installation and user manual

GUARD TOWER

GTT 6000 - 10000

RIELLO ELETTRONICA
riello ups

INTRODUCTION

Congratulations on purchasing a **UPS GTT Tower** product and welcome to **Riello UPS**! To use the support service offered by **Riello UPS**, for USA, Canada and Mexico visit the site **www.rielloupsamerica.com** for other Countries **www.riello-ups.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 anyone on the condition that they have **READ THIS INSTALLTION AND USER MANUAL CAREFULLY.**

The UPS and the Battery Cabinet 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 and any additional Battery Cabinet.
For information on how to use and maximize the performance of your device, please retain this manual and read it carefully before operating the equipment.

ENVIRONMENTAL PROTECTION

In the development of its products, the company devotes abundant resources to analyzing the environmental aspects.
All our products pursue the objectives defined in the environmental management system developed by the company in compliance with applicable standards.

No hazardous materials such as CFCs, HCFCs or asbestos are used in this product.

When evaluating packaging, the choice of material has been made favoring recyclable materials.
For correct disposal, please separate and identify the type of material of which the packaging is made according to the table below.
Dispose of all material in compliance with applicable standards in the country in which the product is used.

DESCRIPTION	*MATERIAL*
Box	Cardboard
Packaging corner	Cardboard
Protective bag	Polythene
Accessories bag	Polythene
Pallet	Heat-treated pine

DISPOSING OF THE PRODUCT

The UPS and the Battery Cabinet contain electronic internal material that (in case of dismiss / disposal) are considered TOXIC and HAZARDOUS WASTE, such as electronic circuit boards and batteries. Treat these materials according to the laws applicable referring to qualified service personnel. Their proper disposal contributes to respect the environment and human health.

CONTENTS

SAFETY AND EMC INSTRUCTIONS

Please carefully read the following user manual and the safety instructions before installing the unit or operating the unit!

IMPORTANT SAFETY INSTRUCTIONS SAVE THESE INSTRUCTIONS!

1-1. TRANSPORTATION AND STORAGE

 Please transport the UPS system only in the original packaging to protect against shock and impact.

 The UPS must be stored in a ventilated and dry location.

1-2. PREPARATION

 Condensation may occur if the UPS system is moved from a cold to a warm environment. The UPS system must be absolutely dry before being installed. Please allow at least two hours for the UPS system to acclimate the environment.

 Do not install the UPS system near water or in moist environments or where it would be exposed to direct sunlight or a nearby heater.

 Do not block the ventilation holes on the UPS.

1-3. INSTALLATION

 This UPS series is **ONLY** intended to be installed in an indoor temperature-controlled environment that is free of conductive contaminants. This UPS series is not intended for use in a computer room as defined in the Standard for the Protection of Electronic Computer/Data Processing Equipment ANSI/NFPA 75.

 Do not connect appliances or devices which would overload the UPS (e.g. big motor-type equipment) to the UPS output.

 Route cables in such a way that no one can step on or trip over them.

 Do not block the air vents on the UPS. The UPS must be installed in a location with good ventilation. Ensure enough space on each side for ventilation.

 UPS has provided an earthed terminal, in the final installed system configuration, equipotential earth bonding to the external UPS battery cabinets.

 The UPS can be installed only by qualified service personnel.

 An appropriate disconnect device for short-circuit protection should be provided in the building wiring installation.

 An integral single emergency switching device which prevents further supply to the load by the UPS in any mode of operation should be provided in the building wiring installation.

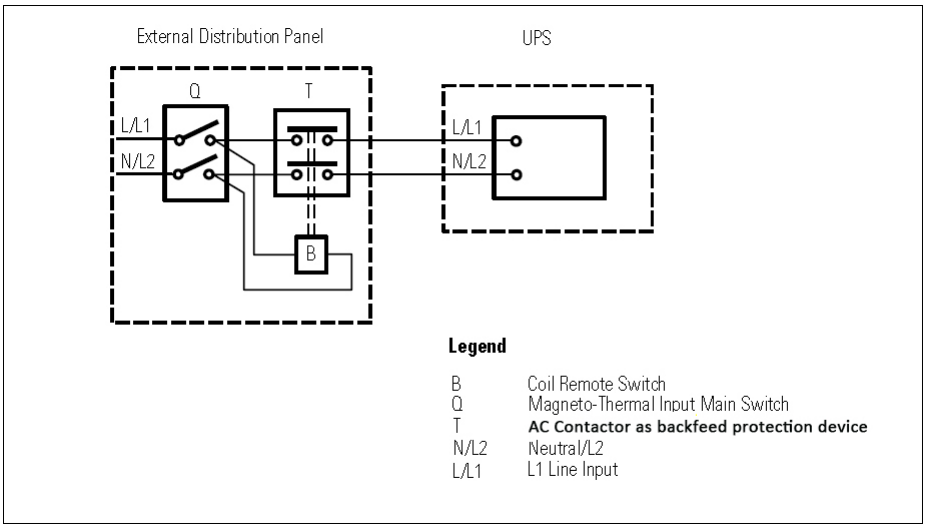
 Connect to the earth grounding before connecting to the building wiring terminal.

 Installation and Wiring must be performed in accordance with the local electrical codes and regulations.

1-4. CONNECTION WARNINGS

- In accordance with safety standard EN-IEC 62040-1, installation has to be provided with a back-feed 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 back-feed protection inside of the UPS. Please isolate the UPS before working according to below diagram. The isolation device must be able to carry the UPS input current.

Extern back-feed protection wiring



⚠ There can be no derivation in the line that goes from the «Back-feed Protection» to the UPS.

- 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:

Before working on this circuit
- Isolate the Uninterruptible Power System (UPS)
- Then check for Hazardous Voltage between all terminals including the protective earth.

Risk of Voltage Back-feed

- This UPS should be connected with **TN** earthing system.
- The mains for this unit must be single-phase rated in accordance with the equipment nameplate. It also must be suitably grounded.

WARNING
HIGH LEAKAGE CURRENT
EARTH CONNECTION ESSENTIAL
BEFORE CONNECTING SUPPLY

- The UPS is connected to a DC source (battery). The output terminals may be live when the UPS is not connected to an AC supply.

1-5. OPERATION

 Do not disconnect the earth conductor cable on the UPS or the building wiring terminals since this would cancel the protective earth of the UPS system and of all connected loads.

 The UPS system features its own, internal current source (batteries). The UPS output may be electrically live even if the UPS system is not connected to the building wiring.

 In order to fully disconnect the UPS system, first press the “STBY” button and then disconnect the mains.

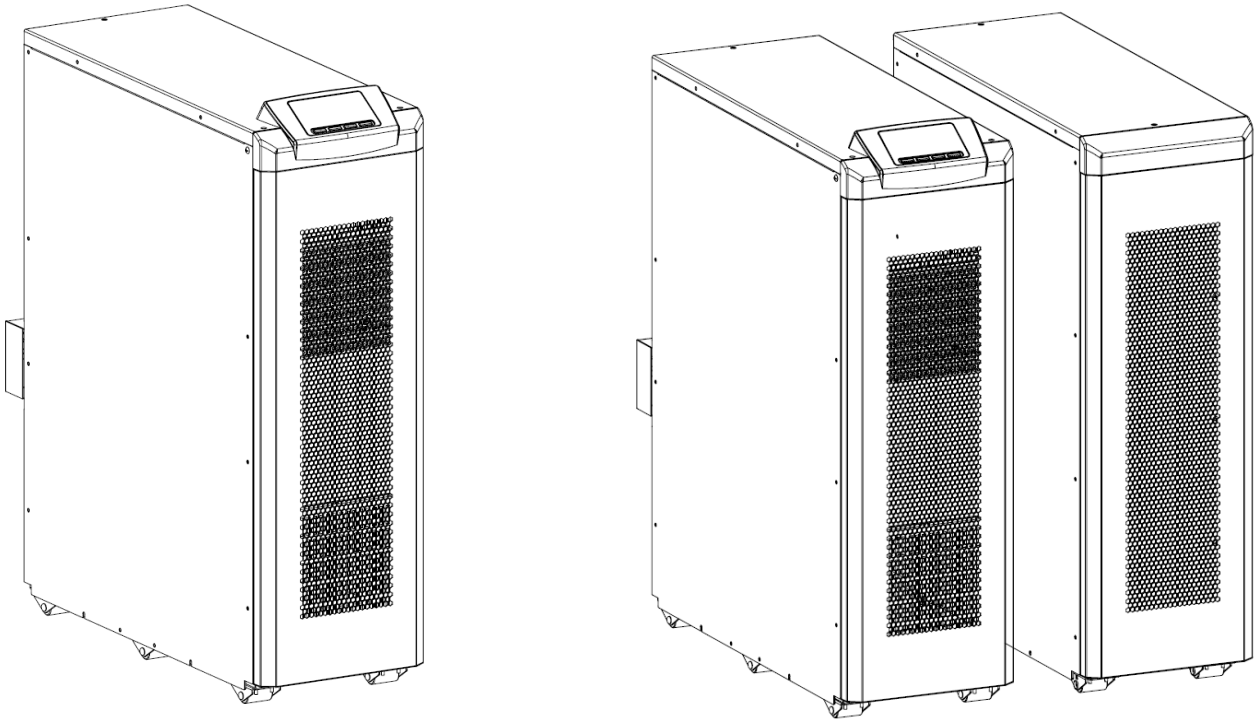
 Ensure that no liquid or other foreign objects can enter into the UPS system.

 Life Support Policy: As a general policy, we do not recommend the use of any of our products in life support applications where failure or malfunction of the product can be reasonably expected to cause failure of the life support device or to significantly affect its safety or effectiveness. We don’t recommend the use of any of our products in direct patient care. We will not knowingly sell our products for use in such applications unless it receives in writing assurances satisfactory to us that (a) the risks of injury or damage have been minimized, (b) the customer assumes all such risks, and (c) our liability is adequately protected under the circumstance.

PRESENTATION

GTT GUARD TOWER uses ON-LINE double conversion technology, the best solution for powering mission critical applications and electro-medical devices requiring maximum power reliability.
Flexibility of installation and use (digital display, user-replaceable battery set), as well as the many communication options available, makes the GTT TOWER suitable for many different applications from IT to security.

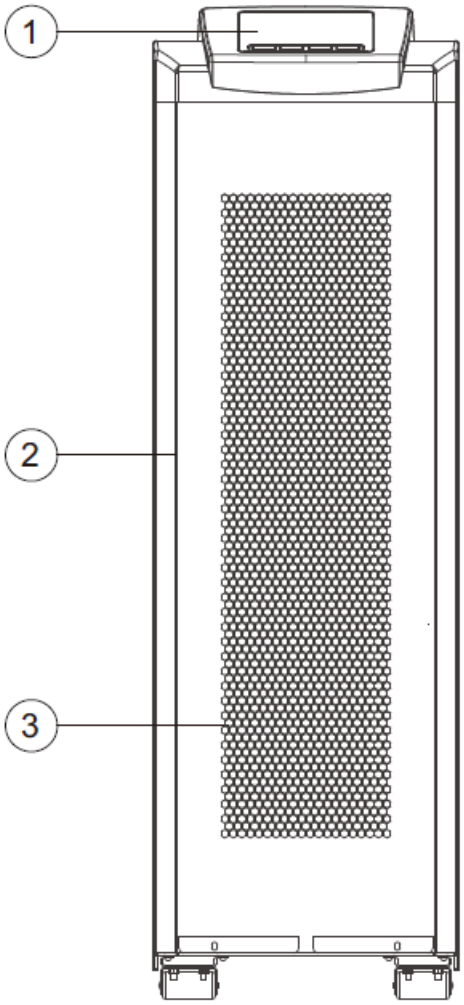
GTT GUARD TOWER in the 6000 VA and 10000 VA versions, was developed to be powered by a single-phase input.



UPS view and UPS with side-by-side BATTERY CABINET

UPS VIEWS

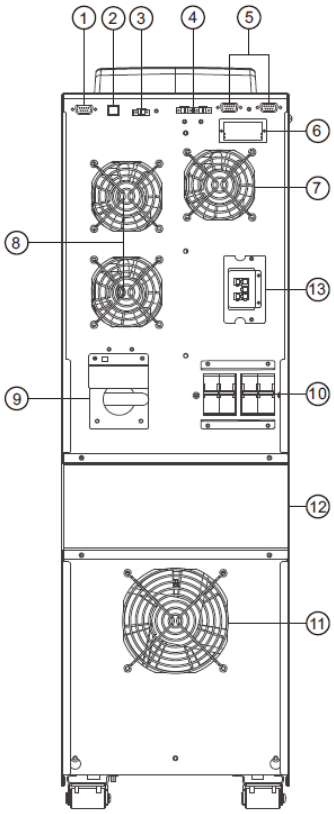
FRONT VIEW



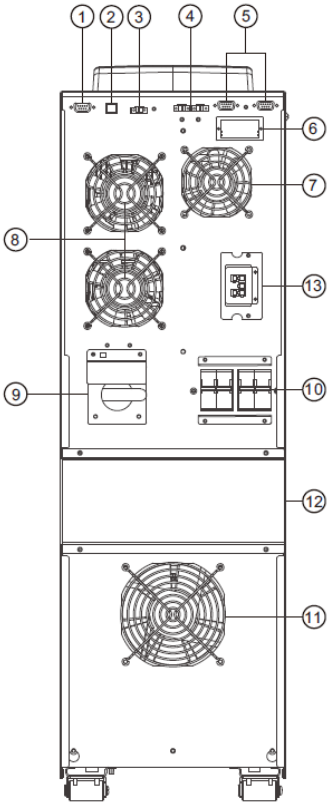
All models

1. Display panel
2. Removable front panel
3. Ventilation grill

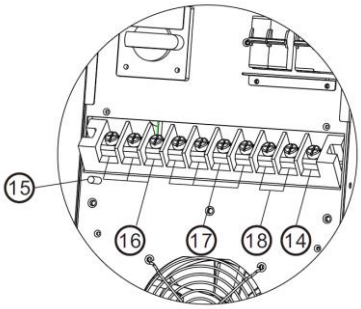
REAR VIEW



Models 6 kVA



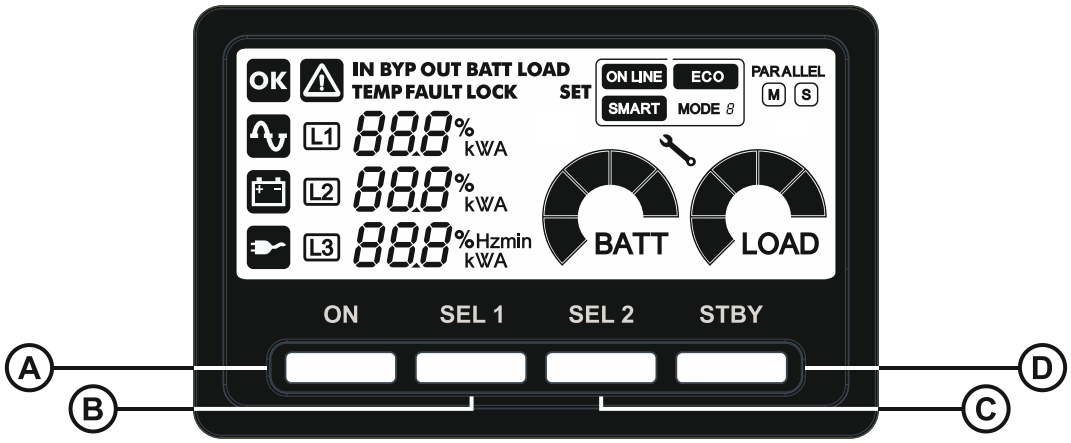
Models 10 kVA

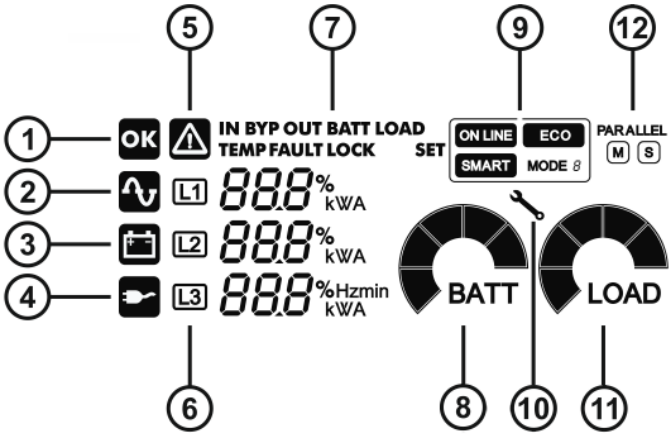


Input / Output Terminal

1	RS-232 communication port	10	Input circuit breaker
2	USB communication port	11	Isolation transformer fan
3	Emergency power off function connector (EPO connector)	12	Terminals cover panel (Refer to ***Input/Output Terminal*** diagram for details)
4	Share current ports	13	External battery connector
5	Parallel ports	14	Input ground
6	Option slot	15	Output ground
7	Charger fan	16	Isolation transformer selections
8	Power stage fan	17	Output terminals
9	Maintenance bypass switch	18	Input terminals

DISPLAY PANEL VIEW

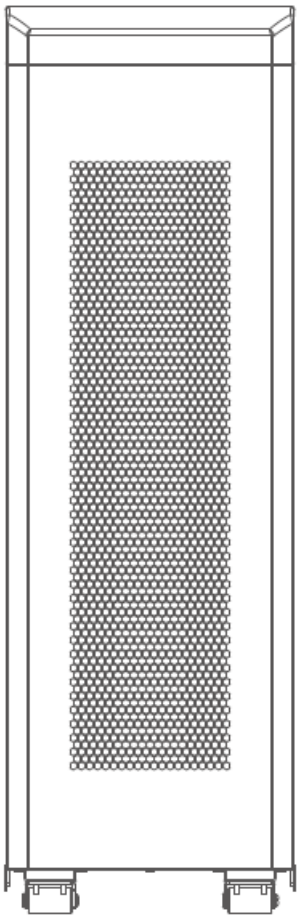




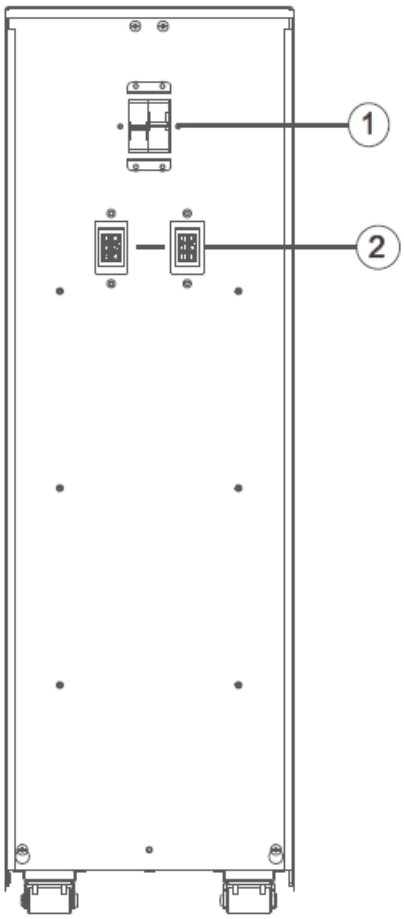
A	"ON" button	5	Stand-by / alarm
B	"SEL1" button	6	Input phase indicator
C	"SEL2" button	7	Measurement display area
D	"STAND-BY" button	8	Battery charge indicator
1	Regular operation	9	Configuration area
2	Mains operation	10	Maintenance request
3	Battery operation	11	Load level indicator
4	Load powered by bypass	12	Parallel mode indicator

BATTERY CABINET (OPTIONAL)

The BATTERY CABINET, with the same dimensions and aesthetic appearance of the UPS, is an optional accessory.
The BATTERY CABINET contains batteries which allow the operating time of the uninterruptible power supplies to be increased during extended blackouts. The number of batteries contained can vary according to the type of UPS for which the BATTERY CABINET is intended. It is therefore necessary to take great care to ensure that the battery voltage of the BATTERY CABINET is the same as the voltage permitted by the UPS.
Several BATTERY CABINETS can be connected in series to achieve a longer extended runtime.



Front view



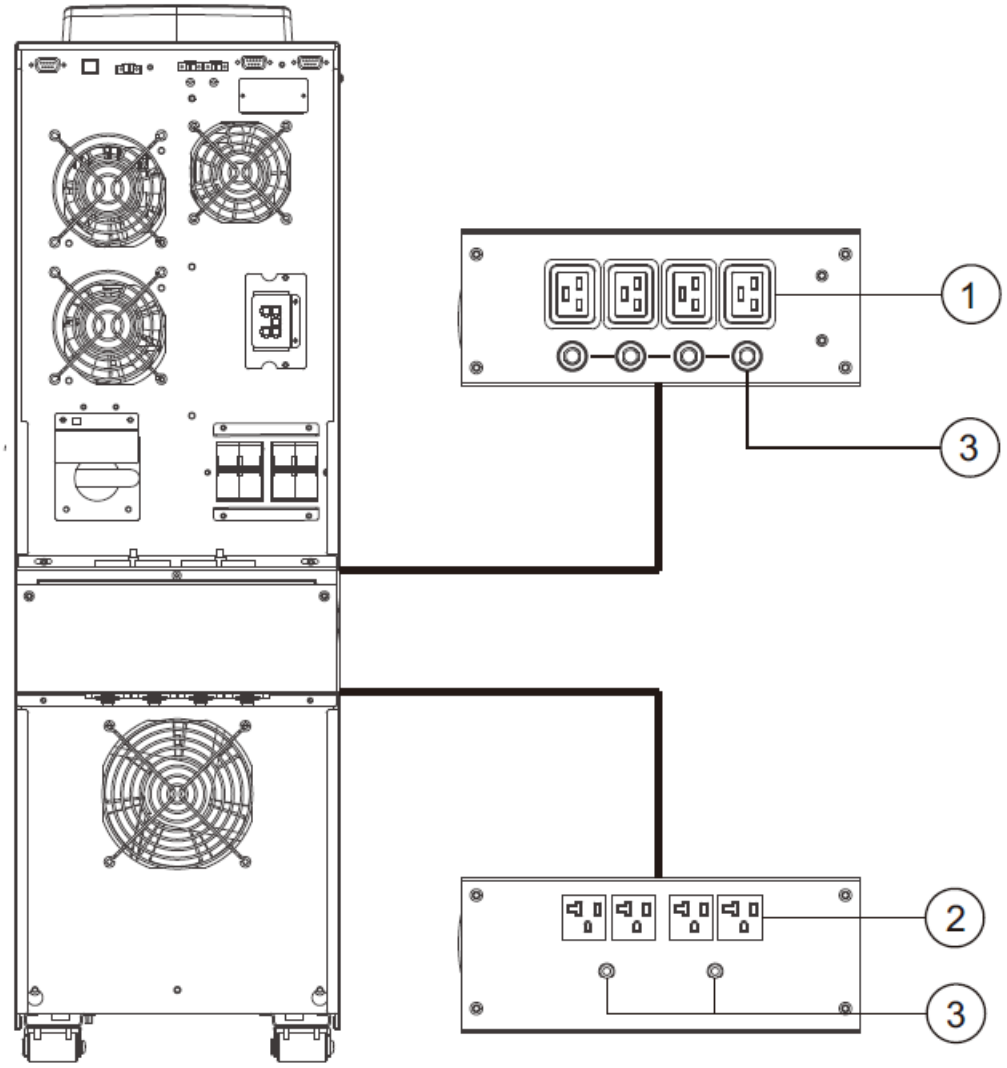
Rear view

① Internal battery fuse holder isolator

② Battery expansion connector

PDU (OPTIONAL)

The product is used as an external power distribution unit in conjunction with CGTT6K0GA0 / A3 or CGTT6K0GA0 / A5.



① C19 sockets

② NEMA sockets

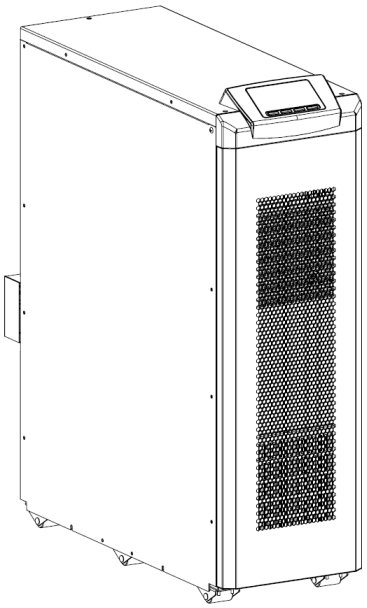
③ BREAKER

INSTALLATION

INITIAL CONTENT CHECK

After opening the packaging, it is first necessary to check the contents.
The UPS package must contain:

UPS

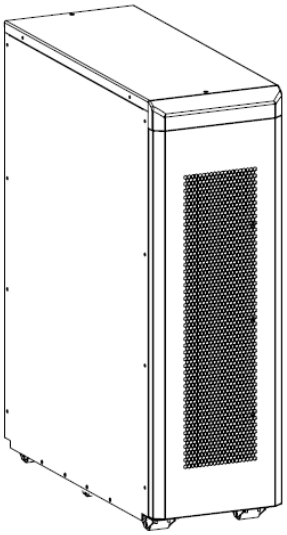


SNMP Card

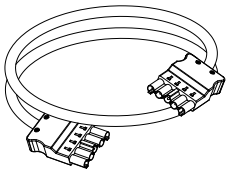
User manual

The Battery Cabinet (optional) package must contain:

BATTERY CABINET

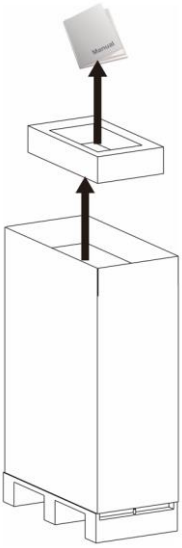


Connection cable UPS - Battery Cabinet

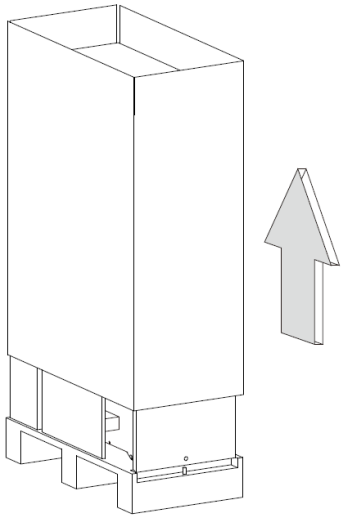


REMOVAL FROM THE PALLET

This chapter describes the operations to remove the product from the pallet and prepare it for installation.

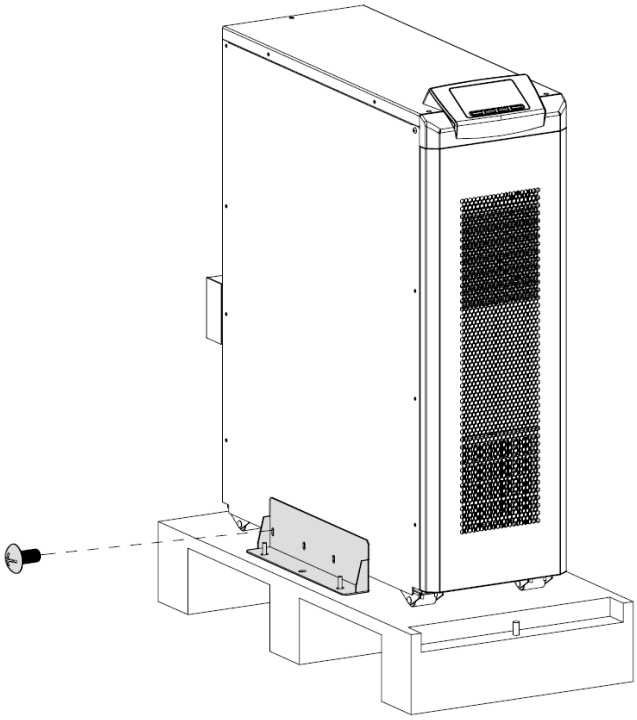


1. Cut the straps and open the cardboard box.
2. Remove the packaging and the accessory box located above the product.

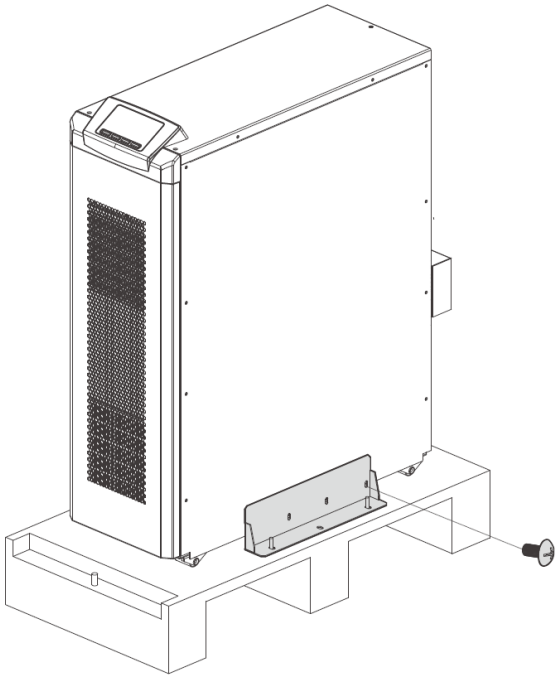


3. Remove the cardboard box by sliding it upwards and remove the side wood and PE-foam.
4. Remove the protective sack.

5. Remove the 2 fixing brackets from the pallet; each bracket is fixed to the pallet by 4 screws.

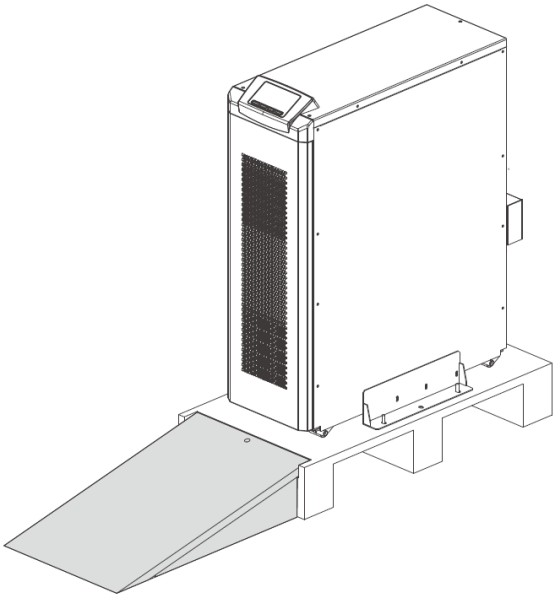


Left-side view

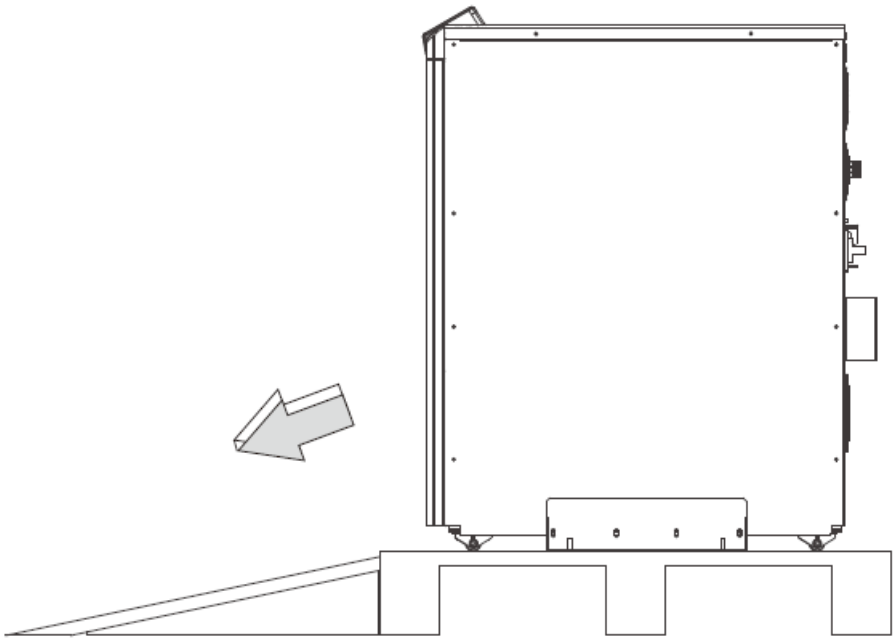


Right-side view

6. Place the ramp in front of the pallet.



7. Guide the product towards the front of the pallet in the direction of the ramp with caution.



(*) If it will be difficult to remove the brackets, unhook the front panel pulling it from the edges; the front panel is hooked with a system of pins and springs, tools are not needed.

INSTALLATION ENVIRONMENT

The UPS and the Battery Cabinet must be installed in ventilated, clean environments which are sheltered from bad weather. The ambient temperature and relative humidity must not exceed the maximum values shown in the "*TECHNICAL DATA*" table. Avoid installation in locations exposed to direct sunlight or hot air.
Select a location, which will provide good air circulation for the UPS at all times. Route power cords so they cannot be walked on or damaged. This UPS series is not intended for use in a computer room as defined in the Standard for the Protection of Electronic Computer/Data Processing Equipment ANSI/NFPA 75. Typical battery life is 3 to 5 years. Environmental factors do affect battery life. High temperatures, poor utility power, and frequent, short duration discharges have a negative impact on battery life

The recommended operating temperature for the product with the batteries is between 20 and 25°C.
Warning: an ambient temperature increase of 10 degrees will half the batteries expected life.

The UPS of category C2 if installed in a residential environment may cause radio interference, in which case the user may be required to take additional measures.

Operating Temperature (Maximum):	0 to 40°C (+32 to +104°F)
Operating Elevation:	0 to 1,000 m (0 to +3,280 ft)
Operating and Storage Relative Humidity:	5% to 95%, non-condensing
Storage Temperature:	-25 to +45°C (-13 to +113°F)
Storage Elevation:	0 to 15,000 m (0 to +50,000 ft)

PLACEMENT

When installing the equipment, the following points should be considered:

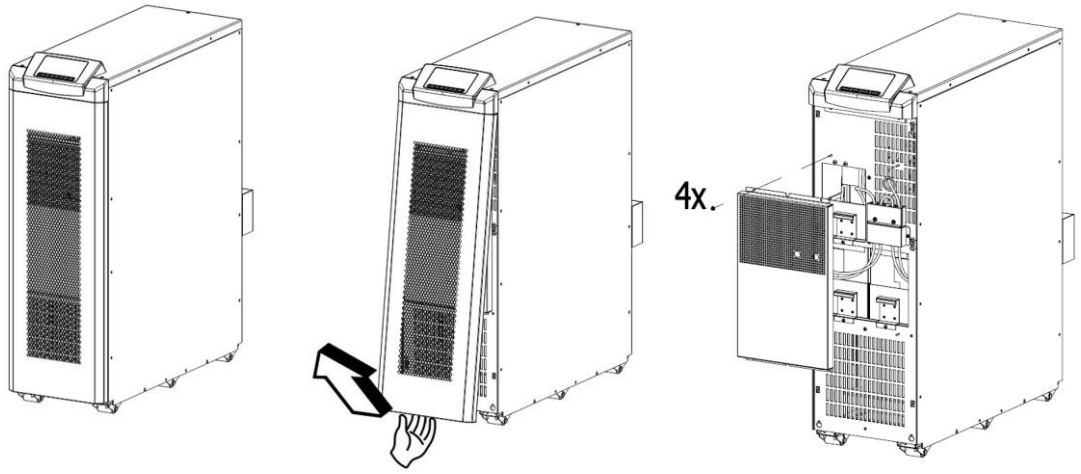
- the wheels are to be used exclusively for fine positioning, and thus for small distances only.
- the plastic parts and the front panel are not to be used for gripping or pushing the UPS.
- enough space should be left in front of the equipment for it to be turned on/off and maintenance operations to be performed on it 1,5 m (5 fts)
- the rear part of the UPS should be set at least 30 cm from the wall, to enable the air blown by the ventilation fans to flow away correctly and to allow access to the disconnector switches
- no objects should be left on its top surface
- check that the room containing the batteries is ventilated in compliance with EN 50272-2 paragraph 8.2

BATTERY INSTALLATION PROCEDURE

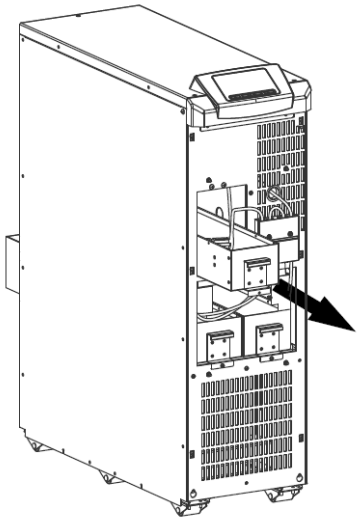
(QUALIFIED SERVICE PERSONNEL ONLY)

This UPS system does not have Hot-swappable batteries. The UPS system must be turned off to perform the Battery Installation Procedure.

1. Remove the retaining screws for the front door (FIG. 1).
2. Make sure the DC circuit breaker on the front panel of the UPS to the off position after removing cover.



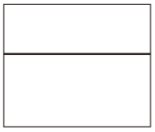
3. Remove the "B-L1 (6EA)" screw and pull out the battery strip (FIG. 2).



4. Before installation, please inspect the unit. Be sure that nothing inside the package is damaged. You should have received the following items inside of package (B-L1 (6EA)).

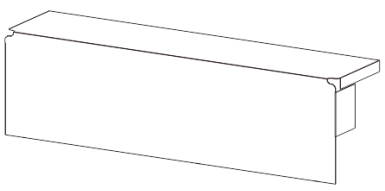
Cable (100mm) *5 PCS

Cable (B-L1(6EA)) *1 PCS



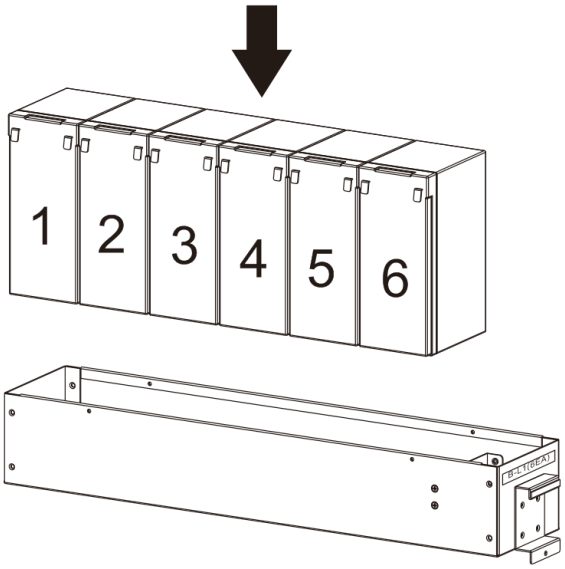
Stickers*3 PCS

Cable tie(100mm) *2 PCS

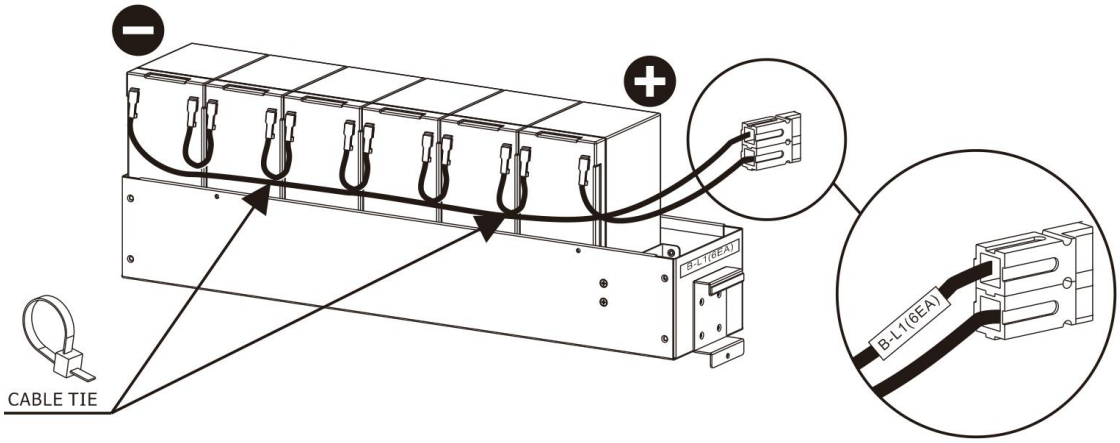


Insulating paper(390mmL) *1 PCS

5. Insert the battery according to the number (FIG. 3).

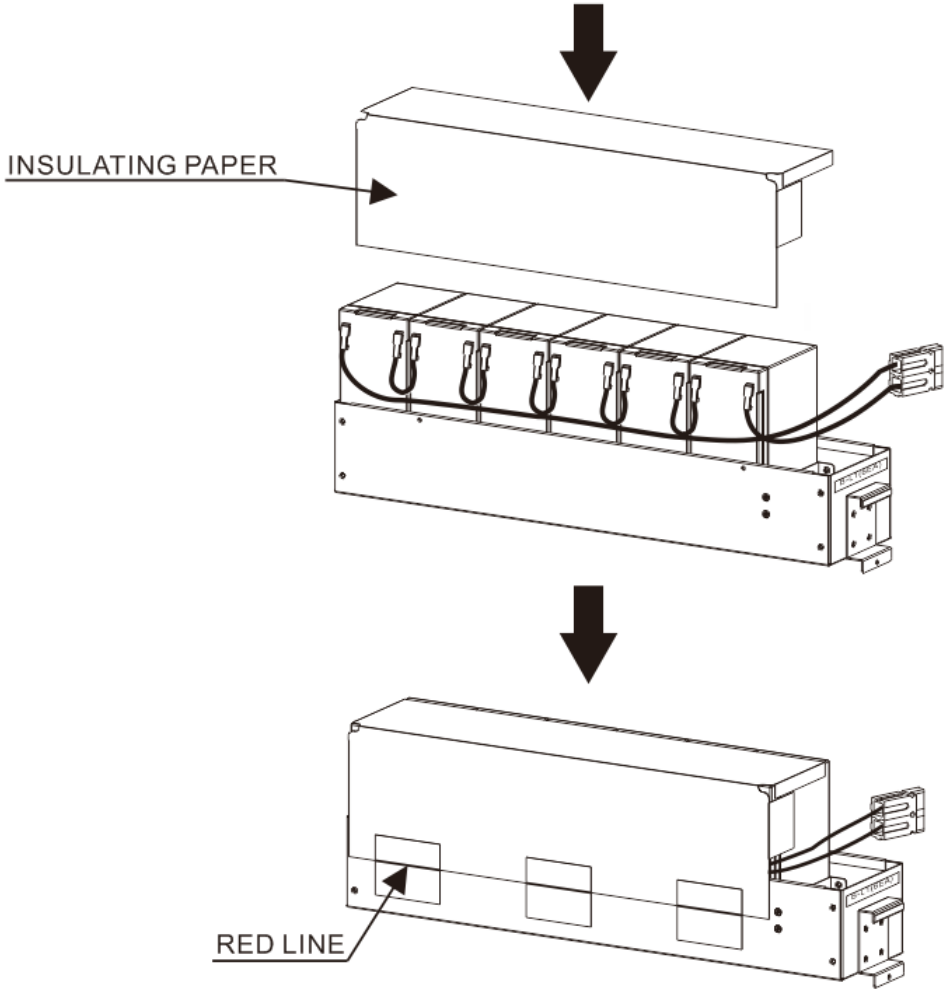


6. Install the battery cable according to the Drawing (FIG. 4).

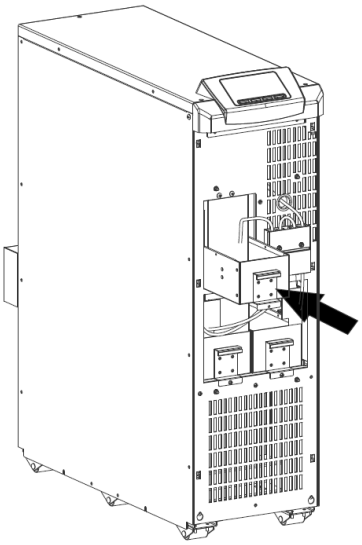


7. Remove the insulating paper backing and align the edges according to the Drawing (FIG. 5).

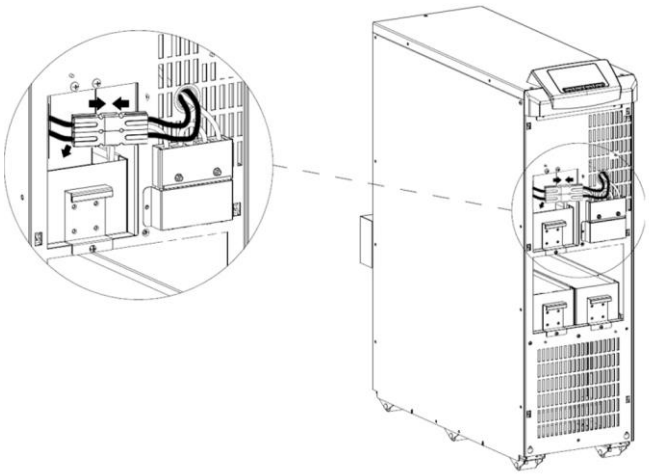
8. Three stickers red line aligned with the edge of the insulating paper according to the Drawing (FIG. 5).



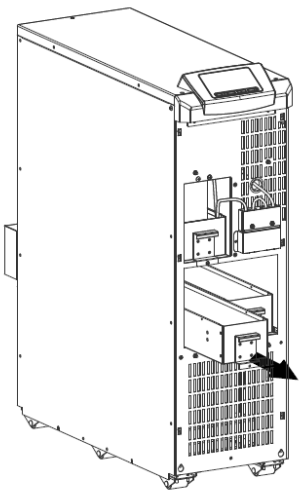
9. Insert the battery strip "B-L1 (6EA)" and then tighten the screws (FIG. 6).



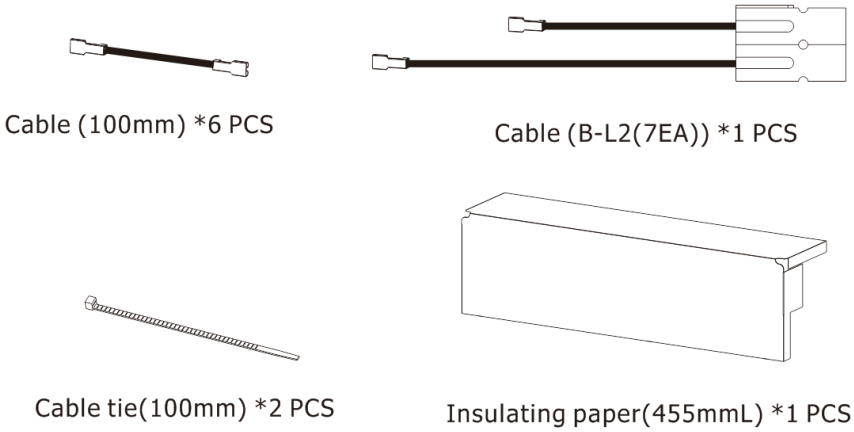
10. Plug in the upper battery terminal and place it in the “B-L1 (6EA)” battery strip (FIG. 7).



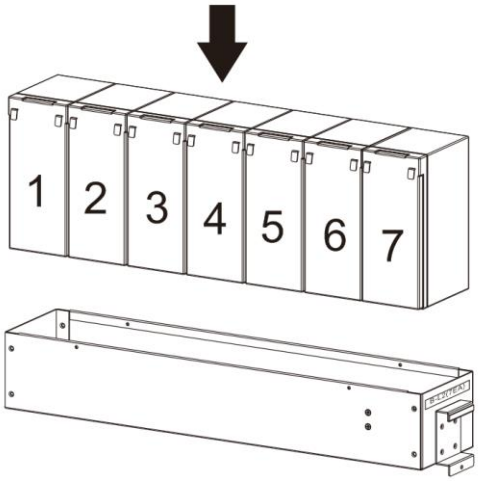
11. Remove the "B-L2 (7EA)" screw and pull out the battery strip (FIG. 8).



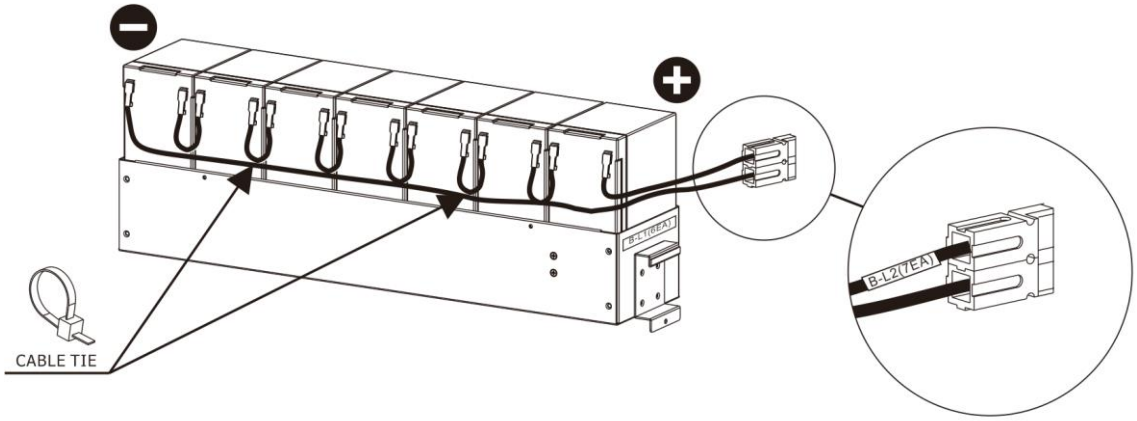
12. Before installation, please inspect the unit. Be sure that nothing inside the package is damaged. You should have received the following items inside of package (B-L2 (7EA)).



13. Insert the battery according to the number (FIG. 9).

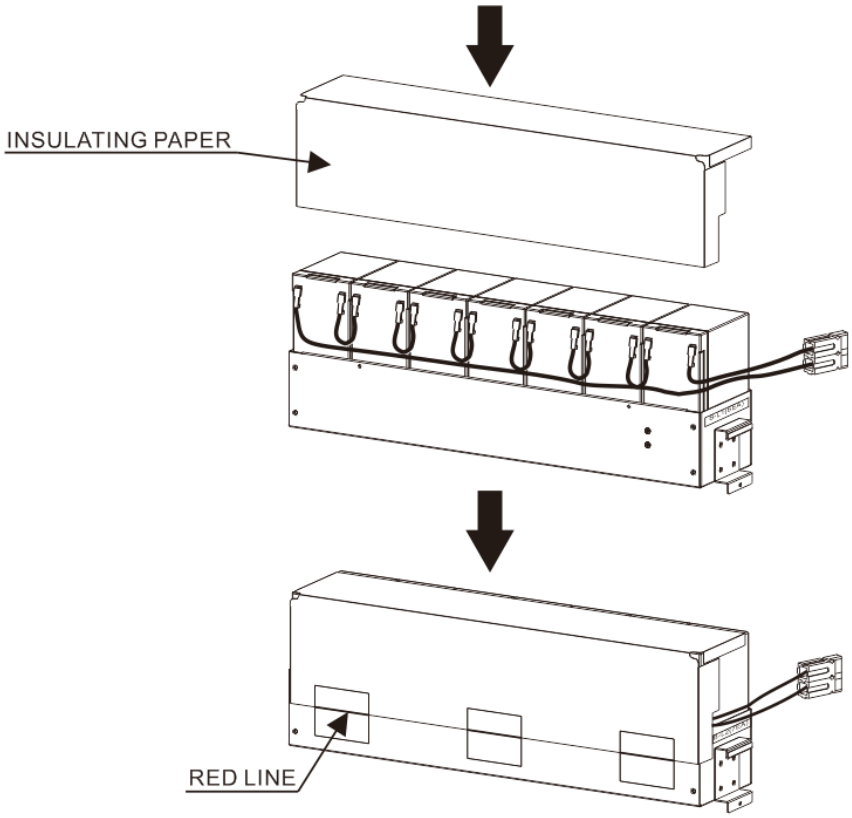


14. Install the battery cable according to the Drawing (FIG. 10).

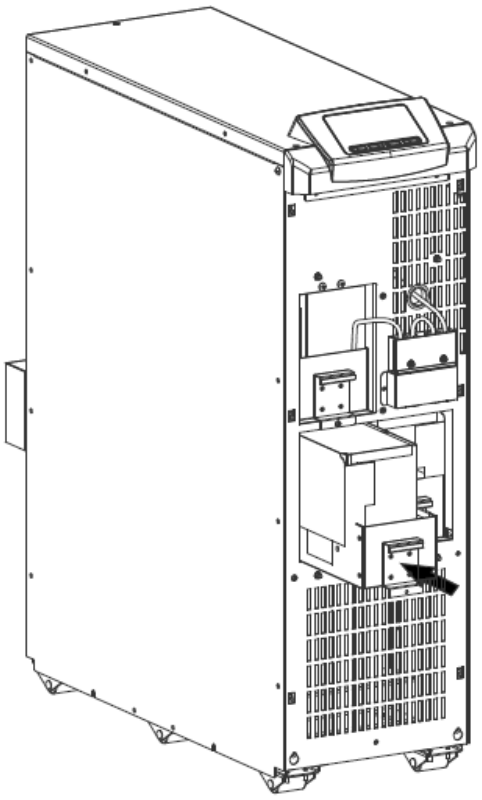


15. Remove the insulating paper backing and align the edges according to the Drawing.

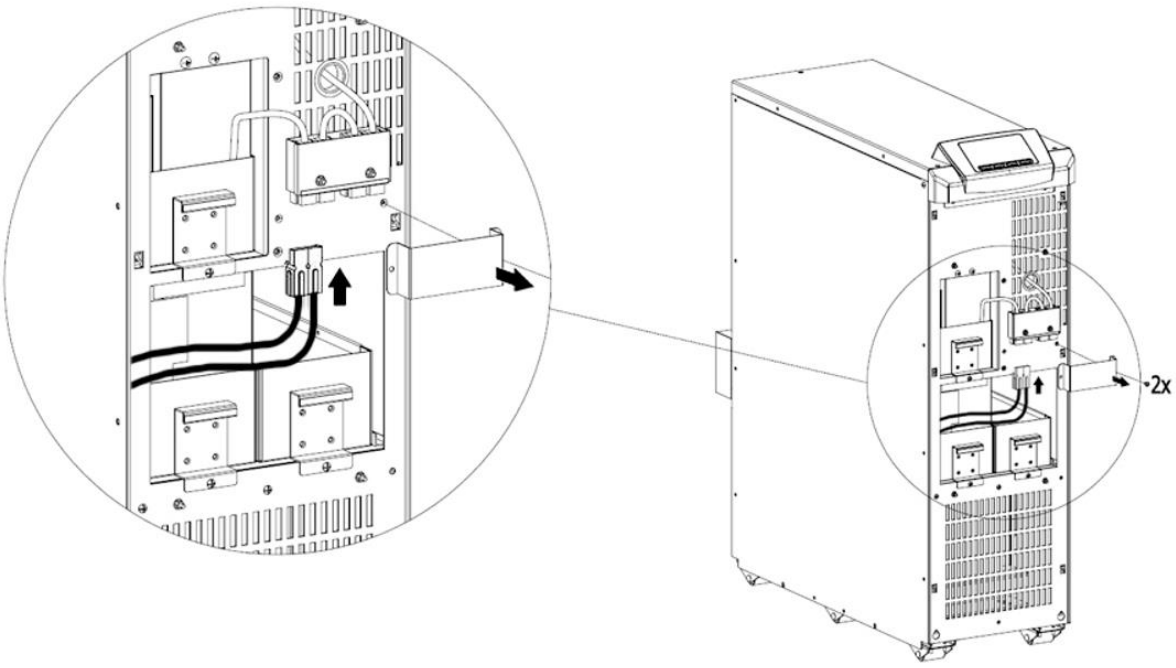
16. Three stickers red line aligned with the edge of the insulating paper according to the Drawing (FIG. 11).



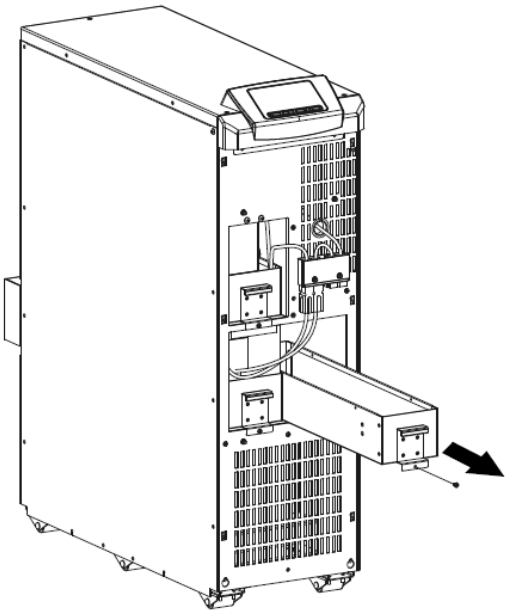
17. Insert the battery strip "B-L2 (7EA)" and then tighten the screws.



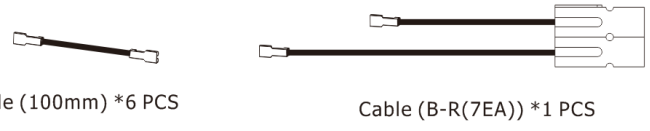
18. Remove the terminal fixture and plug in the left battery terminal.



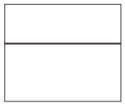
19. Remove the "B-R (7EA)" screw and pull out the battery strip.



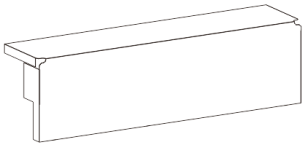
20. Before installation, please inspect the unit. Be sure that nothing inside the package is damaged. You should have received the following items inside of package (B-R (7EA)).


Cable (100mm) *6 PCS

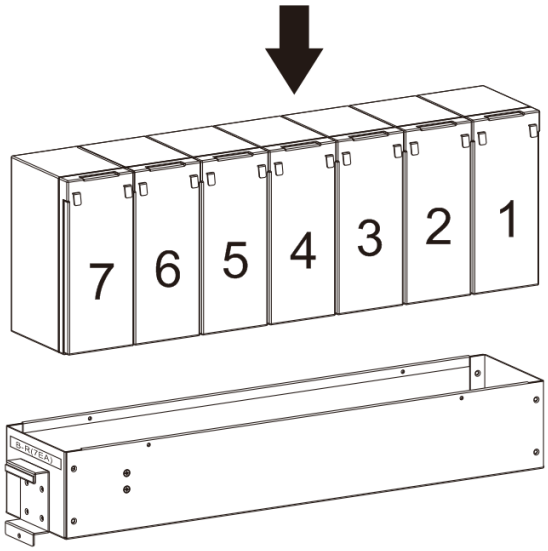
Cable (B-R(7EA)) *1 PCS


Stickers*3 PCS

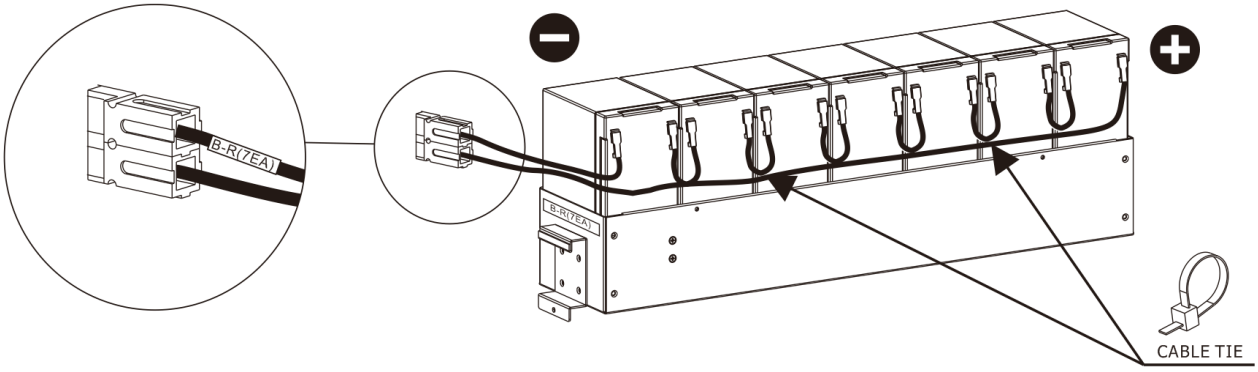

Cable tie(100mm) *2 PCS


Insulating paper(455mmR) *1 PCS

21. Insert the battery according to the number.

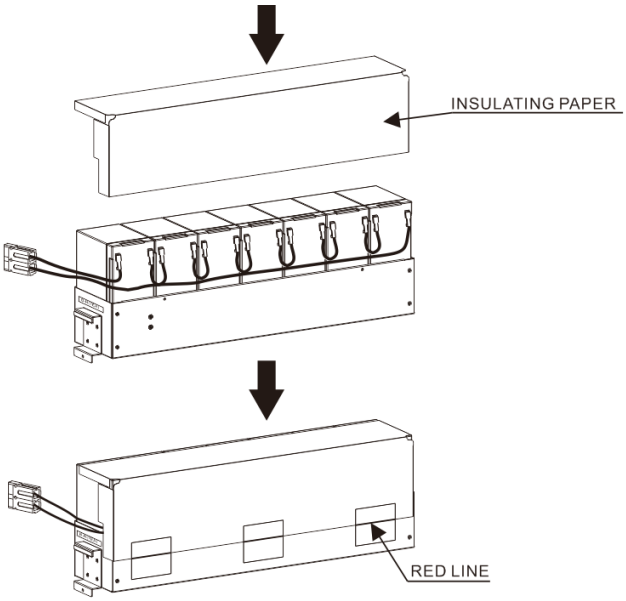


22. Install the battery cable according to the Drawing.

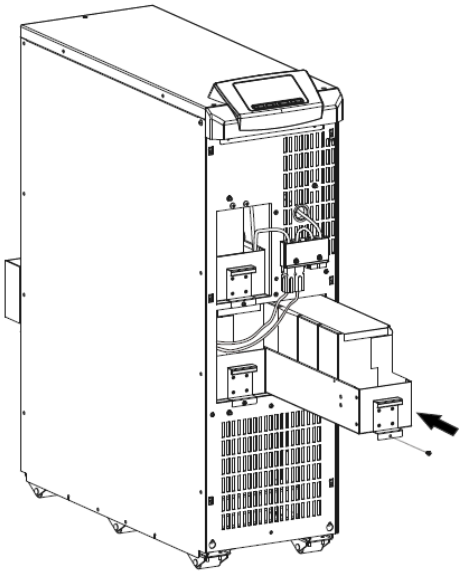


23. Remove the insulating paper backing and align the edges according to the Drawing (FIG. 17).

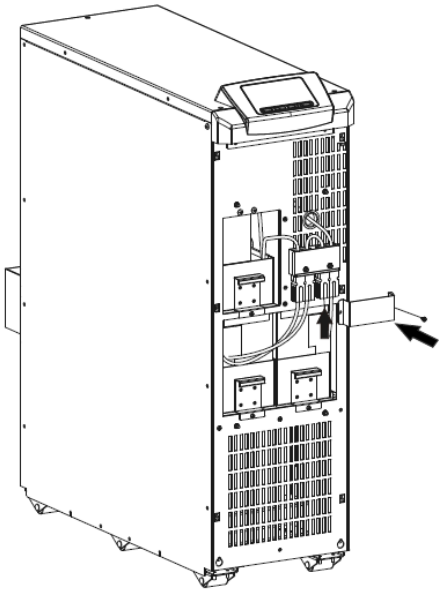
24. Three stickers red line aligned with the edge of the insulating paper according to the Drawing (FIG. 17)



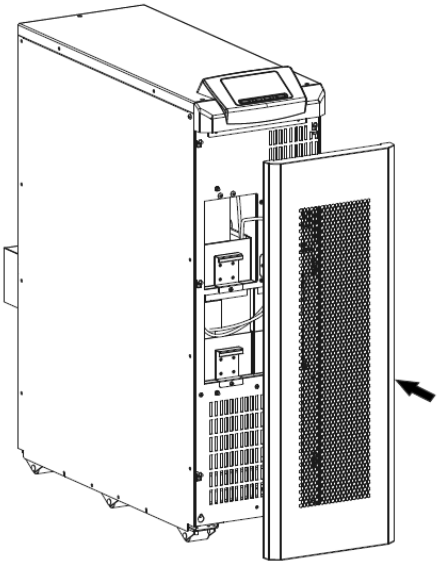
25. Insert the battery strip "B-L2 (7EA)" and then tighten the screws.



26. Plug in the right battery terminal and place the original seat terminal fixture.



27. Install the front door and lock the set screws.



POWER CONNECTION

INSTRUCTIONS FOR CONNECTION

Installation and wiring must be performed in accordance with the local electric codes/regulations by qualified service personnel.

1) Make sure the mains wire and breakers in the building are rated appropriately for the 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 to the UPS before installation.

3) Turn off all the connected devices before connecting to the UPS.

4) Use the following wire sizes for the UPS wiring:

	Cross section of cables (AWG) *			
Model	INPUT	OUTPUT	Non-isolated Neutral	Ground
6 kVA	6	6	6	6
10 kVA	4	4	4	4

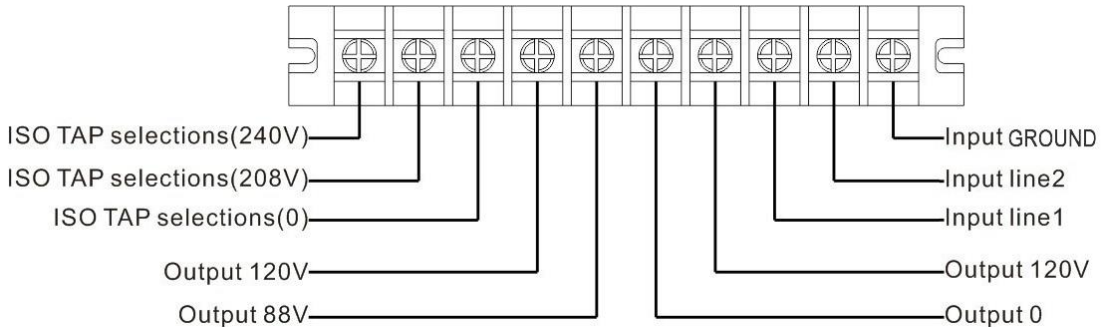
NOTE 1: *The cable for 6K should be able to withstand over 40A current. It is recommended to use 6 AWG or thicker wire for safety and efficiency.*

NOTE 2: *The cable for 10K should be able to withstand over 63A current. It is recommended to use 4 AWG or thicker wire for safety and efficiency.*

NOTE 3: *For single model, it's not necessary to connect the Non-isolated Neutral terminal.*

NOTE 4: *The selections for color of wires should be followed by the local electrical codes and regulations.*

5) Remove the terminal block cover on the rear panel of UPS. Then connect the wires according to the following terminal block diagrams: (Connect the earth wire first when making the rest of the wire connections. Disconnect the earth wire last when disconnecting the wires!)



Terminal block wiring diagram of 6K/10K

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

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

6) Put the terminal block cover back on the rear panel of the UPS

Warning:

- Make sure the Battery Pack DC breaker is in the OFF position before connecting the battery cable.
- Pay attention to the rated battery voltage marked on the rear panel. The connection with wrong battery voltage may cause permanent damage of the UPS. Make sure the voltage of the battery pack is correct.
- Pay 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 connections are correct and not reverse or short-circuited.

INTERNAL PROTECTIVE

Within the cabinet there are fuses (not accessible) in order to protect the rectifier input stage, the output stage of the inverter and the batteries. The table below shows the values of the internal protection fuses.

NOTE: the UPS internal bypass line is not protected by fuses. We recommend installing an external protection device as defined in the chapter *"EXTERNAL PROTECTION DEVICES"*.

	Internal protective devices		
Model	Input Breaker	Battery fuses	Battery Breaker
6 kVA	40A	40A	50A
10 kVA	63A	60A	50A

WARNING: the battery fuse holder on the back of the UPS, if present, only insulates the internal batteries. To insulate the UPS from the D.C. supply, disconnect all of the Battery Cabinets (if present).

SHORT CIRCUIT

If a fault occurs on the load, the UPS protects itself by limiting the value and the duration of the current supplied (short circuit current). The short circuit current value is related to the UPS operating status at the time of the fault, these can either be (in the "*TECHNICAL DATA*" table the protection characteristics and timings are described):

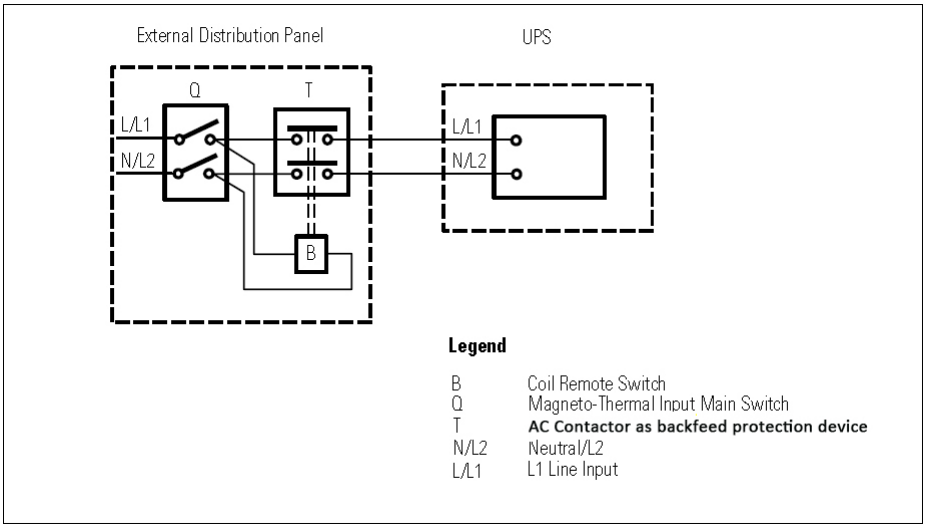
- UPS in NORMAL OPERATION with the Bypass Line available: the load is switched instantaneously to the bypass line; the input line is connected to the output without any internal protection.
- UPS in BATTERY OPERATION or in NORMAL OPERATION but with no Bypass Line available: the UPS protects itself by providing a higher current than the nominal one (see paragraph "*TECHNICAL DATA*") and turns itself off after this time has elapsed.

NOTE FOR SELECTIVITY: if the load is made up of more than one device, to avoid the opening of the protective devices upstream of the UPS due to a failure of a single piece of equipment, it is recommended to protect each output line with a suitably rated thermal or magnetothermal protection device. The maximum value for the protective device of each single line must be lower than the current threshold of the protection upstream of the UPS and lower than the current supplied by the UPS with the inverter on.

BACKFEED

The UPS has internal protection against back-feed by software detection.

In accordance with safety standard, installation must be provided with a Back-feed 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 back-feed protection inside of the UPS. Please isolate the UPS before working according to below diagram. The isolation device must be able to carry the UPS input current.



External back-feed protection wiring

There can be no derivation in the line that goes from the «Back-feed Protection» to the UPS.

- 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:

Before working on this circuit
- Isolate the Uninterruptible Power System (UPS)
- Then check for Hazardous Voltage between all terminals including the protective earth.

Risk of Voltage Back-feed

EXTERNAL PROTECTIVE DEVICES

LINE PROTECTION: MAGNETOTHERMAL OR FUSE

Within the UPS there are protection devices for output and internal faults.
You must protect the input line (and the separate bypass line if present) with the appropriate protection devices. These devices must comply with the regulations of the country where the UPS is installed.
In order to set up the power line, install a magnetothermal switch upstream from the UPS with intervention curve C or D (breaking capacity ≥6kA) or gR type fuse. Please follow the indications in the table below:

	Automatic external protective devices
Model	Mains input
	Single-phase input (1W+N)
6 kVA	40A
10 kVA	70A

SAFETY DEVICES: DIFFERENTIAL

The UPS can cause a D.C. current in the PE conductor.
An RCD located upstream is suggested: its trip current should be the sum of UPS + Load leakage current, with a suitable margin to prevent unwanted interventions.
Only a RCD Type B is allowed.

CONNECTION CABLES CROSS SECTION DETAILS

To determine the minimum cross section of the input and output cables, see the table below:

	Cross section of cables (AWG) *			
Model	INPUT	OUTPUT	Non-isolated Neutral	Ground
6 kVA	6	6	6	6
10 kVA	4	4	4	4

** The cable for GTT 6000 should be able to withstand over 40A current. It is recommended to use 6 AWG or thicker wire for safety and efficiency.*

The cable for GTT 10000 should be able to withstand over 63A current. It is recommended to use 4 AWG or thicker wire for safety and efficiency.

The selections for color of wires should be followed by the local electrical codes and regulations.

For single model, it's not necessary to connect the Non-isolated Neutral terminal.

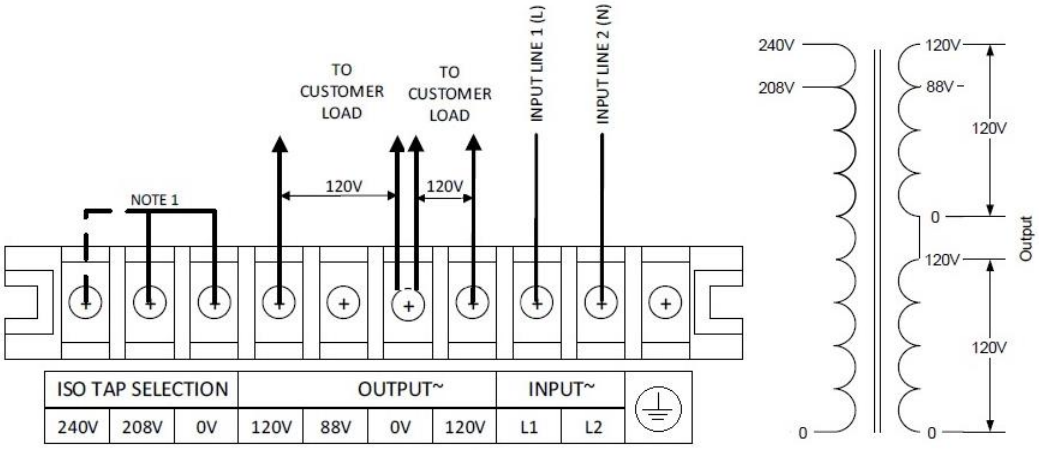
CONNECTIONS

The first wire to be connected is the protective earth wire, which is to be inserted in the terminal marked PE. During operation the UPS must be connected to the earthing system

Connect the cables to the terminals following the information provided on the label placed upon the UPS. In the images below there are some notes in relation to the installation:

There are 2 sets of 120 V outputs. Each set can carry half of the total UPS capacity.
The 2 sets connected in parallel can carry the total UPS capacity.

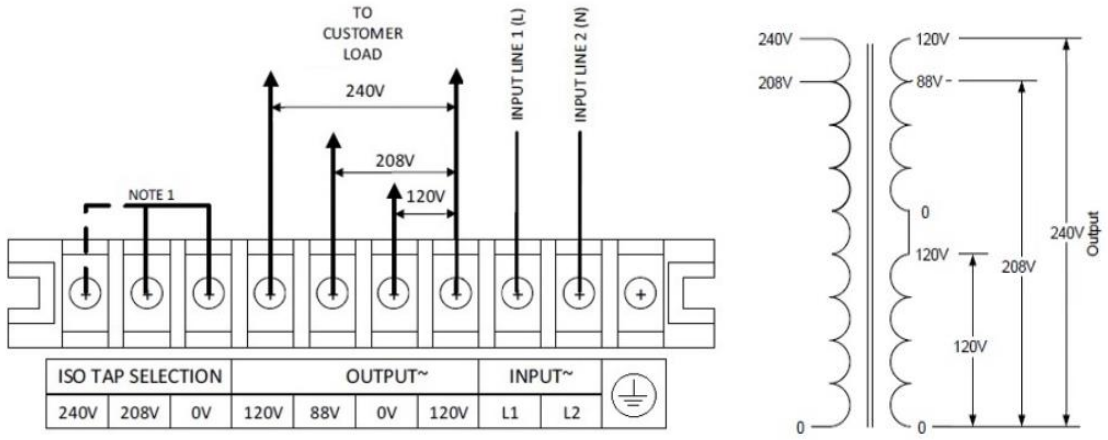
Models 6-10 kVA(120V Outputs)



NOTE

- ISO Tap Selection needs to be set to match the input voltage. Install a jumper between 0-208V or 0-240V.
- Make sure that the wires are connected to the terminals.
- Install the output breaker between the output terminal and the load. The breaker should be qualified with leakage current protection if necessary.

Models 6-10 kVA (240V - 208V and 120V Output)



NOTE

- ISO Tap Selection needs to be set to match the input voltage. Install a jumper between 0-208V or 0-240V.
- Make sure that the wires are connected to the terminals.
- Install the output breaker between the output terminal and the load. The breaker should be qualified with leakage current protection if necessary.

WARNING! Pay attention to connect the input neutral (N_{IN}) and output neutral (N_{OUT}); incorrect connection could cause a failure of the load when the Maintenance Bypass switch is closed.

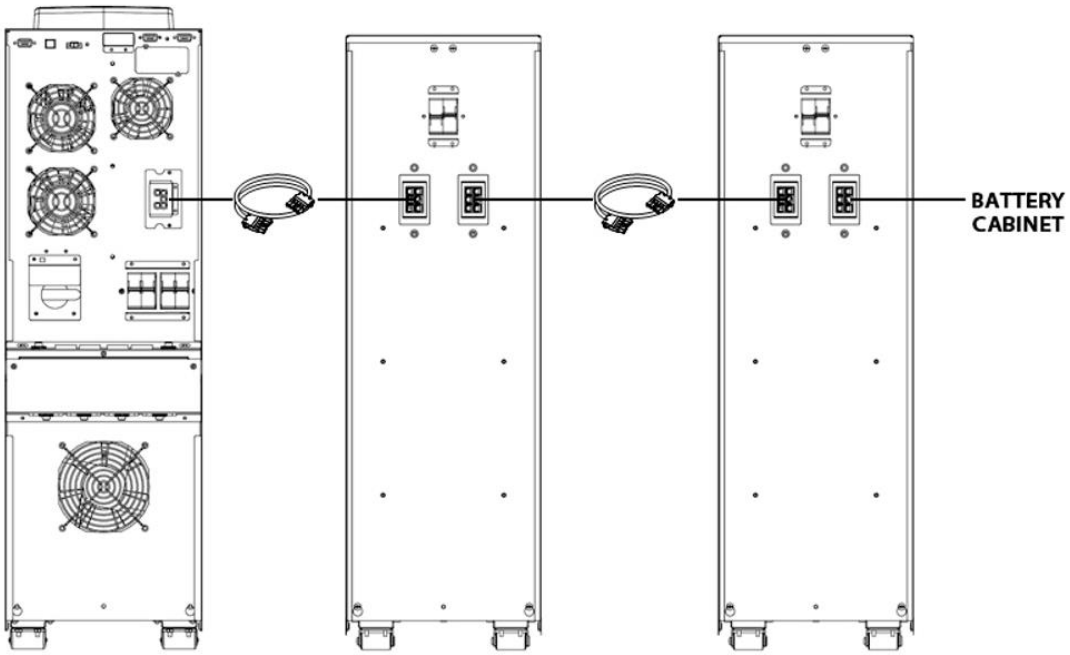
OTHER INSTALLATION MODES

For more information regarding the parallel installation of the UPS, isolation transformers, accessories for maintenance Bypass and others, consult the website **www.rielloupsamerica.com**.

BATTERY CABINET INSTALLATION

ATTENTION:
REFER TO THE UPS SPECIFICATION LABEL TO CONFIRM THAT THE VOLTAGE FROM THE BATTERY CABINET IS THE SAME AS THAT ALLOWED BY THE UPS.
CONFIRM THAT THE BATTERY CABINET IS EQUIPPED WITH A 50A gR FUSE TO PROTECT THE BATTERY EXPANSION PORT OF THE UPS.
THE CONNECTION BETWEEN THE UPS AND THE BATTERY CABINET MUST BE MADE WITH THE BATTERY CABINET FUSE HOLDER ISOLATOR OPEN.
CONNECT THE CABLE BETWEEN THE UPS AND THE BATTERY CABINET. CLOSE THE FUSE HOLDER ISOLATORS ONLY IF THE UPS IS POWERRED ON OR IN STAND-BY CONDITION.

Battery Cabinets can be installed in series for extended runtimes. Connect the Battery Cabinets in series as shown in the figure below:



UPS – BATTERY CABINET CONNECTION

ATTENTION:
The UPS is not equipped with devices for the disconnection of the external batteries. Verify that the Battery Cabinets are fitted with a suitable fuse and/or fuse disconnector.

To prevent damage occurring to the batteries, the fuse holders must only be closed if the battery voltages between the UPS and the Battery Cabinet are similar. Otherwise, recharge each battery unit following the procedure below:

UPS battery recharge:

With the fuse holders of the connected Battery Cabinet open (or its fuse disconnector), only close the UPS fuse holder. In these conditions, power the UPS and wait for the battery to recharge.

External Battery Cabinet recharge:

Open the fuse holder of the UPS and close the fuse holders of the external Battery Cabinet (or its fuse disconnector). In these conditions, power the UPS and wait for the battery to recharge.

CONFIGURING THE RATED BATTERY CAPACITY

Before installing one or more Battery Cabinets, the UPS must be configured in order to update the rated capacity value (total Ah UPS's internal batteries + external batteries) using the dedicated configuration software.
The Battery Cabinet must only be installed while the UPS is switched off and disconnected from the mains power supply.

CAUTION:
The connection cables cannot be extended by the user.
The maximum length of the connecting cables between the UPS (without internal batteries) and the Battery Cabinet is 3 meters.
After connecting the UPS to its Battery Cabinets, insert the fuses and close the Battery Cabinet battery fuse holders (SWBATT).
It is recommended that you do not connect more than 5 Battery Cabinets in cascade to a single UPS. To increase capacity, we recommend installing a Battery Cabinet with higher battery capacity.

WARNING! This UPS contains potentially hazardous voltages. Do not attempt to disassemble the UPS beyond the battery Installation procedure. This UPS contains no user serviceable parts. Repairs and battery Installation must be performed by **QUALIFIED SERVICE PERSONNEL ONLY.**

CAUTION: Do not open or mutilate batteries. Released electrolyte is harmful to the skin and eyes and may be toxic.

CAUTION: Do not dispose of batteries in a fire. The batteries may explode. The batteries in this UPS are recyclable. Dispose of the batteries properly. The batteries contain lead and pose a hazard to the environment and human health if not disposed of properly. Refer to local codes for proper disposal requirements or return the battery to the supplier.

CAUTION: The battery system can present a risk of electrical shock. These batteries produce sufficient current to burn wire or tools very rapidly, producing molten metal. Observe these precautions when Installation the batteries:

1. Remove watches, rings, or other metal objects.
2. Use hand tools with insulated handles.
3. Wear protective eye gear (goggles), rubber gloves and boots.
4. Do not lay tools or other metal parts on top of batteries.
5. Disconnect the charging source prior to connecting or disconnecting the battery terminals.
6. Determine if the battery is inadvertently grounded. If the battery is, remove the source of the grounding. Contact with any part of a grounded battery can result in an electrical shock. The likelihood of such shock will be reduced if such grounds are removed during installation and maintenance.

USE

SWITCHING ON FOR THE FIRST TIME

1) Power on the UPS.
2) Turn on the mains input breaker and battery breaker in the back of the UPS.
3) After a few moments, the UPS will power on, the display will light up, there will be a beep and the ⚠ icon will start to flash when bypass is disabled. The UPS is in stand-by mode: meaning that it is only consuming a small amount of power. The microcontroller supervising the self-diagnoses is powered; the batteries are charging; and everything is ready for UPS activation.
4) Connect the equipment to the output of the UPS using cables no longer than 32 fts / 10 m.
5) Check which operating mode is set on the display and, if necessary, see the "*CONFIGURING PAGE*" paragraph to set the required mode.

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 buzzer beeps once.
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) Hold down the "ON" button for at least 5 seconds. All the icons on the display light up for 1 second and the buzzer beeps once.
2) Switch on the equipment connected to the UPS.

SWITCHING OFF THE UPS

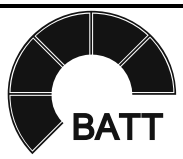
In order to switch off the UPS, hold down the "STBY" button for at least 2 seconds. The UPS goes back to stand-by mode and the ⚠ icon starts to flash:

1) If the mains power is present, turn off the mains breaker to complete shutdown.
2) During battery mode operation, hold down the "STBY" key for at least 5 seconds to turn off the UPS. For complete shutdown, turn off the battery breaker.

DISPLAY PANEL MESSAGES

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

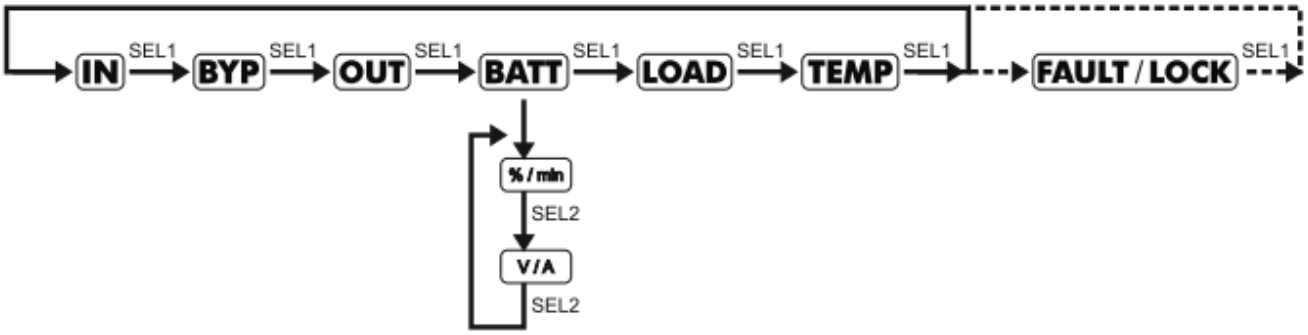
UPS STATUS MESSAGES

ICON	STATUS	DESCRIPTION
	Fixed	Indicates a Fault or a Lock happen
	Flashing	The UPS is in stand-by mode
	Fixed	Indicates regular operation when the UPS is on.
	Fixed	The UPS is ON and operating from the mains
	Flashing	The UPS is operating from the mains, but the output voltage is not synchronized with the mains voltage
	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 emits a beep at regular 1-second intervals. UPS is in start-up process before into battery mode.
	Fixed	Indicates that the loads connected to the UPS are powered by the bypass
	Dynamic	Indicates the estimated percentage charge of the batteries
	Flashing	Indicates battery low or open condition.
	Dynamic	Indicates the percentage of load applied to the UPS compared with the nominal value.
	Flashing	Indicates output overload condition.
	Flashing	Maintenance is required. Contact the support center.
	Fixed	UPS is in “ON LINE” mode.
	Flashing	During entering “ON LINE” mode.
	Fixed	UPS is in “ECO” mode.

MEASUREMENT DISPLAY AREA

The front panel can be used to display important UPS operating information.
When the UPS is switched-on, the display shows the main voltage value.
To display a different measurement, press the “SEL1” button repeatedly until the desired measurement appears.
Some measurements have more pages, press the “SEL2” to display them.

The functional diagram of the button “SEL1” and “SEL2” is shown below:



NOTE:

- The views of FAULT / LOCK are not displayed in absence of anomalies, alarm or lock.
- 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.

MEASUREMENT	DESCRPTION
IN	Display input mains data, such as voltage and frequency.
BYP	Display bypass line data, such as voltage, current and frequency.
OUT	Display the UPS output data, such as voltage, current and frequency.
BATT	Display batteries data, such as recharge percentage, autonomy estimation, voltage and current. Display the recharging current with the mains present, otherwise the discharging current if the UPS is on battery.
LOAD	Display the UPS load data, such as load percentage, apparent power (kVA) and active power (kW).
TEMP	Display the temperature of: system environment temperature (inside the UPS), power module inverter temperature.
FAULT (1)	Display the code of the anomaly or alarm active
LOCK (1)	Display the code of the lock active

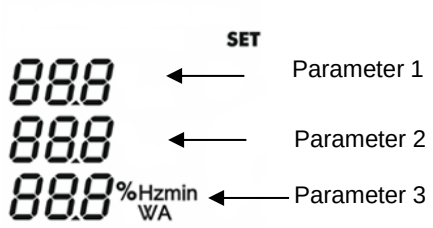
(1) The FAULT / LOCK codes can only be displayed if they are active (presence of a fault/alarm or a lock).

CONFIGURATION PAGE

Access to the setting page:

- To access the configuration area, hold down the “SEL1” button for at least 3 seconds, the buzzer beep once, then release the “SEL1” button, it goes to the setting page.
- To change the parameters, press the “SEL1” or “SEL2” button for selecting up or down to different parameters.
- To set up the settings, press the “ON” button. If you would like to back to the setting page first level, you can press the “STB” button.
- To leave the configuration area, hold down the “SEL1” button for at least 3 seconds, the buzzer beep once, then release the “SEL1” button, it’s back to the main page.

There are three parameters to set up the UPS. Refer to following diagram:



Parameter 1: It’s for program alternatives. Refer to below table.

Parameter 2 is the symbol for each program.

Parameter 3 is the setting values for each program.

15 programs available list for parameter 1:

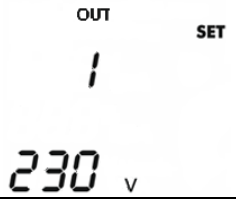
Code	Description	Bypass/No output	AC	ECO	CVCF	Battery	Battery Test
1	Output voltage	Y					
2	Output frequency	Y					
3	Voltage range for bypass	Y					
4	Frequency range for bypass	Y					
5	ECO mode enable/disable	Y					
6	Voltage range for ECO mode	Y					
7	ECO mode frequency range setting	Y					
8	Bypass mode setting	Y	Y				
9	Battery backup time setting	Y	Y	Y	Y	Y	Y
10	Reserved	Reserved for future					
11	Reserved	Reserved for future					
12	Hot standby function enable/disable	Y	Y	Y	Y	Y	Y
13	Battery voltage adjustment	Y	Y	Y	Y	Y	Y
14	Charger voltage adjustment	Y	Y	Y	Y	Y	Y
15	Inverter voltage adjustment		Y		Y	Y	
16	Output voltage calibration		Y		Y	Y	
17	Charging current setting	Y	Y	Y	Y	Y	Y

*Y means that this program can be set in this mode.

Note: All parameter settings will be saved only when UPS shuts down normally with internal or external battery connection.

(Normal UPS shutdown means turning off input breaker in bypass/no output mode).

1. Output voltage

Interface	Setting
	**Parameter 3: Output voltage** You may choose the following output voltage in parameter 3: **208:** Presents output voltage is 208Vac **220:** Presents output voltage is 220Vac **230:** Presents output voltage is 230Vac **240:** Presents output voltage is 240Vac

2. Output frequency

Interface	Setting
60 Hz, CVCF mode  **50 Hz, Normal mode**  **AU** 	**Parameter 2 & 3: Output Frequency** Setting the output frequency. You may choose following three options in parameter 2&3: **50CF:** Setting UPS to CVCF mode and output frequency will be fixed at 50Hz. The input frequency could be from 46Hz to 64Hz. **60CF:** Setting UPS to CVCF mode and output frequency will be fixed at 60Hz. The input frequency could be from 46Hz to 64Hz. **50NC:** Setting UPS to normal mode (not CVCF mode). If selected, the output frequency will synchronize with the input frequency within 46~54 Hz. UPS will transfer to battery mode when input frequency is not within 46~54 Hz. **60NC:** Setting UPS to normal mode (not CVCF mode). If selected, the output frequency will synchronize with the input frequency within 56~64 Hz. UPS will transfer to battery mode when input frequency is not within 56~64 Hz. **AU:** If selected, output frequency will be decided according to the latest normal utility frequency. If it is from 46Hz to 54Hz, the output frequency will be 50.0Hz. If it is from 56Hz to 64Hz, the output frequency will be 60.0Hz. The last two digits will show the current frequency. At is default setting.

Note: If the ups is set to CVCF mode, the bypass function will be disable automatically.

3. Output frequency

Interface	Setting
  	**Parameter 2 & 3:** Setting acceptable voltage range for bypass mode. You have to set up the range by setting high and low points. When it shows “HLS” in parameter 2, please press “ON” key and it will show “HS” in parameter 2. Now, you can set up low point in parameter 3 by pressing “SEL 1” or “SEL 2” key. **LS:** Set the acceptable low voltage for bypass. Setting range is from 110V to 209V and the default value is 110V. Pressing “ON” key to confirm the setting value for low point. Then, it will show HS in parameter 2. Please set up high point in parameter 3 by pressing “SEL 1” or “SEL 2” key. **HS:** Set the acceptable high voltage for bypass. Setting range is from 231V to 276V and the default value is 264V.

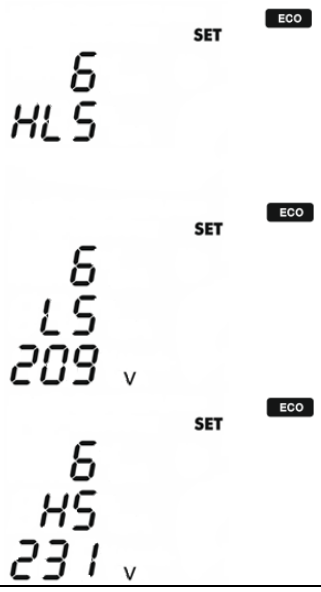
4. Frequency range for bypass

Interface	Setting
	**Parameter 2 & 3:** Setting acceptable frequency range for bypass mode. You have to set up the range by setting high and low points. When it shows “HLS” in parameter 2, please press “ON” key and it will show “HS” in parameter 2. Now, you can set up low point in parameter 3 by pressing “SEL 1” or “SEL 2” key. **LS:** Set the acceptable low frequency for bypass. 50 Hz system: Setting range is from 46.0Hz to 49.0Hz. 60 Hz system: Setting range is from 56.0Hz to 59.0Hz. The default value is 46.0Hz/56.0Hz. Pressing “ON” key to confirm the setting value for low point. Then, it will show HS in parameter 2. Please set up high point in parameter 3 by pressing “SEL 1” or “SEL 2” key. **HS:** Set the acceptable high frequency for bypass. 50 Hz: Setting range is from 51.0Hz to 54.0 Hz. 60 Hz: Setting range is from 61.0Hz to 64.0Hz. The default value is 54.0Hz/64.0Hz.

5. ECO mode enable/disable

Interface	Setting
	**Parameter 2:** Enable or disable ECO function. You may choose following two options: **DIS:** disable ECO function **ENA:** enable ECO function If ECO function is disabled, voltage range and frequency range for ECO mode still can be set, but it is meaningless unless the ECO function is enabled.

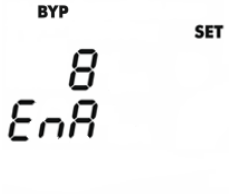
6. Voltage range for ECO mode

Interface	Setting
	**Parameter 2 & 3:** Setting acceptable voltage range for ECO mode. You must set up the range by setting high and low points. When it shows “HLS” in parameter 2, please press “ON” key and it will show “HS” in parameter 2. Now, you can set up low point in parameter 3 by pressing “SEL 1” or “SEL 2” key. **LS:** Low voltage point in ECO mode. The setting range is from 5% to 10% of the nominal voltage. Pressing “ON” key to confirm the setting value for low point. Then, it will show HS in parameter 2. Please set up high point in parameter 3 by pressing “SEL 1” or “SEL 2” key. **HS:** High voltage point in ECO mode. The setting range is from 5% to 10% of the nominal voltage.

7. Frequency range for ECO mode

Interface	Setting
	**Parameter 2 & 3:** Setting acceptable frequency range for ECO mode. You must set up the range by setting high and low points. When it shows “HLS” in parameter 2, please press “ON” key and it will show “HS” in parameter 2. Now, you can set up low point in parameter 3 by pressing “SEL 1” or “SEL 2” key. **LS:** Set low frequency point for ECO mode. 50 Hz system: Setting range is from 46.0Hz to 48.0Hz. 60 Hz system: Setting range is from 56.0Hz to 58.0Hz. The default value is 48.0Hz/58.0Hz. Pressing “ON” key to confirm the setting value for low point. Then, it will show HS in parameter 2. Please set up high point in parameter 3 by pressing “SEL 1” or “SEL 2” key. **HS:** Set high frequency point for ECO mode. 50 Hz: Setting range is from 52.0Hz to 54.0 Hz. 60 Hz: Setting range is from 62.0Hz to 64.0Hz. The default value is 52.0Hz/62.0Hz.

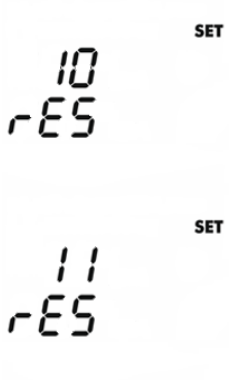
8. Bypass mode setting

Interface	Setting
	After it shows “08” in parameter 1, please press “ON” key first. Then, you have the following options to choose in **ENA**/**DIS**. **ENA**: Bypass enabled. When selected, Bypass mode is activated. **DIS**: Bypass disabled. When selected, automatic bypass is acceptable, but manual bypass is not allowed. Manual bypass means users manually operate UPS for Bypass mode. For example, pressing “STBY” button in AC mode to turn into Bypass mode.

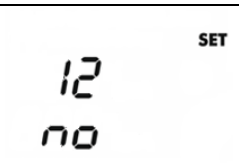
9. Battery backup time setting

Interface	Setting
	**Parameter 3:** **000~999:** Set the maximum backup time from 0min to 999min. UPS will shut down to protect battery after backup time arrives. The default value is 990min. **DIS:** Disable battery discharge protection and backup time will depend on battery capacity. The default value is DIS.

10,11. Reserved

Interface	Setting
	Reserved

12. Hot standby function enable/disable

Interface	Setting
	**Parameter 2: YES.no** Enable or disable Hot standby function. You may choose following two options in **Parameter 2**: **YES:** Hot standby function is enabled. It means that the current UPS is set to host of the hot standby function, and it will restart after AC recovery even without battery connected. **NO:** Hot standby function is disabled. The UPS is running at normal mode and can't restart without battery.

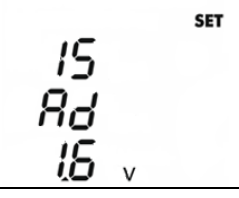
13. Battery voltage adjustment

Interface	Setting
 	After it shows "13" in parameter 1, please press "ON" key first. Then, you may choose **Add** or **SUB** to adjust battery voltage in **parameter 2** by pressing "SEL 1" or "SEL 2" key. After pressing "ON" key to confirm your selection, it will jump to parameter 3 to set up the value. **Parameter 3:** the voltage range is from 0V to 5.7V, the default value is 0V.

14. Charger voltage adjustment

Interface	Setting
 	After it shows "14" in parameter 1, please press "ON" key first. Then, you may choose **Add** or **SUb** to adjust charger voltage in **parameter 2** by pressing "SEL 1" or "SEL 2" key. After pressing "ON" key to confirm your selection, it will jump to parameter 3 to set up the value. **Parameter 3:** the voltage range is from 0V to 9.9V, the default value is 0V. **NOTE:** *Before making voltage adjustment, be sure to disconnect all batteries first to get the accurate charger voltage. *We strongly suggest to use the default value (0). Any modification should be suitable to battery specifications.

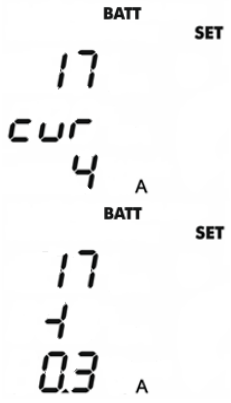
15. Inverter voltage adjustment

Interface	Setting
 	After it shows "15" in parameter 1, please press "ON" key first. Then, you may choose **Add** or **SUb** to adjust inverter voltage in **parameter 2** by pressing "SEL 1" or "SEL 2" key. After pressing "ON" key to confirm your selection, it will jump to parameter 3 to set up the value. **Parameter 3:** the voltage range is from 0V to 6.4V, the default value is 0V.

16. Output voltage adjustment

Interface	Setting
	After it shows “16” in parameter 1, please press “ON” key first. Then, you may choose **Add** or **SUb** to adjust output voltage in **parameter 2** by pressing “SEL 1” or “SEL 2” key. After pressing “ON” key to confirm your selection, it will jump to parameter 3 to set up the value. **Parameter 3:** the voltage range is from 0V to 6.4V, the default value is 0V.

17. Charging current setting

Interface	Setting
	After it shows “17” in parameter 1 and “Cur” in parameter 2, please press “ON” key first. Then, you may select 01, 02, 03 or 04 to set the charging current from 1A to 4A in **parameter 3**. Then, calibrate the charging current by selecting “+” or “-“ in **parameter 2**. **± 0~± 5:** You may choose **‘+’** as **add** or **‘-’** as **Sub** to adjust charging current. This setting number is the first number after the decimal point. For example, if setting value is “+” and “3”, it means the calibrated formula is to add 0.3A. The setting charging current will become 4.3A as shown in left screen. (4A + 0.3A = 4.3A.)

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 and SEL keys simultaneously for at least 4 seconds. The code "C08" appears on the display.
To return to the normal operation mode press the ON and SEL keys again for at least 4 sec.

MAINTENANCE BYPASS (SWMB)

WARNING: Maintenance work inside the UPS is to be performed exclusively by qualified staff. Inside the UPS there may be a voltage present even when the input, output and battery switches are open. Removal of the UPS panels by non-qualified staff may result in injury to the operator and damage the equipment.

Below is a list of the operations to be performed in order to carry out maintenance work on the equipment without shutting off the power supply to the load:

- The UPS must power the load via the automatic bypass or the inverter, with the mains voltage present.
  N.B.: If the UPS is in battery power mode, activating the maintenance bypass entails shutting off the power supply to the load.
- Close the maintenance bypass switch (SWMB): in this way, the input is short-circuited with the output.
- Turn off the input breaker. The display panel is turned off. Wait for the electrolytic capacitors on the power board to discharge (about 5 minutes) and then proceed to perform the maintenance operations.
  N.B.: During this phase, with a load powered via the maintenance bypass, any disturbance on the power supply line of the UPS will affect the devices powered (the load is connected directly to the mains, the UPS is no longer active).

Having completed the maintenance operations, proceed as follows to restart the UPS:

- Turn on the input breaker. The display panel is reactivated. Turn on the UPS again from the "ON" button on the display panel. Wait for the UPS to turn on completely.
- Open the maintenance bypass: the UPS resumes normal operation.

R.E.P.O.

The R.E.P.O remote command terminals, enable the connection of an emergency shutdown system (Remote Emergency Power Off).

The UPS is provided by the manufacturer with the R.E.P.O. 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 R.E.P.O. 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.

	R.E.P.O.	This feature is activated by opening the dry contact

AUTORESTART

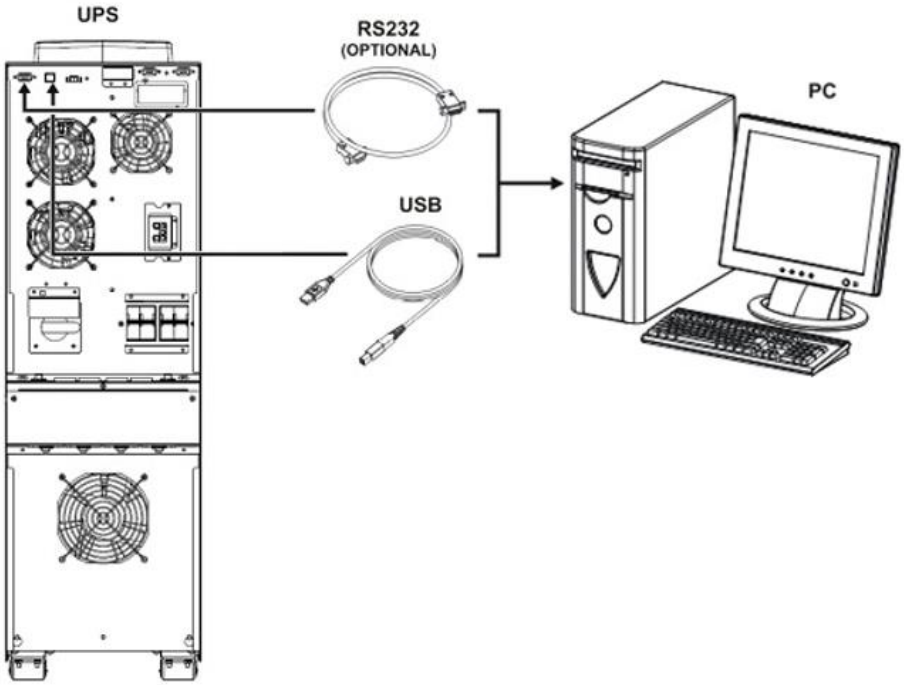
The Autorestart allows the automatic switch on of the UPS when power is restored, if during battery operation the UPS switches off due to end of autonomy, remote shutdown command or Auto power off enabled.

CAUTION:
THE AUTORESTART FUNCTION IS ENABLED BY DEFAULT.

SOFTWARE

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 10 ft / 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 or for more information about the accessories available, consult the website **www.rielloupsamerica.com**.



MONITORING AND CONTROL SOFTWARE

The **PowerShield³** 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, send e-mails 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** 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**

CONFIGURATION SOFTWARE

Configuration and customization software allows the configuration and complete visualization of UPS status via USB or RS232 port.
For a list of possible configurations available to the user, refer to the "*UPS CONFIGURATION*" paragraph.

INSTALLATION OPERATIONS

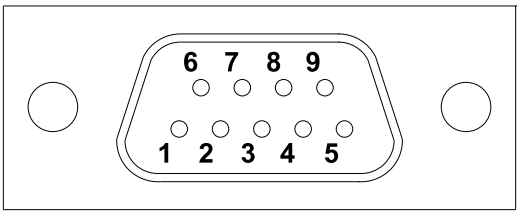
1) Connect one of the UPS's communication ports to one of the PC's communication ports using the cable supplied.
2) Follow the installation program instructions. For more detailed information about installation and use, refer to the software manual which can be downloaded from our website **www.rielloupsamerica.com**

COMMUNICATION PORTS

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

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

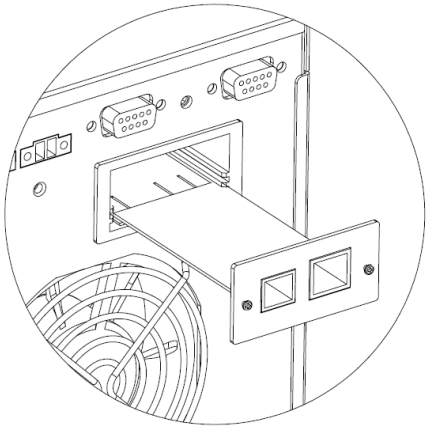
RS232 CONNECTOR

RS232 CONNECTOR		
		
PIN #	**SIGNAL**	**NOTES**
1	N/A	For further information about interfacing with the UPS, refer to the dedicated manual
2	TXD	
3	RXD	
5	GND	
6	N/A	
8	N/A	
9	N/A	

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:

- Card with Ethernet communication
- Card with relay isolated contacts



To check the availability of other accessories, visit the website **www.rielloupsamerica.com**

TROUBLESHOOTING

An irregular operation of the UPS is frequently not due to malfunctions, but to simple problems, inconveniences or distractions. Therefore, the user is advised to consult the table below providing useful information on how to solve the most common problems.

WARNING: *the table below often refers to the use of the maintenance BYPASS (SWMB). If the device is installed, before restoring the correct operation of the UPS, make sure that it is switched on and* ***not in STAND-BY****.*

NOTE: For the exact meaning of the codes mentioned in the table, please read the *"STATUS / ALARM CODES"* section.

PROBLEM	POSSIBLE CAUSE	SOLUTION
THE UPS CONNECTED TO THE MAINS, DOES NOT SWITCH TO STAND BY MODE (THE DISPLAY DOES NOT LIGHT UP)	CONNECTION TO THE INPUT TERMINAL MISSING	Connect the mains to the terminals following the indications in the paragraph *"POWER CONNECTION"*
	NEUTRAL CONNECTION MISSING	The UPS cannot function without the neutral connection. WARNING: the absence of this connection can damage the UPS and/or the load. Connect the mains to the terminals as explained in the paragraph *"POWER CONNECTION"*.
	THE ISOLATOR (SWIN) IS OPEN	Close the isolator
	MAINS POWER MISSING (BLACKOUT)	Make sure the mains power is present. If necessary, perform battery start-up to power the load.
	INTERVENTION OF THE UPSTREAM PROTECTION DEVICE	Restore the protection. Warning: make sure there is no overload or short circuit on the UPS output.
NO POWER REACHES THE LOAD	CONNECTION TO THE OUTPUT TERMINAL MISSING	Connect the load to the terminals
	THE UPS IS IN STAND-BY MODE	Run the start-up sequence
	MALFUNCTION OF THE UPS AND AUTOMATIC BYPASS OUT OF USE	Insert the maintenance bypass (SWMB) and contact the nearest service center
THE UPS OPERATES OFF THE BATTERIES EVEN THOUGH MAINS POWER IS PRESENT	INTERVENTION OF THE UPSTREAM PROTECTION DEVICE	Restore the protection. WARNING: make sure there is no overload or short circuit on the UPS output.
	THE INPUT VOLTAGE IS OUT OF THE ALLOWED OPERATING VALUES FOR MAINS POWER	Problem caused by the mains power. Wait for the input mains voltage to return within the tolerance limits. The UPS will return automatically to mains operation.

PROBLEM	POSSIBLE CAUSE	SOLUTION
THE DISPLAY SHOWS THE FOLLOWING CODE: C01	THE JUMPER IS MISSING FROM THE R.E.P.O. CONNECTOR OR IT IS NOT INSERTED CORRECTLY	Assemble the jumper or make sure that it is inserted correctly.
THE DISPLAY SHOWS THE FOLLOWING CODE: C05	MAINTENANCE BYPASS SWITCH (SWMB) CLOSED	Open the manual bypass switch (SWMB).
	THE JUMPER IS MISSING FROM THE TERMINALS "SWITCH BYPASS"	Insert the jumper
THE DISPLAY SHOWS ONE OR MORE OF THE FOLLOWING CODES: A30, A32 AND THE UPS DOES NOT START UP	AMBIENT TEMPERATURE < 0°C	Heat the environment, wait for the heat sink temperature to rise above 0°C and then start up the UPS
	FAULT IN HEAT SINK TEMPERATURE PROBE	Activate the maintenance bypass (SWMB) if present, turn the UPS off and back on again and exclude the maintenance bypass. If the problem persists, contact the nearest service center
THE DISPLAY SHOWS ONE OR MORE OF THE FOLLOWING CODES: F11, F17, L06, L07, L08, L09, L14, L17	ANOMALOUS LOADS APPLIED	Remove the load. Insert the maintenance bypass (SWMB) if present, turn the UPS off and back on again. Exclude the maintenance bypass. If the problem persists, contact the nearest service center
	FAULT IN THE INPUT OR OUTPUT STAGE OF THE UPS	Activate the maintenance bypass (SWMB) if present, turn the UPS off and back on again. Exclude the maintenance bypass. If the problem persists, contact the nearest service center
THE DISPLAY SHOWS ONE OR MORE OF THE FOLLOWING CODES: A08	CONNECTION MISSING	Check the input connection
	INTERNAL PROTECTION FUSES ON THE PHASE OR ON THE INPUT RELAY BROKEN	Contact the nearest service center
THE DISPLAY SHOWS ONE OR MORE OF THE FOLLOWING CODES: A18	PROTECTION DEVICE UPSTREAM FROM THE BYPASS LINE OPEN (ONLY IF BYPASS IS SEPARATE)	Restore the protection device upstream. WARNING: check that there is no overload or short circuit at the output of the UPS
	BYPASS ISOLATOR OPEN (SWBYP ONLY IF BYPASS IS SEPARATE)	Close the isolator.

PROBLEM	POSSIBLE CAUSE	SOLUTION
THE DISPLAY SHOWS THE FOLLOWING CODE: F19	BATTERY CHARGER FAULT	Open the battery fuse holders (SWBATT) and insert the maintenance bypass (SWMB) if present, turn the UPS off completely. Turn the UPS back on and if the problem persists, contact the nearest service center
THE DISPLAY SHOWS THE FOLLOWING CODE: A26	BATTERY FUSES BLOWN OR FUSE HOLDER ISOLATORS OPEN	Replace the fuses or close the battery fuse holder isolator (SWBATT). WARNING: if necessary, we recommend fuses be replaced with others of the same type.
	BATTERY BREAK NOT CLOSE	Check battery breaker on the rear panel.
THE DISPLAY SHOWS THE FOLLOWING CODE: L01, L10, A29, L39	FAULT IN: TEMPERATURE PROBE OR UPS COOLING SYSTEM MAIN AUXILIARY POWER SUPPLYSTATIC BYPASS SWITCH	Activate the maintenance bypass (SWMB) if present, turn the UPS off and back on again. Exclude the maintenance bypass. If the problem persists, contact the nearest service center
THE DISPLAY SHOWS THE FOLLOWING CODE: F23, L23	THE LOAD APPLIED TO THE UPS IS TOO HIGH	Reduce the load to below the 100% threshold (or user threshold for the code A22)
THE DISPLAY SHOWS ONE OR MORE OF THE FOLLOWING CODES: L26	SHORT CIRCUIT AT OUTPUT	Switch off the UPS. Disconnect all the devices. Turn the UPS back on. Reconnect the devices one by one until the fault is identified.
THE DISPLAY SHOWS ONE OR MORE OF THE FOLLOWING CODES: F34, L34	AMBIENT TEMPERATURE HIGHER THAN 40°C HEAT SOURCES CLOSE TO THE UPS VENTILATION SLITS OBSTRUCTED OR TOO CLOSE TO THE WALLS	Activate the maintenance bypass (SWMB) if present, without switching off the UPS. This way, the fans will cool the heat sink more rapidly. Eliminate the cause of the over temperature and wait for the temperature of the heat sink to drop. Exclude the maintenance bypass.
	FAULT IN TEMPERATURE PROBE OR UPS COOLING SYSTEM	Insert the maintenance bypass (SWMB) if present, without switching off the UPS, so that the fans, while keeping running, cool the heat sink more rapidly and wait for the temperature of the heat sink to drop. Turn the UPS off and back on again. Exclude the maintenance bypass and if the problem persists, contact the nearest service center.
THE DISPLAY SHOWS NOTHING OR PROVIDES INCORRECT INFORMATION	THE DISPLAY HAS POWER SUPPLY PROBLEMS	Activate the maintenance bypass (SWMB), shut down the UPS completely and wait for a few seconds. Turn ON the UPS again and verify display regular operation. Exclude the maintenance bypass. If the fault persists, contact the nearest technical support center.
THE DISPLAY IS OFF, THE FANS ARE OFF BUT THE LOAD IS POWERED	FAULT IN THE AUXILIARY POWER SUPPLIES. THE UPS IS IN BYPASS SUPPORTED BY THE REDUNANT POWER SUPPLY.	Activate the maintenance bypass (SWMB) if present. Switch off the UPS, wait for a minute and turn the UPS back on. If the display does not turn on or if the sequence fails, contact the nearest service center, leaving the UPS in manual bypass mode.

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**

STATUS / ALARM CODES

By using a sophisticated self-diagnostic system, this UPS can check and indicate on the display panel its status and any error and/or fault occurred during operation. Whenever a problem arises, the UPS signals the event by showing the code and the corresponding alarm on the display.

- **Commands:** these codes indicate that a command has been activated.

CODE	DESCRIPTION
C01	Remote switch-off command / Emergency switch-off command
C04	Battery test running
C05	Manual bypass command

- **User messages:** these messages refer to a specific configuration or operation of the UPS.

CODE	DESCRIPTION
U01	Low battery warning
U04	Bypass disabled

- **Anomalies:** these are “minor” problems, which do not bring the UPS to a halt, but can reduce its performance or inhibit the use of some of its functions.

CODE	DESCRIPTION
A03	Inverter not synchronized / Synchronization disabled (UPS in Free running mode)
A05	Overvoltage on input line of Phase1
A08	Under voltage on input line of Phase1
A11	Input frequency outside tolerance limits
A16	Bypass frequency out of tolerance limits
A18	Voltage on bypass line out of tolerance limits
A26	Positive branch batteries missing or battery fuses open
A29	System temperature probe damaged
A30	System temperature < 0°C
A31	System temperature too high
A32	Temperature of heat sink Phase1 < 0°C

- **Faults:** These are more critical problems compared to the “Anomalies”, as if they persist they may bring the UPS to a halt even in a very short time.

CODE	DESCRIPTION
F01	Internal communication error
F11	BOOST stage anomaly
F17	Inverter stage anomaly
F19	Positive battery overvoltage
F23	Output overload
F34	Heat sink over temperature / Battery charger over temperature
F38	ISO over temperature
F40	Fan failure

- **Locks:** these codes indicate that the UPS, or one of its parts, is locked. Usually, they are preceded by an alarm signal. In case of faults and consequent locking of the inverter, the latter will be turned off and the load will be powered via the bypass line (this procedure is excluded for locks caused by serious and persistent overloads and for those caused by a short circuit).

CODE	DESCRIPTION
L01	Incorrect auxiliary power supply
L06	BOOST stage overvoltage positive
L07	BOOST stage overvoltage negative
L08	BOOST stage under voltage positive
L09	BOOST stage under voltage negative
L10	Static bypass switch fault
L14	Phase1 inverter overvoltage
L17	Phase1 inverter under voltage
L23	Phase1 output overload
L26	Short circuit at Phase1 output
L34	Phase1 heat sink over temperature
L38	ISO over temperature lock
F11	Bus soft start fail
L50	BUS Unbalance
L51	Inverter Negative Power
L52	Battery SCR lock
L53	Inverter Relay Short
L54	Charger Short
L55	CAN communication lock
L56	R Inverter over Current
L57	Battery mode PFC current lock
L58	Bus Voltage Vary Lock

TECHNICAL DATA

MODEL		GTT 6000		GTT 10000	
CAPACITY*		6000 VA / 6000 W		10000 VA / 10000 W	
INPUT					
Voltage Range	Low Line Loss	110 Vac(L-N) ± 3 % at 0-60% Load 176 Vac(L-N) ± 3 % at 60%-100% Load			
	Low Line Comeback	Low Line Loss Voltage + 10V			
	High Line Loss	300 Vac(L-N) ± 3 %			
	High Line Comeback	Low Line Loss Voltage - 10V			
Frequency Range		46Hz ~ 54 Hz @ 50Hz system **56Hz ~ 64 Hz @ 60Hz system**			
Phase		Single phase with ground			
Power Factor		≧ 0.99 at 100% Load			
OUTPUT					
Output voltage		104/110/115/120 Vac or 208/220/230/**240** Vac			
AC Voltage Regulation		± 2%			
Frequency Range (Synchronized Range)		46Hz ~ 54 Hz @ 50Hz system **56Hz ~ 64 Hz @ 60Hz system**			
Frequency Range (Batt. Mode)		50 Hz ± 0.1 Hz or 60Hz ± 0.1 Hz			
Overload	AC mode	100%~110%: 10min; 110%~130%: 1min; >130% : 1sec			
	Battery mode	100%~110%: 30sec; 110%~130%: 10sec; >130% : 1sec			
Current Crest Ratio		2.6:1 max			
Harmonic Distortion		≦ 2 % @ 100% Linear Load; ≦ 6 % @ 100% Non-linear Load			
Transfer Time	Line ⟷ Battery	0 ms			
	Inverter ⟷ Bypass	0 ms			
	Inverter ⟷ ECO	<10 ms (Typical)			
EFFICIENCY					
AC mode		> 89%			
Battery Mode		> 87%			
BATTERY					
Type		Internal battery	External battery	Internal battery	External battery
		12 V / 7 Ah	Depending on applications	12 V / 9 Ah	Depending on applications
Numbers		20	20	20	20
Recharge Time		7 hours recover to 90% capacity	According to external battery pack	9 hours recover to 90% capacity	According to external battery pack
Charging Current		1 A ± 10% (max.)	4 A ± 10% (max.)	1 A ± 10% (max.)	4 A ± 10% (max.)
Charging Voltage		(Battery number*13.65 V) ± 1%			
PHYSICAL					
IP Protection		IP20 (Static)			
Dimensions (WxDxH) [inches/mm]		9.84x24.80x32.44 / 250x630x824			
Net Weight [lbs / kg]		258 / 117		313 / 142	
ENVIRONMENT					
Operation Temperature		32 – 104 °F / 0 – 40 °C (the battery life will down when > 77 °F / 25°C)			
Operation Humidity		<95 % and non-condensing			
Maximum altitude [fts / m]**		3280 / 1000			
Acoustic Noise Level		Less than 55dB @ 1 Meter		Less than 58dB @ 1 Meter	
MANAGEMENT					
Smart RS-232 or USB		Supports Windows®, Linux, Unix, and macOS			
Optional SNMP		Power management from SNMP manager and web browser			

**Derate capacity to 50% of capacity in CVCF mode and to 90% when the output voltage is adjusted to 208 Vac or when UPS is operated in parallel.*

***If the UPS is installed or used in a place where the altitude is above than 3280 fts / 1000 m, the output power must be derated one percent per 328 fts / 100 m.*

Product specifications are subject to change without further notice.

MECHANICAL DIMENSION BATTERY CABINET

BATTERY CABINET MODEL		BBX GTT xx
Dimensions W x D x H	[inches / mm]	9.82x24.80x30.98 / 250x630x787
Net Weight	[lbs / Kg]	440.5 / 183.5

www.riello-ups.com

headquarter

RPS SpA - *Riello Power Solutions*
Viale Europa, 7
37045 Legnago (VR) Italy

RPS AMERICA - *Riello Power Solutions*
8808 Beckett Rd,
West Chester, Ohio, 45069 USA

Telephone +1-513-282-3777

0MLGTT6K0RUENUB