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Delta UPS - Amplon Family

RT Series, Single Phase
5/ 6/ 8/ 10kVA

RT Series, Three Phase
10/ 11/ 15/ 17/ 20kVA

Lithium-ion Battery Pack

User Manual

www.deltapowersolutions.com



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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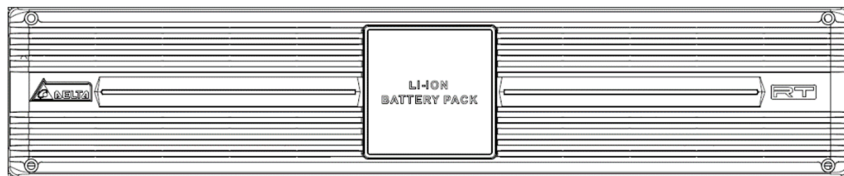
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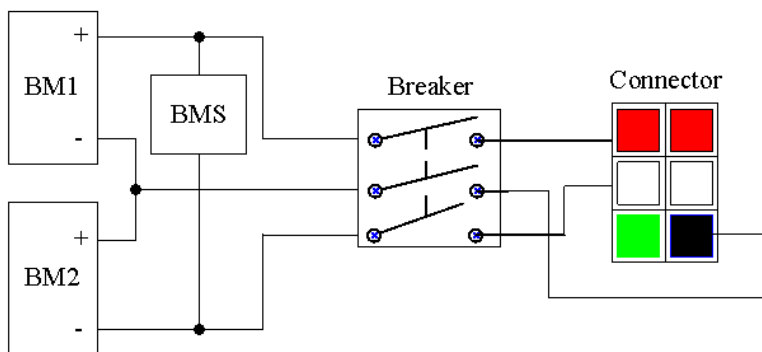
Chapter 1 : Product Introduction

The Delta lithium-ion battery pack (hereafter referred to as 'battery pack') provides DC power and maintains inverter's operation of transferring DC-to-AC power to supply stable power to the critical loads connected to the UPS when the main AC source is abnormal. It must be operated in conjunction with a corresponding Delta Amplon RT series UPS as shown in the table below. For its appearance and block diagrams, please refer to the following figures.

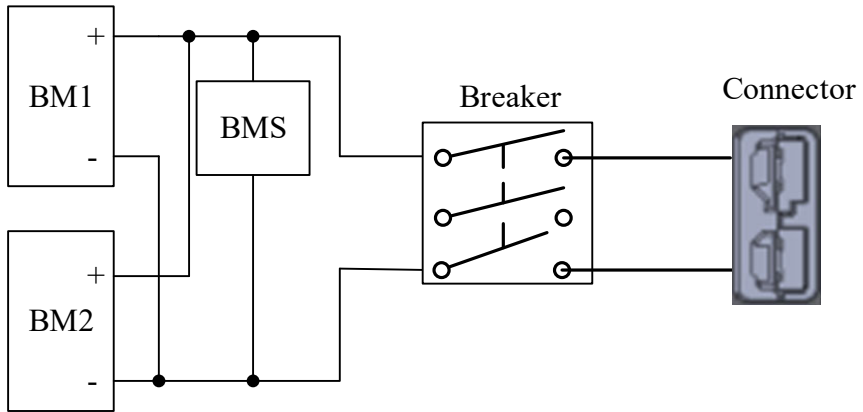
Delta Lithium-ion Battery Pack Model	Applicable to Delta Amplon RT Series UPS Model
RT-20K-LIB	RT-11K3P-LV, RT-15K3P, RT-17K3P, RT-20K3P
RT-10K-LIB	RT-5K1P, RT-6K1P, RT-8K1P, RT-10K1P, RT-10K3P



(Figure 1-1: Front View of the Delta Lithium-ion Battery Pack)



(Figure 1-2: Block Diagram of RT-20K-LIB)



(Figure 1-3: Block Diagram of RT-10K-LIB)

Chapter 2 : Important Safety Instructions

2.1 Safety Instructions

- Servicing of batteries and battery packs must be performed or supervised by qualified service personnel knowledgeable in the batteries, battery packs and the required precautions. Keep unauthorized personnel away from the batteries and battery packs.
- A battery can present a risk of electric shock and high short-circuit current.
- To reduce the risk of fire or electric shock, install the battery pack in a temperature and humidity controlled indoor area free of conductive contaminants.
- Forbid opening or removing the cover of the battery pack to avoid high voltage electric shock.
- The risk of dangerous high voltage is possible when the batteries are still connected to the UPS even though the UPS is disconnected from the mains. Do not forget to disconnect the battery cable to completely cut off the battery source.
- Only qualified service personnel can perform battery replacement. Before battery replacement, please turn off the battery breaker. If replacing the batteries without turning off the UPS, please make sure the UPS has detected “Battery Disconnected” before turning on the battery breaker.
- Only use the same type of batteries from the same supplier. Never use old, new and different Ah batteries at the same time.
- Do not reverse or short circuit the polarity + and – when connecting the batteries because this will destroy the device and constitute a risk of electric shock or fire.
- The external slits and openings in the battery pack are provided for ventilation.
- To ensure reliable operation of the battery pack and to protect the battery pack from overheating, these slits and openings must not be blocked or covered. Do not insert any object into the slits and openings that may hinder ventilation.

- Do not pour or splash any liquid on the battery pack.
- Do not insert any object into the battery pack.
- Do not place beverages or any liquid-containing vessels on or near the battery pack.
- Do not dispose of the battery or batteries in a fire. The batteries may explode.
- Do not open or mutilate the battery or batteries. The released electrolyte is harmful to the skin and eyes and may be toxic.
- Observe the following before battery replacement:
 1. Remove watches, rings, or other metal objects.
 2. Use tools with insulated handles.
 3. Wear rubber gloves and boots.
 4. Do not lay tools or metal parts on the top of batteries.
 5. Disconnect charging source prior to connecting or disconnecting battery terminals.



The two symbols shown above indicate that there is high voltage circuit. Do not open the cover(s) of the Delta lithium-ion battery pack.

- The operating temperature of the Delta lithium-ion battery pack is 0°C ~ 45°C (32°F ~ 113°F).

2.2 Standard Compliance

- CE
- CAN/ UL1973

2.3 Storage

- Prior to installation

If the Delta lithium-ion battery pack needs to be stored prior to installation, it should be placed in a dry area. The allowable storage temperature and relative humidity (non-condensing) are $-15^{\circ}\text{C} \sim +50^{\circ}\text{C}$ ($5^{\circ}\text{F} \sim 122^{\circ}\text{F}$) and 5% ~ 95% respectively.

- After usage

Remove all connected devices from the Delta lithium-ion battery pack, and store it in a dry and well-ventilated area at a temperature between -15°C and $+50^{\circ}\text{C}$ ($5^{\circ}\text{F} \sim 122^{\circ}\text{F}$) and at a relative humidity (non-condensing) between 5% ~ 95%.

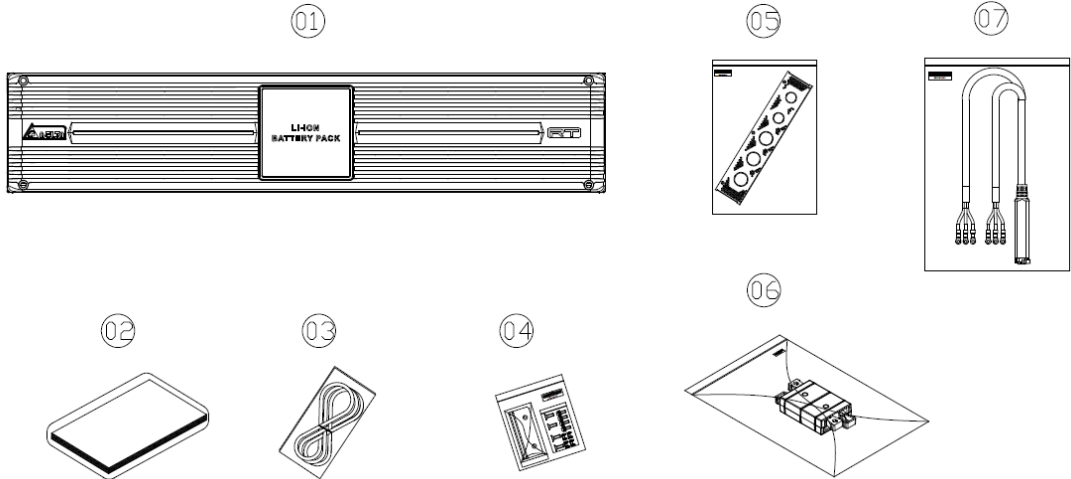
2.4 Recycling and Disposal

- Please follow the local government's laws to handle and dispose of the Delta lithium-ion battery pack.

Chapter 3 : Package List

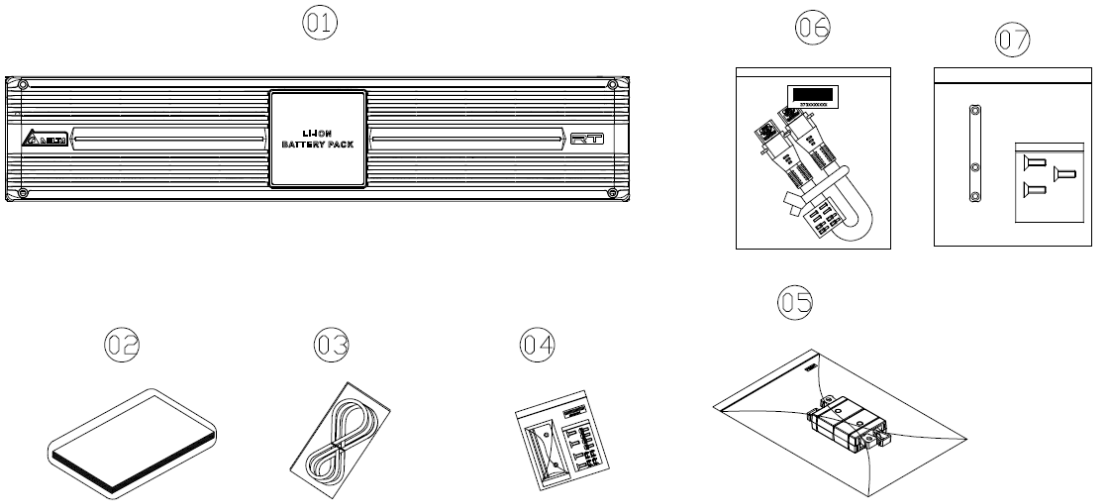
The package contains the following items. Please check if any item is missing. If there is anything missing, please contact the dealer immediately.

Model: RT-20K-LIB



No.	Item	Q'ty
1	Delta Lithium-ion Battery Pack	1 PC
2	User Manual	1 PC
3	RS-485 Cable	1 PC
4	Ear Bracket Kit	1 SET
5	Rear Panel for UPS	1 PC
6	Tower Stand Extender	4 PCS
7	Battery Cable	1 PC

Model: RT-10K-LIB



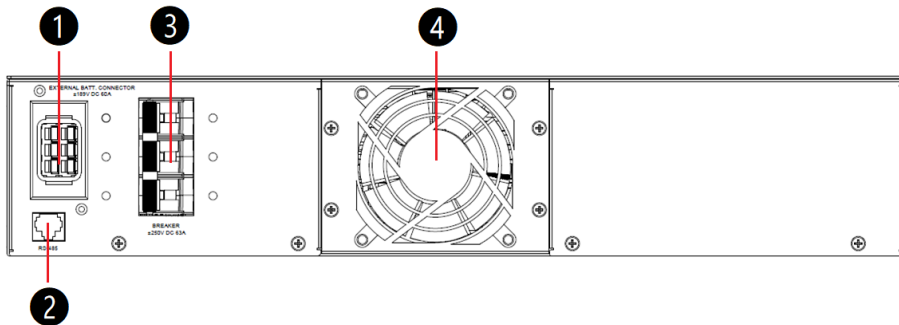
No.	Item	Q'ty
1	Delta Lithium-ion Battery Pack	1 PC
2	User Manual	1 PC
3	RS-485 Cable	1 PC
4	Ear Bracket Kit	1 SET
5	Tower Stand Extender	4 PCS
6	Battery Cable	1 PC
7	Grounding kit	1 SET





















NOTE:

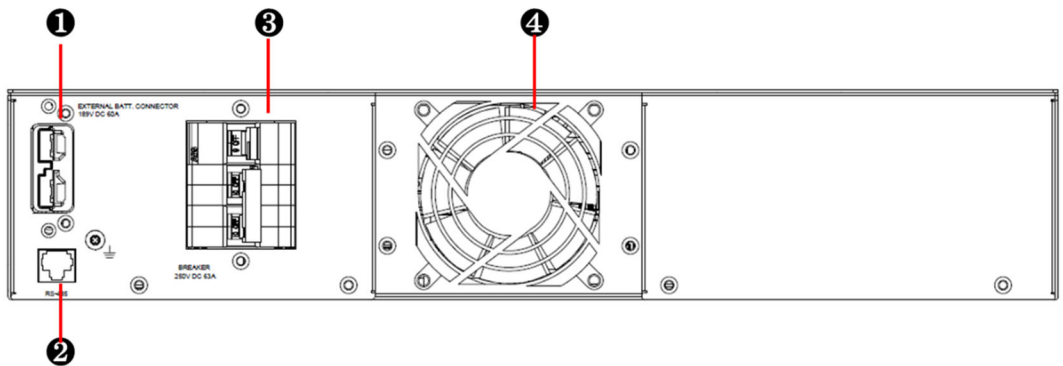
1. If there is any damage or anything missing, please immediately contact the dealer from whom you purchased the unit.
2. If the battery pack needs to be returned, carefully repack the battery pack and all of the accessories using the original packing materials that came with the unit.

Chapter 4 : Rear Panel




(Figure 4-1: Rear View of RT-20K-LIB)

No.	Item	Function												
1	External Batt. Connector	<p>Connects with the UPS to supply battery power. Pin assignment of the external battery connector is shown as follows.</p> <table style="margin-left: auto; margin-right: auto;"> <tr> <td>Battery Positive (Red)</td> <td></td> <td></td> <td>Battery Positive (Red)</td> </tr> <tr> <td>Battery Negative (White)</td> <td></td> <td></td> <td>Battery Negative (White)</td> </tr> <tr> <td>Ground (Green)</td> <td></td> <td></td> <td>Neutral line(Black)</td> </tr> </table>	Battery Positive (Red)			Battery Positive (Red)	Battery Negative (White)			Battery Negative (White)	Ground (Green)			Neutral line(Black)
Battery Positive (Red)			Battery Positive (Red)											
Battery Negative (White)			Battery Negative (White)											
Ground (Green)			Neutral line(Black)											
2	RS-485 Port	The lithium-ion battery pack communicates with the UPS via the RS-485 port.												
3	Breaker	Serves as a switch for safety protection.												
4	Fan	Ventilates the air to avoid overheating.												



(Figure 4-2: Rear View of RT-10K-LIB)

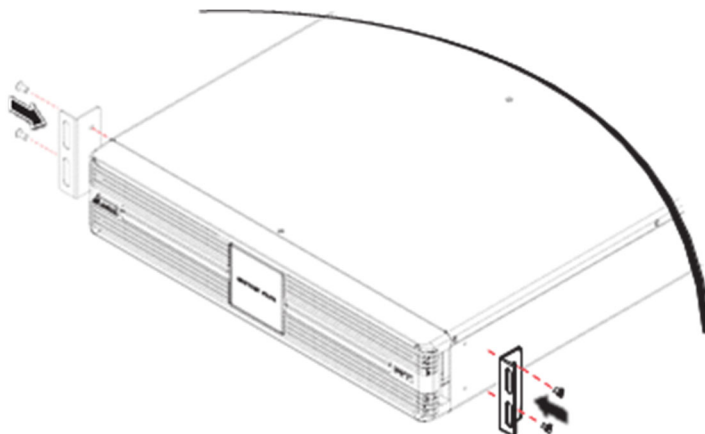
No.	Item	Function
1	External Batt. Connector	Connects with the UPS to supply battery power. Pin assignment of the external battery connector is shown as follows. <div style="text-align: center; margin-top: 10px;">  <div style="display: flex; justify-content: center; gap: 20px;"> <div style="text-align: center;">—Battery Positive</div> <div style="text-align: center;">—Battery Negative</div> </div> </div>
2	RS-485 Port	The lithium-ion battery pack communicates with the UPS via the RS-485 port.
3	Breaker	Serves as a switch for safety protection.
4	Fan	Ventilates the air to avoid overheating.

Chapter 5 : Installation Procedures

5.1 Rack Mounting

You can rack-mount the UPS and the Delta lithium-ion battery pack in a standard 19-inch server rack. The UPS and the Delta lithium-ion battery pack adopt the same mounting kits and mounting procedures. The instructions below only show the rack mounting procedures of the Delta lithium-ion battery pack. If you want to check the rack mounting procedures of the UPS, please refer to the Delta Amplon RT Series UPS's *User Manual*.

1. Attach the ear brackets provided in the package to the lateral mounting holes of the Delta lithium-ion battery pack. See **Figure 5-1**.



(Figure 5-1: Fix the Ear Brackets)

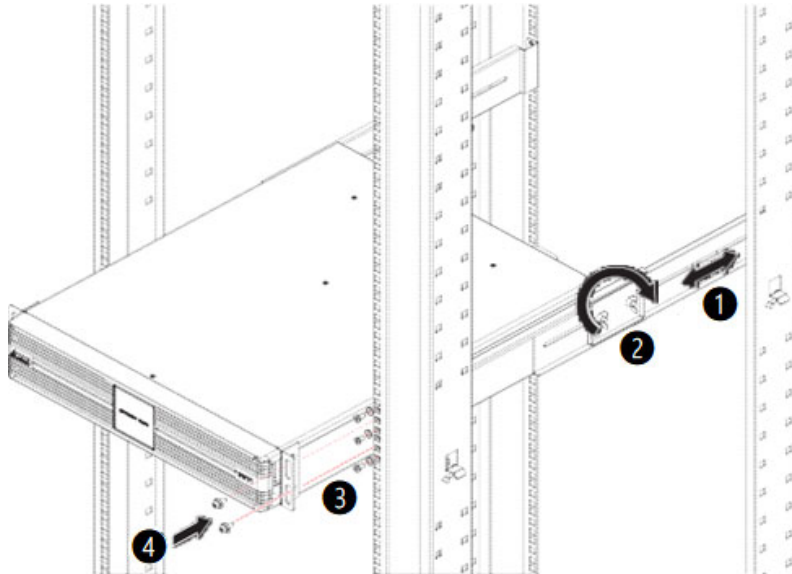
2. Follow the steps ❶ ~ ❸ to install the Delta's rail kit (optional) onto your rack, and follow the step ❹ to insert the Delta lithium-ion battery pack into the rack. See **Figure 5-2**.

Step ❶ : Adjust the length of the rails according to your rack.

Step ❷ : Tighten the rails' nuts.

Step ❸ : Fix the rails onto your rack.

Step ④ : Insert the Delta lithium-ion battery pack into your rack and tighten the provided screws.



(Figure 5-2: Insert the Delta Lithium-ion Battery Pack into Your Rack)



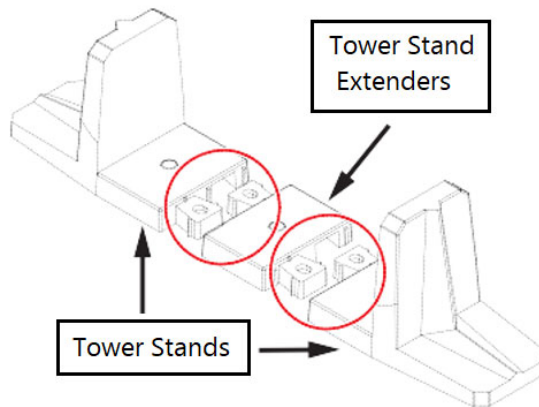
NOTE:

If you want to use a non-Delta rail kit, please only follow step ④.

5.2 Tower Mounting

You can tower-mount the UPS and the Delta lithium-ion battery pack in an upright position. The UPS and the Delta lithium-ion battery pack adopt the same mounting kits and mounting procedures. The instructions below only show the tower mounting procedures of the Delta lithium-ion battery pack. If you want to check the tower mounting procedures of the UPS, please refer to the Delta Amplon RT Series UPS's *User Manual*.

1. Connect the provided tower stand extenders with the tower stands provided in the UPS's package. Please take the UPS and the Delta lithium-ion battery pack's size into consideration. See **Figure 5-3**.



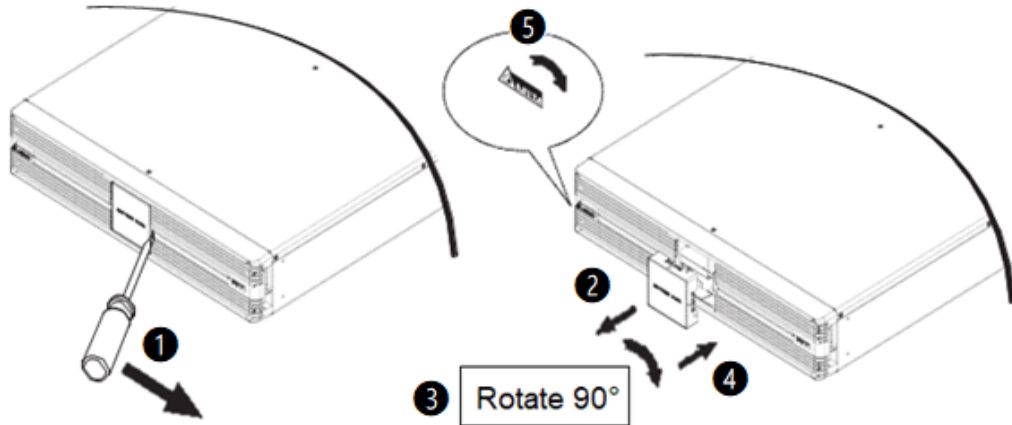
(Figure 5-3: Connect the Tower Stand Extenders with the UPS's Tower Stands)



NOTE:

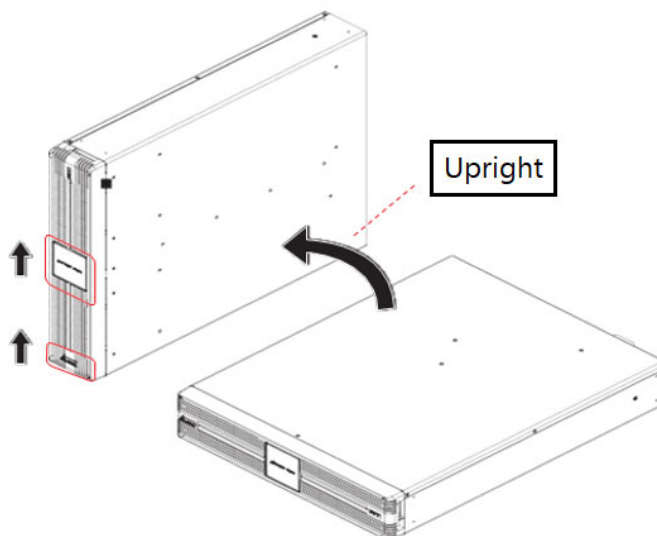
Delta lithium-ion battery pack does not provide any tower stands. The tower stands are only provided in the UPS's package.

2. Pull out the Delta lithium-ion battery pack's control panel (❶ & ❷), rotate it 90° clockwise (❸) and re-insert the control panel (❹). After that, rotate the Delta logo nameplate 90° clockwise (❺). See **Figure 5-4**.



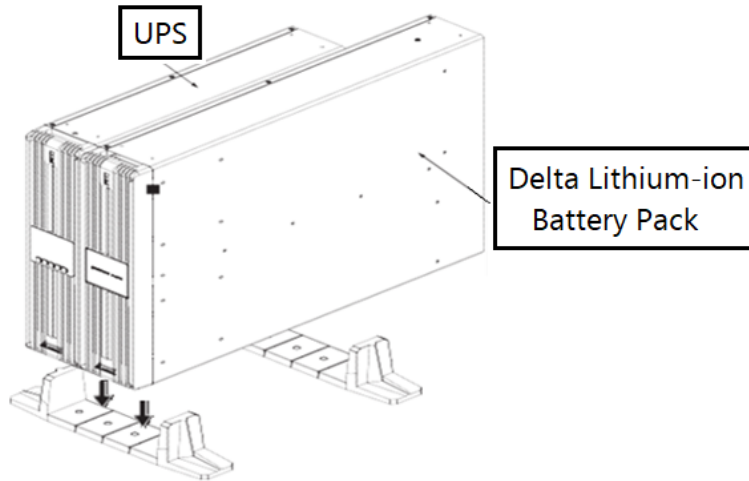
(Figure 5-4: Rotate the Delta Lithium-ion Battery Pack's Control Panel & Delta Logo Nameplate)

- Carefully lift the Delta lithium-ion battery pack upright with the Delta logo and icon on the control panel facing up. At least two people are required. See ***Figure 5-5.***



(Figure 5-5: Lift the Delta Lithium-ion Battery Pack Upright)

4. Fit the Delta lithium-ion battery pack and the UPS into the tower stands. See **Figure 5-6**.

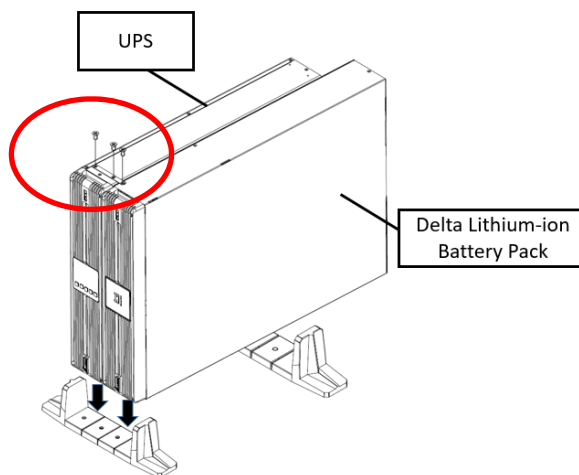


(Figure 5-6: Fit the Delta Lithium-ion Battery Pack and the UPS into the Tower Stands)



NOTE:

For RT-10K-LIB model, follow the figure below to install the provided grounding kit on the UPS and the Delta lithium-ion battery pack for grounding purpose.



(Figure 5-7: Grounding Kit Installation)

Chapter 6 : Connection



NOTE:

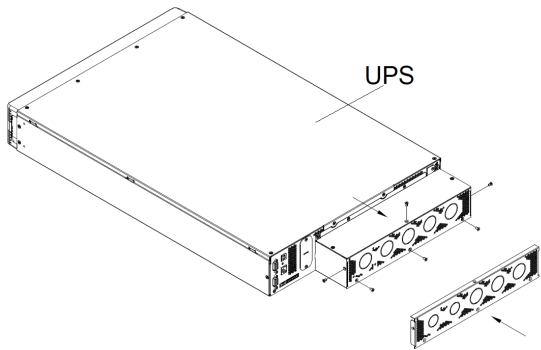
Before connecting the Delta lithium-ion battery pack (model: RT-20K-LIB) to its corresponding UPS, you have to replace the rear panel of the UPS because the rear panel of the UPS is only suitable for the Delta lead-acid battery pack. For the Delta lithium-ion battery pack whose model is RT-10K-LIB, there is no need to replace its UPS's rear panel.

6.1 Connecting the Delta Lithium-ion Battery Pack (Model: RT-20K-LIB) to its corresponding UPS

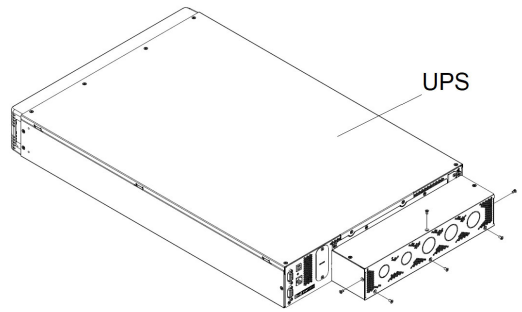
Follow the instructions below and the steps ① ~ ⑥ shown in **Figure 6-1** to connect the Delta lithium-ion battery pack (Model: RT-20K-LIB) to its corresponding UPS.

- Step ① : Replace the rear panel of the UPS with the rear panel provided in the Delta lithium-ion battery pack's package.
- Step ② : Tighten the rear panel's screws.
- Step ③ : Place the Delta lithium-ion battery pack under the UPS.
- Step ④ : Install the cable glands (not provided).
- Step ⑤ : Remove the upper cover at the rear of the UPS to find the UPS's wiring terminals. For more information about the upper cover location and the UPS's wiring terminals, please refer to the Delta Amplon RT Series UPS's **User Manual**.
Use the provided battery cable to connect the UPS's battery terminals and the Delta lithium-ion battery pack's external battery connector. Make sure that the battery cable's positive pole (+), negative pole (-) and the neutral pole (N) connect to the UPS's battery terminals (+), (-), and (N) respectively. Do not make wrong connections.
- Step ⑥ : Use the provided RS-485 cable to connect the UPS's RS-485 port and the Delta lithium-ion battery pack's RS-485 port.

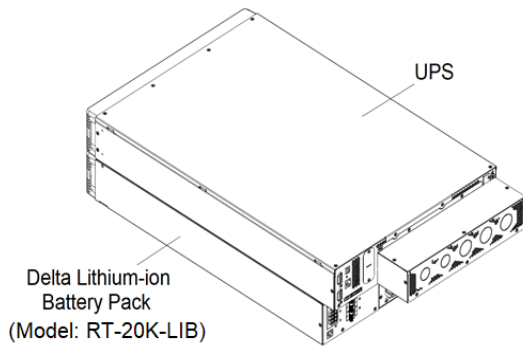
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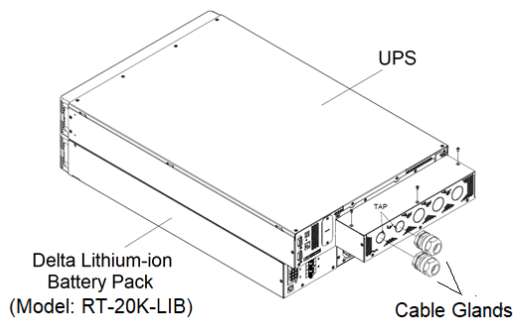
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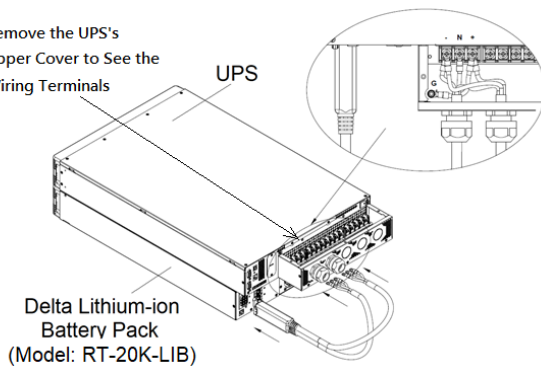


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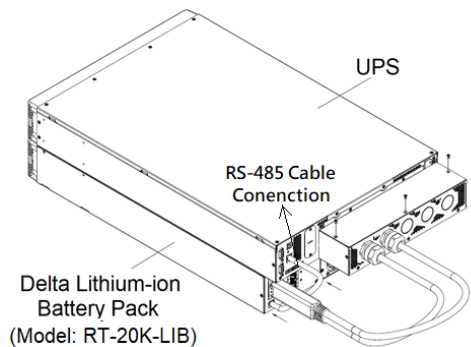


5

Remove the UPS's
Upper Cover to See the
Wiring Terminals



6

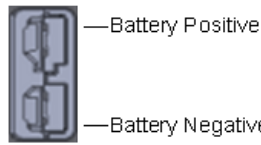


(Figure 6-1: Connect the RT-20K-LIB with the UPS)

6.2 Connecting the Delta Lithium-ion Battery Pack (Model: RT-10K-LIB) to its corresponding UPS

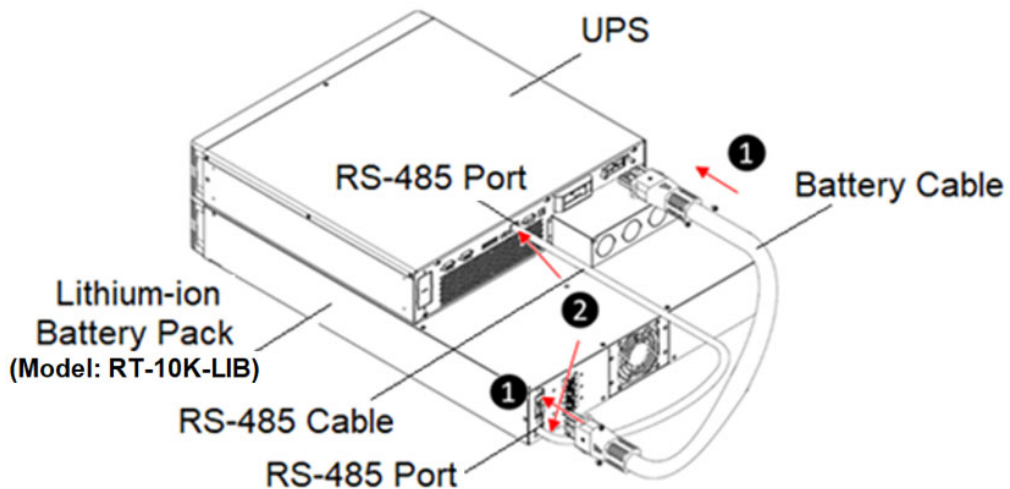
Follow the instructions below and the steps ① ~ ② shown in **Figure 6-2** to connect the Delta lithium-ion battery pack (Model: RT-10K-LIB) to its corresponding UPS.

Step ① : Use the provided battery cable to connect the UPS's external battery connector and the Delta lithium-ion battery pack's external battery



connector (). Make sure that the positive cable (+) connects to the positive pole (+) and the negative cable (-) connects to the negative pole (-).

Step ② : Use the provided RS-485 cable to connect the UPS's RS-485 port and the Delta lithium-ion battery pack's RS-485 port.



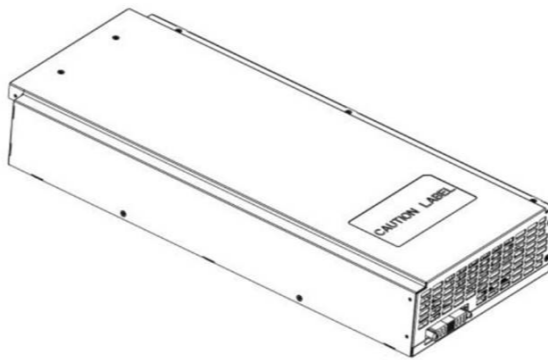
(Figure 6-2: Connect the RT-10K-LIB with the UPS)

Chapter 7 : Battery Module Installation & Replacement



NOTE:

1. The lithium-ion battery module is optional. Please refer to **Figure 7-1** for its appearance.
2. For model RT-20K-LIB, two lithium-ion battery modules are required.
3. For model RT-10K-LIB, it can be configured with one lithium-ion battery module per customer's future demand.



(Figure 7-1: Lithium-ion Battery Module)

Follow the instructions below and the steps ① ~ ④ shown in **Figure 7-2** to install or replace the lithium-ion battery module in the Delta lithium-ion battery pack.

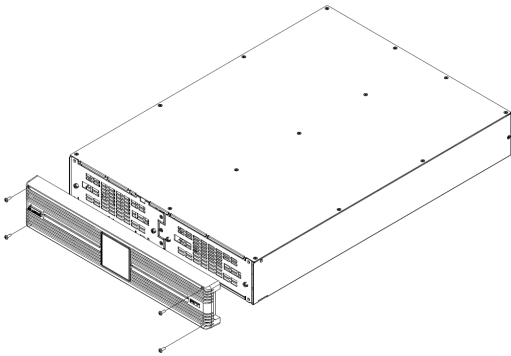
Step ① : Unscrew the screws to remove the battery pack's front panel.

Step ② : Use a Phillips screwdriver to remove the protection cover's screws.

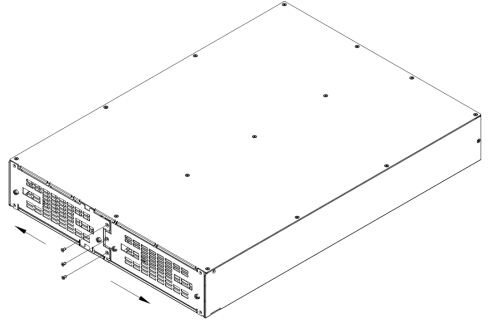
Step ③ : Remove the protection cover.

Step ④ : For installation, please insert a new battery module. For replacement, extract the used battery module from the left or the right compartment and replace it with a new one.

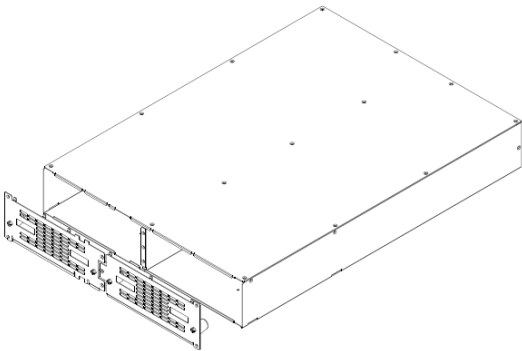
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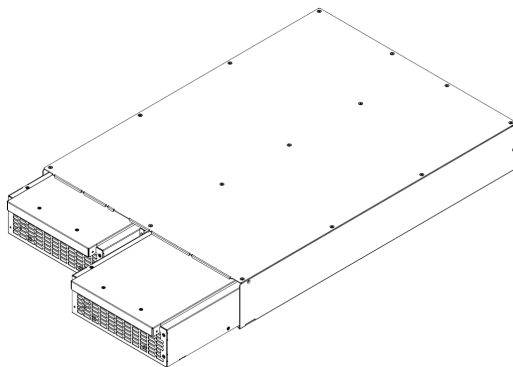
2



3



4



(Figure 7-2: Lithium-ion Battery Module Installation or Replacement)



NOTE :

1. To reassemble the battery pack, please perform the steps ① ~ ④ shown above in reverse sequence.
2. If the MBB (Delta Maintenance Bypass Box) is installed behind the Delta lithium-ion battery pack, please keep the MBB away from the Delta lithium-ion battery pack at least 1cm (0.39”).
3. If you install two lithium-ion battery modules and there is any fault in one of the two modules, it is suggested that you replace both of the battery modules at the same time.

Chapter 8 : Operation Procedures

1. Follow **Chapter 6: Connection** to connect the UPS and the Delta lithium-ion battery pack.
2. After ensuring that the UPS and the Delta lithium-ion battery pack have been firmly connected with the provided battery cable and RS-485 cable, turn on the Delta lithium-ion battery pack's breaker and the UPS's input breaker.
3. Follow the Delta Amplon RT Series UPS's **User Manual** to turn on the UPS.



NOTE :

To safely turn off the Delta lithium-ion battery pack after usage, please follow the steps below.

Step ① : Turn off the Delta lithium-ion battery pack's breaker.

Step ② : Disconnect the provided RS-485 cable.

Step ③ : Disconnect the provided battery cable.

Chapter 9 : Maintenance

It is recommended that you follow the following checklist to ensure the reliability and efficiency of the Delta lithium-ion battery pack.

1. Check the State of Capacity every week via the UPS's LCD.
2. Check the State of Health (SOH) every 3 months (i.e. perform deep discharge test). If the SOH is lower than 30%, please replace the lithium-ion battery module(s).
3. Check the air flow every month.

Appendix 1 : Technical Specifications

Model			RT-10K-LIB	RT-20K-LIB
Battery Type			NMC	
Battery Module Rated Capacity			8.8 Ah (4.4 Ah per module)	4.4 Ah
Max. Discharging Power			11kW	22kW
Nominal Voltage			189 Vdc	± 189 Vdc
Nominal Current			60A	
Connection			Battery connector	
Breaker			63A, 250 Vdc 2P	63A, ± 250 Vdc 3P
Charging	Max. Charging Voltage		216 Vdc	± 216 Vdc
	Max. Charging Current		5A	
Communication Interfaces			RS-485 port x 1	
Physical	Dimensions (W x D x H)	Lithium-ion battery pack	440 x 646.2 x 88 mm (17.3" x 25.5" x 3.5")	
		Battery module	212 x 506 x 76.8 mm (8.3" x 19.9" x 3.0")	
	Weight	Lithium-ion battery pack without battery module	13.7 kg (30.2 lb)	13.7 kg (30.2 lb)
		Per battery module	12.0 kg (26.5 lb)	12.0 kg (26.5 lb)

Model		RT-10K-LIB	RT-20K-LIB
Environment	Operating Altitude	0 ~ 3000 m (0 ~ 10000 ft); 0 ~ 1000 m (0 ~ 3300 ft) (without derating)	
	Operating Temperature	0 ~ 45°C (32 ~ 113°F)	
	Storage Temperature	-15 ~ 50°C (-59 ~ 122°F)	
	Relative Humidity	5 ~ 95% (non-condensing)	



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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- Global Headquarter

Taiwan

Delta Electronics Inc.
39 Section 2, Huandong Road, Shanhua District,
Tainan City 74144, Taiwan
T +886 6 505 6565
E ups.taiwan@deltaww.com

- Regional Office

The United States

Delta Electronics (Americas) Ltd.
46101 Fremont Blvd. Fremont, CA 94538
T +1 510 344 2157
E ups.na@deltaww.com

Australia

Delta Energy Systems Australia Pty Ltd.
Unit 20-21, 45 Normanby Road, Notting Hill VIC 3168, Australia
T +61 3 9543 3720
E ups.australia@deltaww.com

South America

Delta Greentech (Brasil) S/A
Rua Itapeva, 26 - 3° andar Edifício Itapeva One - Bela Vista
01332-000 - São Paulo - SP - Brazil
T +55 11 3568 3850
E ups.brazil@deltaww.com

Thailand

Delta Electronics (Thailand) Public Co.,Ltd.
909 Soi 9, Moo 4, E.P.Z., Bangpoo Industrial Estate, Tambon Prakasa,
Amphur Muang-samutprakarn, Samutprakarn Province 10280, Thailand
T +662 709-2800
E ups.thailand@deltaww.com

China

Delta GreenTech (China) Co., Ltd.
238 Minxia Road, Pudong, Shanghai, 201209 P.R.C
T +86 21 5863 5678
+86 21 5863 9595
E ups.china@deltaww.com

South Korea

Delta Electronics (Korea), Inc.
1511, Byucksan Digital Valley 6-cha, Gasan-dong, Geumcheon-gu,
Seoul, Korea, 153-704
T +82-2-515-5303
E ups.south.korea@deltaww.com

Singapore

Delta Electronics Int'l (Singapore) Pte Ltd.
4 Kaki Bukit Ave 1, #05-04, Singapore 417939
T +65 6747 5155
E ups.singapore@deltaww.com

India

Delta Power Solutions (India) Pvt. Ltd.
Plot No. 43, Sector-35, HSIIDC, Gurgaon-122001, Haryana, India
T +91 124 4874 900
E ups.india@deltaww.com

EMEA

Delta Electronics (Netherlands) BV
Zandsteen 15, 2132MZ Hoofddorp, The Netherlands
T +31 20 655 09 00
E ups.netherlands@deltaww.com

Japan

Delta Electronics (Japan), Inc.
2-1-14 Shibadaimon, Minato-Ku, Tokyo, 105-0012, Japan
T +81-3-5733-1111
E jpstps@deltaww.com

