installation and user manual

CSS SENTINEL TOWER

CAM 3 - 5

RIELLO ELETTRONICA riello ups

INTRODUCTION

Congratulations on purchasing a **CSS Sentinel Tower** product and welcome to **Riello UPS**! To use the support service offered by **Riello UPS**, visit the site **www.riello-ups.com**

Our Company is a specialist in the design, development and manufacturing of uninterruptible power supplies (UPS).
The CPS 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 CPS 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 CPS and any additional Battery Cabinet.
For information on how to use and maximise 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 analysing 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 favouring 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 CPS 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

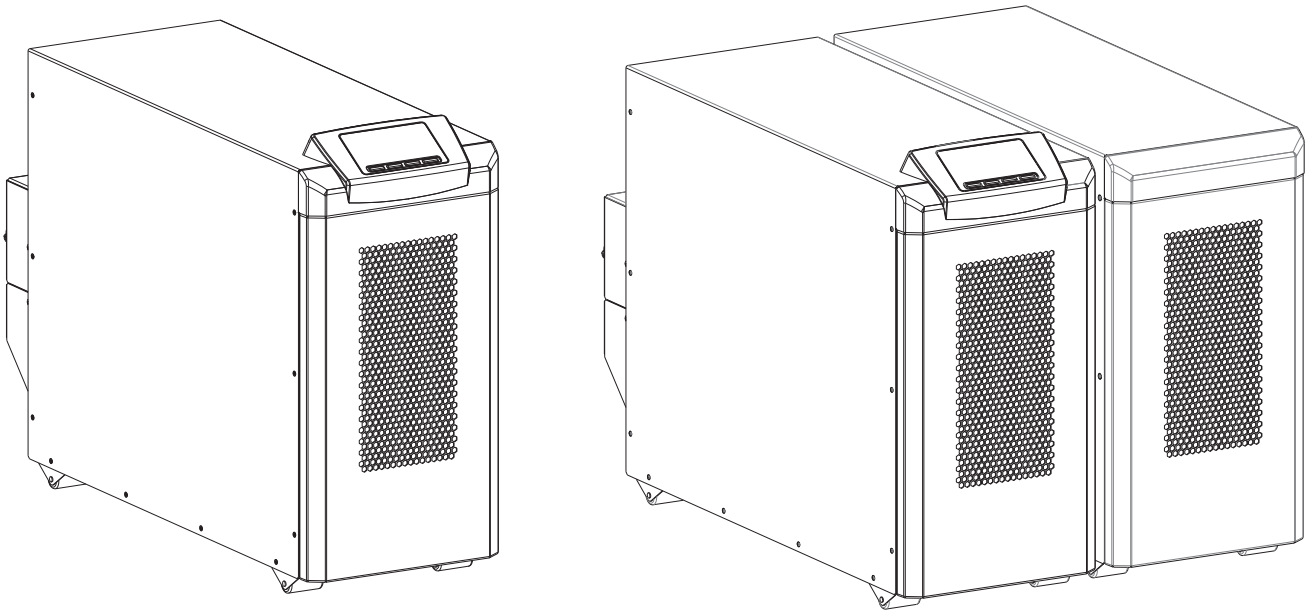
PRESENTATION

The CSS ***SENTINEL TOWER*** developed by Riello UPS utilises ON-LINE double conversion technology, classified as VFI-SS-111 according to standard IEC EN 62040-3.

The CSS ***SENTINEL TOWER*** consists of transformerless CPS units with single phase input and output available in versions 3000 and 5000 VA/W.

CPS are equipment designed especially for use in buildings subject to fire safety regulations, their main objective is to supply safety lighting systems in case of power failure, but they are also used to supply:

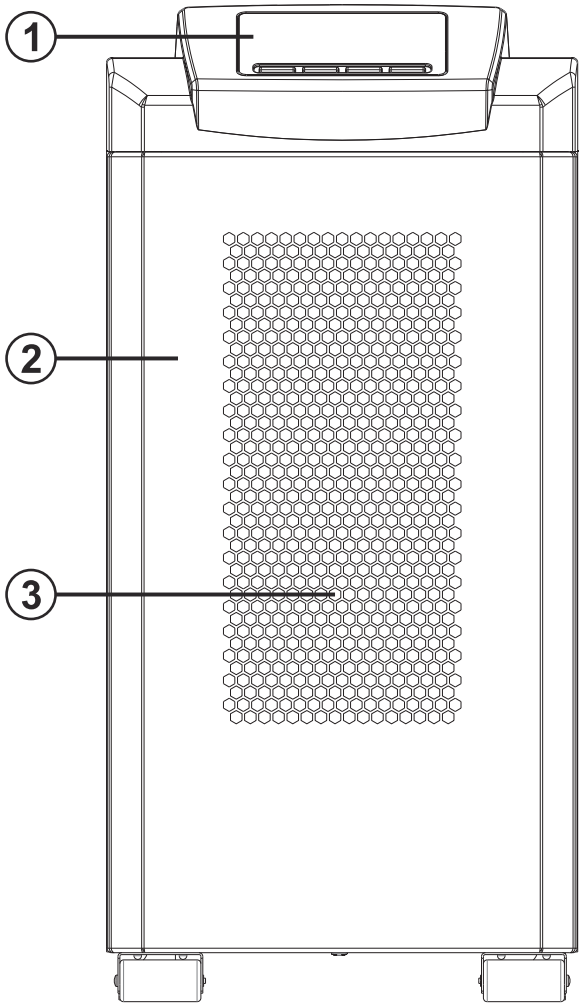
- electric circuits supplying automatic fire extinguishing systems;
- paging systems and signaling security systems;
- fume extraction equipment;
- carbon monoxide alarm systems;
- special security systems in relation to specific properties, for example high risk areas.



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

CPS VIEWS

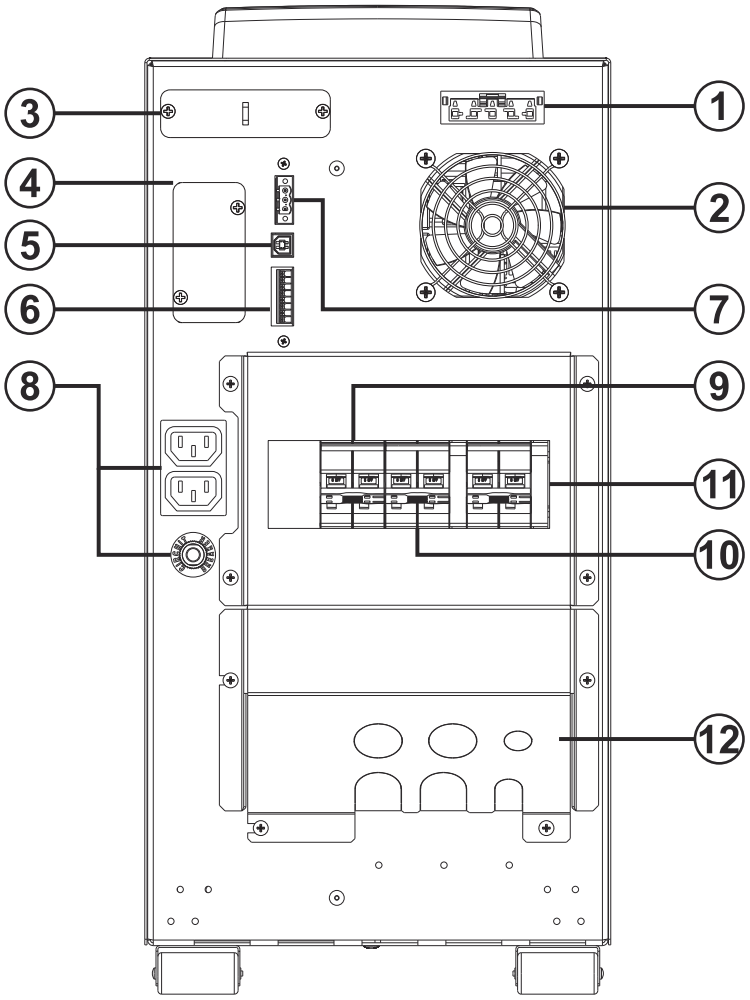
FRONT VIEW



All models

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

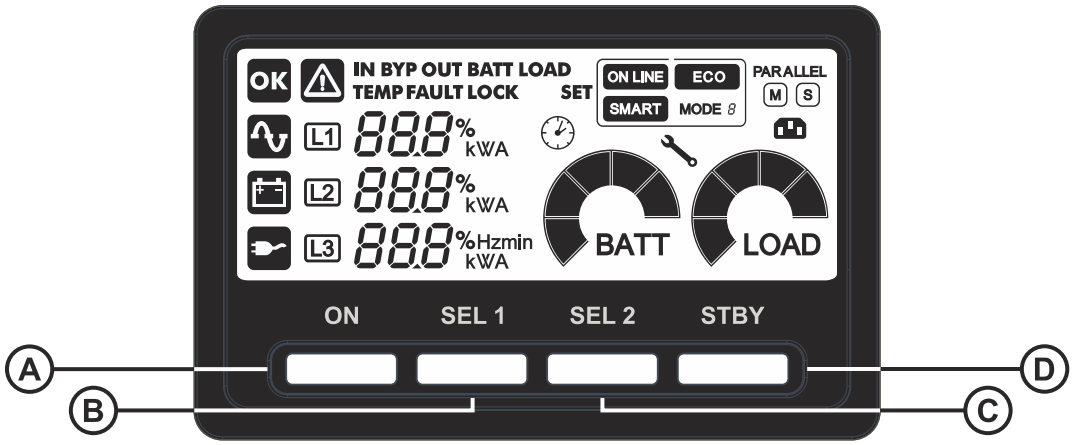
REAR VIEW

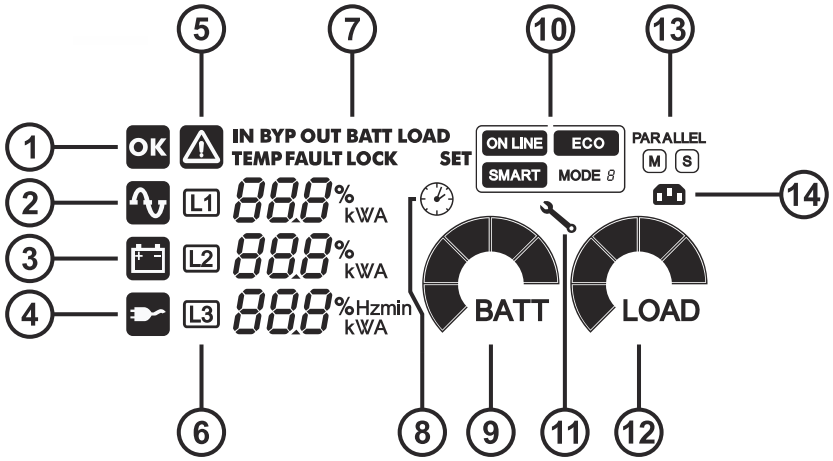


All models

1	Battery expansion connector	7	Remote commands terminal
2	Cooling fan	8	EnergyShare sockets (10A max) and overcurrent protection
3	Parallel card (optional)	9	Mains input switch (SWIN)
4	Slot for optional accessory communication cards and contacts cards	10	Manual bypass switch (SWMB)
5	USB communication port	11	Output switch (SWOUT)
6	Dry contact outputs	12	Terminals cover panel

DISPLAY PANEL VIEW

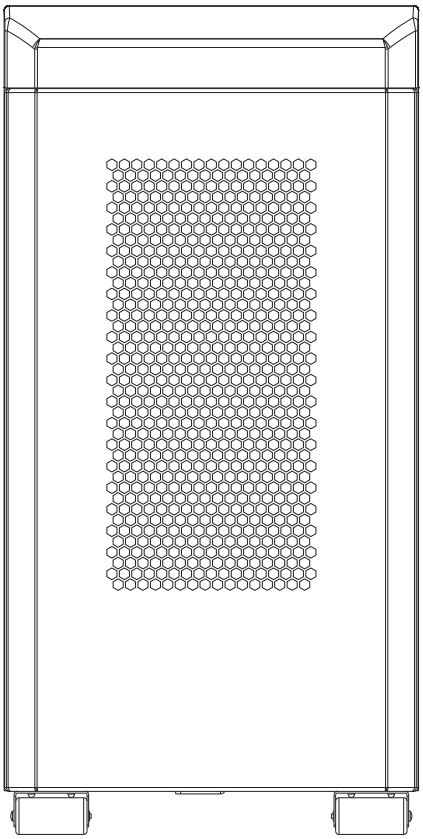




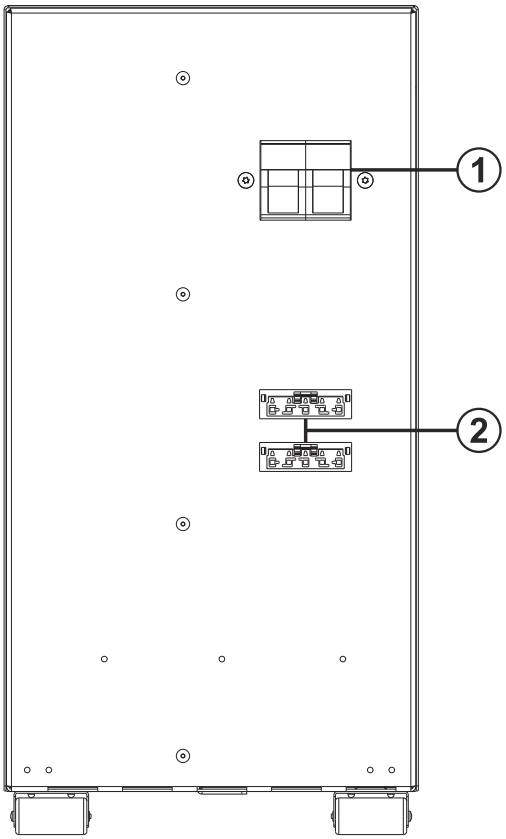
A	"ON" button	6	Input phase indicator
B	"SEL1" button	7	Measurement display area
C	"SEL2" button	8	Timer
D	"STAND-BY" button	9	Battery charge indicator
1	Regular operation	10	Configuration area
2	Mains operation	11	Maintenance request
3	Battery operation	12	Load level indicator
4	Load powered by bypass	13	Parallel mode indicator
5	Stand-by / alarm	14	EnergyShare

BATTERY CABINET (OPTIONAL)

The BATTERY CABINET, with the same dimensions and aesthetic appearance of the CPS, 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 CPS 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 CPS.
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

BATTERIES

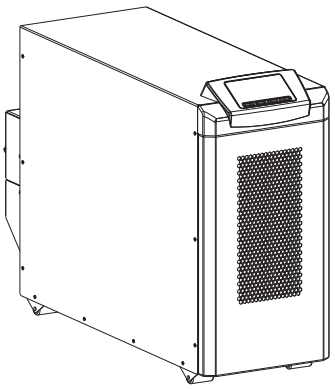
EN 50171 norm requires the batteries to be compliant to EN60896-2 and to have 10 years estimated service life at an ambient temperature of 20°C.

INSTALLATION

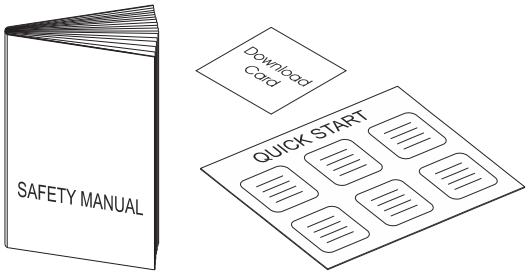
INITIAL CONTENT CHECK

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

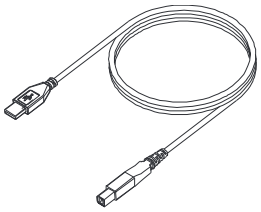
CPS



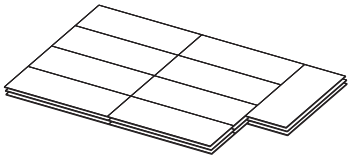
Safety manual + Quick start guide + Download card



USB cable

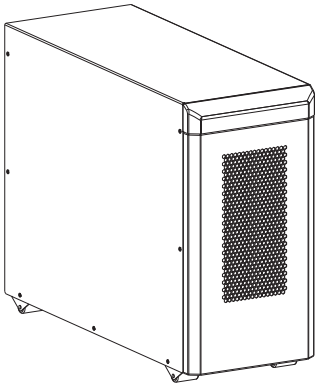


Warning labels against backfeed

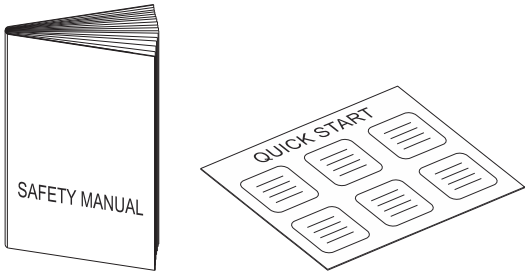


After opening the packaging, it is first necessary to check the contents.
The Battery Cabinet (optional) package must contain:

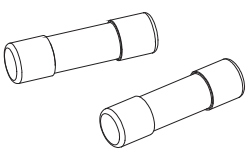
BATTERY CABINET



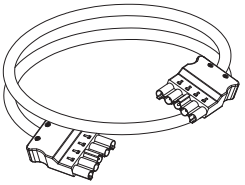
Safety manual + Quick start guide



Fuses

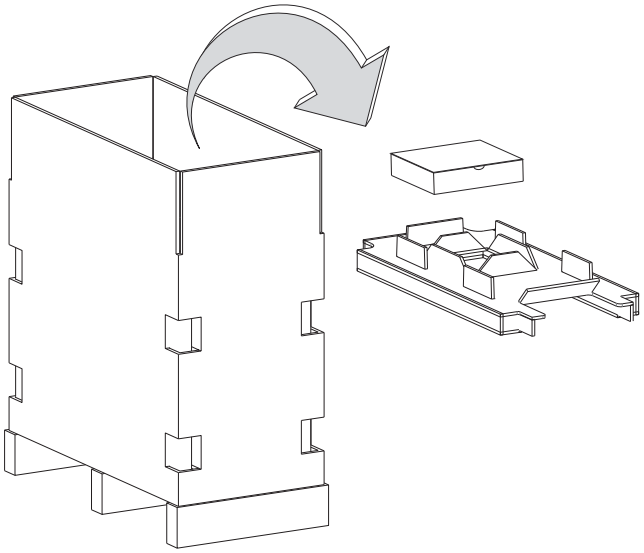


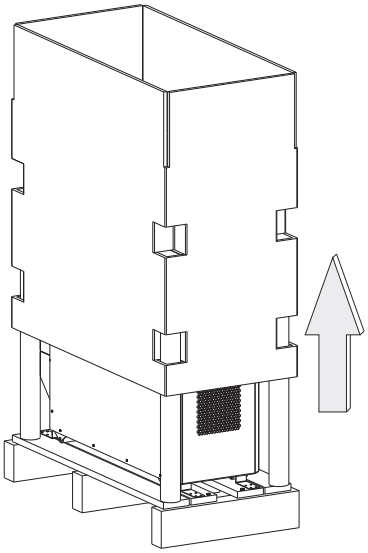
Connection cable CPS - Battery Cabinet



REMOVAL FROM THE PALLET

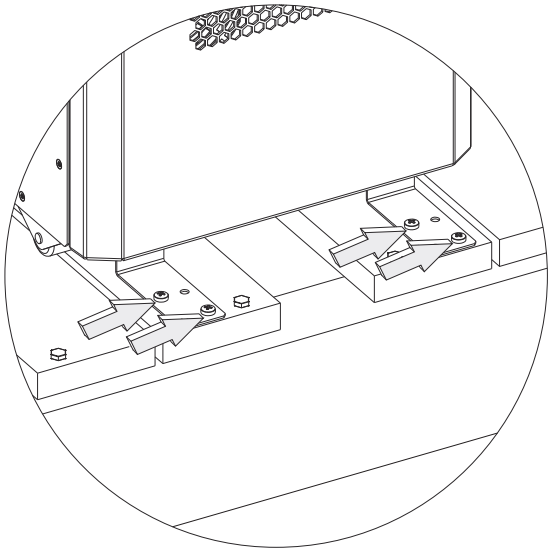
This chapter describes the operations to remove the product from the pallet and prepare it for installation.



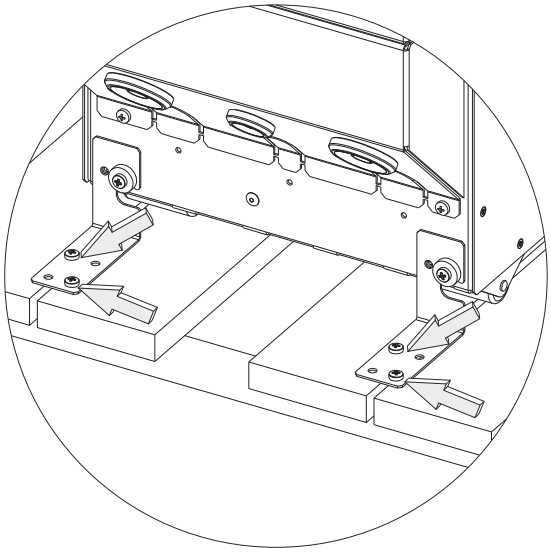


1. Cut the straps and open the cardboard box.
2. Remove the packaging and the accessory box located above the product.
3. Remove the cardboard box by sliding it upwards and remove the corner supports.
4. Remove the protective sack.

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

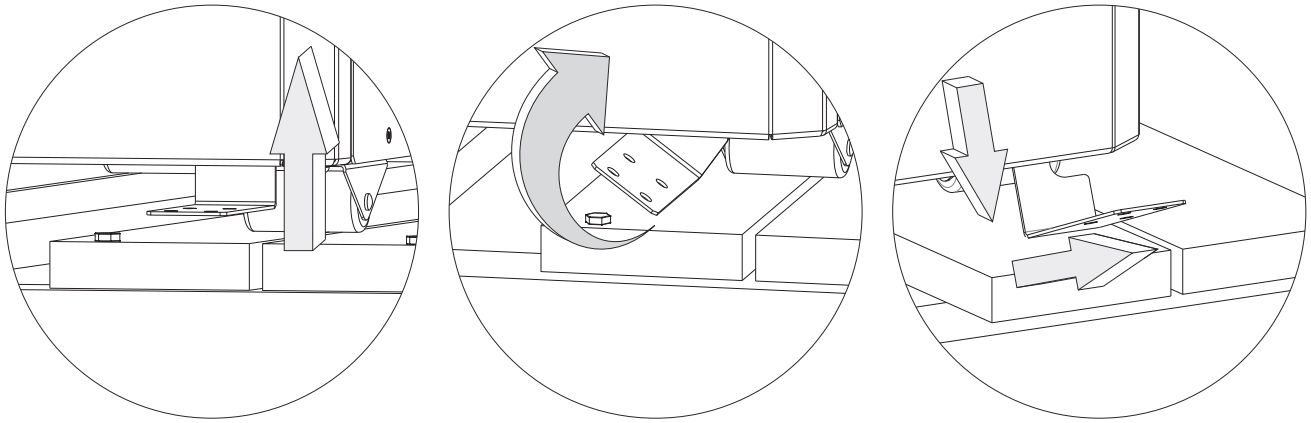


FRONT VIEW

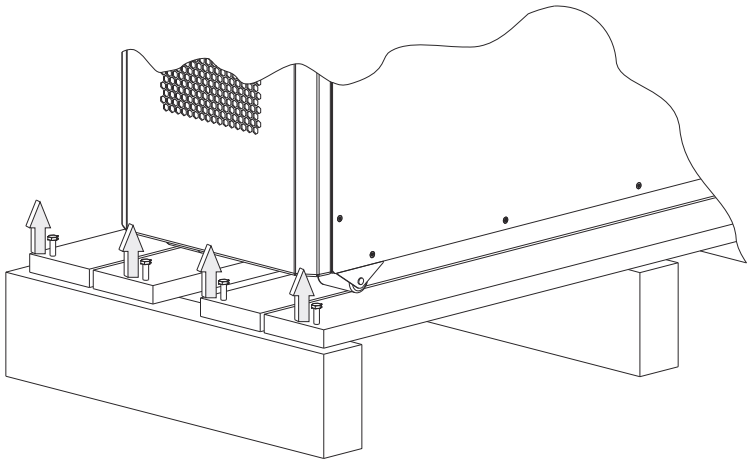


REAR VIEW

6. Move the brackets upwards and rotate for releasing them from the retaining bushing.
   Follow the instructions below to remove the fixing brackets without releasing the front panel (*).

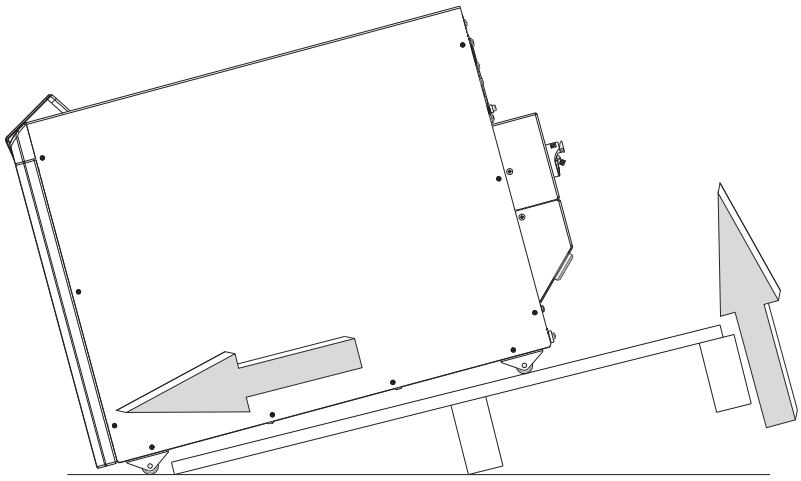


7. Remove the 4 fixing screws of the frontal wooden beam of the pallet.



8. Remove the end wooden support, and ensure that the product is held stable during this process .

9. Guide the product towards the front of the pallet with caution; the pallet will begin to tilt down acting as a ramp; continue to move the product down off the pallet.



(*) 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 CPS 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.

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 CPS 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.

For three-phase installation, this equipment complies with IEC 61000-3-12 provided that the short-circuit power Ssc is greater than or equal to 2.94MW (7.4kA) at the interface point between the user's supply and the public system. It is responsibility of the installer or the user to ensure that the equipment is connected to a supply with the adequate short-circuit power Ssc (if required, consult the distribution network operator).
If the supply doesn't meet the above requirements or if the requirements listed above are difficult to obtain, a single-phase installation is suggested.

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.
- 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)
- the rear part 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

POWER CONNECTION

ATTENTION: BEFORE PROCEDING WITH THE FOLLOWING OPERATIONS, MAKE SURE THAT THE CPS IS COMPLETELY OFF AND DISCONNECTED FROM THE MAINS AND ANY LOAD.

ALL OPERATIONS DESCRIBED IN THIS SECTION MUST BE PERFORMED BY QUALIFIED PERSONNEL ONLY. Our Company assumes no liability for damages caused by incorrect connections or operations not contained in this manual.

The CPS and the Battery Cabinet contains HAZARDOUS electrical voltages inside them, even when the input and/or battery switches are off. The internal parts are protected by safety panels which can be removed by trained personnel only. All installation and maintenance or operations involving access inside the CPS or Battery Cabinet require the use of tools and may ONLY be performed by trained personnel.

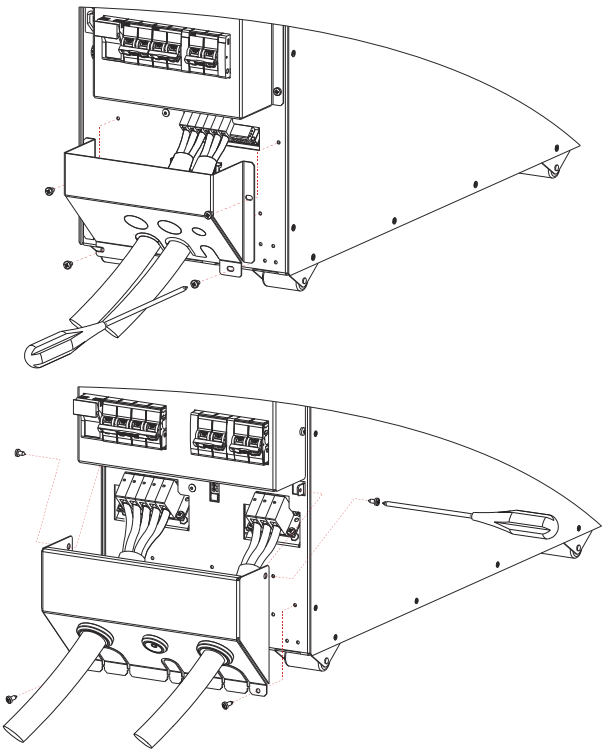
To carry out the following operations, the CPS must be disconnected from the mains power supply, switched off, and with all the equipment switches and fuse holders open. Check that there are no Battery Cabinets connected to the CPS, if this is the case open all their fuse holders.

INSTRUCTIONS FOR CONNECTION

Follow the instruction below to access the terminals of the CPS and made the electrical connections:

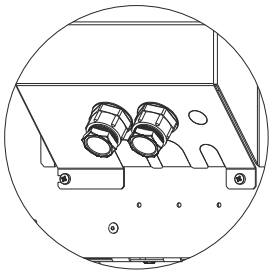
1. Remove the terminals cover in the back of the CPS, placed below the disconnector switches (see *"CPS VIEWS*")
2. Pierce the rubber grommets to allow the wires to pass through, otherwise remove the pre-cut slots (located in the bottom part of the terminal cover) using cutters.
3. We recommend using double-insulated multi-core cables to be connected, respectively, to the “INPUT” and “OUTPUT”.
4. For the cross section and the cable stripping, refer to the paragraph "*CONNECTION CABLES CROSS SECTION DETAILS*
5. The wires should be stripped and inserted into the terminals (for the length of the stripping, refer to the paragraph “*CONNECTION CABLES CROSS SECTION DETAILS*”).

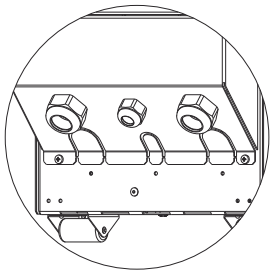
   NOTE: To remove the wire, insert a flat blade screwdriver into the clamp slot above the wire inlet.
6. Fix the cables to the ties block in the back of the CPS.
7. When the installation is complete, close the terminals cover and secure with the screws

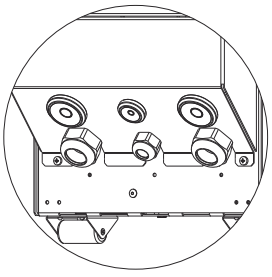


Option with cable glands (not supplied):

Cable glands (not supplied) can be used to secure the cables, using the pre-cut holes in the terminal cover; refer to the example images below. To remove the pre-cut disks use a suitable pair of cutters.







INTERNAL PROTECTION

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 CPS 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 fuses	Battery fuses	Output fuses
3 kVA	2 x 25A GF (6.3x32)	80A aR	2 x 25A GF (6.3x32)
5 kVA	2 x 25A GF (6.3x32)	80A aR	2 x 25A GF (6.3x32)

WARNING: To insulate the CPS from the D.C. supply, disconnect all of the Battery Cabinets (if present).

SHORT CIRCUIT

If a fault occurs on the load, the CPS 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 CPS operating status at the time of the fault, these can either be (in the "*TECHNICAL DATA*" table the protection characteristics and timings are described):

- CPS 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.
- CPS in BATTERY OPERATION or in NORMAL OPERATION but with no Bypass Line available: the CPS 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 CPS 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 CPS and lower than the current supplied by the CPS with the inverter on.

BACKFEED

The CPS has internal protection against backfeed, however the label supplied with the CPS must be affixed to all disconnectors installed within the electrical system upstream of the CPS.

EXTERNAL PROTECTIVE DEVICES

LINE PROTECTION: MAGNETOTHERMAL OR FUSE

Within the CPS 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 CPS is installed.
In order to set up the power line, install a magnetothermal switch upstream from the CPS 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 single-phase input (1P+N)
3 kVA	20A (Max 40A)
5 kVA	32A (Max 40A)

SAFETY DEVICES: DIFFERENTIAL

The CPS can cause a D.C. current in the PE conductor.
An RCD located upstream is suggested: its trip current should be the sum of CPS + 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 (sqmm) *					
Model	INPUT			OUTPUT		
	PE ⏚	N	L	PE ⏚	N	L
3 kVA	10	4 (10 max)		4 (10 max)		
5 kVA	10	6 (10 max)		6 (10 max)		

* *The cross sections indicated in the table refer to a maximum length of 10 meters.*
The cross sections refer to bare cables (without terminals).

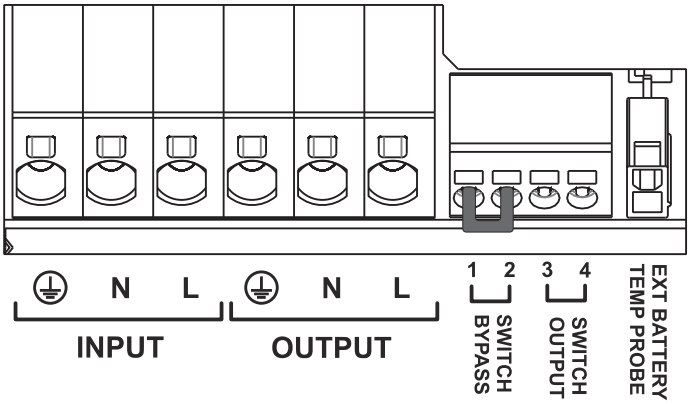
Note: the length of the cable stripping must be equal to 15mm

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 CPS must be connected to the earthing system

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

Models 3-5 kVA



NOTE

1. If an "external manual bypass" is not provided, make sure that there is a jumper between terminals 1 - 2 (Switch bypass).
2. The maximum cross section of the cables that may be inserted in the terminal board 1, 2, 3 & 4 are:

- 2.5 sqmm for bare cables
- 1.5 sqmm for cables with lugs.

The stripping length is 8 mm

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.

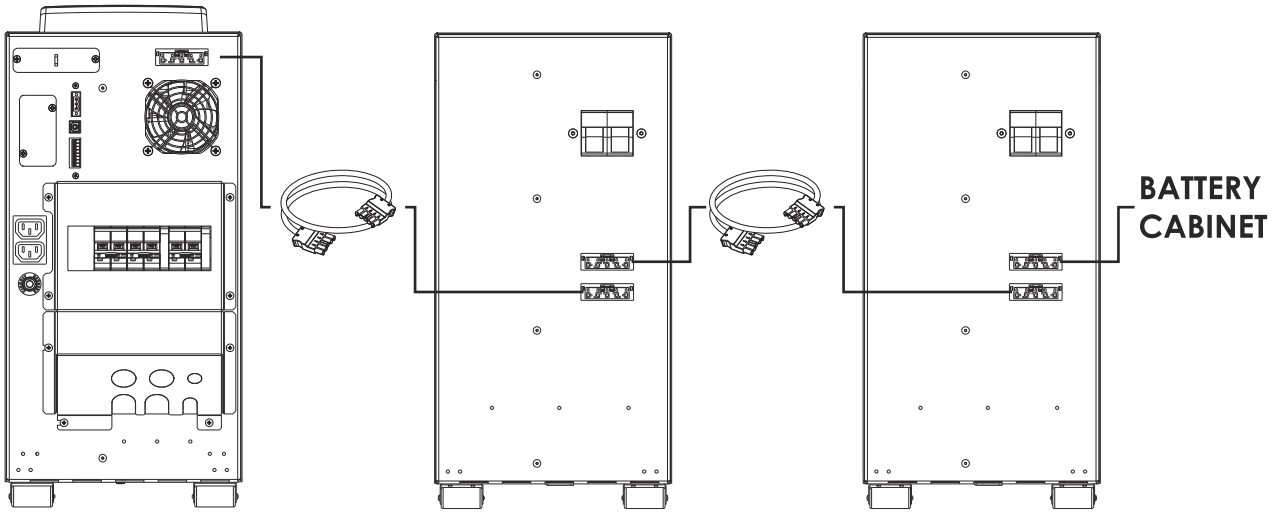
OTHER INSTALLATION MODES

For more information regarding the parallel installation of the CPS, isolation transformers, accessories for maintenance Bypass and others, consult the website **www.riello-ups.com**.

BATTERY CABINET INSTALLATION

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



CPS – BATTERY CABINET CONNECTION

ATTENTION:
The CPS 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 CPS and the Battery Cabinet are similar. Otherwise, recharge each battery unit following the procedure below:

CONFIGURING THE RATED BATTERY CAPACITY

Before installing one or more Battery Cabinets, the CPS must be configured in order to update the rated capacity value (total Ah CPS's internal batteries + external batteries) using the dedicated configuration software.
The Battery Cabinet must only be installed while the CPS 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 CPS (without internal batteries) and the Battery Cabinet is 3 meters.
After connecting the CPS to its Battery Cabinets, insert the fuses and close the Battery Cabinet battery fuse holders (SWBATT). Do not open the SWBATT fuses whilst the CPS is on.
It is recommended that you do not connect more than 5 Battery Cabinets in cascade to a single CPS. To increase capacity, we recommend installing a Battery Cabinet with higher battery capacity.

USE

SWITCHING ON FOR THE FIRST TIME

1) Power on the CPS.
2) If there are Battery Cabinets, insert the fuse in the battery fuse holder isolator (SWBATT)
3) Close the mains input switch (SWIN) in the back of the CPS. Close the fuse holder isolator (SWBATT) paying due attention as described in the previous chapter. We recommend reading the paragraph "*CPS – BATTERY CABINET CONNECTION*"
4) After a few moments, the CPS will switch on, the display will light up, there will be a beep and the ⚠ icon will start to flash. The CPS 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 CPS activation. Battery operation is also in stand-by mode provided that the timer is active.
5) Connect the equipment to the output of the CPS using cables no longer than 10 metres.
   WARNING: Do not connect the EnergyShare sockets to devices that absorb more than 10A. For equipment that exceeds these levels, use the appropriate terminals only.
6) Check which operating mode is set on the display and, if necessary, see the "*CONFIGURING OPERATING MODES*" paragraph to set the required mode. For advanced configurations, set up the CPS with the appropriate configuration software.

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 CPS beeps.
2) Close the output switch (SWOUT) in the back of the CPS.
3) Switch on the equipment connected to the CPS.

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

   1) Simulate a blackout by disconnecting power to the CPS.
   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 CPS 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.
2) Switch on the equipment connected to the CPS.

SWITCHING OFF THE CPS

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

1) If the mains power is present, open the mains switch disconnector (SWIN) to completely turn off the CPS.
2) During battery mode operation with the timer not set, the CPS automatically switches off after 30 seconds. However, if the timer is set, press and hold down the "STBY" key for at least 5 seconds to turn off the CPS. For complete shutdown, open the mains switch disconnector (SWIN).

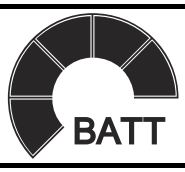
INTERNAL CLOCK SETTING

During the first installation, you must set the internal CPS clock through the configuration software. If the CPS remains off or deactivated for more than 3 days, it will be necessary to re-configure the clock to avoid a failure of any programmed power-on or shut-down configuration.

DISPLAY PANEL MESSAGES

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

CPS STATUS MESSAGES

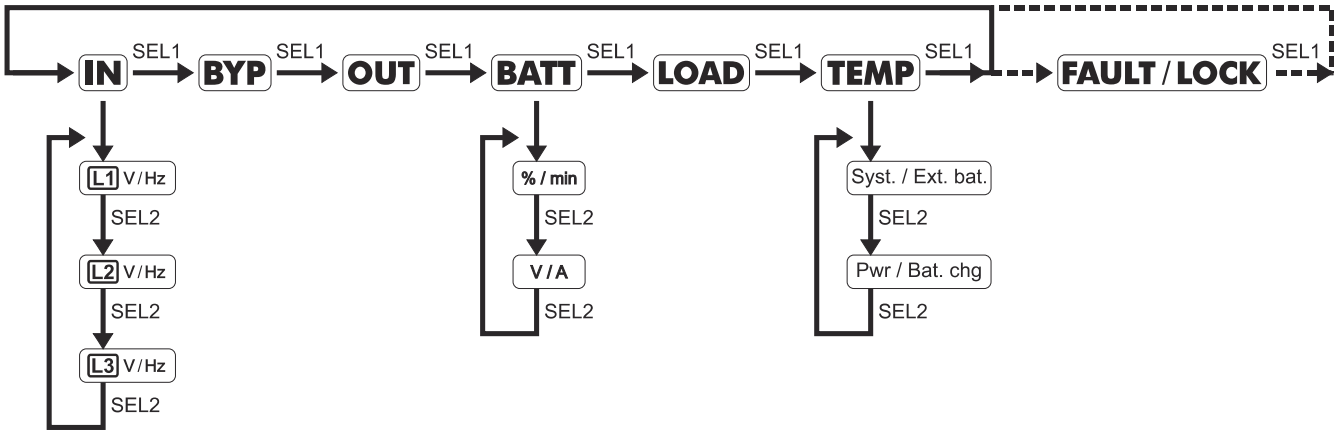
ICON	STATUS	DESCRIPTION
	Fixed	Indicates a fault
	Flashing	The CPS is in stand-by mode
	Fixed	Indicates regular operation
	Fixed	The CPS is operating from the mains
	Flashing	The CPS is operating from the mains, but the output voltage is not synchronised with the mains voltage
	Fixed	The CPS is operating from the battery. In this condition, the CPS 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 CPS emits a beep at regular 1-second intervals.
	Fixed	Indicates that the loads connected to the CPS are powered by the bypass
	Dynamic	Indicates the estimated percentage charge of the batteries
	Dynamic	Indicates the percentage of load applied to the CPS compared with the nominal value.
	Flashing	Indicates output overload condition.
	Flashing	Maintenance is required. Contact the support centre.
	Fixed	Indicates that the timer is active (programmed switch-on and switch-off). The timer can be activated/deactivated using the configuration software.
	Flashing	1 minute until the CPS switches back on or 3 minutes until it switches off
	Off *	The EnergyShare sockets are not configured (always connected).
	Fixed*	The EnergyShare sockets was configured via configuration software. At this time the sockets are connected.
	Flashing *	The associated event occurred; the EnergyShare outlets have been disconnected.

* For more information about the configuration of the EnergyShare sockets, see "*ADDITIONAL FUNCTIONS*".

MEASUREMENT DISPLAY AREA

The front panel can be used to display important CPS operating information.
When the CPS 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:

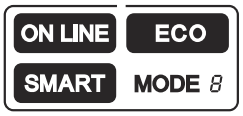
- the views of FAULT / LOCK are not displayed in absence of anomalies, alarm or lock.
- In the event of a fault/alarm (FAULT) or a lock (LOCK), the display will automatically show the type and code of the corresponding alarm.

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 CPS 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 CPS is on battery.
LOAD	Display the CPS load data, such as load percentage, apparent power (kVA) and active power (kW).
TEMP	Display the temperature of: system (inside the CPS), Battery Cabinet (with optional probe), power module and battery charger.
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).

OPERATING MODE CONFIGURATION

The area of the display shown in the figure displays the active operating mode and allows the user to choose other modes directly from the display panel.



HOW TO PROCEED:

- To access the configuration area, hold down the “SEL1” button for at least 3 seconds.
- To change the mode, press the “ON” button.
- The icon corresponding to the mode currently set lights up.
- To confirm the mode chosen, hold down the “SEL1” button for at least 3 seconds.

POSSIBLE SETTINGS

The CPS is designed to be configured in various operating modes:

- **ON-LINE** is the mode with the greatest load protection and the best quality of the output waveform (*)
- **ECO** is the mode with which the CPS consumes the least amount of power, and is therefore the most efficient (**)
- **SMART ACTIVE:** in this mode, the CPS decides whether to operate in ON-LINE or ECO mode according to a statistic about the quality of the mains power.
- **STAND-BY OFF** [Mode 1]: the CPS operates as an emergency power supply. If mains power is present, the load is not powered, however should the mains supply fail, the load is powered by the CPS.

Additional operating modes can be set through the configuration software.

(*) The effective value (rms) of the output frequency and voltage is constantly controlled by the microprocessor, independently from the waveform of the mains voltage, maintaining the output frequency synchronised to the mains within a configurable range.
Outside this range, the CPS output de-synchronises from the mains supply, moving to the nominal frequency; in this condition, the CPS cannot use the bypass.

(**) In order to optimise performance, in ECO mode, the load is normally powered by the bypass. If the mains goes out of the permitted tolerance range, the CPS switches to ON LINE operation. If the mains returns within the permitted tolerance range for at least five minutes, the CPS goes back to powering the load from the bypass.

ADDITIONAL FUNCTIONS

EXTERNAL BATTERY CAPACITY CONFIGURATION

This procedure must be performed only when installing the system or at one of its subsequent modification.

HOW TO PROCEED:

- Press the "SEL 1" key several times to display the "BATT" measurement page. To show the current configuration of the battery capacity, press the "SEL 2" key several times until the value appears.
- When the "BATT" page is displayed, press and hold the "SEL2" button for at least 4 seconds to enter in the external battery capacity configuration mode.
- Press the “SEL 2” button to select the digit to be changed (hundreds / tens / units). The selected digit is the blinking one.
- Press the "SEL 1" button to increase the selected digit by one unit.
- To save the set value, press and hold the "SEL 2" button for at least 4 seconds.
  During this time all digits will blink. When the digits stop blinking, the new battery capacity value has been saved and after a few seconds the display will exit from the configuration mode.

NOTE: to set 9Ah, you must enter 009. The maximum accepted value is 120Ah.

NOTE: During configuration mode, if no key is pressed for more than 30 seconds, the display exits from the configuration mode without saving.

MANUAL BYPASS

Using the Manual Bypass feature, the CPS 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 CPS'S INPUT AND OUTPUT FREQUENCY COINCIDE AND THAT THE CPS IS NOT OPERATING FROM THE BATTERY

Attention: even when the CPS is switched on, the load is disconnected in the event of a mains blackout.
If the input mains deviates from the established tolerances, the CPS automatically switches to Stdby mode and disconnects the load.
To force the CPS 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 CPS is to be performed exclusively by qualified staff. Inside the CPS there may be a voltage present even when the input, output and battery switches are open. Removal of the CPS 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 CPS must power the load via the automatic bypass or the inverter, with the mains voltage present.
  N.B.: If the CPS 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.
- Open the input switch (SWIN) and output switch (SWOUT). 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 CPS will affect the devices powered (the load is connected directly to the mains, the CPS is no longer active).

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

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

PROGRAMMABLE AUXILIARY SOCKETS (ENERGYSHARE)

The EnergyShare sockets are outlets that allow for the automatic disconnection of the load applied to them in certain operating conditions. The events that determine automatic disconnection of the EnergyShare sockets can be selected by the user through the configuration software. For example, it is possible to select disconnection after a certain period of battery operation; or when the pre-alarm threshold for battery discharge has been reached, or when an overloading event occurs.
By default the Energyshare sockets are not configured and therefore function as other outlets.
The EnergyShare function is associated with an icon on the display whose meaning is explained in the paragraph entitled "*DISPLAY PANEL MESSAGES*".
The presence and the number of these sockets will depend upon the CPS type, these sockets are easily recognised by the EnergyShare label located beside them.

REMOTE COMMANDS TERMINAL BOARD AND 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 CPS 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 CPS goes into stand-by mode and the load is completely disconnected.

Attention: before restarting the CPS, reset the stop device. Shutdown via R.E.P.O. inhibits the "Remote ON" function; it is only possible to turn the CPS back on using the “ON” button on the display panel.

The ON/OFF terminals, enable the use of the turn on / turn off function, this is configurable using the configuration software (default Remote ON).
The circuitry of the remote command 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 15mA circulates.
All connections with the remote command terminal board are made through a cable which guarantees a double insulation connection. Logic of the connections:

	R.E.P.O.	This feature is activated by opening the contact between pin’s 1 and 2.
	REMOTE ON	This feature is activated by closing the contact between pin’s 2 and 3 for a few seconds.

AUTORESTART

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

CAUTION:
THE AUTORESTART FUNCTION IS ENABLED BY DEFAULT.

REDUNDANT AUXILIARY POWER ADAPTER FOR AUTOMATIC BYPASS

The CPS is equipped with a redundant auxiliary power adapter which permits operation on the automatic bypass even in the event of main auxiliary power faults. If a fault occurs in the CPS shutting off the main auxiliary power supply, the load is powered by the automatic bypass automatic bypass without any internal protection and without any limitation of the power delivered to the load. In this emergency condition, any perturbations present on the input line affect the load. The multiprocessor board and control panel are not powered in this mode; therefore, the displays is off.

EXTERNAL TEMPERATURE PROBE

This **NON-ISOLATED** input can be used to measure the temperature inside a remote Battery Cabinet.

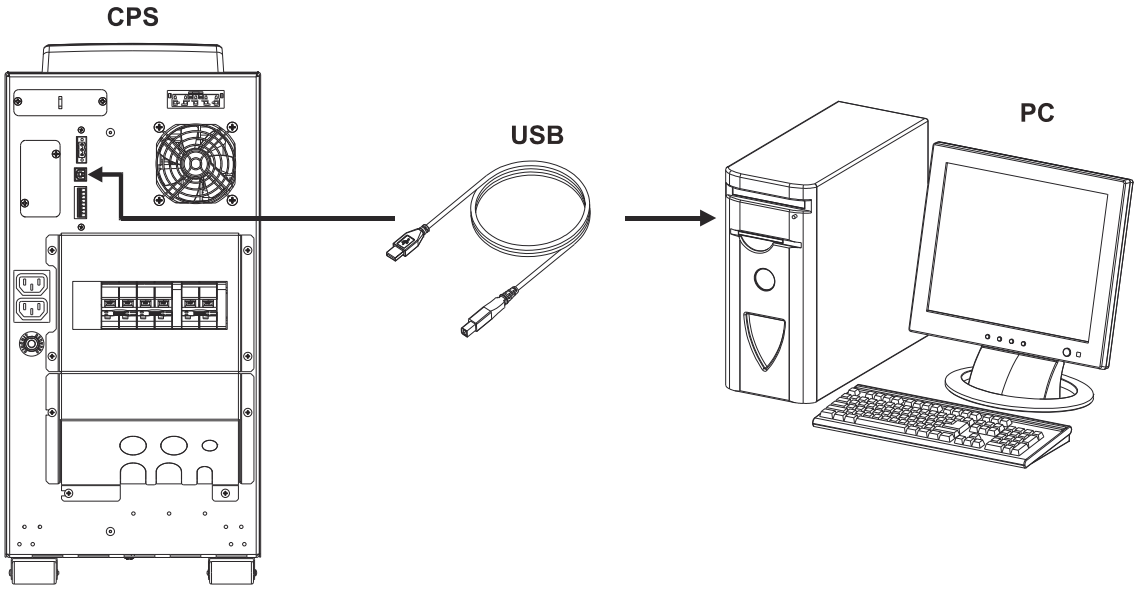
It is essential that only the kit provided by the manufacturer is used. Any uses not conforming to the specifications may cause faults or breakdowns of the equipment.

To install, connect the cable included in the special kit to the "EXT BATTERY TEMP PROBE".
After installation, enable the outdoor temperature measuring function using the configuration software.

SOFTWARE

CAUTION:
It is advisable to use a cable which is shorter than 3 metres for communication with the CPS.
To obtain additional communication ports with different functions, independent from the standard USB ports on the CPS, 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.riello-ups.com**.



MONITORING AND CONTROL SOFTWARE

The **PowerShield³** software guarantees effective, intuitive CPS 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 the USB communication ports of the CPS to the USB communication ports of the PC using the cable supplied.
2) Download the software from the web site **www.riello-ups.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.riello-ups.com**.

CONFIGURATION SOFTWARE

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

INSTALLATION OPERATIONS

1) Connect one of the CPS'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.riello-ups.com**.

CPS CONFIGURATION

The table below illustrates all the possible configurations available to the user in order to best adapt the CPS for individual requirements. It is possible to perform these operations using the configuration software. For more detailed information regarding the additional features refer to the software manual.

FUNCTION	DESCRIPTION	DEFAULT
Operating mode	Selects the operating modes	ON LINE
Output voltage	Selects the rated output voltage (Phase - Neutral)	230 V
Output nominal frequency *	Selects the rated output frequency	50 Hz
Autorestart	Waiting time for automatic power-on after the return of mains voltage	5 s
Auto power off	Automatic CPS power-off in battery operation mode if the load is lower than 5%	Disabled
Buzzer Reduced	Selects the audible alarm operating mode	Reduced
EnergyShare off	Selects the operating mode of EnergyShare sockets	Always connected (**)
Timer	Programmed CPS power ON/OFF (daily)	Disabled
Autonomy limitation	Maximum battery operation time	Disabled
Maximum load	Selects the user overload limit	Disabled
Bypass Synchronization speed	Selects the synchronisation speed of the inverter to the bypass line	1 Hz/s
External temperature	Activates reading of the external temperature probe	Disabled
Bypass mode *	Selects the mode of use of the bypass line	Enabled / High sensitivity
Bypass active in stand-by	Load supply from bypass with CPS in stand-by	Disabled (load NOT supplied)

FUNCTION	DESCRIPTION	DEFAULT
Bypass frequency tolerance	Selects the accepted range for the input frequency for switching to the bypass and for the synchronisation of the output	± 5% (**)
Bypass min.-max. threshold	Selects the accepted voltage range for switching to the bypass	Low: 180 V High: 264 V
Eco mode sensibility	Selects the intervention sensitivity during operation in ECO mode	Normal
Eco mode min.-max. threshold	Selects the accepted voltage range for operation in ECO mode	Low: 200 V High: 253 V
UPS without battery	Operating mode without batteries (for converters or voltage stabilizers)	Operating with Batteries
Battery low time	Estimated autonomy time remaining for “battery low” warning	10 min. (**)
Automatic battery test	Interval of time for the automatic battery test	40 hours (**)
Parallel common battery	Common Battery for parallel CPS systems	Disabled
Internal battery capacity	Nominal Battery capacity for internal batteries	Change according with UPS model
External battery capacity	Nominal Battery capacity for external batteries	9 Ah for UPS without internal batteries; 0Ah all other cases (**)
Battery recharging current	Recharging current compare to battery nominal capacity	12%

* *On all CPS devices of the STW series, for “Frequency converter” mode configurations or if the synchronisation with the bypass is disabled, the CPS will derate the output power.*

(**) *Compliance with standard EN 50171, the following parameters must be configured according to the indications below:*

Bypass frequency tolerance → *Configure to ± 2% or lower value*
Energy Share off → *Configure in accordance with the expected installation methods*
Automatic battery test → *Configure the battery test at least once a week*
External battery capacity → *Configure the Ah value in accordance with the battery capacity connected*
Battery low time → *Minimum value configurable 10 minutes*

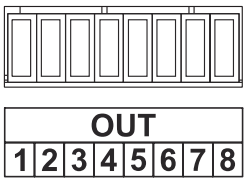
COMMUNICATION PORTS

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

- USB connector
- Dry contact OUT
- Expansion slot for additional communication cards

CONFIGURATION FOR OUTPUT SIGNALS (FACTORY DEFAULT)

The table lists the default configurations for the output signals.



OUTPUT	FUNCTION	DESCRIPTION
OUT 1	Battery working	▪ N.O. contact between pin 7 and pin 8 *(If the contact is closed, the CPS system is on battery)*
OUT 2	Battery low (*)	▪ Double throw contact: N.O. between pin 6 and pin 8; N.C. between pin 5 and pin 8 *(If the contact between pin 6 and pin 8 is closed, the battery is at the end of discharge)*
OUT 3	Battery circuit alarm	▪ N.C. contact between pin 3 and pin 4 *(If the contact is open, at least one anomaly or fault is active in the charger stage or in the batteries)*
OUT 4	Normal operation	▪ Double throw contact: N.O. between pin 2 and pin 4; N.C. between pin 1 and pin 4 *(If the contact between pin 6 and pin 8 is closed, the CPS system is working)*

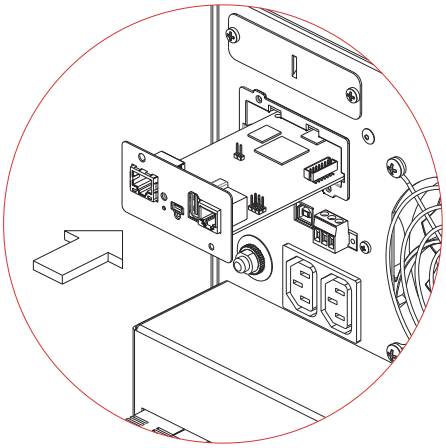
(*) Double throw contact configurable via the configuration software

NOTE: The output dry contacts are rated to 1A @ 24Vdc or 1A @ 30Vac

COMMUNICATION SLOT

The CPS 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:

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



To check the availability of other accessories, visit the website **www.riello-ups.com**.

TROUBLESHOOTING

An irregular operation of the CPS 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 CPS, 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 CPS 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 CPS cannot function without the neutral connection. WARNING: the absence of this connection can damage the CPS 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 CPS output.
NO POWER REACHES THE LOAD	CONNECTION TO THE OUTPUT TERMINAL MISSING	Connect the load to the terminals
	THE CPS IS IN STAND-BY MODE	Run the start-up sequence
	THE STAND-BY OFF MODE HAS BEEN SELECTED	The operating mode must be changed. In fact, the STAND-BY OFF (emergency) mode only powers the loads when a black out occurs.
	MALFUNCTION OF THE CPS AND AUTOMATIC BYPASS OUT OF USE	Insert the maintenance bypass (SWMB) and contact the nearest service centre
THE CPS 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 CPS 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 CPS 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 CPS 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 CPS
	FAULT IN HEAT SINK TEMPERATURE PROBE	Activate the maintenance bypass (SWMB) if present, turn the CPS off and back on again and exclude the maintenance bypass. If the problem persists, contact the nearest service centre
THE DISPLAY SHOWS ONE OR MORE OF THE FOLLOWING CODES: F09, F10	THE VOLTAGE VALUE OF PHASE 1 IS NOT SUFFICIENT TO PRE-LOAD THE CPS	Wait for the input network voltage values to stabilise within the ranges accepted by the CPS.
	FAULT IN THE CPS INPUT STAGE	Activate the maintenance bypass (SWMB) if present, turn the CPS off then back on again. Exclude the maintenance bypass. If the problem persists, contact the nearest service centre.
THE DISPLAY SHOWS ONE OR MORE OF THE FOLLOWING CODES: F11, F14, F17, L06, L07, L08, L09, L14, L17, L20	ANOMALOUS LOADS APPLIED	Remove the load. Insert the maintenance bypass (SWMB) if present, turn the CPS off and back on again. Exclude the maintenance bypass. If the problem persists, contact the nearest service centre
	FAULT IN THE INPUT OR OUTPUT STAGE OF THE CPS	Activate the maintenance bypass (SWMB) if present, turn the CPS off and back on again. Exclude the maintenance bypass. If the problem persists, contact the nearest service centre
THE DISPLAY SHOWS ONE OR MORE OF THE FOLLOWING CODES: F03, A08	INTERNAL PROTECTION FUSES ON THE PHASE OR ON THE INPUT RELAY BROKEN	Contact the nearest service centre

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 CPS off completely. Turn the CPS back on and if the problem persists, contact the nearest service centre
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.
THE DISPLAY SHOWS THE FOLLOWING CODE: U06	THE BATTERIES ARE DISCHARGED; THE CPS WAITS FOR THE BATTERY VOLTAGE TO EXCEED THE SET THRESHOLD	Wait for the batteries recharging or force start-up manually.
THE DISPLAY SHOWS ONE OR MORE OF THE FOLLOWING CODES: L01, L10, L38, L39, L41	FAULT IN: ▪ TEMPERATURE PROBE OR CPS COOLING SYSTEM ▪ MAIN AUXILIARY POWER SUPPLY ▪ STATIC BYPASS SWITCH	Activate the maintenance bypass (SWMB) if present, turn the CPS off and back on again. Exclude the maintenance bypass. If the problem persists, contact the nearest service centre
THE DISPLAY SHOWS ONE OR MORE OF THE FOLLOWING CODES: A22, F23, L23	THE LOAD APPLIED TO THE CPS IS TOO HIGH	Reduce the load to below the 100% threshold (or user threshold for the code A22)
THE DISPLAY SHOWS THE FOLLOWING CODE: L26	SHORT CIRCUIT AT OUTPUT	Switch off the CPS. Disconnect all the devices. Turn the CPS back on. Reconnect the devices one by one until the fault is identified.
THE DISPLAY SHOWS THE FOLLOWING CODE: A39	THE BATTERIES HAVE FAILED THE PERIODIC EFFICIENCY TEST	It is recommended to replace the batteries of the CPS, since they ate no longer able to maintain the charge for a sufficient autonomy. **Warning: The replacement of the batteries must be carried out by qualified personnel.**

PROBLEM	POSSIBLE CAUSE	SOLUTION
THE DISPLAY SHOWS ONE OR MORE OF THE FOLLOWING CODES: F34, L34	▪ AMBIENT TEMPERATURE HIGHER THAN 40°C ▪ HEAT SOURCES CLOSE TO THE CPS ▪ VENTILATION SLITS OBSTRUCTED OR TOO CLOSE TO THE WALLS	Activate the maintenance bypass (SWMB) if present, without switching off the CPS. This way, the fans will cool the heat sink more rapidly. Eliminate the cause of the overtemperature and wait for the temperature of the heat sink to drop. Exclude the maintenance bypass.
	FAULT IN TEMPERATURE PROBE OR CPS COOLING SYSTEM	Insert the maintenance bypass (SWMB) if present, without switching off the CPS, 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 CPS off and back on again. Exclude the maintenance bypass and if the problem persists, contact the nearest service centre.
THE DISPLAY SHOWS ONE OR MORE OF THE FOLLOWING CODES: F37, L37	▪ AMBIENT TEMPERATURE HIGHER THAN 40°C ▪ HEAT SOURCES CLOSE TO THE CPS ▪ VENTILATION SLITS OBSTRUCTED OR TOO CLOSE TO THE WALLS ▪ FAULT IN THE TEMPERATURE PROBE OR IN THE BATTERY CHARGER COOLING SYSTEM	Eliminate the cause of the overtemperature. Activate the maintenance bypass (SWMB) if present, open the battery fuse holder isolators (SWBATT) and wait for the temperature of the battery charger heat sink to drop. Close the battery fuse holders. If the problem persists, contact the nearest service centre. WARNING: never open the SWBATT fuse holder isolators during battery operation.
THE DISPLAY SHOWS THE FOLLOWING CODE: L11	STATIC BYPASS RUPTURE OR FAULT	Activate the maintenance bypass (SWMB) if present. Turn the CPS off and back on again. Exclude the maintenance bypass and if the problem persists, contact the nearest service centre.
THE DISPLAY SHOWS NOTHING OR PROVIDES INCORRECT INFORMATION	THE DISPLAY HAS POWER SUPPLY PROBLEMS	Activate the maintenance bypass (SWMB), shut down the CPS completely and wait for a few seconds. Turn ON the CPS again and verify display regular operation. Exclude the maintenance bypass. If the fault persists, contact the nearest technical support centre.
THE DISPLAY IS OFF, THE FANS ARE OFF BUT THE LOAD IS POWERED	FAULT IN THE AUXILIARY POWER SUPPLIES. THE CPS IS IN BYPASS SUPPORTED BY THE REDUNANT POWER SUPPLY.	Activate the maintenance bypass (SWMB) if present. Switch off the CPS, wait for a minute and turn the CPS back on. If the display does not turn on or if the sequence fails, contact the nearest service centre, leaving the CPS in manual bypass mode.
THE DISPLAY SHOWS THE FOLLOWING CODE: ddp	THE CPS HAS REACHED THE MINIMUM BATTERY VOLTAGE LEVEL DURING THE LAST MAINS FAILURE	The alert message can be removed only when the system has returned to work correctly from the mains (as required by the EN50171 standard). To remove the alert message, press the ON key.

(*) The alarm may occur the first time the CPS is switched on if the battery is incorrectly connected.

ATTENTION:
The CPS 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.riello-ups.com**

STATUS / ALARM CODES

By using a sophisticated self-diagnostic system, this CPS can check and indicate on the display panel its status and any error and/or fault occurred during operation. Whenever a problem arises, the CPS 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
C02	Remote load on bypass command
C03	Remote start-up command
C04	Battery test running
C05	Manual bypass command
C06	Emergency switch-off command
C08	Load on bypass command

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

CODE	DESCRIPTION
U01	Low battery warning
U02	Programmed switch-off enabled
U03	Programmed switch-off imminent
U04	Bypass disabled
U05	Synchronisation disabled (CPS in Free running mode)
U06	Waiting for battery charging
U07	Service CPS
U08	Service Batteries

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

CODE	DESCRIPTION
A03	Inverter not synchronised
A05	Overvoltage on input line of Phase1
A08	Undervoltage on input line of Phase1
A11	Input frequency outside tolerance limits
A13	Voltage on bypass line of Phase1 out of tolerance limits
A16	Bypass frequency out of tolerance limits
A18	Voltage on bypass line out of tolerance limits
A22	Load on Phase1 > user-defined threshold
A25	Output isolator open
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
A37	External battery temperature probe damaged
A38	External battery overtemperature
A39	Positive branch batteries must be replaced
A45	Exceeding the load
ddp	Deep discharge protection

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

CODE	DESCRIPTION
F01	Internal communication error
F03	Phase1 input fuse blown
F09	Precharge of positive branch condensers failed
F10	Precharge of negative branch condensers failed
F11	BOOST stage anomaly
F14	Inverter Phase1 sine curve distorted
F17	Inverter stage anomaly
F19	Positive battery overvoltage
F23	Output overload
F26	Phase1 output relay locked (will not open)
F29	Phase1 output fuse broken or output relay locked (will not close)
F32	Battery charger stage anomaly
F33	Battery measures error
F34	Heat sink overtemperature
F37	Battery charger overtemperature
F39	VDC Bus measures error
F40	Fan failure
F41	Redundant Bypass failure

- **Locks:** these codes indicate that the CPS, 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
L02	One or more internal cables disconnected
L03	Phase1 input fuse broken
L06	BOOST stage overvoltage positive
L07	BOOST stage overvoltage negative
L08	BOOST stage undervoltage positive
L09	BOOST stage undervoltage negative
L10	Static bypass switch fault
L11	L1 bypass output locked
L14	Phase1 inverter overvoltage
L17	Phase1 inverter undervoltage
L20	Continuous voltage at inverter output or Sine curve of Phase1 inverter distorted
L23	Phase1 output overload
L26	Short circuit at Phase1 output
L34	Phase1 heat sink overtemperature
L37	Battery charger overtemperature
L38	Temperature probe 1 damaged
L39	Temperature probe 2 damaged
L41	Battery charger temperature probe damaged
L49	Inverter capacitor damaged

TECHNICAL DATA

CPS MODELS		3 kVA	5 kVA

INPUT

Nominal voltage	[Vac]	220 - 240 (1P+N+PE)	
Earthing system		TN - TT - IT	
Maximum operating voltage	[Vac]	300	
Nominal frequency	[Hz]	50 - 60	
Accepted tolerance for input voltage without activation of battery		±20% @ 100% load -40% +20% @50% load	
Accepted tolerance for input frequency without activation of battery (for 50/60Hz)		±20% 40-72Hz	
Rated current (1)	[A]	15	25

BATTERY

Recharge time (standard versions)	[h]	< 4h for 80% of the charge
Nominal voltage	[Vdc]	180
Maximum recharging current (2)	[A]	6

OUTPUT

Nominal voltage (3)	[Vac]	Selectable: 220 / **230** / 240	
Frequency (4)	[Hz]	Selectable: **50** / 60	
Rated apparent output power	[VA]	3000	5000
Rated active output power	[W]	3000	5000
Rated apparent output power compliant with EN 50171	[VA]	2500	4000
Rated active output power compliant with EN 50171	[W]	2500	4000
Overloading: 100% < load < 110%		Bypass line available:	Bypass activated after 10 min. Then continues to work on bypass line
		Bypass line not available:	Blocked after 10 min
Overloading: 110% < load < 130%		Bypass line available:	Bypass activated after 1 min. Blocked after 1 hour
		Bypass line not available:	Blocked after 1 min
Overload: 130% < load < 150%		Bypass line available:	Bypass activated after 5 s. Blocked after 10 min
		Bypass line not available:	Blocked after 5 s
Load overload > 150%		Bypass line available:	Bypass immediately activated. Blocked after 3 s
		Bypass line not available:	Blocked after 0.5 s
Short circuit current (Bypass line not available)		Icc =2.5 In x 200 ms + 1.5 In x 300 ms	
Short circuit current with available bypass line		bypass activated instantaneously	
Max current in short circuit (Tj 25°C)	10 ms 100 ms 200 ms 300 ms 400 ms 500 ms	1100 A 670 A 570 A 530 A 520 A 510 A	
Specification of Bypass SCR (to size the bypass line protection)		I^2t_{max} = 4325 A^2 s	

OTHER DATA

Leakage current towards ground	[mA]	≤ 1.5
Room temperature (5)	[°C]	0 – 40
Humidity		5 ÷ 95 % without condensation
Storage temperature	[°C]	-15 ÷ 40 (CPS with batteries) -25 ÷ 60 (CPS without batteries)
Maximum operating altitude	[m]	1000 a.s.l. (derating of 1% for each 100m between 1000 and 4000m)
Safety standard		CEI EN 62040-1 (*General and safety requirements for UPS*)
Electromagnetic Compatibility		Cat. C2
Pollution degree		PD2
Overvoltage category		OVC II
Protective class		Class I
IP protection class		IP20 (IP21 available on request)
Protection devices		excessive battery discharge – battery inversion - over current - short circuit - over voltage - under voltage - thermal
Dimensions W x D x H	[mm]	250x698x500
Weight	[Kg]	25

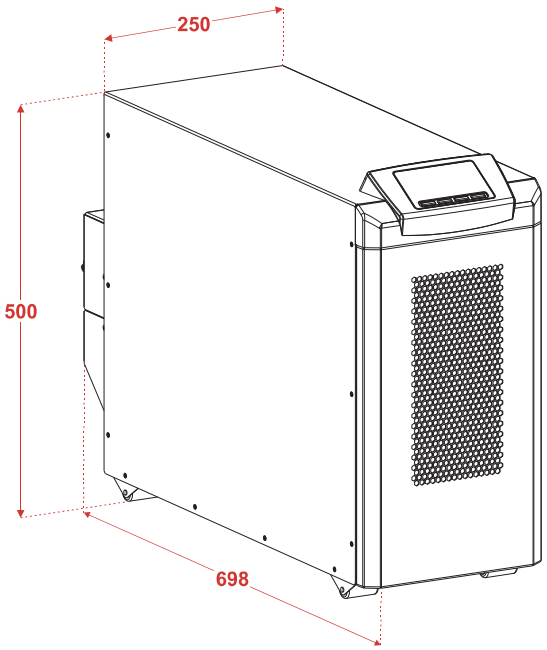
BATTERY CABINET MODEL		**KSTW180-A------ KSTW180-L------**	**KSTW180-M------ KSTW180-V------**
Rated battery voltage	[Vdc]	180	
Dimensions W x D x H	[mm]	250 x 698 x 500	
Weight	[Kg]	57	87

The "-" symbol replaces an alphanumeric code for internal use.

For additional details regarding technical data refer to website

(1) *In the Bypass operating mode, all the load current is absorbed by the input line*
(2) The recharging current is regulated automatically according to the capacity of the battery installed. Derating of the current delivered with a load greater than 80%.
(3) To maintain output voltage within the accuracy range specified, recalibration may be necessary after a long period of operation.
(4) If the mains frequency is within ± 5% of the selected value, the CPS is synchronized with the mains. If the frequency is out of tolerance range or in battery operation, the frequency is that selected ± 0.1%.
(5) 20 - 25 °C for maximum battery life.

MECHANICAL DIMENSION



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