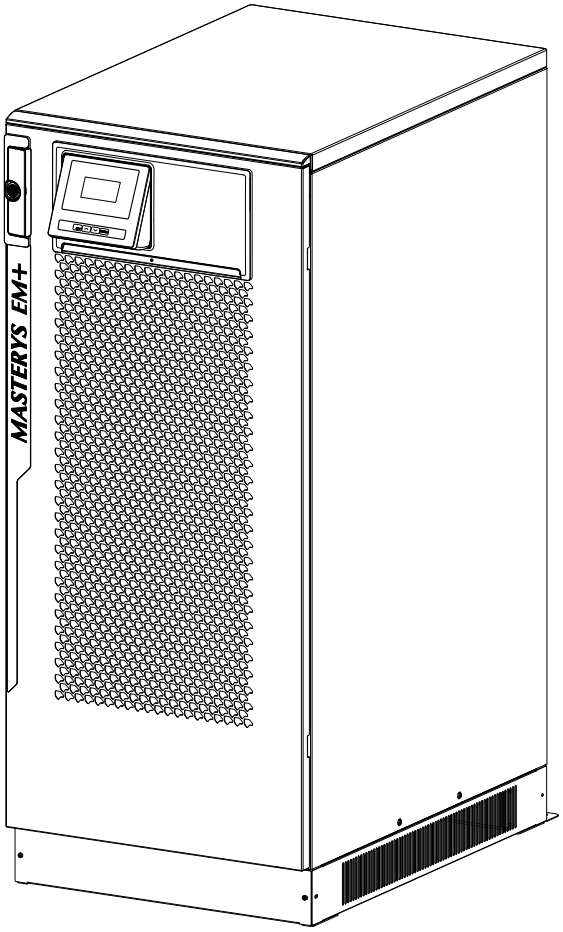
INSTALLATION AND OPERATING MANUAL

EN

MASTERYS EM+

80-120 kVA



Socomec Resources Center
To download brochures, catalogues
and technical manuals

socomec
Innovative Power Solutions

CONTENTS

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 carried been 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 to 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.

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.
	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 standards applicable 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 specifications' 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 performances, 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 the specified purpose will be considered improper. The manufacturer/ supplier shall not be held responsible for damage resulting from this. Risk and responsibility lies with the system manager.

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

NOTE!
This is a product for commercial and industrial application – installation restrictions or additional measures may be needed to prevent disturbances.

Safety requirements for secondary batteries and battery installations.

The installer is responsible for ensuring that the battery installation and their operating environment conform to national and international codes and safety standards.

2.1 Description of symbols

Symbols	Description
	Protective earth terminal (PE).
	Authorised personnel only. Only qualified personnel are permitted to work on the batteries.
	Do not use naked flames or cause sparks in the vicinity of the accumulators.
	No smoking.
	Batteries charging! Batteries and related parts contain lead which is dangerous to health if ingested. Wash hands after handling!
	Accumulators are heavy! Use suitable transport and lifting equipment to work safely.
	Risk of electric shock! Connecting accumulators in series creates hazardous voltages.
	Risk of explosion! Avoid short circuits! Never place tools or metal objects on the accumulators.
	Corrosive liquids (electrolyte).
	Read the user instructions carefully. Read the user manual before performing any operations.
	Wear protective gloves
	Wear safety shoes.
	Wear protective goggles.
	In the event of accidents, improper use, failure or electrolyte leakage wear a protective apron.
	In the event of accidents, improper use, failure or electrolyte leakage wear a gas mask.
	In the event of contact with the eyes, wash immediately with plenty of water and call a doctor. Call a doctor immediately in the event of accidents or illness.
	Do not dispose of in normal waste stream (symbol waste electrical and electronic equipment).

3. ENVIRONMENTAL REQUIREMENTS AND HANDLING

NOTE!
Before carrying out any operations on the unit read the 'Safety standards' chapter carefully.

3.1 Environmental requirements

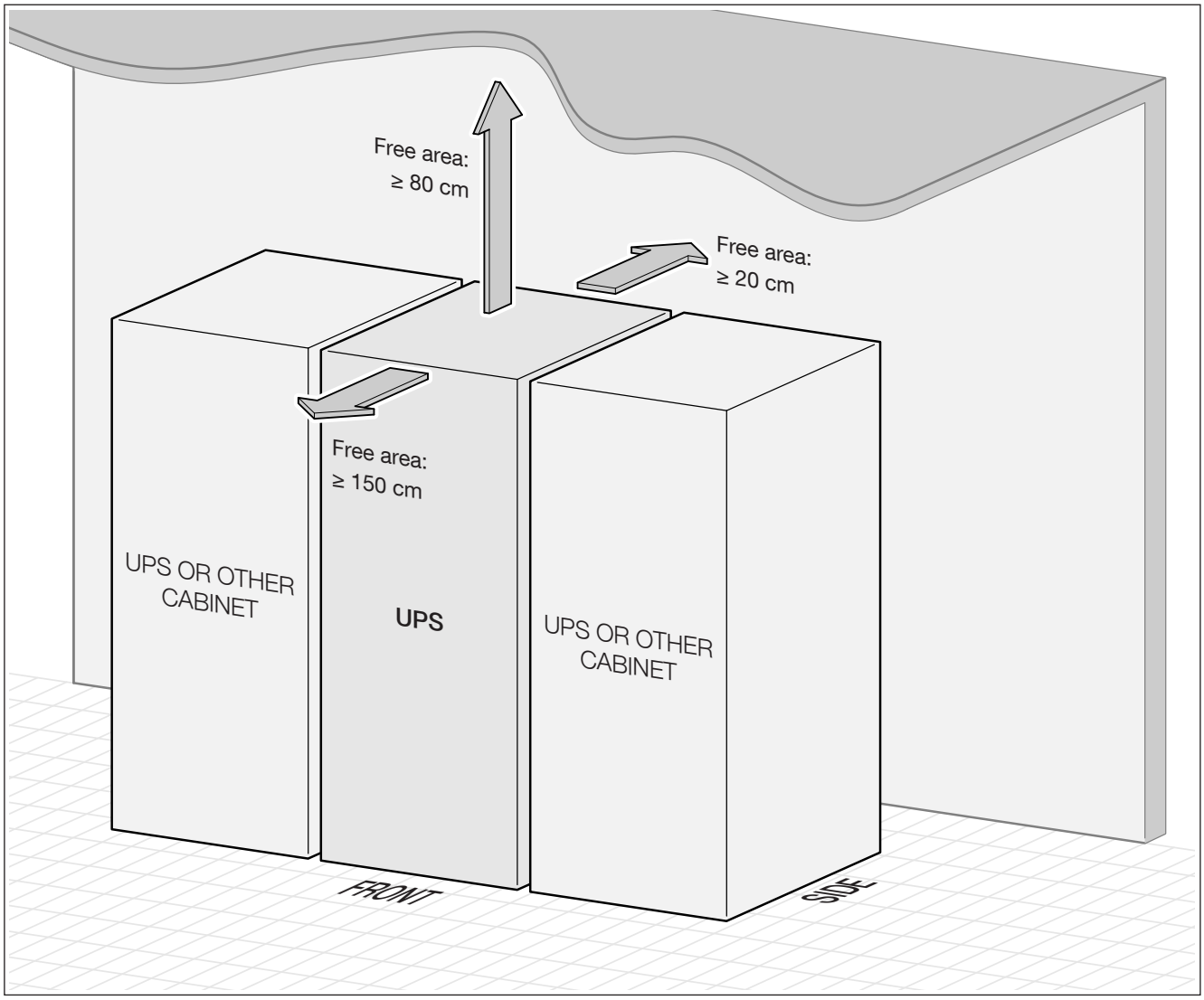
The room must be:

- 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.

Room positioning

For information regarding ambient temperature, dimensions and weights refer to the 'Technical specifications' chapter.

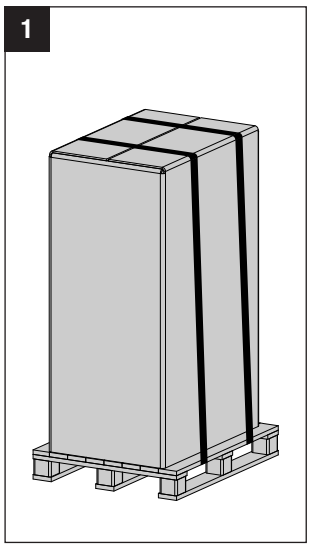


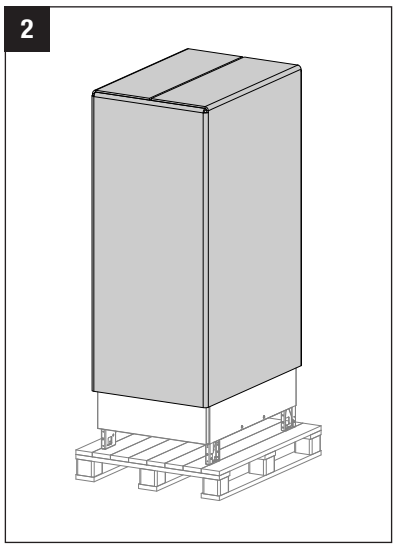
3.2 Handling

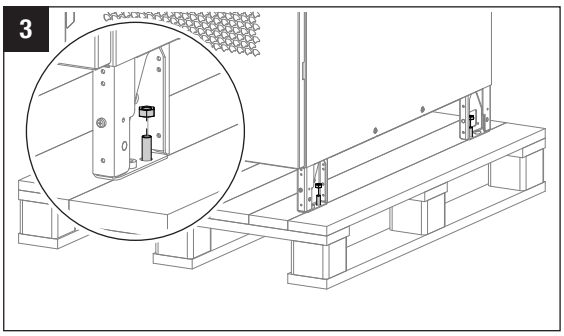
- The packaging guarantees the stability of the unit during shipping and physical transfer.
- The unit must remain in a vertical position during all shipping and handling operations.
- Ensure that the floor is strong enough to support the weight of the unit.
- Carry the packaged unit as close as possible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

⚠	WARNING! HEAVY WEIGHT! Move the unit using a fork lift truck taking the utmost caution at all times.
⚠	The unit MUST be handled by at least two people. The people MUST take position at the sides of the UPS with respect to the direction of movement.
⚠	Do not move the unit by pushing 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.

Unpacking procedures



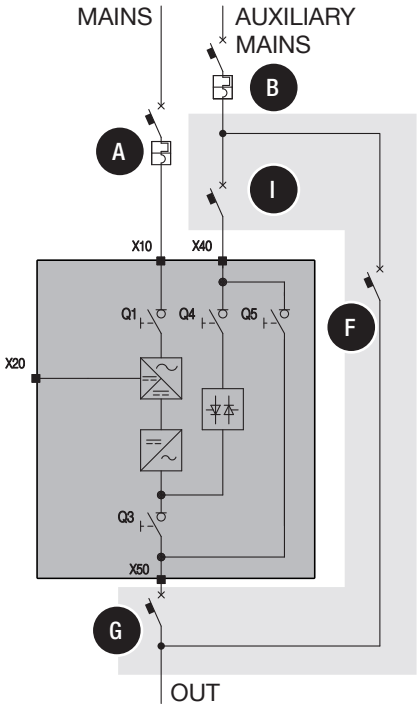




4. ELECTRICAL INSTALLATION

4.1 UPS configuration

4.1.1 Mains and Auxiliary mains connected separately



KEY

- A — Input mains thermal-magnetic circuit breaker.
- B — Auxiliary mains thermal-magnetic circuit breaker.
- F — External maintenance bypass switch[1].
- G — Unit output switch.
- I — Unit Auxiliary mains switch.
- UPS
- External Maintenance Bypass[2]

1. *Connect a normally-closed early make contact from the External Maintenance bypass switch to the dedicated connector (if present) or to the ADC+SL board.*
2. *See 'Standard features and option' chapter.*

4.2 Electrical requirements

⚠	NOTE! **Before carrying out any operations on the unit read the 'Safety standards' chapter carefully.**

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.
Residual Current Detection (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

In/Out phase	Model rating	Input Mains Breaker[1]	Auxiliary Mains Breaker[1]	Differential input	Battery protection[3]
	(kVA)	(A)			
		A	B	Selective type	Fuse type aR
3/3	80	160	200	0.5	200
	120	250	250	0.5	315

Cable core size

In/Out phase	Model rating	Input	Auxiliary	Output	Battery	⏚
	(kVA)	(mm^2)				
		Max[2]				
3/3	80	70 (M8)	70 (M8)	70 (M8)	70 (M10)	M10
	120	2 x 120 (M10)	2 x 120 (M10)	2 x 120 (M10)	2 x 120 (M10)	M10

M8 terminals	*Tightening torque 20 Nm*
M10 terminals	*Tightening torque 40 Nm*

1. *Circuit breaker switch recommended with magnetic intervention threshold curve C. It is necessary to use a D curve selective breaker if an optional external transformer is used.*
2. *Determined by the size of the terminals.*
3. *Tripole protection on external battery cabinet.*
   Recommended values to avoid unwanted tripping with UPS at full power, minimum battery voltage and backup time of at least 5 min. Recommended Rapid fuse type or thermal-magnetic circuit breaker with intervention threshold = 3 In suited for DC applications.

⚠	**NOTE: the neutral of the AUX Mains line must be electrically common with the neutral of the main input feed line.**
⚠	**CAUTION: Residual Current Detection (RCD) can only be used in the case of a common input and auxiliary mains (configuration not recommended). It has to be placed upstream of the connection between input mains and auxiliary mains.** **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 the earth current leakage with the UPS installed and operational with the definitive load, so as to prevent the RCD tipping over.**
⚠	**NOTE:** **To ensure the integrity of the 80 kVA bypass thyristors, I^2t must be lower than 120 kA^2s and peak current must be lower than 5 kA for 20 ms.** **To ensure the integrity of the 120 kVA bypass thyristors, I^2t must be lower than 400 kA^2s and peak current must be lower than 9 kA for 20 ms.** **Contact SOCOMEC for detailed information.**

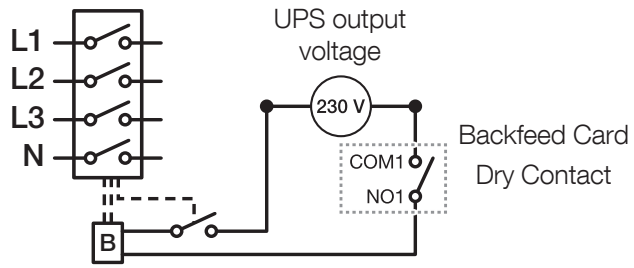
	The UPS is designed for transient overvoltages in category II installations. If the UPS is part of the building's electrical circuit, or is likely to be subject to transient overvoltages in category III installations, additional external protection must be provided, either on the UPS or in the AC power supply network powering the UPS.
	The UPS is designed for indoor environmental service conditions according to IEC 60721-3-3 with pollution degree lower or equal to 2 (non-conductive pollution).
	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-C, TN-S, TT and IT AC distribution systems (IEC 60364-3).

4.2.1 Backfeed protection

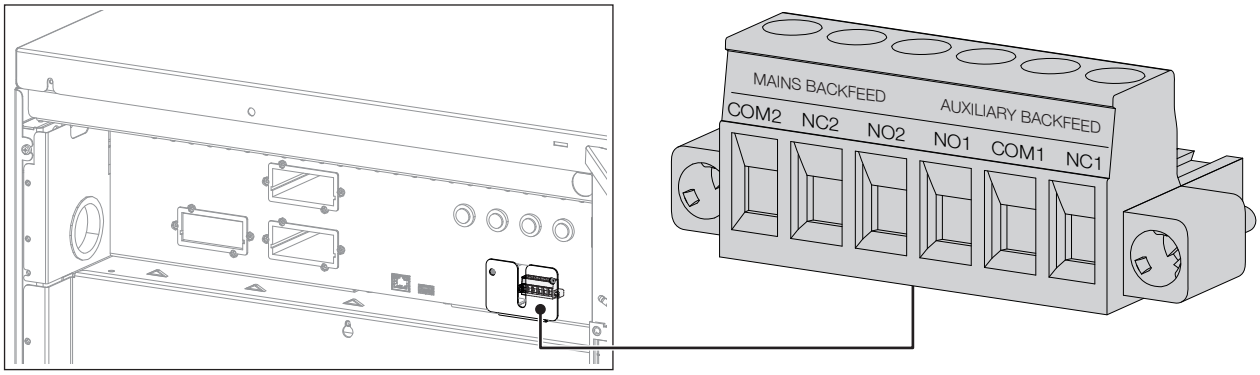
The UPS is set up for the installation of external protection devices against the backfeed of dangerous voltages, on both the input power supply line (MAINS SUPPLY) and on the auxiliary backup mains power supply line (AUXILIARY MAINS SUPPLY); these devices are controlled by means of the card shown in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

The current rating of the switching device has to follow the instruction outlined in 'Electrical requirements' chapter.

⚠	**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).**

Warning label (supplied with the equipment)	Backfeed electrical diagram
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**	

Backfeed trip coils supply

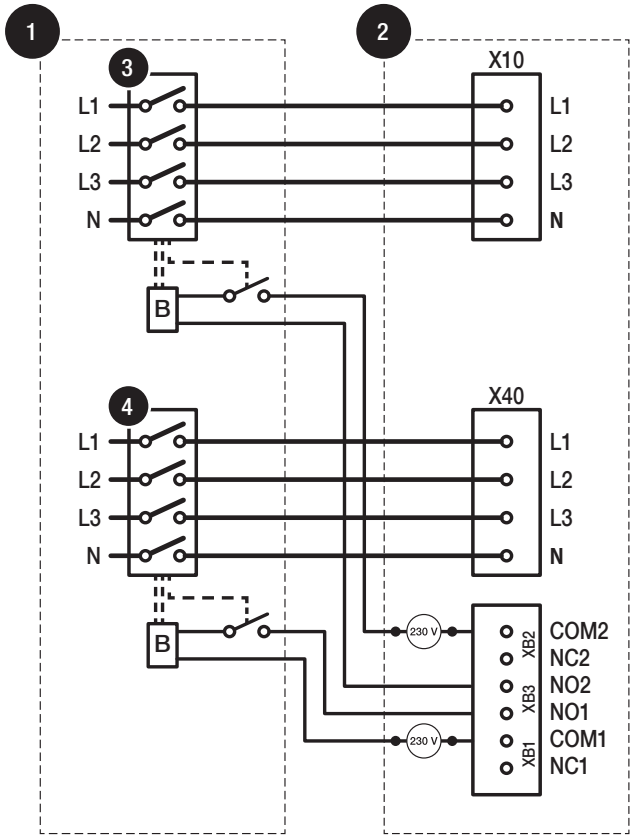


⚠	**NOTE: Use a 220-240 V trip coil with integrated travel limit contact to pilot the input/auxiliary protection systems. If a trip coil without an integrated end of travel contact is used, a normally open contact must be added. Electrical contact data: 1.6 A 250 V AC.**

As an option the unit can be delivered with the integrated internal backfeed switches. Refer to 'Standard features and option' chapter.

• Separated input mains

Activating UPS protection on the mimic panel: access the MAIN MENU > SERVICE > UPS SETTINGS > MAINS CONFIGURATION > MAINS / AUXILIARY and set the parameter to SEPARATED.

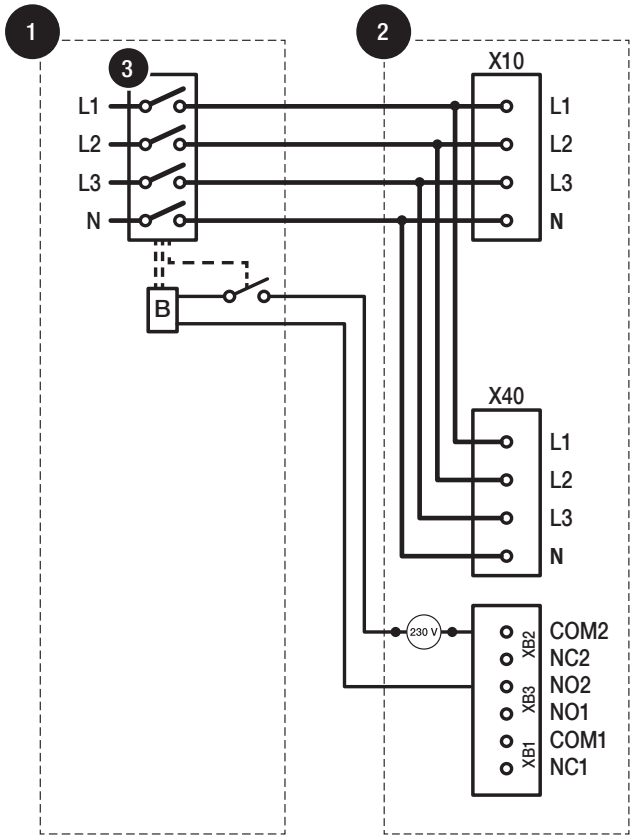


KEY

1	Distribution panel
2	UPS
B	Trip coil
X10	Mains terminal
X40	Auxiliary Mains terminal
3	Mains switch
4	Auxiliary Mains switch
XB2 (COM2) - XB3 (NO2)	Mains BKF connector
XB1 (COM1) - XB3 (NO1)	Auxiliary Mains BKF connector
230 V	UPS output voltage

• Common input mains

Activating UPS protection on the mimic panel: access the MAIN MENU > SERVICE > UPS SETTINGS > MAINS CONFIGURATION > MAINS / AUXILIARY and set the parameter to COMMON.



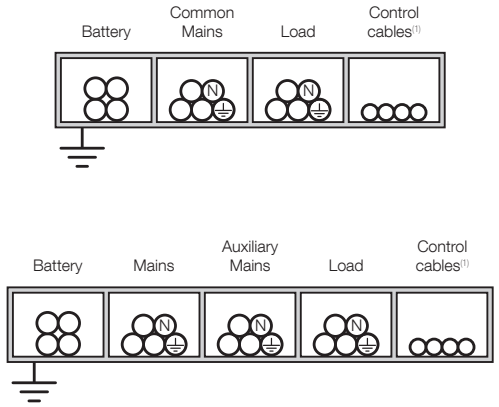
KEY

1	Distribution panel
2	UPS
B	Trip coil
X10	Mains terminal
X40	Auxiliary Mains terminal
3	Mains switch
XB2 (COM2) - XB3 (NO2)	Common mains BKF connector
230 V	UPS output voltage

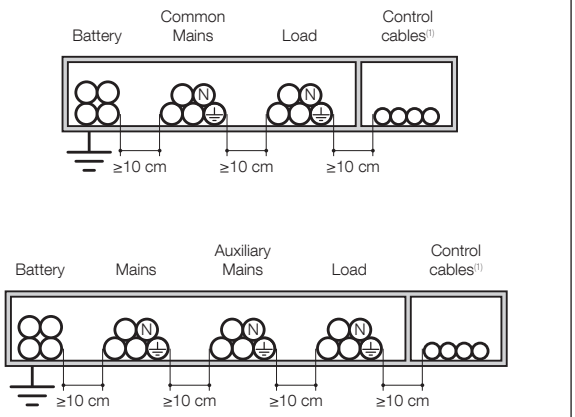
4.3 Cable positioning

⚠	WARNING! The cables must be installed on trays according to the following diagrams. The trays must be positioned near the UPS.
⚠	WARNING! All metal and suspended ducts or those in raised flooring MUST be connected to earth and to the various cabinets
⚠	WARNING! Power cables and control cables MUST NEVER be installed in the same duct.
⚠	WARNING! Risk of electromagnetic interference between battery cables and output cables.

Correct installation



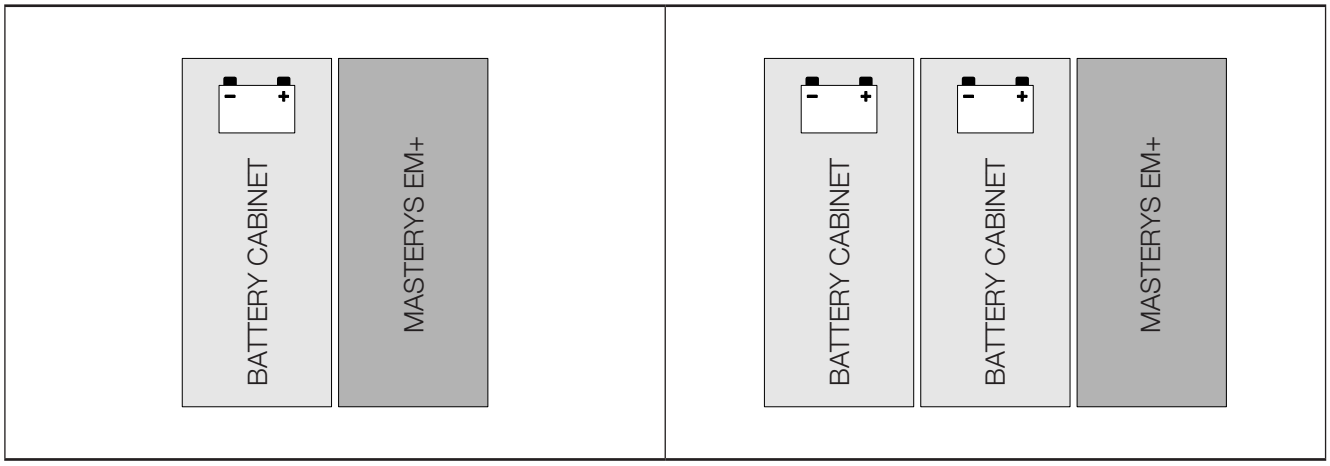
Acceptable installation



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

5. OVERVIEW

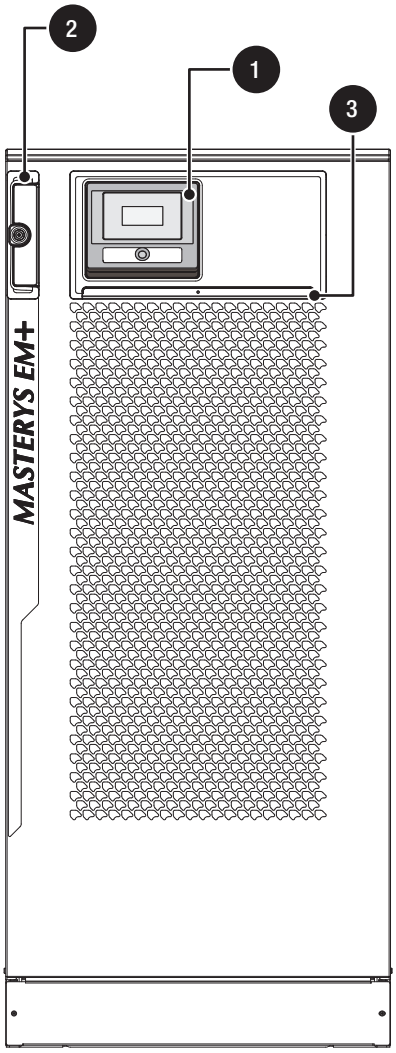
5.1 Recommended configurations



5.2 Front view

KEY

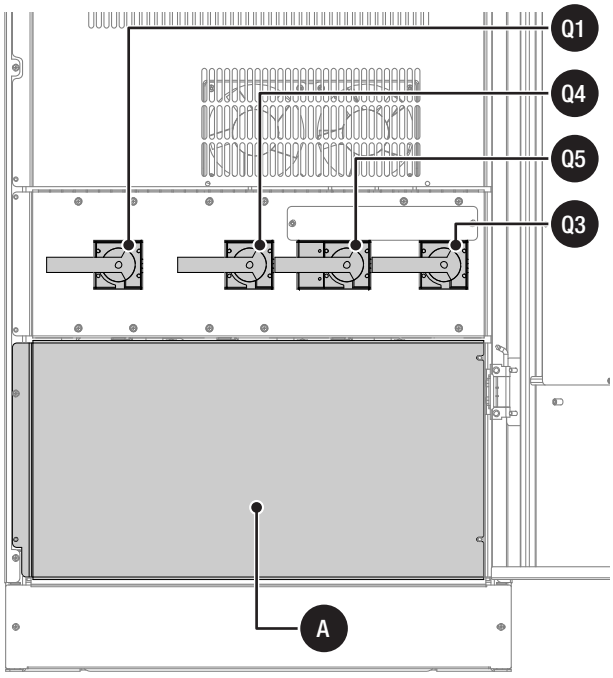
1. Control panel
2. UPS door
3. Luminous status bar



5.3 UPS switches

KEY

- **Q1** Input switch (MAINS)
- **Q4** Auxiliary mains Input switch (AUXILIARY MAINS)
- **Q5** Maintenance bypass switch
- **Q3** Output switch
- **A** UPS connections

UPS kVA	In/Out phase	Battery type	Details
80-120	3/3	External battery	

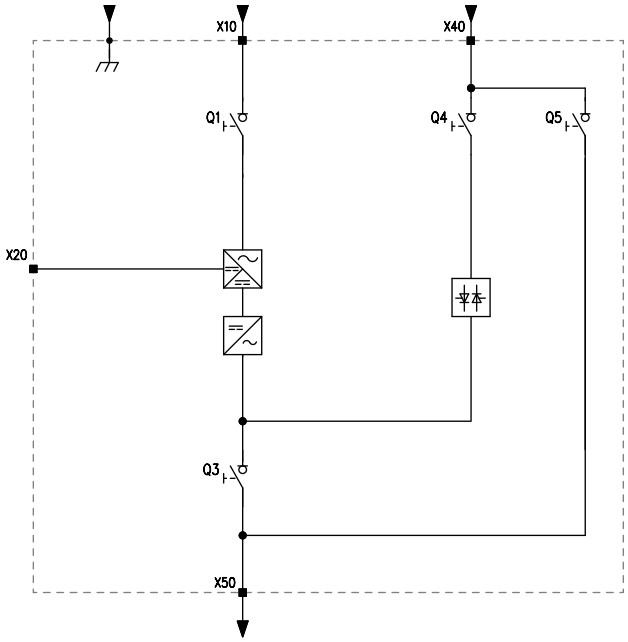
5.4 Wiring diagram

KEY

X10	Input mains	**Q1**	Input switch (MAINS)
X40	Auxiliary mains	**Q4**	Auxiliary mains Input switch (AUXILIARY MAINS)
X20	Battery	**Q5**	Maintenance bypass switch
X50	Output	**Q3**	Output switch
⏚	PE	**A**	Protection

80-120 kVA

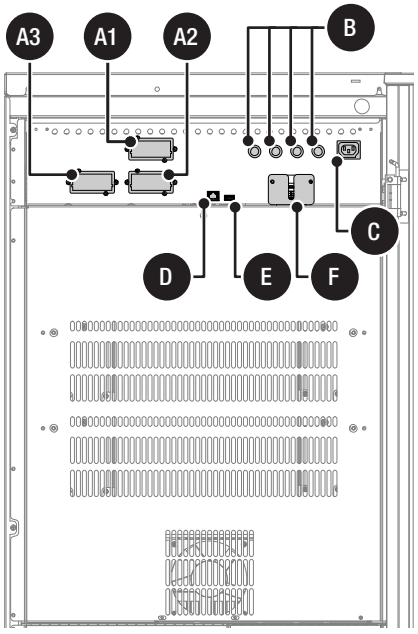
External battery



5.5 Internal front view details

KEY

- **A1** ADC+SL card *(EN 50171 - must be set as Configuration 1; refer to 'Standard features and option' chapter)*
- **A2** Option slots 2
- **A3** Option slots 3[1]
- **B** Fuses for service only
- **C** 230 V AC socket for service only
- **D** Ethernet network for service only
- **E** USB connector for service only
- **F** Backfeed card

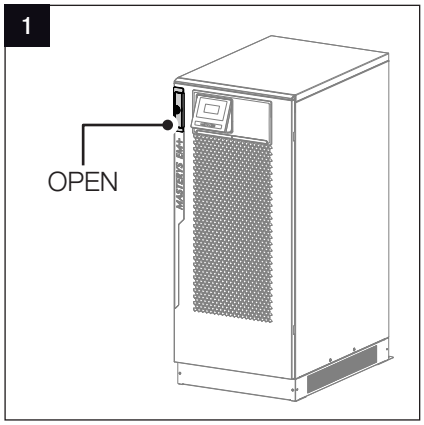


1. See 'Standard features and option' chapter.

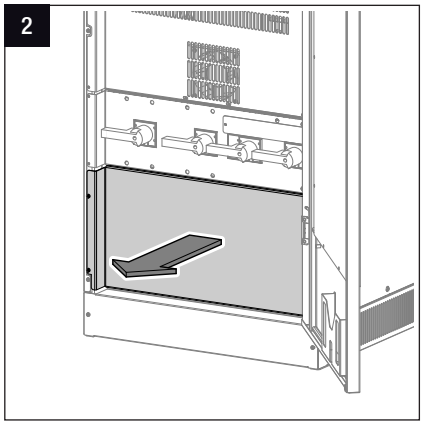
6. CONNECTIONS

⚠	NOTE! Before carrying out any operations on the unit read the 'Safety standards' chapter carefully.
⚠	WARNING! Battery power terminals are 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) Check for presence of voltage before operating.
⚠	Use cables with tin-plated eyelets for the connections.

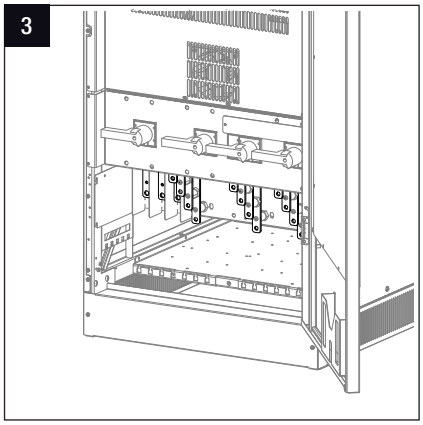
1



2



3



6.1 UPS connection

> **WARNING!**
> **Cabling errors with inversion between phase and neutral conductors may cause permanent damage to the equipment.**

KEY

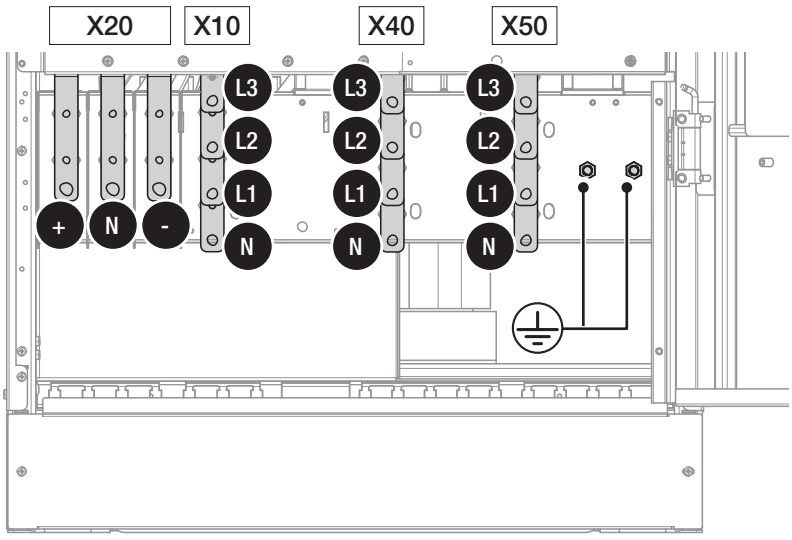
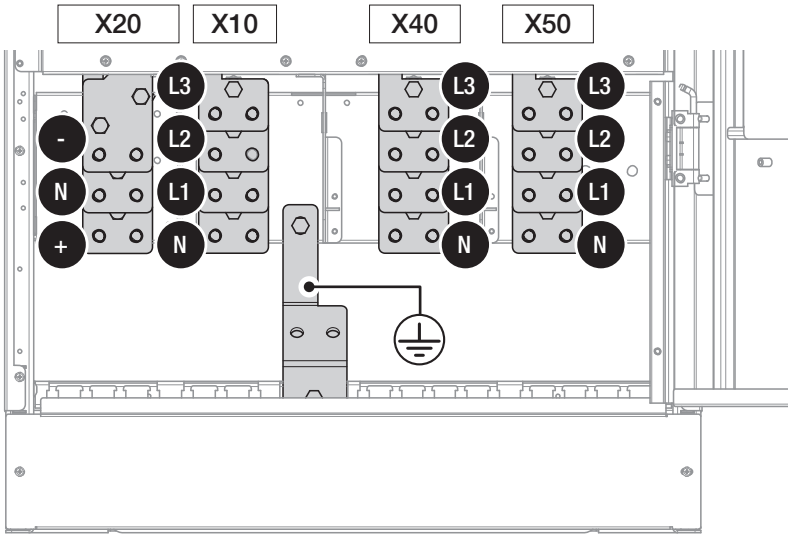
X10 Input mains

X40 Auxiliary mains

X20 Battery

X50 Output

PE

UPS kVA	In/Out phase	Battery type	Details[1]
80	3/3	External battery	
120	3/3	External battery	

1. For further details refer to 'Electrical requirements' chapter.

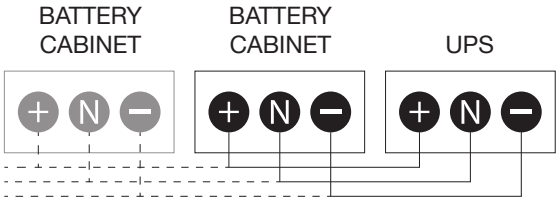
6.1.1 External battery connection

⚠	NOTE! For further information refer to the battery cabinet manual.

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

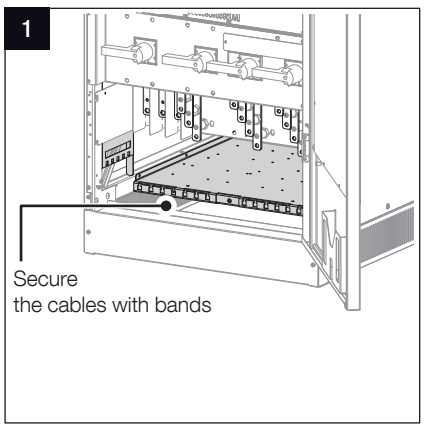
⚠	WARNING! Strictly observe: - the polarity of each individual string (refer to the figure below); - the cable cross section (refer to 'Electrical requirements' chapter).
⚠	NOTE! Cabling errors with inversion of battery polarity gives wrong configuration battery alarm (A016 'BATTERY DISCONNECTED', A093 'BATTERY VOLTAGE OUT OF RANGE').
⚠	Reassemble the plastic terminal block protection.
⚠	WARNING: pay attention to the individual cable range for battery connections.

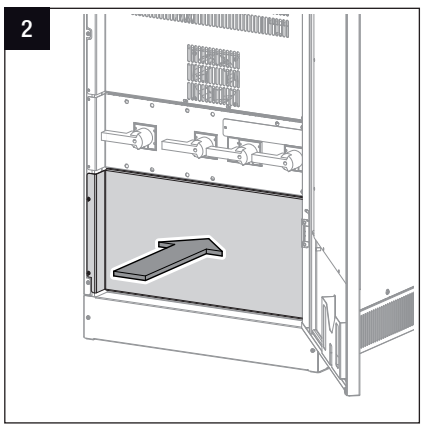
Connection example - unit

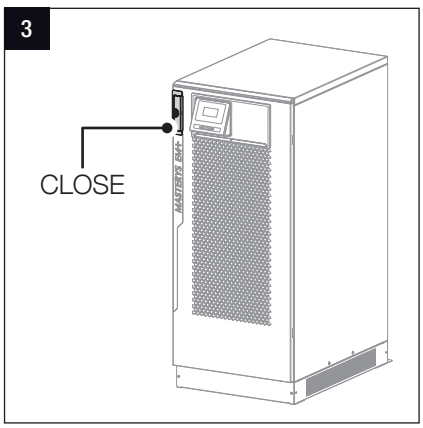


⚠	Note! When battery cabinets not supplied by Socomec are used, the installer is responsible for: - checking electrical compatibility; - checking the presence of appropriate protective devices (fuses and circuit breakers that ensure the cables are protected from the UPS to the battery cabinet). Once 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.

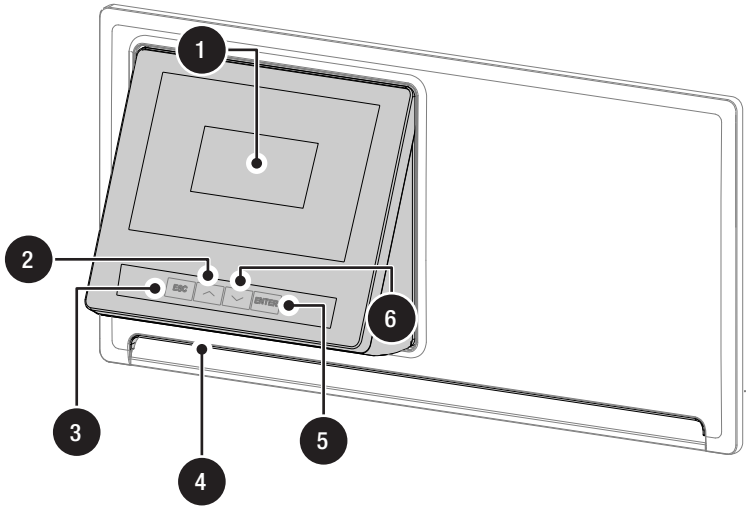
6.2 Completion of the installation







7. CONTROL PANEL



1 **Display**

2 **UP button**
Scrolls up through the available menus/values

3 **ESC button**
Exits current page, aborts operations

4 Luminous status bar

5 **ENTER button**
Accesses the currently displayed menu, accepts/sends configurations and controls

6 **DOWN button**
Scrolls down through the available menus/values

Control panel with LED status bar indicator	
Colour	Description
Flashing red-yellow-green-red	No communication. The data is no longer updated or not present. Load status cannot be given.
Flashing red	Load supplied, but the output will stop in a few minutes.
Red	Load not supplied: Output switched OFF due to an alarm.
Flashing yellow-red	Load supplied, but no longer protected. A critical alarm occurs.
Flashing yellow	Maintenance request / in progress.
Yellow	Load supplied with warning.
Flashing green-yellow-green	Load supplied and preventive alarm present.
Flashing green	Load going to be supplied and tested.
Green	Load protected in inverter.
Grey (OFF)	Load not supplied output on standby / isolated / OFF.

KEYPAD LOCK

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

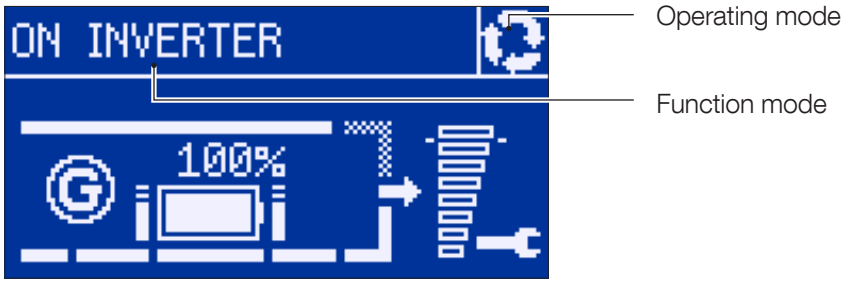
These sequences work only on the MIMIC PANEL page.

When the keypad is locked the key symbol is shown.

8. MENU

8.1 Display overview (UNIT)

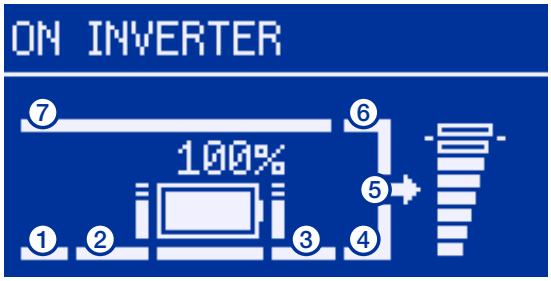
Status bar (always displayed)



Unit status	Description
UPS STARTING	The start procedure is in progress
UPS STOPPING	The stop procedure is in progress
ON MAINT. BYPASS	The manual bypass is active
IMMINENT STOP	The output supplying switch-off is imminent
ON BATTERY	The output load is on battery
BATTERY TEST	Battery test in progress
ON INVERTER	The output load is on inverter (normal mode)
ON AUTO BYPASS	The output load is on static bypass
STANDBY	Unit on standby
LOAD OFF	The output load is off

Function mode	Description
	The UPS is in maintenance mode
	Output breaker / output relays open
	Eco mode schedule enabled
	An eco mode command has been carried out
	A remote stand-by command has been carried out
<NOTHING DISPLAYED>	Normal mode

Mimic panel



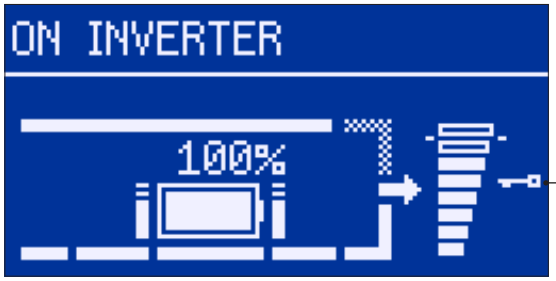
SEGMENT	DESCRIPTION
1	INPUT MAINS
2	RECTIFIER ON
3	INVERTER INPUT OR BATTERY OUTPUT
4	INVERTER OUTPUT
5	UNIT OUTPUT
6	OUTPUT FROM STATIC SWITCH
7	BYPASS INPUT

NOTE!
When in converter mode, 6 and 7 are not shown.

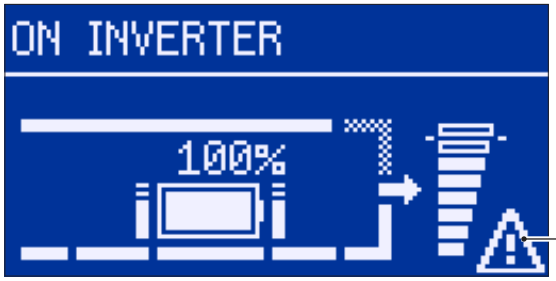
Bar styles identify the energy flow:

- solid: enabled
- dotted: disabled

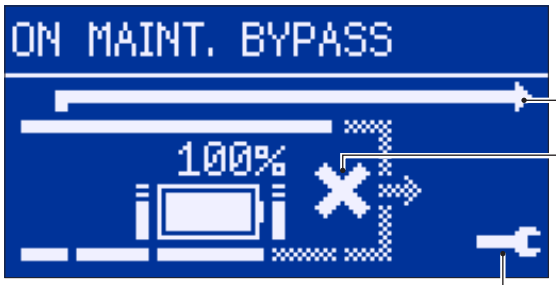
Additional icons



key icon: displayed if the keypad is locked



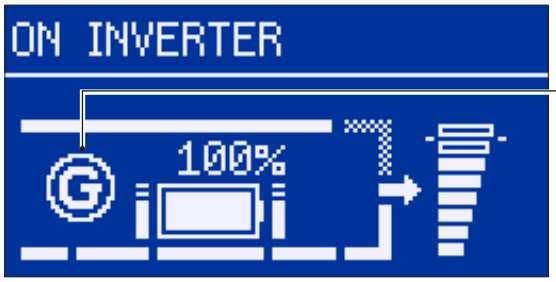
General alarm



On maintenance bypass

Bypass mode (or Eco Mode) not possible

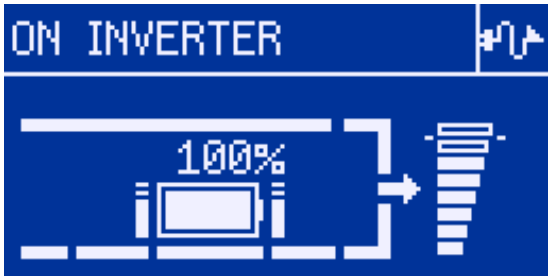
Scheduled Inspection warning: machine inspection required, call SOCOMEC support service

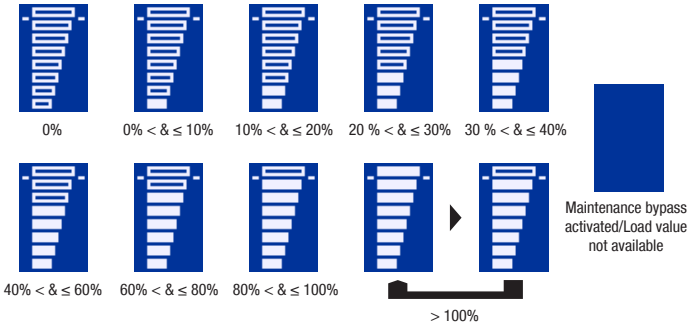


Operating on GenSet

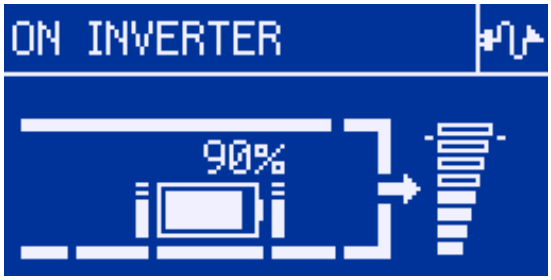
NOTE! Available only with ADC+SL option card

Load level





Battery status



NOTE: Battery symbol is shown only if battery available

Battery charging

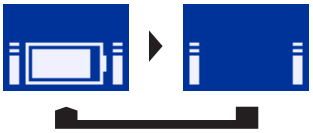
Upper level flashing

Battery discharging

Level reached is flashing

Battery open

Battery alarm flagged



8.2 Menu tree

	MENU ITEMS[1]
	Stand alone UPS
▶ **ALARMS**	•
▶ **STATUS**	•
▶ **EVENT LOG**	•
▼ **MEASUREMENTS**	
▶ OUTPUT MEASURES	•
▶ BATT MEASURES	^
▶ INPUT MEASURES	•
▶ BYPASS MEASURES	•
▼ **CONTROLS**	
▼ PROCEDURES	
▶ START PROCEDURE	•
▶ MAINT. BYPASS PROC.	•
▶ STOP PROCEDURE	•
▼ BATTERY	
▶ BATT. TEST RESULT	^
▶ BATTERY TEST	^
▶ BATT TEST SCHEDULE	^
▼ ECO MODE	
▶ ECO MODE ON	•
▶ ECO MODE OFF	•
▶ ECO MODE SCHEDULE	•
▼ MAINTENANCE	
▶ ALARMS RESET	•
▶ POSTPONE MAINT. ALARM	•
▶ LED TEST	•
▼ **UPS CONFIG**	
▶ CLOCK	•
▶ REMOTE CTRL	•
▼ COM SLOTS	
▶ TEMPERATURE PROBE	^
▶ RS485 PORT SLOT1	•
▶ RS485 PORT SLOT2	•
▼ REFERENCES	
▶ UPS INFORMATION	•
▶ SERIAL NUMBER	•
▶ SOCOMEC REFERENCE	•
▶ USER DEVICE REF	•
▶ USER DEV LOCATION	•

MENU ITEMS[1]	Stand alone UPS
▼ USER PARAM	
▶ LANGUAGE	•
▶ PASSWORD	•
▶ BUZZER	•
▼ ADC+SL CONFIG	•
▶ CARD 1	•
▶ CARD 2	•
▶ CARD 3[2]	•
▼ SERVICE	
▶ SERVICE REPORT	•
▶ FIRMWARE VERSION	•
▼ NETWORK PARAMETERS	
▶ DHCP	•
▶ IP ADDRESS	•
▶ SUBNET MASK	•
▶ GATEWAY	•
▶ MAC ADDRESS	•
▼ UPS SETTINGS	
▼ OUTPUT	
▶ OUTPUT VOLTAGE	•
▶ OUTPUT FREQUENCY	•
▶ CONVERTER MODE	•
▶ AUTO RESTART	•
▼ BATTERY	
▶ BATTERY AVAILABLE	^
▶ BATTERY CONNECTION	^
▶ BATTERY TYPE	^
▶ RECHARGE TYPE	^
▶ ...	^
▶ MAINS CONFIGURATION	•

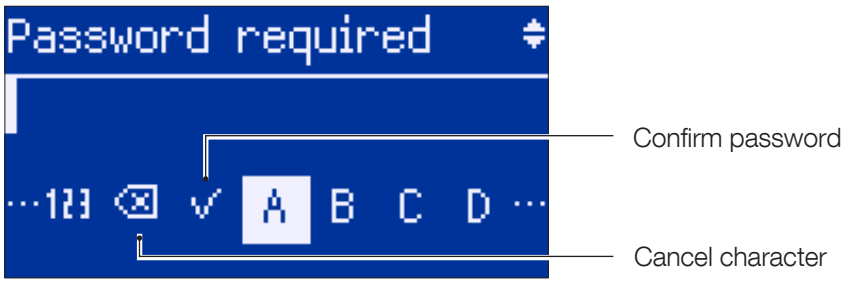
(^). depending on setting.

1. *Some menu options may not be available on some UPS models.*
2. *See 'Standard features and option' chapter.*

8.3 Menu function descriptions

8.3.1 Entering passwords

Some operations and settings require a password in order to be performed.



The default password is **SOCO**.

Press **UP** and **DOWN** to scroll the letters. Press **ENT** to confirm the selection or **ESC** to abort.

8.3.2 ALARMS menu

This menu displays all pending UPS alarms.

To reset alarms enter the menu MAIN MENU > CONTROLS > MAINTENANCE > ALARMS RESET.

If there is more than one page press **UP/DOWN** to scroll pages.

8.3.3 STATUS menu

This menu displays all UPS ON statuses.

If there is more than one page press **UP/DOWN** to scroll pages.

8.3.4 EVENT LOG menu

This menu accesses the event log (Status and Alarms).

8.3.5 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.

8.3.6 CONTROLS menu

This menu contains the controls that can be sent to the UPS. Some of them are password protected. If a command is not available, a COMMAND FAILURE message appears.

- PROCEDURES: START PROCEDURE/MAINT. BYPASS PROC./STOP PROCEDURE see 'Operating procedures' chapter.
- BATTERY: BATTERY TEST: this function checks whether or not test conditions are available then returns the results.
- ECO MODE: ON/OFF: this function sets/resets the ECO MODE.
- MAINTENANCE: ALARMS RESET: this function clears the alarm history, LED TEST: this function activates the LED by flashing for few seconds.

8.3.7 USER PARAM menu

This menu contains all the machine settings such as language, date and buzzer.

To reset the language back to English, press the **ESC** button for 5 seconds.

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

8.3.8 SERVICE menu

This menu is reserved for support service personnel and holds UPS identification data and utilities for software upgrades.

- UPS SETTINGS: critical machine settings for output, batteries and backfeed.
  Some parameters cannot be modified when the UPS supplies the load by INVERTER or BYPASS.

	**Wrongly configured UPS SETTINGS could damage the load or batteries.**

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.
- Switch **ON** input switch **Q1**.
- Wait until display switch on.
- Enter MAIN MENU > CONTROLS > PROCEDURES.
- Select **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 > CONTROLS > PROCEDURES.
- Select **STOP** 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.

- Carry out the operations indicated on the display.

9.3 Bypass operations

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 AUXILIARY MAINS: your load is exposed to mains disturbances.**

- Enter menu MAIN MENU > CONTROLS > PROCEDURES.
- Select **ON MAINTENANCE BYPASS** and press **ENTER**.
- Carry out the operations indicated on the display.

	**NOTE!** **When an external maintenance bypass is present:** - carry out the procedure described above; - close the external switch.

Switching on from maintenance bypass

- Put switch **Q1** into position **1** (mains ON).
- Wait for the display to switch on.
- Enter menu MAIN MENU > CONTROLS > PROCEDURES.
- Select **START PROCEDURE** and press **ENTER**.
- Carry out the operations indicated on the display.

	**NOTE!** **When an external maintenance bypass is present, put the switch to position 0 (OFF).**

9.4 Extended out of service

When the UPS is deactivated for some time, the batteries must be recharged regularly.

They should be recharged every three months.

- Check that output switches **Q3** and **Q5** are **OFF**.
- Connect the mains and auxiliary mains to the UPS.
- Switch **ON** input switch **Q1**.
- Wait until displays switch on.
- Enter menu MAIN MENU > CONTROLS > PROCEDURES.
- Select START and press ENTER.
- Carry out the operations indicated on the display.
- Close the external battery breaker/fuses.
- Wait until the batteries are fully charged. Check in the menu MAIN MENU > MEASUREMENTS > BATT MEASURES.
- Open the external battery breaker/fuses.
- Switch **OFF** input switch **Q1**.

9.5 Emergency shutdown

⚠	NOTE! **This operations interrupts the supply to the output load from both inverters and automatic bypass.**
⚠	**If the UPS is operating from the maintenance bypass 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.**

UPS power OFF

Put **Q3** to position 0 when it's necessary to interrupt the power supply quickly.

⚠	NOTE! **This operations interrupts the supply to the output load from both inverters and automatic bypass.**

Remote UPS power OFF

It is possible to interrupt the power supply to the output load using the ADC+SL card. Refer to 'Standard features and option' chapter.

⚠	**To restart the UPS, reset the alarm after the UPS power OFF activation.**

10. OPERATING MODES

10.1 On line mode

A special feature of the UPS is the 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 ON LINE 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 (50 Hz or 60 Hz is available as output frequency value).

NOTE: only set this mode on UPS units with the auxiliary mains (AUXILIARY 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 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.

10.5 Operation with motor generator (GENSET)

The UPS can be operated in conjunction with a generator (GENSET) over the ADC+SL card (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 GENSET and at the same time to avoid operation from the battery or risks of out-of-synchronisation switching on to the bypass.

10.6 Operation in non-maintained changeover mode

In non-maintained changeover mode, the UPS output (load) is assured only in the event of a normal MAINS INPUT failure. The bypass in this operative mode is always disabled.

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

11. STANDARD FEATURES AND OPTION

Availability	
●	*Factory-installed option*
○	*Available as option*
–	*Not available*
STD	*Standard feature*

Features	MASTERYS EM+		Note
	80 kVA	120 kVA	
	External batteries	External batteries	
Battery Option			
Additional charger	STD	STD	⚠ ⊘ Kit for Rectifier Neutral creation
Communication Option			
ACS card *(Automatic Cross Synchronisation)*	●○	●○	
ADC+SL card *(Advanced Dry Contact + Serial Link)*	○	○	
Temperature sensor	○	○	⚠ ! ADC+SL card
Remote touchscreen display	○	○	⚠ ! ADC+SL card
BACnet card	○	○	
Modbus TCP card	○	○	
Net Vision card	○	○	
EMD *(Environmental Monitoring Device)*	○	○	⚠ ! Net Vision card
PROFIBUS protocol interface	○	○	⚠ ! ADC+SL card
Electrical Option			
External Isolation Transformer	–	○	
IMD *(Insulation Monitoring Device)*	–	○	⚠ ! External Isolation Transformer
External Maintenance Bypass	○	○	
Kit for TN-C / Neutral-Ground connection	●○	●○	⚠ ⊘ Kit for Rectifier Neutral creation
Internal Backfeed Protection	●	●	
Kit For Common Mains	○	○	⚠ ⊘ Kit for Rectifier Neutral creation
Kit for Rectifier Neutral creation	●	●	⚠ ⊘ Kit for TN-C / Neutral-Ground connection ⊘ Kit For Common Mains ⊘ Additional charger
Redundant Bypass Ventilation	●	●	
Mechanical Option			
Option slots 3	●	●	
Anti-vermin protection	●	●	
Kit for IP21	○	○	
Other			
Cold start	●○	●○	

! *Required option*

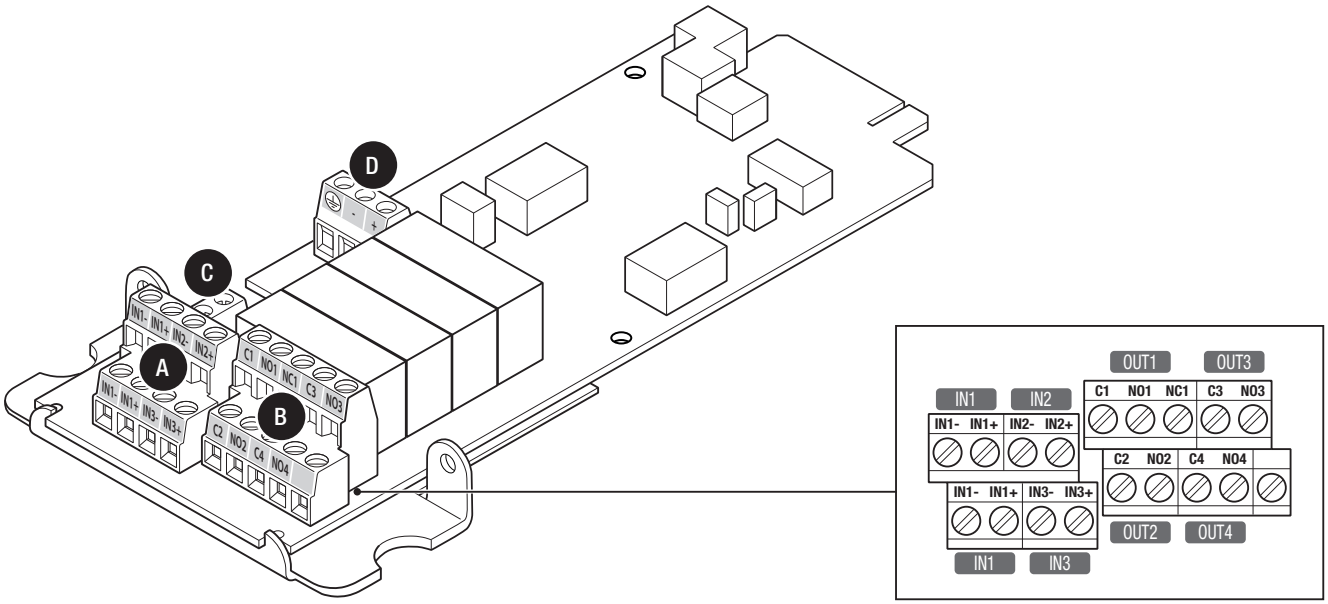
⊘ *Incompatible option*

11.1 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 battery temperature sensor (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. It is possible to create a custom operation mode through after sales service.



KEY

- **A** 3 free inputs to link external contacts to UPS.
- **B** 4 relays for external device activation.
- **C** 1 connector for external temperature sensor.
- **D** RS485 insulated serial link.

> NOTE!
> **If the board is removed while operating, an alarm is flagged on the control panel.**
> **Perform an "Alarm reset" control to cancel it.**

Input

- Free voltage loop.
- INx+ has to be connected to INx- to close the loop on **A** connector.
- Inputs must be isolated with basic insulation from a primary circuit up to 277 V.
- IN1 is duplicated, giving the possibility to link the UPS POWER OFF signal to other equipment, for example.

Relay outputs

- Contact voltage guaranteed at 277 V (AC) / 25 V (DC) – 4 A (for higher voltage, please contact the manufacturer).
- Relay 1 gives the possibility of choosing between normally closed (NC1) or normally open (NO1) position. Relays 2, 3 and 4 only have normally open position (NOx).
- On connector **B**, Cx means common, NOx means normally open position.

Configuration 1			EMERGENCY configuration (default for EN 50171)		
IN/OUT	DESCRIPTION	ACTIVATION DELAY (s)	REMARK[1]	INPUT TYPE	STATE
IN1	UPS POWER OFF	1	Command sent to UPS[2]	Close to activate	Normally open
IN2	BATTERY ROOM ALARM	10	Activate A021	Open to activate	Normally closed
IN3	INSULATION FAULT	10	Activate A026	Open to activate	Normally closed
RELAY 1	LOAD ON INVERTER OR BYPASS	10	Relating to S000 or S002		Normally open/closed
RELAY 2	OPERATING ON BATTERY	30	Relating to A019		Normally open
RELAY 3	UPS ALARM	10	Relating to A016, A018, A021, A025, A026, A093, A094 or A095		Normally open
RELAY 4	BATTERY CHARGER FAULT	10	Relating to A038 and A094		Normally open

Configuration 2			OPTIONS SUPERVISOR configuration		
IN/OUT	DESCRIPTION	ACTIVATION DELAY (s)	REMARK[1]	INPUT TYPE	STATE
IN1	UPS POWER OFF	1	Command sent to UPS[2]	Close to activate	Normally open
IN2	FAN FAILURE	10	Activate A054	Close to activate	Normally open
IN3	BATTERY DISCONNECTED	10	Activate A016	Open to activate	Normally closed
RELAY 1	GENERAL ALARM	10	(NC1 or NO1 position can be chosen) Relating to A015		Normally open/closed
RELAY 2	OPERATING ON BATTERY	30	Relating to A019		Normally open
RELAY 3	REDUNDANCY LOST	10	Relating to A006		Normally open
RELAY 4	BATTERY DISCONNECTED	1	Relating to A016		Normally open

Configuration 3			SAFETY configuration		
IN/OUT	DESCRIPTION	ACTIVATION DELAY (s)	REMARK[1]	INPUT TYPE	STATE
IN1	UPS POWER OFF	1	Command sent to UPS[2]	Close to activate	Normally open
IN2	INSULATION FAULT	1	Activate A026	Open to activate	Normally closed
IN3	CHARGER DISABLE/ENABLE	10	Command sent to UPS[2]	Open to activate	Normally closed
RELAY 1	GENERAL ALARM	10	(NC1 or NO1 position can be chosen) Relating to A015		Normally open/closed
RELAY 2	UPS POWER OFF	1	Relating to A059		Normally open
RELAY 3	END OF BACK-UP TIME	10	Relating to A017		Normally open
	IMMINENT STOP	10	Relating to A000		Normally open
RELAY 4	INSULATION FAULT	1	Relating to A026		Normally open

Configuration 4			ENVIRONMENTAL configuration		
IN/OUT	DESCRIPTION	ACTIVATION DELAY (s)	REMARK[1]	INPUT TYPE	STATE
IN1	UPS POWER OFF	1	Command sent to UPS[2]	Close to activate	Normally open
IN2	PROGRAMMABLE ALARM	10	Activate A064	Open to activate	Normally closed
IN3	BATTERY TEMPERATURE ALARM	10	Activate A020	Open to activate	Normally closed
RELAY 1	GENERAL ALARM	10	(NC1 or NO1 position can be chosen) Relating to A015		Normally open/closed
RELAY 2	BATTERY TEMPERATURE ALARM	10	Relating to A020		Normally open
RELAY 3	REDUNDANCY LOST	10	Relating to A006 and A001		Normally open
RELAY 4	PROGRAMMABLE ALARM	10	Relating to A064		Normally open

Configuration 5			EXTERNAL MAINTENANCE BYPASS configuration		
IN/OUT	DESCRIPTION	ACTIVATION DELAY (s)	REMARK[1]	INPUT TYPE	STATE
IN1	UPS POWER OFF	1	Command sent to UPS[2]	Close to activate	Normally open
IN2	GEN SET ON	1	Activate S023 status	Open to activate	Normally closed
IN3	EXTERNAL MAINTENANCE BYPASS CLOSED	10	Activate S018 status	Open to activate	Normally closed
RELAY 1	GENERAL ALARM	10	(NC1 or NO1 position can be chosen) Relating to A015		Normally open/closed
RELAY 2	OPERATING ON BATTERY	30	Relating to A019		Normally open
RELAY 3	END OF BACK-UP TIME	10	Relating to A017		Normally open
	IMMINENT STOP	10	Relating to A000		Normally open
RELAY 4	LOAD SUPPLIED BY AUTOMATIC BYPASS	10	Relating to S002		Normally open

1. The acronyms mentioned are linked to MODBUS table (Snnn=Status/Annn=Alarm).

2. A self-locking emergency push button must be used for the UPS Power Off input.

Note: custom configuration is also available. For more information contact Socomec.

RS485 serial link

- Insulated RS485, protected against over voltage. Only for local bus purposes; maximum ~500 m.
- Pull up and pull down line resistor XJ1 (failsafe biasing): jumper open by default.
- Possibility of fixing the RS485 cable to the board.
- Cable type required: twister pair cable + shield to connect to ground. (AWG 24, 0.2 mm^2 for example).

The INPUT and RELAYS are managed with information coming from the UPS.

NOTE!
Inputs and relays can be re-programmed depending on requirements.
Contact your SOCOMEC after-sales service to change Input/Output programming.

Information coming from inputs can be reported in the UPS database for display on the mimic panel and is accessible on the MODBUS table.

The cards can be re-programmed for other uses.

Modbus serial link

The RS485 provides MODBUS RTU protocol.

The description of MODBUS addresses and UPS database are described in the MODBUS user manual. All manuals are available on SOCOMEC's web site (www.socomec.com).

Serial link settings

COM1 relates to serial port on board in SLOT 1.

COM2 relates to serial port on board in SLOT 2.

COM3 relates to serial port on board in SLOT 3.

Settings are available via the mimic panel to configure:

- Baud rate
- Parity
- MODBUS slave number

Board status

Board presence is reported through status S064 for slot 1, S065 for slot 2 and S068 for slot 3.

In the case of board failure, 'Option board alarm' (A062) occurs to prevent malfunctioning.

11.1.1 Temperature sensor

The temperature sensor can be used to monitor the battery temperature.

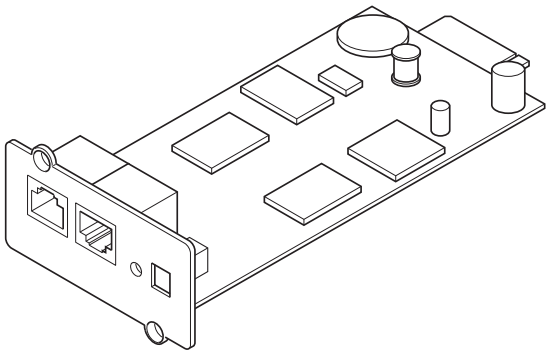
The ADC+SL card can be ordered with or without the temperature sensor in kit.

If the sensor is present, temperature values are available on MODBUS protocol.

11.2 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.

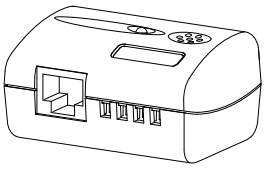
NET VISION allows a direct interface between the UPS and LAN network avoiding dependence on the server and support SMTP, SNMP, DHCP and many other protocols. It interacts via the web browser.



11.2.1 EMD

EMD (Environmental Monitoring Device) is a device to be used in conjunction with the NET VISION interface and provides the following features:

- temperature and humidity measurements + dry contact inputs,
- alarm thresholds configurable via Web browser,
- notification of environmental alarm via email and SNMP traps.

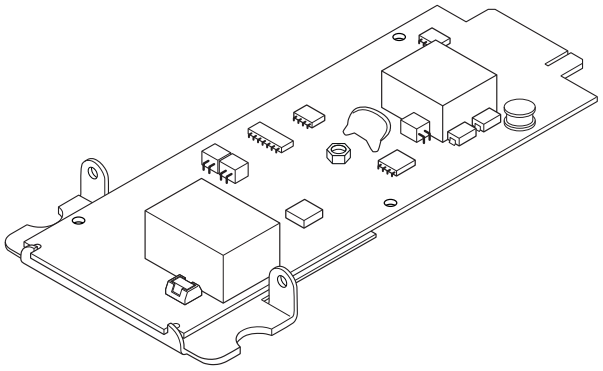


11.3 ACS card

ACS (Automatic Cross Synchronisation) card is used to receive a synchronisation signal from an external source and manage it for the UPS where it is installed, and provide a synchronising signal, where requested, to another UPS.

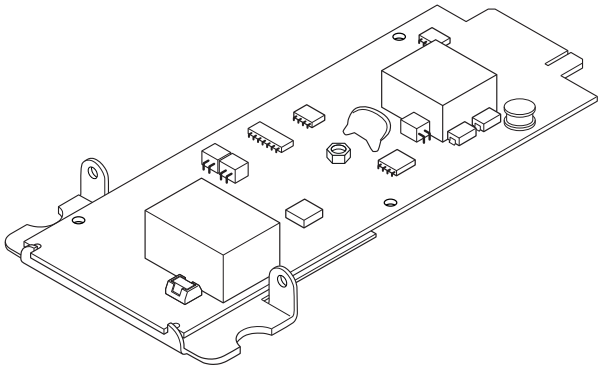
11.4 Modbus TCP card

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

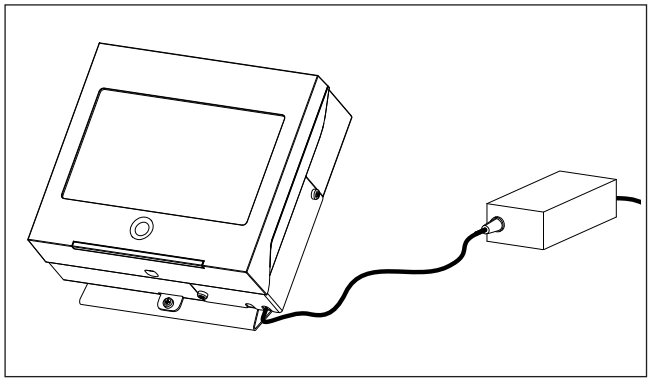


11.5 BACnet card

With the BACnet card fitted in the options slot, the UPS can be monitored from remote stations using the appropriate protocol (BACnet - IDA).



11.6 Remote touchscreen display



NOTE!
Available only with ADC+SL option card.

11.7 PROFIBUS protocol interface

Socomec UPS can be provided with an interface of PROFIBUS ® DP slave type for the UPS to be connected to a PROFIBUS ® PLC.

PROFIBUS ® protocol is aimed at exchanging data between input/output monitoring devices and a master unit.

The frame exchanged with the PLC only manages input data comprising a maximum of 255 bytes. Controls that are considered as output data are not managed by means of the PROFIBUS ® coupler.

11.8 Software option

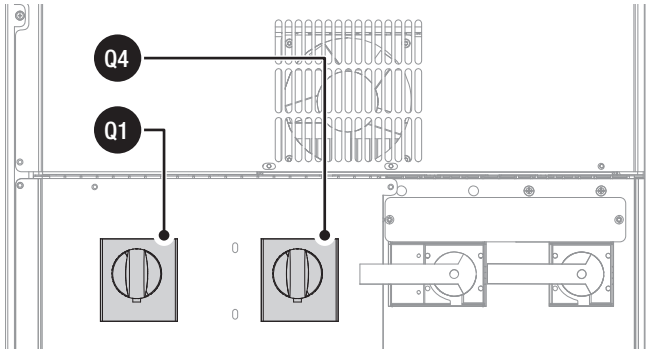
Visit www.socomec.com and enter DOWNLOAD > SOFTWARE > UPS SOFTWARE to find the communication software suitable for your requirements.

NOTE!
Before performing any operations, check that the software is compatible with your UPS model.

11.9 Internal Backfeed Protection

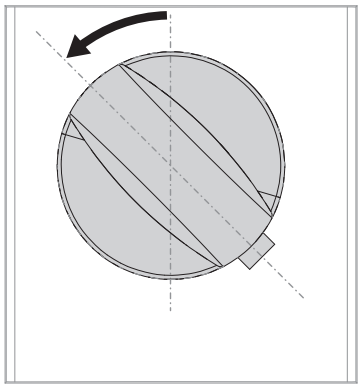
Internal backfeed protection for Mains and Auxiliary Mains.

The Q1 Mains switch and the Q4 Auxiliary Mains switch have an integrated trip coil directly controlled from the UPS.



Q1 Mains switch with integrated trip coil.

Q4 Auxiliary Mains switch with integrated trip coil.

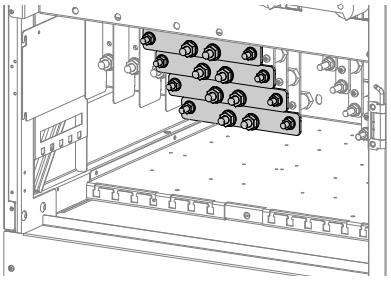
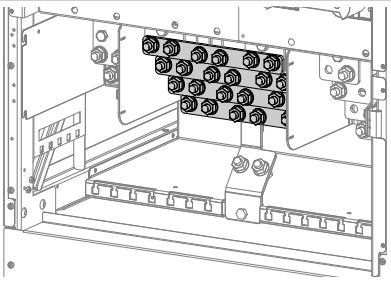


TRIPPED

TRIPPED POSITION for **Q1** or **Q4** when backfeed alarm occurs.

To reset, turn to **OFF** position and then **ON** to restart.

11.10 Kit For Common Mains

UPS	
80 kVA	
120 kVA	

11.11 External Maintenance Bypass

The external maintenance bypass is designed to provide maximum system availability for critical equipment. It offers the possibility of transferring the load to an alternative power path allowing full isolation of the UPS. In this case the UPS can be turned off and removed without power interruption at the connected loads.

For further information contact SOCOMEC.

11.12 External Isolation Transformer

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

- Refer to the relevant installation manual.
- See section on Electrical Installation for details about protection.
- 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 be operated without the neutral connection to the input.

For connection details refer to the transformer terminal board diagram.

11.12.1 IMD

IMD (Insulation Monitoring Device) is reccomended for IT systems.

11.13 Kit for Rectifier Neutral creation

For three wire input mains (without neutral) a neutral kit is available as an option. The neutral kit does not change the type of grounding system and it does not create galvanic insulation.

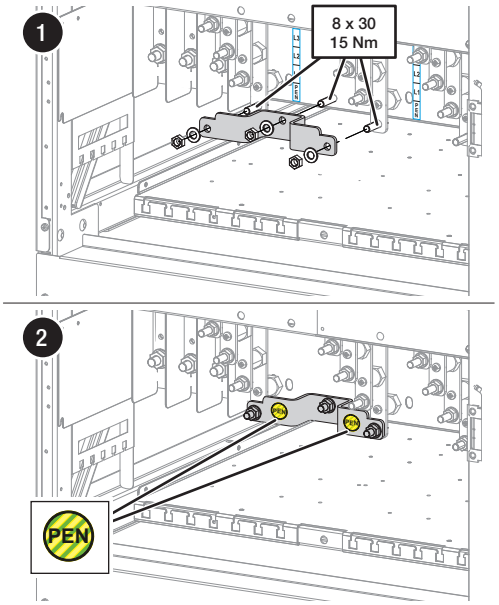
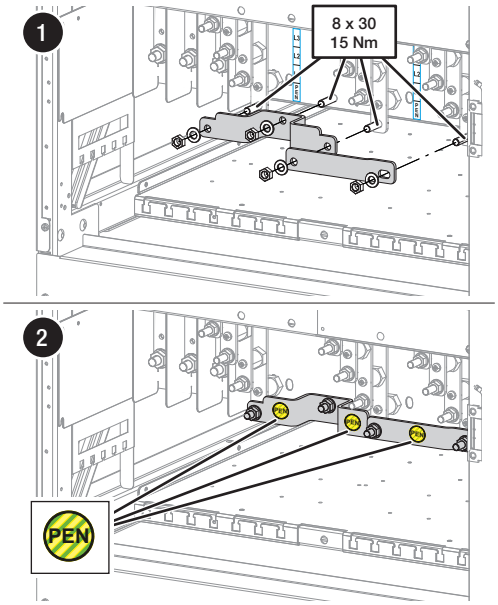
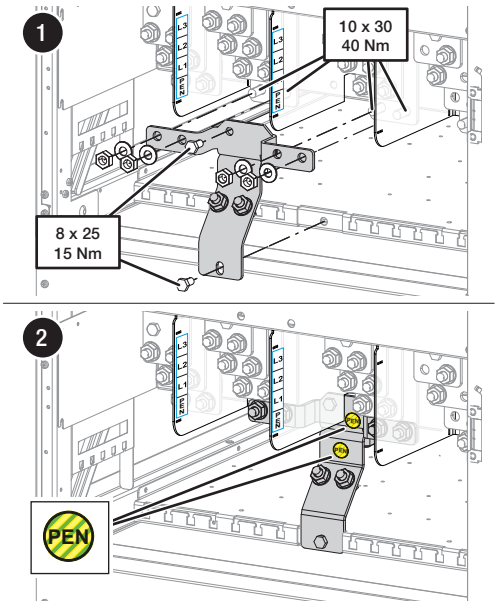
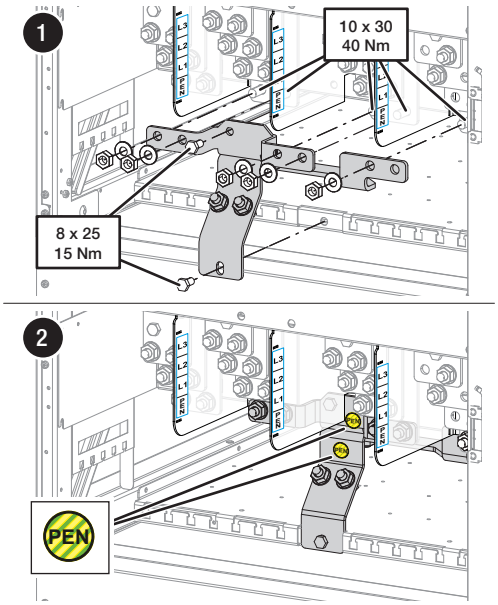
The input mains neutral bar is not available.

The input mains and auxiliary mains must be separate.
The auxiliary mains must always have a neutral wire.
The auxiliary mains neutral wire must be galvanically isolated from the PE.

11.14 Kit for TN-C / Neutral-Ground connection

To deal with different plant needs, a connection bar between Neutral and Protection Earth is available as an option (see figure). For further information contact SOCOMEC.

⚠	The UPS does not ensure continuity of the neutral conductor. The output neutral must not be used as a PEN connection for the load.
⚠	A PEN conductor is prohibited in the case of unbalanced and third harmonic current circulation.

UPS	TN-C-S connection	TN-C connection
80 kVA		
120 kVA		

11.15 Cold start

During a prolonged mains failure the load is supplied by the UPS until the protection threshold is reached and the UPS switches off.

With the cold start option enabled, the user has 2 hours time to disconnect the non-essential load and restart manually the UPS (START PROCEDURE via HMI) directly in Stored Mode (battery mode) of operation (Cold Start) in order to supply the indispensable load by exploiting the available residual energy in batteries.

NO retry is possible after the first Cold Start procedure.

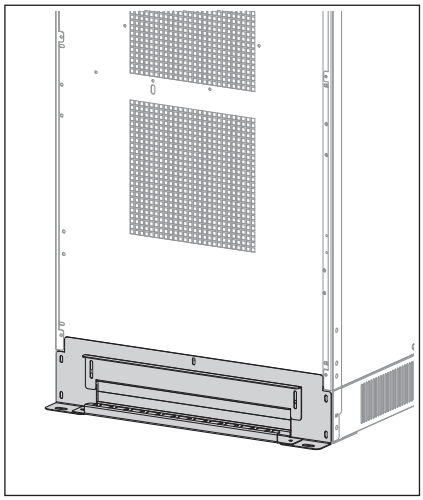
Note:
This option can only be used for single UPS setups, not parallel configurations.
For more information contact Socomec.

11.16 Redundant Bypass Ventilation

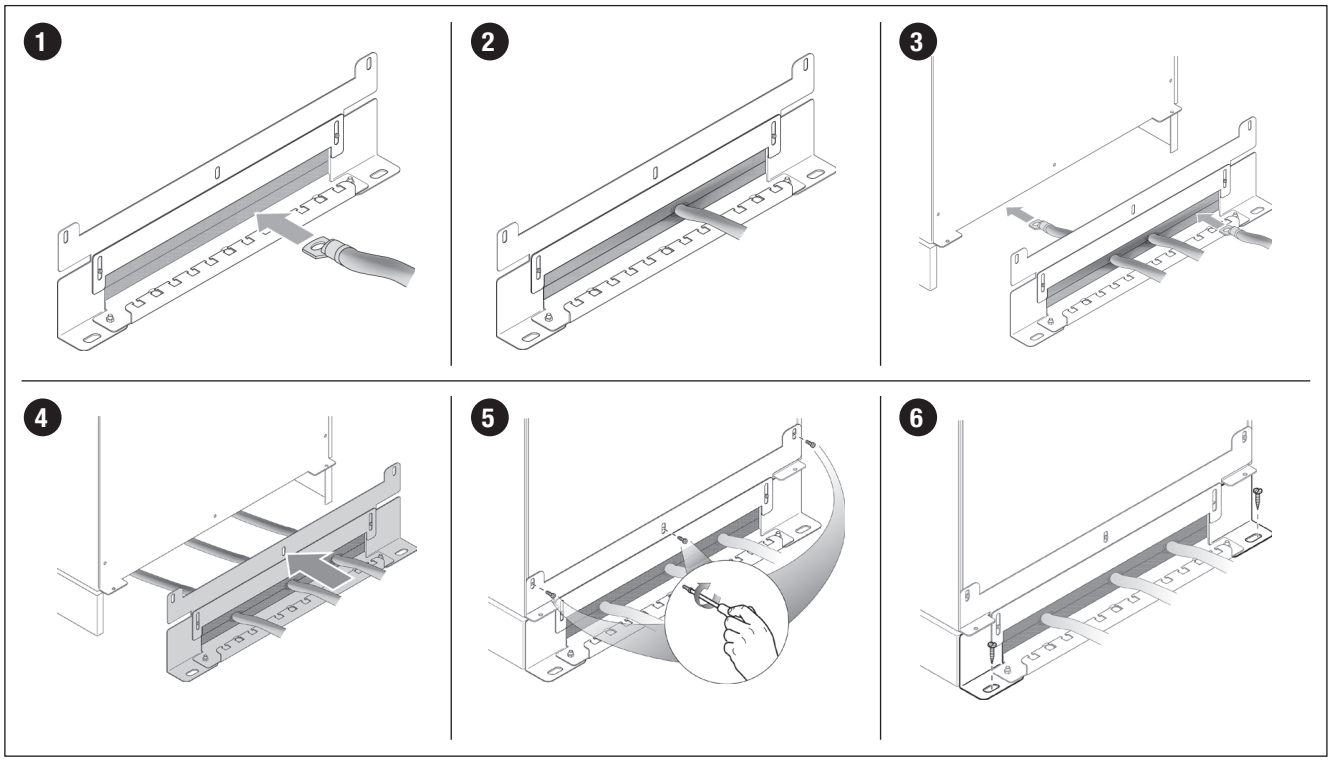
Redundant ventilation is available as an option to improve the reliability of the Bypass subset.

For further information contact SOCOMEC.

11.17 Anti-vermin protection



NOTE!
The cables coming from the rear of the unit must pass through the appropriate gap.
This operation must be carried out:
- before wiring operations;
- before securing the kit to the unit and the floor.



12. 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 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 'Menu' chapter.

For other alarms that may appear please contact the Service Dept.

12.1 System alarms

A000	IMMINENT STOP	An imminent stop is about to happen. In few minutes the UPS will be shut down. This can be caused by a critical alarm or a user request.
A001	OVERLOAD ALARM	The load is exceeding the UPS power specification. The machine will turn off. Reduce the load immediately.
A002	AMBIENT TEMPERATURE ALARM	Environmental temperature is too high. UPS functionality may be affected, if the condition last for prolonged time.
A003	TRANSFER LOCKED	The UPS is unable to transfer the load between bypass and inverter.
A004	TRANSFER IMPOSSIBLE	Bypass is not available.
A005	INSUFFICIENT RESOURCES	Some components are not operational.
A007	OUTPUT SHORT CIRCUIT DETECTION	A short circuit is detected on the output. Please contact the Service Dept.
A008	ECO MODE DISABLED BY UPS	Eco mode is disabled due to bypass failure.
A012	MAINTENANCE ALARM	UPS needs routine maintenance. Please contact the Service Dept.
A013	REMOTE SERVICE ALARM	UPS needs immediate maintenance. Please contact the Service Dept.
A014	REMOTE SERVICE PREVENTIVE ALARM	A non-critical alarm is present. Please contact the Service Dept.
A015	GENERAL ALARM	An alarm is present.
A016	BATTERY DISCONNECTED	The battery is not connected to the UPS.
A017	BATTERY DISCHARGED	The battery charge level is below the minimum value.
A018	END OF BACK-UP TIME	Supply from batteries is close to finishing.
A019	OPERATING ON BATTERY	The UPS is running on battery. Load is supplied by batteries.
A020	BATTERY TEMPERATURE ALARM	Battery temperature is greater than the threshold. If temperature is measured using ADC+SL, verify NTC is still connected, otherwise, check the internal UPS temperature.
A021	BATTERY ROOM ALARM	The battery cabinet temperature is too high.
A022	BATTERY TEST FAILED	The battery has failed the last battery test.
A026	INSULATION FAULT	There is an insulation problem with the plant. Verify input from ADC+SL.
A027	BATTERY ALARM	A battery alarm is present. Maximum recharging time at two levels, or slow discharging time protection has occurred.
A032	RECTIFIER CRITICAL ALARM	There is a problem with the rectifier. Please contact the Service Dept.
A033	RECTIFIER PREVENTIVE ALARM	There is a non-critical problem with the rectifier. Check the fans are working properly. Please contact the Service Dept.
A035	RECTIFIER INPUT SUPPLY NOT OK	The input mains supply is out of tolerance. Verify that the input voltage and frequency are within the UPS ratings.
A037	CHARGER CRITICAL ALARM	There is a problem with the battery charger. Please contact the Service Dept.

A038	CHARGER PREVENTIVE ALARM	Battery charger was blocked by a critical alarm, or Battery Voltage is too low after 16 hours of charging.
A040	INVERTER CRITICAL ALARM	There is a problem with the inverter. Please contact the Service Dept.
A041	INVERTER PREVENTIVE ALARM	There is a non-critical problem with the inverter. Check the fans are working properly. Please contact the Service Dept.
A043	INVERTER IMMINENT STOP	Imminent redundancy was lost due to overload, unit imminent stop, etc.
A048	BYPASS CRITICAL ALARM	There is a problem with the bypass. Please contact the Service Dept.
A049	BYPASS PREVENTIVE ALARM	There is a non-critical problem with the bypass. Please contact the Service Dept.
A050	BYPASS INPUT SUPPLY NOT OK	The auxiliary supply is out of tolerance. Verify that the input voltage and frequency are within the UPS ratings.
A051	PHASE ROTATION FAULT	The auxiliary mains is not connected properly. Please check phase connection order is correct.
A052	BYPASS BACK-FEED DETECTION	There is a backfeed problem with the bypass. Please contact the Service Dept.
A054	FAN FAILURE	Fan Failure can generate overheating. Please contact the Service Dept.
A055	ACS ALARM	Communication between ACS and Inverter is lost.
A056	MAINTENANCE BYPASS ALARM	Output and Maintenance ByPass switches are closed at the same time.
A057	INTERNAL BACKFEED DETECTION	There is a backfeed problem with the rectifier. Please contact the Service Dept.
A059	UPS POWER OFF	The UPO emergency input on ADC+SL has been activated.
A060	WRONG CONFIGURATION	UPS is not configured properly. Please check the configurations or contact the Service Dept.
A061	INTERNAL / COMMUNICATION FAILURE	The internal communication between UPS sub-system is lost. Please contact the Service Dept.
A062	OPTION BOARD ALARM	There is a communication problem with the option board. Please contact the Service Dept.
A063	SPARE PARTS NOT COMPATIBLE	Spare parts are not registered on the UPS or are not compatible.
A092	OVERLOAD PRE ALARM	Inverter is handling up to 120% of the nominal load when UPS is working on battery. (Unlike alarm A001, this warning will not turn OFF the load).
A093	BATTERY VOLTAGE OUT OF RANGE	Wrong battery connection or battery polarity inversion.
A094	BATTERY CHARGER FAILURE	Failure in battery charger; no charge current, although input mains is OK.
A095	BAT. DEEP DISCHARGE PROTECTION INITIATED	Minimum battery threshold voltage has been reached during the last battery discharging (reset alarm command needed).

12.2 System status

S002	LOAD SUPPLIED BY AUTOMATIC BYPASS	Load on bypass, supplied by auxiliary mains. Load not protected.
S018	EXTERNAL MAINTENANCE BYPASS CLOSED	External maintenance bypass input is closed.
S023	GEN SET ON	Genset input. Verify input from ADC+SL.
S064	CARD IN SLOT 1 PRESENT	
S065	CARD IN SLOT 2 PRESENT	
S068	CARD IN SLOT 3 PRESENT	

13. PREVENTIVE 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.

13.1 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.

Expected battery lifetime 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 must be placed in appropriate containers to avoid acid leakage. They should only be entrusted to a specialist waste disposal company.

13.2 Fans & capacitors

The lifespan of consumable parts such as fans and capacitors (AC and DC) depends on whether or not the 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	7

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

14. SAFEGUARDING THE ENVIRONMENT

Do not dispose of electrical appliances with normal waste, use separate collection facilities.

Follow local council waste regulations for proper disposal arrangements to reduce the environmental impact of waste electrical and electronic equipment or contact your local government for information regarding the collection arrangements available.

If electrical appliances are disposed of in landfills or dumps, hazardous substances can leak into the groundwater and get into the food chain, damaging health and wellbeing. Depleted batteries are considered as toxic waste. When battery replacement becomes necessary, only give rundown batteries to certified and licensed waste disposal companies. In accordance with local legislation, it is prohibited to dispose of batteries together with other industrial waste or household refuse.

The crossed-out trash bin symbol is placed on this product to encourage users to recycle components and units whenever possible. Please be environmentally responsible and recycle this product through your recycling facility at the end of its lifetime.

For any questions regarding the disposal of the product, contact local distributors or retailers.

In case of product with incorporated battery, please use the proper recycling.

15. TECHNICAL SPECIFICATIONS

Models			MASTERYS EM+	
			80 kVA	120 kVA
Input/Output phases		kVA	3/3	
Electrical specifications - Input				
Mains voltage		Vin	3ph + N 400 Vac (-10/+20%) up to -40% @ 70% of nominal load	
Input frequency		Hz	50-60 ±10%	
Input power factor			≥ 0.99	
Current distortion (THDi)			≤ 3% (@: Pn, Resistive load, Mains THDv ≤ 1%)	
Electrical specifications - External battery				
Battery voltage range		V bat	from +/- 200[2] up to +/- 330[3]	
Electrical specifications - Output				
Output voltage		V	3Ph+N 380/400/415 V ±1%	
Output frequency		Hz	50-60 Hz (selectable) ±0.01%	
Sn - Nominal apparent power		kVA	80	120
Pn - Nominal active power		kW	72	108
Pn - Nominal active power (according to EN 50171)		kW	72	108
Max active power (according to EN 50171)[4]		kW	86.4	129.6
Overload (@ 25 °C; Vin > 380)[1]	10 minutes	kW	90	135
	1 minute		108	162
Crest factor			≥ 2.7	
Voltage distortion (THDv)			≤ 1% (@: Pn, Resistive load) ≤ 5% (@: Sn, non-linear load)	
Discrimination	Curve B breaker	A	40	63
	Curve C breaker	A	20	32
Electrical specifications - 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)	
Environment				
Operating temperature		°C	0-35 (15-25 recommended)	
Storage temperature		°C	-5 to 50	
Relative humidity		%	up to 95% (condensation-free)	
Max. altitude		m	1000 (without derating)	
Acoustic noise (@ 70% Pn)		dBA	< 53	< 53
Cooling type			Air cooling	
Required cooling capacity		m^3/h	480	1080
Dissipated power max at Pn nominal condition		W	3550	5325
		kcal/h	3052	4579
		BTU/h	12120	18180
Dissipated power max at Pn worst condition		W	3860	5790
		kcal/h	3319	4979
		BTU/h	13179	19768

Models			MASTERYS EM+	
			80 kVA	120 kVA
Standards				
Safety			EN/IEC 62040-1	
Type and performance			EN/IEC 62040-3, EN 50171	
EMC			EN/IEC 62040-2	
Product certification			CE - UKCA	
Protective class			Protective Class I	
Touch current			< 1 mA	
Protection level			IP20; IP21 (option)	
Mechanical characteristics				
Colour			RAL 7016	
Dimensions *Models with external batteries*	Width	mm	600	
	Depth	mm	855	
	Height	mm	1400	
Weight		kg	186	240

1. Initial Condition Pout ≤ 80% Pn.

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

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

4. On battery mode the inverter is capable of permanently handling 120 % Pn.

15030325

Sales offices

CORPORATE HQ CONTACT:
SOCOMEC SAS,
1-4 RUE DE WESTHOUSE,
67235 BENFELD, FRANCE

www.socomec.com

553306A-EN 03.2025

socomec
Innovative Power Solutions