

DELPHYS XL

High Power UPS from 1.2MW to 4.8MW



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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 Socomec product(s) and does not extend to third-party equipment which may be integrated with this(these) product(s), nor the performance of such third-party equipment.

The manufacturer guarantees its products to be free from manufacturing faults and defects in design, materials 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.

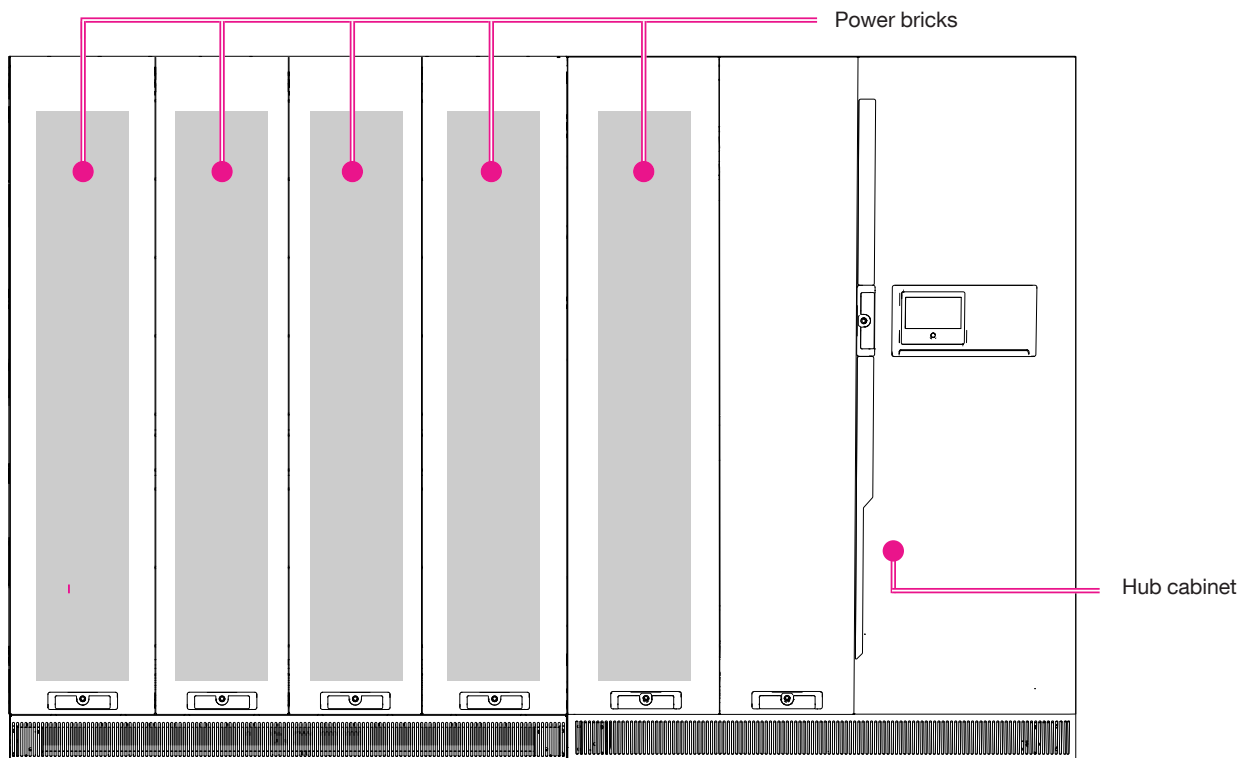
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2. GENERAL DESCRIPTION

2.1. Range

DELPHYS XL is a highly reliable UPS solution based on our field proven high power XL platform, integrated into a fully redundant architecture that guaranties service continuity for the most critical applications. Systems can be parallelized to increase the rated power up to 4.8 MW.

Manufactured in France, Delphys XL is composed of 5 Self-sufficient power bricks with advanced selective disconnection and a robust static bypass. Complete mechanical and electrical segregation between the power converters avoids any default propagation inside the system for the best possible availability.



Hub cabinet for the UPS UNIT

- All input(s) –outputs and battery connections to the UPS units
- 1.2MW centralized static switch on bypass line
- Local users interface (HMI)
- Remote communications interfaces

5 power bricks rated for 1200kW/kVA continuous operation

- Single and fully rated Rectifier - Inverter & Battery charger per power brick
- Highly efficient & reliable power bricks
- Selective disconnection to allow electrical isolation of the brick when required

2.2. Rated power

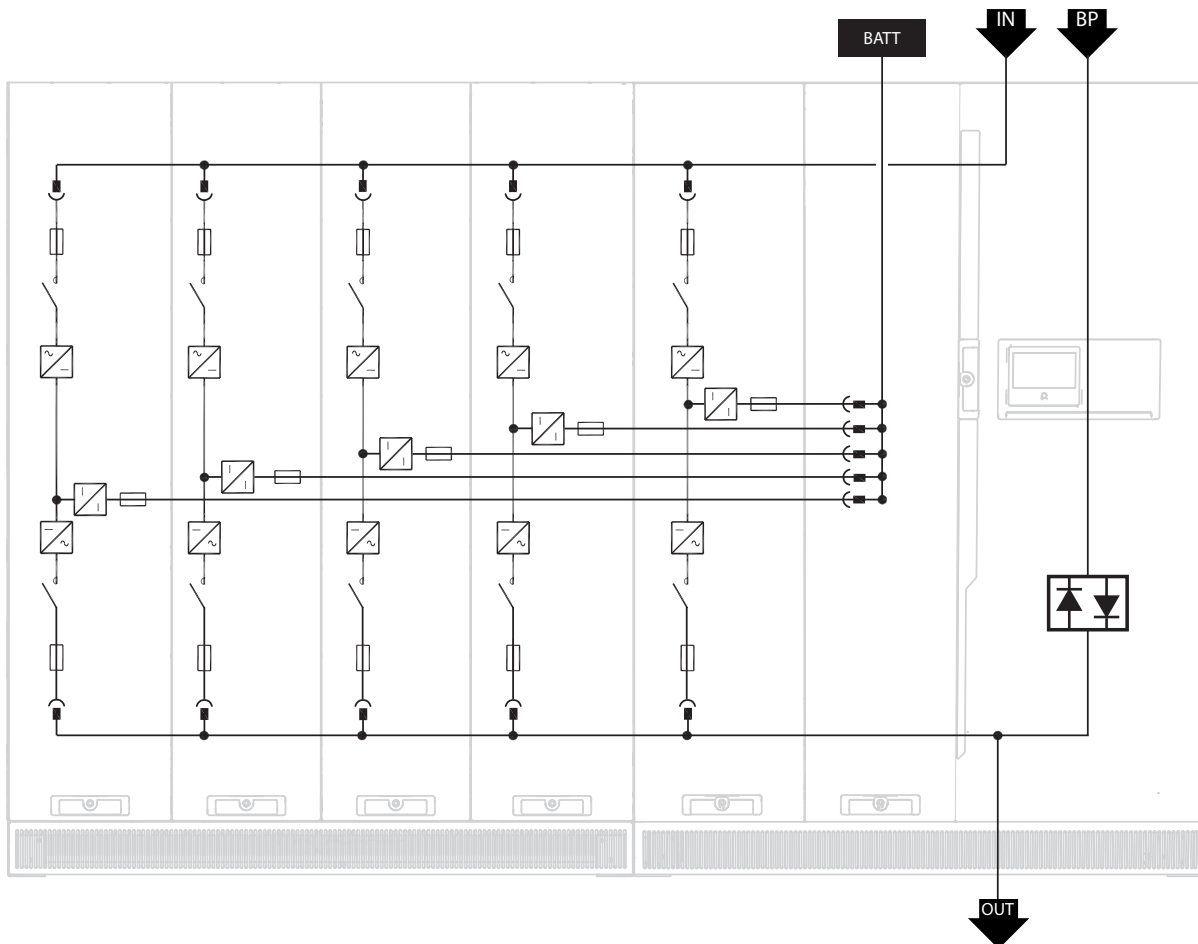
Rated power per UPS UNIT	
UPS power rating	1200 kVA
Power (kW) at 35°C	1200 kW
Parallel units	up to 4 units in parallel

2.3. The System

Delivering far greater benefits than conventional monolithic systems, DELPHYS XL packs 1200kW into an overall space-saving design that makes for simple and flexible integration within your existing architecture.

2.4. Single-wire electrical diagram

Electrical diagram example with separated inputs adapted depending on the requirements:



3. SAFETY

3.1. Important note

- This document provides important instructions for the safe use, handling and connection of the Uninterruptible Power System (UPS).
- Socomec retains full and exclusive ownership of this document. Only a personal right to use the document for the application indicated by Socomec is granted to the recipient of this document. All reproduction, modification, dissemination of this document whether in part or whole and by any manner is 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 reference.
- Reference security information is in English.
- The manufacturer will not be held liable for failure to follow the instructions in this manual, which is also available at www.socomec.com.

- The UPS must be installed and activated only by qualified technical personnel authorized by Socomec (wearing appropriate safety headgear, gloves, shoes and glasses).
- The UPS must be repaired only by authorized technicians that have been specially trained for this purpose (wearing appropriate safety headgear, gloves, shoes and glasses)

- Do not expose the UPS Unit to dust, rain or liquids in general. Do not insert foreign objects into the UPS Unit.
- It is recommended that the ambient temperature and the humidity of the DELPHYS XL UPS Unit environment are maintained below the values specified by the manufacturer.




The DELPHYS XL 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 Unit 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.).

- Affix a label bearing the following words on all the external switches of the UPS Unit power supply:

005




BEFORE WORKING ON THIS CIRCUIT

- ISOLATE UNINTERRUPTIBLE POWER SYSTEM (UPS)
- THEN CHECK FOR HAZARDOUS VOLTAGE BETWEEN ALL TERMINALS INCLUDING THE PROTECTIVE EARTH


RISK OF VOLTAGE BACKFEED

- Do not connect the output neutral to ground (except for TNC earthing option). The DELPHYS XL UPS Unit 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 Unit (refer to § 8.5.1 Connecting earth cables).
- Switch off and isolate the UPS Unit and then wait for 5 minutes before any maintenance operations.



The DELPHYS XL UPS Unit could restart automatically.



- Before connecting the external battery cabinet, check that this is fully compatible with the model of the UPS Unit.
- The use of external battery cabinets not supplied by the manufacturers is not recommended.
- CAUTION: Danger of explosion if batteries are replaced with non-original ones.
- 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 Unit 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:



The regulations and standards applicable to the place of installation of the product 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.

3.2. Description of the symbols used on the labels affixed 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 Unit

3.3. Label positions

3.3.1. Hub cabinet

WARNING

004 HIGH LEAKAGE CURRENT

EARTH CONNEXION ESSENTIAL BEFORE CONNECTING SUPPLY



002

SEE INSTALLATION INSTRUCTIONS BEFORE CONNECTING THE SUPPLY



005

BEFORE WORKING ON THIS CIRCUIT

- ISOLATE UNINTERRUPTIBLE POWER SYSTEM (UPS)
- THEN CHECK FOR HAZARDOUS VOLTAGE BETWEEN ALL TERMINALS INCLUDING THE PROTECTIVE EARTH

RISK OF VOLTAGE BACKFEED



003

WARNING : HIGHT VOLTAGE INSIDE

WAIT 5 MINUTES BEFORE REMOVING THE PROTECTIVE COVERS



Product nameplate

socomec INNOVATIVE Power Solutions

CORPORATE HQ CONTACT: SOCOMECSAS, 14 RUE DE WESTHOUSE 87200 BENEDEUX - FRANCE

TYPE: MODULYS XL
MODEL: POWER SLOT
REFERENCE: 1
S/N: 458585611000277
1910000000001
Cabinet: 1

POWER: 200 kVA / 200 kW
Temperature: 0-40°C
Rectifier input: 50/60 Hz, 380 - PE
380 - 415 VAC, 50/60 A Max
Output: 50/60 Hz, 0M - N - PE
380/400 VAC, 300/300/275 A

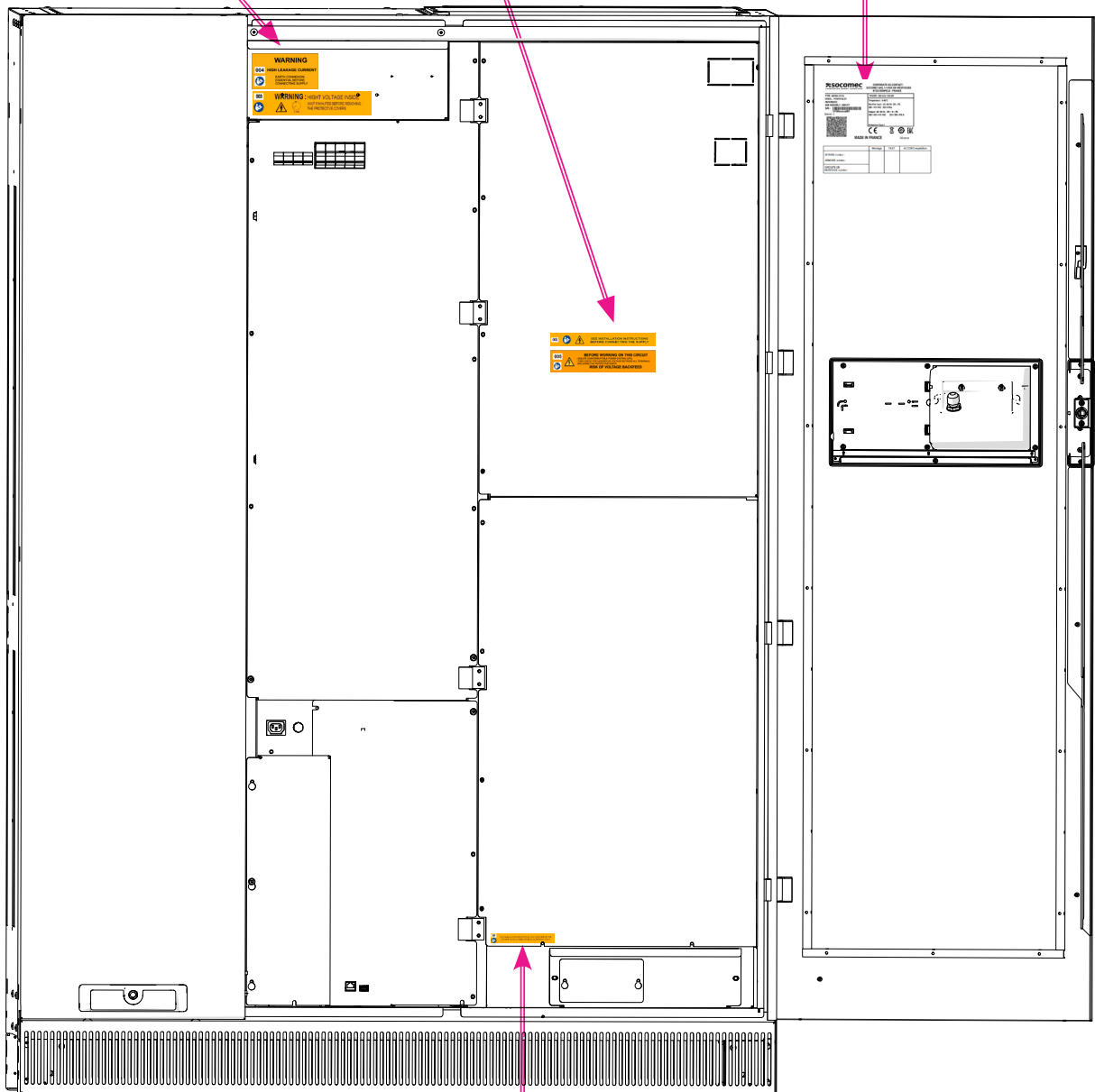
Protection Class: I

MADE IN FRANCE Alsace



Business plate

	Manage	TEST	ACCORD équipement
APPAREIL numéro:			
ARMOIRE numéro:			
GRUPPE DE MONTAGE numéro:			



001

SUITABLE FOR MOUNTING ON CONCRETE OR OTHER NON-COMBUSTIBLE SURFACE ONLY



3.3.2. Power Bricks

Product nameplate

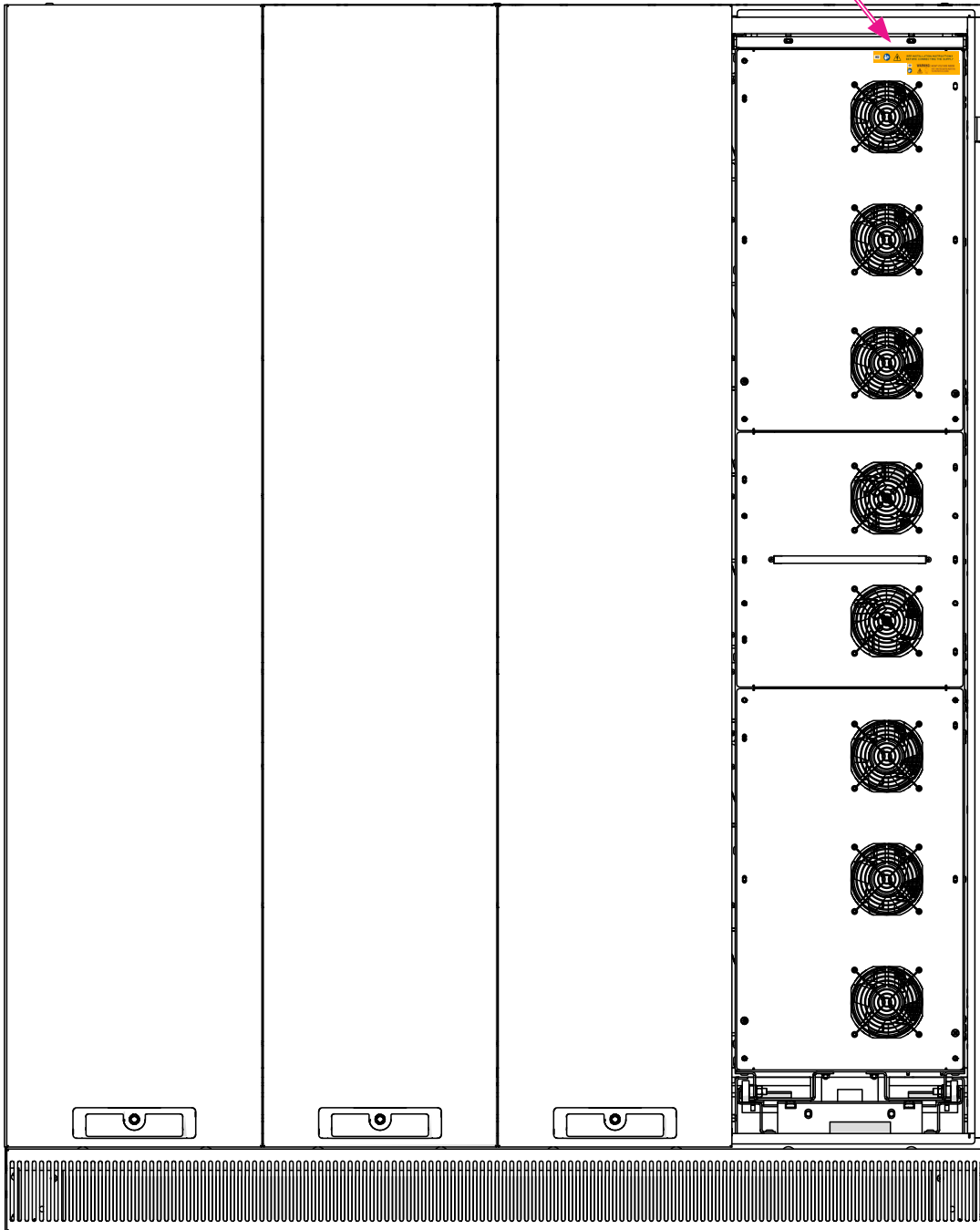
socomec INNOVATION Power Solutions		CORPORATE HQ CONTACT: SOCOMEC SAS, 14 RUE DE WESTHOUSE 67293 BENFELD - FRANCE	
TYPE: MODULYS XL	MODEL: POWER SLOT	POWER: 200 kVA / 200 kW	Temperature: 0-40°C
REFERENCE:	SUB ASSEMBLY: 5591777	380-415 VAC 320 A Max	Protection input: 50/60 Hz 3W + N + PE
SN: 19100xxxxx001	19100xxxxx001	Output: 50/60 Hz 3W + N + PE	380/400/415 VAC 35A/289/279 A
Cabinet 1		Protection Class I	
MADE IN FRANCE		CE F4C Alsace	

002   **SEE INSTALLATION INSTRUCTIONS BEFORE CONNECTING THE SUPPLY**

003    **WARNING: HIGHT VOLTAGE INSIDE**
WAIT 5 MINUTES BEFORE REMOVING THE PROTECTIVE COVERS

Business plate

	Message	TEST	ACCORD separation
AF FRAME number:			
ANNOUE number:			
CIRCUITE DE MICROUSE number:			



4. FOREWORD

4.1. General remarks

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

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

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.

4.2. 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.

5. STORAGE, TRANSPORT AND HANDLING

If the product is to be stored for more than 6 months, please contact us.

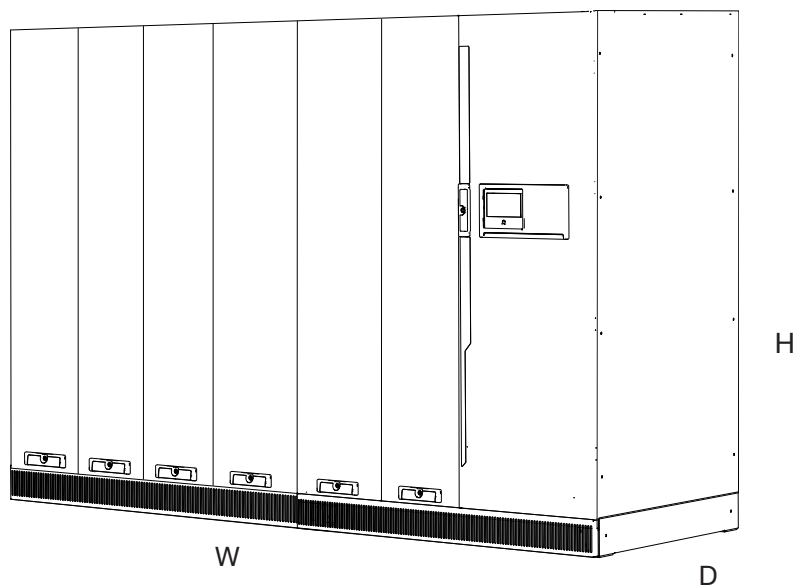
The DELPHYS XL must remain in a vertical position during all shipping and handling operations.

Ensure that the floor is strong enough to support the weight of the UPS Unit and of the battery cabinet, if used.

	Avoid moving the unit by putting pressure on the front door.
	The UPS Unit 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 should be contacted.

5.1. Dimensions and weight (total)

Dimensions (installation)					
		Unit	Hub cabinet	Bricks cabinet	Brick
Width [W]	(mm)	3003	1405	1605	/
Depth [D]	(mm)	1000	1000	1000	/
Height [H]	(mm)	2005	2005	2005	/
Weight	(kg)	3200	886 + 1x 363	496 + 4x 363	363
Single unit clearances	No rear or lateral clearance, Top = 400mm				
Access for maintenance and operation	Front only (≥ 1200 mm free space for brick extraction)				
Installation	Back to back installation / Against a wall				

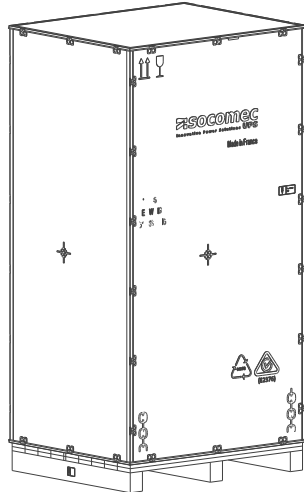


5.2. Unpacking procedure

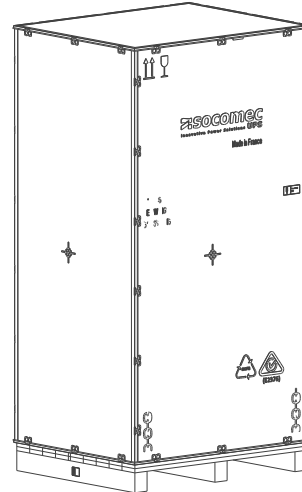
Place the various elements in the installation area.



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



Hub cabinet



Bricks cabinet



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 should be contacted.



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

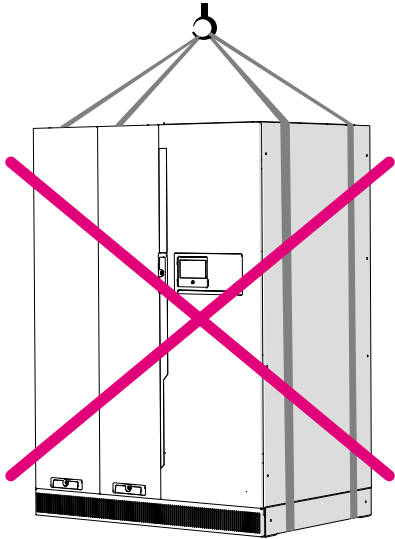


The Bricks cabinet includes four Power Brick (see §5.1 for weight).



CAUTION: Handle with care to avoid damaging the Bricks cabinet and Hub cabinet.

5.3. Handling from the top

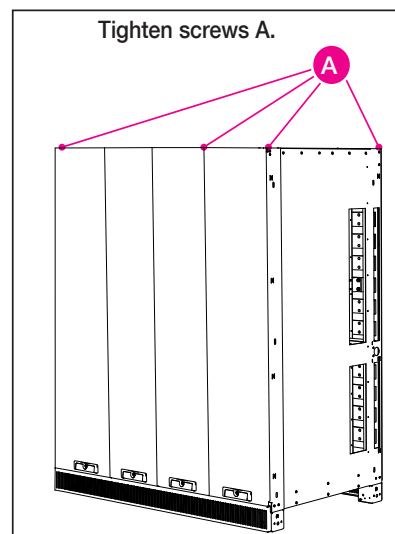
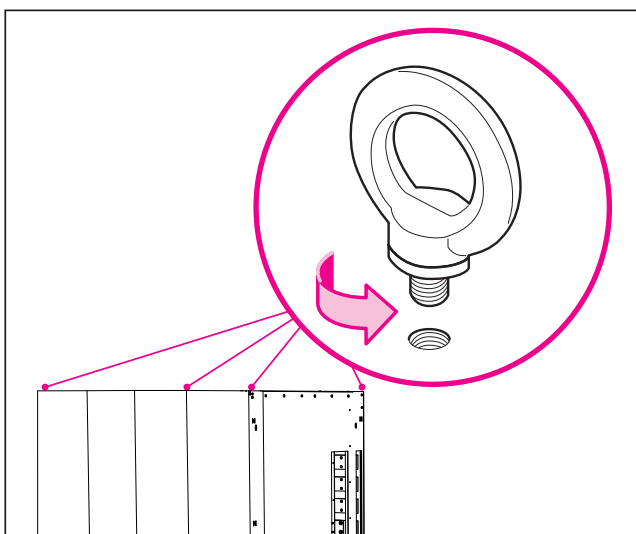
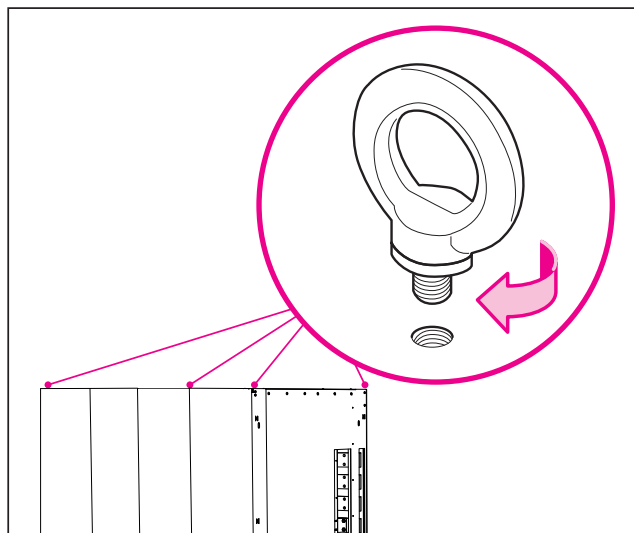
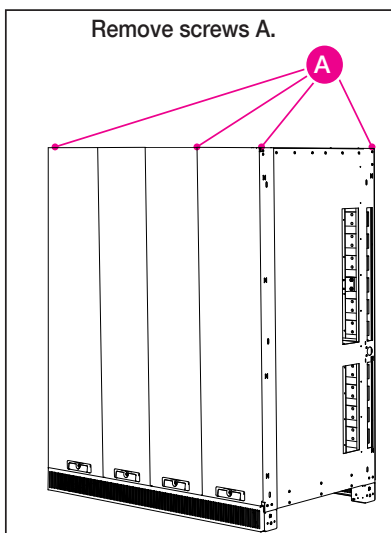


	When being moved, the cabinets must be kept in an upright position. Lift and handle the cabinets with the utmost care and without jerking.
	Never use harnesses!

5.3.1. Handling with belts

- Hoisting rings (delivered on request): inner \varnothing 30 mm, M16 thread.




	Lift and handle the cabinets with the utmost care and without jerking.
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Length of belts = 200 cm

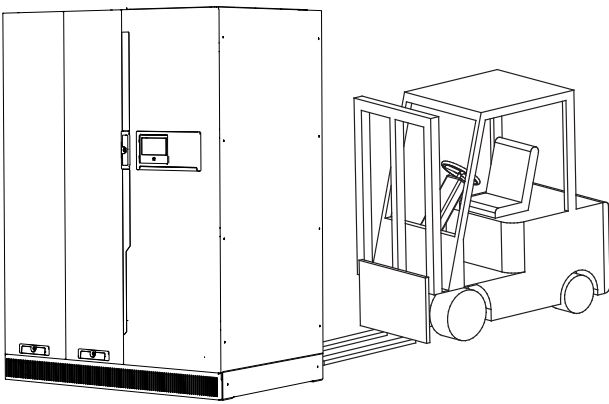
5.4. Handling from underneath

The Hub cabinet and Power Brick cabinet arrive on pallets.

	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 braking devices to ensure that the unit does not fall over.
	Take all required precautions and use appropriate means and tools.

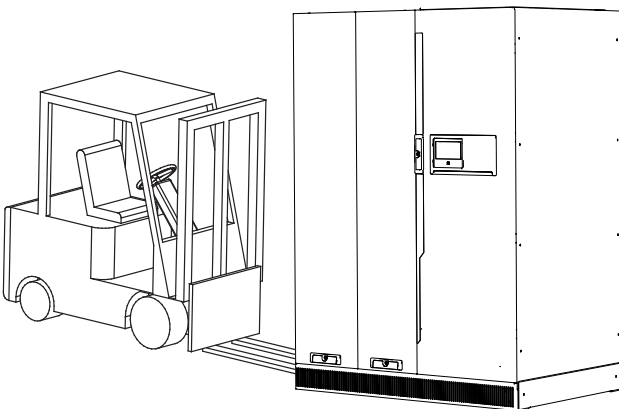
HANDLING FROM THE FRONT OR REAR


Remove the lower grids on the front and rear of the Hub cabinet or Bricks cabinet and place the forklift under the unit.



LATERAL HANDLING

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










	The fork should be at least 2 cm longer than the cabinet.
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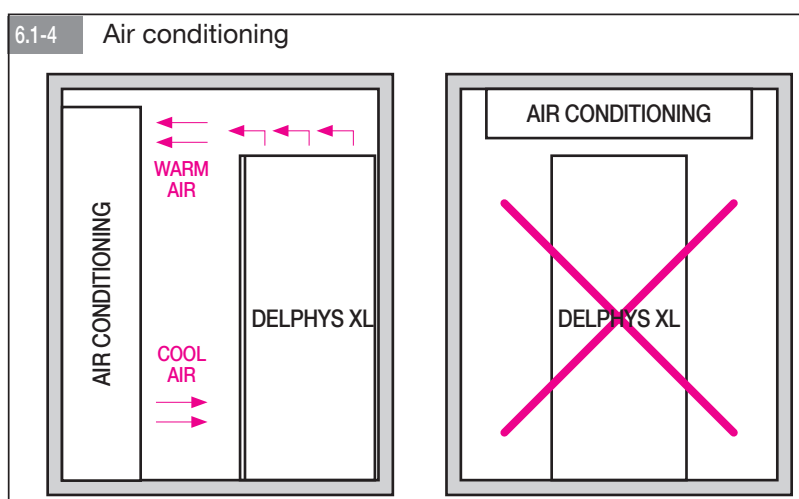
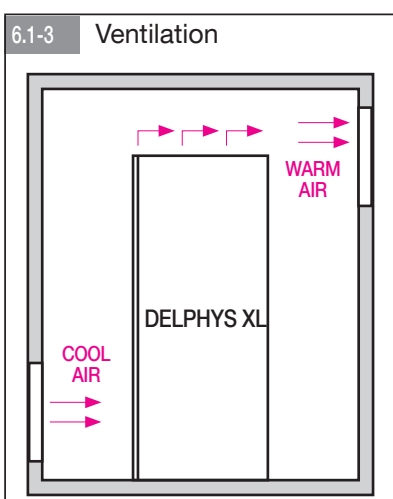
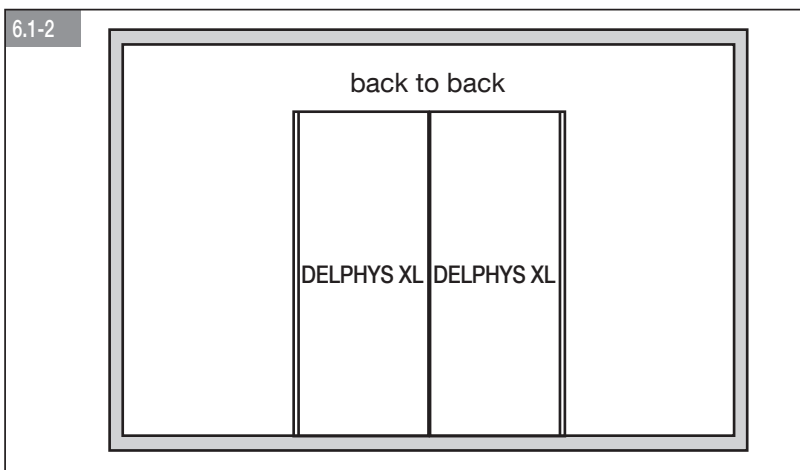
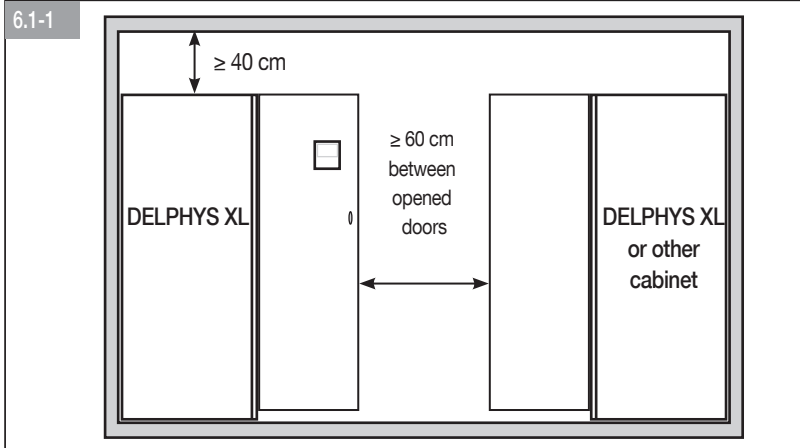
To take the Hub cabinet and the Bricks cabinet off its pallet, it must be lifted by lateral handling

6. POSITIONING

6.1. Environmental requirements

- The DELPHYS XL is not designed for outdoor use.
- Do not expose the DELPHYS XL 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 § 13). Cooling systems may be required to maintain these values.
- The DELPHYS XL 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).
- DXL has been designed for a pollution degree 2 according to the table 8 §4 .4.7.1.2 of IEC 62040-1
- Definition of pollution degree 2 : Normally, only non-conductive pollution occurs. Occasionally, however, a temporary conductivity caused by condensation is to be expected.
- Site environmental condition must be compliant with PD2 level in order to guaranty the equipment lifetime and proper operation.
- If operating in G3 environment is required, caution shall be undertaken (filtering, heat drying ...) to ensure the aforementioned pollution degree 2 conditions in the UPS technical room.
- The DELPHYS XL can be installed against a wall. The upper part of the DELPHYS XL must be positioned at least 40 cm away from the ceiling (see figure 6.1-1).
- The DELPHYS XL switches are accessed from the front; however, a space of at least 1.2 metres should be left at the front of The DELPHYS XL for maintenance purposes.
- For UPS units 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 6.1-1).
- Two DELPHYS XL can be installed back to back (see figure 6.1-2).
- Observe the direction of the ventilation flows (see figure 6.1-3) and heat dispersion flows (see figure 6.1-4). See § 6.2 for the technical specifications relating to the required ventilation values.

	Provide enough space around DELPHYS XL to be able to move the Power Brick in case of extraction.
	The DELPHYS XL should only be installed on a concrete surface or other non-combustible surface.
	In case of corrosive or industrial atmosphere environments, 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, the DELPHYS XL must be installed in a room with restricted access; entry into this restricted access room should only be possible for authorized qualified personnel.
	For optimum ventilation, the side panels must remain in place.
	For fixing on the floor, see § 14.2.



6.2. Heat dissipation and ventilation characteristics

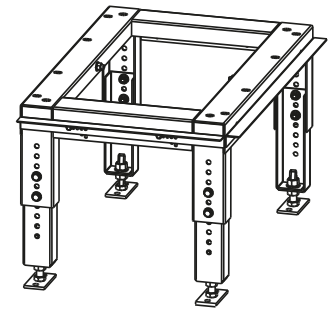
UNIT rated power (kVA)		1200
Maximum air flow	(m ³ /h)	10500
Power dissipation (max) in nominal conditions	(kW)	55
	(kcal/h) x1000	47
	BTU/h x1000	188

6.3. Floor mounting

Extension feet may be required depending on the UPS Unit system and its configuration.

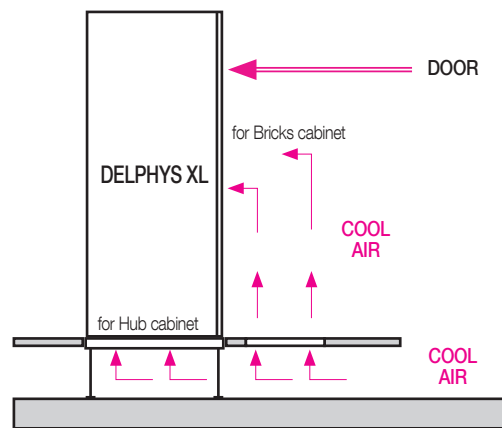
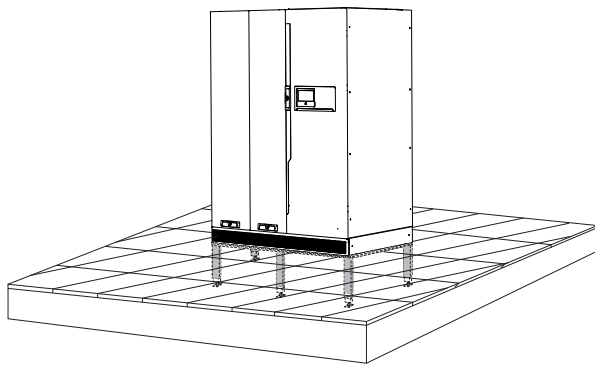
6.3.1. Installation on raised flooring

If the DELPHYS XL is to be installed on raised flooring, a Socomec adjustable frame (see figure on the right) must be used to support the weight of each cabinet (see figure below left).

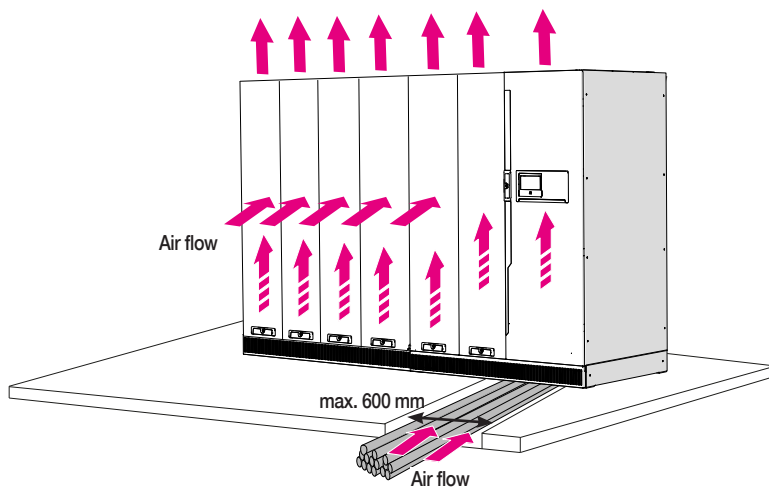


Refer to the relevant installation manual provided in the packaging for information on frame assembly operations.

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

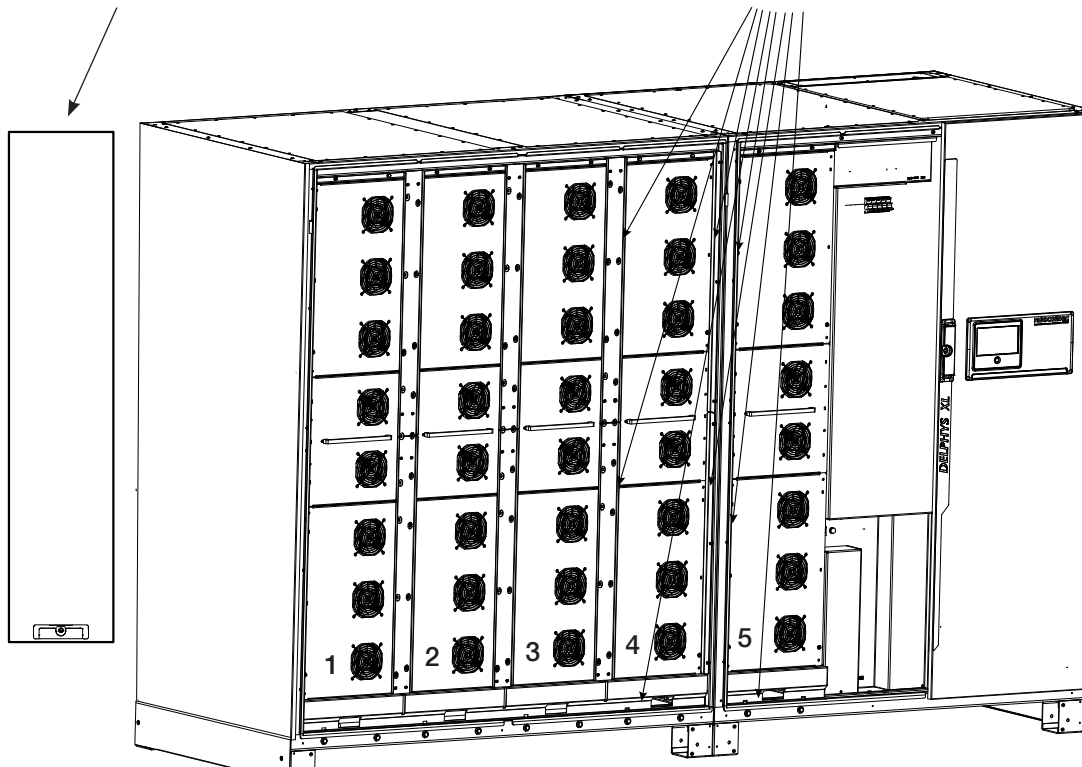


6.3.2. Installation over cable trench



7.3. Removing the front face panels

The front face panels of all Power Brick and anti air recycling parts of Power Brick 3, 4 and 5 must be removed:



There is a correspondence between a front panel and its Power Brick, therefore please, respect this correspondence:

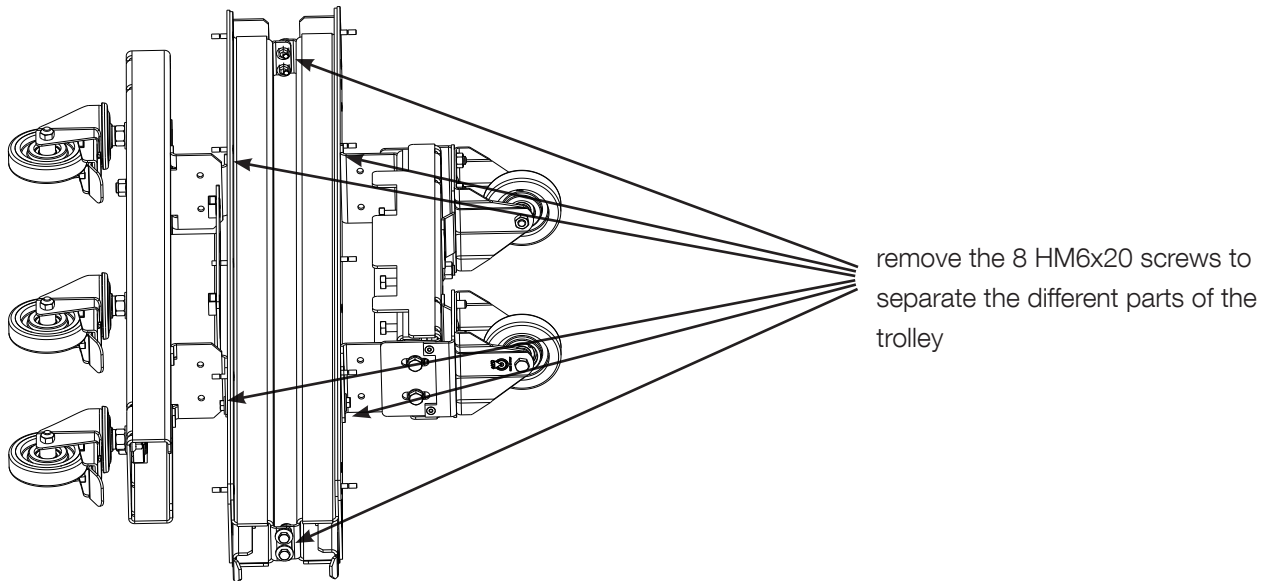
- Power Brick 1: front panel EA235993
- Power Brick 2: front panel EA236023
- Power Brick 3: front panel EA236023
- Power Brick 4: front panel EA235993
- Power Brick 5: front panel EA235993
- Hub Cabinet: front panel EA236873

7.4. Assembly of the handling trolley

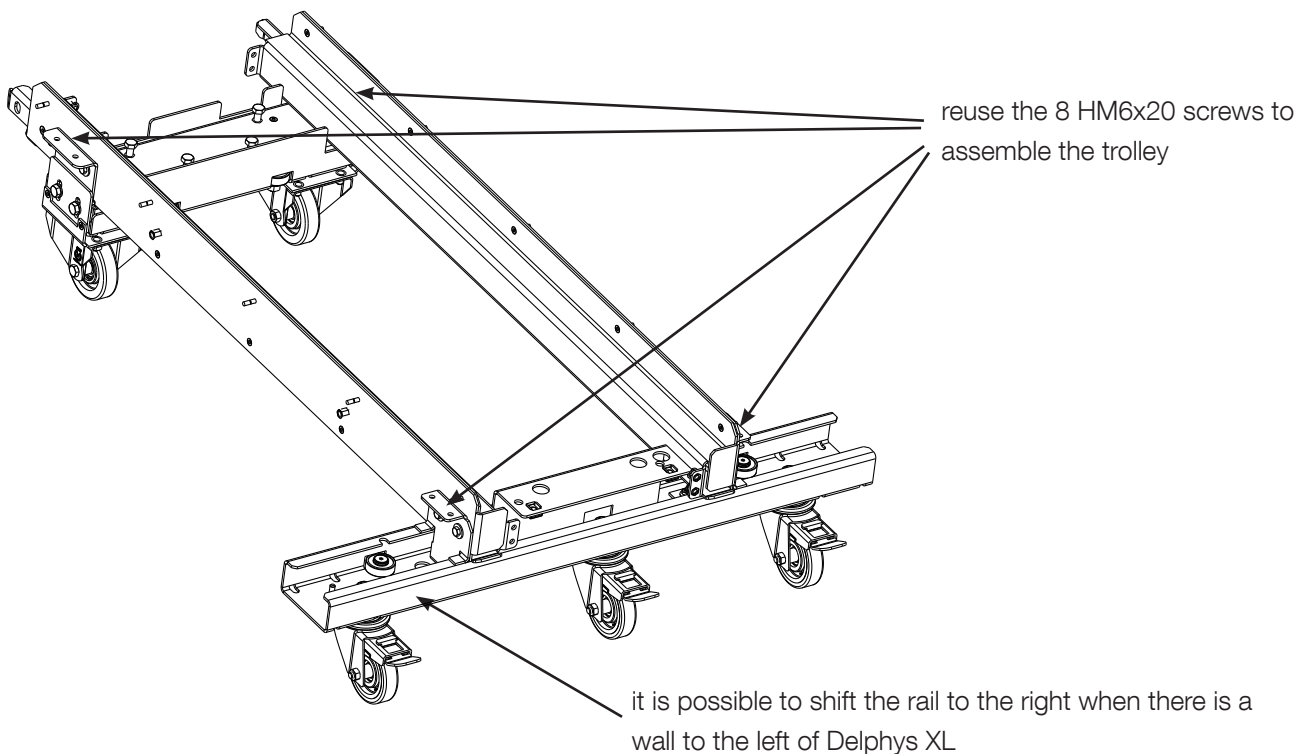


Only to be used to move a Socomec Power Brick.

A. Dismantling from its storage position:



B. Montage:



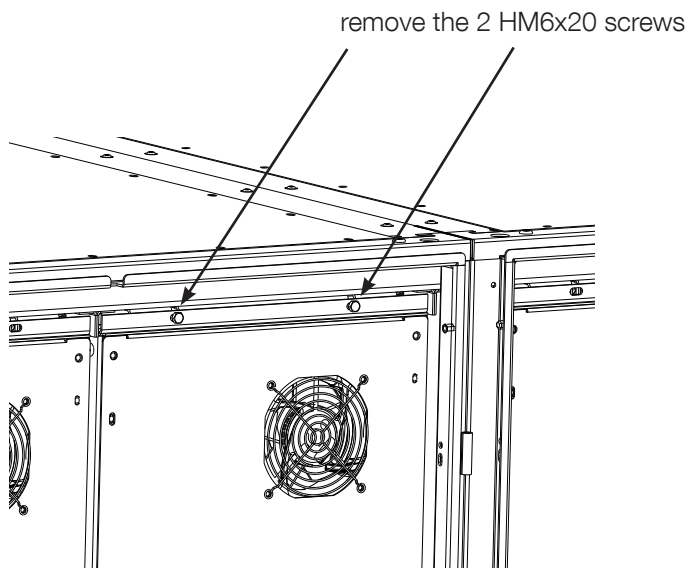
Do not store in traffic aisles

Do not use on a slope of more than 10°

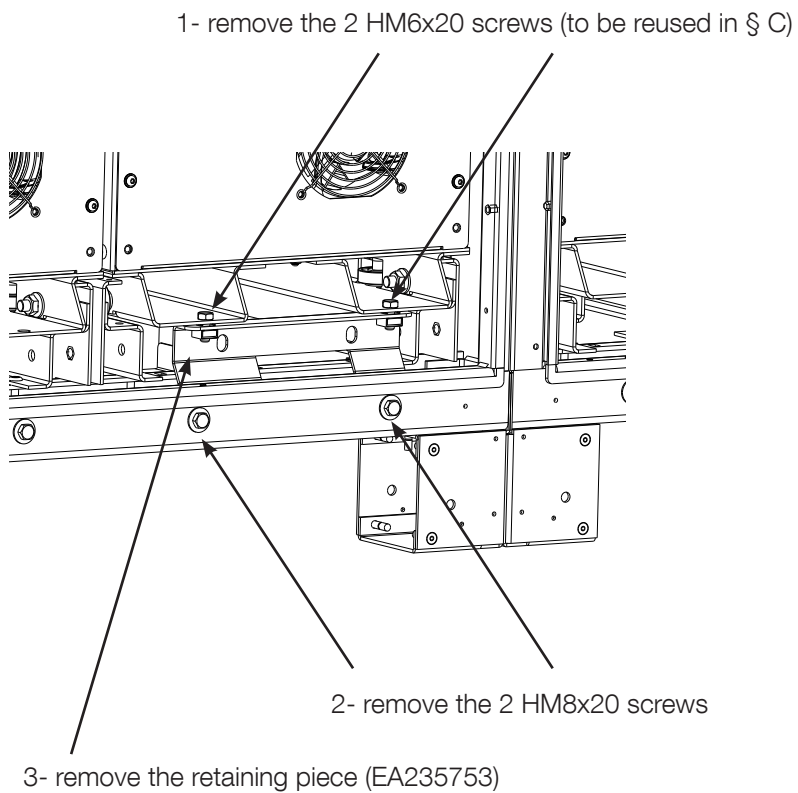
7.5. Extraction of Power Brick n°4

A. Unlock the right Power Brick (n°4) from the Bricks Cabinet:

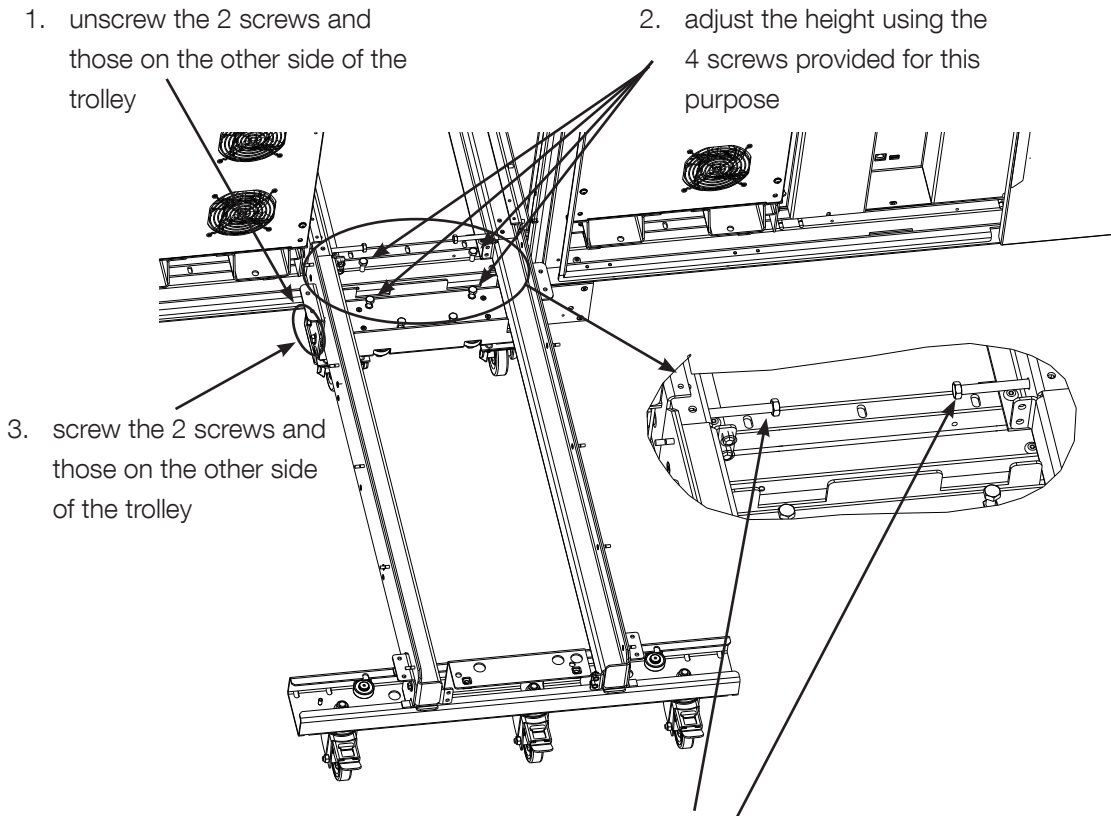
Upper part



Lower part

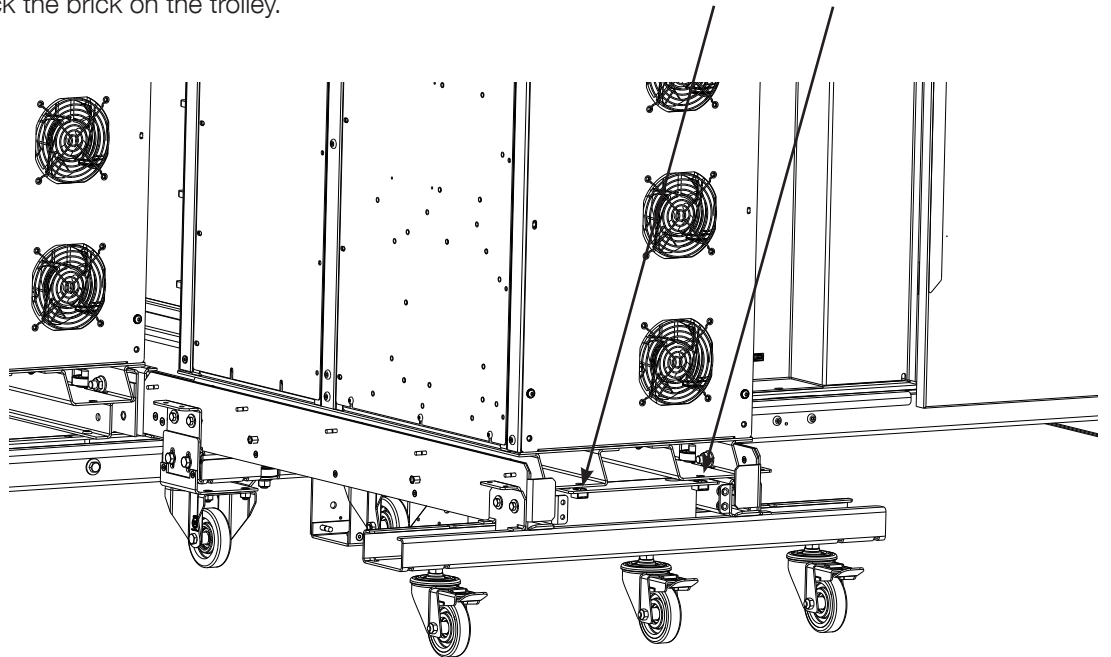


B. Setting up, height adjustment:



C. Locking the trolley in front of Power Brick n°4 by using 2 HM8x80 screws

D. Extract the Power Brick on the trolley as far as the front stop of the trolley and install the 2 HM8X20 screws (from § A) to lock the brick on the trolley.

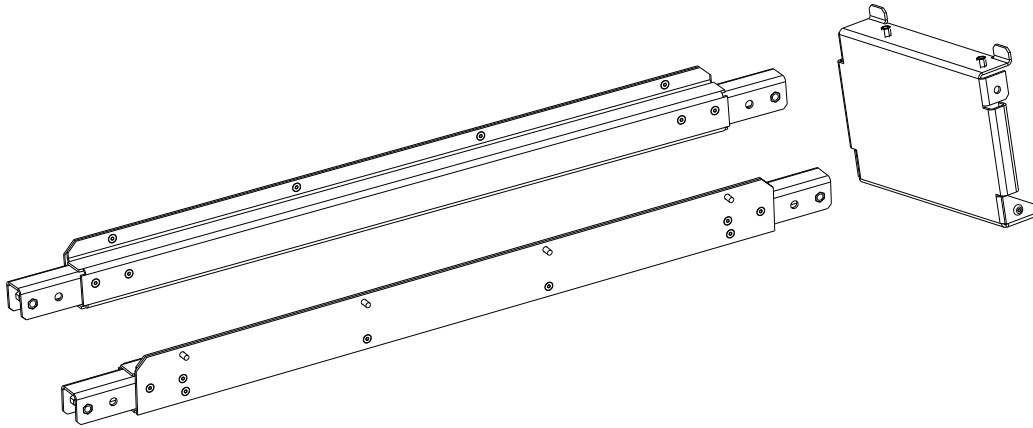


E. Remove the 2 HM6X80 locking screws installed in B.

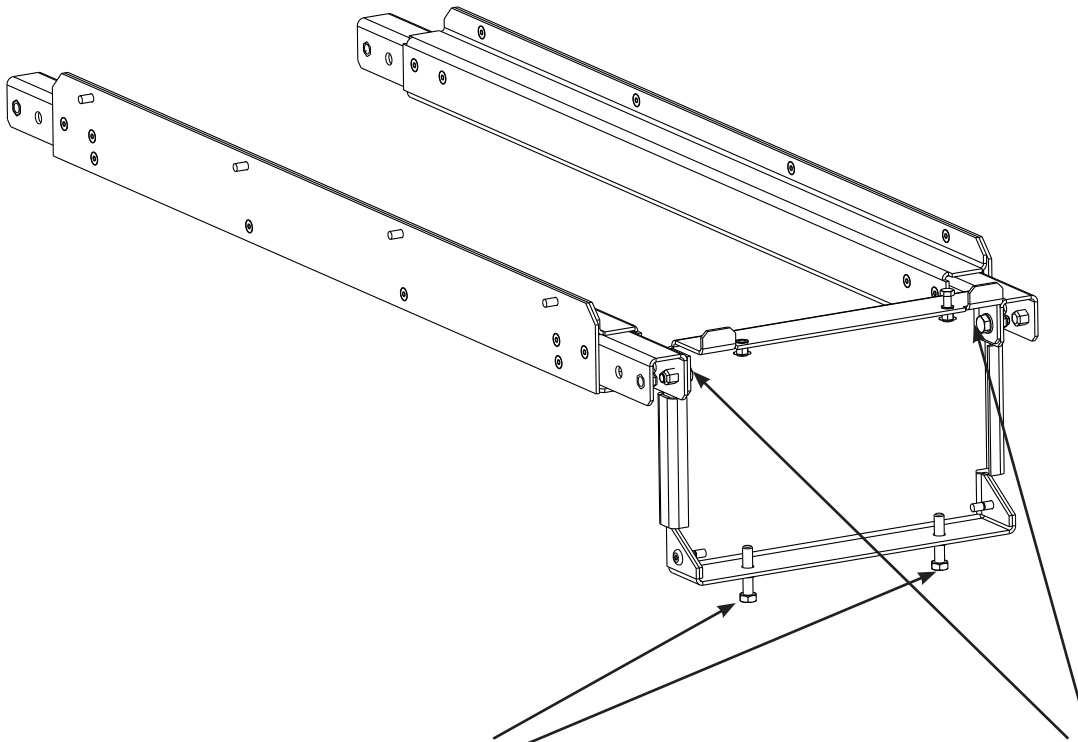
F. Unlock and move the trolley with the Power Brick on it.

7.6. Assembly of the maintenance rails

The maintenance rails comprise of two side members and a foot:



Assembly of the maintenance rails:



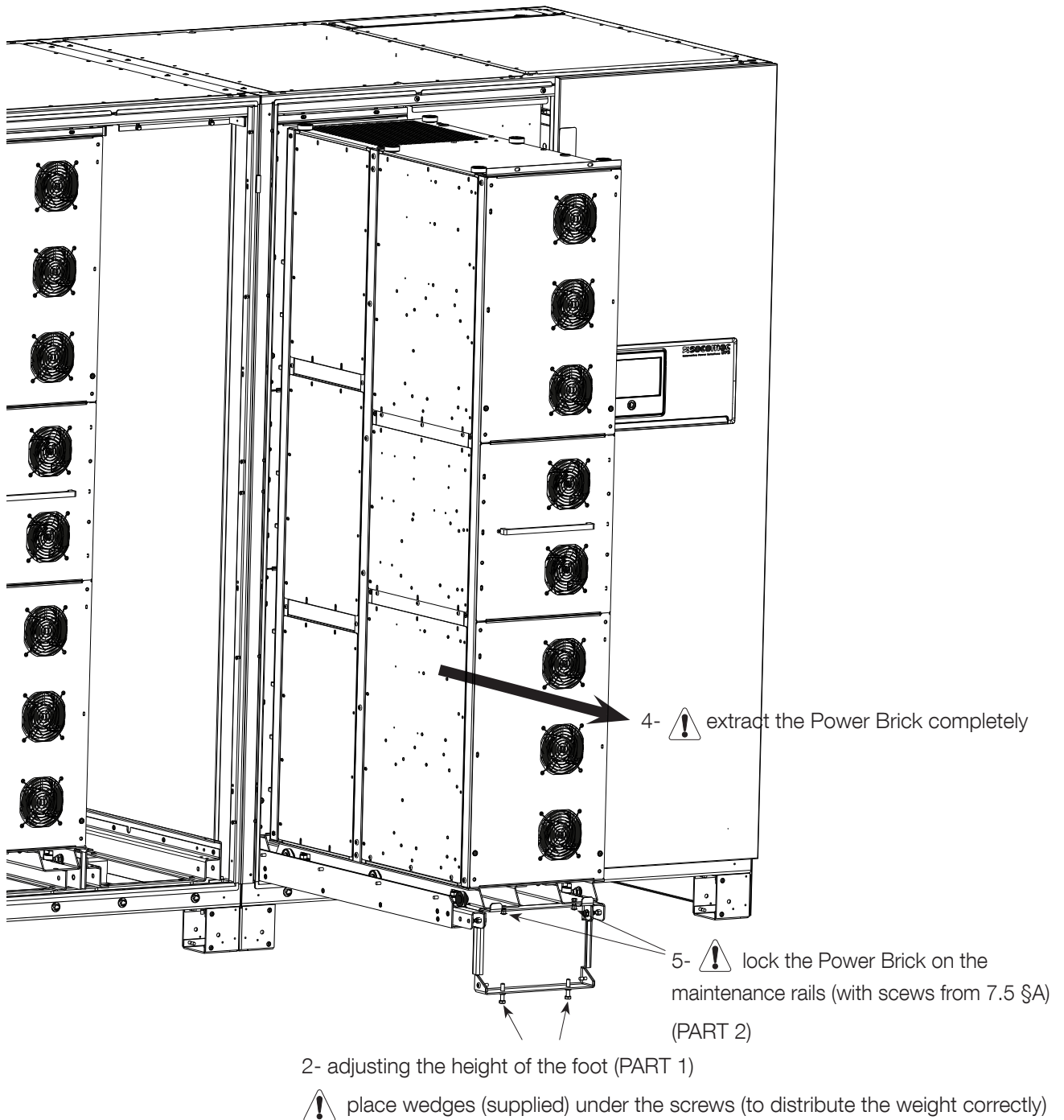
2 HM8x40 screws for adjusting the height of the foot

2 HM8x20 assembly screws from the kit

PART 1

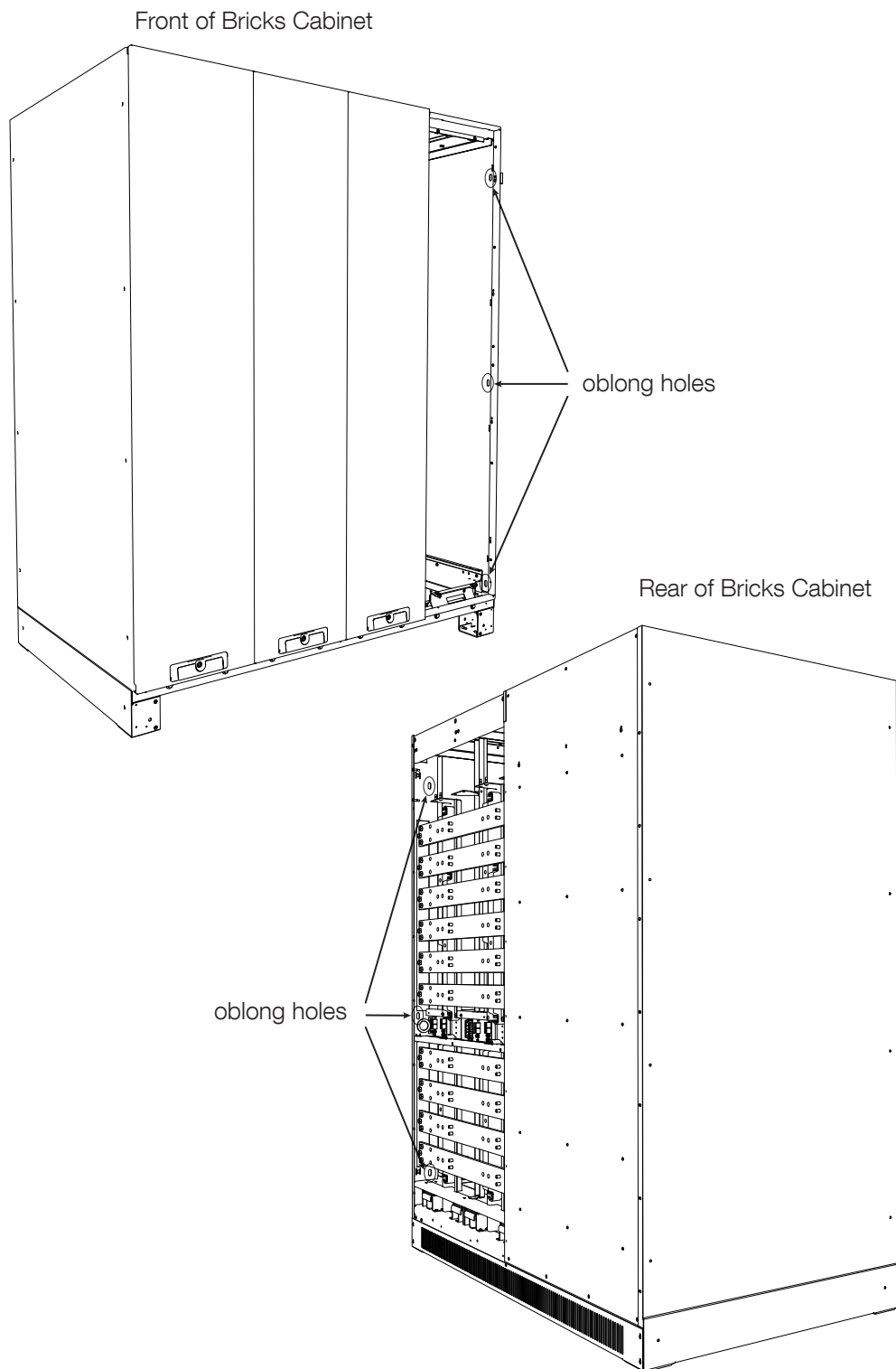
7.7. Extraction of Power Brick n°5

1. Unlock Power Brick n°5 from the HUB cabinet: see 7.5. step A.
2. Position and adapt the height (PART 1 below) of the maintenance rails in front of Power Brick n°5.
3. ⚠ Lock it on the Hub cabinet: see 7.5. step B.
4. Extract the Power Brick to take it out completely in order to have access to the connection pads.
5. ⚠ Lock it on the maintenance rail (PART 2 below).



7.8. Mechanical assembly of the 2 cabinets

in order to fix the 2 cabinets against each other, pass the 3 Tensilock screw and nut (M10x25) through the 3 oblong holes present in the uprights of the cabinets at the front of the cabinet and repeat the operation to fix the rear.



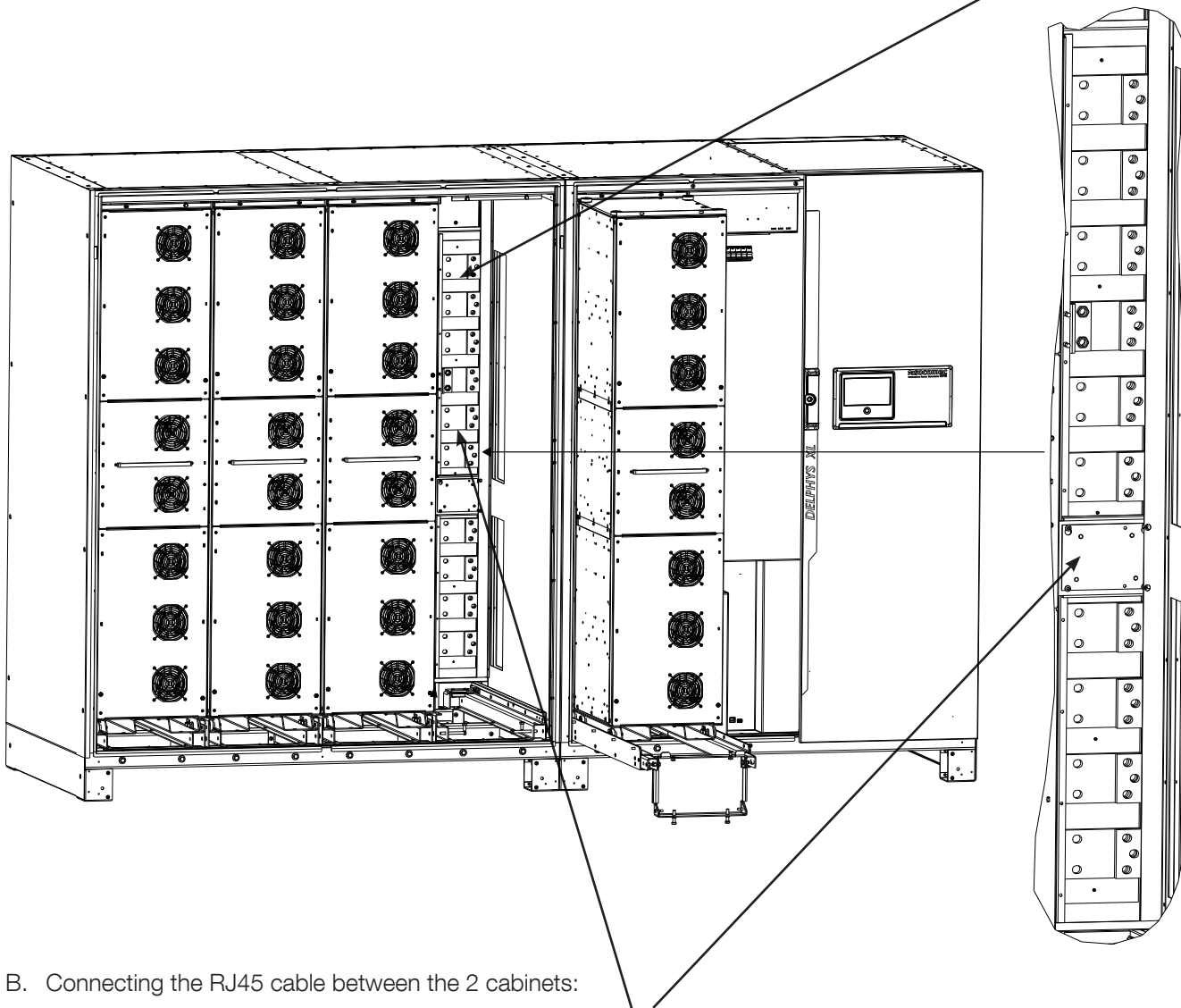
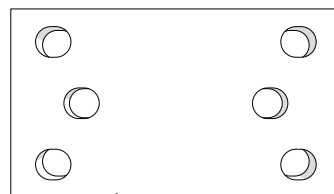
 these operations are to be carried out from the front

7.9. Interconnection of the two cabinets

A. Installation of the 10x EA239183 connection pads using 6 HM12x35 screws.



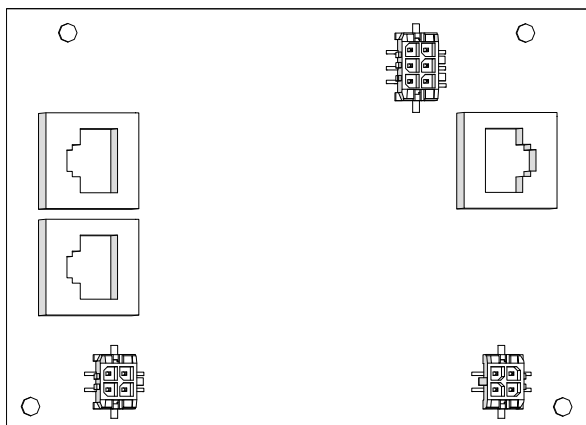
Check that all the screws are properly tightened to their torque (70NM).



B. Connecting the RJ45 cable between the 2 cabinets:

Unscrew the 4 screws at each corner of the plate shown above, rotate it in a horizontal position to have access to the RJ45 terminals.

Retrieve the RJ45 cable which is waiting in the HUB cabinet through the right opening and connect it to the card on the RJ45 terminal XC5. The other 2 RJ45 terminals are already equipped with cables.



8. ELECTRICAL PROPERTIES

8.1. 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 and the auxiliary mains. If a differential switch is installed on the mains power switch (optional), it must be inserted upstream of the distribution panel.

8.2. Backfeed protection

The DELPHYS XL 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 internally.

Warning labels must be affixed on all mains power disconnectors installed away from the DELPHYS XL area, in order to remind support personnel that the circuit is connected to a UPS Unit (see also § 3 “Safety” of this manual and paragraph 4.9.3 of standard IEC62040-1). The label is supplied with the equipment.

For the connections, see picture on the next page.

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.

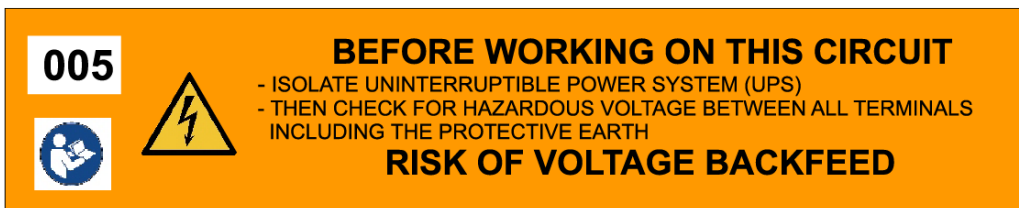
PRINCIPLE:

The backfeed protection consists of an electronic voltage detection PCB fitted (> 30 Vrms Ph/N) inside the DELPHYS XL 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 § 8.7.

LABEL (SEE § 3.3):

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

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

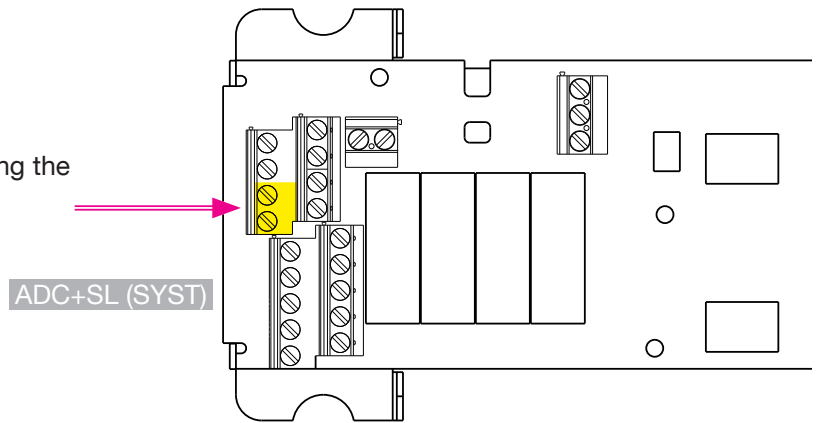


CONNECTION (ON THE ADC+SL (SYST) CARD SEE § 9.5):

IN3+ and IN3- terminals (XB4 7-8):

In: Backfeed Status

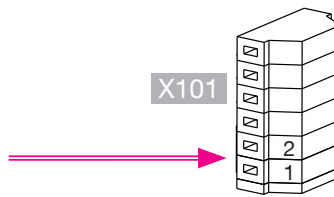
Connection of the auxiliary contact indicating the status of the power isolating device.



X101 terminals 1-2 (NO):

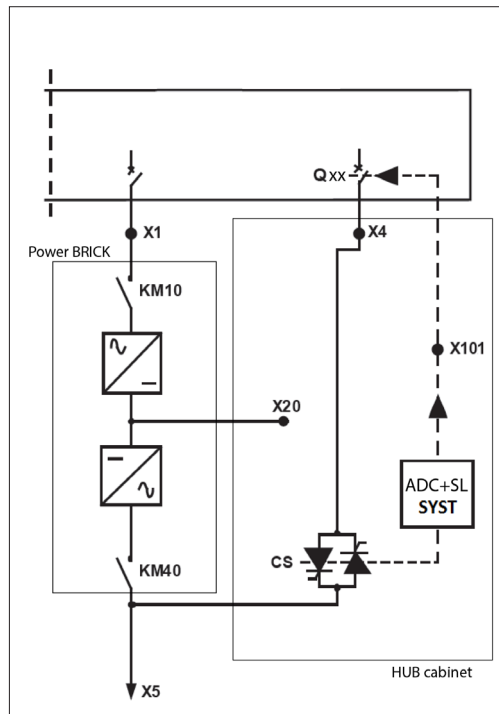
Out: Backfeed Tripping coil

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



(SEE § 9.5)

FUNCTIONAL DIAGRAM



Qxx: Customer switch of the installation used to trigger the backfeed.

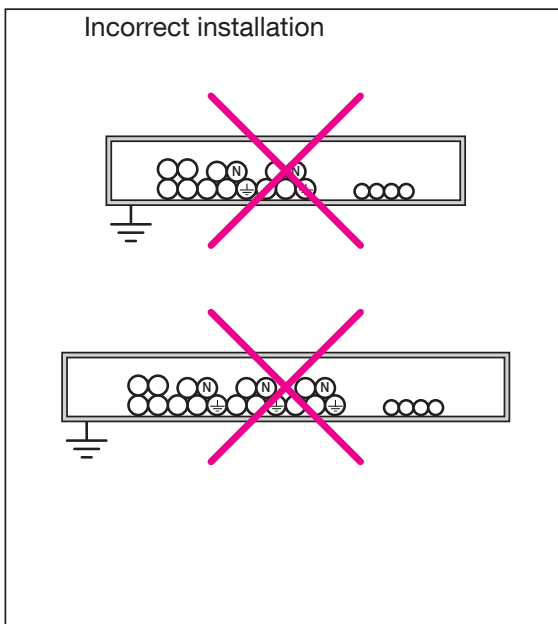
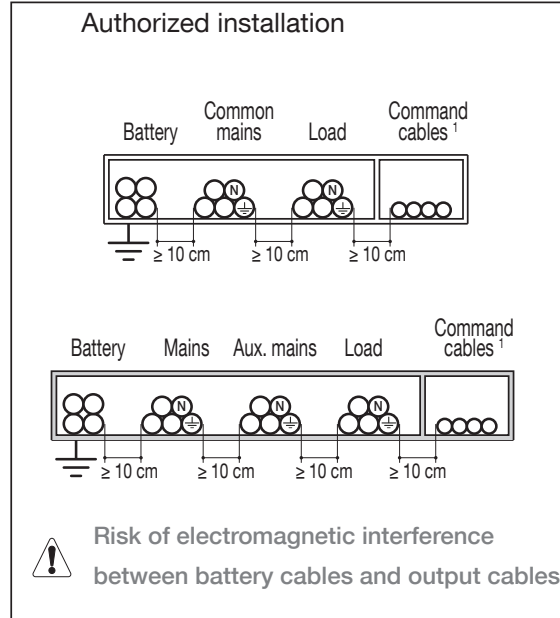
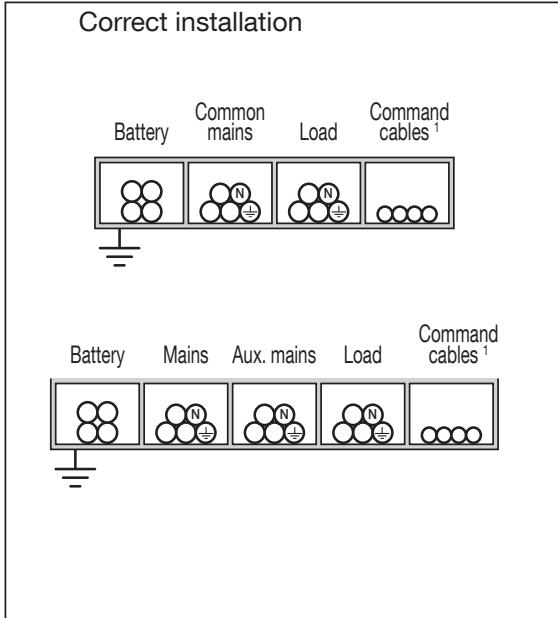
8.3. General rules for cable installation on trays



The cables must be installed on trays as indicated in the following diagrams. The trays must be positioned near the DELPHYS XL UPS Unit.



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



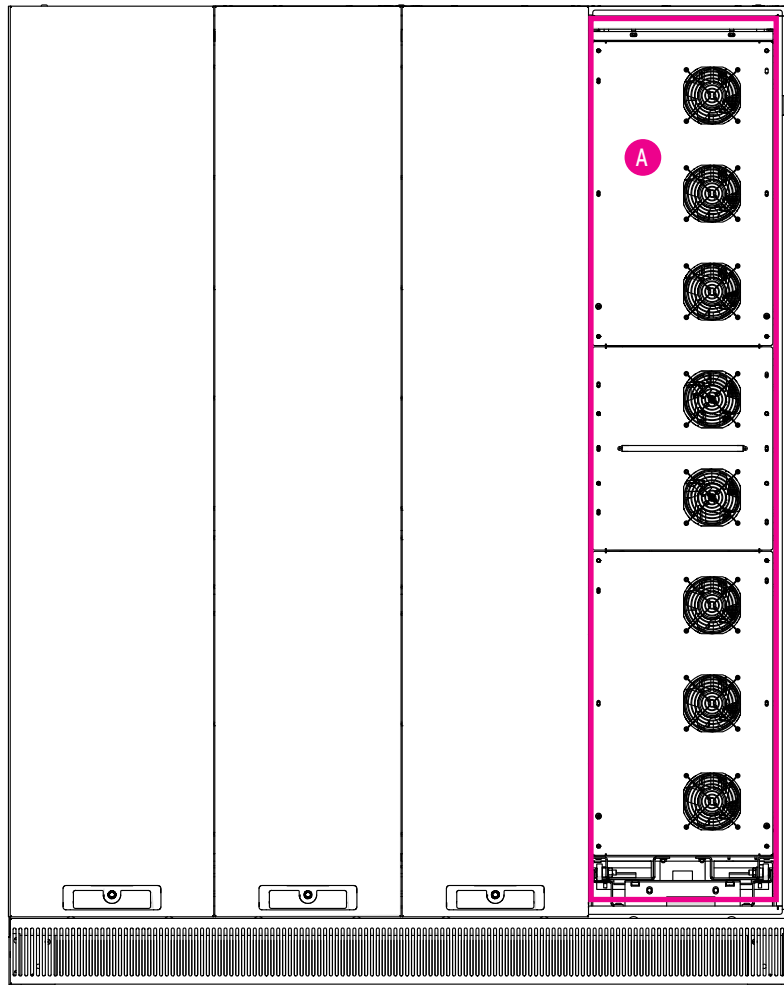
¹ Command cables: connections between the cabinets and each unit, alarm signals, connection to the BMS (Building Management System), emergency stop, connection to generator.



Do not route control and power cables close to other equipment sensitive to electromagnetic fields.

8.4. Identifying switching and connection devices

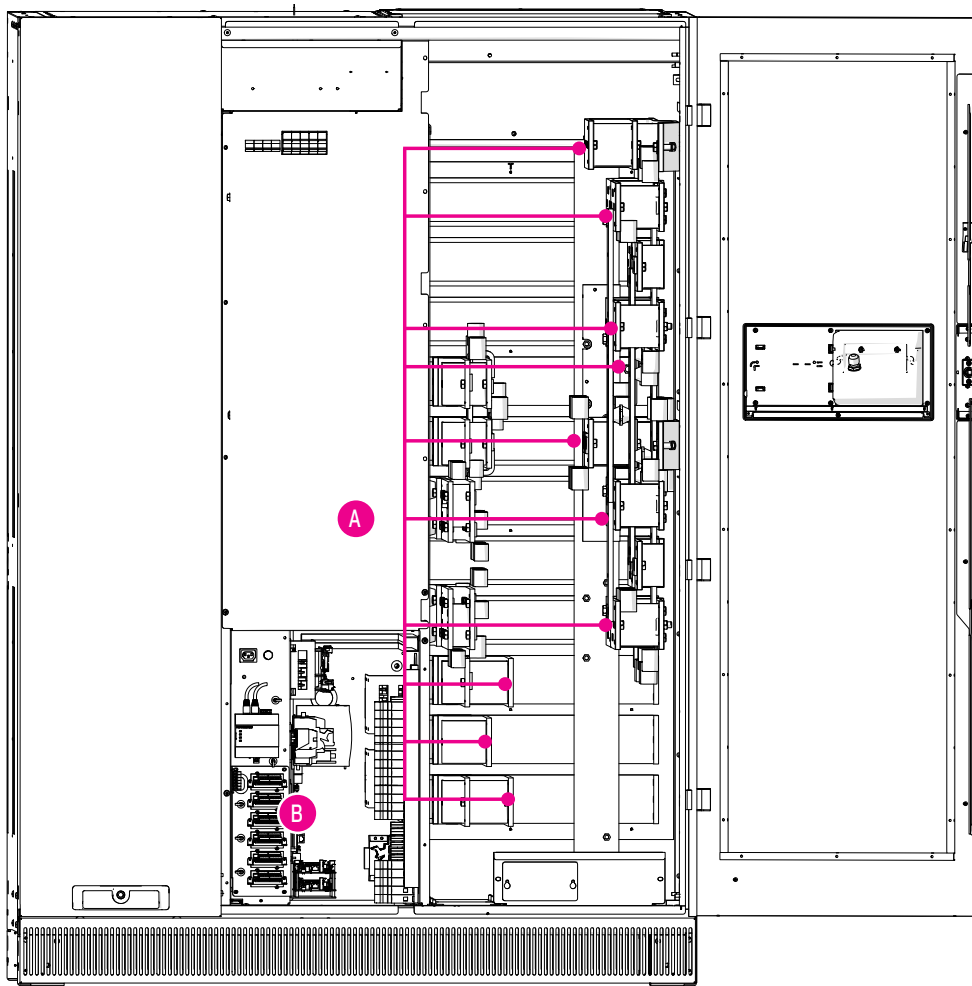
Bricks cabinet



Key:

A Power Brick

Hub cabinet



Key:

- A Power connections
- B Communication Slot (see § 9.5)

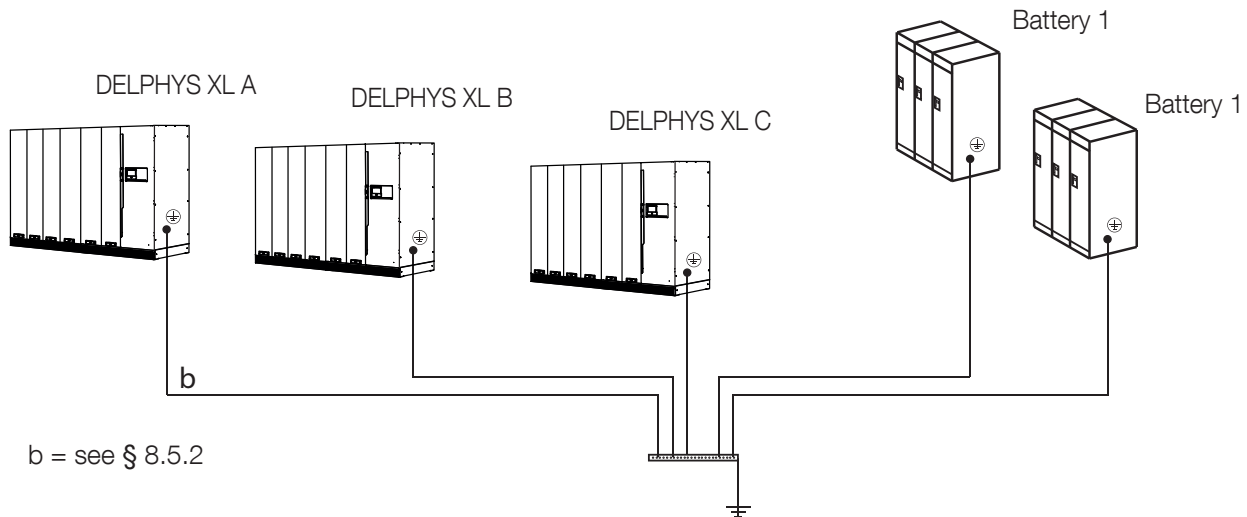
8.5. External connections

8.5.1. Connecting earth cables

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

As a consequence, it is imperative to connect earthing 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 Unit cabinet as a grounding structure.

8.5.2. Earth cable cross-section

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

8.5.3. Leakage current (rating of the earth leakage current device)

The minimum “off-delay relays” recommended is 3 A.

8.5.4. Earthing systems and UPS Unit



Only one copper bar available to connect the earth (see §14.7).

In TNC: UPS Unit output neutral must be grounded.

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

8.5.5. Neutral cable cross-section

The following must be checked:

- a) the minimum cross-section of the neutral cable must be at least equal to active poles (L1-L2-L3),
- b) the balancing of the loads across the three phases,
- c) the values that will trip the protective devices.

8.6. Values of currents for cable sizing

NOTE: these values are only indicative for standard single unit systems.

8.6.1. Input rectifier currents for DELPHYS XL

DELPHYS XL power output (kVA)	1200
Maximum rectifier input current (A)	1950

8.6.2. Mean current supplied by the battery when discharging

The mean current value has to be taken into account for sizing connecting cables between the battery and the DELPHYS XL.

Example with VRLA batteries 43 blocks 200kW

Rated power (kW)	1200
Mean current (A)	2646

For others VRLA battery configurations, please refer to the project folder or use this formula:

$$\text{Mean current}_{\text{Nbr blocs}} \text{ (A)} = 2646\text{A} \times 43 \text{ blocks} / \text{Nbr blocks}$$

For lithium batteries, please observe the battery supplier's sizing cables.

8.6.3. Bypass current (or output current to the load)

Operating conditions are as follows:

- Rated Input/output power supply voltage is 3 x 400V. For 380V or 415V, the current value must be multiplied by 1.052 and 0.964 respectively,,
- The DELPHYS XL is operating at rated power.

UPS Unit power output (kVA)	1200
Bypass current or output current (A)	1732

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

- overloads caused by non-linear loads,
- occasional overloads tolerated by the DELPHYS XL UPS Unit (i.e., 1.1 In in continuous, 1.25 In for 10 mn or 1.5 In for 1 mn).

8.7. Sizing of circuit breakers

CIRCUIT BREAKER ON RECTIFIER INPUT, BYPASS INPUT AND COMMON RECTIFIER AND BYPASS INPUT

Values are only indicative as per the following conditions:

- the rectifier and bypass input voltage is 3x400V,
- the length of cabling between the circuit breaker and the *DELPHYS XL* UPS Unit is <10 metres:

Rectifier input

DELPHYS XL power output (kVA)	1200
Circuit breaker rating (A)	2000

Bypass input

DELPHYS XL power output (kVA)	1200
Circuit breaker rating (A)	2000

Note 1: The rating of the circuit breakers must be set accordingly to the rated voltage and associated tolerances.

Note 2: Ensure that the bypass circuit breaker trigger curve takes into account the overload capacity.



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

8.8. Protection and cross-section of battery cables

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.



Please consult us in order to get an appropriated cable sizing.

Use double insulated cables 90°C

9. CONNECTION

9.1. Installation procedures and instructions

Before carrying out work on the terminal board or on UPS Unit internal parts, ensure that the DELPHYS XL is switched off, disconnect 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 work on or to install/disassemble the product.
- The instructions are valid together with the operating 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, dismantling, 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 to be repaired by the user.
- Contact Socomec for any questions regarding the disposal of the product.
- For other languages please contact Socomec or your local distributor.
- Failure to follow the product instructions and this safety information may result in personal injury, electric shock, burns, death or damage to property.

9.2. Terminal connections characteristics (Hub cabinet)

	Designation	Centre-centre distance	Screws	Max number of cable according the size (Others on demand)			Clamping torque
PE	PE	See §14.7 Drawing 7	M12x35 ⁽¹⁾	6 x 240 mm ² per pole	5 x 300 mm ² per pole	4 x 400 mm ² per pole	70 Nm
X1	Rectifier mains input 3PH			6 x 240 mm ² per pole	5 x 300 mm ² per pole	4 x 400 mm ² per pole	
X4	Bypass mains input 3PH+N			6 x 240 mm ² per pole	5 x 300 mm ² per pole	4 x 400 mm ² per pole	
X5	Load Output 3PH+N			6 x 240 mm ² per pole	5 x 300 mm ² per pole	4 x 400 mm ² per pole	
X2	Battery input			up to 10 x 240mm ² per pole (+/-)			



⁽¹⁾ Must be connected using M12x35 screws + contact washer supplied



Double insulated cables 90° cables should be used; please consult us for other requirements.



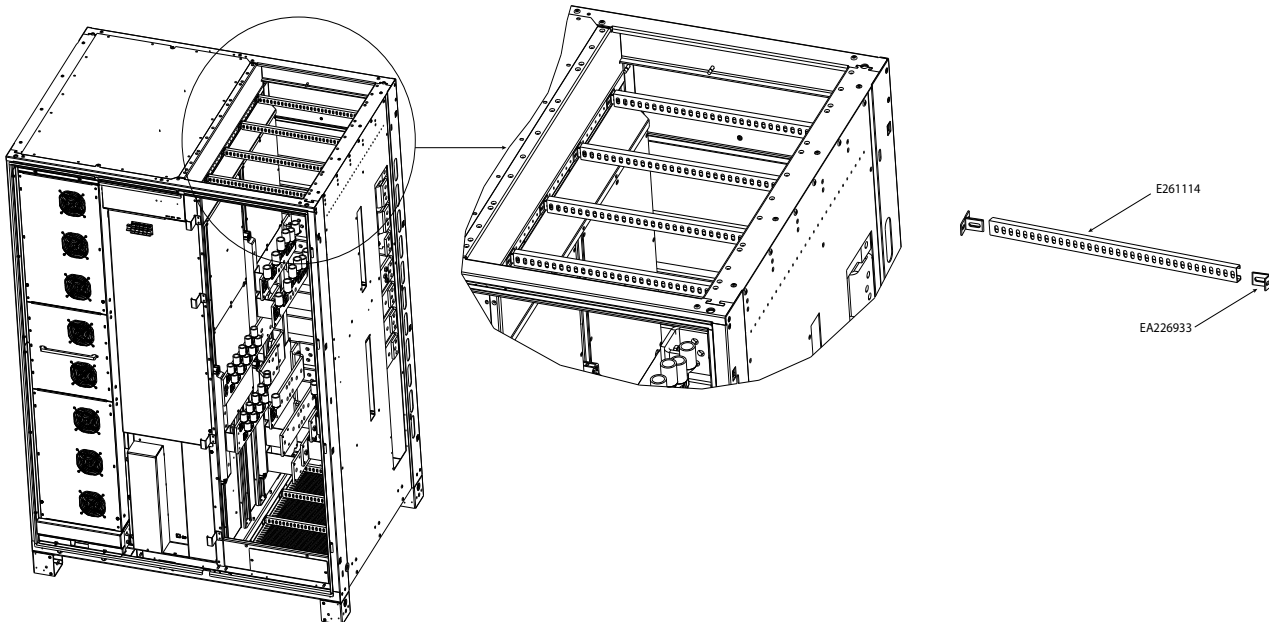
All terminal blocks are already fitted with a nut at the back.

9.3. TELEX rails

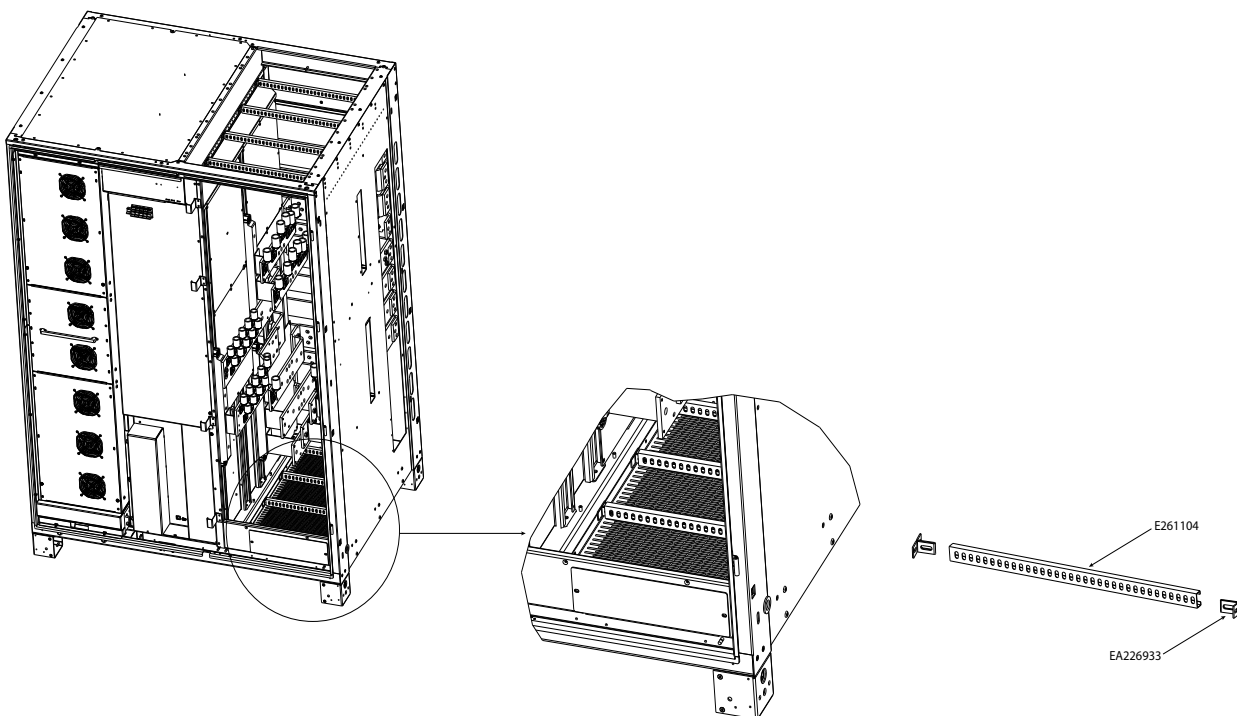
These rails are to be used to support the weight of your power cables on the route they take, so to be installed according to your configuration.

they are supplied as a kit:

- for the top: TELEX rail length 570 mm E261114 (4x) + fix TELEX rail EA226933 (x8)



- for the bottom: TELEX rail length 420 mm E261104 (x4) + fix TELEX rail EA226933 (x8)



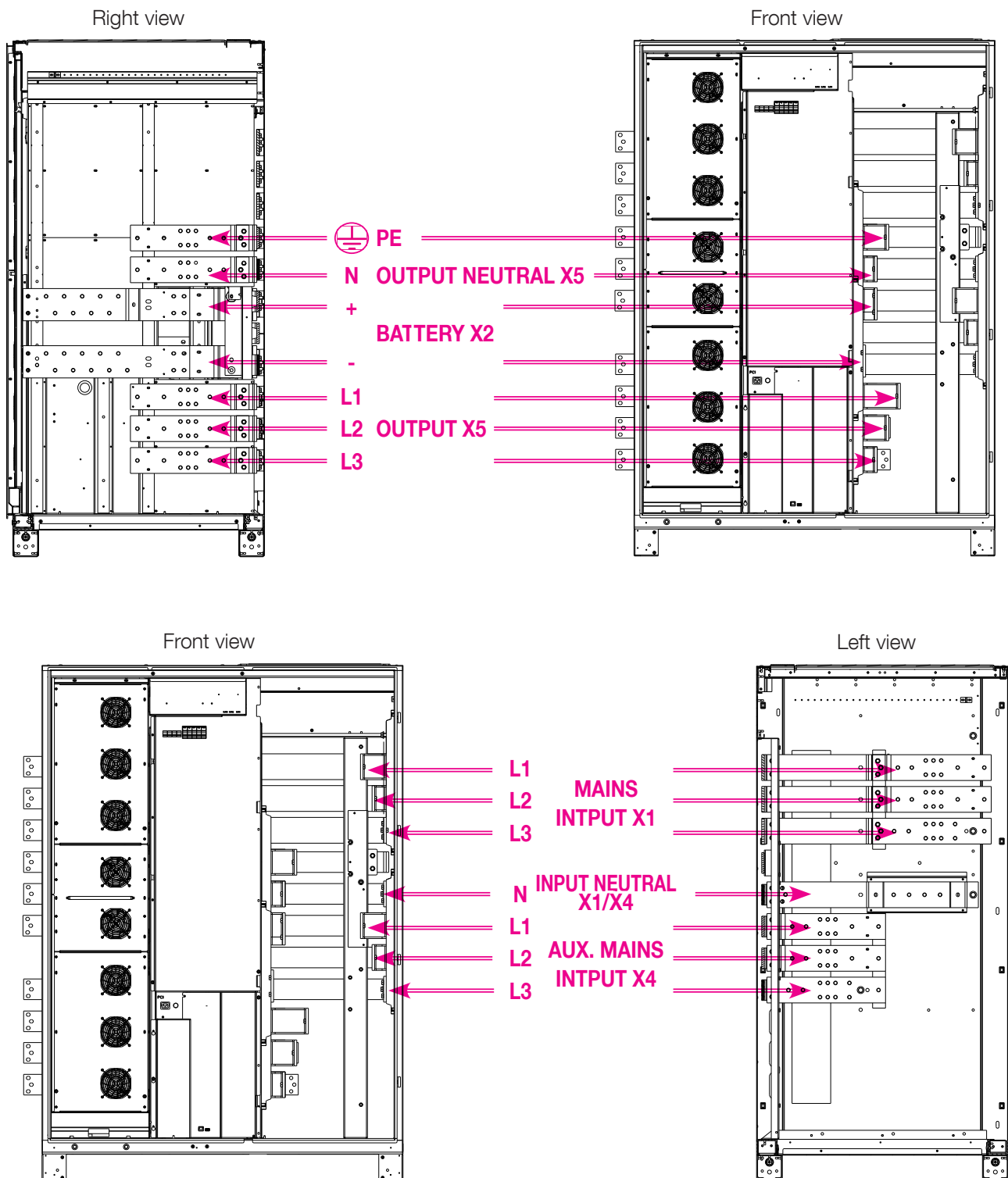
- TENSILOCK screw H M6x16 8.8 ZnB E430028 (x8)
- TENSILOCK nut M6 CL.8 ZnB E430048 (x8)
- screw ATFOR CBX M5-12 ZnB E432388 (x16)

9.4. Network power cabling in Hub cabinet

⚠ Ensure the Hub cabinet switches are “open” before starting connection.

⚠ It is recommended to start connections with the battery cables.

9.4.1. MAINS and AUX MAINS connected SEPARATELY, arrival from below



For other configuration (mains and aux. mains connected in common, arrival from the top...) see drawing § 14 Appendix.

9.4.2. Optional configurations

For options (Extended neutral R1) please consult us.

9.5. External battery cabinet connection



Before carrying out any operation, ensure that:

- the battery protections located inside the battery cabinet are open,
- The DELPHYS XL is not live and all mains or battery switches are open,
- the switches upstream of the DELPHYS XL are open.



Use double insulated cables or the cables supplied with the unit to connect the DELPHYS XL to the Battery cabinet.



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



If cabinets not supplied by the manufacturers of the DELPHYS XL are used, it is the responsibility of the installer to check the electrical compatibility and the provision of suitable protective devices between the DELPHYS XL and the battery cabinet (fuses and switches of sufficient capacity to protect the cables from the DELPHYS XL to the battery cabinet). As soon as the DELPHYS XL is switched on (before closing the battery switches) the battery parameters must be verified accordingly (voltage, capacity, number of elements, etc.) on the mimic panel menu.



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



Connection must be performed by authorized staff, who have been previously trained. Connections to be performed are :

- grounding of the 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 has started up!

AUTOMATIC TRIPPING OF BATTERY PROTECTION Q20

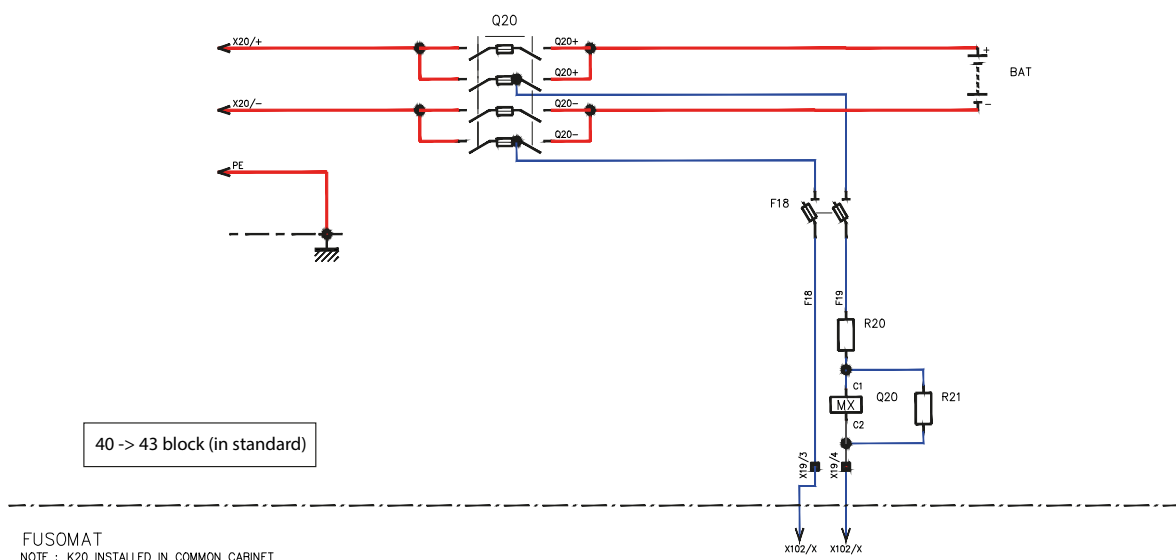
The “opening/closing” position of Q20 is not indicated. DC voltage coming from the battery is monitored.

DELPHYS XL detects the presence or absence of the battery to inform the user and manage the corresponding states / alarms. It is therefore not necessary to reassemble the position of the battery protection Q20.

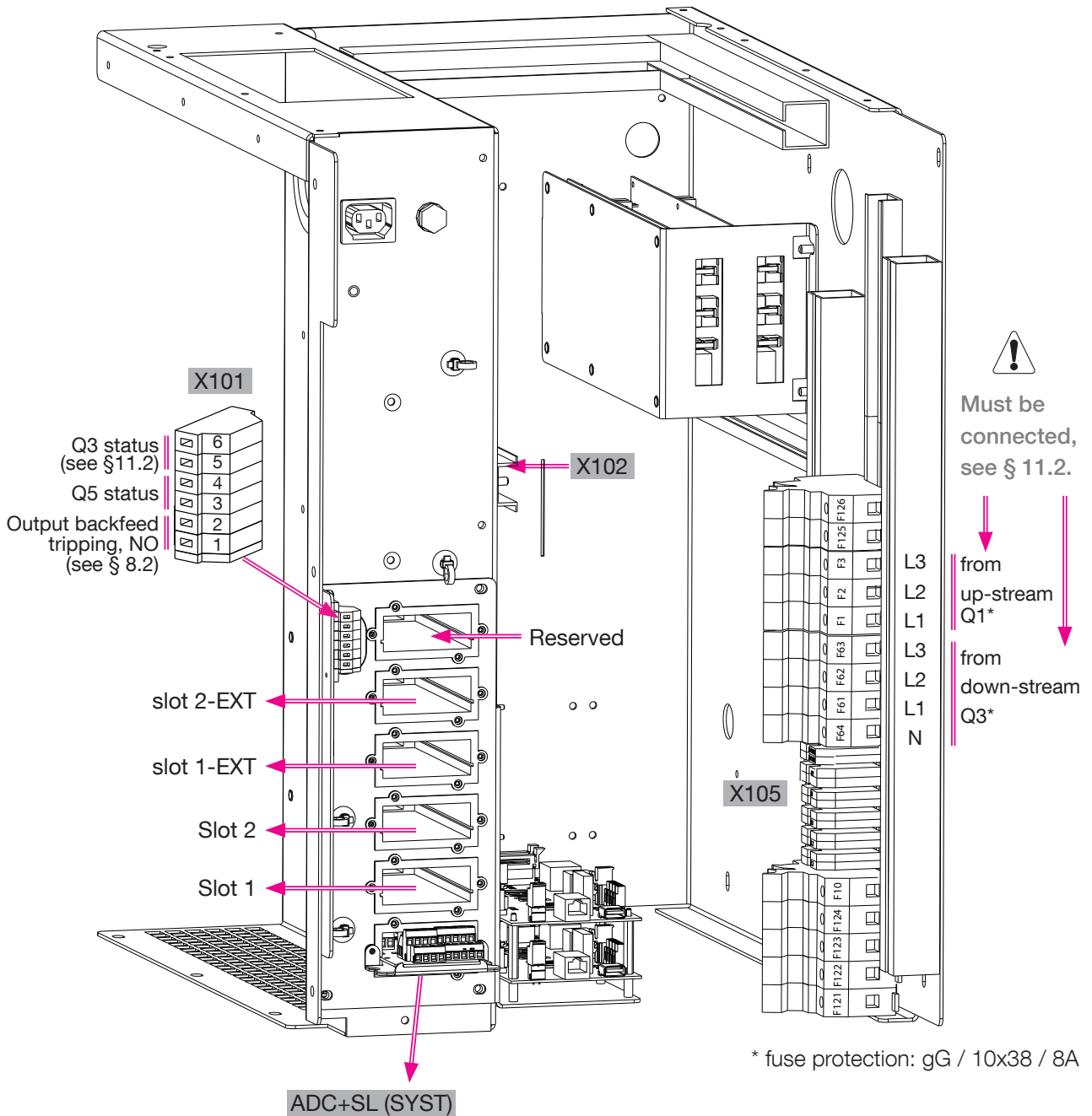
If using an MCCB, the status of the battery opening circuit is indicated on X104 (see § 9.5)

This option enables Q20 to be opened following an UPS general power OFF or a slow discharge.

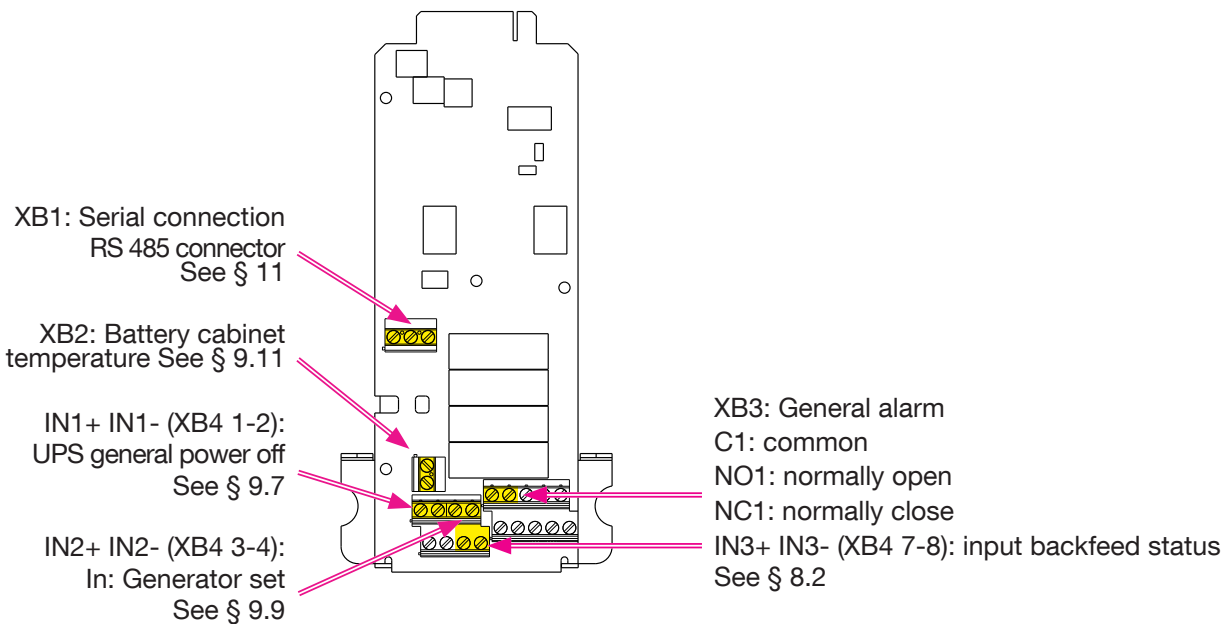
Exemple with FUSOMAT protection (see § 14 for other protections):



9.6. Terminals



ADC+SL (SYST)



9.7. Completion of the installation



Do not forget to put the protective screens back on.

9.8. External "UPS general power off" connection

A « UPS general power OFF » contact can be connected to ADC+SL (SYST) card (See §9.5).

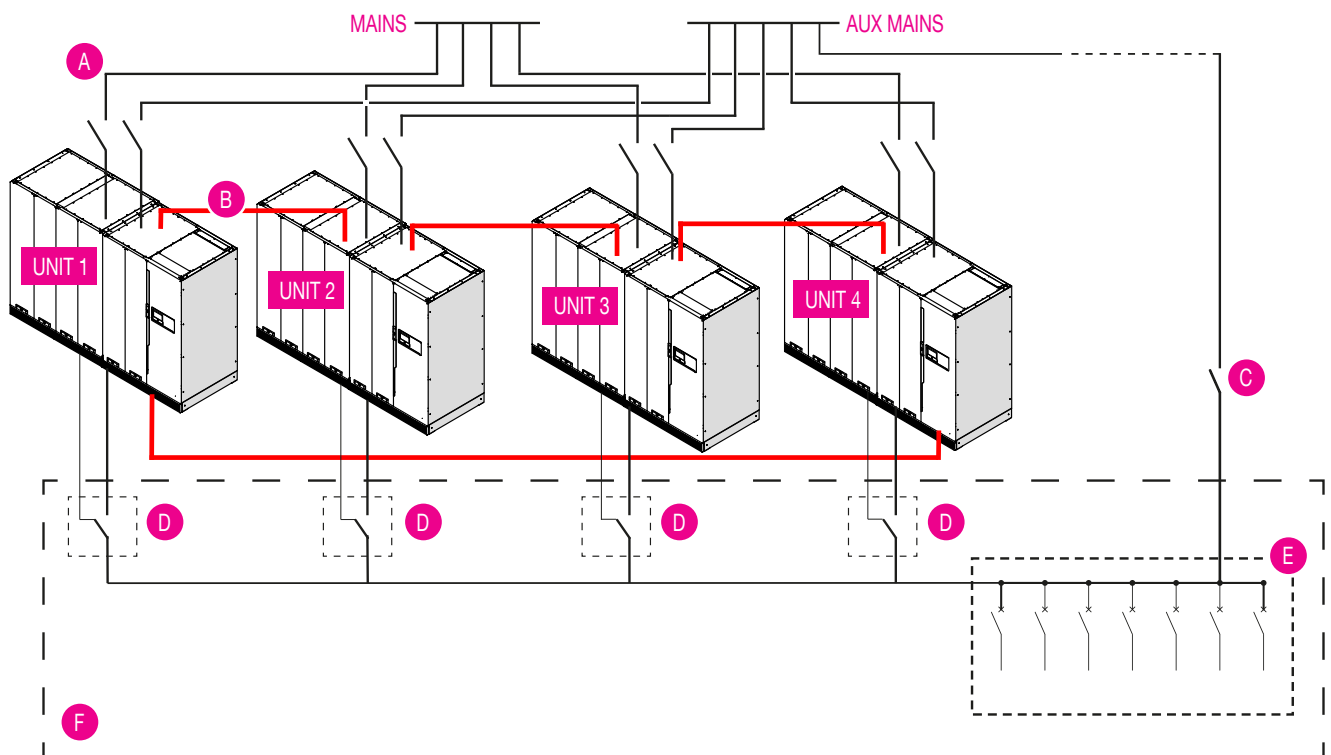
The UPS general power OFF causes:

- Load power supply cut
- Inverter, Rectifier and automatic bypass shutdown
- Disconnection of battery if the additional Mx Coil is mounted (option). Otherwise, battery remains connected

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

Connect a dry NO contact to terminals IN1+ and IN1- on ADC+SL (SYST) card of each Hub cabinet.

9.9. Parallel configuration



Key:

- | | |
|---|--------------------------|
| A Inputs protections Q1 (rectifier) Q4 (Bypass or common) | D Coupling switches (Q3) |
| B "Parallel bus" cable (RJ45) | E Distribution |
| C Maintenance bypass Q5 | F PDU |

The cross section of the input and output cables must be identical for all the units. If not possible due to the site configuration, please consult us



The impedance deviation of the length of the cables (input + output) must be a maximum of 2.5% ($Z \pm 1.25\%$ compared to the average impedance of the lines, respectively phase by phase). In this case, the load rate of the units will be between 97% and 103% - which is fully within the capacity of the UPS under normal conditions.

9.10. Gen-set contact connection

GENERATOR SET information allows the DELPHYS XL to modify its behavior when the generator set supplies the UPS Unit. The corresponding input is located on terminals IN2+ and IN2- on the ADC+SL (SYST) card (see § 9.5), When used, this feature allows the following adaption:

- Power walk-in to avoid load step on the generator (configurable ramp)
- Battery charge current limitation (configurable)
- Bypass voltage/frequency tolerances enlargement (configurable)
- Inhibition of the synchronization to the bypass line (on demand)
- Possibility to lock the transfer to the bypass line (on demand)
- Advanced genset management

9.11. Galvanic isolation transformer

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

- The protection cable marked with the ground symbol should be connected directly to the distribution panel,
- The transformer can either be connected to the DELPHYS XL input or output.



If the neutral is not connected to the bypass input, please contact us.

For details of the connections, refer to the transformer terminal board diagram available on the DELPHYS XL door.

9.12. Connecting the battery cabinet temperature probe

One sensor per unit

In standard, DELPHYS XL delivers one input to connect a battery temperature sensor

- use the specific kit available with the UPS Unit,
- fix the probe in the battery room or inside the battery cabinet,
- connect the temperature probe on XB2 on ADC+SL (SYST) card (See § 9.5); without cabling distance limits and without the need to observe polarity, by using a 2 x 1 mm² double isolation cable,

10. COMMUNICATION

10.1. Multiple communication options

The DELPHYS XL UPS Unit 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 § 11 "options" for a detailed evaluation of the functionality of the cards that can be installed in the slot).

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

POSSIBLE OPTIONS

	slot 1	slot 2	slot 1 - EXT	slot 2 - EXT
<u>ADC + Serial Link interface</u>	•	•	a	b
<u>NetVision</u>	•	•	a	b
<u>Modbus TCP</u>	•	•	a	b
<u>IoT Gateway</u>	•	•	a	b
<u>BACnet</u>	•	•	a	b
<u>External gateway for LIB</u>	•	•		

a: possible only if slot 1 is equipped with an ADC + Serial Link interface.

b: possible only if slot 2 is equipped with an ADC + Serial Link interface.

for localisation, please see § 8.4 "Identifying switching and connection devices".

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

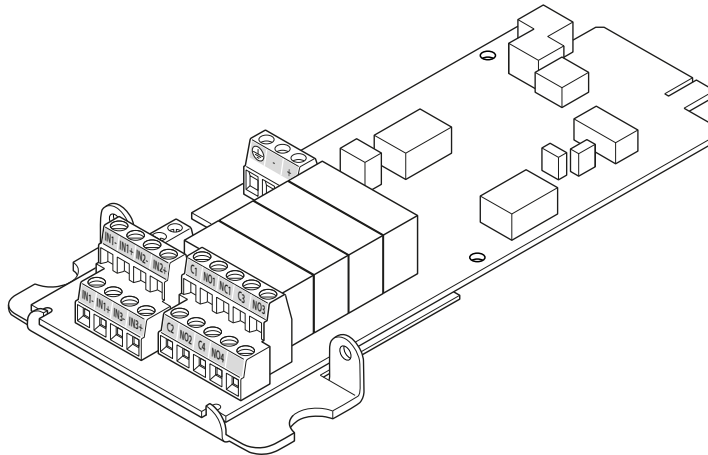
11. OPTIONS

11.1. ADC + Serial Link interface

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

- 4 relays for external device activation (can be set as normally closed or normally open),
- 3 free inputs to signal external contacts to the UPS Unit,
- 1 connector for an external temperature sensor (optional),

The board is plug&play: the UPS Unit is able to recognize its presence and configuration and manages the ADC outputs and the inputs accordingly. It is possible to create a customized operating mode using the XpertSoft tool. For more details, please see the Quick Start Guide of this card.



11.2. External switch

For the safety of the equipment, the open or closed status of the output switches (Q3 and Q5) must be connected to terminal block X101; see § 9.5.

In case no Q3 on a single DELPHYS XL installation, shunt X101 5-6 in order to simulate the auxiliary contact (similar to a Q3 always closed)

To supply voltage to certain optional features, the input voltages (to be tapped upstream of the primary network power switch Q1) and the output voltages (to be tapped downstream of the output switch Q3) must be connected to the fuse holders:

F1 to F3:

- Li-ion battery option for SAMSUNG & VISION brand only

F61 to F64:

- ACS option for a connection between SOCOMEC UPS Unit
- PROFIBUS option
- PROFINET option
- Li-ion battery option for SAMSUNG brand only
- Long distance parallel wiring

See § 9.5.

11.3. Isolation controller

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

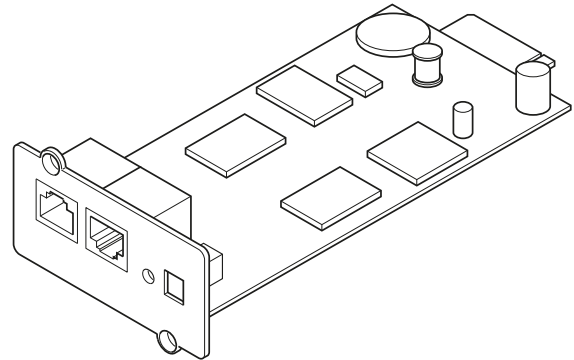
11.4. External maintenance bypass

This device will electrically exclude and isolate the DELPHYS XL UPS Unit (e.g. for maintenance operations) without interrupting the power supplied to the load (please see § 9.5).

11.5. Net Vision card

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

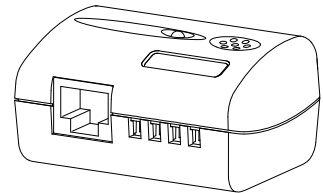
NET VISION provides a direct interface between the UPS Unit and LAN network avoiding dependence on the server and supports SMTP, SNMP, DHCP and many other protocols. It interacts via the web browser.



11.5.1. EMD

The 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 alarms via email and SNMP traps.



11.6. ACS card

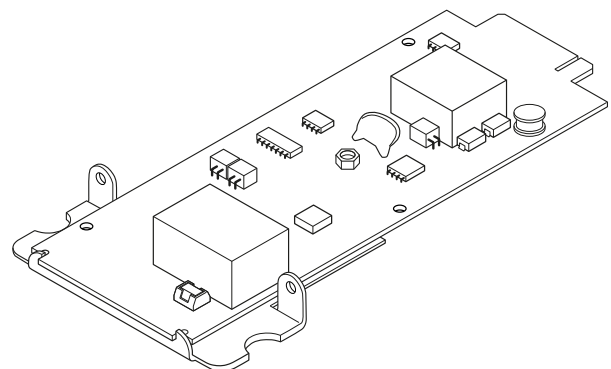
ACS (Automatic Cross Synchronisation) card is used to receive a synchronisation signal from an external source and manage it for the UPS Unit where it is installed, and provide a synchronising signal, where requested, to another UPS.

11.7. Modbus TCP card

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

11.8. BACnet card

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



12. PREVENTIVE MAINTENANCE



All operations on the equipment must be carried out solely by Socomec personnel or by authorized 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 specialized maintenance (annually), in order to keep the equipment at the maximum level of efficiency and to avoid the installation being taken out of service with possible damage/risks. In addition, attention should be paid to any preventive maintenance requests that the equipment may automatically display with an alarm/warning message.

12.1. Batteries

The state of the battery is fundamental to the operation of the UPS Unit.

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 optimize battery life expectancy and offer maximum performance.

Furthermore, during the operating life of the battery, the DELPHYS XL™ 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 authorized 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 authorized recycling and disposal centres.



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

12.2. Fans

The service life of the fans used to cool the power parts depends on the use and the environmental conditions (temperature, dust).

Preventive replacement by an authorized technician is recommended after 7 years (in normal operating conditions).



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

12.3. Capacitors

The equipment houses electrolytic capacitors (used in the rectifier and inverter section) and filtering capacitors (used in the output section), whose service life depends on use and environmental conditions.

The average expected service life of these components is shown below:




- electrolytic capacitors: 7 years,
- filtering capacitors: 7 years.

In any case the actual state of the components is checked during preventive maintenance.

12.4. Power supplies

The average expected service life of the power supplies is 10 years

13. TECHNICAL SPECIFICATIONS

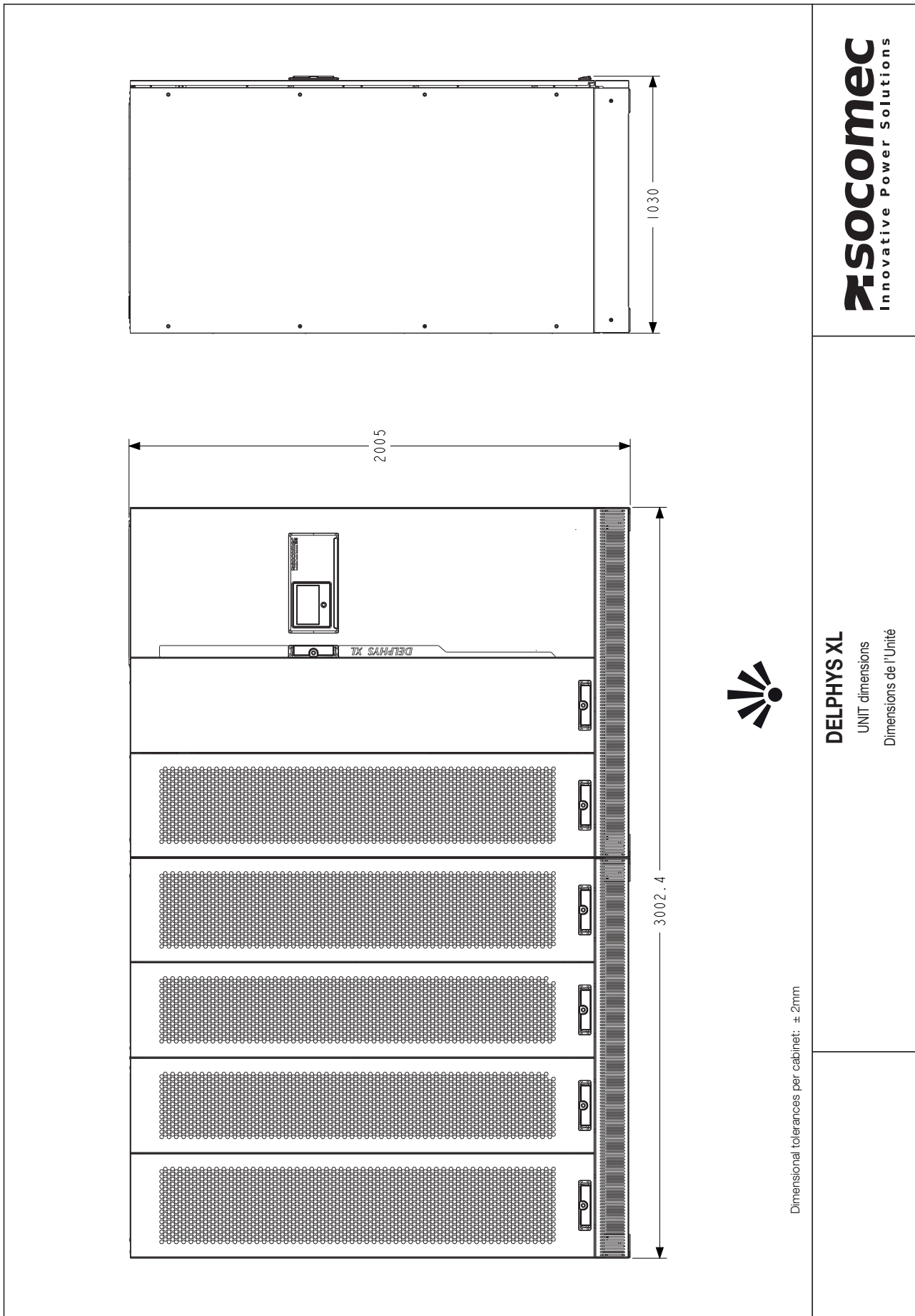
DELPHYS XL		kVA	1200
Electrical specifications - Rectifier input			
Mains voltage (power rating, Power Factor $\cos \phi = 1$)		400 V 3-ph	
Voltage tolerance ⁽¹⁾		200V to 480V	
Input frequency		45 - 65 Hz	
Input Power factor		> 0.99	
THDI (at full load and rated voltage)		< 2.5 % (with THDV input < 1 %)	
Electrical specifications - Output			
Output voltage on inverter		3 x 380/400/415 V with neutral	
Frequency		50 / 60 Hz (± 0.01 % if no mains power supply)	
Rated power at 35°C		1200 kVA / kW	
Overload ⁽²⁾ :			
• 60 minutes		1320 kW	
• 10 minutes		1500 kW	
• 1 minute		1800 kW	
Total voltage distortion		ThdU < 1 % with linear load	
Inverter short-circuit capacity		4090 A	
Electrical specifications - Bypass input			
Bypass rated voltage		Output rated voltage	
Bypass voltage tolerance		$\pm 15\%$ (Configurable)	
Input frequency		50 / 60 Hz	
Maximum overload capacity admitted		110% continuous, 125% 10 min, 150% 1 min	
Bypass short-circuit capacity		Up to 45 500 A peak	
Rated short-time withstand current I _{scw}		65 kA (100 kA optional)	
Environment			
UPS storage conditions		-20 to 70 °C under $\leq 70\%$ condensation free RH	
UPS start-up and working conditions		0 to 40 °C under $\leq 95\%$ condensation free RH	
Max. altitude		1000 m	
Acoustic noise		< 83 dBA	
Airflow	m ³ / h	10500	
Heat dissipation (max) in worst conditions	W	62500	
	BTU/h	213125	
Standards			
Appliance classes		Protective Class I (IEC 62477-1)	
Safety		IEC 62040-1	
EMC		IEC 62040-2	
Product certification		  	
Protection degree		IP20 (others on request)	

⁽¹⁾ Conditions apply – consult us

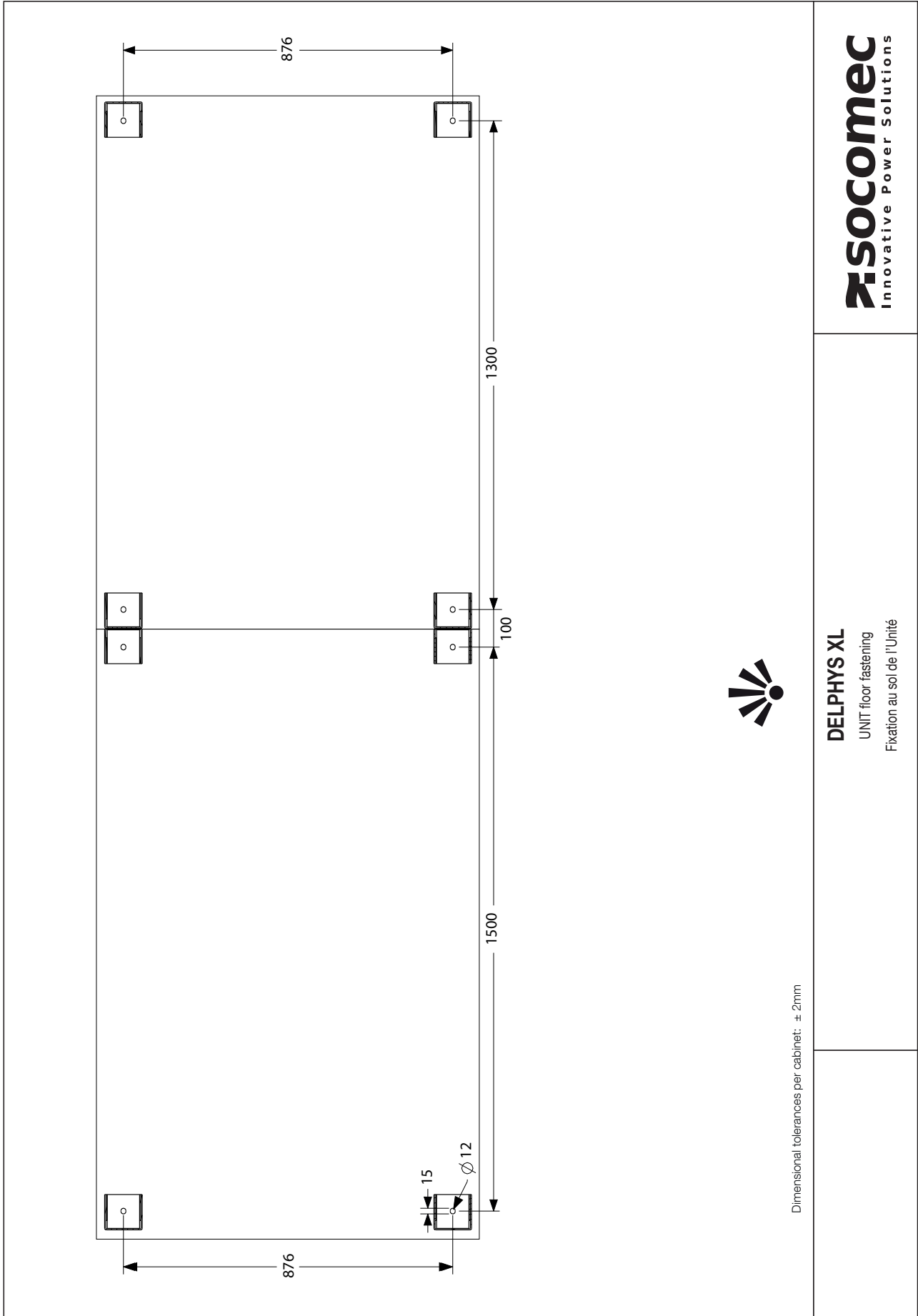
⁽²⁾ These levels of performance are given for information purposes at nominal load (resistive)

14. APPENDIX

14.1. Drawing 1: DELPHYS XL Unit dimensions



14.2. Drawing 2: DELPHYS XL Unit floor fastening



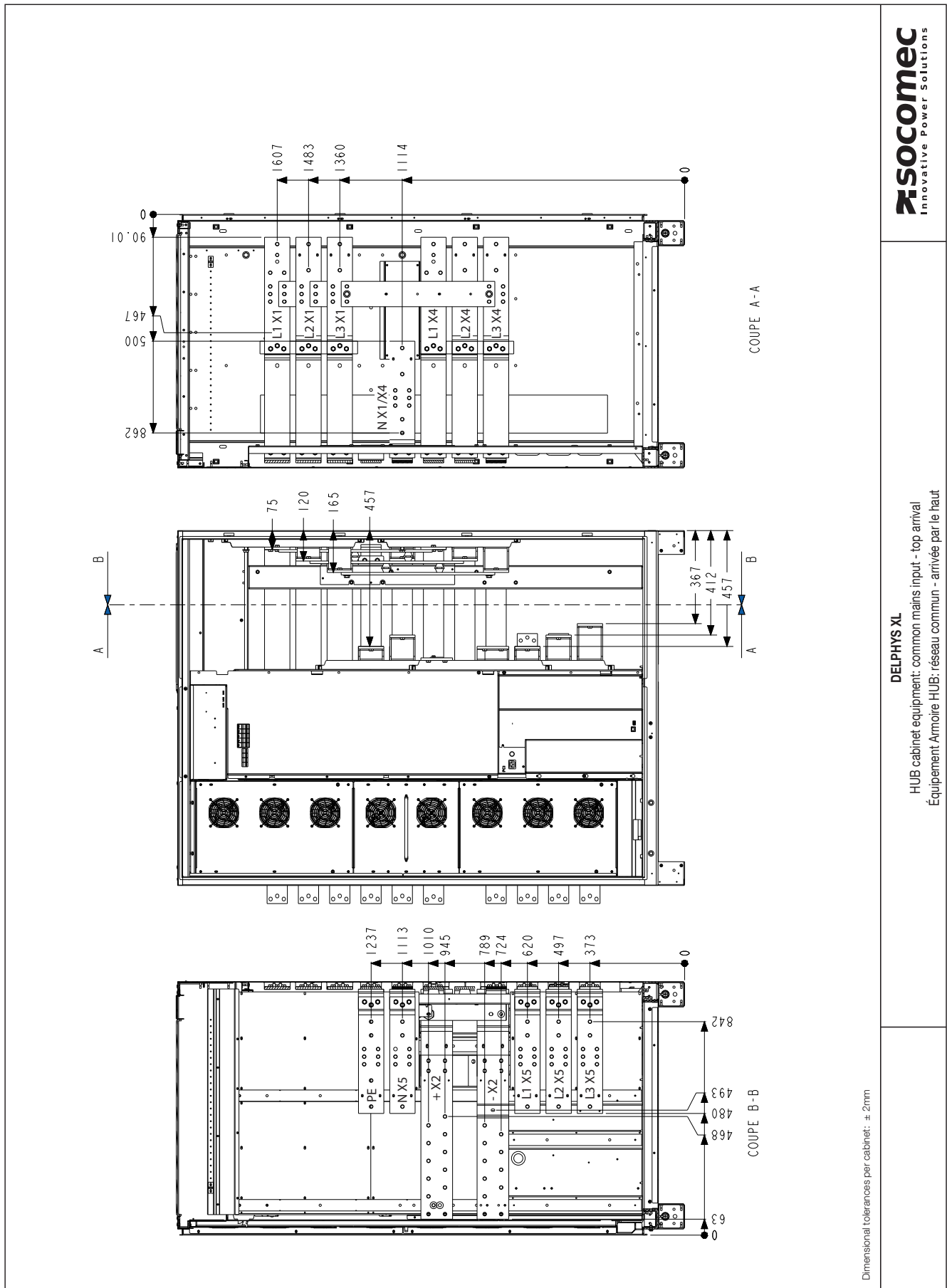
SOCOMEc
Innovative Power Solutions



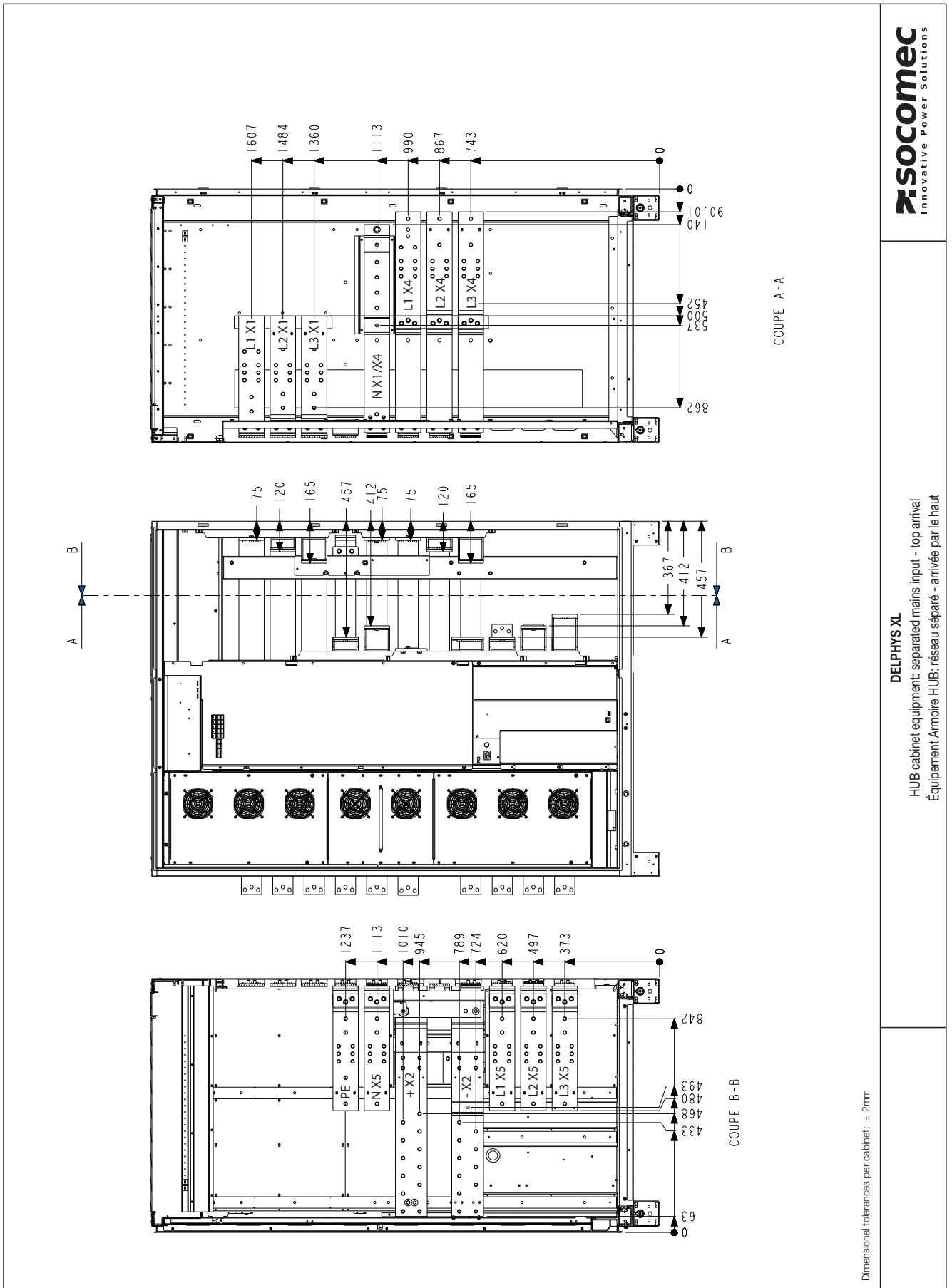
DELPHYS XL
UNIT floor fastening
Fixation au sol de l'Unité

Dimensional tolerances per cabinet: ± 2 mm

14.3. Drawing 3: Hub cabinet, common mains input, top arrival



14.4. Drawing 4: Hub cabinet, separated mains input, top arrival

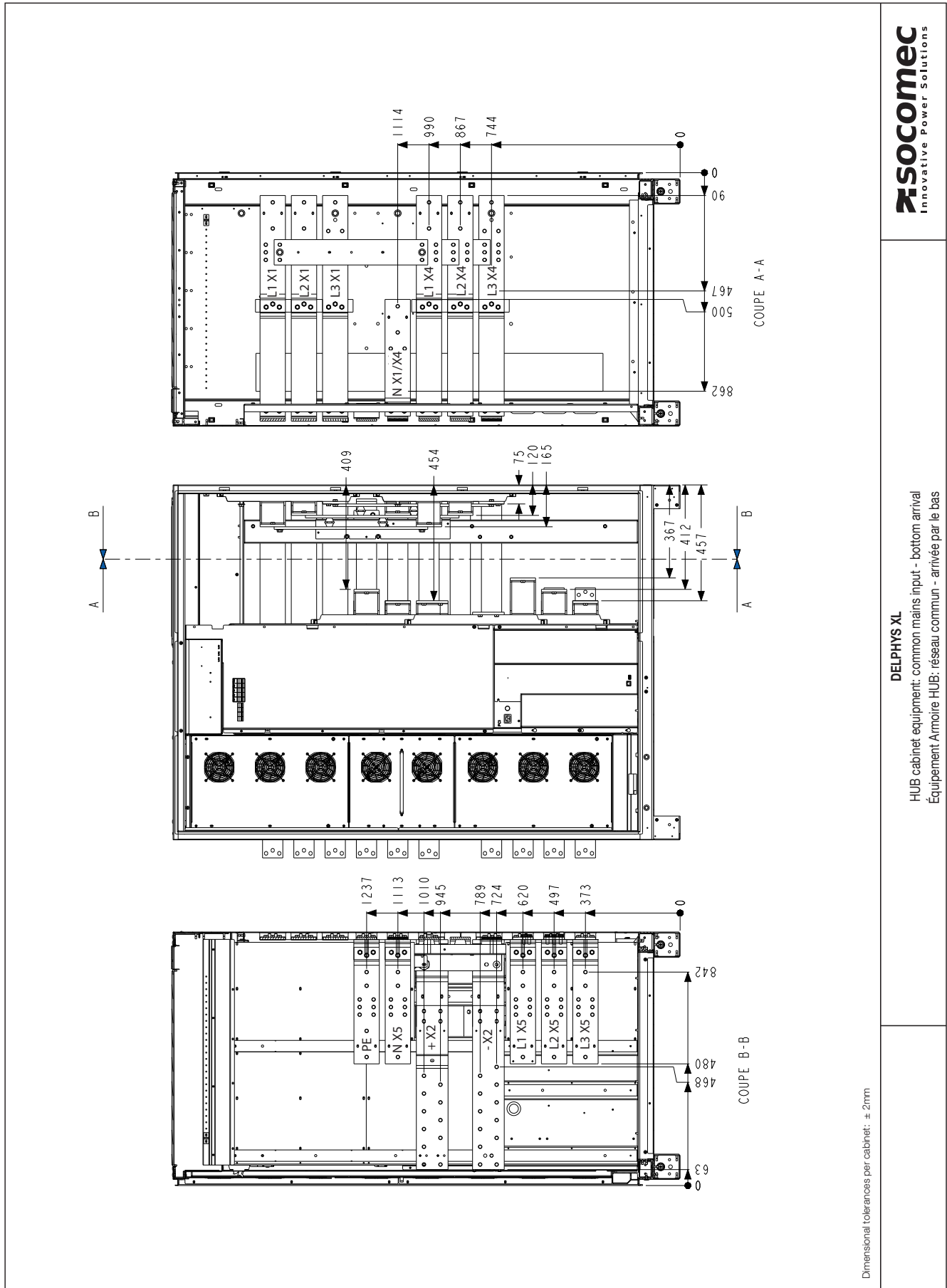


Dimensional tolerances per cabinet: ± 2mm



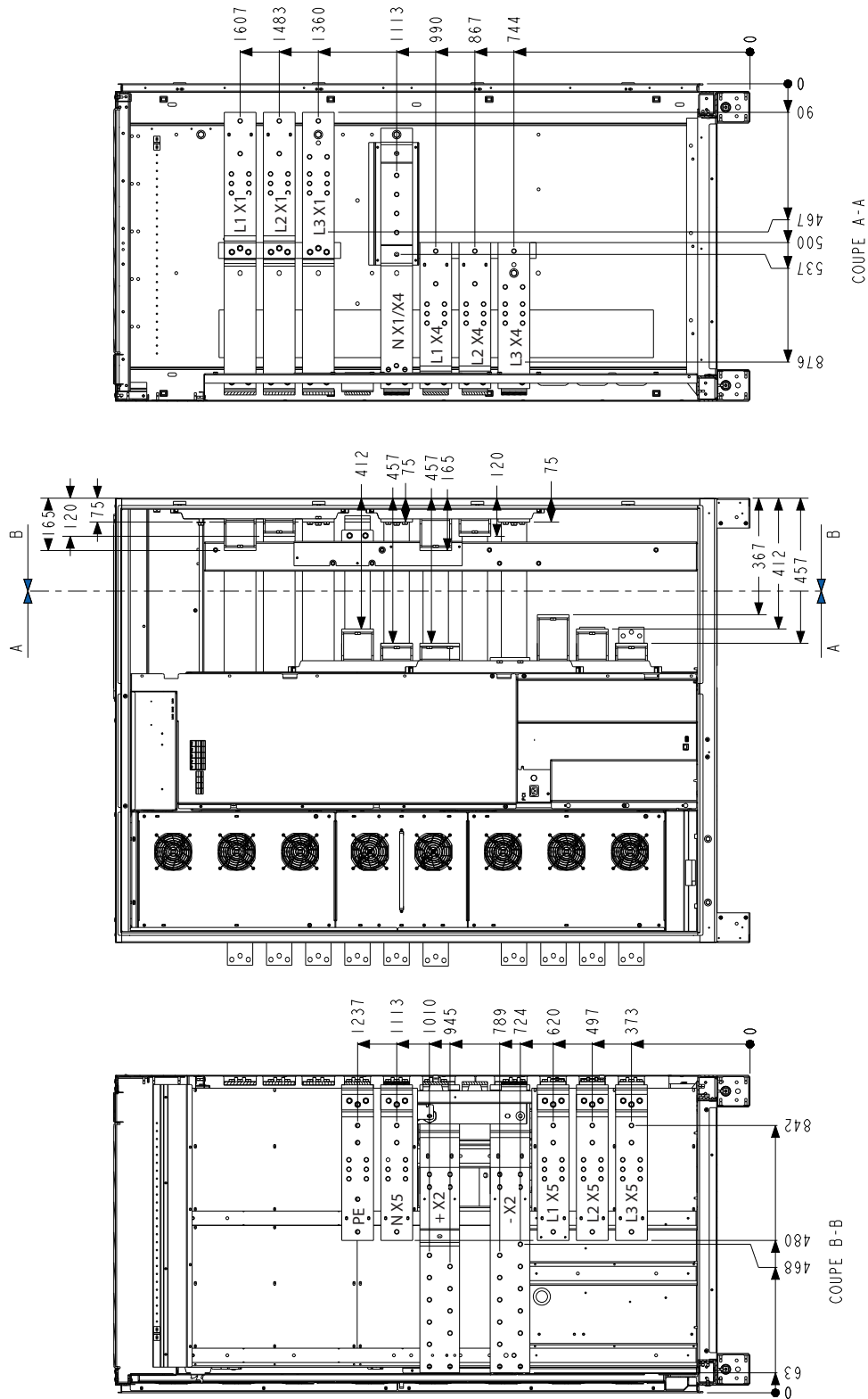
DELPHYS XL
 HUB cabinet equipment: separated mains input - top arrival
 Equipement Armoire HUB: réseau séparé - arrivée par le haut

14.5. Drawing 5: Hub cabinet, common mains input, bottom arrival



DELPHYS XL
 HUB cabinet equipment: common mains input - bottom arrival
 Équipement Armoire HUB: réseau commun - arrivée par le bas

14.6. Drawing 6: Hub cabinet, separated mains input, bottom arrival



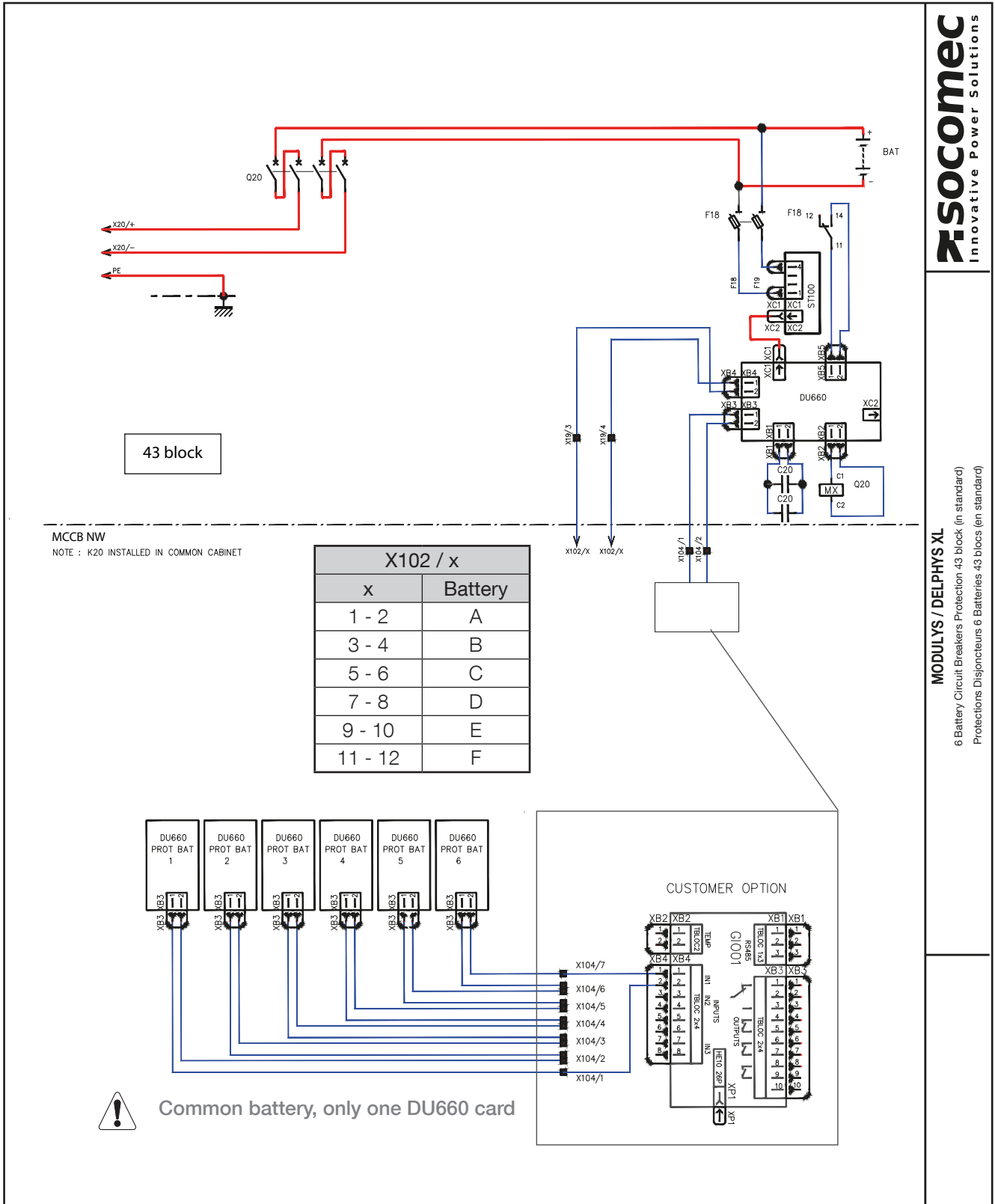
Dimensional tolerances per cabinet: ± 2mm

DELPHYS XL

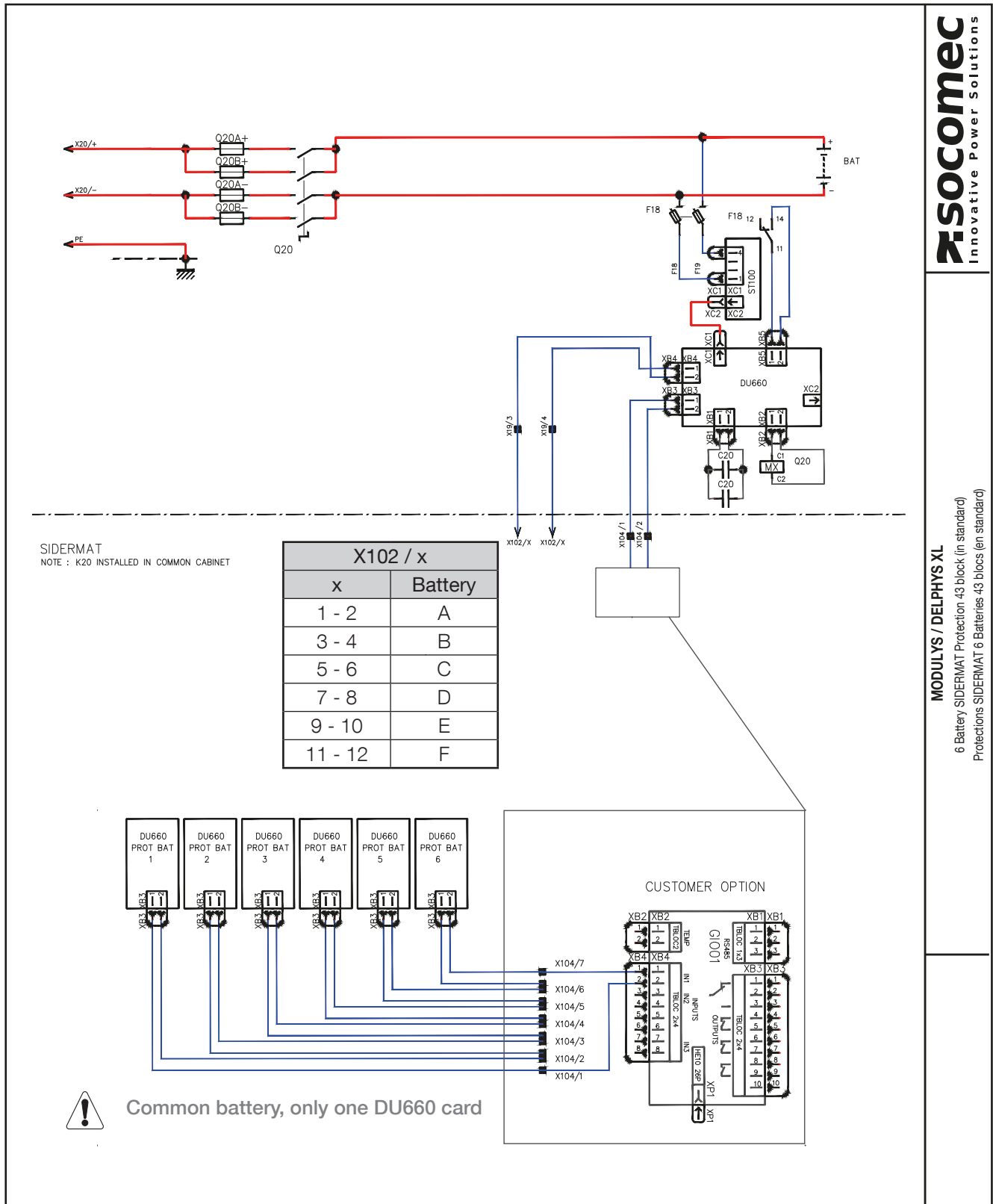
HUB cabinet equipment: separated mains input - bottom arrival
 Equipement Armoire HUB: réseau séparé - arrivée par le bas



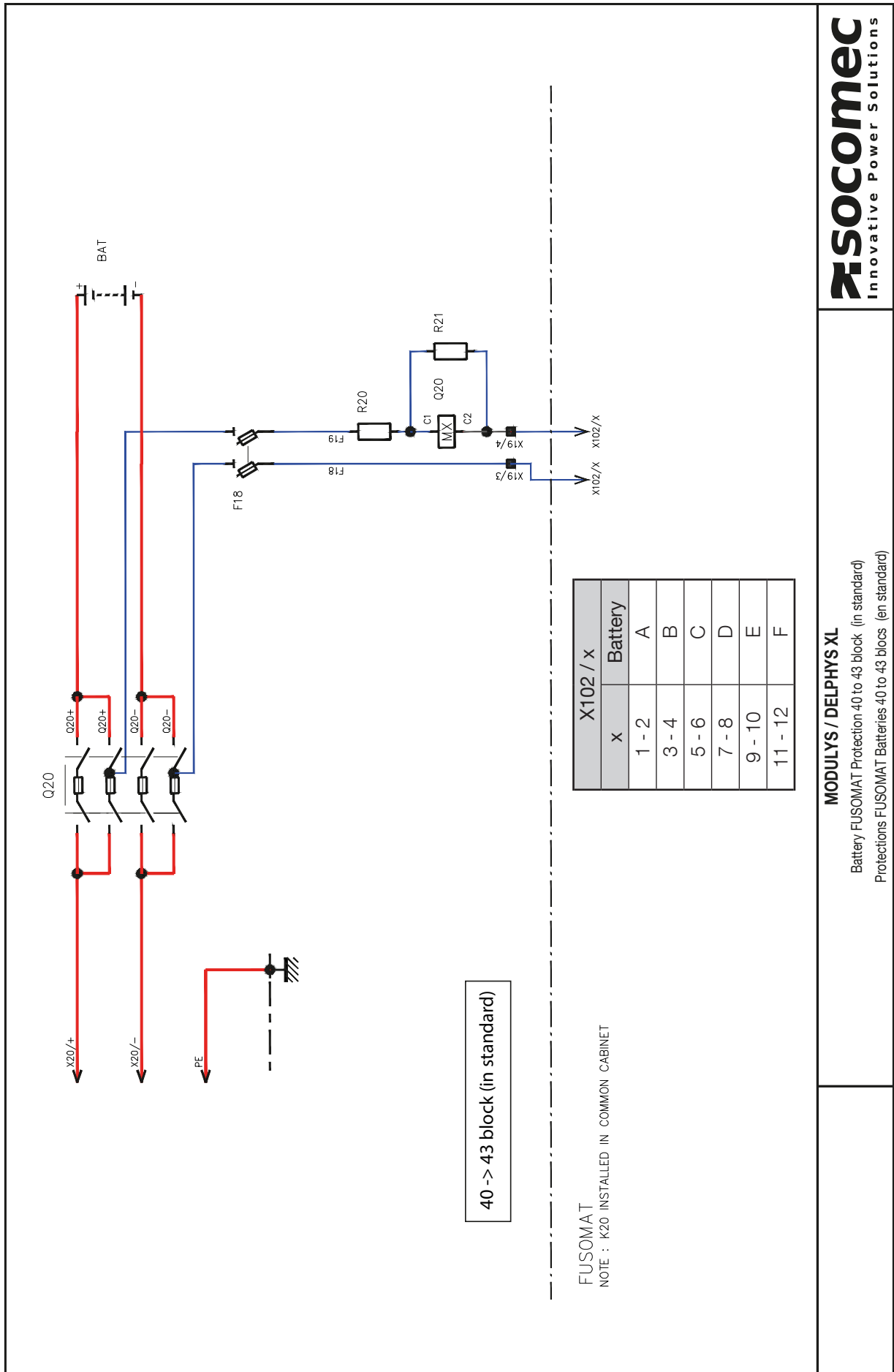
14.8. Drawing 8: Battery protection



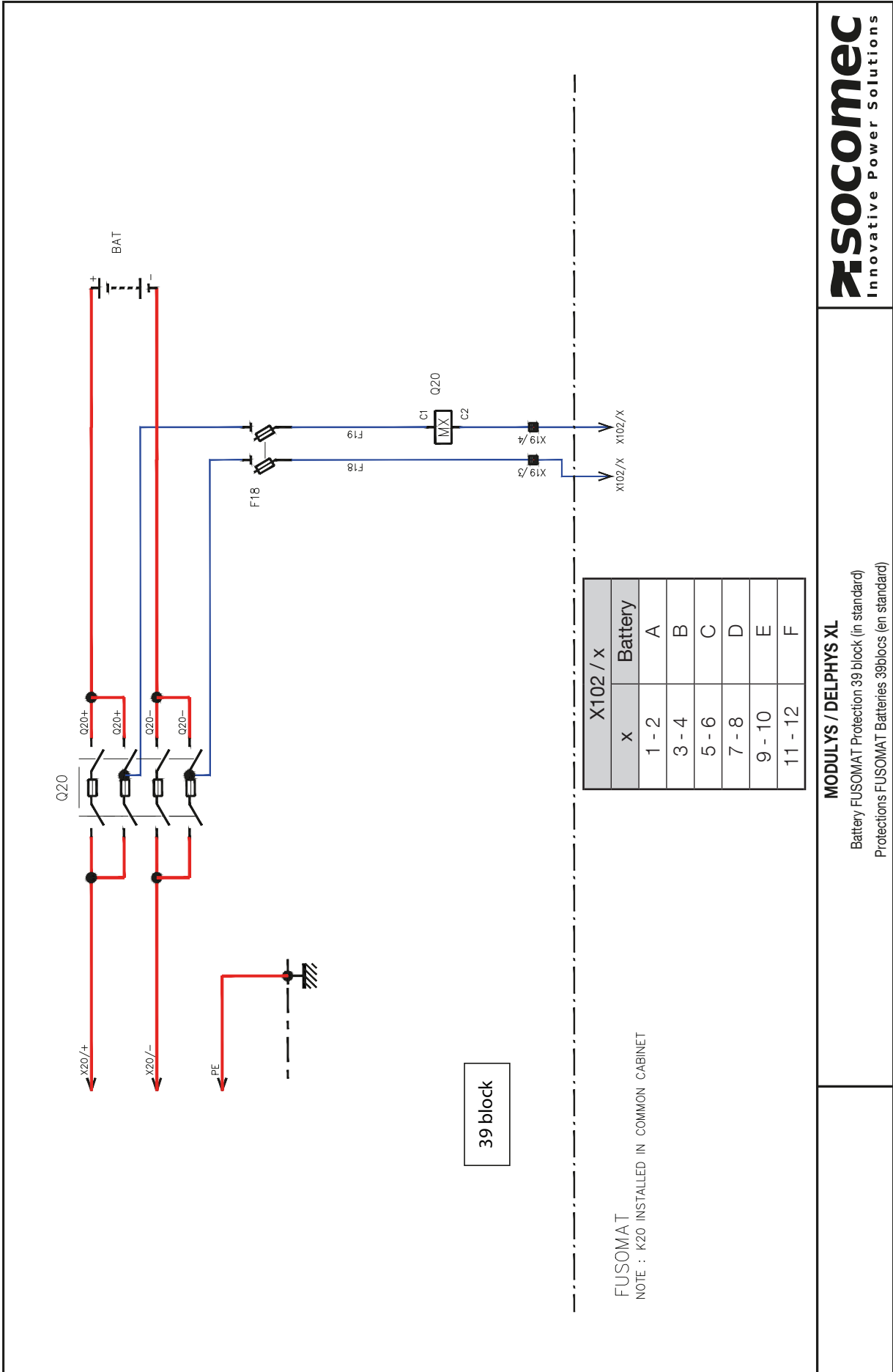
14.9. Drawing 9: Battery protection



14.10. Drawing 10: Battery protection



14.11. Drawing 11: Battery protection



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