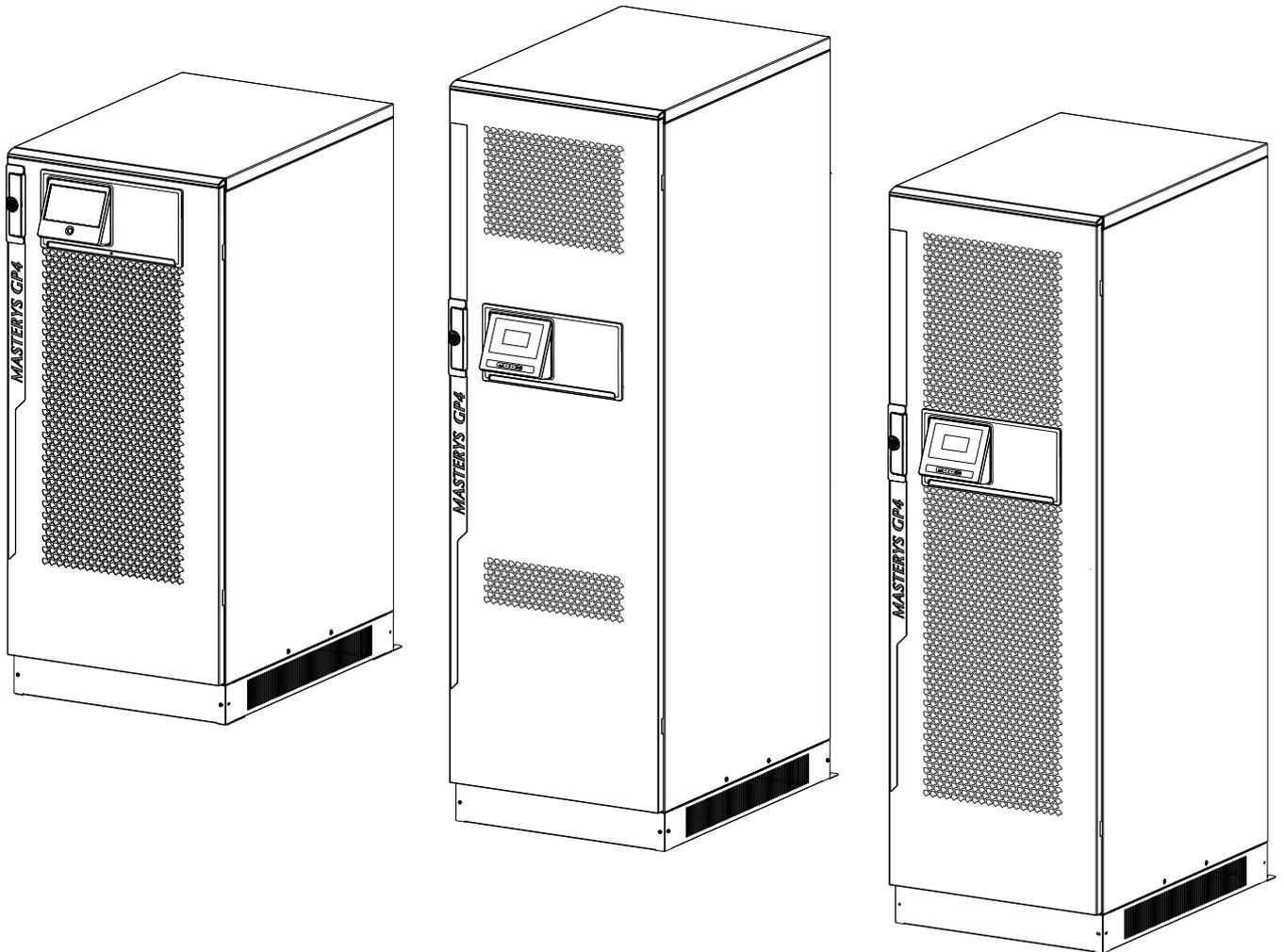


MASTERYS GP4

60-250 kVA



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This Safety Information is to be retained for future reference.



Reference security information is in English.



For other languages please contact Socomec or local distributor.



The manufacturer will not be held liable for failure to follow the instructions in this manual which is also available at www.socomec.com

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This Application is meant to support the User when installing the relevant SOCOMEC products in tutoring the installation step by step. The Application shall in no way substitute the installation and user manual provided with this SOCOMEC product, which remains the sole accurate instructions in terms of safety, handling, connection and use of SOCOMEC products.

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1. CERTIFICATE AND CONDITIONS OF WARRANTY

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

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

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

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

The warranty shall not apply in the following cases:

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

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

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

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

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

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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.

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! Before carrying out any operations on the unit read the installation and operating manual carefully. Keep this manual safe for future reference.
	NOTE! Any work carried out on the equipment must be performed by skilled, qualified technicians.
	NOTE! The models are not available for all markets. Contact Socomec for further information.
	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 allow access to handling devices and guarantee sufficient ventilation (refer to 'Environmental requirements and handling' 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.
	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! Installing the equipment correctly guarantees the IP20 protection level
	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.

	<p>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:</p> <ul style="list-style-type: none"> • Remove watches, rings or metal objects. • Use tools with insulated handles. • Wear rubber gloves and boots. • Do not lay tools or metal parts on top of the batteries. • Disconnect the charging source prior to connecting or disconnecting battery terminals. • Determine if battery is inadvertently grounded. If inadvertently grounded, remove source from ground. Contact with any part of 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 not having a grounded supply circuit).
	<p>CAUTION! Do not open or mutilate batteries. Released electrolyte is harmful to the skin and eyes. It may be toxic.</p>
	<p>CAUTION! Do not dispose of batteries in a fire. The batteries may explode.</p>
	<p>WARNING! Care shall be taken not to wear clothes and footwear which may build up electrostatic charge. Absorbing cloth moistened only with water shall be used for battery cleaning. Other cleaning agents may result in built up of static charge or may damage the battery cases.</p>
	<p>NOTE! Only use accessories recommended or sold by the manufacturer.</p>
	<p>NOTE! Batteries must only be replaced with batteries recommended or sold by the manufacturer. Batteries must only be replaced by qualified technicians.</p>
	<p>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 system where 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.</p>
	<p>WARNING! This is a product for commercial and industrial application in the second environment installation restrictions or additional measures may be needed to prevent disturbances.</p>

Safety requirements for secondary batteries, battery installations and backfeed protection as well.

	<p>The installer is responsible for ensuring that the battery installation and their operating environment conform to national and international codes and safety standards.</p>
	<p>The installer is responsible for implementing the backfeed protection with the use of AC input line insulation devices external to the UPS and add the provided warning labels 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. Refer to 'Electrical requirements' chapter.</p>

2.1 Description of symbols

Symbols	Description
	Protective earth terminal (PE).
	Authorized 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

	<p>NOTE! Before carrying out any operations on the unit read the 'Safety standards' chapter carefully.</p>
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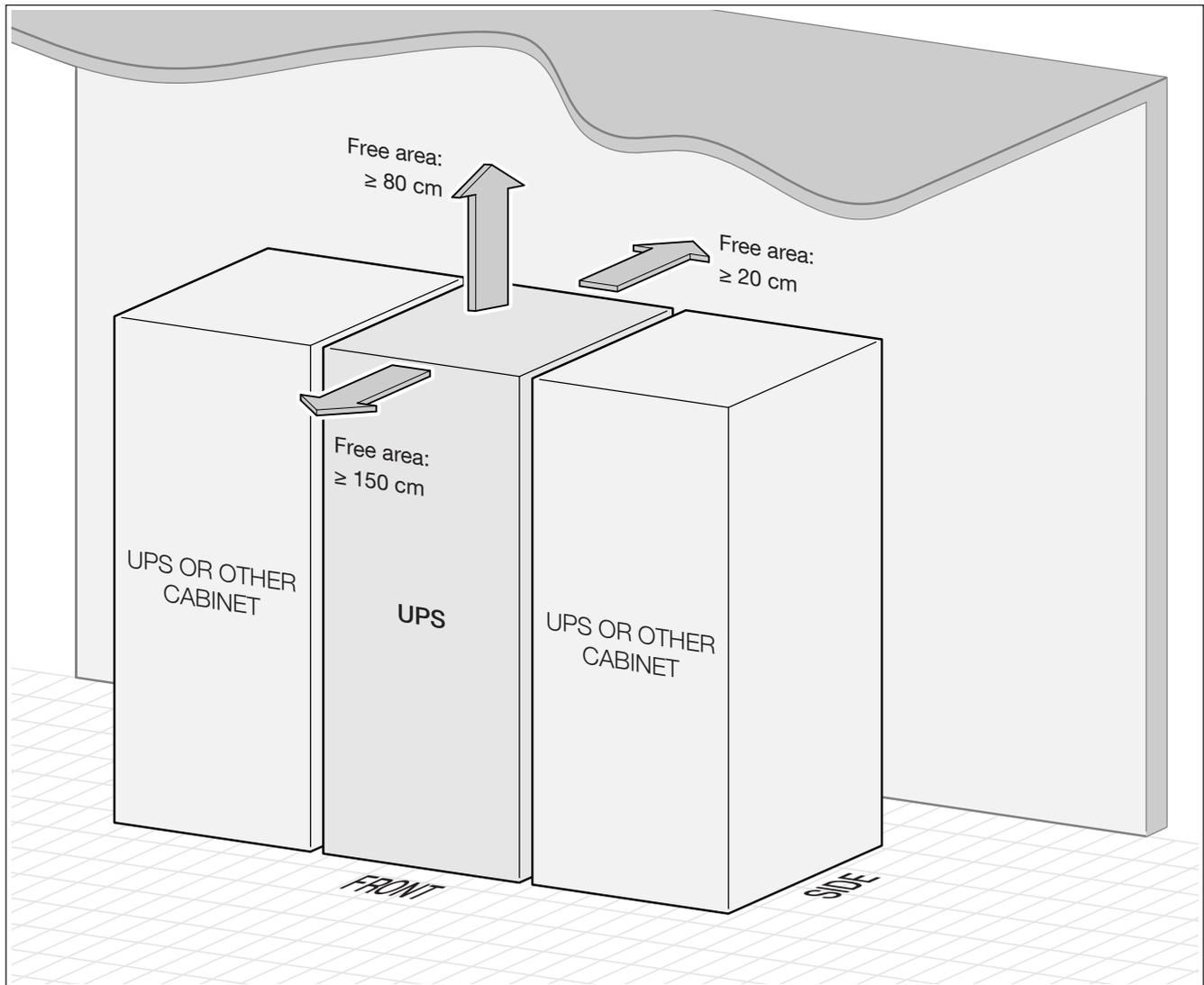
3.1 Environmental requirements

	<p>The area must be of a suitable size, not exposed directly to sunlight. The floor must support the weight of the unit and guarantee its stability.</p>
	<p>Factory packaging, wrapping and debris shields of the equipment should not be removed until the equipment is ready to be installed in the dedicated installation area.</p>
	<p>Equipment should be placed in an indoor, dry, clean, ventilated area, in a temperature and humidity-controlled environment. The area must be protected from dampness, water, changes in temperature, dust, dirt, rubble, paint, conductive particles, corrosive atmosphere, chemical agents and gases.</p>
	<p>The area should have a plan for condensation and environmental control and mitigation prior to the equipment's arrival.</p>
	<p>Avoid any presence of mechanically active substances, that cause mechanical wear and abrasion in electronic boards, cooling reduction and short circuits.</p>
	<p>The combination of high humidity, pollution and chemical gases could trigger failure mechanisms related to corrosion, short circuits, and intermittent connections. Air-side economizers increase the reliability risk in the air-conditioned area, in which supplemental real-time monitoring is recommended to enable quick reaction to outdoor events.</p>
	<p>The gases that react with silver and copper are extremely dangerous for electronic components, causing a fast reduction of the UPS lifetime and reliability. When the gas presence is unknown, reactive monitoring or real time monitoring is suggested.</p>
	<p>Exceeding the maximum admitted ambient temperature condition of the UPS will result in over-temperature alarms, transfers to bypass, and possible product lifetime reduction. A safe humidity level of 50% is recommended in the warehouse and in the installation area, especially when the load is variable and drops below 15%.</p>

3.2 Room positioning

For information regarding ambient temperature, dimensions and weights refer to the 'Technical specifications' chapter. The connections need to be accessible from the rear; a space of at least 1.5 meters 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, if necessary.

A space at least 20 cm must be left at the back for adequate ventilation (see figure).



3.3 Handling

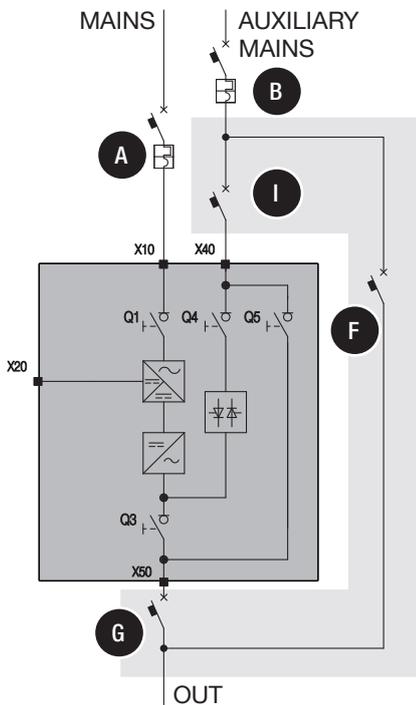
- The packaging guarantees the stability of the unit during shipping and physical transfer.
- The unit must remain in a vertical position during all shipping and handling operations.
- Ensure that the floor is strong enough to support the weight of the unit.
- Carry the packaged unit as close as possible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

4. ELECTRICAL INSTALLATION

4.1 UPS single configuration

4.1.1 Mains and Auxiliary mains connected separately (with external batteries)

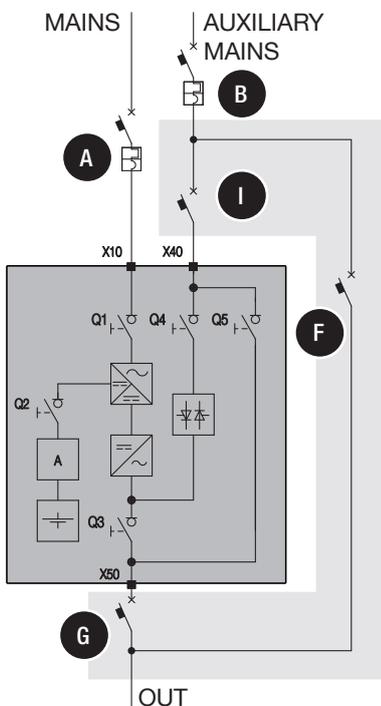


KEY

- 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.

4.1.2 Mains and Auxiliary mains connected separately (with internal batteries)



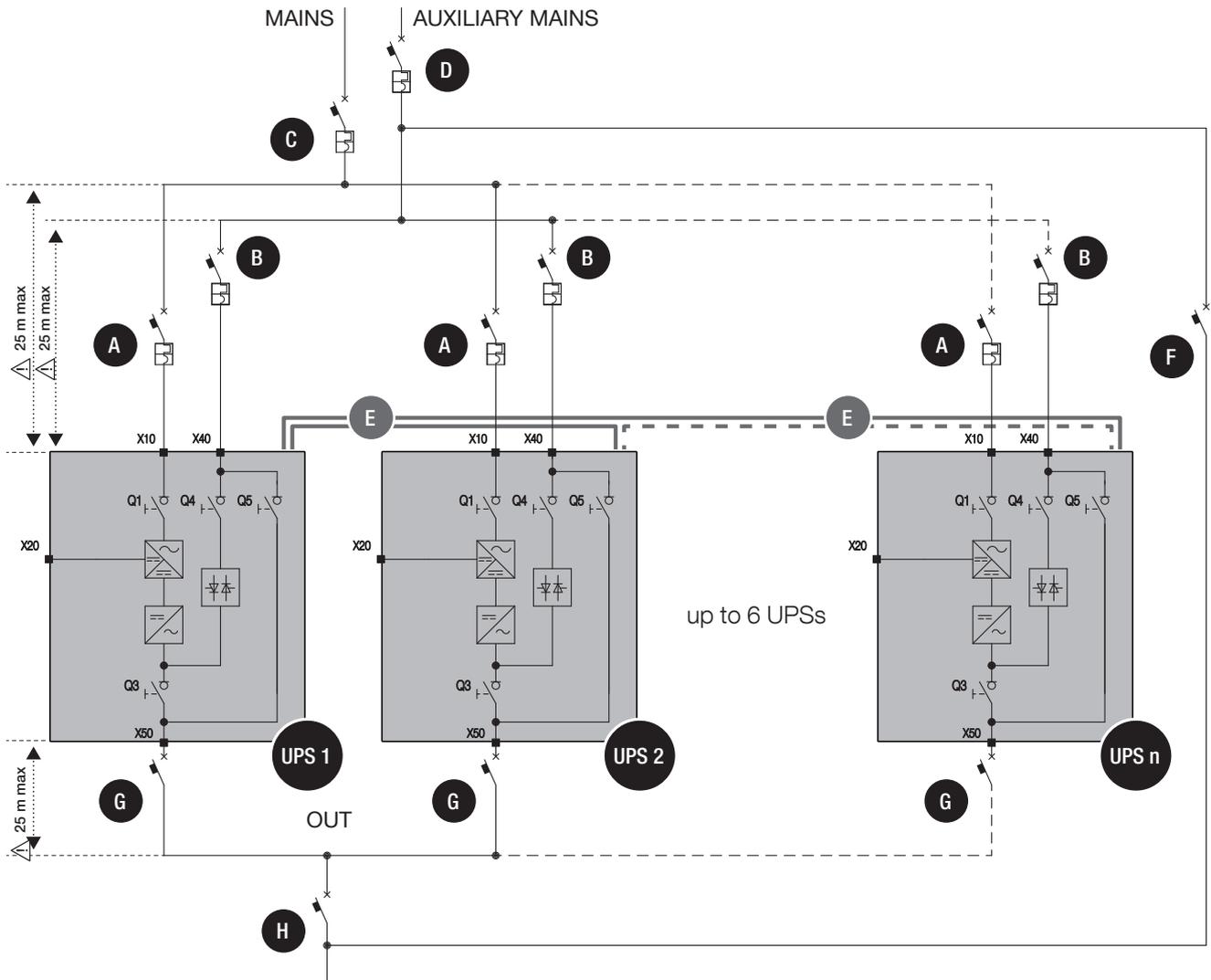
KEY

- A** Input mains thermal-magnetic circuit breaker.
- B** Auxiliary mains thermal-magnetic circuit breaker.
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- 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 UPS Parallel configuration

4.2.1 Mains and Auxiliary mains connected separately (with external batteries)



KEY

- | | | | |
|----------|--|----------|---|
| A | Unit Input mains thermal-magnetic circuit breaker. | E | Parallel bus cable. |
| B | Unit Auxiliary mains thermal-magnetic circuit breaker. | F | External maintenance bypass switch ⁽¹⁾ . |
| C | Input mains thermal-magnetic circuit breaker. | G | Unit output switch ⁽²⁾ . |
| D | Auxiliary mains thermal-magnetic circuit breaker. | H | System shutdown switch ⁽³⁾ . |

1. If an external maintenance bypass switch **F** is present, it is advisable to connect a normally closed early make contact from the switch to the parallel board of the concentrator unit.
2. If unit output switches **G** are present, it is advisable to connect a normally open early break contact from the switch to the unit's parallel board.
3. If a system shutdown switch **H** is present, it is advisable to connect a normally open early break contact from the switch to the parallel board of the concentrator unit.

4.2.2 Parallel setup rules

In order to achieve the best performance in a parallel configuration ensure that the mains input, output and auxiliary input cables:

- Have the same length (maximum length range is $\pm 5\%$).
- Are as short as possible.
- Are not longer than 15 metres.
- Are arranged evenly and not wrapped in coils. Cabling must be the same for each UPS in parallel.

	WARNING! In a parallel system it is necessary to oversize the auxiliary input cables at least 20% more than the rated value, due to the auxiliary input current balance tolerances.
	Only units with the same power rating (nominal apparent power and nominal active power) can be connected in parallel. See chapter 15

4.2.3 Control connections

Control cables **E** are required for units connected in a parallel configuration.

The control cables are supplied with the UPS in the case of standard parallel arrangements, or attached to the parallel kit if the system is upgraded at a later date.

The control cables supplied allow a maximum distance of about 1-2 meter between the UPS units.

Furthermore, every individual unit must read the status of its output switch, and one of the two units, known as the concentrator, must read the status of the external manual bypass of the system **F** and the status of the output switch of the system **H**.

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

4.3 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 ⁽⁴⁾
	(kVA)	(A)				
		A	B	Selective type		Fuse type aR
Single unit	Parallel (n) (n=1 up to 6)					
3/3	60	125	160	0.5	0.5*n	160
	80	160	200	0.5	0.5*n	200
	100	250	250	0.5	0.5*n	250
	120	250	250	0.5	0.5*n	315
	160	315	400	0.5	0.5*n	400
	200	400	400	1	1*n	500
	250	450	450	1	1*n	630

Cable core size ⁽²⁾						
In/Out phase	Model rating	Input	Auxiliary	Output	Battery	
	(kVA)	(mm ²)				
		Max ⁽³⁾				
3/3	60	70 (M8)	70 (M8)	70 (M8)	70 (M10)	M10
	80	70 (M8)	70 (M8)	70 (M8)	70 (M10)	M10
	100	2 x 120 (M10)	2 x 120 (M10)	2 x 120 (M10)	2 x 120 (M10)	M10
	120	2 x 120 (M10)	2 x 120 (M10)	2 x 120 (M10)	2 x 120 (M10)	M10
	160	2 x 150 (M10)	2 x 150 (M10)	2 x 150 (M10)	2 x 150 (M10)	M10
	200	2 x 150 (M10)	2 x 150 (M10)	2 x 150 (M10)	3 x 150 (M10)	M10
	250	2 x 150 (M10)	2 x 150 (M10)	2 x 150 (M10)	3 x 150 (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. **For parallel configuration**, cables shall have the same size and length for each unit (maximum length tolerance is $\pm 5\%$).
3. Determined by the size of the terminals. The neutral conductor must not be dimensioned smaller than the phase conductor.
4. 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 = $3 I_n$ 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.

	<p>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. If RCD is installed the trigger value must be 0.5 A multiplied by the number of units connected in parallel.</p> <p>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.</p>
	<p>NOTE:</p> <p>To ensure the integrity of the 60-80 kVA bypass thyristors, I^2t must be lower than 120 kA²s and peak current must be lower than 5 kA for 20 ms.</p> <p>To ensure the integrity of the 100-250 kVA bypass thyristors, I^2t must be lower than 400 kA²s and peak current must be lower than 9 kA for 20 ms.</p> <p>Contact SOCOMEC for detailed information.</p>
	<p>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.</p>
	<p>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).</p>
	<p>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.</p>
	<p>NOTE: 3-Phase 4-Wire Input Power is required.</p> <p>The unit can be installed in TN-C, TN-S, TT and IT AC distribution systems (IEC 60364-3).</p>
	<p>In the standard configuration, the UPS does not modify the type of electrical supply system where it is connected. Then the same system will supply to both the load and the battery cabinets, if any.</p>

Additional requirements for parallel configuration

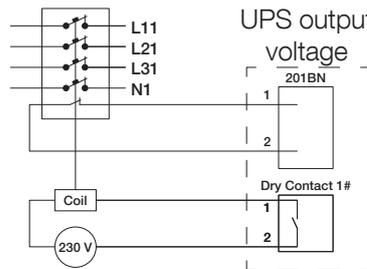
	<p>The UPS is designed for transient overvoltages in category II installations. If the UPS is part of a parallel configuration and the total output rated current is > 400 A, additional external protection must be provided.</p>
	<p>The phase rotation of auxiliary mains and output cables must be the same for each unit.</p>
	<p>System shutdown switch H should always be installed in the external distribution cabinet and recognised as an emergency shutdown switch (red handle). If this switch is far from the UPS or in another room a remote shutdown button shall be installed near the UPS.</p>
	<p>Before turning on an individual unit ensure that the relevant unit output switch G is closed.</p>
	<p>Before opening unit output switch G ensure that the relevant unit is turned off.</p>

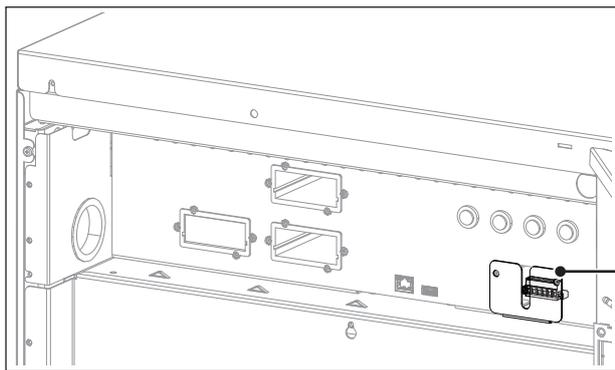
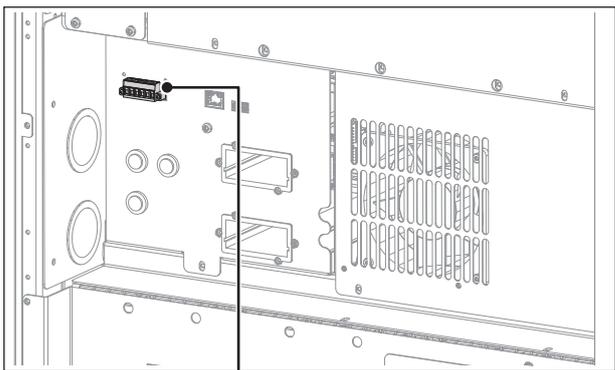
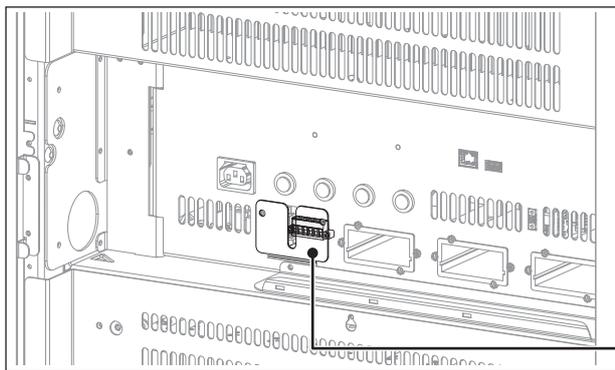
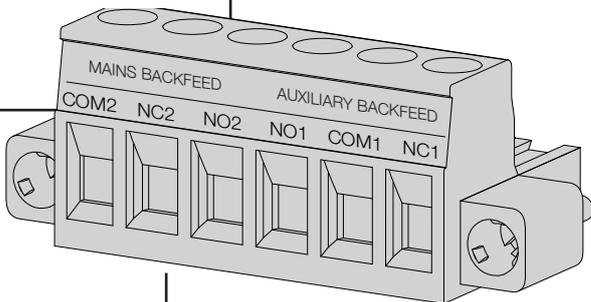
4.3.1 Backfeed protection

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.

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

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

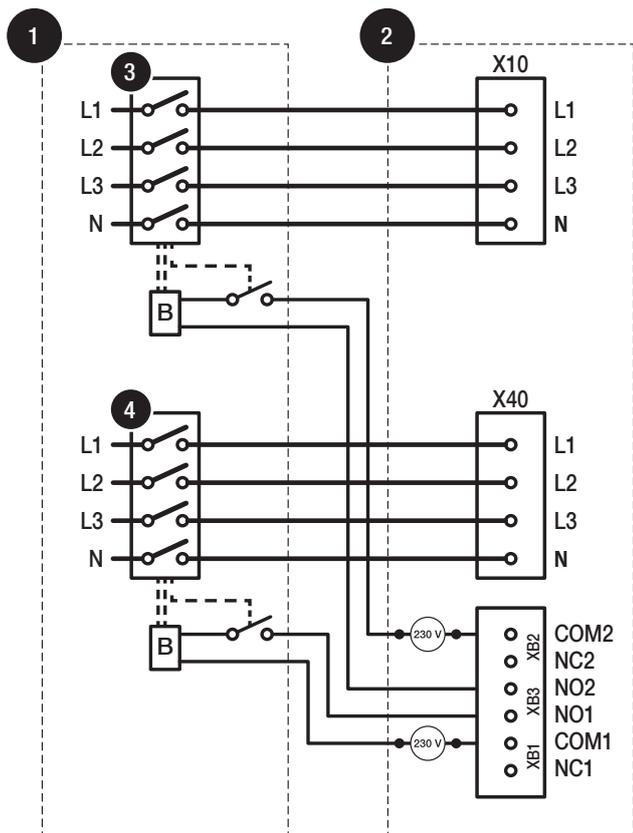
Backfeed trip coils supply	
<p>60-120 kVA — External batteries</p> 	<p>60-80 kVA — Internal batteries</p> 
<p>160-250 kVA — External batteries</p> 	

	<p>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.</p>
---	---

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.

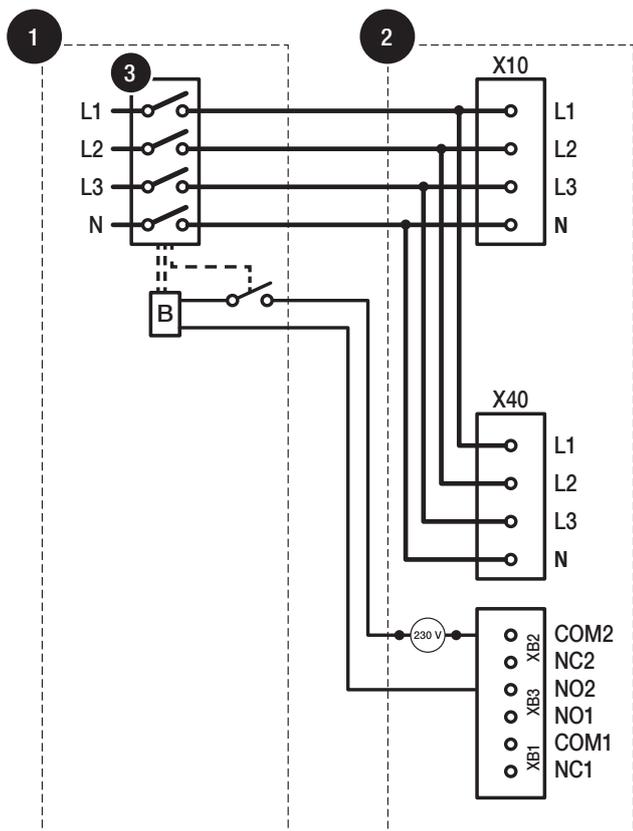


KEY

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.

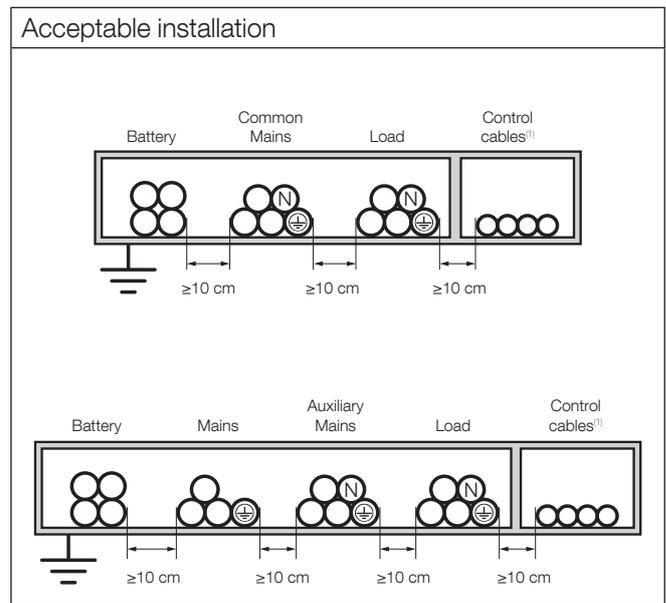
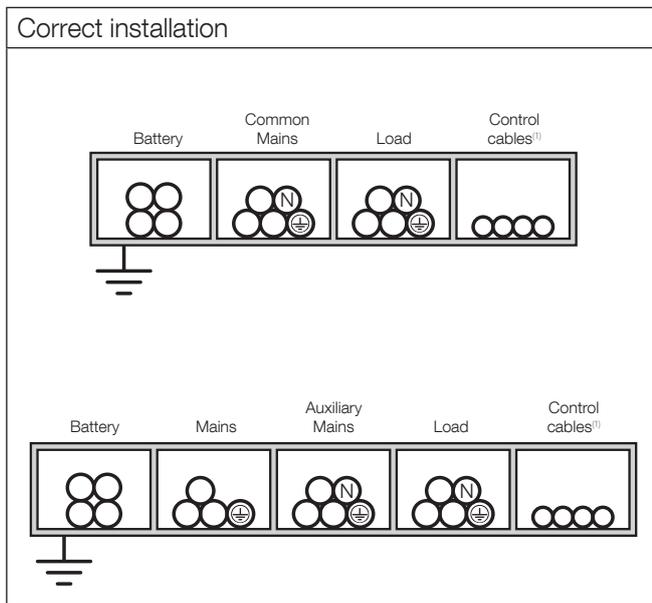


KEY

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

4.4 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.

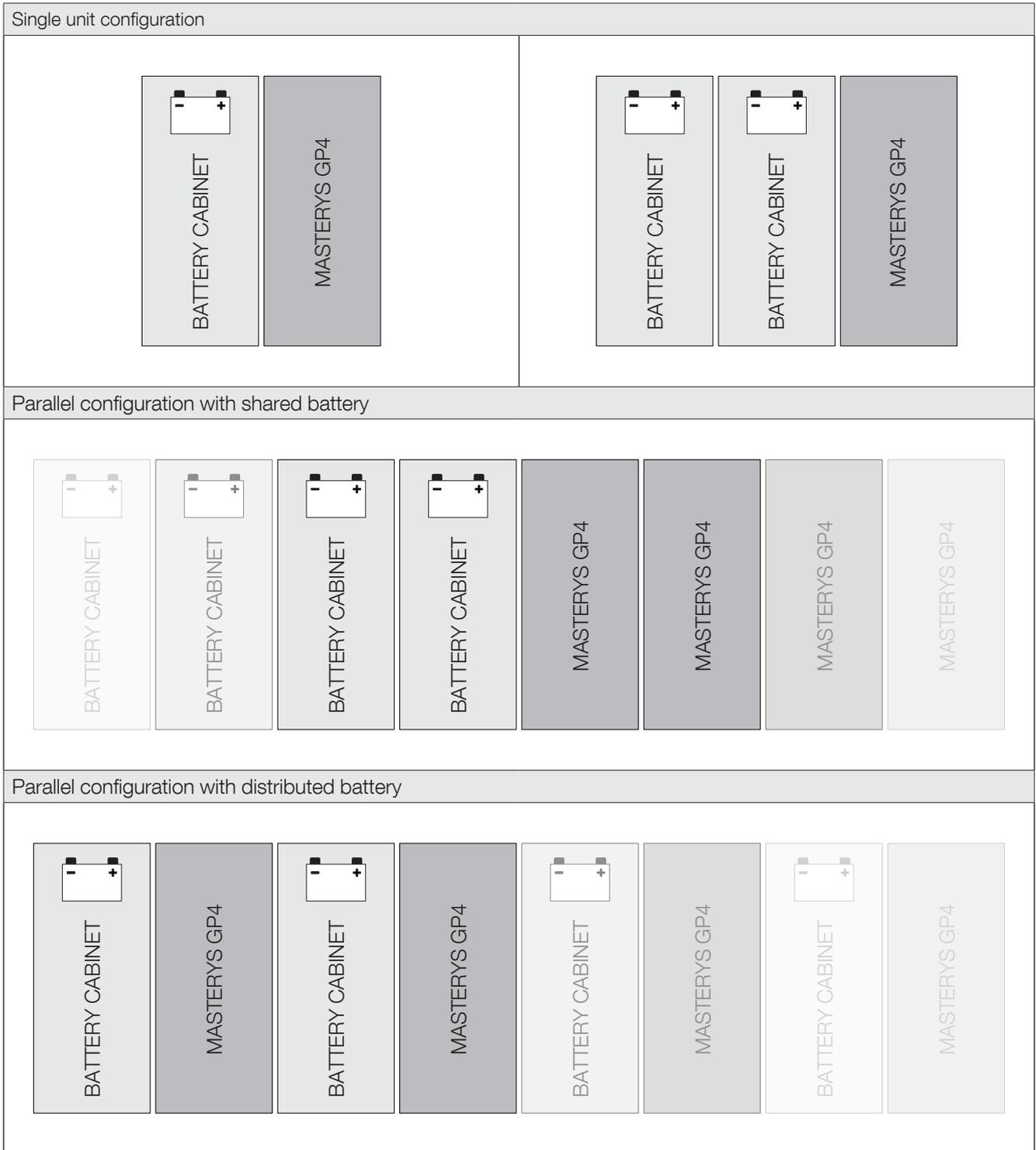


1. Control cables: connections between the cabinets and each unit, alarm signals, remote mimic panel, connection to the BMS (Building Management System), emergency stop, connection to generator.

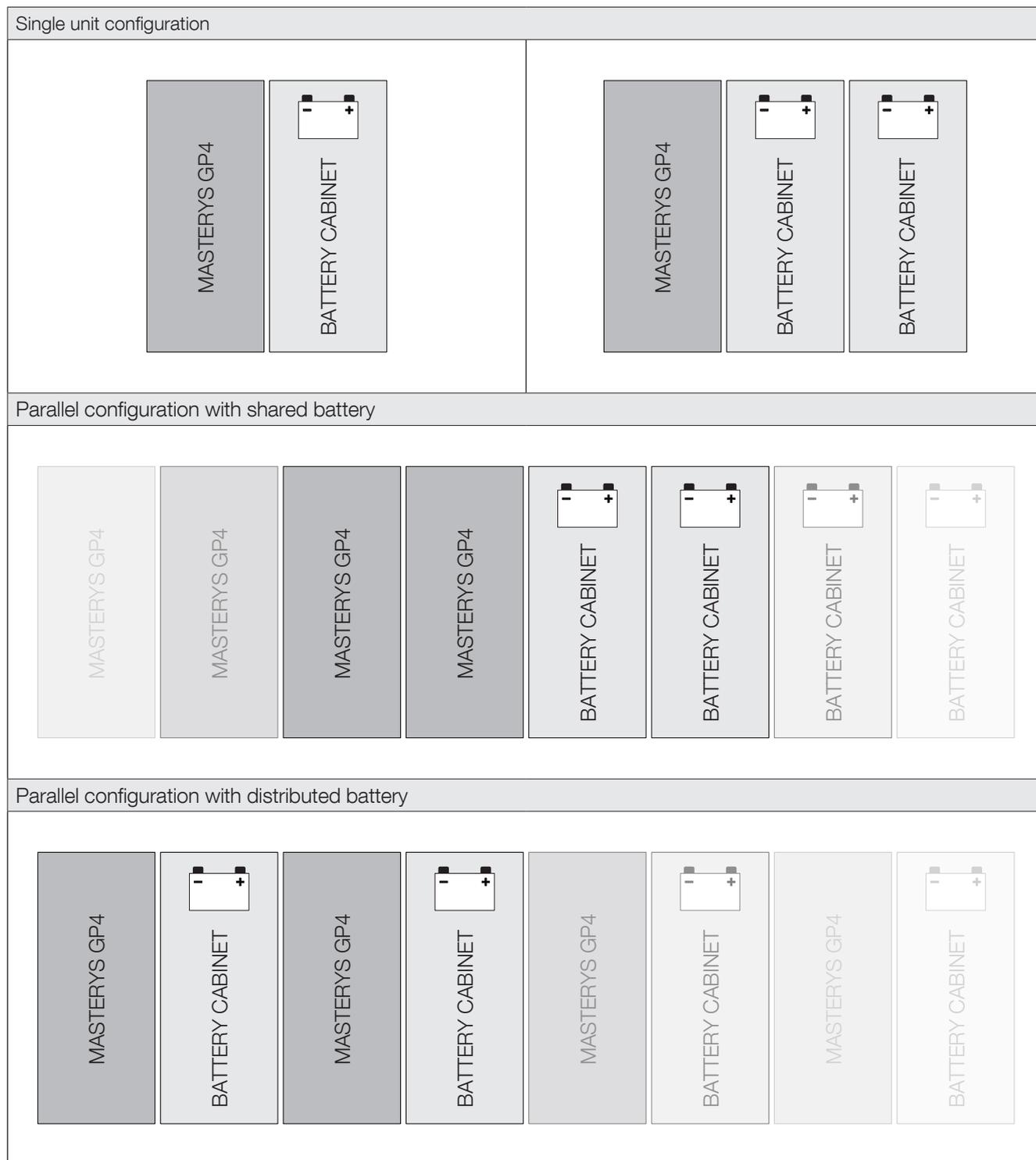
5. OVERVIEW

5.1 Recommended configurations

5.1.1 60-120 kVA with external battery cabinet



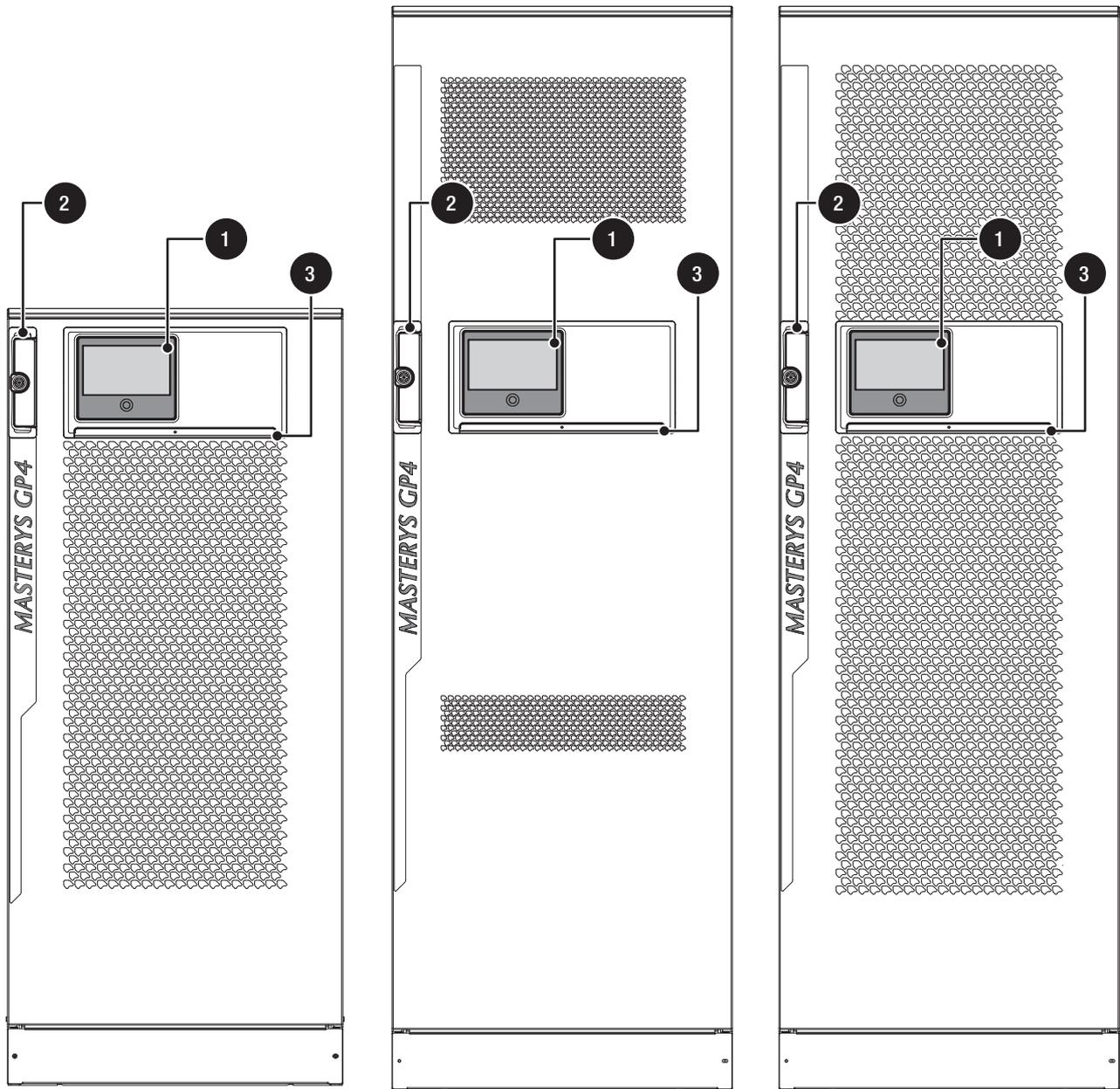
5.1.2 160-250 kVA with external battery cabinet



5.2 Front view

KEY

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



Model "M"

Model "T"

5.3 UPS switches

KEY

- Q1** Input switch (MAINS)
- Q2-1** Battery switch
- Q4** Auxiliary mains Input switch (AUXILIARY MAINS)
- Q2-2** Battery switch
- Q5** Maintenance bypass switch
- Q2-3** Battery switch
- Q3** Output switch
- Q2-4** Battery switch
- A** UPS connections

UPS kVA	In/Out phase	Battery type	Details
60-80	3/3	Internal battery	

UPS kVA	In/Out phase	Battery type	Details
60-120	3/3	External battery	
160-250	3/3	External battery	

5.4 Wiring diagram

KEY

X10 Input mains

X40 Auxiliary mains

X20 Battery

X50 Output

 PE

Q1 Input switch (MAINS)

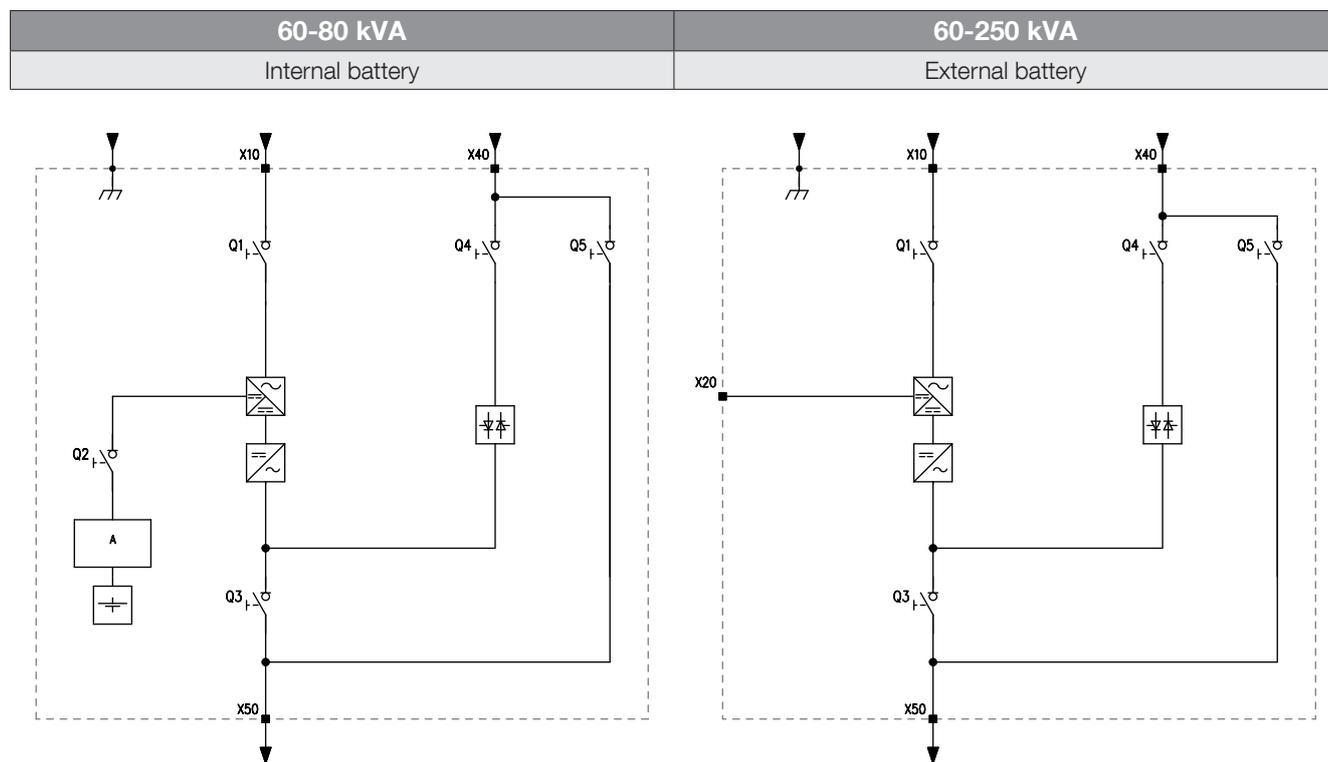
Q4 Auxiliary mains Input switch (AUXILIARY MAINS)

Q5 Maintenance bypass switch

Q2 Battery switch

Q3 Output switch

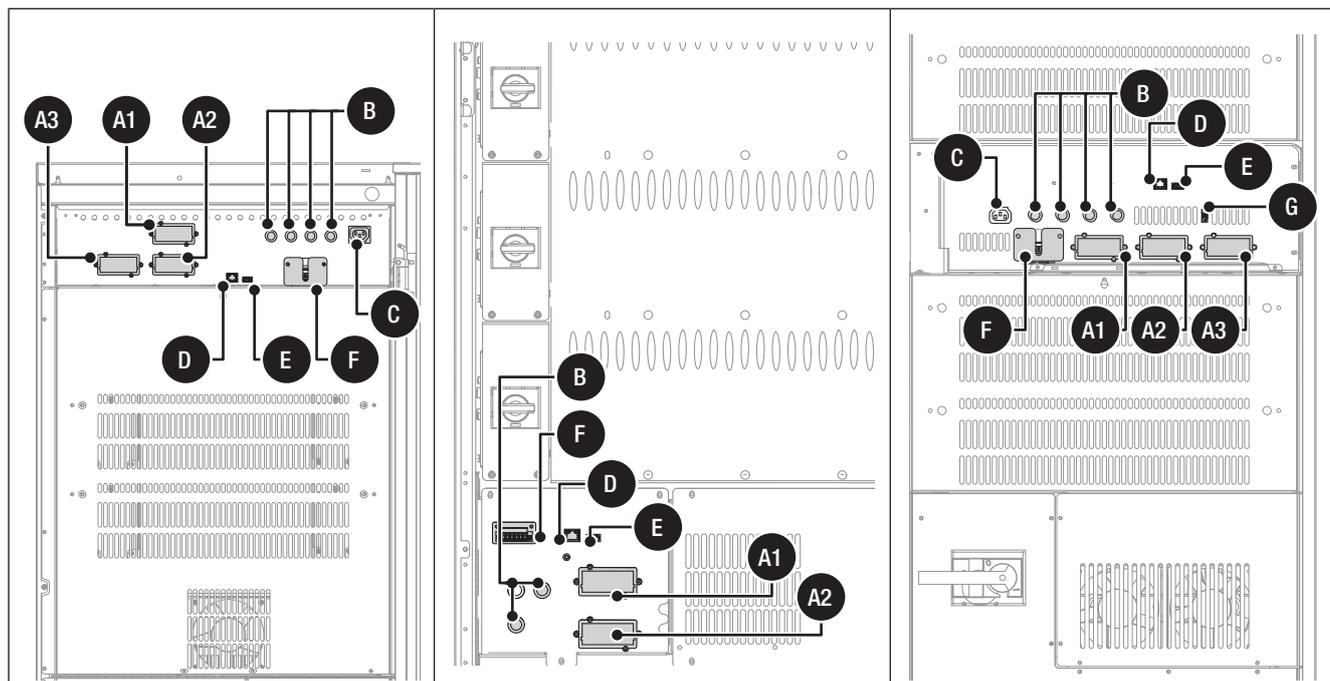
A Protection



5.5 Internal front view details

KEY

- | | |
|---|---|
| A1 Option slots 1 | D Ethernet network for service only |
| A2 Option slots 2 | E USB connector for service only |
| A3 Option slots 3 ¹ | F Backfeed card |
| B Fuses for service only | G External Maintenance Bypass for UPS single configuration only ² |
| C 230 V AC socket for service only | |



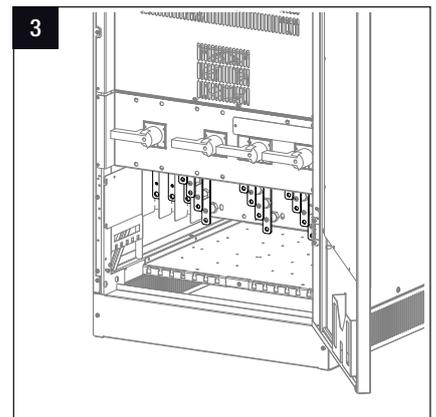
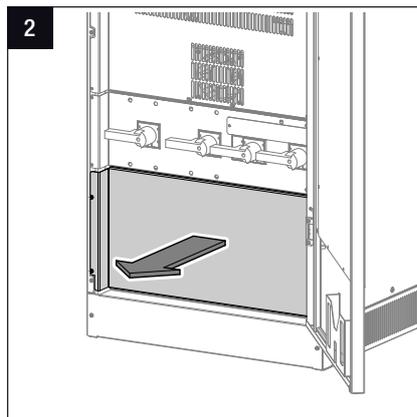
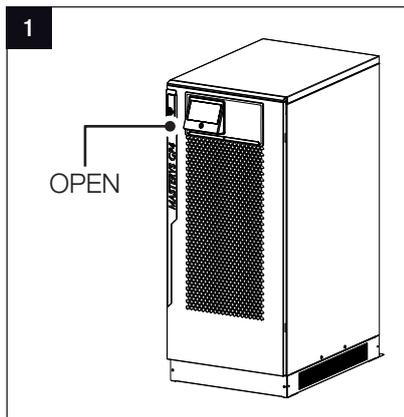
1. See 'Standard features and option' chapter.

2. Connect a normally-closed early make contact from the external maintenance bypass switch.

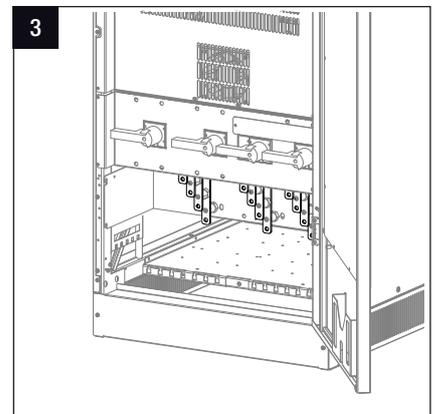
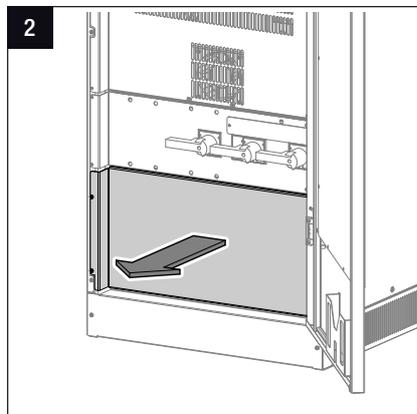
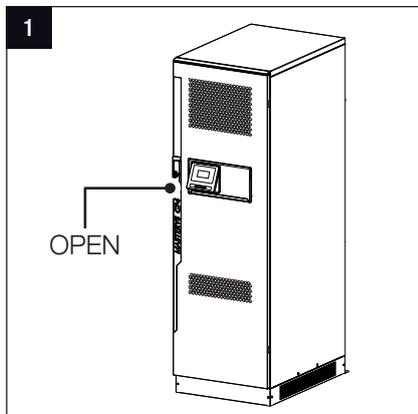
6. CONNECTIONS

	<p>NOTE! Before carrying out any operations on the unit read the 'Safety standards' chapter carefully.</p>
	<p>WARNING! Battery power terminals are supplied by external battery cabinet. Before working on this circuit ensure that:</p> <ul style="list-style-type: none"> • all the external battery cabinet switches are in OFF position; • the UPS is in maintenance bypass mode (refer to 'Operating modes' chapter) <p>Check for presence of voltage before operating.</p>
	<p>Use cables with tin-plated eyelets for the connections.</p>

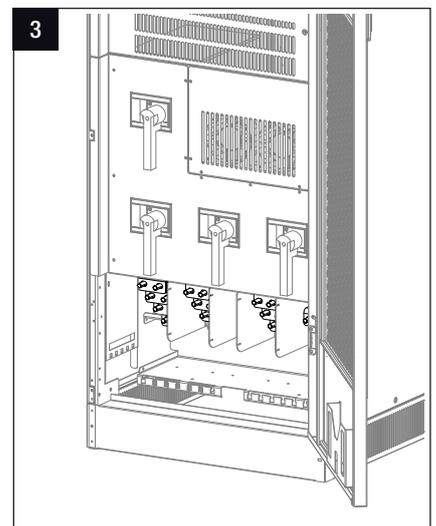
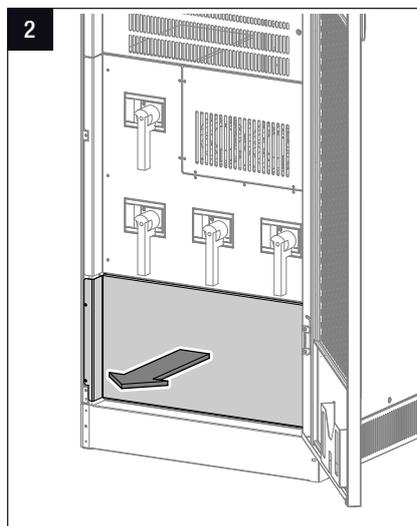
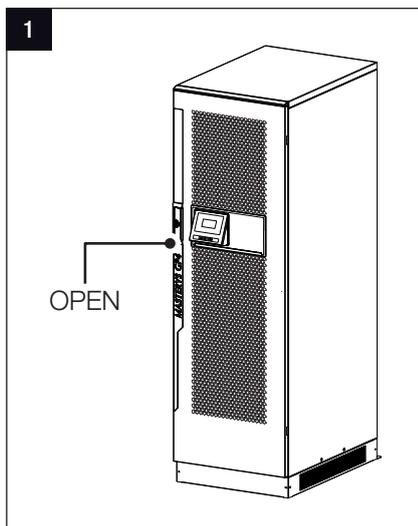
- 60-120 kVA external batteries



- 60-80 internal battery



- 60-250 kVA external batteries



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
60-80	3/3	External battery	
60-80	3/3	Internal battery	

UPS kVA	In/Out phase	Battery type	Details
100-120	3/3	External battery	
160	3/3	External battery	
200-250	3/3	External battery	

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

6.1.1 External battery connection

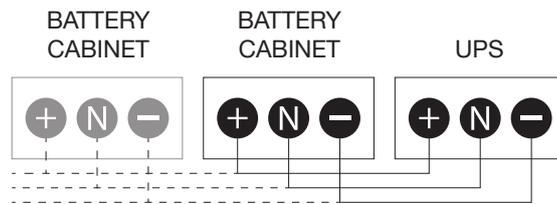
	NOTE! For further information refer to the battery cabinet manual.
---	--

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

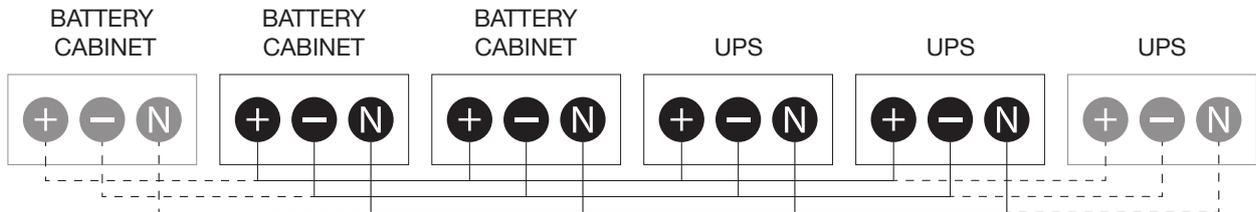
	WARNING! Strictly observe: <ul style="list-style-type: none">• the polarity of each individual string (refer to the figure below);• the cable cross section (refer to 'Electrical requirements' chapter).
	WARNING! Cabling errors with inversion of battery polarity may cause permanent damage to the equipment.
	Reassemble the plastic terminal block protection.

	WARNING: pay attention to the individual cable range for battery connections.
---	--

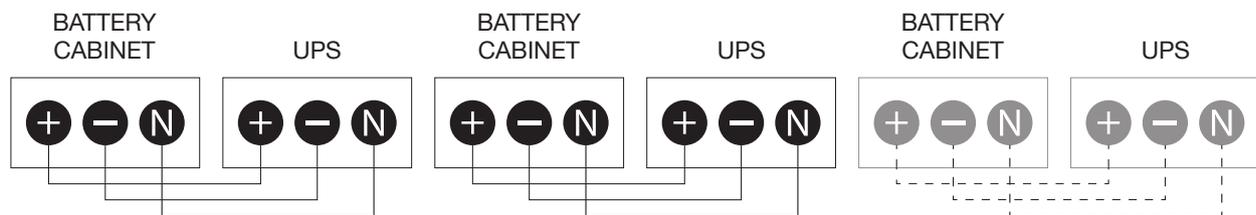
Connection example - single unit



Connection example - parallel configuration with shared battery



Connection example - parallel configuration with distributed battery



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 'Display operation' chapter.

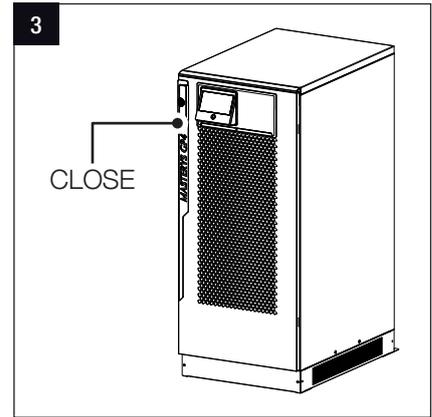
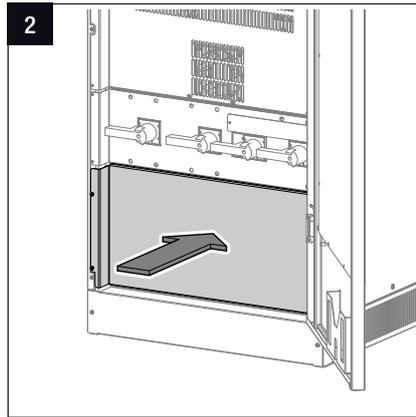
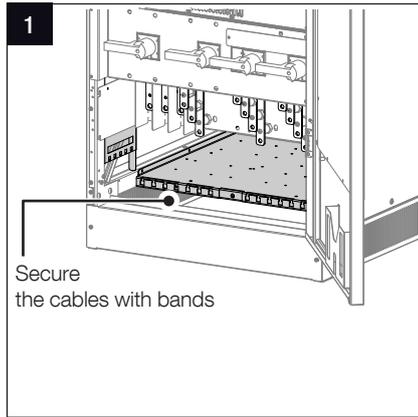


Note!

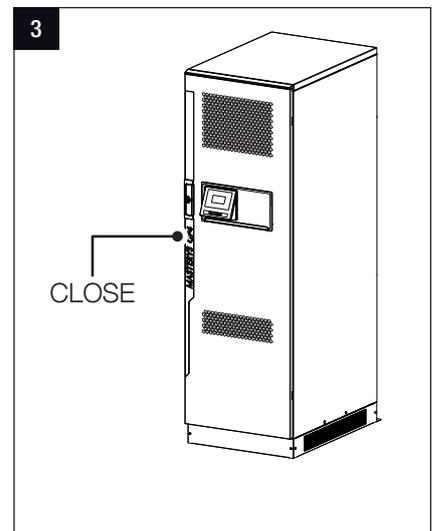
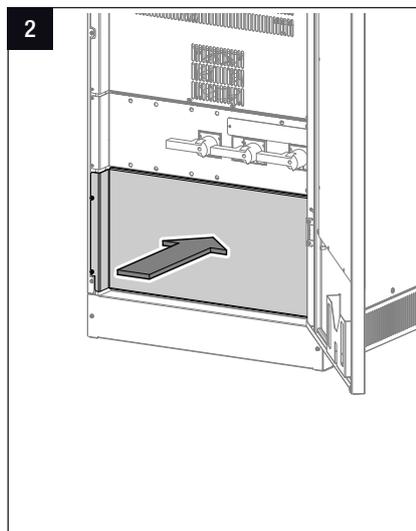
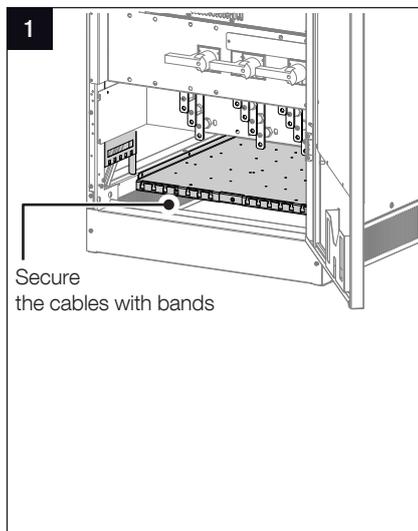
Not all battery/capacity combinations are available.

6.2 Completion of the installation

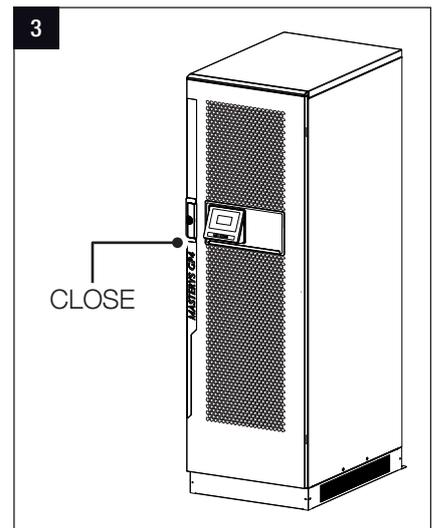
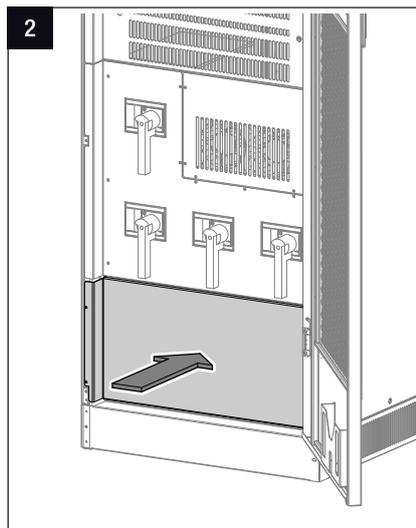
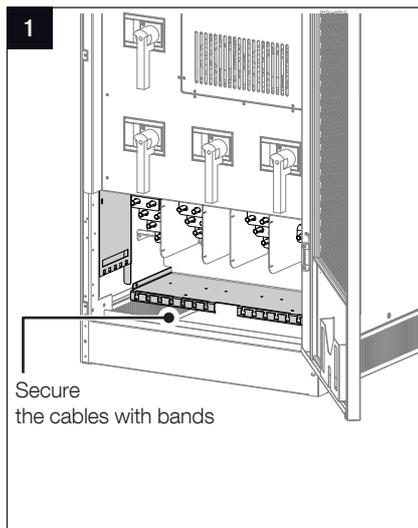
- 60-120 kVA external batteries



- 60-80 internal battery



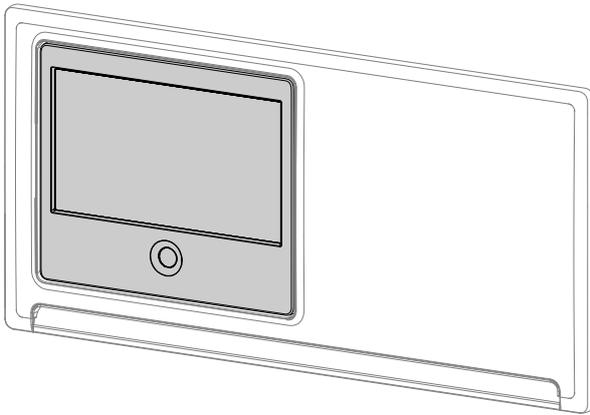
- 60-250 kVA external batteries



7. CONTROL PANEL

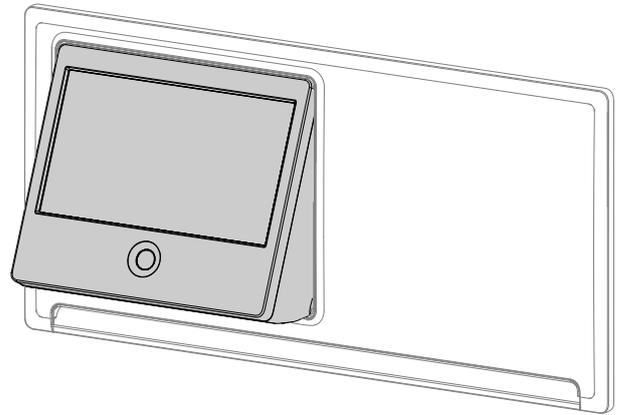
Vertical mount
(Factory standard)

IP21

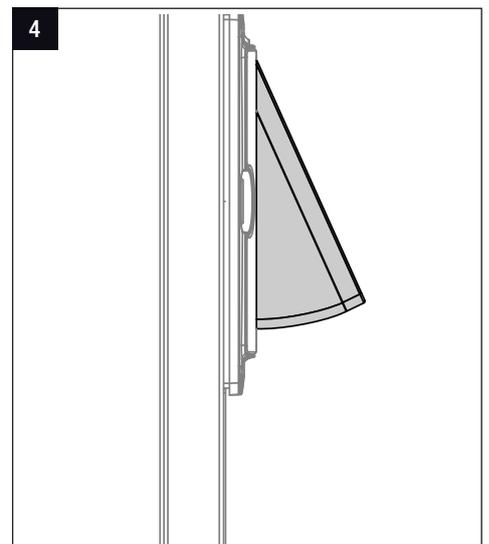
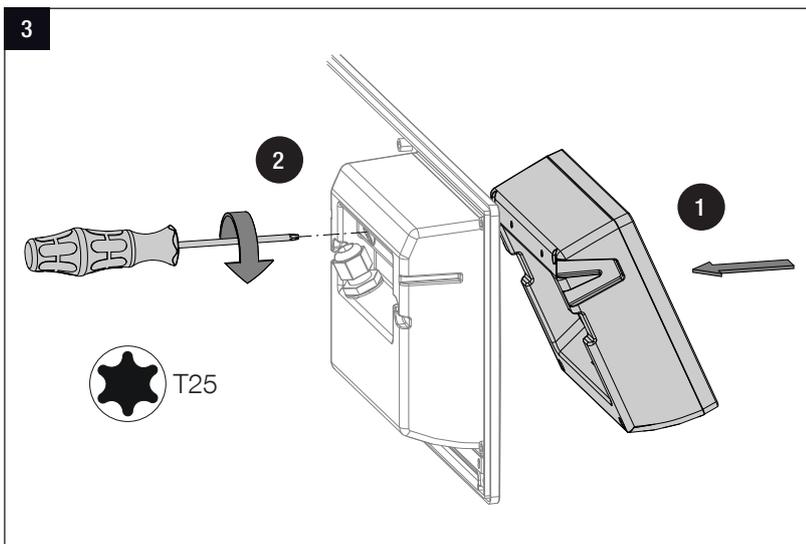
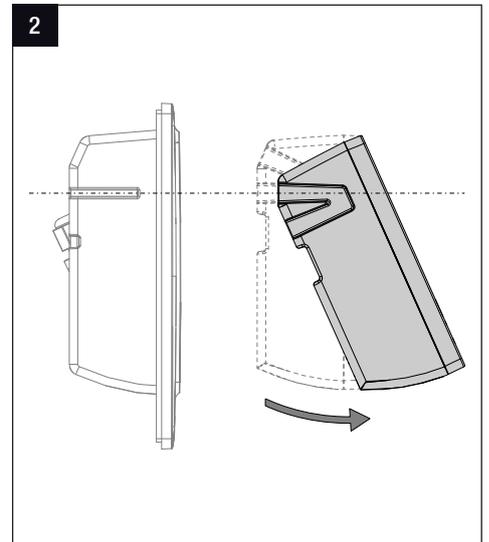
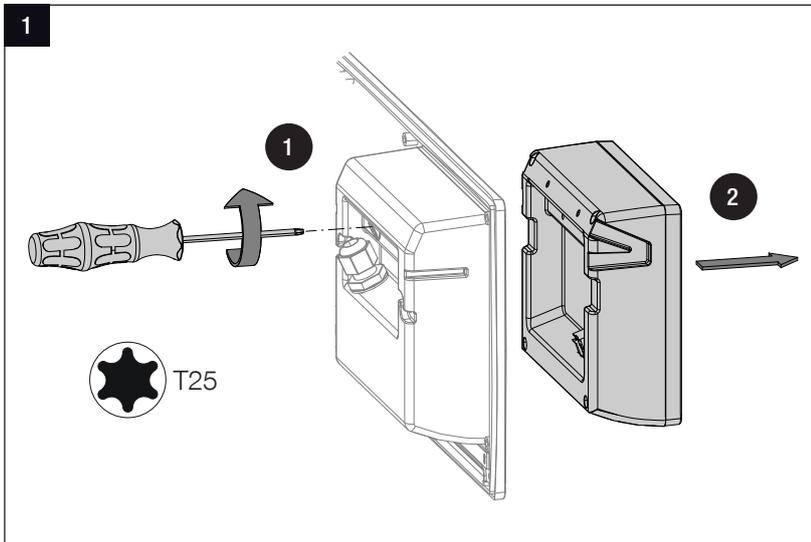


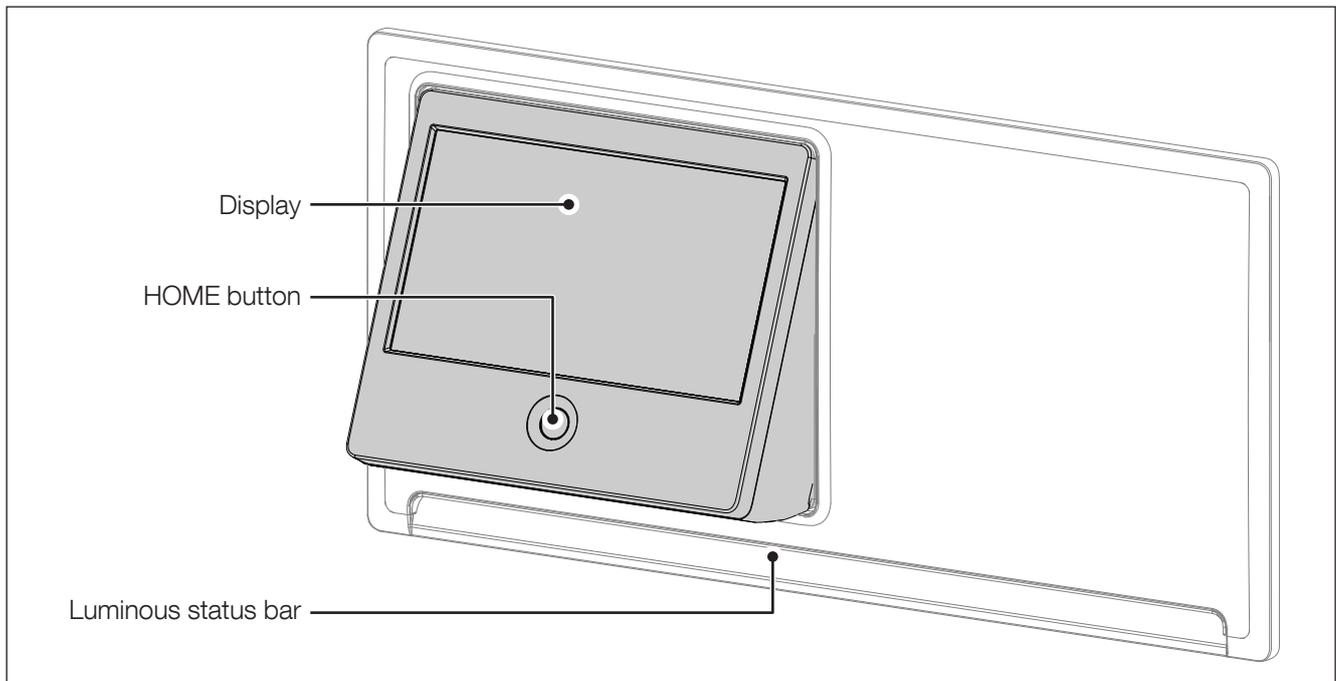
Angled mount

IP20



From vertical to angled mount





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 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 requested / or service mode in progress.
Yellow	Load supplied with warning.
Flashing green-yellow-green	Load supplied and preventive alarm present.
Flashing green	Load going to be supplied, battery test in progress or UPS auto-test running.
Green	Load protected by inverter or UPS in eco mode.
Grey (OFF)	Load not supplied: output on standby / isolated / OFF.
Blue	Bluetooth connection active
Flashing blue	Bluetooth advertising in progress

Only two elements are necessary to interact with the unit:

- HOME button: is a mono-stable button used to interact manually with the display especially in emergency situations. Logic behind the interaction is:
 - Single pressing (below 3 sec): HOME page return of graphic display
 - 3 sec < time < 6 sec: change the language to the default (English)
 - 6 sec < time < 8/9 sec: go to the calibration screen automatically
 - Above 8/9 sec: implement the hw reset of the micro controller and restart of the graphic
- Display: is the main active matrix of the display sensitive to touch pressure. The display is designed for rugged industrial applications. The display is single-touch only (no double touch effects). Depending on pressure, the navigation tree and various functions will be executed.

Two special functions are present on the control panel:

- Standby screen: for safety reasons, after a programmable amount of time, the display goes on standby. Display goes to the main screen and touch screen sensitivity is disabled. A label on the bottom of the main screen displays this status. To exit this status press the screen for the HOME button.
- OFF status: for power consumption and life enhancement, after a programmable amount of time display goes in "off". Display goes black and no interaction is possible. Touching the HOME button or screen resumes normal operations.

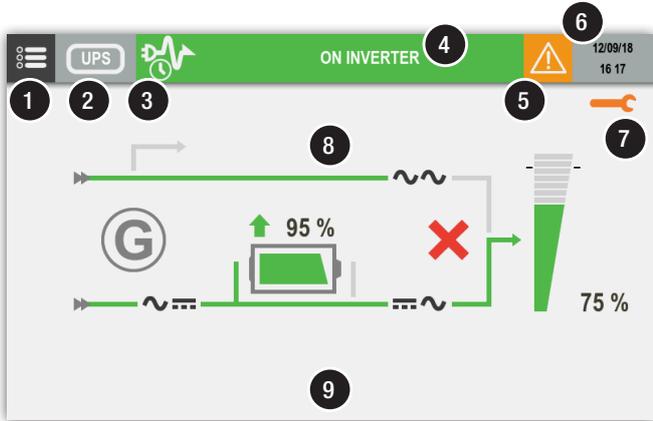


**Handle the control panel with care. It is made of metal, glass and plastic and contains delicate electronic components. The control panel may be damaged if dropped, pierced or broken or comes into contact with liquids.
Do not use the control panel with a cracked screen, as it may cause injury.**

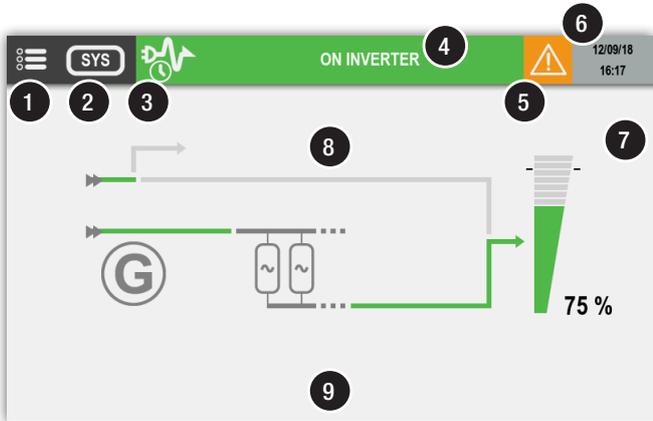
8. DISPLAY OPERATION

8.1 Display description

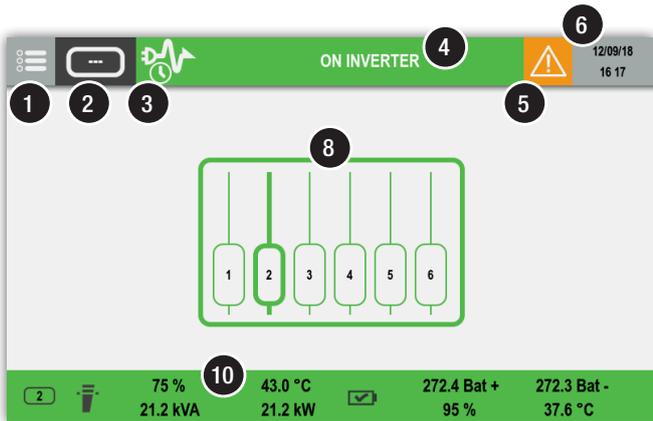
- Stand alone UPS or unit view



- UPS parallel system: System view



- UPS parallel system: Units overview



- 1 Menu access
- 2 Device reference
- 3 Functioning mode (see 'Functioning mode' chapter)
- 4 Status displaying / Status page access
- 5 Alarm present – access to alarm page
“Alarms” icon appears in case of preventive/critical alarm. A dedicated pop-up appears and can be cleared.
- 6 Clock
- 7 Maintenance alert
- 8 Synoptic area
- 9 Help message area
“Press Key to wake up” appears when the display goes on standby. Touch the display to wake it up.
- 10 Measures report

8.2 Menu architecture

	MENU ITEMS		
	Stand alone UPS [UPS]	Unit [1] to [6]	UPS System [SYS]
▼ MONITORING			
▶ ALARMS	•	•	•
▶ STATUS	•	•	•
▶ SYNOPTIC	•		
▶ UNIT		•	•
▶ SYSTEM		•	•
▶ UNITS OVERVIEW		•	•
▶ EVENTS LOG	•	•	•
▼ MEASUREMENTS			
▶ OUTPUT MEASUREMENTS	•	•	•
▶ BATTERY MEASUREMENTS	^	^	^
▶ INPUT MEASUREMENTS	•	•	•
▶ INVERTER MEASUREMENTS	•	•	
▶ BYPASS MEASUREMENTS	^	^	^
▼ CONTROLS			
▼ UPS PROCEDURES			
▶ START	• ¹		• ¹
▶ STOP	• ¹	• ¹	• ¹
▶ ON MAINTENANCE BYPASS	• ¹		• ¹
▼ MODE			
▼ ECO MODE CONTROLS			
▶ Eco Mode ON	^		^
▶ Eco Mode OFF	^		^
▶ ECO MODE SCHEDULE	^		^
▼ ENERGY SAVER CONTROLS			
▶ Energy Saver ON			^
▶ Energy Saver OFF			^
▼ SMART CONVERSION CONTROLS			
▶ SMART CONVERSION ON	^		^
▶ SMART CONVERSION OFF	^		^
▶ SMART CONVERSION SCHEDULE	^		^
▼ FLEX MODE CONTROLS			
▶ FLEX ON	^		^
▶ FLEX OFF	^		^
▼ BATTERY			
▼ BATTERY CONTROLS			
▶ BATTERY TEST	^	^	^
▶ BATTERY SCHEDULE	^	^	^
▼ MAINTENANCE			
▶ ALARMS RESET	•	•	•
▶ POSTPONE MAINTENANCE ALARM	•	•	•
▶ LED TEST	•	•	•
▶ USER REPORT	•	•	•

	MENU ITEMS		
	Stand alone UPS [UPS]	Unit [1] to [6]	UPS System [SYS]
▼ CONFIGURATIONS	•		•
▶ CLOCK	•		•
▼ COM-SLOTS			
▶ COM-Slot 1	^	^	
▶ COM-Slot 2	^	^	
▶ COM-Slot 3 ⁽²⁾	^	^	
▶ TEMPERATURE PROBE	^	^	^
▼ REFERENCE			
▶ SOCOMEC REFERENCE	•	•	•
▶ SERIAL NUMBER	•	•	•
▶ User Reference	•	•	
▶ Location	•	•	
▼ REMOTE			
▶ Remote ON	•		•
▶ Remote OFF	•		•
▼ USER PARAMETERS			
▶ LANGUAGE	•		•
▶ PASSWORD	•		•
▶ BUZZER	•		•
▶ DISPLAY	•		•
▶ PREFERENCES	•		•
▶ ADC+SL CONFIG	•	•	
▶ TOUCHSCREEN	•	•	•

	MENU ITEMS		
	Stand alone UPS [UPS]	Unit [1] to [6]	UPS System [SYS]
▼ SERVICE			
▶ SERVICE REPORT	•	•	
▶ FW VERSION	•	•	
▼ UPS SETTINGS			
▼ OUTPUT MENU			
▶ Output voltage	•		•
▶ Output frequency	•		•
▶ Converter mode	•		•
▶ Automatic restart	•		•
▶ Fine Output Voltage	•		•
▼ BATTERY MENU			
▼ BATTERY INSTALLATION			
▶ Battery available	^	^	^
▶ Battery connection	^	^	^
▶ Battery type	^	^	^
▼ BATTERY DATA			
▶ Capacity	^	^	^
▶ N° of cells	^	^	^
▶ N° of blocks	^	^	^
▶ Recharge type	^	^	^
▶ Premin. Voltage	^	^	^
▶ Min. Voltage	^	^	^
▶ Floating	^	^	^
▶ Boost Voltage	^	^	^
▼ BATTERY THRESHOLDS			
▶ Rech. Curr. Limit	^	^	^
▶ Float-Boost Threshold	^	^	^
▶ Boost-Float Threshold	^	^	^
▼ TEMP. COMPENSATION			
▶ Temper. Compensation	^	^	^
▼ MAINS CONFIGURATION			
▶ Mains configuration	•		•
▼ PARALLEL SYSTEM			
▶ Units in parallel			•
▶ Redundancy level			•
▶ NETWORK PARAMETERS (Only for service)			
▶ DHCP	•	•	
▶ IP	•	•	
▶ MASK	•	•	
▶ GATEWAY	•	•	
▶ MAC	•	•	

(^). Depending on setting

1. Displayed depending on state.

2. See 'Standard features and option' chapter.

8.3 Functioning mode



Service



Isolated



Eco mode / Smart Conversion scheduling active



Fast Eco Mode



Eco Mode active



Standby active



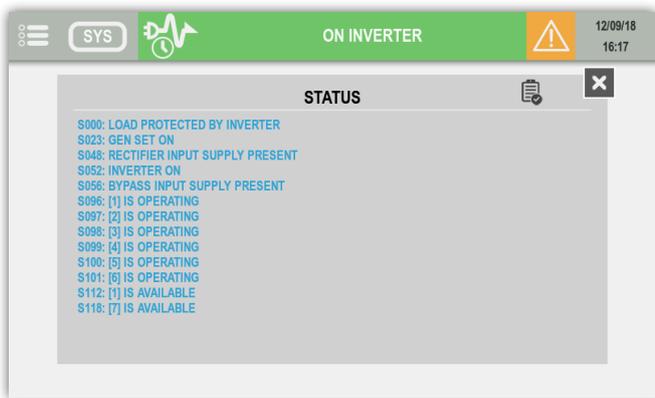
Energy saver active



Autotest

8.4 STATUS

8.4.1 Status page



Filtering



List all active status



List all status



List all status not active

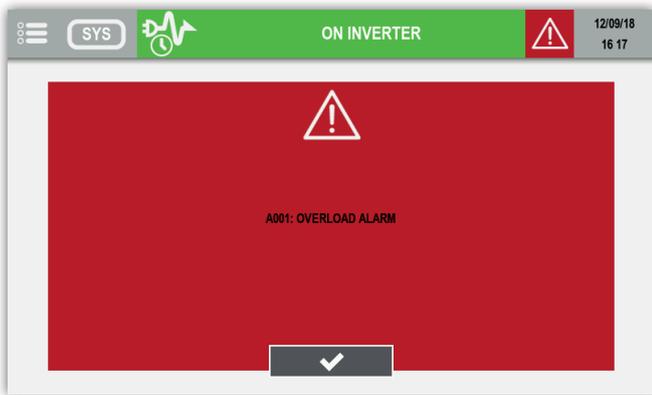
8.5 Alarms management

8.5.1 Alarm report

The alarm icon is present if at least one alarm is present.
Tap on the icon to open the alarm list.

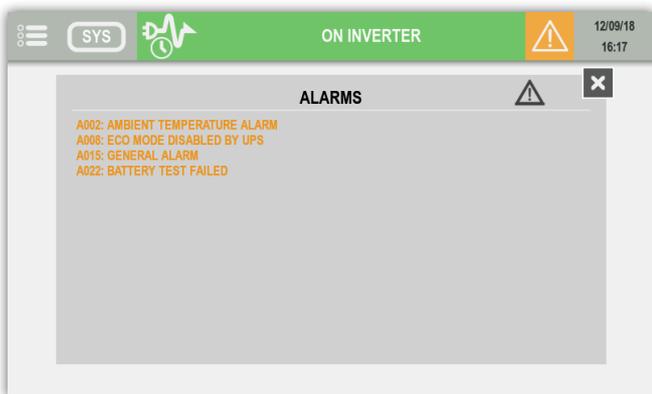
8.5.2 Alarm popup

In case of critical alarm a popup message appears and the buzzer is running according its settings.
The highest priority alarm is displayed.



Tap on valid button to stop the buzzer and to close the popup message. The alarm page is automatically display after this action.

8.5.3 Alarm page



Filtering

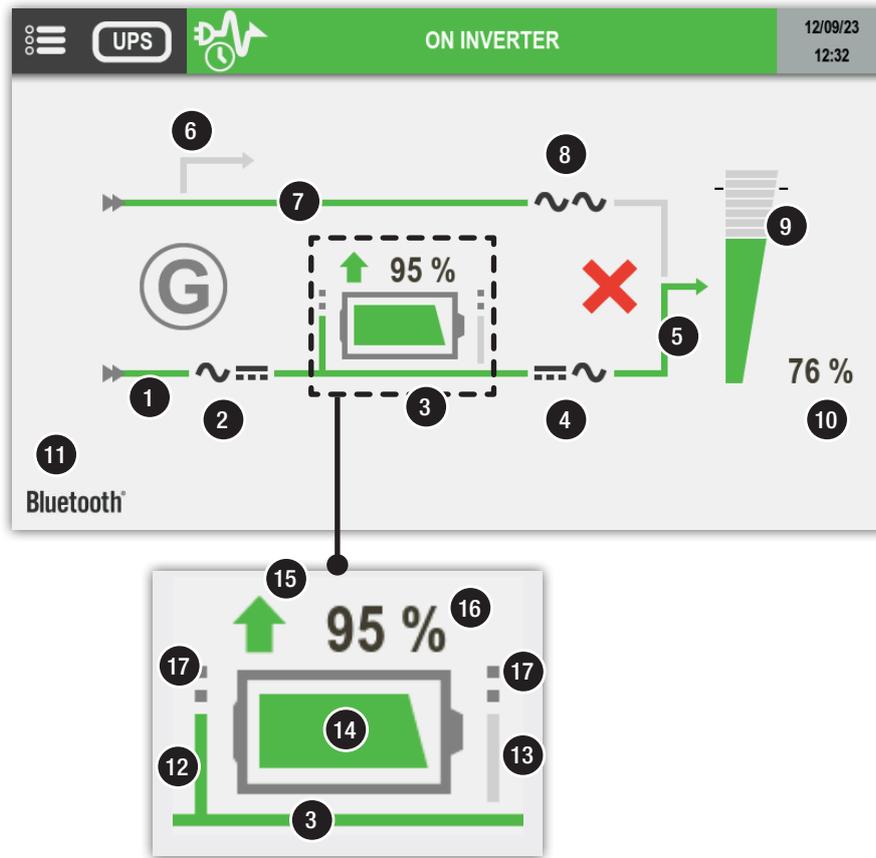
-  List all active alarms
-  List all active preventive alarms
-  List all active critical alarms

Popup alarm for preventive alarm

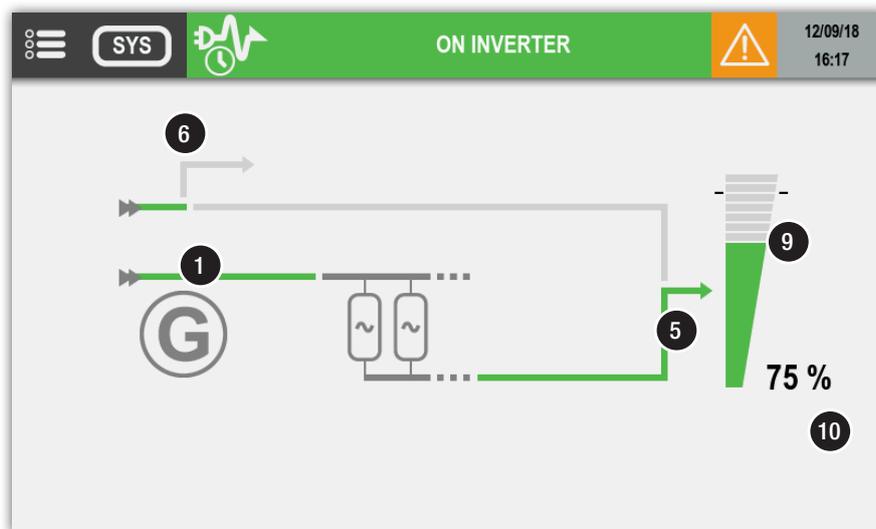
In USER PARAMETERS menu, PREFERENCES item gives the possibility to enable popup alarm also with preventive alarms.

8.6 Synoptic animation

- Stand alone UPS or unit view



- UPS parallel system: System view

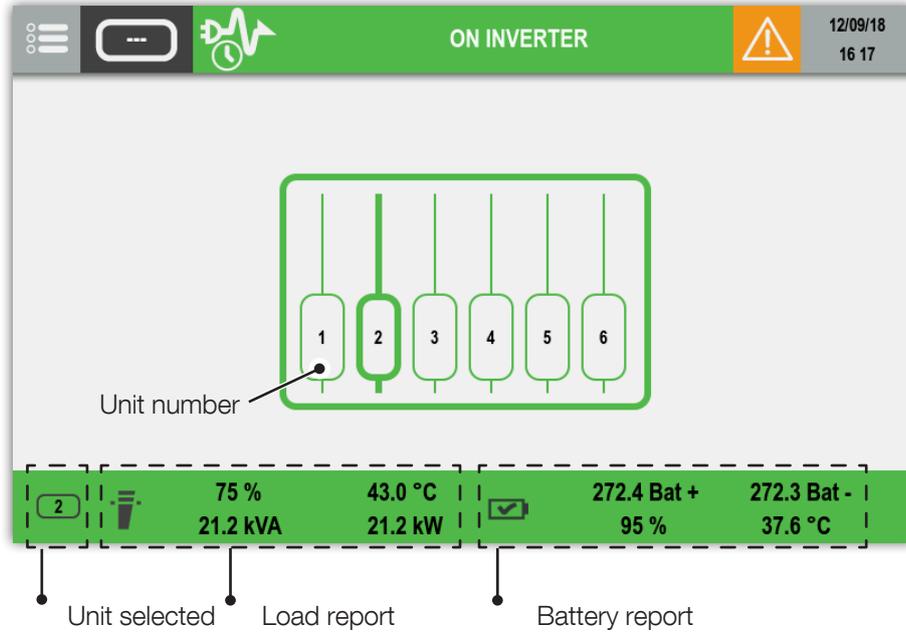


Item	Description	Rules of animation				Touch actions
		Grey	Green	Yellow	Red	
1	Rectifier input supply	Not present	Present	Out of tolerance	-	-
2	Rectifier status	Normal status	-	Preventive alarm	Critical alarm	Access to input measurements page
						
3	DC voltage bus	DC voltage absent	DC voltage presence	-	-	-
4	Inverter status	Normal status	-	Preventive alarm	Critical alarm	Access to inverter measurements page
						
5	Inverter output	Inverter OFF	Inverter ON	Inverter on battery	-	-
6	Maintenance bypass *	MBP present	-	Load on maintenance bypass	-	-
7	Bypass input *	Not present	Present	Out of tolerance	-	-
8	Bypass status *	Normal status	-	Preventive alarm	Critical alarm	Access to bypass page
						
9	Load rate symbol	No load	Fill-up to 95%	Fill-up to 110%	Fill-up over 110%	Access to output measurements pages
						
10	Load rate value	Instantaneous value. displayed if value > 0				-
11	Bluetooth	BLE dongle for Remote Xpert Service plugged				Access to Bluetooth connection
12	DC battery input **	DC voltage absent	DC voltage presence	BCR function running	-	-
13	DC battery output **	DC voltage absent	DC voltage presence	Inverter on battery		-
14	Battery indicator **	-	Fill-up to 100%	Fill-up to 45%	Fill-up to 15%	Access to battery measurements page
						
15	Battery charging / discharging **	-	Battery charging	Battery discharging	-	-
						
16	Battery level or remaining backup time during battery discharge **	Instantaneous value. displayed if value > 0 The backup time is no more displayed if it is below two minutes.				-
17	Shared battery symbol not present if each unit has its own battery. **					-

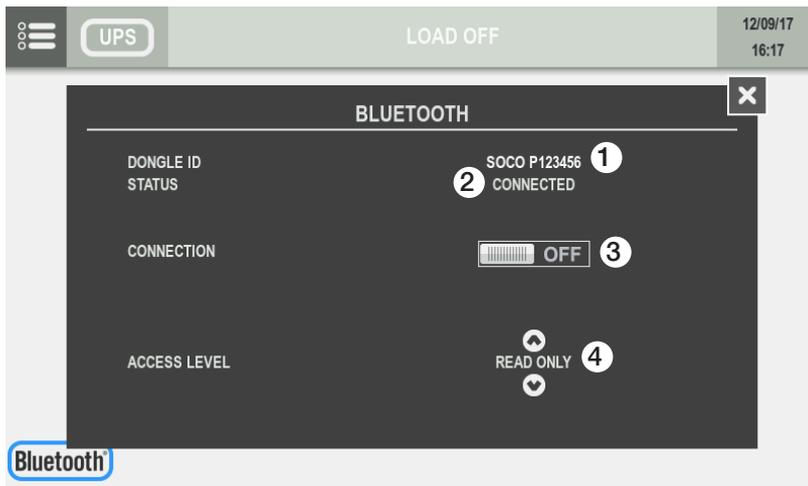
* Element disappears if converter mode is active

** Not present if batteries are not present

• UPS parallel system: Units overview

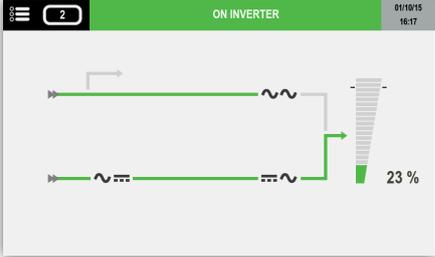
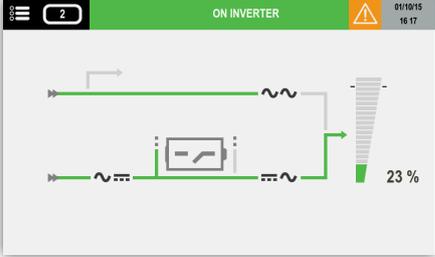
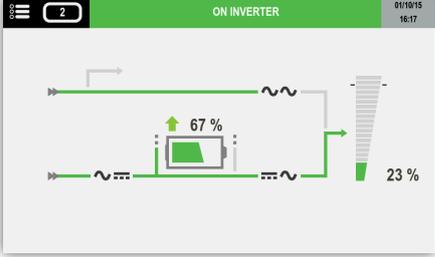
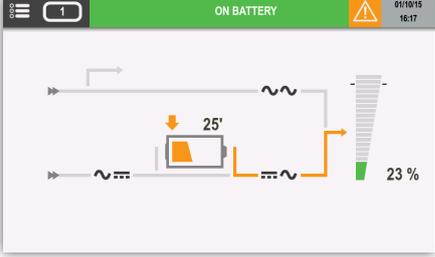
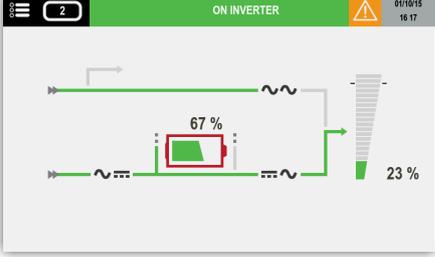


• Bluetooth setup

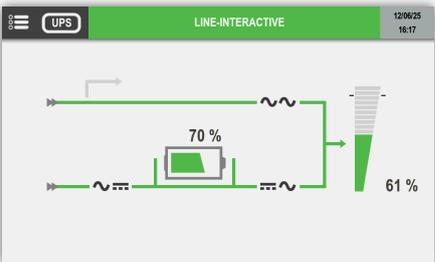
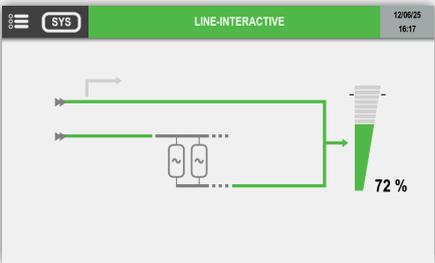
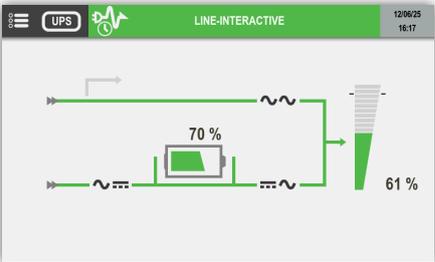
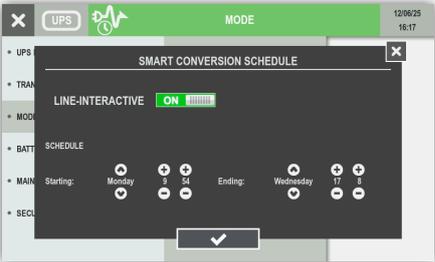


- 1 Unique identifier of Bluetooth dongle
- 2 Status of connection (ABSENT, PLUGGED, ADVERTISING, CONNECTED)
- 3 Activate/deactivate the connection
- 4 Level granted to remote technician (READ ONLY, FULL ACCESS, UPGRADE FW)

• Battery animation

BATTERY STATUS	DESCRIPTION
	<p>If battery is absent, the battery icon is not displayed</p>
	<p>If battery is present but not connected, the icon is displayed</p>
	<p>If the battery is present and charging, the arrow icon is displayed</p>
	<p>If the battery is present and discharging, the arrow icon is displayed</p>
	<p>If a battery alarm has occurred, the red icon is displayed</p>

- Smart conversion mode

HOME PAGE SINGLE LINE DIAGRAM	DESCRIPTION
	<p>SMART CONVERSION Mode menu</p> <p>Selection mode SMART CONVERSION ON</p>
	<p>MODE SMART CONVERSION ON (Unit or UPS view)</p>
	<p>MODE SMART CONVERSION ON (System view)</p>
	<p>MODE SMART CONVERSION ON via scheduling (Unit view)</p>
	<p>SMART CONVERSION SCHEDULING menu to activate the mode within a specific time slot</p>

8.6.1 Additional icons



Bypass impossible



Bypass locked



“Genset Mode” when the gen set contact is active. Need ADC+SL correctly configured.



Maintenance alarm.
Preventive maintenance is requested.



BLE dongle for Remote Xpert Service plugged.

8.7 Event log page

Date	Time	Code	Description	Status
13/12/16	08:30:00	S000	LOAD PROTECTED BY INVERTER	NO
31/12/16	08:31:05	S112	[1] IS AVAILABLE	YES
31/12/16	08:31:07	A032	RECTIFIER CRITICAL ALARM	YES
31/12/16	08:31:09	A064	PROGRAMMABLE A064	YES
16/01/17	12:25:00	A208	PROGRAMMABLE S079	YES
17/01/17	13:40:00	A176	ALL UNITS OR MODULES ARE AVAILABLE	YES
18/01/17	16:30:00	S000	LOAD PROTECTED BY INVERTER	NO
25/01/17	00:15:00	A016	BATTERY DISCONNECTED	YES
15/01/17	10:20:00	S000	LOAD PROTECTED BY INVERTER	NO
18/01/17	16:30:00	S096	[1] IS OPERATING	NO



Show STATUS events



Show ALARMS events

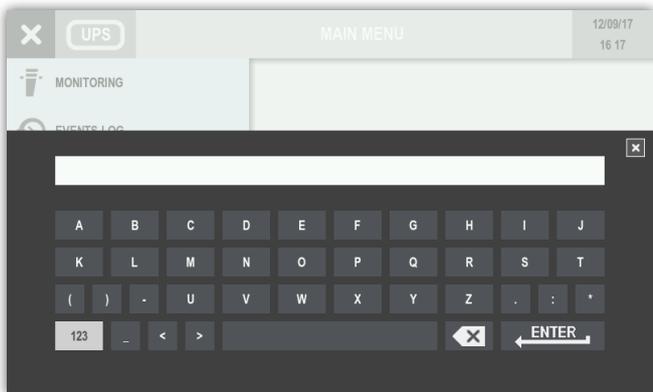


Show CONTROLS

8.8 Menu function descriptions

8.8.1 Entering passwords

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



Wildcard covering of the password is active by default.
The default password is **SOCO**.

Press **ENTER** to confirm the selection or close the window to abort.

8.8.2 MONITORING menu

Submenu Alarm opens the alarm pages.

Submenu Status opens the status pages.

8.8.3 EVENTS LOG menu

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

8.8.4 MEASUREMENTS menu

This menu displays all UPS measurements relating to the rectifier input stage, output stage, batteries, bypass input stage and inverter.

The pins on the bottom of the screen indicate whether or not there are more pages. Sliding to the right or left changes measurements page.

8.8.5 CONTROLS 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.

- **UPS PROCEDURES: START/ON MAINTENANCE BYPASS/STOP** see 'Operating procedures' chapter.
- **BATTERY: BATTERY CONTROLS > BATTERY TEST:** this function checks whether or not test conditions are available and returns the results.
- **ECO MODE CONTROLS:** this function sets/resets the **ECO MODE**.
- **MAINTENANCE: Alarms reset:** this function clears the alarm history, **LED test:** this function activates LED flashing for a few seconds.

8.8.6 UPS CONFIGURATION menu

- **CLOCK:** this function sets the date and time.
- **COM-SLOTS:** this function configures the RS485 modbus serial link.
- **REFERENCE:** this function gives the possibility to customised the unit reference and the location.
- **REMOTE:** this function enables controls from remote devices through MODBUS protocol (NET VISION for example).

8.8.7 USER PARAMETERS menu

This menu contains the different functions for users such as language, password, buzzer, display, preferences, touchscreen calibration.

8.8.8 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 and backfeed. Some parameters cannot be modified when the UPS supplies the load by INVERTER or BYPASS.

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

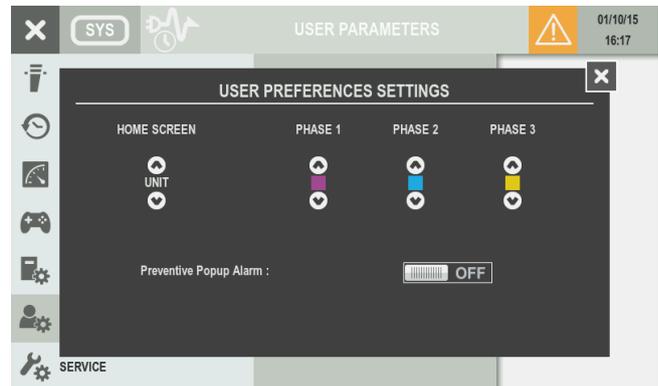
8.9 Additional user functions

8.9.1 Phase color modification

- Enter menu MAIN MENU > USER PARAMETERS > PREFERENCES

For each phase is possible to select a specific colour in a set of colour range. Those colours are applying in the measurements pages.

Colour	Default colour
 Yellow	Phase 3
 Orange	
 Red	
 Green	
 Light blue	Phase 2
 Dark blue	
 Purple	Phase 1
 Brown	
 Light grey	
 Dark grey	
 Black	



The popup alarm appears in case of critical alarms. This function can be extended to preventive alarms by switching “Preventive Popup Alarm” to ON.

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

	Warning ! Output terminals and load will be supplied!
---	--

- Connect the mains and auxiliary mains to the UPS.
- Switch **ON** input switch **Q1**.
- Wait until display switch on.
- Enter MAIN MENU > CONTROLS > UPS PROCEDURES.

	NOTE: In parallel configuration the procedure must be performed from the system menu.
---	---

- 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 > UPS PROCEDURES.

	NOTE: In parallel configuration, the procedure performed from the system menu will disconnect the load.
---	---

- 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 > UPS 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 > UPS PROCEDURES.



NOTE: In parallel configuration the procedure must be performed from the system menu.

- Select **START PROCEDURE** and press **ENTER**.
- Carry out the operations indicated on the display.



NOTE!

When an external maintenance bypass⁽¹⁾ is present, put the switch to position 0 (OFF).

1. Not monitored by the UPS or by the parallel system.



NOTE!

When an external maintenance bypass is not present, it is recommended to close all the Q5 switches as quickly as possible when instructed by the screen procedure.

9.4 Extended out of service



Warning !
Output terminals and load will be supplied

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 > UPS 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 > BATTERY MEASUREMENTS.
- 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.



WARNING!
In parallel configuration open the system shutdown switch **H**.



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 U.P.O 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 Smart conversion mode (for selected models only)

This operating mode offers a perfect trade-off between high power quality and best efficiencies up to 99% - reducing your TCO without exposing the critical load to the grid disturbances. In this mode, a specific algorithm monitors in real time the network quality and selects the optimum working mode between Double Conversion (VFI) and Line Interactive (LI). Line interactive working mode combines the high efficiency of the static bypass as a main source, in parallel with the inverter working as an active filter able to compensate the load reactive power and harmonics. In case of any abnormal event on the electrical network, the UPS instantaneously transfers to VFI mode to ensure the critical load protection, without any interruption due to the transfer (Class 1 according to 62040-3).

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.

11. STANDARD FEATURES AND OPTION

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

Features	MASTERY'S GP4 (kVA)					Note
	60-80		100-120	160	200-250	
	External batteries	Internal batteries	External batteries	External batteries	External batteries	
Battery Option						
Additional charger	●○	–	●○	●○	●○	  Kit for Rectifier Neutral creation
Communication Option						
ACS card <i>(Automatic Cross Synchronisation)</i>	●○	●○	●○	●○	●○	
ADC+SL card <i>(Advanced Dry Contact + Serial Link)</i>	○	○	○	○	○	
LIB-ADC <i>(Lithium Ion Battery interface)</i>	○	○	○	○	○	
Temperature sensor	○	○	○	○	○	  ADC+SL card
Remote touchscreen display	○	○	○	○	○	  ADC+SL card
Modbus TCP card	○	○	○	○	○	
Net Vision card	○	○	○	○	○	
EMD <i>(Environmental Monitoring Device)</i>	○	○	○	○	○	  Net Vision card
Electrical Option						
Parallel card	●○	●○	●○	●○	●○	  Cold start
Kit for Parallel Configuration (C7)	–	–	●○	●○	●○	  Parallel card
External Isolation Transformer	–	–	○	–	–	
IMD <i>(Insulation Monitoring Device)</i>	–	–	○	–	–	  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

Features	MASTERYS GP4 (kVA)					Note
	60-80		100-120	160	200-250	
	External batteries	Internal batteries	External batteries	External batteries	External batteries	
Kit for Rectifier Neutral creation	●	–	●	●	–	<ul style="list-style-type: none"> Kit for TN-C / Neutral-Ground connection Kit For Common Mains Additional charger
Redundant Bypass Ventilation	●	●	●	●	STD	
Mechanical Option						
Option slots 3	●	–	●	STD	STD	
Anti-vermin protection	●	●	●	●	●	
Kit for IP21	○	○	○	○	○	<ul style="list-style-type: none"> Top air exhaust kit Top entry cables
Seismic kit	●	–	●	●	●	Top entry cables
"T" cabinet	–	STD	●	STD	STD	
Top air exhaust kit	–	–	●	●	○	<ul style="list-style-type: none"> "T" cabinet Kit for IP21 Top entry cables
Top entry cables	–	–	○	○	○	<ul style="list-style-type: none"> "T" cabinet Seismic kit Kit for IP21 Top air exhaust kit
Other						
Cold start	●○	●○	●○	●○	●○	Parallel card

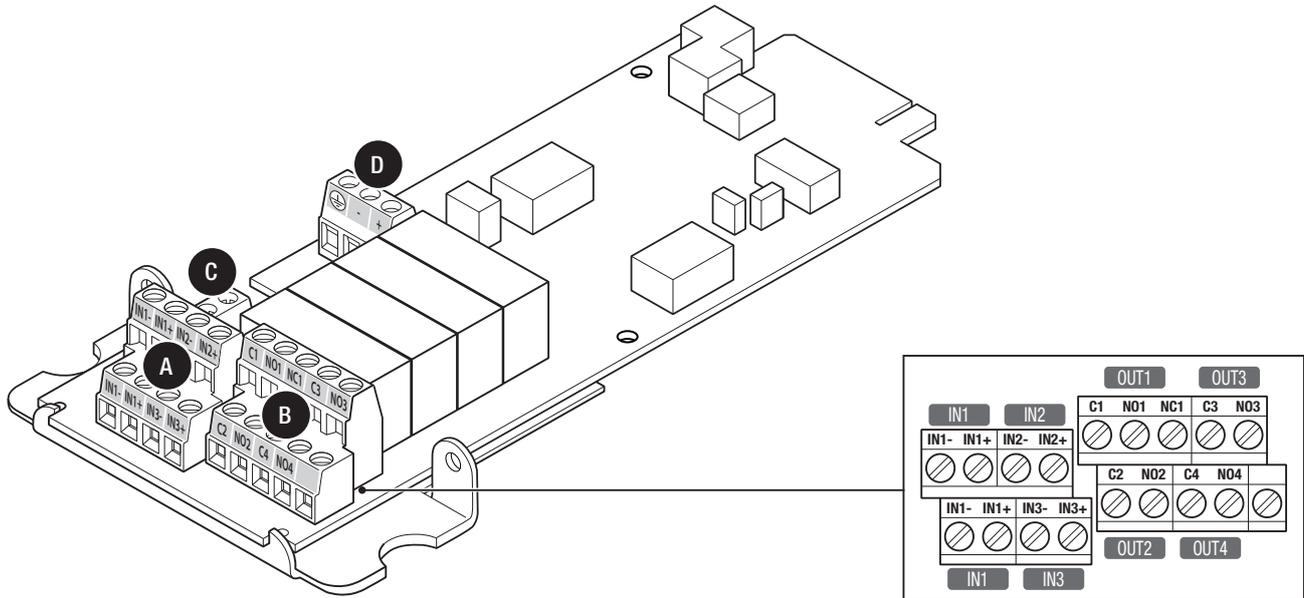
- Required option
- Incompatible option

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 **STANDARD configuration (default)**

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	INSULATION FAULT	10	Activate A026	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 AUTO-MATIC BYPASS	10	Relating to S002		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		Normally open
	OVERLOAD	10	Relating to 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 [®]	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 AUTO-MATIC BYPASS	10	Relating to S002		Normally open

Configuration 6		FLEX MODE configuration			
IN/OUT	DESCRIPTION	ACTIVATION DELAY (s)	REMARK ⁽¹⁾	INPUT TYPE	STATE
IN1	FLEX MODE ENABLE	1	Enabling / disabling the Flex Mode functionality	Close to activate	Normally open/closed
IN2	FLEX MODE REQUEST ON	1	Activates the Flex Mode (short response) if all conditions are respected	Close to activate	Normally open/closed
IN3	/	/	/	/	/
RELAY 1	MODE OPERATING	1	Flex Mode Operating		Normally open
RELAY 2	/	/	/	/	/
RELAY 3	/	/	/	/	/
RELAY 4	/	/	/	/	/

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 mm² 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 UPS can manage up to two ADC+SL option cards. The cards can be re-programmed for other uses.

In this specific case, the 2 serial links (SLOT 1 and SLOT 2) are independent.

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.

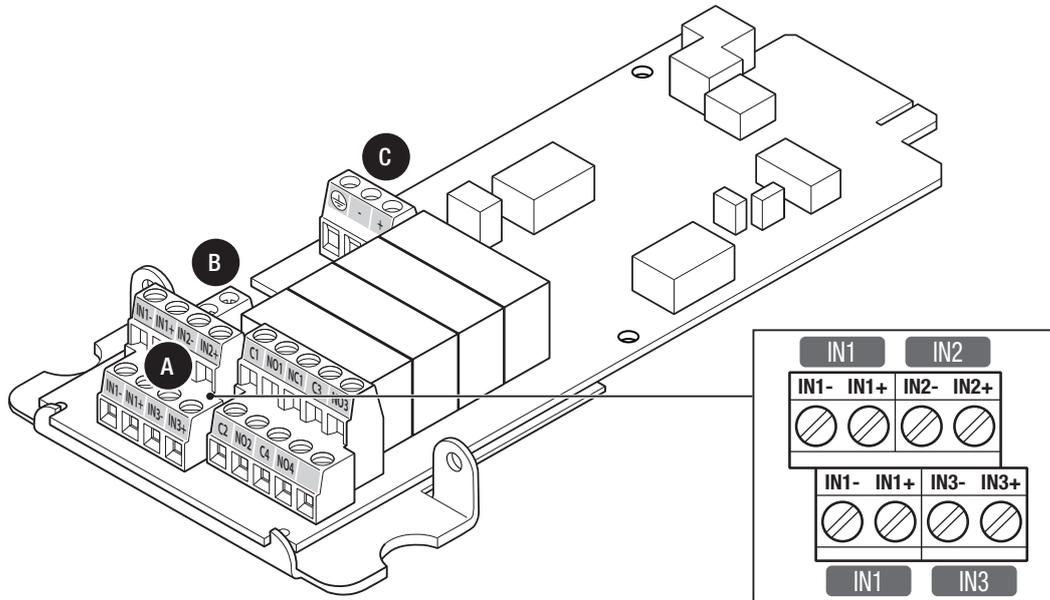
11.2 LIB-ADC CARD

The LIB-ADC (Lithium Ion Battery interface) is a slot optional board that provides:

- 3 inputs to report external contacts to UPS
- 1 connector for external temperature sensor (optional)
- RS485 insulated serial link providing MODBUS RTU protocol
- 4 leds indicating the board status and RS485 communication status

The input and output connections of this card are exclusively reserved for the LIB interface: they cannot be used for general purposes. Setting up the UPS and activation of the system must be done by qualified technicians.

Please contact the SOCOMEC service centre.



KEY

- A** 3 inputs to link external contacts to UPS
XB4 (reserved for LIB interface)
- B** 1 connector for external temperature sensor
XB2 (reserved for LIB interface)
- C** RS485 insulated serial link
XB1 (reserved for LIB interface)

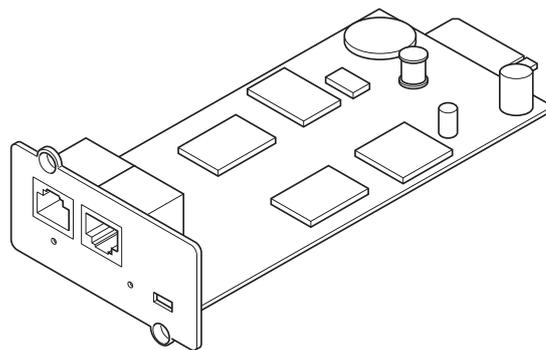
DESCRIPTION

- Auto detect of the BMS connected.
- Smart interface with LIB system, thanks to the serial connection.
- Easy connection and configuration.
- BMS data tunneling feature for building management system.

11.3 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.



11.3.1 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.

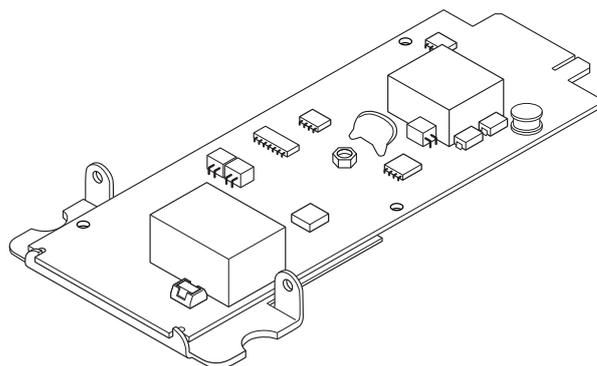


11.4 ACS card

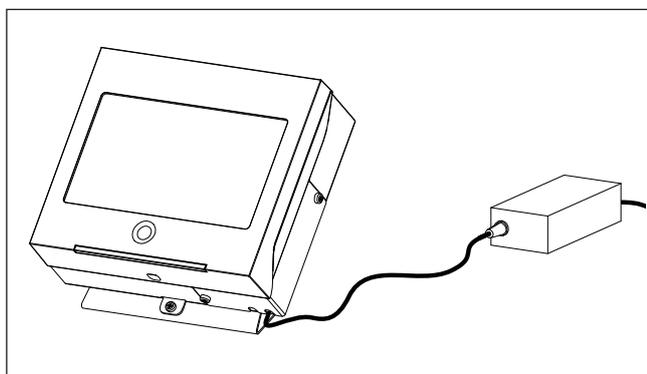
ACS (Automatic Cross Synchronisation) card is used to receive a synchronisation signal from an external source and manage it for the UPS where it is installed, and provide a synchronising signal, where requested, to another UPS.

11.5 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).



11.6 Remote touchscreen display



NOTE!
Available only with ADC+SL option card.

11.7 Software option

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



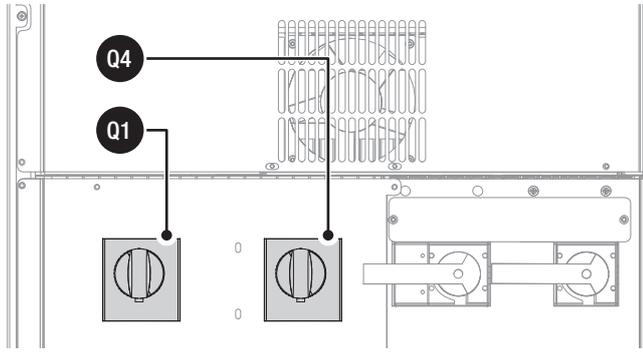
NOTE!
Before performing any operations, check that the software is compatible with your UPS model.

11.8 Internal Backfeed Protection

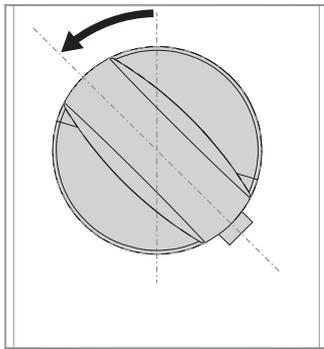
Internal backfeed protection for Mains and Auxiliary Mains.

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

11.8.1 60-120 kVA



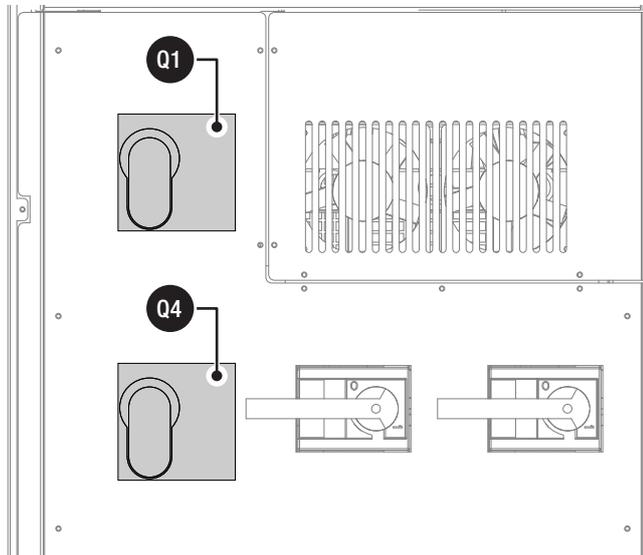
Q1 Mains switch with integrated trip coil.
Q4 Auxiliary Mains switch with integrated trip coil.



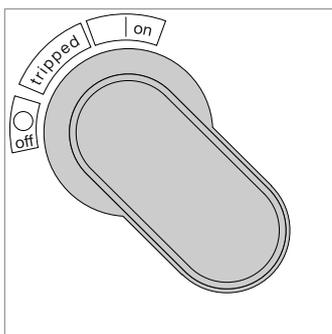
TRIPPED

TRIPPED POSITION for **Q1** or **Q4** when backfeed alarm occurs.
To reset, turn to **OFF** position and then **ON** to restart.

11.8.2 160 kVA



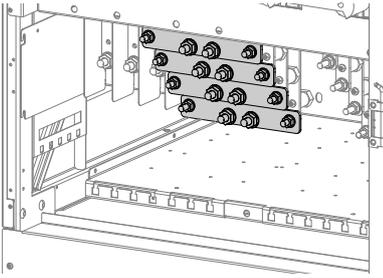
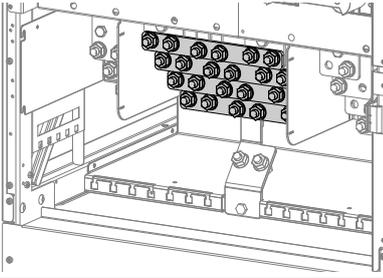
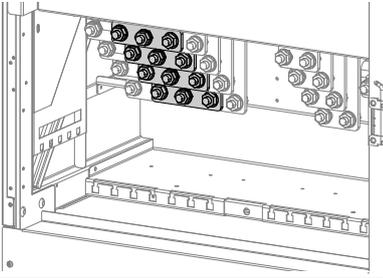
Q1 Mains switch with integrated trip coil.
Q4 Auxiliary Mains switch with integrated trip coil.



TRIPPED

TRIPPED POSITION for **Q1** or **Q4** when backfeed alarm occurs.
To reset, turn to **OFF** position and then **ON** to restart.

11.9 Kit For Common Mains

UPS	
60-80 kVA	
100-120 kVA	
160-250 kVA	

11.10 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 SOCOMECC.

11.11 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.
The transformer cannot be connected to the output on individual UPS units connected in parallel configuration.

For connection details refer to the transformer terminal board diagram.

11.11.1 IMD

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

11.12 Kit for Rectifier Neutral creation (not available for 200-250 kVA)

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.

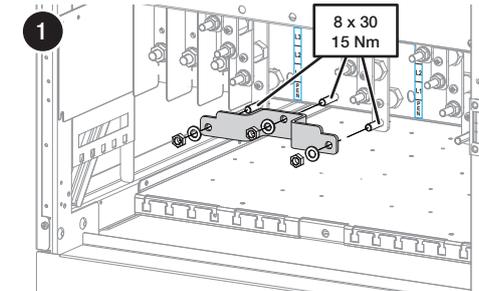
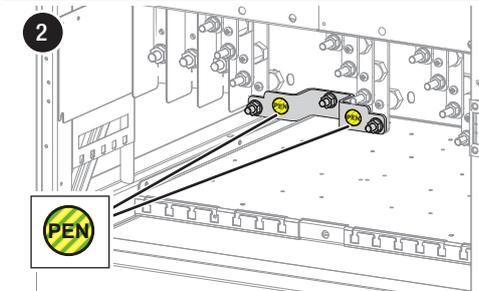
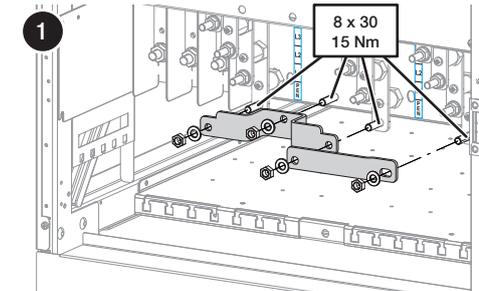
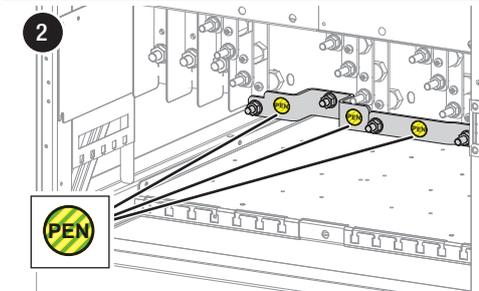
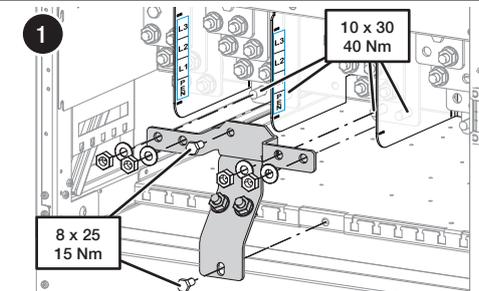
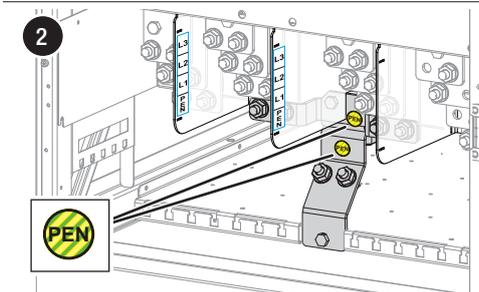
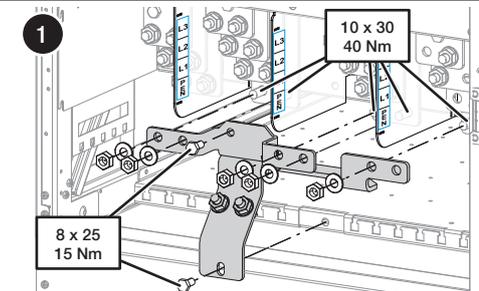
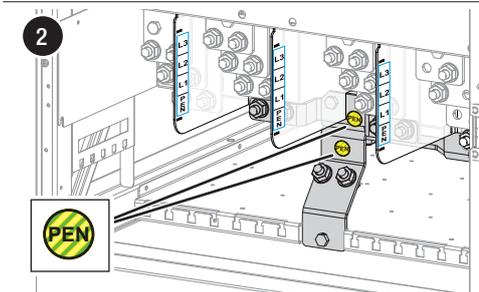
The input mains neutral bar is not available.

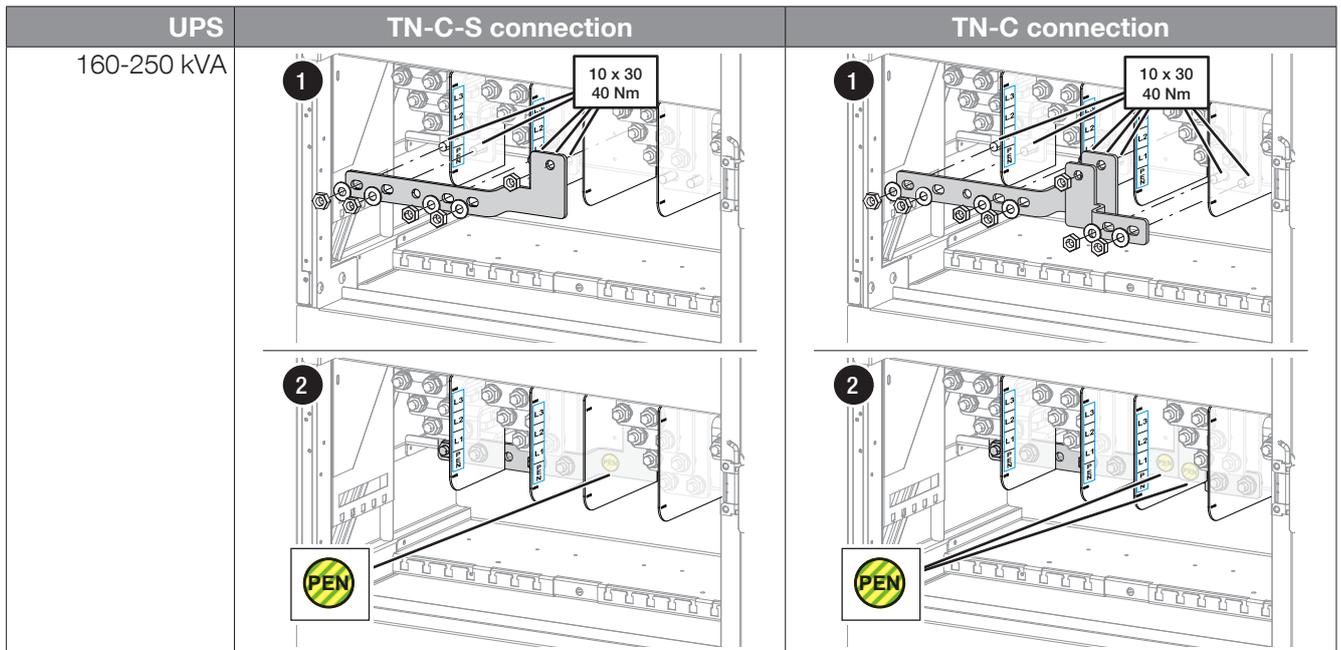
	<p>The input mains and auxiliary mains must be separate. The auxiliary mains must always have a neutral wire. The auxiliary mains neutral wire must be galvanically isolated from the PE.</p>
---	---

11.13 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.

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

UPS	TN-C-S connection	TN-C connection
60-80 kVA	<div style="text-align: center;">  <p>1</p> </div> <div style="text-align: center;">  <p>2</p> </div>	<div style="text-align: center;">  <p>1</p> </div> <div style="text-align: center;">  <p>2</p> </div>
100-120 kVA	<div style="text-align: center;">  <p>1</p> </div> <div style="text-align: center;">  <p>2</p> </div>	<div style="text-align: center;">  <p>1</p> </div> <div style="text-align: center;">  <p>2</p> </div>



11.14 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:

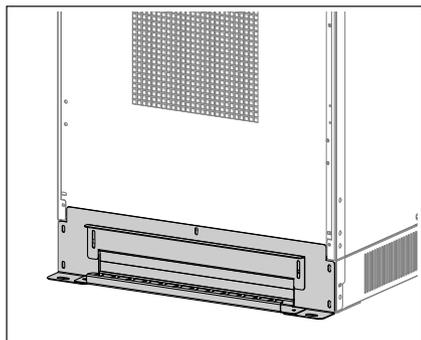
This option can only be used for single UPS setups, not parallel configurations.
For more information contact Socomec.

11.15 Redundant Bypass Ventilation

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

For further information contact SOCOMECC.

11.16 Anti-vermin protection

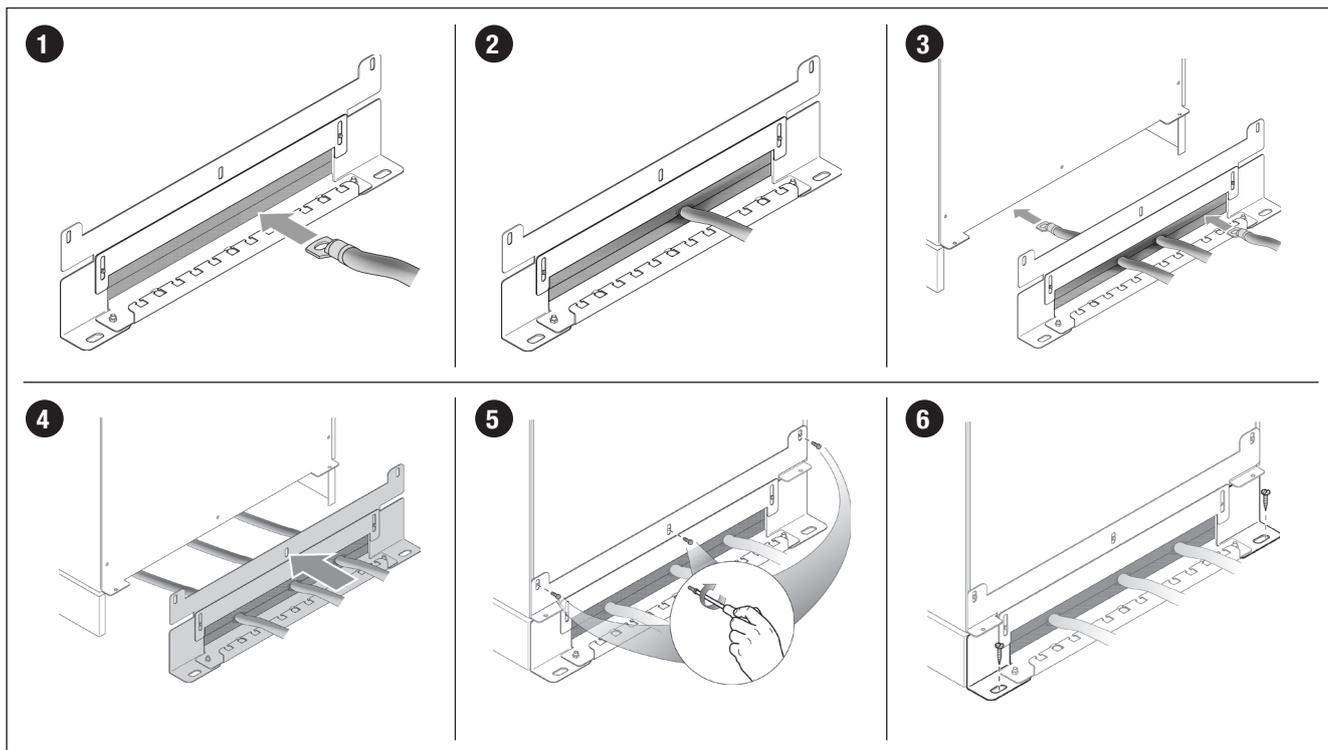


NOTE!

The cables coming from the rear of the unit must pass through the appropriate gap.

This operation must be carried out:

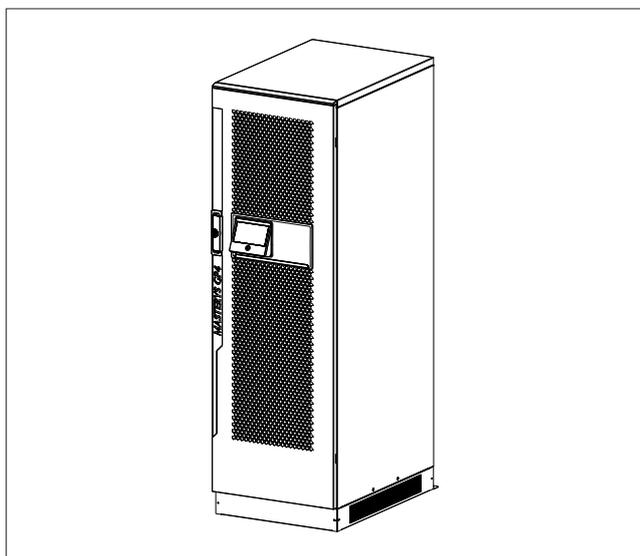
- before wiring operations;
- before securing the kit to the unit and the floor.



11.17 Seismic kit

The structure of the UPS is modified to allow it to operate in Zone 4 seismic activity installations (UBC 1997 "Zone 4" IEEE 693 2018 CEI IEC/TS 62271-210 2016).

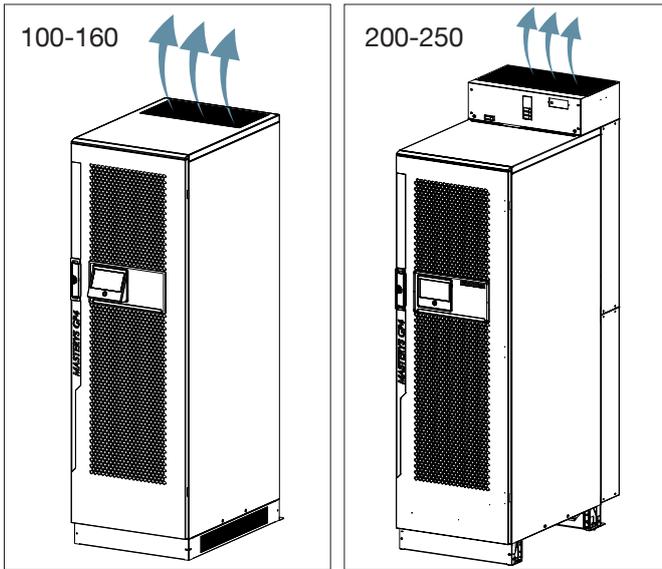
11.18 "T" cabinet



Mechanical characteristics

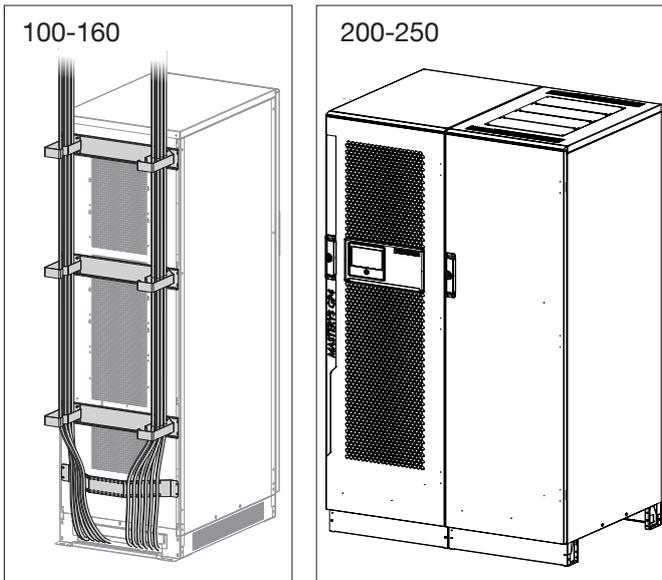
Dimensions	Height	mm	1930
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11.19 Top air exhaust kit



Environment		100-160	200-250
Acoustic noise	dBA	70	70
According to ISO 3746			

11.20 Top entry cables



NOTE!
This option can only be used with flexible cables.

Mechanical characteristics			100-160	200-250
Dimensions	Width	mm	600	1200
	Depth		1040	855
	Height		1930	1930

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 'Display operation' 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.
A006	REDUNDANCY LOST	The redundant Unit is not available. Check individual unit alarms to locate which is excluded from the System.
A008	ECO MODE DISABLED BY UPS	Eco mode is disabled due to bypass failure.
A009	ENERGY SAVER DISABLED BY UPS	An event has occurred forcing the UPS to stop the energy saver function.
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 low and reached a warning threshold.
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. 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.
A046	PARALLEL BOARD CRITICAL ALARM	There is a problem with the Parallel Board. Please contact the Service Dept.
A047	PARALLEL BOARD PREVENTIVE ALARM	There is a non-critical problem with the Parallel Board. Please contact the Service Dept.
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	Please contact the Service Dept.
A072	LINE INTERACTIVE DISABLE	Line Interactive Mode is disabled by UPS
A074	FLEX MODE REDUCED BY UPS	Power is downgraded by UPS

12.2 System status

S002	LOAD SUPPLIED BY AUTOMATIC BYPASS	Load on bypass, supplied by auxiliary mains. Load not protected.
S010	LINE-INTERACTIVE MODE	
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	
S082	UPS IN LINE INTERACTIVE OPERATION	
S088	FLEX MODE ENABLED	
S089	UPS IN FLEX MODE OPERATION	Flex Mode is in progress

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.

Installing the UPS in environments with excessive dust or dirt, it is likely that over time they will accumulate on the mesh attached to the front door.

It is suggested to clean excessive accumulation to ensure the best working conditions.

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 life-span 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 consumable 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 (kVA)		MASTERYS GP4									
		60	80	100	120	160	200	250	200 HE	250 HE	
Input/Output phases		3/3									
Electrical specifications - Input											
Mains voltage	Vin	3ph + N 400 Vac (-15/+20%) up to -40% @ 70% of nominal load									
Input frequency	Hz	40 - 70									
Input power factor		≥ 0.99									
Current distortion	THDi	≤ 2%			≤ 3%			≤ 2%			
		@: Pn, Resistive load, Mains THDv ≤ 1%									
Electrical specifications - External battery											
Battery voltage range	V bat	from ±160V ⁽¹⁾ to ±330V ⁽²⁾ (from 16+16 to 24+24 VRLA battery blocks)									
Electrical specifications - Output											
Output voltage 3Ph+N	V	380/400/415 V ±1% ⁽¹⁾			380 ⁽³⁾ /400/415 V ±1% ⁽⁴⁾			380/400/415 V ±1% ⁽⁴⁾			
Output frequency	Hz	50-60 Hz (selectable) ±0.01%									
Sn - Nominal apparent power	kVA	60	80	100	120	160	200	250	200	250	
Pn - Nominal active power	kW	60	80	100	120	160	200	250	200	250	
Overload (@ 25 °C; Vin > 380) ⁽⁵⁾	10 minutes	kW	75	100	125	150	200	250	312,5	250	312,5
	1 minute		90	120	150	180	240	300	375	300	375
Crest factor		≥ 2.7			≥ 2			≥ 2.2			
Voltage distortion	THDv	≤ 1% (@: Pn, Resistive load)									
		≤ 5% (@: Sn, non-linear load)									
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	0-40 (15-25 recommended)									
Storage temperature	°C	-5 to 50									
Relative humidity	%	up to 95% (condensation-free)									
Max. altitude	m	1000 (without derating)									
Acoustic noise <i>Models with external batteries</i>	@ 70% Pn	dBA	< 53	< 55	< 57	< 55 ⁽⁷⁾	< 63 ⁽⁷⁾	< 57 ⁽⁷⁾	< 65 ⁽⁷⁾		
	@ 100% Pn					< 62 ⁽⁷⁾	< 68 ⁽⁷⁾	< 65 ⁽⁷⁾	< 70 ⁽⁷⁾		
Acoustic noise (@ 70% Pn) <i>Models with internal batteries</i>			< 55	< 55	< 57						
Cooling type		Air cooling									
Required cooling capacity	m ³ /h	480	720	840	1080	1440	2100	2800	2400	3000	
Dissipated power max at Pn nominal condition	W	2880	3950	4800	5940	8000	9400	11800	7250	9050	
	BTU/h	9833	13486	16388	20280	27297	32074	40263	24738	30880	
Dissipated power max at Pn worst condition	W	3360	4630	5500	6560	9350	11600	14550	9400	11800	
	BTU/h	11471	15807	18778	22397	31904	39581	49646	32074	40263	

Models (kVA)			MASTERY5 GP4								
			60	80	100	120	160	200	250	200 HE	250 HE
Standards											
Safety			EN/IEC 62040-1, AS 62040-1								
Type and performance			EN/IEC 62040-3, AS 62040-3								
EMC			EN/IEC 62040-2, AS 62040-2								
Product certification			IECEE CB Scheme								
Product marks			CE - RCM ⁽⁶⁾ - EAC ⁽⁶⁾ - CMIM ⁽⁶⁾ - UKCA ⁽⁶⁾								
Protective class			Protective Class I								
Touch current			< 1 mA								
Protection level			IP20; IP21 (option)								
Mechanical characteristics											
Colour			RAL 7016								
Dimensions <i>Models with external batteries</i>	Width	mm	600								
	Depth	mm	855								
	Height	mm	1400				1930				
Weight		kg	174	186	228	240	338	291	346	339	395
Dimensions <i>Models with internal batteries</i>	Width	mm	600								
	Depth	mm	855								
	Height	mm	1930								
Weight		kg	680 ÷ 820								

(1) @Battery Full Discharged. Conditions apply. Call SOCOMEC support service.

(2) @Battery Full Charged. Conditions apply. Call SOCOMEC support service.

(3) 380 V with $P_{out} = 95\% P_n$.

(4) 360 V with $P_{out} = 90\% P_n$.

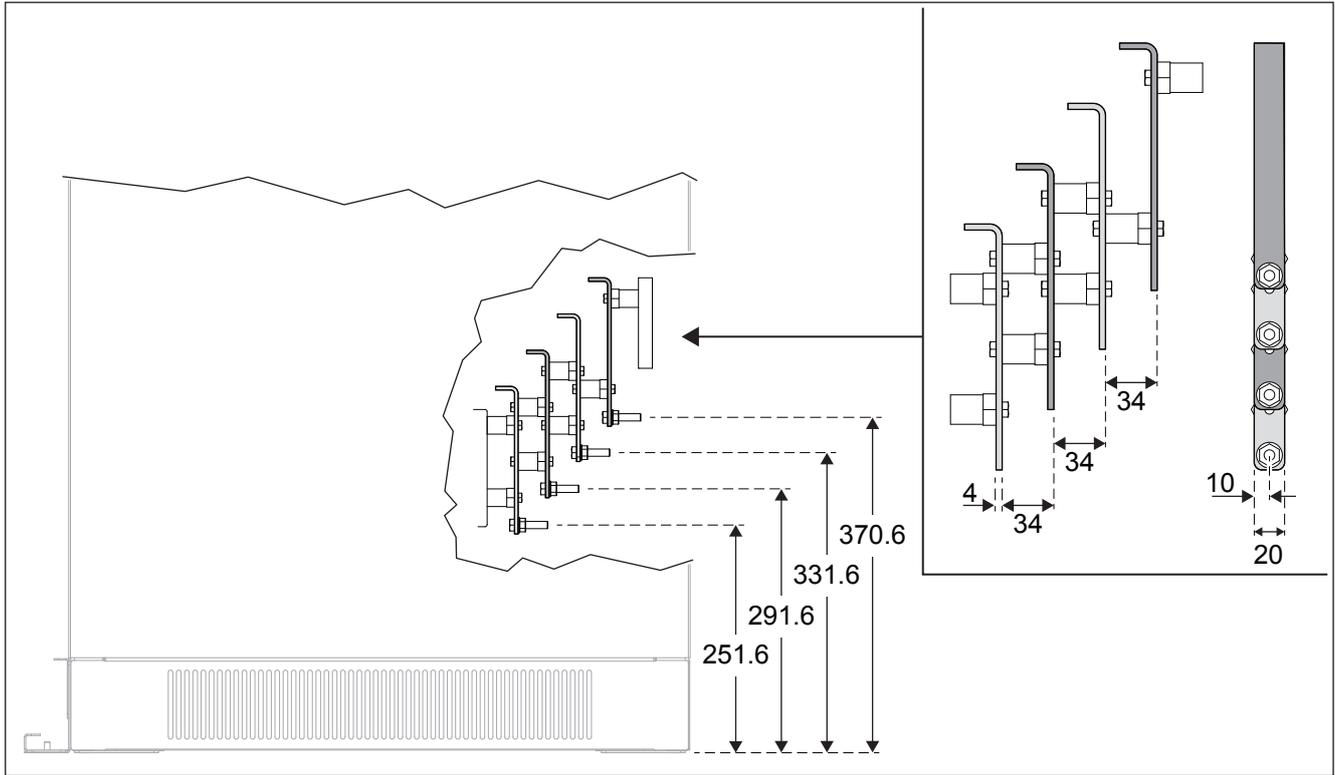
(5) Initial Condition $P_{out} \leq 80\% P_n$.

(6) Depends on the production site. Consult the data plate on the equipment.

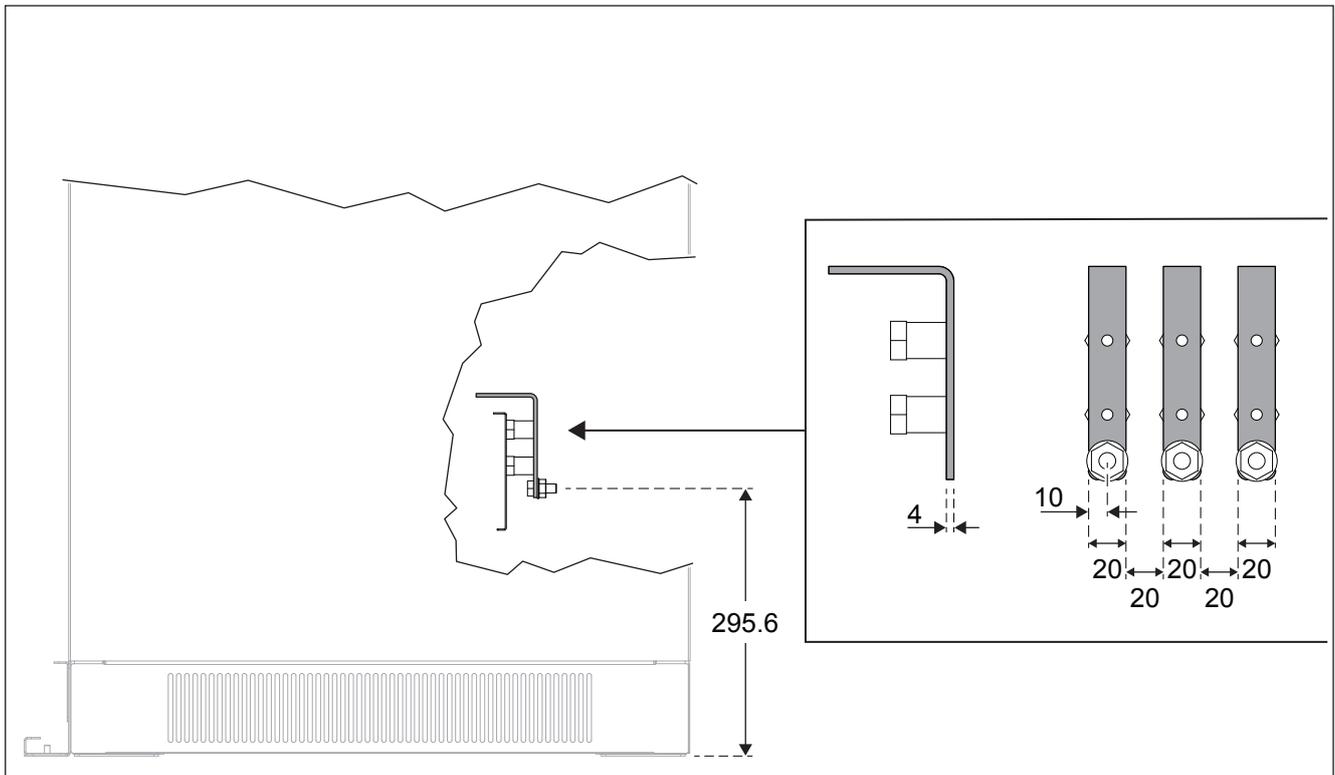
(7) 69 dBA with Top ventilation.

16. APPENDIX

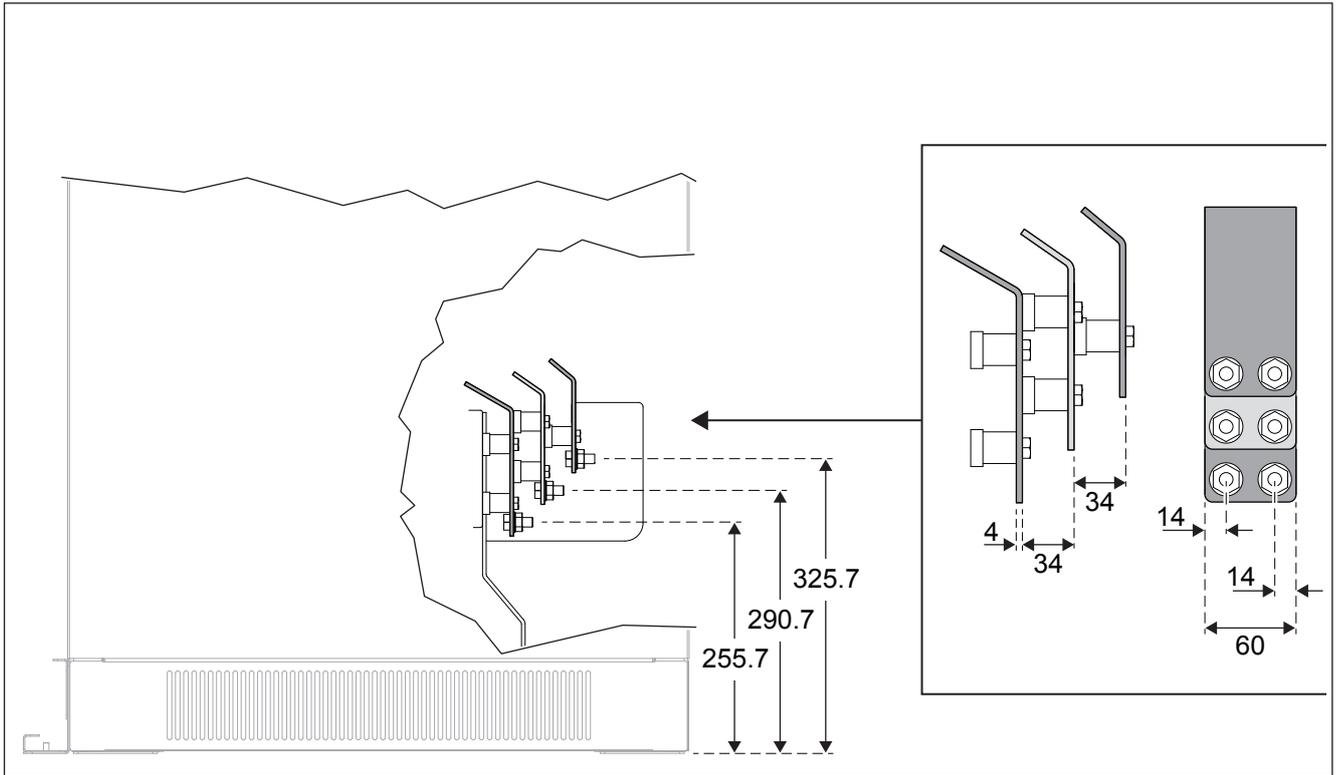
16.1 60-80 kVA - DIMENSIONS OF MAINS SUPPLY, AUX MAIN SUPPLY, OUTPUT BARS



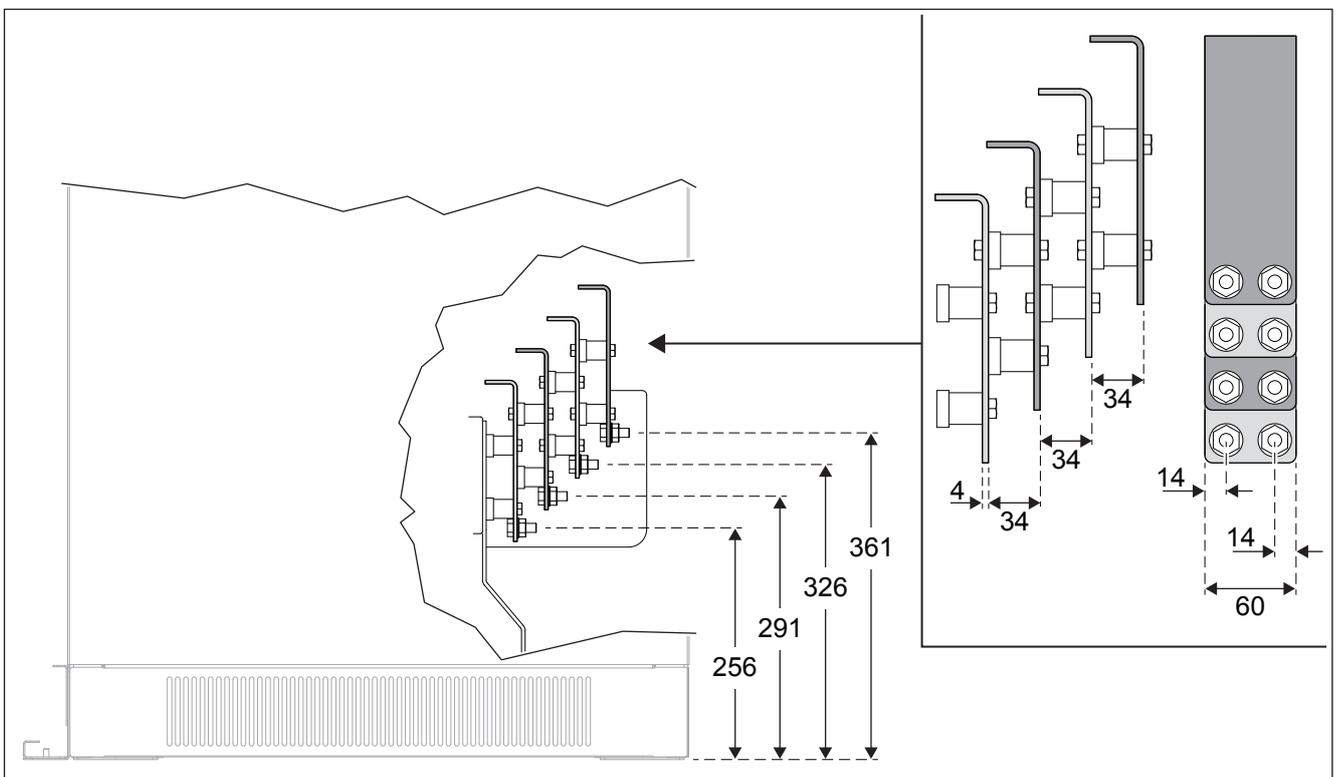
16.2 60-80 kVA - DIMENSIONS OF EXTERNAL BATTERY BARS



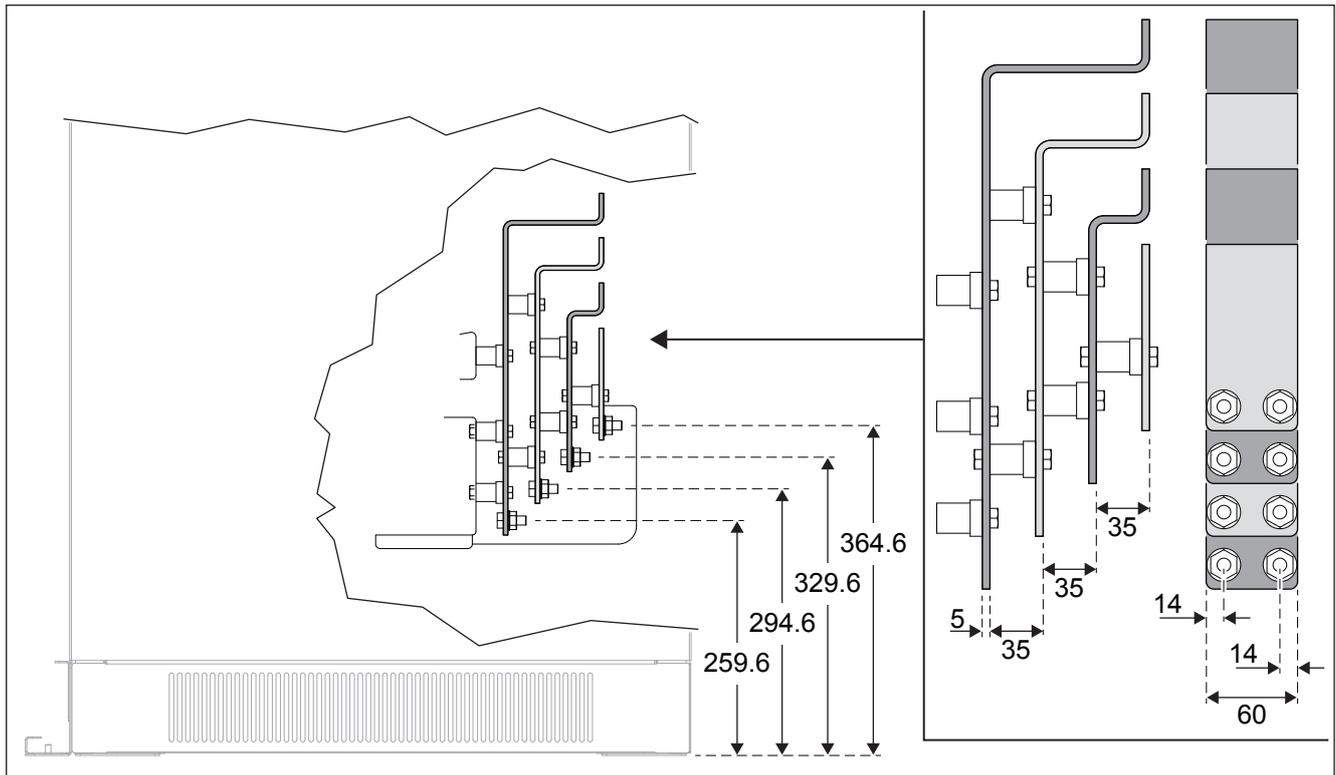
16.3 120 kVA - DIMENSIONS OF MAINS SUPPLY, AUX MAIN SUPPLY, OUTPUT BARS



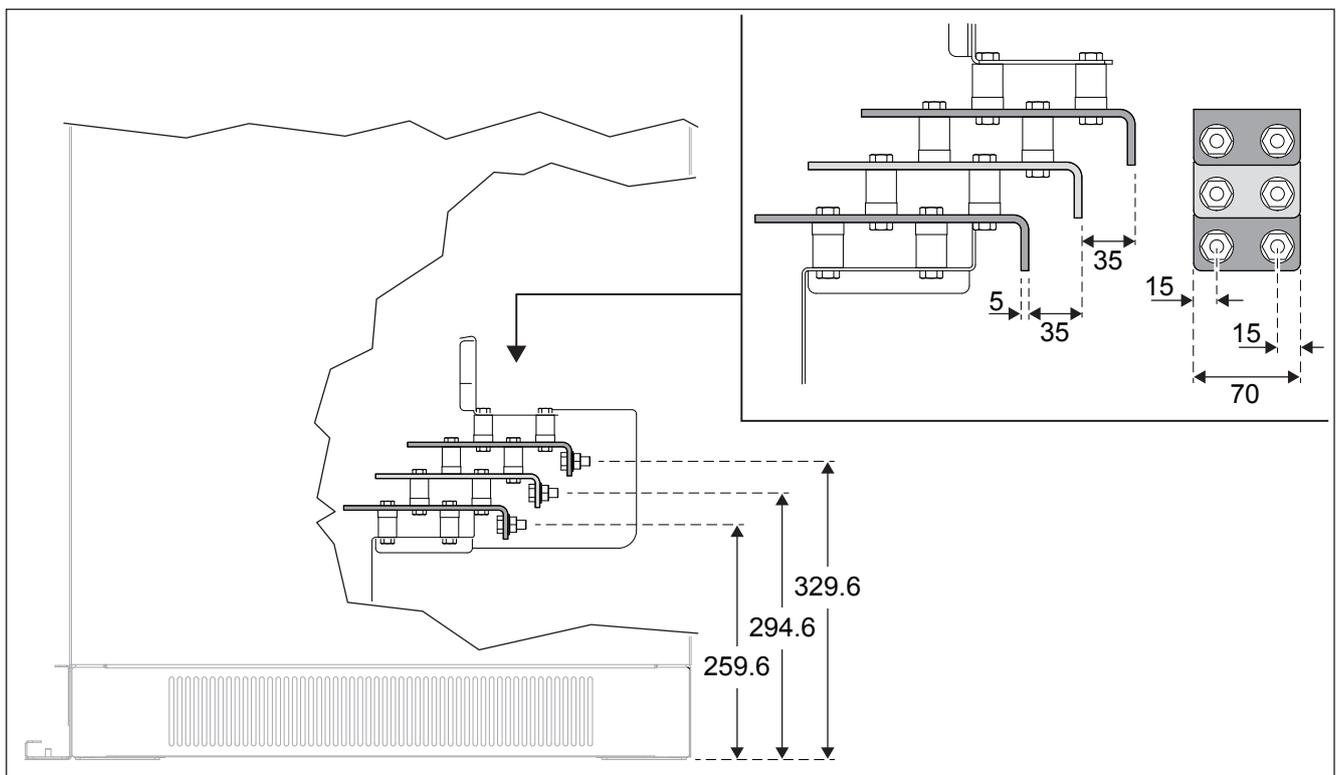
16.4 120 kVA - DIMENSIONS OF EXTERNAL BATTERY BARS



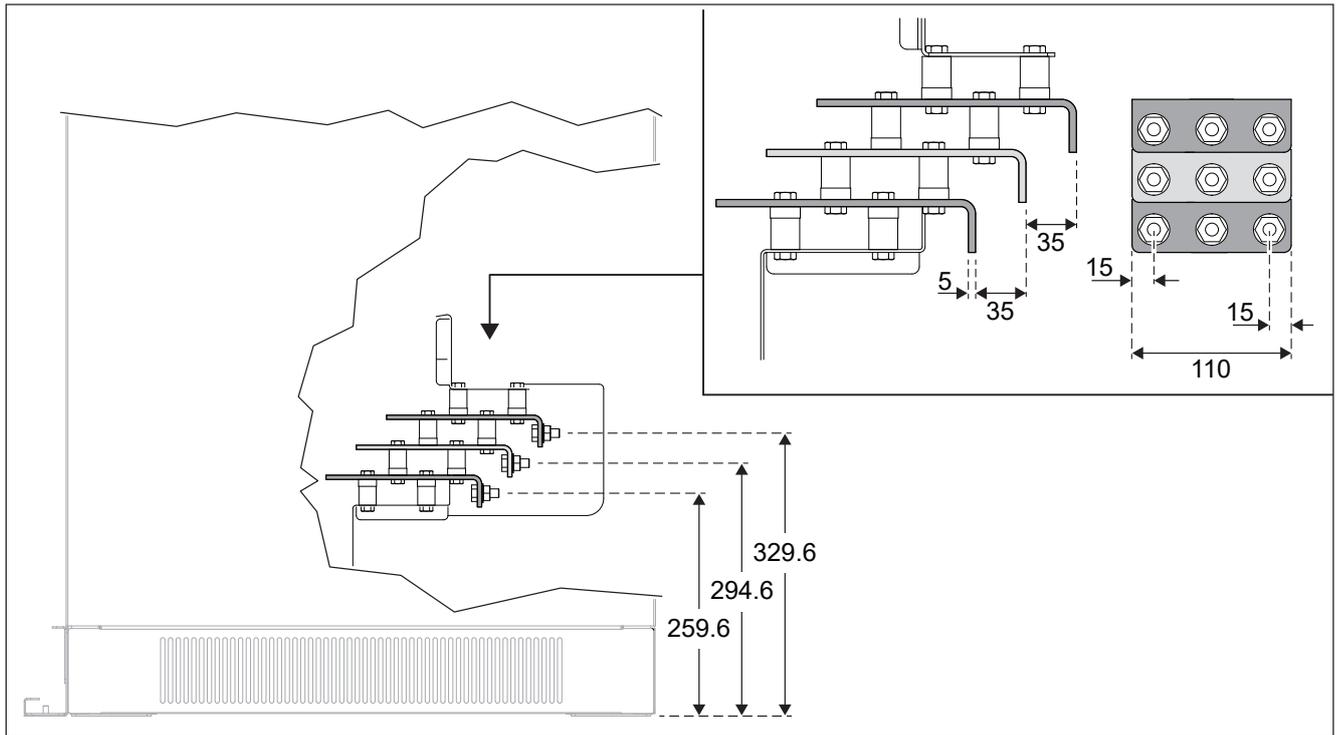
16.5 160-250 kVA - DIMENSIONS OF MAINS SUPPLY, AUX MAIN SUPPLY, OUTPUT BARS



16.6 160 kVA - DIMENSIONS OF EXTERNAL BATTERY BARS



16.7 200-250 kVA - DIMENSIONS OF EXTERNAL BATTERY BARS



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