

# ***Green Power 2.0***

10 - 40 kVA

安装及操作手册 (CN)

Installations- und bedienungsanleitung (DE)

Manual de instalación y uso (ES)

Manuel d'installation et d'utilisation (FR)

Installation and operating manual (GB)

Manuale di installazione e uso (IT)

Installatie- en bedieningshandleiding (NL)

Dokumentacja Techniczno-Ruchowa (PL)

Manual de instalação e funcionamento (PT)

Manual de instalare și utilizare (RO)

Руководство по установке и эксплуатации (RU)

Navodila za priključitev in uporabo (SI)

Kurulum ve kullanım kılavuzu (TR)



# 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.

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# 1. SAFETY STANDARDS

## 1.1. IMPORTANT

- This document provides important instructions for the safe use, movement and connection of the Green Power 2.0 uninterruptible power system (UPS).
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- This document is not a specification. SOCOMEC reserves the right to make any changes to the information provided without prior notice.
- The unit must only be installed and activated by qualified technical personnel who have been authorised by SOCOMEC.



**The UPS MUST only be moved by two people at least.**  
**They MUST take position at the sides of the UPS with respect to the direction of movement.**

- The unit must remain in a vertical position at all times.
- Connect the PE ground conductor first before making any other connection.
- Do not expose the UPS to rain or liquids in general. Do not insert foreign bodies.



**The installer is responsible for implementing the backfeed protection with the use of AC input line isolation devices external to the UPS (see section 2.4.1).**

**Before working on this circuit**

- Isolate the Uninterruptible Power System (UPS)
- Then check for Hazardous Voltage between all terminals including the protective earth

**Risk of Voltage Backfeed**

- For the purpose of warning electrical technicians against backfeed situations not caused by the UPS, which may arise when a particular load fault is present while the UPS is operating in stored energy mode, or while unbalanced loads are supplied through a particular power distribution system e.g. an impedance grounded IT system, the installer must attach the labels provided to all primary power isolators installed remotely from the UPS area and on external access points, if present, between the said isolators and the UPS. In particular the label must be attached to the external AC input line isolation service (backfeed insulation).
- The UPS may be powered from an IT distribution system with a neutral conductor.
- Keep this manual in a convenient place for future consultation.
- If the unit fails, it must only be repaired by authorised technicians who have been specially trained for this purpose.
- This equipment complies with European Community directives for industrial equipment and bears the approval mark
- The UPS requires three-phase plus neutral input connections (3P+N).
- Do not connect the output neutral to ground. The UPS does not modify the neutral setup of the system; the use of an isolation transformer is required should it be necessary to modify the neutral setup downstream of the UPS.
- Before connecting any external battery cabinets, ensure they are fully compatible with the UPS model used.
- The use of external battery cabinets not supplied by the manufacturer is not recommended.
- Switch off and isolate the UPS and wait for 5 minutes before removing the protection panels in order to carry out work on parts under dangerous voltage.
- Risk of explosion if the batteries are replaced with others of the wrong type.
- Used batteries must be disposed of at authorised waste disposal centres.



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



**CAUTION!**  
**A battery can present a risk of electrical shock and high short circuit current.**  
The following precautions should be observed when working on batteries:

- a) Remove watches, rings or other metal objects.
- b) Use tools with insulated handles.
- c) Wear rubber gloves and boots.
- d) Do not lay tools or metal parts on top of batteries.
- e) Disconnect the charging source prior to connecting or disconnecting battery terminals.
- f) Determine if battery is inadvertently grounded. If inadvertently grounded, remove source from ground. Contact with any part of a grounded battery can result in electrical shock. The likelihood of such shock can be reduced if such grounds are removed during installation and maintenance (applicable to equipment and remote battery supplies without a grounded supply circuit).

The product you have chosen is designed for commercial and industrial use only.

If 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 harm to people or property, the products may have to be adapted.

For such use please contact SOCOMEC beforehand to check if these products meet the required level of safety, performance, reliability and comply with applicable laws, regulations and specifications.

## 1.2. DESCRIPTION OF SYMBOLS USED ON LABELS ATTACHED TO THE UNIT

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



**DANGER! HIGH VOLTAGE (BLACK/YELLOW)**



**GROUND TERMINAL**



**READ THE USER MANUAL BEFORE USING THE UNIT**

## 2. UNPACKING AND INSTALLATION OF 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 locking equipment and braking devices to ensure that the unit does not fall over.

### 2.1. SHIPPING AND MOVING

- The UPS must remain in a vertical position during all shipping and moving operations.
- The unit has wheels that can be used to move it for short distances.
- Ensure the floor is strong enough to support the weight UPS and battery cabinet, if used.



Avoid pressing on the front panels when moving the unit.

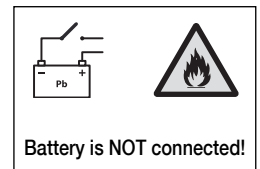


The UPS **MUST** only be moved by two people at least. They **MUST** take position at the sides of the UPS with respect to the direction of movement.



#### CAUTION IF DAMAGED NON-SPILLABLE BATTERIES

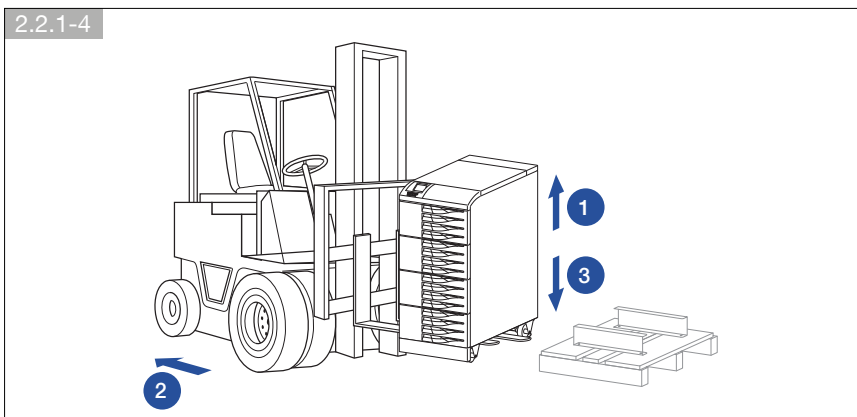
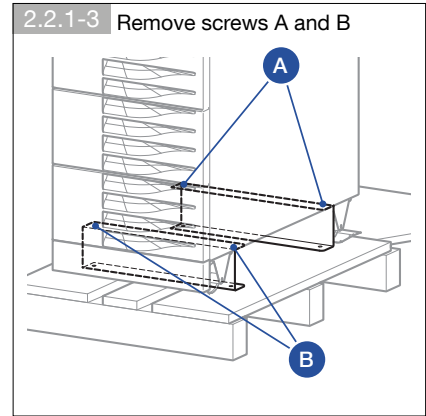
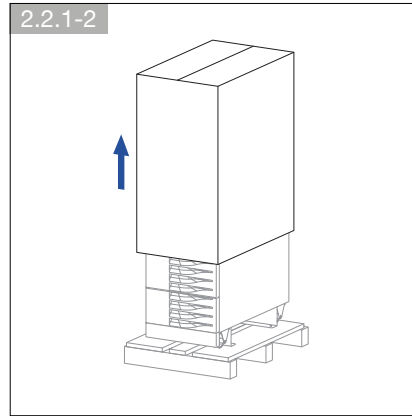
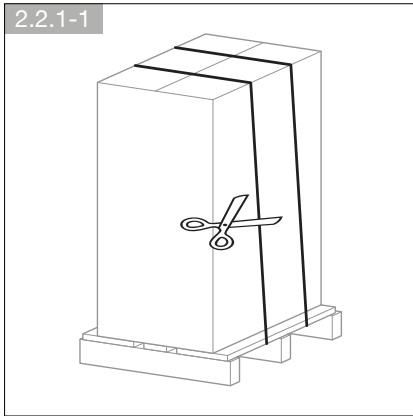
If packaging is crushed, torn or open such that the inner contents are revealed, the equipment should be kept in an isolated area and inspected by a qualified person. If the packaging cannot be shipped the contents should be collected promptly, kept apart, and the sender or recipient should be contacted.



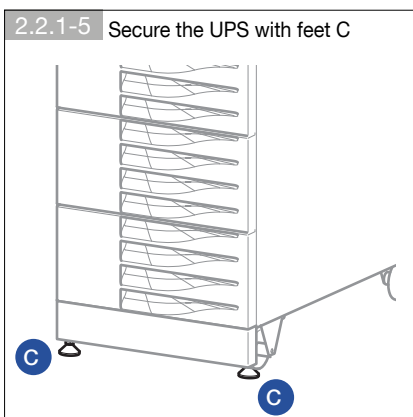
All packaging must be recycled in compliance with existing legislation in the country where the system is installed.

### 2.2. UNPACKING PROCEDURE

#### 2.2.1. S Models (h 800 mm) and M Models (h 1000 mm)



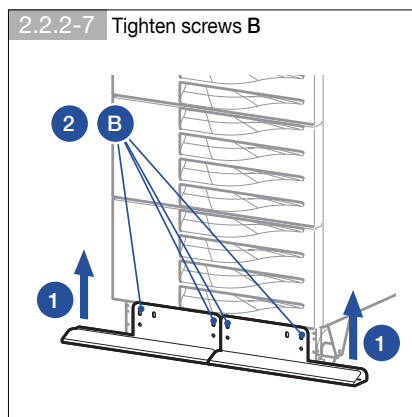
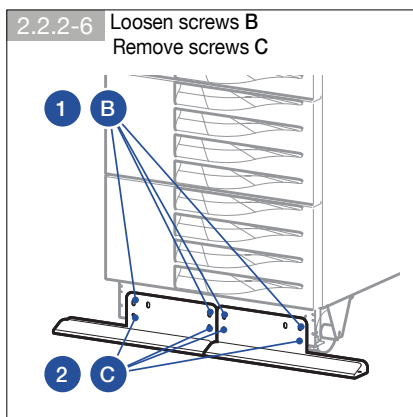
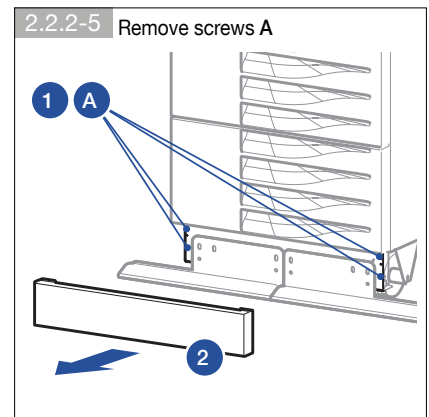
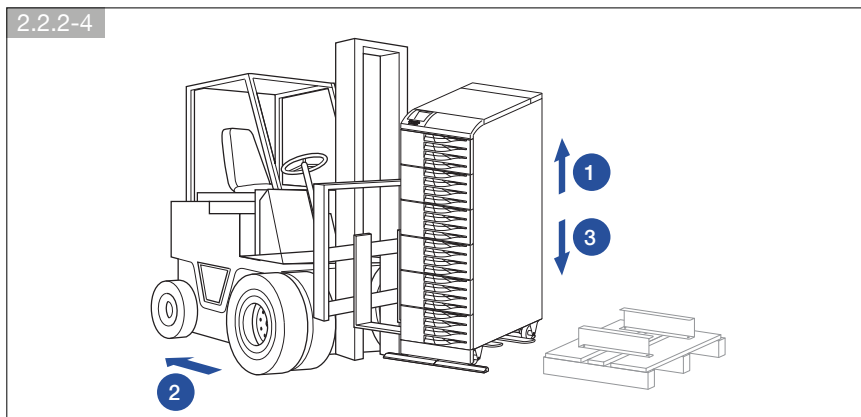
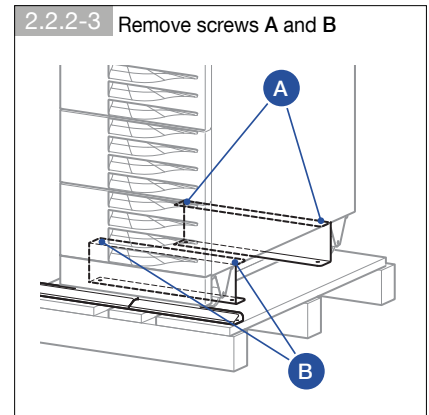
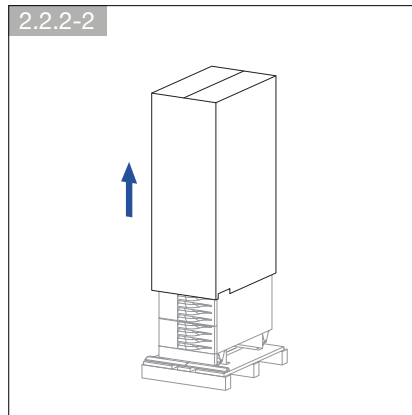
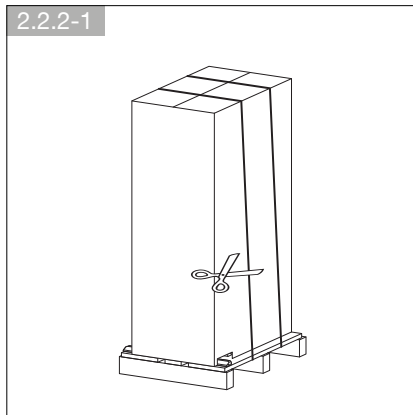
The UPS can be moved.  
Place the UPS in the installation area.




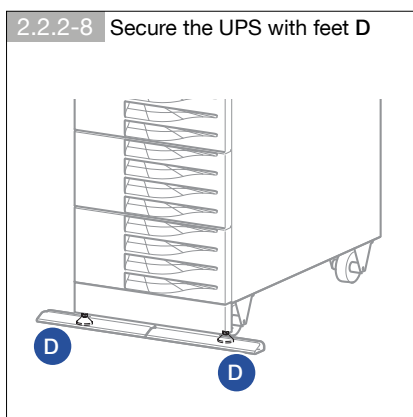
Secure the UPS with feet D  
only when it is in position with  
cables connected.

## 2. UNPACKING AND INSTALLATION OF THE UNIT

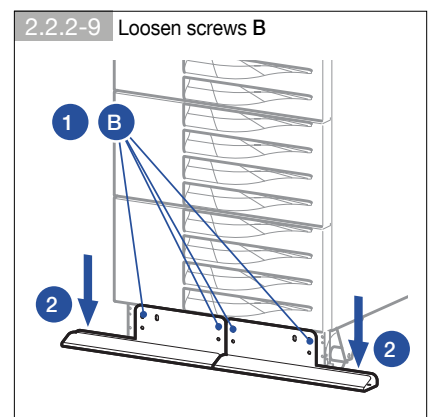
### 2.2.2. T Models (h 1400 mm)



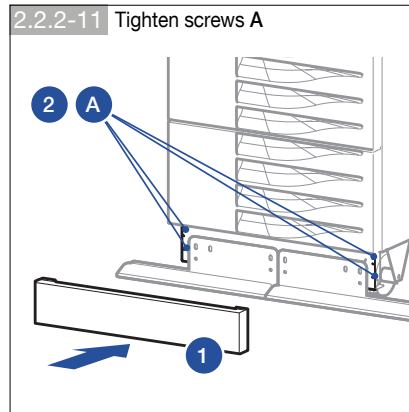
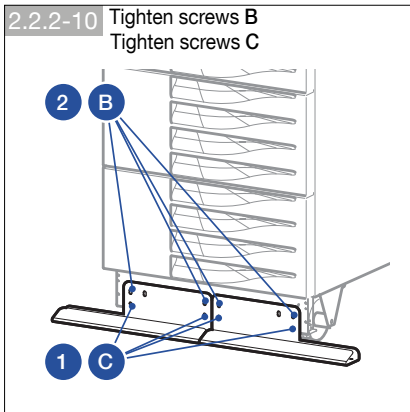
 The UPS can be moved.  
Place the UPS in the installation area.



 Secure the UPS with feet D only when it is in position with the cable connected.

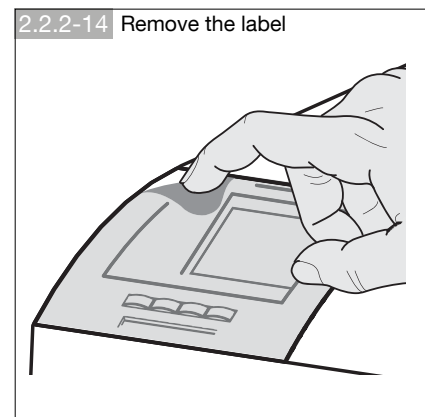
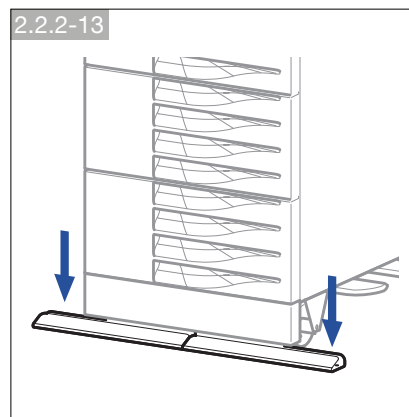
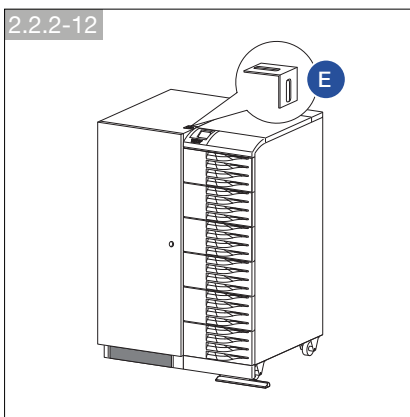






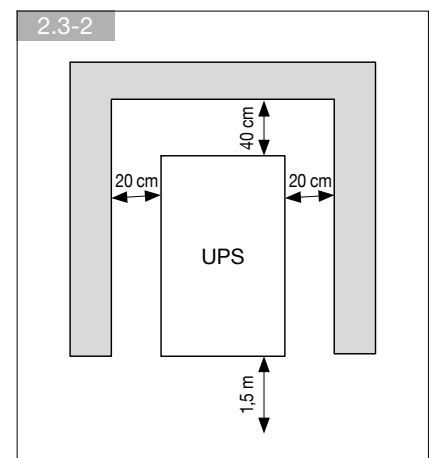
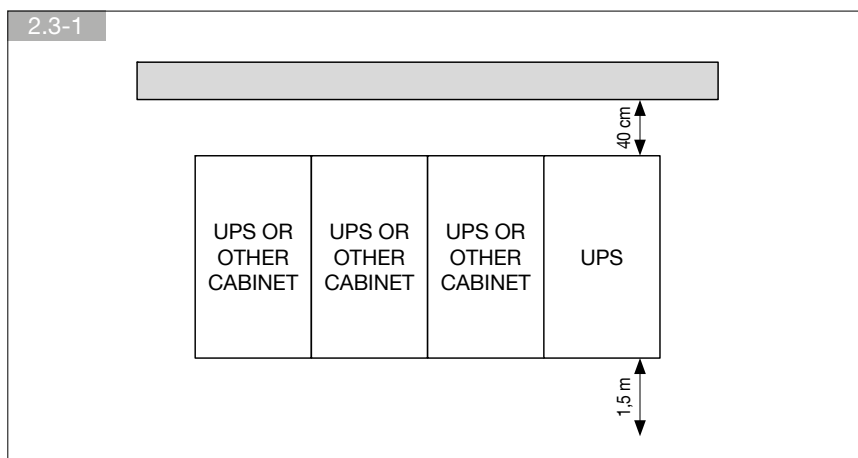
For UPS 15-40kVA height 1.400mm without internal battery:

- with battery cabinet fitted alongside: remove leveller E from the cabinet. Secure the UPS to the cabinet using the bracket E provided (figure 2.2.2-12).
- without battery cabinet fitted alongside: secure the UPS to the floor (figure 2.2.2-13).



### 2.3. ENVIRONMENTAL REQUIREMENTS

- The recommended operating temperature, humidity and altitude values are listed in the technical specifications table (see chapter 10). Cooling systems may be required to maintain these values.
- Avoid dusty environments or areas where there is dust from conductive or corrosive materials (e.g. metal dust or chemical solutions).
- The UPS is not designed for outdoor use.
- Do not expose the UPS to direct sunlight or sources of excessive heat.
- A space of at least 40 cm must be left at the back for adequate ventilation (see figure 2.3-1).
- 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. It is also advisable to ensure that cable connections are sufficiently long and flexible so that the unit can be extracted during maintenance (see figure 2.3-2).
- If it is not possible to leave sufficient space at the front, adequate access must be ensured from both sides.



## 2.4. ELECTRICAL REQUIREMENTS

The installation and 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 shows the size of input protection devices recommended for correct installation.

Size of input protection devices										
UPS	Magnetothermal input <sup>1</sup>		Magnetothermal Aux Mains <sup>1</sup>		Differential input <sup>5</sup>	Input/Output cable core size		Battery cable core size		Battery protection <sup>4</sup>
(kVA)	(A)		(A)		(A)	(mm <sup>2</sup> )		(mm <sup>2</sup> )		(A)
	single	parallel <sup>2</sup>	single	parallel <sup>2</sup>	selective type <sup>5</sup>	Min	Max <sup>3</sup>	Min	Max <sup>3</sup>	
10 3/1	32	40	100	125	0.5	6	35	6	35	50 Gr
	100 <i>if common input mains</i>	125 <i>if common input mains</i>				16 <i>aux mains and output</i>				
15 3/1	32	40	100	125	0.5	6	35	6	35	50 Gr
	100 <i>if common input mains</i>	125 <i>if common input mains</i>				25 <i>aux mains and output</i>				
10 3/3	32	40	32	40	0.5	6	35	6	35	50 Gr
15 3/3	32	40	32	40	0.5	6	35	6	35	50 Gr
20 3/3	40	63	40	63	0.5	10	35	10	35	50 Gr
30 3/3	63	80	63	80	0.5	16	35	16	35	100 Gr
40 3/3	80	100	80	100	0.5	25	35	25	35	125 Gr

<sup>1</sup> Recommended magnetothermal switch: four poles with 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.

<sup>2</sup> In systems with two or more UPSs operating in a redundant or power parallel configuration.

<sup>3</sup> Determined by the size of the terminals.

<sup>4</sup> Protection on the external battery cabinet.

<sup>5</sup> 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.



The UPS is designed for transitory overvoltages in category II installations. If the UPS is part of the building's electric circuit or 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. Additionally, the 'surge arrester' 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 protection devices type 1 must be  $U_p \leq 4\text{kV}$  is  $\geq 15\text{m}$ .



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.



### WARNING!

This is a product for commercial and industrial application in an industrial environment - installation restrictions or additional measures may be needed to prevent interference.



### IMPORTANT!

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.

### 2.4.1. Backfeed protection

If the UPS does not have an automatic protection device against current backfeed, the operator/installer must add a warning label to all the mains power disconnecting switches installed at a distance from the UPS area. This serves to remind technicians of the fact that the circuit is connected to a UPS (see chapter 1 of this manual and paragraph 4.7.3. of the EN62040-1 2009-05 standard).

The label is supplied with the system.

The backfeed protection device may be built into the system (only on specific request), or an electromechanical switch may be installed externally in the input of the UPS.

- If the UPS incorporates this protection, proceed with the connections as described in paragraph 2.5 of this manual.
- To install the external backfeed protection it is necessary to use the BKF card and an external electromechanical switch that should be installed. For further information on the connection and the type of remote switch, please read paragraphs 8.8 and 8.9 of this manual.



#### WARNING!

The neutral is not disconnected as, even in the event of a single fault on the UPS, it never has high potential when the mains and/or auxiliary power supplies are disconnected upstream. This is to prevent transformation of the power source to the UPS every time there is a power failure.

If under certain irregular conditions, or due to 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.



#### NOTE

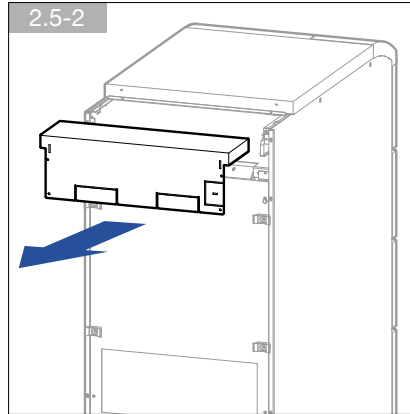
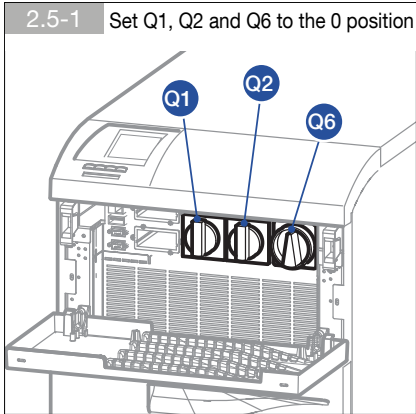
For equipment with separate Emergency Mains, the neutral of the Emergency Mains line must be electrically common with the neutral of the main input feed line.

### 2.5. 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.

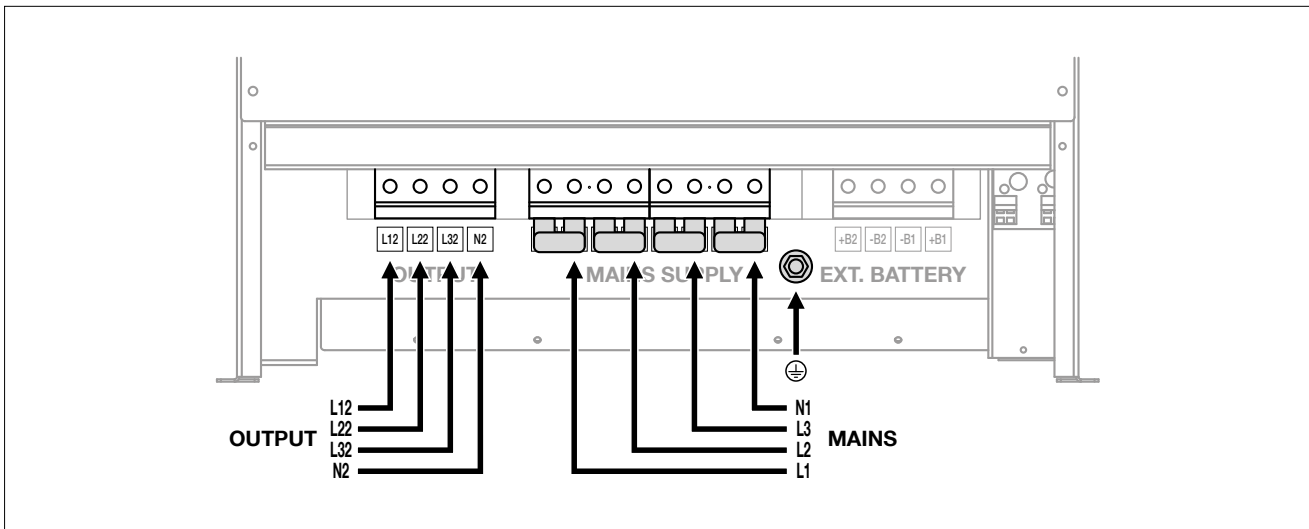


#### Cable specifications:

- strip length: 18 mm
- tightening torque: 2.5 - 4.5 Nm

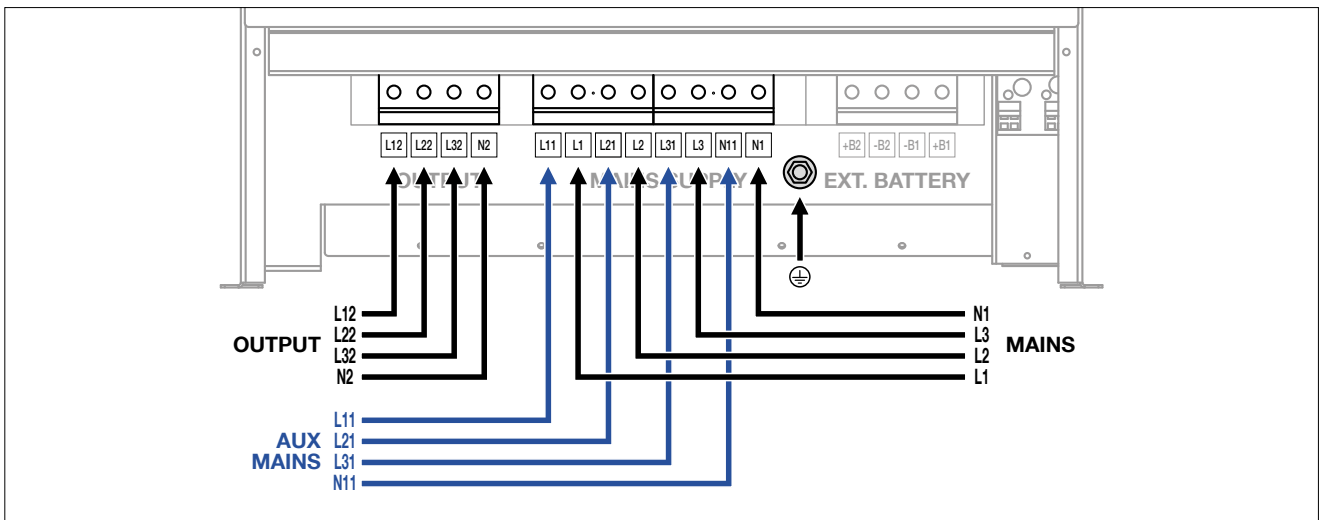
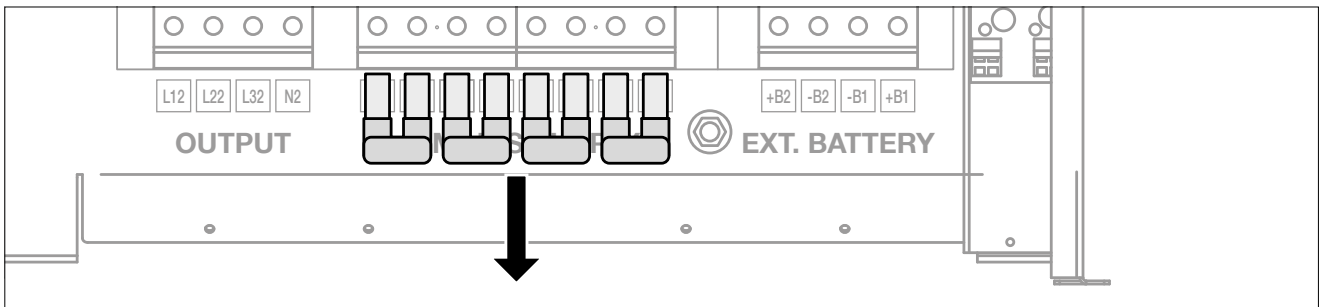
3/3

Connections if  
THE MAINS AND AUX MAINS ARE CONNECTED IN COMMON

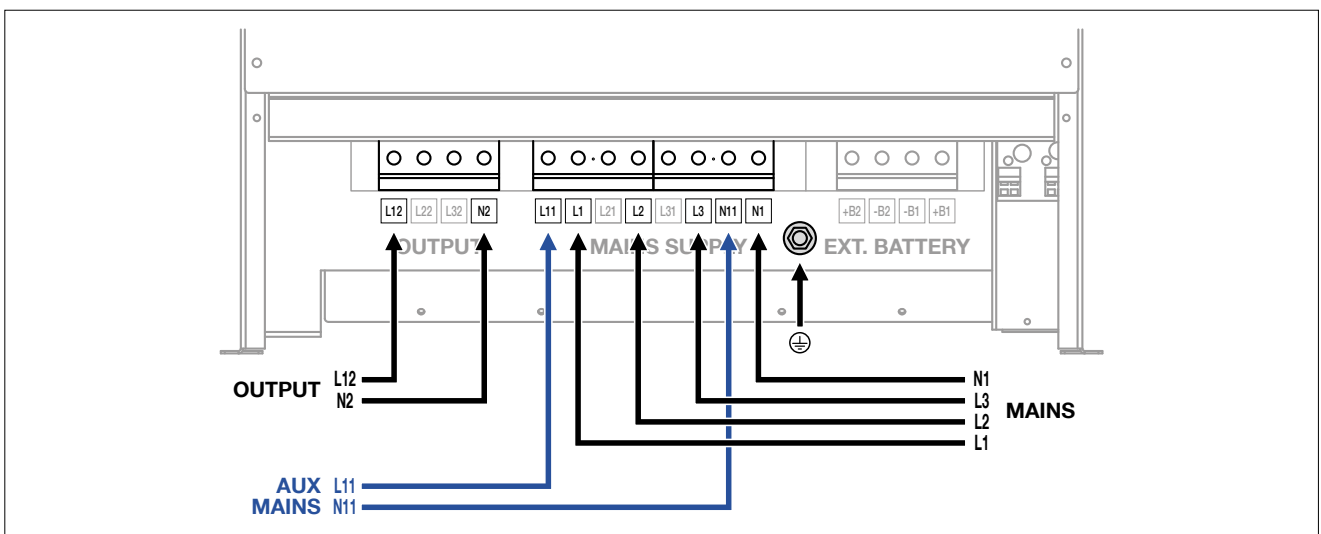


## 2. UNPACKING AND INSTALLATION OF THE UNIT

### 3/3 Connections if THE MAINS AND AUX MAINS ARE CONNECTED SEPARATELY



### 3/1 Connections if THE MAINS AND AUX MAINS ARE CONNECTED SEPARATELY

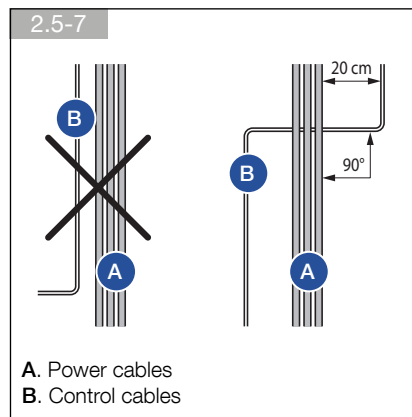
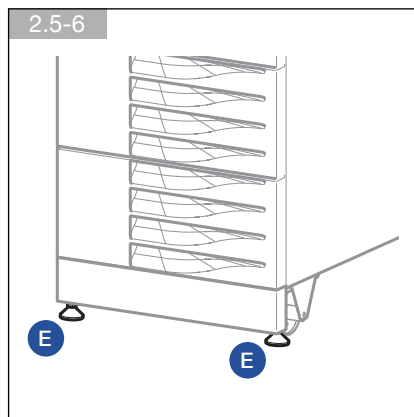
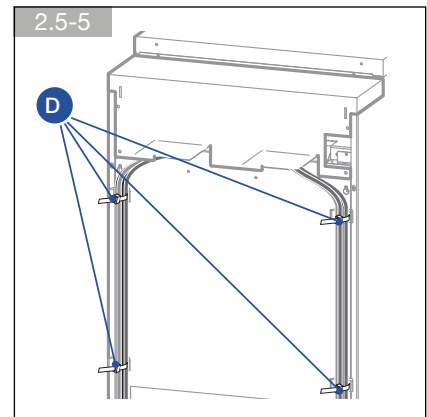
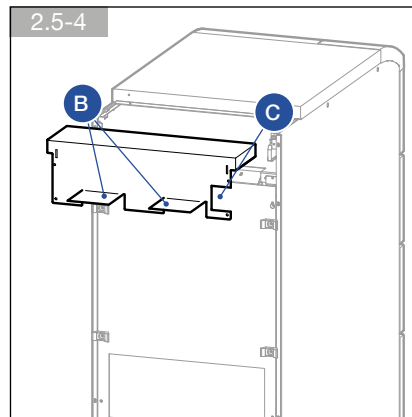
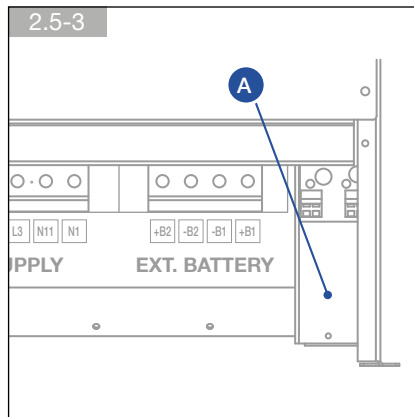


- 2.5-3** Guide any control cables from the front (RS232, signalling relay contacts, etc.) into the appropriate side cable run **A**.
- 2.5-4** Remove the pre-cut element **C** and bend elements **B** to feed through the cables, secure the terminal board cover with the four screws.
- 2.5-5** Secure the cables to the couplings **D** located on the rack ensuring that the air vents are not obstructed in any way.

- 2.5-6**  **Once cabling has been carried out, secure the UPS with the fixing feet E**

*Note: if the system is installed on a raised floor (such as in a data processing room):*

- leave a space of at least 20 cm between the power and the control cables;
- avoid parallel channelling over long distances; choose cables crossing at 90° instead.



## 2.6. GENERATOR CONNECTION

If your system uses a generator, connect the 'generator set ready' no-potential contact to connector IN 2 on the optional ADC PCB configured in standard or power safe mode (see paragraph 7.3). This automatically extends the voltage and frequency value range when power is supplied by the generator set.

## 2.7. EXTERNAL ESD CONNECTION

A remote emergency shutdown system (ESD) can be installed by means of the optional ADC PCB (see paragraph 7.3). Connect a normally closed zero-potential contact to terminals IN1+ and IN1- of the ADC PCB.

### 2.8. ISOLATION TRANSFORMER

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

- Refer to chapters 1 and 2 of this manual for indications on moving and installing the cabinet.
- See paragraph 2.4 for details about protection devices.
- 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 connection details refer to the transformer terminal board diagram.

### 2.9. UPS PARALLEL CONFIGURATION

#### 2.9.1. General

Parallel connection enhances UPS system reliability, performance and power.

All Green Power 2.0 models can be installed in parallel configuration provided they have the special parallel kit that can be installed in the factory or later by specialist personnel.

UPS modules for parallel operation are identical to standard UPS modules, as a result safety, shipping and installation recommendations in chapters 1 and 2 also apply.



**For 3/1 versions only two units in parallel are allowed.**

#### 2.9.2. Installation

UPS units operating in parallel are interconnected using control cables **B** (fig. 2.9.3-1) and are configured differently depending on the position they are assigned.

For this reason the units have a position label **C** (Fig. 2.9.4-1):

- 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) means this unit must be positioned between the two other cabinets.

The control cables supplied allow a maximum distance of about 3 metres between the UPS units. This gives enough room for an external battery cabinet to be inserted beside each UPS.

#### 2.9.3. Power connections

- The power supply to each unit must be protected as indicated in the table in paragraph 2.4.
- The cross section and length of the input and output cables must be identical for all 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 metres (Fig. 2.9.3-1).
- The cables from the UPS module to circuit breaker **F** must be of the same length (max. 15 metres) with multi-core cables.
- If a differential switch is installed on the mains power switch (optional), it must be inserted upstream from the distribution panel (see fig. 2.9.3-1, detail H), it **must be a selective type and the trigger value must be 0.5 A multiplied by the number of UPSs connected in parallel.**



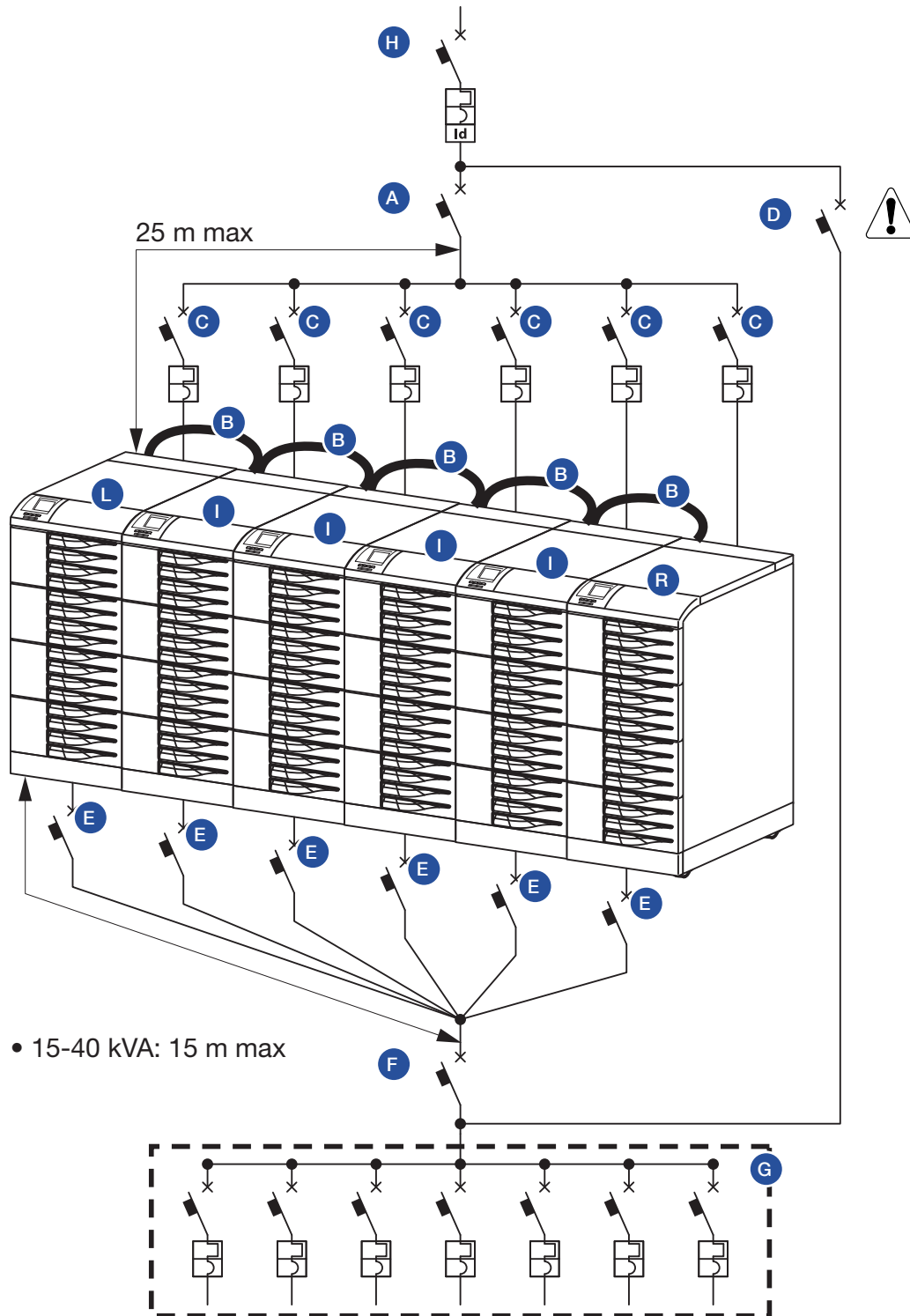
**Only activate circuit breaker D after carrying out the procedure for switching onto the maintenance bypass.**



**Only activate circuit breaker E after turning off the UPS.**



### 2.9.3-1 Recommended parallel configuration



#### Key

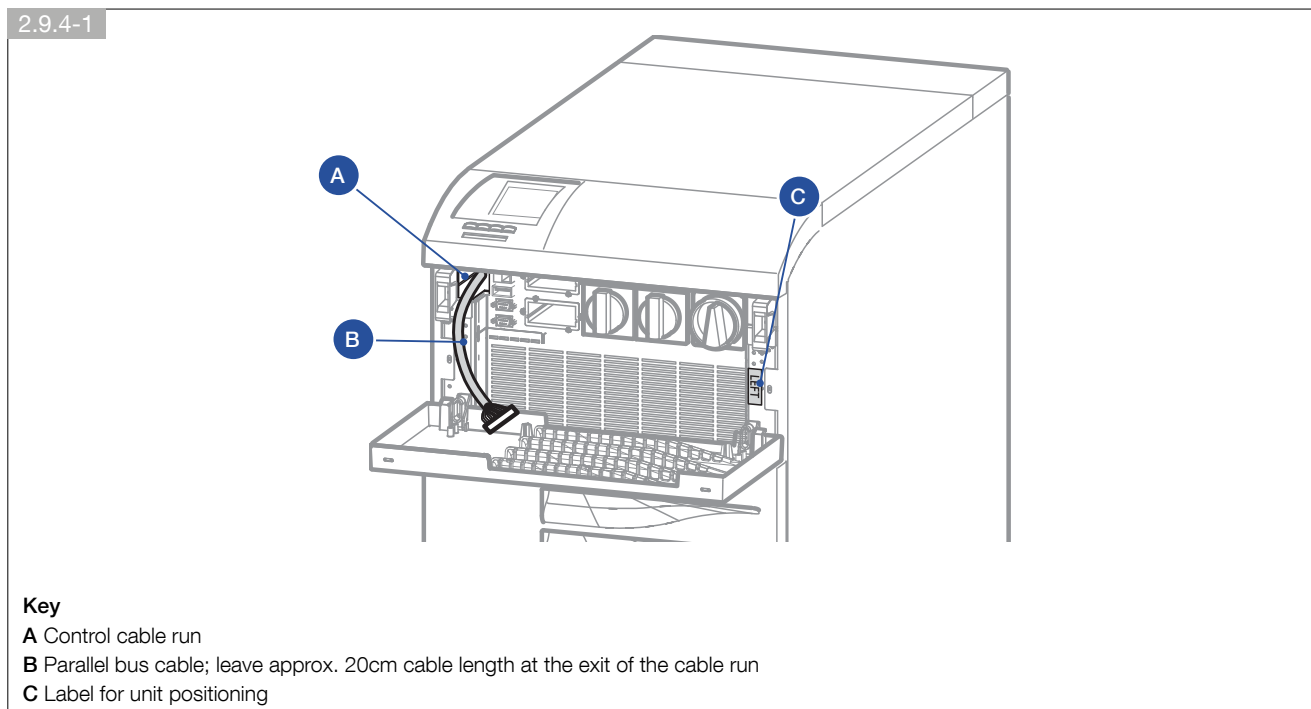
- |   |                                      |  |
|---|--------------------------------------|--|
| A System input switch   | D Ext. bypass magneto-thermal switch | H Main differential magneto-thermal switch |
| B Parallel bus cable  | E Output switch                      | I Internal UPS                             |
| C Single UPS magneto-thermal switch (if a separate auxiliary power source is used, add a magneto-thermal switch for each UPS) | F System shutdown switch             | L Left UPS                                 |
|   | G Distribution                       | R Right UPS                                |

### 2.9.4. Control connections

In order for units connected in a parallel configuration to operate correctly, control cables are required to exchange data between the various UPS units making up the parallel system, for management of correct load sharing and synchronisation logic.

The cables in question are supplied with the UPS in the case of a standard parallel setup or are attached to the parallel kit in the case of a later system upgrade.

**Parallel configuration must only be activated by SOCOMEC qualified personnel;** in each case arrange the control cables in the relevant cable run as shown in figure 2.9.4-1, leaving the connector(s) unconnected (in the central UPS one incoming and one outgoing control cable must be used).



## 2.10. SPECIAL PARALLEL CONFIGURATION FEATURES

### 2.10.1. Energy saver

**Energy Saver** ensures system availability and simultaneously reduces energy consumption. It is available for parallel systems with more than two units.

**Energy Saver** can be activated in: HMI **MAIN MENU > SETTINGS > UPS SETTINGS > PARALLEL SYSTEM > Energy Saver**. A high speed digital control is used to keep only the units needed to supply the energy to the load in operation. When the power consumed by the load increases the UPS units needed to supply the increased power requirements switch on immediately.

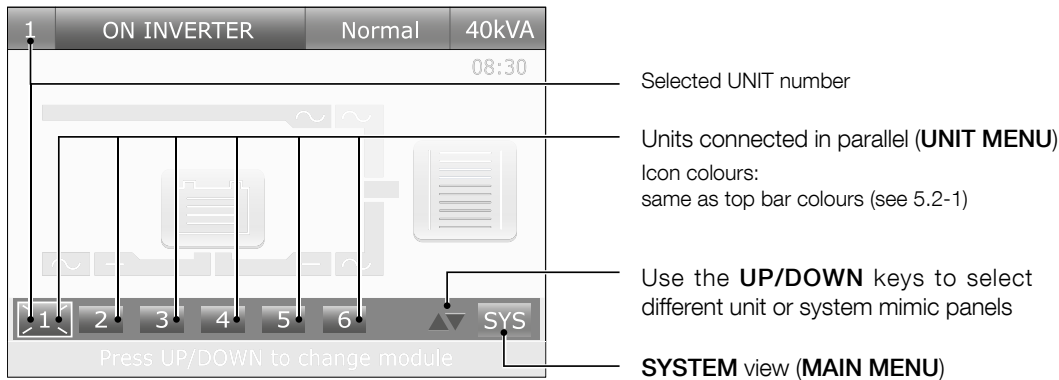
### 2.10.2. Intelligent communication module (ICM)


Intelligent Communication Module (ICM) allows the hierarchical supervision both of each unit and the whole system from all displays. The advantage of using ICM is that the options and external communication accessories for system monitoring and diagnostics (i.e. Net Vision, ADC board, etc.) can be installed on only one UPS.

In the UPS parallel configuration, an additional navigation bar is displayed on the mimic panel page, where all connected units appear. To enter the **MAIN MENU** select the **SYS** icon and press **ENTER**.

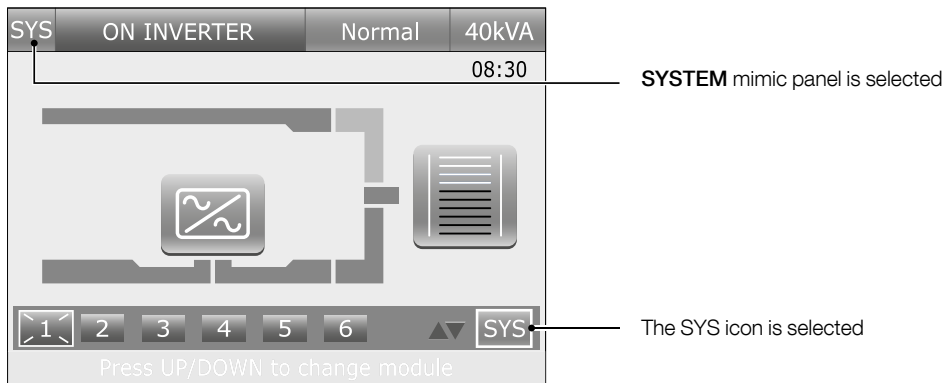
To enter the **UNIT MENU** select one of the numbered icons and press **ENTER**.

#### 2.10.2-1 UNIT VIEW



The  symbol (number surrounded by four lines) indicates the Unit number of the UPS upon which the display is fitted (the display is fitted on UPS #1 in this example). The **BATTERY SETTINGS** menu and the **Automatic Stop Procedure** are only available on this **UNIT MENU**.

#### 2.10.2-2 SYSTEM VIEW



### 2.10.3. Sequential start (configurable by Socomec service personnel only)

In a parallel configuration a sequential start can be set in all the units. It allows a reduction of the power impact on the mains or GenSet when the UPS system resumes from battery mode. The delay restart time (from 0 to 65 seconds) can only be set via ASSIST. The delay restart rectifier (T\_delay\_start\_rect) has to be the same for each module according to the following specification:

T\_delay\_start\_rect = 5000 ms for each module

Sequential start						
	Module 1	Module 2	Module 3	Module 4	Module 5	Module 6
Delay time	1x5 s = 5 s	2x5 s = 10 s	3x5 s = 15 s	4x5 s = 20 s	5x5 s = 25 s	6x5 s = 30 s

### 2.11. EXTERNAL BATTERY CABINET CONNECTION



If the UPS has internal batteries, connecting external battery cabinets is prohibited.

Position the battery cabinet next to the UPS.



Before carrying out any operations, ensure that:

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

- Remove the terminal boards protection.
- Connect the ground cable (figure 2.11-1).
- Connect the cables between the UPS terminals and the battery cabinet terminals, strictly observing the polarity of each individual string (figure 2.11-1) and the cross-sections indicated in table 3.4.



Use double insulated cables or the cables supplied with the unit to connect the UPS to the battery cabinet. The length L of battery cable must not be more than 8 metres long (if  $L > 8$  m, please contact the support service).

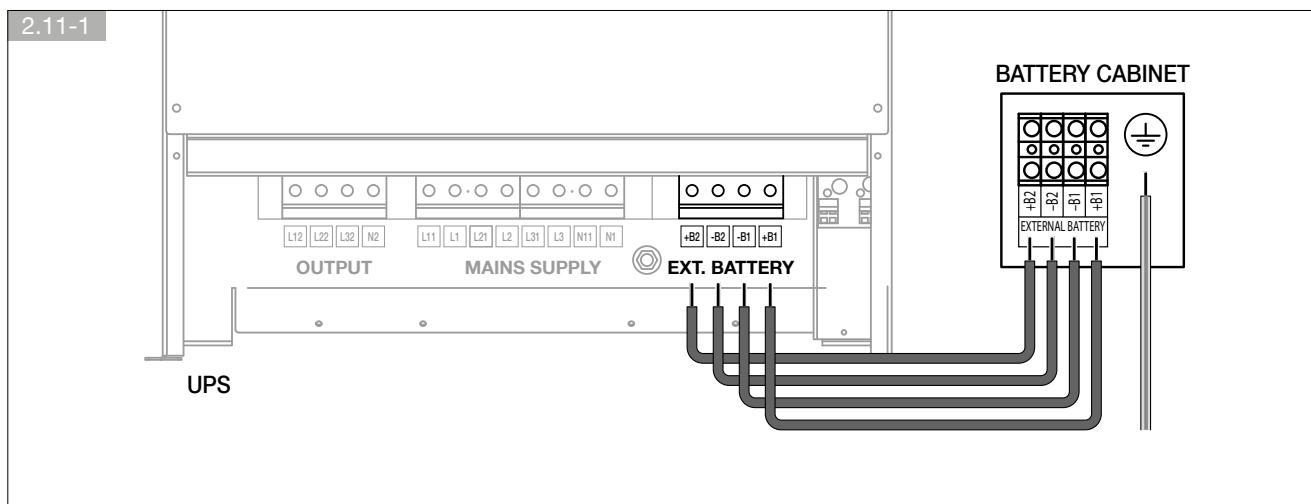


Cabling errors with inversion of battery polarity may cause permanent damage to the equipment.

- Replace the terminal board's protection.



If using cabinets not supplied by the UPS manufacturers, it is the installer's responsibility to check 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. See 5.3.6 paragraph for battery settings configuration.



## 3. MODES OF OPERATION

### 3.1. ON LINE OPERATION

A special feature of the Green Power 2.0 series is the ON LINE double conversion feature in conjunction with low distortion mains power absorption. With ON LINE mode, the UPS is able to 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:

- **Normal 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 the 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 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. The Expert Battery System keeps the user constantly informed on battery status and back-up time available.

### 3.2. OPERATION IN HIGH EFFICIENCY MODE

The UPS makes it possible to select a programmable economy operating mode that can increase overall efficiency by up to 98% for energy saving purposes. With this mode of operation, specific daily or weekly time intervals can be selected and programmed to power the applications directly from the auxiliary mains. 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 ON LINE mode. Thus the use of this mode should be carefully evaluated according to the level of protection required by the application.

Eco Mode operation provides very high efficiency, since the application is powered directly from the auxiliary mains via the automatic bypass in normal operating conditions.

### 3.3. OPERATION WITH MANUAL MAINTENANCE BYPASS

If the maintenance bypass is activated using the appropriate procedure, the load is powered directly from the maintenance bypass, while the UPS is separated 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.

### 3.4. OPERATION WITH EXTERNAL MANUAL BYPASS

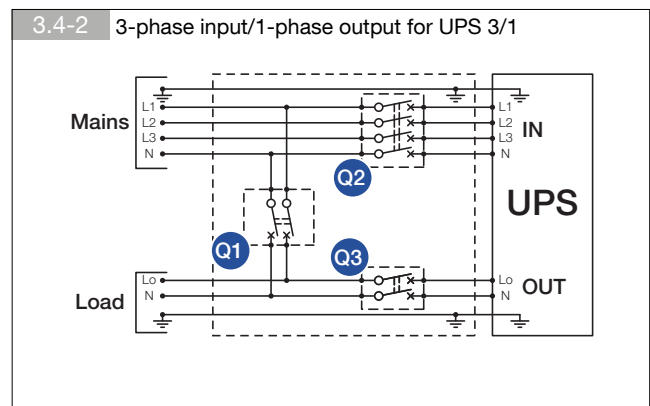
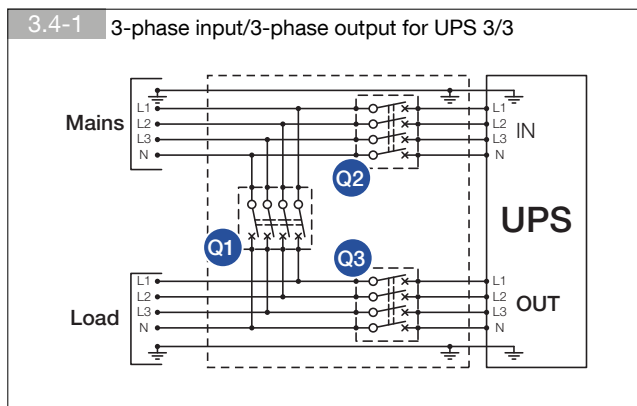
The external maintenance bypass may be placed on the general distribution panel when the UPS is installed, or by installing the bypass panel that is supplied on request.

If the UPS has an input for the auxiliary power supply, the **Q2** switch must be connected to this input and the main power supply input must be disconnected on the control panel.

If the maintenance bypass is activated with the appropriate procedure, the load is powered directly from the maintenance bypass, while the UPS is separated 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.

#### Bypass panel connection diagram



#### Key

- Q1** Bypass switch
- Q2** Mains power switch
- Q3** Output switch

### 3.5. OPERATION IN GE CONFIGURATION

Green Power 2.0 can be operated in conjunction with a generator (GE).

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

### 3.6. ENERGY SAVER MODE

This mode ensures that the UPS system always operates at the highest load efficiency (40-70% of the nominal power).



**This mode can only be activated on UPSs connected in parallel and operating in normal mode.**

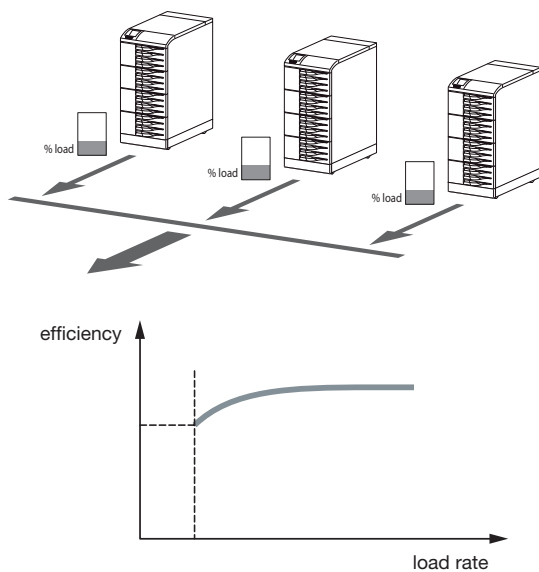
In the case of low load, the system shuts down any unnecessary UPS units, thus increasing the load on the remaining units.

This leads to higher system efficiency, as the UPSs on in standby are not using any power, while the active units with a high load are operating at maximum productivity.

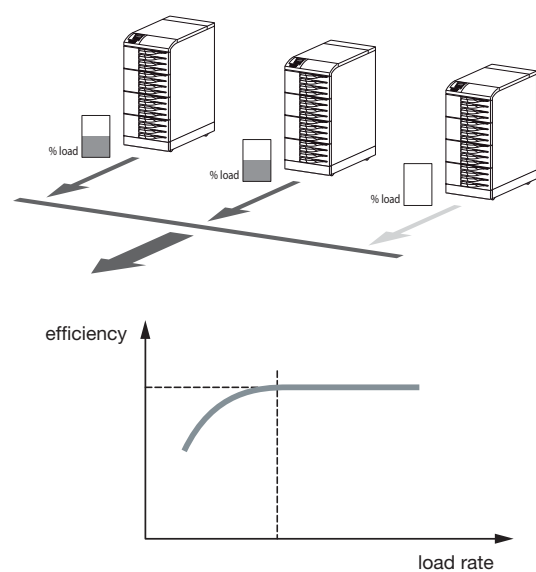
When the load increases, the units on standby are immediately reactivated to guarantee continuous power supply.

Monitoring the hours of operation means that the hours are distributed over all the UPSs, alternating the units that are shut down from time to time. This prolongs the life of the units and reduces the risk of failure.

3.6-1 Load sharing



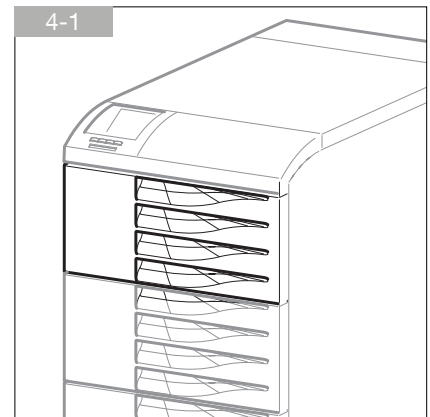
3.6-2 Load sharing + Energy Saver



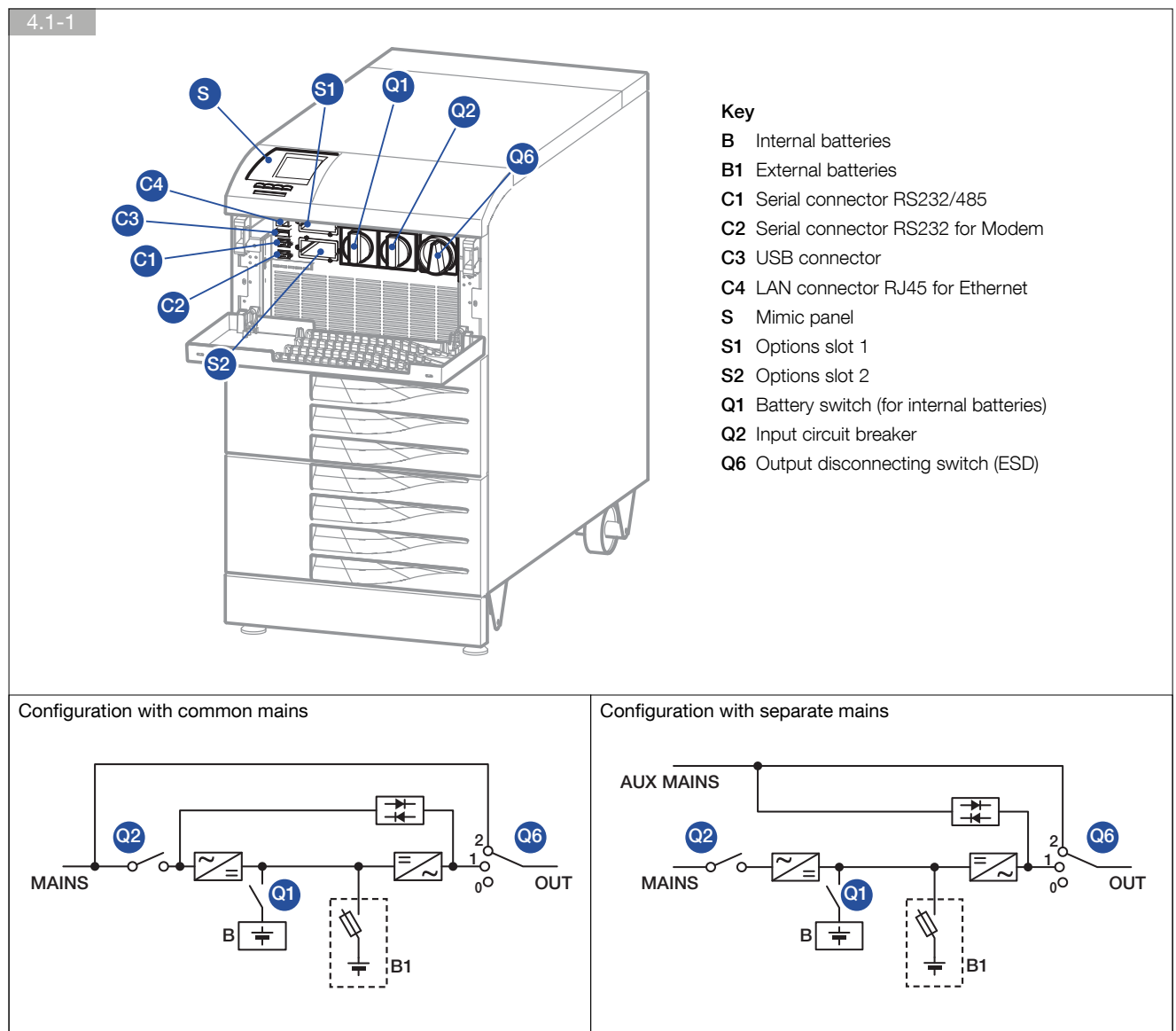
## 4. ACCESS TO CONTROLS

This chapter identifies the electromechanical switches, described below, used for start-up, shutdown and maintenance bypass procedures.

Access to the control area is from the front by opening the upper door using the red handle as shown in figure 4-1. The control area also contains the communication interface connectors and the slots for the optional signalling cards. Please refer to the relevant chapter for more details on the connection and use of the relevant communication interfaces/cards.



### 4.1. IDENTIFYING THE SWITCHES AND INTERFACES





## 4.2. FUNCTIONS OF SWITCHES

### Input switch Q2

The input switch provides the primary power supply to the UPS.

In normal operating conditions it should be in position **1 ON**.

The position **0 OFF** will cause the batteries to discharge.

In a configuration with separate mains, the switch only interrupts the rectifier power supply.

### Output disconnecting switch Q6

The disconnecting switch Q6 has three positions with the following functions:

- **Position 1 UPS:** this is the position for normal UPS operation for a continuous power supply to the load;
- **Position 2 MANUAL BYPASS:** This position should only be selected for standard or special maintenance operations (manual bypass); the load is connected directly to the mains power supply. It may be used in the event of a UPS failure to power applications from the auxiliary mains while awaiting the intervention of technical personnel;
- **Position 0 OFF:** This completely isolates the UPS output by removing the voltage from the applications in any operating condition. It is used for the emergency shutdown of the system (internal ESD).

### Battery switch Q1 (UPS batteries)

When closed, this switch connects the batteries of the UPS to the DC/DC converter stage to power the inverter in the event of a mains failure. The normal operating position is **1** (closed).

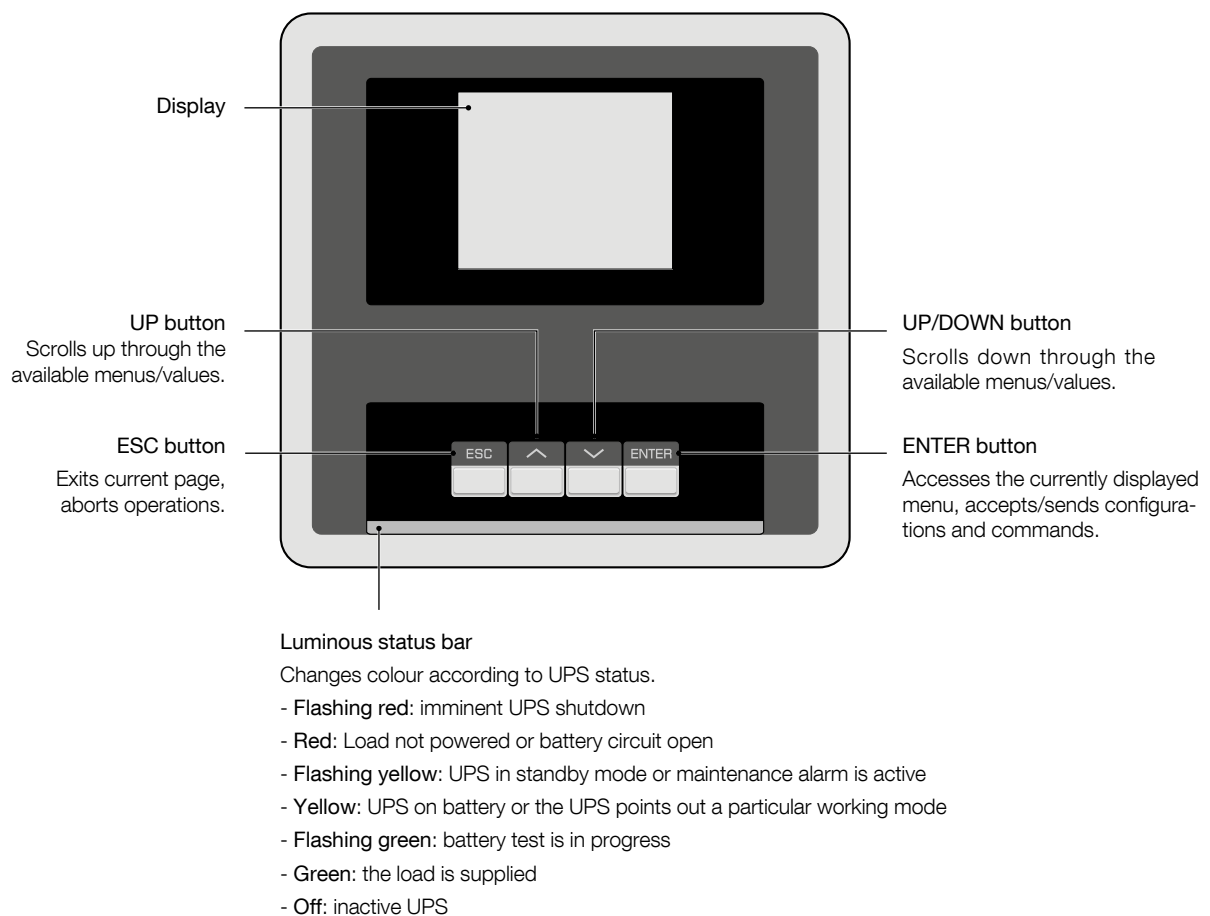
## 5. HUMAN MACHINE INTERFACE

### 5.1. INTRODUCTION

The HMI (Human Machine Interface) 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:

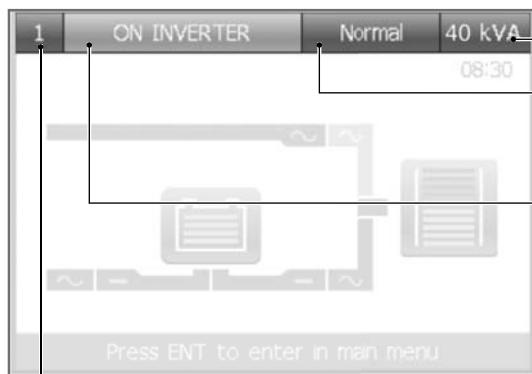
- mimic panel;
- measurements and alarms;
- changing UPS operating modes and programming battery tests;
- assisted startup and switching on maintenance bypass procedures;
- settings menu;
- list of events and statistics.

5.1-1 3-phase input/3-phase output for UPS 3/3



## 5.2. MIMIC PANEL OVERVIEW

5.2-1 Status bar (always displayed)



Unit panel reference

### UPS Rated Power (kVA)

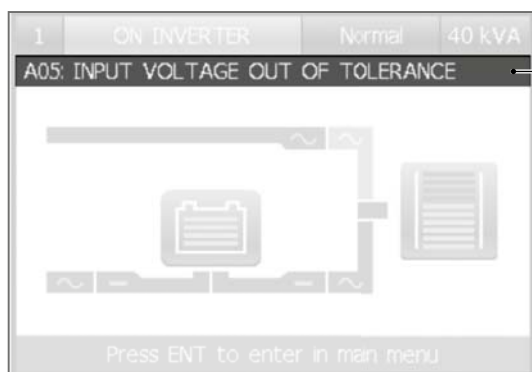
Operating modes:

**Normal** (Normal mode), **Eco** (Eco mode), **Ener. 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 in standby mode or maintenance alarm is active
- Yellow: UPS on battery or the UPS points out a particular working mode
- Flashing green: battery test is in progress
- Green: the load is supplied
- Grey: inactive UPS

5.2-2 Alarms area

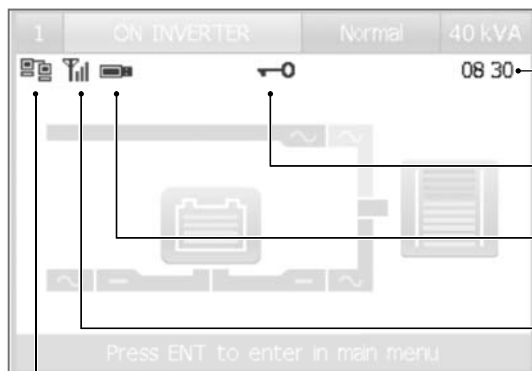


### Alarms area

Present when an alarm is active.

Enter **ALARMS** menu to display the complete alarms list (see chapter 8).

5.2-3 Status icons



### Network icon:

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

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

### 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 file system.

### Modem icon:

This icon is shown when a modem is connected to the UPS. The available GSM signal power is displayed by the vertical bars, as with mobile phones. Il modem viene rilevato dall'UPS solo se è attivato il servizio di **NOTIFICHE VIA SMS** (vedere **MENU PRINCIPALE > CONFIGURAZIONI > CONNETTIVITÀ > SERVIZI**).

### Keypad locking

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

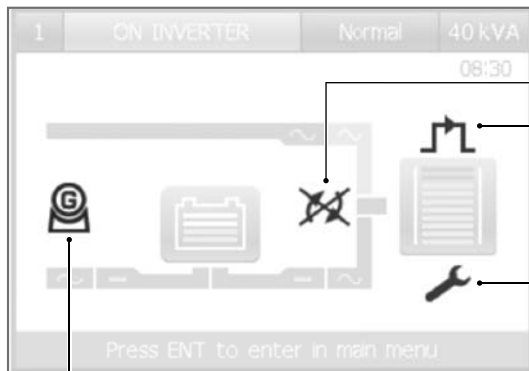
**ESC → UP → DOWN → ENTER**

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.

#### 5.2-4 Additional Icons



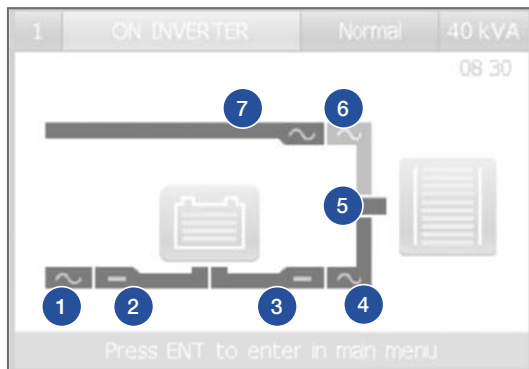
Operating on GenSet

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.

#### 5.2-5 Mimic panel



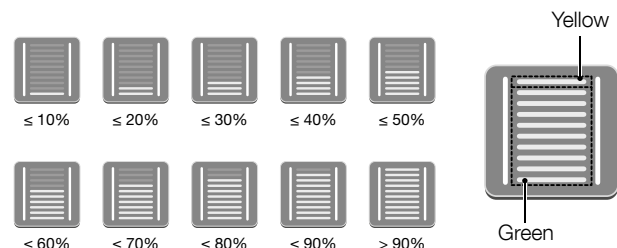
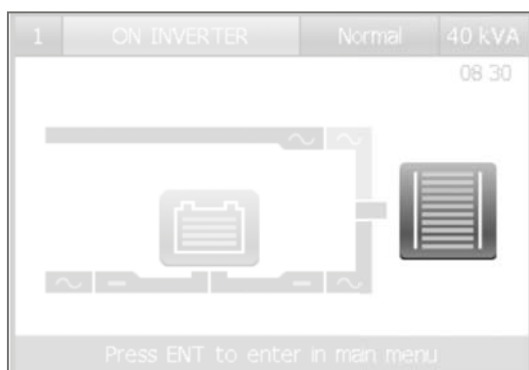
#### Bars

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

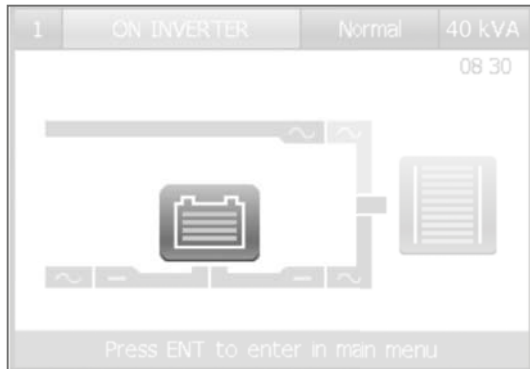
#### Bar colour identifies energy flow:

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

#### 5.2-6 Load level



## 5.2-7 Battery status (unit only)

**Battery charging**

Bar colour: green; continuous when level reached other levels flashing

**Battery discharging**

Bar colour: yellow; upper level flashing

**Battery charged**

Bar colour: green

**Battery discharged****Battery open****Battery in alarm**

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



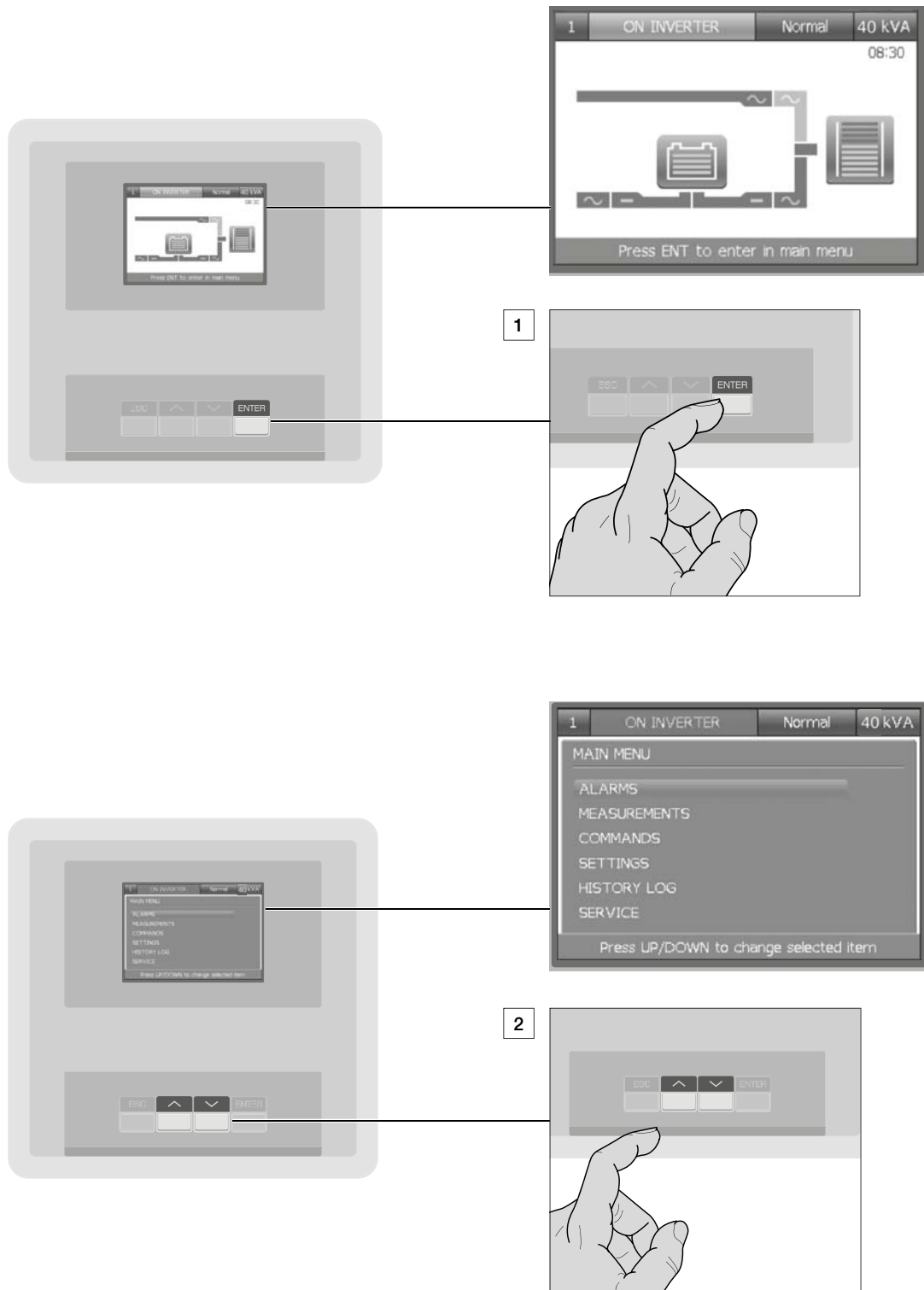
## 5.2-8 Message area

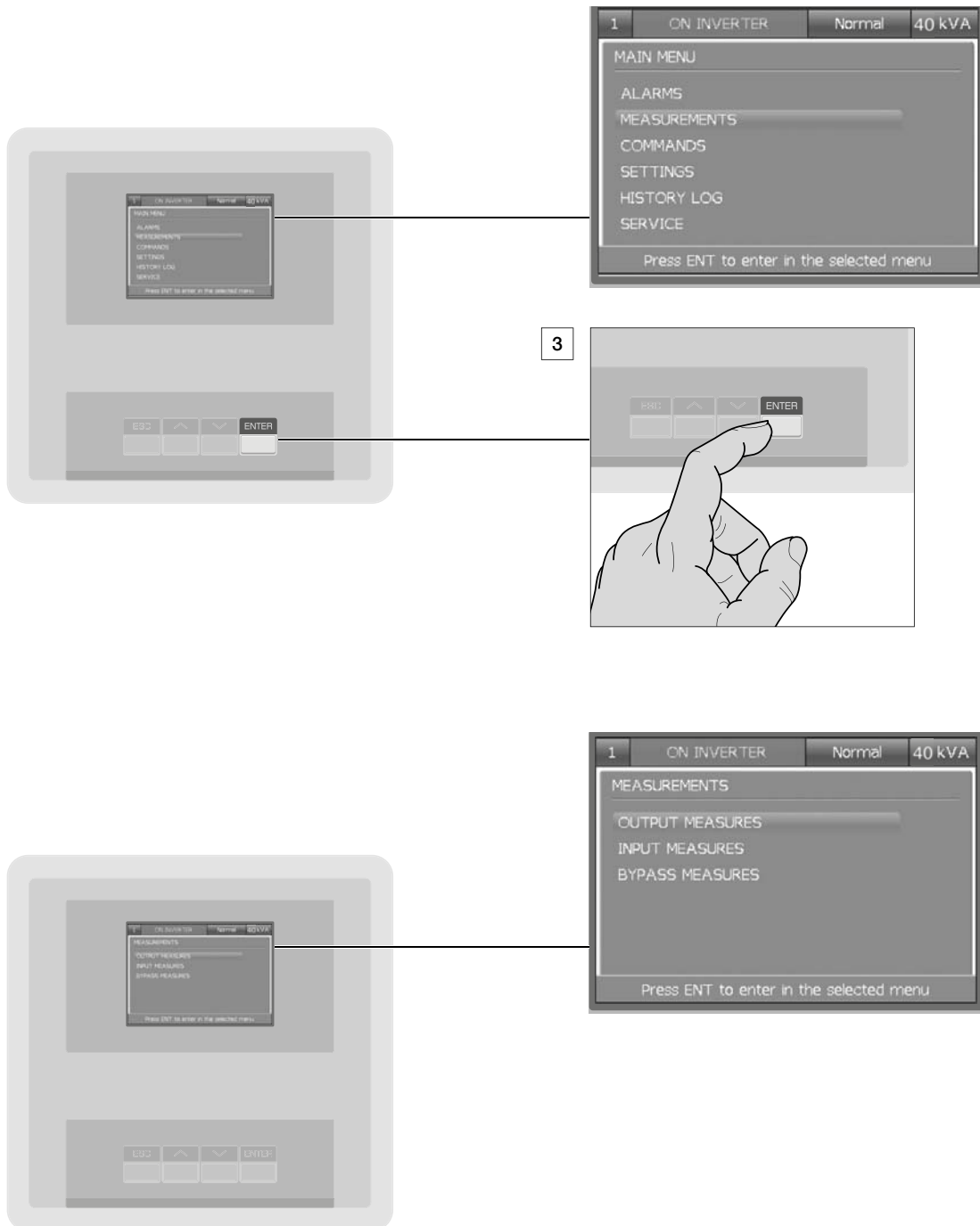
**Message area**

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

### 5.3. MENU NAVIGATION

From the mimic panel page press the **ENTER** key to access the **MAIN MENU**. Use the **UP/DOWN** key to scroll menu items, **ENTER** to confirm a choice, **ESC** to exit the current page or to abort an operation.

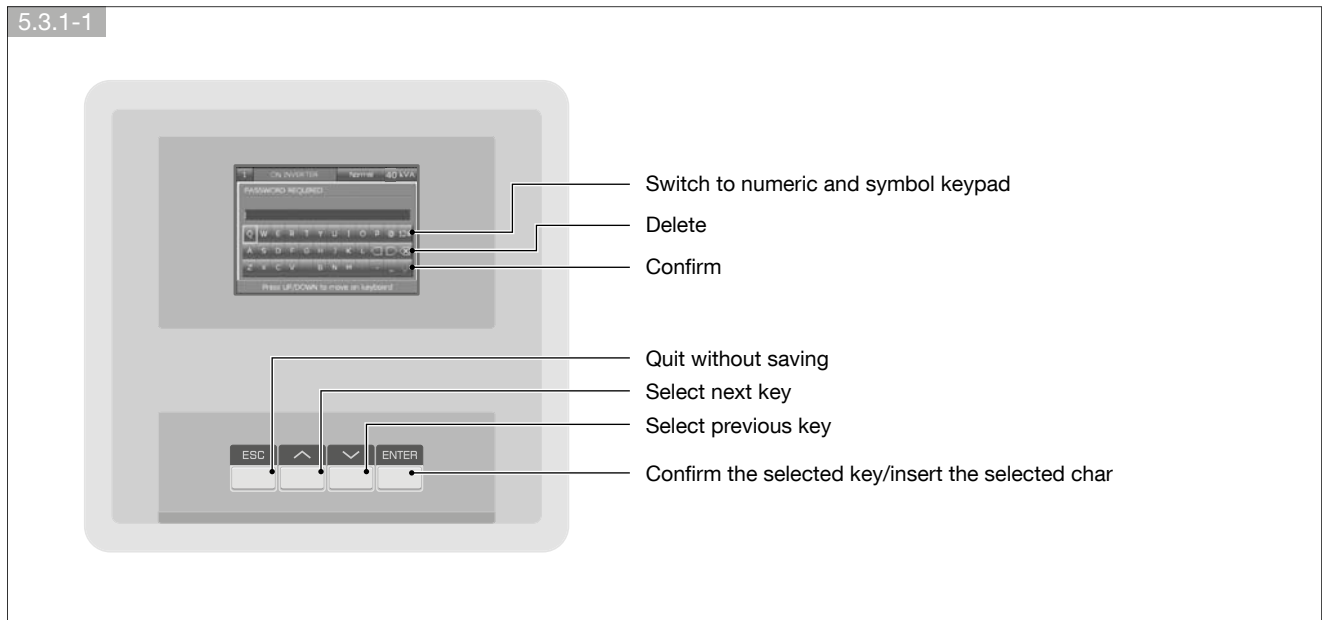




### 5.3.1. Entering passwords

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 MAST.



### 5.3.2. ALARMS menu

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

### 5.3.3. 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.

### 5.3.4. 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 a command failure message appears.

### 5.3.5. 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.**

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

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



### 5.3.6. BATTERY SETTINGS menu

This is the menu for battery configuration. Scroll down 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**.

In the case of UPSs connected in parallel enter the menu: **UNIT MENU > BATTERY SETTINGS**.



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

### 5.3.7. HISTORY LOG menu

**EVENTS LIST** menu: it shows the list of UPS alarms and events that have occurred. The 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 to verify whether certain critical operating situations are repetitive or only random.

**COUNTERS** menu: provides the number of events (in the last 14 days) relating to switches onto the battery, overloads and the number of operational hours on genset.

### 5.3.8. SERVICE menu

This menu is reserved for support service personnel and holds UPS identification data, utilities for SW upgrades, and utilities for the download of reports to an USB key.

### 5.3.9. 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 alarm symbol is shown on the mimic panel (🚨).

The **Commissioning Code** is provided directly by the reference 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 regular preventive maintenance programs.

### 5.3.10. Language upgrade

Text translations in several languages are held in files with the \*.lng extension which are provided by SOCOMEC. Language upgrades must be performed through the USB port, using a standard USB memory stick. The USB device must be formatted with FAT32 file system.

#### Step 1

The language file to be installed must be copied onto a USB stick and placed in the standard folder:

**{USB stick}\SOCOMEC\AOMI**

#### Step 2

Insert the USB stick into the UPS USB port placed on the front of the UPS.

#### Step 3

A menu appears with the USB services. Choose **UPGRADE LANGUAGES**.

Alternatively enter the menu: **MAIN MENU > SERVICE > UPGRADE FIRMWARE > UPGRADE LANGUAGES**. When on a parallel system the SYS unit has to be selected beforehand on the mimic panel page.

#### Step 4

The list of files in the **\SOCOMEC\AOMI** folder in the USB memory stick is shown.

Select the file you want to install and follow the instructions displayed.

#### Step 5

At the end of the process select Yes to restart the display.

#### Step 6

Remove the USB stick when requested.

#### Step 7

The new language is available after restarting.

If the display doesn't restart automatically choose the **Restart Display** command in **COMMANDS** menu.

To change the language go to the **MAIN MENU > PREFERENCES > LANGUAGES**.

*Note: to restore English as the default language press the ESC button for at least 4 seconds on the mimic panel page.*

### 5.3.11. REPORT ON USB

Reports containing UPS information can be downloaded onto a standard USB memory stick. The USB device must be formatted with FAT32 file system.

There are two commands to download USB reports:

- **User Report:** this is a .txt file translated into the language set in the display. It contains information regarding the UPS, statistics, counters and the history log.
- **Service Reports:** there are three files that can help troubleshooting for after sales service.

#### Step 1

Insert the USB stick into the UPS USB port placed on the front of the UPS.

#### Step 2

A menu appears with the USB services. Choose **REPORT ON USB**. Alternatively enter the menu: **MAIN MENU > SERVICE > REPORT ON USB**. When on a parallel system the SYS unit has to be selected beforehand on the mimic panel page.

#### Step 3

Select the required report, press **ENTER** and follow the instructions displayed.

#### Step 4

Remove the USB stick when completed.

#### Step 5

The reports are saved in the folder **\SOCOMEC\REPORTS**

## 5.3.12. Tree mimic panel menu

FIRST LEVEL	SECOND LEVEL	THIRD LEVEL
ALARMS		
MEASUREMENTS	OUTPUT MEASURES	
	BATTERIES MEASURES	
	INPUT MEASURES	
	BYPASS MEASURES	
COMMANDS	UPS PROCEDURES	
	ECO MODE	
	ALARMS RESET	
	BATTERY TEST	
	LED BAR TEST	
	RESTART DISPLAY	
	PERIODIC CHECKUP	
	MODEM TEST	
	MAIL TEST	
SETTINGS	PREFERENCES	LANGUAGE DATE AND TIME BUZZER DISPLAY PASSWORDS REMOTE COMMANDS
	UPS SETTINGS	OUTPUT BATTERIES TRANSFORMER BACKFEED
	CONNECTIVITY	PERIPHERALS - NETWORKS PARAMETERS - NETWORK TCP PORTS - MAIL ACCOUNT - MODEM - RS232/485 PORT - RS232/MODEM PORT - RS232 SLOT OPTIONS SERVICES - NETWORK - MAIL NOTIFICATIONS - SMS NOTIFICATIONS
	SLOT OPTIONS	NET VISION ADVANC. DRY CONTACTS (ADC) BATTERY TEMPERATURE PROBE
HISTORY LOG	EVENTS LIST	
	STATISTICS	
	COUNTERS	
SERVICE	UPS REFERENCE	
	FIRMWARE VERSION	
	COMMISSIONING CODE	
	SERVICE CODE	
	UPGRADE FIRMWARE	UPGRADE HMI FIRMWARE UPGRADE LANGUAGES UPGRADE WEB SERVER
	REPORT ON USB	

## 6. OPERATING PROCEDURES

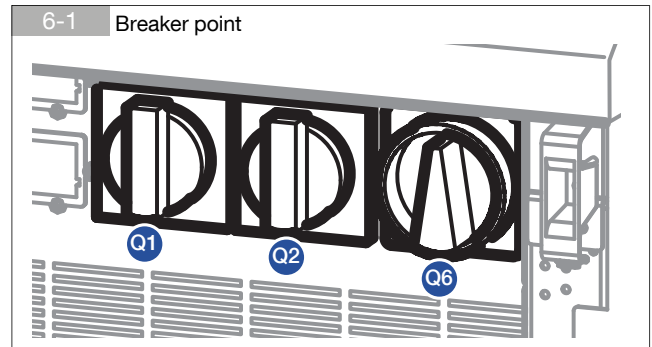
UPS procedures can be activated from the menu **COMMANDS > UPS PROCEDURES**. Select the procedure to be activated and press **ENTER**. If the conditions to start the selected procedure are not fulfilled an error message is shown.

When the selected procedure starts, the mimic panel is shown on the display. Follow the instructions that are given on the bottom help bar. Some instructions require confirmation with the **ENTER** button. Some procedures cannot be aborted.



### WARNING!

With the stop procedure the load will be disconnected.



### 6.1. SWITCHING ON

- Connect the mains and auxiliary mains to the UPS.
- Put switch **Q2** into position **1** (mains ON).
- 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.



In the case of UPSs connected in parallel choose the Automatic Start Procedure available in MAIN MENU (SYSTEM) in order to switch on the whole system. The Automatic Start Procedure is also available in each UNIT MENU, and only concerns the unit from which the command has been activated: it does not affect the behaviour of the other units.

### 6.2. COMMISSIONING WIZARD

The **Commissioning Wizard** is a guided, interactive procedure to manage initial unit commissioning easily. It is only available only for standalone UPS systems.

Following a standard procedure when first switching on ensures correct:

- installation and connection check.
- Configuration setting.
- UPS startup.
- Testing of battery circuit and automatic bypass.

The **Commissioning Code** is required at **Commissioning Wizard** startup (see chapter 5.3.9). Contact the support service for further information.

### 6.3. SHUTDOWN

Shutdown interrupts the power supply to the load and causes the UPS and the battery charger to stop.

- Enter menu **MAIN MENU > COMMANDS > UPS PROCEDURES**.
- Select **Automatic Stop Procedure** and press **ENTER**.
- Wait approx. 2 minutes for the UPS to shut down (controlled shutdown of any server connected to the LAN can be managed by proper shutdown software).
- Carry out the operations indicated on the display.

This operation cannot be aborted.



In the case of UPSs connected in parallel, the Automatic Stop Procedure is available on UNIT MENU, and only concerns the unit from which the command has been activated: it does not affect the behaviour of the other units. In order to switch off the whole system, repeat the Automatic Stop Procedure on each UPS unit.

## 6.4. SWITCHING ONTO MAINTENANCE BYPASS

Switching onto maintenance bypass creates a direct connection between the UPS input and output, completely excluding the equipment control element. This operation is performed in the event of standard maintenance on the equipment, so as not to remove the power supply from the load, or in the event of serious failure while waiting for the equipment to be repaired.

- Enter menu **MAIN MENU > COMMANDS > UPS PROCEDURES**.
- Select **On Maint. Bypass** procedure and press **ENTER**.
- Carry out the operations indicated on the display.



If there is an external manual bypass carry out the procedure described above before activating this switch.



In the case of UPSs connected in parallel the maintenance bypass procedure is available in MAIN MENU (SYSTEM) and affects the whole system.

## 6.5. SWITCHING ON FROM MAINTENANCE BYPASS

- Put switch **Q2** into position **1** (mains 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.



If there is an external manual bypass not monitored from the UPS or the parallel system put the switch to position **OFF** to avoid overlap of mains and inverter.

## 6.6. EXTENDED OUT OF SERVICE

If the UPS is deactivated for some time the batteries must be recharged regularly. They should be recharged every three months.

- Connect the mains and auxiliary mains to the UPS.
- Put switch **Q2** into position **1** (mains ON).
- Wait for the display to switch on.
- Put switch **Q1** into position **1** or close the external battery breaker/fuses.
- Put or keep switches **Q6** (output) in position **0**.
- The battery must be charged for at least ten hours.
- Once ten hours have elapsed put switch **Q1** into position **0** or open the external battery breaker/fuses.
- Put switch **Q2** into position **0** (mains OFF).

## 6.7. EMERGENCY SHUTDOWN

Should it be necessary to interrupt the continuous power provided by the UPS quickly (emergency shutdown) this can be implemented by putting switch **Q6** to position **0**.



The UPS output can only be electrically disconnected by means of **Q6**.

If the UPS is operating from the maintenance bypass (**Q6** in position **2**) with the mains present, the emergency shutdown does not interrupt the power supply to the load. In emergency conditions all power supplies upstream of the UPS must be disconnected.

## 6.8. UPS GENERAL POWER OFF

Using a button/switch connected to the ADC (Advanced Dry Contacts) card it is possible to interrupt the continuous power provided by the UPS (see chapter 7.3).

# 7. CONNECTIVITY AND COMMUNICATION OPTIONS

## 7.1. MULTILEVEL COMMUNICATION

Green Power 2.0 is capable of managing different communication channels simultaneously. It is equipped with standard communication ports and two slots to host additional optional boards.

This gives Green Power 2.0 immediate interfacing and integration flexibility as soon as the unit is installed, with no need for trained personnel.

The table below lists the possible connections between the UPS and the external devices.

7.1-1

Status bar (always displayed)

Key

B

Internal batteries

B1

External batteries

C1

Serial connector RS232/485

C2

Serial connector RS232 for Modem

C3

USB connector

C4

LAN connector RJ45 for Ethernet

S

Mimic panel

S1

Options slot 1

S2

Options slot 2

Q1

Battery switch (for internal batteries)

Q2

Input circuit breaker

Q6

Output disconnecting switch (ESD)

As each channel is independent, simultaneous connections can be made to satisfy the different levels of signalling and remote monitoring.



For UPSs connected in parallel: all the options listed in this chapter must be installed only on the UPS in the parallel configured as ICM (chapter 2.10.2). For further information about parallel systems please refer to the corresponding chapter

7.1-2

C

RS232/485 pinout

1

Not connected

2

RX for RS232

3

TX for RS232

4

Data + for RS485

5

GND

6

Data – for RS485

7

Reserved

8

Not connected

9

+12 V

D

RS232 forModem pinout

1

Reserved

2

RX for RS232

3

TX for RS232

4

Reserved

5

GND

6

Not connected

7

RTS

8

CTS

9

+12 V

## 7.2. STANDARD WEB PAGES

It is possible to remotely monitor the UPS using an Internet browser from a PC, through a standard ethernet connection (tested with Windows XP Service Pack 3 on Internet Explorer 8, Google Chrome 17.0 and Mozilla Firefox 9.0 with JavaScript enabled).

### 7.2.1. Activation

Perform the following operations to activate the monitoring system:

1. Connect the UPS to the LAN network (connector B in figure at page 2.9.4-1).

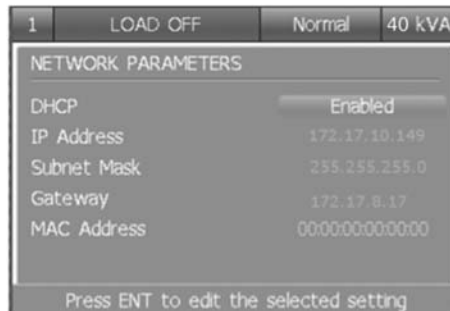
Check if the **Web Server** service is **Enabled**.


The configuration is in **MAIN MENU > SETTINGS > CONNECTIVITY > SERVICES > NETWORK**.

2A. If the **DHCP** service is enabled in your local network the network parameters assigned to the UPS can be seen in the **MAIN MENU > SETTINGS > CONNECTIVITY > PERIPHERALS > NETWORK PARAMETERS** menu.

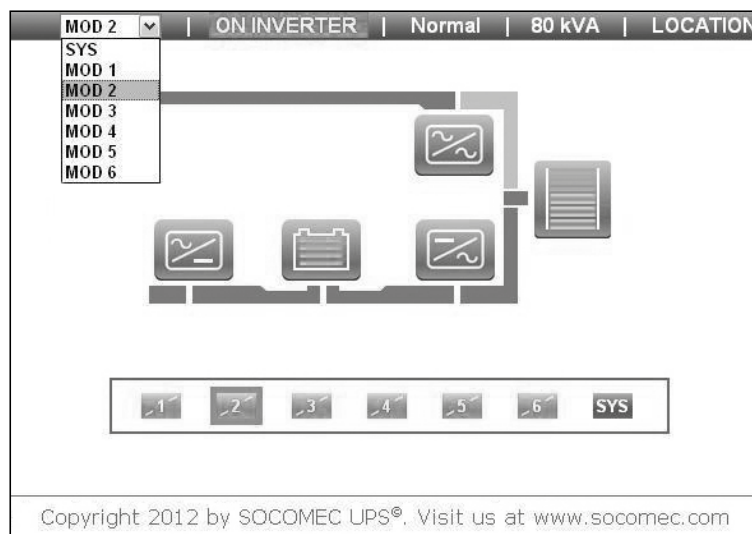
2B. If the DHCP service is not enabled on the local network:

- enter the **MAIN MENU > SETTINGS > CONNECTIVITY > PERIPHERALS > NETWORK PARAMETERS** menu.
- disable the **DHCP** and save.
- set the device network parameters according to those on the network and save.



3. Once these operations have been completed, you should see the network icon on the main screen . It will now be possible to open your web browser and type the device IP address (i.e.: <http://192.168.0.11>).

*Note: the default HTTP port is 80 but it can be changed in the **MAIN MENU > SETTINGS > CONNECTIVITY > PERIPHERALS > NETWORK TCP PORTS** menu on the display.*



Via web pages it is possible to monitor the UPS and set the different functions available via the network, such as e-mail notifications, network parameters, web password and UPS location.

All settings pages are password protected.

The login is **admin** and the default password is **public** (lower case only). The password can be changed in the **SETTINGS > PASSWORD** web pages or in the HMI menu: **MAIN MENU > SETTINGS > PREFERENCES > PASSWORDS > Web Password**.

### 7.2.2. UPS monitoring

The main page displays current UPS status. This screen is refreshed automatically.

You can click on Input, Battery, Output, Bypass symbols to access these measurements.

Using the **UPS MONITOR** link in the menu it is possible to return to the UPS synoptic.

In the case of a parallel system, a line is added at the bottom of the screen showing the current status of each unit.

### 7.2.3. Network configuration

It is possible to configure the main network parameters using the **SETTINGS > NETWORK** web page.

**NETWORK CONFIGURATION**

DHCP	Disabled ▼
Ip Address	172.17.11.43
Subnet Mask	255.255.252.0
Gateway	172.17.8.15
MAC Address	00:00:00:00:00:00

Submit

Copyright 2012 by SOCOMECS UPS®. Visit us at [www.socomec.com](http://www.socomec.com)



### 7.2.4. E-mail setting

If the UPS is connected to an ethernet network (through the standard RJ45 10/100 Base-T connector), an e-mail can be automatically sent by the UPS to defined recipients, if any events occur.

Possible events are the following:

- 1: On Automatic Bypass
- 2: Rectifier Input Supply fault
- 3: UPS Imminent Stop
- 4: UPS Overload
- 5: UPS On Battery
- 6: Battery Discharged
- 7: Temperature Alarm
- 8: Customer Input Alarm
- 9: UPS General Alarm

The end of the event is notified by another e-mail.

The mail notification service can be enabled in the **SETTINGS > MAIL NOTIFICATIONS** web pages:

EMAIL CONFIGURATION	
Mail Account Configuration	
User Account	<input type="text"/>
User Password (only for authenticated account)	<input type="password"/>
SMTP Server Address (xxx.xxx.xxx.xxx)	<input type="text" value="192.168.0.2"/>
SMTP Server port	<input type="text" value="25"/>
<input type="button" value="Submit"/>	
Events Configuration	Receivers List
Mail Service: <input type="button" value="Enabled"/>	Receiver 1: <input type="text"/>
On Automatic Bypass <input checked="" type="checkbox"/>	Receiver 2: <input type="text"/>
Rectifier Input Supply Fault <input checked="" type="checkbox"/>	Receiver 3: <input type="text"/>
UPS Imminent Stop <input checked="" type="checkbox"/>	Receiver 4: <input type="text"/>

The email notification policy is defined by the events that have been selected by the user. If a new event occurs a new email is sent. All active events are listed in the mail body. If the event has been cancelled by the UPS a cancelled event email is also sent. It is possible to send an email for test purposes.

### 7.3. ADC CARD

To be installed in one of the two slots available, these cards can be used to manage up to four normally closed or normally open outputs, and up to three digital inputs in configurable mode. If more than one ADC card is used simultaneously, the dip switch configurations must be different. Secure the card with the appropriate screws.

This card can be configured to control up to four outputs that can be set as normally closed or normally open and up to three digital inputs. The card is inserted in one of two slots provided. Up to four operating modes can be selected using the two DIP switches 1 or 2.

- **Electrical data**

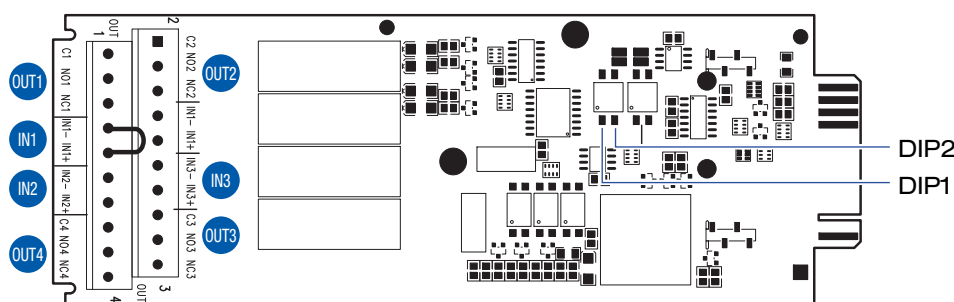
- Permitted Nominal current and voltage of NO or NC contacts: 2 A 250 Vac depending on the terminal used.
- Inputs are activated on loop closing.

- **Connection of the generator**

If your system uses a generator connect the 'generator set ready' no-potential contact to connector IN 2 on the optional ADC card configured in standard or power safe mode. This automatically extends the voltage and frequency value range when power is supplied by the generator set.

- **External ESD connection**

A remote emergency shutdown system (ESD) can be installed by means of the optional ADC card. Connect a normally closed zero-potential contact to terminals IN1+ and IN1- of the ADC card.



The filter level indicates the activation delay: 1 immediate activation (1 second minimum communication time), 2 10 s delay, 3 30 s delay.

STANDARD configuration (default) DIP1: OFF - DIP2: OFF		
IN/OUT	Description	Filter level
OUT 1	General alarm	2
OUT 2	Battery discharging	3
OUT 3	Battery low or imminent stop	2
OUT 4	UPS on bypass	2
IN 1 <sup>(1)</sup>	ESD	1
IN 2	Supply from GenSet	1
IN 3 <sup>(2)</sup>	Insulation controller	2

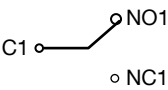
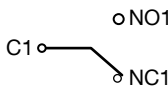
POWER SAFE configuration DIP1: ON - DIP2: OFF		
IN/OUT	Description	Filter level
OUT 1	General Alarm	2
OUT 2	Power safe plug 1	2
OUT 3	Power safe plug 2	2
OUT 4	Power safe plug 3	2
IN 1 <sup>(1)</sup>	ESD	1
IN 2	Supply from GenSet	1
IN 3 <sup>(2)</sup>	Management of energy consumption	1

SAFETY configuration DIP1: OFF - DIP2: ON		
IN/OUT	Description	Filter level
OUT 1	General Alarm	2
OUT 2	ESD activation	1
OUT 3	Battery low or imminent stop	2
OUT 4	ESD activation	1
IN 1 <sup>(1)</sup>	ESD	1
IN 2	External alarm A39	2
IN 3 <sup>(2)</sup>	External alarm A40	2

ENVIRONMENTAL configuration DIP1: ON - DIP2: ON		
IN/OUT	Description	Filter level
OUT 1	General Alarm	2
OUT 2	Overheating	2
OUT 3	Overload / Loss of redundancy	2
OUT 4	External alarm In2	2
IN 1 <sup>(1)</sup>	ESD	1
IN 2	External alarm A39	2
IN 3 <sup>(2)</sup>	External alarm A40	2

(1) If the external ESD button is not used always insert a jumper to short circuit input IN 1.

(2) The IN3 input on the ADC card with temperature sensor is for the external battery temperature sensor.

Description of signals	
Message on the mimic panel	Description
General Alarm	<p>'General Alarm' contact output</p> <p>No alarm</p>  <p>'General Alarm' active</p> 
Battery Low or Imminent stop	Battery low voltage and imminent shutdown contact output
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 low battery
Management of energy consumption	Input for the battery to help providing energy in the event of peak consumption
ESD activation	Shutdown for ESD contact output
Overheating	Internal overheating contact output
Overload/Loss of redundancy	Overload / loss of redundancy contact output



Intervention of the ESD input switches off the UPS output.

To restore the UPS to operation:

- Close the ESD contact on 'In 1' on the ADC board.
- Send the Alarms Reset command.
- Run the Automatic Start Procedure

## 7.4. ADC CARD WITH TEMPERATURE SENSOR

This card's inputs/outputs have the same functions as the ADC card, with the exception of the third input (IN3).



### CAUTION!

Two ADC cards with temperature sensor cannot be connected simultaneously.

## 7.5. ISOLATED SERIAL PORT RS232 (DB9 CONNECTION) AND RS485 CARD

To be installed in the UPS slot.

A serial RS232 DB9 connector and an isolated RS485 connector are available on the card.

## 7.6. REMOTE MIMIC PANEL

This device monitors and interacts with the UPS through a serial link RS 485 (maximum distance of 175 m) 25 m cable supplied standard and 50 m cable available as an option.

## 7.7. GSM MODEM

Enables SMS messages to be sent regarding equipment operating status.

See GSM installation manual for connection details and use.

## 7.8. NET VISION LAN/WEB INTERFACE

**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, DHCP and many other protocols. It interacts via the Web browser (HTTP).

### 7.9. SOFTWARE OPTIONS

A large number of SW solutions can be adopted on Green Power 2.0 thanks to its advanced communication facilities. These solutions have been specially designed for the efficient management of power protection devices.

Visit [www.socomec.com](http://www.socomec.com) and click on **DOWNLOAD** then **SOFTWARE** to find the communication software which is suitable for your requirements.

### 7.10. SMS NOTIFICATION

If a GSM modem is connected to the RS232/Modem port it is possible to receive a SMS notification in the event of:

- **UPS Critical Alarms:** the SMS is only sent in the event of UPS critical troubleshooting;
- **UPS General Alarm:** the SMS is sent if any alarm occurs (e.g. running on battery, bypass impossible).

The SMS includes the type of alarm and the UPS reference for its identification.

If the alarm condition clears an SMS is sent to cancel the notification.


To test the SMS service select the command: **Send test SMS** in **MAIN MENU > COMMANDS > MODEM TEST**.

#### 7.10.1. SMS settings

1. Before enabling the SMS service, the modem serial link must be configured according to the settings shown in the **MAIN MENU > SETTINGS > CONNECTIVITY > PERIPHERALS > RS232/MODEM PORT** menu.

Please refer to the modem user manual.

2. If required, set the PIN code of the modem SIM card in the **MAIN MENU > SETTINGS > CONNECTIVITY > PERIPHERALS > MODEM** menu.
3. Enter the **MAIN MENU > SETTINGS > CONNECTIVITY > SERVICES > SMS NOTIFICATIONS** menu.
4. Set the **SMS Status:** select **Critical Alarms** or **General Alarm**, according to the required notification policy.
5. Enter the recipient's telephone number.

1	LOAD OFF	Normal	40 kVA
SMS NOTIFICATIONS 			
SMS Status		Critical Alarms	
Phone Number Recipient 1		0123456789	
Phone Number Recipient 2		9876543210	
Press ENTER to edit settings			

## 8. ELECTRICAL OPTIONS

### 8.1. INSULATION CONTROLLER

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

### 8.2. REMOTE MIMIC PANEL

This device monitors and interacts with the UPS through a serial link RS 485 (maximum distance of 175 m) 25 m cable supplied standard (50 m cable available as an option).

### 8.3. 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.

### 8.4. EXTERNAL MAINTENANCE BYPASS WITH BACKFEED PROTECTION

This device will electrically exclude and isolate the UPS (e.g. for maintenance operations) without interrupting the power supplied to the load. 3-pole contactors are used for the backfeed protection (refer to paragraph 10.8).

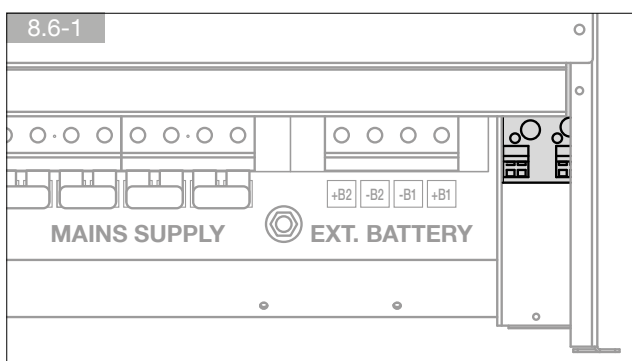
*Note: an additional option is available to bring the manual bypass signal back to the UPS.*

### 8.5. ACS PCB

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

### 8.6. EXTERNAL BACKFEED PROTECTION

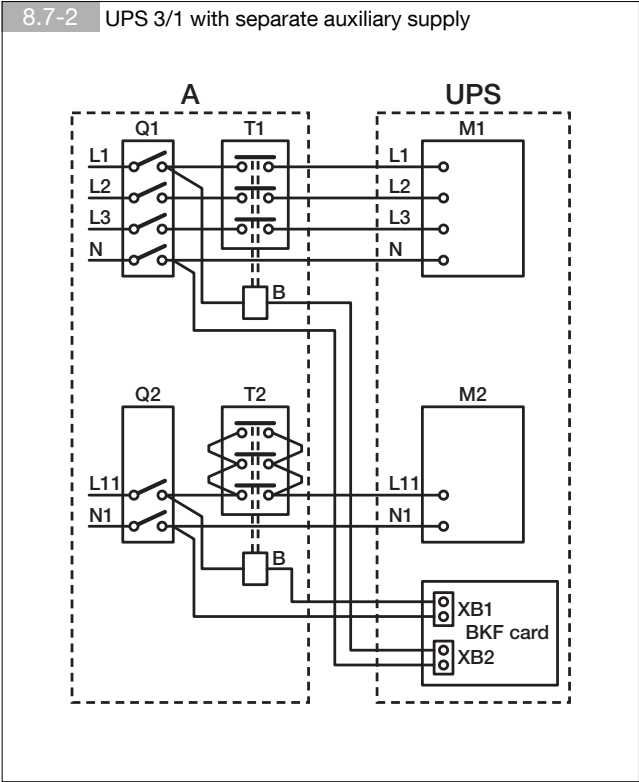
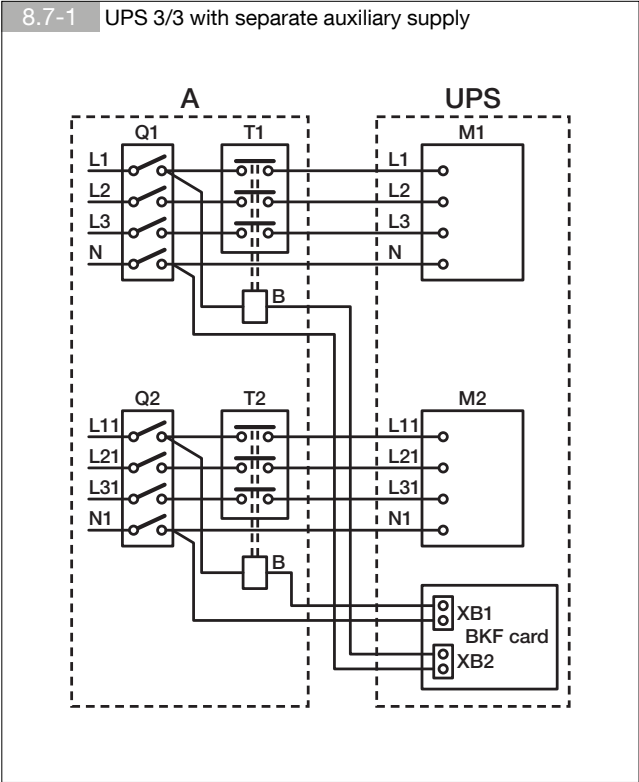
External devices can be installed to protect against the back-feed of dangerous currents, both on the **MAINS SUPPLY** and on the **AUX MAINS SUPPLY**. These devices are controlled by the BKF PCB installed in the position shown in figure 8.6-1. Refer to the following paragraphs for details on electrical connections and activating the chosen protection.



8.7. PROTECTION ON MAINS SUPPLY AND AUXILIARY MAINS SUPPLY

Activating UPS protection on the mimic panel: access the **MAIN MENU > SETTINGS > UPS SETTINGS > BACKFEED** and set the parameter **Backfeed Type** to **Separate Mains**.

Cable and trunk schematic.



Key

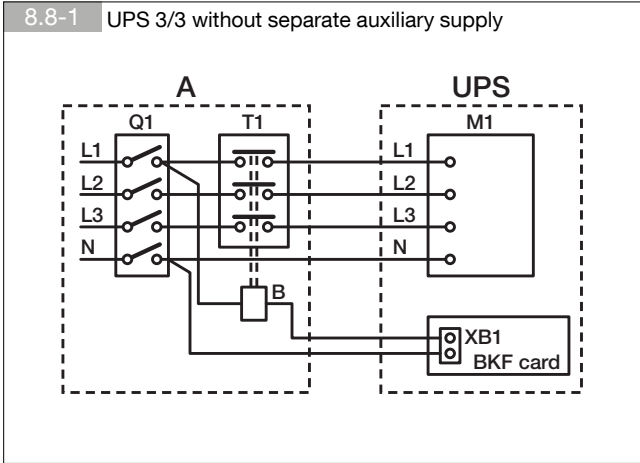
- A Distribution panel
- B Remote coil switch
- L1-L2-L3-N Input power source
- L11-L21-L31-N1 Backup power source
- M1 Input power terminal board
- M2 Backup power terminal board
- T1 Remote switch<sup>1</sup>
- T2 Remote switch<sup>1</sup>
- Q1 Input power switch
- Q2 Backup power switch
- XB1 Connector on BKF PCB
- XB2 Connector on BKF PCB

1Remote switches - rated current		
Model	T1	T2
10 3/1	32 A AC1	45 A AC1
15 3/1	32 A AC1	45 A AC1
20 3/1	45 A AC1	60 A AC1
10 3/3	32 A AC1	32 A AC1
15 3/3	32 A AC1	32 A AC1
20 3/3	45 A AC1	45 A AC1
30 3/3	60 A AC1	60 A AC1
40 3/3	90 A AC1	90 A AC1

8.8. PROTECTION ON A UPS WITHOUT AUXILIARY MAINS SUPPLY

Activating UPS protection on the mimic panel: access the **MAIN MENU > SETTINGS > UPS SETTINGS > BACKFEED** and set the parameter **Backfeed Type** to **Common Mains**.

Cable and trunk schematic.



Remote switches - rated current	
Model	T1
10 3/1	32 A AC1
15 3/1	32 A AC1
20 3/1	45 A AC1
10 3/3	32 A AC1
15 3/3	32 A AC1
20 3/3	45 A AC1
30 3/3	60 A AC1
40 3/3	90 A AC1

Key

- A Distribution panel
- B Remote coil switch
- L1-L2-L3-N Input power source
- M1 Input power terminal board
- Q1 Input power switch
- T1 Remote switch 1
- XB1 Connector on BKF PCB



**WARNING**  
The neutral connections on the UPS input and output are identical. Consequently there is no risk of high potential when the input power supply is absent.  
However, depending on the type of system connected to the output or in some failure conditions (earth leakage, significant phase dispersion or in the case of a non-isolated neutral system), high potential can be detected. It would therefore be necessary to install either adequate neutral switching or a protection system.

8.9. MANAGEMENT OF EXTERNAL MANUAL BYPASS CONTACT

Allows management of on/off indication for the external manual bypass isolating switch.

## 9. TROUBLESHOOTING

The alarm messages displayed enable immediate diagnosis.

Alarms are divided into two categories:

- Alarms relating to external UPS circuits: input mains, output mains, temperature and environment.
- Alarms relating to the internal UPS circuits: in this case corrective action will be carried out by the After Sales Department.

The USB report makes it possible to have full information on what occurred. Refer to 6.3.11 to download it.

*Note: the service code number in the HMI menu service and give it to the after sales service to help with diagnosis and troubleshooting.*

### 9.1. SYSTEM ALARMS

#### • A02: UPS OVERLOAD

The power required by the loads is higher than the power available.

Check the load is well balanced on the three phases by checking the measurements on the display. If necessary, disconnect any loads that do not need uninterruptible power.



#### IMPORTANT!

The accepted overload time limit is defined in the technical specifications. When this time limit is exceeded the loads will no longer be powered by the inverter.

#### • A06: AUXILIARY MAINS OUT OF TOLERANCE

The auxiliary mains exceeds the acceptable tolerance values. Possible causes are:

- No voltage or frequency present or voltage and frequency outside acceptable values (see the technical specifications).
- The frequency is subject to continuous variations (typical with power supplied from an incorrectly sized GE).

#### • A07: INSIDE OVER TEMPERATURE

The UPS internal temperature is higher than 50 °C (please refer to Measurements menu on the mimic panel).

Check the ventilation or air conditioning system in the UPS room.

#### • A08: MAINTENANCE BYPASS ACTIVE

The output disconnecting switch Q6 is in position 2 (maintenance bypass).

The load is therefore powered directly by mains power supply.

#### • A17: IMPROPER USE

This alarm does not indicate a malfunction or failure of the UPS, but incorrect use/sizing of the system. It is activated in the event of:

- Operation for long periods at high temperatures (battery deterioration)
- High number of overloads (wrong sizing)
- Continuous battery discharging (mains not stable)
- High number of switches onto the bypass (high impulsive loads)

#### • A22: INPUT MAINS OUT OF TOLERANCE

The input mains is not present or not sufficient (voltage and/or frequency values incorrect with reference to the technical data); if there is no input mains failure, check that no protection devices upstream of the UPS have tripped. Check that the voltage applied and frequency values are in compliance with the values set on the mimic panel.

#### • A38, A39, A40, A41: EXTERNAL ALARM 1, 2, 3, 4

One of the ADC PCB inputs has been activated; check the situation of the devices connected to this PCB.

#### • A56: GENERATOR SET GENERAL ALARM, A57: GENERATOR SET FAULT

The generator has issued an alarm; check the GE directly.

#### • A61: PHASE DETECTION FAULT

The phase cycle sequence is incorrect. In this case, invert two phases of the input mains. For a UPS with separate auxiliary mains, exchange the two phases of the auxiliary mains only.

### 9.2. UPS ALARMS

#### • A01: BATTERY ALARM

Failure or problem on the battery circuit. Check that the battery switch is closed.

#### • A18: BLOCKING INVERTER FOR OVERLOAD

Reduce the load rate applied to the UPS and reset the alarms.

#### • A20: WRONG CONFIGURATION

Error in the configuration parameters; please contact the support service.



- **A30: UPS STOPPED FOR OVERLOAD**

Reduce the load rate applied to the UPS and reset the alarms.

- **A42: REMOTE SERVICE ALARM**

This alarm indicates that a critical anomaly has occurred on the UPS. Where a maintenance contract with the Remote Monitoring option is in place, the procedure for analysing the UPS via remote connection will be automatically activated by your service centre provider.

- **A44: PERIODIC SERVICE CHECK-UP**

The equipment has to undergo regular checks by the support service in order to ensure optimum performance and efficiency. If the Scheduled Inspection signal appears on the mimic panel, the equipment should be inspected by an adequately trained technician.

- **A59: BATTERY CIRCUIT OPEN**

Battery switch open.

- **A60: FAN FAILURE**

Fault in the ventilation system; check that the air inlet at the front and the air outlet at the back of the UPS are not obstructed.

## 9.3. PREVENTIVE MAINTENANCE

We recommend regular specialist maintenance (annually) for the Green Power 2.0, to achieve optimum operating efficiency and avoid equipment downtime.

It is strongly advisable to comply with any requests for preventive maintenance automatically displayed with an alert message (🔧).

All operations on equipment must only be carried out by SOCOMEC personnel or authorised support personnel.

Maintenance consists of accurate functional checks on electronic and mechanical parts with replacement of parts subject to wear if necessary (typically batteries, fans and capacitors).

### 9.3.1. Batteries

The condition of the external batteries is fundamental to UPS operation.

Thanks to the Expert Battery System, battery condition information is processed in real time and recharging and discharging procedures are selected automatically in order to optimise battery lifetime expectancy and offer maximum performance.

Furthermore, during the operating lifetime of the battery, Green Power 2.0 stores statistics on battery conditions of use for analysis.

Since the expected lifetime of batteries is very much dependent on operating conditions (number of charging and discharging cycles, load rate, temperature), a regular inspection 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. Used 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 lifetime of fans used to cool the power parts is dependent on usage and environmental conditions (temperature, dust).

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



**Fans must be replaced by SOCOMEC technicians when required.**

### 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 lifetime is dependent on usage and environmental conditions.

The average expected lifetime of these components is shown below:

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

The actual condition of components is verified during preventive maintenance.

## 10. TECHNICAL SPECIFICATIONS

Models			10	15	20	30	40
Input/Output phases			3/1 and 3/3	3/1 and 3/3	3/1 and 3/3	3/3	3/3
Electrical specifications - Input							
Mains voltage		Vin	3P+N 400 V -10% +10% 3Ph (up to 40% @ 45% of nominal load)				
Input frequency		Hz	50-60 ±10%				
Input power factor			0.99				
THDI			< 2.5%				
Electrical specifications - External battery							
Battery voltage range		V bat	from +/-175 <sup>2</sup> up to +/-360 <sup>3</sup>				
Electrical specifications - Output							
Output voltage (three phase + neutral)		V	230 single phase (selectable: 208 <sup>4</sup> /220/230/240) ±1% 400 three phase (selectable 360 <sup>4</sup> /380/400/415) ±1%				
Frequency		Hz	50-60 ±2% (from 1% to 8% if generator is used)				
Automatic bypass			nominal output voltage ±15% (from 10% to 20% selectable if generator is used)				
Nominal power		kW	10	15	20	30	40
Overload (@ 25 °C; Vin > 380; Vbat > 216)	<ul style="list-style-type: none"><li>• 10 minutes</li><li>• 5 minutes</li><li>• 1 minute</li><li>• 30 seconds</li></ul>	kW	11,5 12,7 13,9 15,1	17,25 19,05 20,85 22,65	23,0 25,4 27,8 30,2	34,5 38,1 41,7 45,3	46,0 50,8 55,6 60,4
Crest factor			≥ 2.7				
Voltage distortion			1% with linear load				
Environment							
Operating temperature		°C	0-35 (15-25 recommended for longer battery life)				
Storage temperature		°C	-5÷45				
Relative humidity		%	0-95 condensation-free				
Max. altitude		m	1.000 without derating; 3.000 max				
Acoustic noise		dBA	< 52	< 52	< 52	< 55	< 55
Required cooling capacity		m³/h	280	280	280	465	465
Dissipated power max		W	686	1005	1333	1902	2474
Dissipated power max		BTU/h	2340	3432	4550	6492	8448
Standards							
Safety			EN 62040-1, EN 60950-1				
Type and performance			EN 62040-3 (VFI-SS-111)				
EMC			EN 62040-2 (CLASS C2)				
Product certification			CE - TÜV-SÜD				
Protection level			IP20 (compliant with 60529), IP21 on request				
Mechanical characteristics with standard batteries							
Models	T	Dimensions	mm	444 x 795 x 1400			
		Weight	kg	390-540			
	M	Dimensions	mm	444 x 795 x 1000			
		Weight	kg	230-315			
	S	Dimensions	mm	444 x 795 x 800			
		Weight	kg	190-200			

1. Initial Condition Pout ≤ 80% Pn

2. @ Battery Fully Discharged. Call SOCOMEC support service.

3. @ Battery Fully Charged. Call SOCOMEC support service.

4. @ Pout = 90% Pnom



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