

# User & Operations Manual

## Sentinel RT

### True-Online UPS System

6000 VA - 6000 VA ER - 10000 VA - 10000 VA ER





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## INTRODUCTION

Congratulations on purchasing a **UPS Sentinel RT** product and welcome to **Riello UPS!** To use the support service offered by **Riello UPS**, visit the site [www.rielloupsamerica.com](http://www.rielloupsamerica.com)

Our Company is a specialist in the design, development and manufacturing of uninterruptible power supplies (UPS).

The UPS described in this manual is a high-quality product which has been carefully designed and built in order to guarantee the highest levels of performance.

This device can be installed by professional personnel on the condition that they have **READ THIS INSTALLTION AND USER MANUAL CAREFULLY.**

**The UPS, the Battery Pack and the Transformer Box generate DANGEROUS internal electrical voltages. All maintenance operations must be carried out by suitably qualified operators.**

This manual contains detailed instructions for using and installing the UPS, the Battery pack and the Transformer Box. **For information on how to use and maximize the performance of your device, please read user manual carefully before operating the equipment.**





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## ENVIRONMENTAL PROTECTION

Whilst developing its products, the company takes great care to analyze all environmental issues. All our products seek the objectives defined by the policies of the environmental management system, developed by the company according to the current legislation.

Hazardous materials such as CFCs, HCFCs or asbestos have not been used in this product.

The packaging is made of recyclable material. Please dispose of the individual elements according to the current legislation in force in the country where the product is to be employed. Please refer to *Table 1* for identifying the materials:

<b>DESCRIPTION</b>	<b>MATERIAL</b>	
Pallet	Wood (FOR)	
Packaging box	Corrugated cardboard (PAP)	
Protective bag	High Density Polyethylene (PE-HD)	
Buffers	Low Density Polyethylene (PE-LD)	

*Table 1 – Packaging material list*

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## DISPOSING OF THE PRODUCT

The UPS, the Battery Pack and the Transformer Box contain electronic PCBs and batteries which are considered TOXIC and HAZARDOUS waste. When the product reaches the end of its operating life, dispose of it in accordance with applicable local legislation.

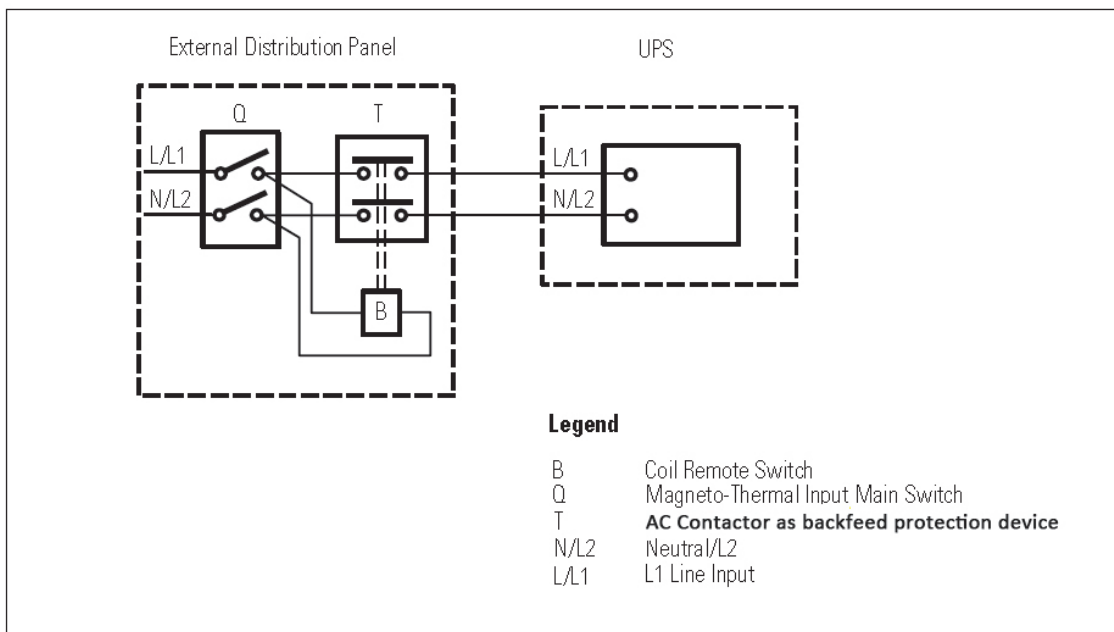
Disposing of the product correctly contributes to respecting the environment and personal health.

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## SAFETY AND EMC INSTRUCTIONS

### WARNING HIGH LEAKAGE CURRENT EARTH CONNECTION ESSENTIAL BEFORE CONNECTING SUPPLY

- Use of this equipment in life support applications where failure of this equipment can reasonably be expected to cause the failure of the life support equipment or to significantly affect its safety or effectiveness is not recommended. Do not use this equipment in the presence of a flammable anesthetic mixture with air, oxygen or nitrous oxide.
- Connect your UPS power module's grounding terminal to a grounding electrode conductor.
- The UPS is connected to a DC energy source (battery). The output terminals may be live when the UPS is not connected to an AC supply.
- In accordance with safety standard EN-IEC 62040-1, installation has to be provided with a «Backfeed Protection» system, as for example a contractor, which will prevent the appearance of voltage or dangerous energy in the input mains during a mains fault. There is no standard backfeed protection inside of the UPS. Please isolate the UPS before working according to Diagram 1. The isolation device must be able to carry the UPS input current.

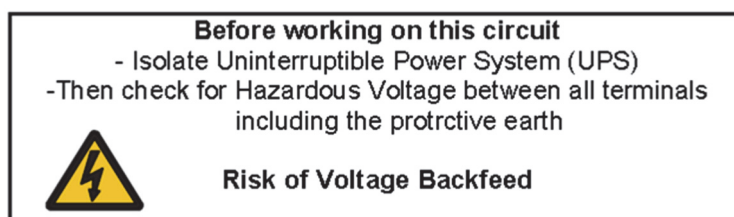


**External backfeed protection wiring**



There can be no derivation in the line that goes from the «Backfeed protection» to the UPS, as the standard safety would be infringed.

Warning labels should be placed on all primary power switches installed in places away from the device to alert the electrical maintenance personnel of the presence of a UPS in the circuit. The label will bear the following or an equivalent text:



## STANDARDS

<b>* Safety</b>	
Safety Conformance: IEC/EN 62040-1,UL1778 (5th Edition)	
Safety Markings : cTUVus, CE	
<b>* EMI</b>	
Conducted Emission.....:IEC/EN 62040-2,FCC PART15 CLASS A	
Radiated Emission.....:IEC/EN 62040-2,FCC PART15 CLASS A	
<b>*EMS</b>	
ESD.....:IEC/EN 61000-4-2	Level 4
RS.....:IEC/EN 61000-4-3	Level 3
EFT.....:IEC/EN 61000-4-4	Level 4
SURGE.....:IEC/EN 61000-4-5	Level 4
CS.....:IEC/EN 61000-4-6	Level 3
Power-frequency Magnetic field.....:IEC/EN 61000-4-8	Level 4
Low Frequency Signals.....:IEC/EN 61000-2-2	
<b>Warning:</b> This is a product for commercial and industrial application in the second environment-installation restrictions or additional measures may be needed to prevent disturbances.	

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# PRESENTATION

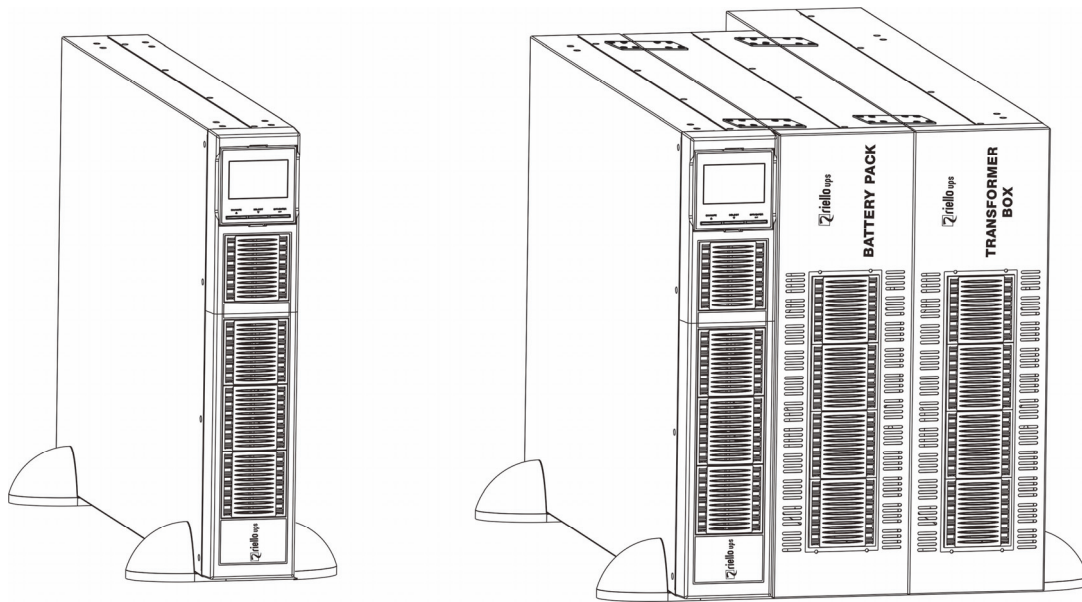
**SENTINEL RT** uses ON-LINE double conversion technology, resulting in the highest levels of reliability and maximum protection for mission critical loads such as servers, IT applications and Voice/Data.

**SENTINEL RT** is equipped with a dedicated Battery Pack that allows for easy battery replacement in complete safety thanks to the protected connection system.

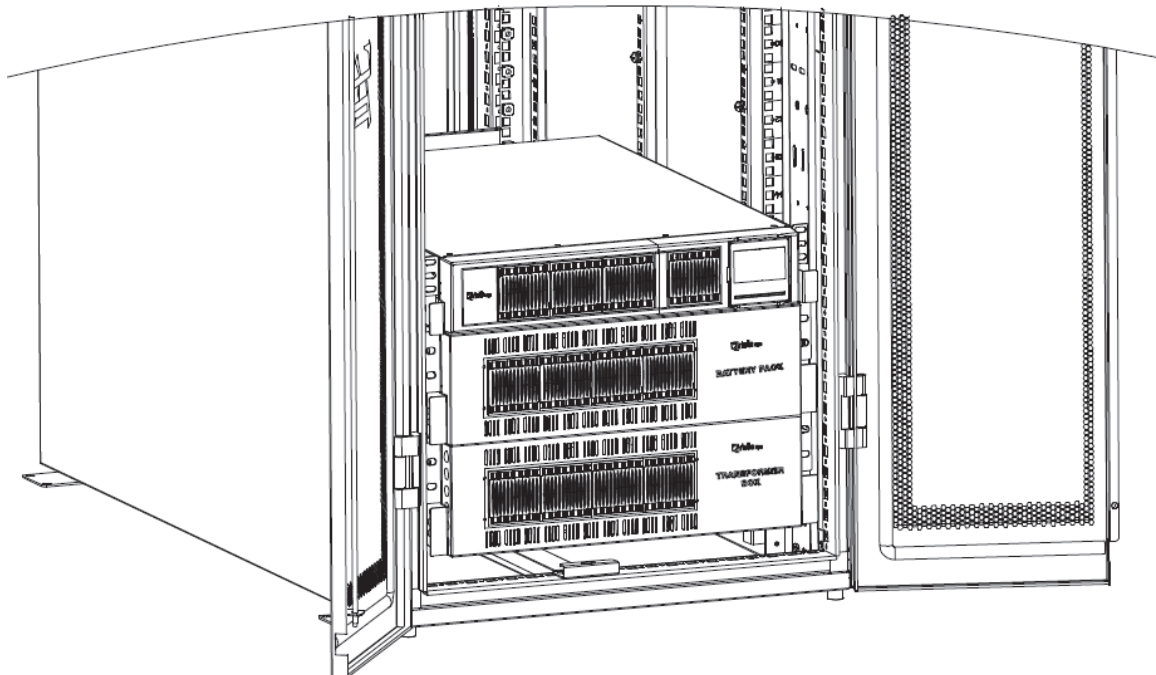
For business continuity applications which require long battery-powered operation time, please choose **ER models** and change the battery charger current via LCD display when adding multiple battery pack(s) in series for extended runtime.

Connecting with the transformer box, the output voltage is converted from 208/240 Vac to 120 Vac.

This family was designed with versatility in mind, allowing for installation in both tower and rack positions. The following shows how the product can be installed in the two different positions:



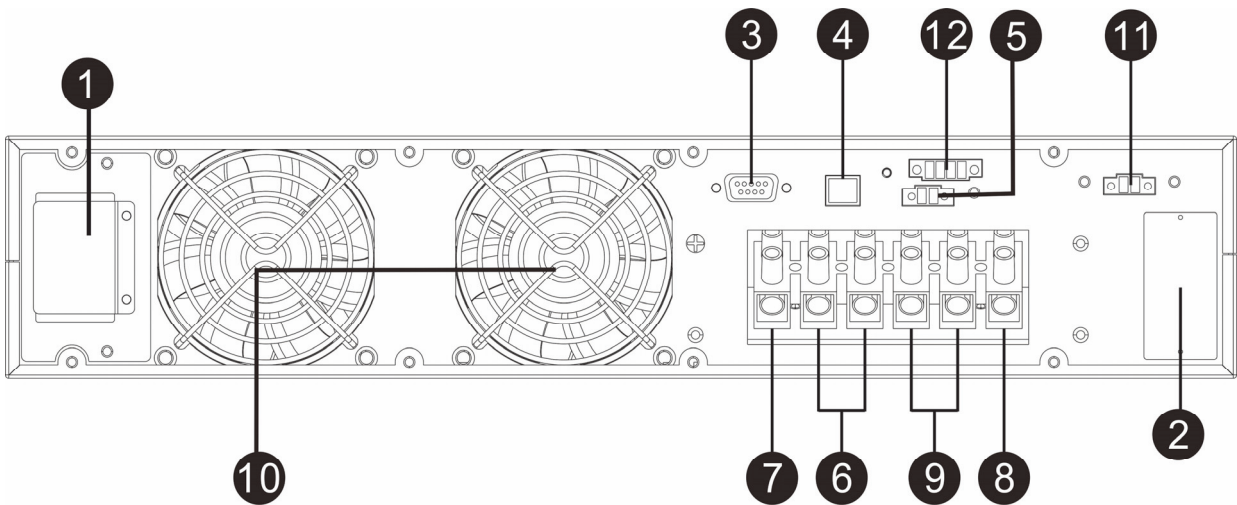
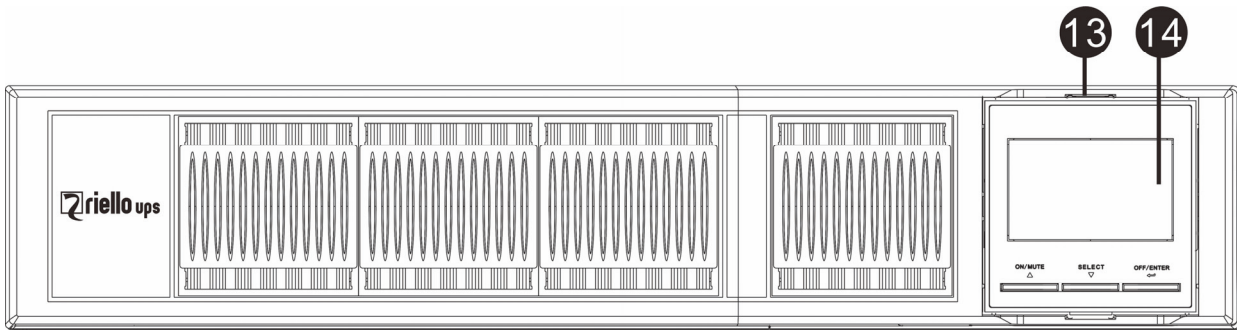
Example of UPS and UPS + BATTERY PACK + TRANSFORMER BOX installed in a tower configuration



Example of UPS and UPS + BATTERY PACK + TRANSFORMER BOX installed in a rack configuration

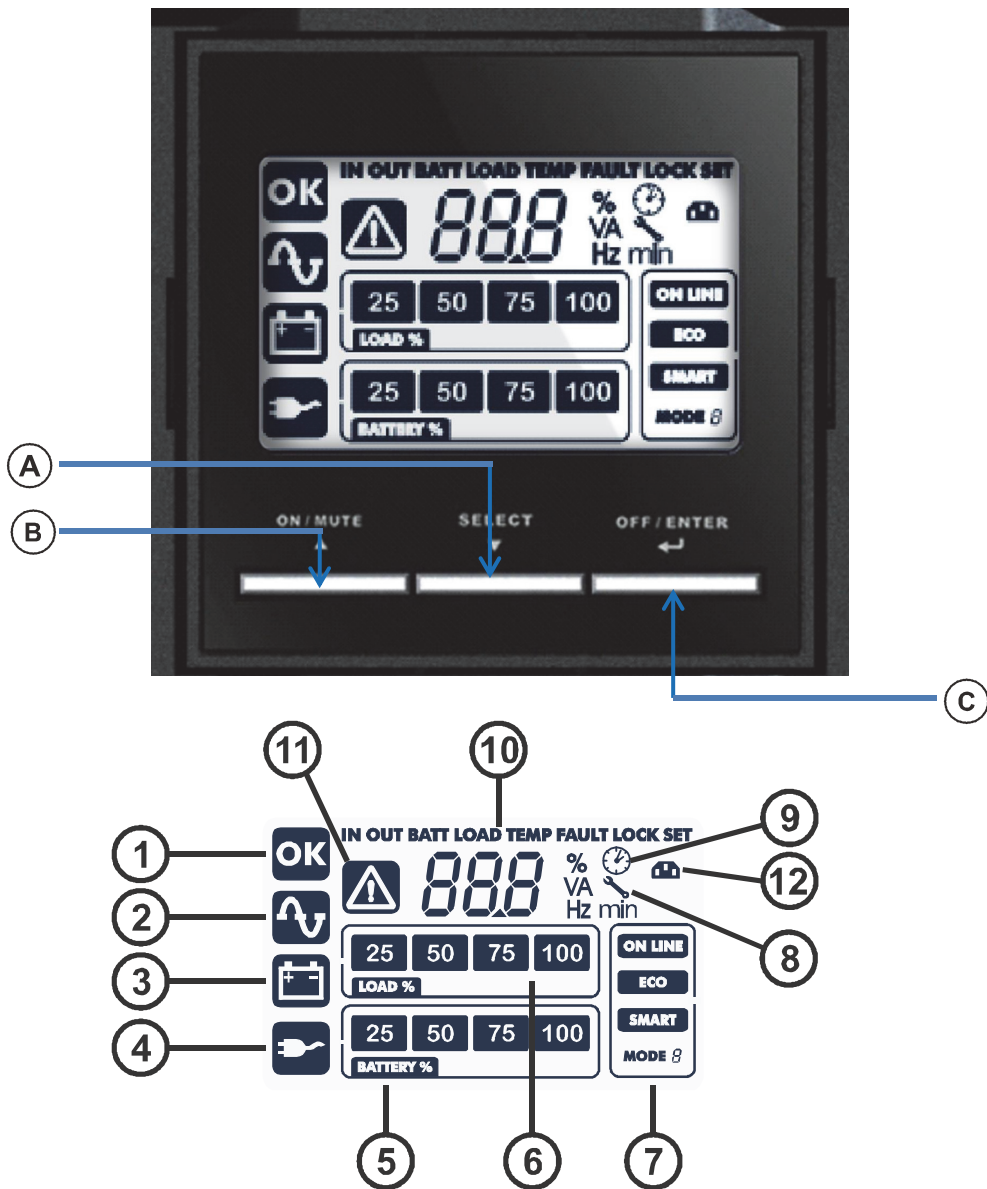


# UPS VIEWS



- |   |   |
|---|---|
| ① Battery pack connector                | ⑧ Input ground                            |
| ② Communication card slot               | ⑨ Input terminal (L1 + L2) 208/240 Vac    |
| ③ RS-232 communication port             | ⑩ Cooling fan                             |
| ④ USB communication port                | ⑪ External maintenance bypass switch port |
| ⑤ Remote control terminal board         | ⑫ Dry contacts communication port         |
| ⑥ Output terminal (L1 + L2) 208/240 Vac | ⑬ Extractable/ rotatable display plate    |
| ⑦ Output ground                         | ⑭ Release slits                           |

## DISPLAY PANEL VIEW

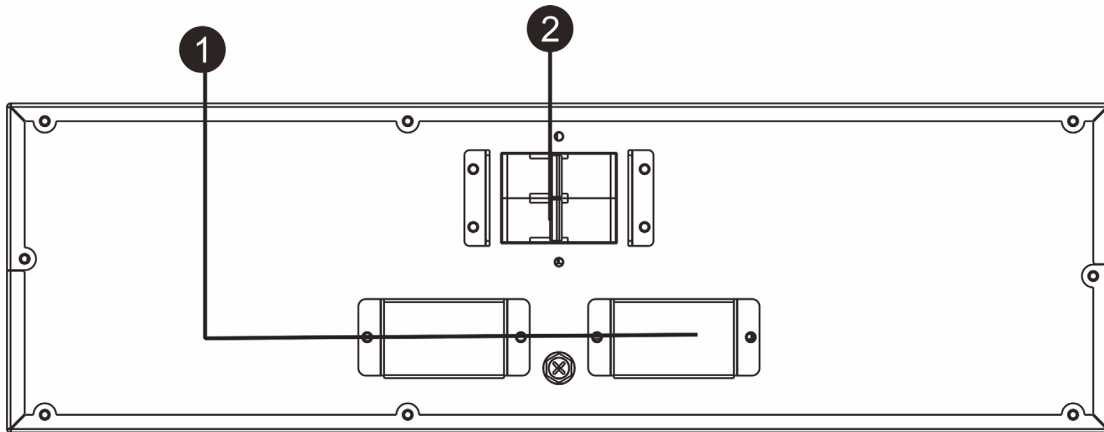
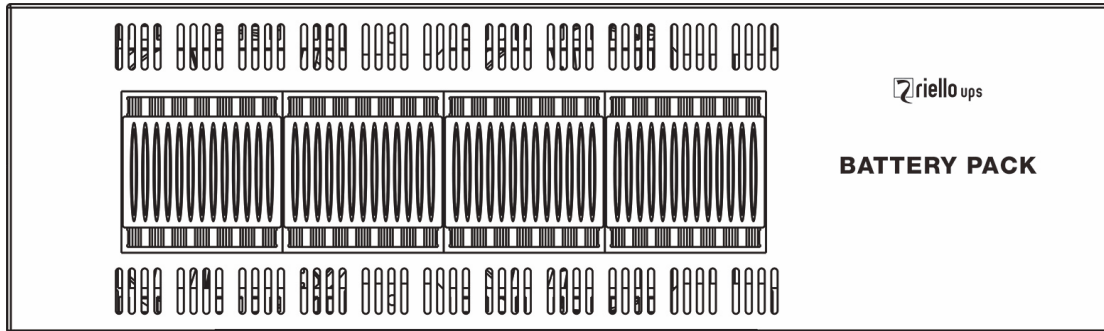


- |                            |                            |
|----------------------------|----------------------------|
| Ⓐ "SEL" button (Select)    | Ⓔ Load level indicator     |
| Ⓑ "ON/MUTE" button         | Ⓕ Configuration area       |
| Ⓒ "OFF/ENTER" button       | Ⓖ Maintenance request      |
| ① Regular operation        | ⑨ Timer                    |
| ② Mains operation          | ⑩ Measurement display area |
| ③ Battery operation        | ⑪ Stand-by / alarm         |
| ④ Load powered by bypass   | ⑫ EnergyShare              |
| ⑤ Battery charge indicator |                            |

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## BATTERY PACK

The BATTERY PACK contains batteries which allow the operating time of the uninterruptible power supplies during blackout. The number of batteries contained can be either 16 or 20. It is therefore necessary to take great care of ensure that the battery voltage of the BATTERY PACK is the same as the voltage permitted by the UPS. Several Battery Packs can be connected in series to achieve a longer extended runtime.

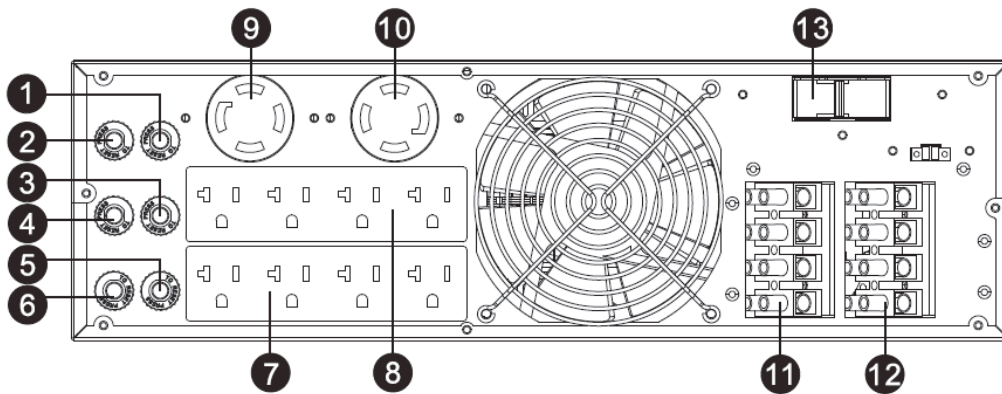
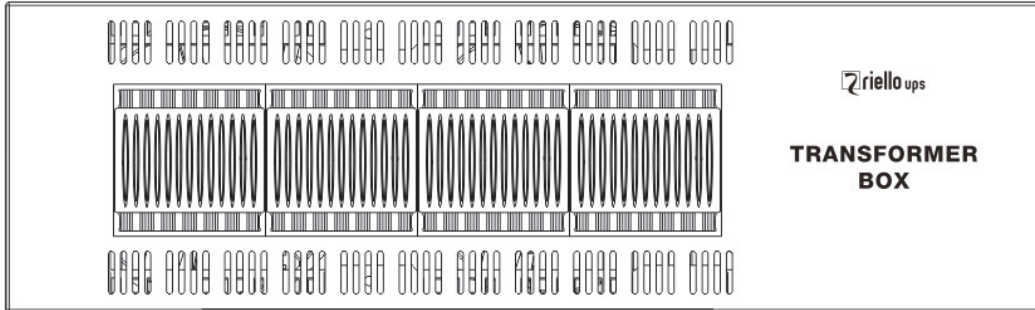


1 Battery expansion connector

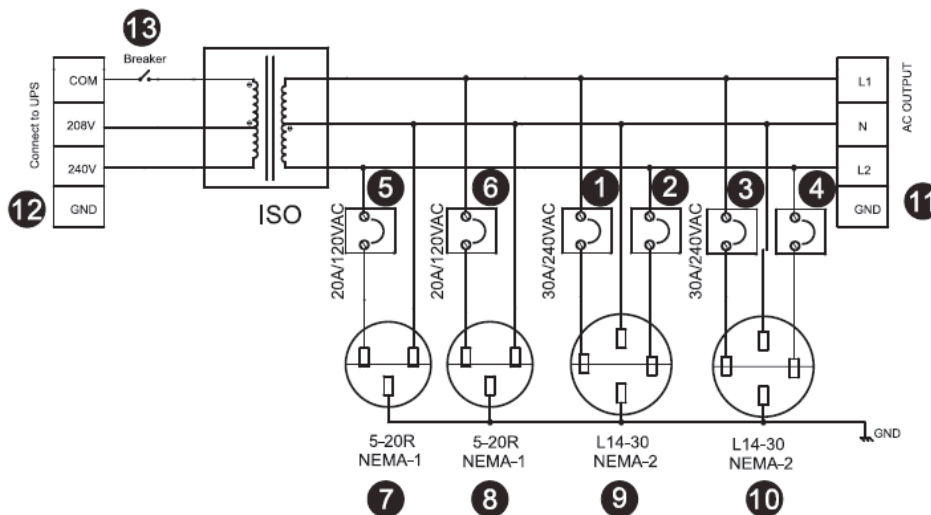
2 Battery isolator

# TRANSFORMER BOX

The TRANSFORMER BOX contains step down transformer to convert output voltage from 208/240 Vac to 120 Vac in some output sockets.



- 1 Output circuit breaker 240V/30A
- 2 Output circuit breaker 240V/30A
- 3 Output circuit breaker 240V/30A
- 4 Output circuit breaker 240V/30A
- 5 Output circuit breaker 120V/20A
- 6 Output circuit breaker 120V/20A
- 7 5-20R output receptacles
- 8 5-20R output receptacles
- 9 L14-30R output receptacles
- 10 L14-30R output receptacles
- 11 Optional load output connection
- 12 Input (to UPS output)
- 13 Output circuit breaker



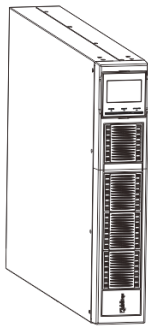
# INSTALLATION

## INITIAL CONTENT CHECK

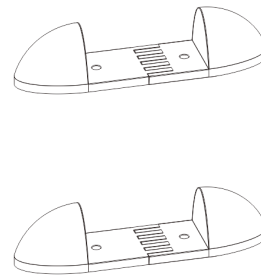
After opening the packaging, it is first necessary to check the contents. The standard model will include one UPS, one transformer box and one battery pack. The long-run **ER model** will only include one UPS and one transformer box. The package must contain:

### UPS

UPS



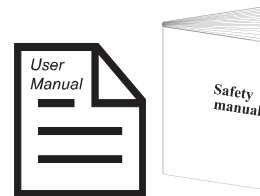
Support feet



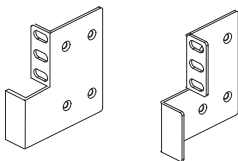
USB cable



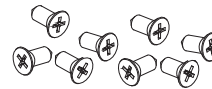
User manual and software download card



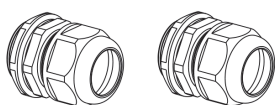
Handles for rack installation



Handle screws

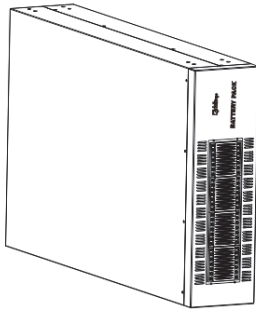


Cable glands



## BATTERY PACK

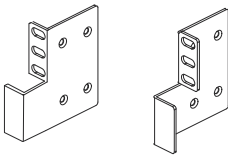
Battery pack



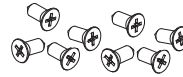
Battery cable



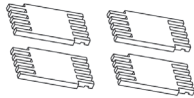
Handles for rack installation



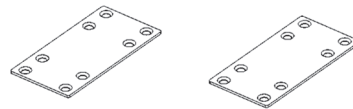
Handle screws



Support feet extend plates

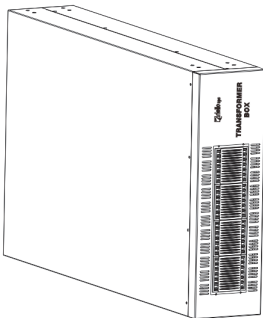


Metal plates

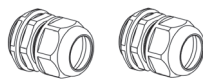


## TRANSFORMER BOX

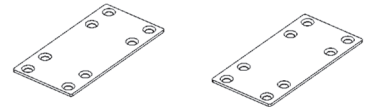
Transformer box



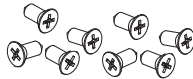
Cable glands



Metal plates



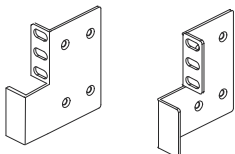
Handle screws



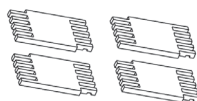
UPS to Transformer box output cable



Handles for rack installation



Support feet extend plates



Temperature signal cable



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## INSTALLATION ENVIRONMENT

The UPS, the Battery Pack and the Transformer Box must be installed in ventilated, clean environments which are sheltered from bad weather.

The relative humidity in the environment must not exceed the maximum values shown in the Technical Data table.

The ambient temperature, whilst the UPS is in operation, must remain between 32 °F (0 °C) and 104 °F (40 °C), and the UPS must not be positioned in places which are exposed to direct sunlight or to hot air.



The recommended operating temperature for the UPS and the batteries is between 68 °F (20 °C) and 77 °F (25 °C). The actual operating life of the batteries is 5 years on average with an operating temperature of 68 °F (20 °C). If the operating temperature reaches 86 °F (30 °C), the operating life is halved.



This is a category C3 UPS product. In a commercial and industrial application in the second environment-installation restrictions or additional measures may be needed to prevent disturbances.

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## BATTERY PACK INSTALLATION

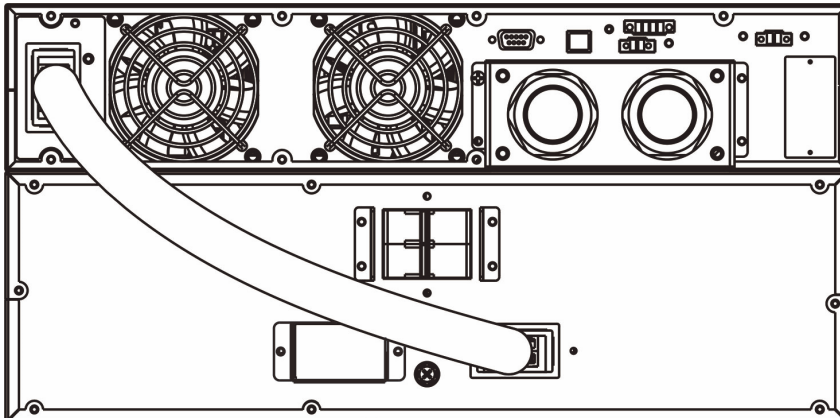


**ATTENTION:**

**CHECK ON THE DATA PLATE THAT THE VOLTAGE OF THE BATTERY PACK IS THE SAME AS THAT ALLOWED BY THE UPS.**

### NON-ER MODEL

The standard 6 kVA / 10 kVA UPS is only allowed to connect **ONE** battery pack. Simply use one battery cable to connect UPS and battery pack as below chart.

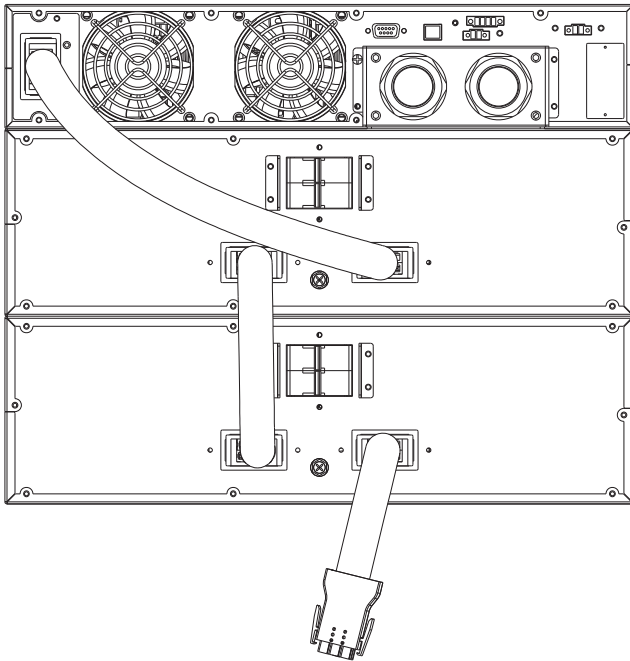


Non-ER Model

Battery Pack

## ER MODEL

Battery packs can be installed in series for extended runtimes. This setting is only for **ER models**. Connect the Battery packs in series as shown in the figure below:



ER Model

#1 battery pack

#2 battery pack

### SET UP BATTERY CHARGING CURRENT

ER model should be set up battery charging current according to the connected external battery pack numbers. Riello offers standard battery pack with 20 pieces of 12 V 9 Ah for the long-run models. When connecting to external battery pack, please follow below table to setup battery charging current.

Connected battery pack numbers in parallel	1	2	3	$\geq 4$
Charging current	1 A	2 A	3 A	4 A

### SETTING THE NOMINAL BATTERY CAPACITY

Before installing one or more Battery packs, the ER model must be configured in order to update the nominal capacity value (total Ah UPS's internal batteries + external batteries) through LCD panel setting. Please refer to setting program 9 << Battery total Ah setting >> in "Configuring the UPS parameters" section.

The battery pack must only be installed while the UPS is switched off and disconnected from the mains power supply.

Note: After completing the settings, please turn off the UPS with battery connected in order to save the setting accordingly. Please also verify the setting again after restart the UPS.



#### CAUTION:

The connection cables cannot be extended by the user.

After connecting the UPS to its Battery Pack(s), insert the fuses and turn the battery isolators of Battery Pack to the ON position.

It is not possible to connect more than one UPS to a single battery pack, or to several Battery packs connected in a series.



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## TOWER VERSION

This chapter describes the steps for preparing the UPS, battery pack and transformer box for tower version use.



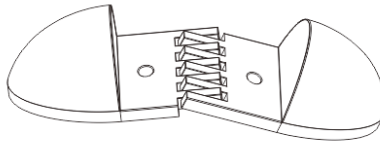
**ATTENTION:**

For your safety and that of the product, you must carefully follow the instructions given here below.

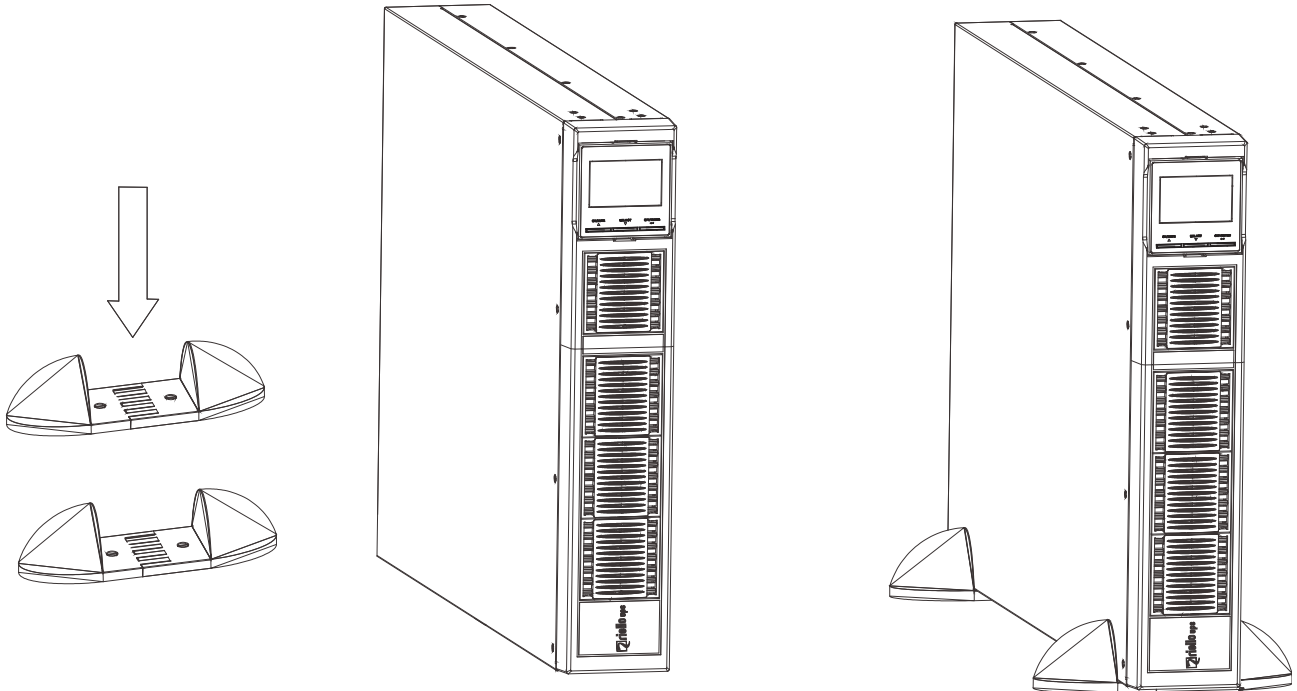
**BEFORE YOU CARRY OUT THE FOLLOWING SEQUENCE OF OPERATIONS, MAKE SURE THAT THE UPS IS COMPLETELY SWITCHED OFF AND NOT CONNECTED TO THE MAINS POWER SUPPLY OR TO ANY LOAD**

Once removed from the packaging, the UPS is already preset for installation in the tower configuration. To complete the configuration, simply mount the UPS on the two support feet.

- Each leg consists of two parts, connecting to each other at joints. To put a leg together proceed as shown in the figure.



- Assemble two legs and secure the UPS on top of them as shown in the figure below.



## TOWER VERSION WITH BATTERY PACK AND TRANSFORMER BOX

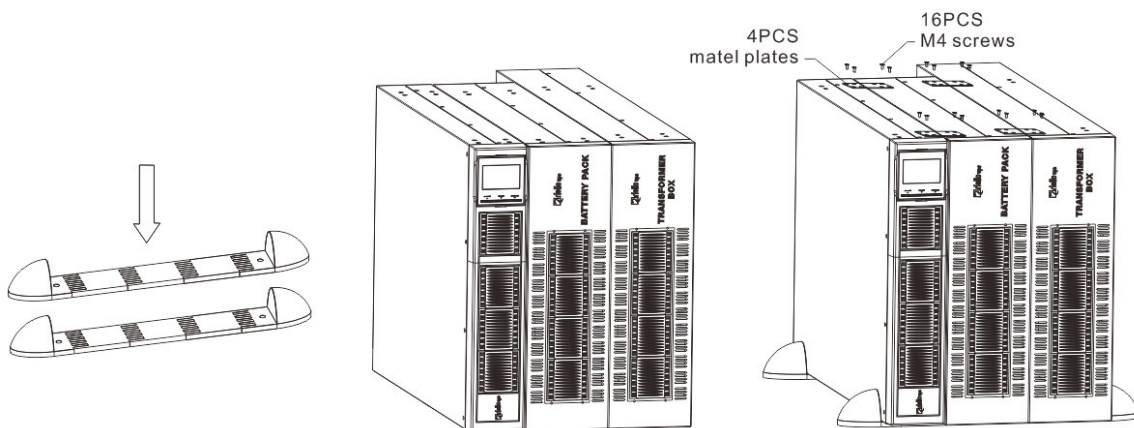


BEFORE CARRYING OUT THE FOLLOWING SEQUENCE OF OPERATIONS, ENSURE THAT: THE UPS IS COMPLETELY SWITCHED OFF AND NOT CONNECTED TO THE MAINS POWER SUPPLY OR TO ANY LOAD.

- THE BATTERY PACK IS DISCONNECTED FROM THE UPS, FROM ANY OTHER BATTERY PACKS AND WITH THE BATTERY ISOLATOR OPEN
- For the battery pack and transformer box version each foot is composed of five parts: two supports and three extension. Assemble two feet as indicated in the figure below.



- Slide the UPS, the battery pack and the transformer box into the two supports



- For any additional battery packs repeat the sequence of operations shown above.

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## RACK VERSION

The sequences of operations to be followed in order to transform the UPS, battery pack or transformer box into rack version are described below.

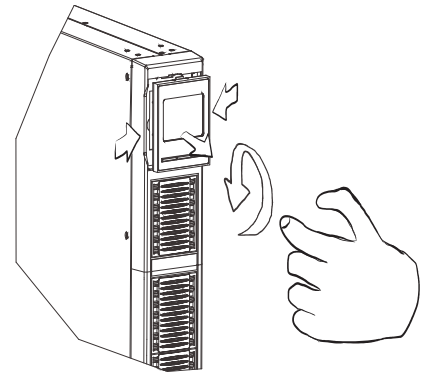


**BEFORE CARRYING OUT THE FOLLOWING SEQUENCE OF OPERATIONS, ENSURE THAT:  
THE UPS IS COMPLETELY SWITCHED OFF AND NOT CONNECTED TO THE MAINS POWER  
SUPPLY OR TO ANY LOAD.**

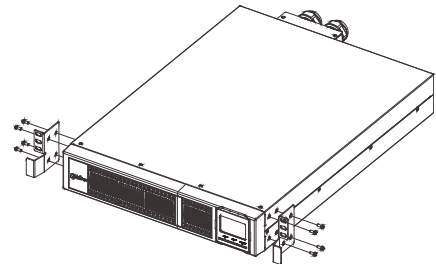
- **THE BATTERY PACK IS DISCONNECTED FROM THE UPS, FROM ANY OTHER BATTERY PACKS AND WITH THE BATTERY ISOLATOR OPEN**

Pick up the panel from the sides and gently pull it away from its position just enough to be able to rotate it: **ATTENTION:** The panel must be moved carefully  
DO NOT ATTEMPT IN ANY WAY TO REMOVE THE PANEL FROM THE UPS

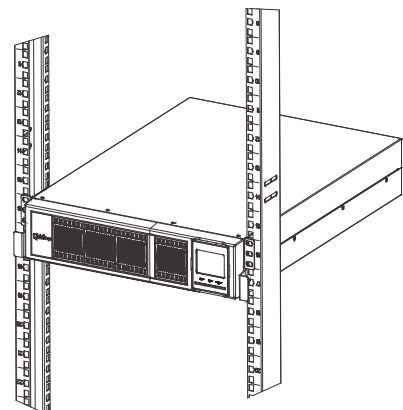
Rotate the panel 90° counterclockwise and reinsert it carefully into the special housing.



At this point, with the UPS, Battery Pack or Transformer Box in the horizontal position, secure the handles using the screws provided, as shown in the figure.



**NOTE:** Given the heavy weight, the use of support brackets is mandatory during rack installation (guide with L-shaped support). For the same reason, it is recommended that the UPS, Battery Pack and Transformer Box are installed in the lower part of the rack cabinet.



# POWER CONNECTION



**ALL CHECK ON THE DATA PLATE THAT THE VOLTAGE OF THE BATTERY PACK IS THE SAME AS THAT ALLOWED BY THE UPS.**

## WIRE CONNECTION

Installation and wiring must be performed in accordance with the local electric laws/regulations and execute the following instructions by professional person.

- 1) Make sure the mains wire and breakers in the building are enough for the rated capacity of UPS to avoid the hazards of electric shock or fire.

**NOTE:** Do not use the wall receptacle as the input power source for the UPS, as its rated current is less than the UPS's maximum input current. Otherwise the receptacle may be burned and destroyed.

- 2) Switch off the mains switch in the building before installation.
- 3) Turn off all the connected devices before connecting to the UPS.
- 4) Prepare wires based on the following table:

Model	Wiring spec (AWG)			
	Input	Output	Battery	Ground
CSDH6K0GA3	6	6	8	6
CSDHK10GA5	4	4	8	4

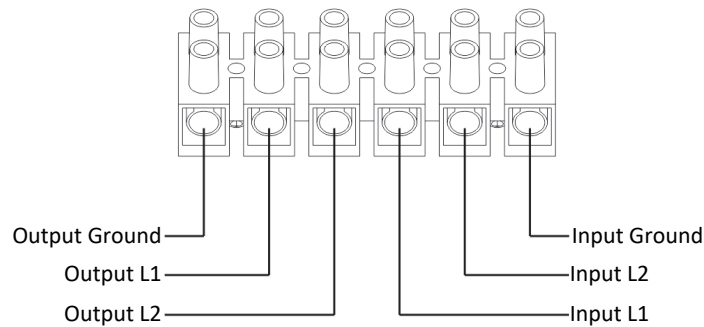
**NOTE 1:** The cable for CSDH6K0GA3 should be able to withstand over 40 A current. It is recommended to use 6AWG or thicker wire for safety and efficiency.

**NOTE 2:** The cable for CSDHK10GA5 should be able to withstand over 63 A current. It is recommended to use 4AWG or thicker wire for safety and efficiency.

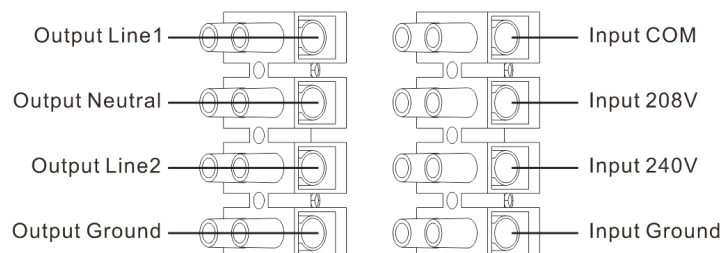
**NOTE 3:** The selections for color of wires should be followed by the local electrical laws and regulations.

The following terminal block diagrams:

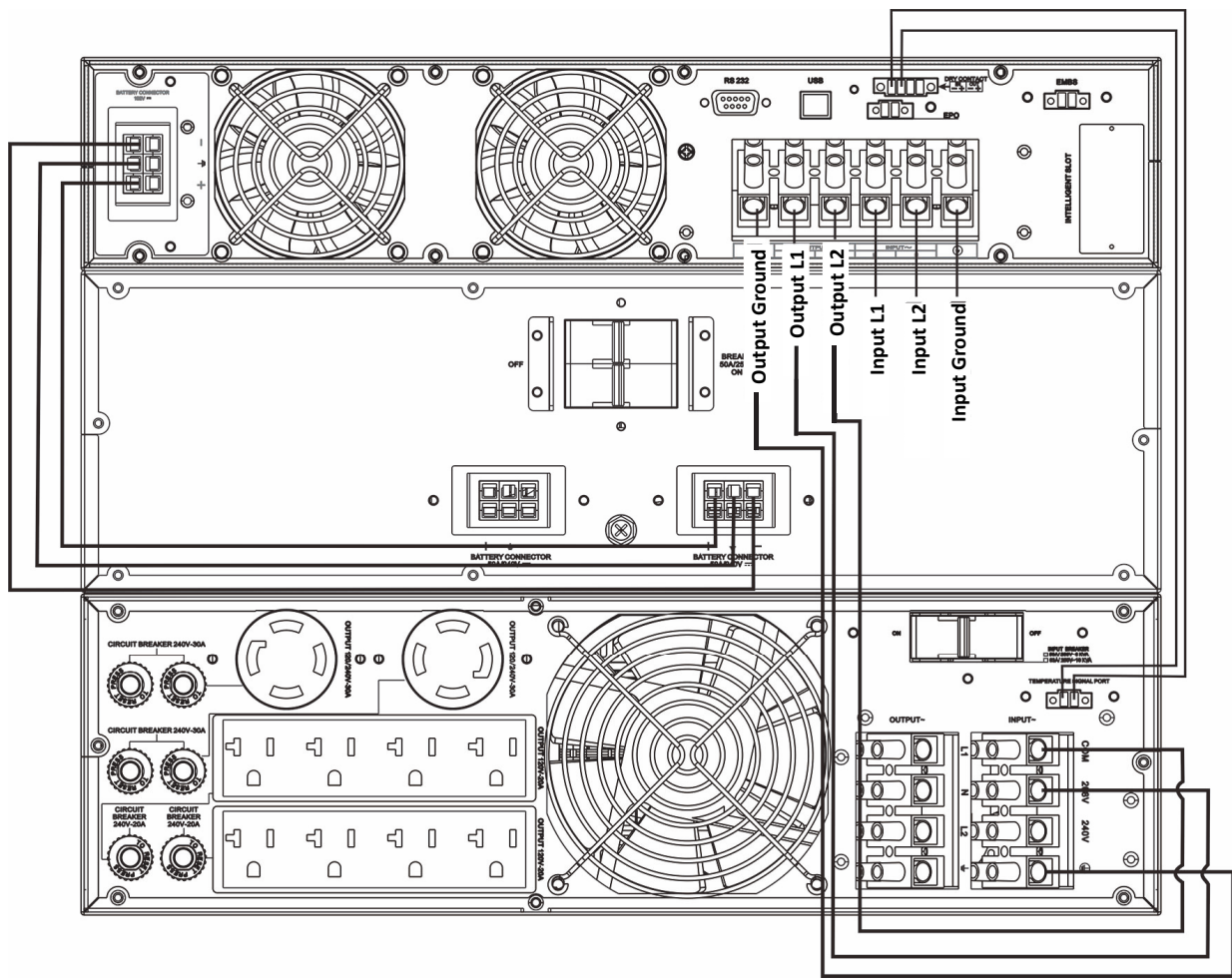
Connect the ground first when making wire connection. Disconnect the earth wire last when making wire disconnection!



**Terminal block wiring diagram of the UPS**



**Terminal block wiring diagram of TRANSFORMER BOX**



### System Connection Overview

NOTE 1: Make sure that the wires are connected tightly with the terminals.

NOTE 2: Please install the output breaker between the output terminal and the load, and the breaker should be qualified with leakage current protective function if necessary.

- 5) Use a Phillips-head screwdriver to remove the screw that secures the terminal block cover. Remove the cover. Retain the cover and screw. Attach the cable gland to the panel.



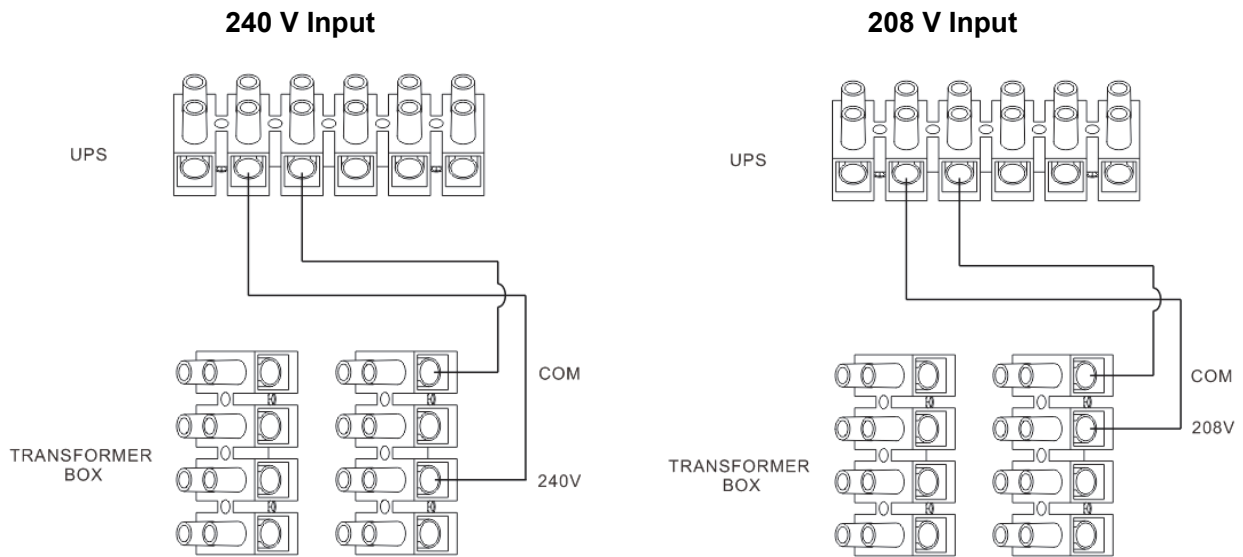
#### ATTENTION:

- For standard battery pack, there are one DC breaker to disconnect the battery pack and the UPS. But for other external battery pack, make sure a DC breaker or other protection device between UPS and external battery pack is installed. If not, please install it carefully. Switch off the battery breaker before installation.  
**NOTE:** Set the battery pack breaker in "OFF" position and then install the battery pack.
- Pay highly attention to the rated battery voltage marked on the rear panel. If you want to change the numbers of the battery pack, please make sure you modify the setting simultaneously. The connection with wrong battery voltage may cause permanent damage of the UPS. Make sure the voltage of the battery pack is correct.
- Pay highly attention to the polarity marking on external battery terminal block, and make sure the correct battery polarity is connected. Wrong connection may cause permanent damage of the UPS.
- Make sure the protective earth ground wiring is correct. The wire current spec, color, position, connection and conductance reliability should be checked carefully.
- Make sure the utility input & output wiring is correct. The wire current spec, color, position, connection and conductance reliability should be checked carefully. Make sure the L/N site is correct, not reverse and short-circuited.

## TRANSFORMER BOX ELECTRICAL INSTALLATION

Output of the UPS should be connected to the input of transformer box and the output of transformer box is the final output of system.

Follow below diagram to connect UPS output to Input of transformer box.



Confirm the UPS output voltage through the front panel and verify that it matches the transformer box output voltage.

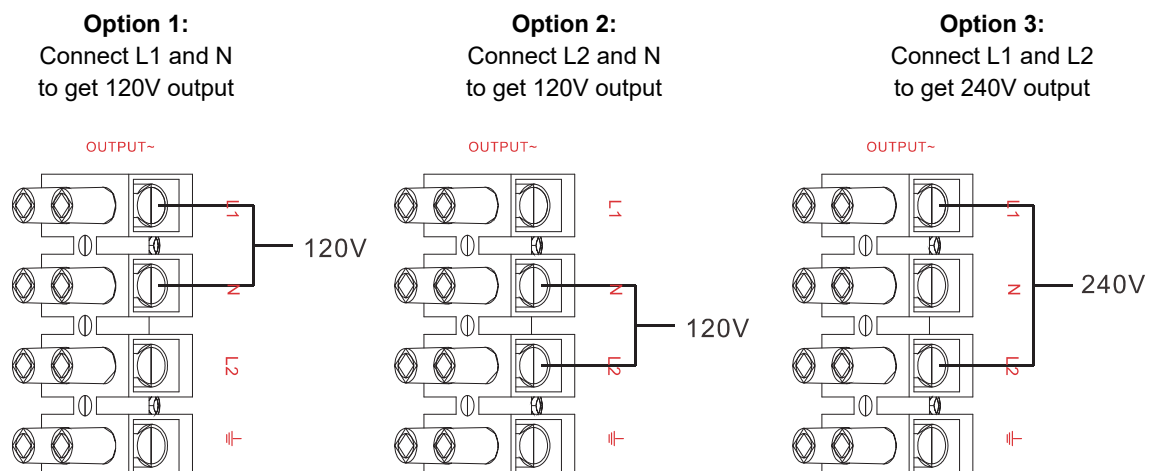
For example, if the input to UPS is 208 Vac, then voltage selection should be 208 Vac.

### There are 3 different output configurations on transformer box

The follow figure shows the transformer box block diagram. The I/O terminal block is hardwired. Before making hardwire, please be sure the power is completely off.

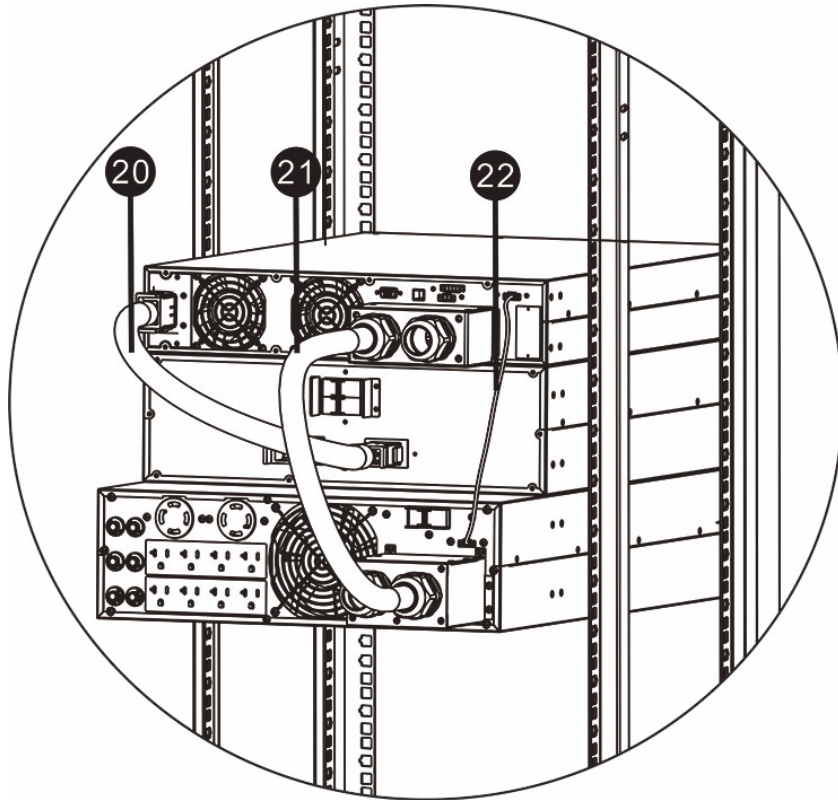
- Switch off utility power at the distribution point where the transformer box will be connected. Be absolutely sure there is no power.
- Verify that the output circuit breaker is in the OFF position.

Three output configurations and the wiring is listed as below:

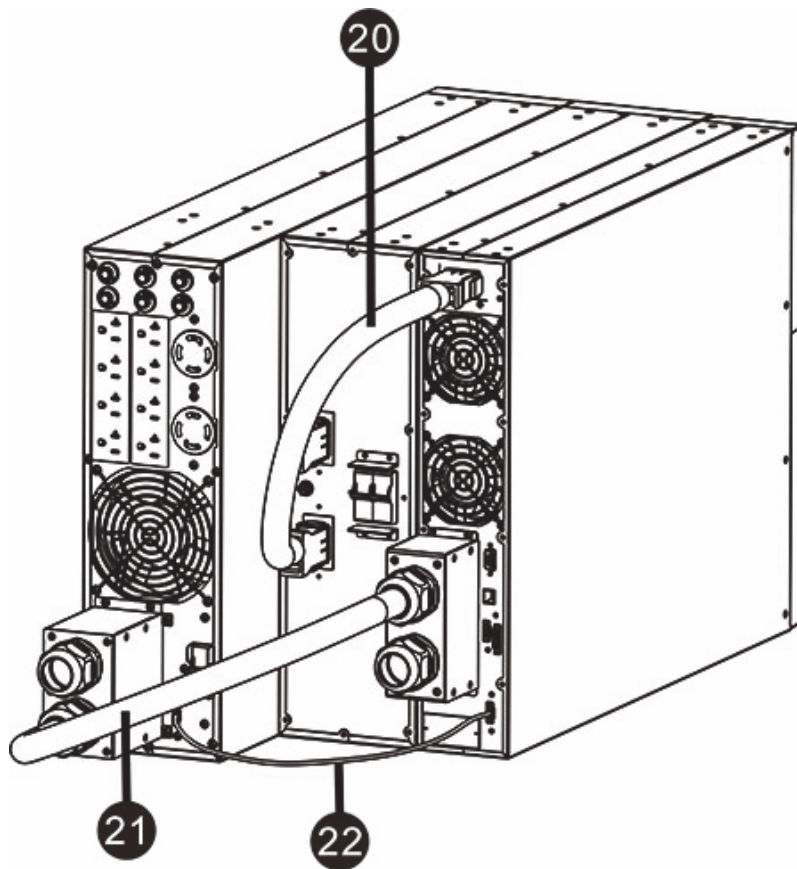


Do not overload the transformer box. For 120V output voltage, the output of L1 or L2 can only be half-loaded.





Transformer box with UPS and Battery Pack in Rack version



Transformer box with UPS and battery pack in Tower version

20 Battery cable

21 UPS to transformer box output cable

22 Temperature signal cable


## CONNECTIONS AND SWITCHING ON FOR THE FIRST TIME

- 1) Make sure the mains wire and breakers in the building are enough for the rated capacity of UPS to avoid the hazards of electric shock or fire.
- 2) Close the mains switch in the building after installation.
- 3) After a few moments, the UPS will switch on, the display will light up. A few seconds later, the UPS will enter to Bypass mode. In Bypass mode, the load is not protected by UPS. To protect your precious devices, you should turn on the UPS.
- 4) Check which operating mode is set on the display and, if necessary, see the “**UPS Configuration**” section to set the required mode. For advanced UPS configurations execute the software ViewPower which can be downloaded from the web site [www.rielloupsamerica.com/download\\_categories](http://www.rielloupsamerica.com/download_categories).

## SWITCHING ON FROM THE MAINS

- 1) Press the “ON” button for 1 second. After pressing it, all the icons on the display light up for 1 second and the UPS beeps. A few seconds later, the UPS will enter to Online mode.
- 2) Switch on the equipment connected to the UPS.

**When switching on for the first time only:** after 30 seconds, check that the UPS is operating correctly:

- 1) Simulate a blackout by disconnecting power to the UPS.
- 2) The load must continue to be powered, the  icon on the display must light up and there must be a beep every 4 seconds.
- 3) When power is reconnected, the UPS must go back to operating from the mains.

## SWITCHING ON FROM THE BATTERY

- 1) Press the “OFF/Enter” button to set up the power supply for the UPS, UPS will enter to power on mode. After initialization UPS will enter to No Output mode. then to turn on the UPS, and the buzzer will beep once.
- 2) Press and hold the “ON/Mute” button for 3 seconds. All the icons on the display light up for 1 second.
- 3) Switch on the equipment connected to the UPS.

## SWITCHING OFF THE UPS

### Turn off the UPS with utility power supply in AC mode

- 1) Turn off the inverter of the UPS by pressing “OFF/Enter” button for at least 2s, and then the buzzer will beep once. The UPS will turn into Bypass mode.

**NOTE 1:** If the UPS has been set to enable the bypass output, it will bypass voltage from utility power to output terminal even though you have turned off the UPS.

**NOTE 2:** After turning off the UPS, please be aware that the UPS is working at Bypass mode and there is risk of power loss for connected devices.

- 2) In Bypass mode, output voltage of the UPS is still present. In order to cut off the output, switch off the input breaker. A few seconds later, there is no display shown on the display panel and UPS is complete off.

## TURN OFF THE UPS IN BATTERY MODE






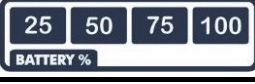




- 1) Turn off the UPS by pressing “OFF/Enter” button for at least 2 seconds, and then the buzzer will beep once.
- 2) Then UPS will cut off output. About 10 seconds later, UPS would shut down completely.



## DISPLAY PANEL MESSAGES

This chapter describes, in detail, the various information that can be displayed on the LCD.

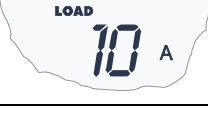


### UPS STATUS MESSAGES

ICON	STATUS	DESCRIPTION
	Fixed	Indicates a fault
	Flashing	Indicates a warning /The UPS is in stand-by mode
	Fixed	Indicates regular operation
	Fixed	The UPS is operating from the mains
	Flashing	The UPS is operating from the mains, but the output voltage is not synchronized with the mains voltage or the UPS is turning on.
	Fixed	The UPS is operating from the battery. In this condition, the UPS emits an acoustic signal (beep) at regular 4-second intervals.
	Flashing	Low battery pre-alarm. Indicates that battery autonomy is coming to an end. In this condition, the UPS will sound every 2 seconds.
	Fixed	Indicates that the loads connected to the UPS are powered by the bypass
	Dynamic	Indicates the estimated percentage charge of the batteries
	Dynamic	Indicates the percentage of load connected to the UPS compared with the nominal value.
	Flashing	Maintenance is required. Contact the support center.
	Fixed	Indicates that the timer is active (programmed switch-on and switch-off). The timer can be activated/deactivated using the software provided.
	Fixed	Power output on Energy Share socket.

## MEASUREMENT DISPLAY AREA

It is possible to display the most important measurements regarding the UPS in sequence on the display. When the UPS is switched-on, the display shows the main voltage value. To display a different measurement, press the "SELECT" button repeatedly until the desired measurement appears. In the event of a fault/alarm (FAULT) or a lock (LOCK), the display will automatically show the type and code of the corresponding alarm.

Some examples are shown below:

GRAPHIC EXAMPLE <sup>(1)</sup>	DESCRIPTION	GRAPHIC EXAMPLE <sup>(1)</sup>	DESCRIPTION
	Mains voltage		Total battery voltage
	Mains frequency		Applied load percentage
	UPS output voltage		Current absorbed by the load
	Output voltage frequency		Temperature of the electronics cooling system inside the UPS
	Residual battery autonomy		Mains current
	Battery charge percentage		Battery current
	Fault / Alarm <sup>(2)</sup> : the corresponding code is displayed		Lock <sup>(2)</sup> : the corresponding code is displayed

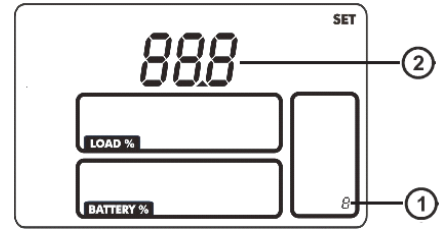
<sup>(1)</sup> The values shown in the images in the table are purely as an indication.

<sup>(2)</sup> The FAULT / LOCK codes can only be displayed if they are active (presence of a fault/alarm or a lock).

# LCD CONFIGURATION

The section of the display shown in the figure displays the setting interface and allows the user to configure UPS parameters.

- ① presents setting item number
- ② presents selected configurations



## HOW TO CONFIGURE:

- To enter the setting mode, press the “SEL” button at least 3 seconds when UPS is operated in STANDBY mode.
- To switch the different setting item numbers or configurations, press the “ON” button for previous selection or press the “SEL” button for next selection.
- To select the setting item numbers or configurations, press the “STBY” button at least 1 second.
- Press “ON” and “SEL” buttons at the same time for 1 second to return to “setting item” level when it’s in the “option” level or exit the setting mode when it’s in the “setting item” level.

## SETTING ITEMS

### ● 1: Output voltage setting

Interface	Description and Possible configurations
	<p><b>Parameter 2: Output voltage</b>            You may choose the following output voltage in parameter 3:</p> <ul style="list-style-type: none"> <li>● 208: Presents output voltage is 208Vac</li> <li>● 220: Presents output voltage is 220Vac (Default)</li> <li>● 230: Presents output voltage is 230Vac</li> <li>● 240: Presents output voltage is 240Vac</li> </ul>

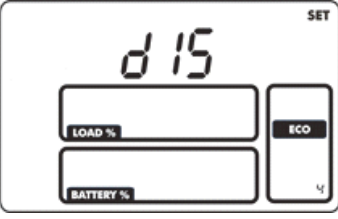
### ● 2: Frequency Converter enable/disable

Interface	Description and Possible configurations
	<p>Enable or disable converter mode. You may choose the following two options:</p> <ul style="list-style-type: none"> <li>● ENA: converter mode enable</li> <li>● DIS: converter mode disable (Default)</li> </ul>

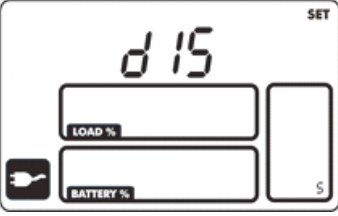
### ● 3: Output frequency setting

Interface	Description and Possible configurations
	<p>Selects the nominal output frequency. You may choose the following two options:</p> <ul style="list-style-type: none"> <li>● 50: presents output frequency is 50Hz</li> <li>● 60: presents output frequency is 60Hz</li> </ul>

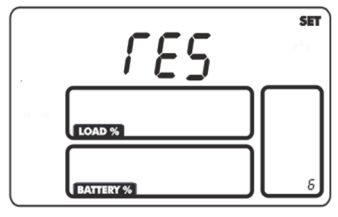
● **4: ECO enable/disable**

Interface	Description and Possible configurations
	<p><b>Parameter:</b> Enable or disable ECO function. You may choose the following two options:</p> <ul style="list-style-type: none"> <li>● <b>ENA:</b> ECO mode enable</li> <li>● <b>DIS:</b> ECO mode disable (Default)</li> </ul>

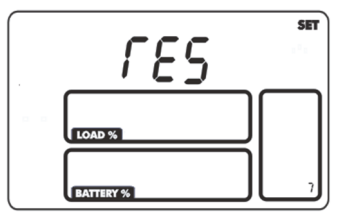
● **5: Bypass enable/disable when UPS is off**

Interface	Description and Possible configurations
	<p>Enable or disable Bypass function. You may choose the following two options:</p> <ul style="list-style-type: none"> <li>● <b>ENA:</b> Bypass enable</li> <li>● <b>DIS:</b> Bypass disable (Default)</li> </ul>

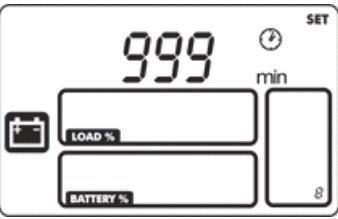
● **6: Reserved**

Interface	Description and Possible configurations
	<p>Reserved</p>

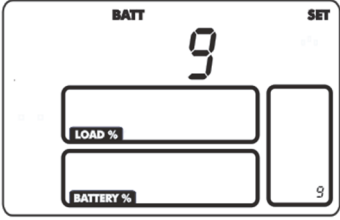
● **7: Reserved**

Interface	Description and Possible configurations
	<p>Reserved</p>

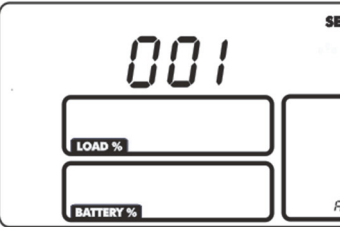
● **8: Autonomy limitation setting**

Interface	Description and Possible configurations
	<p><b>Parameter 2:</b> Set up backup time on battery mode for <b>000~999</b>: Set the maximum backup time from 0 min to 999 min. UPS will shut down to protect battery after backup time arrives.</p> <p><b>DIS:</b> Disable battery discharge protection and backup time will depend on battery capacity. The default value is DIS.</p>

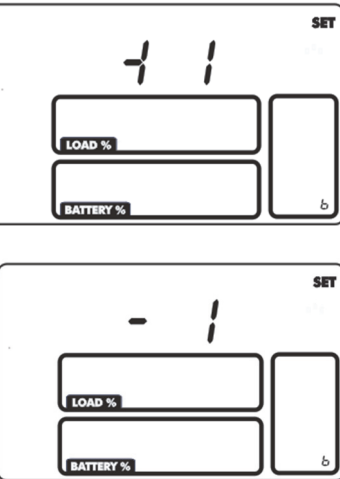
● **9: Battery total AH setting**

Interface	Description and Possible configurations
	<p><b>Parameter 2:</b> Set up the battery AH of the UPS .  <b>7-200:</b> setting the battery capacity from 7-200 in Ah (1 PCS).            Please set the correct battery total capacity if external battery pack is connected.</p>

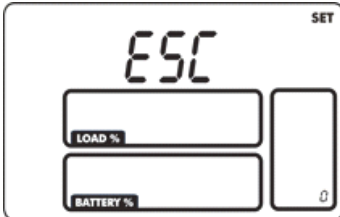
● **10: Setting charge current**

Interface	Description and Possible configurations
	<p><b>Parameter 2:</b> Set up charging current of the charger <b>001~004</b>.  <b>CAUTION: This setting is only available for ER models. NEVER change this setting for standard models.</b></p> <p>Set the charging current of the charger from 1 A to 4 A.</p>

● **11: Fine-turning charge current**

Interface	Description and Possible configurations
	<p><b>Parameter 2:</b> Fine-turning charge current  <math>\pm 0 \sim \pm 5</math>: you may choose '+' as <b>add</b> or '-' as <b>Sub</b> to adjust charging current</p> <p>+ 1: Charging current will increase about 0.01 A.            - 1: Charging current will decrease about 0.01 A.</p>

● **0: Exit setting**

Interface	Description
	<p>Exit the setting mode.</p>

## ADDITIONAL FUNCTIONS

### MANUAL BYPASS

Using the Manual Bypass feature, the UPS can be switched to bypass. In this condition the load is powered directly by the input mains, any disruption in the mains directly affects the load.



**CAUTION:**  
**BEFORE CARRYING OUT THE FOLLOWING SEQUENCE OF OPERATIONS, ENSURE THAT THE UPS'S INPUT AND OUTPUT FREQUENCY COINCIDE AND THAT THE UPS IS NOT OPERATING FROM THE BATTERY**

**Attention: even when the UPS is switched on, the load is disconnected in the event of a mains blackout.**

If the input mains deviates from the established tolerances, the UPS automatically switches to STANDBY mode and disconnects the load.

To force the UPS into manual bypass mode, press and hold down the ON/MUTE and SELECT keys simultaneously for at least 4 seconds.

The code "C02" appears on the display.

To return to the normal operation mode press the ON/MUTE and SELECT keys again for at least 4 sec.

### REMOTE CONTROL TERMINAL BOARD

The remote control terminal allows for implementation of the REPO function (Remote Emergency Power Off).

The UPS is provided by the manufacturer with the REPO terminals short-circuited. For installation remove the short circuit and connect to the device's normally closed contact.

In case of an emergency, if the stop device is used, the REPO control is opened and the UPS goes into stand-by mode and the load is completely disconnected.

**Attention:** before restarting the UPS, reset the stop device.

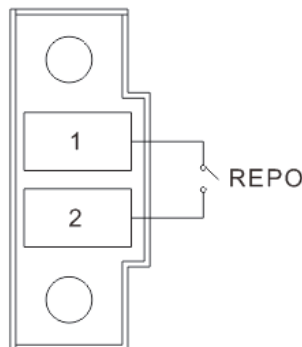
The circuitry of the remote control terminal board is self-powered with SELV circuits. Therefore, an external voltage supply is not required. When a contact is closed, a maximum current of 15 mA circulates.

All connections with the remote control terminal board are made through a cable which guarantees a double insulation connection.

Logic of the connections:

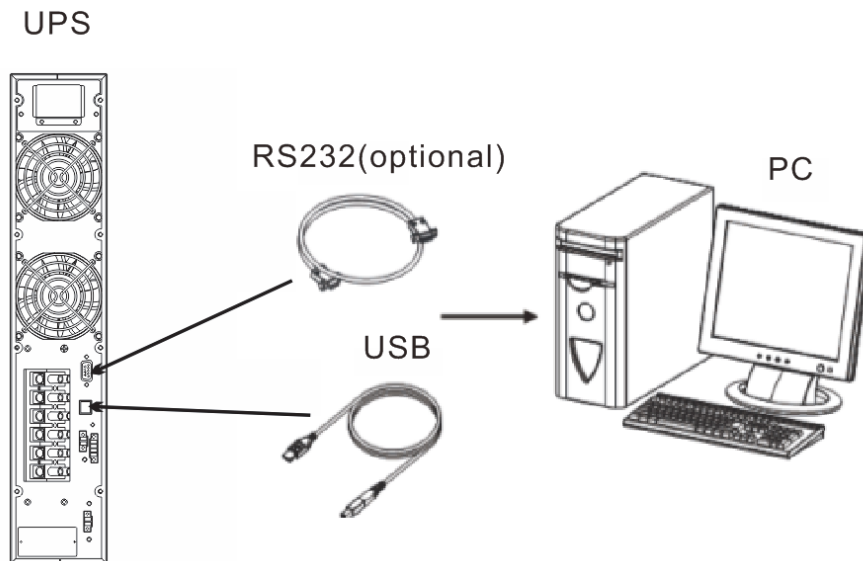
- PIN 1-2 REPO

The function is activated when the contact is opened.



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## SOFTWARE



### **MONITORING AND CONTROL SOFTWARE**

The **ViewPower** software guarantees effective, intuitive UPS management, displaying all the most important information such as input voltage, applied load and battery capacity.

It is also able to perform shutdown operations and send e-mails, text messages and network messages automatically when certain events, selected by the user, occur.

### **INSTALLATION OPERATIONS**

- 1) Connect one of the UPS's communication ports to one of the PC's communication ports using the cable supplied.
- 2) Download the software from the web site [www.rielloupsamerica.com/download\\_categories](http://www.rielloupsamerica.com/download_categories) selecting the specific operating system.
- 3) Follow the installation program instructions.
- 4) For more detailed information please read the user manual which can be downloaded from [www.rielloupsamerica.com/download\\_categories](http://www.rielloupsamerica.com/download_categories).

PowerShield<sup>3</sup> provides efficient, user-friendly UPS management using bar chart displays to show major operational information such as the input voltage, UPS load % and batteries charge %. The software also provides detailed information on fault conditions and UPS operating characteristics. PowerShield<sup>3</sup> has been developed with a client/server architecture that makes it flexible and easy to use, and provides multi-lingual and on-line support.

It works in conjunction with the NetMan 104 network board.

### **INSTALLATION OPERATIONS**

- 1) Insert the Netman 104 board on the UPS's communication slot.
- 2) Download the software from the web site [www.rielloupsamerica.com/download\\_categories](http://www.rielloupsamerica.com/download_categories) selecting the specific operating system.
- 3) **IMPORTANT:** the Third party UPS gateway software must be also installed.
- 4) Follow the installation program instructions, connection chose SNMP protocol.
- 5) For more detailed information please read the user manual which can be downloaded from [www.rielloupsamerica.com/download\\_categories](http://www.rielloupsamerica.com/download_categories).

## CONFIGURATION SOFTWARE

The **ViewPower** software allows the configuration and full display of the status of the UPS via USB or RS232. For a list of possible configurations available to the user, refer to the UPS Configuration paragraph.

### INSTALLATION OPERATIONS

- 1) Connect one of the UPS's communication ports to one of the PC's communication ports using the cable supplied.
- 2) Follow the installation instructions shown within the software manual which can be located in the ViewPower directory or downloaded from the web site [www.rielloupsamerica.com/download\\_categories](http://www.rielloupsamerica.com/download_categories).



#### CAUTION:

If the RS232 communication port is used, it is not possible to communicate with the USB port and vice versa.

It is advisable to use a cable which is shorter than 9,84 feet (3 m) for communication with the UPS. To obtain additional communication ports with different functions, independent from the standard USB and RS232 ports on the UPS, various accessories are available which can be inserted into the communication card slot.



To check the availability of new, more updated software versions and for more information about the accessories available, consult the website [www.rielloupsamerica.com/download\\_categories](http://www.rielloupsamerica.com/download_categories).

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## UPS CONFIGURATION

The table below illustrates all the possible configurations available to the user in order to best adapt the UPS to individual requirements. It is possible to perform these operations by using the LCD configuration and ViewPower software.

FUNCTION	DESCRIPTION	DEFAULT	POSSIBLE CONFIGURATIONS
<b>Output voltage*</b>	Selects the nominal output voltage	208V	208/220/230/240
<b>Converter mode*</b>	Converter mode enable or disable	Disabled	<ul style="list-style-type: none"> <li>• Enabled</li> <li>• Disabled</li> </ul>
<b>Output frequency</b>	Selects the nominal output frequency when converter mode enable	50Hz	<ul style="list-style-type: none"> <li>• 50 Hz</li> <li>• 60 Hz</li> </ul>
<b>ECO mode</b>	ECO mode enable or disable	Disabled	<ul style="list-style-type: none"> <li>• Enabled</li> <li>• Disabled</li> </ul>
<b>Bypass when UPS is off</b>	Bypass when UPS is off enable or disable	Enable	<ul style="list-style-type: none"> <li>• Enabled</li> <li>• Disabled</li> </ul>
<b>Autonomy limit</b>	Maximum battery operation time	Disabled	<ul style="list-style-type: none"> <li>• Disabled (complete battery discharge)</li> <li>• (1 - 999) minutes. in 1 minutes steps</li> </ul>
<b>Battery Ah</b>	Battery Ah (1PCS )	7 or 9	7 – 999 in Ah steps
<b>Charger current</b>	Select Charger current	1Amp	• 1-4Amp
<b>Charger current Calibration</b>	Calibration Charger current	0	• ± 0~± 5

\* If converter mode is enabled or 208V output is selected, the UPS output power will be de-rate.

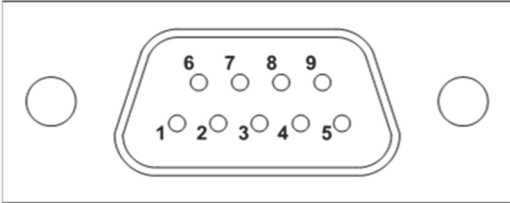


## COMMUNICATION PORTS

On the back of the UPS (see *UPS Views*), the following communication ports are present:

- RS232 connector
- USB connector
- Expansion slot for additional communication cards

### RS232 CONNECTOR

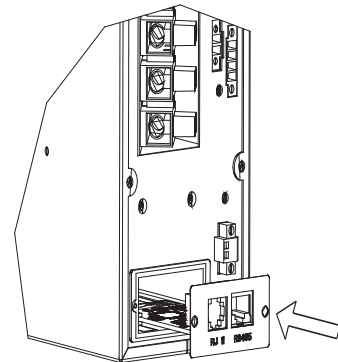
RS232 CONNECTOR		
		
PIN #	SIGNAL	NOTES
2	TXD	
3	RXD	
5	GND	

### COMMUNICATION SLOT

The UPS is equipped with an expansion slot for optional communication cards (see figure on right) which allows the device to communicate using the main communication standards.

Some examples:

- Ethernet network card with TCP/IP, HTTP and SNMP protocols
- MODBUS protocol converter card
- Card with relay isolated contacts



To check the availability of other accessories, visit the website [www.rielloupsamerica.com](http://www.rielloupsamerica.com).

## TROUBLESHOOTING

Irregular UPS operation is most likely not an indication of a fault but due to simple problems or distraction. It is therefore advisable to consult the table below carefully as it summarizes information which is useful for solving the most common problems.

PROBLEM	POSSIBLE CAUSE	SOLUTION
THE DISPLAY DOES NOT LIGHT UP	ON/OFF SWITCH NOT PRESSED	Press the ON/OFF switch on the front panel.
	MAIN CONNECTION CABLE MISSING	Check that the power cable is connected correctly.
	NO MAINS VOLTAGE (BLACKOUT)	Check that the power reaches the socket where the UPS is connected (try it with a table lamp, for example).
	INTERVENTION OF THE INPUT CIRCUIT BREAKER	If present, reset the circuit breaker by pressing the button on the back of the UPS. <b>CAUTION:</b> Check that there is no output overload to the UPS.
THE DISPLAY IS ON BUT THE LOAD IS NOT POWERED	THE UPS IS IN STAND-BY MODE	Press the "ON" button on the front panel to power the loads.
	NO CONNECTION TO THE LOAD	Check the connection to the load.
THE UPS IS OPERATING FROM THE BATTERY DESPITE THE PRESENCE OF MAINS VOLTAGE	THE INPUT VOLTAGE IS OUTSIDE THE PERMITTED TOLERANCE RANGE FOR MAINS OPERATION	Problem with the mains. Wait until the input mains voltage returns within the tolerance range. The UPS will automatically return to mains operation.
	INTERVENTION OF THE INPUT CIRCUIT BREAKER	If present, reset the circuit breaker by pressing the button on the back of the UPS. <b>CAUTION:</b> Check that there is no output overload to the UPS.
THE BUZZER SOUNDS CONTINUOUSLY AND THE DISPLAY SHOWS ONE OF THE FOLLOWING CODES: <b>F50, L50</b>	THE LOAD APPLIED TO THE UPS IS TOO HIGH	Reduce the load to within the threshold of 100%. If the display shows a lock: remove the load and switch the UPS off and back on again.
THE DISPLAY SHOWS THE FOLLOW CODE: <b>A62</b>	BATTERIES MISSING OR BATTERY PACK MISSING OR NOT CONNECTED	On the versions with an additional battery charger in place of the batteries, check that the Battery Pack is inserted and connected to the UPS correctly.

PROBLEM	POSSIBLE CAUSE	SOLUTION
THE BUZZER SOUNDS CONTINUOUSLY AND THE DISPLAY SHOWS ONE OF THE FOLLOWING CODES: <b>F04, L04</b>	THE TEMPERATURE OF THE DISSIPATORS INSIDE THE UPS IS TOO HIGH	Check that the temperature of the environment in which the UPS is located does not exceed 40°C. Whether the fan work normally.
THE BUZZER SOUNDS CONTINUOUSLY AND THE DISPLAY SHOWS THE FOLLOW CODE: <b>L53</b>	THERE IS A FAULT ON ONE OR MORE OF THE UTILITIES POWERED BY THE UPS	Disconnect all the utilities, switch the UPS off and back on again, reconnect the utilities one at a time to identify which one is faulty.
THE BUZZER SOUNDS CONTINUOUSLY AND THE DISPLAY SHOWS ONE OF THE FOLLOWING CODES: <b>L04, L13, L20, L21, L40, L43, L50, L53, L61, L62, L63, L64, L65, L77</b>	THE UPS IS MALFUNCTIONING	If possible, disconnect the power to the load, switch the UPS off and back on again; if the problem occurs again, call the support center.
THE BUZZER SOUNDS CONTINUOUSLY AND THE DISPLAY SHOWS ONE OF THE FOLLOWING CODES: <b>F79, L78</b>	THE TEMPERATURE OF THE DISSIPATORS INSIDE THE TRANSFORMER IS TOO HIGH	Check that whether the fan work normally.
THE DISPLAY SHOWS <b>C01</b>	AN EMERGENCY POWER OFF IS ACTIVE	If unwanted, check the status of the emergency power off connector.



**ATTENTION:**

The UPS in case of a permanent failure will be not able to supply the load. To ensure total protection of your equipment we suggest you install an ATS device (Automatic Transfer Switch) or an external automatic by-pass.

For more information visit [www.rielloupsamerica.com](http://www.rielloupsamerica.com).

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## ALARM CODES

Using a sophisticated self-diagnosis system, the UPS is able to check its own status and any anomalies and/or faults which may occur during normal operation and display them on the display panel. If there is a problem, the UPS signals the event by showing the code and the type of active alarm on the display (FAULT and/or LOCK).

### ALARMS/FAULT

These are more critical problems than anomalies because, if they persist, they could cause the UPS to lock in a very short time.

CODE	DESCRIPTION
A62	Battery unconnected
F04	Over temperature
F50	Overload
F60	Overcharge
F68	Low battery
F69	Fan failure
F70	Charger failure
F74	Locked in bypass after overload 3 times in 30min
F75	Cover of maintain switch is open
F76	Bypass unstable
F77	Boot loader is missing
F79	Over temperature on Transformer box
C01	EPO enable

### LOCK

LOCK alerts are normally preceded by an alarm signal and their scale leads to the power-off of the inverter and the load being powered by the bypass line (this procedure is excluded for locks due to serious, persistent overloads and short circuits).

CODE	DESCRIPTION
L04	Over temperature
L13	Capacitor pre-charge failed
L20	Capacitor bank under-voltage
L21	Capacitor bank over-voltage
L40	Inverter over-voltage
L43	Inverter under-voltage
L50	Overload
L53	Inverter short circuited
L61	Bus unbalance
L62	Inverter soft start failure
L63	Negative power fault
L64	Battery SCR short circuited
L65	Battery SCR short circuited
L68	Inverter relay short circuited
L69	Charger short circuited
L71	CAN communication fault
L72	Inverter over current
L73	Battery turn-on failure
L74	Bus voltage changes too fast
L77	CPU communication failure
L78	Over temperature fault on transformer box

## TECHNICAL DATA

UPS MODELS	6KVA	10KVA
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### INPUT

Nominal voltage	[Vac]	208/220/230/240 (1Φ; 2W+PE)	
Maximum operating voltage	[Vac]	300	
Input threshold		Maximum: 300 Vac Minimum: 176 Vac @ load 100% 110 Vac @ load 60%	
Nominal frequency	[Hz]	50/ 60	

### BATTERY

Recharge time(standard version)	[h]	< 7 hours for 90% capacity	< 9 hours for 90% capacity
Nominal voltage	[Vdc]	192	240
Recharge current	[A]	1/2/3/4 Default 1	

### OUTPUT

Nominal voltage(1)	[Vac]	Selectable: 208/220/230/240	
Frequency	[Hz]	Selectable: 50, 60 or <b>auto sensing</b>	
Nominal power(3)	[VA]	6000	10000
Nominal power(2)	[W]	6000	10000
Overload: 100% < load < 110%		Warning, transfer to bypass after 10 min (+/- 4s) On line mode. Warning and fault after 30 sec (+/-0.5s) On Battery mode	
Overload: 110% < load < 130%		Warning, transfer to bypass after 1 min (+/- 4s) On line mode. Warning and fault after 10 sec (+/- 0.5s) On Battery mode.	
Overload: load > 130%		Warning, transfer to bypass mode after 1s (+/- 0.5s) On line mode. Fault, transfer to Shut down mode immediately On Battery mode.	
Short circuit current (Bypass line not available)		Icc = 3 In x 100ms +1.2 In x 4s	

### OTHER DATA

Earth leakage current (L-ground / N-ground)	[mA]	≤ 5 Note: the UPS generates an earth leakage current. The customer must ensure that the sum of the UPS and load earth leakage current is less than 10mA.	
Environment temperature	[°C]	0 – 40	
Humidity		< 95% non-condensing	
Protection against overvoltage		660 Joule	
Noise		< 55 dB(A) a 1 m	< 58 dB(A) a 1 m
Dimensions W x D x H	[inch/(mm)]	17,24 x 24,04 x 3,42 (438 x 610 x 87)	
Weight	[lbs/(kg)]	37,47 (17)	44,09 (20)

BATTERY PACK	6KVA	10KVA
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N° bateries / V	[n°] / [V]	16 / 12	20 / 12
Capacity (only for standard version)	[Ah]	7Ah	9Ah
Float charge voltage	[Vdc]	13,65 Vdc (2,28 V/cell) controlled by uC	
Cut off voltage	[Vdc]	10.7 Vdc/pcs @ load <30% standard mode& long run mode 10.2 Vdc/pcs @ load <70% standard mode 9.6 Vdc/pcs @ load >70% standard mode	
Expandability and nominal voltage of the Battery Pack	[Vdc]	192	240
Dimensions W x D x H	[inch/(mm)]	17,24 x 24,04 x 3,42 (438x 607 x 131)	
Weight	[lbs/(kg)]	108,02 (49)	138,89 (63)

TRANSFORMER BOX		6KVA	10KVA
Input voltage	[Vac]	208/240	
Output voltage	[Vac]	120V (X2) isolated /240V (X1) isolated	
Input Connection		Hardwired Terminal Block	
Output Outlets		Hardwired Terminal Block 87A/300V X 4 and plug receptacles (2) L14-30R; (8) 5-20 R	
Dimensions W x D x H	[inch]	17,24 x 25,39 x 3,42	438 x 28,54 x 3,42
Dimensions W x D x H	[mm]	438 x 645 x 131	438 x 725 x131
Weight	lbs/(kg)]	142,20 (64.5)	206,13 (93.5)

- (1) Derated capacity to 60% of capacity in CVCF mode and to 90% when the output voltage is adjusted to 208 Vac is operated.
- (2) For Standard back up UPS, output PF is one. For long back up, Output PF is depending on battery number:16 > 0.8, 18/19 > 0.9, 20 = 1.
- (3) If the UPS is installed or used in a place where the altitude is above than 3280 ft (1000 m), the output power must be derated one percent per 328 ft (100 m).
- (4) Product specifications are subject to change without further notice.

UPS MODELS	6KVA ER	10KVA ER
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#### INPUT

Nominal voltage	[Vac]	208/220/230/240 (1Φ; 2W+PE)	
Maximum operating voltage	[Vac]	300	
Input threshold		Maximum: 300 Vac Minimum: 176 Vac @ load 100% 110 Vac @ load 60%	
Nominal frequency	[Hz]	50/ 60	

#### BATTERY

Nominal voltage	[Vdc]	240	240
Recharge current	[A]	1/2/3/4 Default 1 A	

#### OUTPUT

Nominal voltage(1)	[Vac]	Selectable: 208/220/230/240	
Frequency	[Hz]	Selectable: 50, 60 or <b>auto sensing</b>	
Nominal power(3)	[VA]	6000	10000
Nominal power(2)	[W]	6000	10000
Overload: 100% < load < 110%		Warning, transfer to bypass after 10 min (+/- 4 s) On line mode. Warning and fault after 30 s (+/-0.5 s) On Battery mode	
Overload: 110% < load < 130%		Warning, transfer to bypass after 1 min (+/- 4 s) On line mode. Warning and fault after 10 s (+/- 0.5 s) On Battery mode.	
Overload: load > 130%		Warning, transfer to bypass mode after 1 s (+/- 0.5 s) On line mode. Fault, transfer to Shut down mode immediately On Battery mode.	
Short circuit current (Bypass line not available)		I <sub>cc</sub> = 3 I <sub>n</sub> x 100 ms +1.2 I <sub>n</sub> x 4 s	





[www.riello-ups.com](http://www.riello-ups.com)

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