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Delta Infrasuite Power Management

Rack-Mount Power Distribution Cabinet

User Manual

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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 Warnings

- Please read this user manual thoroughly before operating and maintaining the rack-mount PDC.
- To avoid injury and damage, please follow the instructions stated in the user manual and the labels attached to the rack-mount PDC to operate.
- Only qualified service personnel can perform maintenance. Do not perform maintenance yourself. Do not open or remove the cover of the rack-mount PDC to avoid high voltage electric shock.

1.2 Installation Warnings

- The rack-mount PDC is applicable to the DPH series 25~150kVA or 25~75kVA UPS. You can install at maximum two rack-mount PDCs into the 25~150kVA UPS and at maximum one rack-mount PDC into the 25~75kVA UPS
- Install the rack-mount PDC in a well-controlled indoor area, away from excess moisture, heat and dust and inaccessible for children.
- Leave adequate space around all sides of the rack-mount PDC for proper ventilation, operation and maintenance.
- To ensure reliable operation of the rack-mount PDC and to protect the rack-mount PDC from overheating, do not block or cover the rack-mount PDC's slits and openings. When wiring, do not block or cover the fan of the rack-mount PDC to hinder ventilation.

1.3 Usage Warnings

- Do not install and operate the rack-mount PDC in an area near humidity, water, gas and heat sources.
- For safety concerns and securing normal operation of the rack-mount PDC, ensure the power supply to the rack-mount PDC is completely cut off before installation and maintenance.
- Before usage, you must allow the rack-mount PDC to adjust to room temperature for at least one hour.
- For safety concerns, it is suggested that you install the 160A breaker in the input end of the rack-mount PDC.

- Proper heat dissipation ensures reliable operation of the rack-mount PDC. Please leave adequate space around all sides of the rack-mount PDC for proper ventilation.
- To avoid a possible risk of current leakage, the rack-mount PDC must be well grounded before connecting to the power.
- The risk of dangerous high voltage is possible when the rack-mount PDC is connected to the power. Please cut off the power when there is no need to use the rack-mount PDC.
- Before initial start-up of the rack-mount PDC or start-up of the rack-mount PDC after being idle for a period of time, qualified service personnel must check the rack-mount PDC thoroughly and check if the rack-mount PDC is grounded or not.
- You must contact qualified service personnel if either of the following events occur:
 1. Liquid is poured or splashed on the rack-mount PDC.
 2. The rack-mount PDC does not run normally after this user manual is carefully observed.

1.4 Storage Warnings

- **Before Installation**

If the rack-mount PDC needs to be stored prior to installation, it should be placed in a dry area. The allowable storage temperature is between $-20^{\circ}\text{C} \sim 40^{\circ}\text{C}$.

- **After Usage**

If the rack-mount PDC needs to be stored for a period of time after usage, please turn off all of its connected critical loads and cut off its input power (e.g. turn off the UPS). Please follow ***Delta UPS- Modulon Family DPH Series, Three Phase 25-150kVA/ 25-75kVA User Manual*** for the UPS's turn-off procedures. Please ensure that the UPS's Manual Bypass Breaker and Output Breaker are in the OFF position and the UPS is completely shutdown. After that, remove all of the critical loads connected to the rack-mount PDC and place the rack-mount PDC in a dry and ventilated area with the temperature between $-20^{\circ}\text{C} \sim 40^{\circ}\text{C}$.

1.5 Standard Compliance

- EN 62040-1

Chapter 2 : Product Introduction

2.1 General Overview

The rack-mount PDC is applicable to the DPH series 25-150kVA or 25-75kVA uninterruptible power supply (UPS). It has the flexibility to distribute its UPS's output power according to its connected critical loads and it provides excellent branch protection and branch monitoring functions.

The unit is composed of a 4U cabinet and a hot-swappable control module, and it can accommodate at maximum six hot-swappable breaker modules (optional). Each hot-swappable breaker module (optional; at maximum six) provides three-phase output.

The rack-mount PDC features good heat-stability, practicality and convenient installation and maintenance.

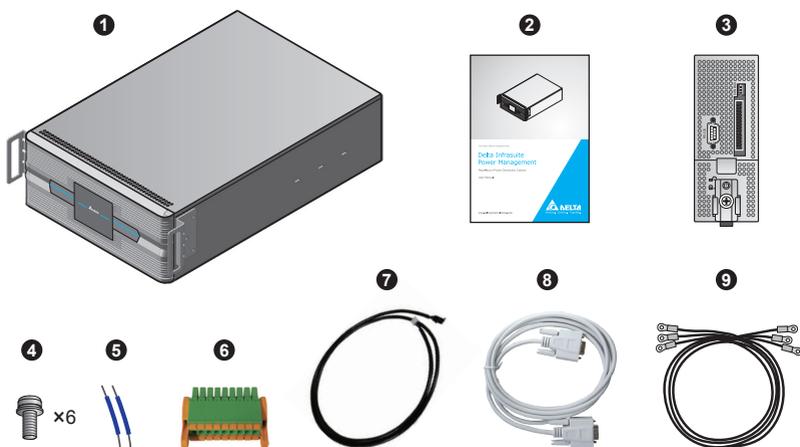
2.2 Package Inspection

- **External**

During rack-mount PDC transportation, some unpredictable situations might occur. It is recommended that you inspect its exterior packaging. If you notice any damage, please immediately contact the dealer from whom you purchased the unit.

- **External**

1. Check the rating label on the rack-mount PDC and make sure the device No. and capacity match what you ordered.
2. Examine if any parts are loose or damaged
3. The rack-mount PDC package includes the following items:



No.	Item	Q'ty
①	Rack-mount PDC	1 PC
②	User Manual	1 PC
③	Hot-swappable Control Module	1 PC
④	M6 Screws	6 PCS
⑤	Shorting Wire	2 PCS
⑥	Terminal Block	1 PC (18-Pin)
⑦	CAN Bus Cable	1 PC (1.1m)
⑧	RS-232 Cable	1 PC (1.8m)
⑨	Input Cable	1 SET

4. If there is any damage or anything missing, please immediately contact the dealer from whom you purchased the unit.
5. If the rack-mount PDC needs to be returned, carefully repack the rack-mount PDC and all of the accessories using the original packing material that came with the unit.

2.3 Functions & Features

Flexible Configurations

- Allows installation of at maximum six hot-swappable breaker modules (optional), which means that it can connect at maximum 18 branches.
- Supports SNMP IPv6 card.

High Reliability

- Detects any hot-swappable breaker module's branch current.
- Provides abnormal voltage and phase-lack alarms.
- Provides system and each branch's current monitoring and alarm functions.
- Intelligently judges the specifications of each hot-swappable breaker module (optional; at maximum six) installed.
- Intelligently judges if each latch is closed or open and each branch's status.

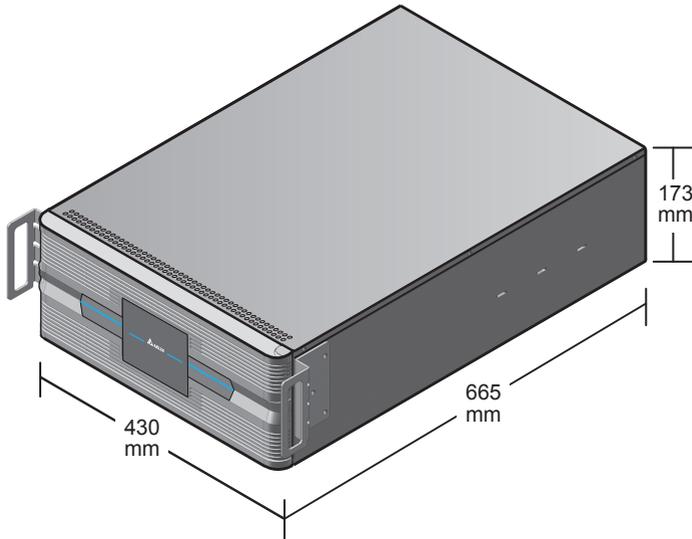
Multi-function

- Built-in RS-232 port and smart slot allow remote mentioning.
- Built-in CAN Bus port allows communication with the UPS.
- Records at maximum 2000 event logs.
- Provides 6 sets of output dry contacts.

Chapter 3 : Exterior & Mechanism

You can install at maximum one hot-swappable control module and at maximum six hot-swappable breaker modules (optional) in the rack-mount PDC. The hot-swappable control module is a standard accessory, which has been installed in the rack-mount PDC before the rack-mount PDC is shipped out of the factory. As for the hot-swappable breaker module, it is optional (at maximum six). The user can follow actual requirements to decide what type of rack-mount PDCs and how many of hot-swappable breaker modules (optional; at maximum six) should be installed. For information about the rack-mount PDC's dimensions, front panel and rear panel, please refer to the following.

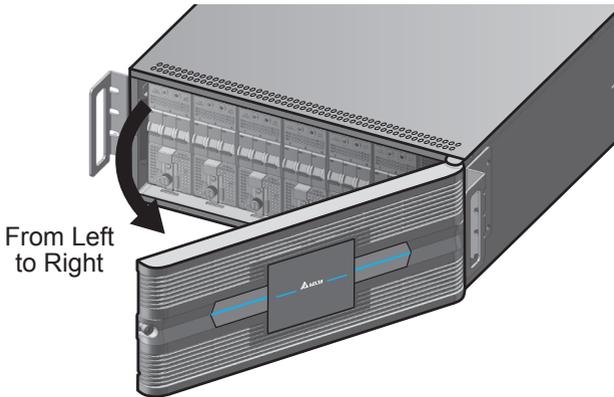
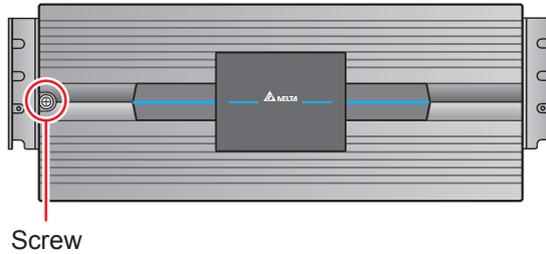
3.1 Dimensions



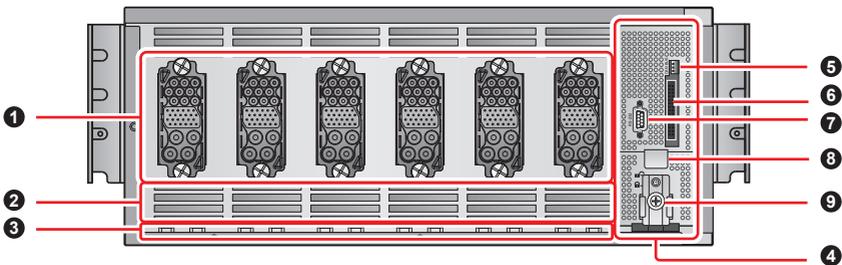
(Figure 3-1: Dimensions)

3.2 Front Panel

Loosen the screw shown in **Figure 3-2** to open the rack-mount PDC's front panel. After that, you can see the internal mechanism of the rack-mount PDC. Please refer to **Figure 3-3**.



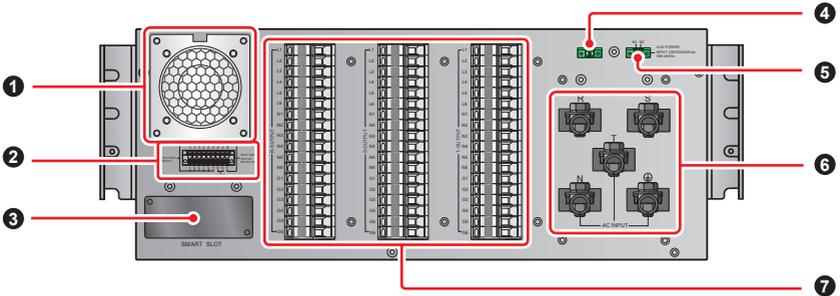
(Figure 3-2: Open the Front Panel)



(Figure 3-3: Internal Mechanism of the Rack-mount PDC (Front Panel))

No.	Item	Function
①	Connector (Total: 6)	Connects the hot-swappable breaker module (optional; at maximum six).
②	Vents	For ventilation.
③	Rails	Assist installation of the hot-swappable breaker module (optional; at maximum six) in the rack-mount PDC and connect with the relevant connector.
④	Hot-swappable control module	Monitors and controls the rack-mount PDC.
⑤	CAN Bus Port	Communicates with the UPS. The UPS receives the hot-swappable breaker module's data via this port and displays the data on the UPS's LCD. You can install at maximum six hot-swappable breaker modules (optional) in the rack-mount PDC.
⑥	LCD communication port.	Reserved.
⑦	RS-232 Port	Communicates with a connected computer, receives the rack-mount PDC's data and upgrades the rack-mount PDC's firmware. If you install two rack-mount PDCs in the UPS, you must use this port to set up each rack-mount PDC's ID No. to judge which rack-mount PDC the data belongs to. For information about setting each rack-mount PDC's ID No., please refer to 6.1 Start-up of the Rack-mount PDC .
⑧	Handle	Helps to pull out the hot-swappable control module.
⑨	Latch	Locks the hot-swappable control module and connects the hot-swappable control module to the power supply. Only when this latch is in the 'LOCKED' position and the latch knob is firmly fixed, will the system work normally.

3.3 Rear Panel



(Figure 3-4: Rear Panel)

No.	Item	Function																
1	Fan	For ventilation.																
2		<div style="text-align: center;"> </div> <table border="1" style="width: 100%; margin-top: 10px;"> <thead> <tr> <th>Function</th> <th>Pin</th> <th>Triggered Event</th> </tr> </thead> <tbody> <tr> <td rowspan="6">Output Dry Contact</td> <td>Pin 1 & 2</td> <td>Reserved.</td> </tr> <tr> <td>Pin 3 & 4</td> <td>When the hot-swappable breaker module's breaker is OFF. You can install at maximum six hot-swappable breaker modules (optional) in the rack-mount PDC.</td> </tr> <tr> <td>Pin 5 & 6</td> <td>Reserved.</td> </tr> <tr> <td>Pin 7 & 8</td> <td>When the hot-swappable breaker module's breaker has an over-current issue. You can install at maximum six hot-swappable breaker modules (optional) in the rack-mount PDC.</td> </tr> <tr> <td>Pin 9 & 10</td> <td>When the system has an over-temperature issue.</td> </tr> <tr> <td>Pin 11 & 12</td> <td>When the input has a phase-lack issue.</td> </tr> </tbody> </table>	Function	Pin	Triggered Event	Output Dry Contact	Pin 1 & 2	Reserved.	Pin 3 & 4	When the hot-swappable breaker module's breaker is OFF. You can install at maximum six hot-swappable breaker modules (optional) in the rack-mount PDC.	Pin 5 & 6	Reserved.	Pin 7 & 8	When the hot-swappable breaker module's breaker has an over-current issue. You can install at maximum six hot-swappable breaker modules (optional) in the rack-mount PDC.	Pin 9 & 10	When the system has an over-temperature issue.	Pin 11 & 12	When the input has a phase-lack issue.
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	REPO	Pin13 & 15	Remote emergency power off.												
	Input Control	Pin14 & 16	Reserved.												
Input Breaker Status Detection	Pin17 & 18	Reserved.													
③	Smart Slot	Connects the SNMP IPv6 card.													
④	L1 & L2 terminals	Use the provided shorting wire to short the L1 and L2 terminals. This ensures the connection of internal power supply and normal operation of the rack-mount PDC.													
⑤	N1 & N2 terminals	Use the provided shorting wire to short the N1 and N2 terminals. This ensures the connection of internal power supply and normal operation of the rack-mount PDC.													
⑥	Input Terminal Block	Connects the UPS's output and includes R/ S/ T/ N/ ⊕ terminals.													
⑦	Output Terminal Block	Connects the critical loads and includes R/ S/ T/ N/ G terminals.													

Chapter 4 : Installation & Removal

4.1 Installation & Removal of the Rack-mount PDC

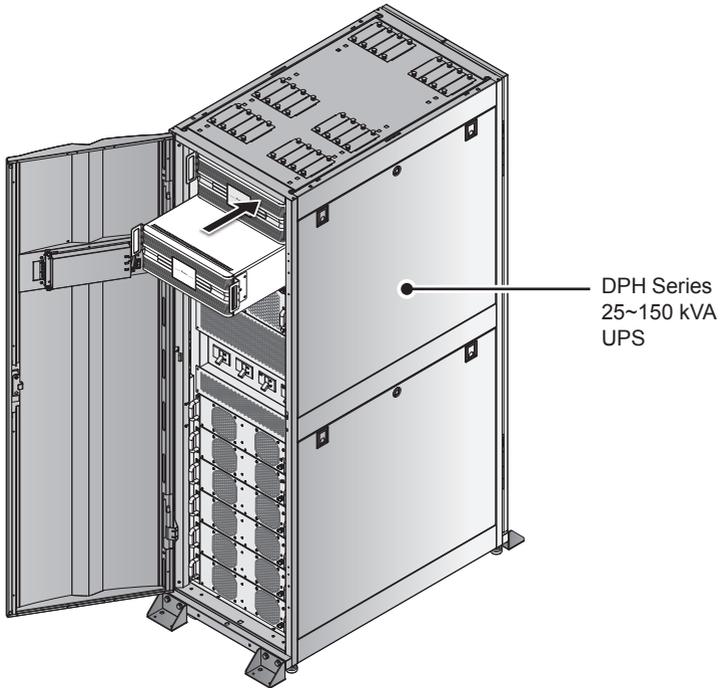


WARNING!

1. Only qualified service personnel can perform installation and removal of the rack-mount PDC.
2. The rack-mount PDC is applicable to the DPH series 25-75kVA or 25-150kVA UPS. The 25-75kVA UPS can accommodate at maximum one rack-mount PDC and the 25-150kVA UPS can accommodate at maximum two rack-mount PDCs. Please refer to the following for installation/removal procedures.
3. The rack-mount PDC is not hot-swappable.
4. The rack-mount PDC is heavy (> 32kg) and requires at least two people for handling.
5. Before installation/ removal of the rack-mount PDC, please cut off all power.
6. Only after the UPS's LCD is off, the rack-mount PDC's fan stops running and the AC power is completely cut off can you remove the rack-mount PDC.

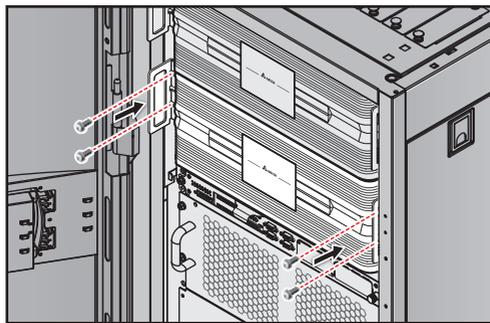
4.1.1 Installation of the Rack-mount PDC

- ① Two people are required to stand at both sides of the UPS to insert the rack-mount PDC together into the UPS's rack-mount PDC slot.



(Figure 4-1: Insert the Rack-mount PDC)

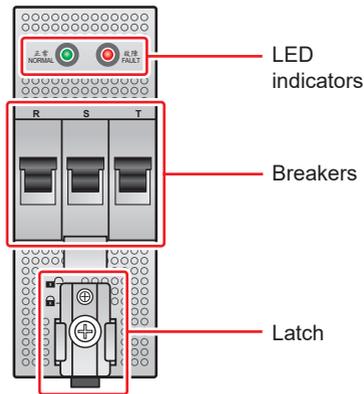
- 2 Take out four M6 screws from the accessory package and firmly screw the rack-mount PDC into the UPS cabinet (please see **Figure 4-2**). The rest of the two M6 screws in the accessory package are spare parts.



(Figure 4-2: Fasten the Screws)

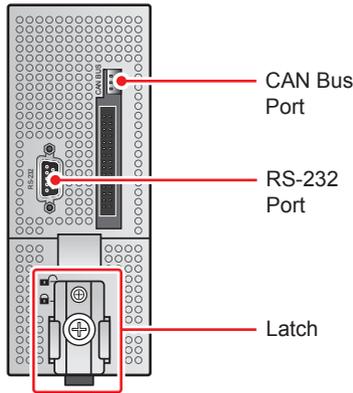
4.1.2 Removal of the Rack-mount PDC

- 1 Loosen the screw shown in **Figure 3-2** to open the rack-mount PDC's front panel
- 2 Before turning off each hot-swappable breaker module's breaker, please make sure that its connected critical loads have been safely shut down. Otherwise, the critical loads won't be protected. Each hot-swappable breaker module (optional; at maximum 6) has three branch breakers.
- 3 Turn off all of the hot-swappable breaker modules' breakers in the rack-mount PDC. Please refer to **Figure 4-3**.



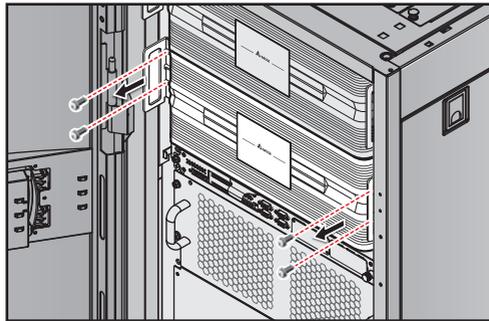
(Figure 4-3: Hot-swappable Breaker Module)

- 4 If the hot-swappable control module is connected with the CAN Bus cable and RS-232 cable, please cut off all power supply first and then remove the CAN Bus cable and RS-232 cable. Please refer to **Figure 4-4**.



(Figure 4-4: Hot-swappable Control Module)

- 5 The rack-mount PDC is not how-swappable. Before removing the rack-mount PDC, please remove all wiring connected to the front and rear panels of the rack-mount PDC.
- 6 Unscrew the four M6 screws shown in **Figure4-5**.



(Figure 4-5: Unscrew the Screws)

- 7 Two people are required to pull out the rack-mount PDC from the UPS cabinet.

4.2 Installation & Removal of the Hot-swappable Control Module



Warning!

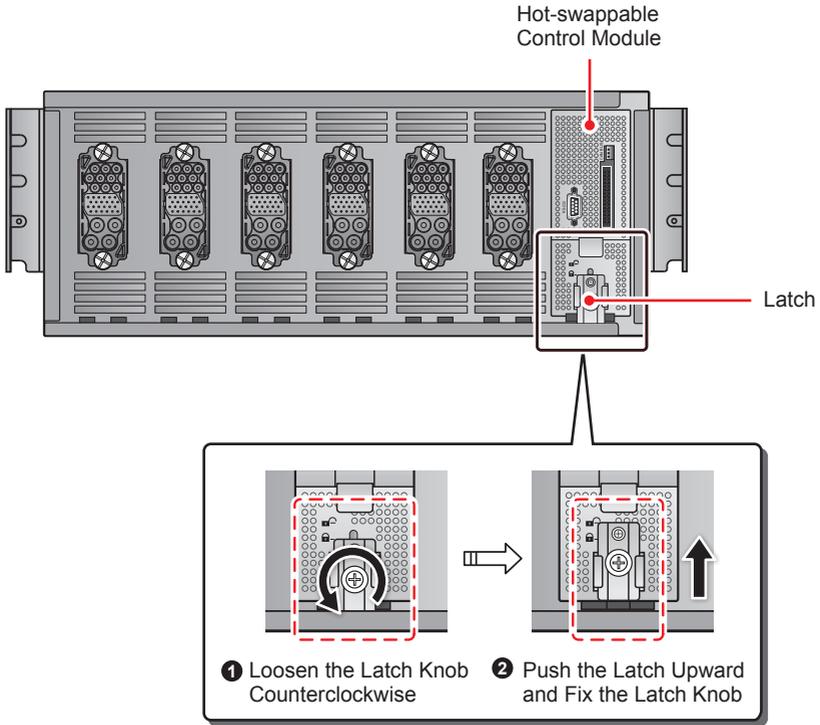
1. Only qualified service personnel can perform installation and removal of the hot-swappable control module.
2. Before installation/ removal of the hot-swappable control module, please cut off all power.

4.2.1 Installation of the Hot-swappable Control Module

- 1 Loosen the screw shown in **Figure 3-2** to open the rack-mount PDC's front panel.
- 2 Face the front of the hot-swappable control module, aim the connector inside the rack-mount PDC (please refer to **Figure 3-3** for the connector's location), and insert the hot-swappable control module along the rails until it snaps into place. Please note that the hot-swappable control module must be installed at the most right side of the rack-mount PDC (please refer to **Figure 4-8**).
- 3 Use the provided CAN Bus cable to connect the hot-swappable control module's CAN Bus port (please see **Figure 4-4**) and the UPS LCD's CAN Bus port. Follow the actual requirements to decide whether the RS-232 cable (provided) should be connected or not.
- 4 Reinstall the rack-mount PDC's front panel.

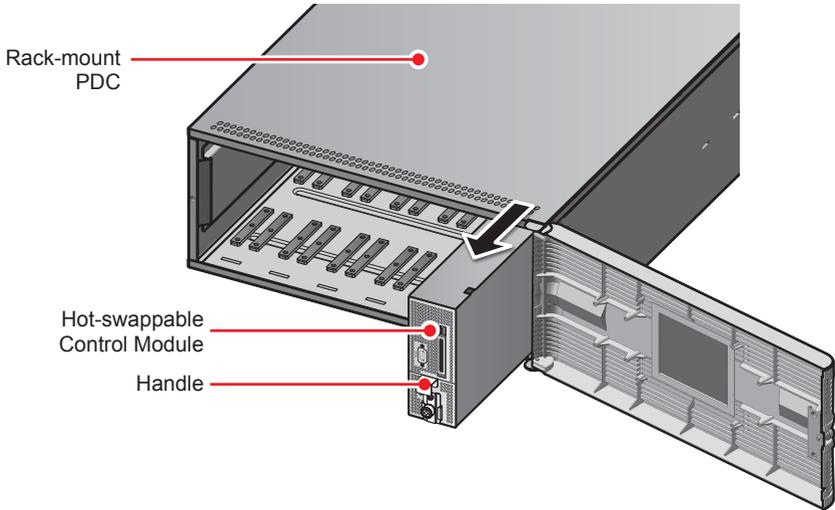
4.2.2 Removal of the Hot-swappable Control Module

- 1 Loosen the screw shown in **Figure 3-2** to open the rack-mount PDC's front panel.
- 2 Loosen the latch knob of the hot-swappable control module until it pops up ① and move the latch knob to the upper position ② and fix it firmly to cut off the hot-swappable control module's internal power ②.



(Figure 4-6: Loosen the Latch Knob, Move it to the Upper Position and Fix it Firmly)

- 3 Remove all wiring connected to the hot-swappable control module.
- 4 Pull out the hot-swappable control module from the rack-mount PDC.



(Figure 4-7: Pull out the Hot-swappable Control Module)

4.3 Installation & Removal of the Hot-swappable Breaker Module (Optional; at Maximum Six)



Warning!

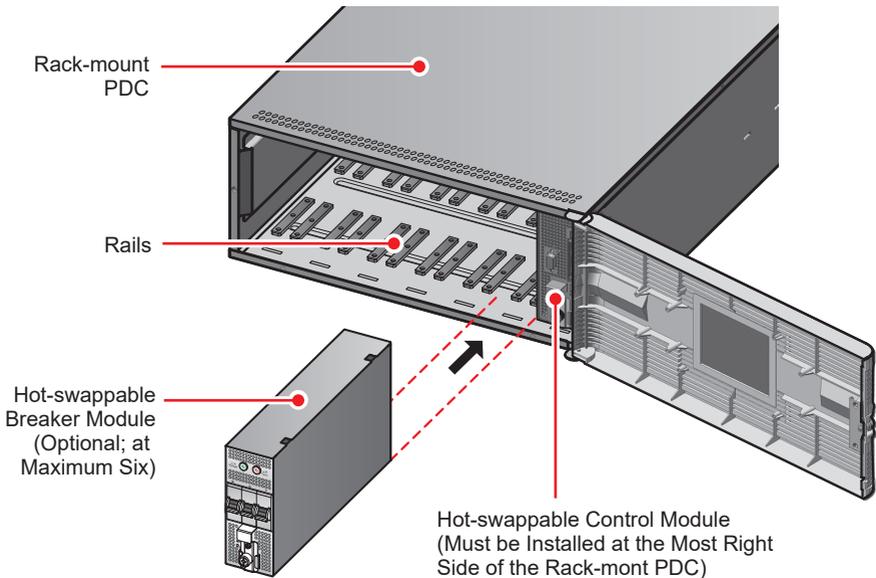
1. Only qualified service personnel can perform installation and removal of the hot-swappable breaker module (optional; at maximum six).
2. You can install at maximum six hot-swappable breaker modules (optional) in the rack-mount PDC. If you install less than six hot-swappable breaker modules (optional), it is suggested that you install the hot-swappable breaker modules dispersedly in the rack-mount PDC for proper ventilation.
3. Before installation/ removal of the hot-swappable breaker module (optional; at maximum six), please cut off all power.
4. You can choose to install different specifications (16A/ 32A) of the hot-swappable breaker modules (optional; at maximum six) in the rack-mount PDC.
5. The removal of the hot-swappable breaker module (optional; at maximum six) will cut off the power supplied to its relevant critical loads.

6. The functions of the LED indicators of the hot-swappable breaker module (optional; at maximum six) are as follows. For LED's location, please refer to **Figure 4-3**.

Red LED Indicator	ON: At least one of the hot-swappable breaker module's breakers is in the OFF position.
Green LED Indicator	ON: All of the three branch breakers of the hot-swappable breaker module (optional; at maximum six) are in the ON position.

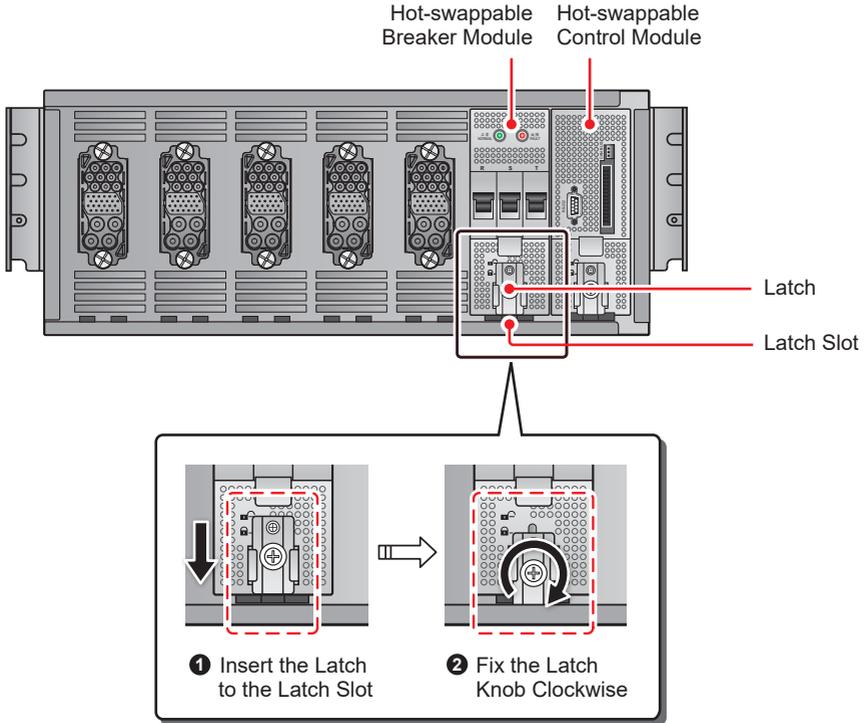
4.3.1 Installation of the Hot-swappable Breaker Module (Optional; at Maximum Six)

- ① Loosen the screw shown in **Figure 3-2** to open the rack-mount PDC's front panel.
- ② Face the hot-swappable breaker module's LED indicators, aim the connector inside the rack-mount PDC (please refer to **Figure 3-3** for the connector's location), and insert the hot-swappable breaker module along the rails until it snaps into place. Please refer to **Figure 4-8**.



(Figure 4-8: Insert the Hot-swappable Breaker Module into the Rack-mount PDC)

- 3 Insert the hot-swappable breaker module's latch into the rack-mount PDC's latch slot ❶ and firmly fix the latch knob into the  position ❷.



(Figure 4-9: Lock the Hot-swappable Breaker Module's Latch Knob)

- 4 Reinstall the rack-mount PDC's front panel.

4.3.2 Removal of the Hot-swappable Breaker Module (Optional; at Maximum Six)

- 1 Loosen the screw shown in **Figure 3-2** to open the rack-mount PDC's front panel.
- 2 Turn off the breakers of the hot-swappable breaker module (optional; at maximum six) that you wish to remove. Please refer to **Figure 6-2**.
- 3 Loosen the latch knob of the hot-swappable breaker module (optional; at maximum six) that you wish to remove until it pops up and move the latch knob to the upper position and fix it firmly (please reverse the procedures shown in **Figure 4-9**).
- 4 Pull out the hot-swappable breaker module (optional; at maximum six) that you wish to remove from the rack-mount PDC (please reverse the procedures shown in **Figure 4-8**).
- 5 Reinstall the rack-mount PDC's front panel.

Chapter 5 : Wiring

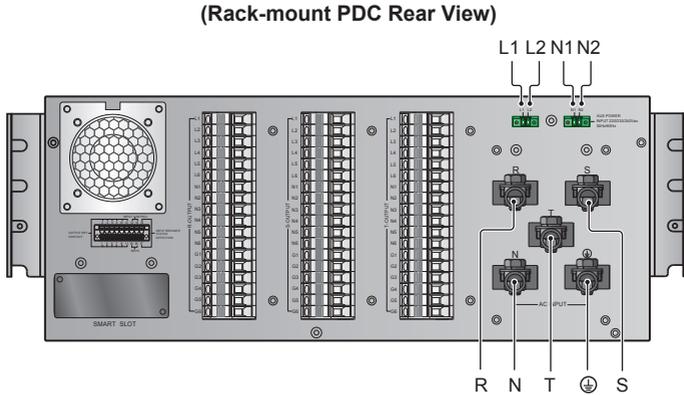
5.1 Pre-wiring Warnings

1. Please read this user manual thoroughly before wiring. Only qualified service personnel can perform installation, wiring, operation and maintenance. If you want to install the rack-mount PDC yourself, installation must be under the supervision of qualified service personnel.
2. Before wiring, ensure that the UPS's Manual Bypass Breaker and Output Breaker are in the OFF position and the UPS is completely shutdown.
3. Install suitable conduits and bushings for the input/ output cables.
4. Please refer to national and local electrical codes for acceptable non-fuse breakers and cable sizes.
5. PVC cables with temperature resistance up to 105°C are suggested for wiring.
6. Check that the size, diameter and phase are correct for each cable that needs connecting to the rack-mount PDC. 0 AWG wires for input and 10 AWG wires for output are suggested if you select copper wires.
7. To protect the rack-mount PDC from overheating, wiring must not block or cover the rack-mount PDC's fan and vents.
8. Ensure that each cable is firmly fixed.
9. The rack-mount PDC's grounding terminal  must be grounded. Please use ring-type terminals for wiring.
10. Incorrect wiring could damage the rack-mount PDC or cause electric shock.

5.2 Input Wiring



NOTE : Please refer to **5.1 Pre-wiring Warnings** first.

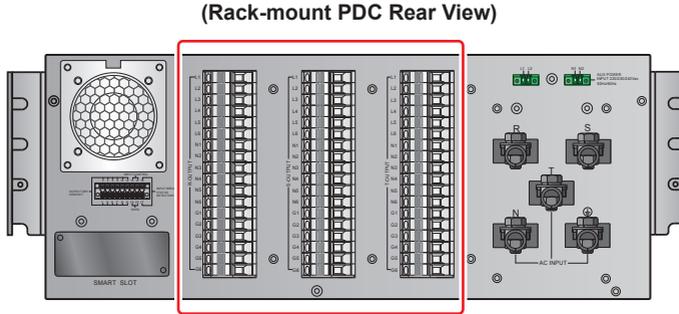


- 1 The wiring terminals are located at the rear of the rack-mount PDC (see **Figure 5-1**). Please use the provide shorting wires to short the L1 & L2 terminals and N1 & N2 terminals.
- 2 Connect the rack-mount PDC's R, S, T and N terminals with the UPS's R, S, T and N output terminals respectively.
- 3 Ground the rack-mount PDC's \oplus terminal.

5.3 Output Wiring

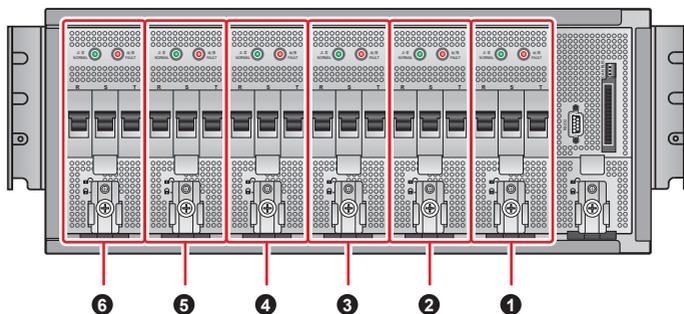


NOTE: Please refer to **5.1 Pre-wiring Warnings** first.



(Figure 5-2: Wiring Terminals_ Output)

- 1 The rack-mount PDC can connect to three-phase critical loads, single-phase critical loads, or three-phase and single-phase critical loads together.
- 2 The rack-mount PDC includes one hot-swappable control module and six hot-swappable breaker module slots. You can install at maximum six hot-swappable breaker modules (optional) in the rack-mount PDC. Please refer to **3.2 Front Panel**. The hot-swappable breaker module (optional; at maximum six) has two different specifications, 16A and 32A.
- 3 You can install the hot-swappable breaker module (optional; at maximum six) in any of the six hot-swappable breaker module slots.
- 4 If you install six hot-swappable breaker modules (optional) in the rack-mount PDC, the No. of the six hot-swappable breaker modules (optional) are defined as 1, 2, 3, 4, 5, and 6 from the right to the left of the rear of the rack-mount PDC shown in the figure and table below. Each hot-swappable breaker module (optional; at maximum six) has three branch breakers, which are T-phase, S-phase and R-phase breakers. If you install six hot-swappable breaker modules (optional) in the rack-mount PDC, there will be a total of 18 branches, and the UPS's LCD will show #1, #2, #3...#18 to present these 18 branches. Please refer to the figure and table below for detailed information.



Slot No.	No. of the Hot-swappable Breaker Module	Breaker No.	Branch No. on the UPS's LCD	Phase	Relevant Output Wiring Terminal
①	Hot-swappable Breaker Module 1	Breaker 1	#1	T	L1
		Breaker 2	#2	S	L1
		Breaker 3	#3	R	L1
②	Hot-swappable Breaker Module 2	Breaker 4	#4	T	L2
		Breaker 5	#5	S	L2
		Breaker 6	#6	R	L2
③	Hot-swappable Breaker Module 3	Breaker 7	#7	T	L3
		Breaker 8	#8	S	L3
		Breaker 9	#9	R	L3
④	Hot-swappable Breaker Module 4	Breaker 10	#10	T	L4
		Breaker 11	#11	S	L4
		Breaker 12	#12	R	L4
⑤	Hot-swappable Breaker Module 5	Breaker 13	#13	T	L5
		Breaker 14	#14	S	L5
		Breaker 15	#15	R	L5
⑥	Hot-swappable Breaker Module 6	Breaker 16	#16	T	L6
		Breaker 17	#17	S	L6
		Breaker 18	#18	R	L6

- 5 When performing output wiring, the output wiring terminals that connect to the critical loads must match to the relevant hot-swappable breaker modules' slots. Please see the above figure and table for relevant information.

Only in the slots installed with hot-swappable breaker modules (optional; at maximum six) can the slots' relevant output wiring terminals connect to the critical loads. Please refer to the following examples.

Example 1:

If you install a hot-swappable breaker module (optional; at maximum six) in slot No. 1 and you wish to connect three-phase critical loads, the relevant output wiring terminals are R-phase L1 terminal, S-phase L1 terminal, T-phase L1 terminal, N1 terminal (any phase) and G1 terminal (any phase).

Example 2:

If you wish to connect single-phase critical loads, please connect the critical loads to the R-phase L1 terminal or S-phase L1 terminal or T-phase L1 terminal, and connect the critical loads' neutral line to the N1 terminal (any phase) and grounding line to the G1 terminal (any phase).

Example 3:

If you want to connect the three-phase critical loads and single-phase critical loads together, please follow above-mentioned two examples to connect the three-phase critical loads and single-phase critical loads respectively.

Chapter 6 : Start-up & Turn-off

6.1 Start-up of the Rack-mount PDC



WARNING!

Before initial start-up of the rack-mount PDC, please check the following to secure safe and normal operation of the connected critical loads.

- **Exterior Inspection**

1. Check the exterior of the rack-mount PDC and see if any damage exists..
2. Check whether there is adequate space around all sides of the rack-mount PDC.

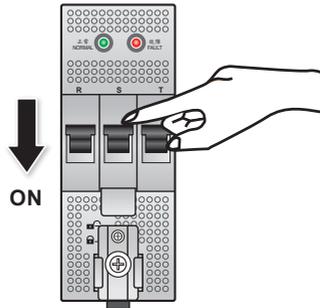
- **Interior Inspection**

1. Open the rank-mount PDC's front panel (please refer to **Figure 3-2**), check whether the hot-swappable control module and hot-swappable breaker module (optional; at maximum six) are installed properly and are firmly connected to the relevant connectors, and each latch is locked.
2. Remove any object or foreign matter that does not belong to the rack-mount PDC.
3. Check if any object or foreign matter blocks or covers the rack-mount PDC's vents or fan.
4. Check if wiring is correct.
5. Check if the rack-mount PDC is grounded.

Please follow below procedures to start up the rack-mount PDC.

- 1) After you connect the power to the rack-mount PDC (please refer to **Chapter 5. Wiring**), please first set an ID No. for the rack-mount PDC. The default setting is 1. If you install two rack-mount PDCs in the UPS, please use the provided RS-232 cable to change the rack-mount PDCs' ID No. For relevant setting information, please contact service personnel.

- 2 Check if the fan runs normally. After confirmation, turn the breakers of the hot-swappable breaker modules (optional; at maximum six) that you want to use to the ON position.



(Figure 6-1: Turn the Breakers to the ON position)

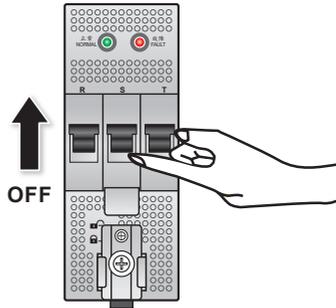
- 3 Read the rack-mount PDC's data from the UPS's LCD. Please refer to **Delta UPS- Modulon Family DPH Series, Three Phase 25-150kVA/ 25-75kVA User Manual - 7.9 Power Distribution**.
- 4 For the rack-mount PDC's alarm message, please refer to **Delta UPS- Modulon Family DPH Series, Three Phase 25-150kVA/ 25-75kVA User Manual - 5.7.4/ 5.9.4 Rack-mount PDC**.

6.2 Turn-off the Rack-mount PDC

If you want to turn off the rack-mount PDC, store it, maintain it or replace its components, you should correctly turn the rack-mount PDC off to ensure that the connected critical loads won't be damaged and the data won't be lost due to power-off. Please follow the procedures below.

- 1 If the critical loads connected to the hot-swappable breaker module (optional; at maximum six) have data-storage functions, please make sure that the data is saved before turning the critical loads off.

- 2 Turn each breaker of the hot-swappable breaker module (optional; at maximum six) to the OFF position.



(Figure 6-2: Turn the Breakers to the OFF position)

Chapter 7 : Optional Accessories

There are several optional accessories available for this rack-mount PDC. Please refer to the table below for the optional accessories and their functions.

No.	Fault	Solution
1	SNMP IPv6 Card	Monitors the rack-mount PDC status via SNMP protocol.
2	Hot-swappable Breaker Module	16A/ 32A power distribution module (3-pole).



NOTE :

1. For detailed installation and operation of any accessory mentioned above, please refer to the Quick Guide, User Guide, or Installation & Operation Guide included in the package of the relevant optional accessory.
2. If you want to buy any accessory mentioned above, please contact your local dealer or customer service.

Chapter 8 : Maintenance

- **Regular Maintenance**

A. To ensure the rack-mount PDC's normal operation, please regularly check:

1. If each component is normal and firmly fixed.
2. If the fan runs normally
3. If any dust or foreign matter exists.
4. If vents are blocked. Regularly clean the rack-mount PDC, especially its slits and openings, to ensure that the air freely flows into the rack-mount PDC to avoid overheating. If necessary, use an air-gun to clean the slits and openings to prevent any object from blocking or covering the areas.

B. The following inspection table is suggested:

When	Inspection Items
24 Hours after Installation	1. Check if each component is normal and firmly fixed.
	2. Check if the fan runs normally.
30 Days after Installation	1. Check if each component is normal and firmly fixed.
	2. Check if the fan runs normally.
Every 6 Months	1. Check if each component is normal and firmly fixed.
	2. Check if the fan runs normally.
	3. Clean dust and check if the vents ventilate well.
Every Year	1. Check if internal components such as breakers and wiring terminals have any loose problems.
	2. Check if the fan runs normally.
	3. Clean dust and check if the vents ventilate well.
	4. Remove any object or foreign matter that does not belong to the rack-mount PDC.

- **Component Replacement or Maintenance**

If the breakers of the hot-swappable breaker module (optional; at maximum six) and cables are worn-out or damaged and need replacement, please contact your local dealer or customer service.

- **Storage**

Storage temperature : $-20^{\circ}\text{C} \sim 40^{\circ}\text{C}$ ($-4^{\circ}\text{F} \sim 104^{\circ}\text{F}$)

Storage relative humidity : $< 90\%$



NOTE:

Please ask your local dealer or customer service for more maintenance information. Do not perform maintenance if you are not trained for it.

Chapter 9 : Troubleshooting

When you see the following alarm messages appear on the UPS's LCD, please follow the solutions shown below.

No.	Alarm Message	Possible Cause	Solution
1	RPDC#n Ln INPUT VOLTAGE ABNORMAL	<ol style="list-style-type: none"> 1. Input voltage is out of spec. 2. Input wiring is missing. 	<ol style="list-style-type: none"> 1. Please check the input voltage. 2. Please check if the input wiring has a good connection.
2	RPDC#n TOTAL INPUT NEUTRAL CURRENT HIGH	Overload	<ol style="list-style-type: none"> 1. Please reduce the critical loads. 2. Please contact your service personnel.
3	RPDC#n Ln INPUT CURRENT HIGH	Overload	Please reduce the critical loads.
4	RPDC#n Ln INPUT CURRENT IS OVER LIMIT	Overload	Please reduce the critical loads.
5	RPDC#n Ln INPUT CURRENT LOW	Total loads are lower than the setup range.	<ol style="list-style-type: none"> 1. Please check the critical loads. 2. Please check wiring.
6	RPDC#n SYSTEM OVERLOAD	Overload	<ol style="list-style-type: none"> 1. Please reduce the critical loads. 2. Please check wiring.
7	RPDC#n SYSTEM ENVIRONMENT TEMP HIGH	The fan has abnormalities or the vents are blocked.	<ol style="list-style-type: none"> 1. Please check the fan and vents. 2. Please decrease the ambient temperature.

No.	Alarm Message	Possible Cause	Solution
8	RPDC#n INPUT POWER ABNORMAL	System abnormal	Please contact your service personnel.
9	RPDC#n FRAM ABNORMAL	System abnormal	Please contact your service personnel.
10	RPDC#n FAN#n FAIL	<ol style="list-style-type: none"> 1. Dust is in the fan or the fan is blocked. 2. The fan is damaged. 	<ol style="list-style-type: none"> 1. Please clean the fan. 2. Please check the fan fuse. 3. Please contact your service personnel.
11	RPDC#n B#nn CIRCUIT BREAKER OPEN	Overload	<ol style="list-style-type: none"> 1. Please reduce the critical loads. 2. Please contact your service personnel.
12	RPDC#n B#nn CURRENT HIGH	Overload	Please reduce the critical loads.
13	RPDC#n B#nn CURRENT LOW	Total loads are lower than the setup range.	<ol style="list-style-type: none"> 1. Please check the critical loads. 2. Please check wiring.
14	RPDC#n COMMUNICATION FAIL	<ol style="list-style-type: none"> 1. Communication wire is not well connected. 2. System failure 	<ol style="list-style-type: none"> 1. Please reconnect the communication wire and confirm that it is firmly connected. 2. Please contact your service personnel.



NOTE:

If all possible causes are eliminated but the alarm still appears, please contact your local dealer or customer service.

Appendix 1 : Technical Specification

Model		Rack-mount PDC
Input	Nominal Voltage	220/380V, 230/400V, 240/415V (3-phase, 4-wire + G)
	Voltage Range	220/380V \pm 15%
	Frequency Range	50/60Hz \pm 5%
Output	Nominal Voltage	220/380V, 230/400V, 240/415V (3-phase, 4-wire + G)
Interface	Standard	RS-232 port x 1, CAN Bus port x 1, Smart slot x 1, Output dry contact x 6, REPOx 1
Environment	Operating Temperature	0 ~ 40°C
	Relative Humidity	90% (non-condensing)
	Audible Noise	<70 dBA in normal mode (at a distance of 1 meter in front of the rack-mount PDC)
	Protection (IP Degree)	IP 20
Others	Parallel Redundancy	N/A
	Emergency Power Off	Yes (Remote)
Physical	Dimensions (Wx Dx H)	430 x 665 x 173 mm
	Weight	38kg (Max.)
	Hot-Swappable Breaker Module	1~6 (at maximum 18-pole supported)

Branch Breaker	16A	32A
De-rating of Branch Breaker when environment temperature at 25°C	12A	23A
De-rating of Branch Breaker when environment temperature at 40°C	11A	21A



NOTE:

1. Please refer to the rating label for the safety rating.
2. All specifications are subject to change without prior notice.

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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