

The power behind competitiveness

# Delta UPS - Ampron Family

RT Series, Single Phase  
1/ 2/ 3 kVA

User Manual

## **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

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## 1.1 Safety Instructions

### Installation Warnings





- Before installation and usage, please read this **User Manual** thoroughly. This helps you to use the product correctly and safely.
- Install the UPS in a well-ventilated area, away from excess moisture, heat, dust, flammable gas or explosives.
- To avoid fire accidents and electric shock, please install the UPS in a temperate and humidity well-controlled indoor area free of conductive contaminants. For the temperature and humidity specifications, please refer to **Appendix 1 : Technical Specifications**.
- Leave adequate space (at least 15 cm (5.91")) around all sides of the UPS for proper ventilation.

### Connection Warnings

- The UPS must be well grounded due to a possible risk of current leakage.
- The installation of upstream and downstream protective devices is highly recommended when the UPS is connected to the mains and the loads.
- The protective devices connecting to the UPS must be installed near the UPS and must be easily accessible for operation.
- If you need to move the UPS or perform re-wiring, please turn off the AC input power and ensure that the UPS has been safely shutdown. Otherwise, the output end might still be energized, which might cause electric shock.

### Usage Warnings

- The 2kVA and 3kVA UPSs are class-A products. In a domestic or an office environment, this product may cause radio interference, in which case, users are required to take adequate measures.
- The UPS can be used to power computers and associated peripheral devices, such as monitors, modems, cartridge tape drives, external hard drives, etc.
- It is not recommended to connect the UPS with the following types of loads. For the load suitability, please contact Delta customer service before purchasing:
  1. regenerative loads (e.g. CNC machines and lifts).
  2. asymmetrical loads (e.g. fans with half-bridge drivers and laser printers).
- To ensure reliable operation of the UPS and to protect the UPS from overheating, the slits and openings in the UPS must not be blocked or covered.
- Before usage, you must allow the UPS to adjust to room temperature for at least one hour to avoid moisture condensing inside the UPS.
- Do not pour and splash any liquid on the UPS. Do not insert any object into the UPS's slits and openings. Do not put beverage containers on or around the UPS.

- When an emergency occurs, (1) press and hold the **ON/OFF** button () for 3 seconds, (2) release it after you hear one beep, (3) use the **Scrolling UP** or **Down** button (/) to select 'Yes', and (4) press the **Enter** button () to confirm your selection to turn off the UPS. After that, cut off the input power to shut down the UPS completely.
- Do not use any cleaning liquid or cleaning spray to clean the UPS. Before cleaning, please make sure that the UPS has been shut down completely, the UPS's input power cord has been unplugged, and the batteries have been disconnected.
- All maintenance services must be performed by qualified service personnel.
- Forbid opening or removing the cover of the UPS yourself to avoid high voltage electric shock.
- You must contact qualified service personnel if either of the following events occurs:
  1. Liquid is poured or splashed on the UPS.
  2. The UPS does not run normally after this *User Manual* is carefully observed.





**NOTE:**

If you use the UPS in an area that generates or incurs dust, you should install two dust filters (optional) in the 1/ 2/ 3kVA UPS to ensure normal product life and function.

**Battery Warnings**

- Keep the batteries away from heat sources. Do not open or mutilate the batteries.
- Do not dispose of batteries in a fire. The batteries may explode.
- The released electrolyte is harmful to the skin and eyes and may be toxic.
- A battery can present a risk of electric shock and high short-circuit current.
- Servicing of batteries and battery packs must be performed or supervised by qualified service personnel knowledgeable in the batteries, battery packs and required precautions.
- The risk of electric shock and short-circuit current is possible when the batteries are connected to the UPS. Before maintenance, disconnect all batteries to cut off the battery power.
- For battery replacement, only use the same number and type of batteries.
- Observe the following before replacing the batteries:
  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 the charging source prior to connecting or disconnecting battery terminals.
  6. Remove every battery grounding during installation and maintenance to reduce the likelihood of electric shock. If any part of the batteries is grounded, please remove the grounding connection.
- Do not connect the batteries in reverse; otherwise, a risk of electric shock or fire accidents might occur.

- The batteries might lose their power during shipment or storage. Before you use the UPS for the first time, please fully charge the batteries until the battery percentage shown on the UPS's LCD is 100% (  ). If the UPS needs to be stored for an extended period of time, please recharge the batteries every three months and ensure that, every time after recharging, the battery percentage shown on the UPS's LCD is 100% (  ).



**WARNING:**

- The risk of electric shock and short-circuit current is possible when the batteries are still connected to the UPS even though the UPS is disconnected from the mains. Make sure to cut off the battery source before maintenance.
- When the UPS is connected to an external battery pack, installation of appropriate protective devices, such as DC fuses or a DC breaker, is required.
- No matter whether you use the external battery pack(s) or not, always keep the internal batteries connected.

## 1.2 Standard Compliance




- 1kVA: VCCI class B
- 2/ 3kVA: VCCI class A


## 1.3 Storage

- Prior to installation**

If the UPS needs to be stored prior to installation, it should be placed in a dry and well-ventilated area. The allowable storage temperature is between -15°C (5°F) and +50°C (122°F).

- After usage**

(1) Press and hold the **ON/OFF** button (  ) for 3 seconds, (2) release it after you hear one beep, (3) use the **Scrolling UP** or **Down** button (  ) to select 'Yes', and (4) press the **Enter** button (  ) to confirm your selection to turn off the UPS. After that, make sure the UPS is shut down, disconnect the UPS from the utility AC power, remove all loads/ equipment from the UPS, and store the UPS in a dry and well-ventilated area at a temperature between -15°C (5°F ) and +50°C (122°F).

Idle batteries must be recharged fully approximately every three months if the UPS needs to be stored for an extended period of time. Ensure that, every time after charging, the battery percentage shown on the UPS's LCD is 100% (  ).



**NOTE:**

After storage and before start-up of the UPS, you must allow the UPS to adjust to room temperature (20°C~25°C or 68°F~77°F) for at least one hour to avoid moisture condensing inside the UPS.

## Chapter 2 : Introduction

### 2.1 General Overview

The RT series UPS is a single-phase input, single-phase output on-line uninterruptible power supply which provides reliable and consistent sine-wave quality power to your electronic equipment. It adopts the latest technology and the highest quality components providing output power factor up to 0.9, and its efficiency in on-line mode reaches up to 91%. The UPS not only provides safe, reliable and uninterruptible power to your sensitive electronic equipment at all times, but also produces greater electronic power efficiency at less cost. There are three different ratings, 1kVA, 2kVA and 3kVA, for your selection.



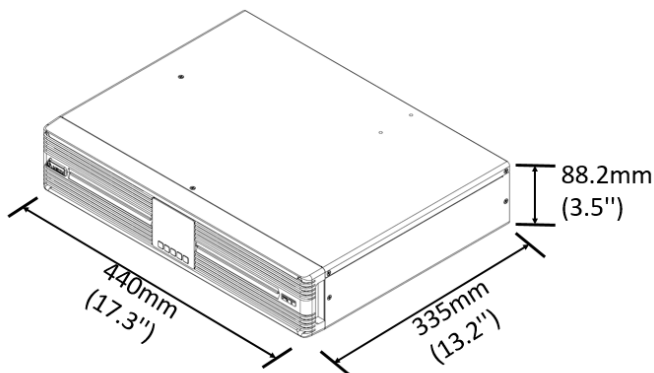
#### NOTE:

The RT series UPS has built-in batteries. Please refer to the table below.

UPS Capacity	Built-in Battery Q'ty
1kVA	2 PCS
2kVA	4 PCS
3kVA	6 PCS

### 2.2 Exterior & Dimensions

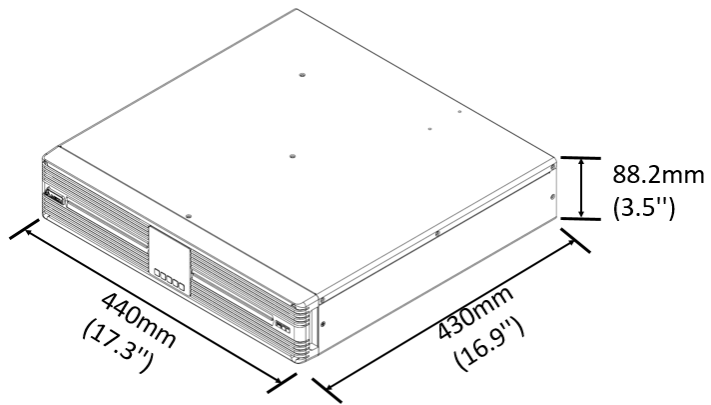
- UPS102R1RT0B0B5



(Figure 2-1: 1kVA Exterior & Dimensions)

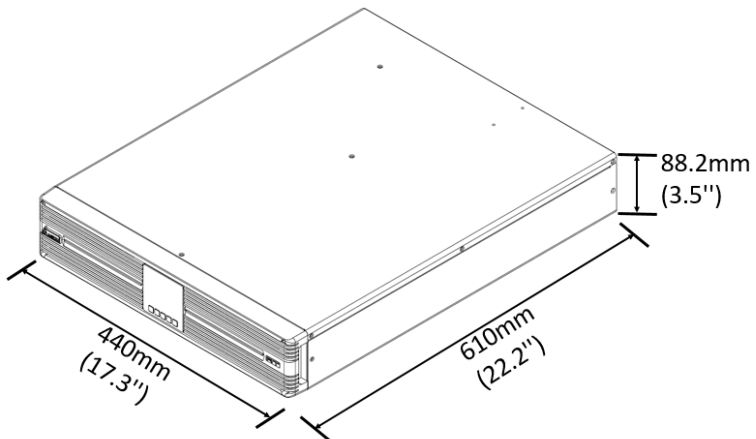


- **UPS202R1RT0B0B5**



*(Figure 2-2: 2kVA Exterior & Dimensions)*

- **UPS302R1RT0B0B5**

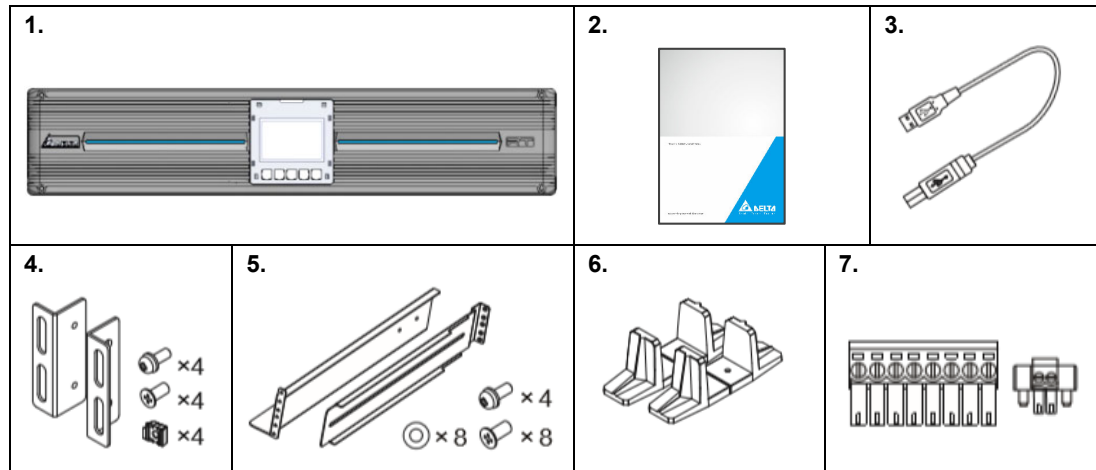


*(Figure 2-3: 3kVA Exterior & Dimensions)*

## 2.3 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.

- UPS102/ 202/ 302R1RT0B0B5**



No.	Item	Q'ty	1kVA	2kVA	3kVA
1	UPS	1 PC	✓	✓	✓
2	User Manual	1 PC	✓	✓	✓
3	USB cable	1 PC	✓	✓	✓
4	Ear Bracket Kit	1 SET	✓	✓	✓
5	Rail Kit	1 SET	✓	✓	✓
6	Tower Stand	1 SET	✓	✓	✓
7	Terminal Kit	1 SET	✓	✓	✓

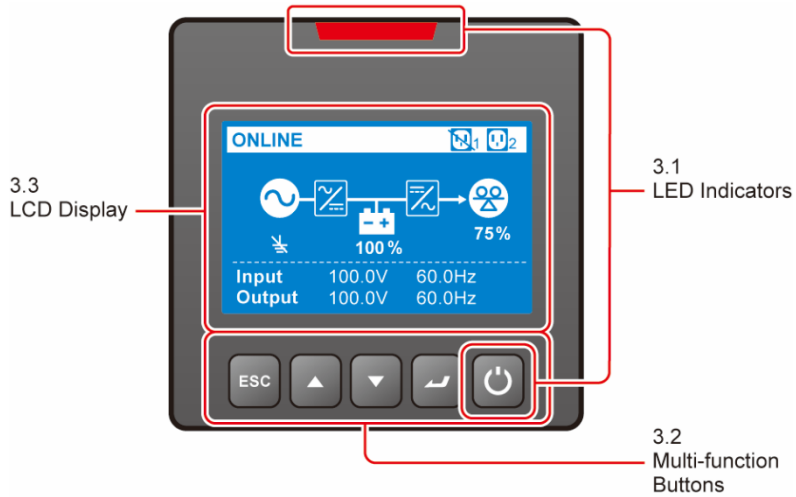


**NOTE:**

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



## Chapter 3 : Operation Panel

On the front panel of the UPS, you'll see two LED indicators, a LCD display, and multi-function buttons.














(Figure 3-1: Operation Panel)



### 3.1 LED Indicators

No.	LED	Description
1		<ol style="list-style-type: none"> <li><b>ON:</b> The output is protected.</li> <li><b>OFF:</b> The output is not protected.</li> </ol>
2		<ol style="list-style-type: none"> <li><b>ON:</b> The UPS detects an internal fault or environmental abnormality.</li> <li><b>OFF:</b> The UPS is normal.</li> <li><b>Flashing:</b> The UPS has at least one warning message. To check the corresponding warning message(s), please refer to <b>Chapter 11: Troubleshooting</b>.</li> </ol>

### 3.2 Multi-function Buttons

No.	Multi-function Button	Description
1	<p data-bbox="257 865 358 923"><b>ON/ OFF Button</b></p> 	<p data-bbox="408 311 1211 369">The button has multiple functions. Please refer to the following for detailed information.</p> <p data-bbox="408 382 546 407"><b>1. Turn on</b></p> <ul data-bbox="474 421 1211 610" style="list-style-type: none"> <li data-bbox="474 421 1211 513">• In standby/ bypass mode, press and hold the button for 3 seconds, and release it after you hear one beep. After that, the UPS will run in on-line mode.</li> <li data-bbox="474 523 1211 610">• Cold start: When there is no AC input, press and hold the button for 3 seconds, and release it after you hear one beep. After that, the UPS will run in battery mode.</li> </ul> <p data-bbox="408 620 550 645"><b>2. Turn off</b></p> <ul data-bbox="474 658 1211 1141" style="list-style-type: none"> <li data-bbox="474 658 1211 867">• In on-line mode, (1) press and hold the button for 3 seconds, (2) release it after you hear one beep, (3) use the <b>Scrolling UP</b> or <b>Down</b> button (/) to select 'Yes', and (4) press the <b>Enter</b> button () to confirm your selection. After that, the inverter will be off and the UPS will transfer to run in standby or bypass mode.</li> <li data-bbox="474 871 1211 1035">• In battery mode, (1) press and hold the button for 3 seconds, (2) release it after you hear one beep, (3) use the <b>Scrolling UP</b> or <b>Down</b> button (/) to select 'Yes', and (4) press the <b>Enter</b> button () to confirm your selection. After that, the UPS will be turned off.</li> <li data-bbox="474 1058 1211 1141">• In battery mode, press and hold the button for 3 seconds, and release it after you hear one beep. After that, the UPS will turn off its output.</li> </ul> <p data-bbox="408 1161 581 1186"><b>3. Fault Clear</b></p> <p data-bbox="454 1199 1211 1286">When the UPS is under a fault condition, press and hold the button for 3 seconds, and release it after you hear one beep. After that, the UPS will try to clear the fault.</p> <p data-bbox="412 1306 485 1373"> <b>NOTE:</b></p> <ol data-bbox="515 1354 1211 1547" style="list-style-type: none"> <li data-bbox="515 1354 1211 1479">1. When the UPS clears the fault, it means that the buzzer/ warning message has been turned off. To eliminate the fault detected, please refer to <b>Chapter 11: Troubleshooting</b> for relevant solutions.</li> <li data-bbox="515 1489 1211 1547">2. The function mentioned above is only applicable to the condition when the UPS has a fault and the inverter is off.</li> </ol>

No.	Multi-function Button	Description
②	<p data-bbox="271 382 348 446"><b>Enter Button</b></p> 	<p data-bbox="408 258 1208 314">The button has multiple functions. Please refer to the following for detailed information.</p> <ol data-bbox="408 324 1208 614" style="list-style-type: none"> <li data-bbox="408 324 1208 450"> <p data-bbox="408 324 707 349"><b>1. Enter the Main Menu</b></p> <p data-bbox="471 363 1208 450">In the <b>Main Screen</b> (that shows the current operation mode), press the button for 0.1 second and the UPS will enter the <b>Main Menu</b> (setup mode). Please refer to <b>Chapter 9: LCD Display &amp; Settings</b>.</p> </li> <li data-bbox="408 459 1208 614"> <p data-bbox="408 459 854 484"><b>2. Select and confirm the parameter</b></p> <p data-bbox="471 498 1208 614">Press the button to choose the parameter you want to change and the chosen parameter will flash. Then, press the <b>Scrolling up</b> or the <b>Scrolling down</b> button to change the parameter and press the enter button again to confirm the change.</p> </li> </ol>
③	<p data-bbox="248 884 369 948"><b>Scrolling UP Button</b></p> 	<p data-bbox="408 645 1208 701">The button has multiple functions. Please refer to the following for detailed information.</p> <ol data-bbox="408 710 1208 1248" style="list-style-type: none"> <li data-bbox="408 710 1208 836"> <p data-bbox="408 710 996 736"><b>1. Enter the Measurement Menu's Output screen</b></p> <p data-bbox="471 749 1208 836">In the <b>Main Screen</b>, press the button for 0.1 second and the UPS will directly enter the <b>Measurement Menu's Output</b> screen. For details about the LCD items, see <b>Figure 9-1: Menu Tree</b>.</p> </li> <li data-bbox="408 846 1208 1145"> <p data-bbox="408 846 882 871"><b>2. Scroll up/ Increase the setting value</b></p> <ul data-bbox="471 890 1208 1145" style="list-style-type: none"> <li data-bbox="471 890 1208 952">• The button can be used to navigate the setting items. Press the button for 0.1 second to go to the previous setting item.</li> <li data-bbox="471 962 1208 1145">• The button can also be used to set up the parameter. Press the button for 0.1 second to increase the setting value. If the button is pressed for more than 2 seconds, the setting value will increase by its minimum adjustable unit every 0.2 second automatically until the button is released or the setting value reaches its maximum.</li> </ul> </li> <li data-bbox="408 1155 1208 1248"> <p data-bbox="408 1155 594 1180"><b>3. Reset LCD</b></p> <p data-bbox="471 1193 1208 1248">Press the <b>Scrolling Up</b> and the <b>Scrolling Down</b> buttons together for 3 seconds to reset the LCD display.</p> </li> </ol>
④	<p data-bbox="230 1329 385 1373"><b>Scrolling Down Button</b></p> 	<p data-bbox="408 1275 1208 1331">The button has multiple functions. Please refer to the following for detailed information.</p> <ol data-bbox="408 1340 1208 1470" style="list-style-type: none"> <li data-bbox="408 1340 1208 1470"> <p data-bbox="408 1340 996 1365"><b>1. Enter the Measurement Menu's Output screen</b></p> <p data-bbox="471 1379 1208 1470">In the <b>Main Screen</b>, press the button for 0.1 second and the UPS will directly enter the <b>Measurement Menu's Output</b> screen. For details about the LCD items, see <b>Figure 9-1: Menu Tree</b>.</p> </li> </ol>

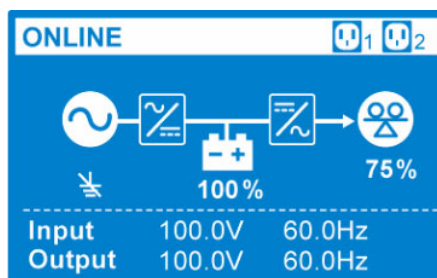
No.	Multi-function Button	Description
④	<b>Scrolling Down Button</b> 	<p><b>2. Scroll down/ Decrease the setting value</b></p> <ul style="list-style-type: none"> <li>The button can be used to navigate the setting items. Press the button for 0.1 second to go to the next setting item.</li> <li>The button can also be used to set up the parameter. Press the button for 0.1 second to decrease the setting value. If the button is pressed for more than 2 seconds, the setting value will decrease by its minimum adjustable unit every 0.2 second automatically until the button is released or the setting value reaches its maximum.</li> </ul> <p><b>3. Reset LCD</b></p> <p>Press the <b>Scrolling Up</b> and the <b>Scrolling Down</b> buttons together for 3 seconds to reset the LCD display.</p>
⑤	<b>Escape Button</b> 	<p>The button has multiple functions. Please refer to the following for detailed information.</p> <p><b>1. Go back to the previous menu level</b></p> <p>Press the button for 0.1 second to go back to the previous menu level.</p> <p><b>2. Silence the buzzer temporarily</b></p> <p>When the UPS is under a fault condition, press and hold the button for 3 seconds and release it after you hear one beep. After that, the buzzer will stop sounding unless a new fault occurs.</p>












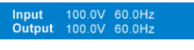
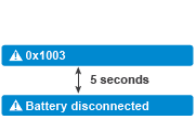


**NOTE:**

If the LCD display goes dim, press any button mentioned above for 0.1 second to wake up the LCD display and enable each button function.






### 3.3 LCD Display



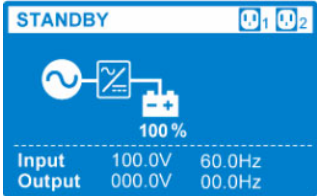
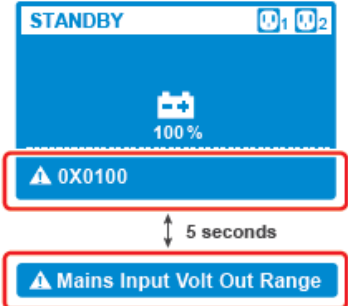

### 3.3.1 Icon/ Display Definition

No.	Icon	Description
1		There is output for the Load 1 and Load 2.
		Indicates the output status for the connected loads. When there is output, the load's icon will light up. When there is no output, the load's icon will light up with a backlash.
		There is no output for the Load 1, but there is output for the Load 2.
		There is no output for the Load 1 and Load 2.
2		Indicates the Site Wiring Fault status. <b>ON:</b> There is Site Wiring Fault. <b>OFF:</b> There is no Site Wiring Fault.
3		Indicates the battery percentage (%).
		When there is no any battery connected to the UPS, this icon will flash.
		Indicates that the batteries are bad and need replacement.
4		Indicates the load level (%).
5		When the UPS runs normally, this display will show the input/ output voltage and frequency.
		When the UPS has abnormalities or is under a fault condition, this display will show an error code and its corresponding alarm message.  <b>NOTE:</b> The error code and the alarm message will appear alternatively for every 5 seconds.
6		Indicates that the buzzer is muted.

### 3.3.2 Operation Mode Diagram Definition

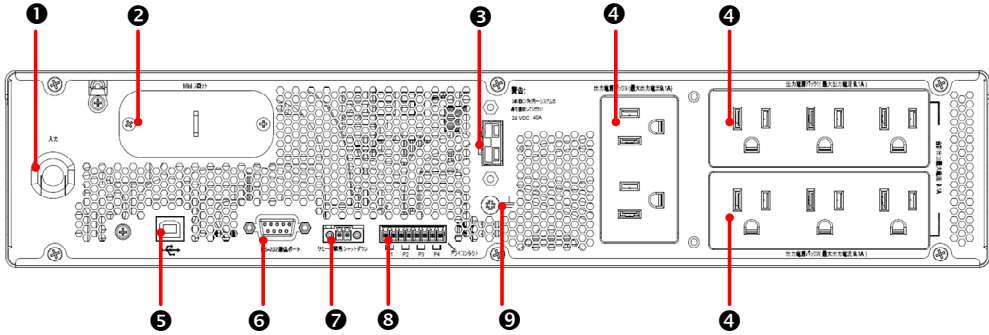
No.	Diagram	Description
1		Indicates <b>ONLINE</b> mode.
2		Indicates <b>ECO</b> mode.  <b>NOTE:</b> In <b>ECO</b> mode, the power flow diagram will change according to the UPS's input voltage and frequency. However, the icon  shown in the upper-left corner will not change even if the UPS transfers to online mode or battery mode.
3		Indicates <b>BATTERY</b> mode.  <b>NOTE:</b> The error code and the alarm message will appear alternatively for every 5 seconds.
4		Indicates <b>BYPASS</b> mode.
5		Indicates <b>Frequency Conversion</b> mode.  <b>NOTE:</b> In <b>Frequency Conversion</b> mode, the power flow diagram will change according to the UPS's input voltage and frequency. However, the icon  shown in the upper-left corner will not change even if the UPS transfers to battery mode.



No.	Diagram	Description
6	 <p>The diagram shows a blue screen with 'STANDBY' at the top. Below it is a power symbol and a battery icon with '100%' next to it. At the bottom, it displays 'Input 100.0V 60.0Hz' and 'Output 000.0V 00.0Hz'.</p>	Indicates <b>AC STANDBY</b> mode.
7	 <p>The diagram shows a blue screen with 'STANDBY' at the top and a battery icon with '100%' below it. Below this, there are two error messages in blue boxes with red borders: '▲ 0X0100' and '▲ Mains Input Volt Out Range'. A double-headed arrow between these boxes is labeled '5 seconds'.</p>	Indicates <b>DC STANDBY</b> mode.  <b>NOTE:</b> The error code and the alarm message will appear alternatively for every 5 seconds.

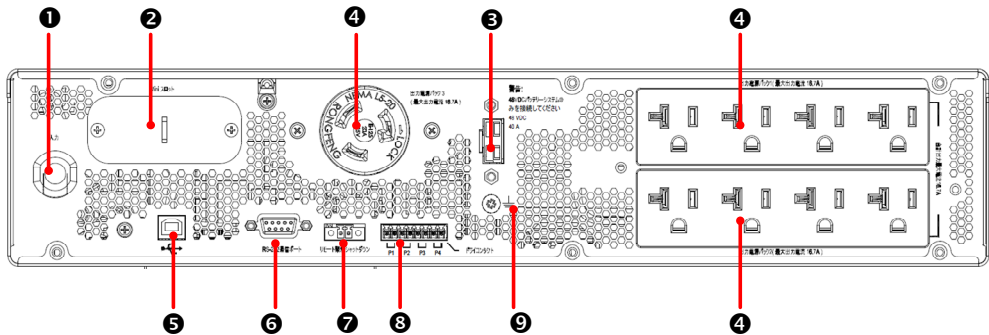
## Chapter 4 : Rear Panel

- UPS102R1RT0B0B5



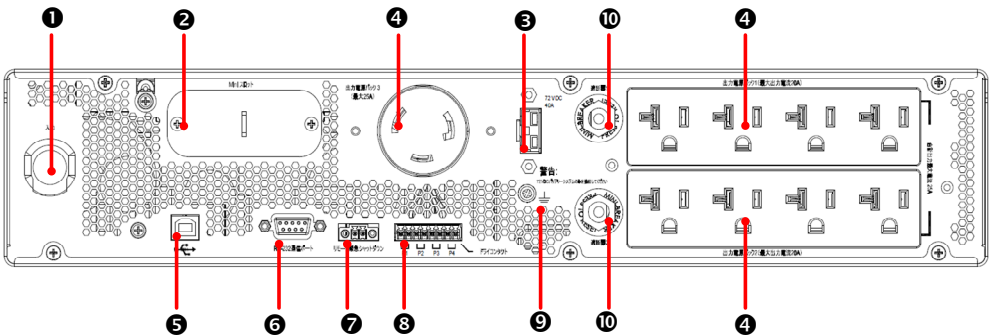
(Figure 4-1: 1kVA Rear Panel)

- UPS202R1RT0B0B5





(Figure 4-2: 2kVA Rear Panel)

- UPS302R1RT0B0B5



(Figure 4-3: 3kVA Rear Panel)

No.	Item	Functions
①	Input Power Cord	Connects to the mains.
②	MINI Slot	For installation of an optional mini card, such as Mini SNMP IPv6 card, Mini Relay I/O card, or Mini MODBUS card. Refer to <b>5.1 MINI Slot</b> for details.
③	External Batt. Connector	Connects to the external battery pack(s) (optional) to extend back up time. (1 kVA: 24V DC 40A) (2 kVA: 48V DC 40A) (3 kVA: 72V DC 40A)
④	Output Sockets	Connect to the loads.
⑤	 (USB Port)	Connects to a computer to monitor the UPS status, configure the parameters and update the management software. (UPSentry 2012 Software is required. Please download it from <a href="https://datacenter-softwarecenter.deltaww.com.cn">https://datacenter-softwarecenter.deltaww.com.cn</a> ).
⑥	RS-232 Port	Connects to a computer to build up RS-232 communication, configure the UPS and upgrade the UPS firmware. (UPSentry 2012 Software is required. Please download it from <a href="https://datacenter-softwarecenter.deltaww.com.cn">https://datacenter-softwarecenter.deltaww.com.cn</a> ).
⑦	REPO Port	Shuts down the UPS safely and immediately when an emergency occurs. Refer to <b>5.3 REPO Port</b> for details.
⑧	Dry Contacts	1. One input dry contact: enables the UPS to receive external control signals. 2. Three output dry contacts: enable users to receive the UPS's event information, status or internal messages. For details about the input and output dry contacts, refer to <b>5.2 Dry Contacts</b> .
⑨		For external battery pack grounding.
⑩	Output Breakers	Prevent the output sockets from damage caused by overload.

## Chapter 5 : Communication Interfaces

---



### NOTE:

1. The UPS can still function properly without making the connections below.
2. For the location of the following communication interfaces, please refer to **Figure 4-1 ~ Figure 4-3**.

### 5.1 MINI Slot

The MINI slot is for mini-size cards. You can install a Mini SNMP IPv6, Mini Relay I/O, or Mini MODBUS card in this slot to let the system have network communication, dry contact function, and MODBUS communication respectively.

### 5.2 Dry Contacts

The RT UPS provides one input dry contact for the UPS to receive external control signals. You can set up relevant items in the **Dry Contact Setting** screen, which includes Disable/ ROO/ RPO/ Remote shutdown/ Forced bypass/ On generator. Besides, there are three configurable output dry contacts for users to receive the UPS's event information, status or internal messages. The output dry contacts are normally open (NO). You can set up relevant items in the **Dry Contact Setting** screen, which includes Disable/ On bat/ Low bat/ Bat fault/ Bypass/ UPS OK/ Load protected/ Load powered/ General alarm/ Overload alarm. Please refer to **9.2.2 Setting Menu** and **9.2.4 Maintenance Menu** for relevant information.

### 5.3 REPO Port

The REPO port can be connected to an external switch. After the external switch is turned to the 'CLOSED' position, the UPS will switch off the inverter immediately and cut off the UPS output without transferring to bypass mode.



### NOTE:

1. You can use the management software to configure the REPO port as normally open (NO) or normally closed (NC). The factory default setting is normally open (NO).
2. The REPO port can also be used for ROO application, which allows you remotely turn on/ off the inverter. If you need detailed ROO information or ROO setup service, please contact your local dealer or customer service. Please note that this port can only be modified by qualified service personnel.

### 5.4 RS-232 Port

You can use a RS-232 cable (user supplied) to connect the UPS with a computer and install the UPSentry 2012 software\*1 to check and monitor the UPS status.

#### The RS-232 port provides the following functions

1. RS-232 communication (baud rate: 2400)
2. UPS configuration
3. Firmware upgrade (baud rate: 9600)

### Pin Assignment

1. PIN 2: TXD <Transmitting Data>
2. PIN 3: RXD <Receiving Data>
3. PIN 5: GND <Signal Ground>

### Hardware

1. Baud Rate: 2400/ 9600bps
2. Data Length: 8 bit
3. Stop Bit: 1 bit
4. Parity: None



#### NOTE:

1. \*1 You can download the software from the following link:  
<https://datacenter-softwarecenter.deltaww.com.cn>
2. Do not use the USB port and the RS-232 port simultaneously. If you connect the provided USB cable to the USB port, the RS-232 port will be disabled right away.

## 5.5 USB Port

Please use the provided USB cable to connect the UPS with a computer and install the UPSentry 2012 software\*1 to check and monitor the UPS status. The USB port has the following functions:

1. HID USB communication
2. UPS configuration with EEPROM programming
3. UPS firmware upgrade
4. Event logs download
5. Dry contacts setup



#### NOTE:

1. \*1 You can download the software from the following link:  
<https://datacenter-softwarecenter.deltaww.com.cn>
2. Do not use the USB port and the RS-232 port simultaneously. If you connect the provided USB cable to the USB port, the RS-232 port will be disabled right away.

## 5.6 External Battery Connector

To increase the battery backup time, you can connect several external battery packs to the UPS. The connector is for connection to the external battery pack(s). Please see below for relevant information.

- **Battery**

UPS	Charge Voltage	Charge Current <sup>*1</sup>	Low Battery Shutdown	The Number of Batteries
1kVA	27.3 ± 0.3Vdc at 25°C	1A	Back-up Time < 1 Hour, 10 ~ 100% = 20.0V ± 3% Back-up Time < 1 Hour, < 10% = 21.2V ± 3% Back-up Time > 1 Hour = 21.6V ± 3%	12V × 2 PCS
2kVA	54.6 ± 0.6Vdc at 25°C	1A	Back-up Time < 1 Hour, 10 ~ 100% = 40.0V ± 3% Back-up Time < 1 Hour, < 10% = 42.4V ± 3% Back-up Time > 1 Hour = 43.2V ± 3%	12V × 4 PCS
3kVA	81.9 ± 0.9Vdc at 25°C	1A	Back-up Time < 1 Hour, 10 ~ 100% = 60.0V ± 3% Back-up Time < 1 Hour, < 10% = 63.6V ± 3% Back-up Time > 1 Hour = 64.8V ± 3%	12V × 6 PCS



**NOTE:**

\*1 The charge current is shared by the internal and external batteries.

- **External Battery Pack**

1. To increase the battery backup time, you can connect several external battery packs to the UPS.
2. Delta external battery pack is optional. Please refer to the Quick Guide, User Manual or Installation & Operation Guide included in the package of the external battery pack.
3. When connecting the external battery pack with the UPS, you must install an appropriate DC breaker or fast-acting fuses that meets the safety certification. Do not use an AC breaker.
4. The breaker must be a 2-pole DC breaker with features of 2-pole 80Vdc and 7kA (or above) DC breaking capacity.

- **Battery/ Battery Pack Connection Warnings**

1. Only use the same type of batteries from the same supplier. Never use old, new and different Ah batteries at the same time.
2. The number of batteries must meet UPS requirements.
3. Do not connect the batteries in reverse.
4. Use the voltage meter to measure whether the total voltage, after battery pack connection, is around  $12.5Vdc \times$  the total number of batteries.

- **Alarm**



When any external battery pack connected to the UPS has the following problems, the UPS system will sound an alarm. Please see the table below.

No.	External Battery Pack Status	Description
1	Battery Mode	The alarm beeps once every 2 seconds.
2	Battery Low Warning	The alarm beeps once every 0.5 second.
3	Battery Missing/ Weak Battery/ Battery Replacement	The alarm beeps once every 2 seconds.
4	Overload	<ol style="list-style-type: none"> <li>1. Overload 105 ~ 125%: The alarm beeps once every 2 seconds.</li> <li>2. Overload 125 ~ 150%: The alarm beeps once every 0.5 second.</li> </ol>
5	Fault	The buzzer sounds continuously for 5 seconds when the UPS detects an internal fault. After the 5-second long beep, the alarm beeps once every 2 seconds.



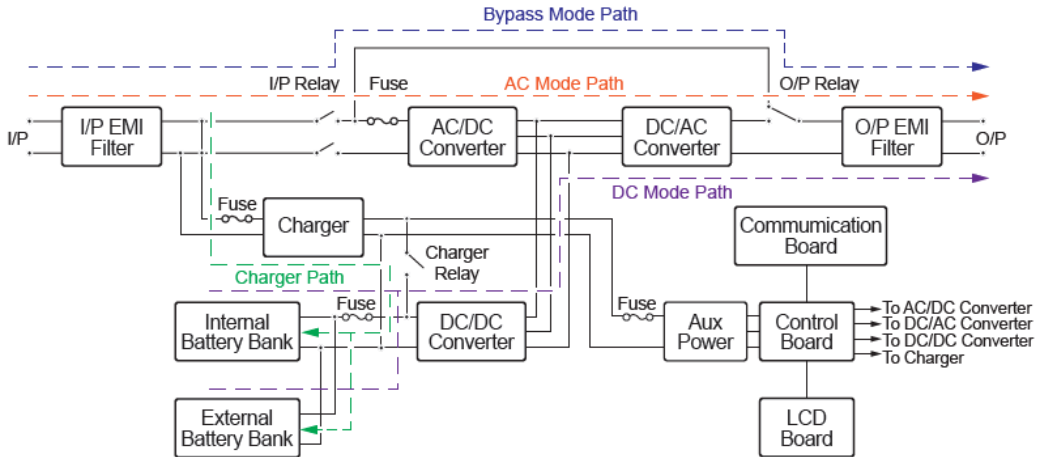
**NOTE:**

After battery reconnection or replacement, it might take a while for the UPS to switch off the alarm automatically. If, after a period of time, the audible alarm still exists, please manually initiate a battery test. Please follow the route below to execute the manual battery test in order to clear the alarm. The charge current is shared by the internal and external batteries.

**Route:** press the button  for 0.1 second → tap the icon  → select **Test** → select **Start Battery Test**. For relevant information, please refer to **9.2 Main Menu**.

# Chapter 6 : Installation

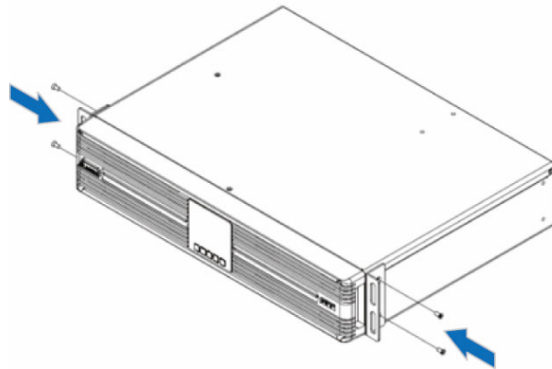
Please refer to the system block diagram and related information below for correct installation.



## 6.1 Rack Mounting

Use the included ear brackets and screws to mount the UPS in a rack by following the procedures below.

- 1 Attach the included ear brackets to the lateral mounting holes of the UPS. See **Figure 6-1**.



(Figure 6-1: Ear Bracket Installation)

- 2 Follow steps 1 to 4 to install the UPS in Delta's rail kit (provided). See **Figure 6-1**.

Step 1 : Adjust the length of the rail according to the rack.

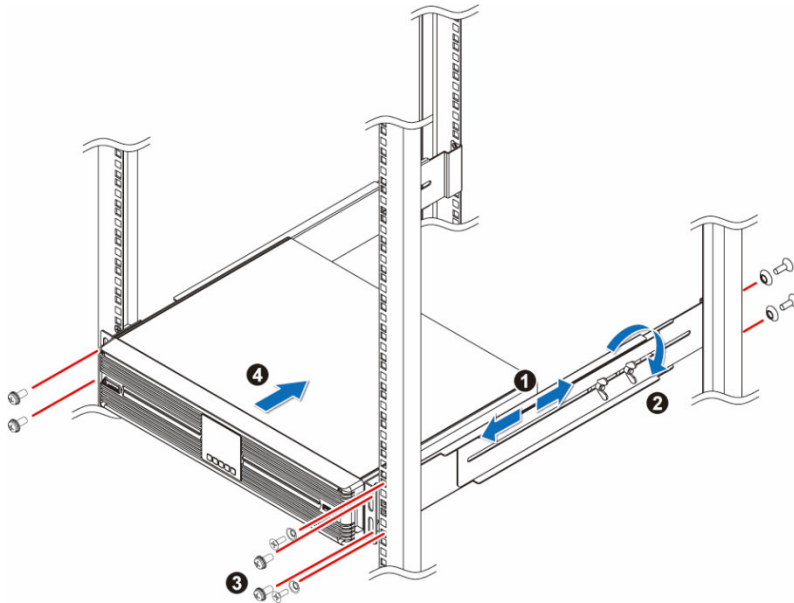
Step 2 : Tighten the nuts.

Step 3 : Fix the rail on the rack.

Step 4 : Insert the UPS in the rack and tighten the screws.



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

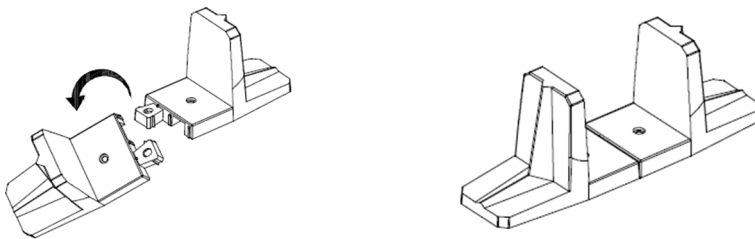


(Figure 6-2: Rack Mounting)

## 6.2 Tower Mounting

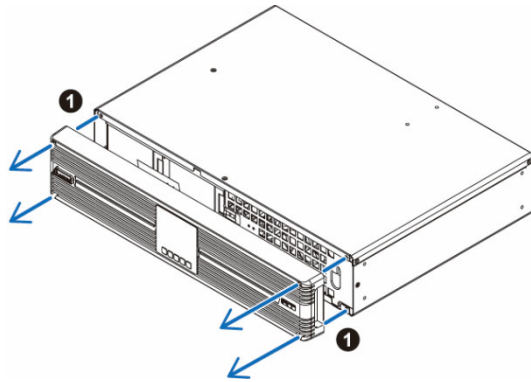
Use the included tower stands to mount the UPS in an upright tower position by following the steps below.

- 1** Assemble the tower stands (see **Figure 6-3**).



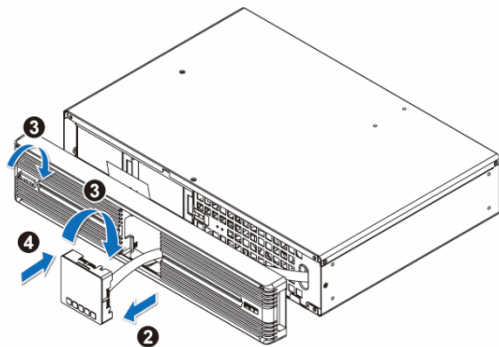
(Figure 6-3: Assemble the Tower Stands)

- 2 Unscrew the screws and pull out the UPS's front bezel 1.

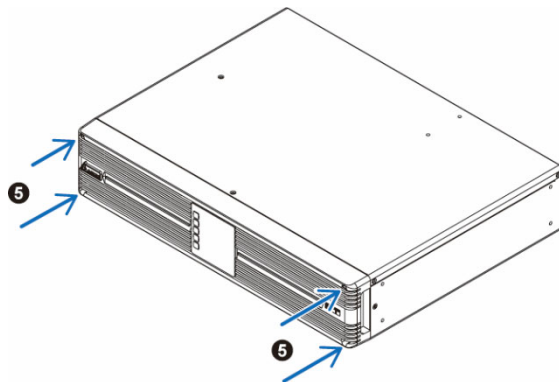


(Figure 6-4: Remove the screws.)

- 3 Pull out the control panel 2, rotate the panel and the Delta logo nameplate 3 90° clockwise 4 and re-insert the control panel 4 (see Figure 6-5). Re-attach the front bezel to the UPS and tighten the screws 5 (see Figure 6-6).

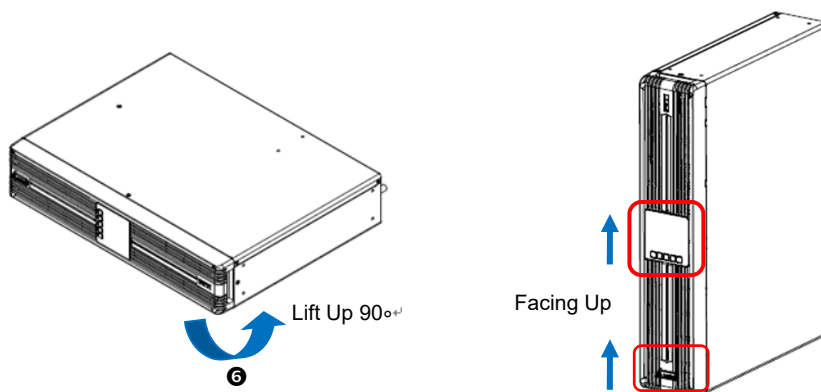


(Figure 6-5: Rotate the Control Panel and the Delta Logo Nameplate)



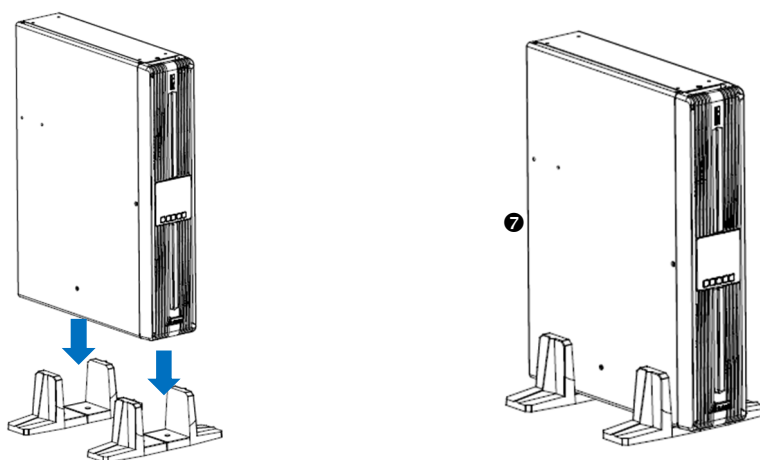
(Figure 6-6: Reattach the front bezel to the UPS.)

- 4 Carefully lift the UPS upright ⑥ (at least two people are required) with the Delta logo nameplate and buttons on the LCD facing up.



**(Figure 6-7: Place the UPS Upright)**

- 5 Fit the whole unit into the tower stands ⑦ (at least two people are required).



**(Figure 6-8: Fit the UPS into the Tower Stands)**

Leave adequate space (at least 50 cm (19.69")) around all sides of the UPS for good ventilation.

## 6.2 Battery/ Battery Pack Replacement

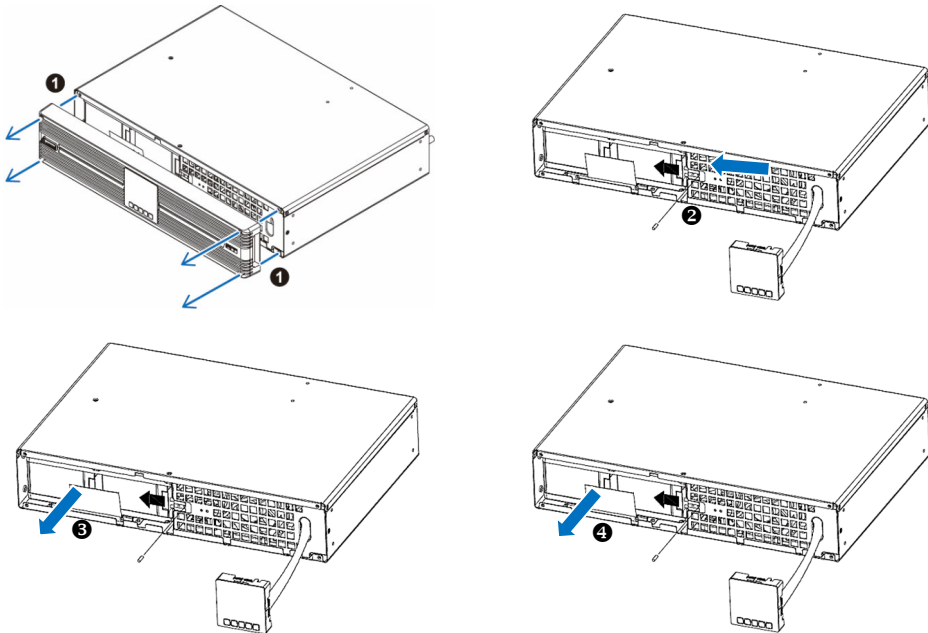


### NOTE:

1. Turn off the UPS and cut off the AC source before performing battery/ battery pack replacement.
2. A battery can present a risk of electric shock and high short-circuit current.
3. Servicing of batteries and battery packs must be performed or supervised by qualified service personnel knowledgeable in batteries, battery packs and the required precautions. Keep unauthorized personnel away from batteries and battery packs.

Replace the battery/ battery pack by following the procedures below.

1. Unscrew the screws and remove the front bezel ❶.
2. Disconnect the battery terminals ❷.
3. Use a Phillips screwdriver to remove the screws from the protection cover located in front of the batteries. Then, remove the protection cover ❸.
4. Pull out the battery from the left battery compartment and insert a new one. Follow the same procedure to replace the battery in the right battery compartment ❹.
5. Reassemble the battery pack in reverse order.



## Chapter 7 : Connection and Wiring

### 7.1 UPS Connection and Wiring Warnings

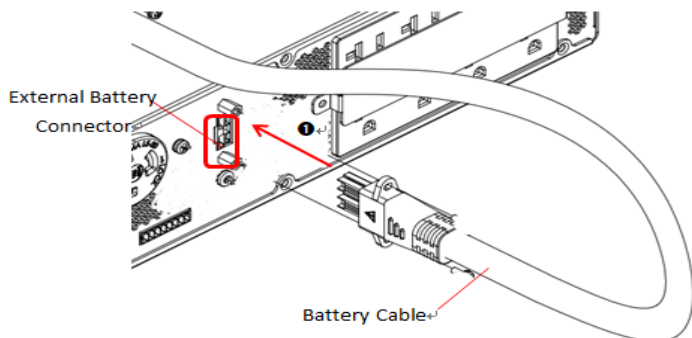
- 1 When connecting the UPS to the mains and the loads, it is highly recommended that you install the protective devices. Please refer to the table below.

Model	Maximum current of branch breaker
UPS102R1RT0B0B5	15A
UPS202R1RT0B0B5	20A
UPS302R1RT0B0B5	30A

- 2 The protective devices must be approved components that meet safety certifications.
- 3 The power supplying to the UPS must be single-phase in accordance with the unit's rating label, and the UPS must be properly grounded.

### 7.2 External Battery Pack Connection

To increase the battery backup time, you can connect several external battery packs to the UPS. Please follow the steps below (**Figure 7-1**) and information in **5.6 External Battery Connector** to complete the connection.



(Figure 7-1: External Battery Pack Connection)

- 1 Insert the battery cable into the external battery connector ❶ and firmly fix the battery cable.
- 2 Connect the other end to the external battery connector on the Delta external battery pack. Make sure that the positive cable (+) connects to the positive pole (+) and the negative cable (-) connects to the negative pole (-).


## Chapter 8 : Operation

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### 8.1 Start-up




#### NOTE:

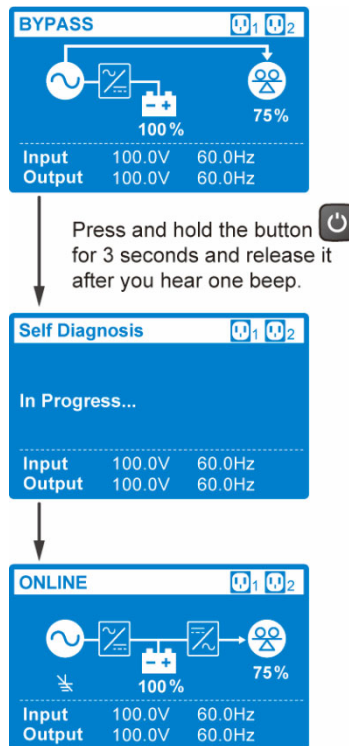
1. Before start-up, ensure that the batteries are fully charged. Before using the UPS for the first time, please check the battery capacity and the charging settings. Make sure that you charge the batteries until the battery percentage shown on the UPS's LCD is 100% (  ).
2. If the UPS is connected to an inductive load, the inrush current (initial surge current) may cause the inverter to restart when you power on the UPS. To avoid this situation, please power on the UPS in bypass mode.

If the UPS is connected to an inductive load, the inrush current (initial surge current) may cause the inverter to restart when you power on the UPS. To avoid this situation, please power on the UPS in bypass mode.


- **Start-up with AC Input**

#### If you don't connect the Delta external battery pack(s) to the UPS:

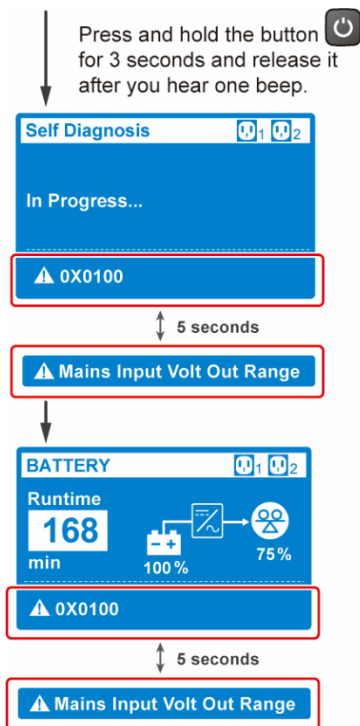
- 1 Verify if the UPS's input cord meets with N, L & G of the wall socket and the utility AC power works normally.
- 2 Plug the UPS's input cord into the wall socket.
- 3 Press and hold the **ON/ OFF** button (  ) for 3 seconds to start up the UPS. Release the button after you hear one beep and the UPS will start up. After the UPS performs self-diagnosis, the UPS will run in **ON-LINE** mode.



**If you connect the Delta external battery pack(s) to the UPS:**

- 1 Verify if the UPS's input cord meets with N, L & G of the wall socket and the utility AC power works normally.
- 2 Check the '+' and '-' poles of the Delta external battery pack(s) and ensure that wiring is correct.
- 3 Connect the Delta external battery pack(s) to the UPS.
- 4 Plug the UPS's input cord into the wall socket.
- 5 Press and hold the **ON/ OFF** button (  ) for 3 seconds and release it after you hear one beep. After the UPS performs self-diagnosis, the UPS will run in **ON-LINE** mode.





- **Start-up with Battery (Cold-start)**



**NOTE:**

To prevent the UPS from activating the overload protection mechanism during start-up process, please turn on the high-power loads first and then low-power loads.

## 8.2 Turn-off

- 1) Make sure all loads connected to the UPS have been completely shut down.
- 2) (1) Press and hold the **ON/ OFF** button () for 3 seconds, (2) release it after you hear one beep, (3) use the **Scrolling UP or Down** button ( / ) to select 'Yes', and (4) press the Enter button () to confirm your selection.
- 3) Disconnect the UPS from the AC power.
- 4) If you connect the external battery pack(s) to the UPS, disconnect the UPS from the external battery pack(s).



## 8.3 Operation Mode

- **Standby Mode**

After the UPS is connected to the utility AC power, it will supply power to the UPS and the batteries will be charged. The default setting of the UPS is set in **Standby** mode

- **Online Mode**

In on-line mode, the connected loads are supplied by the inverter, which derives its power from the utility AC power, and the UPS charges the batteries and provides power protection to its connected loads.

- **Bypass Mode**

In bypass mode, the critical loads are directly supplied by the utility AC power and the batteries are charged.

- **Battery Mode**

When the UPS is operating during a power outage, the batteries provide DC power, which maintains inverter operation to supply power to the critical loads.

You can install the UPSentry 2012 software (please download from <https://datacenter-softwarecenter.deltaww.com.cn>) or install the Mini SNMP IPv6 card (optional) or the Mini MODBUS card (optional) to monitor and estimate the battery remaining capacity. For more information about the Mini SNMP IPv6 card (optional) or the Mini MODBUS card (optional), please refer to its user manual.

- **ECO Mode**

In ECO mode, when the utility input voltage and frequency are within the range of rating voltage  $\pm 10\%$  and rating frequency  $\pm 3$  Hz, the loads are supplied by the utility AC power; if out of the range, the loads are supplied by the inverter.

- **Frequency Conversion Mode**

In Frequency Conversion mode, the UPS output frequency is manually set up. The system will disable the bypass function and there is no bypass output.

## Chapter 9 : LCD Display & Settings




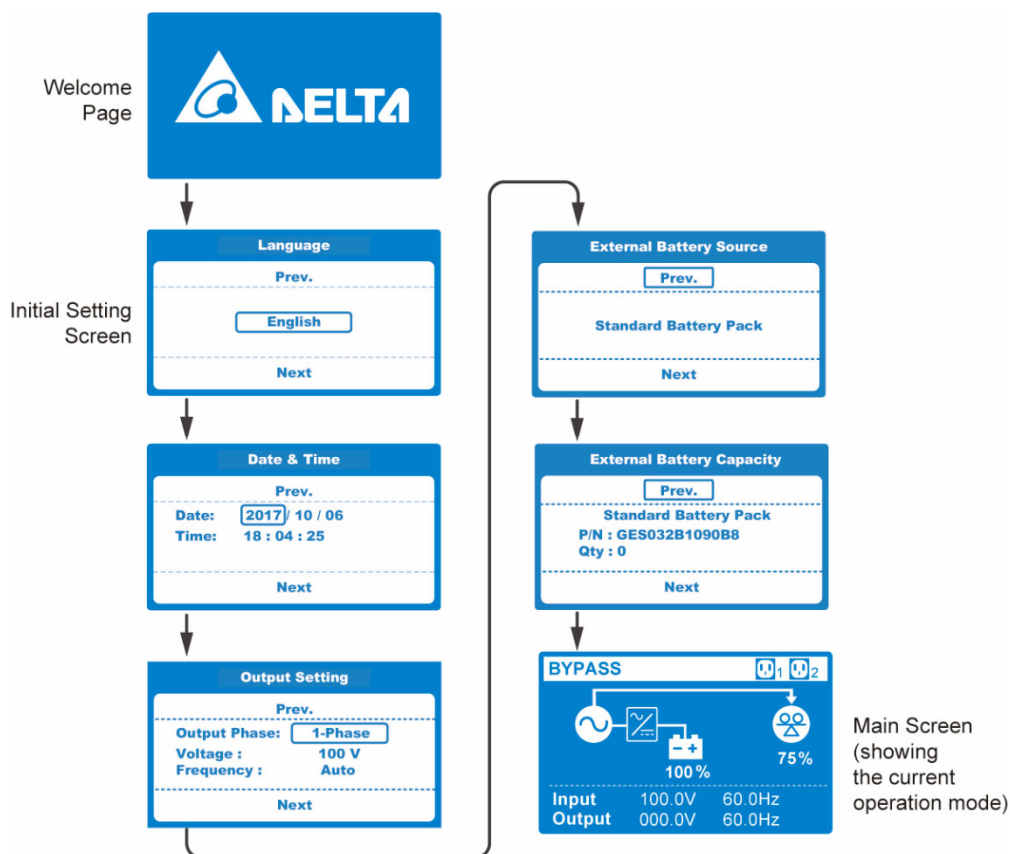
### NOTE:

1. Please refer to **Chapter 3: Operation Panel** to learn how to operate the operation panel and understand every icon/ diagram definition.
2. Each of the display diagrams shown in this chapter is for reference only. Actual display depends on the operation of the UPS.

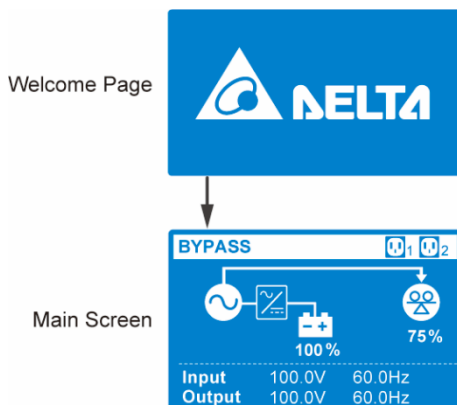
The following flow chart helps you to understand how to navigate each display screen.

### 9.1 Initial Setting Screen


When the UPS is powered on for the first time with the AC input, the LCD display will enter the **Initial Setting Screen** and you can modify the settings of **Language**, **Date & Time**, **Output Setting**, **External Battery Source** and **External Battery Capacity** based on your needs and actual conditions. The default settings may vary according to different models. Press the **Scrolling Down** button  to continue if there is no need to change. After initial settings, the **Main Screen** will appear and show the current operation mode.

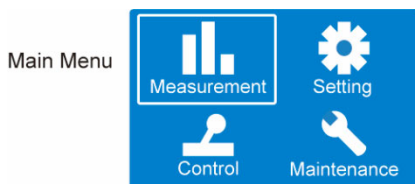


The **Initial Setting Screen** will no longer appear after initial configurations. Next time, when the UPS is powered on, the LCD display will show **DELTA** welcome page for 3 seconds and then directly go to the **Main Screen** that shows the current operation mode.



## 9.2 Main Menu









In the **Main Screen**, press the button  for 0.1 second to enter the **Main Menu**. You can set up relevant items here.






### NOTE:

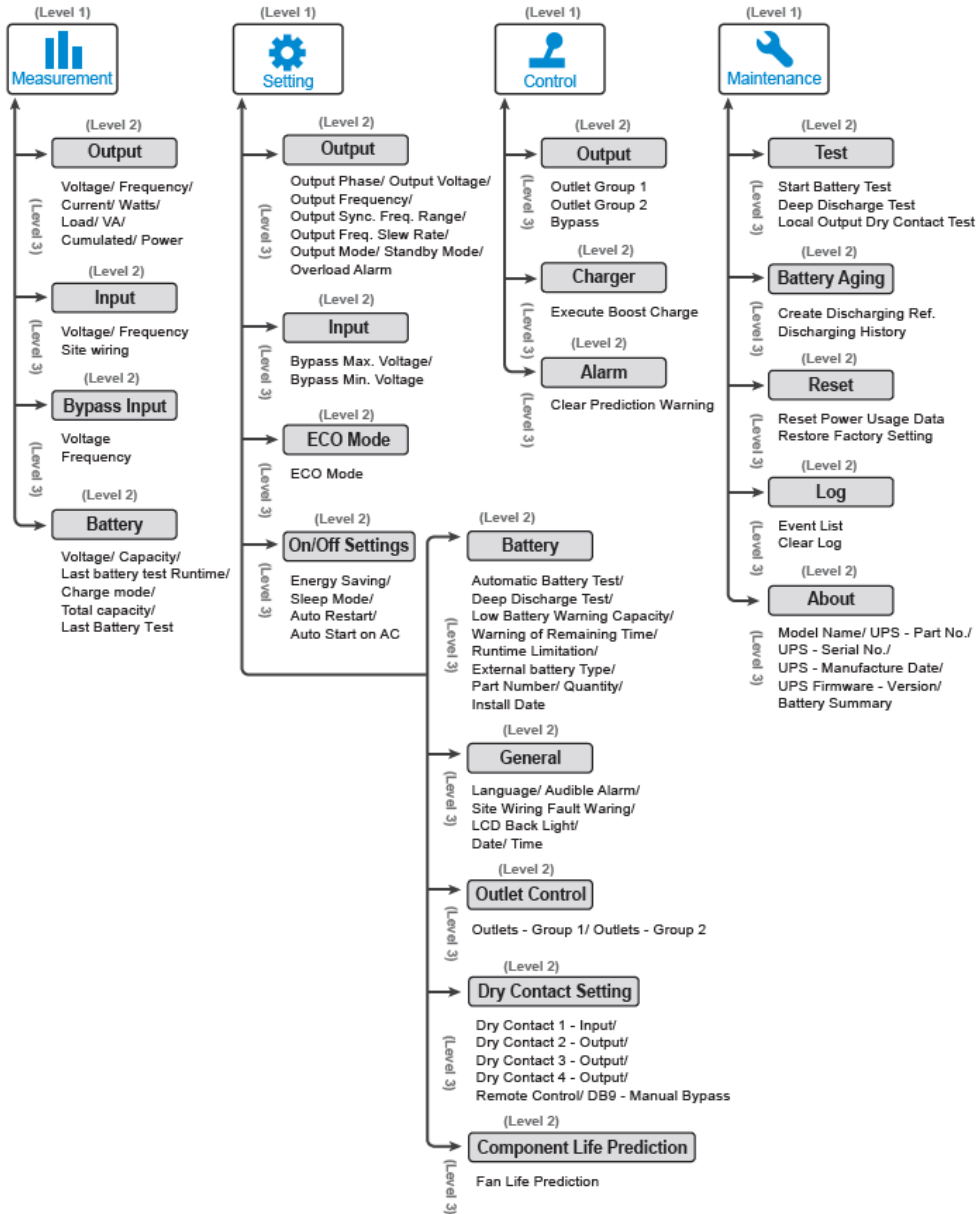
Please note that only qualified service personnel can perform setup actions.

For setup procedures, please refer to the following:

- 1 In the **Main Menu**, select the item you want to configure and press the **ENTER** button  for 0.1 second. After that, the UPS will enter the setup mode.
- 2 Press the **Scrolling Up** or **Down** button ( / ) for 0.1 second to navigate the setting items.
- 3 Press the **ENTER** button  for 0.1 second to choose the parameter that you want to change, and the parameter will flash.
- 4 Press the **Scrolling Up** or **Down** button ( / ) for 0.1 second to increase or decrease the parameter value. If either of the buttons is pressed for over 2 seconds, the LCD will automatically switch between the selectable values every 0.2 second until either of the buttons is released or the parameter reaches its highest or lowest value.
- 5 Press the **ENTER** button  to confirm your parameter setup or press the **ESC** button  to go back to the previous status.



- 6 After that, press the **Scrolling Up** or **Down** button (  /  ) for 0.1 second to move to the previous or the next setting item.
- 7 If you press the **ESC** button  , the LCD will exit the setup mode. If you don't press any button for more than 5 minutes, the LCD will exit the setup mode and go back to the original display automatically.

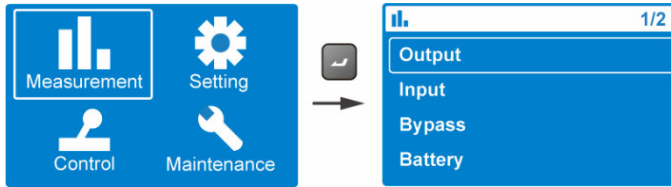
Please refer to the **Menu Tree** below for all the setup items.





(Figure 9-1: Menu Tree)

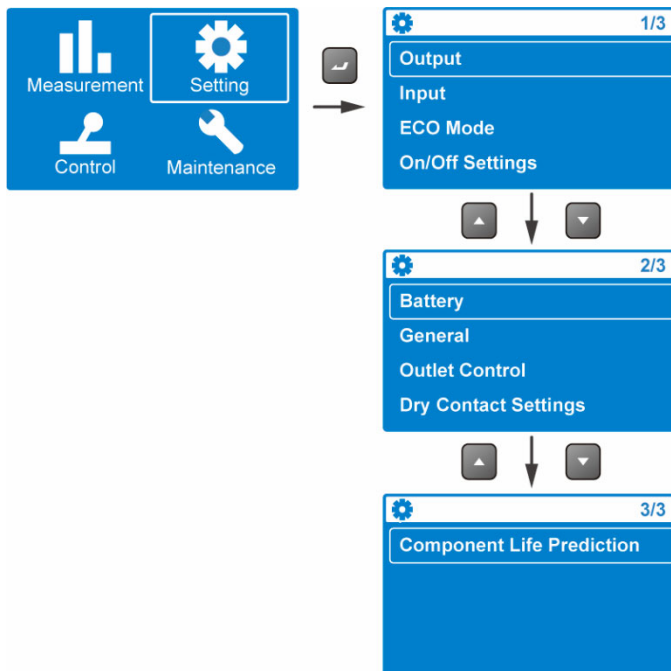
## 9.2.1 Measurement Menu

In **Main Menu**, select  and press the button  to enter the **Measurement Menu**. The **Measurement Menu** displays the UPS's status readings, such as **Output**, **Input**, **Bypass** and **Battery** information.



## 9.2.2 Setting Menu

In **Main Menu**, select  and press the button  to enter the **Setting Menu**.



You can choose the setup items such as **Output**, **Input**, **ECO Mode**, **On/ Off Settings**, **Battery**, **General**, **Outlet Control**, **Dry Contact Settings** and **Component Life Prediction** to set up relevant settings. For more information about the **Setting Menu**, please refer to the tables below for each setup item's relevant default value and selectable value.

- **Output**

Setup Item	Selectable Value	Default Value
<b>Output Phase</b>	1-phase	1-phase
<b>Output Voltage</b>	100V, 110V, 115V, 120V	100V
<b>Output Frequency</b>	Auto*1/ Converter-50 Hz*2/ Converter-60 Hz**	Auto

Setup Item	Selectable Value	Default Value
Output Sync. Freq. Range	± 0.5/ 1/ 3/ 5 Hz	± 3Hz
Output Freq. Slew Rate	0.5/ 1/ 2/ 3/ 4 Hz/ sec.	1 Hz/ sec.
Output Mode	Industrial/ IT	IT
Standby Mode	No output/ Bypass output	No output
Overload Alarm	30-105% (per step: 5%)	105%



**NOTE:**

- \*1 When the **Output Frequency** is set as **Auto**, the output frequency will vary according to the bypass frequency. If the bypass frequency is  $\geq 55$  Hz, the **Free\_Run\_Frequency/ Cold\_Start\_Frequency** will be set as 60 Hz.  
If the bypass frequency is  $< 55$  Hz, the **Free\_Run\_Frequency/ Cold\_Start\_Frequency** will be set as 50 Hz.
- When the **Output Frequency** is set as **Auto** and the **Bypass Output** under the **Standby Mode** item is set as **Enable**, the bypass output range will be the same as the **Output Sync. Freq. Range**.
- \*2 When the **Output Frequency** is set as **Converter-50 Hz/ Converter-60 Hz**, the UPS will enter **Frequency Conversion** mode and the bypass output will be disabled.

• **Input**

Setup Item	Selectable Value	Default Value
Bypass Max. Voltage	+10/ 15/ 20%	+15%
Bypass Min. Voltage	-10/ 15/ 20/ 25/ 30/ 35/ 40%	-20%

• **ECO Mode**

Setup Item	Selectable Value	Default Value
ECO Mode	Disable/ Enable	Disable
ECO Max. Voltage* <sup>1</sup>	5-15% (per step: 1%)	+10%
ECO Min. Voltage* <sup>1</sup>	5-15% (per step: 1%)	-10%



**NOTE:**

- \*1 The setup items **ECO Max. Voltage** and **ECO Min. Voltage** will only be shown on the display when the UPS is in ECO Mode.

- On/ Off Settings

Setup Item	Selectable Value	Default Value
<b>Energy Saving</b>	Option 1*1: Enable/ Disable Option 2: 1-15 mins (per step: 1 min) Option 3: 100W-270W (per step: 10W)	Disable
<b>Sleep Mode</b>	Option 1: Enable/ Disable Option 2: 10-120 mins (per step: 10 mins)	Disable
<b>Auto Restart</b>	Enable/ Disable	Enable
<b>Auto Start on AC</b>	Enable/ Disable	Disable



**NOTE:**

\*1 In **Setting Menu**, the sub item **Option 1** under the item **Energy Saving** cannot be changed.

- Battery

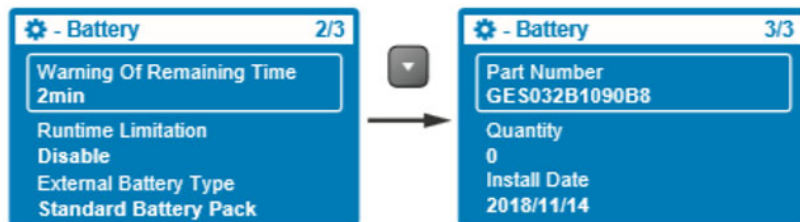
Setup Item	Selectable Value	Default Value
<b>Automatic Battery Test</b>	No test/ Daily/ Weekly/ Biweekly/ Monthly	No test
<b>Deep Discharge Test</b>	20-90% (per step: 10%)	90%
<b>Low Battery Warning Capacity</b>	0-95% (per step: 5%)	10%
<b>Warning of Remaining Time</b>	0-60 mins (per step: 1 min)	2 mins
<b>Runtime Limitation</b>	Disable/ 1/ 2/ 3.../ 240 (per step: 1 min)	Disable
<b>Internal Charging Current</b>	Not adjustable	
<b>External Battery Type</b> *1	Standard Battery Pack/ Customer Own Batt. Pack	

Setup Item	Selectable Value	Default Value
External Battery Capacity	<b>Standard Battery Pack:</b> Part Number Quantity	
	<b>Customer Own Batt. Pack:</b> Battery Voltage Total Capacity	
Install date	YYYY/ MM/ DD	



**NOTE:**

\*1 When the **External Battery Type** is set as **Standard Battery Pack**, you need to configure the **Part Number** and **Quantity**.



When the **External Battery Type** is set as **Customer Own Batt. Pack**, the **Part Number** and **Quantity** will be changed according to **Battery Voltage** and **Total Capacity**.

• **General**

Setup Item	Selectable Value	Default Value
Language	English/ Japanese	Japanese
Audible Alarm	Enable/ Disable	Enable
Site Wiring Fault Wiring	Enable/ Disable	Enable
LCD Back Light	Always On/ Auto Off	Auto Off



- **Outlet Control**

Setup items	Selectable Value- Level 2	Selectable Value- Level 3	Default
<b>Outlets - Group 1</b>	Output Reboot Duration	Disable/ 5/ 6/.../ 300 Seconds (per step: 1 sec)	Disable
	Load Bank Runtime Limitation	Disable/ 1/ 2/.../ 240 mins (per step: 1 min)	Disable
<b>Outlets - Group 2</b>	Output Reboot Duration	Disable/ 5/ 6/.../ 300 Seconds (per step: 1 sec)	Disable
	Load Bank Runtime Limitation	Disable/ 1/ 2/.../ 240 mins (per step: 1 min)	Disable

- **Dry Contact Settings**

Setup Item	Selectable Value	Default Value
<b>Dry Contact 1 - Input</b>	Option 1*1: Disable/ ROO/ RPO/ Remote shutdown/ Forced bypass/ On generator Option 2: 0-999s (per step: 1 sec) Option 3: Normal open/ Normal close	ROO/ 10s
<b>Dry Contact 2 - Output</b>	Disable/ On bat/ Low bat/ Bat fault/ Bypass/ UPS OK/ Load protected/ Load powered/ General alarm/ Overload alarm	On Batt.
<b>Dry Contact 3 - Output</b>	Disable/ On bat/ Low bat/ Bat fault/ Bypass/ UPS OK/ Load protected/ Load powered/ General alarm/ Overload alarm	Low Batt.
<b>Dry Contact 4 - Output</b>	Disable/ On bat/ Low bat/ Bat fault/ Bypass/ UPS OK/ Load protected/ Load powered/ General alarm/ Overload alarm	General Alarm
<b>Remote Control</b>	Option 1: REPO/ ROO	REPO/ NO
	Option 2: (For REPO) Normally Open/ Normally Closed (For ROO) Delay Time 0s ~ 999s (per step: 1s)	
<b>DB9 - Manual Bypass</b>	Enable/ Disable	Disable





**NOTE:**

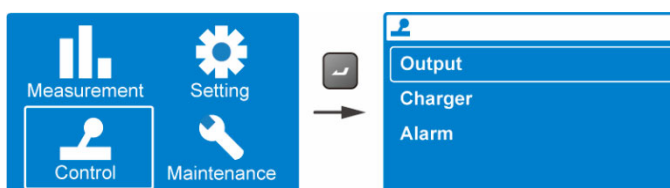
\*1 For detailed information about **Option 1**, please contact service personnel.

- **Component Life Prediction**

Setup Item	Selectable Value	Default Value
Fan Life Prediction	No/ Yes	No

### 9.2.3 Control Menu

In **Main Menu**, select  and press the button  to enter the **Control Menu**.





You can enable specific UPS functions through the **Control Menu**. Please refer to the table below for more information.

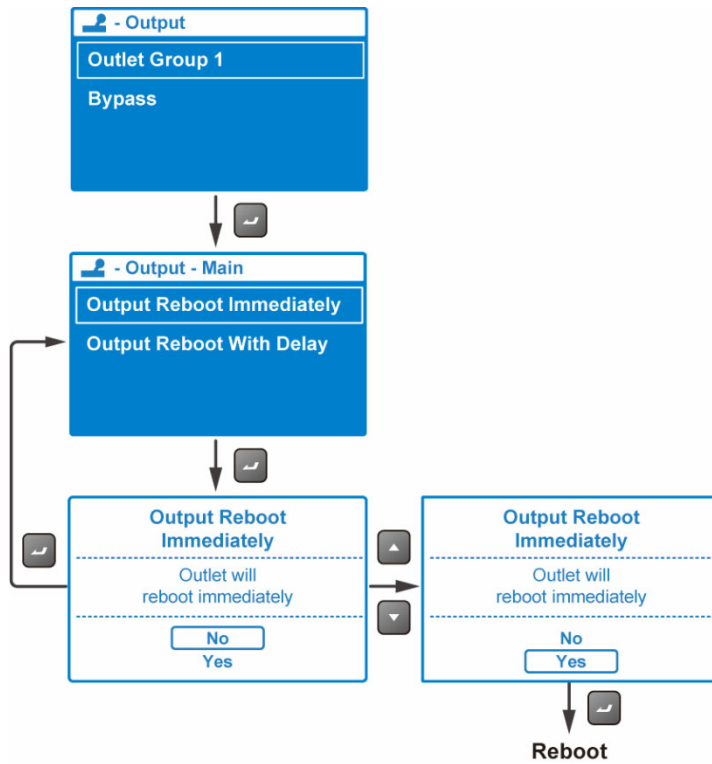
Level 1	Level 2	Level 3	Level 4	Level 5
<b>Control</b>	<b>Output</b>	Outlet Group 1	Output Reboot Immediately	Yes/ No
			Output Reboot With Delay	Yes/ No
		Bypass* <sup>1</sup>	Go into Bypass	Yes/ No
			Go out of Bypass	Yes/ No
	<b>Charger</b>	Execute Boost Charge	Yes/ No	
	<b>Alarm</b>	Clear Prediction Warning* <sup>2</sup>	Yes/ No	





**NOTE:**

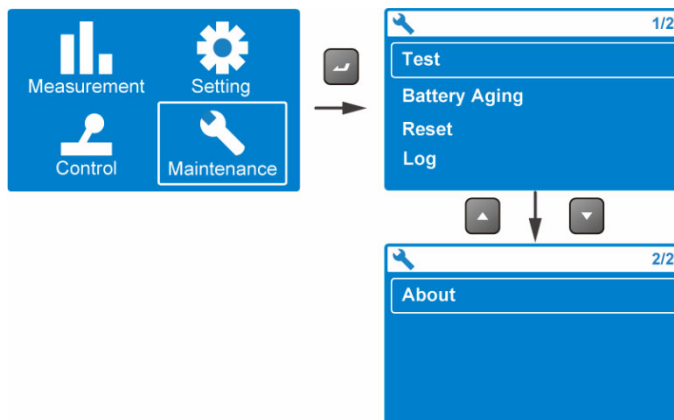
- \*<sup>1</sup> The item **Bypass** will be hidden if you set the **Standby Mode** as **Bypass Output**. To set up **Bypass Output**, please go to  → **Output** → **Standby Mode** → **Bypass Output**.
- \*<sup>2</sup> The item **Delay Alarm Again** under **Control** → **Alarm** → **Clear Prediction Warning** can be set from 1 week to 52 weeks.

For example, if you need the UPS to reboot the output immediately, please go to  → **Output** → **Outlet Group 1** → **Output Reboot Immediately** → **Yes**.



### 9.2.4 Maintenance Menu


In **Main Menu**, select  and press the button  to enter the **Maintenance Menu**.

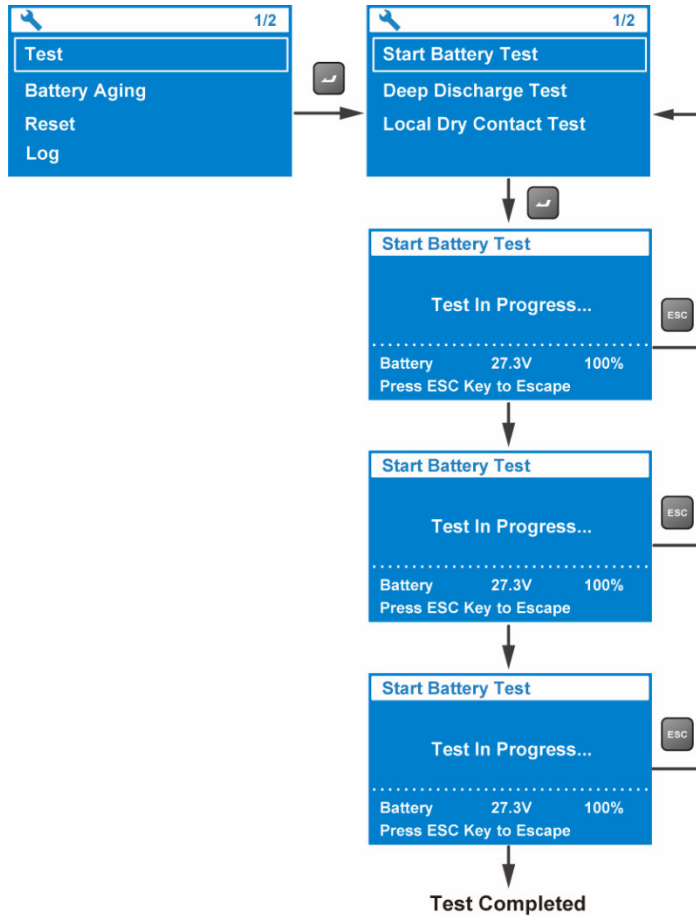


You can perform tests, enable maintenance functions, view event logs and the UPS's data through the **Maintenance Menu**. For more information, please refer to the table below.

Level 1	Level 2	Level 3	Level 4	Level 5
Maintenance	Test	Start Battery Test	Test in Progress...	Test Result: Pass
				Test Result: Fail
				Test Result: Not Finished
		Deep Discharge Test	Test in Progress...	Test Result: Pass
				Test Result: Fail
				Test Result: Not Finished
		Local Output Dry Contact Test	Dry Contact 1	Dry Contact 1 In Progress...
			Dry Contact 2	Dry Contact 2 In Progress...
			Dry Contact 3	Dry Contact 3 In Progress...
			Dry Contact 4	Dry Contact 4 In Progress...
	Battery Aging	Create Discharging Reference	Yes/ Cancel	
		Battery Discharging History	Item, Output power, Total discharging time	Date/ Time, Average Load (W), Actual Discharging Time, Estimated Remaining Time, Total Discharging Time
	Reset	Reset Power Usage Calculator	Yes/ Cancel	
		Restore Factory Setting	Yes/ Cancel	

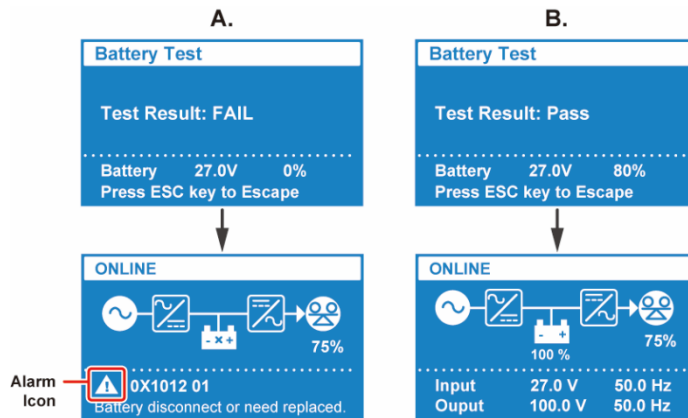
Level 1	Level 2	Level 3	Level 4	Level 5
Maintenance	Log	Event List	Description Event code YYYY/ MM/ DD HH:MM:SS	Error Description
		Clear Log	Yes/ Cancel	
	About	Model Name: RT-1K		
		UPS - Part No. UPS102R1RT0B0B5		
		UPS - Serial No. 1BA0150001		
		UPS - Manufacture Date YYYY-MM		
		PS Firmware – Version 06AR004		
	Battery Summary: Installed YYYY/ MM/ DD Replace YYYY/ MM/ DD			

For example, if you need to execute a battery test, please go to  → **Test** → **Start Battery Test** → **Test in Progress...** → **Test Result: Pass (or Fail)**.



Once the test is completed, the test result will be shown as follows.

- A. Test Result\_ Fail: The alarm icon will show at the left bottom of the LCD display.
- B. Tests Result\_ Pass: No alarm icon occurs, and the UPS runs normally.



## Chapter 10: Optional Accessories

There are several optional accessories available for this RT series UPS. Please refer to the table below for the optional accessories and their functions.

No.	Item	Function
1	Dust Filter	Prevents dust from entering into the UPS to ensure UPS reliability and to prolong product life.
2	Mini SNMP IPv6 Card	Monitors and controls the status of the UPS via a network system.
3	Mini Relay I/O Card	Increases the number dry contacts.
4	Mini MODBUS Card	Lets the UPS have MODBUS communication function.
5	External Battery Pack	Provides external batteries to let the UPS continue supplying power to its connected loads when a power outage occurs.
6	External Maintenance Bypass Box	Lets the connected critical loads continued to be powered by the input power during UPS maintenance or during the unlikely event of a UPS failure.



### 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 11 : Troubleshooting

1. When a problem occurs, please check if the following situation exists before contacting Delta service personnel:
  - Is the main input voltage present?
2. Please have the following information ready before contacting the Delta service personnel:
  - Unit information including model, serial number, etc.
  - An exact description of the problem; the more detailed, the better.
3. When you see the following problems occur, please refer to the solutions shown below.

Error Code	Meaning	Possible Cause	Solution
<b>0X8221</b>	DC Bus Over Shutdown - Positive	<ol style="list-style-type: none"> <li>1. The output is connected to capacitive loads or inductive loads.</li> <li>2. The UPS has an internal fault.</li> </ol>	<ol style="list-style-type: none"> <li>1. Remove the capacitive loads or inductive loads.</li> <li>2. Please contact service personnel.</li> </ol>
<b>0X8241</b>	DC Bus Over Shutdown - Negative	<ol style="list-style-type: none"> <li>1. The output is connected to capacitive loads or inductive loads.</li> <li>2. The UPS has an internal fault.</li> </ol>	<ol style="list-style-type: none"> <li>1. Remove the capacitive loads or inductive loads.</li> <li>2. Please contact service personnel.</li> </ol>
<b>0X82A1</b>	DC Bus Under Shutdown - Positive	The UPS has an internal fault.	Please contact service personnel.
<b>0X82C1</b>	DC Bus Under Shutdown – Negative	The UPS has an internal fault.	Please contact service personnel.
<b>0x1200</b>	INV Volt Abnormal	The UPS has an internal fault.	Please contact service personnel.
<b>0x1101</b>	Output Overload Shutdown	The UPS is overloaded.	Check the power consumption of the loads, and remove the unnecessary loads.
<b>0xA000</b>	Charger Fault	The UPS has an internal fault.	Please contact service personnel.
<b>0X2402</b>	INV IGBT Over Heat Shutdown	<ol style="list-style-type: none"> <li>1. The vents are blocked.</li> <li>2. The UPS has an internal fault.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check whether the vents are blocked.</li> <li>2. Contact service personnel.</li> </ol>
<b>0X2402</b>	PFC Over Heat Shutdown	<ol style="list-style-type: none"> <li>1. The vents are blocked.</li> <li>2. The UPS has an internal fault.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check whether the vents are blocked.</li> <li>2. Contact service personnel.</li> </ol>



Error Code	Meaning	Possible Cause	Solution
0x1003	Battery Disconnected	<ol style="list-style-type: none"> <li>1. The UPS is not properly connected to the external battery pack(s).</li> <li>2. The battery/ batteries is (are) damaged.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check whether the UPS is properly connected to the external battery pack(s).</li> <li>2. Contact service personnel.</li> </ol>



**NOTE:**

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

# Chapter 12: Maintenance

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## 12.1 UPS

### ● UPS Cleaning

Regularly clean the UPS, especially the slits and openings, to ensure that the air freely flows into the UPS to avoid overheating. If necessary, use an air blower to clean the slits and openings, and clean and replace the filters regularly to prevent any object from blocking or covering these areas.


### ● UPS Regular Inspection

Regularly check the UPS every half year and inspect:

1. Whether the UPS, LEDs, and alarm function are operating normally.
2. Whether the battery voltage is normal. If the battery voltage is too high or too low, find the root cause.

## 12.2 Batteries

The UPS uses lead-acid batteries. Make sure to replace the batteries according to battery life. The actual battery life depends on the environment temperature, usage, and charging/ discharging frequency. High temperature and high charging/ discharging frequency will quickly shorten the battery life; thus, battery inspection and maintenance are required periodically. Please follow the suggestions below to ensure normal battery life.

- Keep the usage temperature at 20 ~ 25°C (68 ~ 77°F).
- Idle batteries must be fully recharged every three months if the UPS needs to be stored for an extended period of time. Please fully charge the batteries until the battery percentage shown on the UPS's LCD is 100% (  ).



#### **NOTE:**

If the UPS's batteries need to be replaced, please contact qualified service personnel. During battery replacement, the loads connected to the UPS will not be protected if input power fails.

## 12.3 Fans

Higher temperatures shorten fan life. When the UPS is running, please check if each fan works normally and make sure if the ventilation air can move freely around and through the UPS. If not, contact service personnel to replace the fans.



#### **NOTE:**

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

## Appendix 1 : Technical Specifications

Model		RT-1K	RT-2K	RT-3K
Power Rating		1kVA/0.9KW	2kVA/1.44kW	3kVA/2.2kW
Waveform		Pure Sinewave		
Input	Nominal Voltage	100/110/115/120 Vac		
	Voltage Range	1. 100 Vac: 90 ~ 150 Vac (full load) & 55 ~ 90 Vac (50 ~ 100% linear load) 2. 110/115/120 Vac: 100 ~ 150 Vac (full Load) & 55 ~ 100 Vac (50 ~ 100% linear load)		
	Frequency	40 ~ 70 Hz		
	Power Factor	> 0.99 (full load)		
	iTHD	< 5%		
Output	Power Factor	0.9	0.7	0.7
	Voltage	100 (default)/110/115/120 Vac		
	Voltage Regulation	± 1% (linear load)		
	Frequency	50/60 Hz (± 0.05 Hz)		
	vTHD	< 3% (linear load); < 4% (non-linear load)		
	Overload Capacity	≤ 105%: Continuous > 105 ~ ≤ 125%: 2 minutes > 125 ~ ≤ 150%: 30 seconds > 150%: 500 msec		
	Crest Factor	3:1		

Model		RT-1K	RT-2K	RT-3K
Output	Connection	<b>Load bank 1</b> (relay controlled): 5-15R × 3 <b>Load bank 2</b> (relay controlled): 5-15R × 3 <b>Load bank 3:</b> 5-15R × 2	<b>Load bank 1</b> (relay controlled): 5-15/20R × 4 <b>Load bank 2</b> (relay controlled): 5-15/20R × 4 <b>Load bank 3:</b> L5-20R × 1	<b>Load bank 1</b> (relay controlled): 5-15/20R × 4 with a 20A 120 Vac 1P branch breaker <b>Load bank 2</b> (relay controlled): 5-15/20R × 4 with a 20A 120 Vac 1P branch breaker <b>Load bank 3:</b> L5-30R × 1
Efficiency*1	Online Mode	89%	90.5%	91%
	ECO Mode	96%	97%	97%
Battery & Charger	Battery Voltage	24 Vdc	48 Vdc	72 Vdc
	Battery Type	12V/9 Ah lead-acid battery		
	Backup Time (100%/75% load)	4/6.5 minutes		
	Charging Current	1A		
	Recharge Time	3 hours to 90%		
Audible Noise*2		< 40 dB	< 45 dB	< 45 dB
Display		Graphic and multilingual LCD		
Communication Interfaces		MINI Slot × 1, RS-232 Port × 1, USB Port × 1, REPO/ROO × 1, Dry Contact × 4		

Model		RT-1K	RT-2K	RT-3K
Physical	<b>Dimensions (W × D × H)</b>	440 × 335 × 88.2 mm (17.3" × 13.2" × 3.5")	440 × 430 × 88.2 mm (17.3" × 16.9" × 3.5")	440 × 565 × 88.2 mm (17.3" × 22.2" × 3.5")
	<b>Weight</b>	13.1 kg (28.9 lb)	22.1 kg (48.7 lb)	30.2 kg (55.58 lb)
Environment	<b>Operating Altitude</b>	0 ~ 3000 m (0 ~ 9900 ft) (without derating)		
	<b>Operating Temperature</b>	0 ~ 50°C (32 ~ 122°F) *3		
	<b>Relative Humidity</b>	0 ~ 95% (non-condensing)		



**NOTE:**

1. \*1: Power loss from the input and output power cord is not included.
2. \*2: At typical environment temperature: ≤ 30°C (86°F).
3. \*3: When the operating temperature is at 40 ~ 50°C (104 ~ 122°F), the UPS will be de-rated to 80% of its capacity.
4. Refer to the rating label for the safety rating.
5. All specifications are subject to change without prior notice.

## Appendix 2 : Warranty

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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.

No. : 501300000000

Version : V 0.0

Release Date : 2020\_12\_29

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