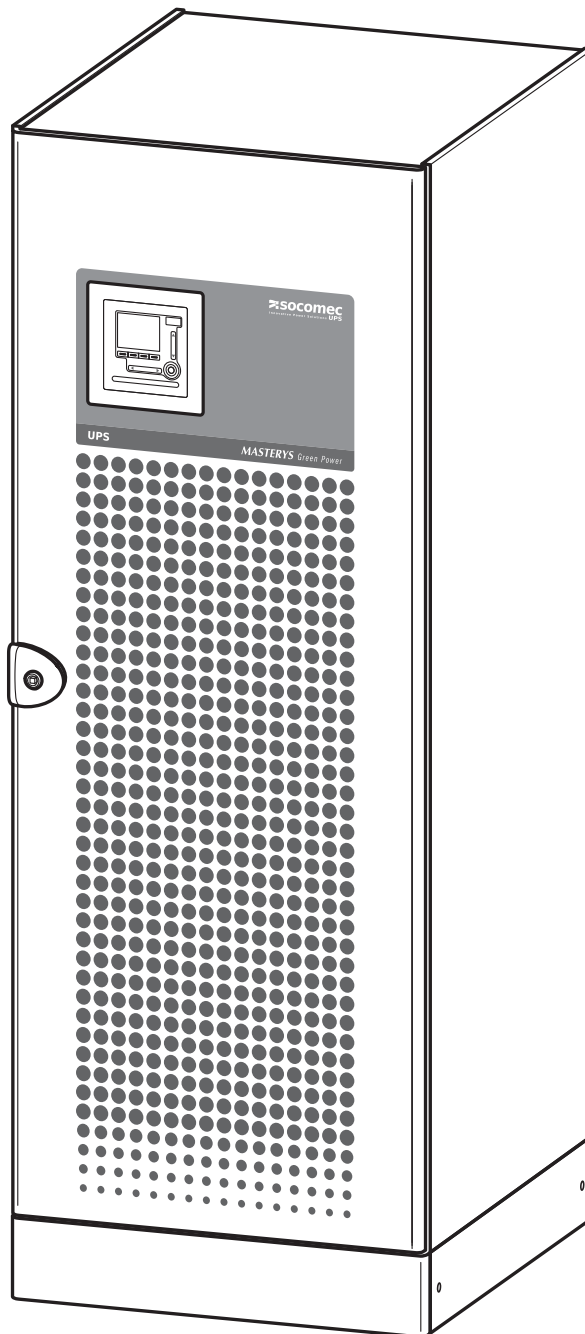


MASTERYS Green Power

100-120 kVA



IOMMASGPXX00-GB_00

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This SOCOMEC UPS continuous power system is guaranteed against any manufacturing and material defects.

The period of validity of the warranty is 12 (twelve) months from the date of commissioning, if said activation is carried out by SOCOMEC UPS personnel or personnel from a support centre authorised by SOCOMEC UPS, and not however more than 15 (fifteen) months from the date of shipment by SOCOMEC UPS.

The warranty is recognized within national territory. If the UPS is exported out of national territory, the warranty shall be limited to the cover of the parts used to repair the fault.

The warranty is valid ex-works and covers labour and parts used to repair the fault.

The warranty shall not apply in the following cases:

- Failures due to fortuitous circumstances or force majeure (lightning, floods, etc.);
- Failures due to negligence or improper use (use out of tolerance: temperature, humidity, ventilation, electric power supply, applied load, batteries);
- Insufficient or inadequate maintenance;
- Attempted maintenance, repairs or modifications not carried out by SOCOMEC UPS personnel or personnel from a support centre authorised by SOCOMEC UPS.
- If the battery has not been recharged in accordance with the terms indicated on the packaging and in the manual, in cases of extended storage or UPS inactivity.

SOCOMEC UPS may, at its own discretion, opt for the repair of the product or for the replacement of the faulty or defective parts with new parts or with used parts that are equivalent to new parts with regard to functions and performance.

Defective or faulty parts replaced free of charge are to be put at the disposal of SOCOMEC UPS who becomes the sole owner.

Replacements or repairs of parts and any modifications to the product during the warranty period cannot extend the duration of the warranty.

In no case will SOCOMEC UPS be responsible for damages (including, without limitations, damage for loss of earnings, interruption of activity, loss of information or other economic losses) deriving from the use of the product.

The present conditions are subject to Italian law. Any dispute falls under the province of the Court of Vicenza.

2.1 IMPORTANT.

- This document provides important instructions for the safe use, movement and connection of the MASTERYS™ uninterruptible power system (UPS).
- SOCOMEC UPS retains the full and exclusive ownership rights over this document. Only a personal right to utilize the document for the application indicated by SOCOMEC UPS is granted to the recipient of such document. All reproduction, modification, dissemination of this document whether in part or whole and by any manner are expressly prohibited except upon Socomec's express prior written consent.
- This document is not a specification. SOCOMEC UPS reserves the right to make any changes to data without prior notice.
- The unit must be installed and activated only by qualified technical personnel and authorised by SOCOMEC UPS.



The UPS MUST be handled with the utmost care by at least two people.

- The unit must remain in a vertical position in all circumstances.
- Connect the PE ground conductor first before you make any other connection.



The UPS mains power supplies (rectifier and bypass) must be protected from voltage transients with devices that are suited to the installation; the mains voltage transients must be limited to 2.5 kV. These devices must be sized to take into account all the installation parameters (geographical position, whether or not there is a lightning rod, whether or not there are other suppressors in the electrical installation, etc.).

- Do not expose the UPS to rain or liquids in general. Do not introduce external bodies.
- If the UPS is not equipped with automatic sectioning against back feed or if the switch is external to the UPS, affix a label bearing the following words on all the external switches of the UPS power supply:

**ISOLATE THE UPS BEFORE
OPERATING ON THIS CIRCUIT**

- Keep this manual handy for future consultation.
- If the unit fails, it must be repaired only by authorised technicians that have been specially trained for this purpose.
- This equipment conforms to the European Community directives for professional equipment and bears the approval mark **CE**
- The UPS requires three-phase plus neutral input connections (3P+N).
- The UPS can be supplied by an IT distribution system with a neutral conductor.



**The connecting bars are made of aluminium!
Use only aluminium cables or cables with tinned eyelets for the connections.**

- Do not connect the output neutral to ground. The UPS does not modify the neutral arrangements of the system;

the use of an isolation transformer is required should it be necessary to modify the neutral arrangements downstream of the UPS.

- If the UPS needs to be scrapped, it is essential to entrust the equipment solely and exclusively to specialist disposal companies. These are obliged to break up and dispose of the various components in accordance with the legal provisions in force nationally.
- Before connecting the external battery cabinet, check that this is fully compatible with the model of UPS.
- The use of external battery cabinets not supplied by the manufacturers is not recommended.
- Switch off and isolate the UPS and then wait for 5 minutes before removing the protection panels in order to carry out work on parts under dangerous voltage.
- Danger of explosion if the batteries are replaced with others of the wrong type.
- The batteries are considered as toxic waste. If they are replaced, entrust the used batteries solely and exclusively to specialist disposal companies. As provided for by the local laws in force, batteries must not be disposed of with other industrial or domestic waste.



It is very dangerous to touch any part of the batteries as there is no isolation between the batteries and the mains power source.

The product you have chosen is designed for commercial and industrial use only. In order to be used for particular “critical applications” such as life support systems, medical applications, commercial transportation, nuclear facilities or any other application or systems where product failure is likely to cause substantial harms to person or property, the products may have to be adapted. For such uses we would advise you to contact SOCOMEC UPS beforehand to confirm the ability of these products to meet the requested level of safety, performance, reliability and compliance with applicable laws, regulations and specifications.



WARNING!

This is a product for commercial and industrial application in the second environment – installation restrictions or additional measures may be needed to prevent disturbances.

2.2 DESCRIPTION OF THE SYMBOLS USED ON THE LABELS APPLIED TO THE UNIT.

All the precautions and the warnings on the labels and plates on the inside and outside of the equipment should be respected.



DANGER! HIGH VOLTAGE (BLACK/YELLOW)



GROUND TERMINAL



READ THE USER MANUAL BEFORE USING THE UNIT

The packaging guarantees the stability of the UPS during shipping and physical transfer. Carry the packaged unit as close as possible to the installation site.



When moving the unit on even slightly sloping surfaces, use the blocking equipment and breaking devices to ensure that the unit does not fall over.

3.1 SHIPPING AND MOVING.

- The UPS must remain in a vertical position during all shipping and moving operations.
- Ensure that the floor is strong enough to support the weight of the UPS and of the battery cabinet, if used.



Avoid moving the unit by putting pressure on the front door.



The UPS MUST be handled with the utmost care by at least two people.



CAUTION IF DAMAGED.

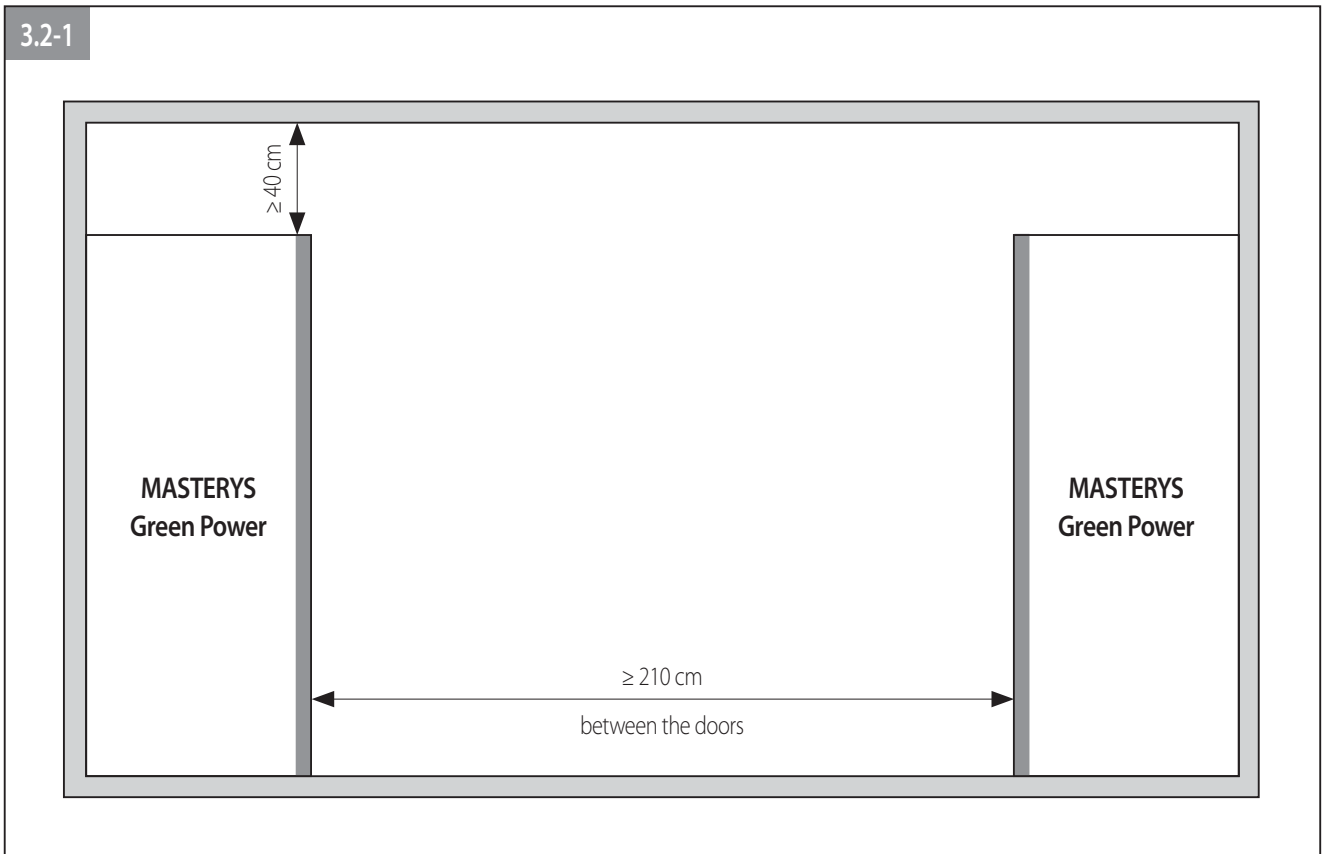
Packages, crushed, punctured, or torn such that contents are revealed must be set aside in an isolated area and inspected by a qualified person. If the package is deemed to be not shippable, the contents must be promptly collected, segregated, and either the consignor or consignee contacted.



All packaging material must be recycled in compliance with the laws in force in the country where the system is installed.

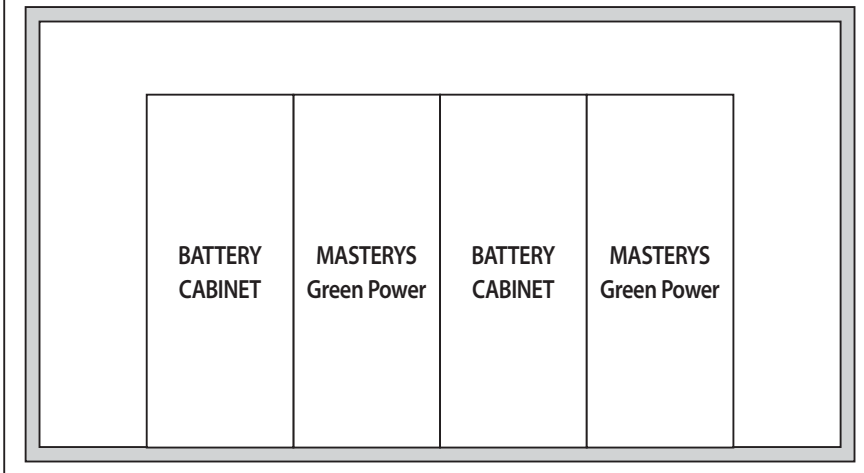
3.2 ENVIRONMENTAL REQUISITES.

- The UPS is not designed for outdoor use.
- Do not expose the UPS to direct sunlight or to sources of excessive heat.
- The recommended operating temperature, humidity and altitude values are listed in the technical specifications table (see chapter 11). Cooling systems may be required to maintain these values.
- The UPS must be installed in an environment without obstructions and which is dry, clean and dust-free.
- Avoid dusty environments or areas where there is dust from conductive or corrosive materials (e.g. metal dust or chemical solutions).
- The UPS can be installed against a wall; the distance will depend on the cables present. The upper part of the UPS must be positioned at least 40 cm away from the ceiling (figure 3.2-1).
- The UPS switches are accessed from the front; however, a space of at least 1.5 metres should be left at the front of the UPS for maintenance purposes (figura 3.2-1).
- For UPSs arranged frontally, leave a minimum space of 210 cm between the two cabinets so as to allow a passageway when both doors are open (in accordance with the provisions of standard IEC 60364 - see figure 3.2-1).

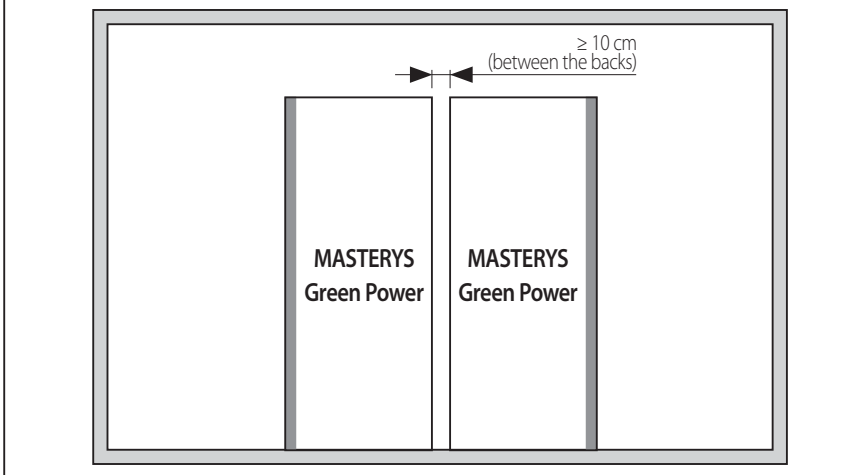


- Several cabinets can be installed adjacent to each other (figure 3.2-2).
- Two Masterys Green Power 100-120 can be installed back to back (figure 3.2-3).
- Observe the direction of the ventilation flows (figure 3.2-4) and heat dispersion flows (figure 3.2-5). See chapter 11 for the technical specifications relating to the required ventilation values.

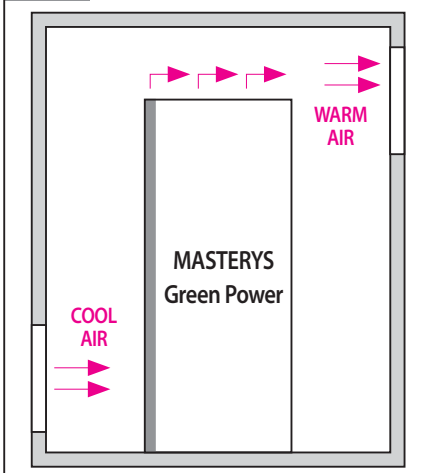
3.2-2



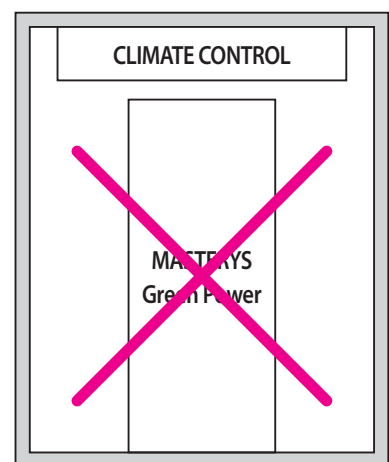
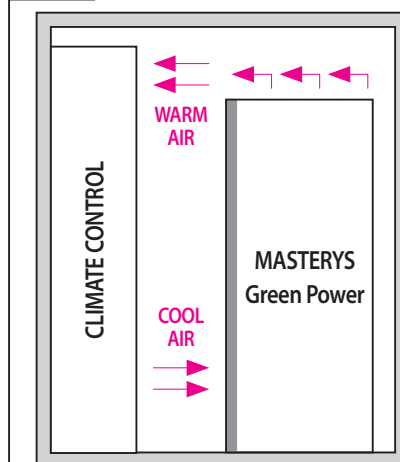
3.2-3



3.2-4 Ventilation.



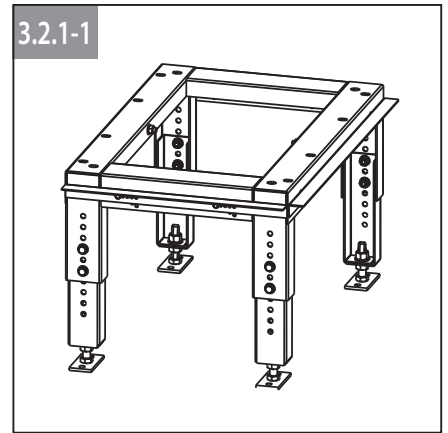
3.2-5 Climate control.



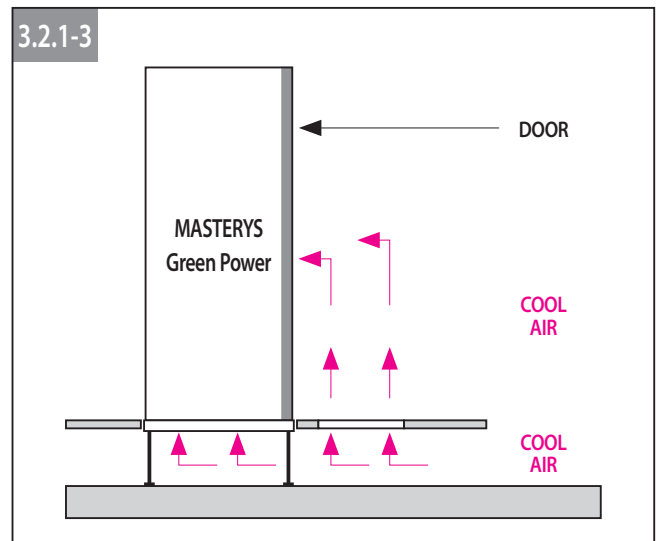
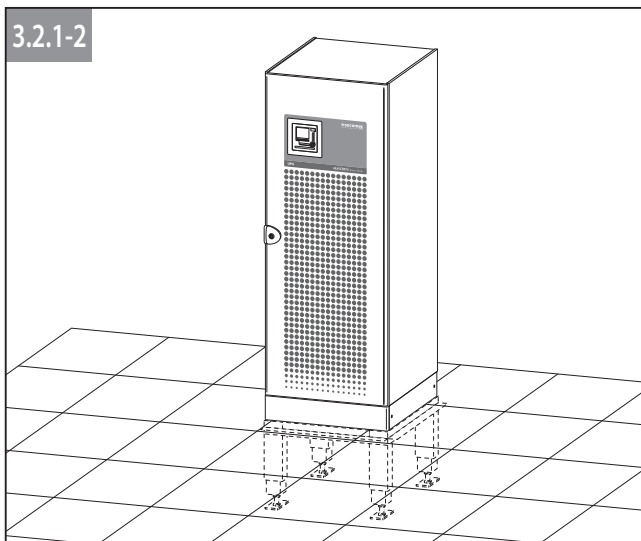
3.2.1 Installation on raised flooring.

If the UPS is to be installed on raised flooring, the SOCOMEC UPS adjustable frame (figure 3.2.1-1) must be used to support the weight of the unit (figure 3.2.1-2).

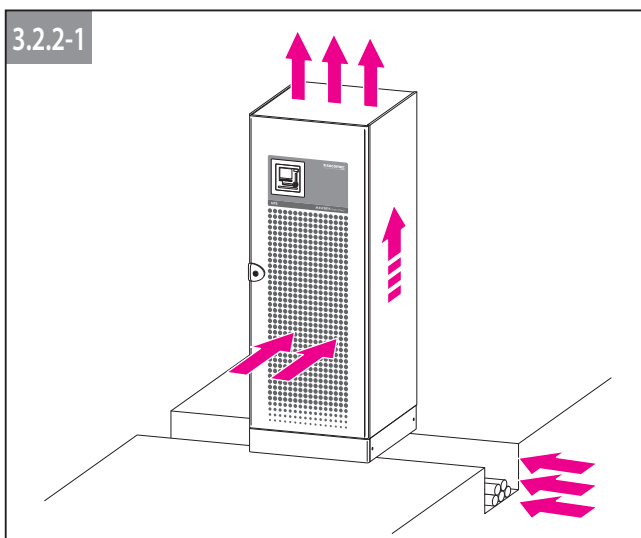
 Refer to the relevant installation manual provided in the packaging for information on frame assembly operations.



Allow for small openings in the floor panels to ensure the air flow at the front (figure 3.2.1-3).



3.2.2 Installation over a tunnel.



3.3 GENERAL RULES FOR CABLE INSTALLATION ON TRAY.


WARNING!

The cables must be installed on trays when indicated in the following diagrams. The trays must be positioned near to the UPS.

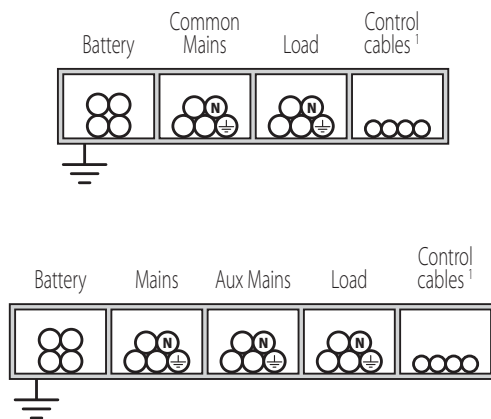

WARNING!

All metal and suspended ducts or those in raised flooring **MUST** be connected to earth and to the various cabinets.

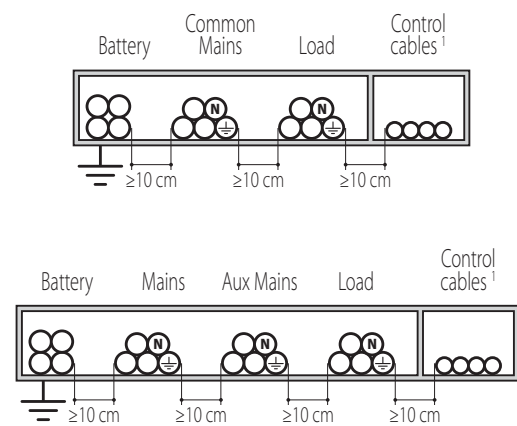

WARNING!

Power cables and control cables **MUST NEVER** be installed in the same duct.

3.3-1 Correct installation.

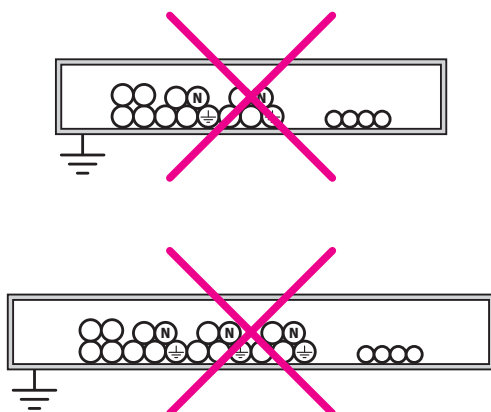


3.3-2 Allowed installation.


WARNING!

Risk of electromagnetic interference between battery cables and output cables.

3.3-1 Wrong installation.


WARNING!

Do not expose power cables to other equipments sensitive to the electromagnetic field.

¹ Control cables: connections between the cabinets and each unit, alarm signals, remote mimic panel, connection to the BMS (Building Management System), emergency stop, connection to generator.

3.4 ELECTRICAL REQUISITES.

The installation and the system must comply with national plant regulations. The electrical distribution panel must have a protection and sectioning system installed for the input mains and the auxiliary mains. If a differential switch is installed on the mains power switch (optional), it must be inserted upstream from the distribution panel.

The table below show the size of the input protection devices recommended for correct installation.

Size of the input protection devices

Magneto-thermal input ¹	Magneto-thermal Aux Mains ¹	Differential input ⁴	Input and output cable core size		Battery cable core size		Magneto-thermal battery ^{3,6}
			min	max	min	max ⁵	
single/parallel ²	single/parallel ²	selective type					
250 A	250 A	0,5 A	70 mm ²	150 mm ²	70 mm ²	120 mm ²	250 A

¹ Recommended magneto thermal switch: four poles with intervention threshold $\geq 10 I_n$

² In installations with two UPSs operating in a redundant or power parallel configuration.

³ Quadropole protection on external battery cabinet.

⁴ Caution! Use type B four-pole selective (S) circuit breakers. Load leakage currents are added to those generated by the UPS and during transitory phases (power failure and power return) short current peaks may occur. If loads with high leakage current are present, adjust the differential protection. It is advisable in all cases to carry out a preliminary check on the earth current leakage with the UPS installed and operational with the definitive load, so as to prevent the sudden activation of the above switches.

⁵ Determined by the size of the terminals.

⁶ Recommended magneto thermal switch: four poles with intervention threshold $\geq 3 I_n$



The UPS is designed for transitory overvoltages in category II installations. If the UPS is part of the building's electric circuit or if it is likely to be subject to transitory overvoltages in category III installations, further external protection must be provided, either on the UPS or in the AC power supply network to the UPS. In addition, the "Surge arrestor" option, specially designed to protect against residual overvoltages in category III installations, can be installed in the external manual bypass cabinet. If used, the distance between the UPS and the centralised 4 kV SPD protections type 1 must be $U_p \leq 4kV$ is $\geq 15m$.



In the event of three-phase distorting loads connected in output, the current on the neutral conductor may have a value that is 1.5 - 2 times the phase value (also for the input bypass). In this case, size the neutral cables and the input/output protection adequately.

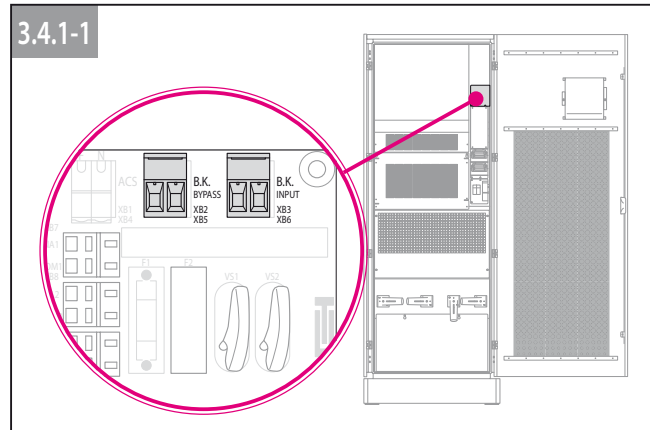
3.4.1 Backfeed protection.

The UPS is preset for the installation of external protection devices against the backfeed of dangerous voltages, on both the input power supply line (MAINS SUPPLY) and on the auxiliary backup mains power supply line (AUX MAINS SUPPLY); these devices are controlled by means of the card shown in figure 3.4.1-1.

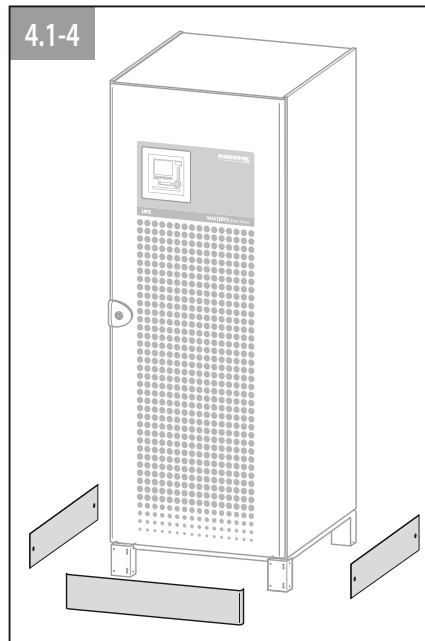
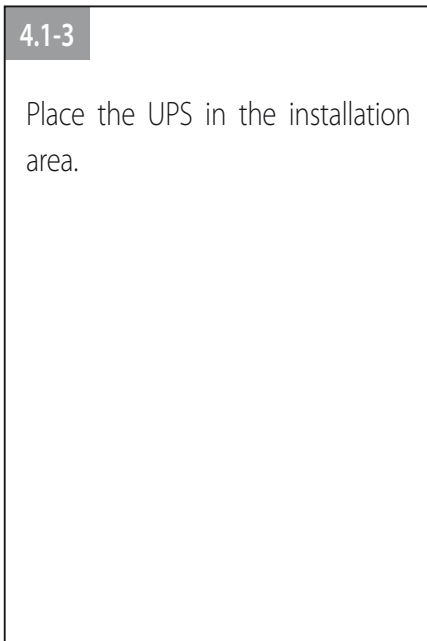
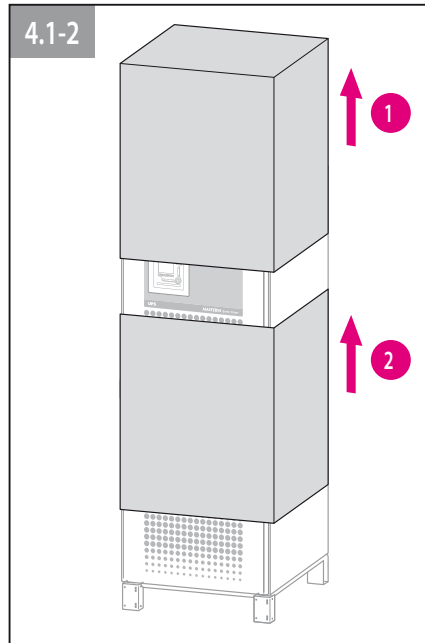
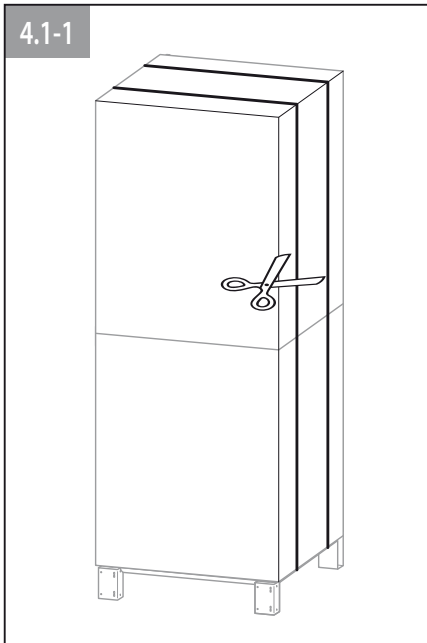
In the event that the equipment does not have a voltage protection device, warning labels must be affixed on all mains power disconnectors installed away from the UPS area, in order to remind support personnel that the circuit is connected to a UPS (see also paragraph 2.1 "Warnings" of this manual and paragraph 4.5.3 of standard EN62040-1-1 2003-11). The label is supplied with the equipment.

If, in certain anomaly states, or because of the installation upstream (e.g. undetected and protected earth fault, or high leakage in a phase, or with IT systems) there is a hazardous potential on neutral, a suitable isolating switch must be provided on the neutral as well, or else there must be a detection, signalling and protection system (see "Input protection scaling" table in section 3.4 "Electrical requirements").

Connections, refer to paragraph 4.4.5.



4.1 UNPACKING PROCEDURE.

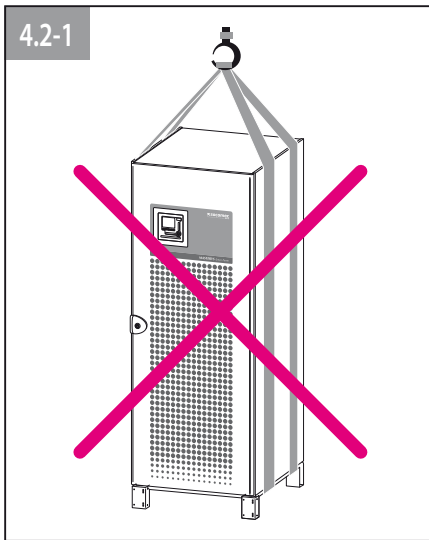
**WARNING!**

Refer to paragraph 4.2 if the equipment has to be moved from above.



All packaging material must be recycled in compliance with the laws in force in the country where the system is installed.

4.2 MOVING FROM ABOVE.

**IMPORTANT!**

When being moved, the cabinets must be kept in an upright position.

**WARNING!**

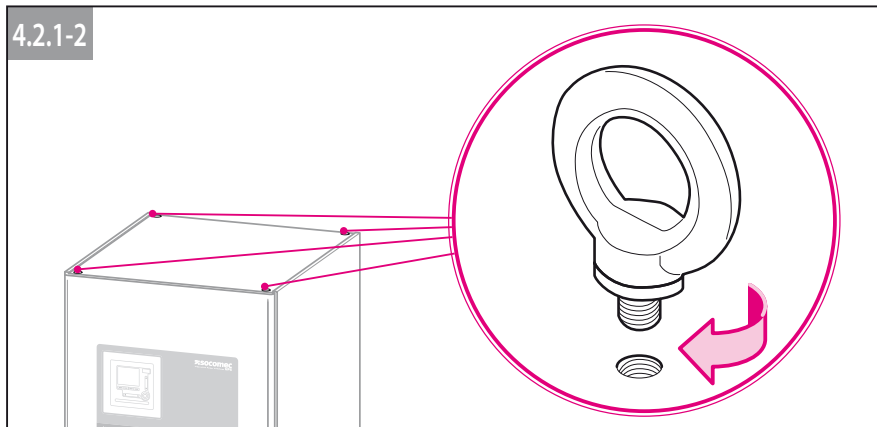
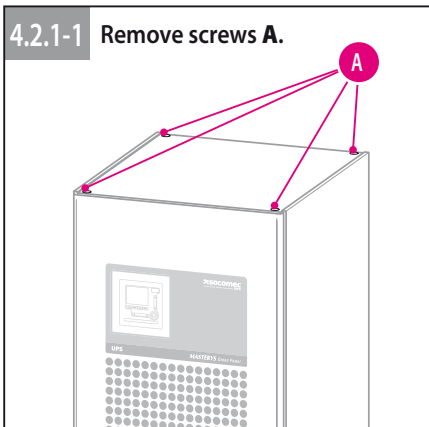
NEVER USE HARNESES!

4.2.1 Moving with belts.

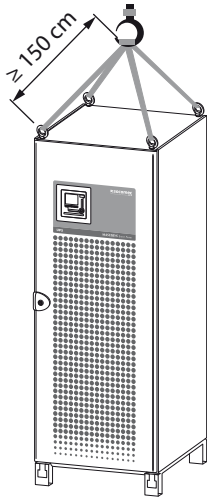
- Length of belts: ≥ 150 cm
- Lifting eyebolts (supplied on request): internal $\varnothing 30$ mm, thread M12.

**WARNING!**

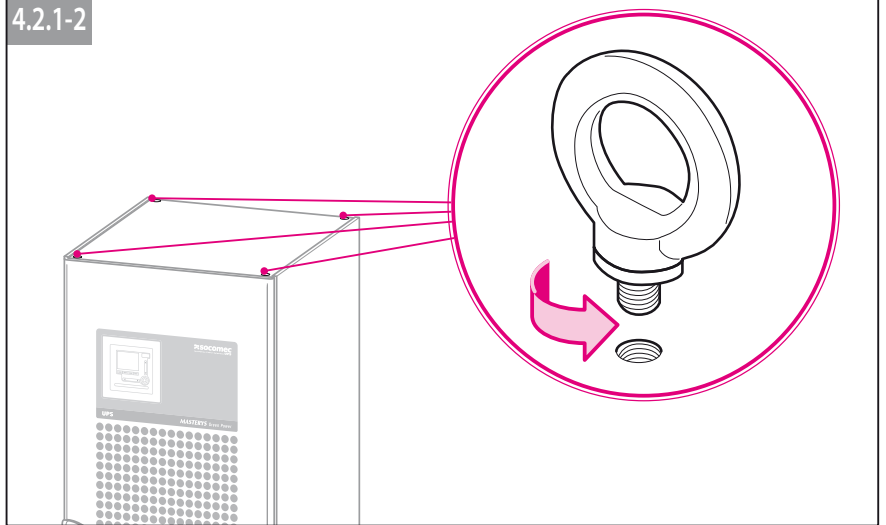
LIFT AND HANDLE THE CABINETS WITH THE UTMOST CARE AND WITHOUT JERKING!



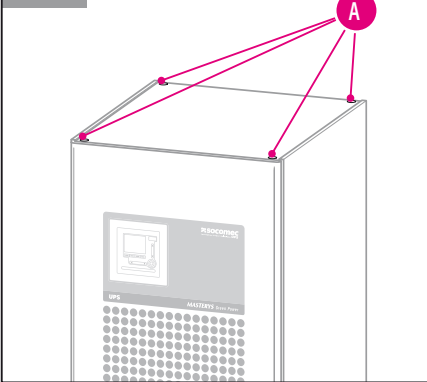
4.2.1-3



4.2.1-2



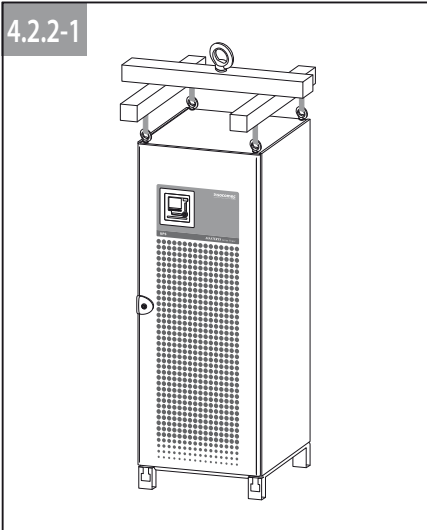
4.2.1-3 Tighten screws A.



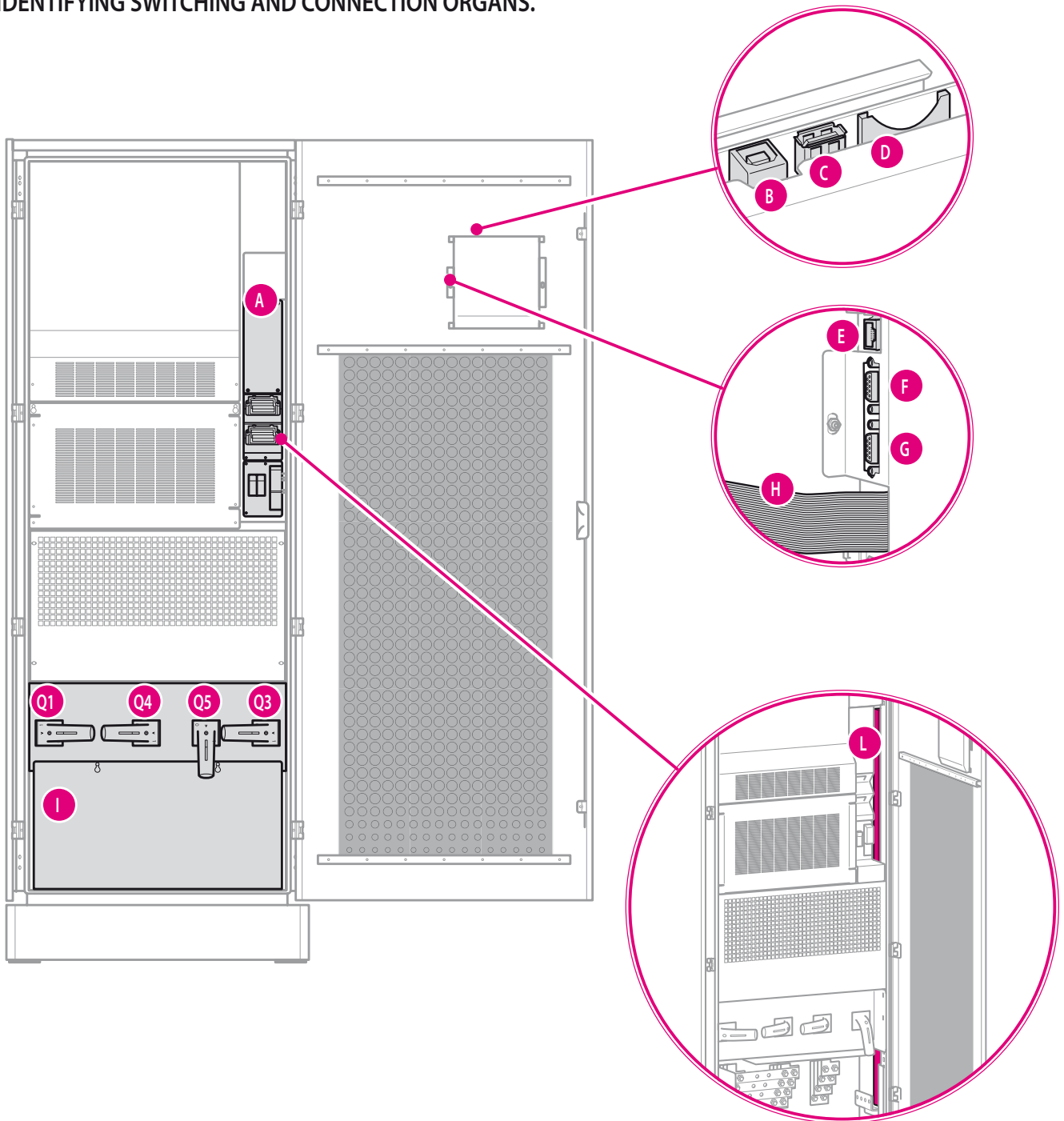
4.2.2 Moving with lifting truss.

If the height of the ceiling does not allow the use of belts, the UPS can be moved using lifting trusses.

4.2.2-1



4.3 IDENTIFYING SWITCHING AND CONNECTION ORGANS.

**Legend.**

- A Slot for optional communication cards.
- B USB port.
- C USB port.
- D Slot for memory card.
- E LAN RJ45 connector for Ethernet.
- F Serial RS232 connector for CIM.

- G Serial RS232 connector for Modem.
- H Cable for power supply and communication signals
- I Power connections.
- L Cable trunking for control cables.

- Q1 Input switch (MAINS).
- Q3 Output switch.
- Q4 Auxiliary mains Input switch (AUX MAINS).
- Q5 Output maintenance bypass switch.

4.4 INSTALLATION PROCEDURES AND INSTRUCTIONS.

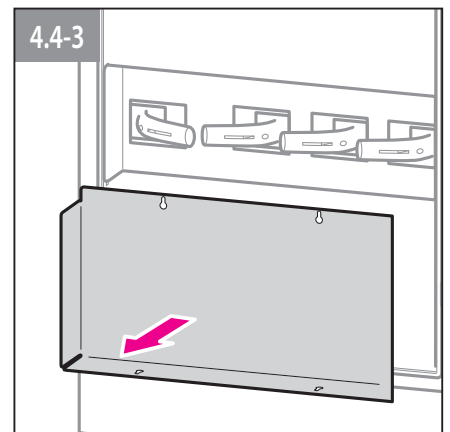
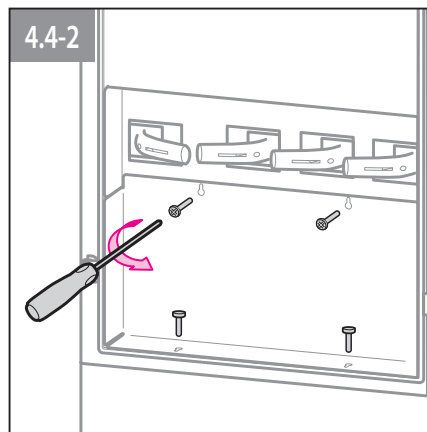
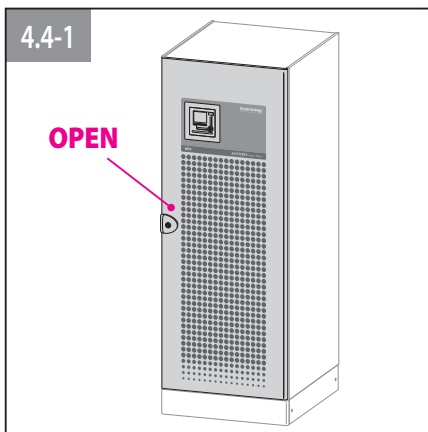
**WARNING!**

Before carrying out work on the terminal board or on UPS internal parts, ensure that the UPS is switched off, remove the power supply, open the external battery cabinet disconnectors, isolate the system and wait 5 minutes.

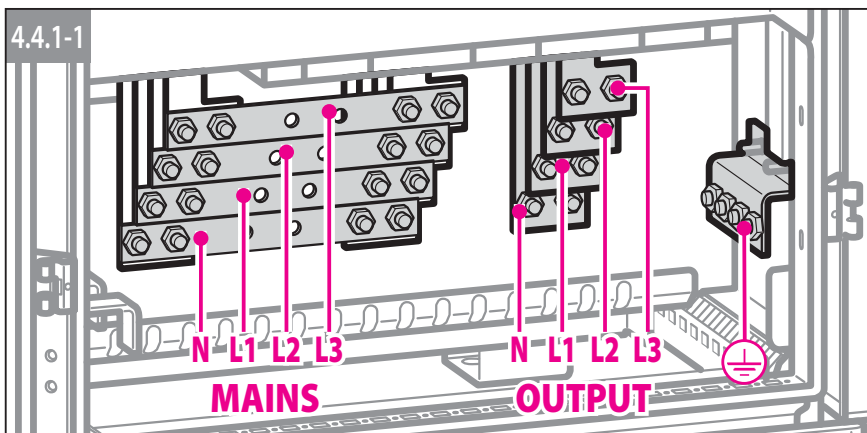


The connecting bars are made of aluminium!

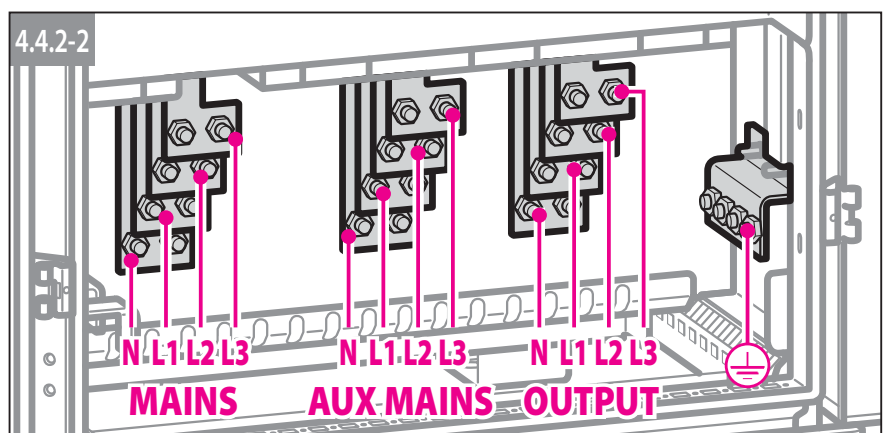
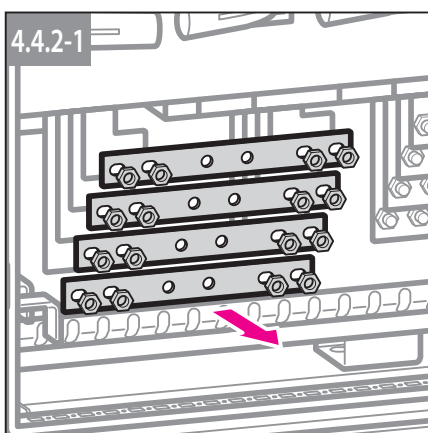
Use only aluminium cables or cables with tinned eyelets for the connections.



4.4.1 Connections if the MAINS and AUX MAINS are connected IN COMMON.



4.4.2 Connections if the MAINS and AUX MAINS are connected SEPARATELY.



4.4.3 EXTERNAL BATTERY CABINET connection.


WARNING!

Before carrying out any operation, ensure that:

- the battery fuses located inside the battery cabinet are open;
- the UPS is not live and all mains or battery switches are open;
- the switches upstream of the UPS are open.



Use double insulated cables or the cables supplied with the unit to connect the UPS to the Battery cabinet.



Cabling errors with inversion of the battery polarity may cause permanent damage to the equipment.

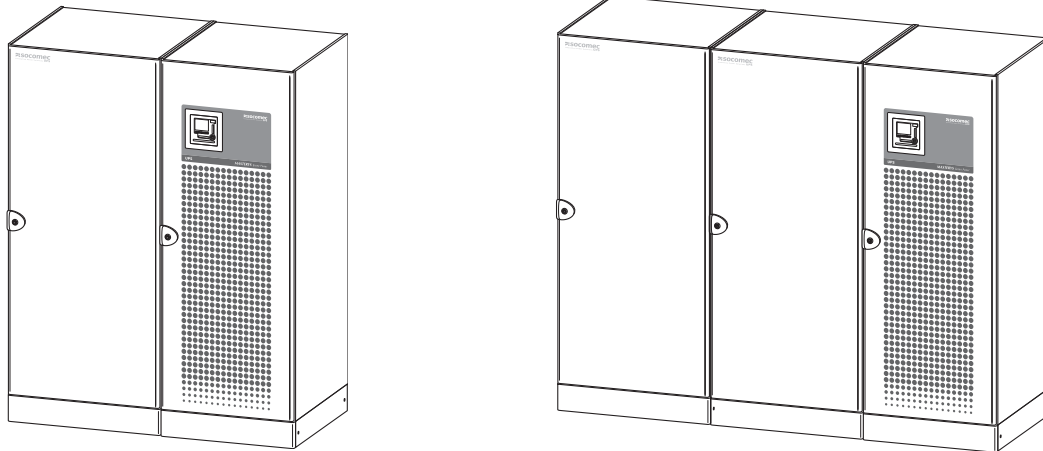


If using cabinets not supplied by the manufacturers of the UPS, it is the installer's responsibility to check the electrical compatibility and the presence of appropriate protection devices between the UPS and the battery cabinet (fuses and switches of sufficient capacity to protect the cables from the UPS to the battery cabinet). As soon as the UPS is switched on (before closing the battery switches) the battery parameters must be verified accordingly (voltage, capacity, number of elements, etc.) on the mimic panel menu. If the values indicated on the battery cabinet data plate are different from those shown on the mimic panel, use the **SERVICE > CONFIGURATIONS** menu to correct the settings.

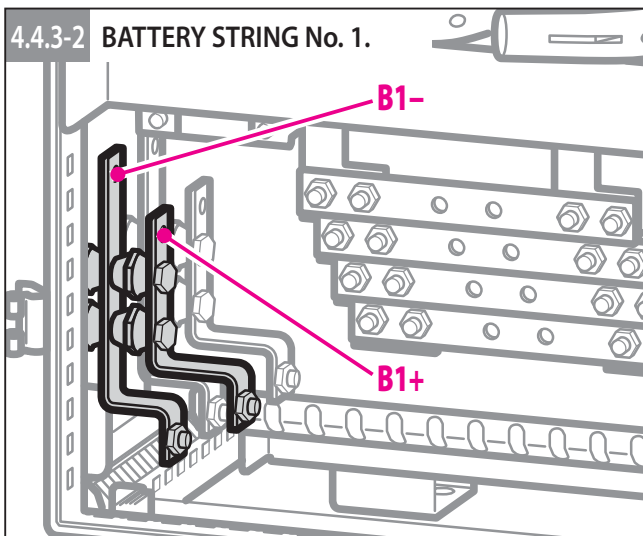
Note.

In the case of external batteries, the minimum number of elements permissible is 20 per branch.

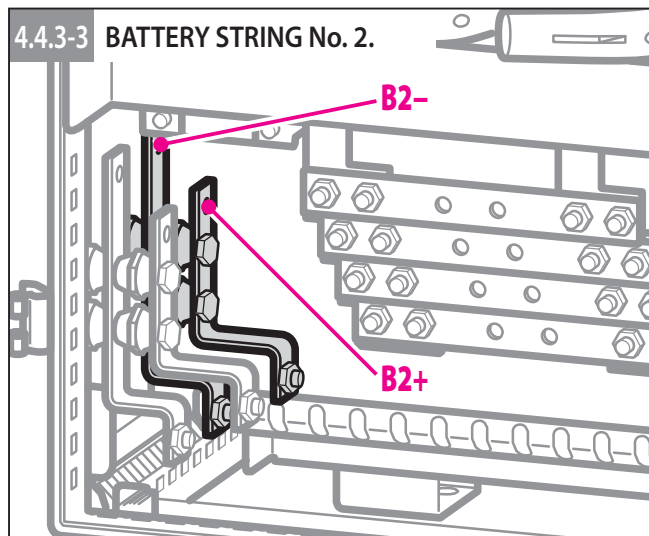
4.4.3-1



4.4.3-2 BATTERY STRING No. 1.



4.4.3-3 BATTERY STRING No. 2.

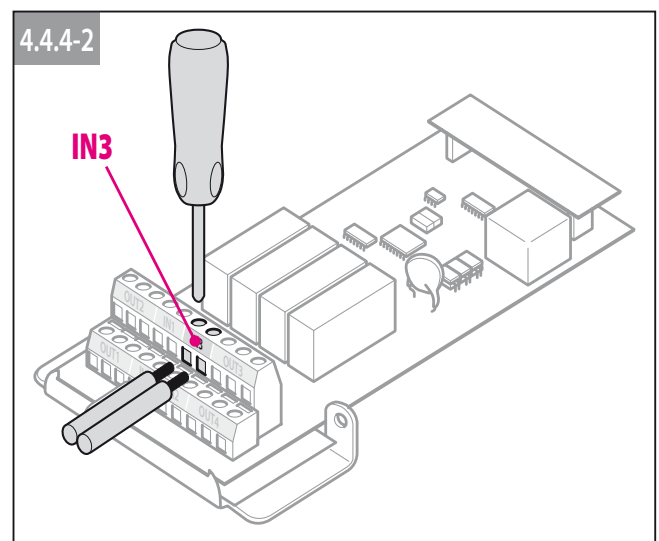
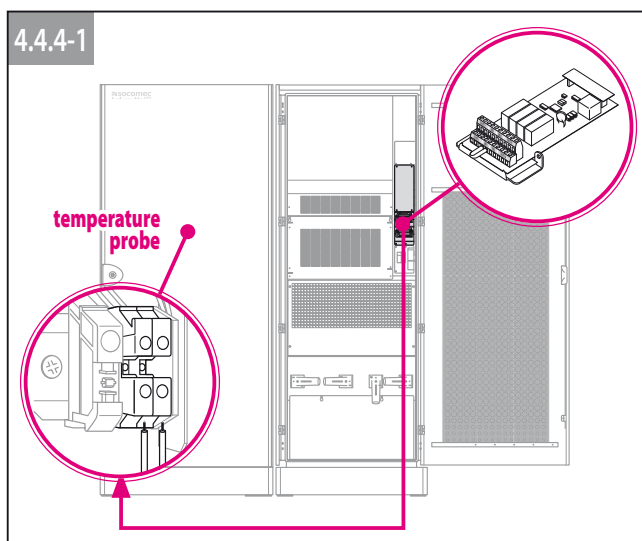


4.4.4 Connecting THE BATTERY CABINET TEMPERATURE PROBE.

- **SOCOMECS UPS battery cabinets:**

- The SOCOMECS UPS battery cabinet comes with a temperature probe which must be connected to the card supplied with the UPS (figure 4.4.4-1).
- Connect the temperature probe as shown in figure 4.4.4-2 without cabling distance limits and without the need to observe polarity.
- In the event of a single UPS with several battery cabinets, use a single temperature sensor.
- In the event of parallel UPSs, connect the battery cabinet temperature sensors to the cards installed in the related UPSs.

See paragraph 8.5.2 "Present configurations" menu, BATTERY TEMP. SENSOR parameter.



- **Other manufacturers' battery cabinets:**

- Use the specific kit available as an option.
- Fix the probe in the battery room or inside the battery cabinet.
- Connect the temperature probe as shown in figure 4.4.4-2 without cabling distance limits and without the need to observe polarity, by using a 2x1 mm² double isolation cable.
- In the event of a single UPS with several battery cabinets, use a single temperature sensor.
- In the event of parallel UPSs, connect the battery cabinet temperature sensors to the cards installed in the related UPSs.

Note.

If you do not intend to use the battery cabinet temperature sensor, go into the **SERVICE > SETTING** menu, select the **BATT. TEMP. PROBE** parameter and set it to **DISABLE**.



WARNING!

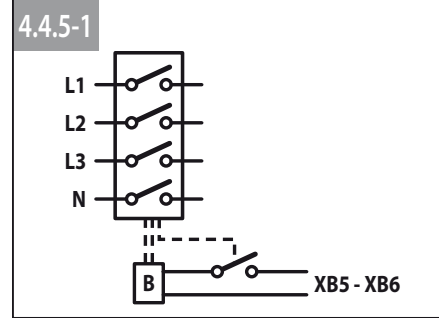
If the **BATT. TEMP. PROBE** parameter is set to **DISABLE**, the battery-charger will not perform correction of the recharge voltage in function of the temperature.

4.4.5 Connecting THE EXTERNAL BACKFEED PROTECTION.



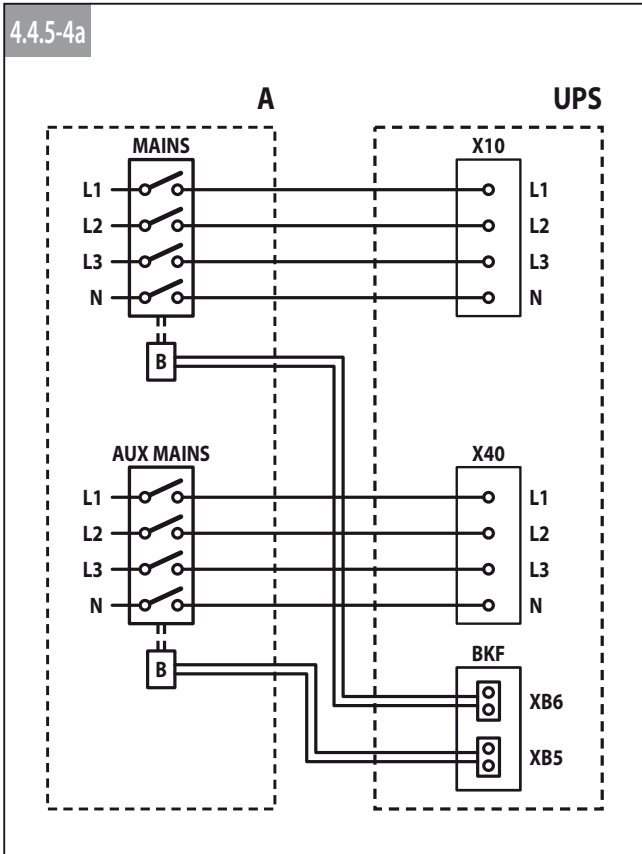
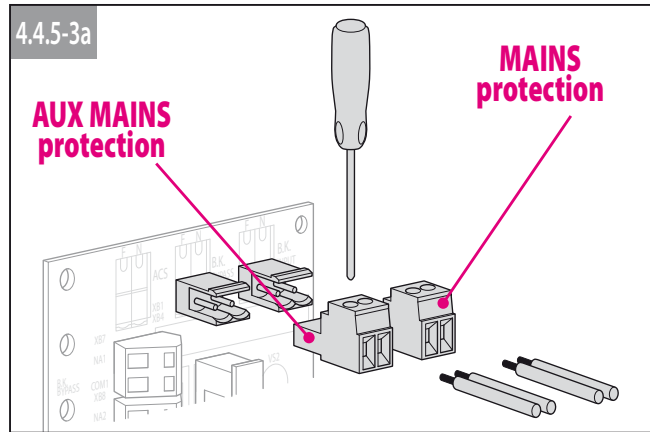
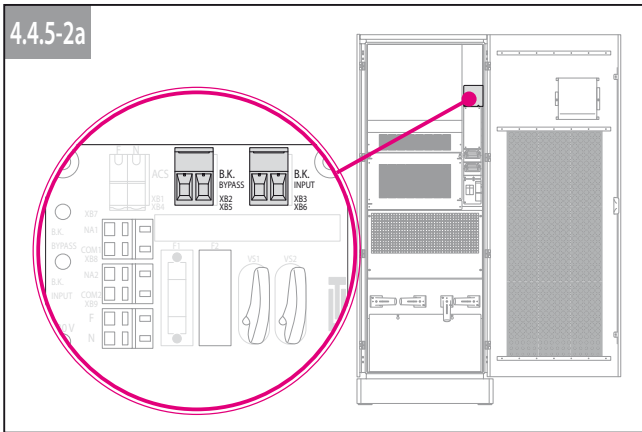
To guarantee maximum protection, use a 220-240 V release coil with integrated travel limit contact to pilot the input protection systems(see section 3.4 “Electrical requirements”). If a trip coil without an integrated end-of-travel contact is used, add an early auxiliary contact as shown in figure 4.4.5-1.

Electrical data of the contacts: 2 A 250 Vac



ENGLISH

• Separate Mains.

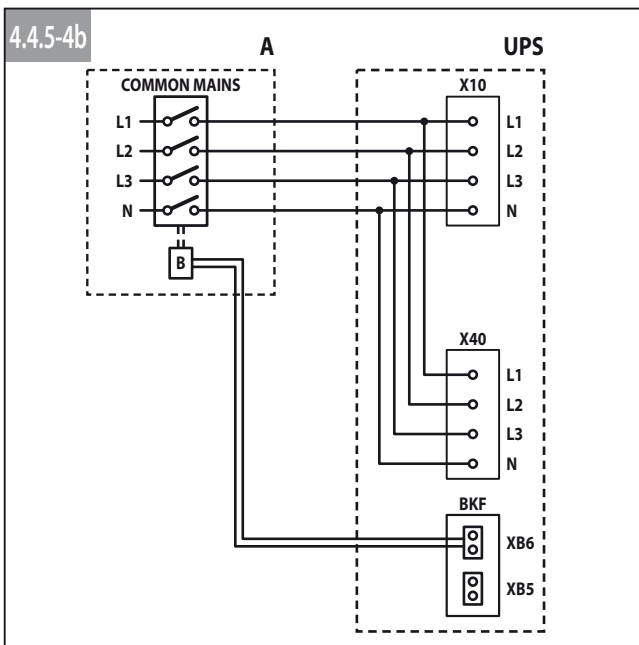
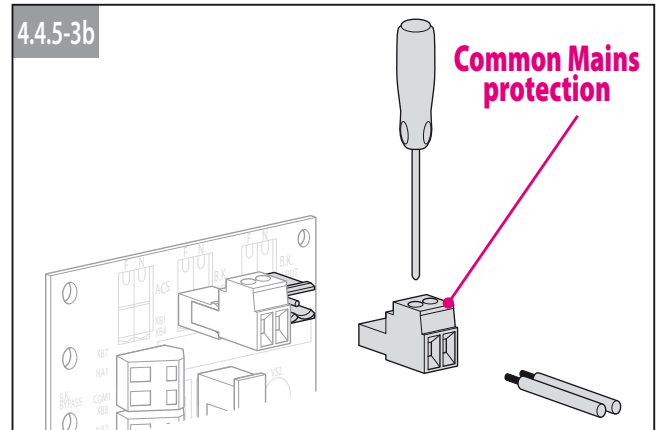
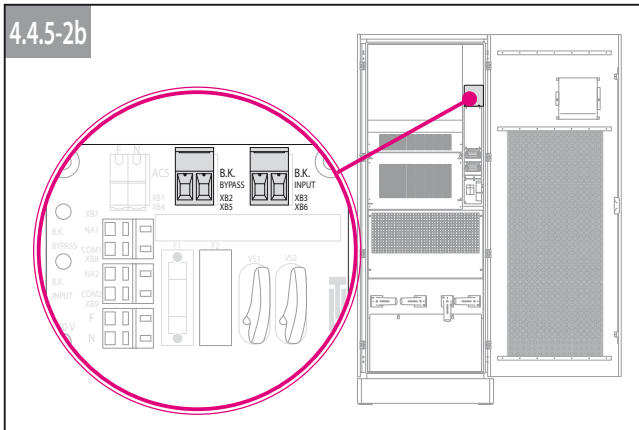


Activating UPS protection on the mimic panel: access the **Configuration** menu on the mimic panel (see the **Configuration** Menu section in the manual) and set the **BACKFEED TYPE** parameter to **2.BYPASS-INPUT Alone**.

Legend.

- A Distribution panel
- B Trip coil
- X10 Mains terminal board
- X40 Aux Mains terminal board
- MAINS Mains switch
- AUX MAINS Aux Mains switch
- XB5 Aux Mains BKF connector
- XB6 Mains BKF connector

• Common Mains



Activating UPS protection on the mimic panel: access the **Configuration** menu on the mimic panel (see the **Configuration** Menu section in the manual) and set the **BACKFEED TYPE** parameter to **3.BYPASS-INPUT Common**.

Legend.

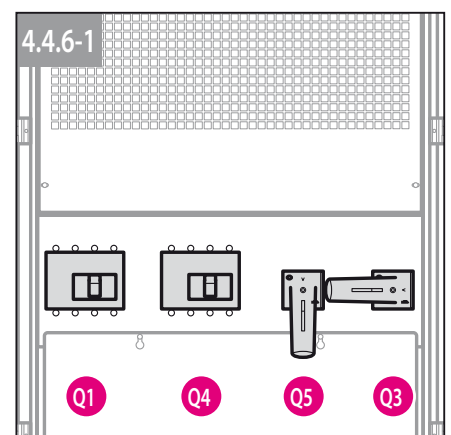
- A Distribution panel
- B Trip coil
- X10 Mains terminal board
- X40 Aux Mains terminal board
- COMMON MAINS Mains switch
- XB5 Aux Mains BKF connector
- XB6 Mains BKF connector

4.4.6 INTERNAL BACKFEED PROTECTION.

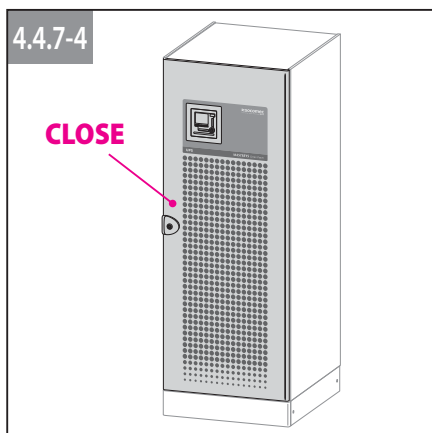
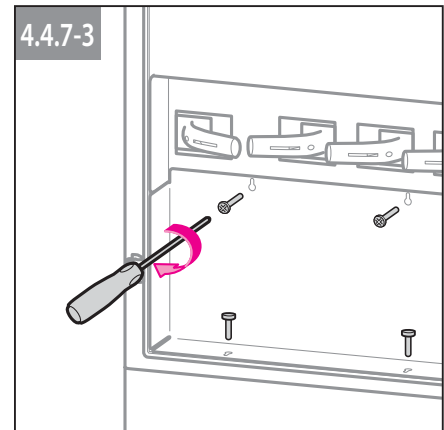
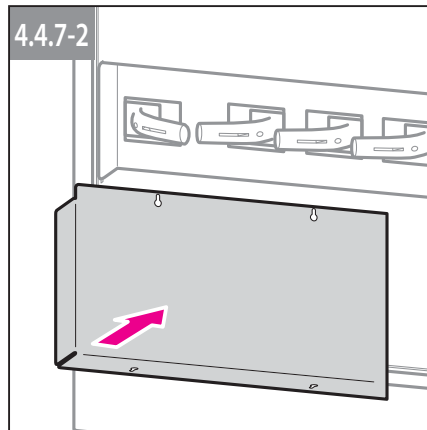
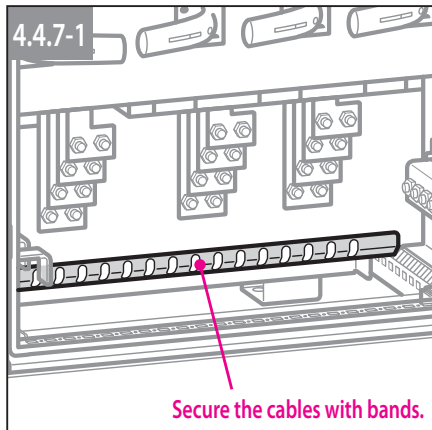


If the UPS has internal backfeed protection:

- there is no need for external backfeed protection;
- connect the UPS as indicated in paragraphs 4.4.1 or 4.4.2;
- the switches should be set as shown in figure 4.4.6-1.



4.4.7 Completion of the installation.



4.5 EXTERNAL E.S.D. CONNECTION.

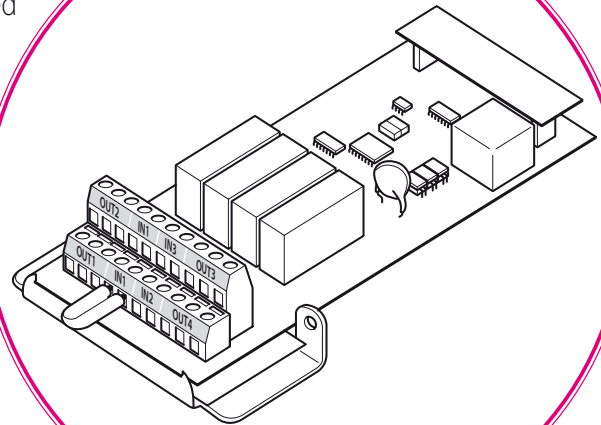
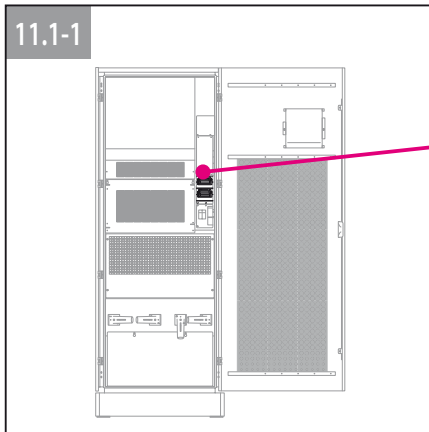
An emergency remote shutdown system (E.S.D.) can be installed using the ADC card (see paragraph 11.1). Connect a normally closed, unpowered contact to terminals **IN1+** and **IN1-** of the ADC card.

4.6 CONNECTION OF THE GENERATOR.

If the installation requires the use of a generator (G.E.), connect the "generator ready" unpowered contact to connector **IN 2** of the ADC card configured in "standard" mode (see paragraph 10.1). This allows the tolerance of the voltage and frequency values to be increased when power is supplied by the G.E.

4.7 ADC CARD WITH TEMPERATURE SENSOR.

This card can be used to manage up to four normally closed or normally open outputs and up to three digital inputs in configurable mode.



4.7.1 Electrical data of the contacts.

- 2 A 250 Vac, NO or NC depending on the terminal used.
- inputs: activated on loop closing.



**Secure the card with the appropriate screws.
Mount the plastic protection.**

Description of signals

IN/OUT	Message on mimic panel	Description	Filter level ¹
Out 1	General alarm	Output contact "General Alarm".	2
		<p>No alarms.</p> <p>"General Alarm" active.</p>	
Out 2	Battery discharging	"Battery discharging" contact output.	3
Out 3	Battery low and imminent stop	"Battery low and imminent stop" contact output.	2
Out 4	UPS on bypass	"UPS su bypass" contact output.	2
In 1 ²	E.S.D.	Contact input for Emergency Shutdown Device.	1
In 2	Supply from GenSet	Generator ready signal input.	1
In 3	Overheating	Internal overheating contact input.	2

1. The filter level indicates:

1 immediate activation (1 seconds minimum communication time); **2** 10 s delay; **3** 30 s delay.

2. if the external E.S.D. button is not used, always insert a jumper to short circuit input IN 1.



Intervention of the E.S.D. input switches off the UPS output. To restore the UPS to operation:

- Close the E.S.D. contact on "In 1" on the ADC board.
- Give the reset alarms" command.
- Run the start procedure

4.8 ISOLATION TRANSFORMER.

If an external isolation transformer cabinet is required, the following instructions should be followed:

- Refer to chapters 2 and 3 of this manual for indications on moving and installing the cabinet.
- See paragraph 3.4 for details about protections.
- The protection cable marked with the ground symbol is connected directly to the distribution panel.
- The transformer can either be connected to the UPS input or output.



**The UPS must not operate without the neutral connection to the input.
The transformer cannot be connected to the output on single UPS unit connected in parallel configuration.**

For details of the connections, refer to the transformer terminal board diagram.

4.9 UPS PARALLEL CONFIGURATION.

- Parallel connection enhances UPS system reliability, performance and power.
- Operating UPSs are connected to each other by a signal cable **B** (Fig. 4.9.1-1) which provides a maximum distance between UPSs of approx. 3 metres and enables the external battery cabinet to be inserted next to each UPS. They are configured differently depending on the position they are assigned; for this reason the units have a position label:
 - the "LEFT" label means that the unit must be positioned to the left.
 - the "RIGHT" label means that the unit must be positioned to the right.
 - the "INTERNAL" label (used only on systems with three UPS) means that this unit must be positioned between the two other cabinets.
- The power supply of each UPS must be equipped with a protection device as shown in the table in paragraph 3.4.
- **The cross section and length of the input and output cables must be identical for all the units.**
- The phase rotation must be the same for each unit connected in parallel and also on any external manual bypass line.
- Cables of the same length and cross section must be used for the connection between the general power switch **A**, the switches **C** and the respective UPS units. The length of the cables from **A** to each UPS module must not exceed 25 meters (Fig. 4.9-1).
- The cables from the UPS module to circuit breaker **D** must be of the same length (max. 20 m with multi-core cables).
- If a differential switch is installed on the mains power switch, it must be inserted upstream from the distribution panel; it must be a selective type and the trigger value **must be 0.5 A by the number of UPS connected in parallel.**



Only activate circuit breaker D after turn off the UPS.

- In order for units connected in a parallel configuration to operate correctly, control cables are required to exchange data between both UPS units making up the parallel system. The cables in question are supplied with the UPS in case of standard parallel setting or are attached to the parallel kit in case of later upgrading of the system.

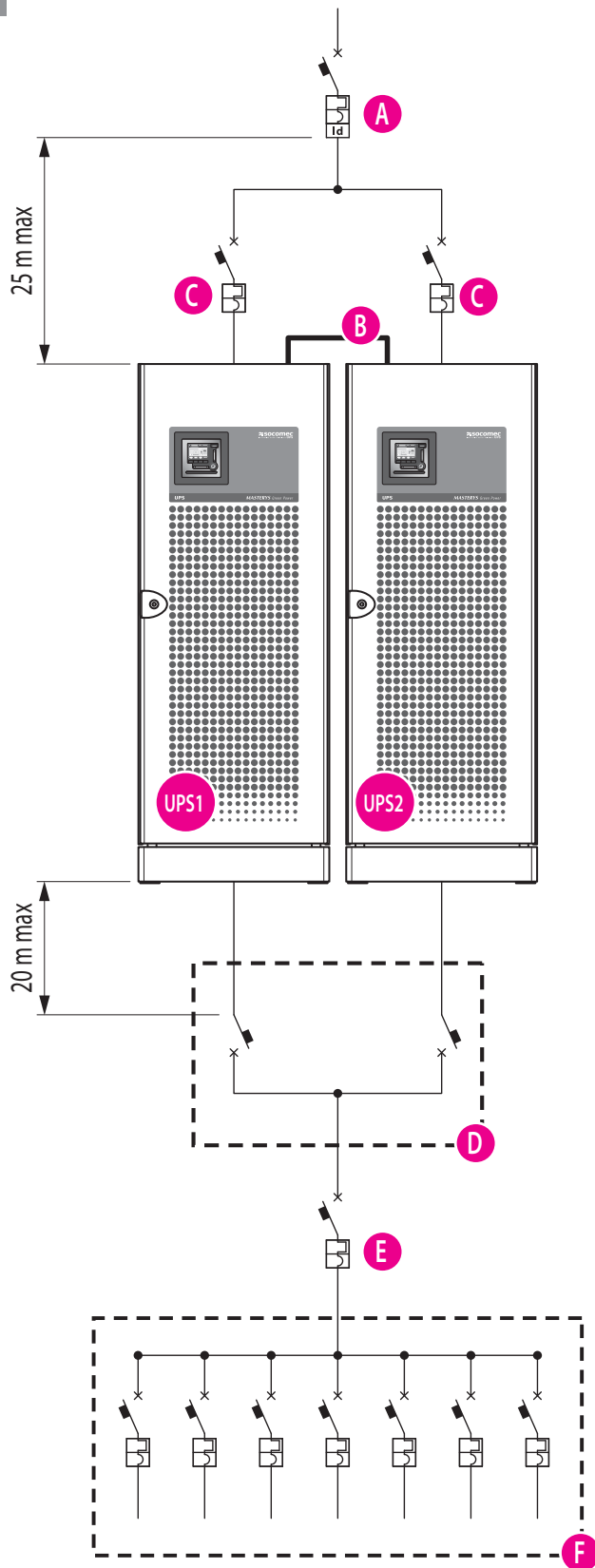


WARNING!

Parallel configuration must only be activated by SOCOMEC UPS qualified personnel.

4.9.1 Recommended 1+1 parallel configuration.

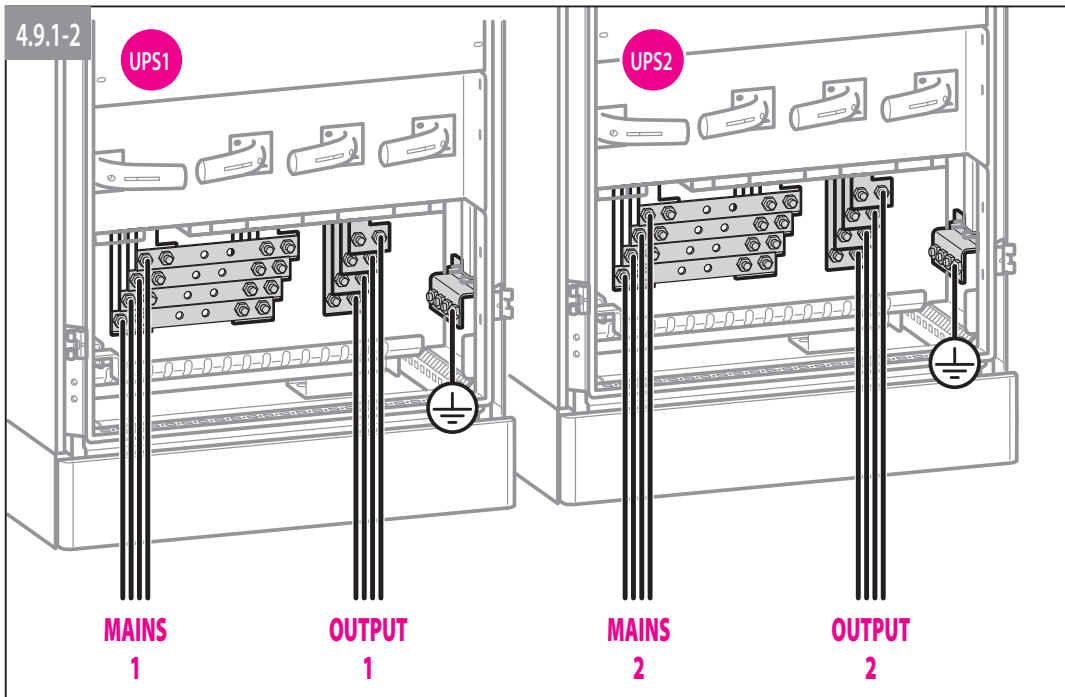
4.9.1-1



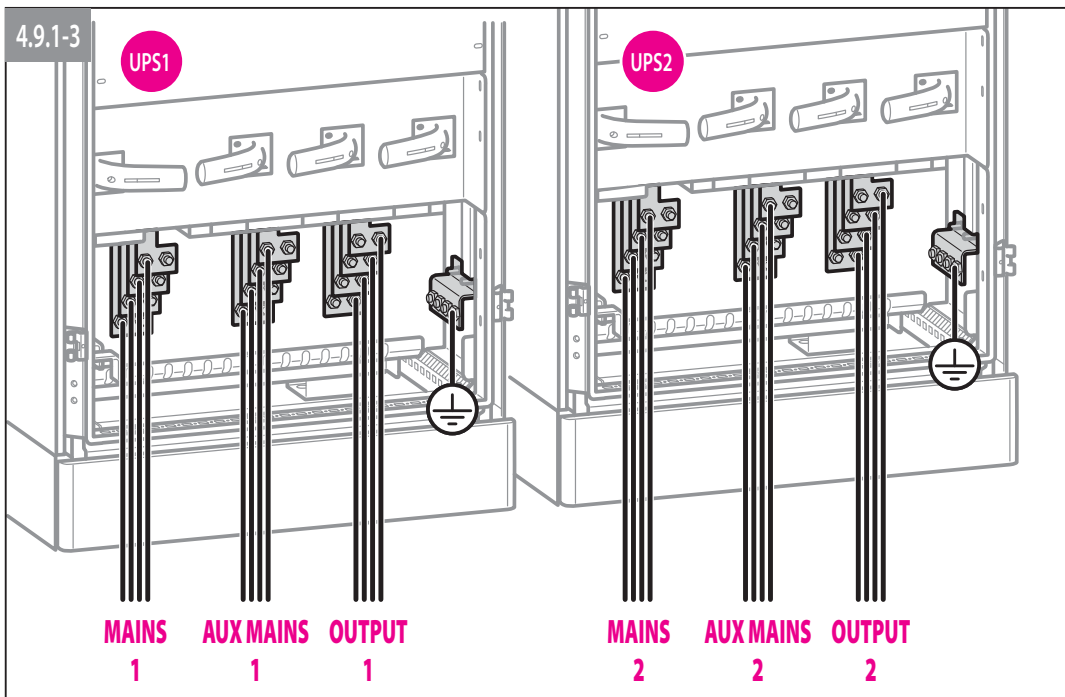
Legend.

- A Selective general differential magneto thermal switch.
- B "Parallel bus" cable.
- C Single UPS magneto-thermal switch (if a separate auxiliary power source is used, add a magneto-thermal switch for each UPS).
- D Additional disconnectors on the distribution panel.
- E System shutdown switch.
- F Distribution.

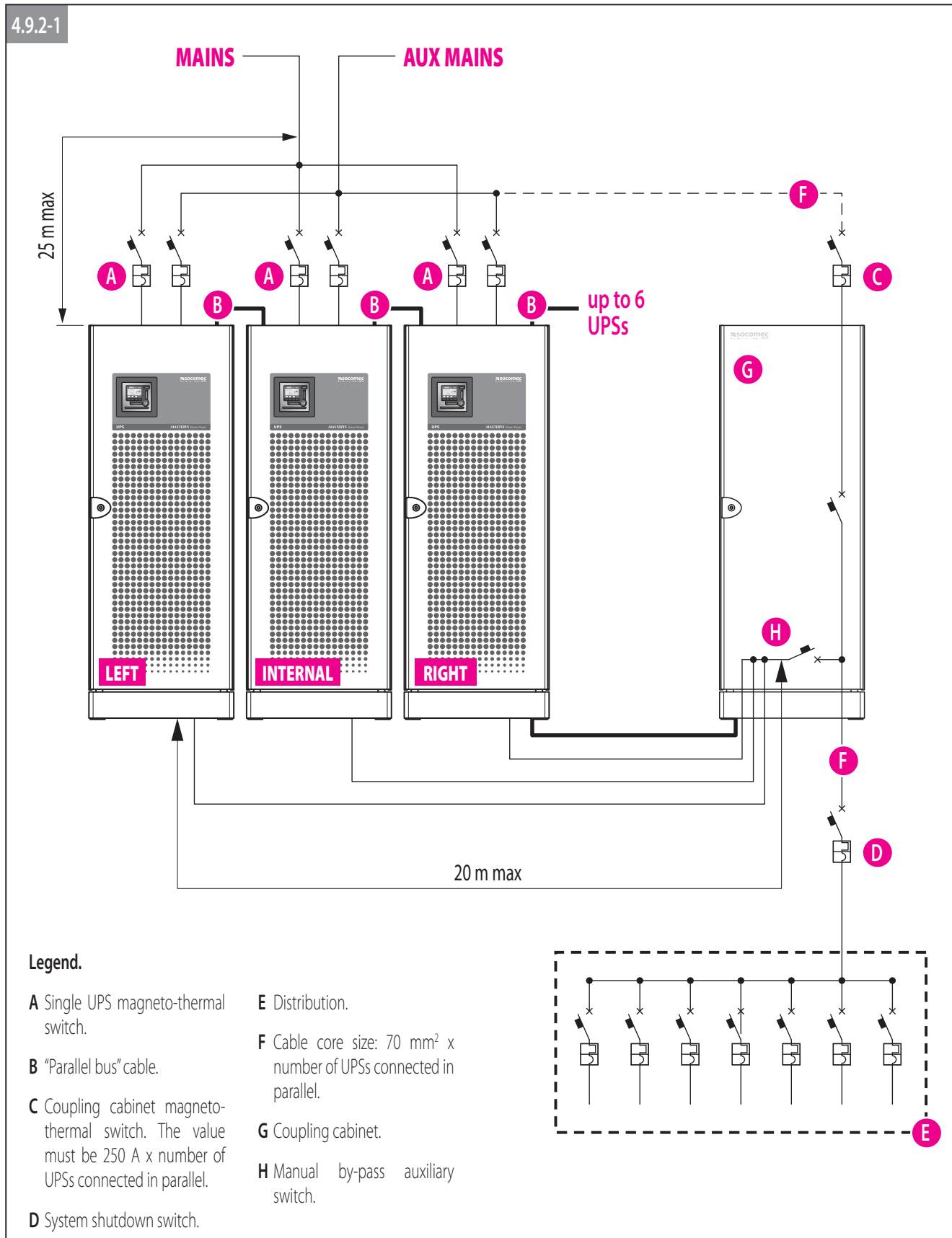
1+1 Parallel configuration - Common Mains.



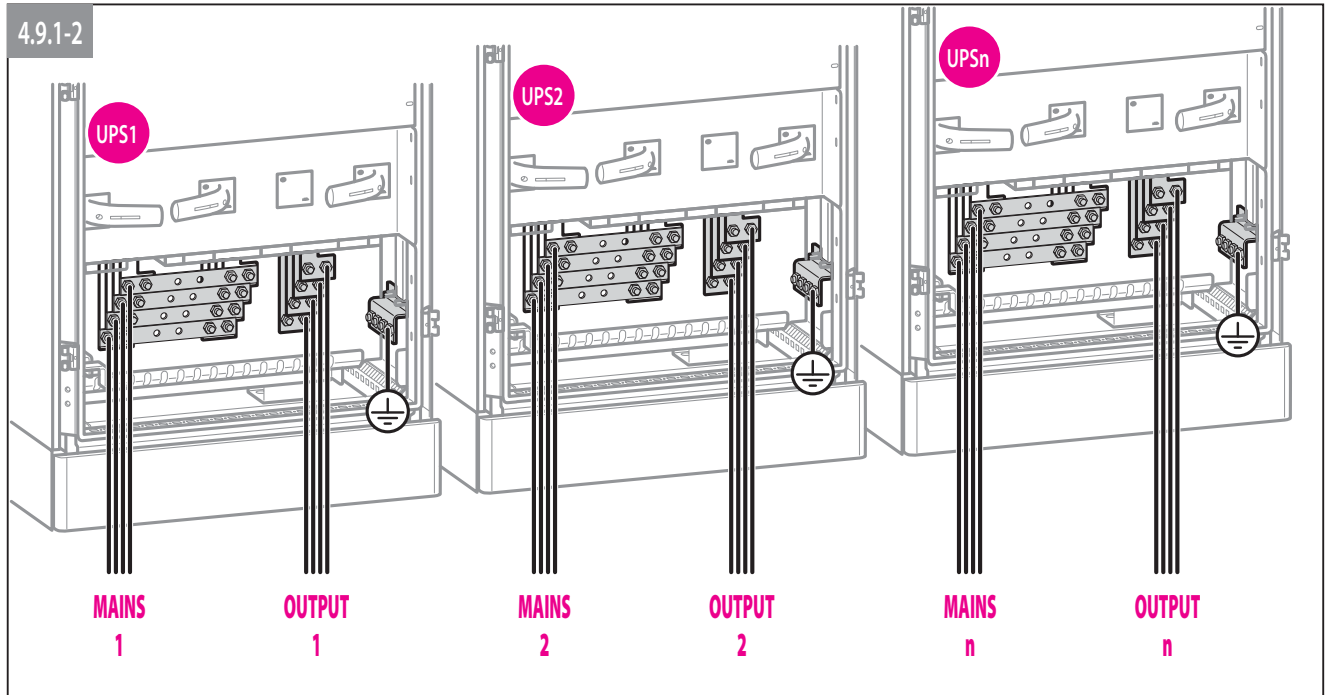
1+1 Parallel configuration - Separate Mains.



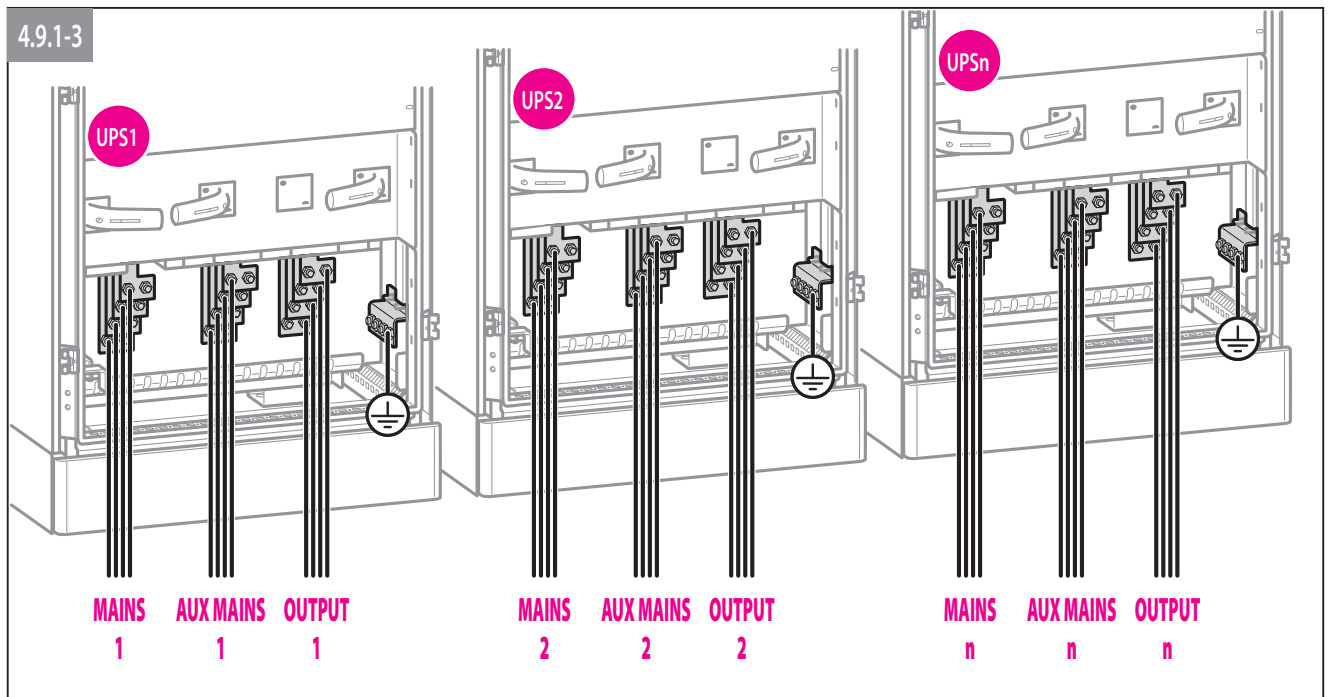
4.9.2 Recommended N+1 parallel configuration.



N+1 Parallel configuration - Common Mains.



N+1 Parallel configuration - Separate Mains.



5.1 ON LINE OPERATIONS.

ON LINE operation consists of double conversion operation in conjunction with mains absorption with very low distortion. This enables the UPS to supply a voltage that is fully stabilised in frequency and amplitude, regardless of any interference in the mains power supply.

ON LINE operation provides three operating modes according to mains and load conditions:

- **“Normale” mode.**

This is the most frequent operating condition: the energy is drawn from the primary mains power supply and is converted and used by the inverter to generate the output voltage to power the loads connected.

The inverter is constantly synchronised in frequency with the auxiliary mains to enable load transfer (due to an overload or inverter shutdown) without any break in the power supply to the load.

The battery charger supplies the energy required to maintain or recharge the battery.

- **“Bypass” mode.**

In case of inverter failure, the load is automatically transferred onto the auxiliary mains without any interruption in the power supply. This procedure may occur in the following situations:

- in the event of a temporary overload, the inverter continues to power the load. If the condition persists, the UPS output is switched onto the auxiliary mains via the automatic bypass. Normal operation, which is from inverter, returns automatically a few seconds after the overload disappears.
- when the voltage generated by the inverter goes out of tolerances due to a major overload or a fault on the inverter.
- when the internal temperature exceeds the maximum value allowed.

- **“Battery” mode.**

In the event of a mains failure (micro interruptions or extended black-outs), the UPS continues to power the load using the energy stored in the battery. The Expert Battery System keeps the user constantly informed on the battery status and on the back-up time available.

5.2 OPERATION IN HIGH EFFICIENCY “ECO-MODE”

Operation in ECO-MODE can increase overall efficiency by up to 98% and, at the same time, energy savings can be achieved by selecting and programming daily or weekly time intervals in which the applications are powered directly from the auxiliary mains. If the mains supply fails, the UPS will automatically switch onto the inverter and continue to supply power to the load through the batteries.

Unlike ON LINE operation, operation in ECO-MODE does not provide perfect stability in frequency and voltage; use of this mode should therefore be carefully evaluated according to the level of protection required by the application.

5.3 OPERATION WITH MANUAL MAINTENANCE BYPASS.

If the manual bypass is activated (with the appropriate procedure), the load is powered directly from the auxiliary mains, while the UPS is in fact excluded from the power supply and can be switched off.

This operating mode is useful when maintenance needs to be carried out on the UPS since service personnel can work on the installation without having to cut off the power supply to the load.

5.4 OPERATION WITH EXTERNAL MANUAL BYPASS (optional).

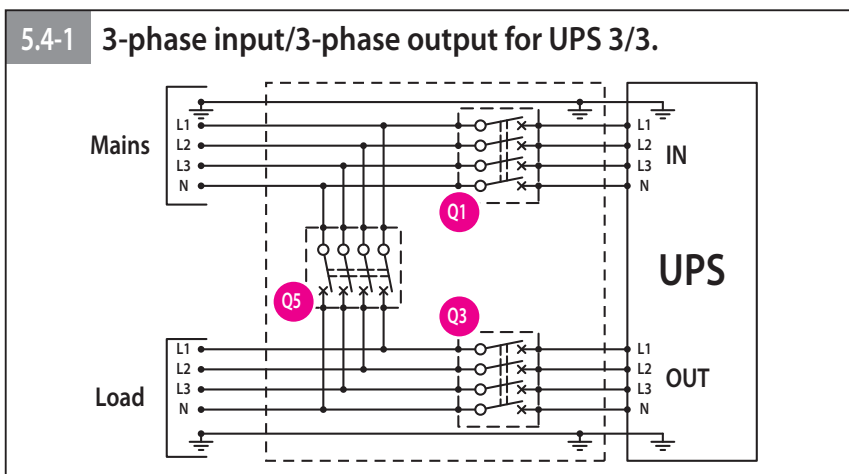
The external maintenance bypass may be placed on the general distribution panel when the UPS is installed, or by installing the bypass panel that is supplied on request.

The **Q1** disconnecter **must** be connected to the auxiliary mains input and the mains input must be isolated on the panel.

If the manual bypass is activated (with the appropriate procedure), the load is powered directly from the auxiliary mains, while the UPS is in fact excluded from the power supply and can be switched off.

This operating mode is useful when maintenance needs to be carried out on the UPS since service personnel can work on the installation without having to cut off the power supply to the load.

Bypass panel connection diagram.



5.5 OPERATION IN G.E. CONFIGURATION.

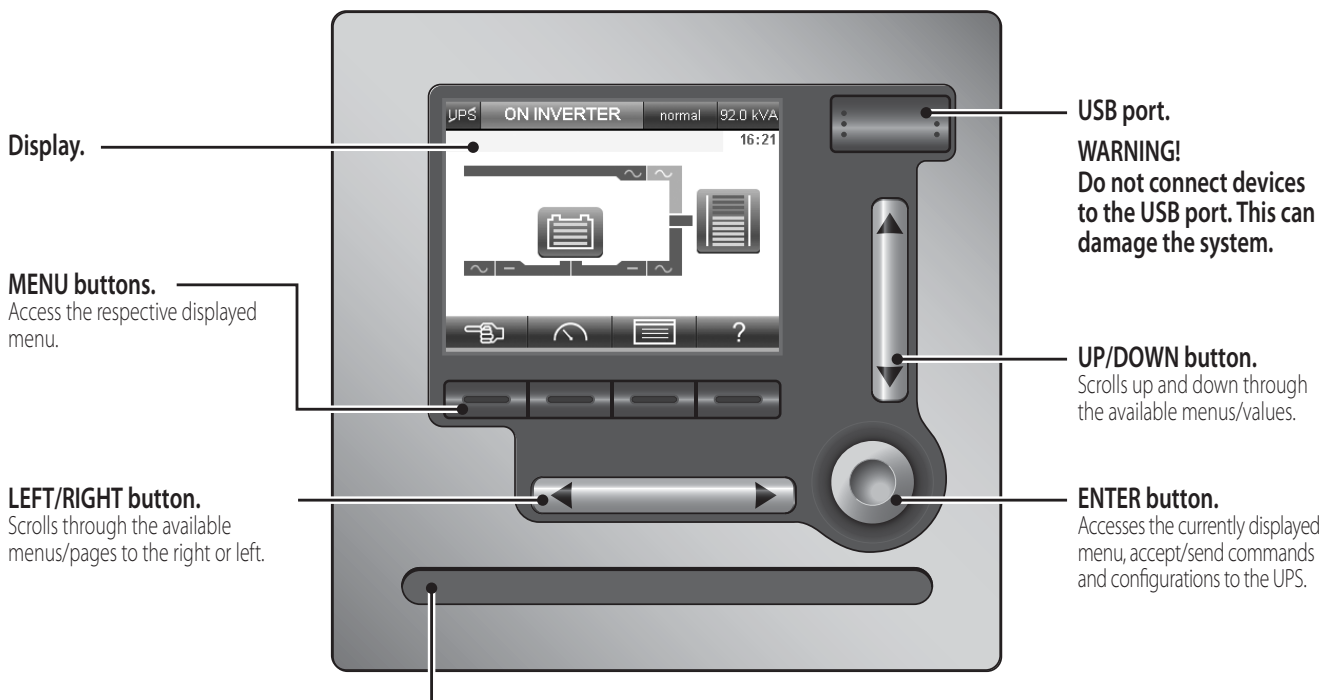
With a generator, the frequency and voltage ranges of the auxiliary mains can be increased to accept the instability of the GE and at the same time to avoid operation from the battery or risks of out-of-synchronisation switching onto the bypass.

The use of the GSS interface, described in the options section, also increases the amount of diagnostic information exchanged between the continuous power system and the generator.

6.1 GRAPHIC MIMIC PANEL.

The graphic mimic panel on the UPS door displays information regarding operating status, electrical measurements, access to control functions and configuration parameters. It includes a colour graphic display and a luminous status bar, and provides access to:

- mimic panel;
- measurements, statuses and commands for the subassemblies;
- programming battery tests and UPS operating modes;
- assisted startup and switching to maintenance bypass procedures;
- event and battery discharge log;
- UPS and battery discharge duration statistics;
- configuration menu;
- list of states and alarms.



Display.

MENU buttons.

Access the respective displayed menu.

LEFT/RIGHT button.

Scrolls through the available menus/pages to the right or left.

USB port.

WARNING!

Do not connect devices to the USB port. This can damage the system.

UP/DOWN button.

Scrolls up and down through the available menus/values.

ENTER button.

Accesses the currently displayed menu, accept/send commands and configurations to the UPS.

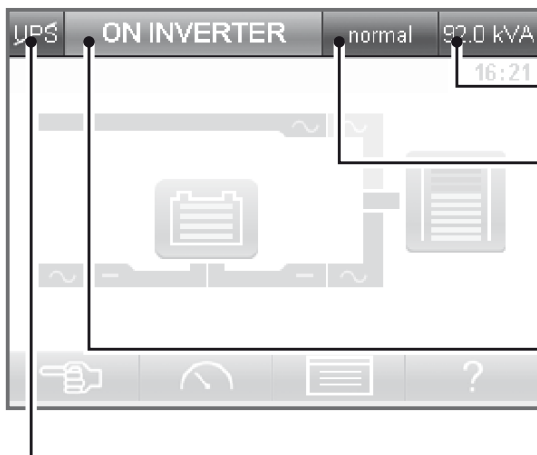
Luminous status bar.

Reflects the general status of the UPS.

The status bar colours are identical for both single and parallel UPS installations.

- Green:
 - load protected by inverter (NORMAL mode);
 - load powered off automatic bypass (ECO-MODE or ENERGY SAVER modes).
- Green flashing: battery test in progress.
- Yellow:
 - load powered off automatic bypass (NORMAL mode).
 - load powered off maintenance bypass;
- Red:
 - on: load not powered;
 - flashing: imminent shutdown.
- Off:
 - the UPS unit or module is isolated from the installation (Q2 or Q3 open)
 - automatic switch on or bypass procedure in progress.

6.2 MIMIC PANEL OVERVIEW.



Mimic panel reference.

UPPER BAR (always displayed).

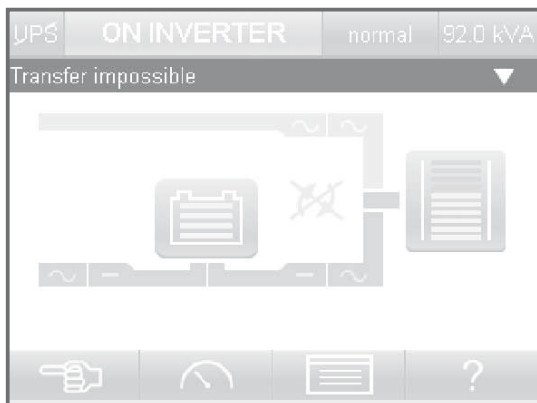
Total output load (kVA).

Operating modes:

Normal (Normal mode), Eco (Eco-Mode mode), Auto (Automatic mode), stdby (Standby program mode), e-saver (Energy Saver mode - parallel configurations only), Service, Isolated (unit isolated from the electric distribution plant).

Unit status:

- Messages displayed: NOT POWERED, ON INVERTER, IMMINENT SHUT-DOWN, FROM BATTERY, BATTERY TEST, ON MAINTENANCE BYPASS, ON AUTO BYPASS, ON AUTO BYPASS, STARTING UPS..., SHUTTING DOWN UPS..., UNIT AVAILABLE.
- Priority of colours (from highest to lowest):
 - red: load not powered (on), shutdown imminent (flashing).
 - grey: when powering up or shutting down.
 - yellow: load powered off bypass or maintenance bypass in Battery Mode.
 - green: load powered off inverter or in ECO-MODE mode.

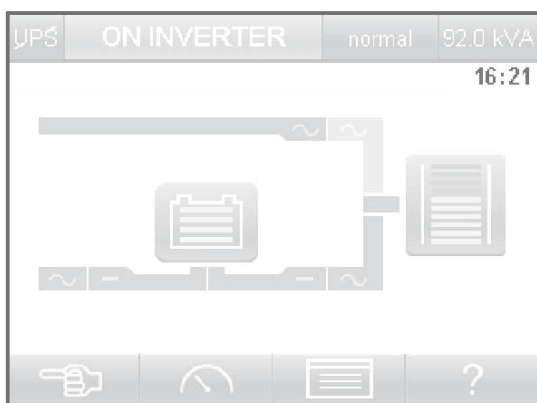


ALARMS AREA.

Present when an alarm is active.

Press button DOWN to display the list of alarms.

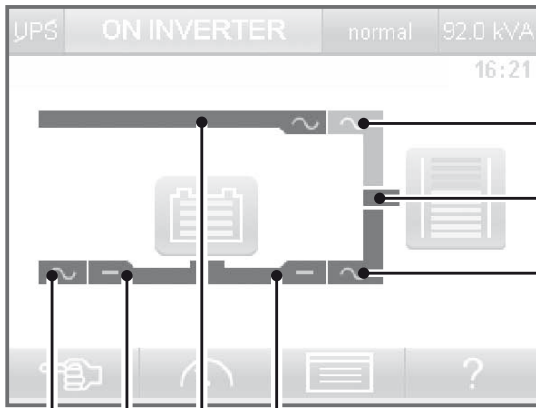
See "Troubleshooting".



CLOCK.

Hours and minutes.

The symbol ":" flashes once a second to indicate that the software is running.



FLOW DIAGRAM ANIMATION.

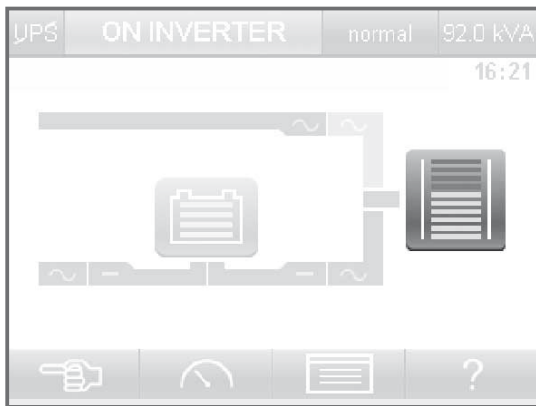
Rectifier input.
Rectifier output.
Bypass input.
Inverter output.
Inverter output.
Unit output.
Static output switch.

Colour of the bar:

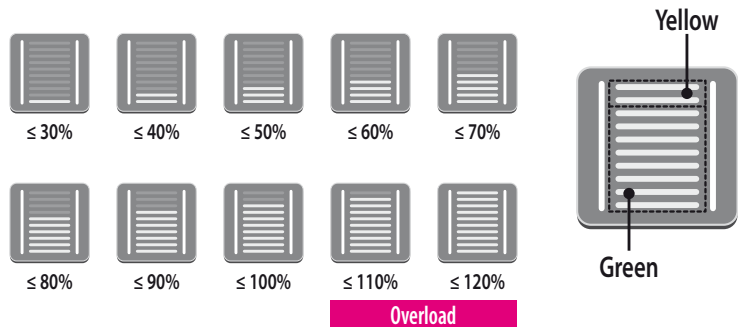
- **blue:** active/mains present.
- **grey:** mains not present.

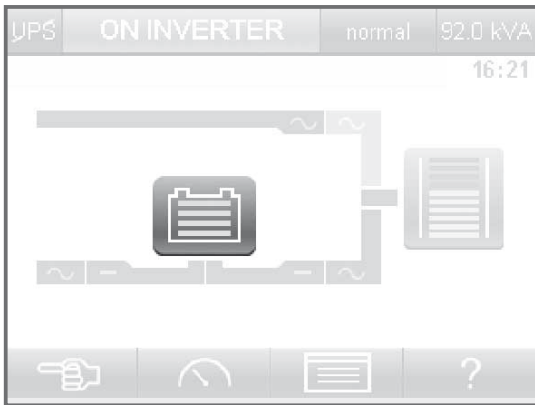
Priority of colours of the symbols "~" and "-"
(from highest to lowest):

- **yellow:** ON or voltage present and pre-alarm active.
- **green:** ON or voltage present and no alarm active.



LOAD LEVEL.

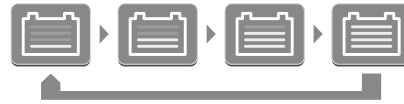




BATTERY STATUS (unit only)

Battery charging.

Colour of bars: green; level reached: light on.



Battery draining.

Colour of bars: yellow.



Battery charged.

Colour of bars: green.



Battery alarm.



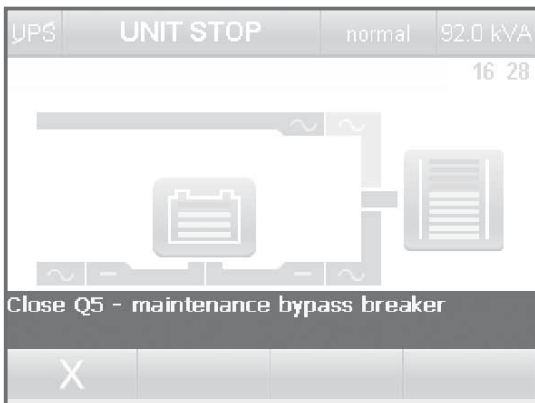
Battery general alarm
(symbol turns to yellow)



Battery circuit open

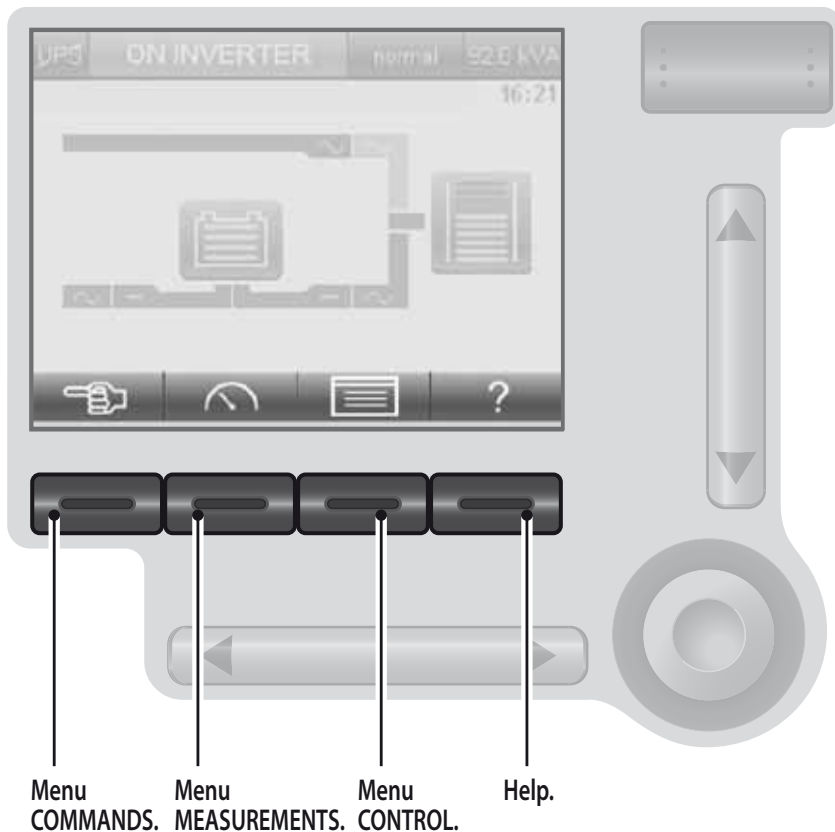


Battery low or end of autonomy.



MESSAGES AREA.

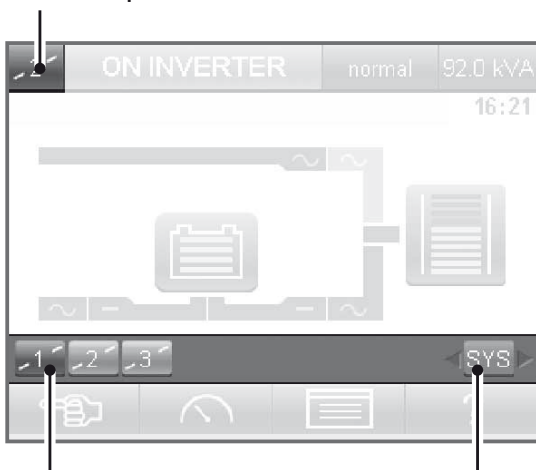
Present during automatic shutdown or maintenance bypass procedure.



MENU ICONS.

6.3 PARALLEL CONFIGURATION.

Unit mimic panel.

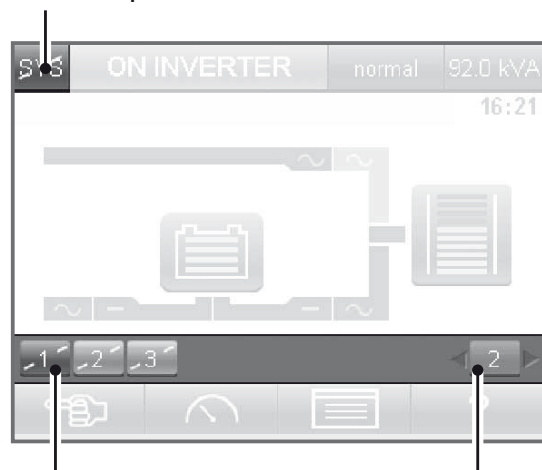


Units connected in parallel.

- Green: unit connected or available.
- Yellow: unit connected with active alarm.
- Red: unit switched off or immediate shutdown
- Grey: unit not connected or "energy saver" procedure in progress.

Use the LEFT/RIGHT button to select the system UPS mimic panel.

UPS mimic panel.

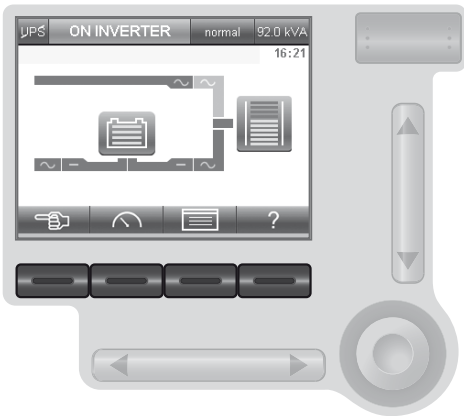


Units connected in parallel.

- Green: unit connected and available.
- Yellow: unit connected with active alarm.
- Red: unit switched off.
- Grey: unit not connected.

Use the LEFT/RIGHT button to select the system unit mimic panel.

6.4 MIMIC PANEL MENU.



1 Select one of the four menus.

















2 Scroll through list (up/down) and pages (left/right).



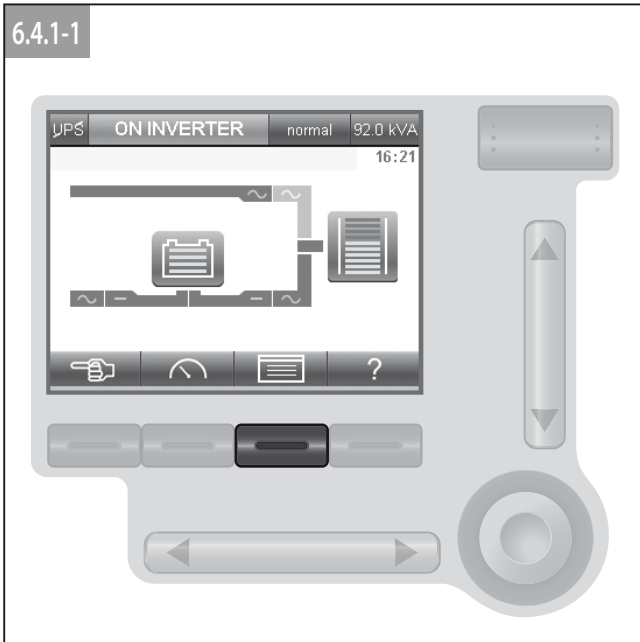
3 Access menu.

Legend of symbols.

	Commands.		Log file.
	Measurements.		Status.
	Control.		Confirm settings.
	Help.		Cancel.
	Home page (mimic panel).		Increment.
	Previous page.		Decrement.
	Reset alarms.		Confirm procedure or send command.

6.4.1 Entering passwords (when required).

ENGLISH



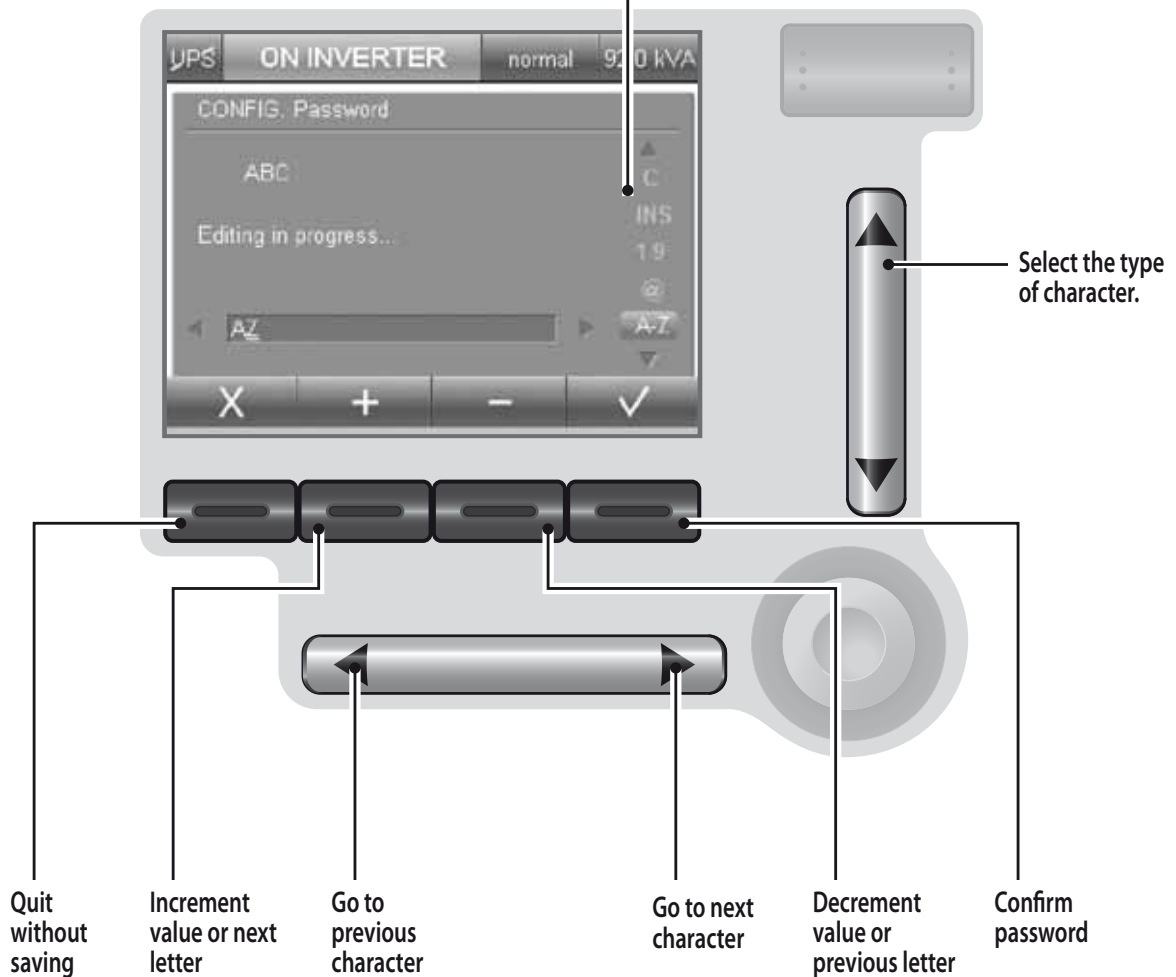
Notes.

- Password to config: protects the MONITORING menu (User Configurations, UPS Options and Maintenance-UPS setting); if set, generates the Contr. password (user modifiable).
- Password to control: protects the CONTROL menu. Can be set only if the Config.n password has been set.

6.4.1-5 Enter password.

Type of character:

- C** Cancel character.
- INS** Enter character.
- 1-9** Number
- @** Special characters
- A-Z** Letters



6.4.1-6



6.4.1-7



6.4.1-8



6.4.1-9



6.4.2 CONTROL menu.



The menu is used to send some immediate commands to activate the UPS or various operating modes. It can also be used to send extended commands to define some UPS settings.

Note.

- The access to configuration and control is protected by password..
- If a control is not available, the related menu will not be displayed.

6.4.3 MEASURES menu.



This menu is used to display all the measurements relating to the input, output and to the battery.

Note.

If a control is not available, the related menu will not be displayed.

6.4.4 MONITORING menu.



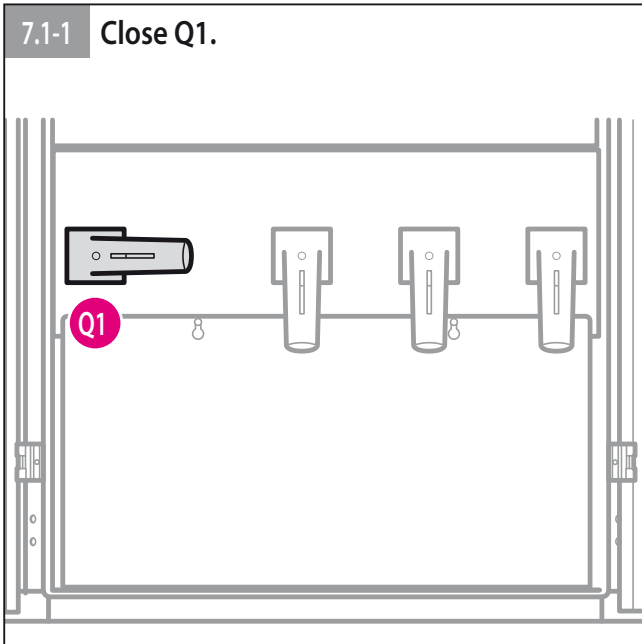
This menu is used for monitoring, to change user's configuration parameters, enabling communication options and to display service information.

Note.

- The access is protected by password.
- If a control is not available, the related menu will not be displayed.

7.1 SWITCHING ON.

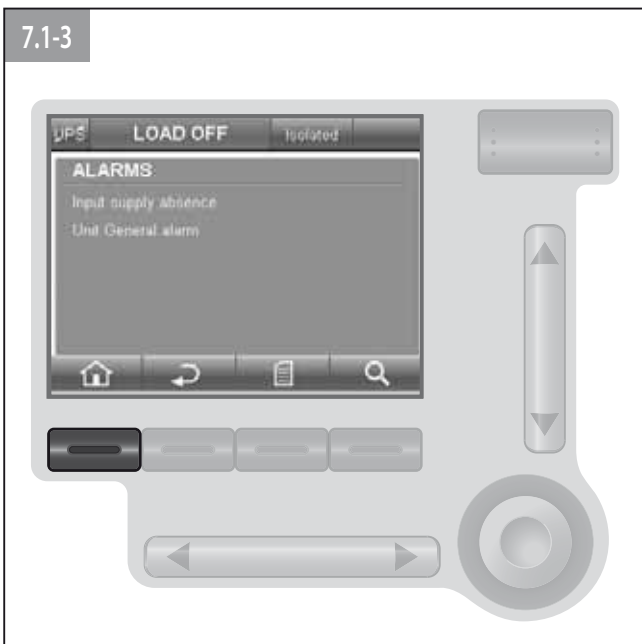
7.1-1 Close Q1.



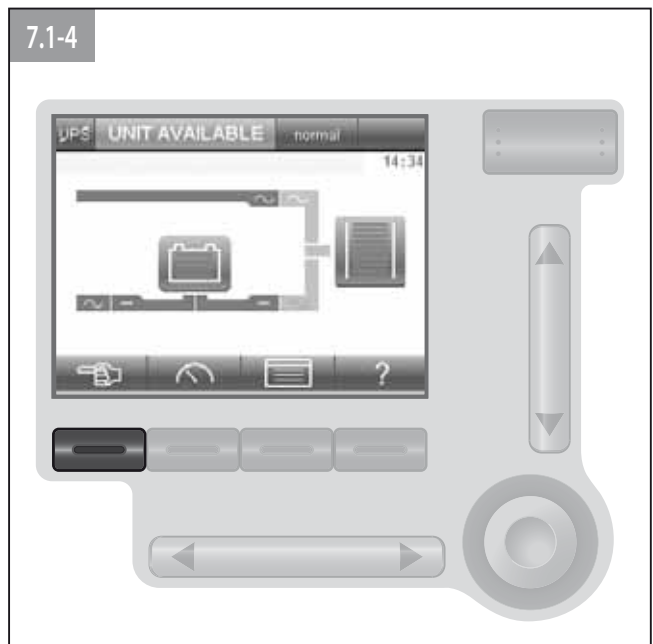
7.1-2



7.1-3



7.1-4







7.1-8

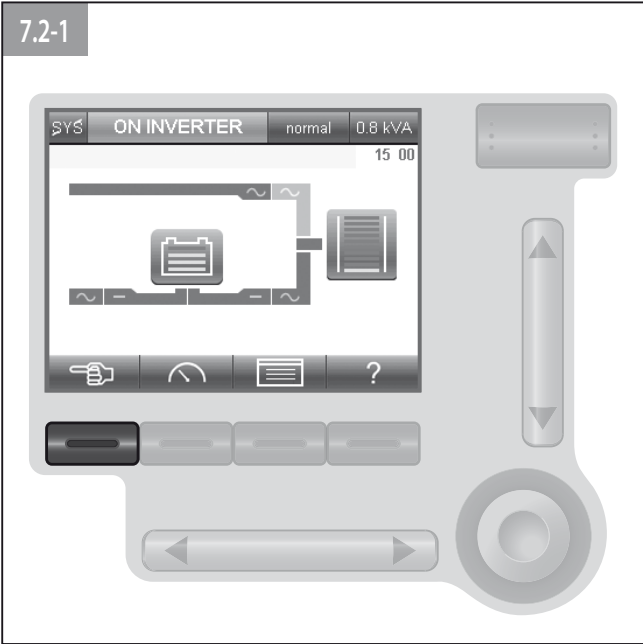
Run the operations prompted for on the display.

Note.

- When prompted, press button  to confirm the operation or button  to cancel it.

7.2 MAINTENANCE BYPASS.

ENGLISH



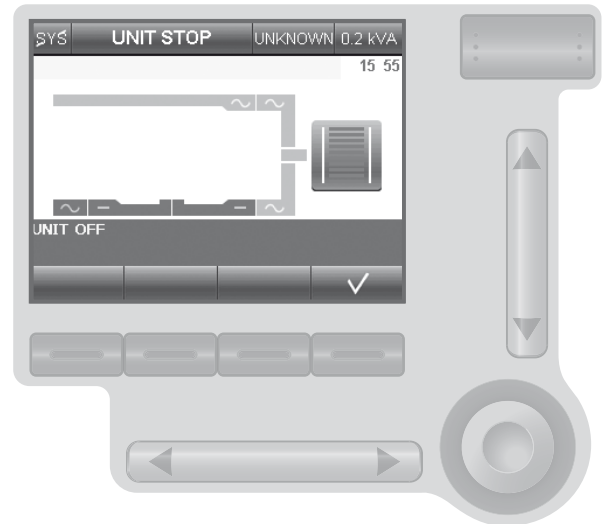
7.2-5

Run the operations prompted for on the display.

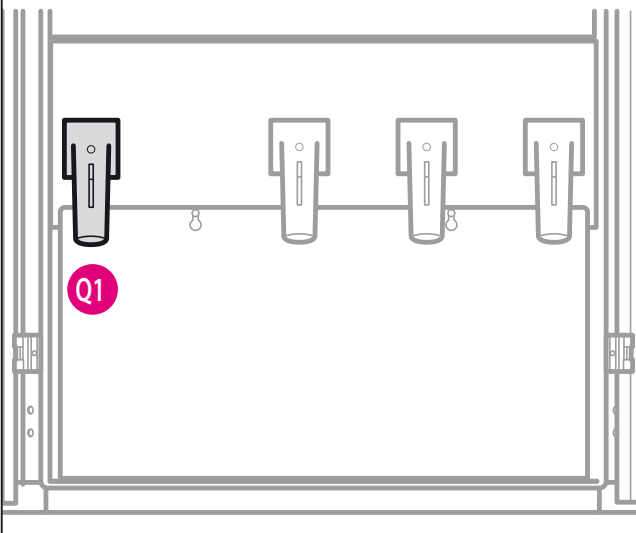
Notes.

- When prompted, press button  to confirm the operation or button  to cancel it.

7.2-6

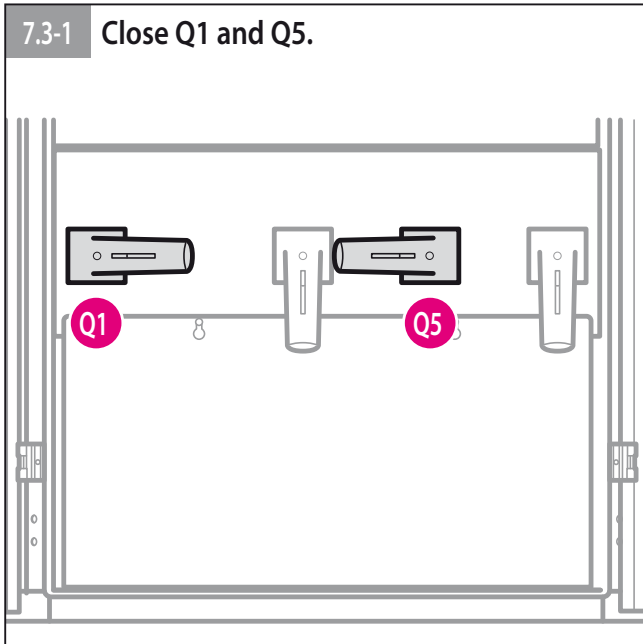
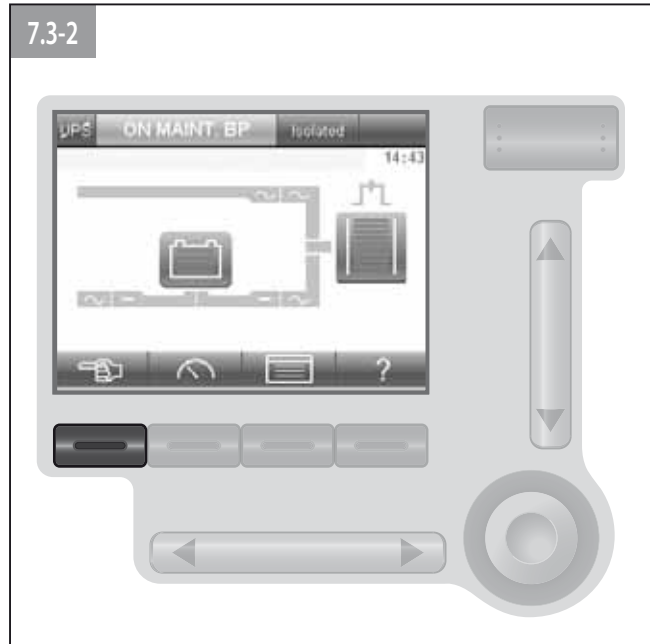


7.2-7 Open Q1.



7.2-8

Wait a few seconds for shutdown.

7.3 SWITCHING ON FROM MAINTENANCE BYPASS.
7.3-1 Close Q1 and Q5.

7.3-2

7.3-3

7.3-4


7.3-5



7.3-6

Run the operations prompted for on the display.

Notes.

- When prompted, press button  to confirm the operation or button  to cancel it.

8.1 MULTILEVEL COMMUNICATION.

The UPS can manage various serial, contact and Ethernet communication channels at the same time. The 2 communication slots available allow the use of signalling accessories and cards.

Each communication channel is independent; simultaneous connections can thus be made to have various levels of remote signalling and monitoring (see the section on the options for a detailed evaluation of the functionalities of the cards that can be installed in the slots).

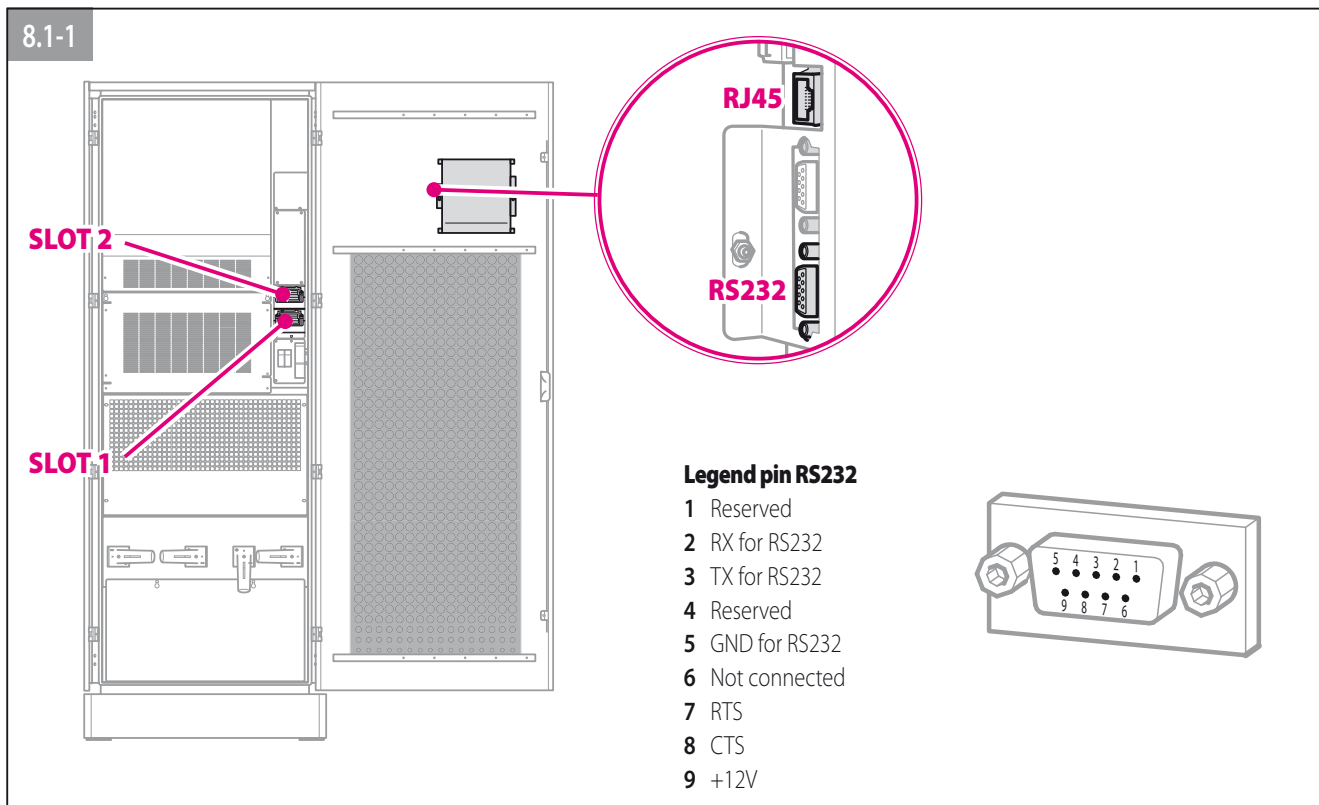
The table below shows the possible connections between the UPS communication channels and the external devices.

Communication levels

	Slot 1	Slot 2	RS232	RJ45
ADC card	●	●		
GSS card	●	●		
Isolated serial port		● ¹		
Modem			● ²	
Modbus TCP				●

¹ It is possible to use one isolated serial PCB only.

² For t.SERVICE via telephone network.



8.2 STANDARD LAN WEB PAGE.

By connecting the UPS to a standard LAN network, the operating status of the UPS can be monitored from any PC connected to the network through an html page.

1. Connect the network cable to the RJ45 port.
2. Configure the network IP address via the mimic panel.
3. Open your favorite web browser.
4. Type the IP address of the UPS to display the synoptic of the UPS.

9.1 UPS SYSTEM ALARMS.

- **Overload in output supply.**

The load power draw is greater than the system's nominal output.

Check the load on the display and disconnect loads not requiring UPS service or distribute the total load over the three phases.

IMPORTANT!

Overloading results in the load not being powered by the UPS for a limited period of time. For further details, see the technical specifications.

- **Switching inhibited.**

Switching from system bypass to inverter may be inhibited by an inverter failure. Reset the alarm and contact Aftersales Service.

- **UPS switching not possible.**

Switching from system inverter to bypass is prevented by problems on the auxiliary mains supply: mains supply out of tolerance, not synchronised, etc. Ensure that Q4 is closed, that the auxiliary mains supply is available and that the values are within range.

- **Insufficient UPS resources.**

The system is in overload, with auxiliary mains supply and inverter inhibited. The power supply to the load will be interrupted if the load is not brought back within range or the auxiliary mains supply fails. Check the load on the display and disconnect loads not requiring UPS service or distribute the total load over the three phases.

- **Loss of UPS redundancy.**

In case of a parallel redundant system, loss of redundancy is due to possible problems with one of the units. Check values and alarms status of all units, and make sure that none of the operating units is overloaded.

- **T.SERVICE alarm.**

Aftersales Service has activated a remote UPS analysis procedure (if the T.SERVICE contract is active).

- **General UPS alarm.**

This alarm is generated if at least one alarm is present on at least one unit. Check the other active alarms for details.

- **General alarm modules 1...6**

These alarms are generated if at least one alarm is present on unit 1 to 6 respectively. Check the other active alarms for details.

9.2 UPS UNIT ALARMS.

- **Overload in output supply.**

The load power draw is greater than the UPS's nominal output.

Check the load on the display and disconnect loads not requiring UPS service or distribute the total load over the three phases.

IMPORTANT!

Overloading results in the load not being powered by the UPS for a limited period of time. For further details, see the technical specifications.

- **Switching inhibited.**

Switching from UPS unit bypass to inverter may be inhibited by an inverter failure. Reset the alarm and contact Socomec UPS Aftersales Service.

- **UPS switching not possible.**

Switching from UPS unit inverter to bypass is prevented by problems on the auxiliary mains supply: mains supply out of tolerance, not synchronised, etc. Ensure that Q4 is closed, that the auxiliary mains supply is available and that the values are within range.

- **Insufficient UPS resources.**

The UPS unit is in overload, with auxiliary mains supply and inverter inhibited. The power supply to the load will be interrupted if the load is not brought back within range or the auxiliary mains supply fails. Check the load on the display and disconnect loads not requiring UPS service or distribute the total load over the three phases.

- **Inverter inhibited due to overload.**

This alarm is generated when the inverter has reached the maximum permitted overload time. Check the UPS's load and reset the alarms.

- **UPS unit inhibited due to overload.**

This alarm is generated when both the inverter and the bypass have reached the maximum permitted overload time. Reduce the UPS's load and reset the alarms.

- **Fan alarm.**

Ventilation system failure. Contact Aftersales Service.

- **Battery charger alarm.**

This alarm is generated in case of a battery charger fault. Check for other alarms and contact Aftersales Service if necessary.

- **Battery powered operation.**

This alarm is generated when the UPS unit is operating on battery power. The input power supply has failed or is insufficient (voltage/frequency out of tolerance). Check for the "rectifier input supply fault" alarm. If there is no power failure, check whether the upstream protections have tripped and whether Q1 is open.

- **Battery alarm.**

General battery alarm due to: battery test failed, maximum battery voltage, battery circuit breaker open, battery charger failure. Check for other alarms and inspect the batteries.

- **Battery room.**

This alarm is generated when the battery room temperature, measured with an external sensor, is higher than the permitted maximum. Check the displayed temperature, and check the battery room ventilation/conditioning system.

- **Batteries exhausted.**

This alarm is generated when the batteries' charge is low and the UPS is about to switch off. Check for other alarms.

- **Battery circuit open.**

Battery circuit breaker open.

- **Rectifier protection.**

The machine room temperature is above the recommended maximum. Check the UPS room ventilation/conditioning system.

- **Inverter protection.**

The machine room temperature is above the recommended maximum. Check the UPS room ventilation/conditioning system.

- **Bypass protection.**

This alarm is generated when the bypass has reached the maximum permitted overload time or in case of problems when switching from inverter to bypass. Check for other alarms. In case of overload, check the UPS's load and reset the alarms.

- **Common protection.**

Incorrect configuration parameters. Contact Aftersales Service.

- **Maximum ambient T°.**

The machine room temperature is above the recommended maximum. Check the UPS room temperature and ventilation/conditioning system. If there is a fan alarm, contact Aftersales Service.

- **Preventive maintenance.**

The UPS must be checked periodically by Aftersales Service to ensure maximum efficiency and performance. If the alarm displays, the UPS must be inspected by a qualified technician.

- **Incorrect use.**

This alarm is not generated by a failure or fault, but by incorrect use or sizing of the UPS system. The alarm may be tripped by:

- Operation for an extended period of time at high temperatures (degradation of the batteries);
 - large number of overloads (incorrect sizing);
 - continuous battery draining (unstable mains voltage);
 - large number of circuit breakers on the bypass (high peak loads).
- **Bypass maintenance alarm.**
This alarm is generated if circuit breakers Q5 (bypass) and Q3 (output) are closed at the same time. Check the position of the circuit breakers.
 - **Phase cycle fault.**
The phase cycle of the auxiliary mains is incorrect. Swap two input phases or two phases of the auxiliary mains supply (only for UPS with separate auxiliary mains supply).
 - **Input mains supply not present.**
The input power supply or auxiliary mains supply has failed or is insufficient (voltage/frequency out of tolerance). Check for “rectifier input power fault” and “bypass power supply out of tolerance” to identify the failure. Check that the voltage and frequency values are in range (see technical specifications).
If there is no input mains supply failure, check whether the upstream protections have tripped or whether circuit breaker Q1 (input power supply) is open.
If there is no auxiliary mains supply failure, check whether the upstream protections have tripped or whether circuit breaker Q4 (auxiliary mains supply) is open.
 - **General unit alarm.**
This alarm is generated if at least one alarm is present on the unit. Check the other active alarms for details.
 - **Genset alarm.**
The genset has sent an alarm; check the genset.
 - **Optional board alarm.**
This alarm is generated if one of the optional boards is no longer communicating with the UPS controller. Check that the board is correctly mounted and reset the alarms.
 - **External alarm 1,2,3,4.**
An ADC board input has been activated; check the devices connected to the board.

9.3 PREVENTIVE MAINTENANCE.



All operations on the equipment must be carried out solely by SOCOMEC UPS personnel or by authorised service personnel.

Maintenance requires accurate functionality checks of the various electronic and mechanical parts and, if necessary, the replacement of parts subject to wear and tear (batteries, fans and condensers). It is recommended to carry out periodic specialised maintenance (annually), in order to keep the equipment at the maximum level of efficiency and to avoid the installation being out of service with possible damage/risks. Moreover, attention should be paid to any requests for preventive maintenance that the equipment may automatically display with alarm/warning message M29.

9.3.1 Batteries.

The state of the battery is fundamental to UPS operation.

Thanks to the **Expert Battery System**, the information relating to the state and the conditions of use of the battery are processed in real time and the recharging and discharging procedures are selected automatically in order to optimise battery life expectancy and offer maximum performance.

Furthermore, during the operating life of the battery, MASTERYS™ stores statistics on the conditions of use of the battery for analysis.

Since the expected life of the batteries is very much dependent on operating conditions (number of charging and discharging cycles, load rate, temperature), a periodic check by authorised personnel is recommended.



**When replacing the batteries, use the same type and configuration by placing them in the appropriate containers so as to avoid the risk of acid leakage.
The replaced batteries must be disposed of at authorised recycling and disposal centres.
Do not open the plastic cover of the batteries as they contain harmful substances.**

9.3.2 Fans.

The life of the fans used to cool the power parts is dependent on the using and environmental conditions (temperature, dust).

Preventive replacement by an authorised technician is recommended within four years (in normal operating conditions).



When needed, fans must be replaced as per specifications by SOCOMEC UPS.

9.3.3 Capacitors.

The equipment houses electrolytic capacitors (used in the rectifier and inverter section) and filtering capacitors (used in the output section), whose life is dependent on using and environmental conditions.

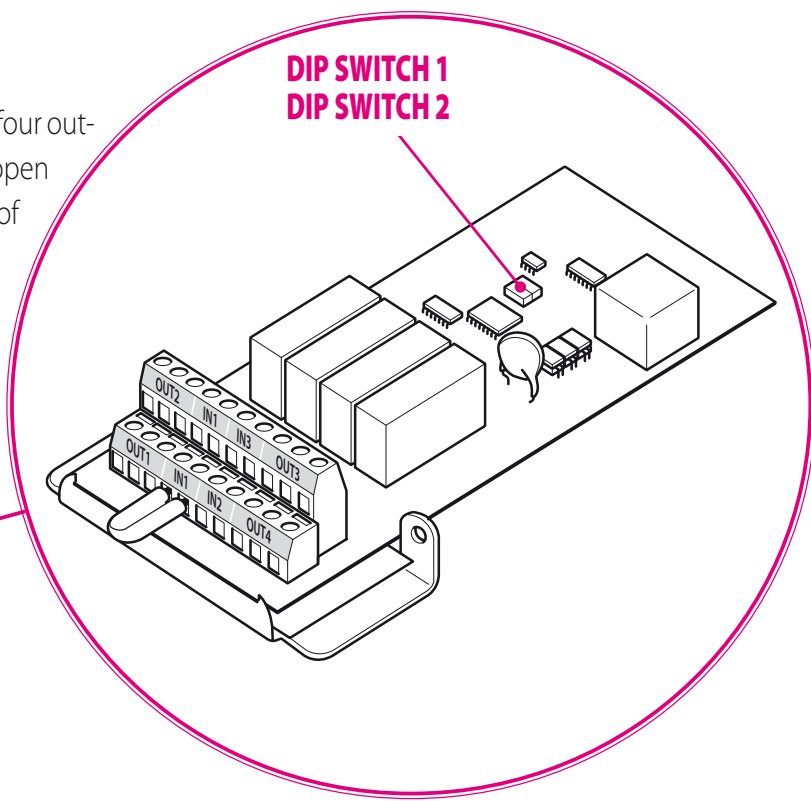
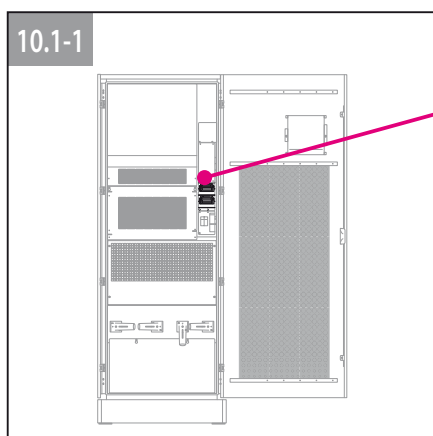
The average expected life of these components is shown below:

- Electrolytic capacitors: 5 years;
- Filtering capacitors: 7 years.

In any case the effective state of the components is verified during preventive maintenance.

10.1 ADC CARD.

This card can be configured to control up to four outputs that are normally closed or normally open and up to three digital inputs. A maximum of two cards can be installed on each unit. Up to four operating modes can be selected using the two DIP switches.



ENGLISH

POWER SAFE configuration

Position dip1	Position dip2	IN/OUT	Description	Filter level ¹
ON	OFF	In1 ²	E.S.D	1
ON	OFF	In2	Supply from GenSet.	1
ON	OFF	In3	Management of energy consumption	1
ON	OFF	Out1	General Alarm	2
ON	OFF	Out2	Power safe plug 1	2
ON	OFF	Out3	Power safe plug 2	2
ON	OFF	Out4	Power safe plug 3	2

SAFETY configuration

Position dip1	Position dip2	IN/OUT	Description	Filter level ¹
OFF	ON	In1 ²	E.S.D	1
OFF	ON	In2	External alarm A39	2
OFF	ON	In3	Isolation controller	2
OFF	ON	Out1	General Alarm	2
OFF	ON	Out2	E.S.D. activation	1
OFF	ON	Out3	Battery low and imminent stop	2
OFF	ON	Out4	E.S.D. activation	1

ENVIRONMENTAL configuration

Position dip1	Position dip2	IN/OUT	Description	Filter level ¹
ON	ON	In1 ²	E.S.D	1
ON	ON	In2	External alarm A39	2
ON	ON	In3	External alarm A40	2
ON	ON	Out1	General Alarm	2
ON	ON	Out2	Over-heating	2
ON	ON	Out3	Overload / Loss of redundancy	2
ON	ON	Out4	External alarm In2	2

- The filter level indicates:
 - 1 immediate activation (1 seconds minimum communication time)
 - 2 delay 10 s
- If the external E.S.D. button is not used, always insert a jumper to short circuit input In1.

Description of signals

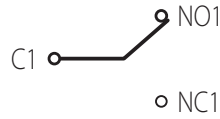
Message on the mimic panel

General Alarm

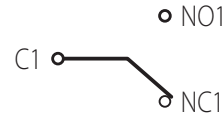
Description

"General Alarm" contact output.

No alarm.



"General Alarm" active.



Battery Low or Imminent stop	Battery low voltage and imminent shutdown contact output.
E.S.D.	Contact input for emergency shutdown device.
Supply from GenSet	Generator ready signal input.
Power safe plug 1	Non privileged load 1 command output activated by overload or loss of redundancy.
Power safe plug 2	Non privileged load 1 command output activated by battery discharging.
Power safe plug 3	Non privileged load 1 command output activated by battery low.
Management of energy consumption	Input for the battery to help providing energy in the event of peak consumption.
E.S.D. activation	Shutdown for E.S.D. contact output.
Over-heating	Internal over-heating contact output.
Overload/Loss of redundancy	Overload / loss of redundancy contact output



Intervention of the E.S.D. input switches off the UPS output.

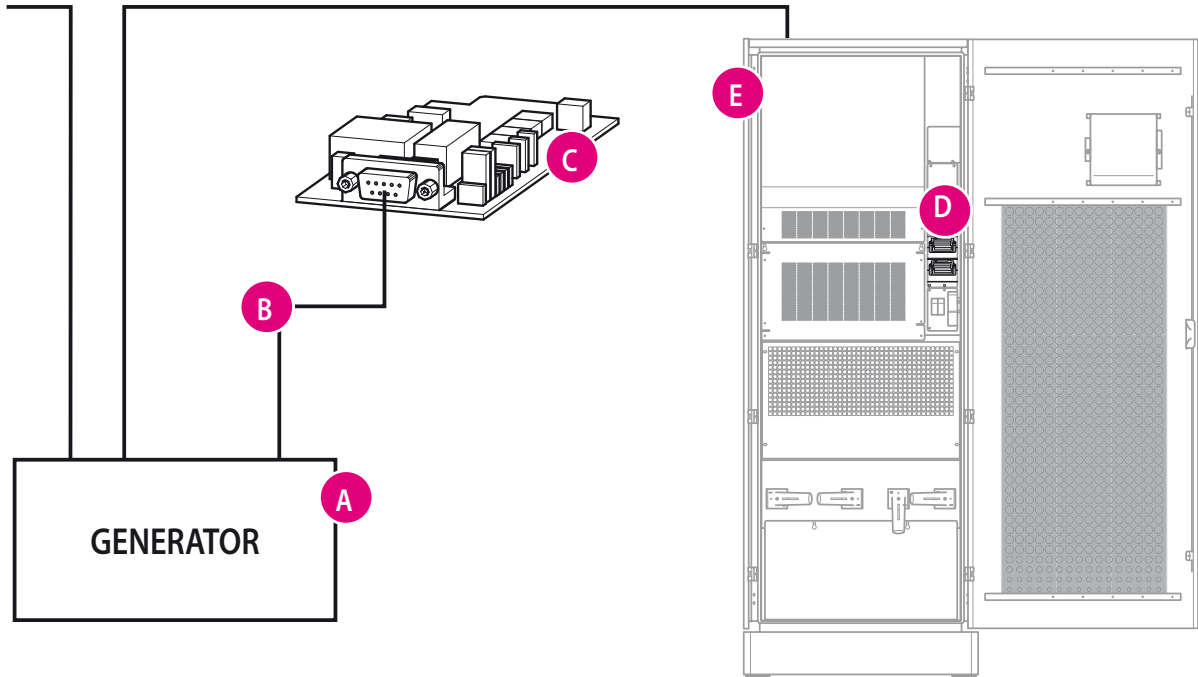
To restore the UPS to operation:

- **Close the E.S.D. contact on "In 1" on the ADC board.**
- **Give the "reset alarms" command.**
- **Run the start procedure**

10.2 KIT GSS (GLOBAL SUPPLY SYSTEM).

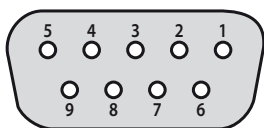
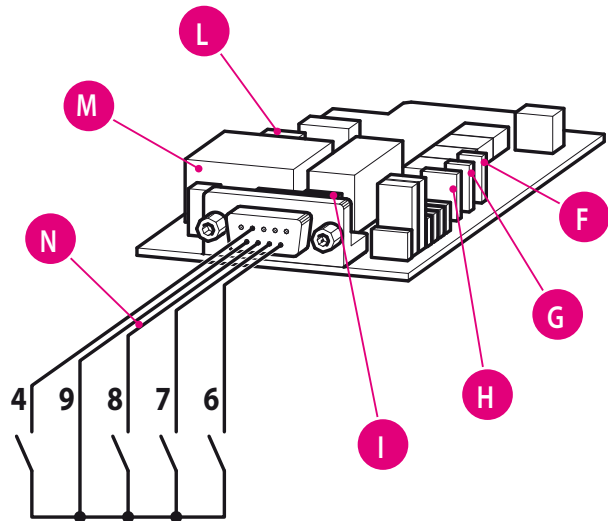
This kit optimises generator sizing and control when connected to the UPS input.

10.2-1



Legend.

- A Generator
- B Connection cable
- C GSS PCB
- D Free slot for the PCB
- E UPS
- F XJ5 jumper
- G XJ4 jumper
- H XJ3 jumper
- I XJ2 jumper
- L XJ1 jumper
- M Buzzer
- N External contacts



Legend pin DB9 serial connector

- | | |
|----------------------------------|--------------------------------------|
| 1 Common relay | 6 Input 2 (GE working conditions OK) |
| 2 Contact relay | 7 Input 3 (GE failure) |
| 3 Not connected | 8 Input 4 (GE preventive alarm) |
| 4 Input 1 (powered by generator) | 9 Common inputs |
| 5 Not connected | |

ENGLISH

Functions available on the GSS card:

- **4 external inputs** to monitor the generator set. The contact at each input must be voltage-free and activate the signal when closed to the common input:
 - **pin 4 "Input 1"**: this contact must be closed when the generator set is used to power the UPS.
 - **pin 6 "Input 2"**: this contact must be closed when the generator set is operating normally.
 - **pin 7 "Input 3"**: this contact must be closed when an alarm condition occurs on the generator set that does not impede its operation (e.g. low fuel, etc.)
 - **pin 8 "Input 4"**: this contact must be closed when an alarm condition occurs on the generator set that impedes its operation (engine failure, no oil, etc.)
 - **pin 9 "Common input"**: the common point for the contacts of the single relays listed above.
- **1 dry-contact relay for "Notification signal from UPS to the generator set ("generator call")**: this is used to activate the generator set start up sequence when a power failure lasts longer than the time set in the UPS configuration and/or battery discharge reaches the minimum safety level. The contact can be configured as normally open or closed using the XJ2 jumper. Maximum current and voltage is 500 mA at 60 Vac.

- **"Simple" operation.**

The generator set performs an auto-start up due to the power failure. The signal sent by the generator set (dry contact activated when the UPS is powered by the generator set) must be connected between inputs 1 and 2 (short circuit) and the common inputs. Inputs 3 (GE alarm) and 4 (GE failure) which respectively generate alarms A56 or A57 on the UPS, are to be considered options. The dry contact (generator call signal) is not used in "Simple" operation.

- **"Advanced" operation.**

The generator set is activated according to the parameters set by the user on the UPS depending on how long the power failure lasts or when the remaining battery backup time is reached. Until these conditions occur, the generator set will remain blocked by the "generator call" contact. Subsequently, a change of status on the same contact will start up the generator set that will send the "Generator running signal (input 2) and then "powered by GE" (input 1). The alarms on Input 3 (GE alarm) or 4 (GE failure) are used by the UPS to generate the A56 or A57 alarms. When alarm A57 occurs, the generator set is disabled using the "generator call" signal.

Note.

In both operating states, an electric and/or electromechanical locking mechanism **must** be used to prevent the simultaneous supply of voltage to the UPS by the generator set and by the main supply.

10.3 ISOLATION CONTROLLER.

This device continually checks the transformer isolation, displaying an alarm message on the mimic panel.

10.4 EXTERNAL MAINTENANCE BYPASS.

This device will electrically exclude and isolate the UPS (e.g. for maintenance operations) without interrupting the power supplied to the load.

10.5 ACS PCB.

Synchronises UPS output with an external power source (another UPS, even of a different brand, generator or transformer).

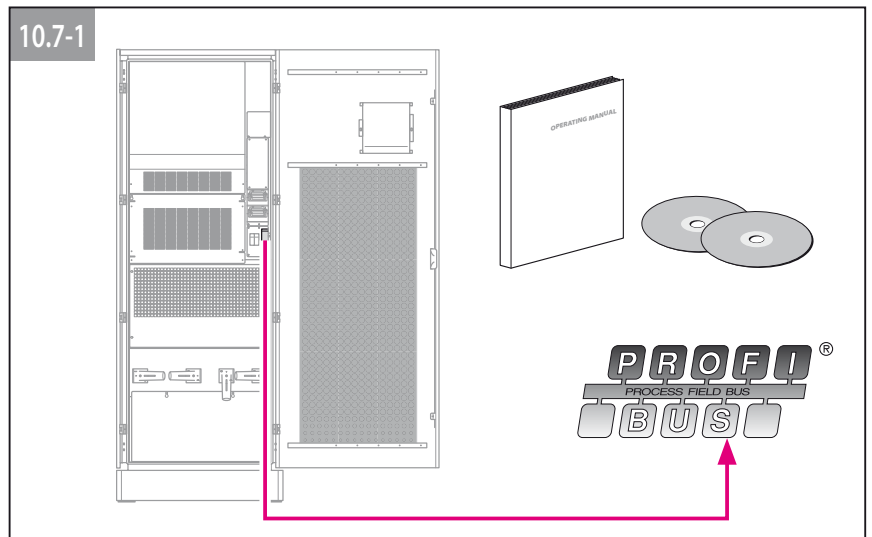
10.6 TEMPERATURE SENSOR.

This allows control of the temperature in the battery room or inside the battery cabinet.

10.7 PROFIBUS.

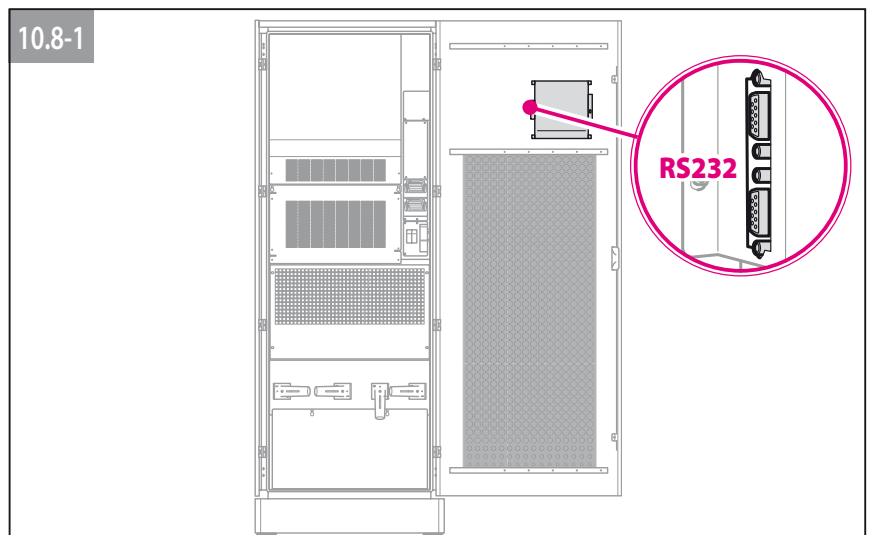
On request, the UPS can be provided with a Profibus protocol converter, installation software, configuration software and user manuals.

If the RS232/485 serial connector is installed on the mimic panel, it should be disabled.



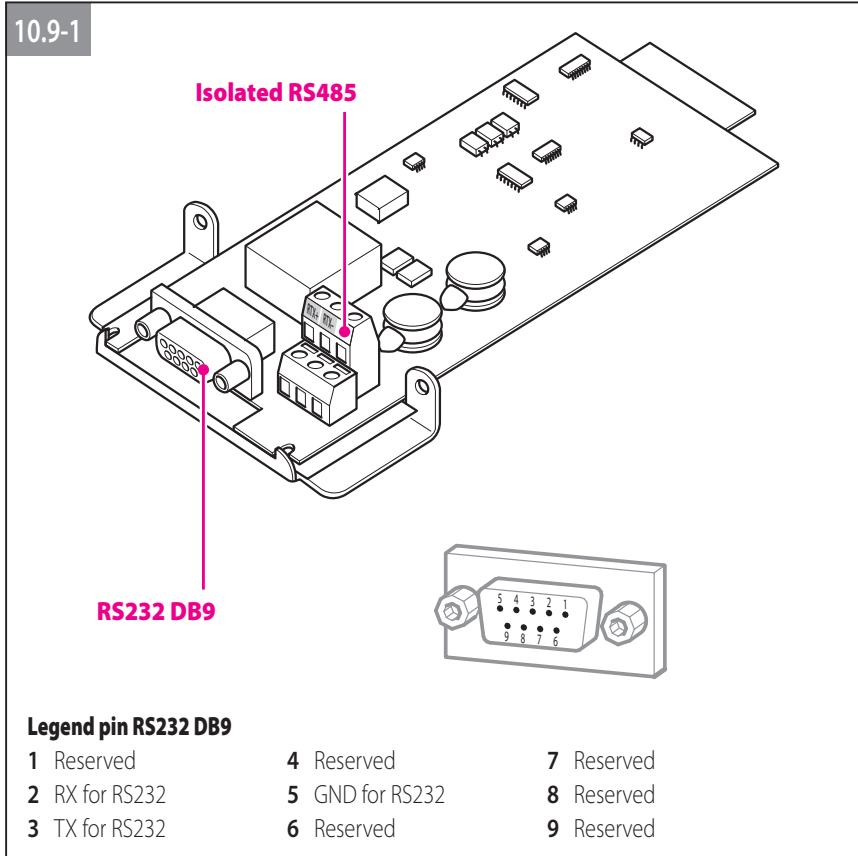
10.8 GSM MODEM.

Enables sending of SMS messages regarding the equipment's operating status.



10.9 SERIAL CONNECTION PCB.

A serial RS232 connector DB9 and an isolated RS485 connector are available on the card (RTX+ and RTX-).



Electrical specifications - Input

	100	120
Mains voltage with nominal power (cos φ = 0,9)	3P+N 400 V -15% +20% (up to -40% @ 50% of nominal load)	
Input frequency	50-60 Hz ±10%	
Input power factor	0,99	
THDI	≤ 3%	

Electrical specifications - Output

	100	120
Output voltage	3P+N 400 V ±1%	
Frequency	50-60 Hz ±0,2%	
Automatic bypass	400 V ±15% (selectable from 10% to 20% if generator is used)	
Nominal power	90 kW	108 kW
Overload:		
• 10 minutes	100 kW	120 kW
• 5 minutes	112 kW	135 kW
• 1 minute	120 kW	144 kW
• 30 seconds	135 kW	162 kW
Crest factor	3:1	
Voltage distortion	< 1% with linear load; < 4% with non-linear load	

Environment

	100	120
Operating temperature	0÷40 °C (15÷25 °C recommended)	
Storage temperature	-5÷45 °C	
Relative humidity (condensation-free)	up to 95%	
Max. altitude	1.000 m	
Acoustic noise	< 65 dB (A)	
Acoustic noise	2.000 m³/h	
Dissipated power max	5.700 W	6.900 W
Dissipated power	19.450 BTU/h	23.550 BTU/h

Standards

	100	120
Safety (TÜV certified)	EN 62040-1-1, EN 60950-1-1	
Type and performance	EN 62040-3 (VFI-SS-111)	
EMC	EN 62040-2	
Product certification	CE	
Protection level	IP20 (compliant with IEC 60529)	

Mechanical characteristics

	100	120
Dimensions (LxDxH)	700x830x1925 cm	
Weight	380 kg	

