INSTALLATION MANUAL

EN

# *DELPHYS Green Power 2.0*

## UPS from 160 to 800 kVA


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Innovative Power Solutions

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# 1. WARRANTY CERTIFICATE

The warranty terms are stipulated in the offer, by default the following clauses apply.

The SOCOMEC warranty is strictly limited to the product(s) and does not extend to equipment which may be integrated with this(these) product(s), nor the performance of this equipment.

The manufacturer guarantees its products to be free from manufacturing faults and defects in design, material or workmanship, subject to the limits set forth below.

The manufacturer reserves the right to modify the delivery with a view to fulfilling these guarantees or to replace defective parts The manufacturer's warranty does not apply in the following cases:

- faults or defects in the design of parts added or supplied by the customer,
- faults due to unforeseen circumstances or force majeure,
- replacement or repair resulting from normal wear and tear of the modules or machinery,
- damage caused by negligence, lack of proper maintenance or misuse of the products,
- repair, modification, adjustment or replacement of parts undertaken by unqualified third parties or personnel without the express consent of SOCOMEC.

The warranty period is twelve months commencing from the date of delivery of the product.
The repair, replacement or modification of the parts during the warranty period does not extend the warranty period.

In order to establish a valid warranty claim, the purchaser must notify the manufacturer in writing immediately after the discovery of any apparent material defects and provide any and all supporting evidence of the defects at the latest within eight days before the date of expiry of the warranty.

Defective parts which have been returned and replaced free of charge shall become the property of SOCOMEC.

The warranty is void if the purchaser has undertaken modifications or repairs on the devices on their own initiative and without the express consent of the manufacturer.

The manufacturer's responsibility is strictly limited to the obligations defined in this warranty (repair and replacement) excluding any other right to claim compensation or indemnity.

Any import tax, duty, fee or charge of any nature whatsoever imposed by European regulations or those of an importing country or of a transit country shall be paid by the purchaser.

# 2. SAFETY

## 2.1. IMPORTANT

- This document provides important instructions for the safe use, movement and connection of the Uninterruptible Power System (UPS).
- SOCOMEC retains the full and exclusive ownership rights over this document. Only a personal right to utilize the document for the application indicated by SOCOMEC is granted to the recipient of such document. All reproduction, modification, dissemination of this document whether in part or whole and by any manner are expressly prohibited except upon Socomec's express prior written consent.
- This document is not a specification. SOCOMEC reserves the right to make any changes to data without prior notice.
- Keep this manual handy for future consultation, this Safety Information is to be retained for future reference
- Reference security information is in English language,
- For other languages please contact SOCOMEC or relevant distributor
- The manufacturer will not be held liable for failure to follow the instructions in this manual or available at www.socomec.com
- The unit must be installed and activated only by qualified technical personnel and authorised by SOCOMEC.
- If the unit fails, it must be repaired only by authorised technicians that have been specially trained for this purpose
- Do not expose the UPS to rain or liquids in general. Do not insert foreign objects into the UPS.
- It is recommended that the ambient temperature and the humidity of the Delphys Green Power UPS environment are maintained below the values specified by the manufacturer.

- The cabinets must be transported and handled in an upright position.

**Green Power 2.0 MUST be handled with the utmost care by at least two people.**

- Connect the PE grounding conductor first before you make any other connection.

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

- If the UPS is not equipped with automatic isolation from back feed or if the switch is external to the UPS, affix a label bearing the following words on all the external switches of the UPS power supply:

**Before working on the electrical circuit**
- Isolate the uninterruptible power supply (UPS)
- Then check there is no hazardous voltage between the terminals including the ground connection

**Risk of return voltage**

- Do not connect the output neutral to ground (except TNC earthing option). The Delphys Green Power UPS does not modify the system's neutral connections; the use of a galvanic isolation transformer is required if the modifications to neutral connections are required downstream of the UPS (refer to § 5.5.1 Connecting Earth cables).
- Switch off and isolate the UPS and then wait for 5 minutes before removing the protection panels in order to carry out work on parts under dangerous voltage.

**The DELPHYS Green Power UPS could restart automatically.**

- Before connecting the external battery cabinet, check that this is fully compatible with the model of the UPS.
- The use of external battery cabinets not supplied by the manufacturers is not recommended.
- Danger of explosion if the batteries are replaced with others than original.
- The batteries are considered as toxic waste If they are replaced, entrust the used batteries solely and exclusively to specialist disposal companies As provided for by the local laws in force, batteries must not be disposed of with other industrial or domestic waste.

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

- If the UPS needs to be scrapped, it is essential to entrust the equipment solely and exclusively to specialist disposal companies These are obliged to dismantle and dispose of the various components in accordance with the legal provisions in force nationally.
- This equipment conforms to the European Community directives for professional equipment and bears the approval mark: CE

The regulations and standards applicable to the place of installation of the apparatus must also be observed to ensure the prevention of accidents. The product you have chosen is designed for commercial and industrial use only. In order to be used for particular “critical applications” such as life support systems, medical applications, commercial transportation, nuclear facilities or any other application or systems where product failure is likely to cause substantial harms to person or property, the products may have to be adapted For such uses we would advise you to contact SOCOMEC 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.

**This product is designed for secondary industrial and commercial applications. Installation restrictions or additional measures may be needed to prevent disturbances.**

**The liability of SOCOMEC in relation with the product subject of these Instructions is as stated in the applicable conditions of sales agreed between SOCOMEC and its client.**

## 2.2. Description of the symbols used on the labels applied to the unit

All recommendations and warnings on labels and plates attached to the interior or exterior of the equipment must be observed.

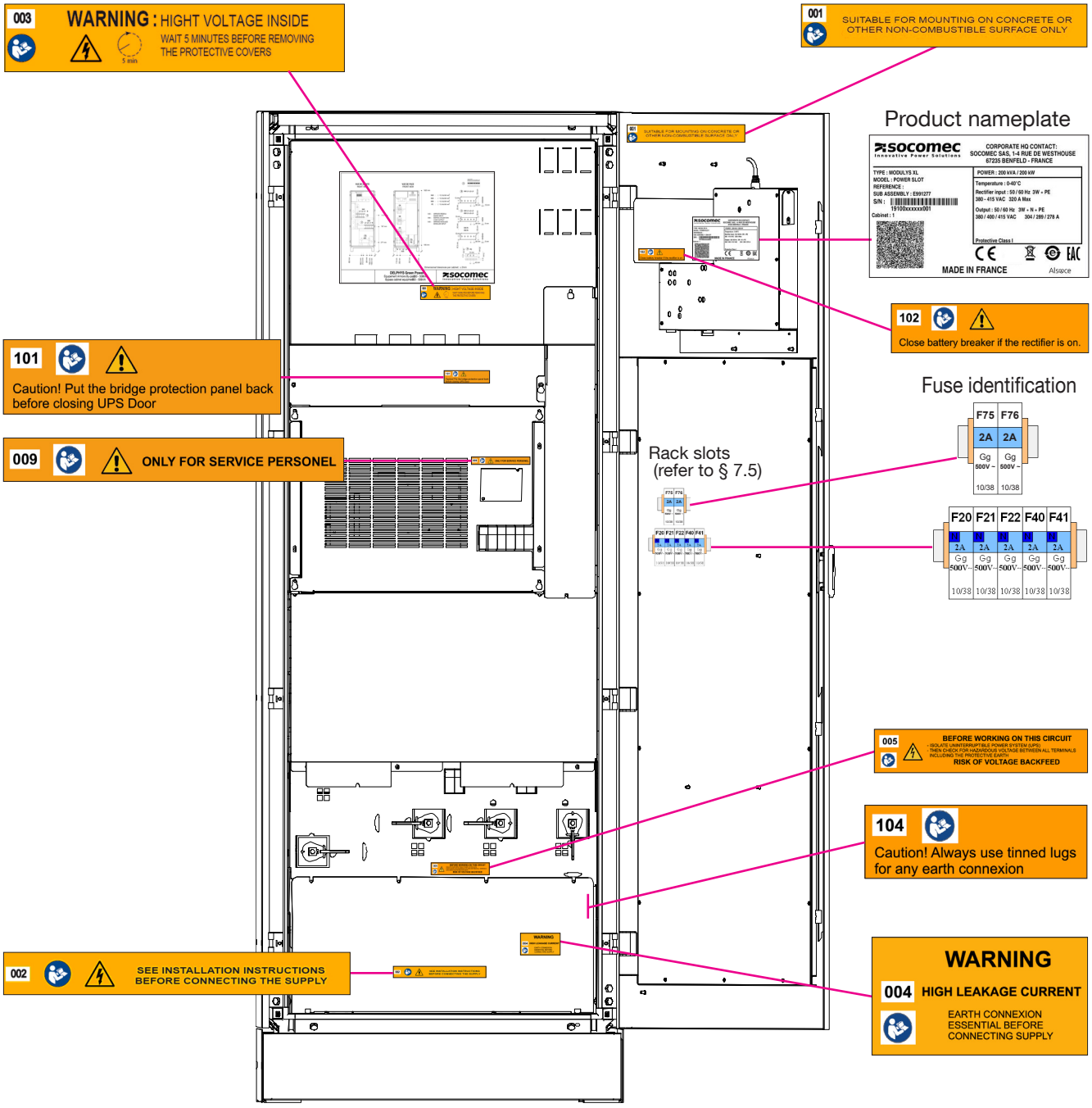
**DANGER! HIGH VOLTAGE (BLACK/YELLOW).**

**EARTH TERMINAL.**

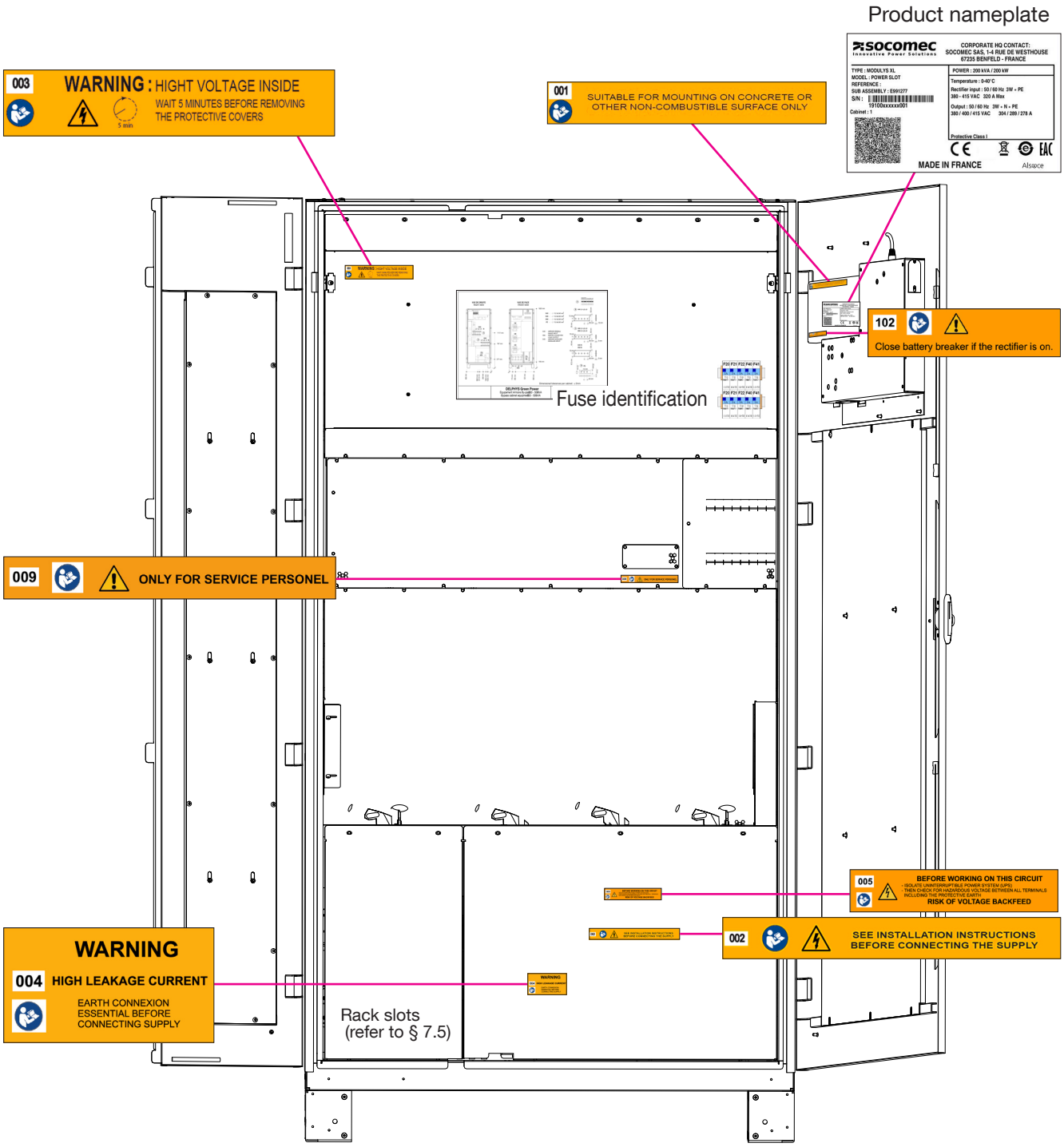
**READ THE MANUAL BEFORE USING THE UPS.**

## 2.3. Label positions

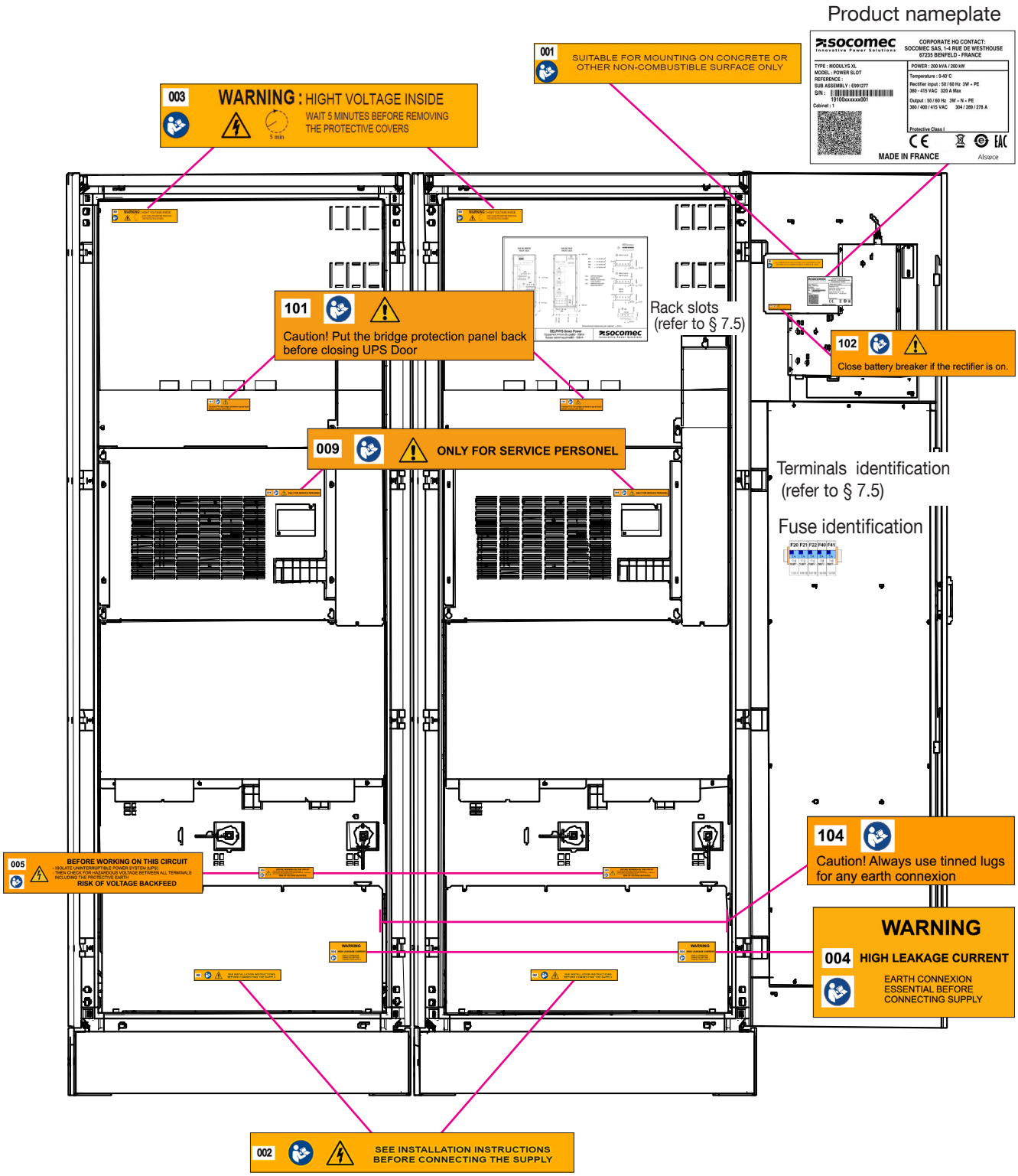
### 2.3.1. 160 and 200 kVA



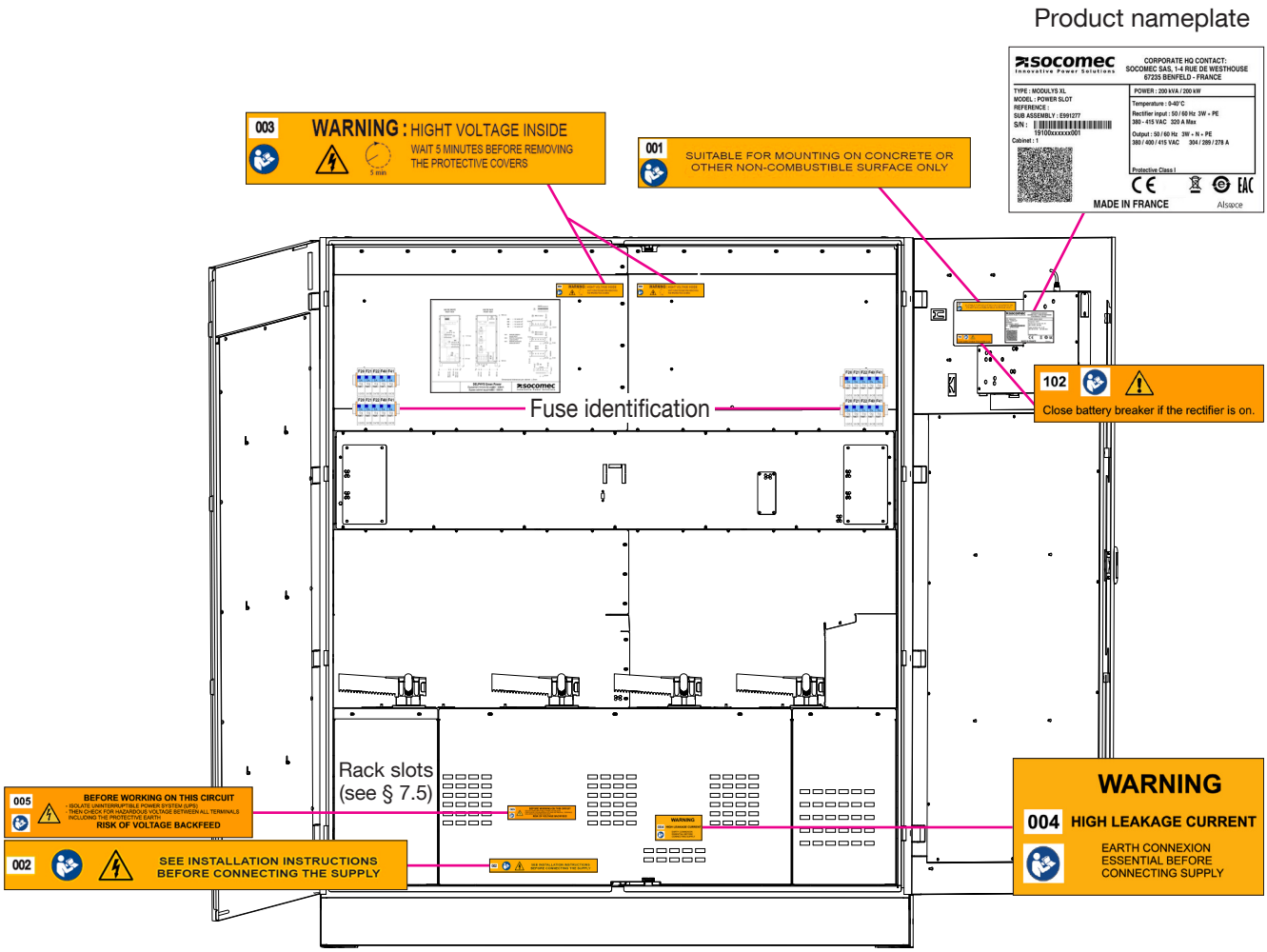
## 2.3.2. 250 AND 300 kVA



## 2.3.3. 400 kVA

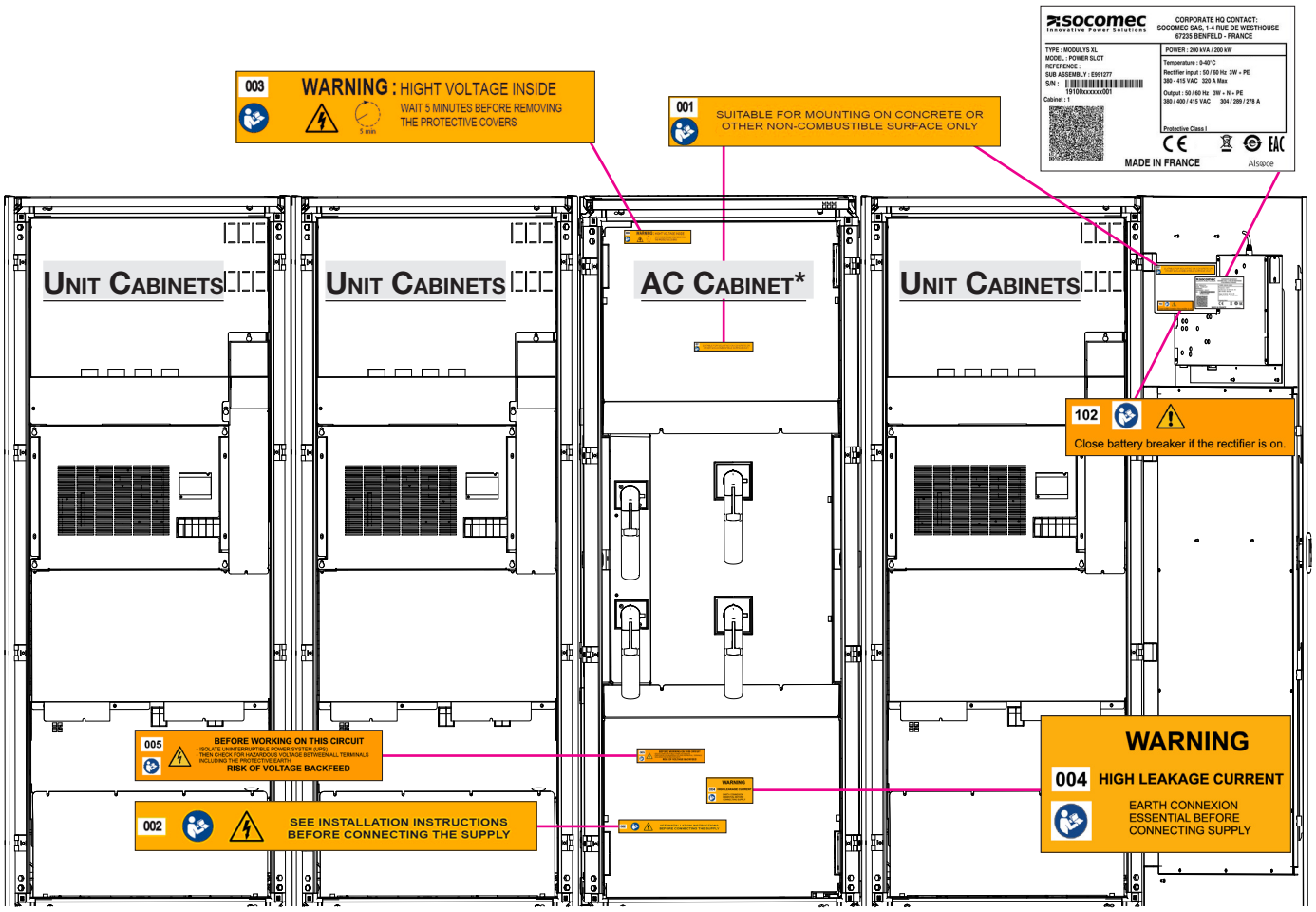

Product nameplate
001
SUITABLE FOR MOUNTING ON CONCRETE OR OTHER NON-COMBUSTIBLE SURFACE ONLY
003
WARNING : HIGHT VOLTAGE INSIDE
WAIT 5 MINUTES BEFORE REMOVING THE PROTECTIVE COVERS
socomec
MADE IN FRANCE
101
Caution! Put the bridge protection panel back before closing UPS Door
Rack slots (refer to § 7.5)
102
Close battery breaker if the rectifier is on.
009
ONLY FOR SERVICE PERSONEL
Terminals identification (refer to § 7.5)
Fuse identification
F20 F21 F22 F40 F41
005
BEFORE WORKING ON THIS CIRCUIT
RISK OF VOLTAGE BACKFEED
104
Caution! Always use tinned lugs for any earth connexion
WARNING
004
HIGH LEAKAGE CURRENT
EARTH CONNEXION ESSENTIAL BEFORE CONNECTING SUPPLY
002
SEE INSTALLATION INSTRUCTIONS BEFORE CONNECTING THE SUPPLY

## 2.3.4. 500 kVA


Product nameplate
003
WARNING : HIGHT VOLTAGE INSIDE
WAIT 5 MINUTES BEFORE REMOVING THE PROTECTIVE COVERS
001
SUITABLE FOR MOUNTING ON CONCRETE OR OTHER NON-COMBUSTIBLE SURFACE ONLY
socomec
MADE IN FRANCE
Fuse identification
102
Close battery breaker if the rectifier is on.
Rack slots (see § 7.5)
005
BEFORE WORKING ON THIS CIRCUIT
RISK OF VOLTAGE BACKFEED
002
SEE INSTALLATION INSTRUCTIONS BEFORE CONNECTING THE SUPPLY
WARNING
004
HIGH LEAKAGE CURRENT
EARTH CONNEXION ESSENTIAL BEFORE CONNECTING SUPPLY

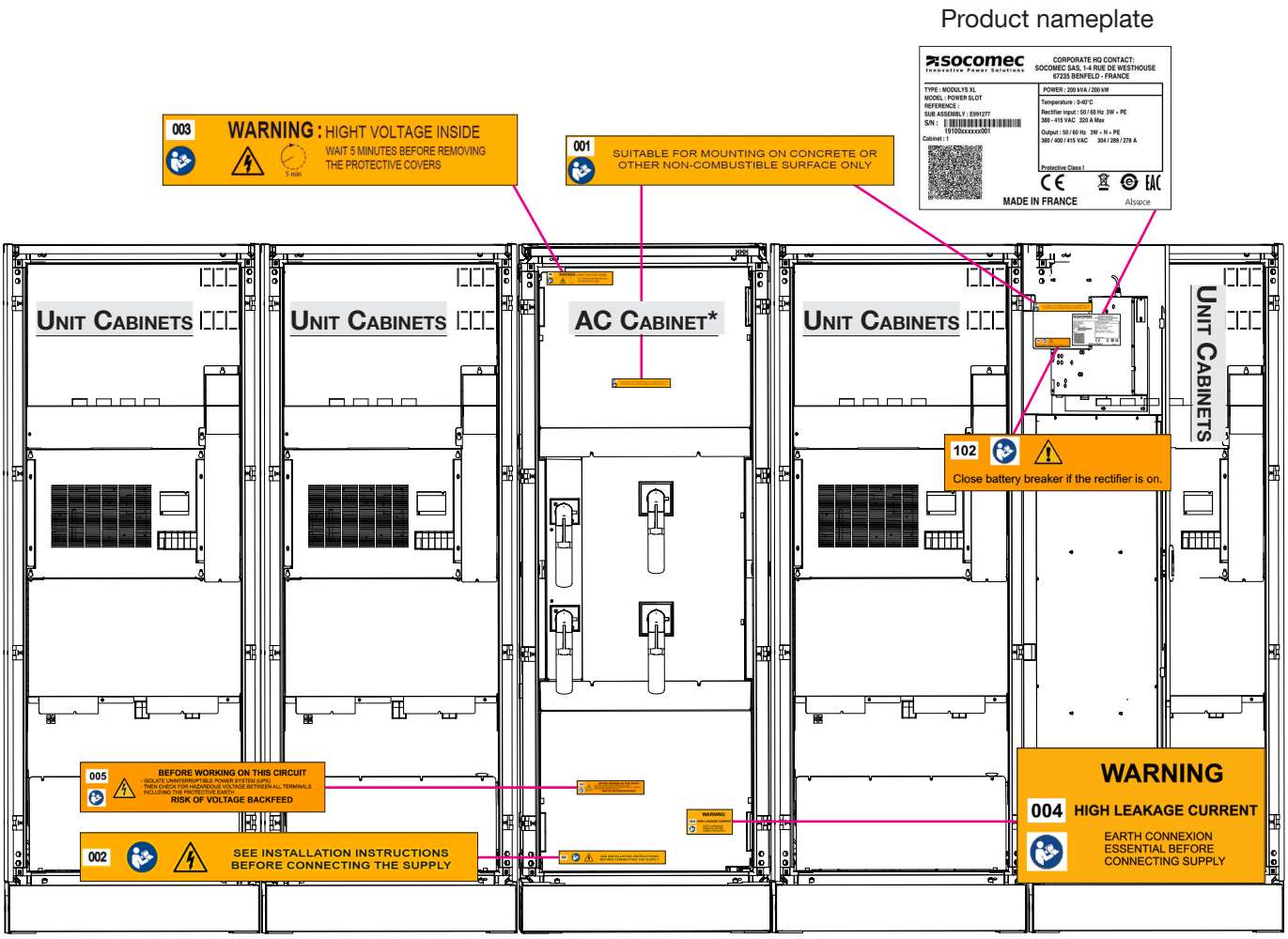
## 2.3.5. 600 kVA

Product nameplate




* AC CABINET = COUPLING CABINET

## 2.3.6. 800 kVA




* AC CABINET = COUPLING CABINET

# 3. FOREWORD

## 3.1. General remarks

Thank you for the trust you have in placed in us by choosing SOCOMEC Uninterruptible Power Systems

This equipment is fitted with up to date technology with power semiconductors (IGBT) including a digital micro-controller.

Our equipment complies with standards IEC 62040-2 and IEC 62040-1.

**This is a product for restricted sales distribution to informed partners Installation restrictions or additional measures may be needed to prevent disturbances.**

## 3.2. Regulations: environmental protection

**Recycling of electrical products and equipment**

Provision is made in European countries to dismantle and recycle materials making up the system The various components must be disposed of in accordance with the legal provisions in force in the country where the system is installed.

**Battery disposal**

Used batteries are considered as toxic waste It is therefore essential to entrust them solely and exclusively to firms specialised in their recycling They cannot be treated with other industrial or household waste, as set out in local regulations in force.

## 3.3. Possible Installation:

C1: Single UPS (Unit) with internal static Bypass,

C2: Single UPS (Unit) without internal static Bypass,

C3: Parallel UPS system with multiple units and centralised static Bypass,

C4: UPS in parallel without static Bypass,

C6: Parallel UPS system with 2 units providing 1+1 redundancy,

C7: Parallel UPS system with multiple units and distributed static Bypass.

please see § 12.2 for more details on layout.

# 4. POSITIONNING

## 4.1. Dimensions and weight (total)

| kVA | 160-200 | | 250 - 300 | 400 | 500 | 600 | 800 |
|---|---|---|---|---|---|---|---|
| Height (mm) | 1930 | | | | | 2060 | |
| Width (mm) | 707 | | 1003 | 1407 | 1603 | 2810 | 3510 |
| Depth (mm) | 845 | | 995 | 845 | 995 | 995 | 995 |
| Weight (kg) | 470 | 490 | 850 | 1000 | 1500 | 2300 | 2800 |

## 4.2. Storage, transport and handling

- If storing more than 6 month, please contact us.
- Green Power 2.0 must remain in a vertical position during all shipping and moving operations.
- Ensure that the floor is strong enough to support the weight of the UPS and of the battery cabinet, if used.

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

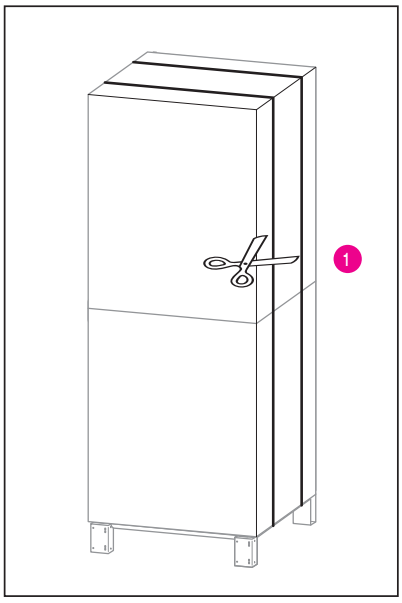
The UPS MUST be handled with the utmost care by at least two people.

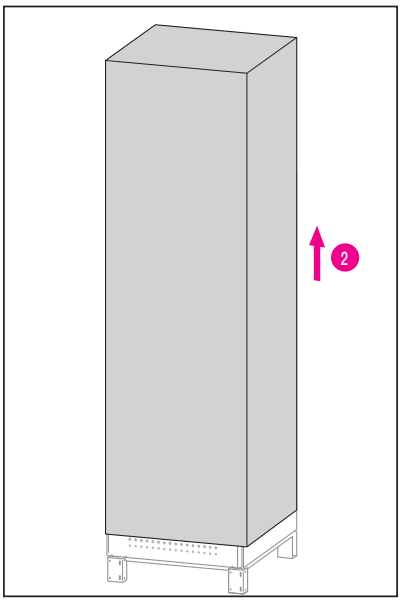
CAUTION IF DAMAGED.
Packages, crushed, punctured, or torn such that contents are revealed must be set aside in an isolated area and inspected by a qualified person. If the package is deemed to be not shippable, the contents must be promptly collected, segregated, and either the consignor or consignee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

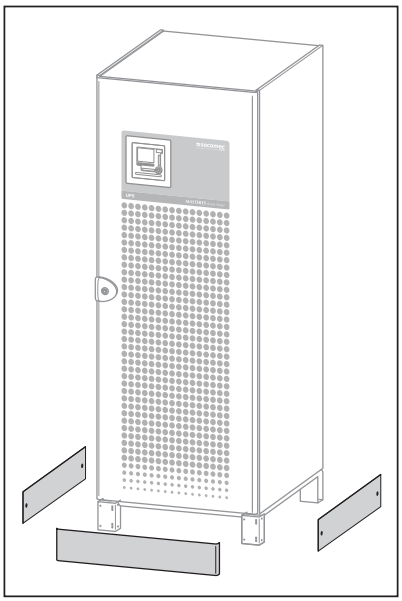
## 4.3. Unpacking procedure

Place the various elements in the installation area.

The packaging guarantees the stability of the element during delivery and transport. Carry the packaged element as close as possible to the installation site.



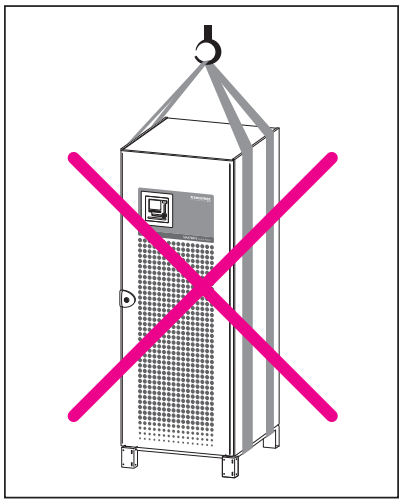



IMPORTANT: IN THE EVENT OF DAMAGE Packages, crushed, punctured, or torn such that contents are revealed must be set aside in an isolated area and inspected by a qualified person If the package is deemed to be not shippable, the contents must be promptly collected, segregated, and either the consignor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

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

## 4.4. Moving from above



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

Never use harnesses!

### 4.4.1. Moving with belts

- Length of belts X:

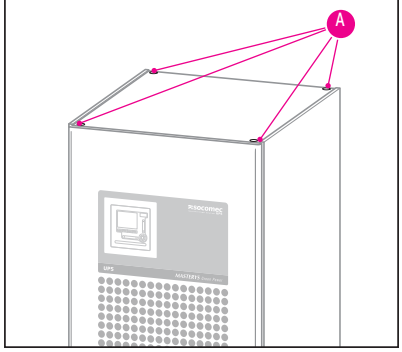
| kVA | 160 | 200 | 250 | 300 | 400 | 500 | 600 | 800 |
|---|---|---|---|---|---|---|---|---|
| X ≥ (cm) | 150 | 150 | 200 | 200 | 200* | 200 | 200* | 200* |

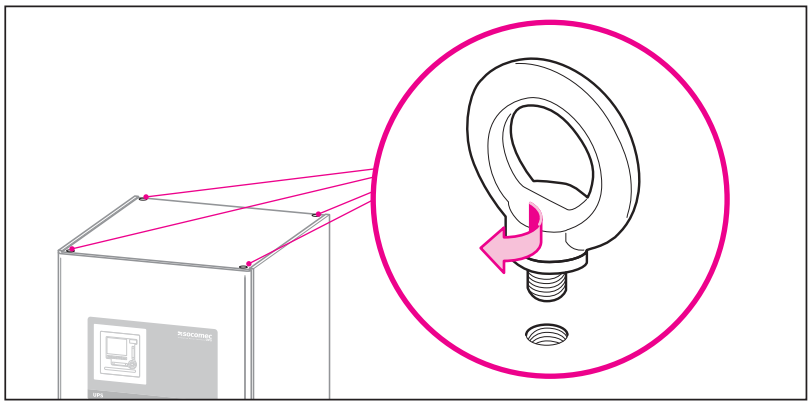
*if using the 8 hoisting rings

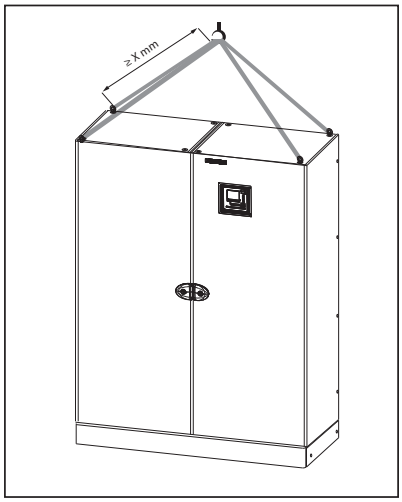
- Hoisting rings (delivered on request): inner ø 30 mm, thread M12.

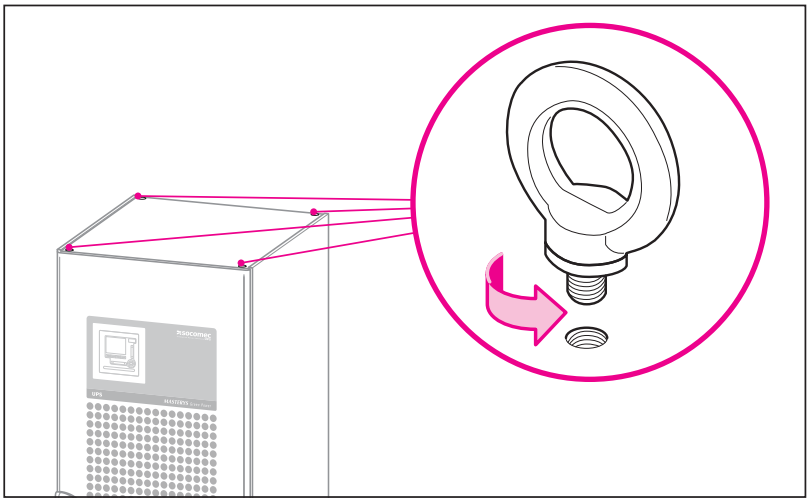
Lift and handle the cabinets with the utmost care and without jerking.

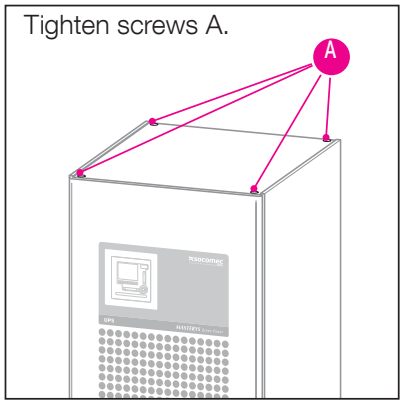
Remove screws A.



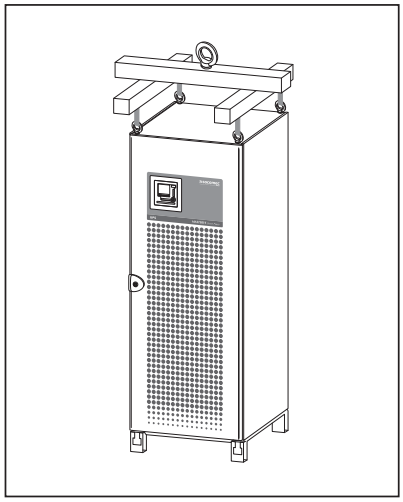





### 4.4.2. Moving with lifting truss

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



## 4.5. Handling from underneath

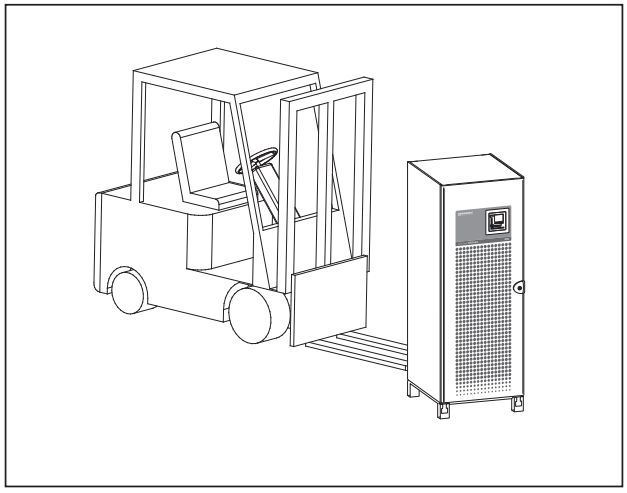
Given the equipment is heavy, handling using a pallet truck on slopes or ramps – even only slightly inclined, is hazardous and can cause severe accidents.

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

Take all required precautions and use appropriate means and tools.

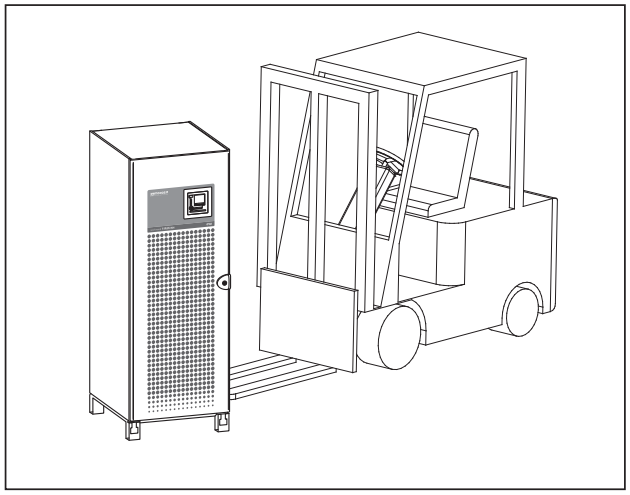
### Handling from the front or rear

Remove the lower grilles on the front and rear of the UPS and place the forklift under the unit.



### Lateral handling

Lateral handling is also possible, provided that the bottom side panels are removed.



the fork should be at least 2 cm longer than the cabinet.

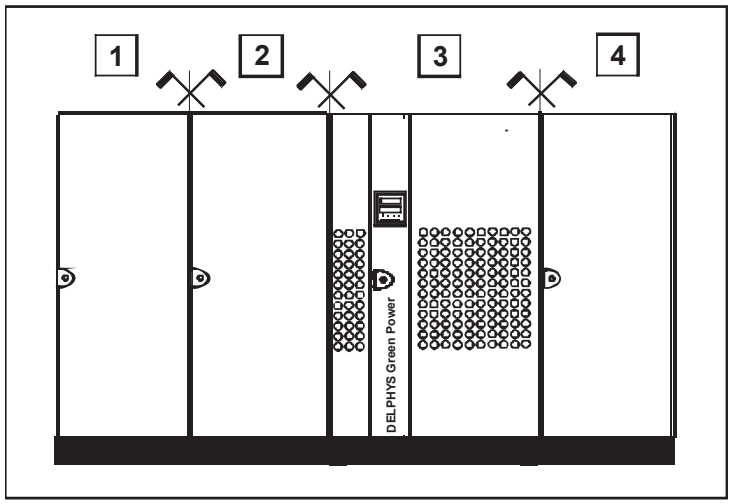
## 4.6. Cabinet positioning

To make transport and handling easier, the system is separated into cabinets (or cabinet sets).

The ⟩⟨ symbol on the front face indicates the separation points between the cabinets.

The individual cabinet position should correspond with sequence / numbers indicated on the front view of the system.

(The number of each cabinet is indicated on the right top corner on the inside of the door).




Note : reference should be made to the technical details in the drawing file.

## 4.7. Environmental requirements

- Green Power 2.0 is not designed for outdoor use.
- Do not expose Green Power 2.0 to direct sunlight or to sources of excessive heat.
- The recommended operating temperature, humidity and altitude values are listed in the technical specifications table (see chapter 11). Cooling systems may be required to maintain these values.
- Green Power 2.0 must be installed in an environment without obstructions and which is dry, clean and dust-free.
- Avoid dusty environments or areas where there is dust from conductive or corrosive materials (e.g. metal dust or chemical solutions).
- Green Power 2.0 can be installed against a wall. The upper part of Green Power 2.0 must be positioned at least 40 cm away from the ceiling (figure 4.7-1).
- Green Power 2.0 switches are accessed from the front; however, a space of at least 1.5 metres should be left at the front of Green Power 2.0 for maintenance purposes.
- For UPS arranged frontally, leave a minimum space of 60 cm between the two open door cabinets to allow a passageway when both are open (in accordance with the provisions of standard IEC 60364 - see figure 4.7-1).
- Several cabinets can be installed adjacent to each other (figure 4.7-2).
- Two Green Power 2.0 can be installed back to back (figure 4.7-3).
- Observe the direction of the ventilation flows (figure 4.7-4) and heat dispersion flows (figure 4.7-5). See chapter 4.8 for the technical specifications relating to the required ventilation values.

**Green Power 2.0 should only be installed on a concrete surface or other non-combustible surface.**

**In case of corrosive or industrial atmosphere environment, please, consult us.**

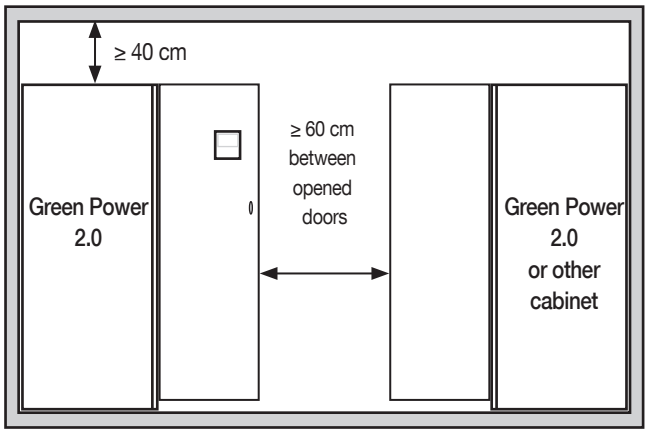
**For all the safety requirements of the battery installation, such as battery room ventilation, consult also the applicable international and local safety codes and standards.**

**In compliance with standard IEC 60364-4-42, Green Power must be installed in a room with restricted access and entry into this restricted access room is possible only to authorized qualified personnel.**

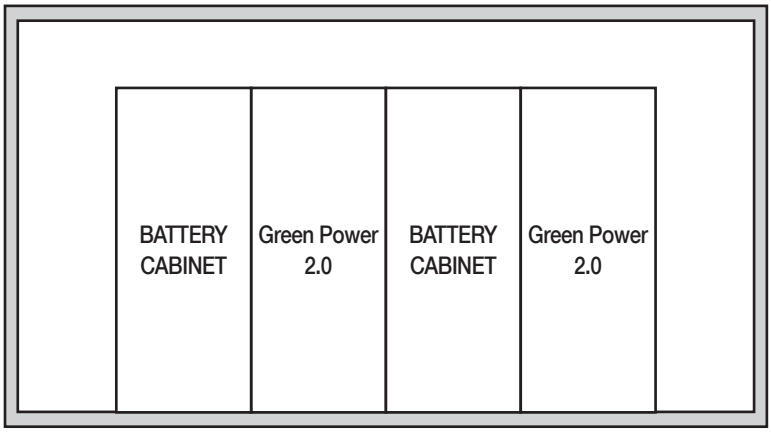
**In order to profit from an optimal ventilation, the side panels must remain in place.**

**For fixing on the floor, see § 12.**

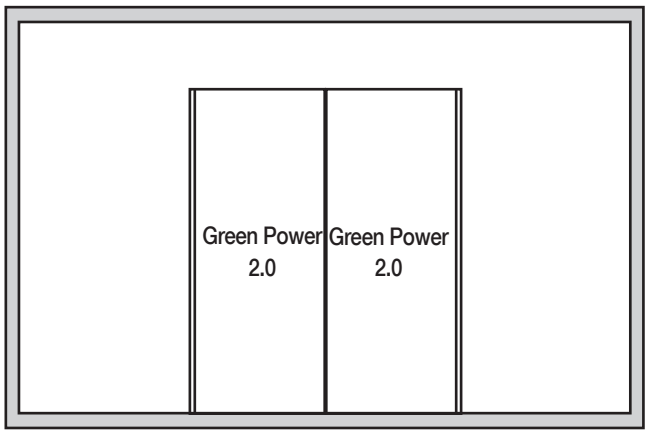
4.7-1



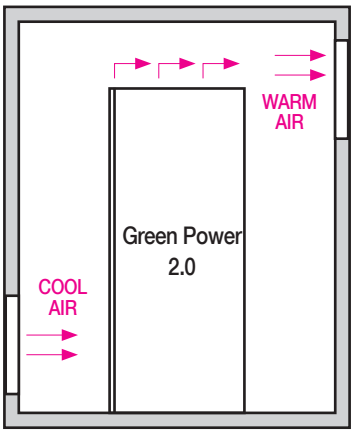

4.7-2



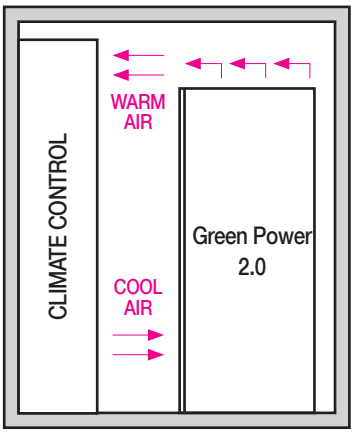

4.7-3

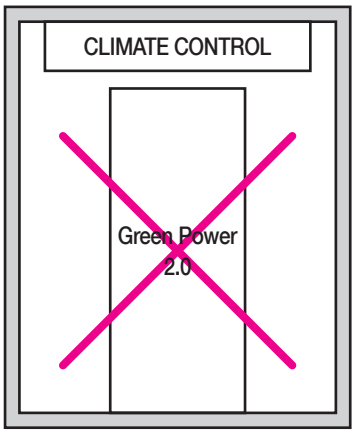



4.7-4 Ventilation.




4.7-5 Climate control.



## 4.8. Heat dissipation and ventilation characteristics

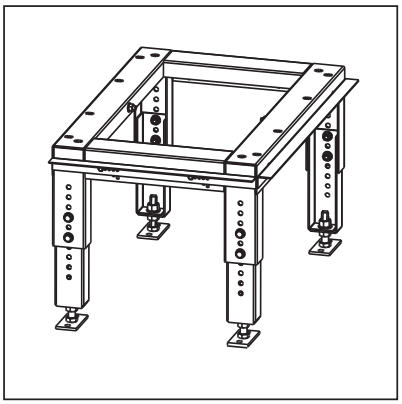
| kVA | air flow | | Total air flow $m^3$ / h | Heat losses at full load MAX. | |
|---|---|---|---|---|---|
| | | | | at nominal / worst case | |
| | Bottom | Mid height | | W | BTU/h |
| 160 | 45 % * | 55 % * | 2250 | 7900 / 10000 | 26956 / 34121 |
| 200 | | | 2250 | 10400 / 13000 | 35486 / 44358 |
| 250 | | | 2700 | 12800 / 15000 | 43675 / 51182 |
| 300 | | | 2700 | 15200 / 18000 | 51864 / 61420 |
| 400 | | | 4500 | 22000 / 26000 | 75066 / 88716 |
| 500 | | | 5400 | 24300 / 30000 | 82914 / 102364 |
| 600 | | | 6750 | 31800 / 39000 | 108505 / 133074 |
| 800 | | | 9000 | 46400 / 56800 | 158300 / 193800 |

## 4.9. Floor mounting

According to the UPS and the configuration (eg 400 kVA model with external cabinet cables arrivals from the top), it is necessary to use extension feet.

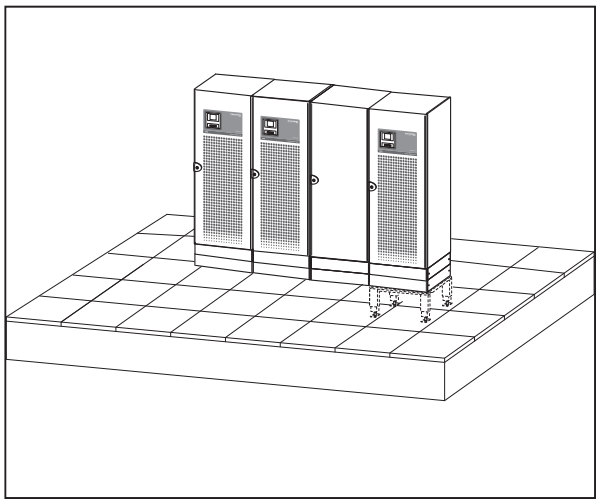
### 4.9.1. Installation on raised flooring

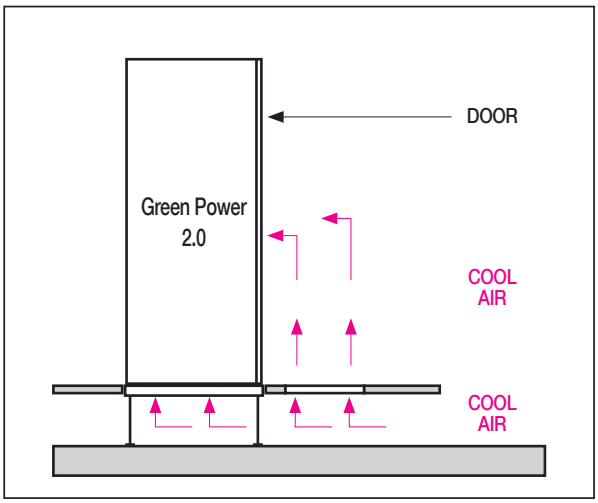
If Green Power 2.0 is to be installed on raised flooring, the SOCOMEC adjustable frame (see figure on the right) must be used to support the weight of the unit (see figure below left).



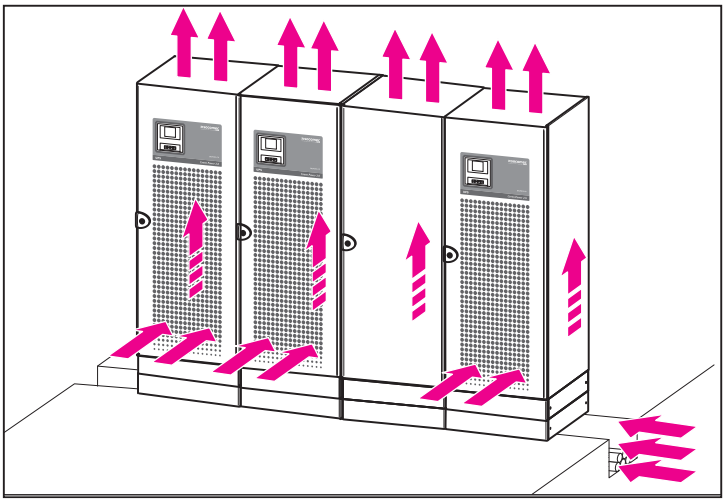
Refer to the relevant installation manual provided in the packaging for information on frame assembly operations.

Allow for small openings in the floor panels to ensure the air flow at the front (see figure below right).





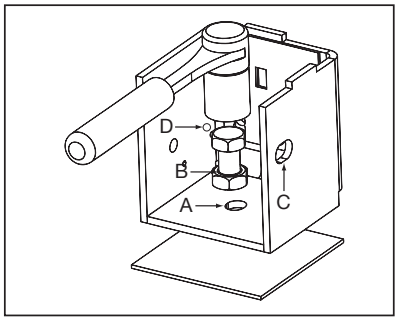
### 4.9.2. Installation over cable trench



### 4.9.3. Fixing to the floor (a raised floor or directly to the floor)

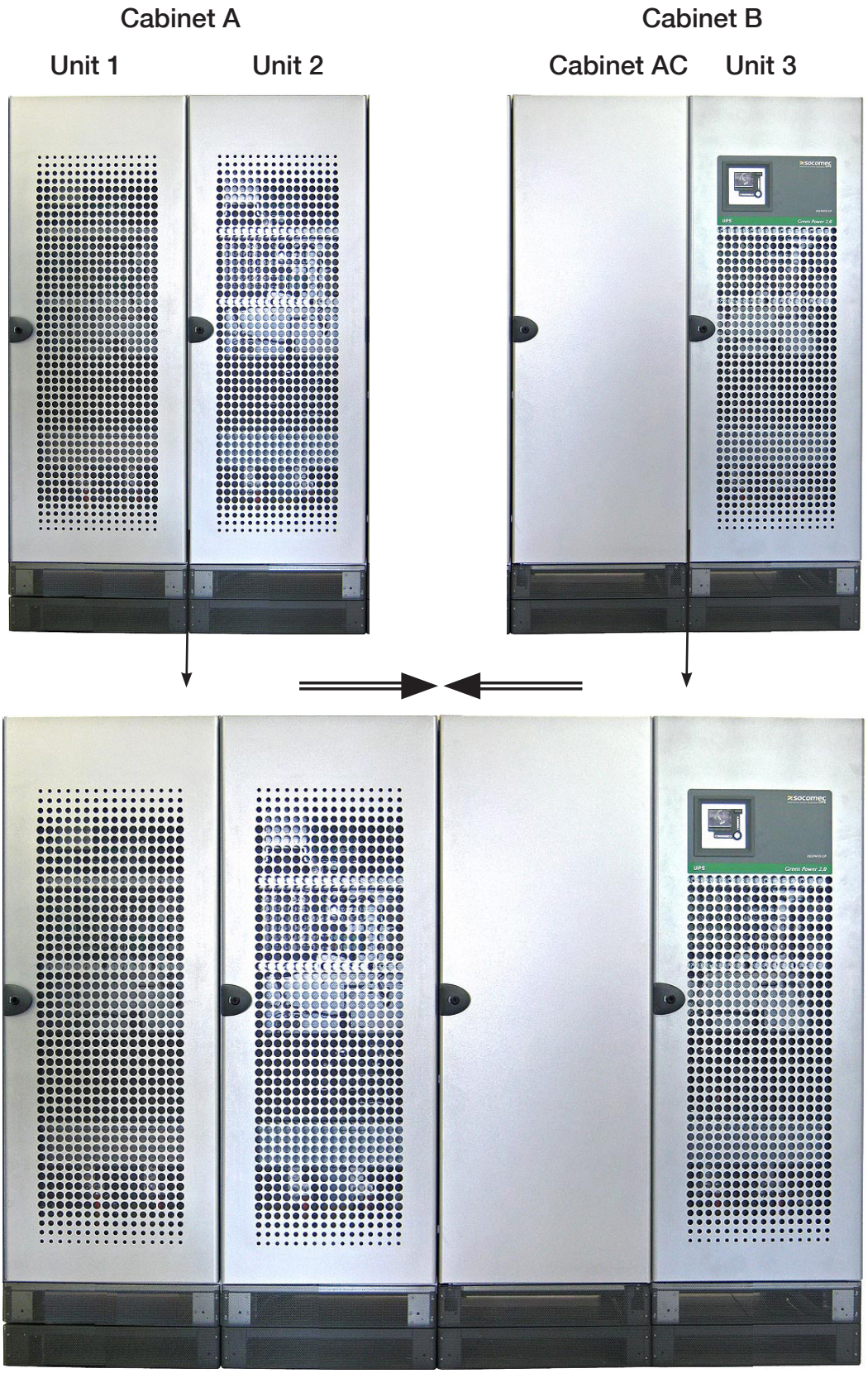
Each foot of the cabinet needs to be linked up to the metallic mesh network (if the cabinet is on a raised floor) or to have direct earth bonding (if the cabinet is directly positioned on the floor) by using short links with a cross-section ≥ 35 mm².

Use braidings to connect all the metallic feet of the raised floor and guarantee equipotential cabling.

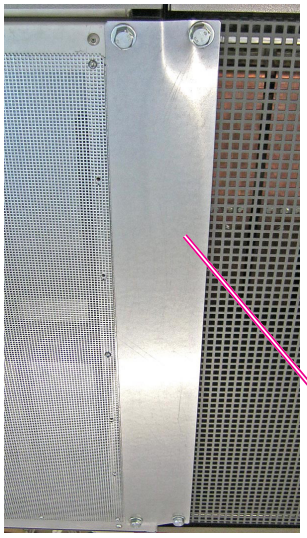



Each foot (exept 500 kVA model) has a floor fixing hole (labelled A : ø 13) and welded nut for level adjusting (labelled B : screw THM 12 not supplied).

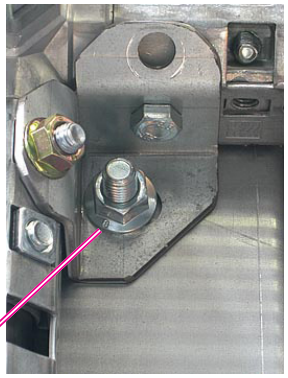
## 4.10. Assembly of Delphys Green Power 600 kVA

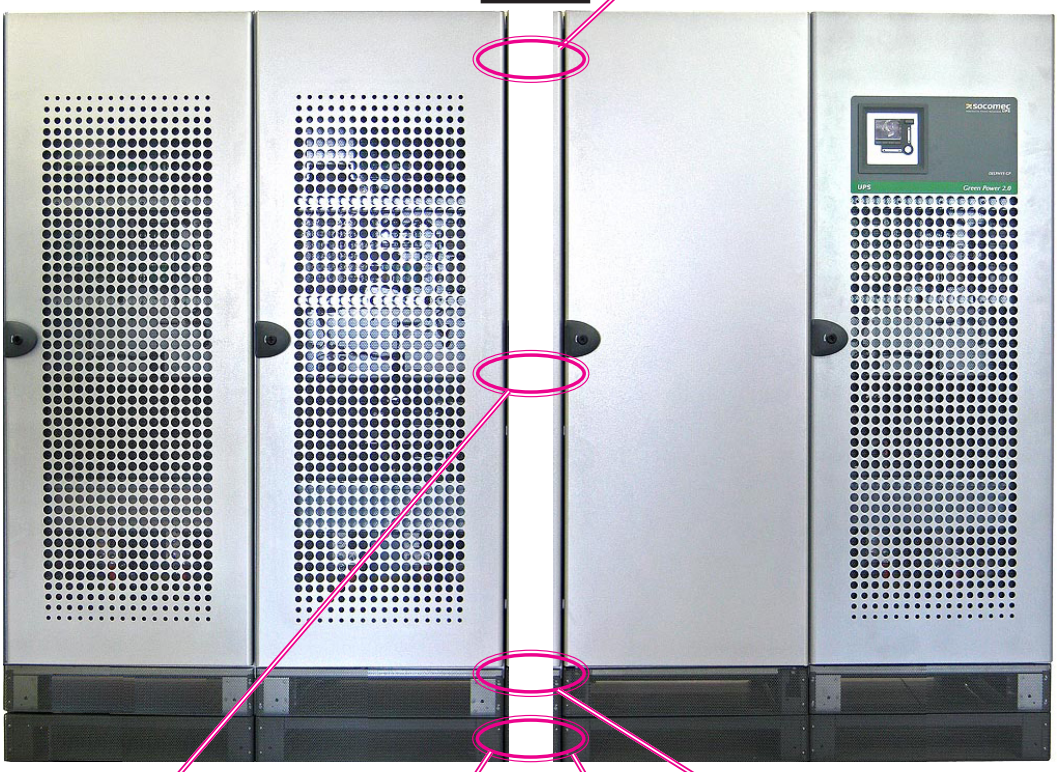


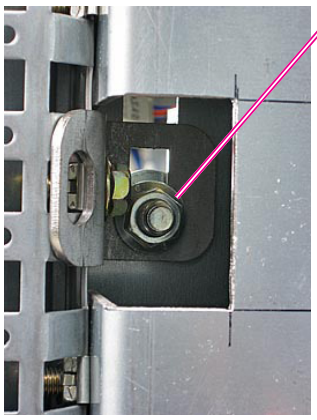

AS the two cabinets are paired at the factory, the order of assembly must be respected.

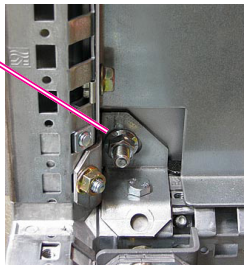


at the front (and at the rear if possible) of the cabinet





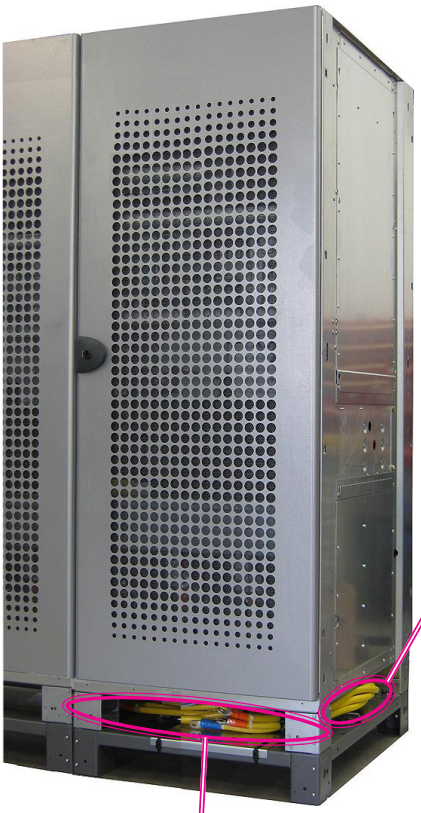


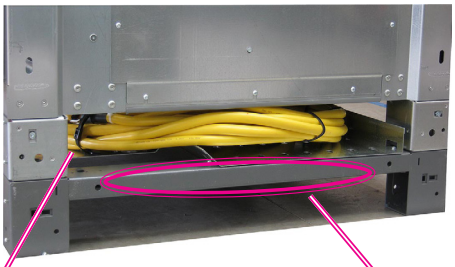


at the front (and at the rear if possible) of the cabinet

Tensilock M10 x 25 + Tensilock nut M10

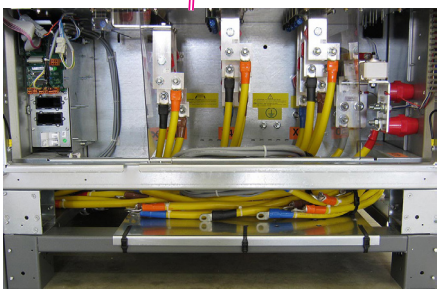
## Cabinet A





cables to unroll

Plate to be removed after removing the cables

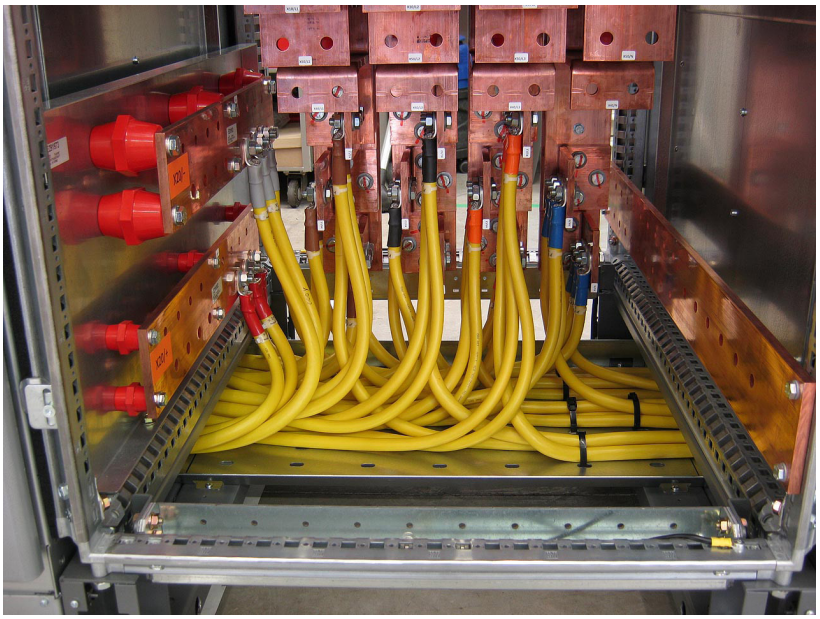


cables coming from Unit 1:

| marks | colors | designation | terminals |
|---|---|---|---|
| Unit 1 - X5 | Brown | OUTPUT L1 | X5 L1 |
| Unit 1 - X5 | Black | OUTPUT L2 | X5 L2 |
| Unit 1 - X5 | Orange | OUTPUT L3 | X5 L3 |
| Unit 1 - X5 | Blue | OUTPUT N | X5 N |
| Unit 1 - X4 | Brown | AUX MAINS. L1 | X4 L1 |
| Unit 1 - X4 | Black | AUX MAINS. L2 | X4 L2 |
| Unit 1 - X4 | Orange | AUX MAINS. L3 | X4 L3 |
| Unit 1 - X4 | Blue | AUX MAINS. N | X4 N |
| Unit 1 - X1 | Brown | MAINS L1 | X1 L1 |
| Unit 1 - X1 | Black | MAINS L2 | X1 L2 |
| Unit 1 - X1 | Orange | MAINS L3 | X1 L3 |
| Unit 1 - X2 | Rouge | battery + | X2 + |
| Unit 1 - X2 | Gris | battery - | X2 - |

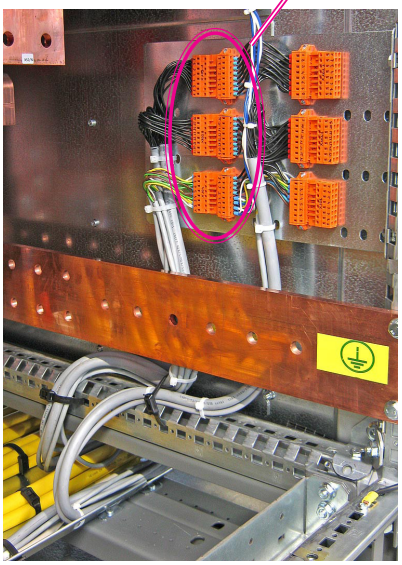
same for cables coming from Unit 2 and 3 (already connected)

## Cabinet B

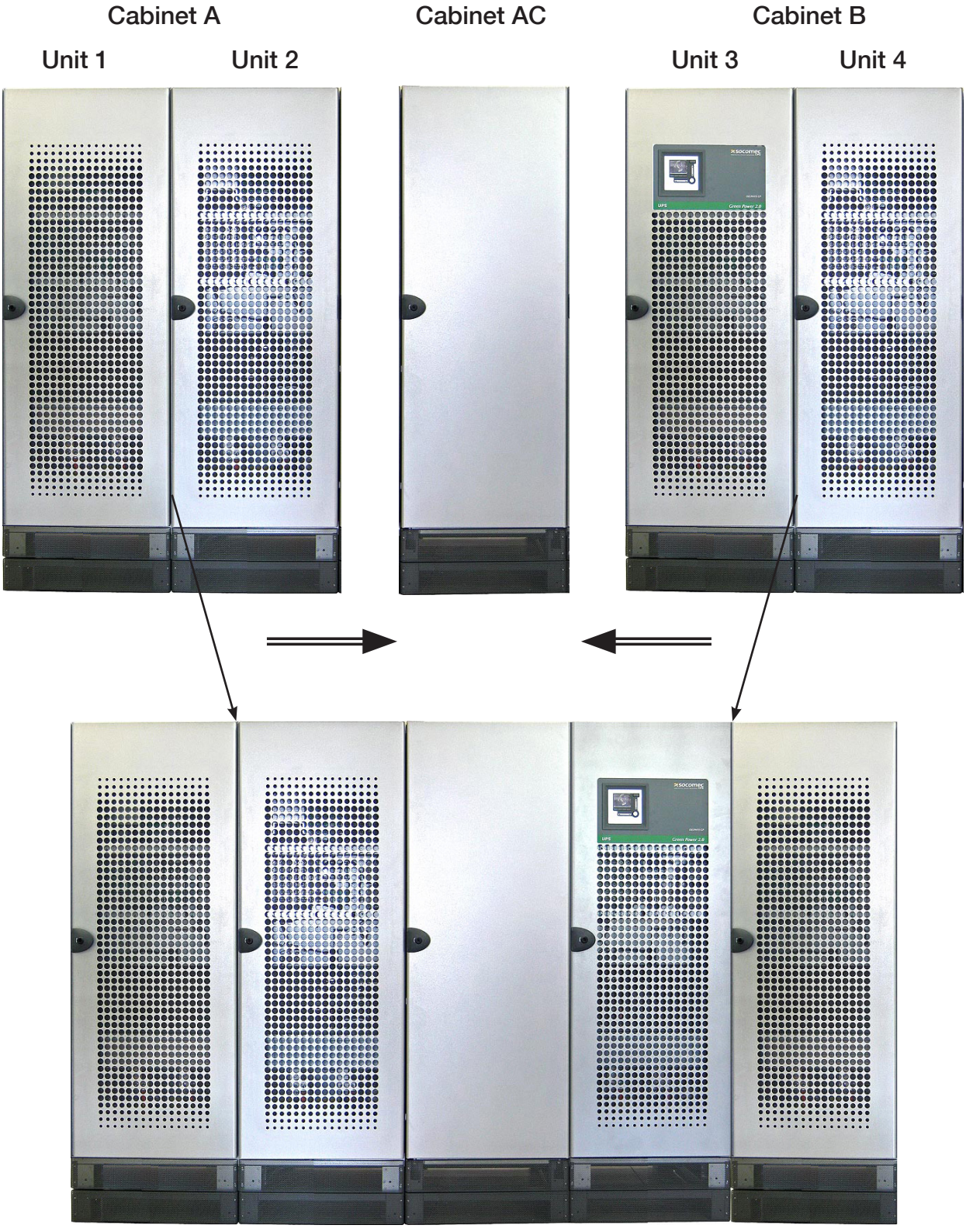


Cabinet A

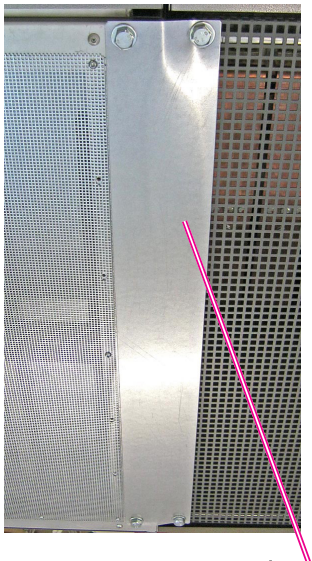
Cabinet B

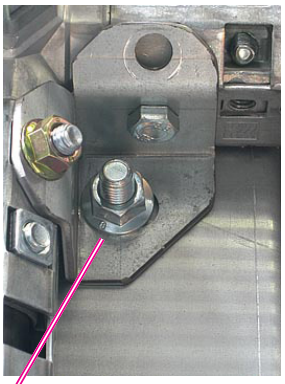
## 4.11. Assembly of Delphys Green Power 800 kVA

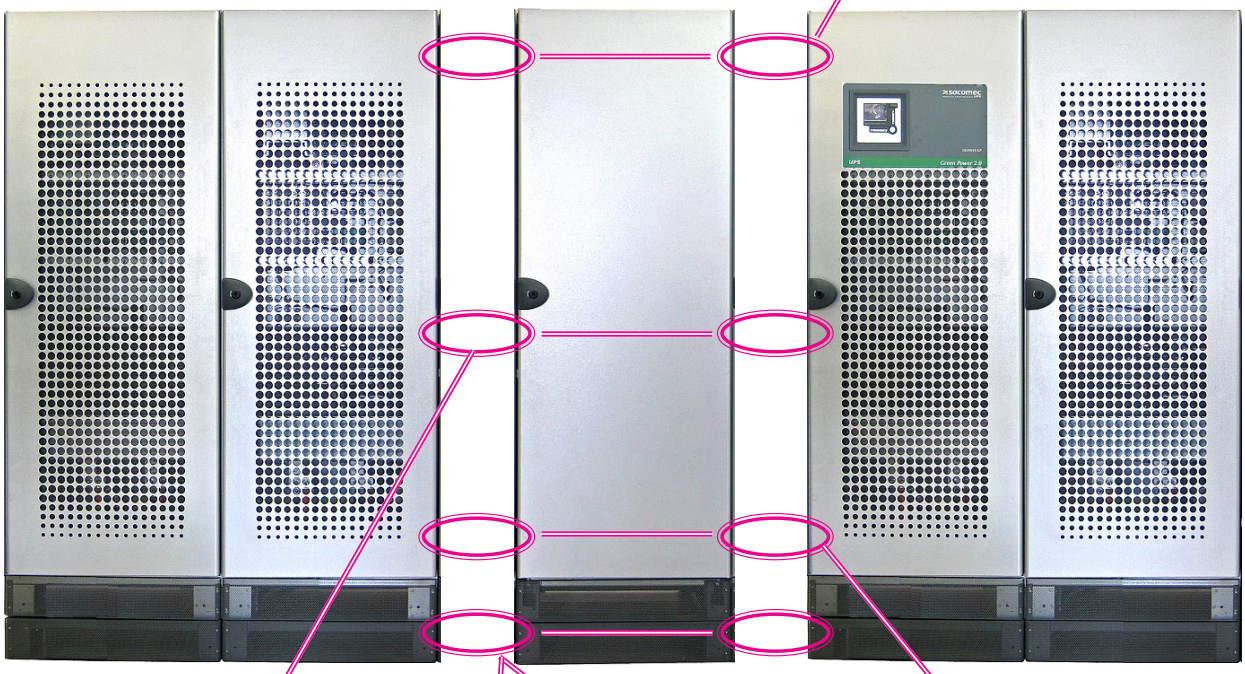


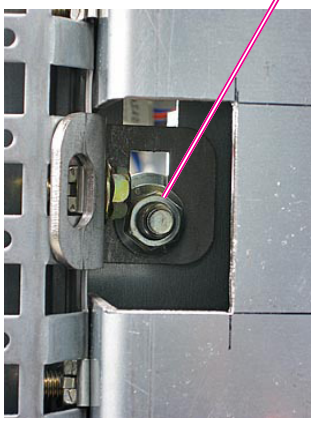

AS cabinets are paired at the factory, the order of assembly must be respected.

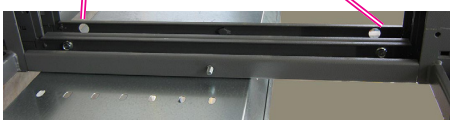


at the front (and at the rear if possible) of the cabinet







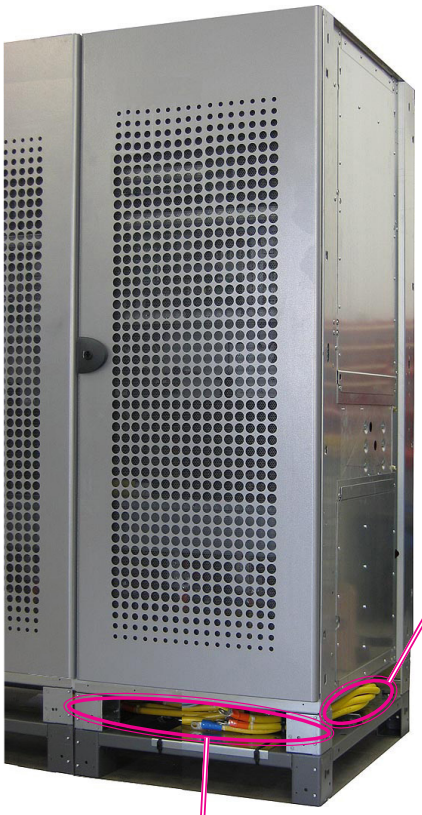


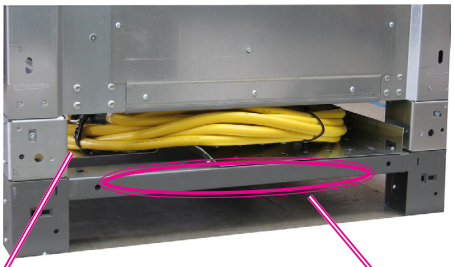
at the front (and at the rear if possible) of the cabinet

Tensilock M10 x 25 + Tensilock nut M10

## 4.12. Electrical Assembly

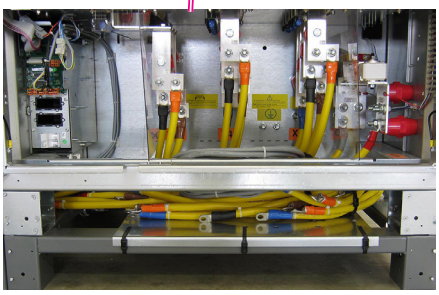
### Cabinet A or B





cables to unroll

Plate to be removed after removing the cables

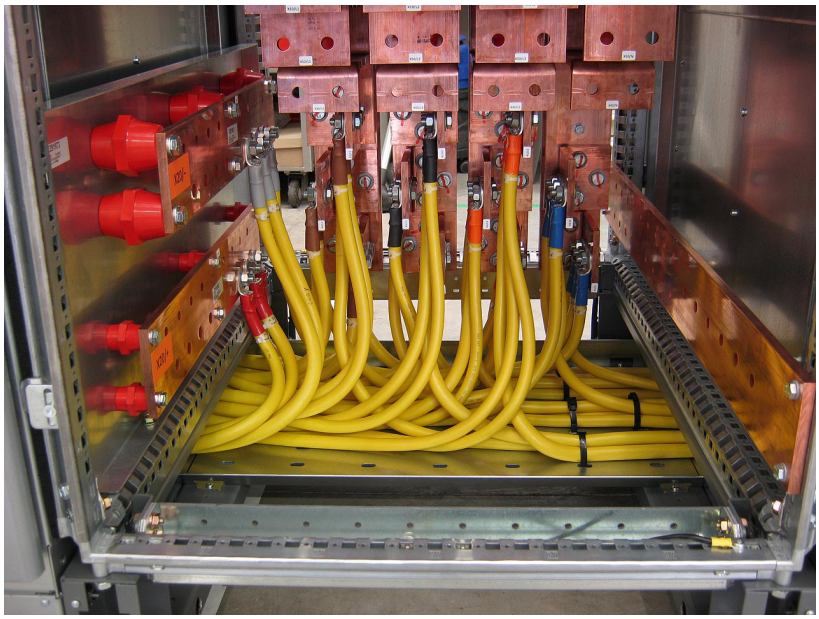


cables coming from Unit 1:

| marks | colors | designation | terminals |
|---|---|---|---|
| Unit 1 - X5 | Brown | OUTPUT L1 | X5 L1 |
| Unit 1 - X5 | Black | OUTPUT L2 | X5 L2 |
| Unit 1 - X5 | Orange | OUTPUT L3 | X5 L3 |
| Unit 1 - X5 | Blue | OUTPUT N | X5 N |
| Unit 1 - X4 | Brown | AUX MAINS. L1 | X4 L1 |
| Unit 1 - X4 | Black | AUX MAINS. L2 | X4 L2 |
| Unit 1 - X4 | Orange | AUX MAINS. L3 | X4 L3 |
| Unit 1 - X4 | Blue | AUX MAINS. N | X4 N |
| Unit 1 - X1 | Brown | MAINS L1 | X1 L1 |
| Unit 1 - X1 | Black | MAINS L2 | X1 L2 |
| Unit 1 - X1 | Orange | MAINS L3 | X1 L3 |
| Unit 1 - X2 | Rouge | battery + | X2 + |
| Unit 1 - X2 | Gris | battery - | X2 - |

same for cables coming from Unit 2, 4 and 3

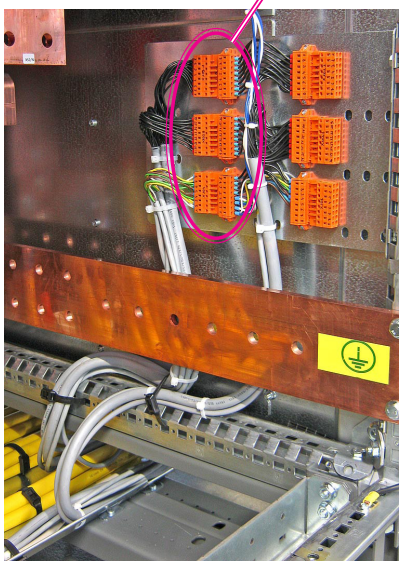
### Cabinet AC



Cabinet A

Cabinet AC

Cabinet B

# 5. ELECTRICAL PROPERTIES

## 5.1. Electrical safety

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

## 5.2. Backfeed protection (UPS C1, module C6, C7 and bypass C3)

Green Power 2.0 is preset for the installation of external protection devices against the backfeed of dangerous voltages on the auxiliary backup mains power supply line (AUX MAINS SUPPLY), the input power supply line (MAINS SUPPLY) is already equipped in internal.

In the event that the equipment does not have a voltage protection device, warning labels must be affixed on all mains power disconnectors installed away from Green Power 2.0 area, in order to remind support personnel that the circuit is connected to a UPS (see also § 2 “Safety” of this manual and paragraph 4.9.3 of standard IEC62040-1). The label is supplied with the equipment.

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

For the connections, see picture 5.2-1.

**Standard:**

the backfeed protection is compliant with standard IEC 62040-1.

**Aim:**

the backfeed protection ensures personnel are safeguarded against the risk of accidental re-injection of power into the upstream circuit. The backfeed protection imposes the automatic opening of isolation device in the event the static commutator malfunctions.

**Principle:**

the backfeed protection consists of an electronic detection pcb internal to Delphys Green Power combined with an external electromechanical device for isolation from the power circuit (not supplied). For further details about the size of the protective device, please see § 5.7.

**Label (see § 2.2):**

a safety label is available in the equipment. It includes the following:

**Before working on this circuit**

- isolate Uninterruptible Power System (UPS) Green Power 2.0
- then check for Hazardous Voltage between all terminals including the protective earth

**Risk of Voltage Backfeed**

The operator shall stick the label on the electromechanical device for isolation from the power circuit.

## Connection (see § 7.5) :

Delphys Green Power: 160, 200, 250, 300 and 500 kVA

**XB2 terminals 1-2:**

**Out : Backfeed Tripping**

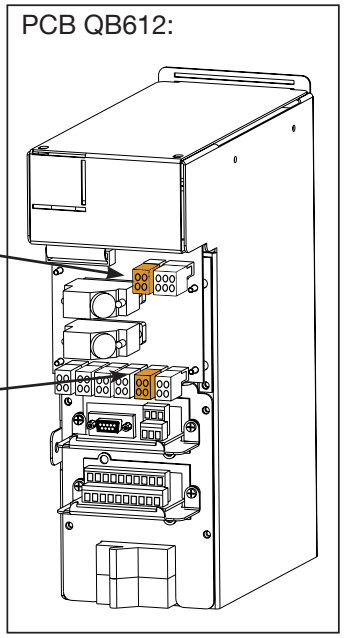
connection of the 220V-240V trip coil of the electromechanical device for isolation from the power circuit.

**XB7 terminals 1-2:**

**In : Backfeed State**

connection of the auxiliary contact indicating the status of the power isolating device.

PCB QB612:



If contact 1-2 on XB7 is open, you will have an alarm, according to the Standard.

Delphys Green Power: 400, 600, 800 kVA

**Terminals 1-2:**

**Out : Backfeed Tripping**

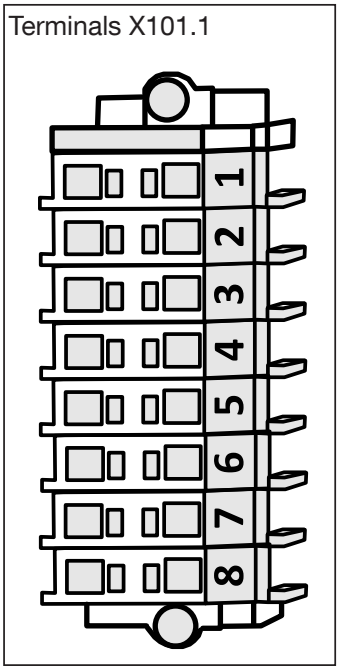
connection of the 220V-240V trip coil of the electromechanical device for isolation from the power circuit.

**Terminals 3-4:**

**In : Backfeed State**

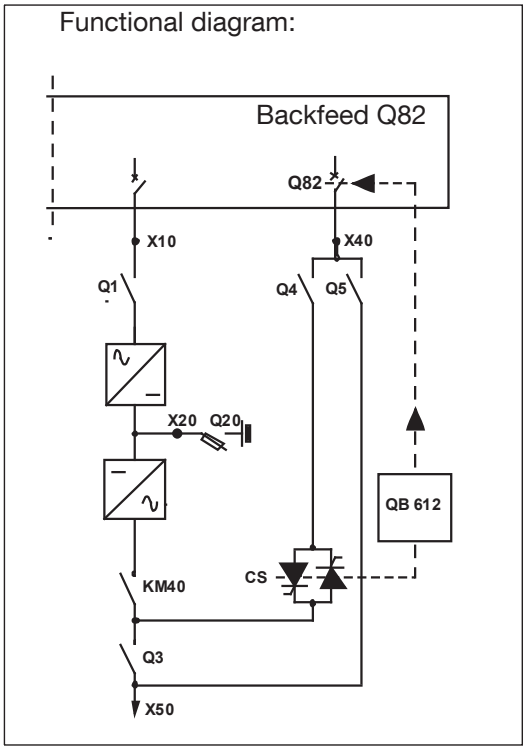
connection of the auxiliary contact indicating the status of the power isolating device.

Terminals X101.1




If contact 3-4 is open, you will have an alarm, according to the Standard.

## FUNCTIONAL DIAGRAM

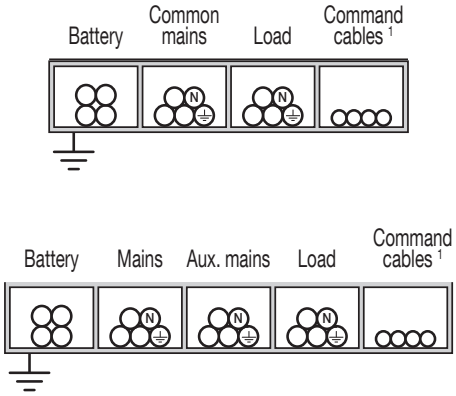


## 5.3. General rules for cable installation on trays

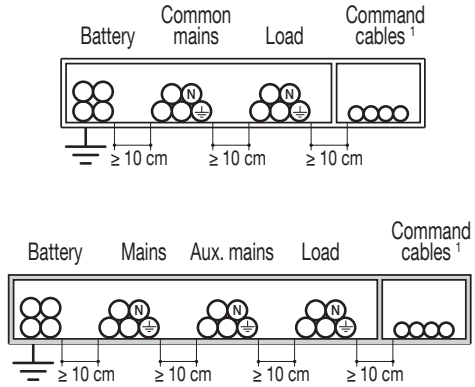
The cables must be in installed on trays when indicated in the following diagrams The trays must be positioned near to the Delphys Green Power UPS.

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

Correct installation

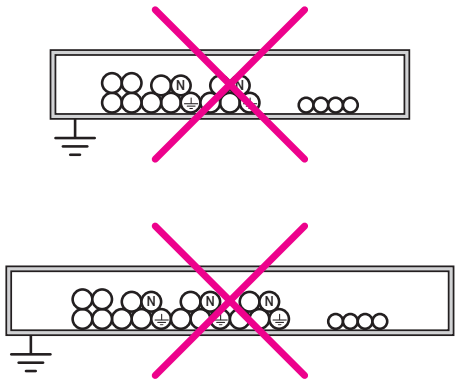



Authorised installation




Risk of electromagnetic interference between battery cables and output cables

Incorrect installation

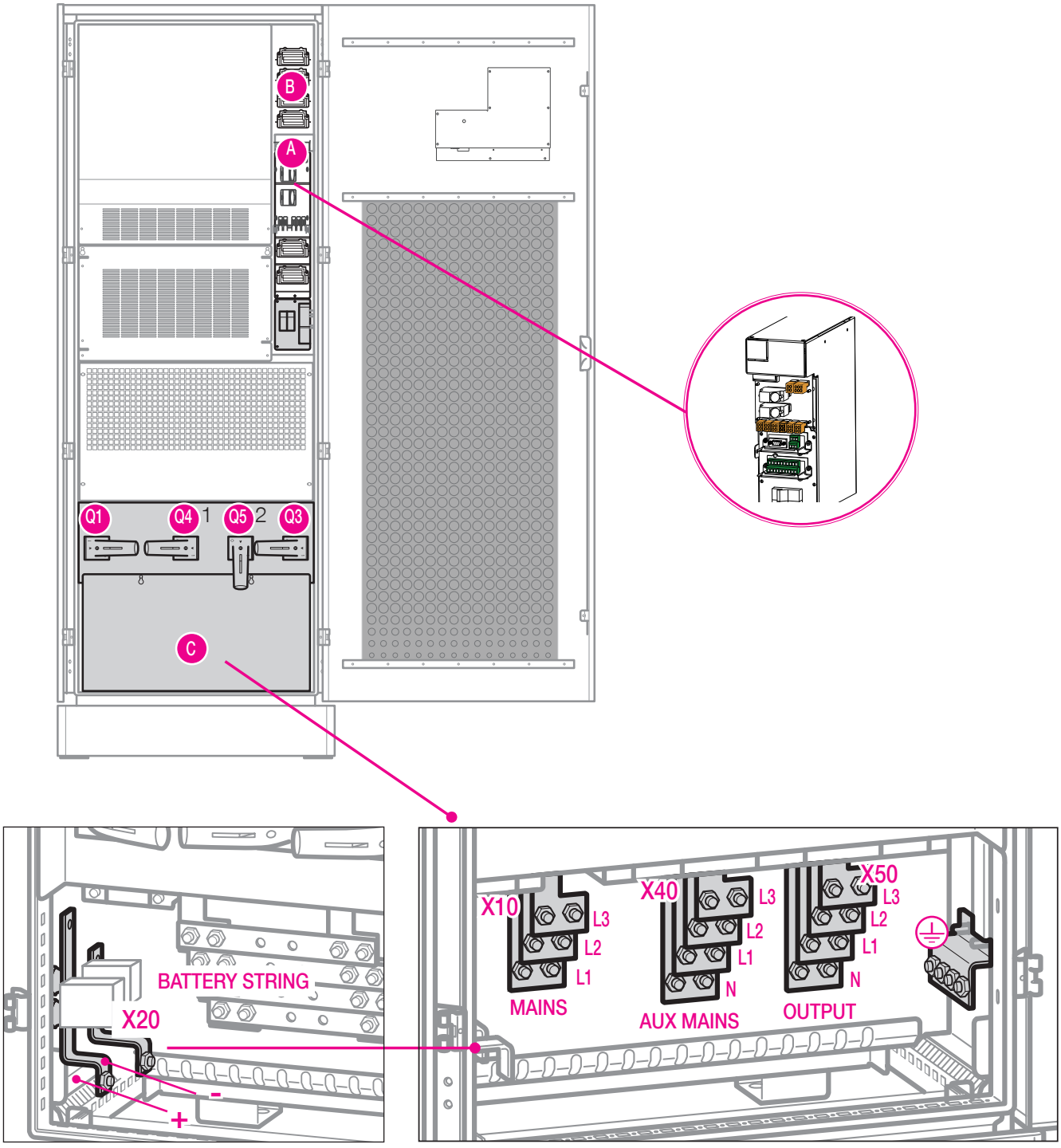


[1] Command cables:connections between the cabinets and each unit, alarm signals, remote mimic panel, connection to the BMS (Building Management System), emergency stop, connection to generator.

Do not expose command and power cables to other equipment sensitive to the electromagnetic field .

## 5.4. Identifying switching and connection organs

Delphys Green Power: 160, 200 kVA




[1] does not exist on C3 (parallel with centralised by-pass)

[2] does not exist on C3 nor C7 (parallel with non redondant by-pass)

**Legend.**

A Com Slot.

B Slot for optional communication cards.

C Power connections.

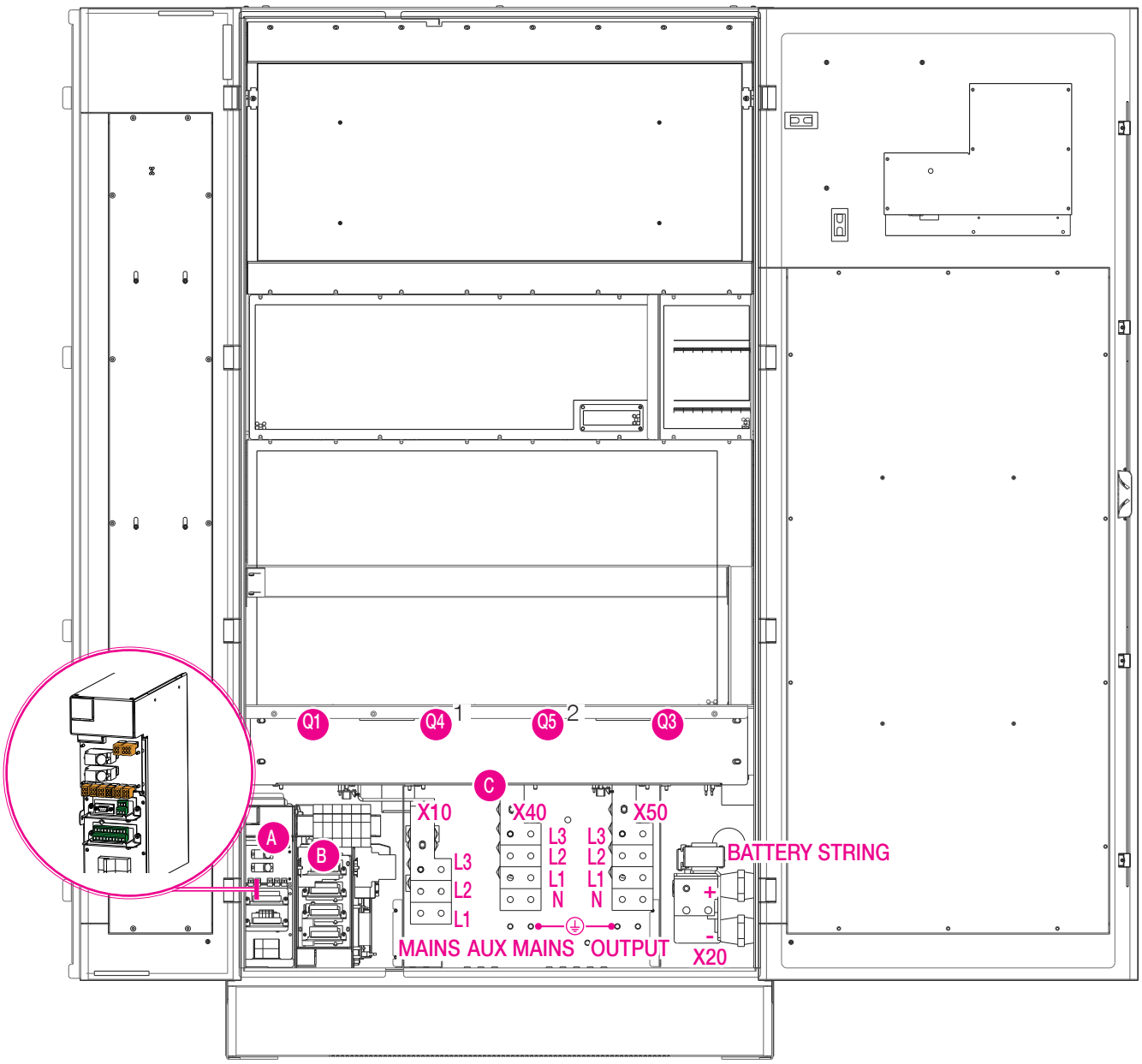
Q1 Input switch (MAINS).

Q3 Output switch.

Q4[1] Auxiliary mains Input switch (AUX MAINS).

Q5[2] Output manual maintenance bypass switch.

Delphys Green Power: 250, 300 kVA




[1] does not exist on C3

[2] does not exist on C3 nor C7

**Legend.**

A Com Slot.

B Slot for optional communication cards.

C Power connections.

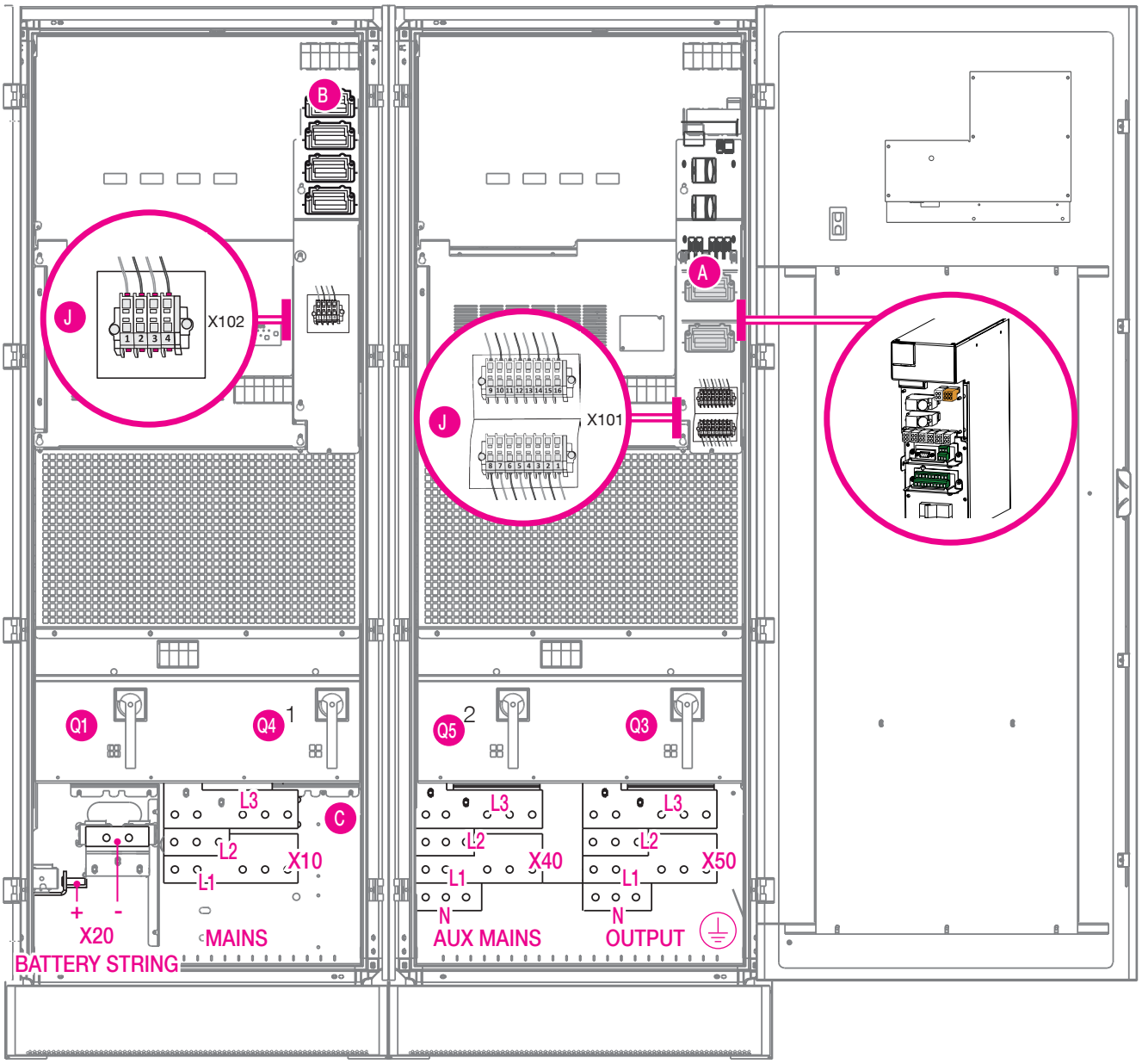
Q1 Input switch (MAINS).

Q3 Output switch.

Q4[1] Auxiliary mains Input switch (AUX MAINS).

Q5[2] Output manual maintenance bypass switch.

Delphys Green Power: 400 kVA




**1** not available on C3

**2** not available on C3 and C7

**Legend.**

A Com Slot

B Slot for optional communication cards.

C Power connections.

J Control Terminals X101 / X102.

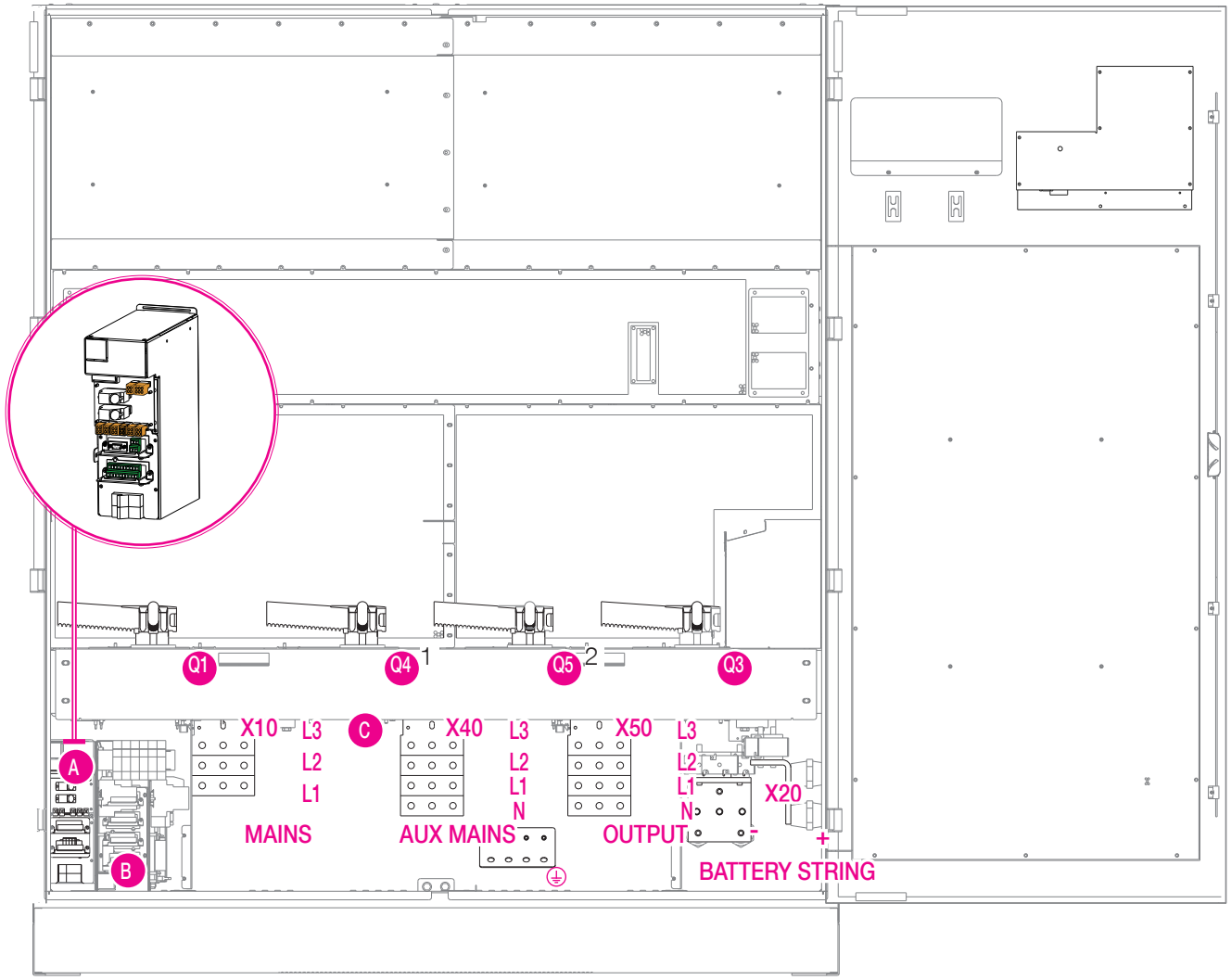
Q1 Input switch (MAINS).

Q3 Output switch.

Q4[1] Auxiliary mains Input switch (AUX MAINS).

Q5[2] Output manual maintenance bypass switch.

Delphys Green Power: 500 kVA




[1] does not exist on C3

[2] does not exist on C3 nor C7

**Legend.**

A Com Slot.

B Slot for optional communication cards.

C Power connections.

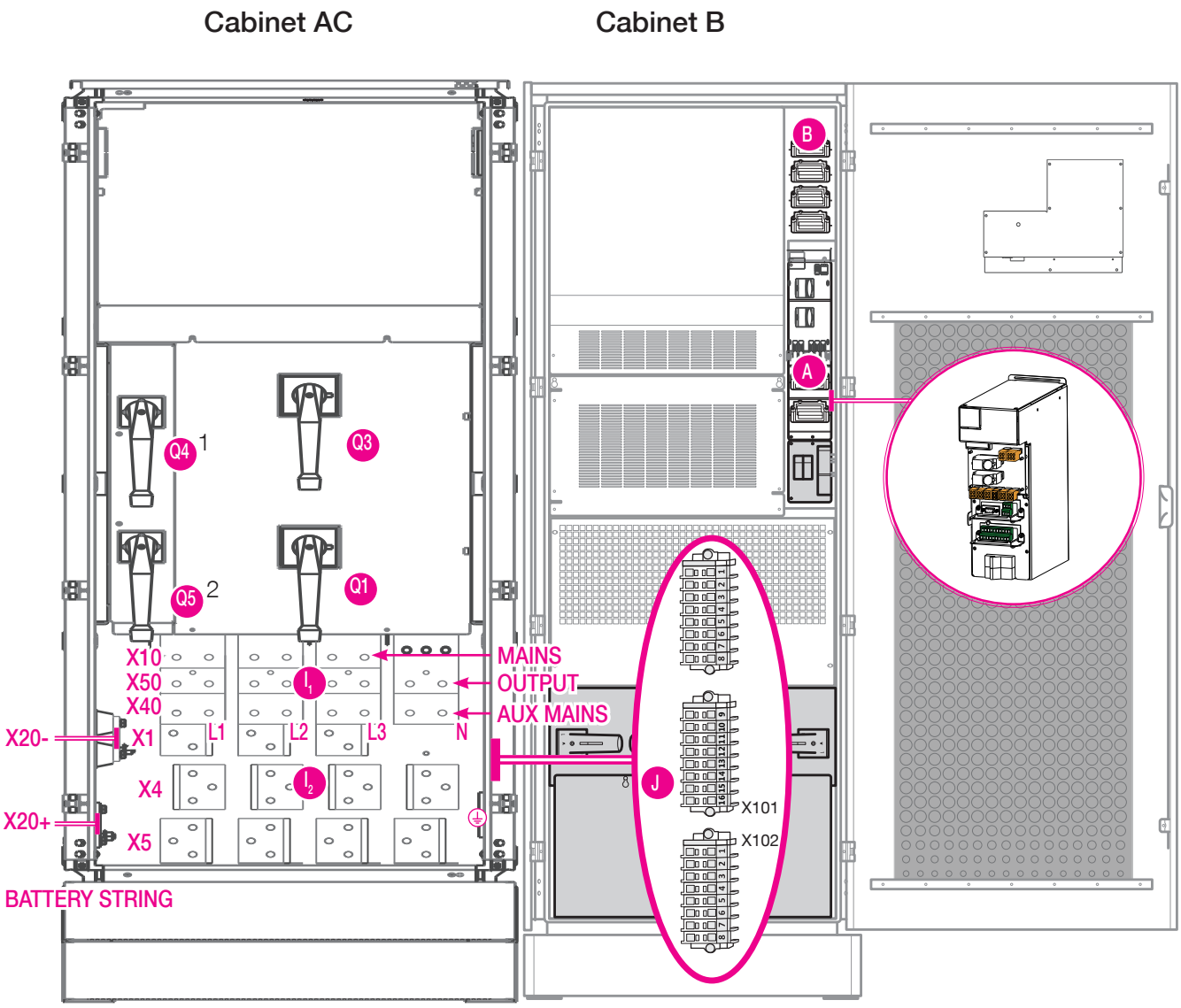
Q1 Input switch (MAINS).

Q3 Output switch.

Q4[1] Auxiliary mains Input switch (AUX MAINS).

Q5[2] Output manual maintenance bypass switch.

Delphys Green Power: 600, 800 kVA




1 does not exist on C3

2 does not exist on C3 nor C7

**Legend.**

A Com Slot.

B Slot for optional communication cards.

C Power connections (1: Main 2: Unit).

J Control Terminals X101 / X102.

Q1 Input switch (MAINS).

Q3 Output switch.

Q4[1] Auxiliary mains Input switch (AUX MAINS).

Q5[2] Output manual maintenance bypass switch.

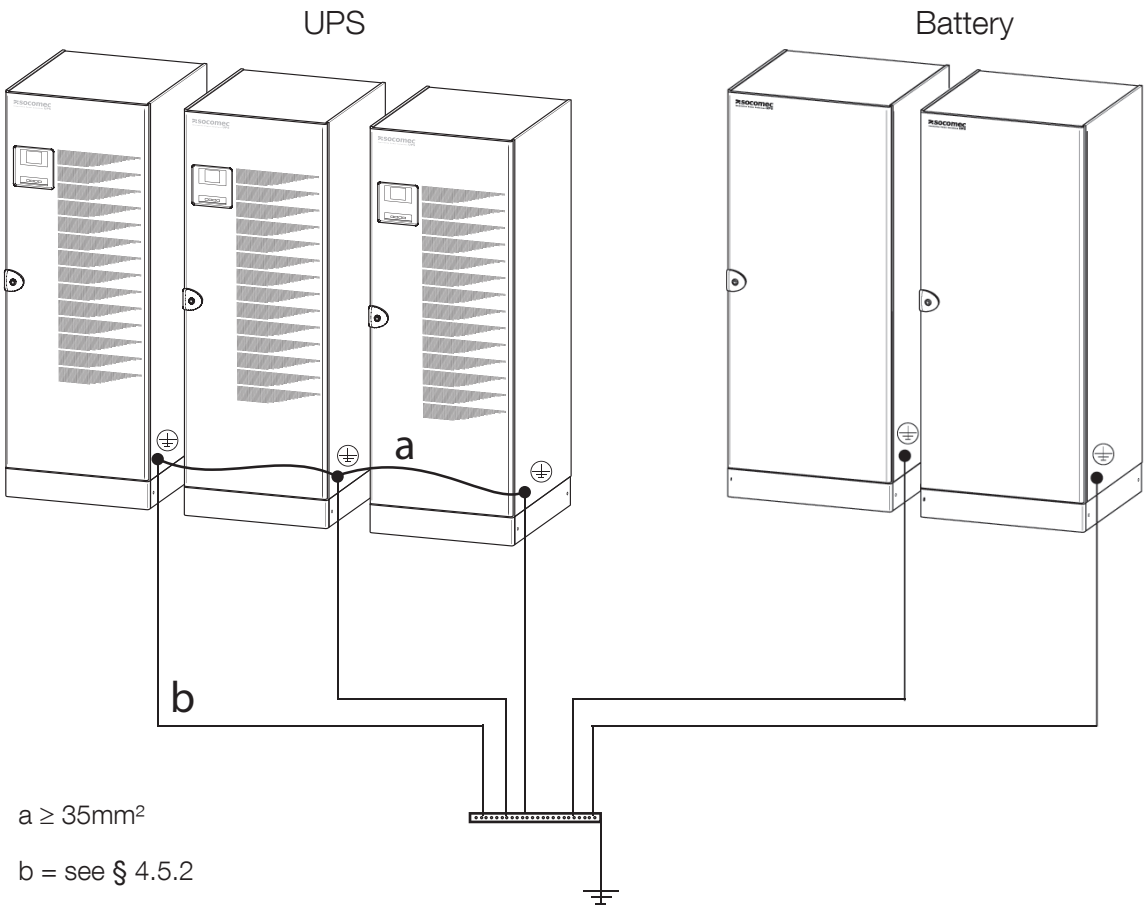
## 5.5. External connections

### 5.5.1. Connecting earth cables

IMPORTANT : due to EMI filters*, there are "HIGH LEAKAGE CURRENTS".

As a consequence, it is imperative to connect earth cables before mains cables.

* EMI filters = protection against electromagnetic disturbances.




The grounding of the auxiliary cabinets must be made directly to the reference earth.

Never use the UPS cabinet as earth terminal building.

### 5.5.2. Earth cable cross-section

We recommend a section of ground wire at least half of the section of cable phases AND comply with standards of the country (for example NFC 15100 in France).

### 5.5.3. Leakage current (rating of the earth leakage current device)

The minimum "off-delay relays" recommended is 3 A.

### 5.5.4. Earthing systems and UPS (IT and TT pease consult us)

In TNC: UPS output neutral must be grounded.

In TNS: when opening a 4 phases switch between UPS output and transformer upstream of the bypass, system grounding must be present to reference the neutral to ground.

### 5.5.5. Neutral cable cross-section

It is necessary to check:

a) the minimum cross-section of the neutral cable must equal one of the phase conductors,

b) the balancing of the loads across the three phases,

c) the values that will trip the protective devices.

## 5.6. Values of currents for cable sizing

NOTE : these values are only indicative for standard systems.

### 5.6.1. Input rectifier currents for Green Power 2.0

Operating conditions are as follows:

- input/output power supply voltage 3 x 400V,
- Green Power 2.0 is operating at rated power and batteries are recharging.

| **Power on UPS output kVA/kW** | **160** | **200** | **250** | **300** | **400** | **500** | **600** | **800** |
|---|---|---|---|---|---|---|---|---|
| Max. rectifier input current* A | 290 | 340 | 425 | 520 | 680 | 850 | 1020 | 1360 |

* Regardless of the conditions (battery recharge, overload, voltage...)

### 5.6.2. Mean current supplied by the battery when discharging

The mean current value is to be taken into account for sizing connecting cables between the battery and Green Power 2.0.

| **kVA/kW** | **160** | **200** | **250** | **300** | **400** | **500** | **600** | **800** |
|---|---|---|---|---|---|---|---|---|
| Currents A | 405 | 504 | 550 | 670 | 1010 | 1100 | 1565 | 2016 |

### 5.6.3. Bypass current (or output current to the load)

Operating conditions are as follows:

- input/output power supply voltage 3 x 400V, for 380V or 415V, the current value must be multiplied by 1.047 and 0.958 respectively,
- Green Power 2.0 is operating at rated power.

| **kVA/kW** | **160** | **200** | **250** | **300** | **400** | **500** | **600** | **800** |
|---|---|---|---|---|---|---|---|---|
| Currents A | 231 | 289 | 361 | 435 | 578 | 722 | 866 | 1155 |

Note: sizing of cables and protections upstream of the bypass shall take into account:

- overloads caused by non-linear loads,
- possible overloads admitted by Green Power 2.0 i.e.(400V / 50Hz, 25°C):

| **kVA/kW** | **160** | **200** | **250** | **300** | **400** | **500** | **600** | **800** |
|---|---|---|---|---|---|---|---|---|
| 1h | 110 % | 110 % | 110 % | 110 % | 110 % | 110 % | 110 % | 110 % |
| 10 min. | 125 % | 125 % | 125 % | 125 % | 125 % | 125 % | 125 % | 125 % |
| 1 min. | 150 % | 150 % | 150 % | 150 % | 150 % | 150 % | 150 % | 150 % |

## 5.7. Sizing of circuit breakers

### 5.7.1. Rectifier input circuit breaker

Values are only indicative as per the following conditions:

- the rectifier and bypass input voltage is 3 x 400V overload 150 %,
- the length of cabling between the circuit breaker and Green Power 2.0 is <10 metres.

| kVA/kW | | 160 | 200 | 250 | 300 | 400 | 500 | 600 | 800 |
|---|---|---|---|---|---|---|---|---|---|
| Sizing of circuit breaker | A | 315 | 400 | 630 | 630 | 800 | 1000 | 1250 | 1600 |

Note: the sizing of circuit breakers takes into account a possible overload rate of 150%.

### 5.7.2. Circuit breaker on bypass input

Values are only indicative as per the following conditions:

- the rectifier and bypass input voltage is 3 x 400V overload 150 %,
- the length of cabling between the circuit breaker and Green Power 2.0 is <10 metres.

| kVA/kW | | 160 | 200 | 250 | 300 | 400 | 500 | 600 | 800 |
|---|---|---|---|---|---|---|---|---|---|
| Sizing of circuit breaker | A | 400 | 400 | 630 | 630 | 800 | 800 | 1000 | 1250 |

Note 1: the admissible input voltage tolerance is +/-10% - the sizing of circuit breakers has therefore to be adjusted accordingly.

Note 2: the protection on the bypass input is intended for cable protection and does not take into account the $I^2T$ of thyristors.

Nota 3: Ensure that the circuit breaker trigger curve takes into account a possible overload

### 5.7.3. Circuit breaker on a common rectifier and bypass input (except C3)

Values are only indicative as per the following conditions:

- the rectifier and bypass input voltage is 3 x 400V,
- the length of cabling between the circuit breaker and Green Power 2.0 is <10 metres.

| kVA/kW | | 160 | 200 | 250 | 300 | 400 | 500 | 600 | 800 |
|---|---|---|---|---|---|---|---|---|---|
| Sizing of circuit breaker | A | 400 | 400 | 630 | 630 | 800 | 1000 | 1250 | 1600 |

Note: the admissible input voltage tolerance is +/-10% - the sizing of circuit breakers has therefore to be adjusted accordingly.

In the event of a fault, the protection must open in less than 100 ms.

## 5.8. Protection and cross-section of battery cables

Please consult us.

Values are provided for a distance of 5 meters between the UPS and the battery (Battery mean current while discharging – Please see § 5.6.2). Use double insulated BN4-F cables.

CAUTION: The size of protective devices depends on the power and back-up time of the system Protective devices other than the ones defined may cause electrical hazard or damage to the equipment.

These protective devices are in place for each battery arrival (distributed).
Please consult us.

# 6. UPS PARALLEL CONFIGURATION

- Parallel connection enhances UPS system reliability, performance and power.
- Operating UPS are connected to each other by a signal cable B (see figure next page) which provides 25m distance between UPS and enables the external battery cabinet to be inserted next to each UPS. They are configured differently depending on the position they are assigned; for this reason the units have a position label:

  the “INTERNAL” label (used only on systems with three UPS) means that this unit must be positioned between the two other cabinets.

- The power supply of each UPS must be equipped with a protection device as shown in the table in § 5.7.
- The cross section and length of the input and output cables must be identical for all the units.
- The phase rotation must be the same for each unit connected in parallel and also on any external manual maintenance bypass line.
- Cables of the same length and cross section must be used for X1 and X2, same thing for Y1 and Y2.
- The length of the cables Y1 and Y2 must not exceed 25 meters (see figure next page).
- If a differential switch is installed on the mains power switch, it must be inserted upstream from the distribution panel; it must be a selective type and the trigger value must be 3A multiplied by the number of UPS connected in parallel.

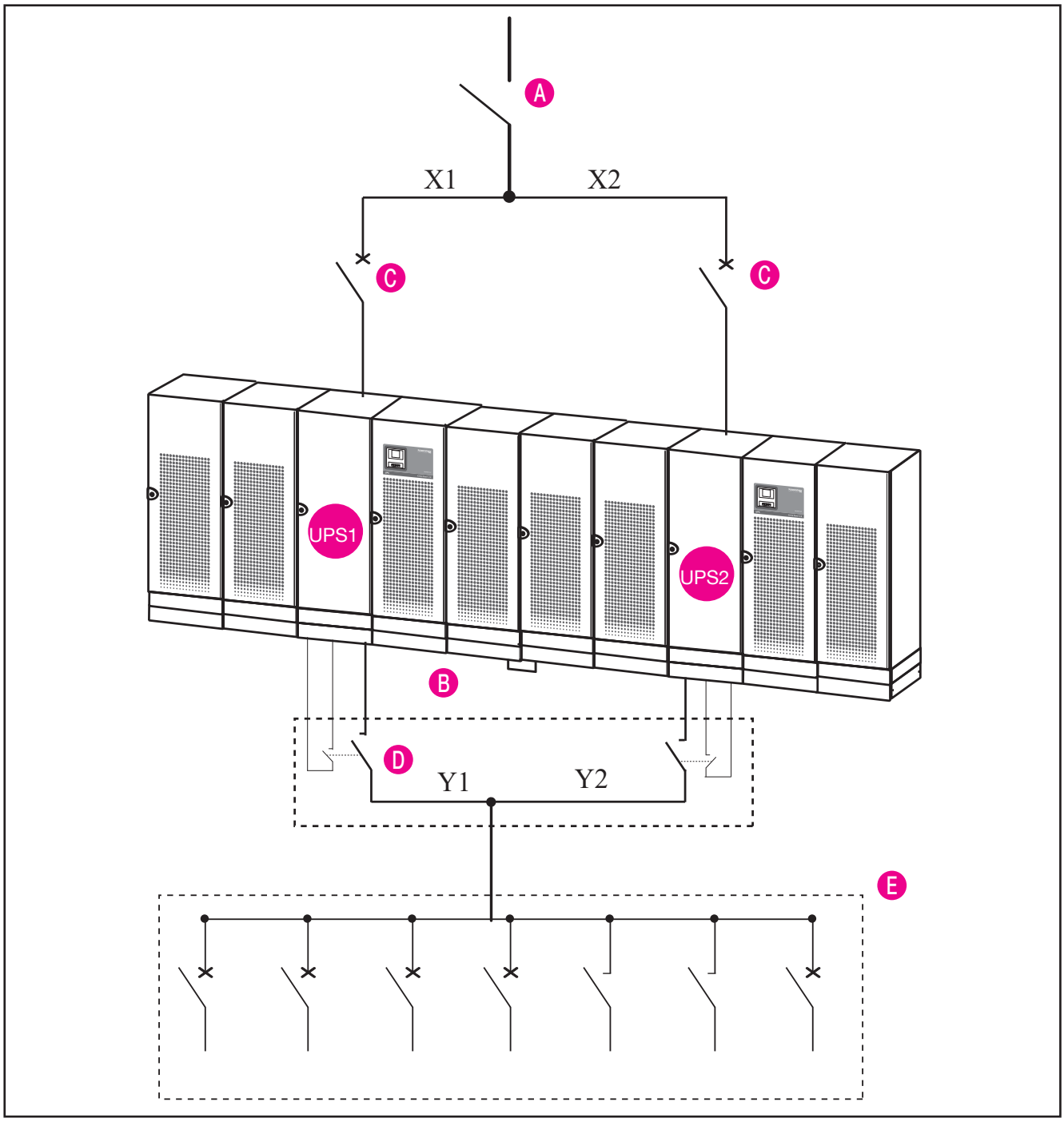
**If other switchgear, switch or circuit breaker, are present downstream of the UPS module (see figure next page , point D), you must bring his contact position (Q21) on the coupling cabinet on terminals XB12 or 13-14 of X101.2 (see § 7.5).**

**The opening and closing of the switch D should only be done only after stopping the unit UPS Green Power 2.0 upstream of this switch.**

- In order for units connected in a parallel configuration to operate correctly, control cables are required to exchange data between both UPS units making up the parallel system. The cables in question are supplied with Green Power 2.0 in case of standard parallel setting or are attached to the parallel kit in case of later upgrading of the system.

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

## 6.1. RECOMMENDED 1+1 PARALLEL CONFIGURATION




**Legend.**

A Selective general differential magneto thermal switch.

B "Parallel bus" cable.

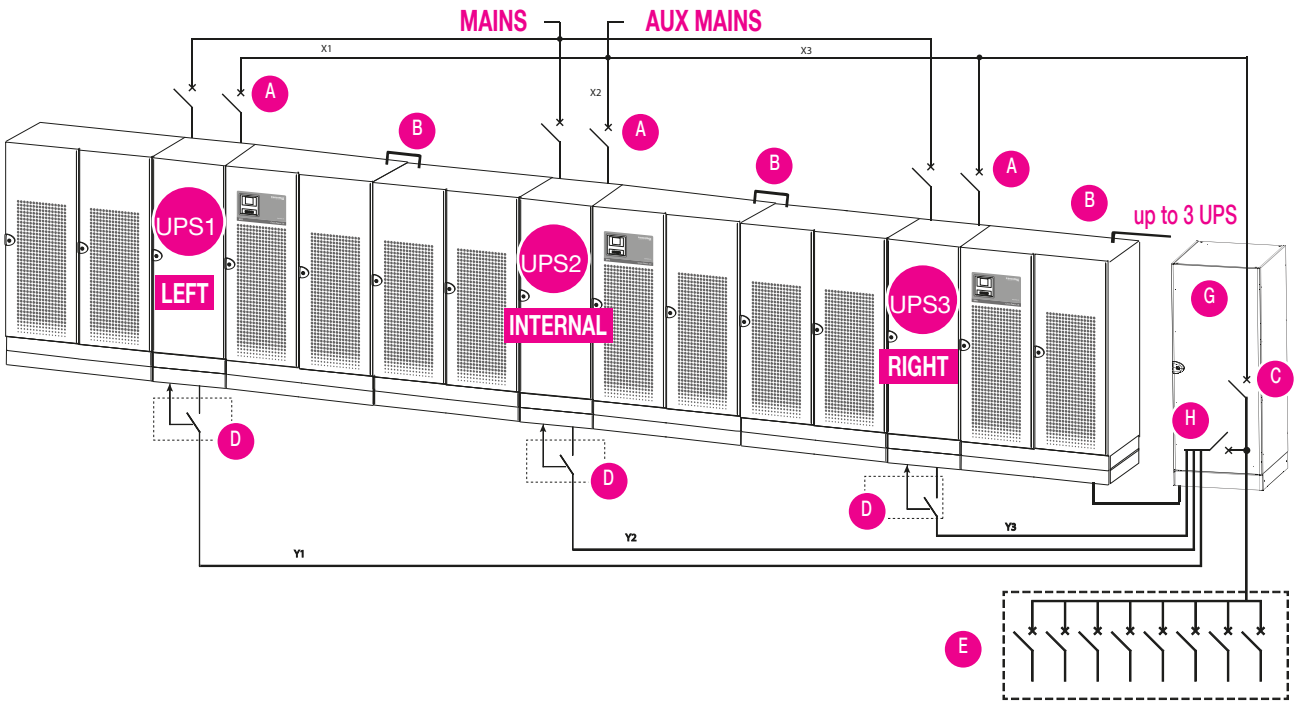
C Single UPS magneto-thermal switch (if a separate auxiliary power source is used, add a magneto-thermal switch for each UPS).

D Additional disconnectors on the distribution panel (Q21, see § 7.5).

E Distribution.

X1 = X2 Y1 = Y2 ≤ 25m

## 6.2. RECOMMENDED N+1 PARALLEL CONFIGURATION




**Legend.**

A Single UPS magneto-thermal switch.

B "Parallel bus" cable.

C Coupling cabinet magneto-thermal switch. The value must be 630A x number of UPS connected in parallel.

D Additional disconnectors on the distribution panel (Q21, see § 7.5).

E Distribution

G Coupling cabinet.

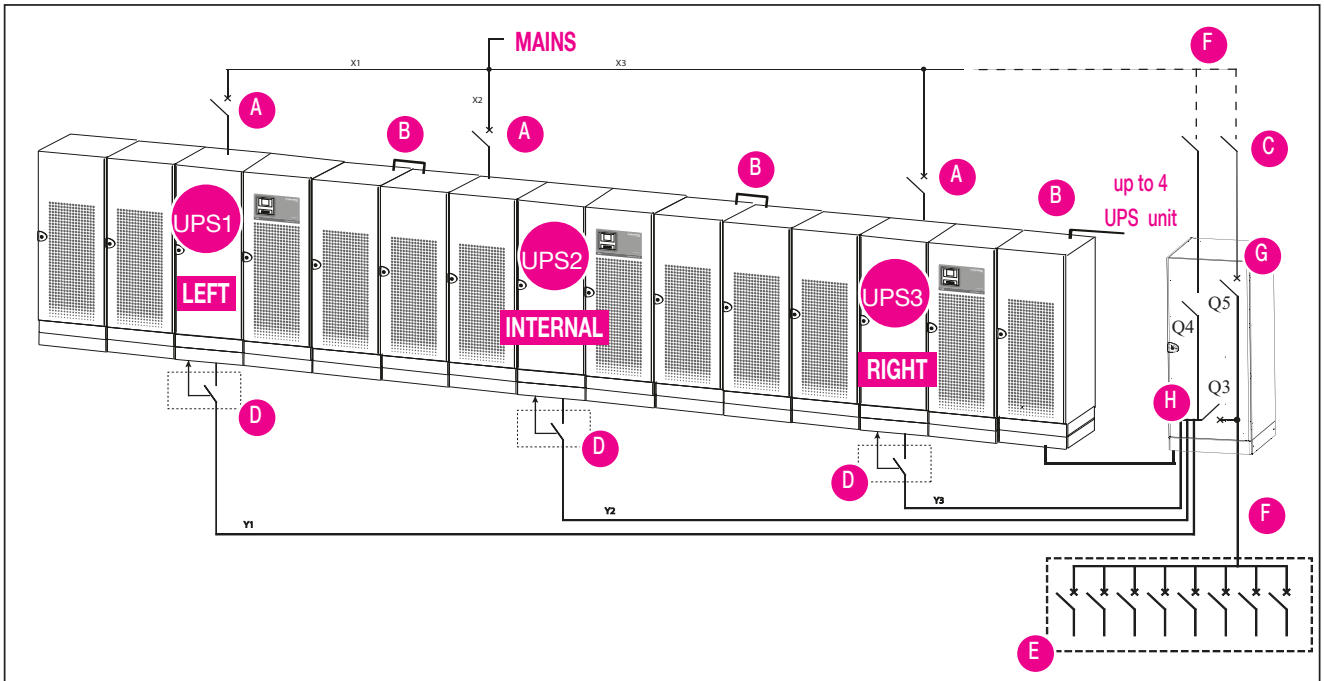
H Manual maintenance bypass auxiliary switch.

Length of cable:

X1 = X2 = X3

Y1 = Y2 = Y3 < 25m

## 6.3. Recommended parallel C3 system configuration




**Legend.**

A Single UPS unit magneto-thermal switch.

B "Parallel bus" cable.

C Coupling cabinet magneto-thermal switch. The value must be 630 A x number of UPS unit connected in parallel.

D Additional disconnectors on the distribution panel (Q21, see § 7.5).

E Distribution.

F Adapted to the power of the bypass

G Bypass cabinet.

H Output switch.

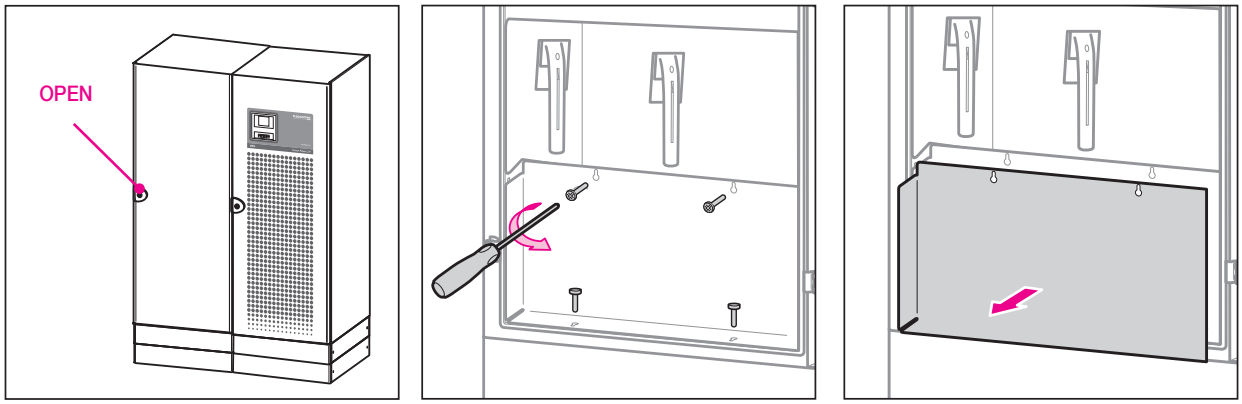
Length of cable:

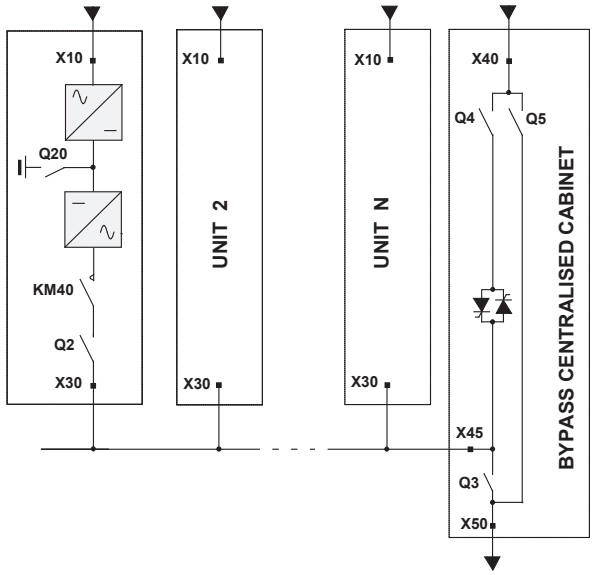
X1 = X2 = X3 Y1 = Y2 = Y3 < 25m

# 7. CLIENT CONNECTION

## 7.1. Installation procedures and instructions

Before carrying out work on the terminal board or on UPS internal parts, ensure that Green Power 2.0 is switched off, remove the power supply, open the external battery cabinet disconnectors, isolate the system and wait 5 minutes.




**Risk of electrocution !**

- Only qualified and authorized personnel are allowed to intervene on the product.
- The instructions are valid in conjunction with the specific instructions of the product.
- The product is designed only for the application specified in the operating instructions.
- Accessories can be used with the product only if approved or specified by SOCOMEC.
- Before proceeding with the implementing, mounting, commissioning, configuration, cleaning, decommissioning, dismounting, wiring or maintenance operations, the product and the installation must be powered off. However, specific instructions for a product may allow live intervention under certain conditions, means, qualifications and authorizations.
- The product is not destined to be repaired by the user.
- Contact SOCOMEC for any questions regarding the disposal of the product.
- **Failure to follow the product instructions and this safety information may result in personal injury, electric shock, burns, death or property damage.**

## 7.2. Terminal connections characteristics

**160 kVA and 200 kVA**

| | Designation | Ø drill hole | Centre-centre distance | Screws | Max. section | Clamping torque |
|---|---|---|---|---|---|---|
| PE | PE | 5 x 11 | 25 mm | M10 | 2 x 240 mm² | 40 Nm |
| X10 | Rectifier mains input | 2 x 11 | 28 mm | M10 | 2 x 150 mm² | 40 Nm |
| X20 | Battery input | 11 | / | M10 | 2 x 240 mm² | 40 Nm |
| X40* | Bypass mains input | 2 x 11 | 28 mm | M10 | 2 x 150 mm² | 40 Nm |
| X50** | Load Output | 2 x 11 | 28 mm | M10 | 2 x 150 mm² | 40 Nm |

**250 kVA and 300 kVA**

| | Designation | Ø drill hole | Centre-centre distance | Screws | Max. section | Clamping torque |
|---|---|---|---|---|---|---|
| PE | PE | 4 | 40 mm | M10x30 | 2 x 240 mm² | 40 Nm |
| X10 | Rectifier mains input | 2 x 11 | 37 mm | M10 | | |
| X20 | Battery input | 4 x 11 | 40 mm | | | |
| X40* | Bypass mains input | 2 x 11 | 37 mm | | | |
| X50** | Load Output | 2 x 11 | 37 mm | | | |

**400 kVA**

| | Designation | | Ø drill hole | Centre-centre distance | Screws | Max. section | Clamping torque |
|---|---|---|---|---|---|---|---|
| PE | PE | | 3 x 13 | 41 mm | M12 | 3 x 300 mm² | 70 Nm |
| X10 | Rectifier mains input | L1 - L3 | 5 x 13 | 41 mm | M12 | 3 x 300 mm² | 70 Nm |
| | | L2 | 3 x 13 | | | | |
| X20 | Battery input | | 2 x 13 | 45 mm | M12 | 2 x 300 mm² | 70 Nm |
| X40* | Bypass mains input | L1 - L3 | 5 x 13 | 41 mm | M12 | 3 x 300 mm² | 70 Nm |
| | | L2 - N | 3 x 13 | | | | |
| X50** | Load Output | L1 - L3 | 5 x 13 | 41 mm | M12 | 3 x 300 mm² | 70 Nm |
| | | L2 - N | 3 x 13 | | | | |

*not available on C3

** become X30 on C3

**500 kVA**

| | Designation | ⌀ drill hole | Centre-centre distance | Screws | Max. section | Clamping torque |
|---|---|---|---|---|---|---|
| PE | PE | 4 x 13 | 41,5 mm | M12 | 4 x 300 mm² | 70 Nm |
| X10 | Rectifier mains input | 3 x 13 | 41,5 mm | M12 | 3 x 300 mm² | 70 Nm |
| X20 | Battery input | 3 x 13 | 41,5 mm | M12 | 3 x 300 mm² | 70 Nm |
| X40* | Bypass mains input | 3 x 13 | 41,5 mm | M12 | 3 x 300 mm² | 70 Nm |
| X50** | Load Output | 3 x 13 | 41,5 mm | M12 | 3 x 300 mm² | 70 Nm |

**600 kVA and 800 kVA**

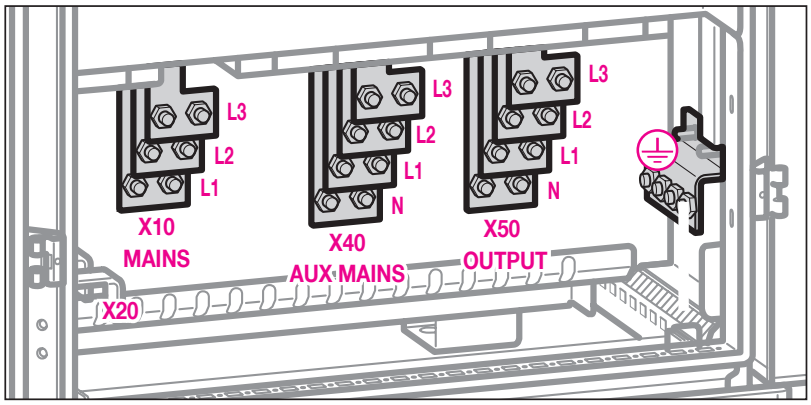
| | Designation | ⌀ drill hole | Centre-centre distance | Screws | Max. section | Clamping torque |
|---|---|---|---|---|---|---|
| PE | PE | 6 x 13 | 50 mm | M12 | 6 x 300 mm² | 70 Nm |
| X10 | Rectifier mains input | 2 x 13 | 50 mm | M12 | 4 x 300 mm² | 70 Nm |
| X20 | Battery input | 4 x 13 | 50 mm | M12 | 4 x 300 mm² | 70 Nm |
| X40* | Bypass mains input | 2 x 13 | 50 mm | M12 | 4 x 300 mm² | 70 Nm |
| X50** | Load Output | 2 x 13 | 50 mm | M12 | 4 x 300 mm² | 70 Nm |

*not available on C3

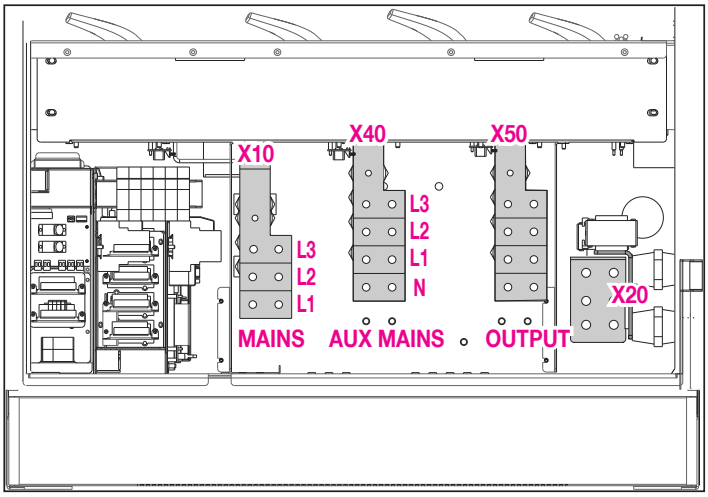
** become X30 on C3

## 7.2.1. Connections if the MAINS and AUX MAINS are connected SEPARATELY

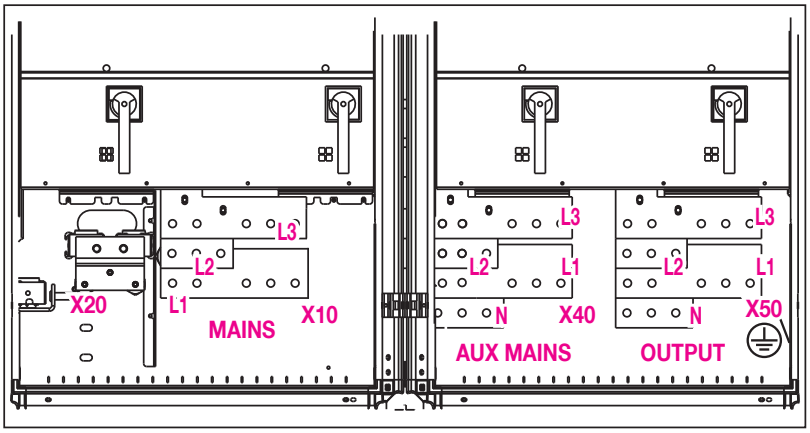
Delphys Green Power: 160 and 200 kVA



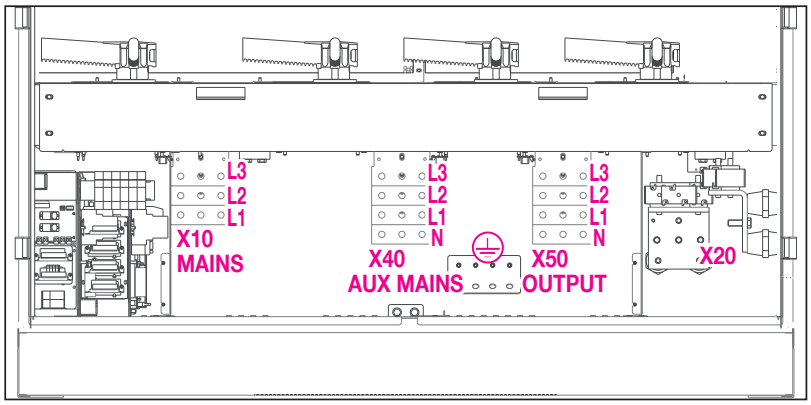

Delphys Green Power: 250 and 300 kVA



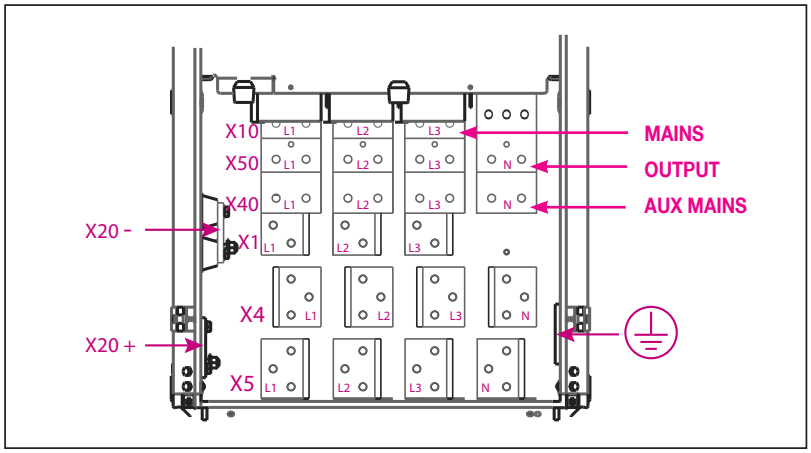

Delphys Green Power: 400 kVA



Delphys Green Power: 500 kVA

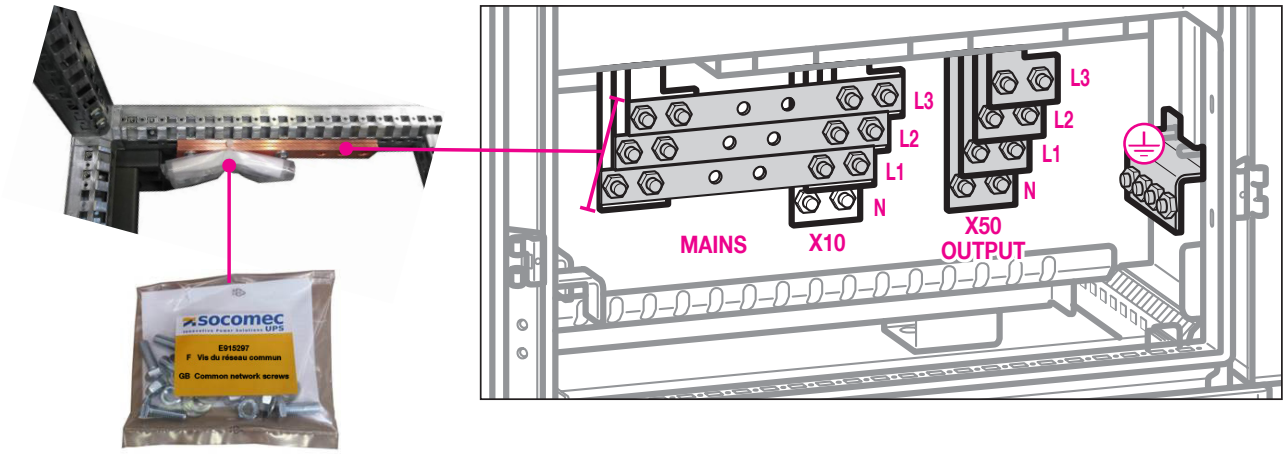



Delphys Green Power: 600 and 800 kVA

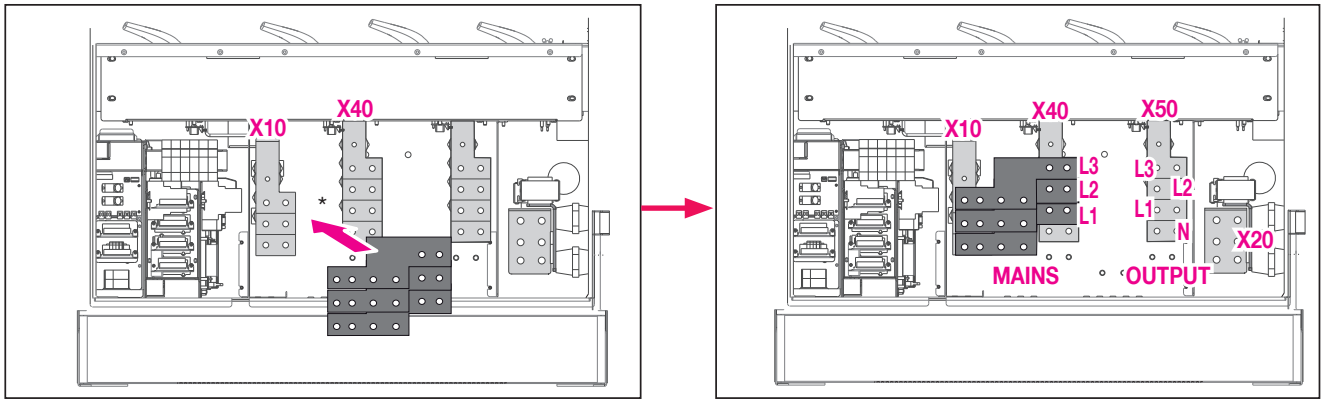


## 7.2.2. Connections if the MAINS and AUX MAINS are connected IN COMMON

Delphys Green Power: 160 and 200 kVA

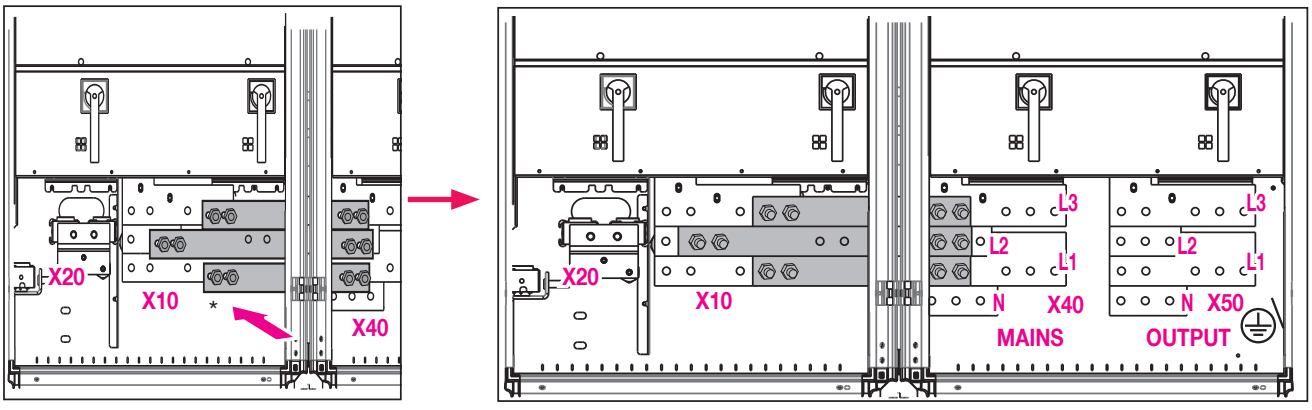



Delphys Green Power: 250 and 300 kVA



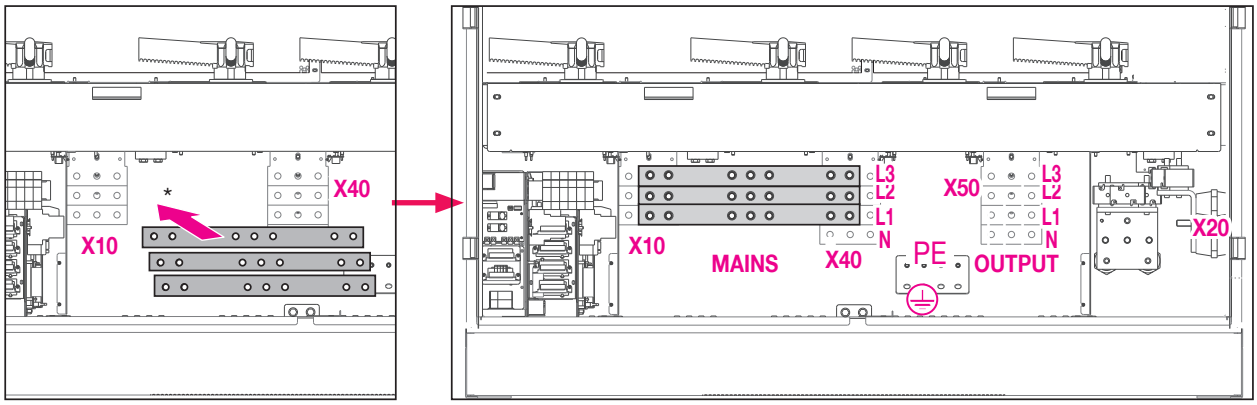

* Optional

Delphys Green Power: 400 kVA



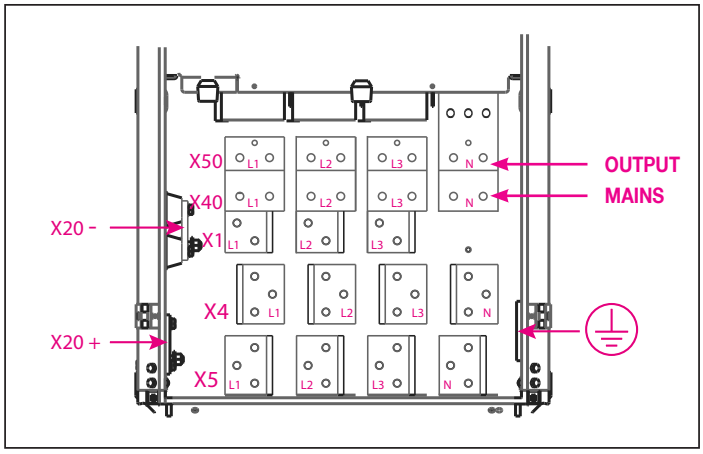

* Optional

Delphys Green Power: 500 kVA



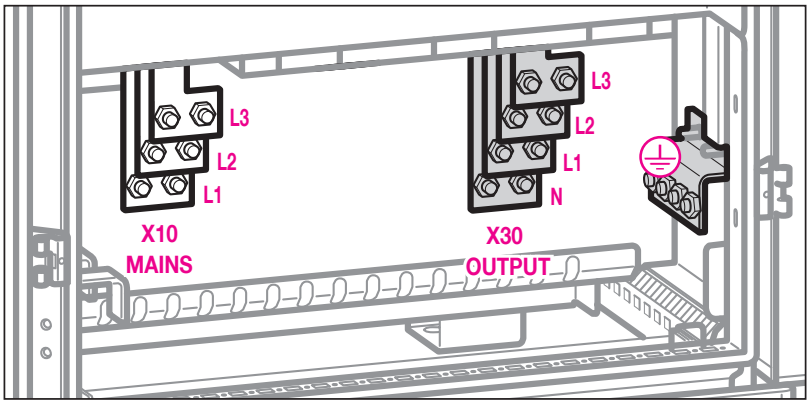

* Optional

Delphys Green Power: 600 and 800 kVA

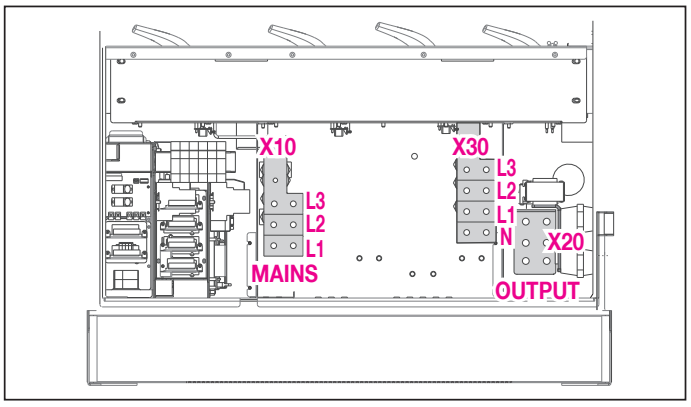


## 7.2.3. Unit connection in C3

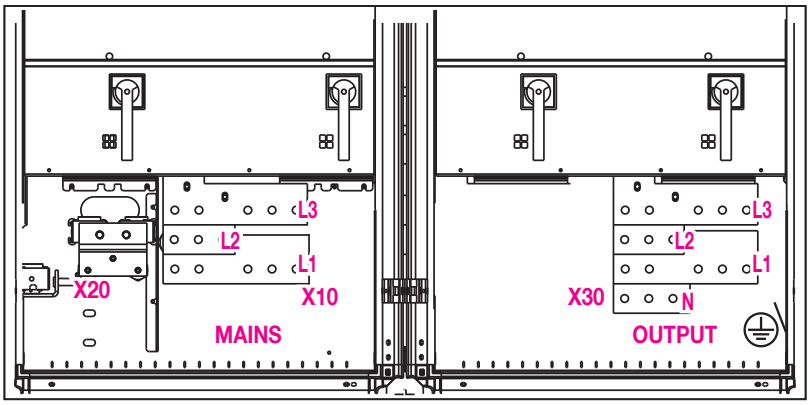
Delphys Green Power: 160 and 200 kVA



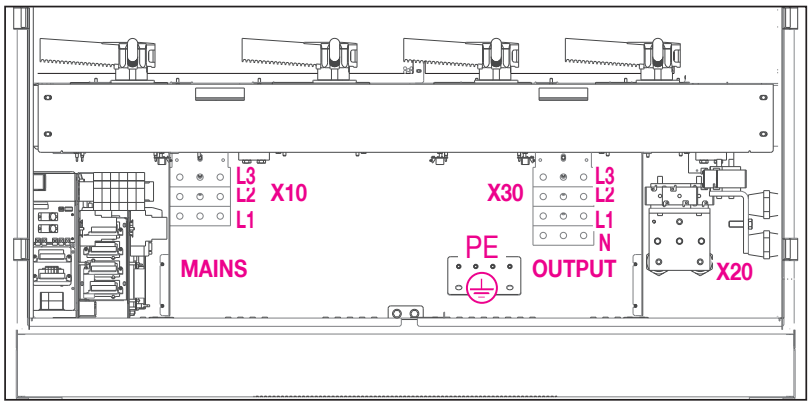

Delphys Green Power: 250 and 300 kVA



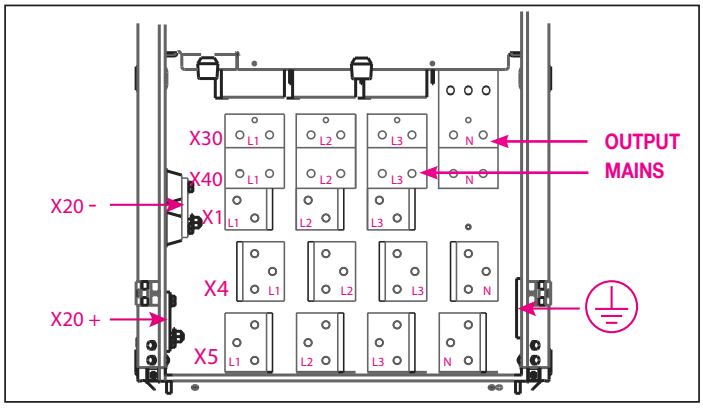

Delphys Green Power: 400 kVA



## Delphys Green Power: 500 kVA




## Delphys Green Power: 600 and 800 kVA



## 7.3. External battery cabinet connection

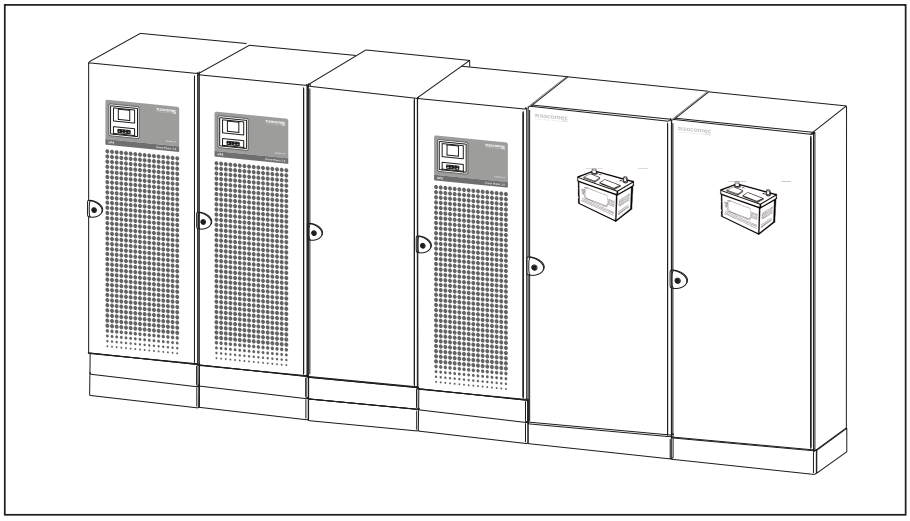
Before carrying out any operation, ensure that:
- the battery fuses located inside the battery cabinet are open;
- Green Power 2.0 is not live and all mains or battery switches are open;
- the switches upstream of Green Power 2.0 are open.

Use double insulated cables or the cables supplied with the unit to connect Green Power 2.0 to the Battery cabinet.

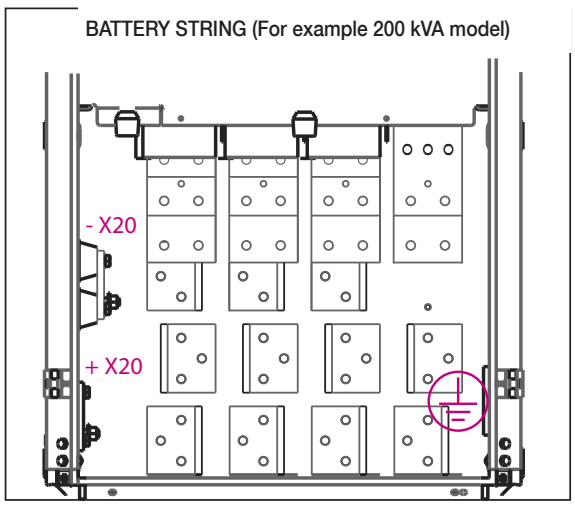
Cabling errors with inversion of the battery polarity may cause permanent damage to the equipment.

If using cabinets not supplied by the manufacturers of Green Power 2.0, it is the installer's responsibility to check the electrical compatibility and the presence of appropriate protection devices between Green Power 2.0 and the battery cabinet (fuses and switches of sufficient capacity to protect the cables from Green Power 2.0 to the battery cabinet). As soon as Green Power 2.0 is switched on (before closing the battery switches) the battery parameters must be verified accordingly (voltage, capacity, number of elements, ...) on the mimic panel menu.

Battery reference and supplier shall be approved by SOCOMEC



BATTERY STRING (For example 200 kVA model)




For safety reasons during transports and handling, batteries are disconnected at the level of each rack (or by sections not exceeding 150 V).
Take all necessary precautions when reconnecting the cables.

Connection must be performed by authorised staff, which have been previously trained. Connections to be performed are :
- grounding of battery cabinet,
- polarities + and – to the inverter,
- between battery sections and/or between shelves.

**IMPORTANT:**

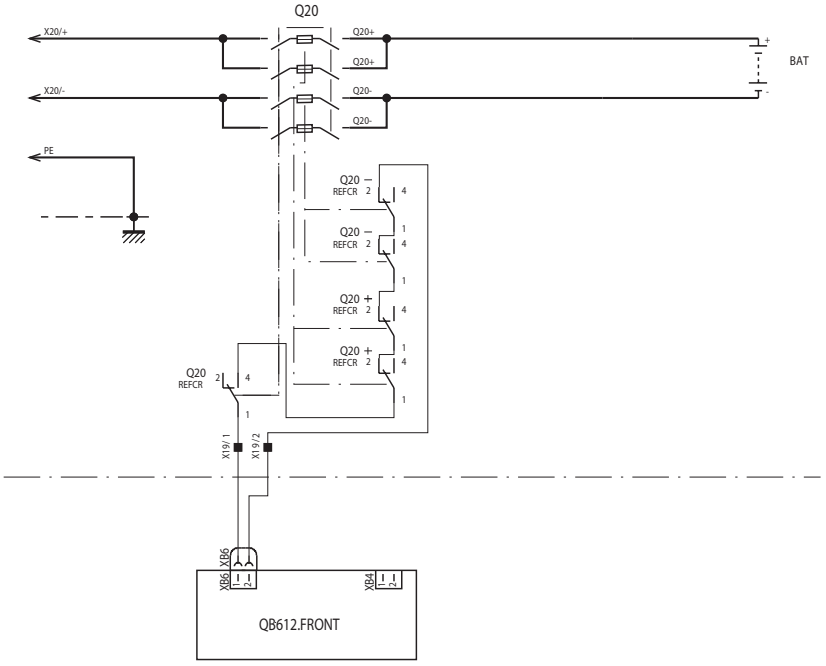
**Before closing the battery protection, be sure that the rectifier is started !**
**See the pictogram ~ | – : the bar must be green.**

## 7.4. Automatic opening of battery protection Q20

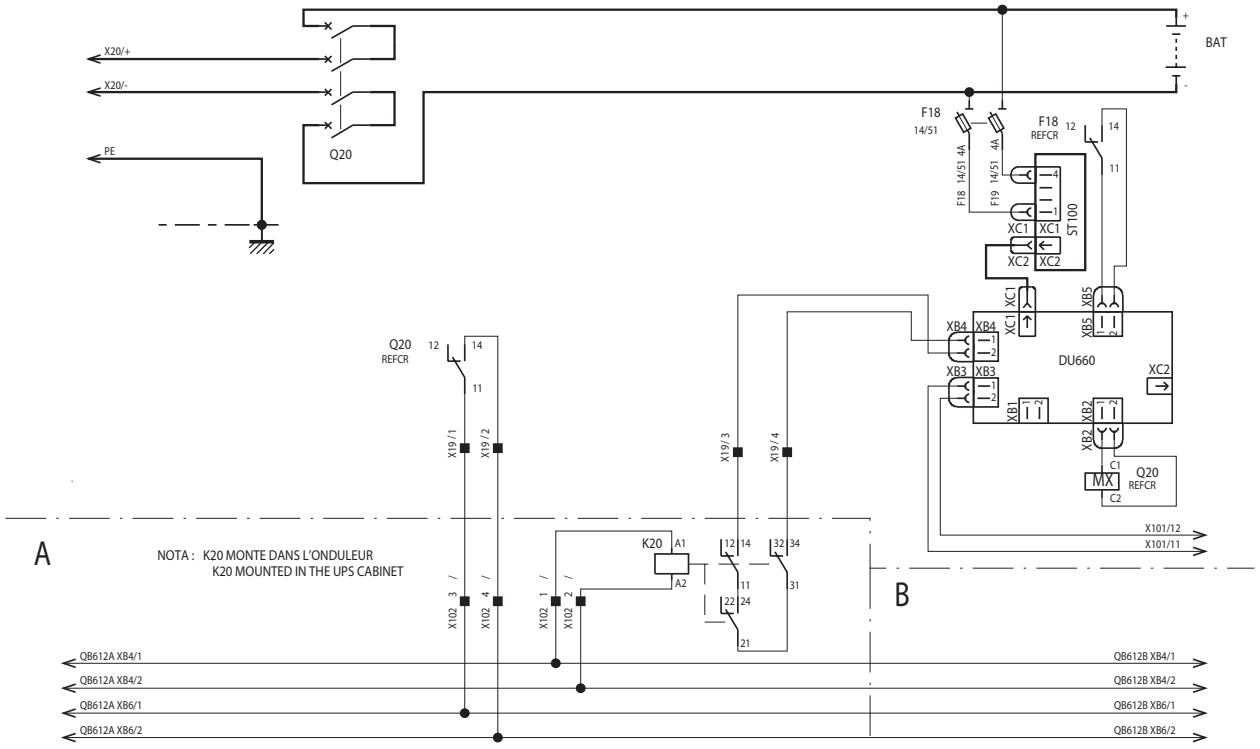
The position «opening / closing» of Q20 is reported on XB6 of PCB QB612 or on 3-4 of X102 terminal (see § 7.5).

This option enables Q20 to be opened following an emergency shutdown or a slow discharge.

Example for Delphys Green Power: 160 and 200 kVA



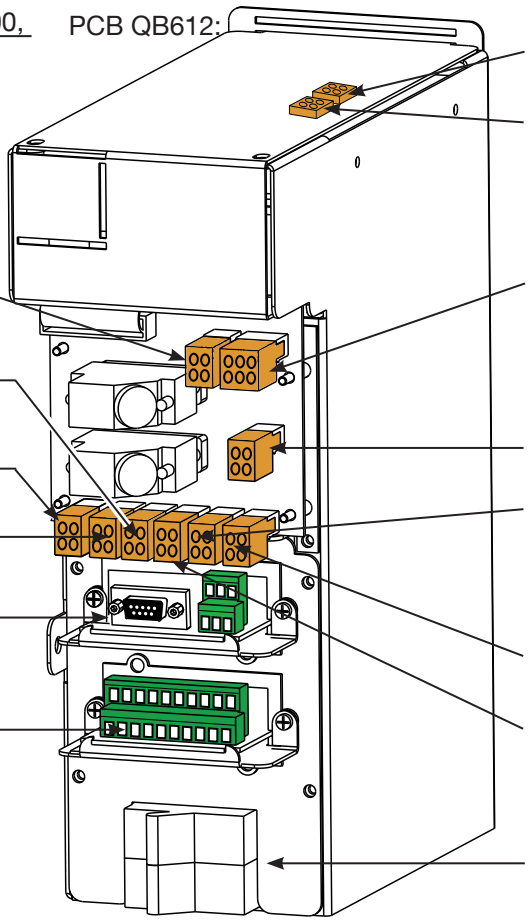

Example for Delphys Green Power: 400 kVA



## 7.5. TERMINALS

Delphys Green Power: 160, 200, 250, 300 and 500 kVA

PCB QB612:



XB11: Q5 Maintenance Bypass
See § 5.4

XB12: switchgear downstream feedback (Q21)
See § 6

XB2: output backfeed
See § 5.3

XB3: general alarm
1: common
2: NO
3: NC

XB14 : input genset
See § 7.8

XB16: UPS general power off System
See § 7.7

XB4 : optional K20 Release of battery protection

XB7: input backfeed
See § 5.3

XB5: battery cabinet temperature See § 7.10

Serial Connection PCB:
RS 232 and 485 connector
See § 9

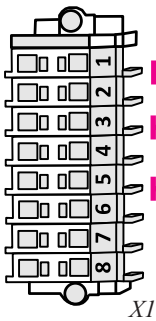
XB8: UPS general power off System
See § 7.7

ADC Card:
Input / Output Relay
See § 9

XB6: Switch Battery connector (Q20)
See § 7.4

Output backfeed cable fuses protection

Delphys Green Power: 400, 600, 800 kVA

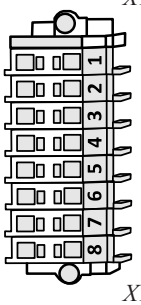



*X102*

1 - 2: Out Battery Tripping: K20 14-34

3 - 4: In Battery Protection State See § 7.4

5 - 6: Battery cabinet temperature probe See § 7.10



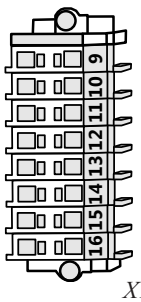

*X101.1*

1 - 2: Output backfeed tripping See § 5.3

3 - 4: Input backfeed state See § 5.3

5 - 6: UPS general power off System See § 7.7

7 - 8: In: Generator set See § 7.8




*X101.2*

9 - 10 : In: external manual ByPass

11 - 12: In: auxiliary input 1

13 - 14: Q21

15 - 16: Q22

- General alarm,
- Output backfeed cable fuses protection,
- RS 232 and 485 connector
- ADC Card

are on PCB QB612,
please see the illustration at the top of this page

**Connectors used depending on the UPS configuration:**

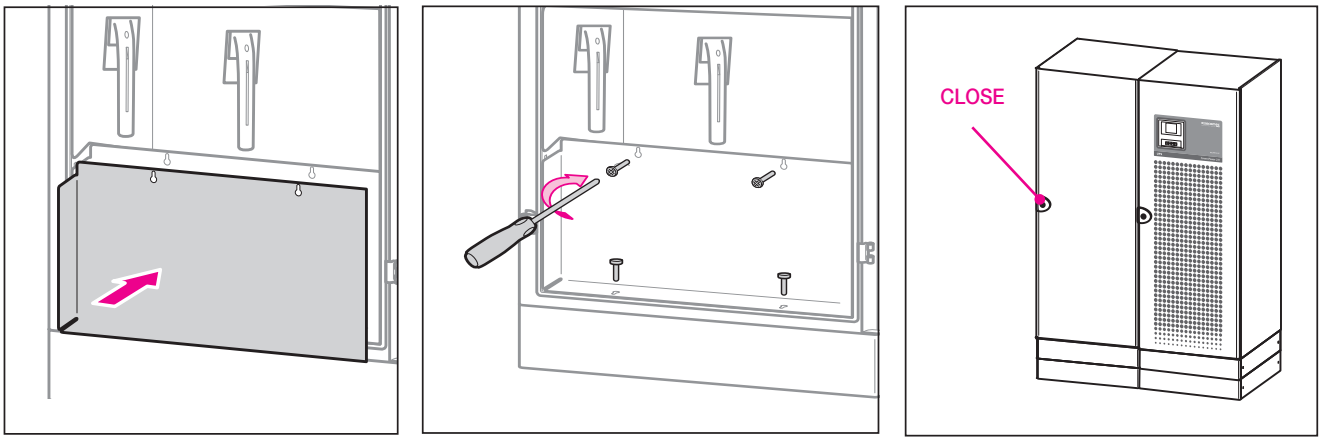
Delphys Green Power: 160, 200, 250, 300 and 500 kVA

| Configuration (see § 12.12)<br>Connectors | C1 | C6 | C7 | C3 / C4 | Centralised bypass |
|---|---|---|---|---|---|
| XB2: output backfeed | X | X | X | - | X |
| XB14: input genset | X | X | X | stop battery recharge | desynchroni-zation |
| XB5: battery cabinet temperature | X | X | X | X | - |
| XB6: Switch Battery connector (Q20) | X | X | X | X | - |
| XB3: general alarm | X | X | X | X | X |
| XB7: input backfeed | X | X | X | - | X |
| XB8 / XB16: UPS general power off System | X | X | X | X | X |

Delphys Green Power: 400, 600, 800 kVA

| Configuration (see § 12.12)<br>Connectors | C1 | C6 | C7 | C3 / C4 | Centralised bypass |
|---|---|---|---|---|---|
| X101.1 1-2: output backfeed | X | X | X | - | X |
| X101.1 3-4: input backfeed | X | X | X | - | X |
| X101.1 5-6: UPS general power off System | X | X | X | X | X |
| X101.1 7-8: input genset | X | X | X | stop battery recharge | desynchroni-zation |
| X101.2 9-10: external manual ByPass | - | X | X | - | X |
| X101.2 11-12: auxiliary input | X | X | X | X | X |
| X102 1-2: output battery Protection State | X | X | X | X | - |
| X102 3-4: input battery Tripping | X | X | X | X | - |
| XB3: general alarm | X | X | X | X | X |
| XB5: battery cabinet temperature | X | X | X | X | - |

## 7.6. Completion of the installation




Do not forget to put back protective screens.

## 7.7. External "General UPS shutdown" connection

A "general UPS shutdown" contact can be connected to PCB QB612 or terminal X101.1 according the UPS (see § 7.5).

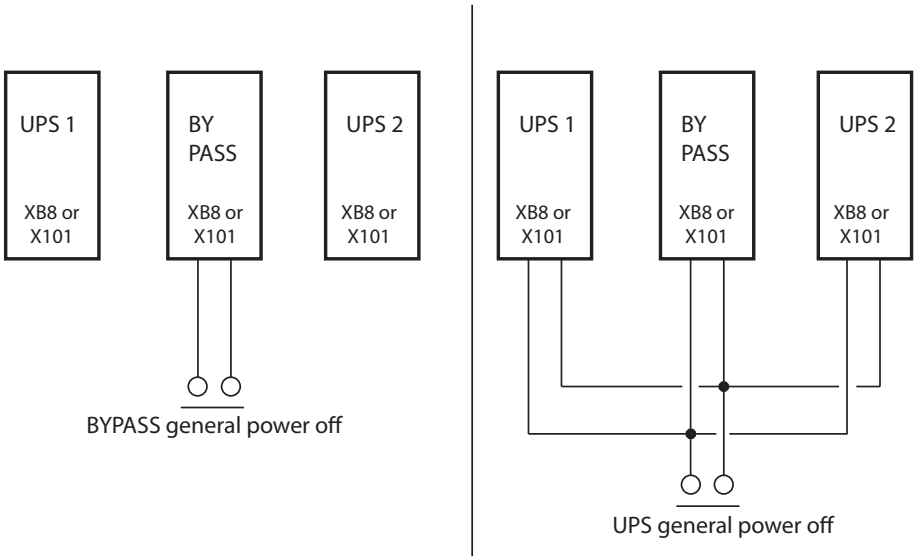
The general UPS shutdown causes:

- load power supply cut,
- inverter, rectifier and automatic bypass shut down; the battery remains connected.

This situation does not meet all cases of "emergency shutdown".

As an option, the battery link may be opened with the addition of a Mx coil controlled directly by the general UPS shutdown.

Connect a dry NO contact to terminals XB8 (and/or XB16) 1 and 2 on QB612 card or 5 and 6 of terminal X101.1 of each cabinet (module and bypass, could be bridged). (see § 7.5).



## 7.8. Connection of the genset contact (where there is the bypass)

GENERATOR SET information allows Delphys Green Power to modify the behaviour when the generator set powers the UPS. The manufacturer can set some conditions for generator set operation, that is:

a. Stop the battery charger. In this case, the corresponding input is located on terminations XB14 1-2 on PCB QB612 or terminals 7 and 8 of terminal X101.1 according the UPS (see § 7.5).
b. Bypass locked. The output frequency comes from the internal clock In this case, transfer to the automatic bypass isn't possible.
c. For modular systems: each unit is connected to terminations XB14 1-2 on PCB QB612 or terminals 7 and 8 of terminal X101.1 according the UPS (see § 7.5). of each module.
d. Total functions a) and function b) per configuration.

**Without a specific request, the factory standard setting implies there is no action on Delphys Green Power UPS when the generator set is operating Configurations mentioned above can be set at commissioning**

## 7.9. Galvanic isolation transformer

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

- Refer to § 4.4 and 4.5 of this manual for indications on moving and installing the cabinet.
- The protection cable marked with the ground symbol is connected directly to the distribution panel.
- The transformer can either be connected to Grenn Power 2.0 input or output.

**If the neutral is not present on the input, please contact us.**

For details of the connections, refer to the transformer terminal board diagram available on the Grenn Power 2.0 door.

## 7.10. Connecting the battery cabinet temperature probe

Battery cabinets on rack:

- Use the specific kit available with the UPS.
- Fix the probe in the battery room or inside the battery cabinet.
- Connect the temperature probe without cabling distance limits and without the need to observe polarity, by using a 2x1 mm² double isolation cable, on XB5 1-2 of PCB QB612 or on 5-6 of X102 terminal (See § 7.5).
- In the event of a single UPS with several battery cabinets, use a single temperature sensor.
- In the event of parallel UPS, connect the battery cabinet temperature sensors to the cards installed in the related UPS.

# 8. COMMUNICATION

## 8.1. Multiple communication options

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

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

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

| *Possible options* | | | Optional | | |
|---|---|---|---|---|---|
| | SLOT 1 | SLOT 2 | SLOT 3 | SLOT 4 | SLOT 5 |
| ADC + Serial Link interface | • | • | • | | |
| NetVision | • | • | | | |
| Modbus TCP | • | • | | | |
| BACnet | • | • | | | |
| External gateway for LIB | | • | | | |
| ADC Delphys | | | | • | • |
| RS485 ModBus RTU Delphys | | | • | | |

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

for localisation, please see § “Identifying switching and connection organs“.

Profibus / Profinet gateway are connected to ADC + Serial Link card.

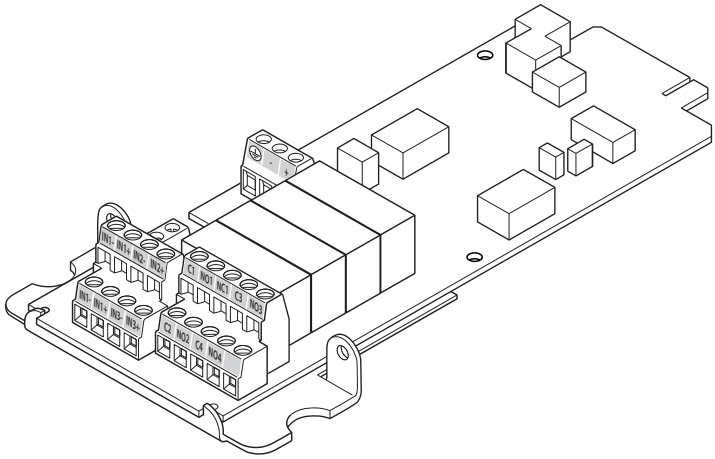
# 9. OPTIONS

## 9.1. ADC + Serial Link interface

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

- 4 relays for external device activation (can be set as normally closed or normally open).
- 3 free inputs to report external contacts to UPS.
- 1 connector for external temperature sensor (optional).
- RS485 insulated serial link providing MODBUS RTU protocol2 leds indicating the board status.

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



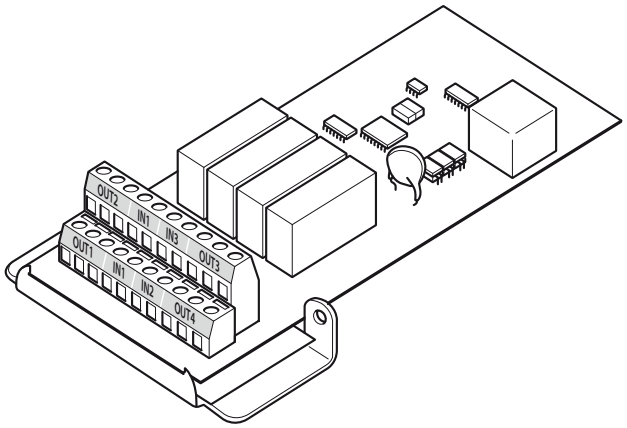
for more details, please see the Quick Start Guide of this card.

## 9.2. ADC Delphys interface

This card can be configured to control up to four outputs that are normally closed or normally open and up to three digital inputs A maximum of two cards can be installed on each unit.

Inputs and relays can be programmed by our Expert Service on purpose.

For default programing, if set, please refer to UPS operating manual according your UPS type.




for more details, please see the Installation manual of this card.

## 9.3. Isolation controller

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

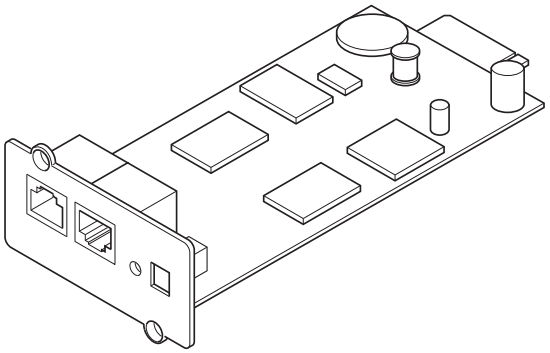
## 9.4. External maintenance bypass

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

## 9.5. Net Vision card

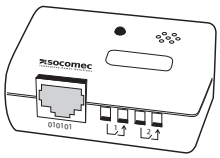
NET VISION is a communication and management interface designed for business networks. The UPS behaves exactly like a networked peripheral, it can be managed remotely, and allows the shutdown of network workstations.

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.



### 9.5.1. 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.

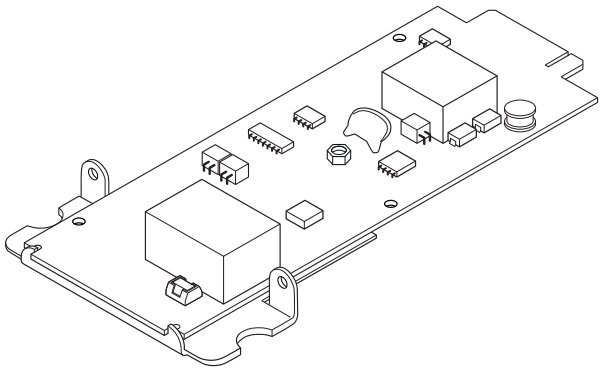



## 9.6. ACS card

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.

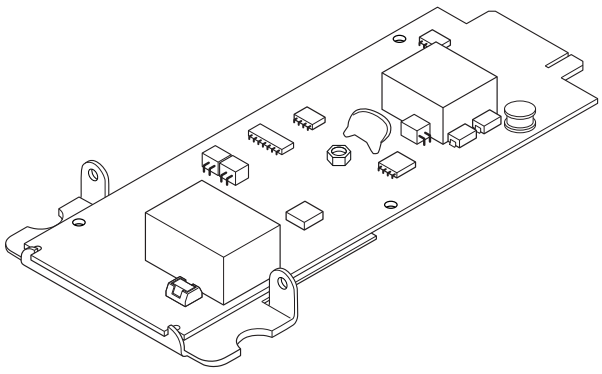
## 9.7. Modbus TCP card

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).



## 9.8. BACnet card

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



# 10. PREVENTIVE MAINTENANCE

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

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

## 10.1. Batteries

The state of the battery is fundamental to UPS operation.

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

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

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

When replacing the batteries, use the same type and configuration by placing them in the appropriate containers so as to avoid the risk of acid leakage.

The replaced batteries must be disposed of at authorised recycling and disposal centres.

Do not open the plastic cover of the batteries as they contain harmful substances.

## 10.2. Fans

The life of the fans used to cool the power parts is dependent on the using and environmental conditions (temperature, dust).
Preventive replacement by an authorised technician is recommended within 4 years (in normal operating conditions).

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

## 10.3. Capacitors.

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

The average expected life of these components is shown below:

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

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

# 11. TECHNICAL SPECIFICATIONS

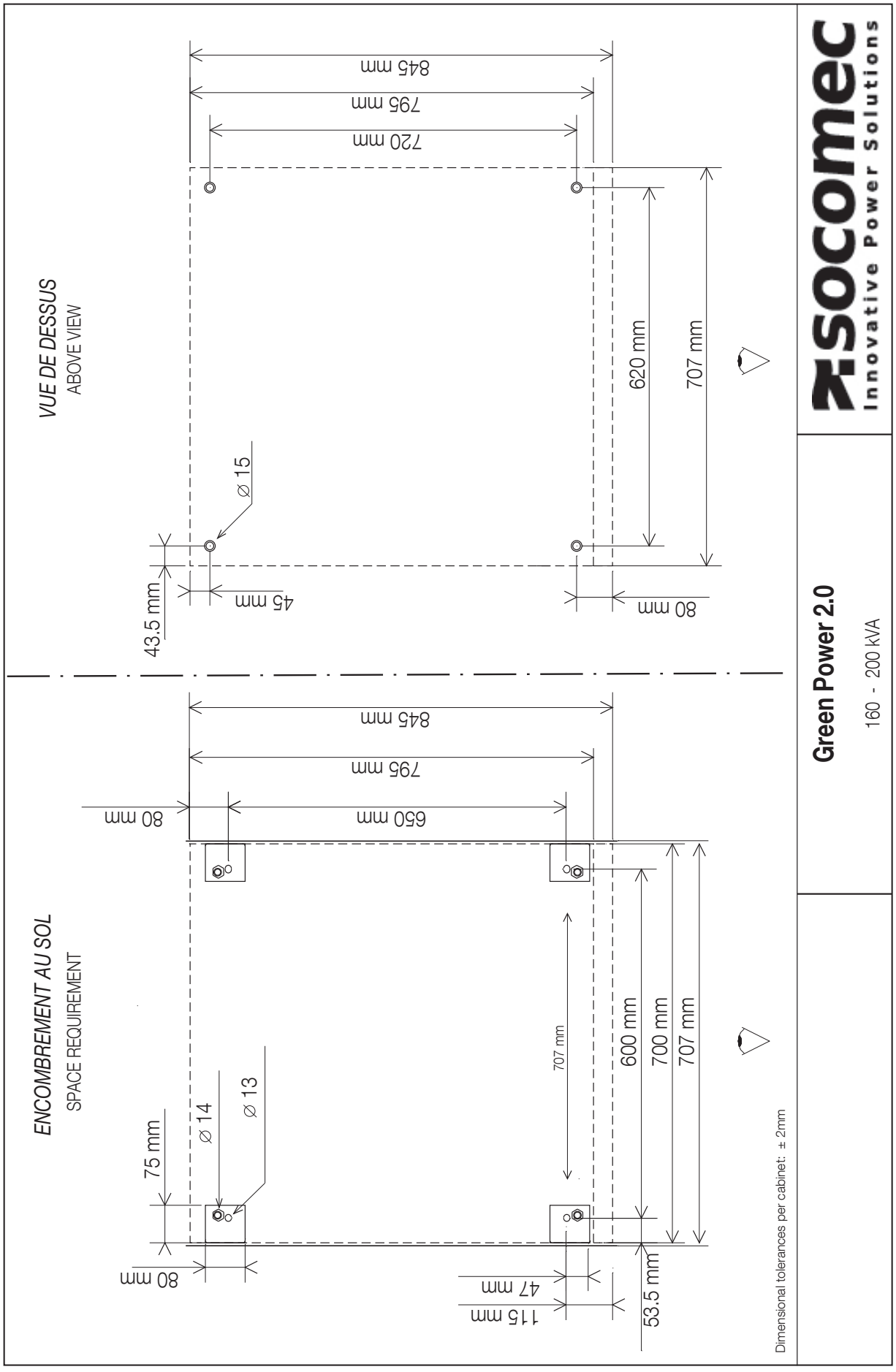
| DELPHYS Green Power kVA | | 160 | 200 | 250 | 300 | 400 | 500 | 600 | 800 |
|---|---|---|---|---|---|---|---|---|---|
| **Electrical specifications - Rectifier input** | | | | | | | | | |
| Mains voltage | | 3P 380 - 415 VAC | | | | | | | |
| Voltage tolerance (1) | | 200-480V | | | | | | | |
| Input frequency | | 42 - 65 Hz | | | | | | | |
| Input power factor | | 0,99 | | | | | | | |
| THDI (at full load and rated voltage) | | < 2.5% (with THDV input < 1%) | | | | | | | |
| **Electrical specifications - Bypass input** | | | | | | | | | |
| Mains voltage (power rating, Power Factor ø = 1) | | Output rated voltage ±15% | | | | | | | |
| Input frequency | | 50 / 60 Hz | | | | | | | |
| **Electrical specifications - Output** | | | | | | | | | |
| Output voltage on inverter | | 3P+N 380 / 400 / 415 VAC | | | | | | | |
| Frequency | | 50 / 60 Hz | | | | | | | |
| Automatic bypass | | 400 V ±15% (Selectable from 10% to 20% if generator is used) | | | | | | | |
| Power rating kW | | 160 | 200 | 250 | 300 | 400 | 500 | 600 | 800 |
| Overload (at ≤ 25°C): | | | | | | | | | |
| • 10 minutes | | 200 | 225 | 280 | 337 | 450 | 560 | 675 | 900 |
| • 1 minute | | 240 | 270 | 312 | 375 | 540 | 625 | 810 | 1080 |
| Crest factor | | 3:1 | | | | | | | |
| Harmonic voltage distortion | | ThdU ≤ 1,5% with rated linear load; < 3% with non-linear load | | | | | | | |
| Inverter short-circuit capacity (A) | | 800 | 800 | 900 | 1100 | 1600 | 1800 | 2200 | 3200 |
| **Bypass** | | | | | | | | | |
| Manual maintenance bypass | | Built-in | | | | | | | |
| Maximum overload capacity admitted | | see § 4.6.3 | | | | | | | |
| Bypass short-circuit capacity peak 20ms (Â) | | 8000 | 8000 | 8000 | 8000 | 12500 | 14500 | 19200 | 25000 |
| Rated short-time withstand current Icw (kA) | | 10 | 10 | 10 | 10 | 12,2 | 15,2 | 18,3 | 24,4 |
| **Environment** | | | | | | | | | |
| Operating temperature | | 0 to 40°C (25 °C recommended) | | | | | | | |
| Storage temperature range | | -20 to 70 °C | | | | | | | |
| Relative humidity (condensation-free) | | up to 95% | | | | | | | |
| Max. altitude | | 1000 m | | | | | | | |
| Acoustic noise (dBA) | | < 65 | < 67 | < 70 | < 70 | < 70 | < 72 | < 72 | < 73 |
| Airflow | $m^3$ / h | 2250 | 2250 | 2700 | 2700 | 4500 | 5400 | 6750 | 9000 |
| Heat dissipation in nominal condition | W | 7900 | 10400 | 12800 | 15200 | 26000 | 24300 | 31800 | 46400 |
| | BTU/h | 26956 | 35486 | 43675 | 51864 | 88716 | 82914 | 108505 | 158300 |
| Heat dissipation (max) in worst conditions | W | 10000 | 13000 | 15000 | 18000 | 22000 | 30000 | 39000 | 56800 |
| | BTU/h | 34121 | 44358 | 51182 | 61420 | 75066 | 102364 | 133074 | 193800 |
| **Standards** | | | | | | | | | |
| Appliance classes | | Protective Class I (IEC 62477-1) | | | | | | | |
| Safety | | IEC 62040-1 | | | | | | | |
| EMC | | IEC 62040-2 | | | | | | | |
| Product certification | | CE EAC | | | | | | | |
| Protection degree | | IP20 (IP 32 on request) | | | | | | | |

**These levels of performance are given for information purposes at nominal load (resistive).**

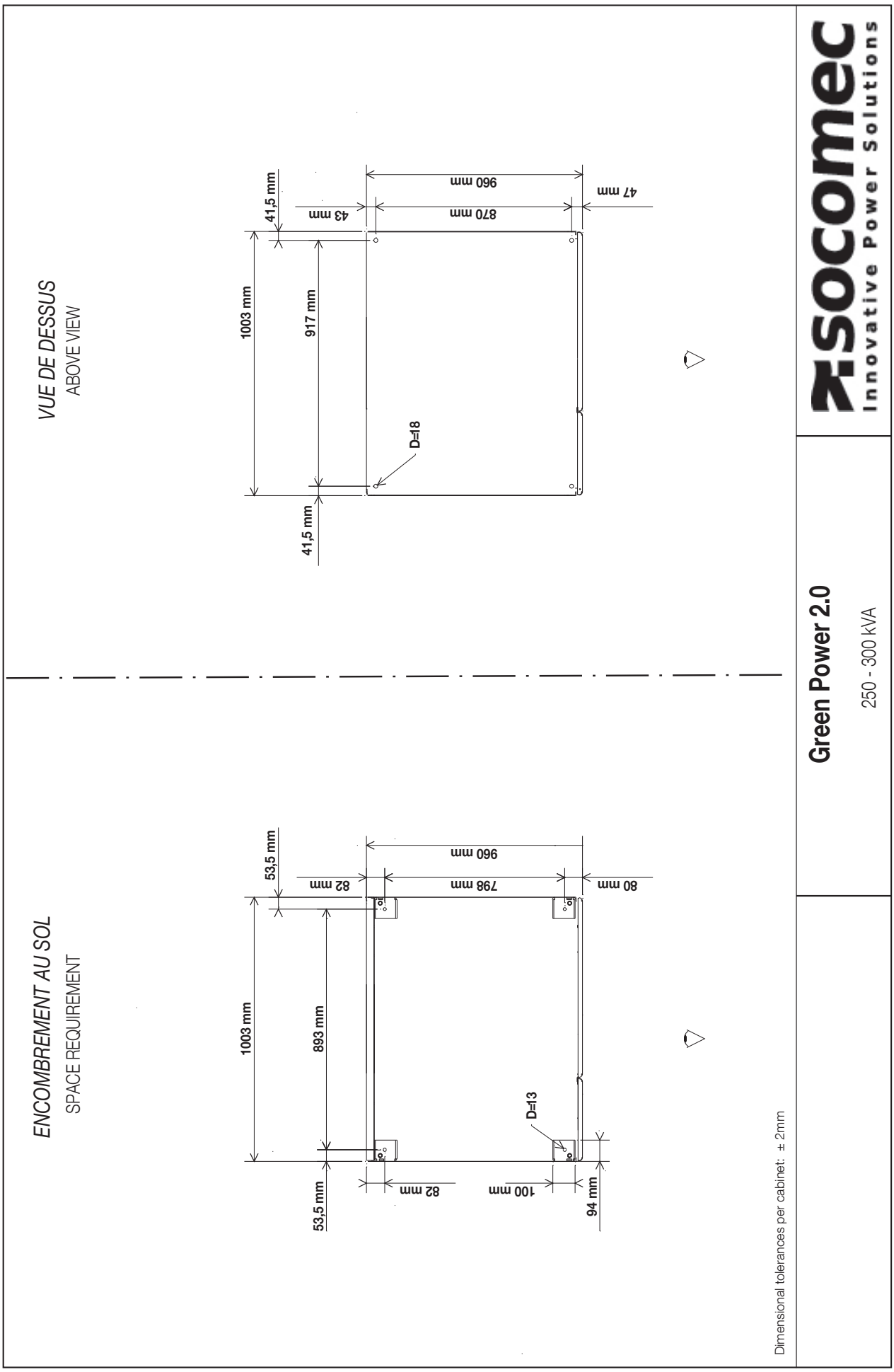
(1) Condition apply – consult us

# 12. APPENDIX

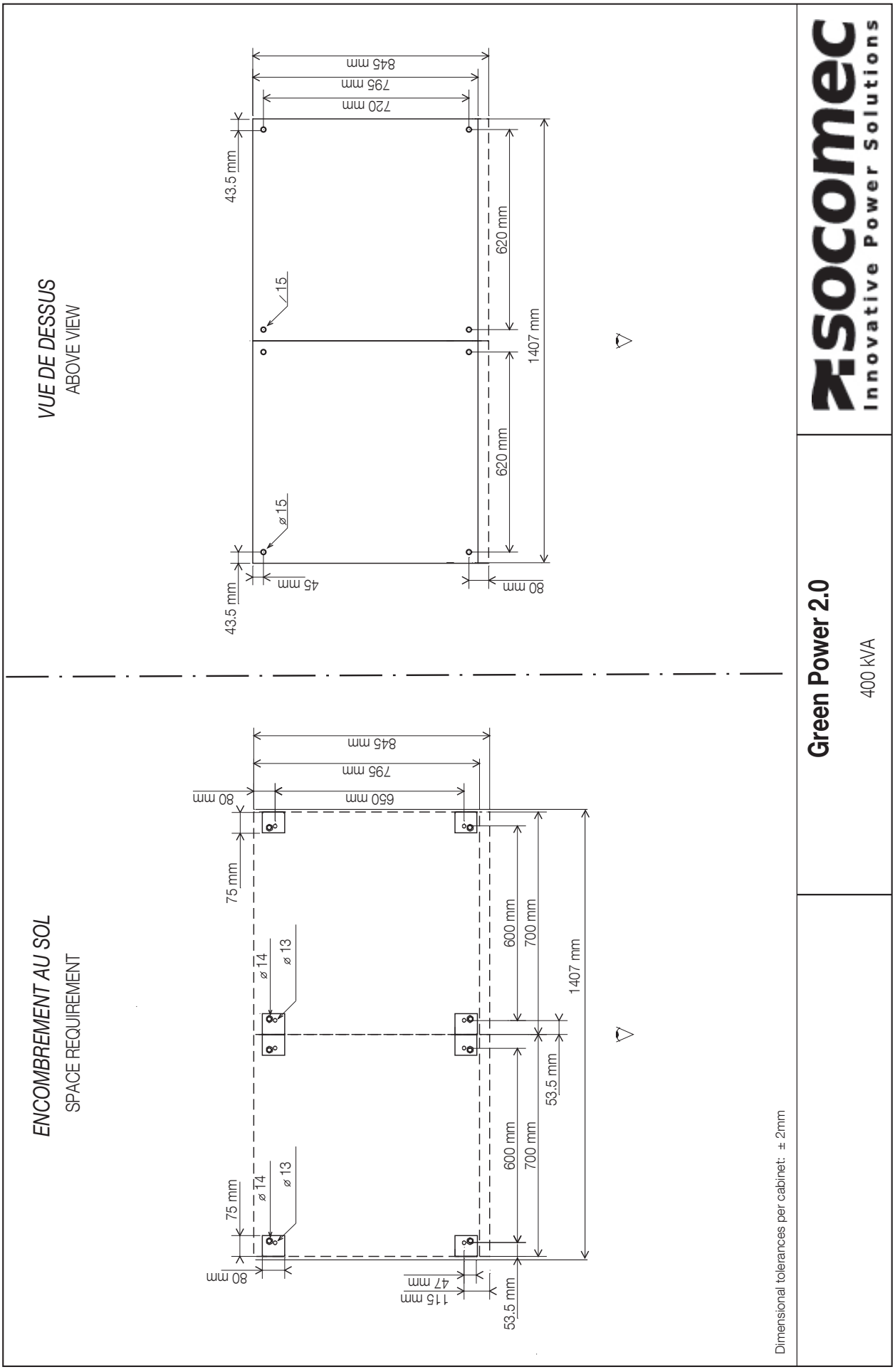
## 12.1. Plan 1: Delphys Green Power 160 and 200 kVA Floor fastening



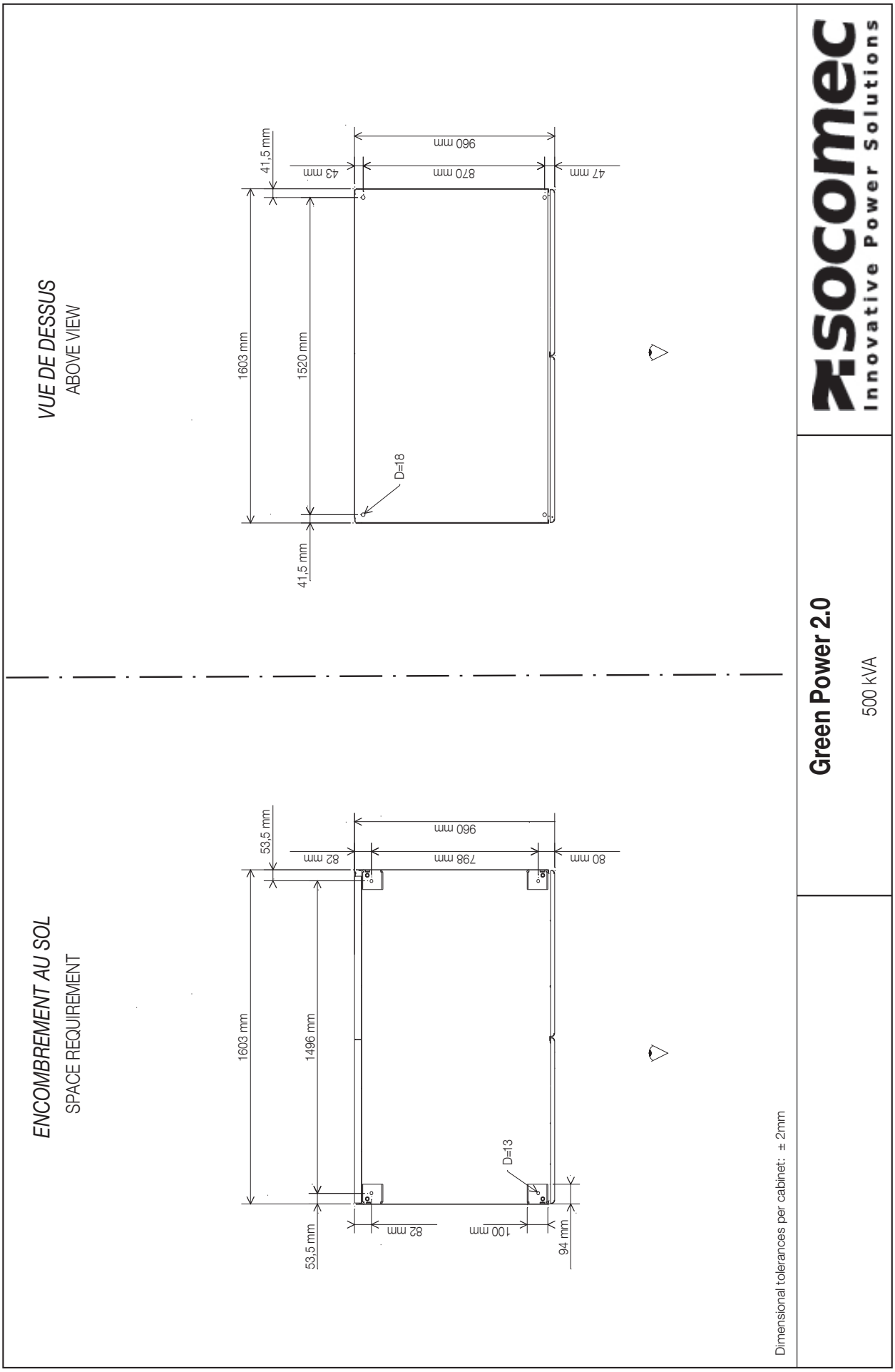
## 12.2. Plan 2: Delphys Green Power 250 and 300 kVA Floor fastening



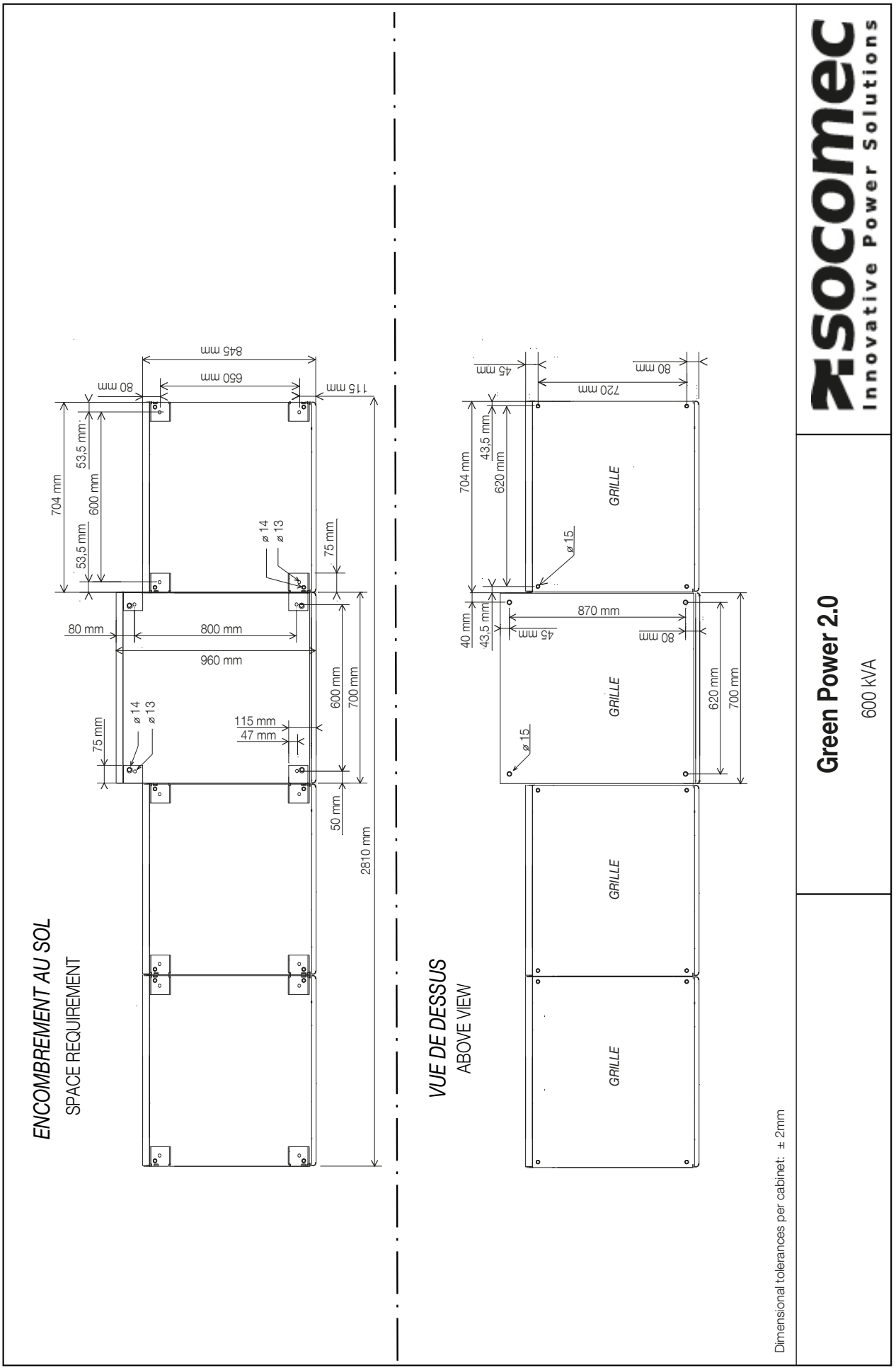
## 12.3. Plan 3: Delphys Green Power 400 kVA Floor fastening



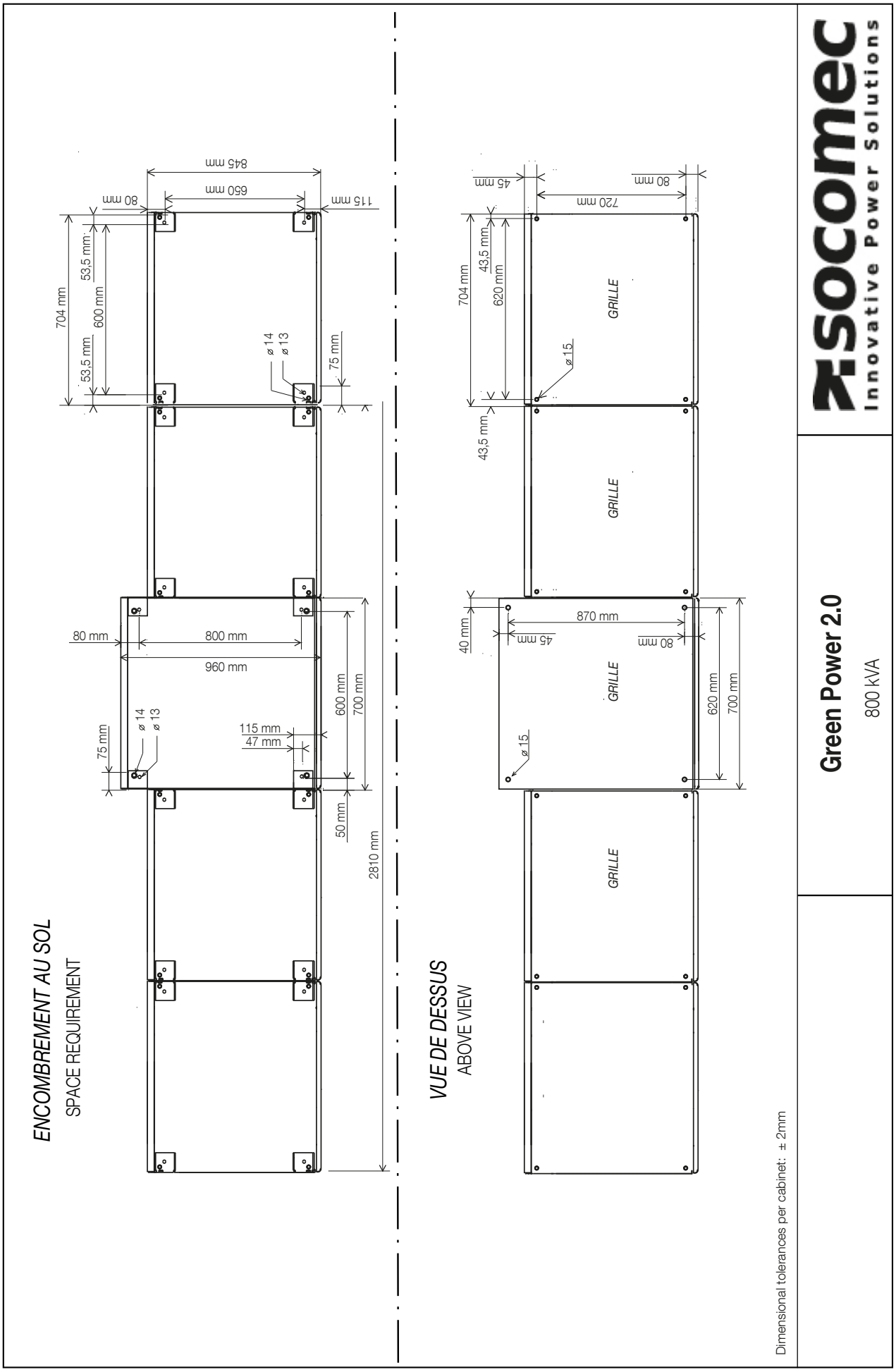
## 12.4. Plan 4: Delphys Green Power 500 kVA Floor fastening



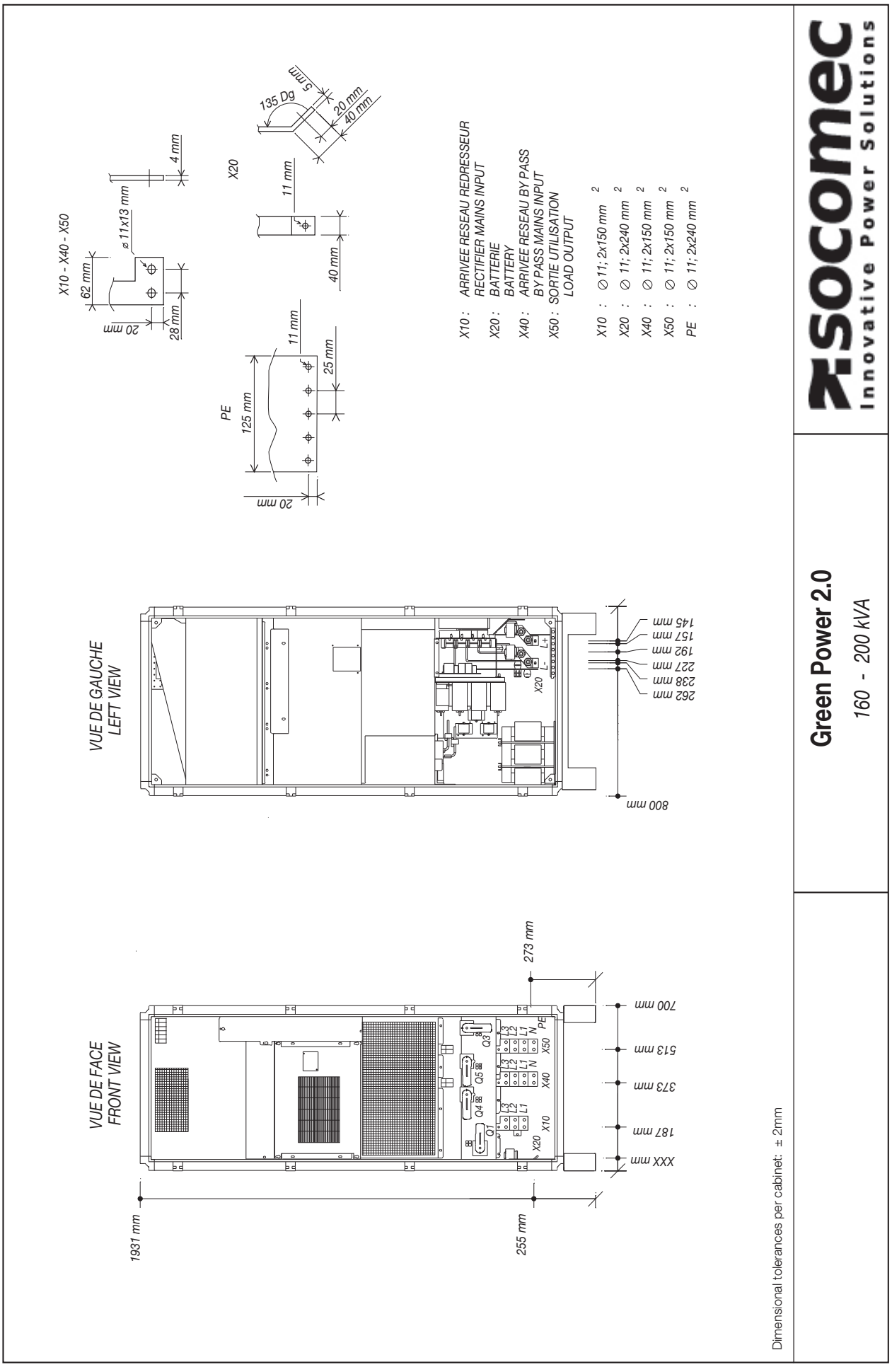
## 12.5. Plan 5: Delphys Green Power 600 kVA Floor fastening



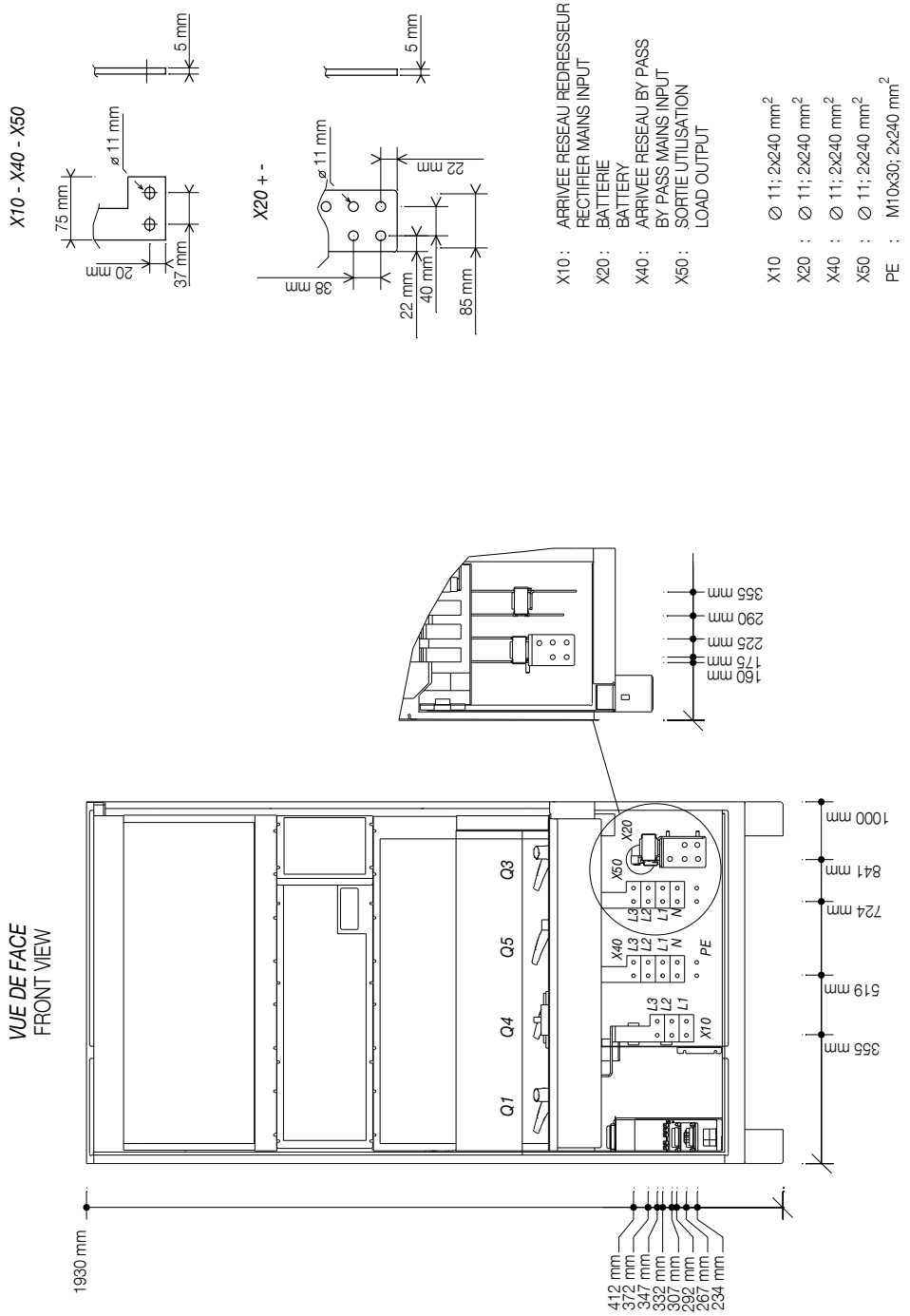
## 12.6. Plan 6: Delphys Green Power 800 kVA Floor fastening



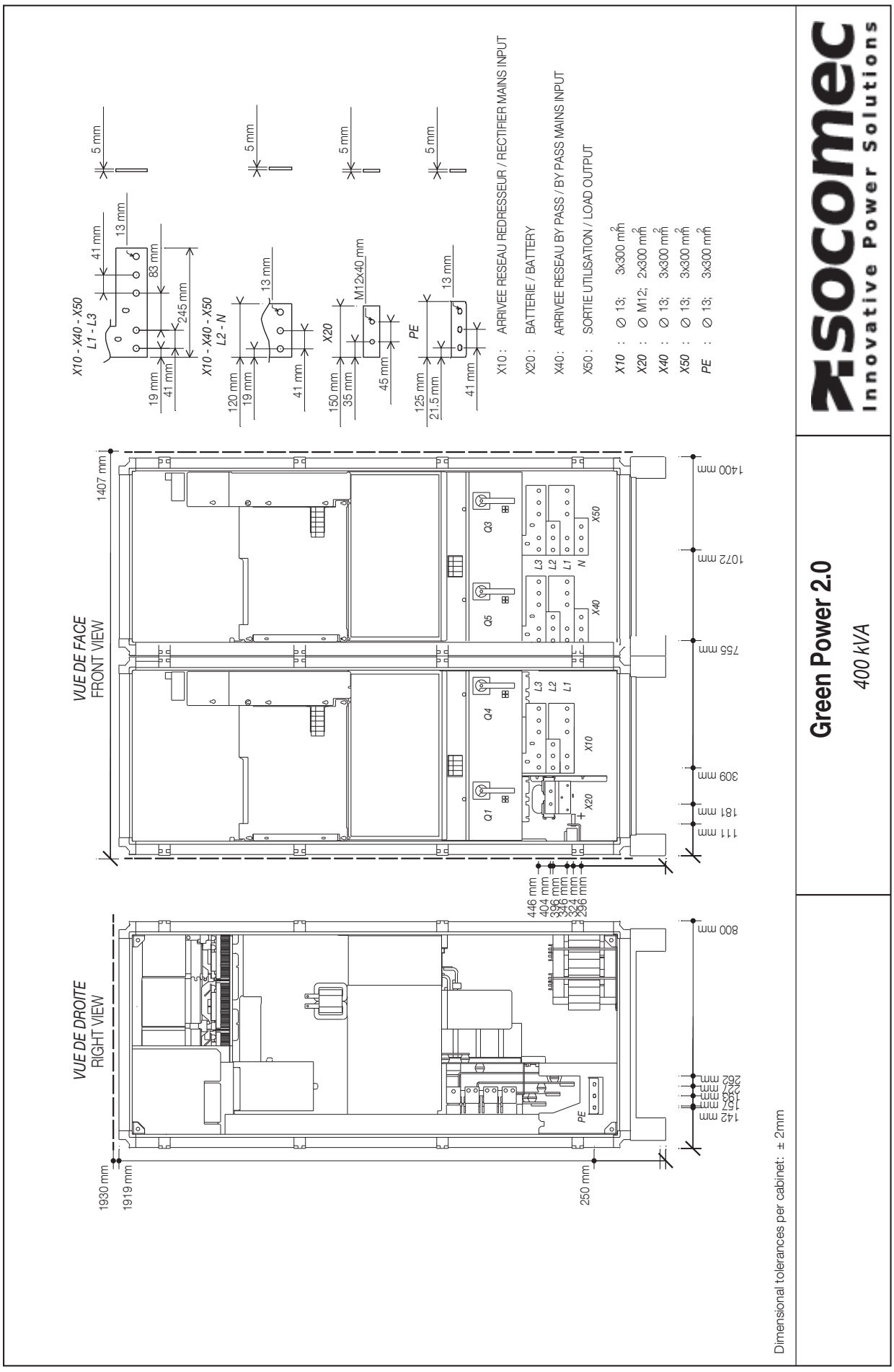
## 12.7. Plan 7 : 160 and 200 kVA Dimensions



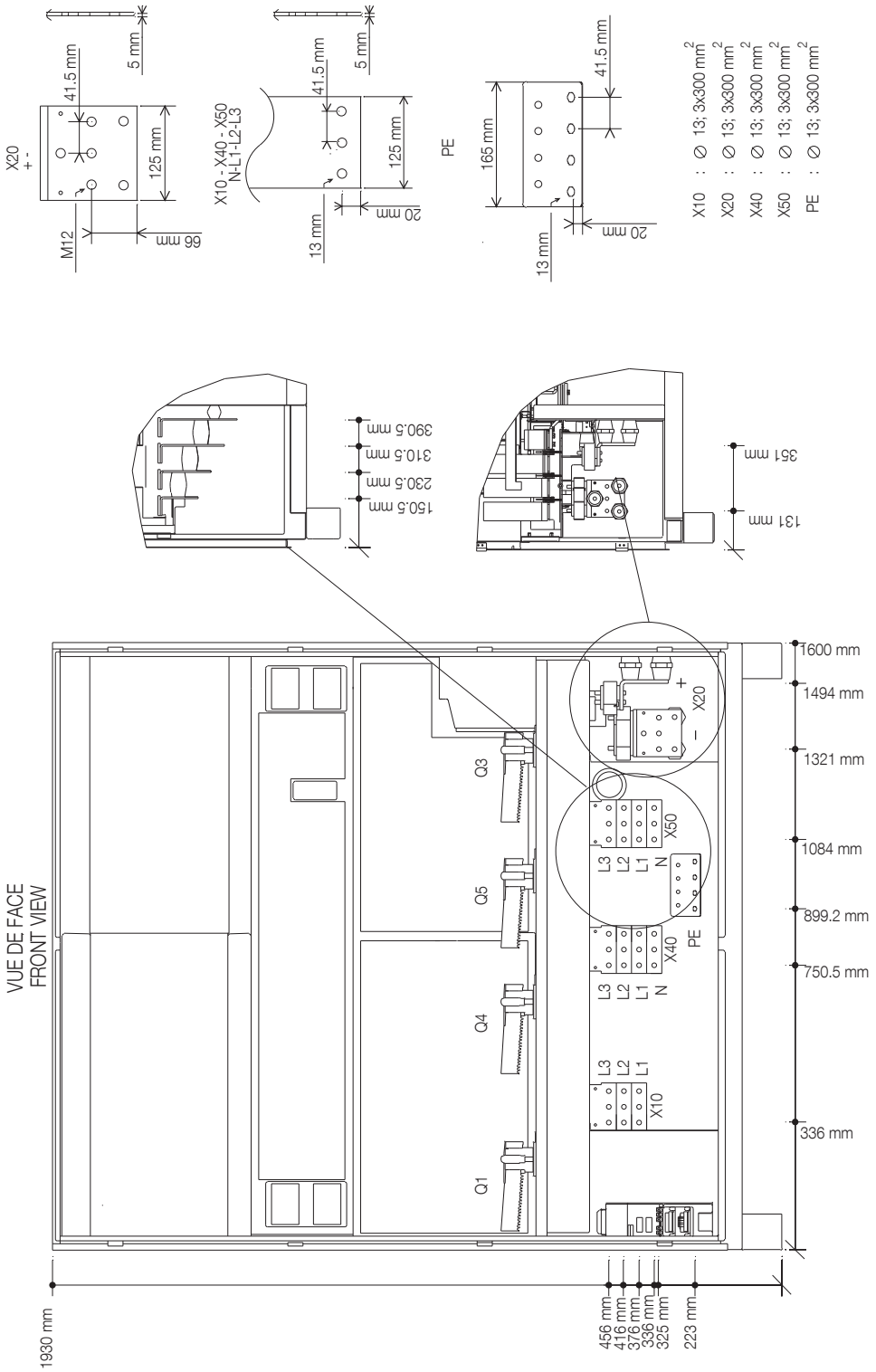
## 12.8. Plan 8 : 250 and 300 kVA Dimensions



## 12.9. PLAN 9 : 400 KVA DIMENSIONS



## 12.10. Plan 10 : 500 kVA Dimensions




**Green Power 2.0**
*500 kVA*

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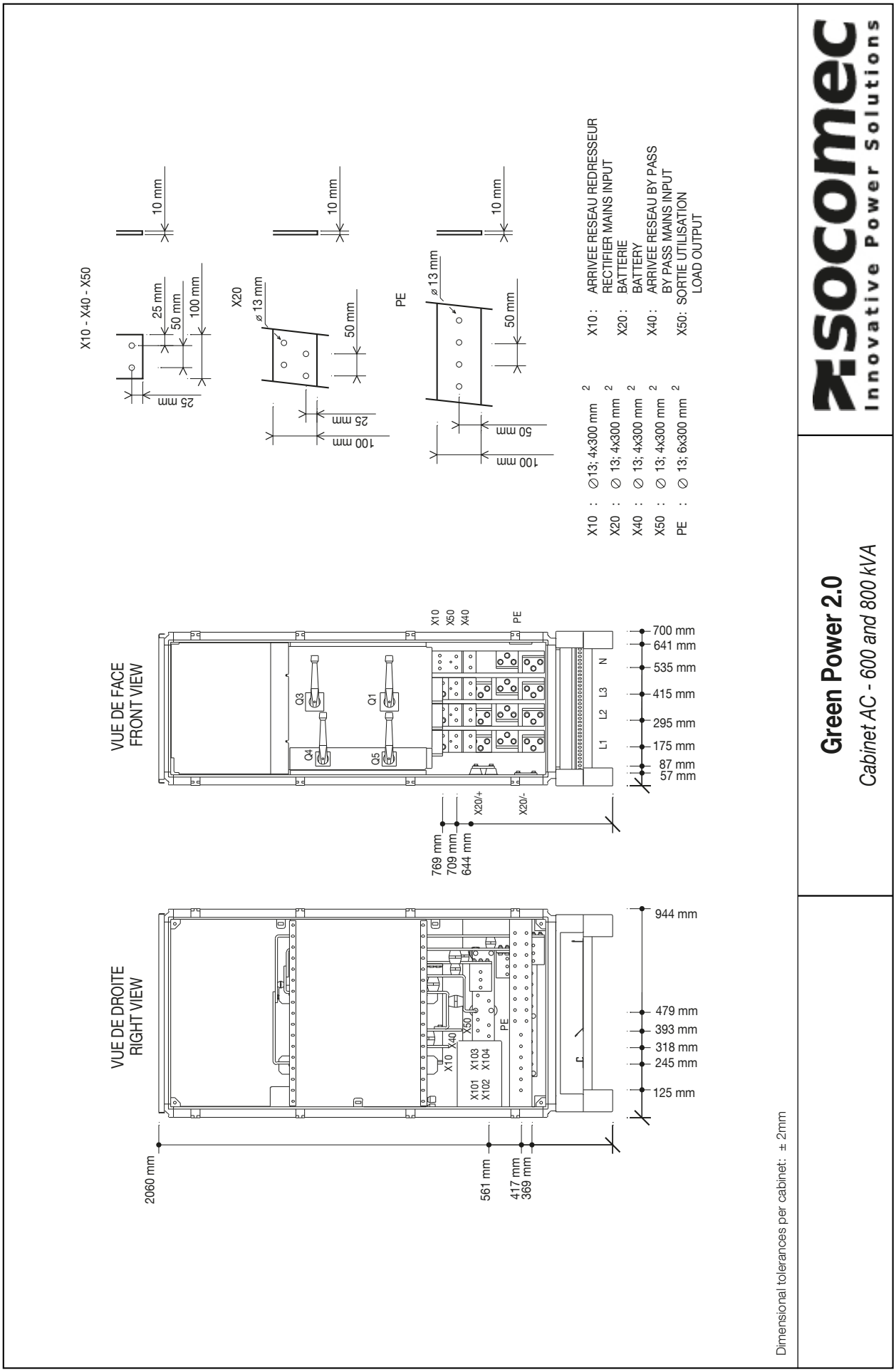
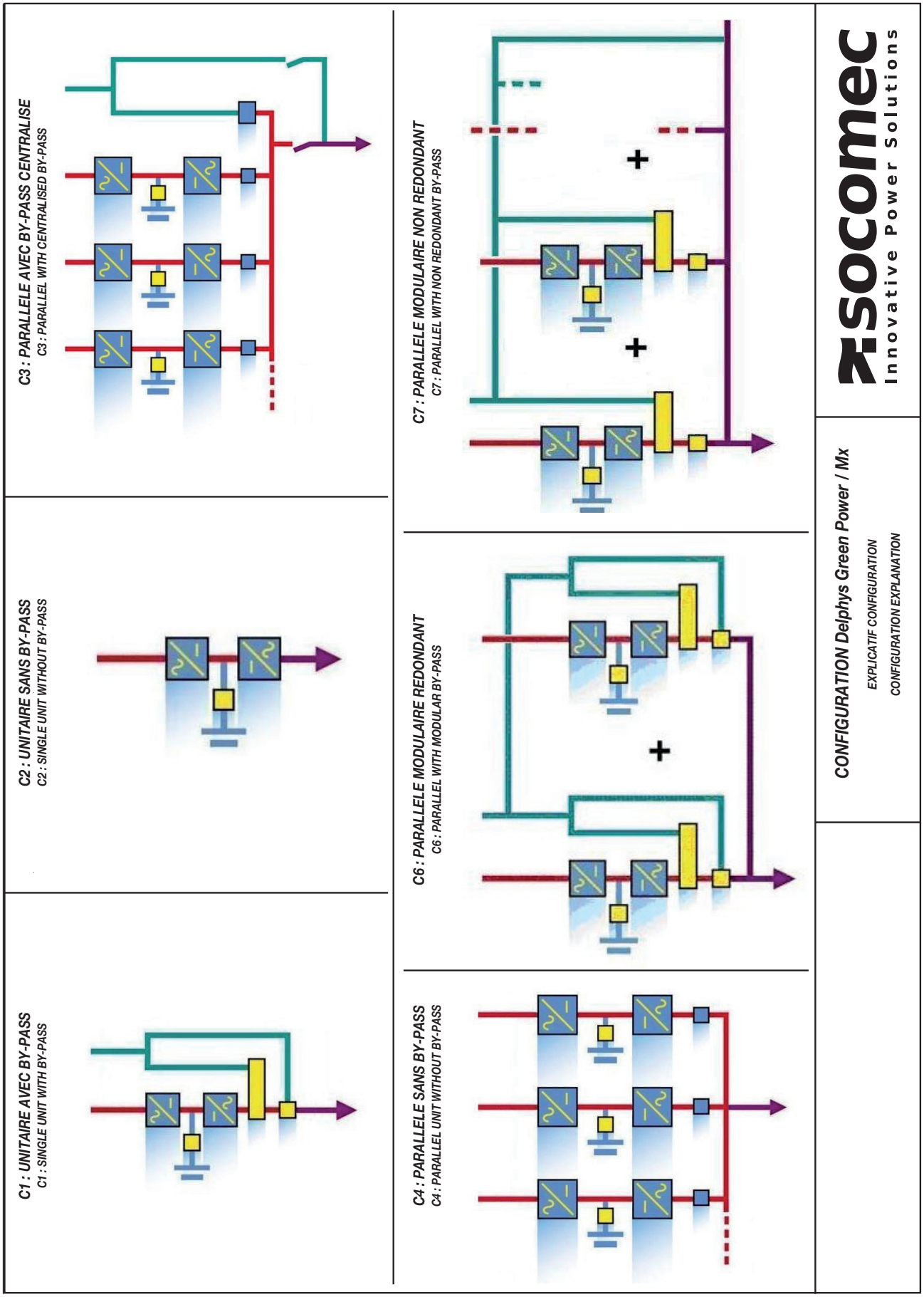
## 12.11. Plan 11 : Cabinet AC (for 600 and 800 kVA model) Dimensions



## 12.12. PLAN 12 : UPS CONFIGURATIONS



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