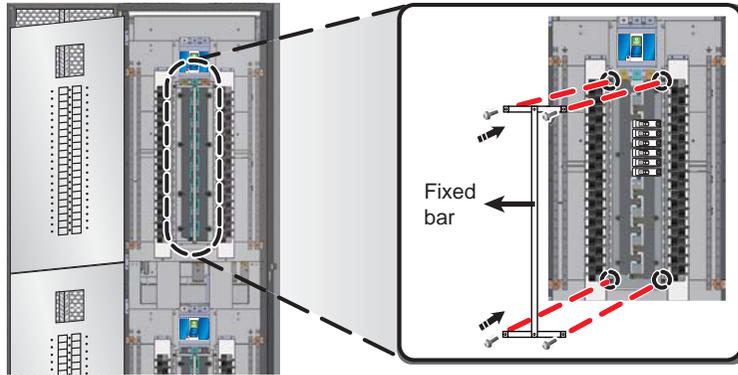
(Figure 3-15: Remove the fixed bar)

2 Insert the plug-in circuit breaker directly into the switchboard.



(Figure 3-16: Install the plug-in circuit breaker)

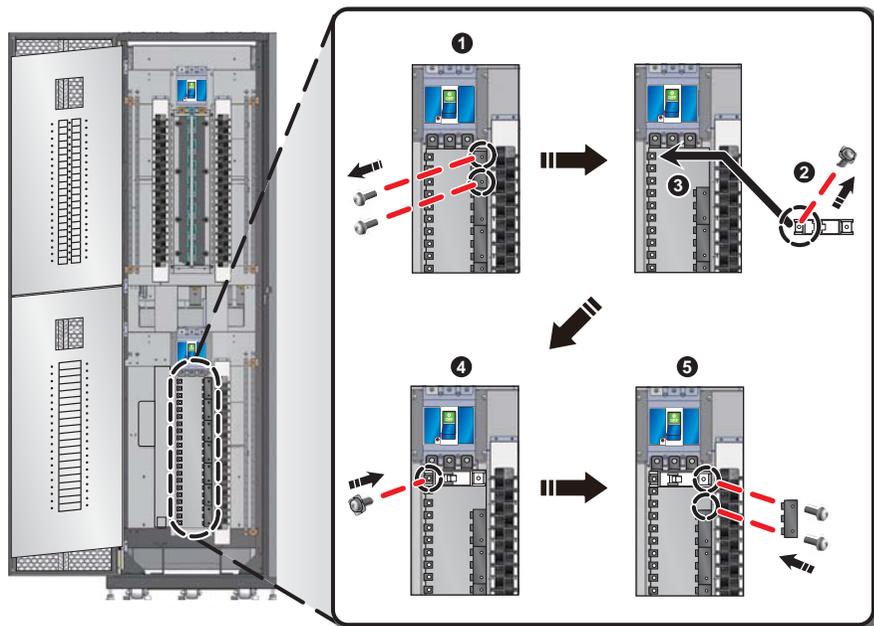
3 When you finish installing all plug-in circuit breakers, please re-lock the fixed bar.



(Figure 3-17: Lock the fixed bar)

## 2. Fixed circuit breaker:

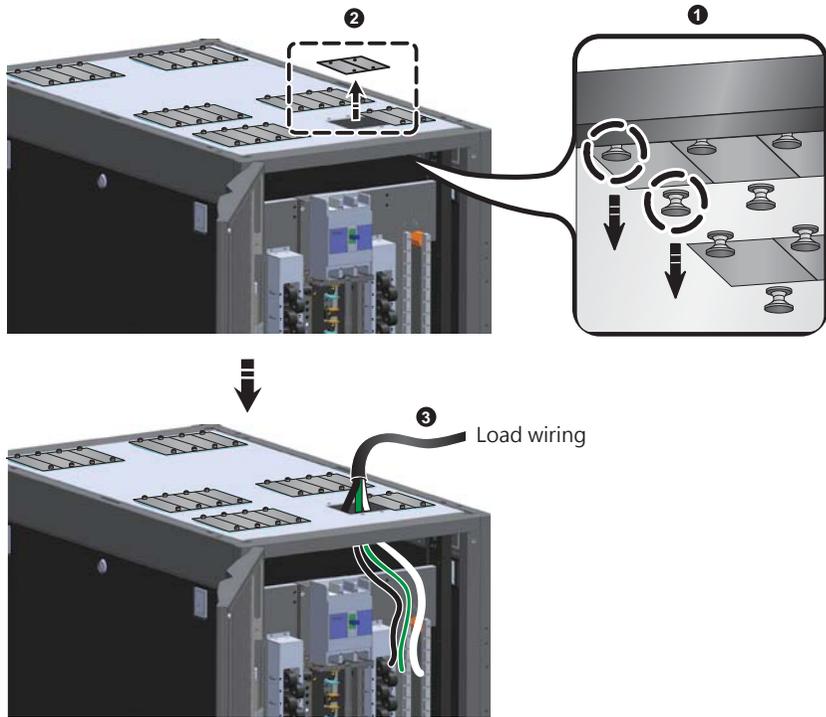
① Please loosen the two screws and remove the fixed plate first, ② then loosen and remove the screw on the circuit breaker. ③ Insert the circuit breaker into the switchboard, ④ and then lock the removed screw to secure it. ⑤ Finally lock back the fixed plate.



(Figure 3-18: Install the fixed circuit breaker)

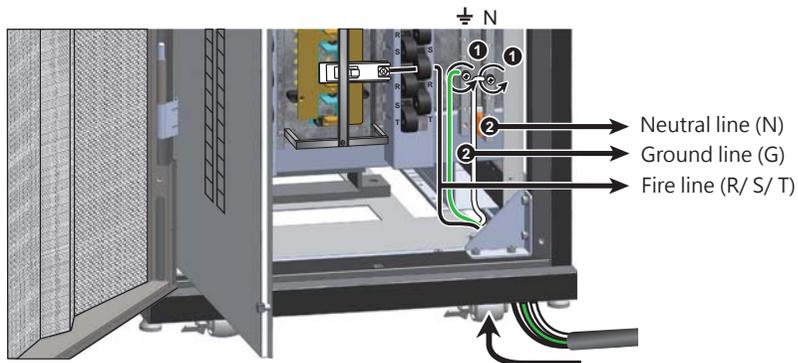
③ Based on wire incoming positions on the cabinet, there are two wire incoming methods, i.e., Top-down method and Bottom-up method.

- 1. Top-down wiring:**
  - 1** Please pull down the buttons at both ends of the wire cover on the top of the cabinet.
  - 2** And take down the wire cover from the top.
  - 3** Pull the wiring into the cabinet from the top. Take out appropriate number of wire covers based on the number of wires.



(Figure 3-19: Pass the load wires from the upper side)

- 2. Lead the wires in from the bottom side:** Make the wires go through the reserved hole at the bottom.
  - 1** Use a screwdriver to loosen the screws,
  - 2** and fix the Grounding (G) and Neutral (N) Lines of the device to the neutral busbar and grounding busbar.



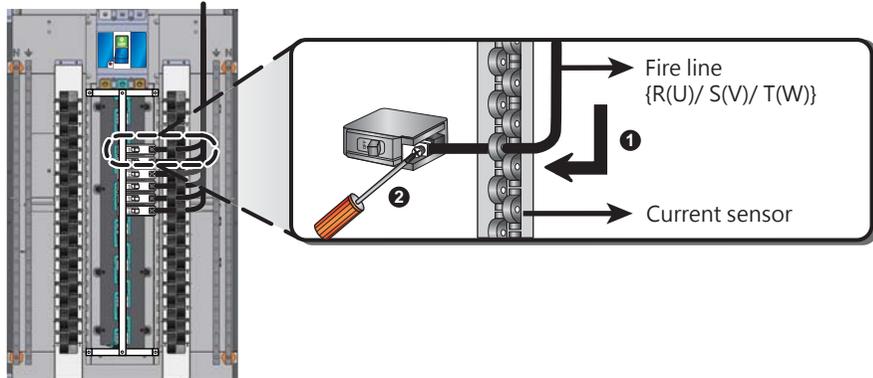
(Figure 3-20: Pass the load wires from the bottom)



**NOTE:**

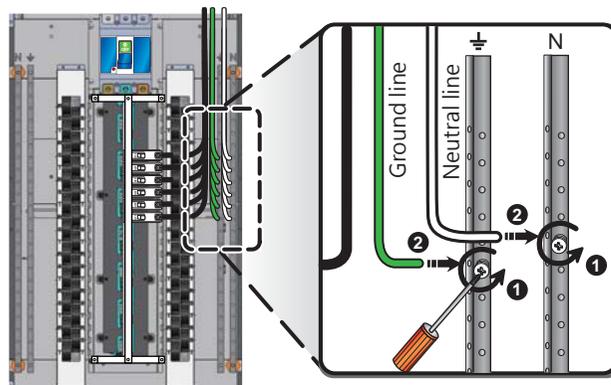
1. Please properly keep the detached wire covers for future use.
2. If you have removed the wire covers previously, please directly lead the wires in.

- 4 **1** Pass the output power line of the device through the current sensor, **2** and use a screwdriver to fix it on the wiring end of the circuit breaker.



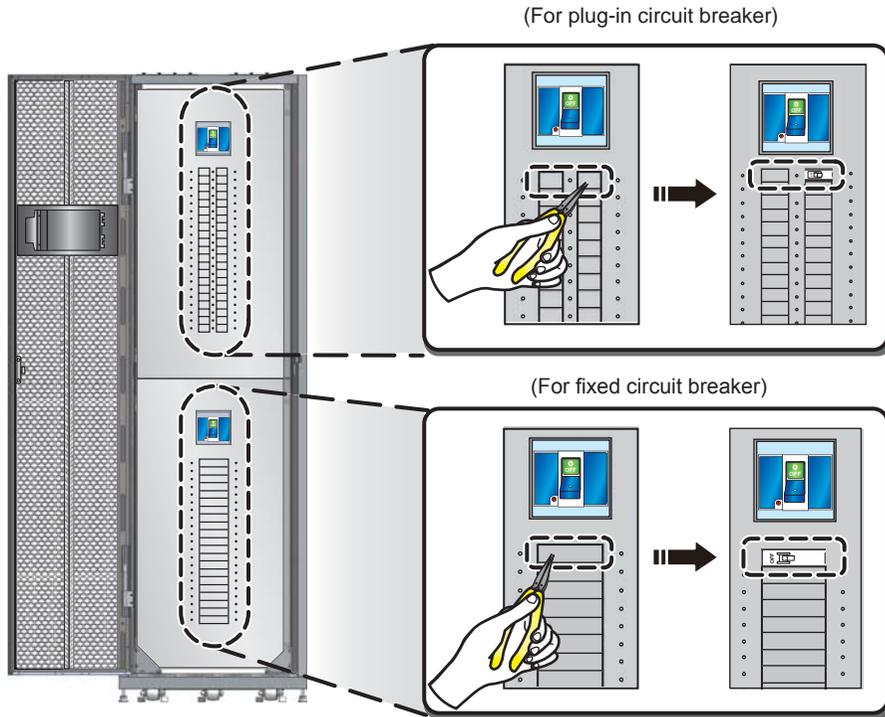
(Figure 3-21: Circuit breaker wiring)

- 5 **1** Use a screwdriver to loosen the screws, **2** and fix the Grounding (G) and Neutral (N) Lines of the device to the neutral busbar and grounding busbar.



(Figure 3-22: Connect the Neutral Line (N) and Grounding Line (G))

- 6 Use sharp-nose pliers to pull down the metal plate of the protective plate and now you can see the switch of the circuit breaker.



(Figure 3-23: Take down the metal plate of the protective plate)

- 7 After the circuit breaker installation and device wiring are completed, please close the protective door and lock back the loosened knobs.



**NOTE:**

If the circuit breaker is to be removed in the future, you can lock the cover provided in the accessories bag to the notch.

### 3.4.6 Emergency Power off Setting

#### Emergency Power Off (EPO) and Remote Emergency Power Off (REPO)

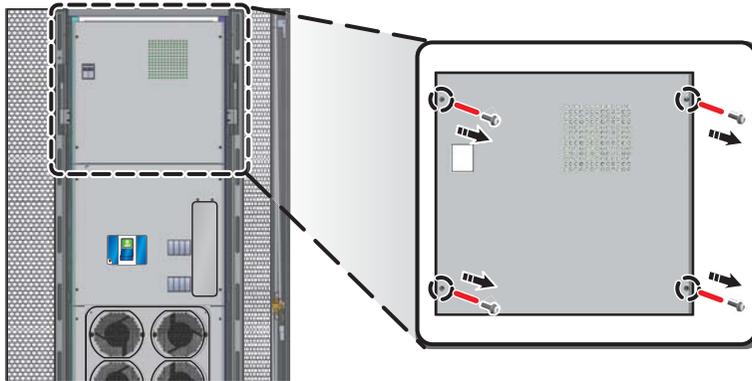
Through the CNM12 jumper on the circuit board, you can freely set whether you want to enable the EPO and REPO functions. When this function is enabled, press the EPO button on the control panel, or initiate the remote device connected via the communication interface REPO interfaces. Then the Power Distribution Cabinet will automatically cut off the input power for emergency power disconnection.

**WARNING:**

When the Power Distribution Cabinet leaves the factory, the DIP switches of the circuit board at the back have been adjusted according to your model. Without permission, do not make changes to settings not mentioned in this manual to avoid equipment damage.

Please follow the following steps in setting:

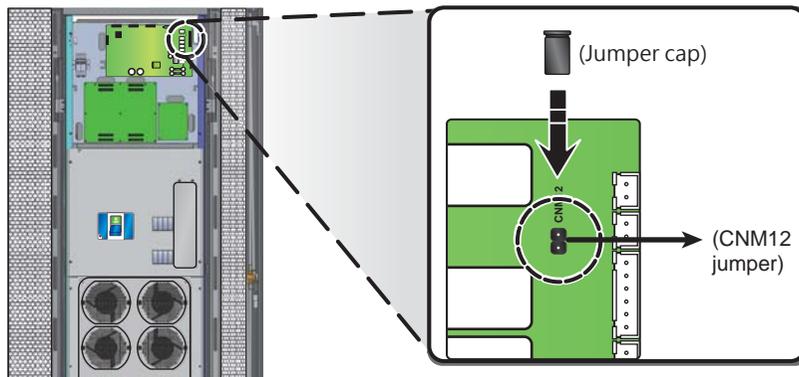
- 1 Open the back door. Use a screwdriver to remove the four screws and take down the protective plate.



(Figure 3-24: Remove the upper protective plate at the back)

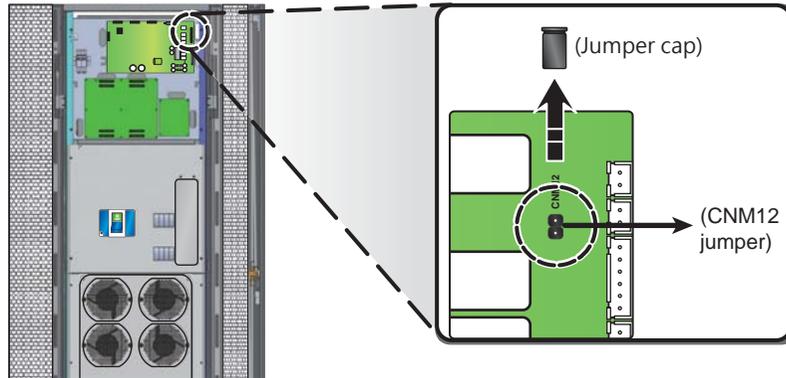
- 2 Find the CNM12 jumper on the upper right of the circuit board, and you can use it to set whether you want to enable the EPO function (the default is enabling the function).

1. **Jumper Connection:** Enable the EPO / REPO function.



(Figure 3-25: Start the EPO/REPO Function)

2. **Jumper Disconnection:** Close the EPO / REPO function.



(Figure 3-26: Close the EPO/REPO Function)

### 3.4.7 Automatic Power Off Mechanism (for models with a transformer)

The type with a transformer can enable the automatic power off mechanism that can automatically cut off the input power when it detects an abnormal state, and can even ensure the system and device safety in the case of unmanned monitoring. To modify the settings, please find JPM1 jumper on the circuit board at the back of the Power Distribution Cabinet and refer to the following startup events:

- A. Transformer temperature is too high (150°C)
- B. System over-temperature (default value is 40°C)
- C. Output phase of the switchboard overloaded

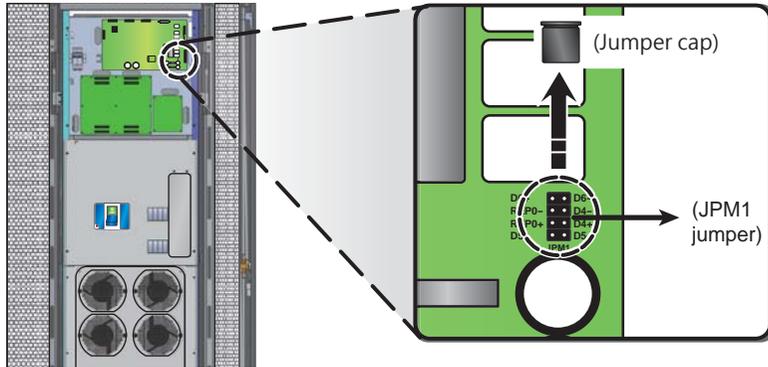


**NOTE:**

You can amend the default values of event B or C. Please refer to **6.7 System Functions**.

To activate the automatic power off mechanism, please take out the jumper cap from the accessories bag and set the jumper according to the startup events:

- No jumper connection: automatic power off mechanism off (default).



(Figure 3-27: Turn off the Automatic Power Off Mechanism.)

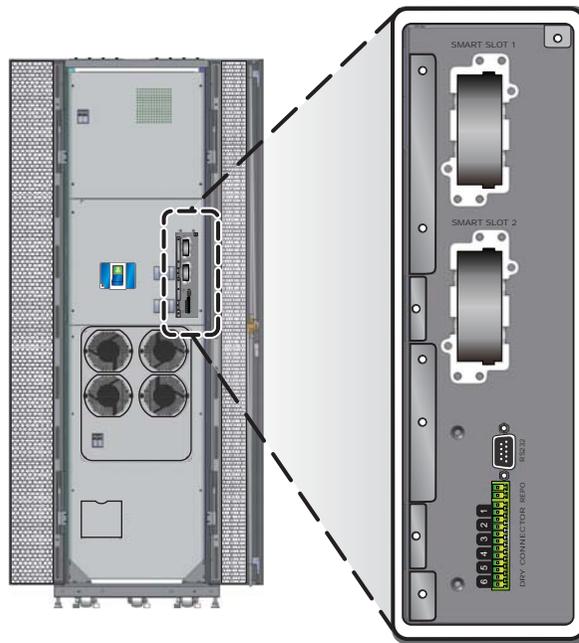
- Jumper connection event:

-  : Jumper connection.       : No jumper connection.

Illustration	Description
<p>D6+  D6-</p> <p>REP0-  D4-</p> <p>REP0+  D4+</p> <p>D5+  D5-</p> <p>JPM1</p>	<p>If event A occurs, then start: Transformer over-temperature.</p>
<p>D6+  D6-</p> <p>REP0-  D4-</p> <p>REP0+  D4+</p> <p>D5+  D5-</p> <p>JPM1</p>	<p>If events A, B and C occur simultaneously, then start: transformer over-temperature, system over-temperature and output phase of the switchboard overloaded.</p>
<p>D6+  D6-</p> <p>REP0-  D4-</p> <p>REP0+  D4+</p> <p>D5+  D5-</p> <p>JPM1</p>	<p>If events A and B occur simultaneously, then start: transformer over-temperature and system over-temperature.</p>

Illustration	Description
<p>D6+    D6-          REP0-    D4-          REP0+    D4+          D5+    D5-          JPM1</p>	<p>If events A and C occur simultaneously, then start: transformer over-temperature and output phase of the switchboard overloaded.</p>

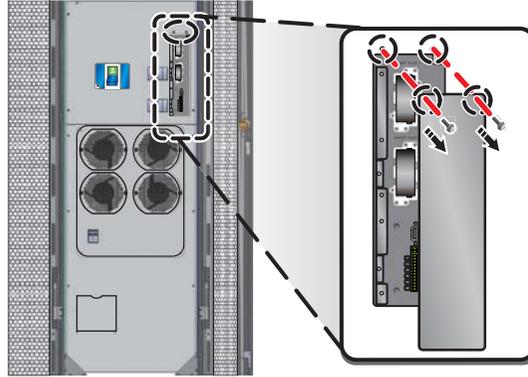
### 3.4.8 Communication Interfaces



(Figure 3-28: Communication Interfaces)

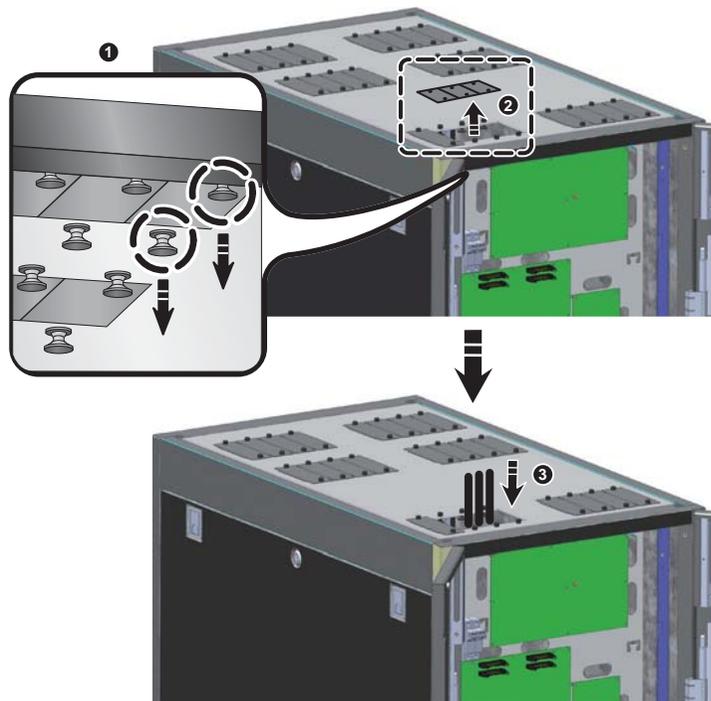
There are two built-in smart slots, an RS232 interface, a set of REPO interface and six sets of dry contact device interfaces inside the Power Distribution Cabinet. To connect the device, please follow the following steps:

- 1 Open the back door. Use a screwdriver to remove the two screws and take away the communication interface cover as shown in the figure.



(Figure 3-29: Remove the Communication Interface Cover)

- 2 Please use the upward incoming wiring. ① Pull down the buttons at both ends of the wire cover on the top of the cabinet, ② and take down the wire cover from the top. ③ Make the wires go into the cabinet and take down the appropriate number of wire covers based on the number of wires and keep them properly.



(Figure 3-30: Lead the Communication Wires in from the Upper Side)



**NOTE:**

1. Please properly keep the detached wire covers for future use.
2. If you have removed the wire covers previously, please directly lead the wires in.

• **Installation of Communication Card**

- The SNMP card can be installed in the smart slot to remotely monitor the Power Distribution Cabinet via the Ethernet. Insert the selected communication card into the slot and refer to the product instructions to connect proper wires and make relevant setting.

• **RS232 Interface**

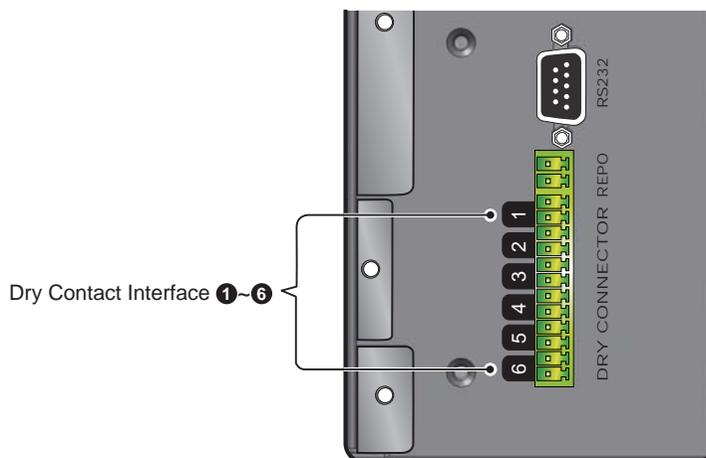
- If you want to connect a workstation via RS232 interface, please connect the additional RS232 communication line to this interface. The Power Distribution Cabinet can connect workstations via Modbus protocol. To download the protocol parameter table, please contact the service personnel or visit <http://www.delta.com.tw/>.

• **Remote Emergency Power Off (REPO) Interface**

- If you want to use the REPO function, please connect the remote control device via the REPO interface.

• **Dry Contact Interface**

- Please connect the dry contact devices such as alarms and switches via the DRY CONNECTOR interface. You can connect up to six devices.



*(Figure 3-31: Dry Contact Interface and Startup Events)*

- The following table is the list of default startup events of the dry contact interface 1~6. The dry contact device will be activated (contact closure) if the relevant event occurs.

No.	Startup Event
①	The main input circuit breaker has tripped or has been disconnected.
②	The switchboard circuit breaker 1 has tripped or has been disconnected.
③	The switchboard circuit breaker 2 has tripped or has been disconnected.
④	The transformer temperature exceeds 150°C (applicable to models with a transformer) *
⑤	The system temperature is too high (default value is 40°C) *
⑥	Output phase is overloaded.

- \*You can change the default values via the control panel. Please refer to **6.7 System Functions**.
- After completing the above connection, please use a screwdriver to lock back the communication interface cover.

**NOTE:**

To purchase optional accessories, please contact your local dealer or customer service.

## Chapter 4: Initial Start-up



### WARNING:

Only qualified service personnel can perform the following operation! High voltage in the cabinet can be fatal. Please use safety devices (such as: insulating gloves and shoes), and carefully follow the steps below.



### NOTE:

1. When initially starting up the Power Distribution Cabinet or re-running it after it has not been used for a long time, please ask a qualified maintenance worker to perform a detailed safety check and monitor the start-up procedures.
2. If you have any question or need assistance during the start-up, please contact your local dealer or customer service.
3. If the side panels, protective doors and protective plates are removed during the installation process, please install them back to the original places.

Before starting the Power Distribution Cabinet, please make sure to perform the following safety checks to ensure proper operation of the device and personnel safety.

#### • External Check

- 1. There are no damages in the appearance of the cabinet.
- 2. There is proper clearance scope surrounding the cabinet. (Please refer to **3.2 Clearance Scope**)

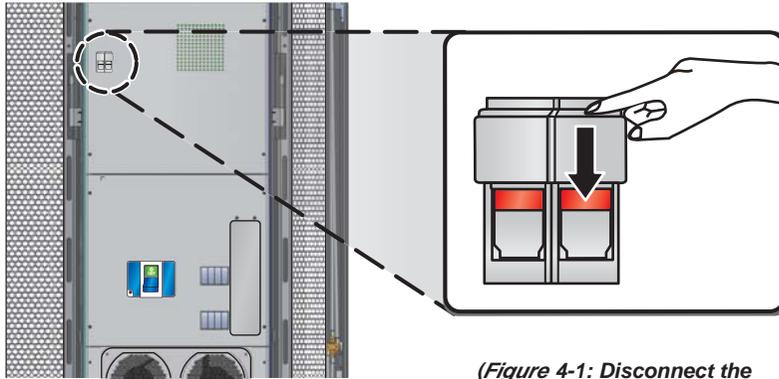
#### • Internal Check

- 1. Open the front door, back door, protective doors and protective plates, then check whether there are damages in the wires and each connection.
- 2. Check whether the internal components or wires are loose, if so, please tighten them.
- 3. Remove any foreign objects not belonging to the Power Distribution Cabinet.
- 4. Check whether the vents or fans (models with transformers) are blocked.

After the wiring and pre-startup checks mentioned above are completed, it is ready for initial startup, Please follow the following steps:

- ① Confirm that input power is off (not energized).
- ② Confirm the switches of the main input circuit breaker, the switchboard circuit breaker and the branch circuit breaker are in the position of **OFF**.

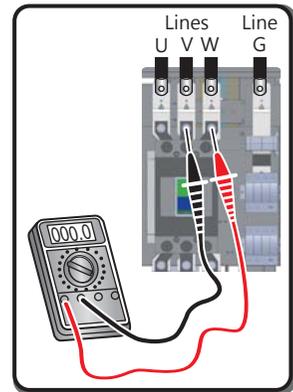
- 3 Disconnect the power fuse holder at the back as shown in the figure below.



(Figure 4-1: Disconnect the Power Fuse Holder)

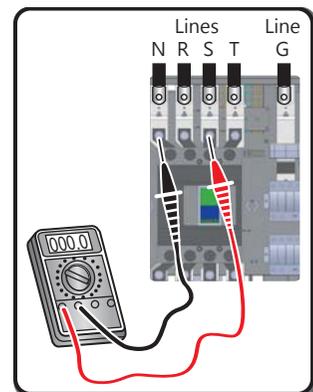
- 4 Turn on the input power (energized).

- 5 When installing the three-phase three-wire model with a transformer, please use a multimeter to check whether the line voltages of UV, VW and WU are within the normal range of input line voltage (based on the model you have ordered, please refer to **2.2 Product Model**). If not within the normal range, please check the input power.



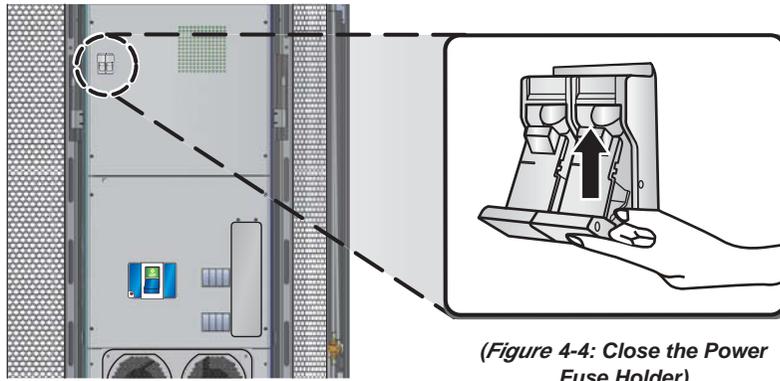
(Figure 4-2: Measure the Input Line Voltage on the Three-phase Three-wire Model)

- 6 When installing the three-phase four-wire model with a transformer, please use a multimeter to check whether the phase voltages of RN, SN and TN are within the normal range of input phase voltage (based on the model you have ordered, please refer to **2.2 Product Model**) and whether the grounding lines are firmly connected. If not within the normal range, please check the input power.



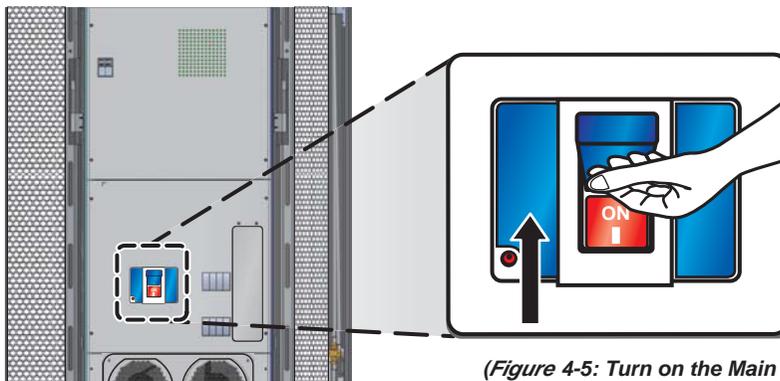
(Figure 4-3: Measure the Input Line Voltage on the Three-phase Four-wire Model)

- 7 After confirming the input phase voltage is normal, turn off the switch of the power fuse holder at the back of the cabinet as shown in the figure below.



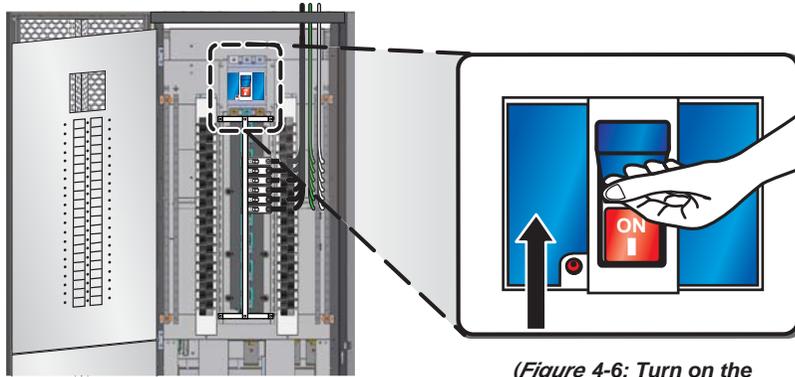
(Figure 4-4: Close the Power Fuse Holder)

- 8 Switch the main input circuit breaker at the back of the cabinet to the position of **ON**. If your Power Distribution Cabinet is equipped with a transformer, please check the output phase and line voltage via the control panel. And based on the model you have ordered (please refer to **2.2 Product Model**) to see whether the output voltage after transformation is normal.



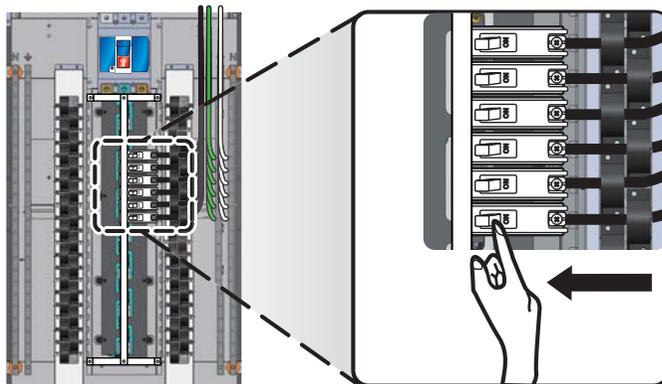
(Figure 4-5: Turn on the Main Input Circuit Breaker)

- 9 Switch the switchboard breaker inside the Power Distribution Cabinet to the position of **ON**.



(Figure 4-6: Turn on the Switchboard Circuit Breaker)

- 10 Switch each branch circuit breaker to the **ON** position.



(Figure 4-7: Turn on each Branch Circuit Breaker)

- 11 Please refer to **6.5 Initial Setting** and **6.6 Alarm Function Setting** to set the system parameters.
- 12 To ensure safety, before maintenance or replacement, please make sure to follow the steps of **5.2 Shut Down the Power Distribution Cabinet** for shutdown.

# Chapter 5: Start-up and Shutdown

This chapter will explain how to start up and shut down:

- Power Distribution Cabinet
- EPO Function
- REPO Function
- Fans (in the model equipped with a transformer)

## 5.1 Start up the Power Distribution Cabinet

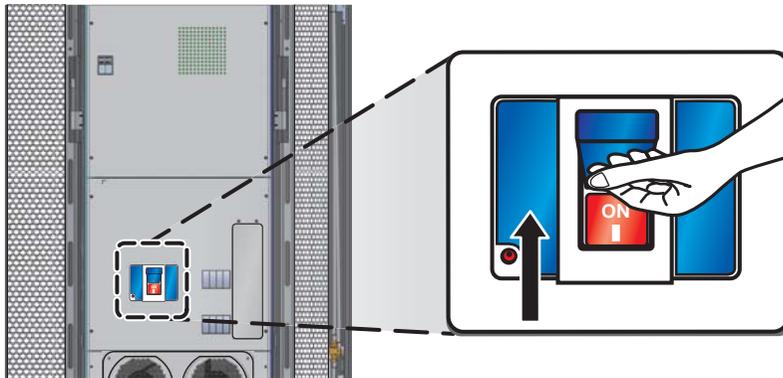


### NOTE:

The following start-up steps apply only to the Power Distribution Cabinet that has been running normally. If this is the initial start-up after you have completed the installation, please make sure to refer to **Chapter 4: Initial Start-up** first.

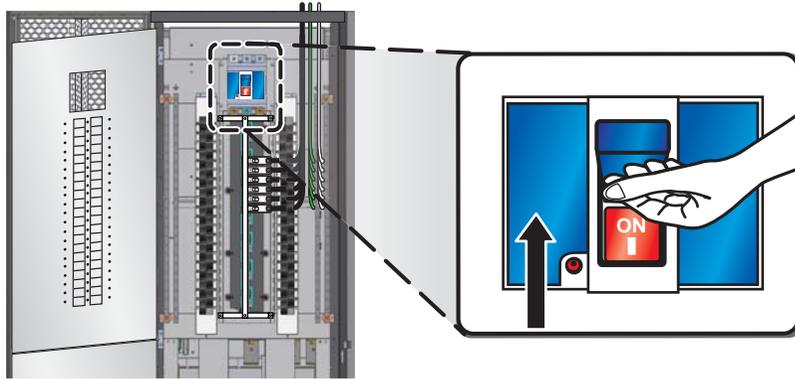
Please start up the Power Distribution Cabinet in accordance with the following steps:

- 1 Switch the main input circuit breaker at the back of the cabinet to the **ON** position. If your Power Distribution Cabinet is equipped with a transformer, please check the input and output voltage through the control panel (please refer to **6.7.2 Check the System, Input and Output Data**). Then please check whether the fans work normally. Please refer to **6.7.7 Test the Buzzer, LEDs and Fans**.



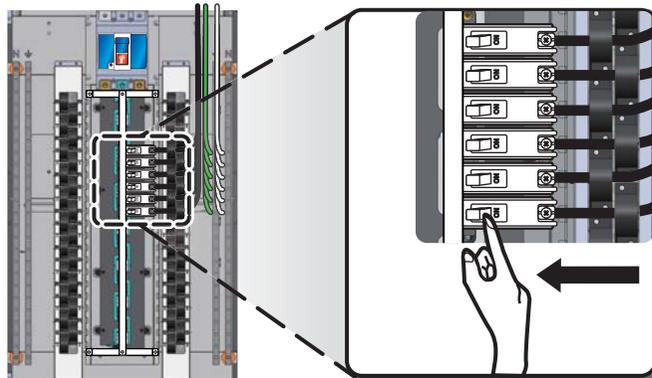
(Figure 5-1: Turn on the Main Input Circuit Breaker)

- 2 Switch each switchboard circuit breaker to the **ON** position.



(Figure 5-2: Turn on Each Switchboard Circuit Breaker)

- 3 Switch each branch circuit breaker to the **ON** position.

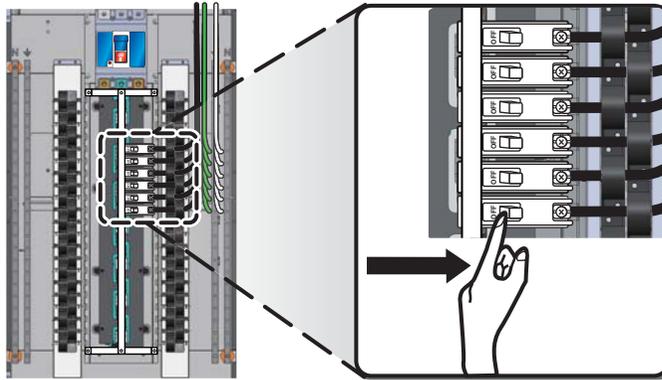


(Figure 5-3: Turn on Each Branch Circuit Breaker)

## 5.2 Shut Down the Power Distribution Cabinet

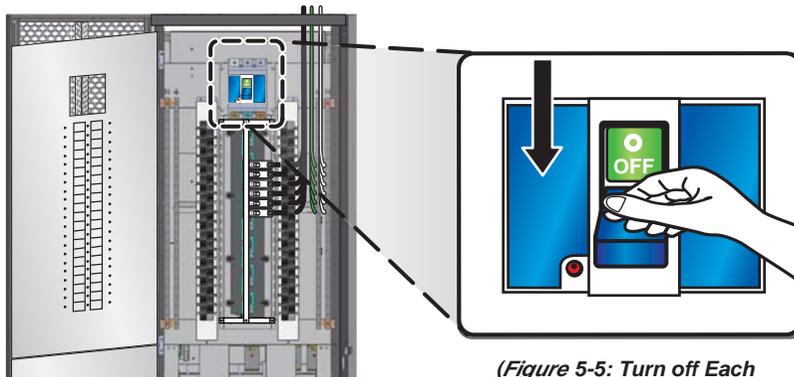
To shut down, store, maintain the Power Distribution Cabinet or replace components, you must correctly shut down the cabinet to ensure that your device is not damaged or the data are not lost due to power disconnection. Please follow the following steps:

- 1 If there is data storage function in the device connected through the circuit breaker, please make sure to confirm that the document is saved, and then shut down the device after confirmation.
- 2 Switch each branch circuit breaker in the cabinet to the **OFF** position.



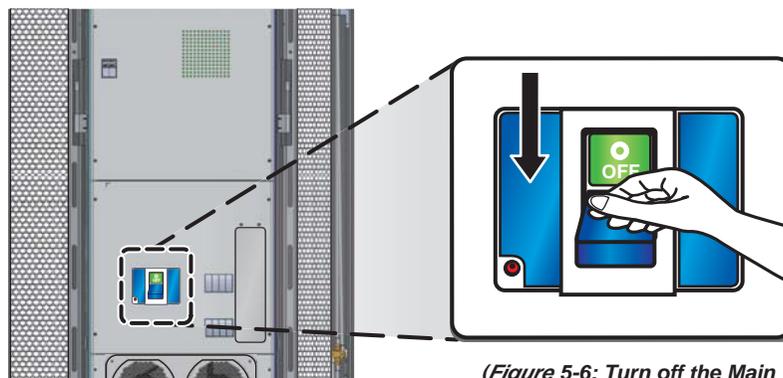
(Figure 5-4: Turn off Each Branch Circuit Breaker)

- 3 Switch each switchboard circuit breaker in the cabinet to the **OFF** position.



(Figure 5-5: Turn off Each Switchboard Circuit Breaker)

- 4 Switch the main input circuit breaker to the **OFF** position.

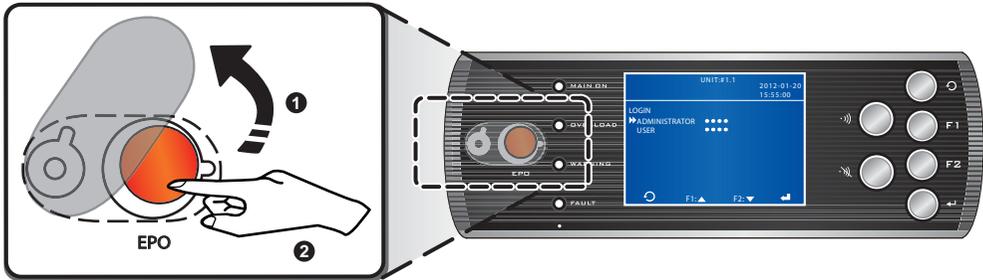


(Figure 5-6: Turn off the Main Input Circuit Breaker)

## 5.3 EPO Function

If you need to immediately shut down the Power Distribution Cabinet in case of emergency, please follow the following steps:

- 1 Please open the plastic cover of the **EPO** button on the control panel.
- 2 Press the **EPO** button, then the main input circuit breaker will trip and stop all switch-board output.



(Figure 5-7: Activate EPO Function)

- 3 Press again the **EPO** button, and it will revert to its normal operating condition.

## 5.4 REPO Function



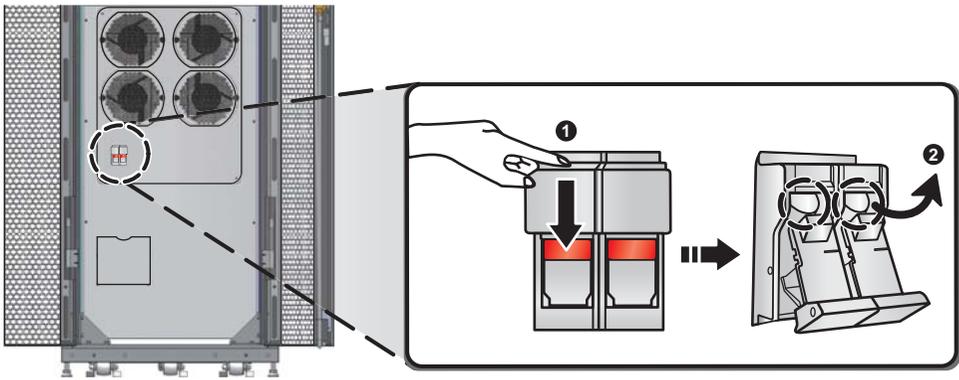
### NOTE:

You must first use the REPO contacts inside the communication interfaces to connect to the remote device for remote shutdown, please see **3.4.8 Communication Interfaces**.

In case of emergency, you must shut down the Power Distribution Cabinet using the REPO Function. Please activate the switch of the remote device, then the main input circuit breaker will trip and stop all switchboard output. Triggering the switch again will make the Power Distribution Cabinet revert to its normal operating condition.

## 5.5 Fans

If your Power Distribution Cabinet is the model with a transformer, there are fans equipped at the back of the cabinet to reduce the system temperature. Turning off the fans may cause the system temperature increase. Unless you need to maintain, clean them or replace the components (such as fuses), please do not open any fan fuse holder. To check whether the fans works normally, please refer to **6.7.7 Test the Buzzer, LEDs and Fans**. If the fuse holder lights are flashing, it indicates that the fuses are abnormal and need to be replaced. ❶ Please pull out the fan fuse holder ❷ and replace fuses as shown in the following figure.



(Figure 5-8: Replace the Fan Fuses)

## Chapter 6: Operation

This chapter explains how to operate, interpret LED indicators, conduct initial setting and set the Power Distribution Cabinet.

The LCD monitor of the Power Distribution Cabinet can display the current system status and event logs, and allows you to set and view parameters. If the back light is not lit, pressing any button will activate it. On the initial status screen, you can view the system date and time as well as the switch-board circuit breaker status. The recycling numbers shown within the parentheses **⏪ PRESS ⏩ TO BROWSE EVENT (004)** represent the code of occurring event. Pressing **F1** or **F2** will access the alarm records. On the status screen, pressing **⏪** will enter the main menu screen. If idling for more than five minutes, the LCD monitor back light will automatically turn off.



### NOTE:

The LCD monitor supports multi-language display. If you want to change the display language, please see **6.7.6 Change the Display Language**.

The following table shows the instructions of the LED indicators and buttons.



(Figure 6-1: Control Panel)

## 6.1 LED Indicators and Buttons

No.	Panel Mark	Function	Description
1	MAIN ON	Power Indicator	<ol style="list-style-type: none"> <li>1. Light up (green): system in operation.</li> <li>2. Dark: The system is not started. If with an alarm every second, it indicates one of the following situations occurs:               <ol style="list-style-type: none"> <li>1) Main input voltage value is abnormal</li> <li>2) Main input voltage frequency is abnormal</li> <li>3) Phase input current THD (total harmonic distortion) is too high</li> </ol> </li> </ol>
2	OVER-LOAD	Overload Indicator	<ol style="list-style-type: none"> <li>1. Light up (orange): The system is overloaded. If with an alarm every second, it indicates one of the following situations occurs:               <ol style="list-style-type: none"> <li>1) Phase output is overloaded</li> <li>2) Output neutral line current is too high</li> <li>3) Switchboard line current is overloaded</li> <li>4) Switchboard neutral line current is too high</li> <li>5) Switchboard branch circuit current is too high.</li> <li>6) Phase input is overloaded</li> <li>7) Input neutral line is overloaded</li> <li>8) System is overloaded</li> </ol> </li> <li>2. Dark: System load is normal</li> </ol>
3	WARNING	Abnormal condition Indicator	<ol style="list-style-type: none"> <li>1. Light up (orange): When the abnormal condition indicator lights up, it will be accompanied with alarms. The following explains the system statuses represented by different warnings:               <ol style="list-style-type: none"> <li>1) Alarming every three seconds indicates one of the following situations occurs:                   <ul style="list-style-type: none"> <li>* Phase input current is high</li> <li>* Phase output current is high</li> <li>* Switchboard phase current is high</li> <li>* The fans are abnormal</li> <li>* Transformer high temperature alarm (above 125°C)</li> </ul> </li> </ol> </li> </ol>

No.	Panel Mark	Function	Description
3	WARNING	Abnormal condition Indicator	<p>2) Alarming every second indicates one of the following situations occurs:</p> <ul style="list-style-type: none"> <li>* System temperature is too high</li> <li>* Output voltage is abnormal</li> <li>* Phase output power factor is too low</li> <li>* Phase output current or voltage THD is too high</li> <li>* Switchboard phase power factor is too low</li> <li>* Switchboard phase current THD is too high</li> </ul> <p>2. Dark: System is normal.</p>
4	FAULT	Internal Abnormal Condition Indicator	<p>1. Light up (red): When the internal abnormal condition indicator lights up, it will be accompanied with alarms. The following explains the system statuses represented by different warnings:</p> <p>1) Alarming every half second indicates one of the following situations occurs:</p> <ul style="list-style-type: none"> <li>* Input voltage phase loss</li> <li>* Input voltage is unbalanced</li> <li>* Grounding current is too high</li> <li>* Transformer temperature is too high (above 150°C)</li> </ul> <p>2) Alarming continuously indicates one of the following situations occurs:</p> <ul style="list-style-type: none"> <li>* Digital Signal Processor (DSP) communication is abnormal</li> <li>* Control panel communication is abnormal</li> <li>* EPO or REPO function is initiated</li> <li>* Memory is abnormal</li> </ul> <p>2. Dark: System is normal</p>
5		ESC key	Goes back to the previous screen or cancels current selection.
6	F1	Function key F1	Previous screen / cursor up / cursor left / value increase
7	F2	Function key F2	Next screen / cursor down / cursor right / value decrease

No.	Panel Mark	Function	Description
8		Enter key	Enters into the selected option, menu or confirms current setting.
9		Buzzer ON button	Enables the buzzer.
10		Buzzer OFF button	Disables the buzzer.
11	EPO	EPO button	Pressing this button will disconnect the main circuit breaker and cut off the loads.



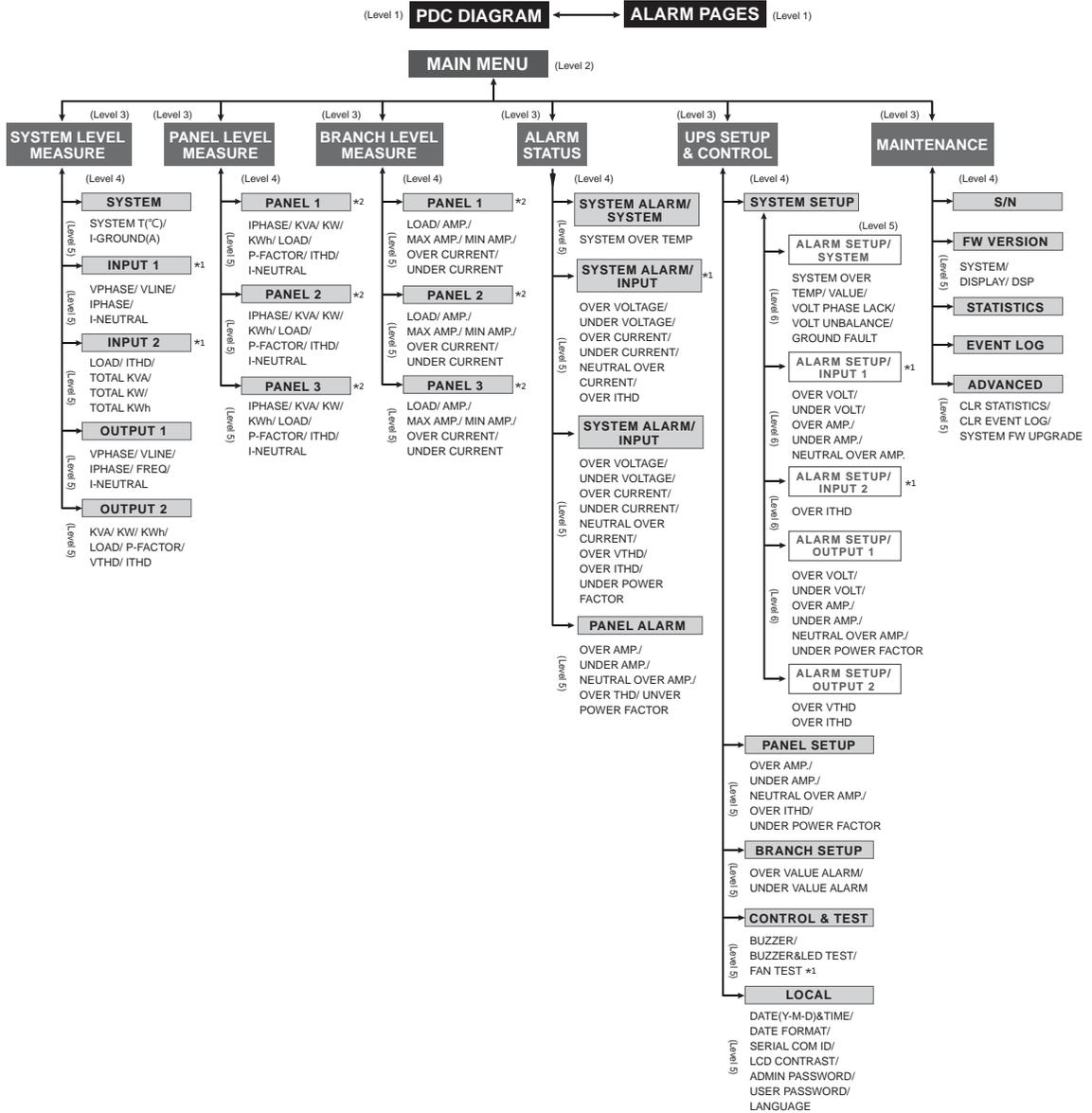
**NOTE:**

Please refer to **Chapter 8: Troubleshooting** to solve problems. If you have any questions, please contact your local dealer or customer service.

## 6.2 Icon Description

No.	Symbol	Description
1	F1: ▲	Cursor up
2	F2: ▼	Cursor down
3	F1: ◀	Cursor to the left
4	F2: ▶	Cursor to the right
5	F1: +	Number increase
6	F2: -	Number decrease
7		Goes back to the previous screen or cancels current selection.
8		Goes to the next screen/ column or confirms current selection.
9		When this symbol occurs, it means that you can change your selected item's setting.
10		The circuit breaker is in the <b>OFF</b> status.
11		The circuit breaker is in the <b>ON</b> status.
12		AC input

## 6.3 Menu Navigation



(Figure 6-2: LCD Monitor Function Menu Navigation)



**NOTE:**

- \*1: Only applicable to the model installed with a transformer.
- \*2: The number of the switchboard varies depending on the model.

## 6.4 Account Permissions and Login

The Power Distribution Cabinet will distribute permissions according to different accounts. The User can set the **date and time**, **date format**, **LCD contrast**, **user password** and **language**. Other settings can only be viewed but not changed. The administrator is authorized to change all the settings.

When you want to modify the settings, but you have not logged in or do not have sufficient permissions (for example, log in as the user but modify settings beyond permissions), the login screen will appear. If five minutes has passed after the last modification, you must re-login.

In the login page, use **F1** or **F2** to select the login account, and select **↵** to confirm. **The administrator password** and **the user password** include four numbers (default password is 0000). Use **F1** or **F2** to select the first number, and then press **↵** to select the next number. After inputting all numbers, press **↵** to confirm.

If the password is wrong, the system will automatically jump back to the original screen. Please repeat the above steps to re-sign in and enter the correct password.

## 6.5 Initial Settings

We recommend that after wiring, you set the **date**, **time** and **password** immediately. In the status screen, please press **↵** to go to the Main Menu. Use **F1** or **F2** to select **UPS Setup & Control**, and then press **↵** to confirm. Press **F1** or **F2** to select **Local**, and then press **↵** to confirm. Use **F1** or **F2** to select **Date & Time**, and then press **↵** to confirm.



### NOTE:

If this is the first time to modify settings after start-up, you must first select the login account and enter the password to continue. For login, please refer to **6.4 Account Permission and Login**.



After login, go to the **Local** page. When the cursor becomes **✎**, it means that you can modify the parameters. Please use **F1** or **F2** to set the values, and then press **↵** to jump to the next

column. After that, please press  to confirm.



After date modification is completed, to protect the system, please continue to change the password. Use **F1** or **F2** to select **Admin Password** or **User Password**, then press  and use **F1** or **F2** to select numbers. Press  to jump to the next number. After inputting all numbers, please press  to confirm. Please note that in order to prevent password leakage, even if the default password has been changed, the screen still shows 0000.

Next, please set **Serial COM ID** in accordance with the position of the Power Distribution Cabinet in the sequence. Use **F1** or **F2** to select **Serial COM ID**. Press  and use **F1** or **F2** to select numbers (1~9). Then press  to confirm.

If you need to adjust **LCD contrast**, please use **F1** or **F2** to select **LCD Contrast**. Press  and use **F1** or **F2** to adjust the contrast ratio (1~9). Then press  to confirm.

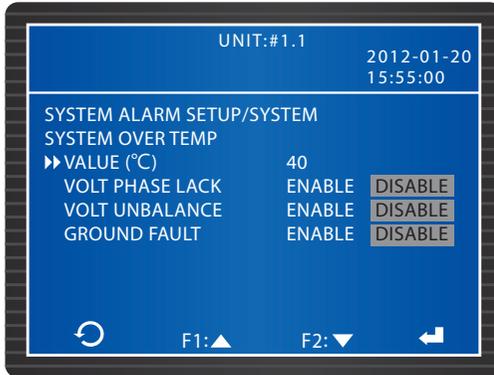
## 6.6 Alarm Function Settings

To make the Power Distribution Cabinet play its monitoring alarm role, you must set each alarm value for the system, switchboards and branches and set the alarming switches. When the system detects abnormal conditions, it will alert the user through the buzzer, and record in the alarm log.

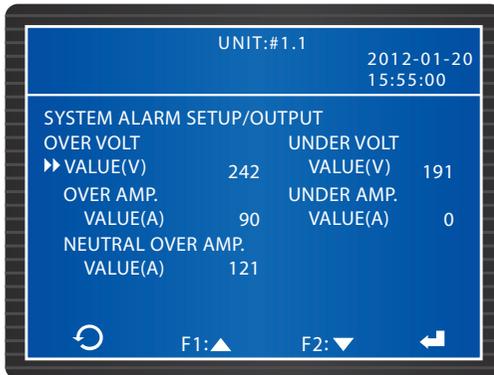
### 6.6.1 System Alarm Settings

- ① In the Main Menu, please select **UPS Setup & Control** → **System Setup** → **Alarm Setup/System**. After that, please set the **System Over-temperature Value**, **Voltage Phase Lack**, **Voltage Unbalance** and **Ground Fault**.

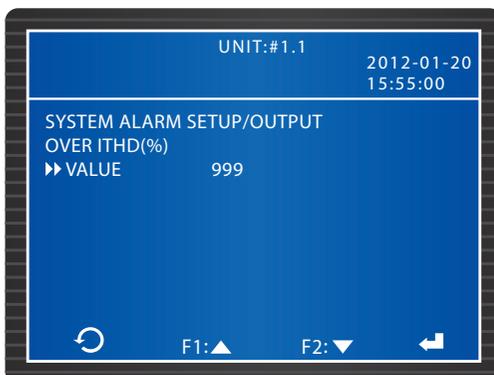
(If your Power Distribution Cabinet is the model with a transformer, please go to ②. If your Power Distribution Cabinet is the model without a transformer, please skip ② and ③, and directly go to ④.)



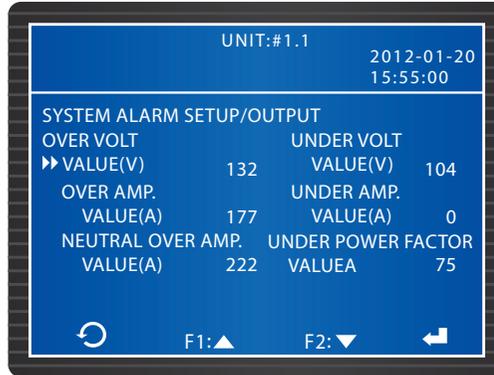
- 2) After finishing the settings, please go back to the previous page and select **Alarm Setup/Input 1**. After that, please set the **over voltage value, under voltage value, over ampere value, under ampere value** and **neutral over ampere value**.



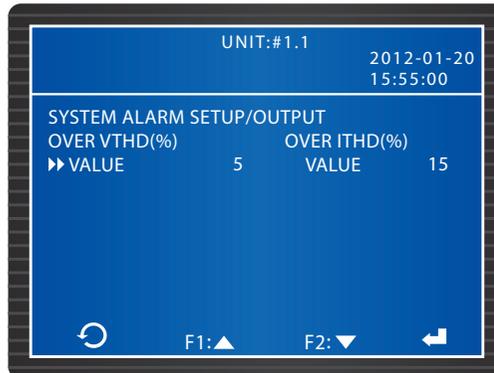
- 3) Please return to the **System Setup** page, and select **Alarm Setup/ Input 2**. After that, please set the **ITHD** value.



- 4 After finishing the setting, please press  go back to the previous page and select **Alarm Setup/Output 1**. After that, please set the **over voltage value**, **under voltage value**, **over ampere value**, **under ampere value**, **neutral over ampere value** and **under power factor value**.

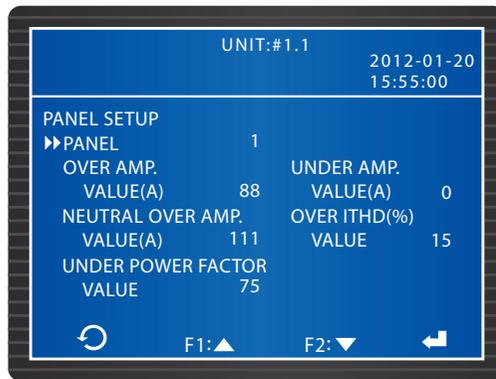


- 5 After finishing the settings, please go back to the previous page and select **Alarm Setup/Output 2**. After that, please set the **over VTHD value** and **over ITHD value**.



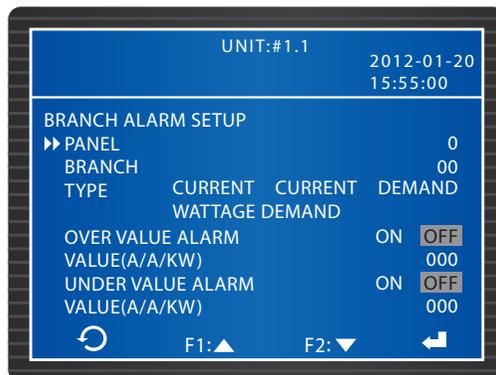
## 6.6.2 Switchboard Alarm Settings

Please go to **Main Menu → UPS Setup & Control → Panel Setup**, then go to the **Panel** column to select the number of the switchboard that you would like to set (1/2/3, depending on the configurations of your Power Distribution Cabinet). Set the **over ampere value**, **under ampere value**, **neutral over ampere value**, **over ITHD value** and **under power factor value** for each switchboard.



## 6.6.3 Branch Alarm Set-up

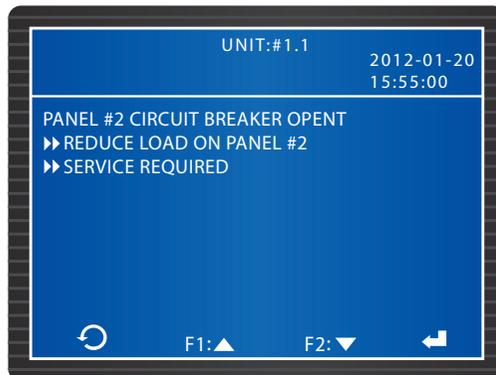
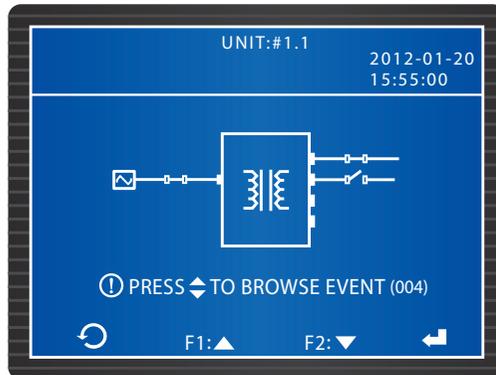
Please go to **Main Menu → UPS Setup & Control → Branch Setup** then go to the **Panel** to select the number of the switchboard that you would like to set (1/ 2/ 3, depending on the configurations of your Power Distribution Cabinet). Use the **Branch** to select the number of the circuit breaker that you would like to set (1~42, depending on your configurations). According to the type and rating of each circuit breaker that you use, set the relevant **type**, **over value alarm** and **value (A/ A/ KW)**, **under value alarm** and **value (A/ A/ KW)**.



## 6.7 System Functions

### 6.7.1 Check the Alarm Page

To view the alarm page, please press **F1** or **F2** in the status screen, then the recycling alarm logs will appear on the LCD monitor. If the system idles for 60 seconds or  is pressed, it will return to the status screen.



## 6.7.2 Check the System, Input and Output Data

Please go to **Main Menu** → **System Level Measure** to select the items that you would like to check. After that, press **F1** or **F2** to switch the **System**, **Input** and **Output** data pages.

UNIT:# 1.1		2012-01-20 15:55:00	
SYSTEM			
SYSTEM T(°C)	29.6		
I-GROUND(A)	0.0		

UNIT:# 1.1		2012-01-20 15:55:00		
OUTPUT				
	L1-N/L2	L2-N/L3	L3-N/L1	
VPHASE(V)	120.0	120.3	118.9	
VLINE(V)	208.0	207.1	206.8	
IPHASE(A)	25.4	25.2	25.6	
FREQ (Hz)	59.9			
I-NEUTRAL(A)	0.0			

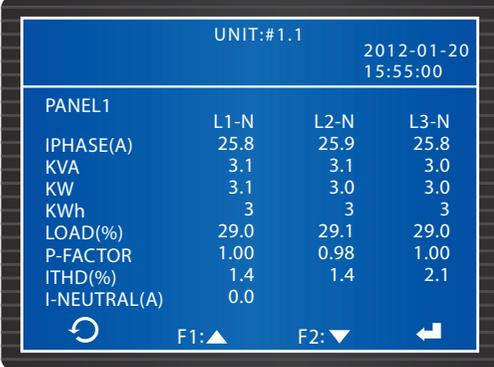
UNIT:# 1.1		2012-01-20 15:55:00		
INPUT				
	L1-N/L2	L2-N/L3	L3-N/L1	
VPHASE(V)	217.6	218.1	215.2	
VLINE(V)	376.9	377.9	372.8	
IPHASE(A)	14.8	14.4	14.8	
I-NEUTRAL(A)	0.0			

UNIT:# 1.1		2012-01-20 15:55:00		
OUTPUT				
	L1-N	L2-N	L3-N	
KVA	3.0	3.0	3.0	
KW	3.0	3.0	3.0	
KWh	3	3	1.4	
LOAD(%)	14.1	14.1	14.4	
P-FACTOR	1.00	1.00	1.00	
VTHD(%)	2.1	2.2	2.8	
ITHD(%)	1.4	1.5	2.1	

UNIT:# 1.1		2012-01-20 15:55:00		
INPUT				
	L1-N	L2-N	L3-N	
LOAD(%)	16.3	15.8	16.3	
ITHD(%)	0.9	1.0	1.3	
TOTAL KVA	9.5			
TOTAL KW	9.4			
TOTAL KWh	80			

### 6.7.3 Check the Switchboard Data

Please go to the **Main Menu** → **Panel Level Measure**. After that, press **F1** or **F2** to switch the displayed pages.

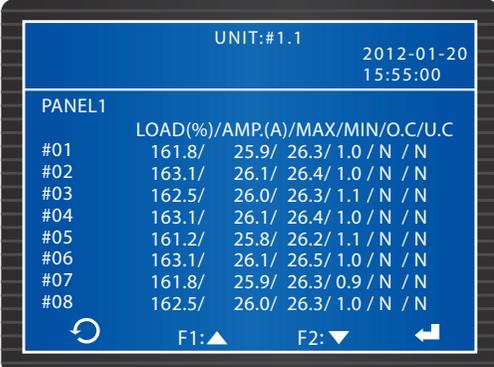


UNIT:#1.1		2012-01-20 15:55:00	
PANEL1			
	L1-N	L2-N	L3-N
IPHASE(A)	25.8	25.9	25.8
KVA	3.1	3.1	3.0
KW	3.1	3.0	3.0
KWh	3	3	3
LOAD(%)	29.0	29.1	29.0
P-FACTOR	1.00	0.98	1.00
ITHD(%)	1.4	1.4	2.1
I-NEUTRAL(A)	0.0		

Navigation icons: Refresh, F1:▲, F2:▼, Back

### 6.7.4 Check the Branch Level Data

Please go to **Main Menu** → **Branch Level Measure**. After that, press **F1** or **F2** to switch the displayed pages.

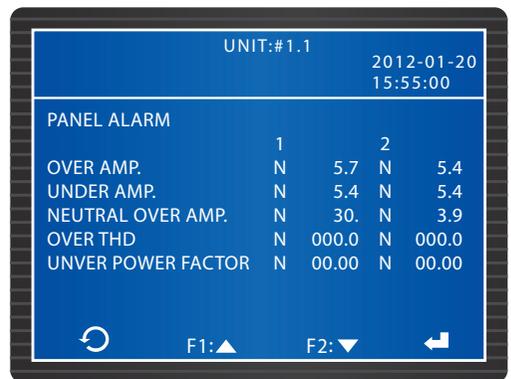
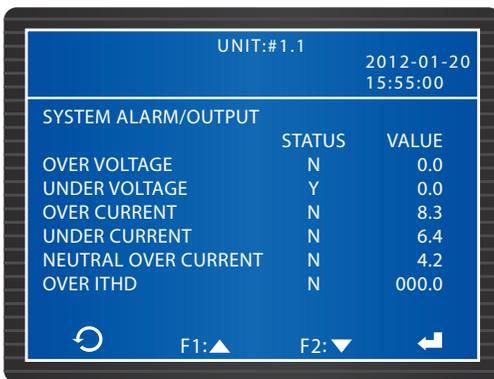
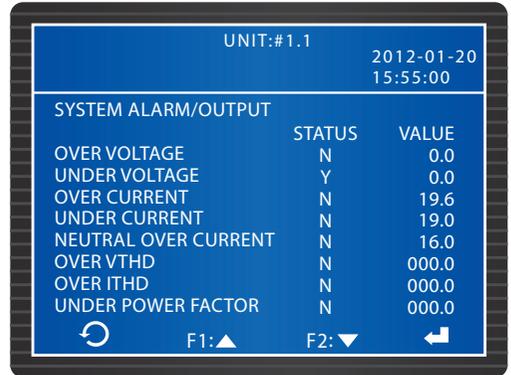
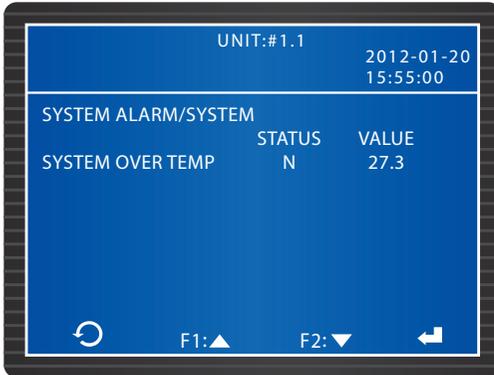


UNIT:#1.1		2012-01-20 15:55:00	
PANEL1			
	LOAD(%) / AMP(A) / MAX / MIN / O.C / U.C		
#01	161.8/	25.9/	26.3/ 1.0 / N / N
#02	163.1/	26.1/	26.4/ 1.0 / N / N
#03	162.5/	26.0/	26.3/ 1.1 / N / N
#04	163.1/	26.1/	26.4/ 1.0 / N / N
#05	161.2/	25.8/	26.2/ 1.1 / N / N
#06	163.1/	26.1/	26.5/ 1.0 / N / N
#07	161.8/	25.9/	26.3/ 0.9 / N / N
#08	162.5/	26.0/	26.3/ 1.0 / N / N

Navigation icons: Refresh, F1:▲, F2:▼, Back

### 6.7.5 Check the Alarm Status

Please go to **Main Menu** → **Alarm Status**, and you can check the statuses of the **System Alarm**, **Input** (model with a transformer), **Output** and **Panel Alarm**.



### 6.7.6 Change the Display Language

Please go to **Main Menu** → **UPS Setup & Control** → **Local** → **Language**, then press **↩**. After that, the cursor will become **✎** and you can specify the display language.



### 6.7.7 Test the Buzzer, LEDs and Fans

On the control panel, press **•))** button to activate the buzzer alarm function, or use the **•))** button to disable it. You can also go to **Main Menu → UPS Setup & Control → Control & Test → Buzzer** to set the buzzer alarm. To test whether the buzzer works normally, select **Buzzer & LED Test**, and then press **←** to confirm. The four alarm indicators on the control panel will light up automatically and the buzzer will also sound to test whether it works normally. To test the fans, please select **Fan Test**, and then select **←** to confirm.



#### NOTE:

1. Only if you install the model with a transformer, the fan test option will appear.
2. If an abnormal condition happens during the test, please refer to **Chapter 8: Troubleshooting**. If you have any questions, please contact your local dealer or customer service.

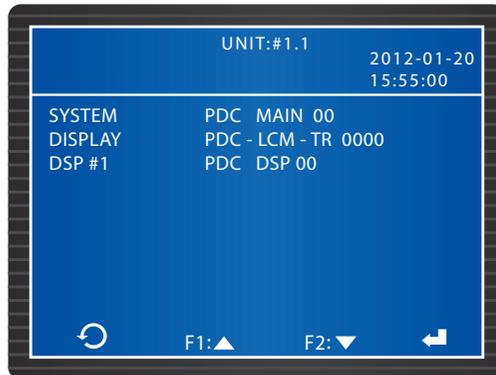
## 6.7.8 Check the Firmware Version

Please go to **Main Menu Maintenance**, and then select **Firmware (FW) Version**. The screen shows the firmware version for the **system**, **display** and **DSP** respectively.



### NOTE:

If you want to upgrade the firmware, please contact your local dealer or customer service.



## 6.7.9 Check the Event Log

Please go to **Main Menu → Maintenance**, and then select **Event Log**. The number, event occurrence time, date and description are recorded in each event. Please use **F1** or **F2** to scroll the pages.



### 6.7.10 Clear Statistical Data and Event Log

Please go to **Main Menu** → **Maintenance** → **Advanced**, then select **Clear Statistics** or **Clear Event Log**, and then click **←**.



### 6.7.11 Restart the Display Panel

There is a restart button on the control panel. In case of the LCD display error, you can use this button to restart. It is located below the Fault indicator. Please insert the tip of a pin into the hole and restart the display panel.



(Figure 6-3: Display Panel Restart Button)



**NOTE:** Restarting the display panel will not affect the saved settings.

# Chapter 7: Maintenance

## 7.1 Regular Maintenance



**WARNING:**

1. Danger! When the Power Distribution Cabinet is in normal operation, the high voltage in the cabinet may be fatal! Only qualified service personnel can carry out maintenance.
2. Before performing any maintenance, please disconnect the power.

In order to maintain the normal operation of the Power Distribution Cabinet, please periodically check whether the electrical contacts are normally solid, the heat dissipation hole is well-ventilated, the fans work normally and there is no foreign object or dust accumulating inside the cabinet. Clean the Power Distribution Cabinet regularly, especially the air vents, and make sure that the air flows freely inside the cabinet. If necessary, use an air gun to clean to ensure there is nothing blocking ventilation.

The following table is the recommended check schedule and inspection items.

Checking Time	Checking Item
24 hours after installation	<ol style="list-style-type: none"><li>1. Whether the connection of each electronic component is solid.</li><li>2. Whether the fans work normally.</li></ol>
30 days after installation	<ol style="list-style-type: none"><li>1. Whether the connection of each electronic component is solid.</li><li>2. Whether the fans work normally.</li></ol>
Every six months	<ol style="list-style-type: none"><li>1. Whether the connection of each electronic component is solid.</li><li>2. Whether the fans work normally.</li><li>3. Remove dust and check whether the air vents dissipate heat well.</li></ol>

Checking Time	Checking Item
Every twelve months	<ol style="list-style-type: none"> <li>1. Whether there is any damage on the front, back, side and top of the cabinet.</li> <li>2. If the adjustable levelling feet and rolling wheels at the bottom of the cabinet are intact and work normally without trouble.</li> <li>3. Open the front and back doors, the protective doors and the protective plates and carefully check whether the parts inside the cabinet are damaged or defective.</li> <li>4. Check whether the internal components (including each circuit breaker and each wiring terminal) are loose. Tighten them if necessary.</li> <li>5. Whether the fans work normally.</li> <li>6. Remove dust and check whether the air vents and the protective plates dissipate heat well.</li> <li>7. Remove any foreign objects not belonging to the inner cabinet.</li> </ol>

If you have any questions, please contact your local dealer or customer service.

## 7.2 Replace or Maintain Components

If internal components such as fuses, circuit breakers and wires are aging or broken down and needed to be replaced, please ask qualified service personnel to conduct the replacement, or contact your local dealer or customer service.

## 7.3 Storage

If you want to store the Power Distribution Cabinet which you do not use temporarily, it is recommended that you use the original packing material to cover the cabinet and put it in a place where temperature and humidity can be well-controlled (-20°C ~ 40°C, RH 90%) and there are no corrosive substances, dust accumulation and pollutants (for environmental specifications, please see **Appendix A: Technical Specifications**). Do not make the Power Distribution Cabinet upside down or lie horizontally, or pile up sundries inside or above the cabinet.

## Chapter 8: Troubleshooting

The following explains the possible causes and solutions of abnormal conditions. If you have any questions or need assistance, please contact your local dealer or customer service immediately.

### System Troubleshooting:

No.	Abnormal Status	Possible Cause	Solution
1	The fuse holder light is flashing	Fuse failure	Please replace the fuses.
2	Alarm event occurs but the buzzer does not sound	The buzzer is not working or turned off.	Use the buzzer button on the control panel to start the buzzer, or refer to <b>6.7.7 Test the Buzzer, LEDs and Fans</b> to carry out test and start-up.
3	LCD monitor does not light up.	The fuse is abnormal.	Please replace the power switch fuse of the monitoring system.
4	RS232 Communication is abnormal.	RS232 communication cable is in poor connection or the system is in poor grounding.	Check the RS232 communication wiring or confirm the system is in normal grounding.
5	The fans are abnormal.	The fan fuses are abnormal. Foreign objects and dust hinder the operation of the blades, or the fans go wrong.	Check the fan fuses and clean the fans. Replace them if the fans fail and refer to <b>6.7.7 Test the Buzzer, LEDs and Fans</b> to test the fans.
6	Abnormal power failure	Output short circuit, overload, automatic power off mechanism is started, or the circuit breaker goes wrong.	Check the load wires, total loads' capacity, the status of each circuit breaker and automatic power off setting (see <b>3.4.7 Automatic Power Off Mechanism</b> ). If the main circuit breaker or the switchboard circuit breaker goes wrong, please replace it.
7	The main circuit breaker cannot be started.	Emergency power off or the automatic power off mechanism hasn't been restored.	Restore the emergency power off button, turn off the remote emergency shutdown device, or eliminate the abnormal status of the automatic power off mechanism. Please see <b>3.4.7 Automatic Power Off Mechanism</b> .

No.	Abnormal Status	Possible Cause	Solution
8	No power supply for parts of the loads	The branch circuit breakers are not started; output short circuit or overload exists; or the branch circuit breakers fail.	Check whether the output wiring is short-circuited. Re-plan load distribution and reduce the output loads. If the branch circuit breakers go wrong, please replace them.

**LCD monitor error message:**

No.	Message	Possible cause	Solution
1	MAINS INPUT VOLTAGE ABNORMAL	Input voltage is abnormal or input wiring is wrong.	Please check the main input voltage.
2	MAINS OUTPUT FREQUENCY OUT OF RANGE	Input wiring is wrong.	Please check input wiring.
3	PHASE #n INPUT CURRENT THD HIGH	System power quality is abnormal.	Please check the loads.
4	MAIN CIRCUIT BREAKER OPEN	The main input circuit breaker trips due to overload or has not yet started.	Please reduce the loads of the system and notify service personnel as soon as possible.
5	PANEL #n CIRCUIT BREAKER OPEN	The #n Switchboard trips due to overload or has not yet started.	Please reduce the loads of the switchboard and notify service personnel as soon as possible.
6	TRANSFORMER TEMP HIGH WARNING	Transformer temperature is higher than 125°C.	Please reduce the loads and check whether the fans operate normally.
7	TRANSFORMER OVER TEMP	Transformer temperature is higher than 150°C.	Please reduce the loads and check whether the fans operate normally.
8	AMBIENT OVER HEAT	Room temperature is too high; ventilation is blocked or the fans are abnormal.	Please adjust the indoor air conditioner temperature and check whether there is a proper clearance around the PDC. If the PDC is equipped with a transformer, please check whether the fans operate normally.

No.	Message	Possible cause	Solution
9	INPUT POWER ABNORMAL	The input voltage exceeds the rated value, or there is input wiring phase loss or the input voltage is unbalanced.	Please notify service personnel as soon as possible.
10	SECONDARY GROUND CURRENT HIGH	The chassis is live with a risk of current leakage!	Please notify service personnel as soon as possible.
11	EMERGENCY OFF	Emergency power off or remote emergency power off starts.	After troubleshooting, press the EPO button again or turn off the remote emergency power off device.
12	DSP #n INNER COMMUNICATION FAIL	DSP chip is abnormal.	Please notify service personnel as soon as possible.
13	LCM COMMUNICATION LOSS	LCM module is abnormal.	Please notify service personnel as soon as possible.
14	FRAM ABNORMAL	FRAM is abnormal.	Please notify service personnel as soon as possible.
15	OUTPUT VOLTAGE ABNORMAL	The output voltage exceeds the rated value.	Please check the system loads.
16	PHASE #n OUTPUT CURRENT HIGH	Phase #n is overloaded.	Please reduce the phase #n loads.
17	PHASE #n CURRENT IS OVER LIMIT	Phase #n is overloaded.	Please reduce the phase #n loads.
18	PHASE #n iTHD OR vTHD HIGH	System power quality is abnormal.	Please check the loads.
19	PHASE #n pf LOW	Fictitious power of the #n phase is too much.	Please check the loads.
20	TOTAL SECONDARY NEUTRAL CURRENT HIGH	Output three-phase loads are unbalanced or load THD is too high.	Please reduce the loads or reduce the load THD. If the problem persists, please notify service personnel.
21	PANEL #n PHASE #n CURRENT HIGH	Switchboard #n Phase #n is overloaded.	Please reduce the phase #n loads.

No.	Message	Possible cause	Solution
22	PANEL #n PHASE #n CURRENT OVER LIMIT	Switchboard #n Phase #n is overloaded.	Please reduce the phase #n loads.
23	PANEL #n PHASE #n iTHD HIGH	Switchboard #n Phase #n is overloaded.	Please check the loads.
24	PANEL #n PHASE #n pf LOW	Fictitious power of Switchboard #n Phase #n is too much.	Please check the loads.
25	PANEL #n NEUTRAL CURRENT HIGH	Switchboard #n three-phase loads are unbalanced.	Please reduce the Switchboard #n loads.
26	PANEL #n BRANCH #n CURRENT HIGH	Switchboard #n branch circuit breaker #n is overloaded.	Please reduce the branch circuit breaker #n loads.
27	SYSTEM OVERLOAD	The system loads exceed the allowable range.	Please reduce the loads and check the wiring.
28	PHASE #n INPUT CURRENT LOW	Phase #n loads are too low, or the switchboard circuit breaker has tripped.	Please check the phase #n loads and the wiring.
29	PHASE #n OUTPUT CURRENT LOW	Phase #n loads are too low, or the circuit breaker has tripped.	Please check the phase #n loads and the wiring.
30	PANEL #n PHASE #n CURRENT LOW	Switchboard #n phase #n loads are too low, or the circuit breaker has tripped.	Please check the loads and the wiring.
31	PANEL #n BRANCH #n CURRENT LOW	Switchboard #n branch circuit breaker #n loads are too low, or the circuit breaker has tripped.	Please reduce the branch circuit breaker #n loads and check the wiring.
32	PHASE #n INPUT CURRENT IS OVER LIMIT	Phase #n is overloaded.	Please reduce the phase #n loads.
33	PHASE #n INPUT CURRENT HIGH	Phase #n is overloaded.	Please reduce the phase #n loads.
34	FAN #n FAIL	The fan fuse is burned out or foreign objects and dust hinder the operation of the blades.	Please clean the fan and check the fan fuse.

# Appendix 1: Technical Specifications

Model		PDC
Capacity (kVA)		30, 50, 80, 100, 125
Number of Switchboard		1 ~ 3
Number of a Single Switchboard's Circuit Breaker		42 (plug-in) / 21 (fixed)
Input	Rated Voltage (Vac)	480/277, 400/230, 380/220, 208/120
	Voltage Range	± 15%
	Frequency	50/60± 3 Hz
	Phase	Three-phase Three-wire + G/ Three-phase Four-wire+ G
Output	Rated Voltage (Vac)	400/230, 380/220, 208/120
	Phase	Three-phase Four-wire+ G
	Switchboard Circuit Breaker	225A, 30kA (220V)
	Type of Circuit Breaker	Single-pole, double-pole and three-pole (plug-in: 15/20/30A; fixed: 40/50A)
	Type of Transformer (Optional)	H-type, K-1, K-13, K-20 @ 50/60 Hz
Interfaces	Monitor	4.9" LCD Monitor
	Communication Interfaces	Smart Slot x 2, RS232 port x 1, Dry Contact x 6, REPO x 1
Environment	Operating Temperature	0°C ~ 40°C (32°F ~ 104°F)
	Storage Temperature	-20°C ~ 40°C (-4°F ~ 104°F)
	Relative Humidity	< 90%
	Running Noise	< 70 dBA (measured in one meter)
	Running Height	0 ~ 3000 meters (0 ~ 10000 feet)
Appearance	Dimensions (W x D x H)	600 x 1090 x 2000 mm
	Weight	Without transformer: 225 kg
		With transformer: 475/545/645/725/795 kg for 30/50/80/100/125kVA respectively (Weight varies depending on optional accessories)



## NOTE:

1. Refer to the rating label for the safety rating.
2. All specifications are subject to change without prior notice.
3. The standard model's input/ output voltage is 220/380Vac.
4. Any model whose input/ output voltage is not 220/380Vac should be used together with a transformer, and such model must be customized and only available in Taiwan market.

## Appendix 2: Warranty

Seller warrants this product, if used in accordance with all applicable instructions, to be free from original defects in material and workmanship within the warranty period. If the product has any failure problem within the warranty period, Seller will repair or replace the product at its sole discretion according to the failure situation.

This warranty does not apply to normal wear or to damage resulting from improper installation, operation, usage, maintenance or irresistible force (i.e. war, fire, natural disaster, etc.), and this warranty also expressly excludes all incidental and consequential damages.

Maintenance service for a fee is provided for any damage out of the warranty period. If any maintenance is required, please directly contact the supplier or Seller.

**WARNING:**

The individual user should take care to determine prior to use whether the environment and the load characteristic are suitable, adequate or safe for the installation and the usage of this product. The User Manual must be carefully followed. Seller makes no representation or warranty as to the suitability or fitness of this product for any specific application.



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