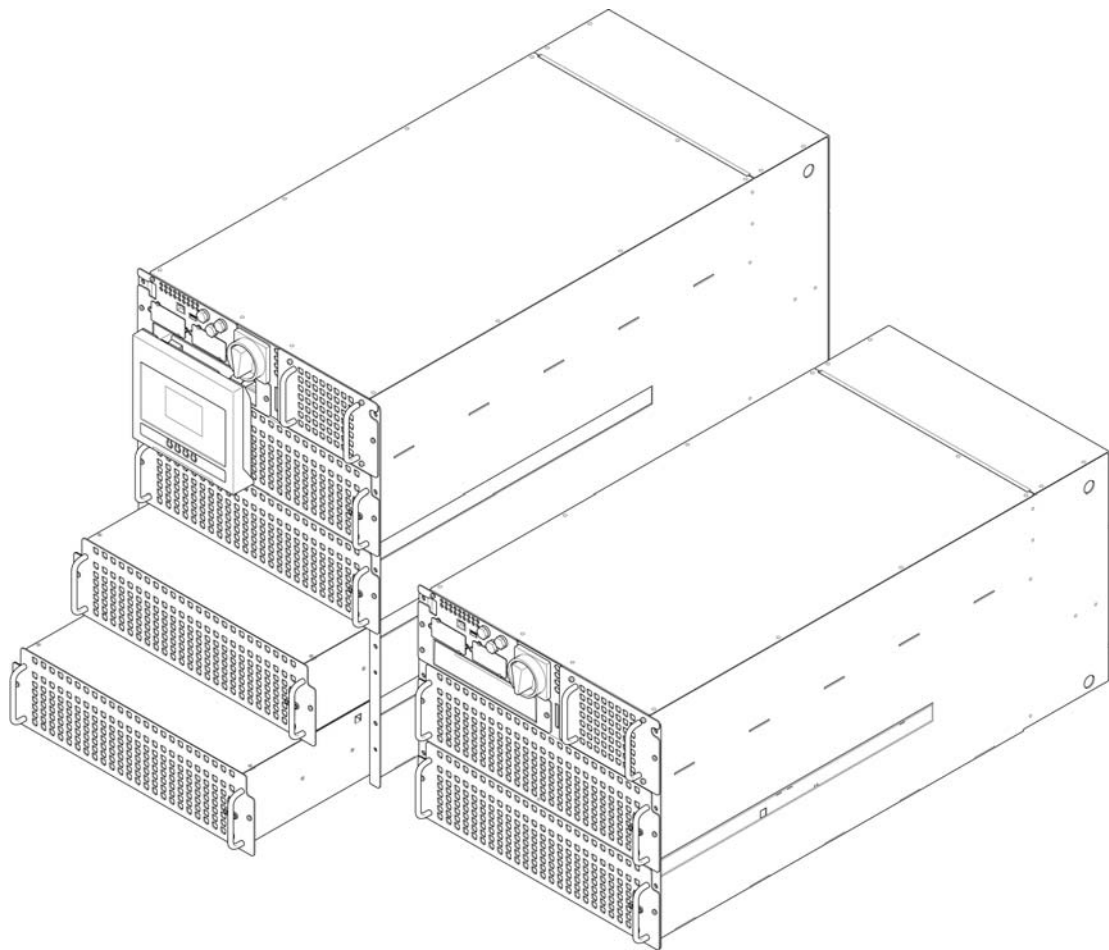


**INSTALLATION
AND OPERATING
MANUAL**

MODULYS RM GP

Green Power 2.0 range
up to 4 x 25 kW

EN



[www.socomec.com/en/
modulys-rm-gp](http://www.socomec.com/en/modulys-rm-gp)

www.socomec.com

socomec
Innovative Power Solutions

- 1. CERTIFICATE AND CONDITIONS OF WARRANTY**5
- 2. SAFETY STANDARDS**6
 - 2.1. DESCRIPTION OF SYMBOLS7
- 3. ENVIRONMENTAL REQUIREMENTS AND HANDLING**8
 - 3.1. ENVIRONMENTAL REQUIREMENTS8
 - 3.1.1. ROOM POSITION8
 - 3.1.2. IN-ROW CONFIGURATION.....8
 - 3.2. HANDLING.....9
 - 3.2.1. RACK INSTALLATION10
- 4. ELECTRICAL INSTALLATION**.....14
 - 4.1. ELECTRICAL REQUIREMENTS14
 - 4.1.1. BACKFEED PROTECTION15
- 5. OVERVIEW**16
- 6. CONNECTIONS**.....19
 - 6.1. EXTERNAL BATTERY CABINET CONNECTION22
 - 6.2. OTHER CONNECTIONS23
 - 6.2.1. POWER MODULE INSERTION24
 - 6.2.2. BYPASS MODULE INSERTION26
- 7. CONTROL PANEL**.....27
- 8. MENU**29
 - 8.1. DISPLAY OVERVIEW29
 - 8.2. MENU TREE.....32
 - 8.3. MENU FUNCTIONS DESCRIPTION33
 - 8.3.1. KEYPAD LOCKING33
 - 8.3.2. ENTERING PASSWORDS.....33
 - 8.3.3. ALARMS MENU.....33
 - 8.3.4. MEASUREMENTS MENU.....33
 - 8.3.5. COMMANDS MENU33
 - 8.3.6. SETTINGS MENU34
 - 8.3.7. BATTERY SETTINGS MENU34
 - 8.3.8. HISTORY LOG MENU.....34
 - 8.3.9. SERVICE MENU.....34
 - 8.3.10. COMMISSIONING CODE34
- 9. OPERATING PROCEDURES**35
 - 9.1. SWITCHING ON35
 - 9.2. SWITCHING OFF.....35
 - 9.3. BYPASS OPERATIONS35
 - 9.3.1. SWITCHING ONTO MAINTENANCE BYPASS.....35
 - 9.3.2. SWITCHING ON FROM MAINTENANCE BYPASS36
 - 9.3.3. EXTENDED OUT OF SERVICE.....36
 - 9.3.4. EMERGENCY SHUTDOWN36
- 10. OPERATING MODES**.....37
 - 10.1. ON-LINE MODE37
 - 10.2. HIGH EFFICIENCY MODE.....37
 - 10.3. CONVERTER MODE.....38
 - 10.4. OPERATION WITH MAINTENANCE BYPASS38
 - 10.5. OPERATION WITH MOTOR GENERATOR (GENSET)38
- 11. STANDARD FEATURES AND OPTION**.....39
- 12. MAINTENANCE**.....42
 - 12.1. BATTERIES.....42
 - 12.2. FANS & CAPACITORS42
- 13. TECHNICAL SPECIFICATIONS**43

All documentation relating to the MODULYS RM GP and the corresponding sensors is available on the SOCOMEC website at the following address:

http://www.socomec.com/range-19rack-rack-tower-convertible-UPS_en.html?product=/ups-modulys-rm-gp-green-power_en.html



1. CERTIFICATE AND CONDITIONS OF WARRANTY

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

The warranty is valid for 12 (twelve) months from the commission date, provided activation is carried out by SOCOMEC personnel or personnel from a support centre authorised by SOCOMEC, and no more than 15 (fifteen) months from being shipped from SOCOMEC.

The warranty is valid throughout national territory. If the UPS is exported abroad, the warranty will only cover the parts used to repair faults.

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

The warranty shall not apply in the following cases:

- Failure due to unforeseen circumstances or force majeure (lightning, floods, etc.);
- Failure due to negligence or improper use (use outside limits: temperature, humidity, ventilation, electric power supply, applied load, batteries);
- Insufficient or inappropriate maintenance;
- When maintenance, repairs or modifications have not been carried out by SOCOMEC personnel, or personnel from a support centre authorised by SOCOMEC.
- If the battery has not been recharged in accordance with the terms indicated on the packaging and in the manual, in the event of long periods of storage or UPS inactivity.

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

Defective or faulty parts replaced free of charge must be made available to SOCOMEC, which becomes the sole owner.

Replacement or repair of parts, or any modifications to the product during the warranty period, will not extend the duration of the warranty.

SOCOMEC will not be responsible for damages under any circumstances (including, without limitations, damage for loss of earnings, interruption of activity, loss of information or other financial losses) arising from the use of the product.











These conditions are subject to Italian law. Any disputes fall under the jurisdiction of the Court of Vicenza.

SOCOMEC retains the full and exclusive ownership rights to this document. Only a personal entitlement to use the document for the application indicated by SOCOMEC is granted to the recipient of this document. The reproduction, modification, distribution of this document, either partially or wholly and in any manner, is strictly prohibited except upon Socomec's express prior written consent.



This document is not a specification. SOCOMEC reserves the right to make any changes to the information provided without prior notice.

2. SAFETY STANDARDS

This user manual specifies installation and maintenance procedures, technical data and safety instructions for SOCOMEC. For further information visit the Socomec website: www.socomec.com.

	NOTE: any work carried out on the equipment must be performed by skilled, qualified technicians.
	NOTE: before carrying out any operations on the unit read the installation and operating manual carefully. Keep this manual safe for future reference.
	DANGER: failure to observe safety standards could result in fatal accidents or serious injury, and damage equipment or the environment.
	CAUTION: if the unit is found to be damaged externally or internally, or any of the accessories are damaged or missing, contact SOCOMEC. Do not operate the unit if it has suffered a violent mechanical shock of any kind.
	NOTE: install the unit in accordance with clearances in order to prevent access to handling devices and guarantee sufficient ventilation (refer to Environmental Requirements chapter).
	NOTE: only use accessories recommended or sold by the manufacturer.
	NOTE: when the equipment is transferred from a cold to a warm place wait approx. two hours before putting the unit into operation.
	NOTE: when carrying out electrical installation, all applicable standards specified by the IEC, in particular IEC 60364, and the electricity supplier must be observed. All national standards applicable to batteries must be observed. For further information refer to Technical Specification chapter.
	WARNING: connect the protective earth (PE) conductor before making any other connections.
	NOTE: the installer is responsible for implementing the backfeed protection with the use of AC input line isolation devices external to the UPS. Refer to Electrical Requirements' chapter.
	DANGER! RISK OF ELECTRIC SHOCK: before carrying out any operations on the unit (cleaning and maintenance operations, connection of appliances, etc.) disconnect all power sources.
	DANGER! RISK OF ELECTRIC SHOCK: after disconnecting all power sources wait approx. 5 minutes for the complete discharge of the unit.
	NOTE: the UPS may be powered from an IT distribution system with a neutral conductor.
	NOTE: any use other than that specified will be considered inappropriate and the manufacturer/supplier cannot be held liable in such cases. Risk and responsibility lies with the system manager.

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

	NOTE: this is a product for commercial and industrial application – installation restrictions or additional measures may be needed to prevent disturbance.
	WARNING: this is a category C2 UPS product. In a residential environment, this product may cause radio interference, in which case the user may be required to take additional measures.


2.1. Description of symbols

All interior and exterior precautions and warnings on labels and plates on the equipment should be complied with.

	DANGER! HIGH VOLTAGE (BLACK/YELLOW)
	Protective earth terminal (PE)
	Read the user manual before using the unit
	It is forbidden for non-qualified personnel to work on the batteries.
	Do not smoke, use naked flames or generate sparks in the vicinity of the accumulators.
	Accumulators are heavy! Use suitable transport and lifting equipment to work safely.
	Connecting accumulators in series creates hazardous voltages.
	The electrolyte corrodes metals and burns the skin and all parts of the human body.
	WARNING: Risk of explosion! Avoid short circuits! Never place tools or metal objects on the accumulators.
	Wear safety goggles and suitable clothing.
	Read the user instructions carefully. Read the user manual before performing any operations.
	Wear protective gloves and clothing.
	In the event of contact with the eyes, wash immediately with plenty water and call a doctor. Call a doctor immediately in the event of accidents or illness.
	The unit MUST be handled by at least two people.
	Batteries and related parts contain lead. Lead is dangerous to health if ingested. Wash hands after handling!

We advise you to contact SOCOMEC beforehand to confirm the ability of these products to meet the required level of safety, performance, reliability and compliance with applicable laws, regulations and specifications.

3. ENVIRONMENTAL REQUIREMENTS AND HANDLING

	NOTE: before carrying out any operations on the unit read the Safety Standards chapter carefully.
---	---

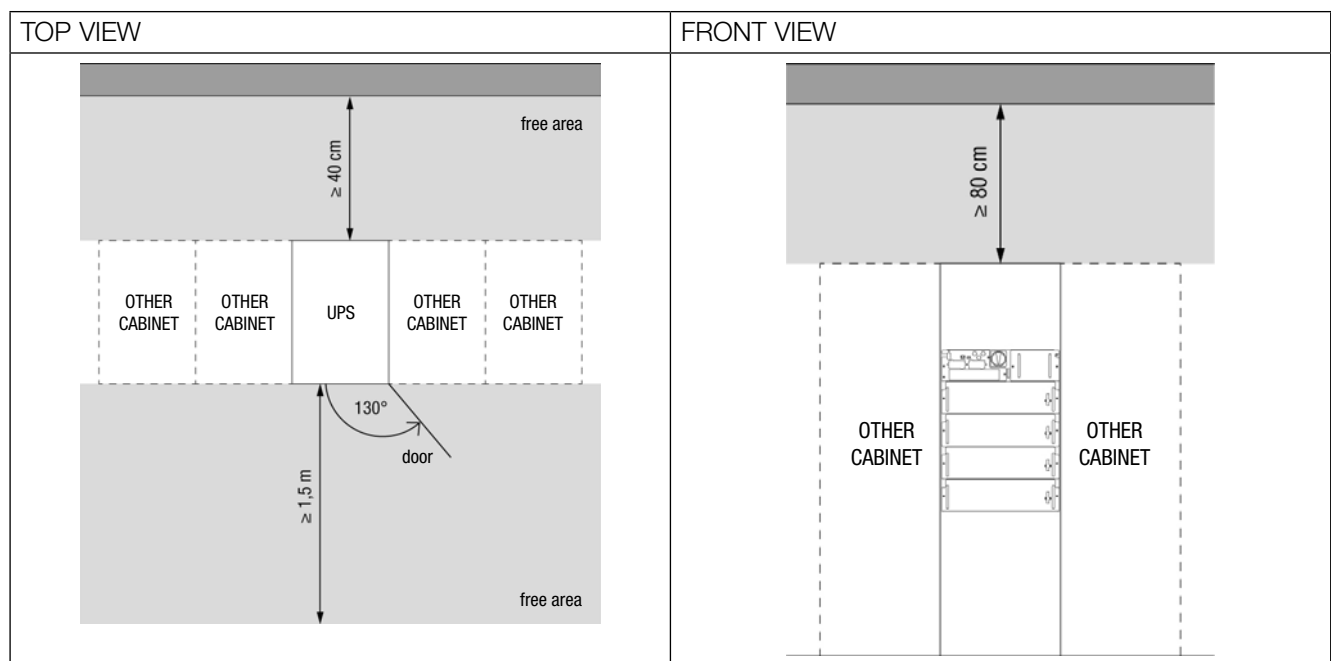
3.1. Environmental requirements

The room must be:

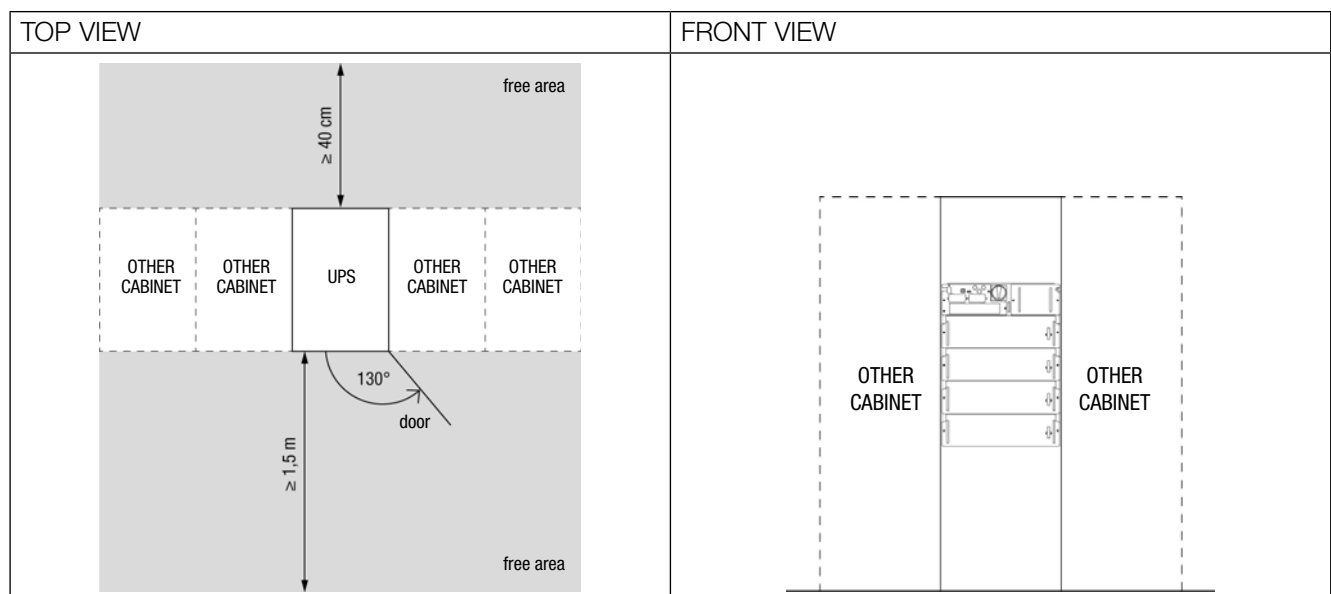
- of a suitable size
- free from conductive, inflammable and corrosive items;
- not exposed directly to sunlight.

The floor must support the weight of the unit and guarantee its stability. The unit is designed for indoor installation only.

3.1.1. Room position








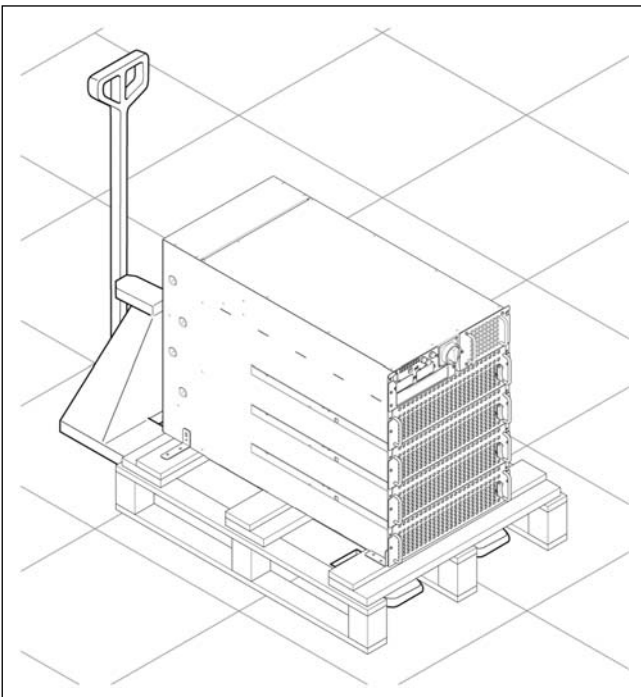
3.1.2. In-row configuration



3.2. Handling

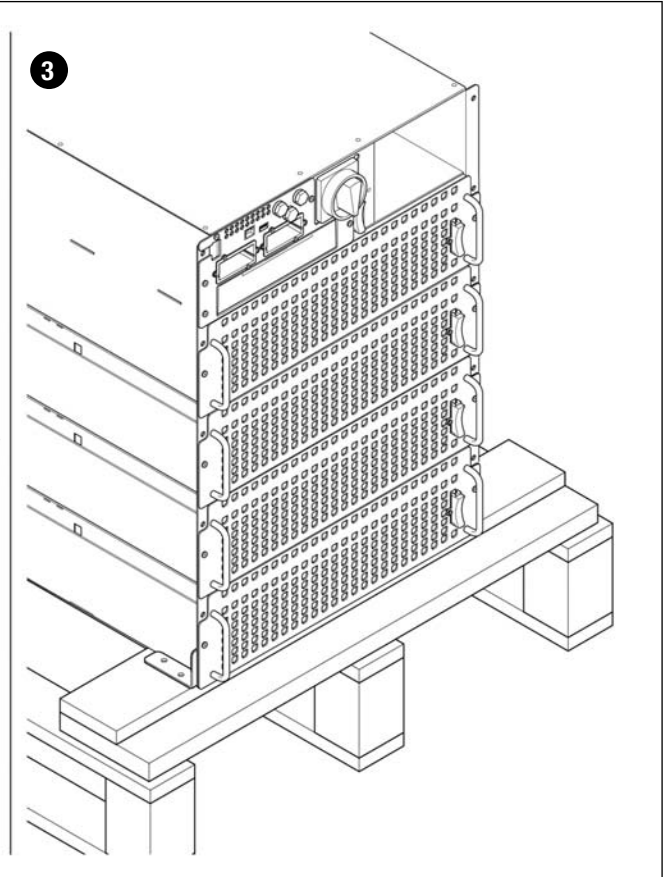
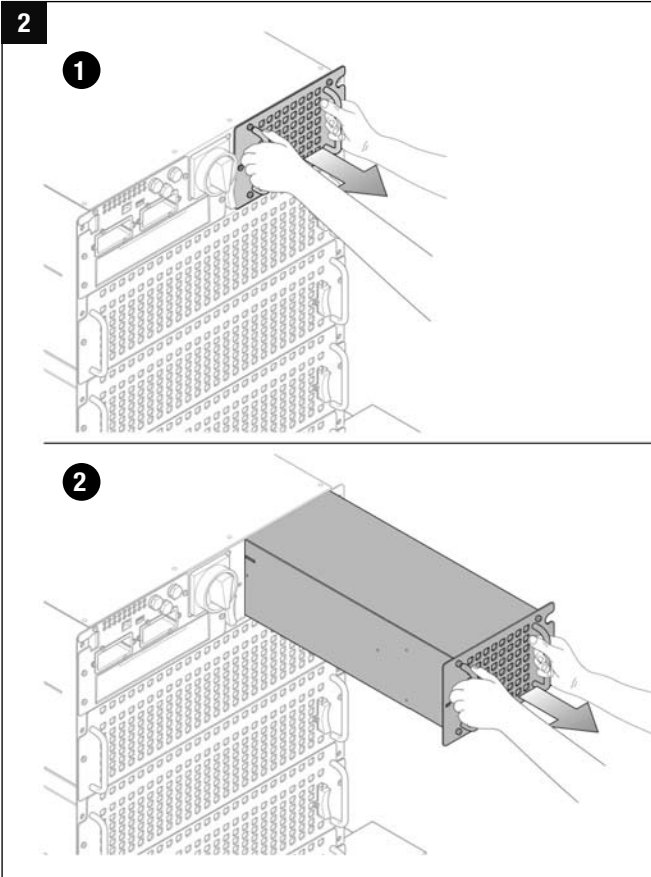
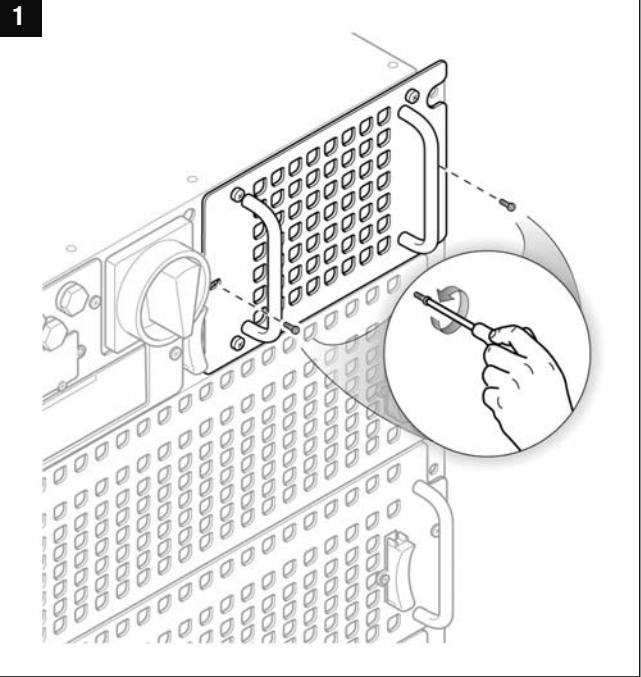
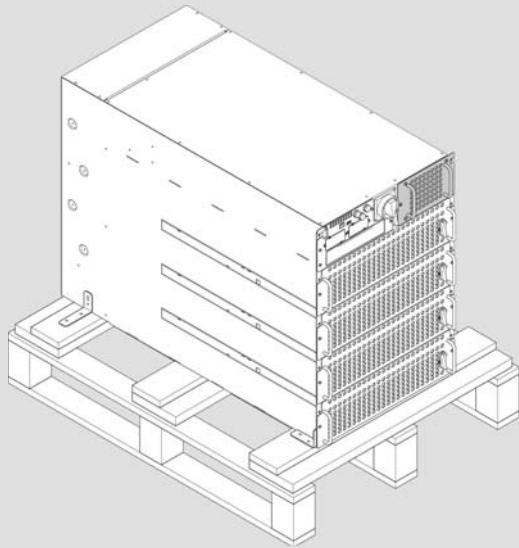
- The packaging guarantees the stability of the unit during shipping and physical transfer.
- The unit must remain in a vertical position during all shipping and handling operations.
- Ensure that the floor is strong enough to support the weight of the unit.
- Carry the packaged unit as close as possible to the installation site.

	WARNING! HEAVY WEIGHT: move the unit using a forklift truck taking the utmost caution at all times.
	The unit MUST be handled by at least three people who MUST stand at the sides of the UPS with respect to the direction of movement.
	Do not move the unit by putting pressure on the front door.
	When moving the unit on even slightly sloping surfaces, use the locking equipment and braking devices to ensure that the unit does not fall over.
	WARNING: the following instructions must be carried out prior to moving the unit (after initial positioning). Failure to heed this warning could result in the unit falling over, equipment damage, injury and even death.

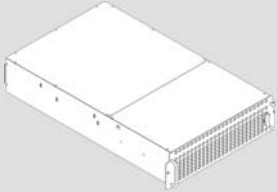
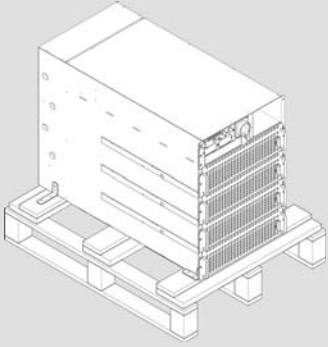


3.2.1. Rack installation

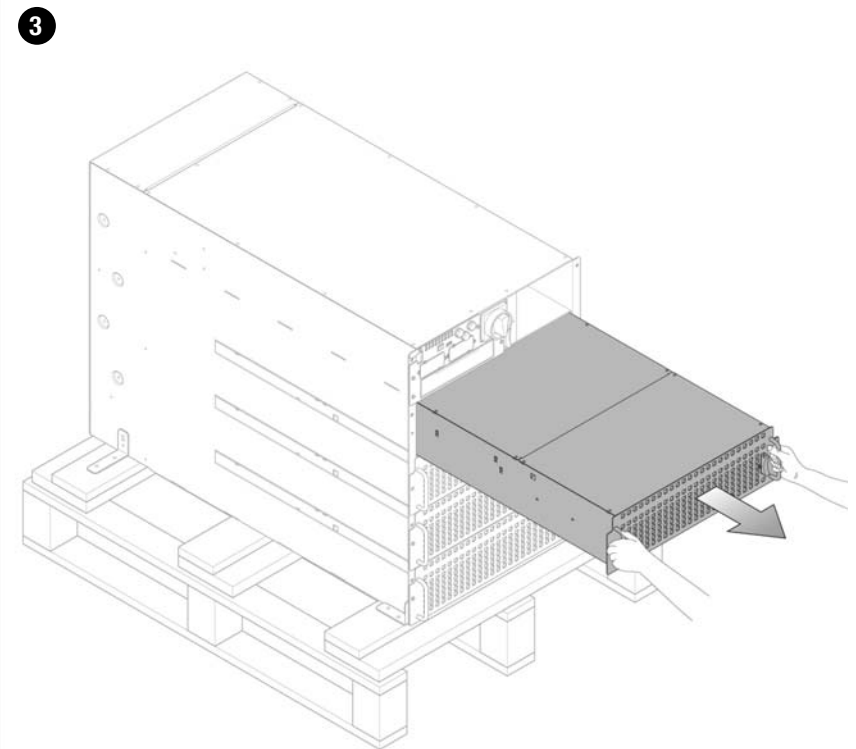
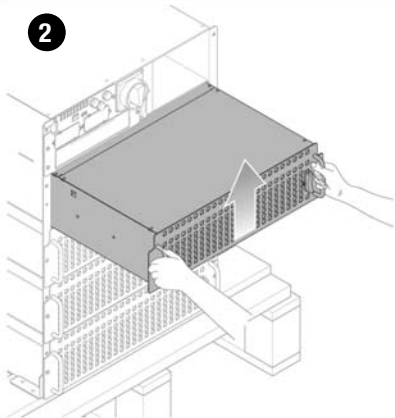
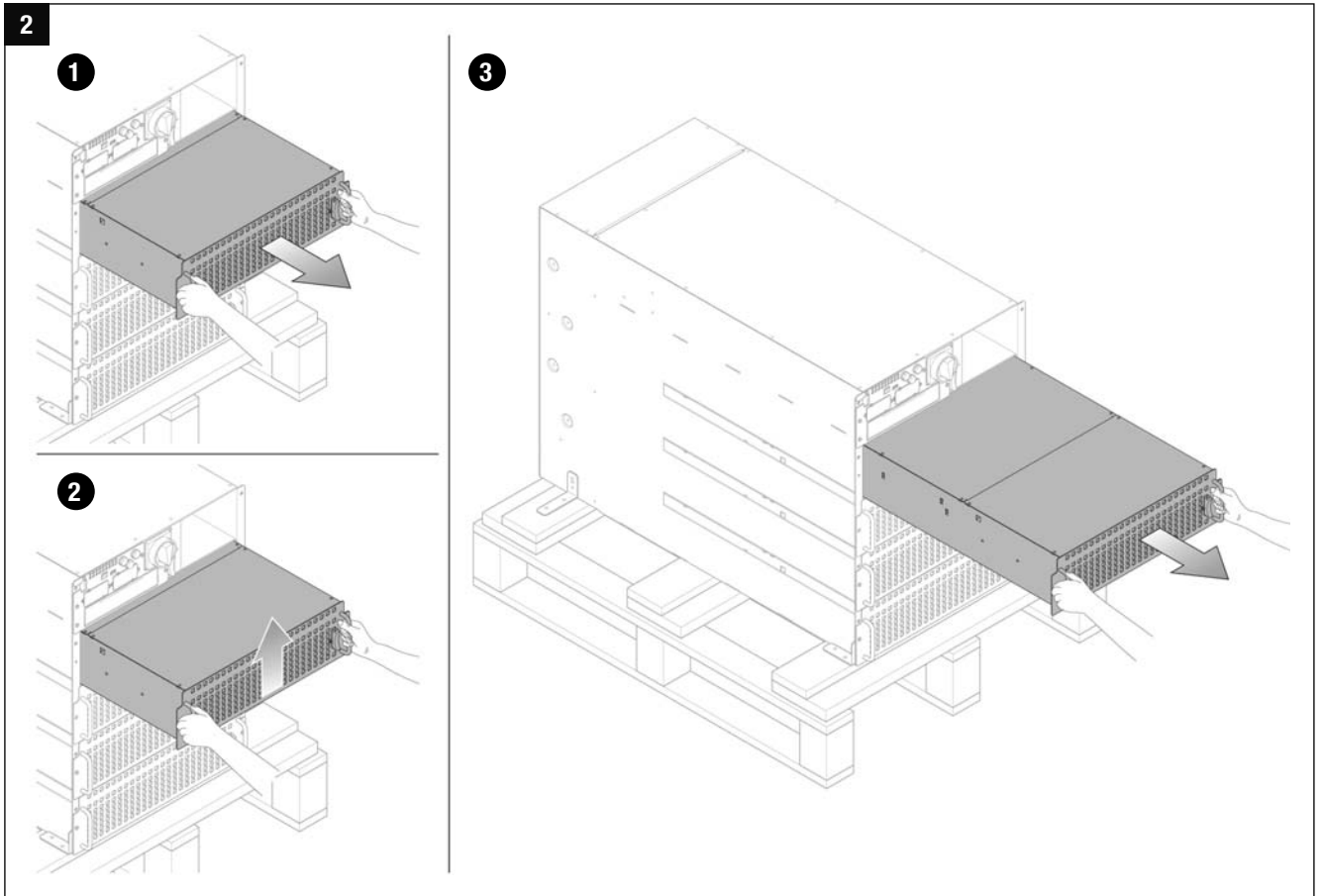
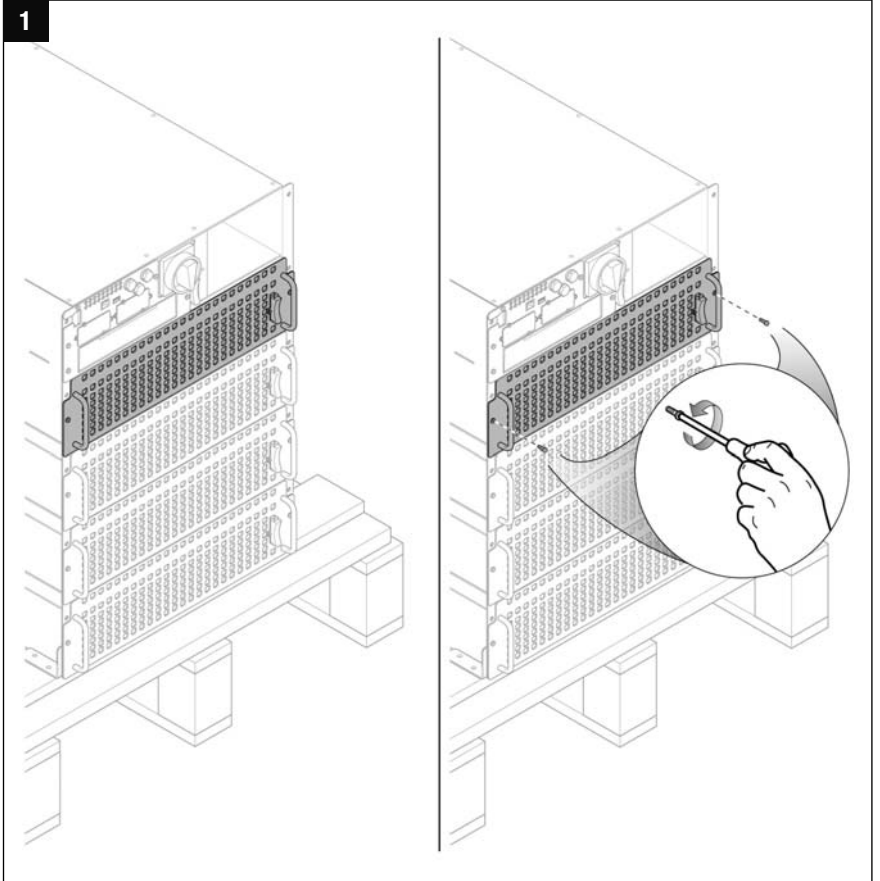
Bypass module extraction

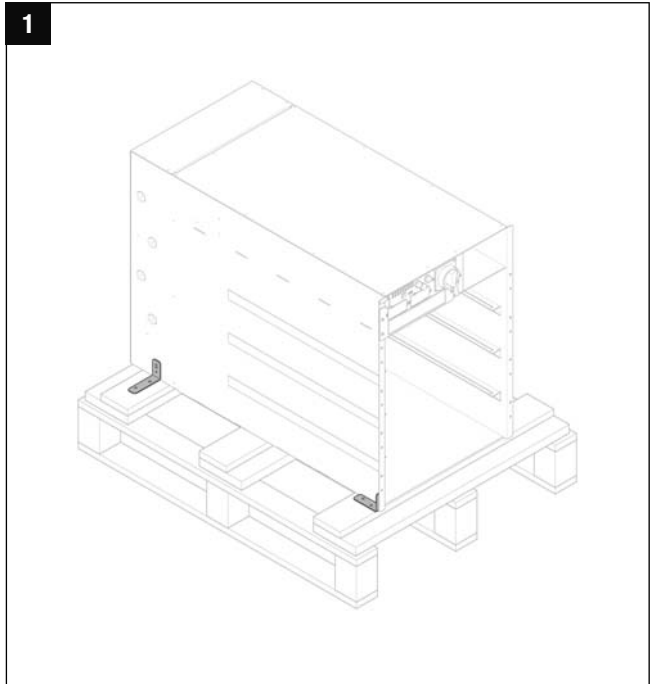
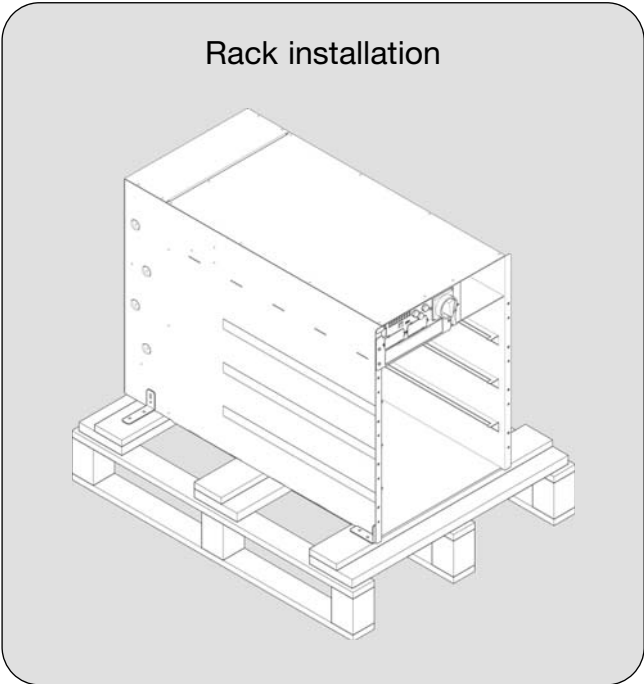
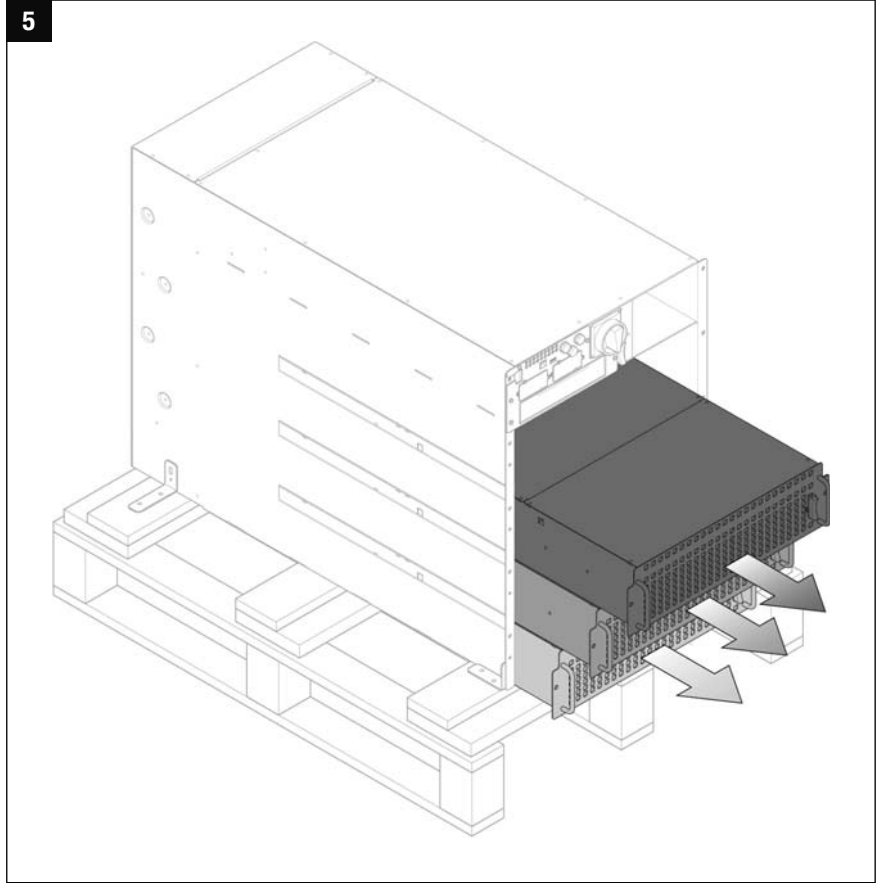
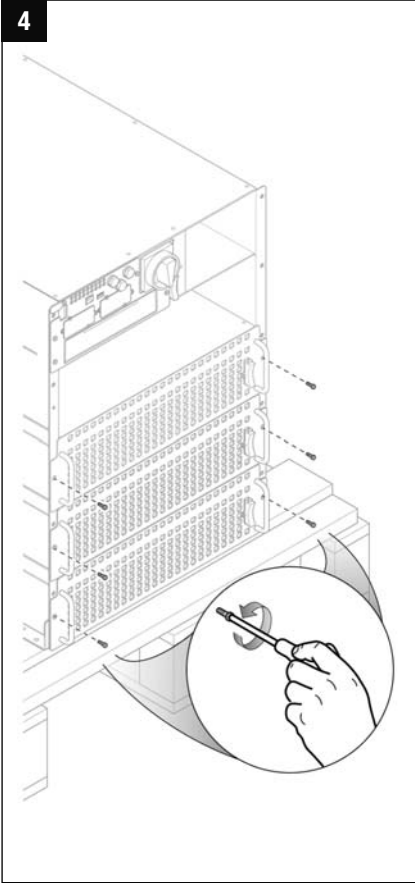


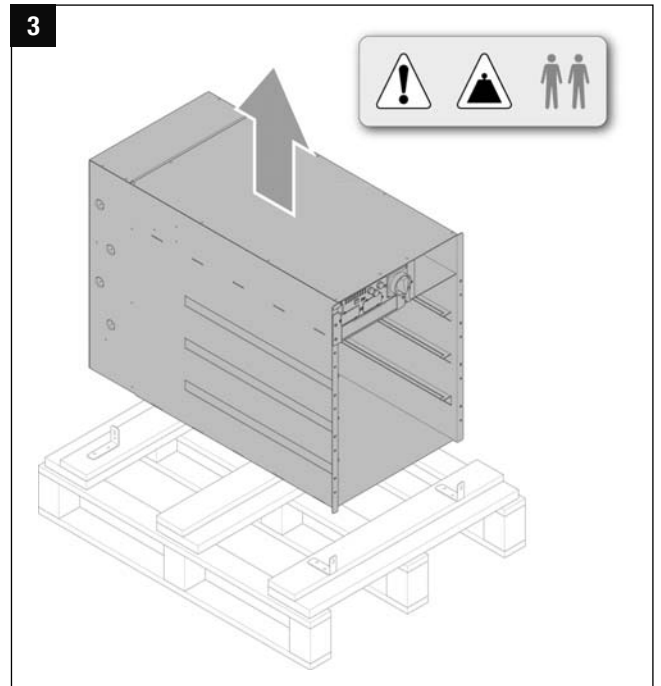
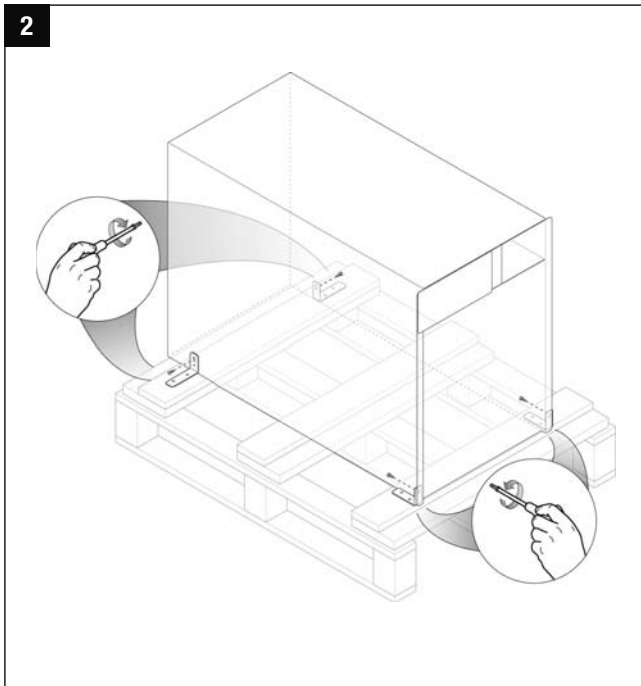
Power module extraction



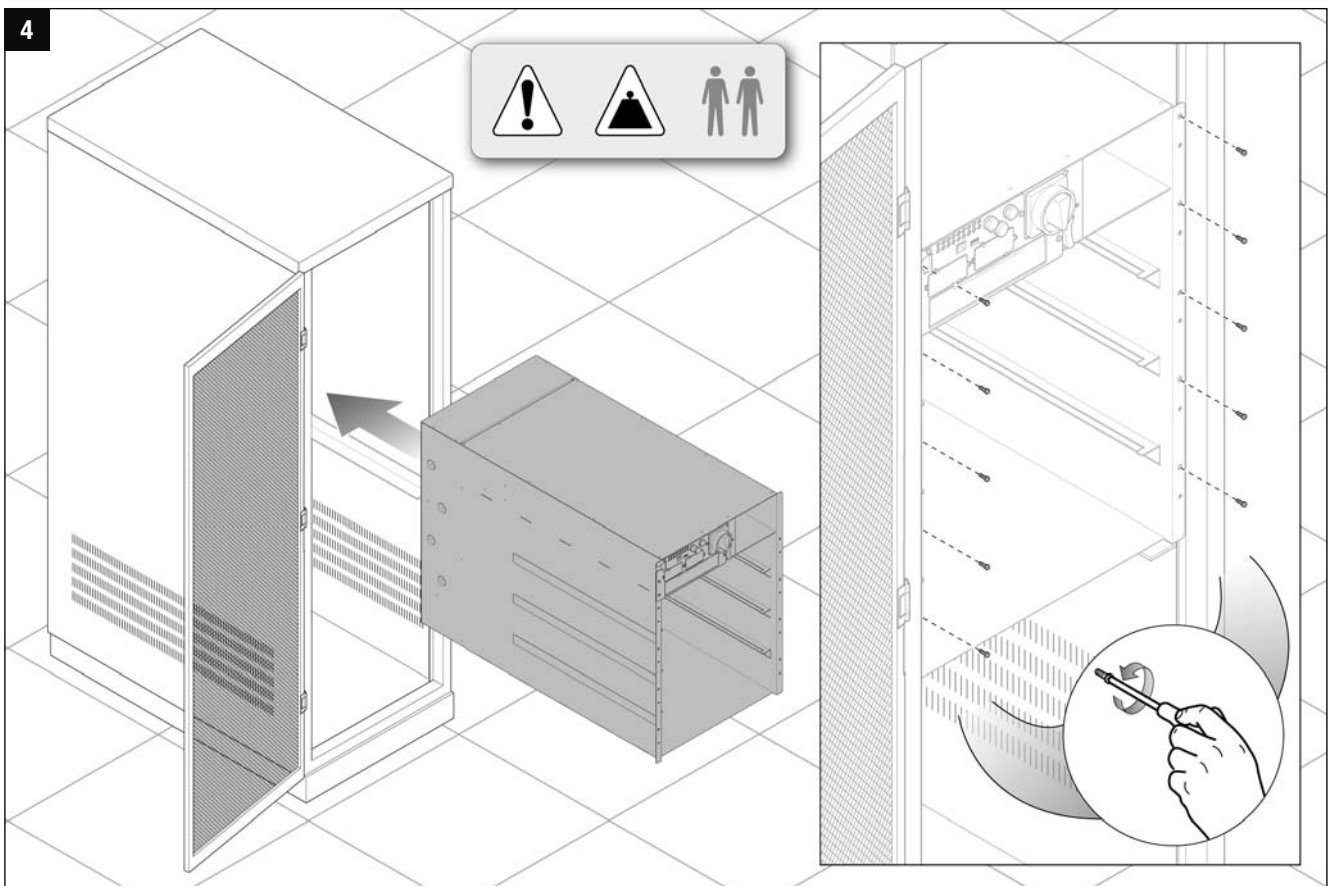
<p>WARNING: ensure the module is installed in the correct position.</p>		








	<p>NOTE: to install the rails refer to the relevant installation manual. Refer to Standard Features and Option chapter.</p>
	<p>WARNING! RISK OF TIPPING OVER: before carrying out any operations, ensure the UPS is secured.</p>



4. ELECTRICAL INSTALLATION

	NOTE: before carrying out any operations on the unit read the Safety Standards chapter carefully.
---	---

4.1. Electrical requirements

The installation and system must comply with national plant regulations.

The electrical distribution panel must have a sectioning and protection system installed for input and auxiliary mains.






RCD is not necessary when the UPS is installed in a TN-S system.

RCD is not allowed on TN-C systems. If a RCD is required a B-type should be used.

Size of input protection devices


Version			2 slots		4 slots				
Model rating	kVA		25	50	25	50	75	75+25 ⁽⁶⁾	
Breaker Input ⁽¹⁾	A	Min.	50	100	50	100	160	160	
		Max.	100	100	160	160	160	160	
Breaker Aux Mains ⁽¹⁾	A	Min.	50	100	50	100	160	160	
		Max.	160	160	200	200	200	200	
Differential input ⁽⁵⁾	A	Min.	0.5	0.5	0.5	0.5	0.5	0.5	
Input/Output cable core size	mm ²	Flexible cable	max ⁽²⁾	1x35	1x35	1x50	1x50	1x50	1x50
Aux cable core size	mm ²	Flexible cable	max ⁽²⁾	1x35	1x35	1x50	1x50	1x50	1x50
Battery cable core size	mm ²	Flexible cable	max ⁽²⁾	1x35	1x35	1x70	1x70	1x70	1x70
Battery protection ⁽⁶⁾	A			80	160	80	160	250	250


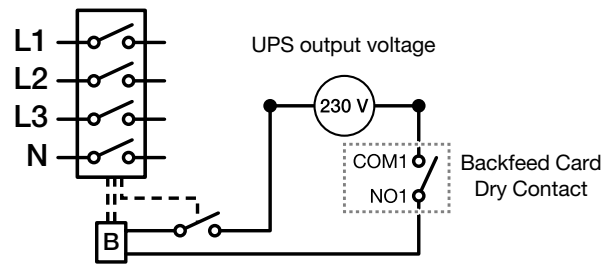
1. Circuit breaker switch recommended with magnetic intervention threshold $\geq 10 I_n$ (curve C). It is necessary to use a D curve selective breaker if an optional external transformer is used. The min value depends on the size of the power cables in the installation, while the max value is limited by the UPS cabinet.
2. Determined by the size of the terminals.
3. Caution! Use type B four-pole selective (S) residual current detectors. Load leakage currents are to be added to those generated by the UPS and during transitory phases (power failures and power returns) short current peaks may occur. If loads with high leakage current are present, adjust the residual current protection. It is advisable in all cases to carry out a preliminary check on earth current leakage with the UPS installed and operational with the final load, so as to prevent the RCD tripping over.
4. The conditional short circuit current (Icc) according to IEC 62040-1 is 10 KA rms, provided that the UPS is protected by a MCCB with adequate breaking capability and current limiting capability under short circuit conditions. Contact SOCOMEC for detailed information.
5. The last power module is redundant. The power 100 kVA are kept as overload for the 75 kVA. For further details refer to 'Technical specification' chapter.
6. Protection on the external battery cabinet (Fast UR fuses are recommended).

	NOTE: to ensure the integrity of the bypass thyristors I ² t must be lower than 130 kA ² s and peak current must be lower than 5 kA for 20 ms. Contact SOCOMEC for detailed information.
	The UPS is designed for transient overvoltages in category II installations. If the UPS is part of the building's electrical circuit, or is likely to be subject to transient overvoltages in category III installations, additional external protection must be provided, either on the UPS or in the AC power supply network powering the UPS.
	WARNING: as specified in 62040-3 Appendix 3: Non-linear Load Reference, in the event of three-phase non-linear loads connected downstream of the UPS, the neutral current on the load can be 1.5 - 2 times higher than the phase current. This must be considered when estimating the correct size of the output and the auxiliary neutral cables.
	WARNING: protective earthing conductor (PE) must have sufficient current-carrying capacity. The PE cable core size must be chosen according to the PROTECTIVE CURRENT RATING of the earth circuit which depends on the provision and location of protective overcurrent devices.
	NOTE: 3-Phase 4-Wire Input Power is required. The unit can be installed in TN, TT and IT AC distribution systems (IEC 60364-3).

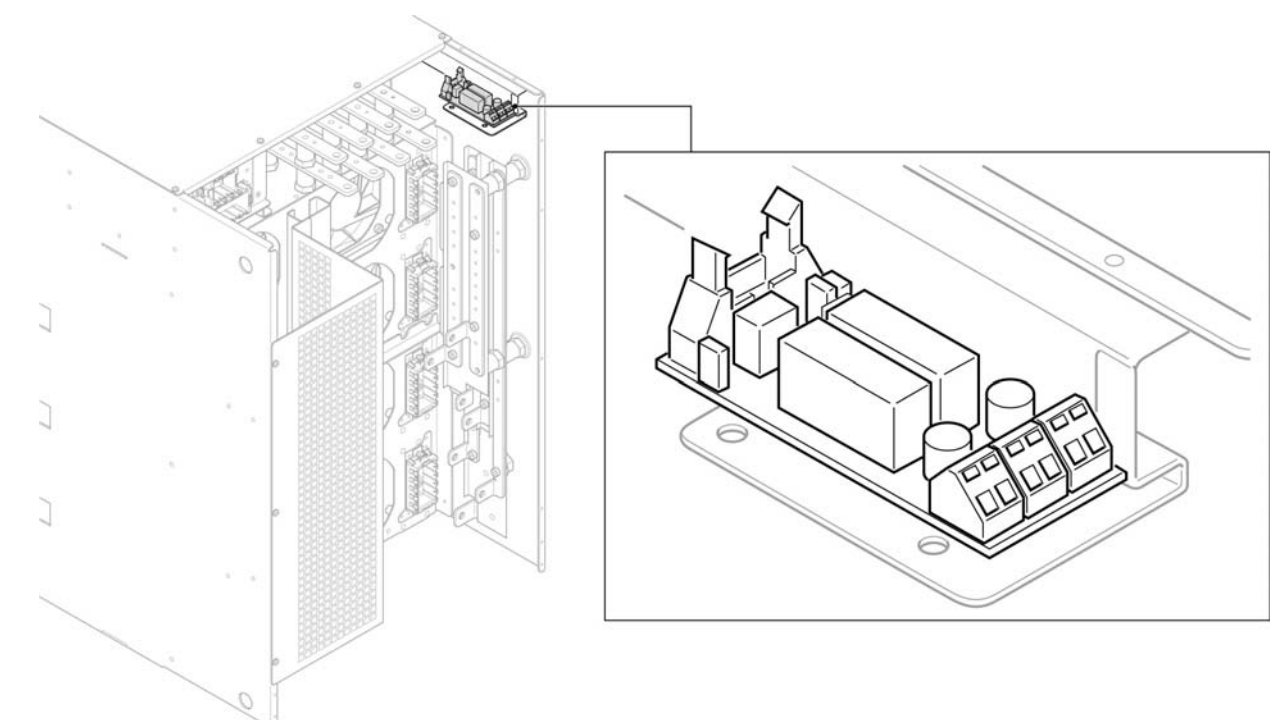
4.1.1. Backfeed protection


The UPS is set up for the installation of external protection devices against the backfeed of dangerous voltages on the auxiliary backup mains power supply line (AUX MAINS SUPPLY). The current rating of the switching device has to follow the instructions outlined in chapter Electrical Requirements.

	<p>DANGER! RISK OF ELECTRIC SHOCK: the installer must attach the warning label in order to warn electrical technicians about dangerous backfeed situations (not caused by the UPS).</p>
---	--


<p>Warning label (supplied with the equipment)</p> <div style="border: 1px solid black; padding: 10px; margin: 10px;"> <p style="text-align: center;">Before working on this circuit</p> <ul style="list-style-type: none"> - Isolate the Uninterruptible Power System (UPS) - Then check for Hazardous Voltage between all terminals including the protective earth <div style="display: flex; align-items: center; justify-content: center;">  <p>Risk of Voltage Backfeed</p> </div> </div>	<p>Backfeed electrical diagram</p> 
---	---

Backfeed card

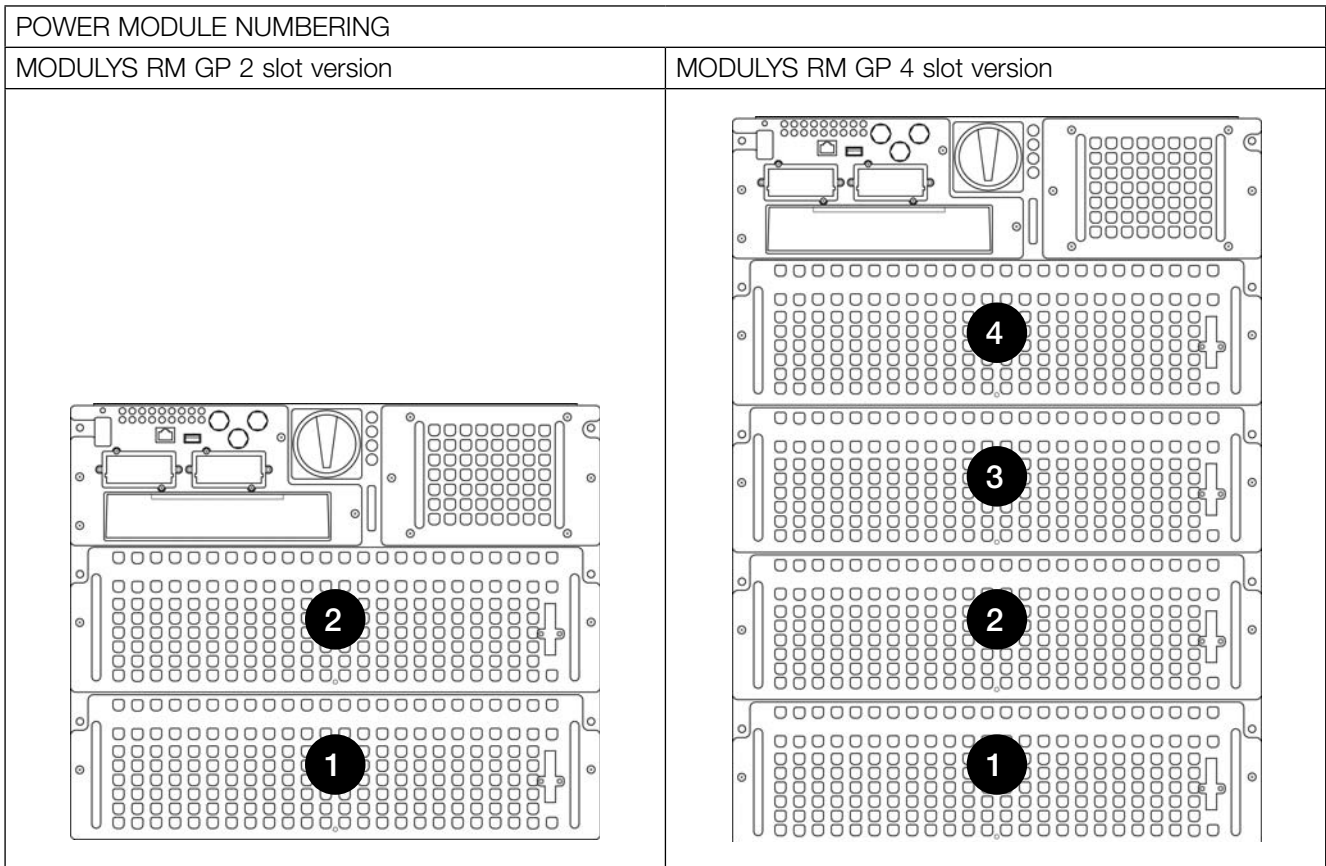
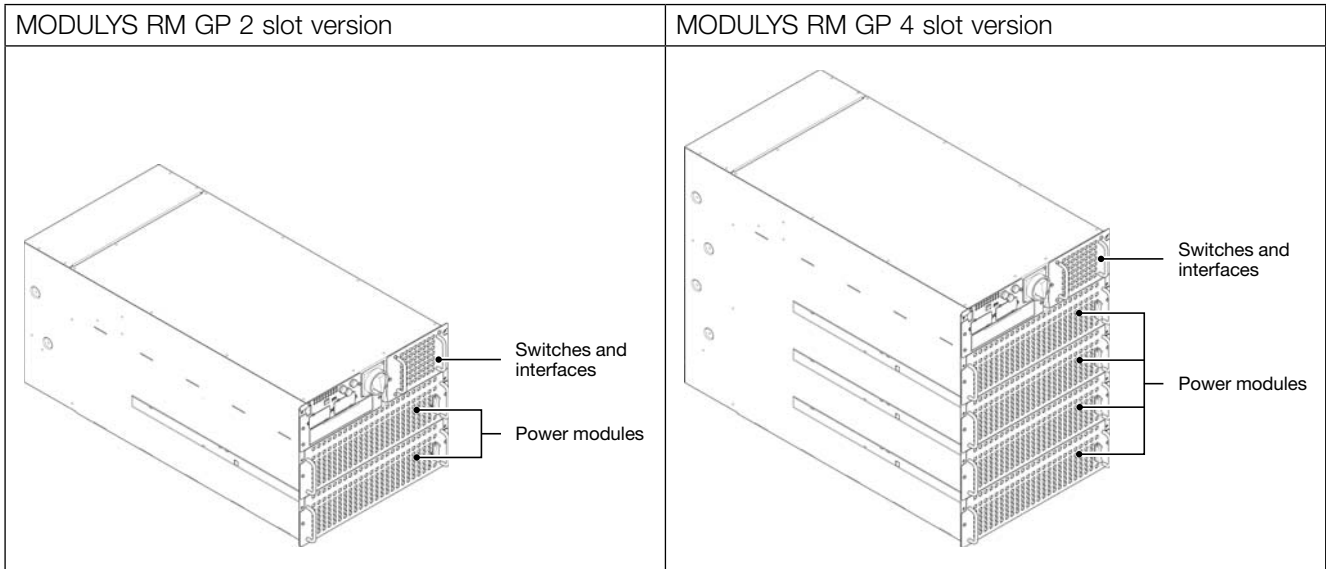


	<p>NOTE: use a 220-240 V release coil with integrated travel limit contact to pilot the input protection systems. If a trip coil without an integrated end-of-travel contact is used, an early auxiliary contact must be added (see figure 3.1-2). Electrical contact data: 2 A 250 Vac.</p>
---	---

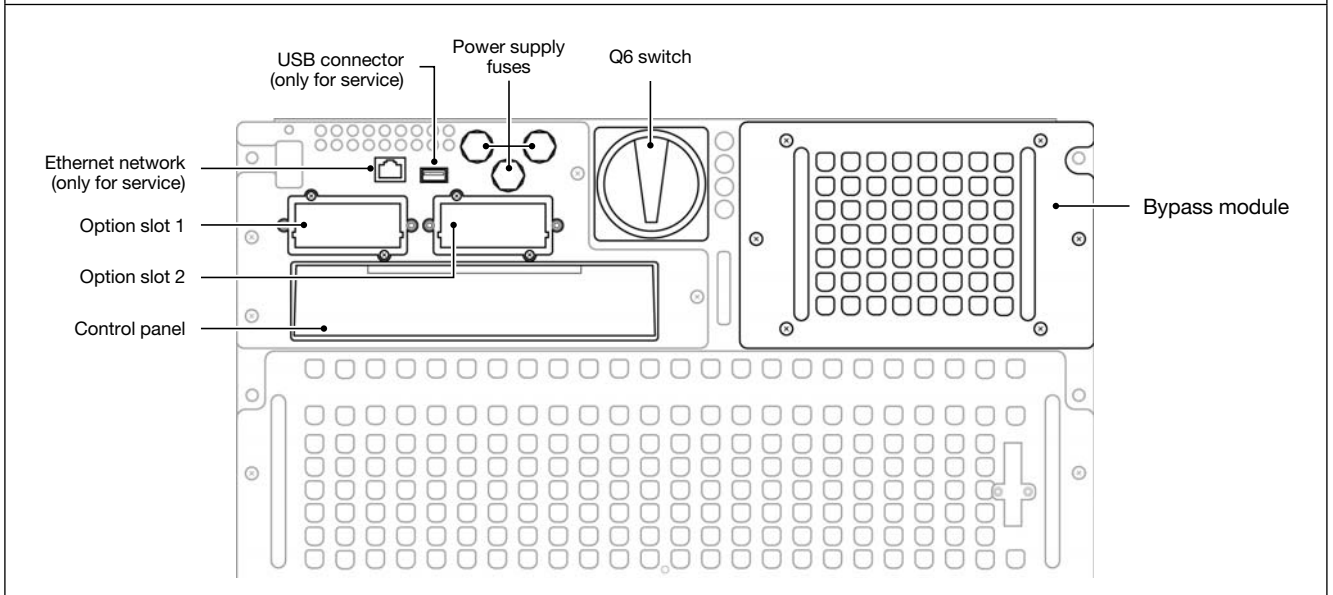
Function	Connector name	V OUT	Internal fuse	Detail
BKF AUX	XB2	230 V RMS	2 A time delay	COM1 NO1

	<p>The backfeed protection for the input mains supply (MAINS SUPPLY) is incorporated in the UPS modules as standard.</p>
---	--

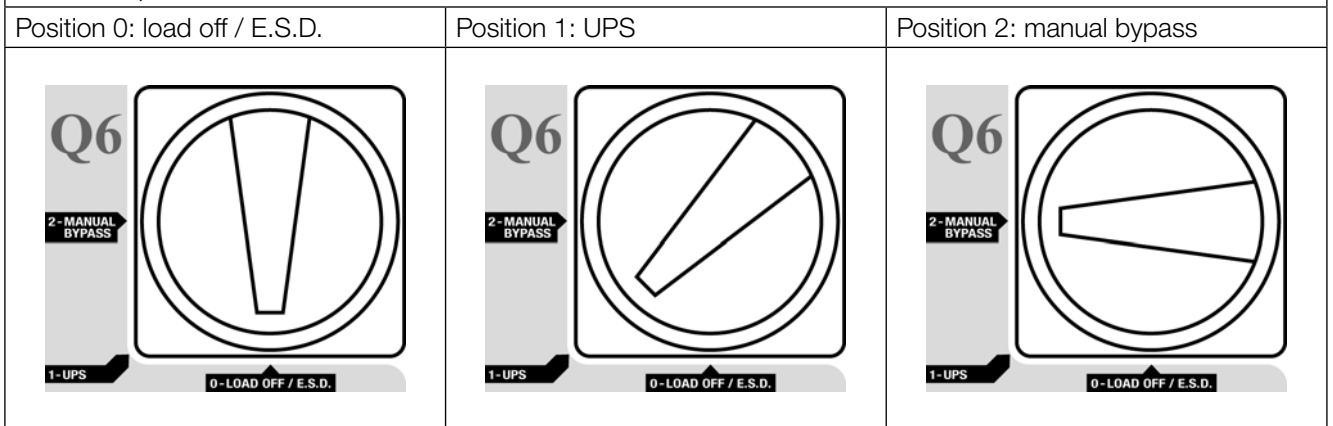
5. OVERVIEW



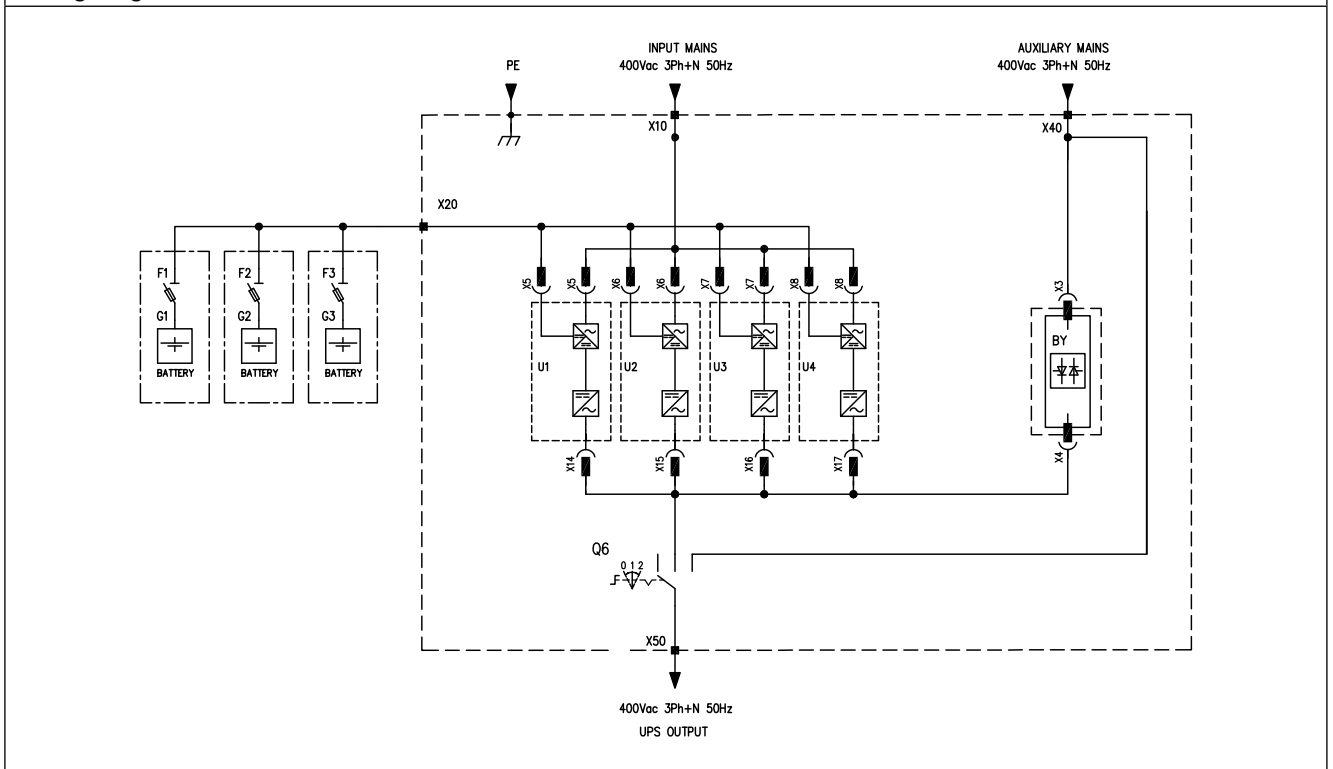
Switches and interfaces



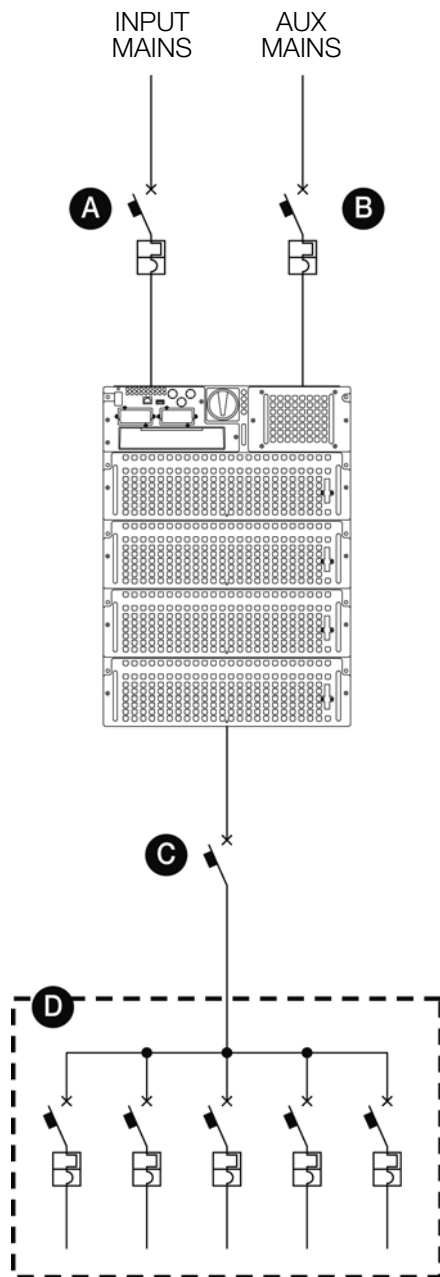
Q6 switch position



Wiring diagram



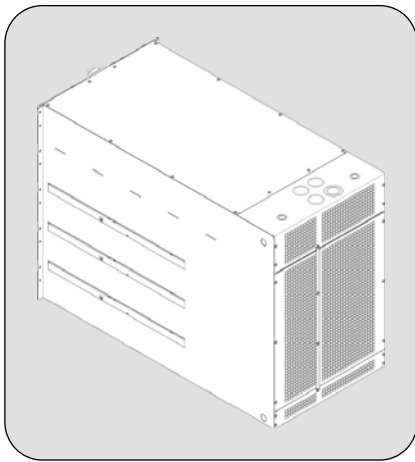
Electrical diagram



Key

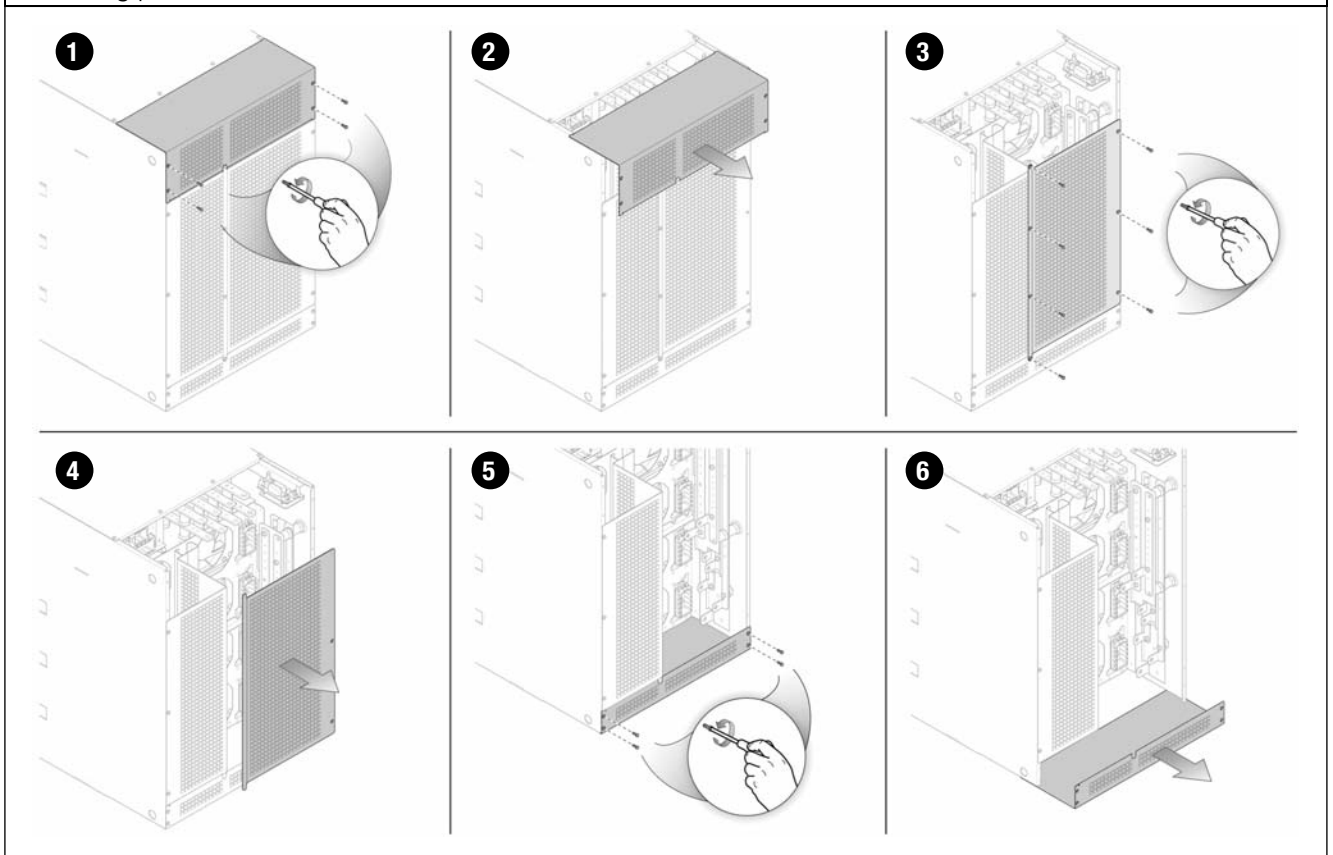
- A Input mains magneto-thermal switch
- B Auxiliary mains magneto-thermal switch
- C System shutdown switch
- D Distribution

6. CONNECTIONS

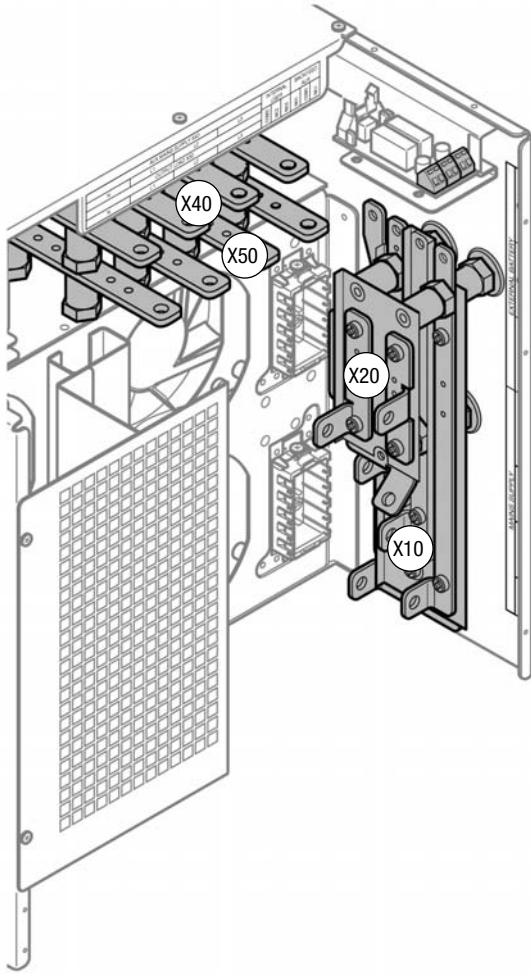


	<p>NOTE: before carrying out any operations on the unit read the Safety standards chapter carefully.</p>
	<p>WARNING: battery power terminals may be supplied by: - external battery cabinet; Before working on this circuit ensure that: - all the external battery cabinet switches are in OFF position; - the UPS is in maintenance bypass mode (refer to Operating Modes chapter) - all UPS power modules are disconnected; Check for presence of voltage before operating.</p>
	<p>NOTE: we strongly recommend adapting separate mains for optimum availability. In practice common mains is a single point of failure. If absolutely necessary combine the mains with the UPS externally.</p>

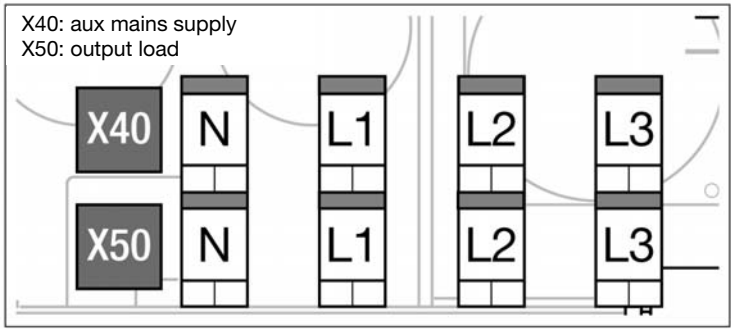
Removing protective covers



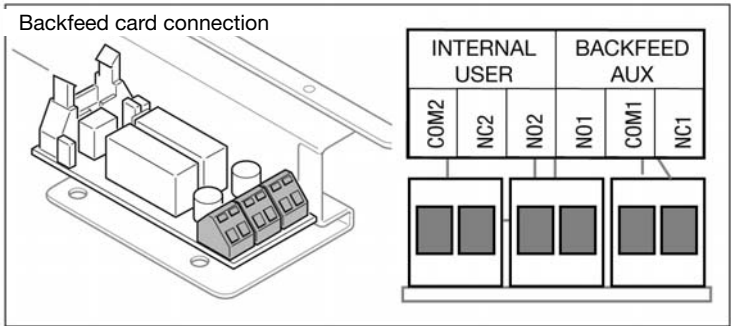
MODULYS RM GP: connections for 2 slot version



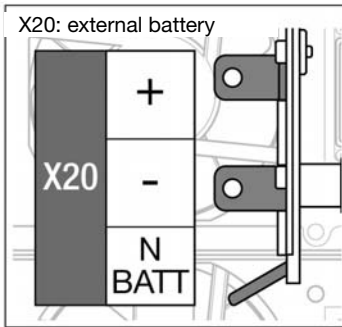
X40: aux mains supply
X50: output load



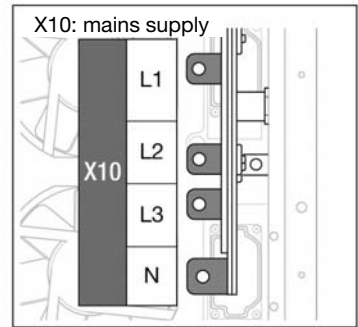
Backfeed card connection



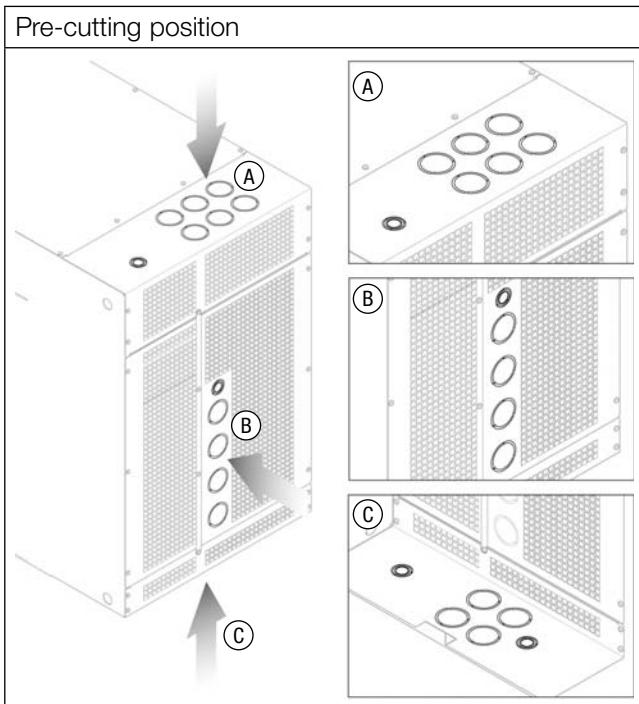
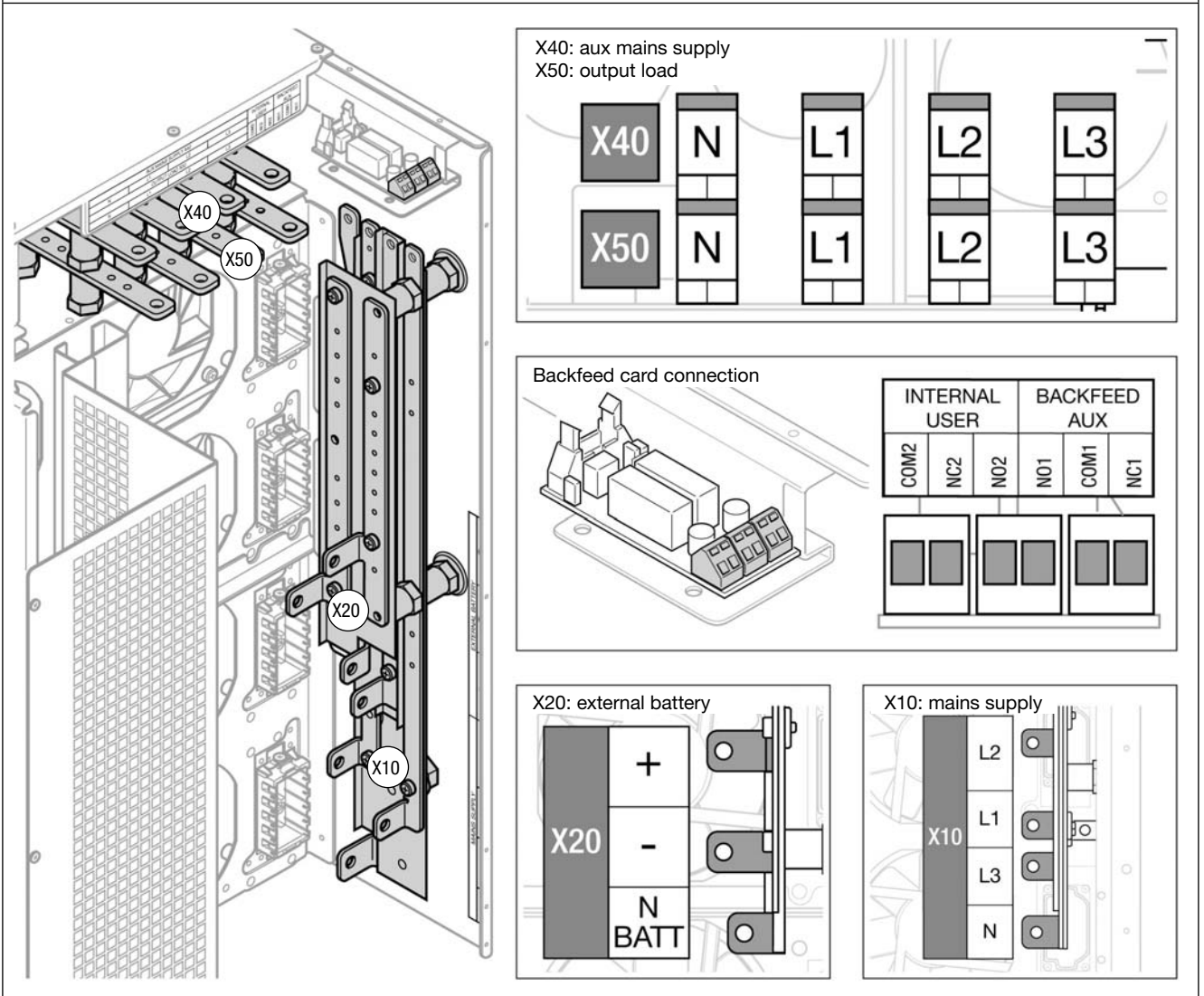
X20: external battery



X10: mains supply




MODULYS RM GP: connections for 4 slot version





	WARNING: use suitable cable glands.
	NOTE: once all connections have been implemented replace the protective covers.


6.1. External battery cabinet connection

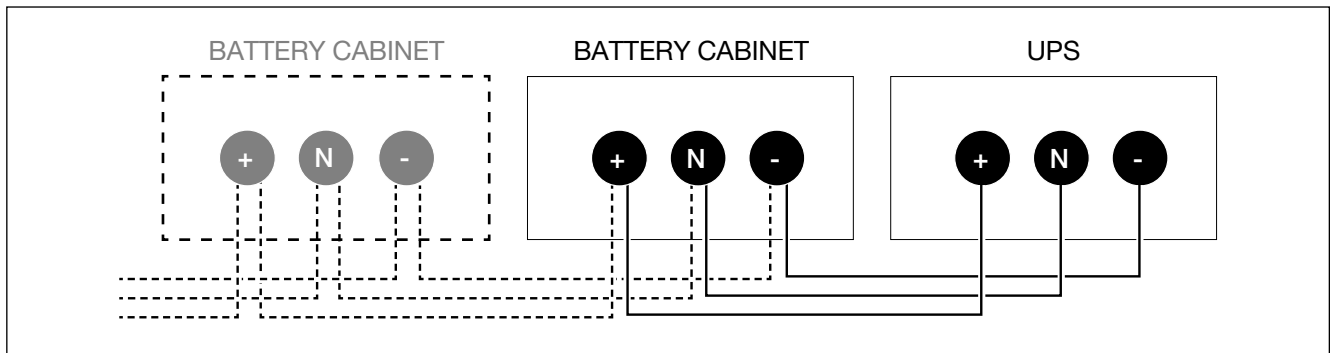
	NOTE: for further information refer to the battery cabinet manual.
---	--


- Remove the metallic terminal block protection.
- Connect the protective earth (PE) cable.
- Connect the cables between the UPS terminals and battery cabinet terminals.


	WARNING: strictly observe: <ul style="list-style-type: none"> - the polarity of each individual string (refer to the figure below); - the cable cross section (refer to Electrical Requirements chapter).
---	---

	WARNING: cabling errors with inversion of battery polarity may cause permanent damage to the equipment.
---	---





	Replace the protective cover on the terminal block.
---	---

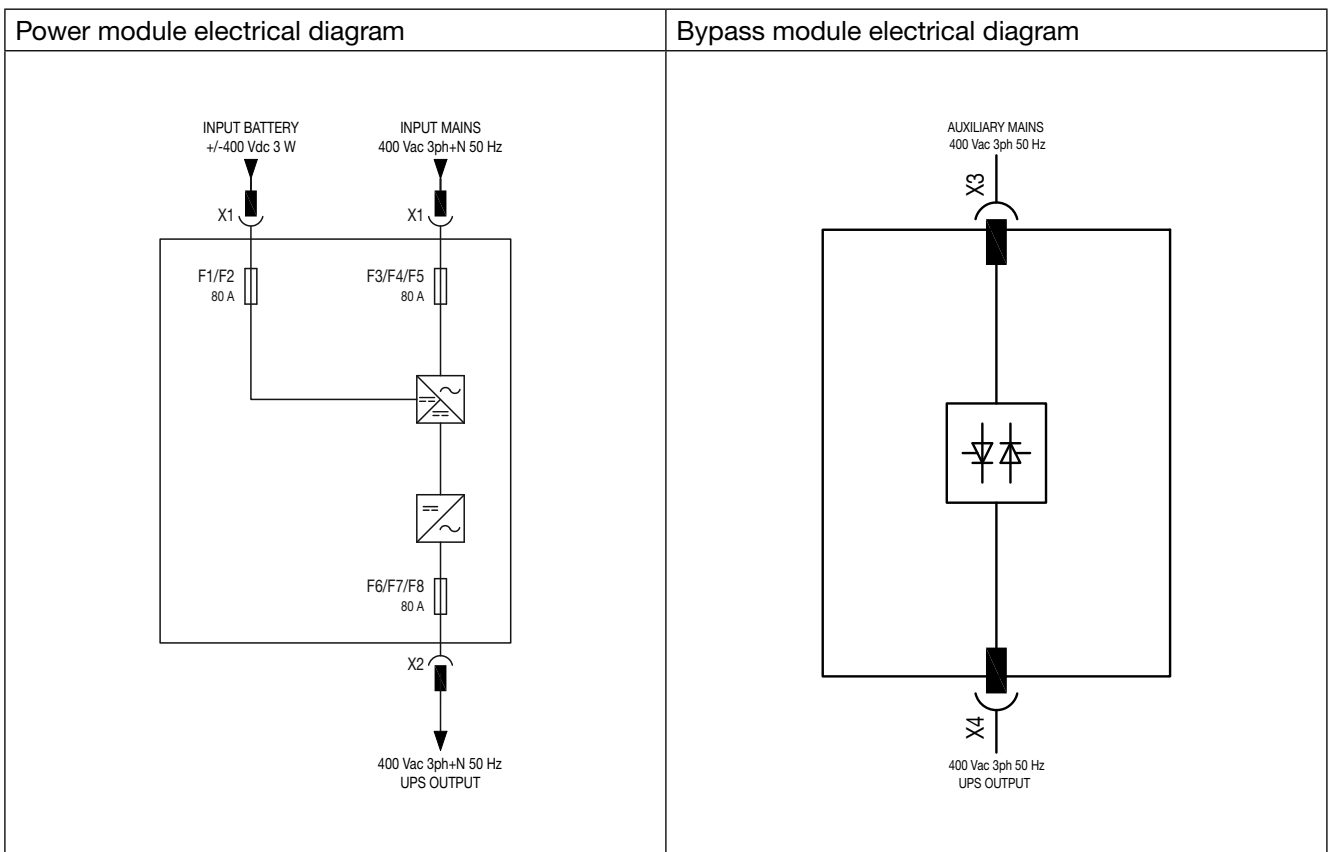


	NOTE: when battery cabinets not supplied by Socomec are used, the installer is responsible for: <ul style="list-style-type: none"> - checking electrical compatibility; - checking the presence of appropriate protective devices (fuses and switches that ensure the cables are protected from the UPS to the battery cabinet). Once the UPS is switched on – before closing the battery switches – check the battery parameters on the control panel menu. For further information, refer to Menu chapter.
---	--

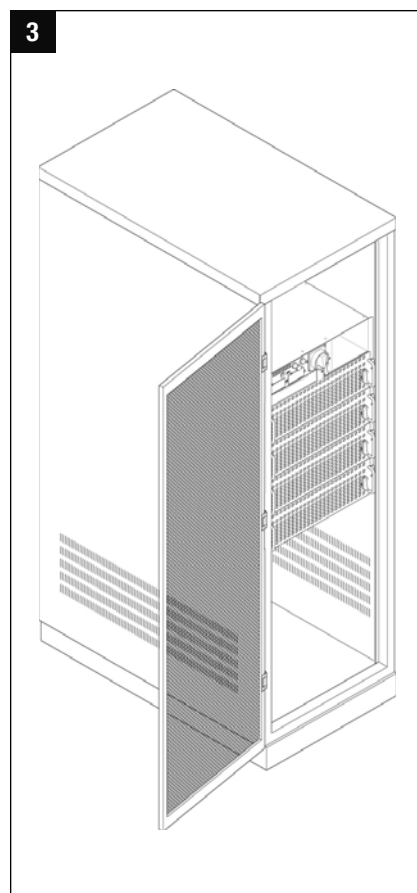
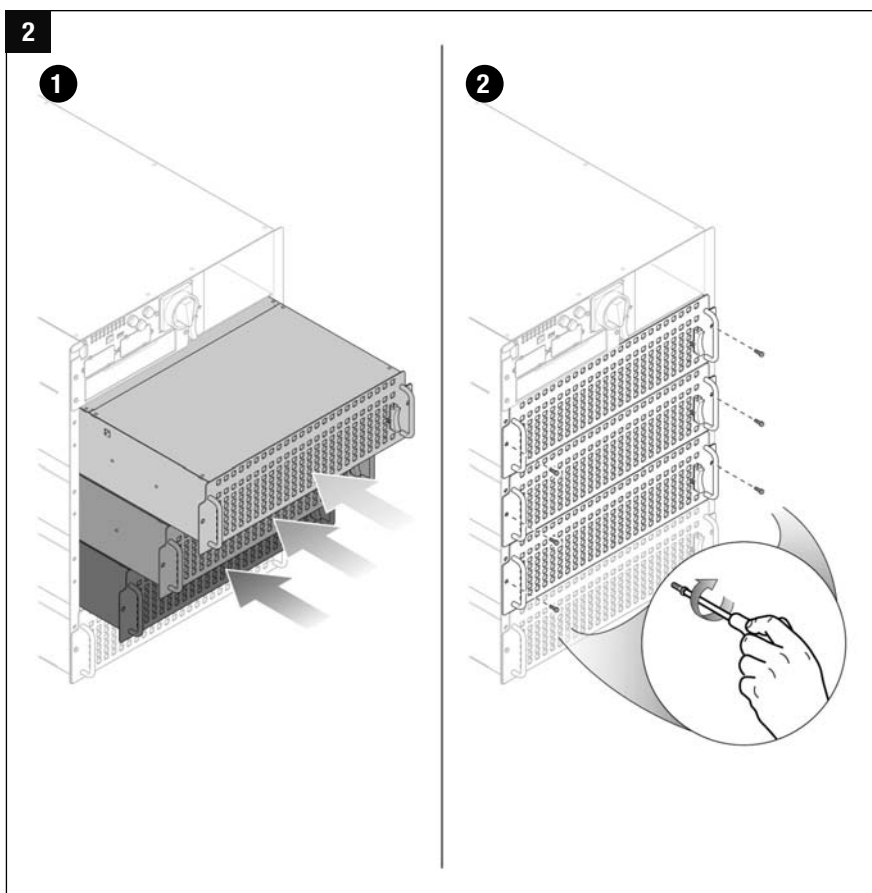
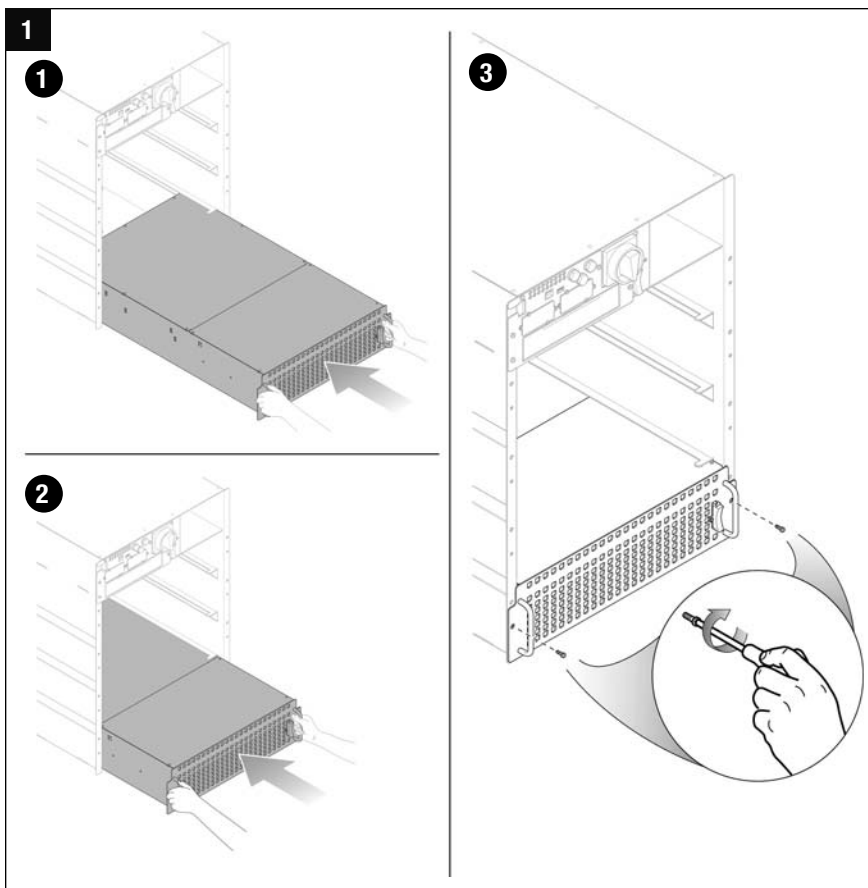
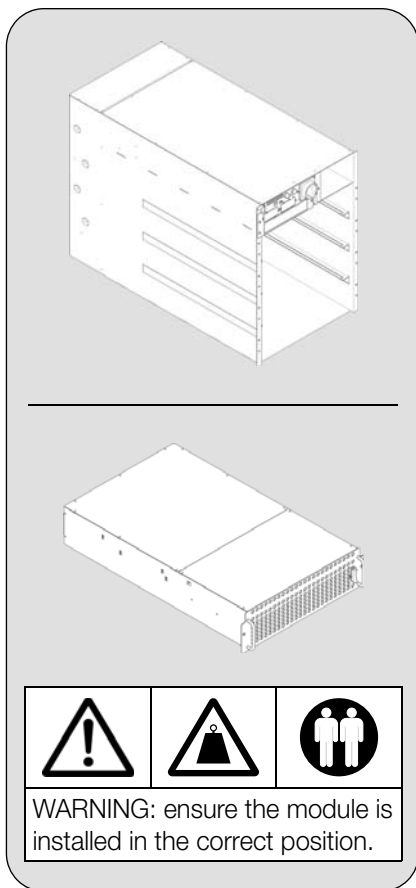
	NOTE: not all battery/capacity combinations are available.
---	--

6.2. Other connections

	NOTE: before carrying out any operations on the unit read the Safety Standards chapter carefully.
	WARNING! RISK OF TIPPING OVER: before carrying out any operations, ensure the UPS is secured.
	WARNING! RISK OF TIPPING OVER: the modules must be inserted from the bottom upwards and removed from the top downwards to ensure the unit remains stable.
	WARNING: before removing any modules, ensure that the remaining power modules can support the load.

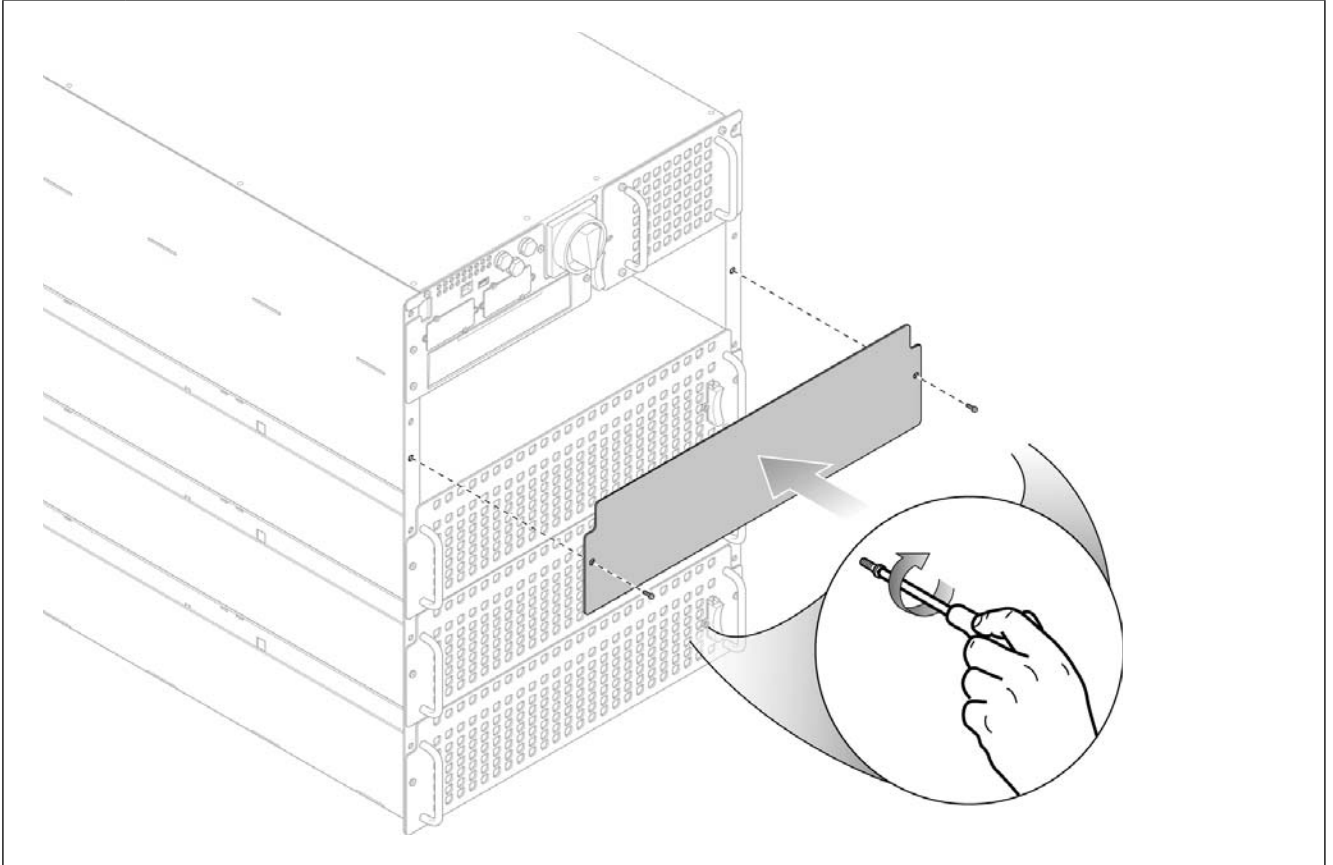


6.2.1. Power module insertion





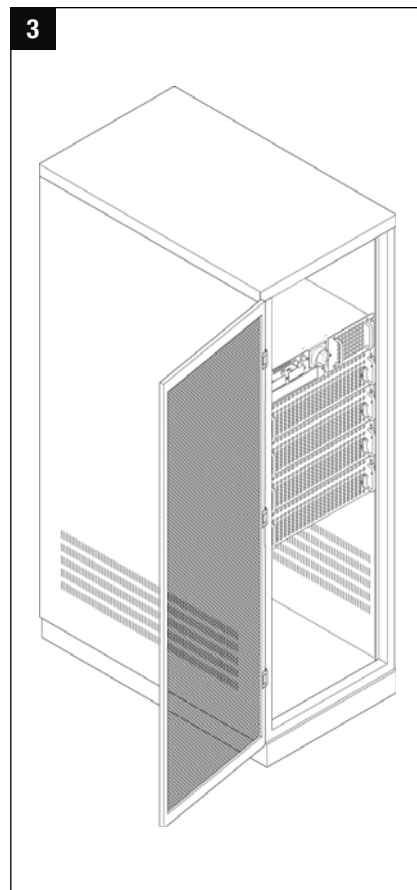
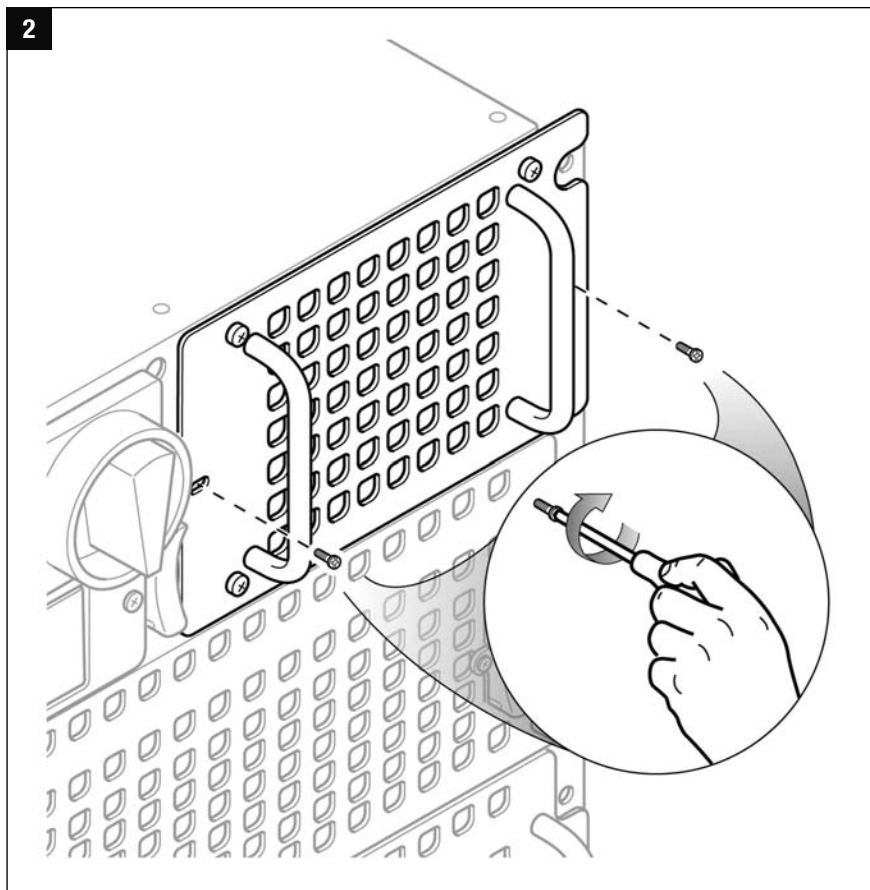
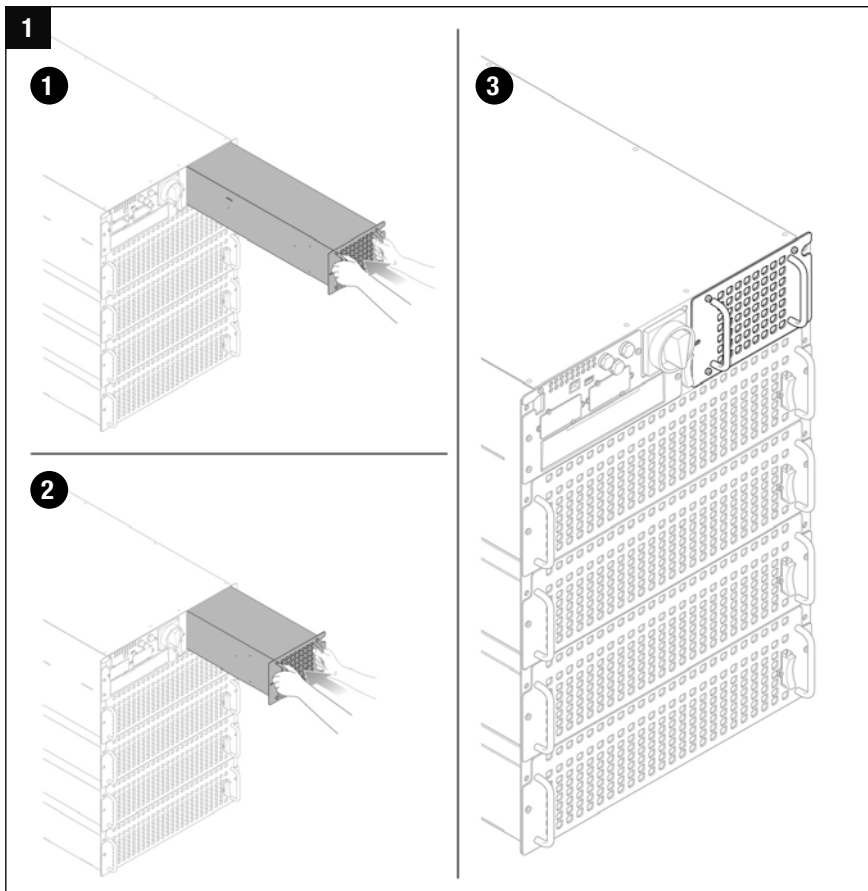
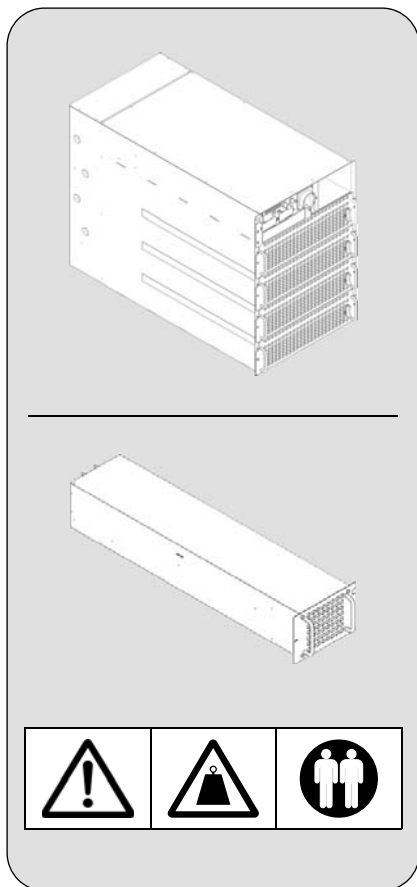
DANGER! RISK OF ELECTRIC SHOCK: if the power module is not present, the protective cover provided must be in place.



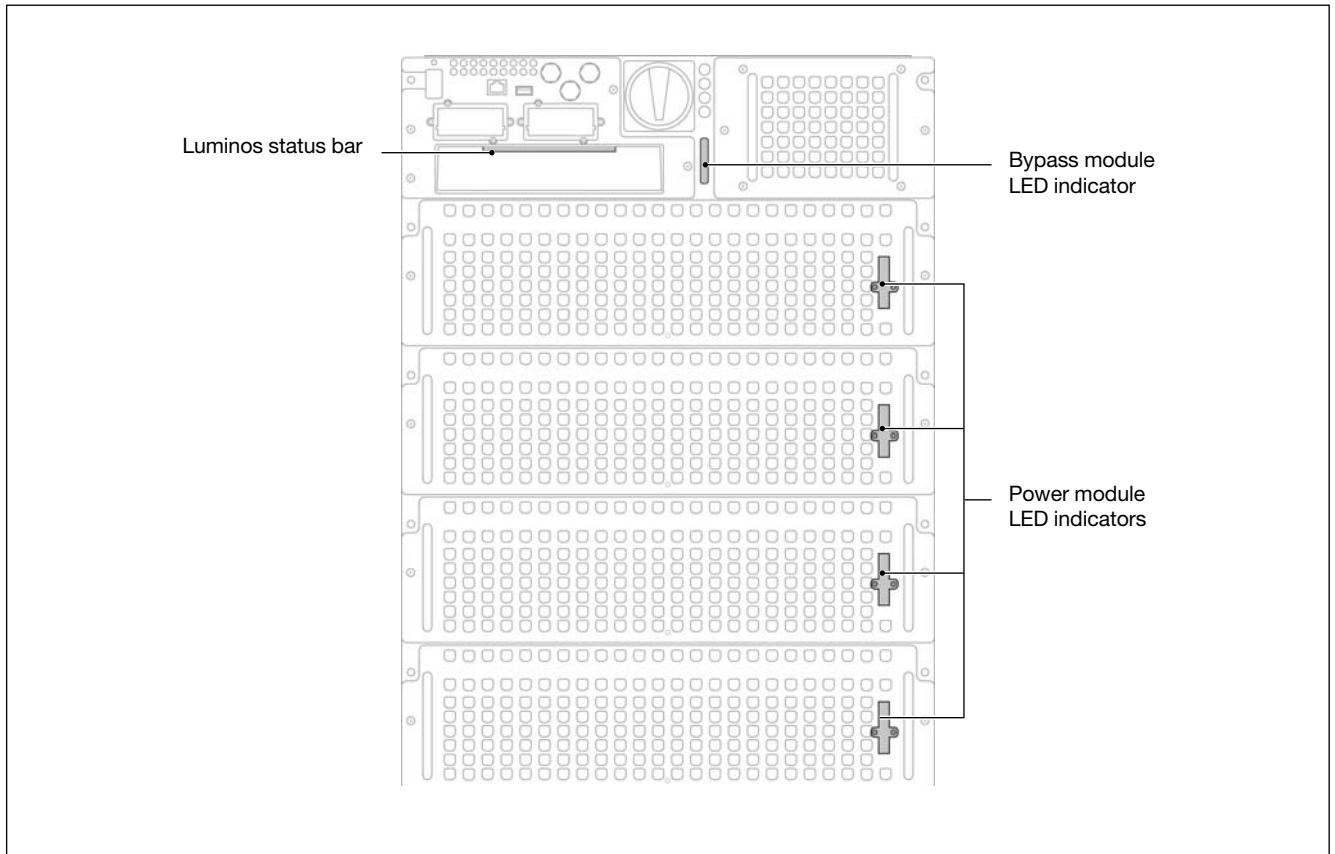
6.2.2. Bypass module insertion



WARNING: it is only possible to remove the bypass module when the unit is in normal mode or maintenance bypass mode (refer to Operating Modes chapter). Before removing the bypass ensure that the unit is not in bypass mode.



7. CONTROL PANEL



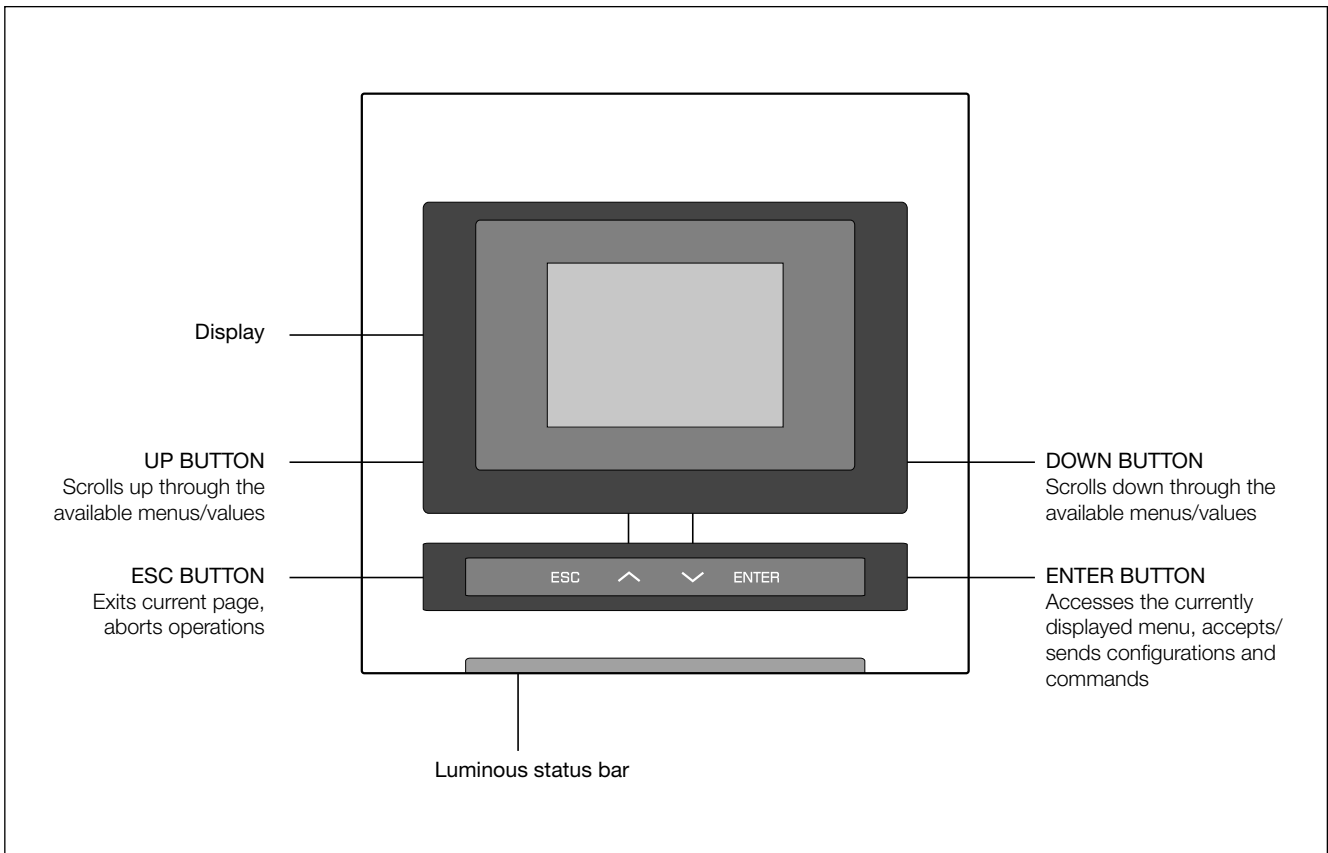
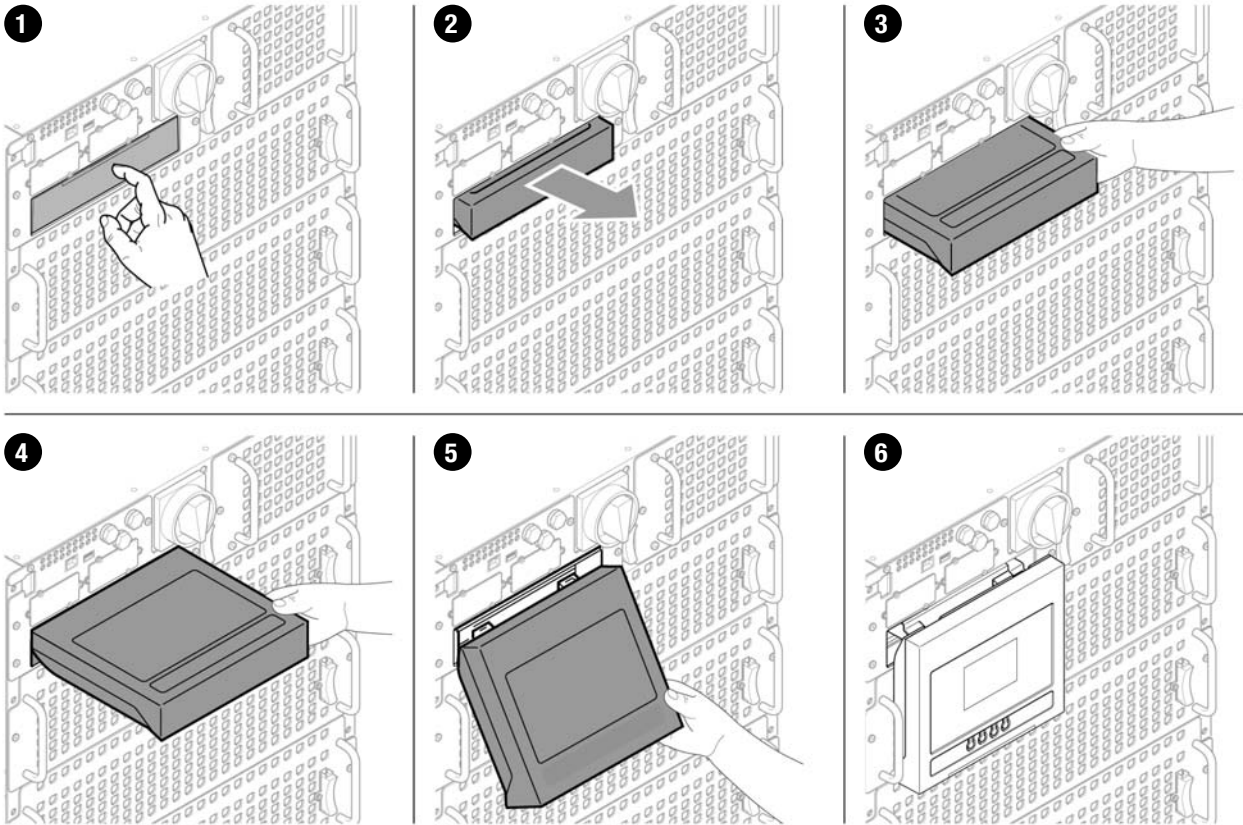
LED indicator

Colour	Power module	Bypass module
Green	Module on inverter	Bypass ready to start
Flashing green	-	Load on bypass
Yellow	Module ready to start	Maintenance bypass
Flashing yellow	Module initialising	Load on inverter or bypass and transfer impossible/locked
Red	Module stopped due to alert	Bypass alert present
Flashing red	Initialising failure	Bypass blocked with alert
Flashing green, yellow and red	No communication	No communication

Control panel luminous status bar indicator

Colour	Status
Green	Load protected on inverter
Flashing green	UPS in startup procedure phase or battery test
Yellow	Load supplied with warning (Bypass, maintenance bypass or battery)
Flashing yellow	Maintenance request/in progress
Flashing green and yellow	Load supplied and preventative alert present
Red	Load not supplied: output switched OFF due to an alert
Flashing red	Load supplied, but the output will stop in a few minutes (imminent stop)
Flashing yellow and red	Load supplied, but no longer protected A critical alert has occurred
Flashing green, yellow and red	No communication

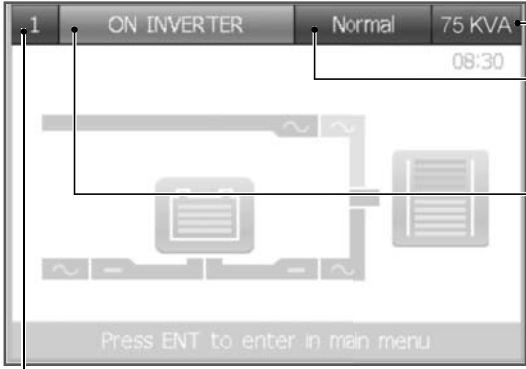
Control panel removal



8. MENU

8.1. Display overview

Status bar (always displayed)



UPS Output Power (kVA)

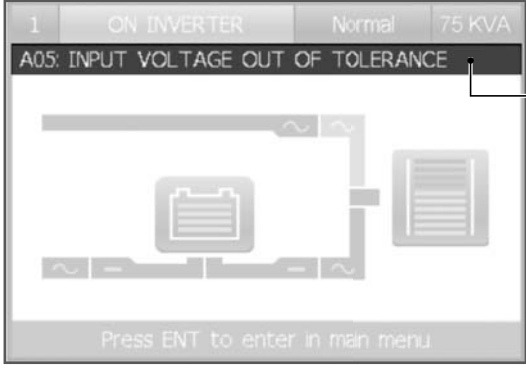
Operating modes:
Normal (Normal mode), **Eco** (Eco mode), **En. Saver** (Energy Saver mode – parallel configurations only), **Standby** (Standby program mode), **Service**.

Unit status:

- Displayed messages: ON MAINT. BYPASS, IMMINENT STOP, ON BATTERY, BATTERY TEST, ON INVERTER, ON AUTO BYPASS, UNIT AVAILABLE, UPS IN STANDBY, LOAD OFF.
- **Flashing red**: imminent UPS shutdown
- **Red**: Load not powered or battery circuit open
- **Flashing yellow**: UPS on standby mode or maintenance alarm is active
- **Yellow**: UPS on battery or the UPS is indicating a particular working mode
- **Flashing green**: battery test is in progress
- **Green**: the load is powered
- **Grey**: inactive UPS

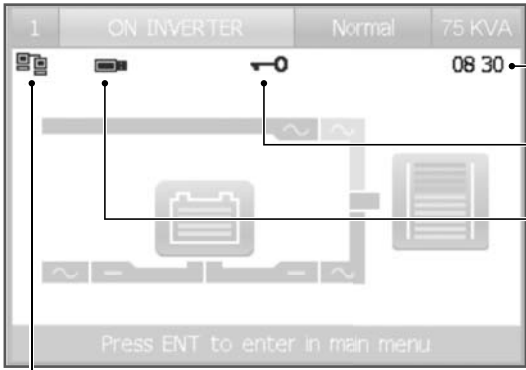
Unit panel reference

Alarms area



Alarms area
 Present when an alarm is active.
 Enter **ALARMS** menu to display the complete alarms list (see chapter 9).

Status icons



Time:
 UPS current time (hours and minutes, with ':' flashing).

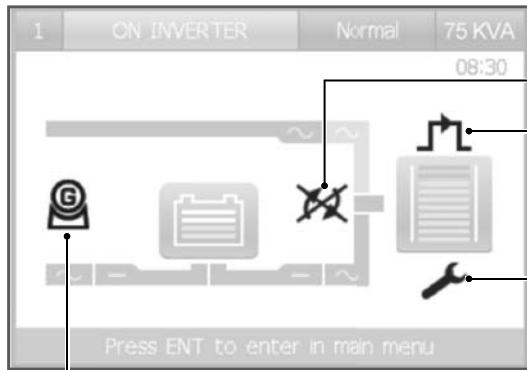
Key icon:
 Displayed if the keypad has been locked.

USB icon:
 Displayed if a USB memory stick is inserted. It must be formatted with FAT32 filesystem.

Network icon:
 Displayed if a valid link has been established on the ethernet. Flashes when a remote host is communicating with the UPS.

Note: status icons and Time are only visible if there are no pending alarms, as the alarm bar overwrites the icons when active.

Additional Icons



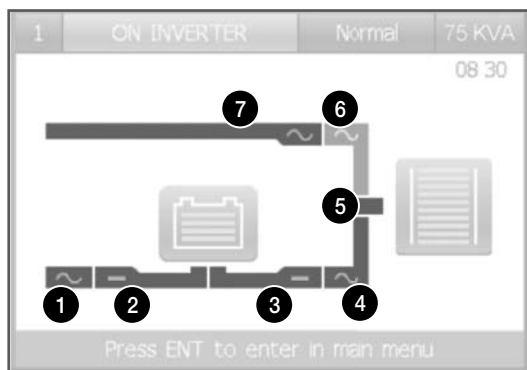
Operating on GenSet

Bypass mode (or **Eco Mode**) not possible

On Maintenance Bypass

Commissioning Code not inserted (see chapter 5.3.9) or Scheduled Inspection warning: machine inspection required call SOCOMEC support service

Mimic panel



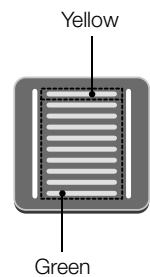
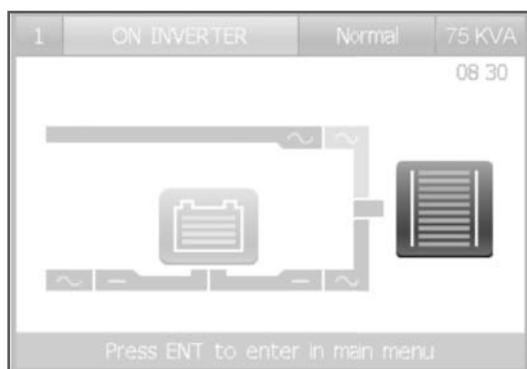
Bars

1. Rectifier input.
2. Rectifier output.
3. Inverter Input or Battery Output.
4. Inverter Output.
5. Unit output.
6. Output from static switch
7. Bypass input.

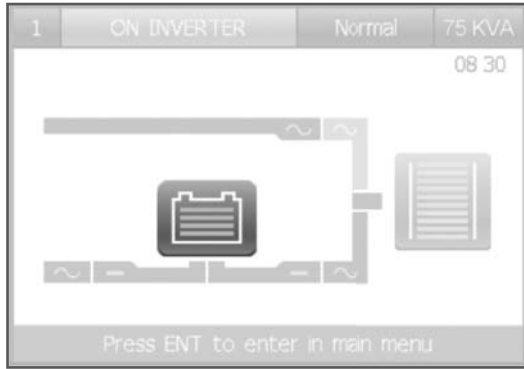
Bar colour identify the energy flow:

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

Local level



Battery status (unit only)



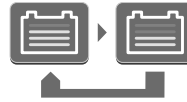
Battery charging

Bar colour: green; level reached is continuous, other levels flashing



Battery discharging

Bar colour: yellow; upper level flashing



Battery charged

Bar colour: green



Battery discharged



Battery open

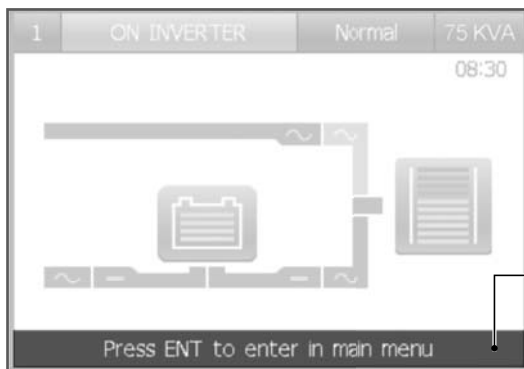


Battery alarm flagged

If there is a pending battery charger alarm the border turns yellow



Message area



Message area

Always present, displays a help message to guide the user through the display functions.

8.2. Menu tree

FIRST LEVEL	SECOND LEVEL	THIRD LEVEL
ALARMS / STATUS	SYSTEM	
	UNIT	
	MODULE 1 ⁽¹⁾	
	MODULE 2 ⁽¹⁾	
	MODULE 3 ⁽¹⁾	
	MODULE 4 ⁽¹⁾	
	BYPASS	
MEASUREMENTS	OUTPUT MEASUREMENTS	
	BATTERIES MEASUREMENTS	
	INPUT MEASUREMENTS	
	BYPASS MEASUREMENTS	
	SUBUNIT MEASUREMENTS	
CONTROLS	ALARMS RESET	
	UPS PROCEDURES	
	ECO MODE	
	ENERGY SAVER	
	BATTERY TEST	
	LED BAR TEST	
SETTINGS	PREFERENCIAS	LANGUAGE
		DATE AND TIME
		BUZZER
		DISPLAY
		PASSWORD
		REMOTE CONTROLS
	UPS SETTINGS	OUTPUT
		BATTERIES
		BACKFEED
		REDUNDANCY
	SLOT OPTIONS	SCHEDULING
		BATTERY TEMPERATURE PROBE
		RS485 PORT SLOT 1
	HISTORY LOG	RS485 PORT SLOT 2
		EVENT LIST
STATISTICS		
SERVICE	DEVICE IDENTIFICATION	
	COMMISSIONING CODE	
	SERVICE COMMANDS	
	NETWORK PARAMETERS	
	FIRMWARE VERSION	

(1). Displayed if the module is present.

8.3. Menu functions description

8.3.1. Keypad locking

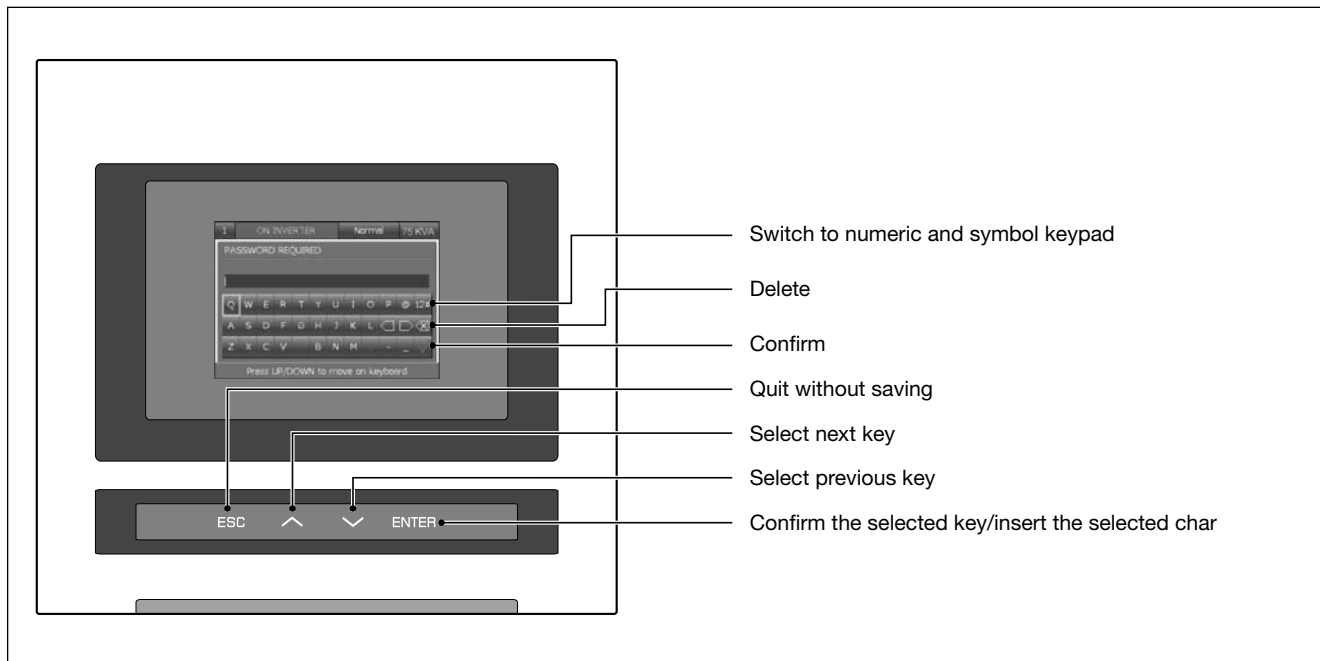
The keypad can be locked by pressing the buttons in the following sequence:

ESC → UP → DOWN → ENTER

To unlock the keypad, the buttons must be pressed in the reverse sequence:

ENTER → DOWN → UP → ESC

These sequences only work on the Mimic Panel page.



8.3.2. Entering passwords

Some operations and settings require a password in order to be performed. If this is the case, a padlock is displayed at the top right of the page. After inserting a valid password, the padlock opens and the operation can be performed. When a password is required, a virtual keyboard is displayed. The default password is SOCO.

8.3.3. Alarms menu

This menu displays all pending UPS alerts. Use the ALARMS RESET command in the COMMANDS menu to reset alerts. If there is more than one page, press UP/DOWN to scroll pages.

8.3.4. Measurements menu

This menu displays all UPS measurements relating to the input stage, output stage, batteries and auxiliary mains (bypass). If there is more than one page, press UP/DOWN to scroll pages.

8.3.5. Commands menu

This menu contains the commands that can be sent to the UPS. Some of them are password protected. If a command is not available for the operating conditions, it cannot be selected.

8.3.6. Settings menu

This menu contains all the machine settings. There are the following sub-menus:

- **PREFERENCES:** user preferences such as language, date and time, display brightness, buzzer;
- **UPS SETTINGS:** critical machine settings for output, batteries and transformer.



Wrong configuration in UPS SETTINGS could damage the load or the batteries.

- **SLOT OPTIONS:** configurations of available optional boards, which can be fitted to the front slots.

System critical parameters are password protected and should be changed by specialist personnel only.

8.3.7. Battery settings menu

This is the menu for battery configuration. The list can be scrolled through to see the full list of battery settings. If batteries are not available, only the first element of the list is shown. When one of the battery settings is edited, all settings below in the list have to be checked and confirmed. The battery settings are saved only when the last battery setting is confirmed. To change battery configurations enter the menu: **MAIN MENU > SETTINGS > UPS SETTINGS > BATTERIES.**



These parameters for battery settings are critical: number of cells, capacity, charge current. Risk of damage to load or batteries.

8.3.8. History log menu

EVENT LIST menu: it shows the list of UPS alerts and events that have occurred. Last 150 events can be displayed. Press **UP/DOWN** to scroll the list.

STATISTICS menu: the system reports some measurements (output load, apparent input power, internal temperature) in graphical format. These values can be used to analyse the situation over the last 14 days or over shorter periods (last 24 hours, last hour or last minute). Enter the required menu and press **UP/DOWN** to scroll through different periods. The last page shows the minimum, maximum and average values of the selected measurement. This information provides an enhanced evaluation of the equipment operating mode, verifying whether certain critical operating situations are repetitive or only random.

8.3.9. Service menu

This menu is reserved for support service personnel and holds UPS identification data, firmware version, reporting, etc.



8.3.10. Commissioning code

To complete equipment activation, a warranty activation code is required. To insert the Commissioning Code go to **MAIN MENU > SERVICE > COMMISSIONING CODE.**

If the Commissioning Code is not inserted an alert symbol is shown on the mimic panel (🔧).

The Commissioning Code is provided directly by the relevant Support Centre upon communication of the serial number. When the Support Centre is contacted for the Commissioning Code, detailed information can be obtained on the UPS functions available and on scheduled preventive maintenance programmes.

9. OPERATING PROCEDURES

	NOTE: before carrying out any operations on the unit read the Safety Standards chapter carefully.
	NOTE: with the stop procedure the load will be disconnected.


9.1. Switching on

- Connect the mains and auxiliary mains to the UPS.
- Wait for the display to switch on.
- Enter MAIN MENU > COMMANDS > UPS PROCEDURES.
- Select Automatic Start Procedure and press ENTER.
- Carry out the operations indicated on the display.

9.2. Switching off

This operation interrupts the power supply to the load. The UPS and the battery charger will be shut down.

- Enter menu MAIN MENU > COMMANDS > UPS PROCEDURES.
- Select Automatic Stop Procedure and press ENTER.
- Wait approx. 2 minutes for the UPS shutdown.

	NOTE: the controlled shutdown of each server connected to the LAN can be managed by shutdown software (only with Net Vision option card).
---	---


- Carry out the operations indicated on the display. This operation cannot be aborted.

9.3. Bypass operations


9.3.1. Switching onto maintenance bypass

This operation creates a direct connection between the UPS input and output, excluding the equipment control part. This operation is performed in the event of:

- standard maintenance
- serious failure has occurred.


	WARNING! LOAD POWERED BY INPUT MAINS: your load is exposed to mains disturbances.
---	---

- Enter menu MAIN MENU > COMMANDS > UPS PROCEDURES.
- Select ON MAINT. BYPASS and press ENTER.
- Carry out the operations indicated on the display.

	NOTE: when an external manual bypass is present: <ul style="list-style-type: none">- carry out the procedure described above;- put the switch to position 1.
---	---

9.3.2. Switching on from maintenance bypass

- Put the external input mains switching device into position ON.
- Wait for the display to switch on.
- Enter menu MAIN MENU > COMMANDS > UPS PROCEDURES.
- Select Automatic Start Procedure and press ENTER.
- Carry out the operations indicated on the display.

	NOTE: when an external manual bypass(1) is present, put the switch to position 0 (OFF).
---	---


1. Not monitored by the UPS.

9.3.3. Extended out of service

When the UPS is deactivated for some time, the batteries must be recharged regularly. They have to be recharged every three months.

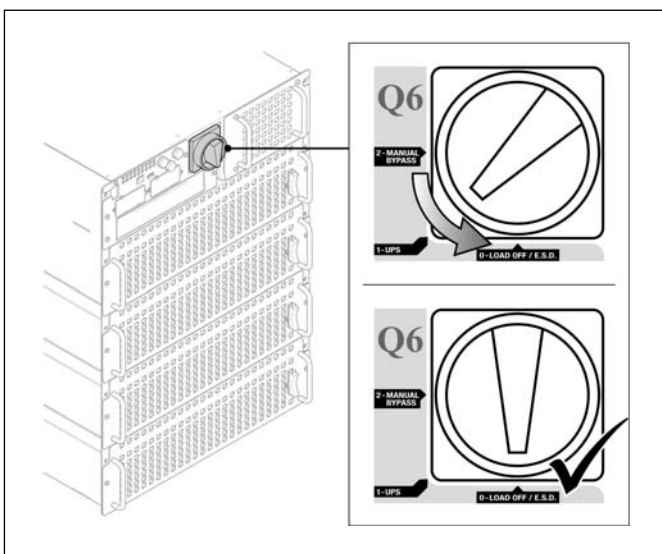
- Connect the mains and auxiliary mains to the UPS.
- Wait for the display to switch on.
- Close the external battery breaker/fuses.
- Put or keep switch Q6 in position 0.
- The battery must be charged for at least ten hours.
- Once ten hours have elapsed, open the external battery breaker/fuses.
- Disconnect the mains and auxiliary mains from the UPS.

9.3.4. Emergency shutdown

	NOTE: this operation interrupts the supply to the output load from both inverters and automatic bypass.
---	---

UPS POWER OFF

- Put Q6 to position 0 when it is necessary to interrupt the power supply quickly. Refer to the figure below.



REMOTE UPS POWER OFF

It is possible to interrupt the power supply to the output load using the ADC board. Refer to Standard Features and Options chapter.

10. OPERATING MODES

10.1. On-line mode

A special feature of the UPS is ONLINE double conversion in conjunction with low distortion mains power absorption. In ON-LINE mode, the UPS can supply a voltage that is fully stabilised in frequency and amplitude, regardless of any interference in the mains power supply, within the most stringent classification of UPS regulations.

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

• Inverter mode

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

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 the event 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
- on to the auxiliary mains via automatic bypass. Normal operation, which is from the inverter, returns automatically a few seconds after the overload disappears.
- When the voltage generated by the inverter goes outside the limits 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 power cuts), the UPS continues to power the load using the energy stored in the battery.

10.2. High efficiency mode

The UPS has a selectable, programmable economy operating mode (ECO MODE) that can increase overall efficiency by up to 99% for energy saving purposes. If the power supply fails, the UPS will automatically switch onto the inverter and continue to supply power to the load by drawing energy from the battery.

This mode does not provide perfect stability in frequency and voltage like the NORMAL MODE. Therefore the use of this mode should be carefully evaluated according to the level of protection required by the application. With the optional board Net Vision, specific daily or weekly time intervals can be selected and programmed to power applications directly from the auxiliary mains.

ECO MODE operation provides very high efficiency, since the application is powered directly from the auxiliary mains via the automatic bypass under normal operating conditions.

To activate follow the correct procedure in the control panel.

10.3. Converter mode

In converter mode the UPS can supply a fully stabilised sinusoidal output voltage with a different frequency from the input power line (50Hz or 60Hz is available as output frequency value).



NOTE: only set this mode on UPS units with the auxiliary mains (AUX MAINS) disconnected! Do not set this mode on UPS units with common mains lines as it could damage the load!

10.4. Operation with maintenance bypass

If the internal maintenance bypass is activated using the appropriate procedure, the load is powered directly from the maintenance bypass, while the UPS is separate from the power supply and can be switched off.

This operating mode can be selected for maintenance to be carried out on the system, so that the necessary actions can be performed by service personnel without having to disconnect the power supply to the load.

10.5. Operation with motor generator (GENSET)

The UPS can be operated in conjunction with a generator (GENSET) over the ADC interface (refer to Standard Features and Option chapter). 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 risks of out-of-synchronisation switching on to the bypass.

11. STANDARD FEATURES AND OPTION

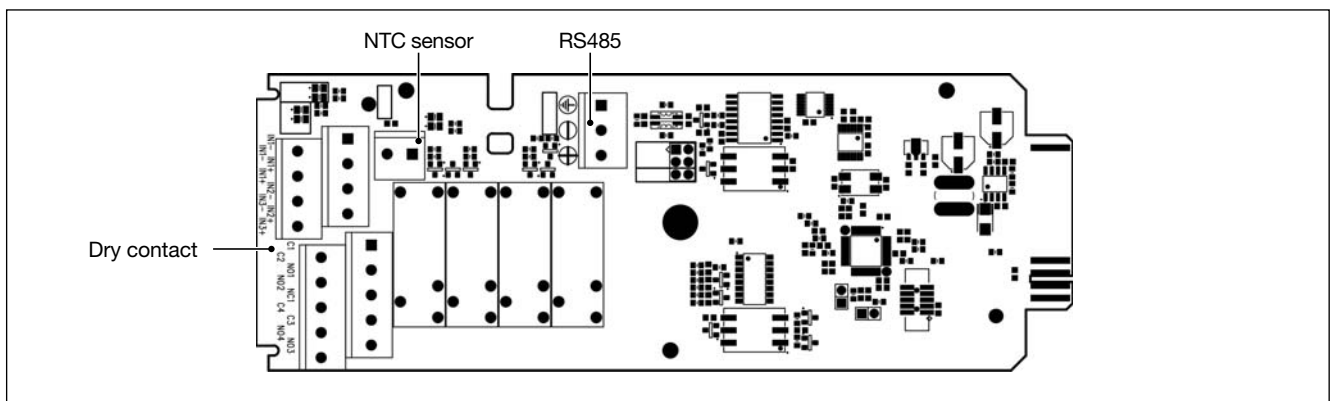
Features	Type	Availability
ADC+SL card	Communication	Available as option
Net Vision card	Communication	Available as option
MODBUS RTU / MODBUS TCP	Communication	Available as option
EMD	Communication	Available as option
Temperature sensor	Communication	Available as option
4U rack-mounted battery module	Electrical	Available as option
Slide rail	Mechanical	Available as option

ADC+SL CARD

The ADC+SL (Advanced Dry Contact + Serial Link) is a slot optional board that provides:

- 4 relays for external device activation (can be set as normally closed or normally open)
- 3 free inputs to report external contacts to UPS
- 1 connector for external temperature sensor(1) (optional)
- RS485 insulated serial link providing MODBUS RTU protocol
- 2 LEDs indicating board status

The board is plug&play: the UPS is able to recognise its presence and configuration (up to 4 standard operating modes can be selected using the two jumpers XJ2 and XJ3, refer to the UPS manual for more details) and manages the ADC outputs and the inputs accordingly. It is possible to create a custom operation mode through after sales service.



STANDARD configuration (default) XJ2: OFF - XJ3: OFF

IN/OUT	Description	Filter (s)	Status
IN1	UPS Power Off	1	NO
IN2	Supply from GenSet	1	NC
IN3	Insulation Fault	10	NC
OUT1	General Alarm	10	NO/NC
OUT2	Battery Discharging	30	NO
OUT3	Battery Low / Imminent UPS stop alarm	10	NO
OUT4	Load on Bypass	10	NO

OPTIONS SUPERVISOR configuration XJ2: ON - XJ3: OFF

IN/OUT	Description	Filter (s)	Status
IN1	UPS Power Off	1	NO
IN2	Fan Failure	10	NO
IN3	Battery disconnected	10	NC
OUT1	General Alarm	10	NO/NC
OUT2	Battery Discharging	30	NO
OUT3	Redundancy lost	10	NO
OUT4	Battery disconnected	1	NO

SAFETY configuration
XJ2: OFF - XJ3: ON

IN/OUT	Description	Filter (s)	Status
IN1	UPS Power Off	1	NO
IN2	Insulation Fault	1	NC
IN3	Charger Disable/Enable	10	NC
OUT1	General Alarm	10	NO/NC
OUT2	UPS Power Off activated	1	NO
OUT3	Battery Low / Imminent UPS stop alarm	10	NO
OUT4	Insulation Fault	1	NO

ENVIRONMENTAL configuration
XJ2: ON - XJ3: ON

IN/OUT	Description	Filter (s)	Status
IN1	UPS Power Off	1	NO
IN2	Programmable Alarm	10	NC
IN3	Battery Temperature Alarm	10	NC
OUT1	General Alarm	10	NO/NC
OUT2	Battery Temperature Alarm	10	NO
OUT3	Overload or Redundancy lost	10	NO
OUT4	Programmable Alarm	10	NO

(1). The ADC card has the possibility of connecting an external NTC sensor, to measure the external battery cabinet temperature.

NET VISION CARD

NET VISION is a communication and management interface designed for business networks. The UPS behaves exactly like a networked peripheral, it can be managed remotely, and allows the shutdown of network workstations.

NET VISION allows a direct interface between the UPS and LAN network avoiding dependence on the server and support SMTP, SNMP, DMCP and many other protocols. It interacts via the web browser.

MODBUS RTU / MODBUS TCP

With the RTU/TCP card fitted in the options slot, the UPS can be monitored from remote stations using the appropriate protocol (RTU/TCP).

EMD

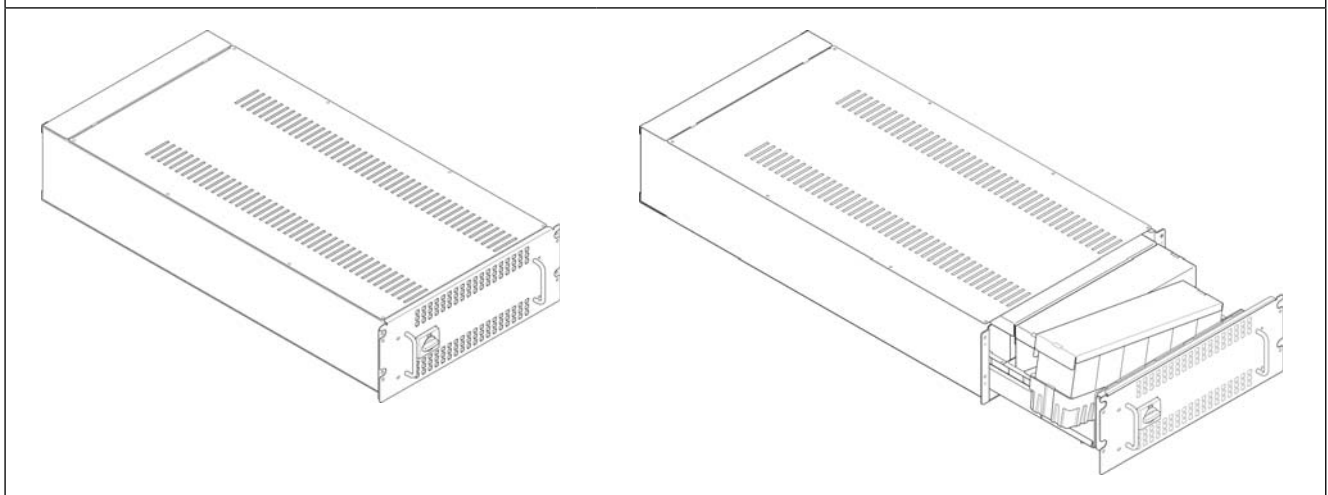
The EMD monitors temperature, humidity and other conditions in the room, and also offers 4 digital input connections for external dry contacts to monitor water, fire and smoke alarms. The LCD display on the EMD device provides direct temperature and humidity information.

TEMPERATURE SENSOR

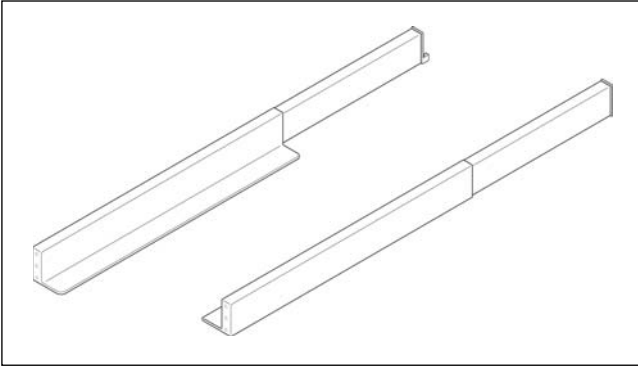
The temperature sensor can be used to monitor the battery temperature should the battery cabinet be provided by another supplier by Socomec (all battery cabinets provided by Socomec are fitted with the temperature sensor as standard). The sensor should be connected to the ADC-SL board, using the relative connector.

4U RACK-MOUNTED BATTERY MODULE

For use on 19" cabinet



SLIDE RAIL





Depth-variable - from 590 to 930 mm - for use on 19" cabinet.

Suitable for both MODULYS RM GP and 4U rack-mounted battery modules.

To support heavy installed equipment up to 150 kg.

12. MAINTENANCE

	NOTE: before carrying out any operations on the unit read the Safety Standards chapter carefully.
	NOTE: any work carried out on the equipment must be performed by qualified technicians authorised by SOCOMEC.

Routine maintenance carried out annually is recommended in order to provide optimum operating efficiency and avoid equipment downtime.

Maintenance consists of thorough functionality checks on:

- electronic and mechanical parts;
- dust removal;
- battery inspection;
- software updating;
- environmental checks.




12.1. Batteries

The condition of the battery is fundamental to UPS operation.

During the operating lifetime of the battery, the UPS stores statistics on the conditions of use of the battery for analysis.

The expected lifetime of the batteries is very much dependent on operating conditions:

- number of charging and discharging cycles;
- load rate;
- temperature.

	NOTE: batteries must only be replaced with batteries recommended or sold by the manufacturer. Batteries must only be replaced by qualified technicians.
	BEWARE: used batteries contain harmful substances. Do not open the plastic cover!
	NOTE: used batteries have to be placed in appropriate containers to avoid leakage acid. They should only be entrusted to a specialist waste disposal company.

12.2. Fans & capacitors

The lifespan of consumable parts such as fans and capacitors (AC and DC) depends on whether or not use and environmental conditions (premises, usage or load type) are abnormal or harsh for the equipment.

It is advisable to replace consumables as follows⁽¹⁾:

Consumable part	Years
Fan	5
AC and DC capacitor	5

(1). Based on operation of the unit according to the manufacturer's specification.

13. TECHNICAL SPECIFICATIONS

Number of modules		1	2	3	3+1
Power	kW	25	50	75	75
Power	kVA	25	50	75	75

Input

Input mains voltage		3ph + N 340 V to 480 V (+20/-15%) up to -40% @ 50% of nominal load			
Input mains frequency	Hz	50/60 +/-10%			
Input power factor		≥ 0.99 ⁽¹⁾			
Total harmonic input current distortion (THDi)		≤ 3% (@: Pn, Resistive load, Mains THDv ≤ 1%)			

External Battery

Battery voltage range	Vdc	min 185; max 330			
-----------------------	-----	------------------	--	--	--

Output

Output voltage (three phase + neutral)	V	380/400/415 selectable				
Frequency	Hz	50/60 selectable				
Total output voltage distortion (THDv)	%	≤ 1% (Ph/Ph); ≤ 2% (Ph/N) (@: Pn, Resistive load)				
Overload ⁽²⁾	%	125% for 10 minutes, 150% for 1 minute				
Overload ⁽²⁾	10 min	kW	31.25	62.5	93.75	93.75
	1 min	kW	37.5	75	112.5	112.5
Crest Factor		≥ 2.7				

Bypass

Bypass input voltage	V	Nominal output voltage ±15% (±20% if GENSET is used)			
Bypass input frequency	Hz	50/60 +/-2% selectable (±8% if GENSET is used)			

Stored energy mode of operation

Number of battery blocks (VRLA)		From 18+18 to 24+24			
---------------------------------	--	---------------------	--	--	--

Environmental

Operating temperature	°C	0 to 40 °C ^(3/4)			
Storage temperature	°C	-5 to +50 °C			
Relative humidity	%	95% condensation-free			
Altitude (max)	m	1000 (3000 with derating)			
Acoustic noise at 1m	dBA	52	52	55	55
Required cooling capacity	m³/h	400	800	1200	1600
Dissipated power (max)	W	1500	3000	4500	4500
Dissipated power (max)	BTU/h	5120	10240	15360	15360

Dimensions and Weight

2 slots version	Dimension (WxDxH)	mm	442 x 920 x 397		
	Weight - sub-rack	kg	35,5		
4 slots version	Dimension (WxDxH)	mm	442 x 920 x 664		
	Weight - sub-rack	kg	41,5		
Weight UPS module		kg	33		
Weight Bypass module		kg	7,5		

Standard

Safety		IEC 62040-1/A1
EMC		IEC 62040-2 (C2)
Performance		IEC 62040-3 (VFI-SS-111)
Product Certifications		CE
Degree of protection standard ⁽⁵⁾		

(1). $P_{out} \geq 50\% S_n$.

(2). Initial Condition $P_{out} \leq 80\% P_n$

(3). For best battery lifetime the suggested temperature range is 15 to 25 °C.

(4). In accordance with EN62040-3

(5). The product is designed to be incorporated in an enclosure; moreover the number of power modules inside is variable.

Therefore IP20 protection degree must be ensured after it is incorporated along with the special protective covers (refer to Connections and Power Module Insertion sections).



I0MM0DG PXX06-EN 00 04.2016