INSTALLATION MANUAL

EN

DELPHYS XM

UPS from 300 to 800 kW

Socomec Resources Center
To download brochures, catalogues
and technical manuals

socomec
Innovative Power Solutions

EN CONTENTS

1. WARRANTY CERTIFICATE 4

2. GENERAL DESCRIPTION 5

2.1. Range. 5
2.2. Rated power 6
2.3. The system 6
2.4. Power module 9
2.5. Control unit 10
2.6. Single-wire electrical diagram 13

3. SAFETY 14

3.1. Important note 14
3.2. Description of the symbols used on labels affixed to the UNIT 15
3.3. Label and documentation positions 16

4. FOREWORD. 17

4.1. General. 17
4.2. Regulations: environmental protection 17

5. STORAGE, TRANSPORT AND HANDLING 18

5.1. Dimensions and weight (total) 18
5.2. Unpacking procedure 20
5.3. List of accessories. 20
5.4. Handling from the top 21
5.5. Handling from underneath. 22

6. POSITIONING. 23

6.1. Environmental requirements 23
6.2. Heat dissipation and ventilation 24
6.3. Floor mounting. 26

7. POSITIONING. 27

7.1. Cabinet positioning 27
7.2. Power module installation 27
7.3. Q5 handle installation 28

8. ELECTRICAL PROPERTIES 29

8.1. Electrical safety 29
8.2. Backfeed protection 29
8.3. General rules for installing cables on trays 30
8.4. External connections 31
8.5. Values of currents for cable sizing. 32
8.6. Sizing of circuit breakers 33
8.7. Minimum inverter short-circuit capacity 33
8.8. Protection and cross-section for battery cables 33

9. ELECTRICAL CONNECTION 34
9.1. Installation procedures and instructions 34
9.2. Terminal connections 34
9.3. Cabling the mains power 36
9.4. Location of connections 38
9.5. Parallel configuration 41
9.6. Optional configurations 43
9.7. Top box assembly on the UPS cabinet (without connection) 48
9.8. Top plate for cable glands assembly 48
9.9. Seismic kit zone 4 assembly 49
9.10. Com slot extension assembly 51
9.11. External battery connection 52
9.12. Completing the installation 54
9.13. External "UPS general power off" connection 54
9.14. Genset contact connection 54
9.15. Galvanic isolation transformer 55
9.16. Connecting the battery cabinet temperature sensor 55
9.17. Automatic tripping of battery protection 56
9.18. Battery connection for Direct BMS communication 57
9.19. ACS (automatic cross synchronisation) 60

10. COMMUNICATION 62
10.1. ADC + Serial Link interface 62
10.2. Net Vision card 63
10.3. Modbus TCP card 63

11. PREVENTIVE MAINTENANCE 64
11.1. Batteries 64
11.2. Fans 64
11.3. Capacitors 64

12. TECHNICAL SPECIFICATIONS 65

13. APPENDIX 66
13.1. Drawing 1: DELPHYS XM 300 to 800 kVA top connection dimensions 66
13.2. Drawing 2: DELPHYS XM 300 to 600 kVA bottom connection dimensions 67
13.3. Drawing 3: DELPHYS XM 800 kVA switches version dimensions 68
13.4. Drawing 4: DELPHYS XM 300 to 800 kVA top connection floor-mounted 69
13.5. Drawing 5: DELPHYS XM 300 to 600 kVA bottom connection floor-mounted 70
13.6. Drawing 6: DELPHYS XM 800 kVA switches version floor-mounted 71

1. WARRANTY CERTIFICATE

The warranty terms are stipulated in the offer, however, the following clauses apply as standard.

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.

2. GENERAL DESCRIPTION

2.1. Range

DELPHYS XM is a full range of high performing UPS (Uninterruptible Power Supply) systems designed to secure critical applications and therefore to ensure business continuity by means of a fully resilient architecture. It has been specifically designed to meet the stringent demands of loads in particular application contexts, in order to optimise the features of the product and to facilitate its integration within the system.

The DELPHYS XM can deliver many more benefits than standard systems, fitting into an overall space-saving design, providing:

- Fault-tolerant architecture and the possibility of setting N+1 internal redundancy.
- Compact footprint thanks to high power density.
- Quick and easy maintenance.
- Lower total cost of ownership for electrical infrastructure.
- Fast deployment time /Flexible installation.

DELPHYS XM is designed using 100 kW power conversion modules combined with a common static bypass rated for permanent operation at the rated power of the UPS. The UPS is designed with a mechanical and electrical segregation solution, so that any abnormal event will be contained in the related Brick and not propagated to the rest of the unit.

2.2. Rated power

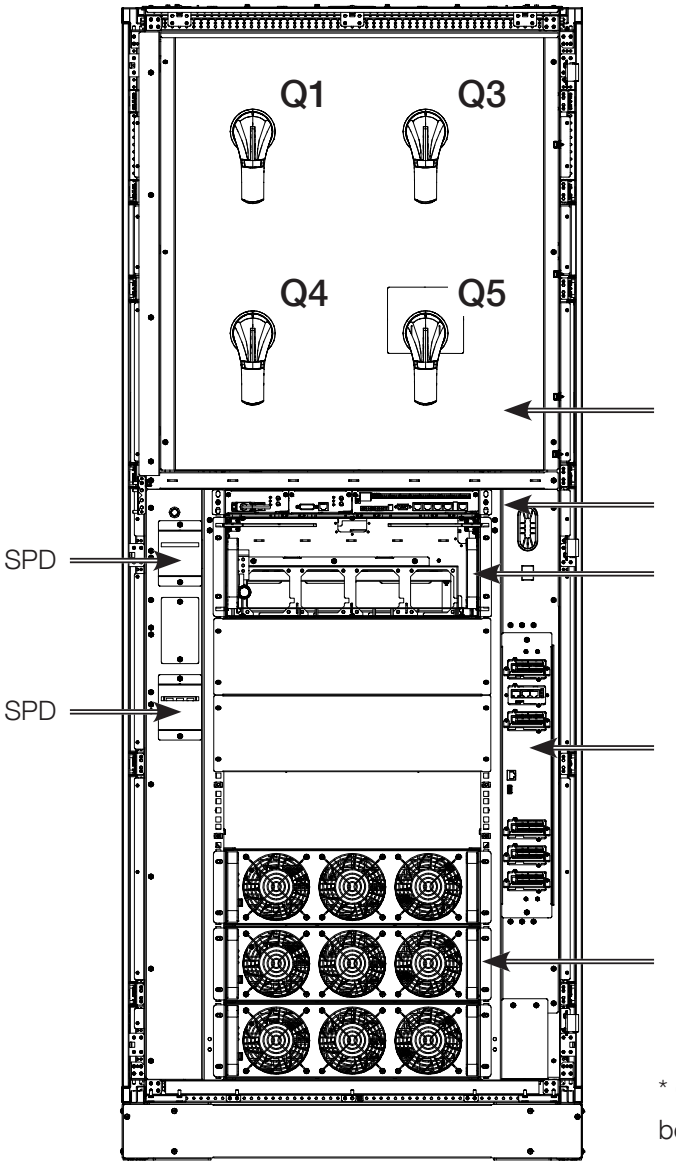
Rated power per UPS Unit		300	400	500	600	800
Number of 100 kW modules		3	4	5	6	8
N configuration	Rated power kVA/kW	300	400	500	600	800
	Intrinsic redundancy up to % of rated power	66%	75%	80%	83%	87%
N+1 configuration	Rated power kVA/kW	200	300	400	500	700
	Intrinsic redundancy up to % of rated power	100%				

To increase system power, DELPHYS XM can be parallelised up to 6 units, for a maximum of 3.6 MVA (6 x 600 kVA). The 800 kVA size can be parallelised up to 4 units, for a maximum of 3.2 MVA.

2.3. The system

Delivering optimised benefits compared with conventional modular systems, the 300/800 kVA DELPHYS XM range fits into an overall space-saving design that makes for easy and flexible integration within your existing architecture, offering many features in the standard configuration.

2.3.1. 300 - 500 kVA top and bottom entry / 600 kVA top entry



Switch	
Q1	Mains
Q3	Output
Q4	Bypass
Q5	Maintenance

Power Connections*

Control unit

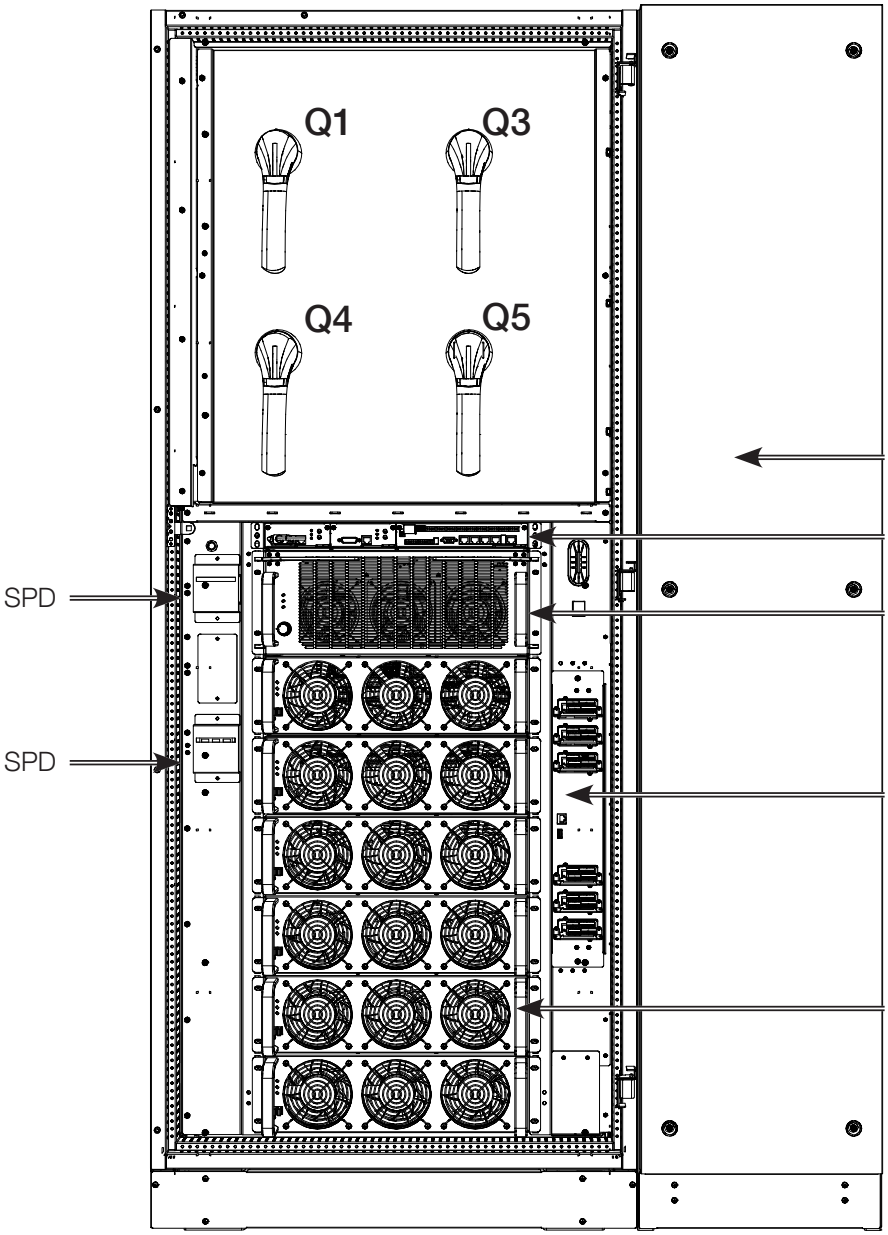
Bypass module

Communication slots

Power module

* Cable tray side cabinet not shown for 300-500 kVA bottom entry.

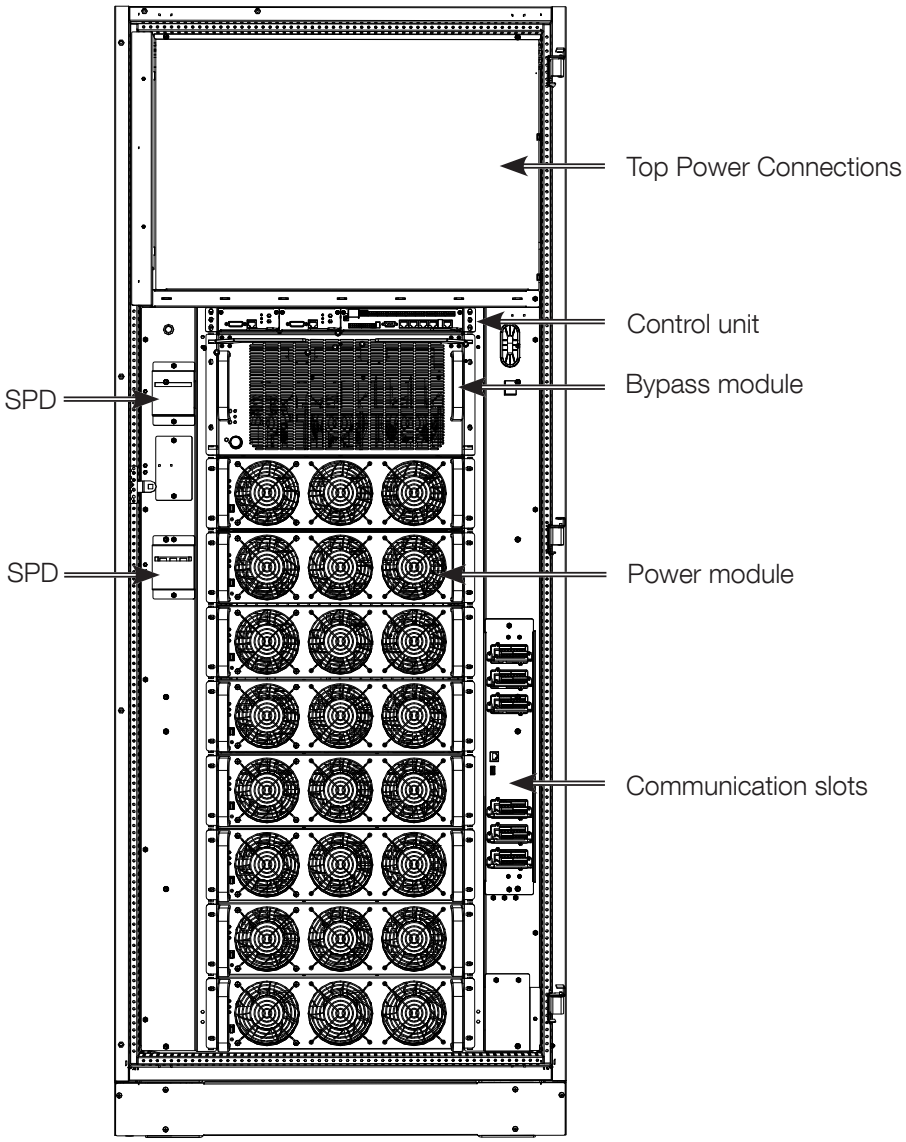
2.3.2. 600 kVA bottom entry



Switch	
Q1	Mains
Q3	Output
Q4	Bypass
Q5	Maintenance

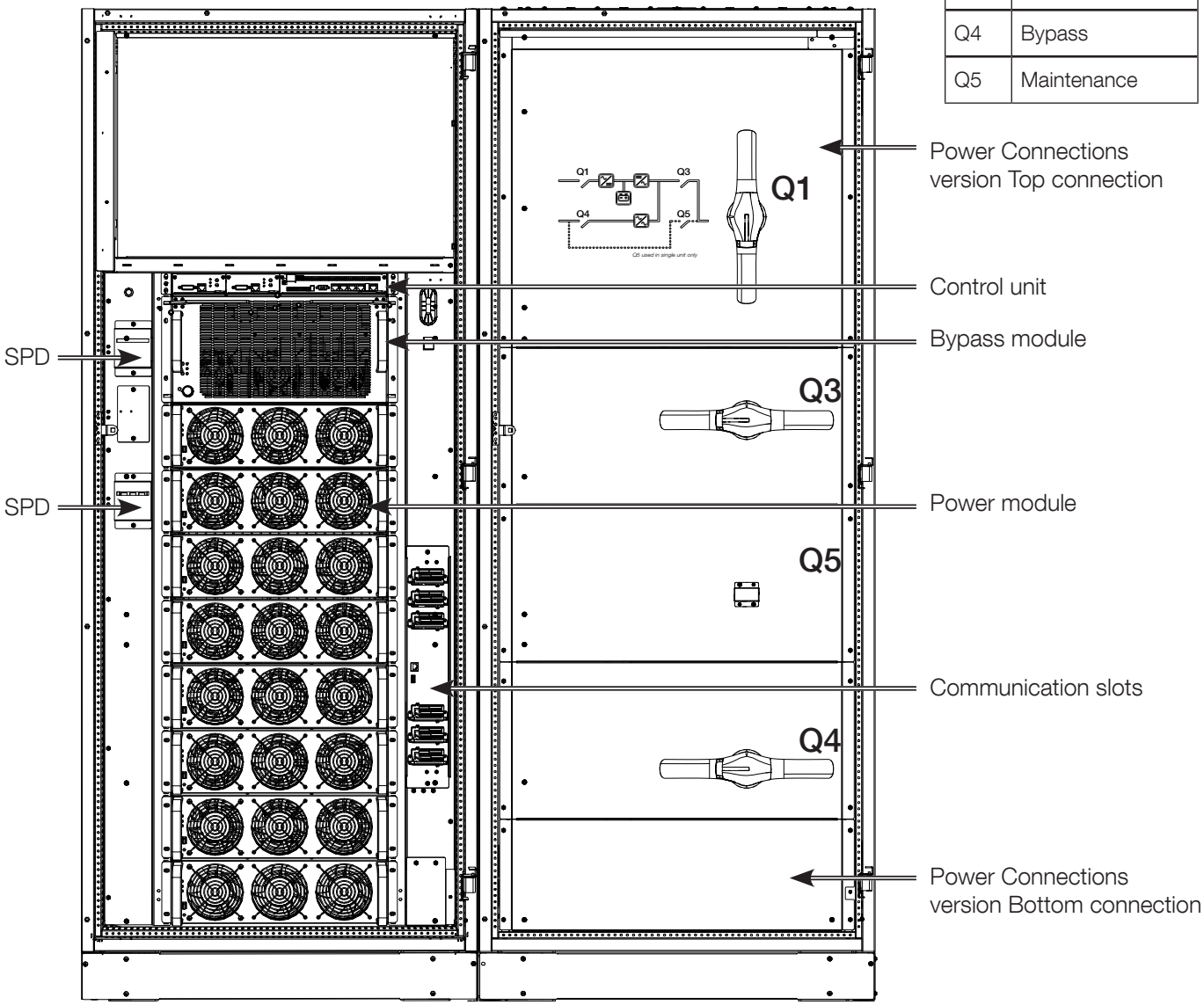
2.3.3. 800 kVA

SINGLE CABINET VERSION: TOP ENTRY

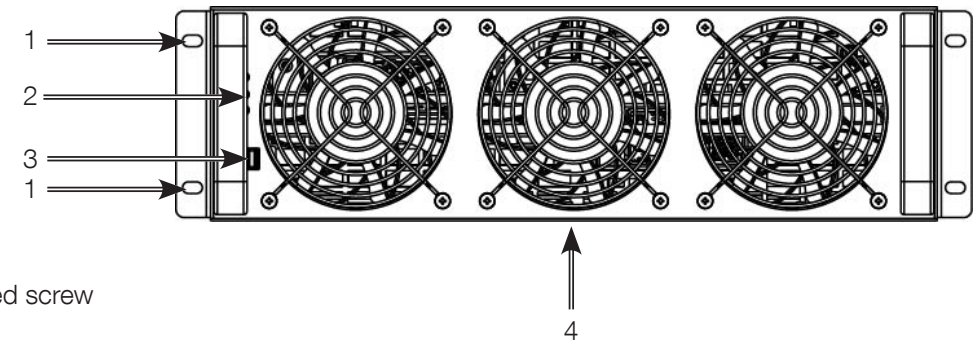


SWITCHES VERSION: TOP OR BOTTOM ENTRY

Switch	
Q1	Mains
Q3	Output
Q4	Bypass
Q5	Maintenance



2.4. Power module



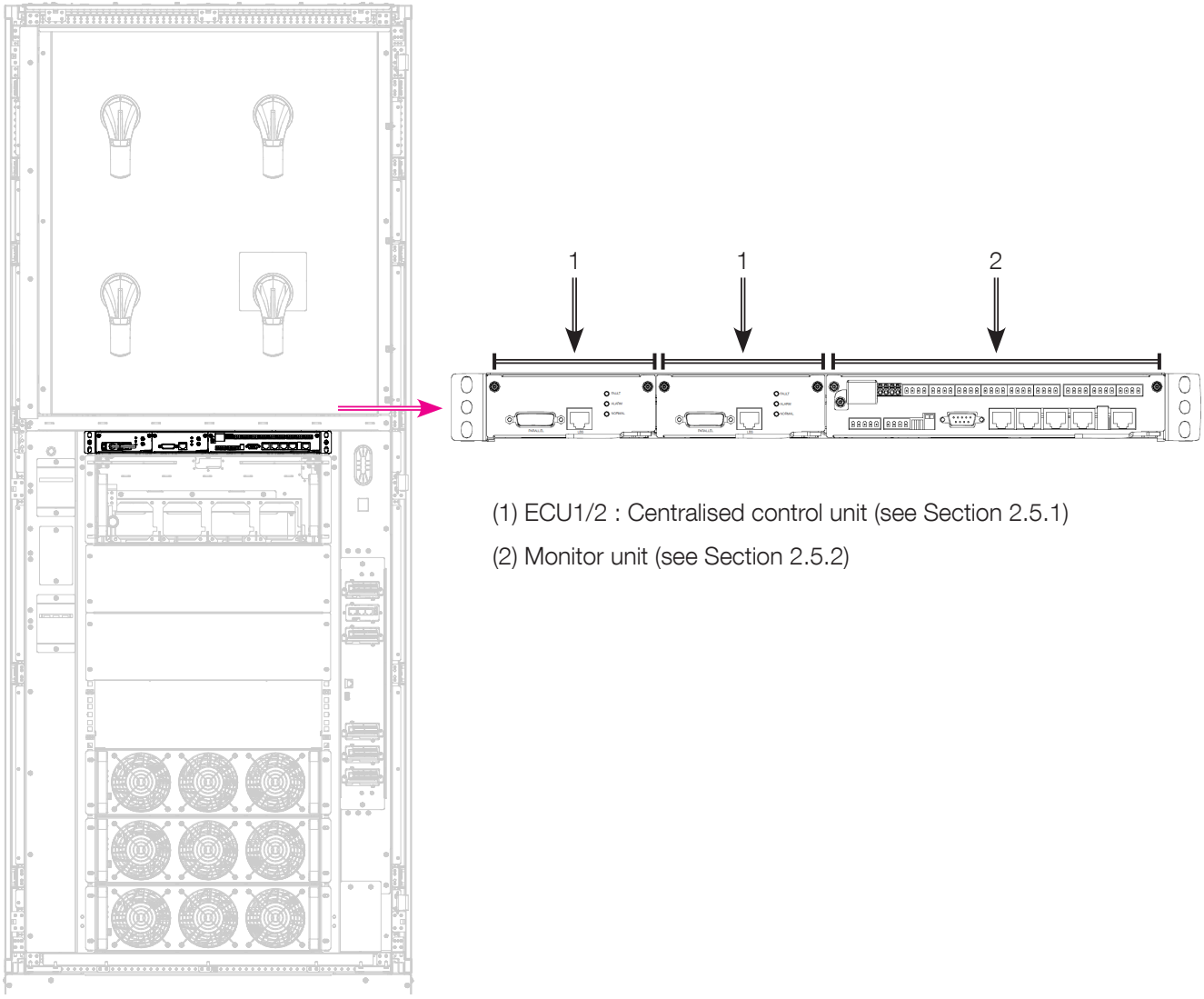
(1) Module fixed screw

(2) Status LED

(3) Module switch

(4) Fan

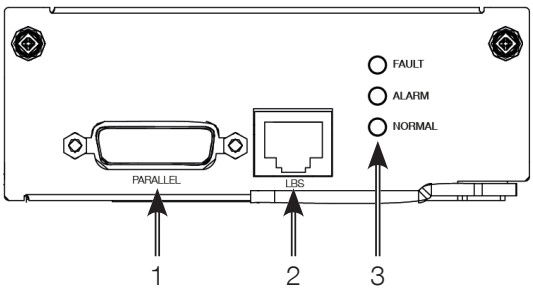
2.5. Control unit



(1) ECU1/2 : Centralised control unit (see Section 2.5.1)

(2) Monitor unit (see Section 2.5.2)

2.5.1. ECU unit (parallel connection)

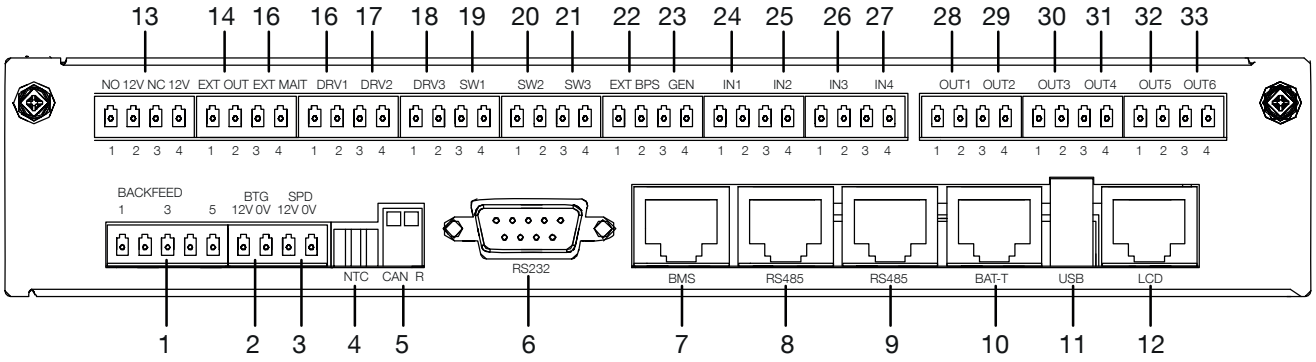


(1) PARALLEL port

(2) LBS port

(3) Status LED

2.5.2. Monitor unit

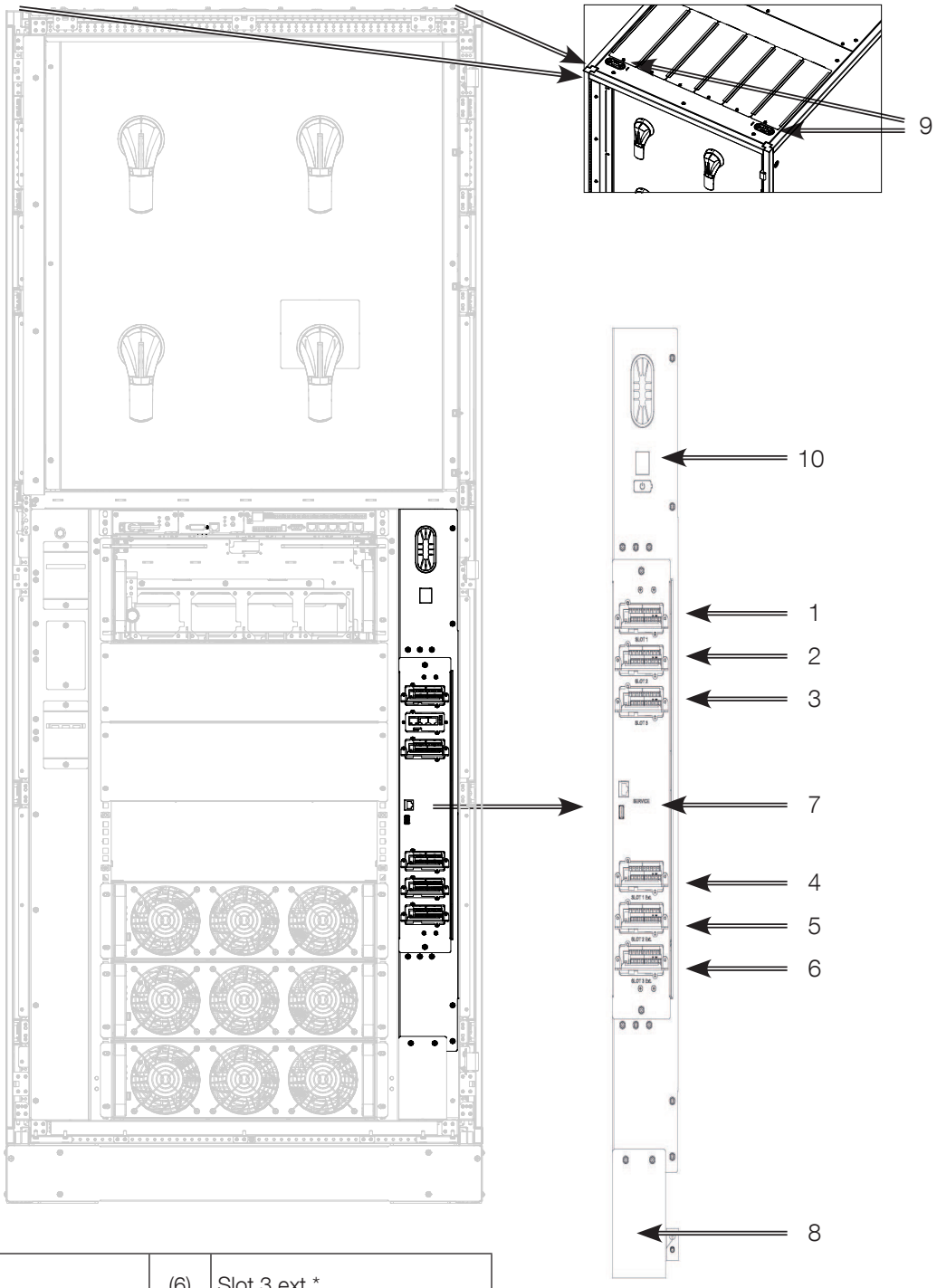


Note: Input dry contacts cannot be used in parallel or series between cabinets!

Note: Battery breaker driver cannot be used in parallel between cabinets!

1	BACKFEED: Bypass backfeed signal input port, PIN1_ common, PIN3_NO, PIN5_NC	18	DRV3: Battery group 3 breaker driver signal output port PIN1: 24Vdc, PIN2: GND
2	BTG: Battery earth detection signal input port, 12V_ power supply, 0V_GND	19	SW1: Battery group 1 breaker auxiliary contact signal port, PIN3: 12Vdc, PIN4: GND
3	SPD: SPD detect signal input port, 12V_power supply, 0V_GND	20	SW2: Battery group 2 breaker auxiliary contact signal port, PIN1: 12Vdc, PIN2: GND
4	NTC: NTC temperature sensor port	21	SW3: Battery group 3 breaker auxiliary contact signal port, PIN3: 12Vdc, PIN4: GND
5	R-CAN: CAN communication resistor adjust	22	EXT.BPS: External bypass breaker auxiliary contact signal port, PIN1: 12Vdc, PIN2: GND
6	RS232: RS232 communication port	23	GEN: Generator detect signal input port, PIN1: 12Vdc, PIN2: GND
7	BMS: Communicate to Li battery BMS, include CAN and RS485 signal	24	IN1: Optional input dry contacts 1, PIN1: 12Vdc, PIN2: GND
8	RS-485: RS485 communication port	25	IN2: Optional input dry contacts 2, PIN3: 12Vdc, PIN4: GND
9	RS-485: RS485 communication port	26	IN3: Optional input dry contacts 3, PIN1: 12Vdc, PIN2: GND
10	BAT-T: battery temperature sensor port RS485	27	IN4: Optional input dry contacts 4, PIN3: 12Vdc, PIN4: GND
11	USB: For software update and history download	28	OUT1: Optional output dry contacts 1, PIN1: common, PIN2: NO
12	LCD: HMI connection	29	OUT2: Optional output dry contacts 2, PIN3: common, PIN4: NO
13	EPO: NO-12 V: Normally open port; NC-12 V : normally closed port;	30	OUT3: Optional output dry contacts 3, PIN1: common, PIN2: NO
14	EXT.OUT: External output breaker auxiliary contact signal port, PIN1: 12Vdc, PIN2: GND	31	OUT4: Optional output dry contacts 4, PIN3: common, PIN4: NO
15	EXT.MAINT: External maintenance breaker contact signal port, PIN1: 12Vdc, PIN2: GND	32	OUT5: Optional output dry contacts 5, PIN1: common, PIN2: NO
16	DRV1: Battery group 1 breaker driver signal output port PIN1: 24Vdc, PIN2: GND	33	OUT6: Optional output dry contacts 6, PIN3: common, PIN4: NO
17	DRV2: Battery group 2 breaker driver signal output port PIN3: 24Vdc, PIN4: GND		

2.5.3. Communication slots



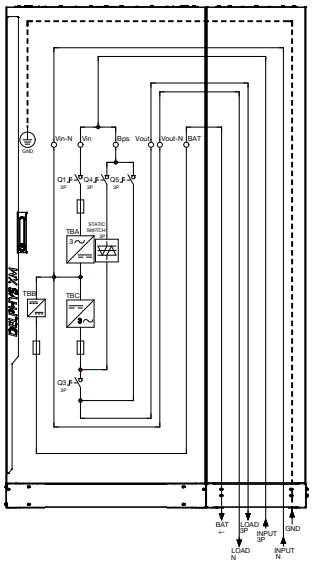
(1)	Slot 1	(6)	Slot 3 ext.*
(2)	Slot 2	(7)	Service
(3)	Slot 3	(8)	Customer cable entry
(4)	Slot 1 Ext.*	(9)	Customer cable entry
(5)	Slot 2 Ext.*	(10)	Black/cold start

* optional

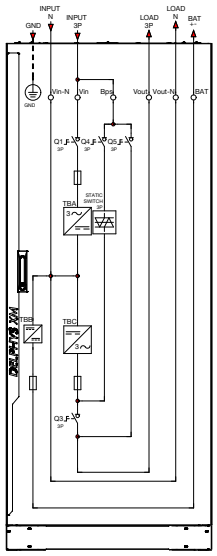
2.6. Single-wire electrical diagram

Wiring diagrams don't represent all possible configurations.
The configuration shown here is common input with separate neutral and earth.

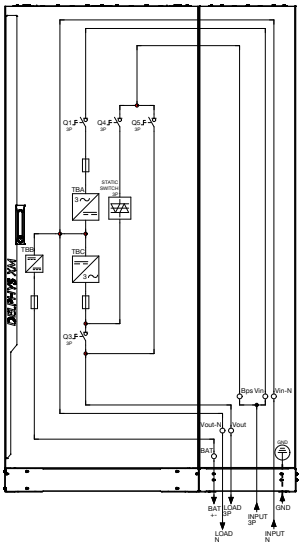
300 - 500 kVA dual cabinet bottom entry



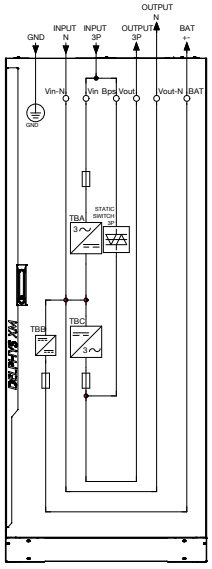
300 - 600 kVA single cabinet top entry



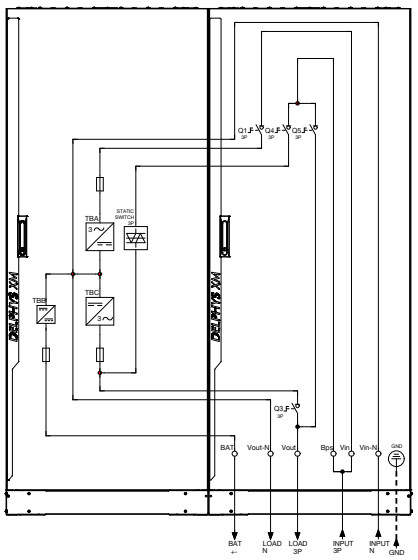
600 kVA dual cabinet bottom entry



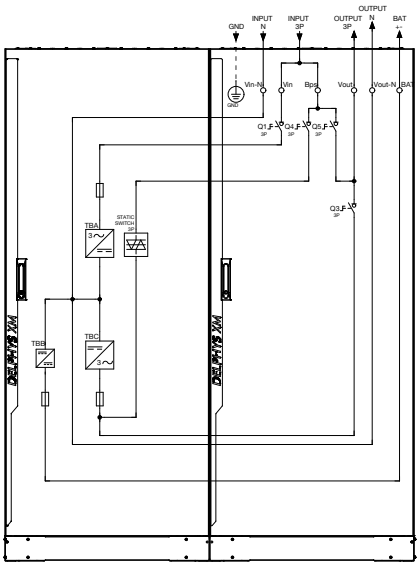
800 kVA single cabinet top entry without switches



800 kVA switches version bottom entry



800 kVA switches version top entry



3. SAFETY

3.1. Important note

- This document provides important instructions for the safe use, handling and connection of the Uninterruptible Power System (UPS) system.
- Socomec retains full and exclusive ownership of this document. Socomec grants the recipient of this document the individual right to use the document for its indicated purpose. 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.
- Safety information is provided 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 authorised by Socomec (wearing appropriate safety headgear, gloves, footwear and eye protection).
- The UPS must be repaired only by authorised technicians specially trained for this purpose (wearing appropriate safety headgear, gloves, footwear and eye protection).

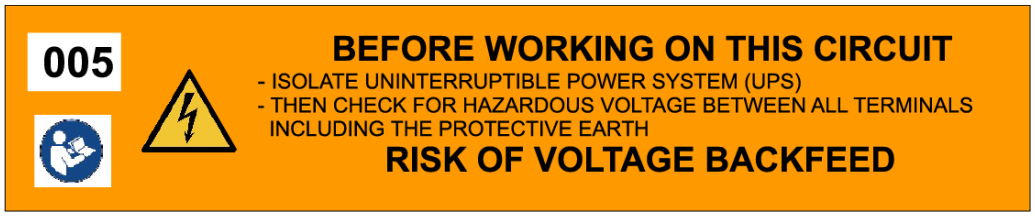
- Do not expose the UPS Unit to dust, rain or liquids in general. Do not insert foreign objects into the UPS Unit.
- It is recommended that the DELPHYS XM UPS Unit be used and stored below the ambient temperatures and humidity values specified by the manufacturer.

The DELPHYS XM must be handled with the utmost care by at least two people.

The power module weighs 55 kg, it must be handled with the utmost care by at least two people.

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

- This UPS is OVCIII (Over Voltage Category Class III) compliant. The UPS power source is protected from transient power surges by the Surge Protective Devices(SPD). The SPDs are installed on the rectifier input after the common inputs copper bar.
- Affix a label bearing the following words on all external switches of the UPS Unit power supply:



Label not supplied by SOCOMEC

- Do not earth the output neutral (except if using the TN-C earthing option). The DELPHYS XM UPS Unit does not modify the system's neutral connections; the use of a galvanic isolation transformer is required if modifications to neutral connections are required downstream of the UPS Unit.
- Switch off and isolate the UPS Unit and then wait for 7 minutes before carrying out any maintenance work, including removing or installing Power Modules.

The DELPHYS XM UPS Unit could restart automatically.

After a short circuit, please check the integrity of cable ties used for mains power and for the top box option

- Before connecting the external battery cabinet, check that this is fully compatible with the model of the UPS Unit model.
- The use of external battery cabinets not supplied by the manufacturer 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, always dispose of used batteries using specialist disposal companies. As provided for by the local laws in force, batteries must not be disposed of with other industrial or domestic waste.
- There is neither output switch nor maintenance switch in the standard version 800 kW UPS. During installation, an external output switch and an external maintenance switch are required, and the auxiliary contact signals of the output switch and the maintenance switch shall be connected to the dry contact of the UPS output switch and maintenance switch, and the output and maintenance dry contact signals from the switches shall be enabled on the UPS display screen.
- Do not connect the UPS output to regenerative load systems including photovoltaic systems and variable speed drives. Failure to follow instruction may result in equipment damage!

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 a lead-acid battery pack fails, acid may leak from the pack. Do not touch the acid as there is a risk of serious burns.

If a lead-acid battery pack fails, dangerous gas may escape. Take precautions to avoid inhaling the gas when working on it.

Working near a UPS can potentially expose you to hazardous noise. Hearing protection is recommended.

- If the UPS Unit needs to be scrapped, always dispose of used batteries using specialist disposal companies. These are obliged to dismantle and dispose of the various components in accordance with the national legal provisions in force.
- This equipment conforms to the European Community directives for professional equipment and bears the approval mark: CE

The regulations and standards applicable to the product's installation location must also be complied with to ensure prevention of accidents. The product you have chosen is designed for commercial and industrial use only. In order to be used for specific 'critical applications', such as life support systems, medical applications, commercial transportation, nuclear facilities or any other application or systems where product failure is likely to cause substantial harm to people or property, the products may have to be adapted. For such 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 interference.

Socomec's liability in terms of the product these instructions relate to is as stated in the applicable purchase terms and conditions agreed between Socomec and the customer.

3.2. Description of the symbols used on labels affixed to the UNIT

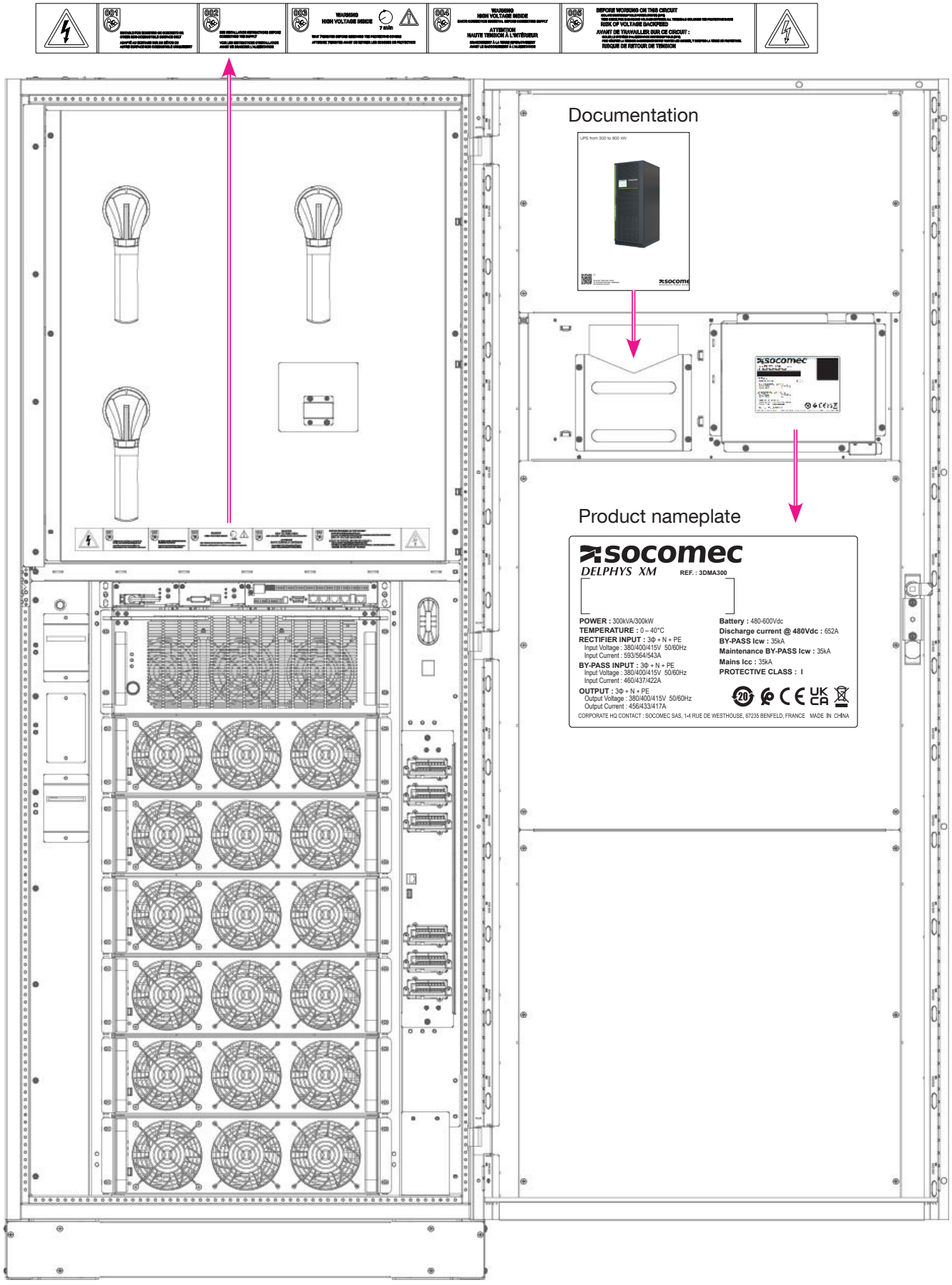
All recommendations and warnings on labels and plates attached to the interior or exterior of the equipment must be complied with.

DANGER! HIGH VOLTAGE (BLACK/YELLOW)

EARTH TERMINAL

READ THE MANUAL BEFORE USING THE UPS UNIT

3.3. Label and documentation positions



4. FOREWORD

4.1. General

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

This equipment is fitted with the latest power semiconductors (IGBT) technology, 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 interference.**

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 always dispose of materials using firms specialised in their recycling. They cannot be treated with other industrial or household waste, as set out in the local regulations in force.

5. STORAGE, TRANSPORT AND HANDLING

The DELPHYS XM 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 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 that are 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 not suitable for shipping, the contents must be promptly collected, segregated, and either the consignor or consignee should be contacted.

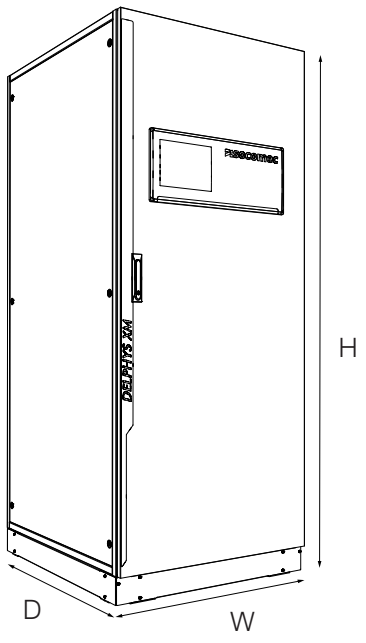
5.1. Dimensions and weight (total)

Power modules		
Weight	(kg)	55

- DELPHYS XM top connection

UPS rating [kVA/kW]		300	400	500	600	800
Number of 100 kW modules		3	4	5	6	8
Width [W]	(mm)	800				
Depth [D]	(mm)	1000				
Height [H]	(mm)	2000				
Weight	(kg)	525	568	660	757	864
Single unit clearances		Rear = 500 mm Lateral = 0 mm Top = 500 mm				
Access for maintenance and operation		Front only				
Installation		Back-to-back installation: 1 m, 0 m with the wall installation kit* Against a wall: with the wall installation kit*				

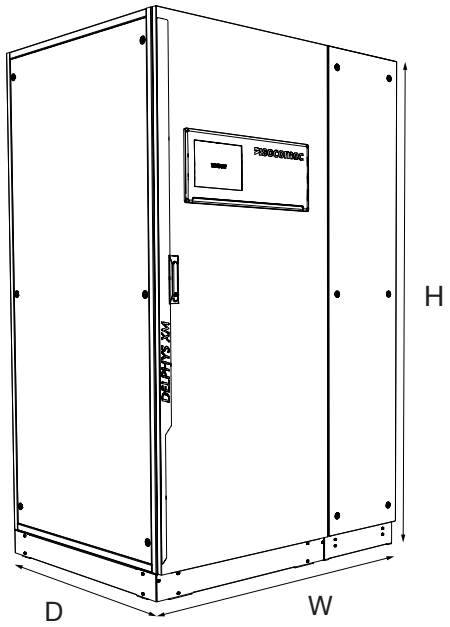
* not available for the 800 version



- DELPHYS XM bottom connection

UPS rating [kVA/kW]		300	400	500	600	800
Number of 100 kW modules		3	4	5	6	8
Width [W]	(mm)	1200				1600
Depth [D]	(mm)	1000				
Height [H]	(mm)	2000				
Weight	(kg)	580	623	715	899	1251
Single unit clearances		Rear = 500 mm Lateral = 0 mm Top = 500 mm				
Access for maintenance and operation		Front only				
Installation		Back-to-back installation: 1 m, 0 m with the wall installation kit* Against a wall: with the wall installation kit*				

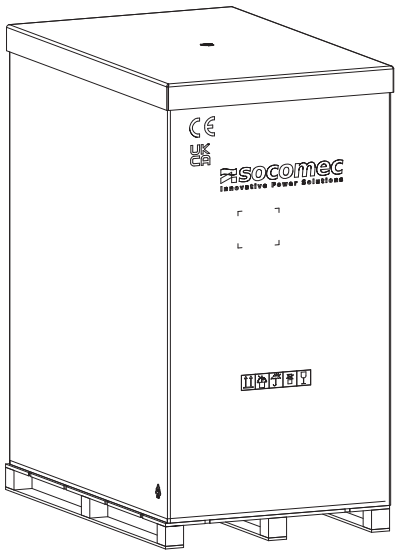
* not available for 800 version



5.2. Unpacking procedure

Place the various elements in the installation area.

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



must be moved from the side (see § 5.5.1)

IMPORTANT: IN THE EVENT OF DAMAGE Packages that are 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 not suitable for shipping, 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.

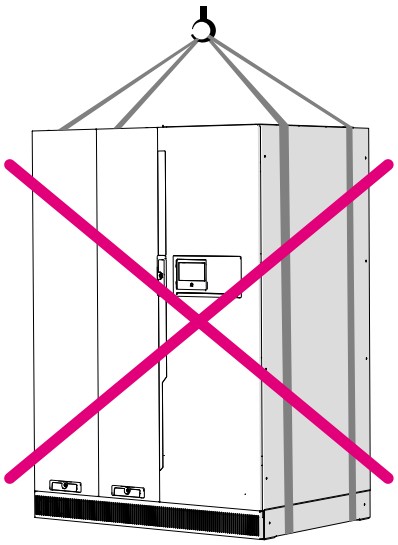
CAUTION: Handle with care to avoid damaging the UPS.

The accessory box is located at the bottom of the cabinet behind the small panel to be removed. Remove this box before removing the UPS from the pallet

5.3. List of accessories

Description kVA/kW	300	400	500	600	800
Shielded control cable (5 m)	X	X	X	X	X
5 m RS485 cable (RJ45 plug)	X	X	X	X	X
Door keys (2x)	X	X	X	X	X
Cable entry screws	X	X	X	X	X
User manual	X	X	X	X	X

5.4. Handling from the top



Always keep cabinets in an upright position during transit. Lift and handle the cabinets with the utmost care and without jerking.

Never use harnesses.

Never handle with belts.

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

5.5. Handling from underneath

The UPS is delivered on a pallet. To take the Cabinet off the pallet, lift it from the side.

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

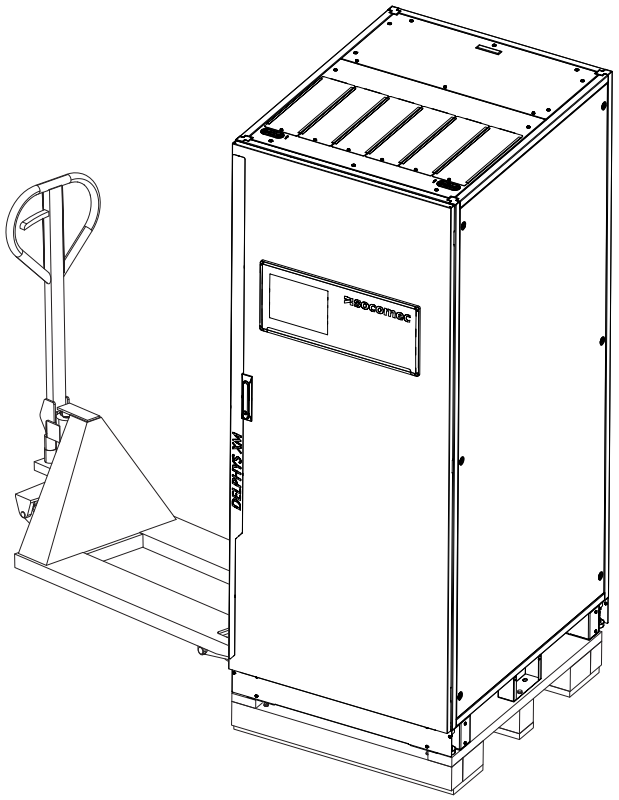
When moving the unit on even slightly sloping surfaces, use the blocking equipment and braking devices to ensure that the unit does not fall over.

Take all required precautions and use appropriate means and tools.

5.5.1. Lateral handling

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

The forks should be at least 2 cm longer than the cabinet.



6. POSITIONING

6.1. Environmental requirements

- The DELPHYS XM is not designed for outdoor use.
- Do not expose the DELPHYS XM 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 Section 12). Cooling systems may be required to maintain these values.
- The DELPHYS XM 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).
- DELPHYS XM has been designed for a Pollution Degree 2-environment according to IEC 62040-1.
- Definition of Pollution Degree 2: Normally, only non-conductive pollution occurs. Occasionally, however, temporary conductivity caused by condensation is to be expected.
- The site's environmental condition must be compliant with PD2 in order to guarantee equipment lifetime and correct operation.
- If you want to operate the equipment in a G3 environment, take precautions (filtration, heat drying, etc.) to ensure the aforementioned pollution degree 2 conditions in the UPS technical room.
- The DELPHYS XM can be installed against a wall by adding the WALL KIT, otherwise it has to be positioned 500 mm away. The upper part of the DELPHYS XM must be positioned at least 500 mm away from the ceiling (see Fig. 6.2-1).
- Always leave a space of at least 0.9 meters at the front of the DELPHYS XM for maintenance purposes.
- For UPS Units arranged facing each other, leave a minimum space of 60 cm between the 2 cabinets with the doors open to allow a passageway (in accordance with the provisions of the IEC standard).
- Two DELPHYS XM units can be installed back-to-back only if the WALL KIT is used (see Fig. 6.2-2).
- Comply with the direction of ventilation flows (see Fig. 6.2-3).

⚠ Provide enough space around the DELPHYS XM to be able to move the Power Modules in the event of removal.

⚠ The DELPHYS XM should only be installed on a concrete floor or other non-combustible surface.

⚠ For use in corrosive or industrial atmosphere environments, please contact us.

⚠ For all safety requirements for the battery installation, such as battery room ventilation, please also refer to the applicable international and local safety codes and standards.

⚠ In compliance with standard IEC 60364-4-42, the DELPHYS XM must be installed in a room with restricted access; entry into this restricted access room should only be possible for authorised qualified personnel.

⚠ For optimum ventilation, the side panels must remain in place.

⚠ To fix to the floor, see Section 13.

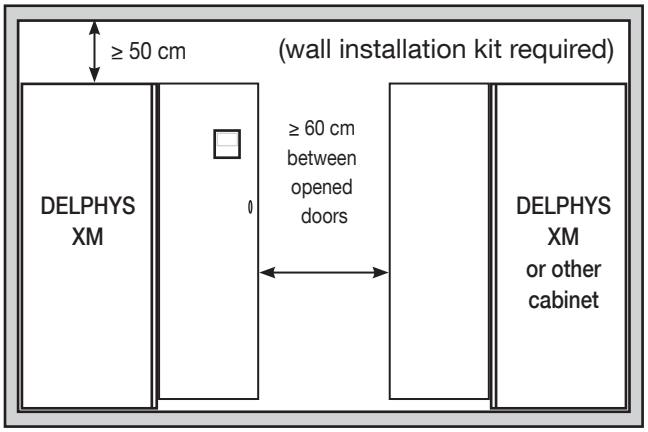
6.2. Heat dissipation and ventilation

UNIT rated power (kVA)		300	400	500	600	800
Phases in/out		3/3				
Power dissipation under nominal conditions (1)	kW	10,58	13,66	18,35	20,7	27,36
	kcal/h	9098	11748	15777	17798	23524
	BTU/h	36102	46622	62610	70628	93352
Power dissipation (max) under the worst-case conditions (2)	kW	13,81	18,41	23,01	27,62	36,82
	kcal/h	11872	15829	19786	23743	31658
	BTU/h	47111	62815	78519	94223	125630

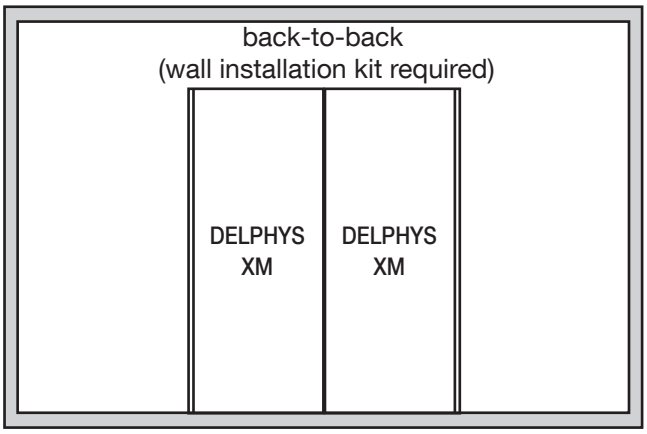
1) Based on nominal input current (400 V, battery charged) and rated output active power (PF1).

2) Based on maximum input current (low input voltage, battery recharge) and rated output active power (PF1).

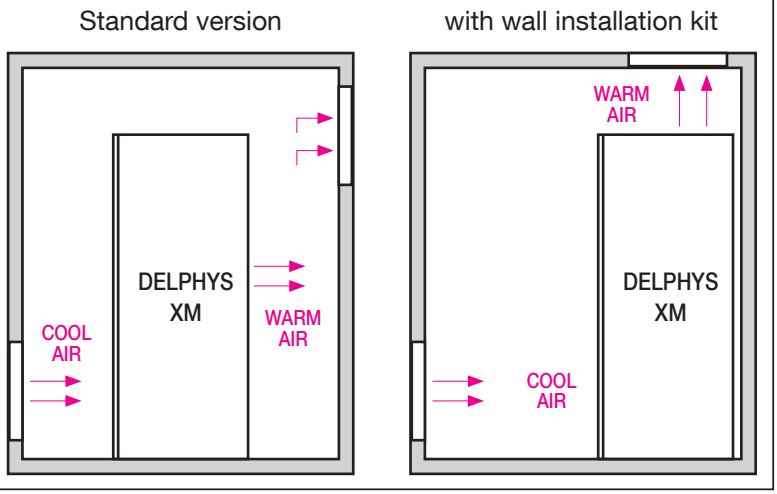
6.2-1



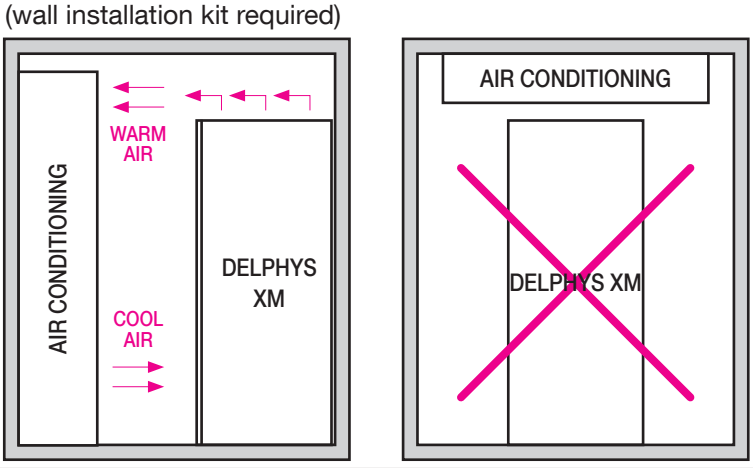
6.2-2



6.2-3 Ventilation



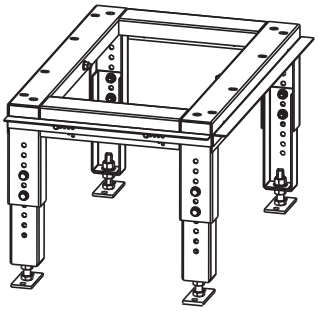
6.2-4 Air conditioning



6.3. Floor mounting

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

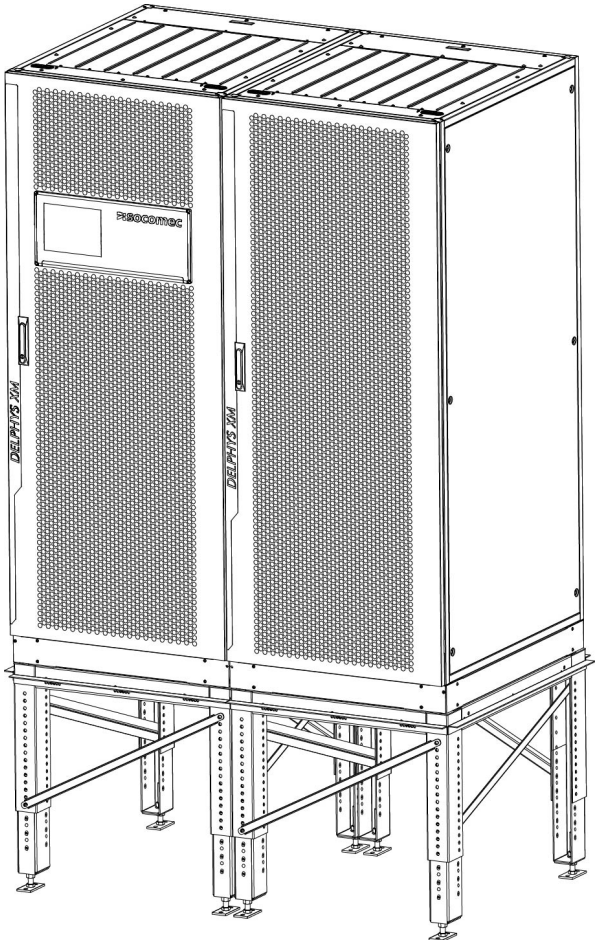
6.3.1. Installation on raised flooring

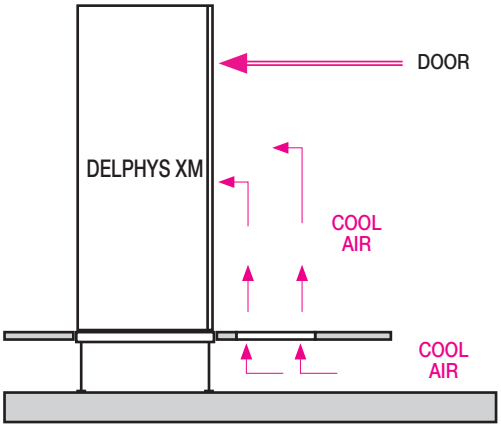


If the DELPHYS XM is to be installed on raised flooring, a Socomec adjustable frame (see image on the right) must be used to support the weight of each cabinet (see image below left).

> ⚠ Refer to the relevant installation manual provided in the packaging to assemble the frame.

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





> ⚠ If cables arrive from below on a raised floor, it is necessary to ensure that the IP20 rating is maintained once installation is complete.

7. POSITIONING

7.1. Cabinet positioning

Please place the UPS in a clean, stable environment, avoid vibration, dust, humidity, flammable gases and liquids, and corrosive environments. To prevent high room temperatures, it is recommended that an extractor fan system is installed in the room. Optional air filters are available if the UPS operates in a dusty environment.

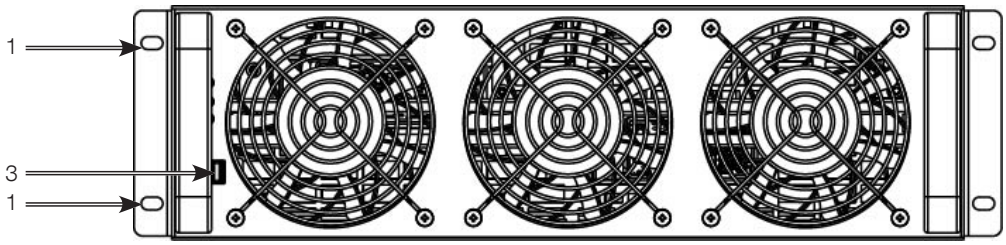
- The ambient temperature around the UPS should be maintained in a range of 0 °C to 40 °C. If the ambient temperature exceeds 40 °C, the rated load capacity should be reduced by 10% per 5 °C. The max temperature must not be higher than 50 °C.
- If the UPS is dismantled at low temperature, it might be in a condensing condition. The UPS must not be installed unless the inside and outside of the equipment is completely dry. Otherwise, there will be a danger of electric shock.
- Batteries should be mounted in an environment where the temperature is within the required specifications. Temperature is a major factor in determining battery life and capacity. In a normal installation, the battery temperature is maintained between 15 °C and 25 °C. Keep batteries away from heat sources or main air ventilation area, etc.
- If the equipment is not to be installed immediately it must be stored in a room where it is protected against excessive humidity and or heat sources.
- The highest altitude at which the UPS may operate with full load is 1500 meters.

7.2. Power module installation

Power module installation is very simple, this installation must to be performed before the UPS is connected to the grid. The UPS control system can detect the inserted or removed module(s) automatically when activated.

The user may easily operate it by following the steps specified below.

⚠ **The UPS module is rather heavy, three people are required to lift the module, or two people with an additional lifter trolley!**



MODULE INSERTION

1. Remove the decorative panel.
2. Insert the power module into the cabinet slot. Ensure that the module switch is “off” then push the module along the slot into the cabinet until the module is fully inserted.
3. Fix the module with screws (1) at the positioning screw holes.
4. Close the module switch (3) at the left of the module panel.

7.3. Q5 handle installation

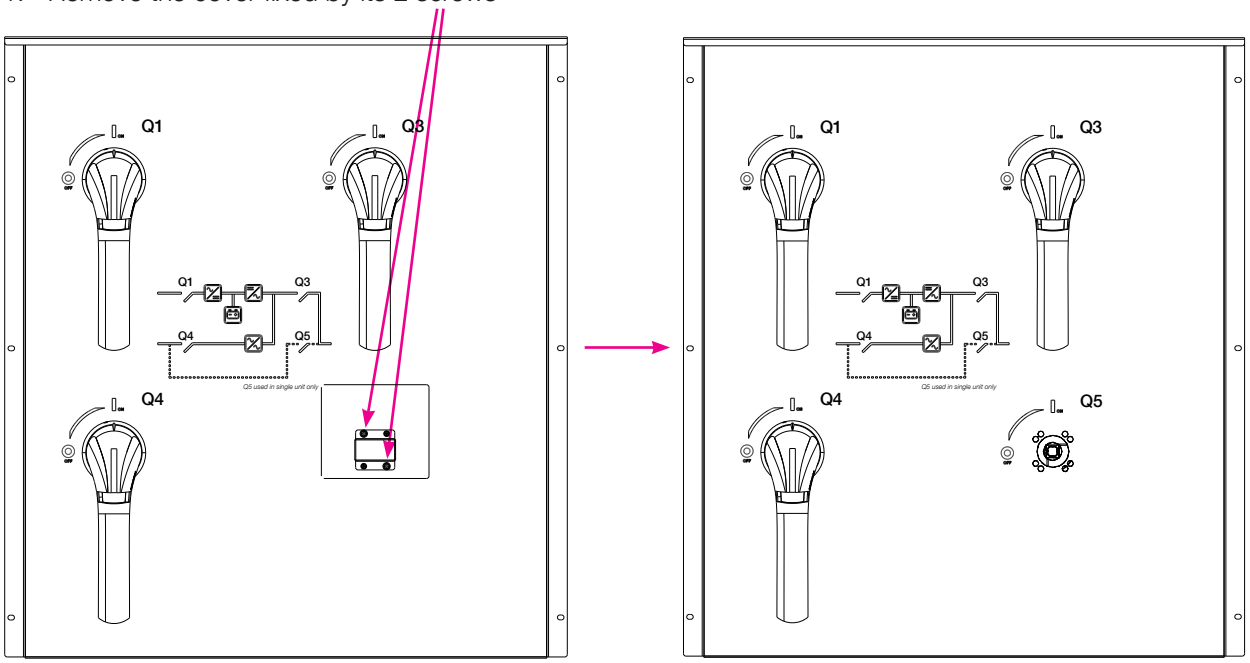
In case of a stand alone UPS (not in parallel), the qualified technician should follow the instructions to enable the MAINTENANCE BY PASS function.

The additional handle is included in the packaging in the case of a single unit with rated power up to 800 kW.

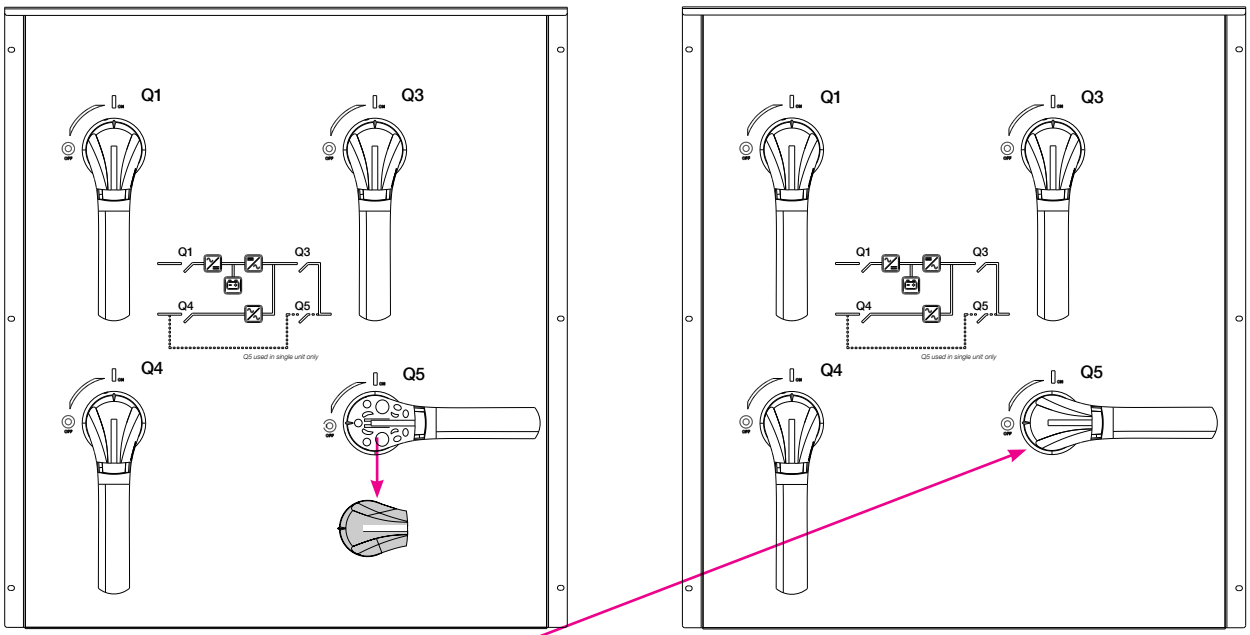
WARNING: the UPS must be disconnected from the grid before performing any operation.

7.3.1. Procedure

1. Remove the cover fixed by its 2 screws



2. Remove the blue cover and fix the handle with 2 M4X16 screws



3. Put the blue cover back on

8. ELECTRICAL PROPERTIES

8.1. Electrical safety

The installation and system must comply with relevant national 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 XM is set up for the installation of external protection devices against the backfeed of dangerous voltages on the bypass power supply.

Warning labels must be affixed on all mains power disconnectors installed away from the DELPHYS XM area, to remind support personnel that the circuit is connected to a UPS Unit (see para. 6.4.3.101 of standard IEC 62040-1).

STANDARD

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

PURPOSE

The backfeed protection ensures personnel are safeguarded against the risk of accidental resumption of power into the upstream circuit. The backfeed protection trips the automatic opening of the isolation device in the event that the static commutator malfunctions.

PRINCIPLE

An additional external isolation device must be installed upstream the UPS system. For further details about the size of the isolation device, please see Section 8.6.

Note: The protection device must be able to carry the UPS input current (common input for single source, bypass input for dual source).

The protection device should be powered by the output of the UPS.

The BACKFEED port should be enabled by the “Bypass Backfeed Trip” on the HMI.

BACKFEED protection is activated when the UPS is operating on battery mode and then bypass SCR is short-circuited.

LABEL

A sample safety label is shown below (not provided with the equipment):

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

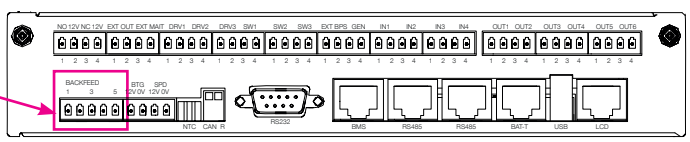
Risk of Voltage Backfeed

The operator must affix the label to the electromechanical device for isolation from the power circuit.

CONNECTION

The backfeed port consist of 3 pins: pin 1 and pin 3 are used to connect the external power supply voltage to the external isolation device coil. The external power supply should be taken from the UPS output (the cabling is not available in the standard product).

Relay rating: 270Vac/5A, 125Vac/10A, 30Vdc/3A.

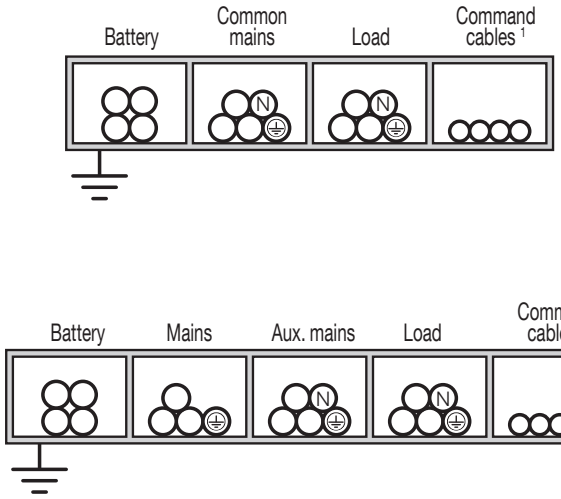


8.3. General rules for installing cables on trays

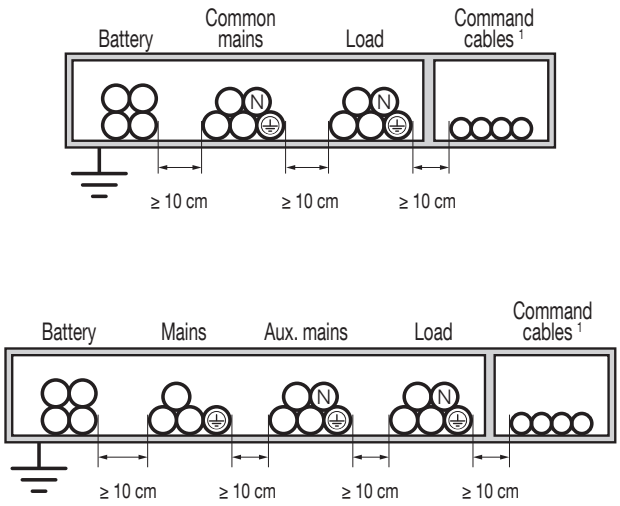
⚠ Cables must be installed on trays as indicated in the following diagrams. The trays must be positioned near the DELPHYS XM UPS Unit.

⚠ All metal and suspended trays or those on raised flooring MUST be earthed and connected to the various cabinets.

Correct installation

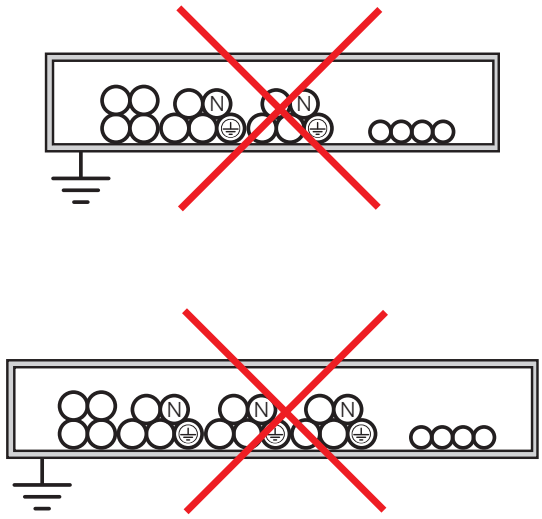


Authorised installation



⚠ Risk of electromagnetic interference between battery cables and output cables.

Incorrect installation



[1] Command cables: connections between the cabinets and each unit, alarm signals, 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.

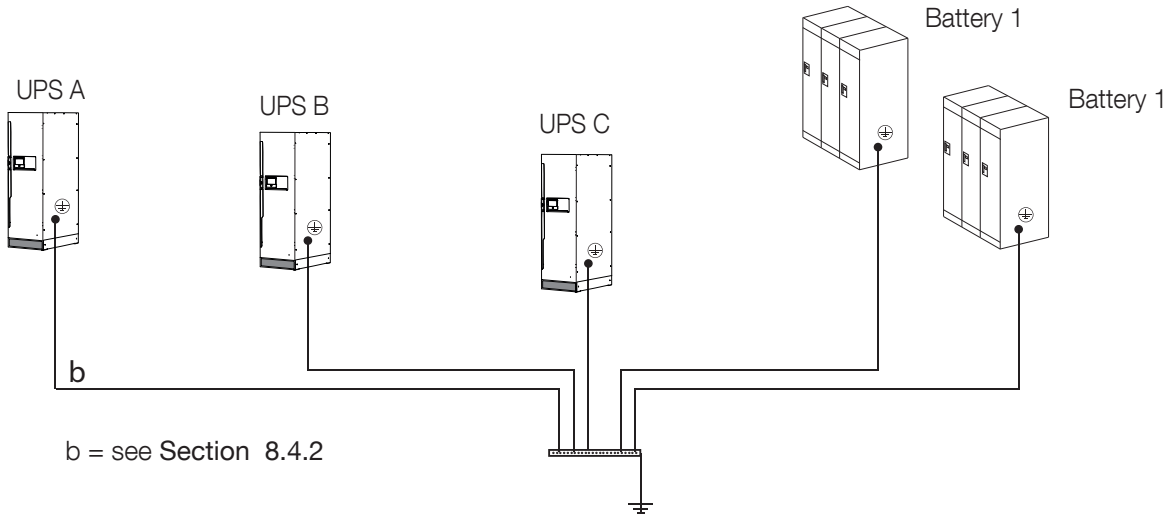
8.4. External connections

8.4.1. Connecting earth cables

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

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

* EMI filters = protection against electromagnetic disturbances.



Earth the auxiliary cabinets directly to the reference earth.
Never use the UPS Unit cabinet as an earthing unit.

8.4.2. Earthing cable cross-section

We recommend an earthing cable cross-section of at least half the phase cross-section of the cable.

It should comply with national standards (for example NFC 15100 in France).

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

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

8.4.4. Earthing systems and the UPS Unit

The earth terminal and the power terminals are located within the same cabinet.

The mains input and bypass input are connected to the same neutral line.

In a TN-S system, a 4-pole circuit breaker is recommended upstream for all inputs and downstream for the output to ensure optimal protection and safety, especially when performing specific maintenance operations.

8.4.5. Neutral cable cross-section

Check the following:

a) The minimum cross-section of the neutral cable must be at least equal to that of the active poles (L1-L2-L3).

b) Load balancing across the three phases.

c) The values that trip the protective devices.

8.5. Values of currents for cable sizing

⚠ These values are only indicative for standard single unit systems.

8.5.1. Input rectifier currents for DELPHYS XM

DELPHYS XM (kVA)	300	400	500	600	800
Phases in/out	3/3				
Maximum input current (A) (@ 176 V input)	597	812	1011	1211	1630

8.5.2. Bypass current

Operating conditions are as follows:

- Rated input/output power supply voltage is 3 x 400 V. For 380 V or 415 V, the current value must be adjusted accordingly.
- The DELPHYS XM is operating at rated power.

DELPHYS XM (kVA)	300	400	500	600	800
Phases in/out	3/3				
Rated bypass input current (A)	437	583	729	875	1166

⚠ **The sizing of cables and protection devices upstream of the bypass must take the following into account:**

- **Overloads caused by non-linear loads.**
- **Occasional overloads tolerated by the DELPHYS XM UPS Unit.**

8.6. 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 3 x 400 V
- The length of cabling between the circuit breaker and the DELPHYS XM UPS Unit is < 10 metres

RECOMMENDED PROTECTION DEVICES - Inputs					
Rated power (kVA)	300	400	500	600	800
Rectifier input main circuit breaker (A)	630	800	1000	1250	1600
Bypass input main circuit breaker(A)	500	630	800	1000	1250

Note 1: The rating of the circuit breakers must be set according 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 60 ms.

8.7. Minimum inverter short-circuit capacity

DELPHYS XM (kVA)	300	400	500	600	800
IK1 RMS current (A) - phase to neutral	1090	1460	1790	1850	2690
IK2 RMS current (A) - phase to phase	1000	1310	1570	1830	2450
IK3 RMS current (A) - 3ph without neutral	870	1170	1450	1730	2310

8.8. Protection and cross-section for battery cables

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

⚠ Please contact us to ensure correct cable sizing.

Use double insulated cables with 90 °C rating

9. ELECTRICAL CONNECTION

9.1. Installation procedures and instructions

Before carrying out work on the terminal board or on UPS Unit internal parts, switch off the DELPHYS XM, disconnect the power supply, open the external battery cabinet disconnectors, isolate the system and wait 7 minutes.

Risk of electrocution!

- Only qualified and authorised personnel are allowed to work on or to install/disassemble the product.
- These instructions apply 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 installation, 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 authorisations.
- The user must not carry out repair work on this product.
- Contact Socomec for any questions regarding 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

For future expansion purpose, it is recommended that power cables are installed according to the full rated capacity from the start. One cable connection suggestion is shown below:

UPS cabinet (kVA)	Cable dimension (cross-section x number of cables) mm²				
	V_{in} - L1 / L2 / L3	Bps - L1 / L2 / L3	V_{out} - L1 / L2 / L3	BAT +/-	GND
300	185 x 2	150 x 2	150 x 2	240 x 2	150
400	240 x 2	185 x 2	185 x 2	240 x 2	185
500	185 x 3	240 x 2	240 x 2	240 x 3	240
600	240 x 3	185 x 3	185 x 3	240 x 4	240
800	240 x 4	240 x 3	240 x 3	240 x 5	240 x 2

600 kVA bottom version with common inputs: the input must be shared between V_{in} and Bps due to copper bar link for common inputs.

800 kVA switches version with common inputs: the input must ONLY be connected on V_{in} due to copper bar link for common inputs.

Power cable connector requirements

Model	Connector	Connection Mode	Bolt Type	Bolt Hole Diameter	Torque
300kVA	Mains input connector	Crimped OT terminals	M12	13.5 mm	44 Nm
	Bypass input connector				
	Battery input connector				
	Output connector				
	Earth connector				
400kVA	Mains input connector				
	Bypass input connector				
	Battery input connector				
	Output connector				
	Earth connector				
500kVA	Mains input connector				
	Bypass input connector				
	Battery input connector				
	Output connector				
	Earth connector				
600kVA	Mains input connector				
	Bypass input connector				
	Battery input connector				
	Output connector				
	Earth connector				
800kVA	Mains input connector				
	Bypass input connector				
	Battery input connector				
	Output connector				
	Earth connector				

If primary loads are non-linear loads, increase the cross-sectional areas of neutral wires by a factor of 1.5–1.7.

The nominal battery discharge current refers to the current of forty 12 V batteries at 480 V in standard configuration.

When the mains input and bypass input share a power source, configure both types of input power cables as mains input power cables.

⚠ **Double insulated cables rated at 90 °C should be used; please contact us for other requirements.**

9.3. Cabling the mains power

⚠ Ensure the cabinet switches are “open” before starting these steps.

⚠ Finish the connections with the battery cables.

9.3.1. Common input and separated input

Before the equipment is installed, must confirm the input source type: common input or separated input.

⚠ WARNING: If the MAIN source is through separated inputs, the copper bars that connected bypass and mains internally to the UPS must be removed. See image in Section 9.4.

9.3.2. Top and bottom entry

- Top entry: the UPS can be connected directly from above on the connection pads.

⚠ it is necessary to ensure that the IP20 rating is maintained once installation is complete.

- Bottom entry: If the cables arrive from below, they must pass through a cabinet installed to the right of the UPS:
  - 300-500 kVA: the cabinet is a cable tray enabling passage of the power cables.

⚠ WARNING: do not install this cabinet with higher power UPS, as the cables can overheat..

  - 600 kVA: the side cabinet includes copper bars connected directly to the UPS. The connection between the side cabinet and the UPS is made in the factory. The cables arriving from below are directly connected to the connection pads in the side cabinet.
  - 800 kVA: the side cabinet includes switches and copper bars connected directly to the UPS. The connection between the side cabinet and the UPS is made in the factory. The cables arriving from below are directly connected to the connection pads in the side cabinet.

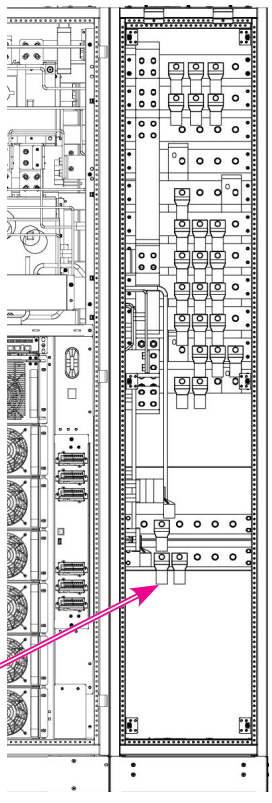
9.3.3. Connection sequence

300-500 kVA top/bottom, 600 kVA top

1. Earth
2. Neutral top position
3. V_{in} A, B, C
4. V_{out} A, B, C
5. Neutral bottom position
6. Bps A, B, C
7. Batt +/-

600 kVA bottom*

1. Earth
2. Batt +/-
3. Bps A, B, C
4. V_{out} A, B, C
5. V_{in} A, B, C
6. Neutral



* In common mains, comply with the position of the lugs as described

800 kVA without switch top

1. Earth
2. V_{in} A, Bps A, V_{out} A
3. Batt –
4. V_{in} B, Bps B, V_{out} B
5. Batt +
6. Neutral
7. V_{in} C, Bps C, V_{out} C

800 kVA switches version bottom

1. Earth
2. Bps A, B, C
3. V_{out} A, B, C
4. V_{in} A, B, C
5. Batt +
6. Batt –

800 kVA switches version top

1. Earth
2. V_{in} A, B, C
3. V_{out} A, B, C
4. Bps A, B, C
5. Batt +
6. Batt –

800 kVA switches version Common Mains bottom

1. Earth
2. **Do not connect cables to Bps A, B, C**
3. V_{out} A, B, C
4. V_{in} A, B, C
5. Batt +
6. Batt –

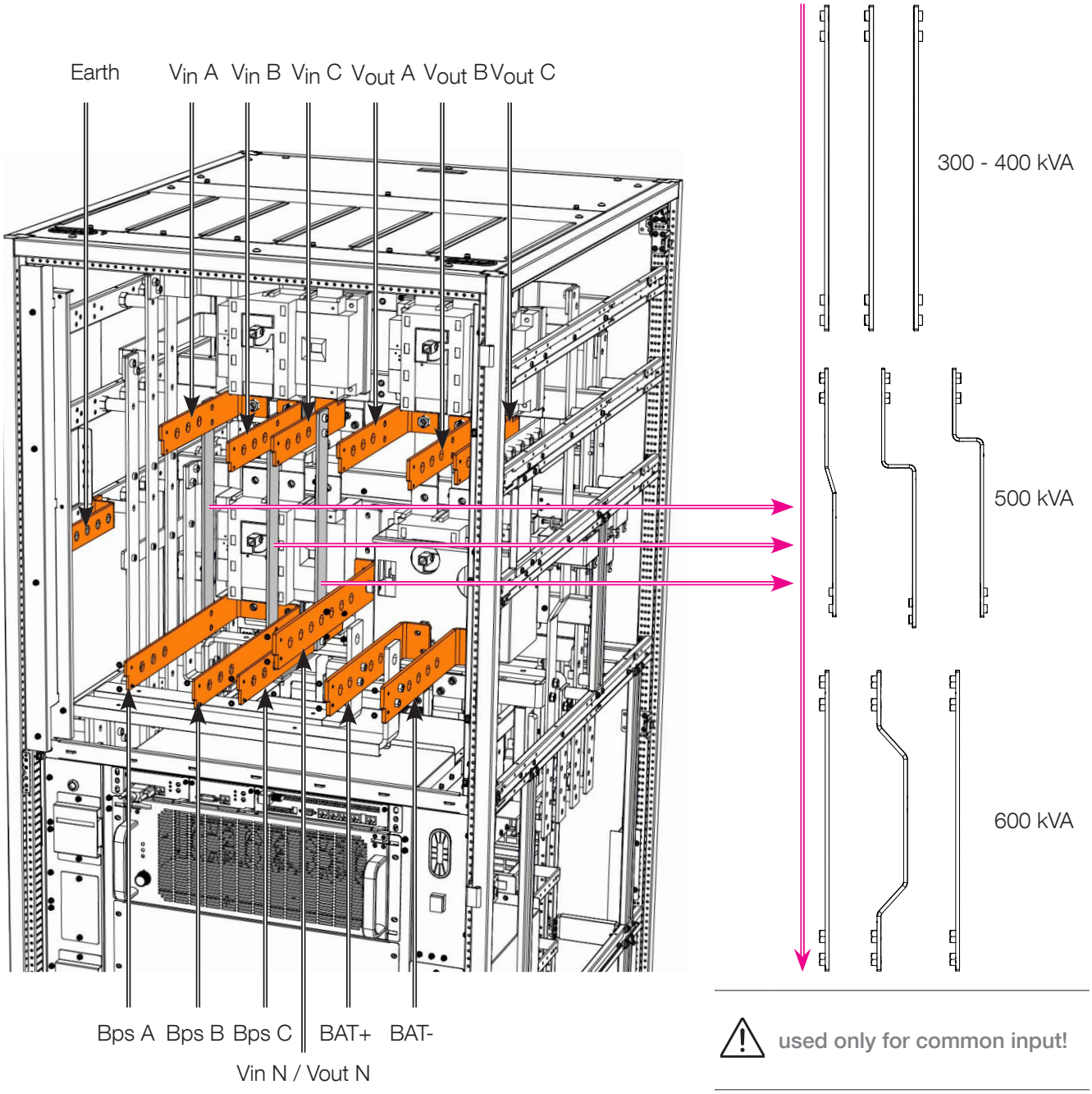
800 kVA switches version Common Mains top

1. Earth
2. V_{in} A, B, C
3. V_{out} A, B, C
4. **Do not connect cables to Bps A, B, C**
5. Batt +
6. Batt –

9.4. Location of connections

Nominal diameter [mm]	Tightening torque [Nm] (+/- 10%)
6	8.3
8	20
10	40
12	70

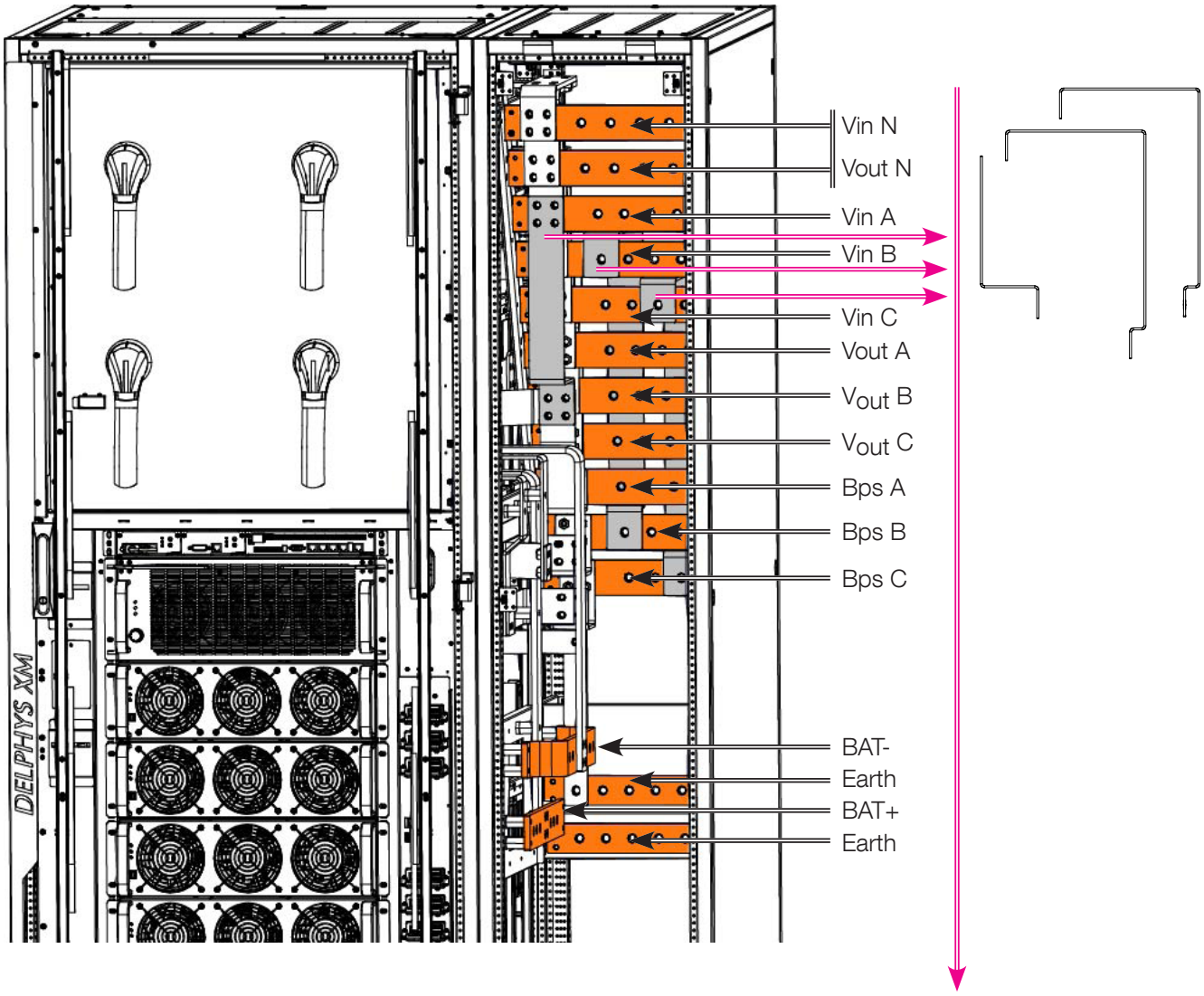
300 - 500 kVA TOP AND BOTTOM ENTRY / 600 kVA TOP ENTRY



⚠ used only for common input!

⚠ remove these 3 copper bars to switch to a separate mains input source!

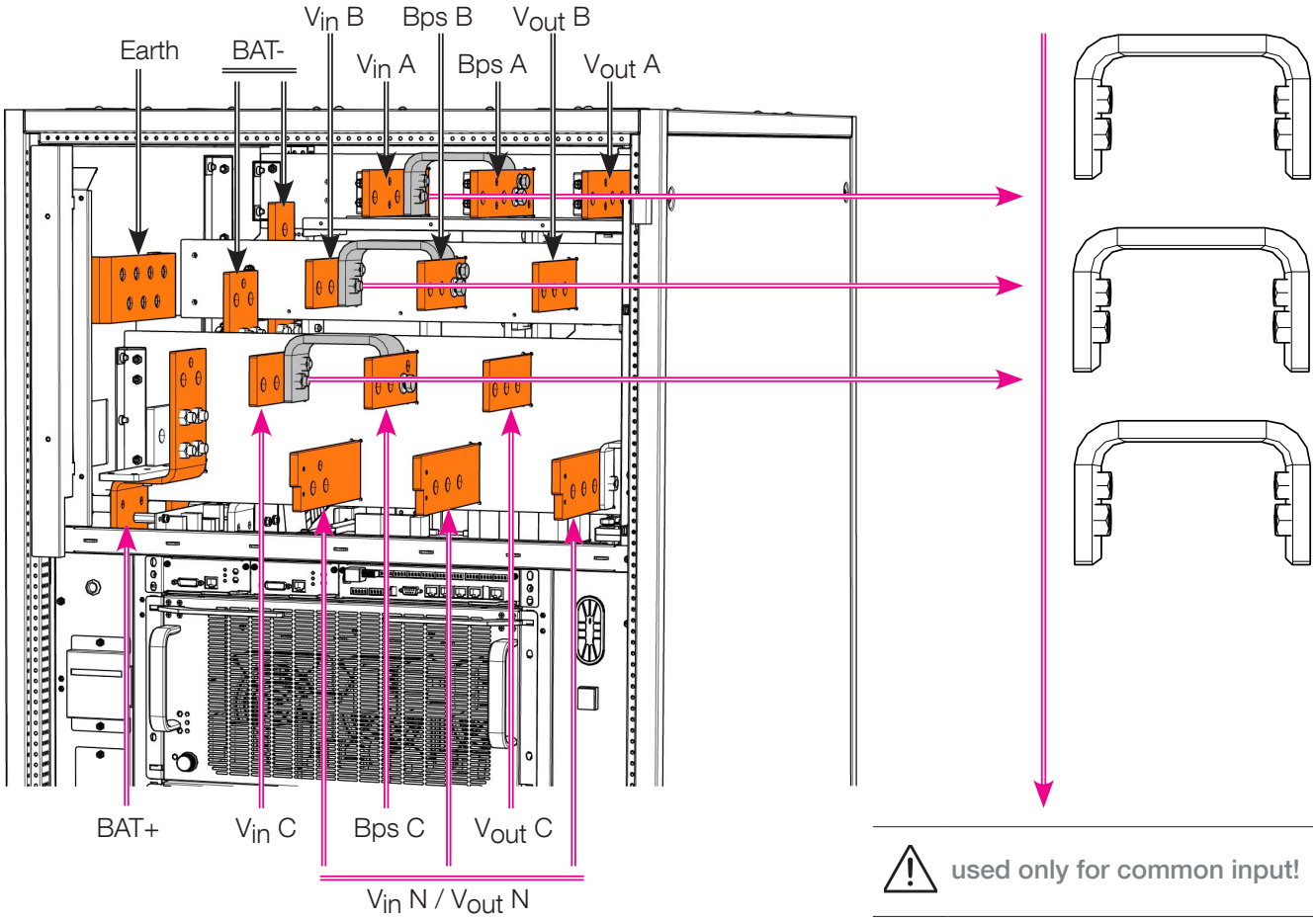
600 kVA BOTTOM ENTRY



⚠ used only for common input!

⚠ remove these 3 copper bars to switch to a separate mains input source!

800 kVA TOP ENTRY

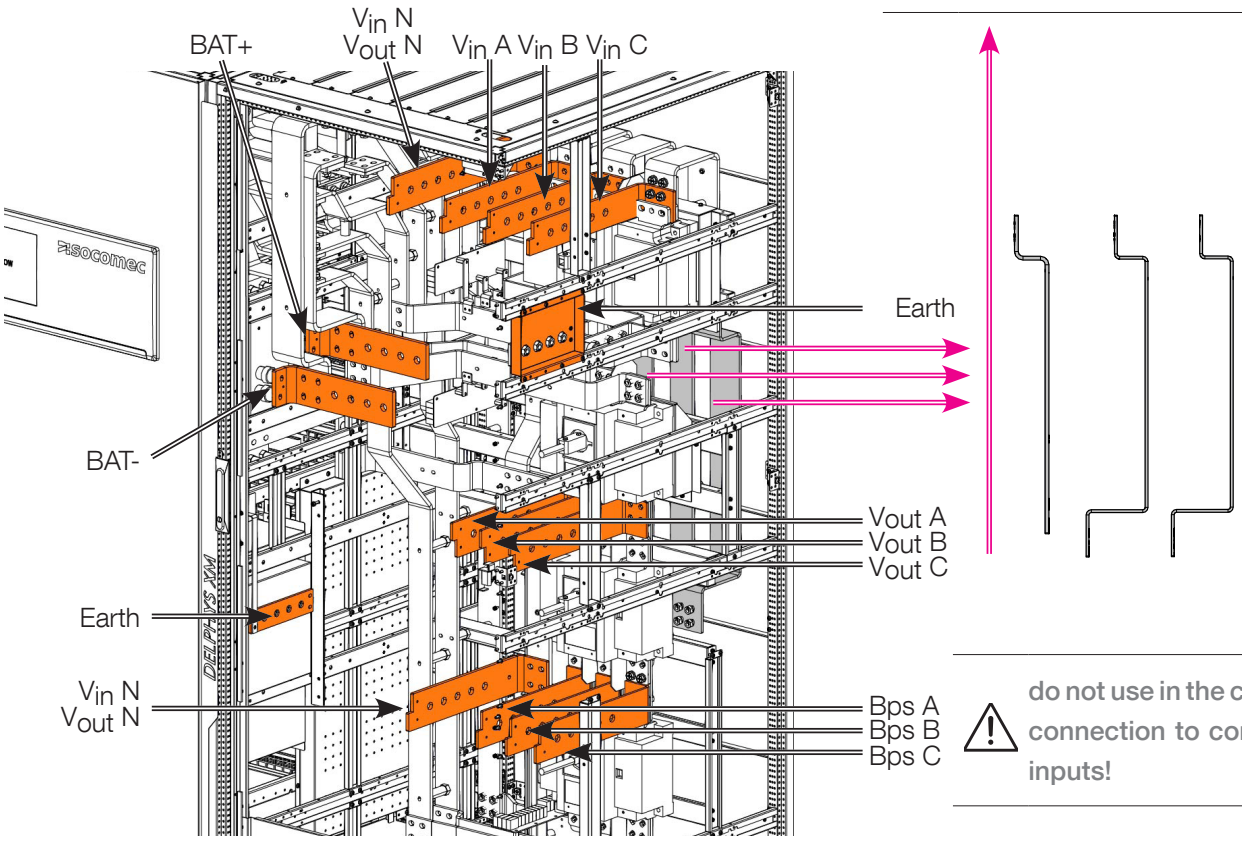


⚠ used only for common input!

⚠ remove these 3 copper bars to switch to a separate mains input source!

Rear access needed!

800 kVA SWITCHES VERSION



⚠ do not use in the case of connection to common inputs!

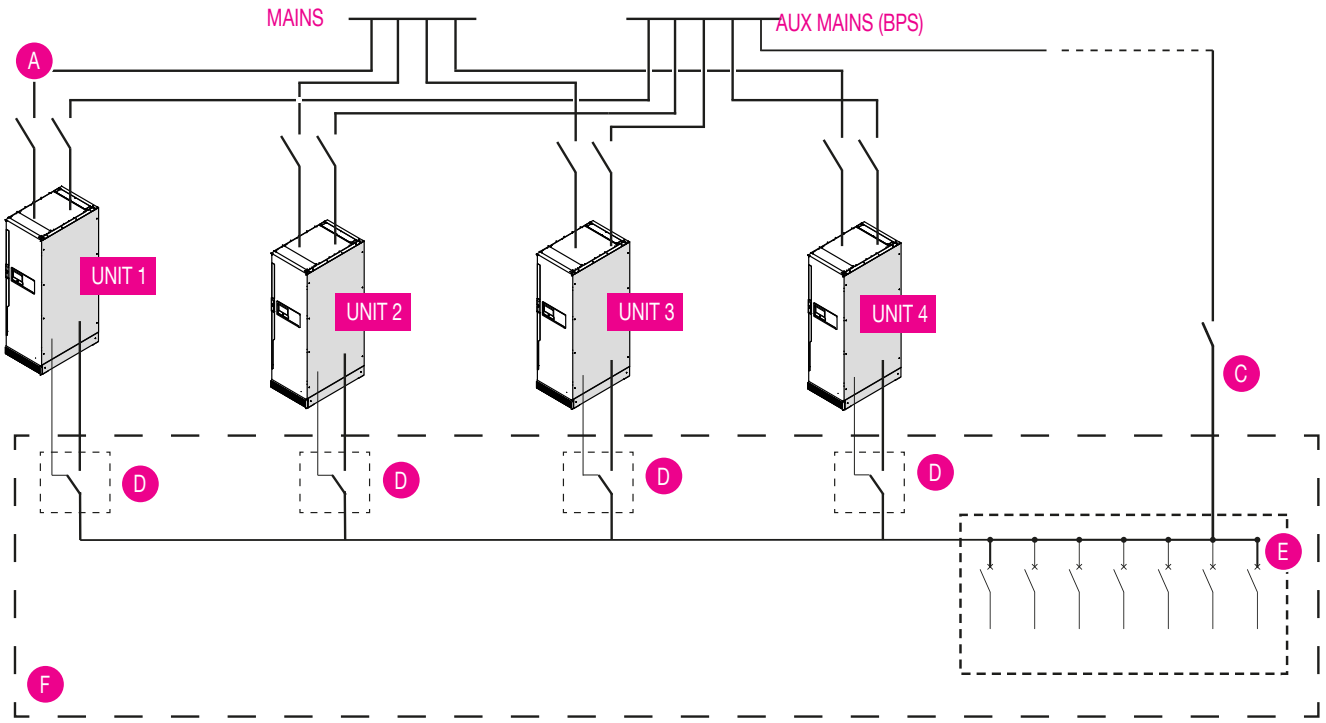
9.5. Parallel configuration

The basic installation procedure for a parallel system involving two or more UPS units is the same as that for single system. The following sections provide the installation procedures specified to the parallel system.

The UPS units includes 2 x 5 m-long cables for communication between units in parallel.

Up to 6 units of 300/400/500/600 kVA UPS and up to 4 units of 800 kVA UPS units can be connected in parallel.

Connect all the UPS units required to be put in parallel as shown below.



Key:

A	Input protections Q1 (rectifier) Q4 (Bypass or common)	E	Distribution
C	Maintenance bypass Q5	F	PDU
D	Coupling switches (Q3)		

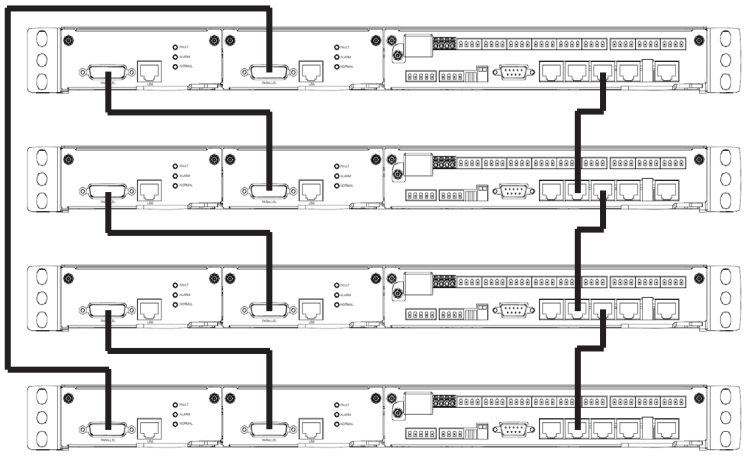
Make sure each UPS input switch is in “off” position and there is no any output from each UPS connected. Battery groups can be connected separately or in parallel, which means the system itself provides both separate battery and common battery.

CAUTION!

A group of parallel systems is equivalent to a high capacity UPS unit, but it has higher reliability. In order to ensure that all UPS units are currently sharing data, and comply with the relevant wiring rules, the following requirements should be met:

- All UPS units must have the same rating and be connected to the bypass power supply in the same way.
- Bypass and the mains input power must be received using the same neutral.
- The output of all UPS units must be connected to a common output bus.
- All bypass input cables and UPS output cables should be of the same length and specification, so that the units provide equal currents when operating in bypass mode.

Shielded and double insulated control cables available must be interconnected in a ring configuration between UPS racks as shown below. The parallel control unit is mounted on each UPS rack. The ring configuration ensures high reliability of control.



1. Shielded and double insulated control cables,
2. RS485 connection (RJ45 plug).

RS485 cabling, follow the instructions:

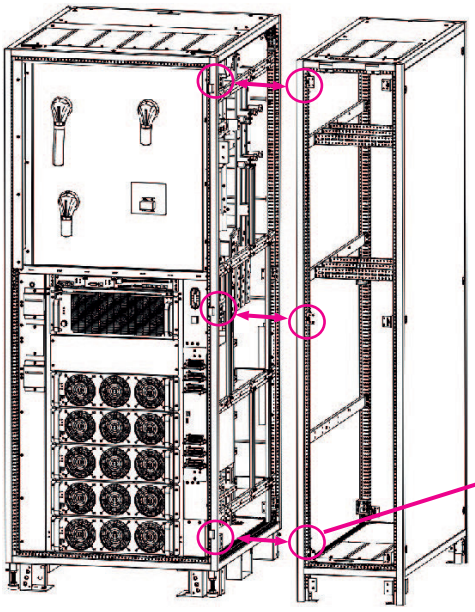
1. disconnect the RS485 cable connected to port N8 in UPS N2 to N, keep it connected only with UPS 1,
2. connect the cable in port N9 of UPS 1 to port 8 of UPS 2,
3. connect the cable in port N9 of UPS 2 to port 8 of UPS 3,
4. connect the cable in port N9 of UPS N to port 8 of UPS N+1.

WARNING: max communication cable length 15 m (please consider the cable routing, at least 2 m are required for routing into the UPS).

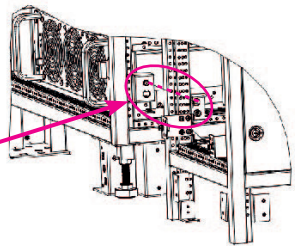
9.6. Optional configurations

9.6.1. Side cabinet 300-500 kVA

Nominal diameter [mm]	Tightening torque [Nm] (+/- 10%)
6	8.3
8	20
10	40
12	70



Use 8 x M8 screws to assemble the 2 cabinets together. This operation need front and rear access.



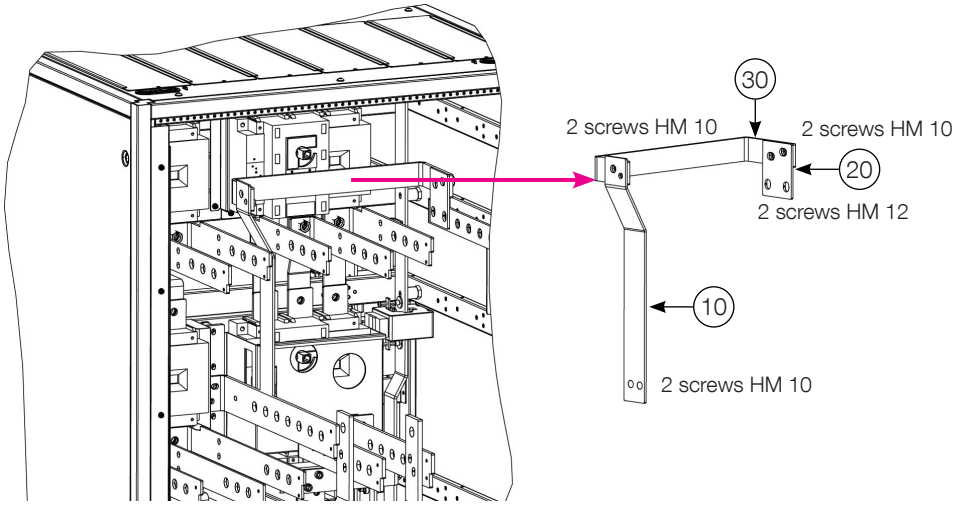
⚠ To install the side cabinet on the left side, align the corners on the left side of the UPS cabinet and on the right side of the side cabinet.

9.6.2. PEN kit

5 versions:

300-500 kVA

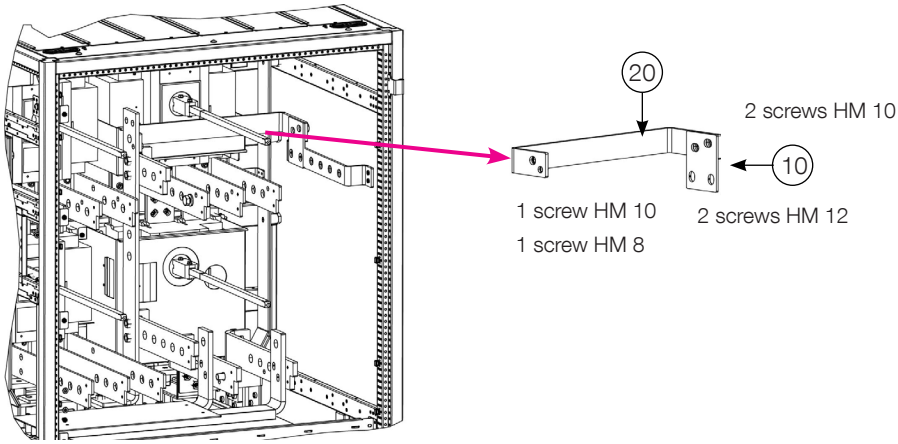
- TOP and BOTTOM:



Rep	BOM
10	4166-1420
20	4166-1419
30	4166-1418

600 kVA

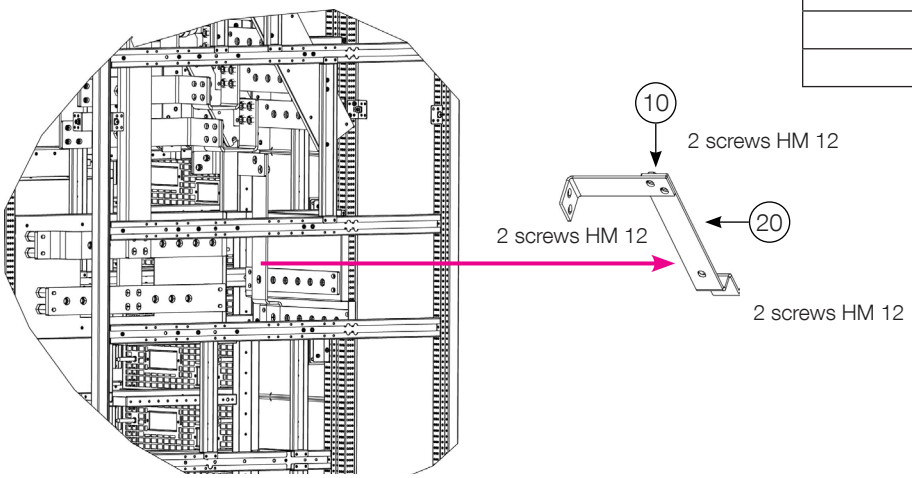
- TOP



Rep	BOM
10	4166-1419
20	4166-1421

• BOTTOM:

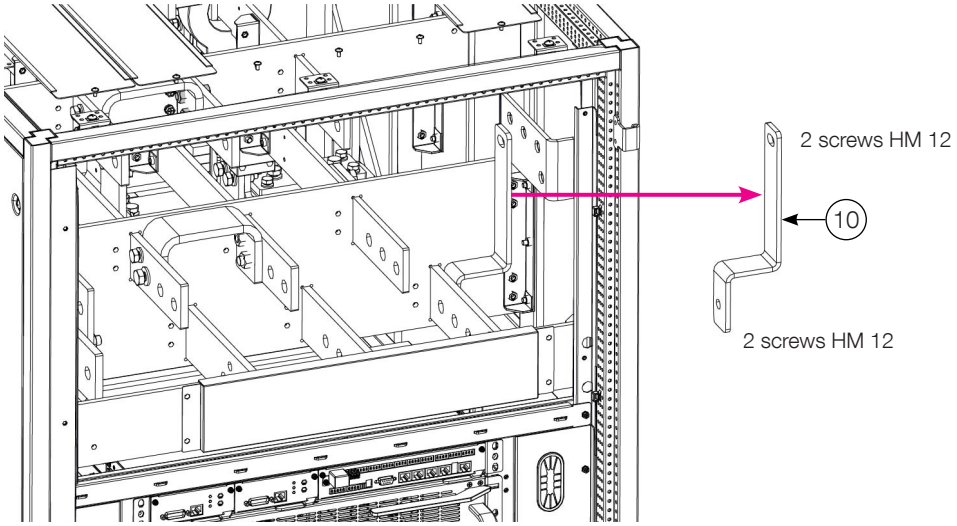
Nominal diameter [mm]	Tightening torque [Nm] (+/- 10%)
6	8.3
8	20
10	40
12	70



Rep	BOM
10	4166-1423
20	4166-1422

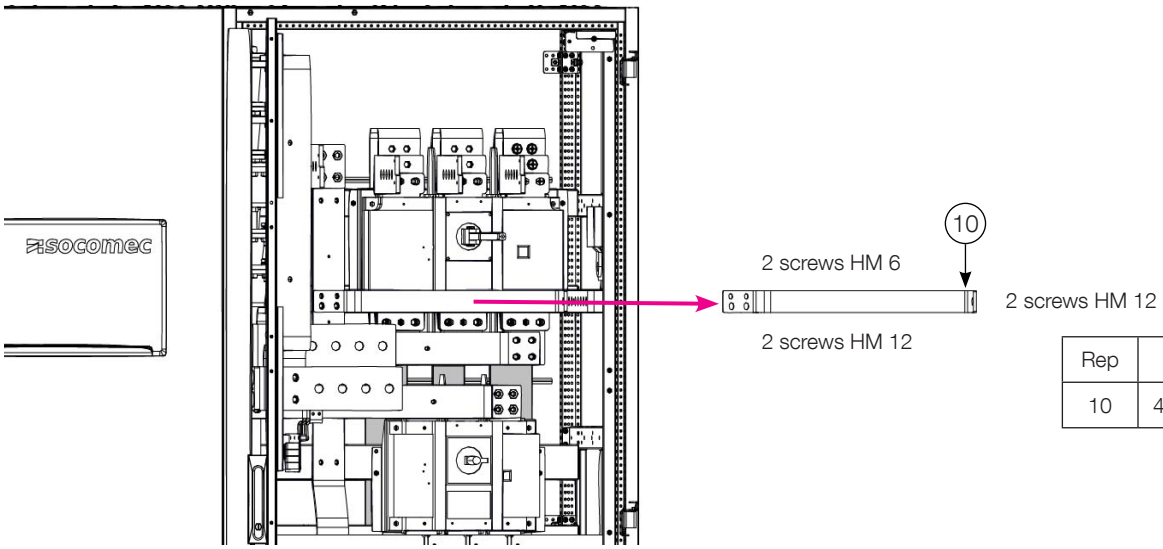
800 kVA

• TOP:



Rep	BOM
10	4166-1047

• BOTTOM:



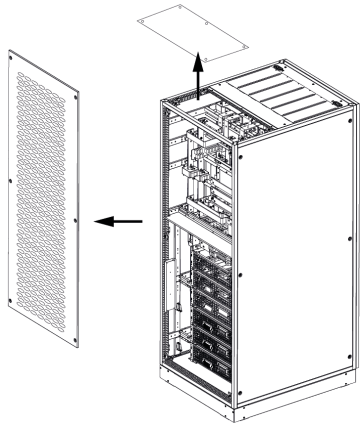
Rep	BOM
10	4166-1048

9.6.3. Wall installation kit

⚠ Not possible in IP30.

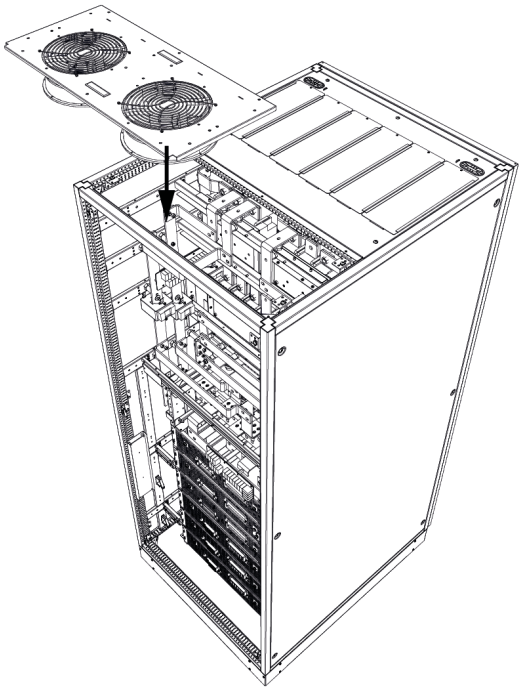
Nominal diameter [mm]	Tightening torque [Nm] (+/- 10%)
6	8.3
8	20
10	40
12	70

1. Remove the rear cover and the top cover.



2. Locate the 5 cables tied near the fan kit.
   Remove the insulation tube on 2 of the cables. (230V connector and 15V connector)

3. Mount the fan kit (10 screws).

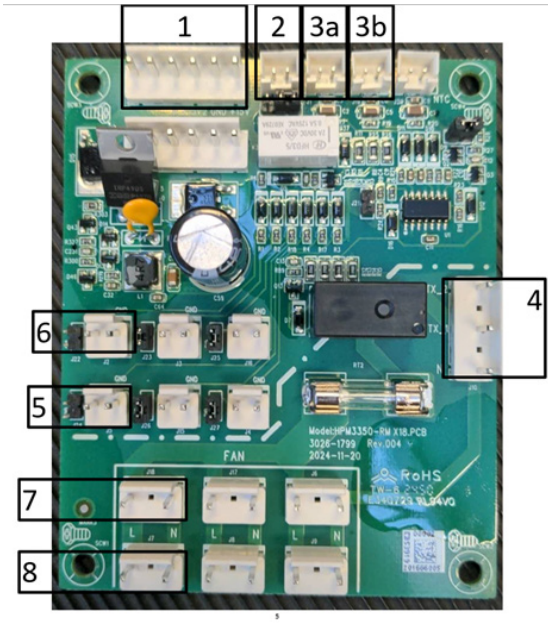


4. Connect the cables into the right connector on the fan kit PCBA following the table and the figure.

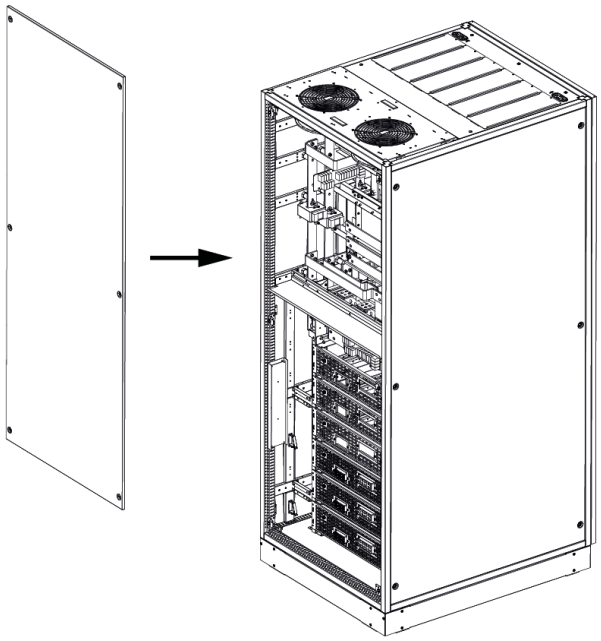
The N° 1 2 3 4 should be wired by the operator;

The N° 5 6 7 8 are connected by default.

N°	Cable colour	Description	Operation
1	Red-brown-black	PCBA 15 V power supply, from Power Module and bypass, Black is GND	Operator wiring
2	Double black cable marked with a label	Dry contact signal	
3a 3b	Double black	2 NTC sensors, applicable regardless of connecting position	
4	Red-blue	Fan power supply from UPS output, Vph-N	
5	Brown-white	Fan 1 fault signal	Default wiring with the kit
6		Fan 2 fault signal	
7	Red-black	Fan 2 power supply	
8		Fan 1 power supply	



5. Install the new rear panel without holes (the old panel can be set aside).



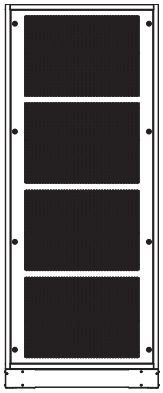
9.6.4. IP30 rear panel

Not compatible with Wall installation kit.

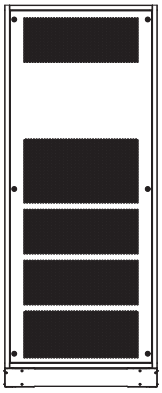
When the IP30 rear panel is installed, UPS power need derating to 85% of nominal power.

An IP30 derating warning label is included in the IP30 KIT package, this label must be affixed to the nameplate when the IP30 rear panel is installed.

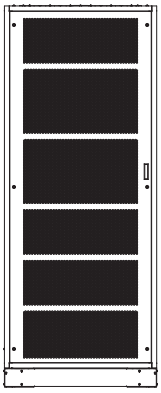
1- remove the default rear panel (IP20),



300-800 kVA IP20 rear panel 2.0
800 kVA switches version (3DMD800) needs 2 pcs



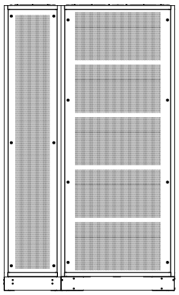
300-600 kVA IP20 rear panel 1.0



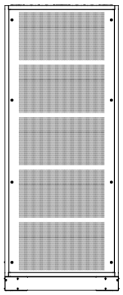
800 kVA IP20 rear panel 1.0
800 kVA switches version (3DMD800) needs 2 pcs

the 800kVA switches version has 2 panels to remove.

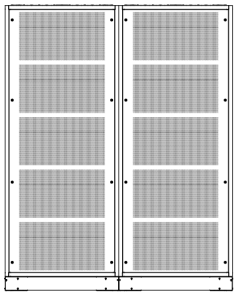
2- install the new rear panel.



300-600 kVA, with side cabinet



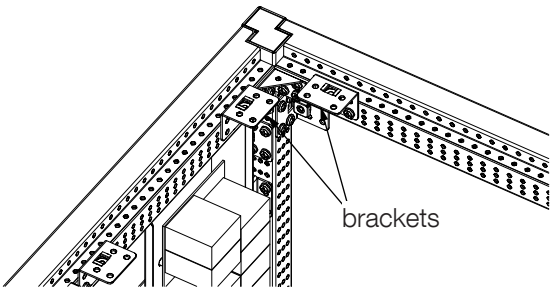
300-800 kVA, single cabinet



800 kVA, double cabinet

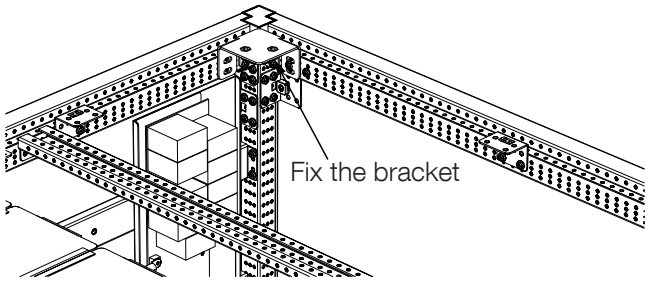
9.7. Top box assembly on the UPS cabinet (without connection)

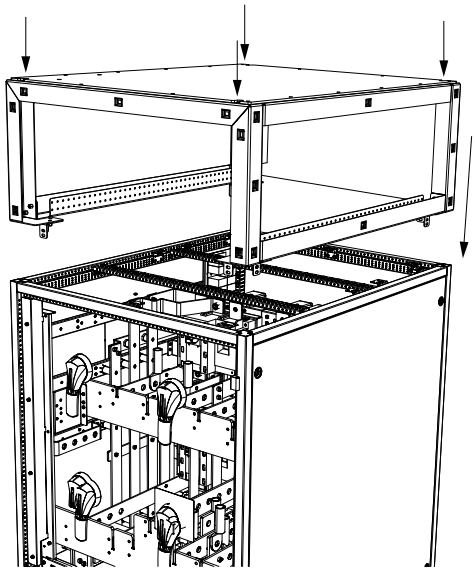
1. Disassemble the UPS roof and the brackets (not used)



Nominal diameter [mm]	Tightening torque [Nm] (+/- 10%)
5	4.8
6	8.3
8	20
10	40
12	70

2. Disassemble the Top Box panels
3. Fix the bracket with 4 M5*10 screws and then assemble the Top box on this bracket by lifting





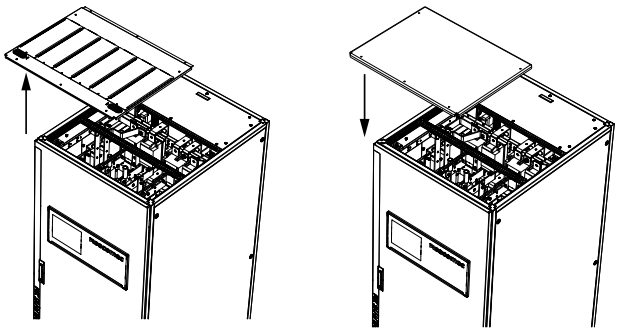
option managed in ETO used to define the busbar flanges connection. The illustration does not show the final version, please contact us.

4. Reassemble the panels

After a short circuit, please check the integrity of cable ties used for the top box option.

9.8. Top plate for cable glands assembly

1. Disassemble the roof front plate
2. Replace the native top plate by the top plate for cable gland

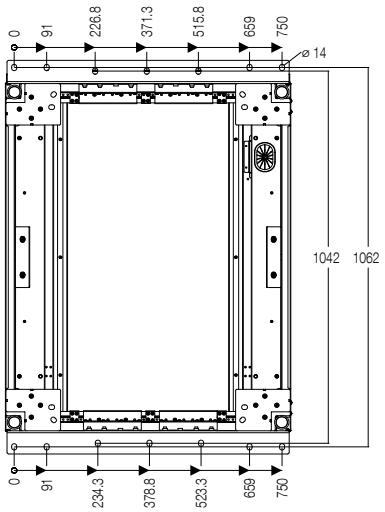


3. Screw the M5x20 screws into each of the housings

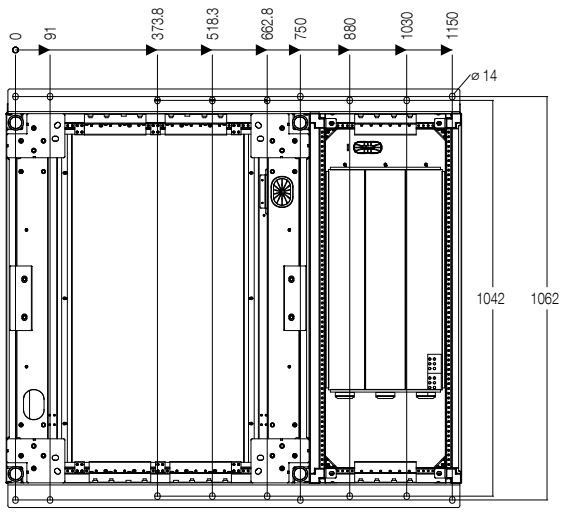
Note: Drill the top plate before the assembly

9.9. Seismic kit zone 4 assembly

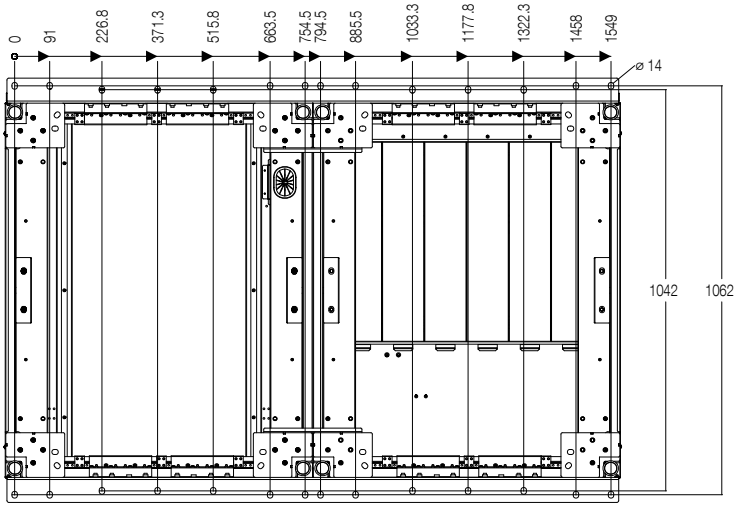
1. Drill the ground to fix the seismic kit



300 - 800 kVA top entry

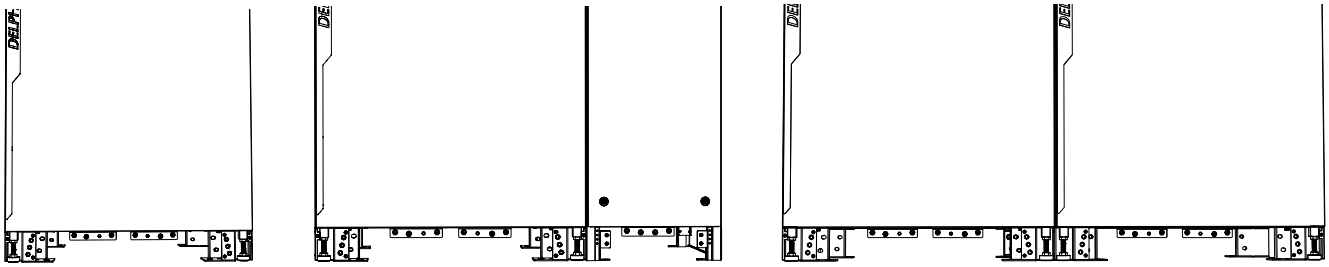


300 - 600 kVA bottom entry

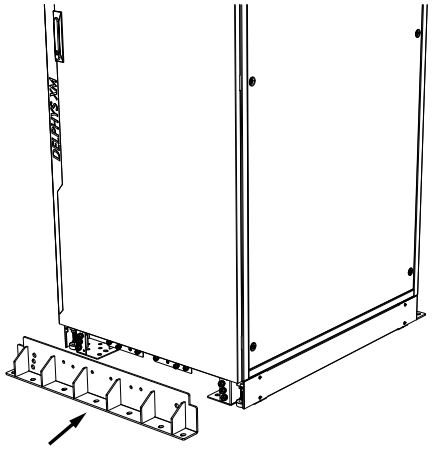


800 kVA switches version

2. Disassemble the UPS bottom plate from the front and the rear of the product.

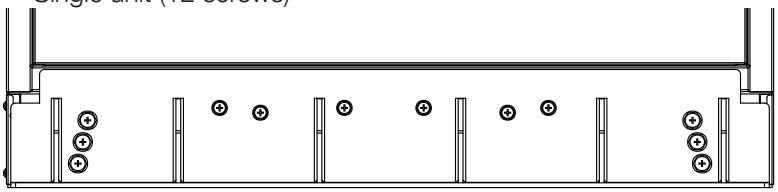


3. Screw the M8*20 bottom seismic brackets of the UPS at the front and at the back of the product.

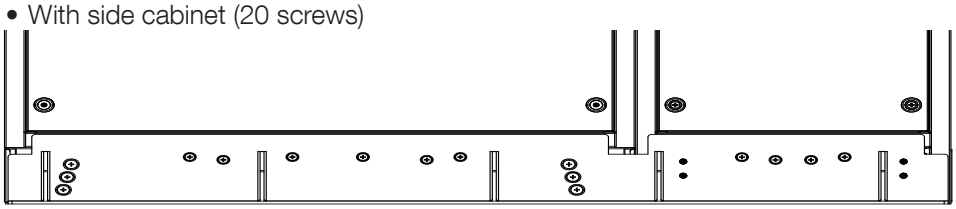


Nominal diameter [mm]	Tightening torque [Nm] (+/- 10%)
5	4.8
6	8.3
8	20
10	40
12	70

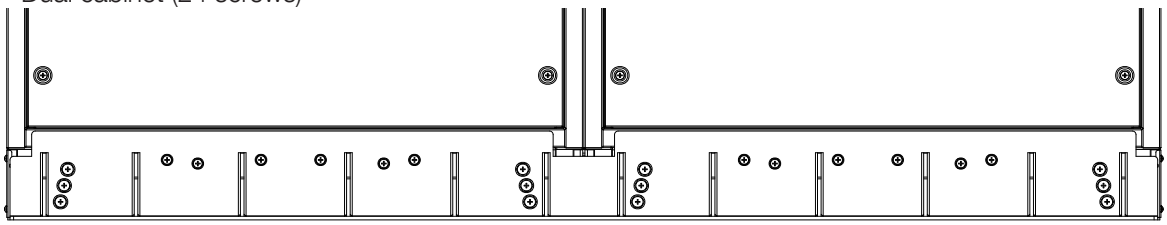
- Single unit (12 screws)



- With side cabinet (20 screws)



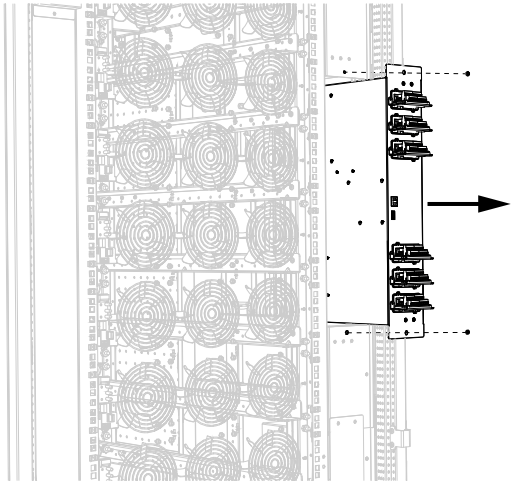
- Dual cabinet (24 screws)

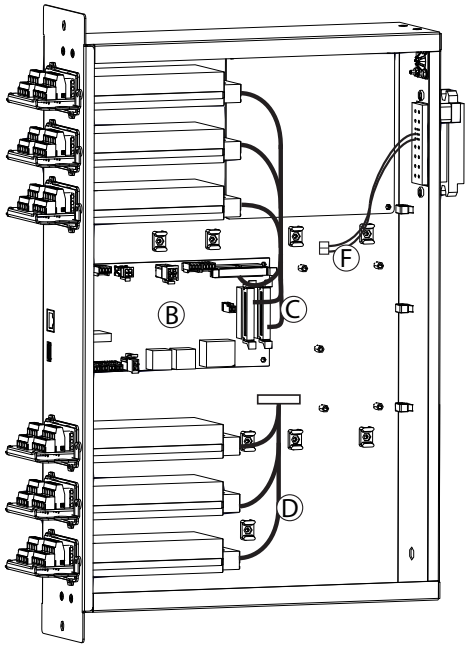


9.10. Com slot extension assembly

The HP613 expansion card (A) is supplied with its screws and 3 ribbon cables (E).

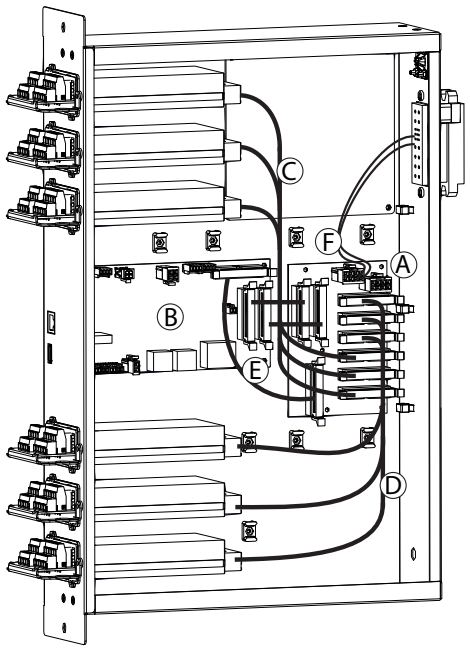
1. Unscrew the two M4*10 to put out the com slot





2. Remove and open the Comslots chassis for internal access.

3. To install the HP613 extension board (A), remove the screws from the chassis, install the board, and then screw back the screws.
4. Disconnect the cables (C) from the Comboard (B) to the three standard slots, leaving the cables in the slots. Connect the cables from the three standard slots to the extension board:
   - Slot 1 disconnected from XC13 and connected to XC2 of HP613
   - Slot 2 disconnected from XC12 and connected to XC3 of HP613
   - Slot 3 disconnected from XC7 and connected to XC1 of HP613



5. Detach the cables (D) from the three extension slots and connect them to the extension board:
   - Slot 1 Ext. connected to XC5 of HP613
   - Slot 2 Ext. connected to XC6 of HP613
   - Slot 3 Ext. connected to XC4 of HP613

6. Connect the 3 ribbons cables (E) from ComBoard to extension board HP613:
   - XC7 of ComBoard connected to XC10 of HP613
   - XC12 of ComBoard connected to XC11 of HP613
   - XC13 of ComBoard connected to XC12 of HP613

7. Detach the power supply (brown-black) cable (F) and insert it to the XC20 of HP613.

8. Close the chassis and install it back to the UPS
9. Screw the two M4*10 to put back the com slot

9.11. External battery connection

⚠ **Before carrying out any of these steps, ensure that:**
- **The battery protection devices are open.**
- **The DELPHYS XM is not live and all mains or battery switches are open.**
- **The switches upstream of the DELPHYS XM are open.**

⚠ **Use double insulated cables or the cables supplied with the unit to connect the DELPHYS XM to the battery coupling cabinet.**

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

⚠ **If batteries not supplied by the manufacturer of the DELPHYS XM are used, it is the responsibility of the installer to check the electrical compatibility and the provision of suitable protective devices between the DELPHYS XM and the batteries (fuses and switches of sufficient capacity to protect the cables from the DELPHYS XM to the battery protection cabinet). As soon as the DELPHYS XM is switched on (before closing the battery switches), the battery parameters (voltage, capacity, number of elements, etc.) must be checked by a Socomec technician.**

⚠ **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 pre-trained authorised staff. The following connections must be made:**
- **Battery cabinet to earth.**
- **Polarities + and - to the UPS.**
- **Between battery sections and/or between racks.**

9.11.1. VRLA battery connection

The UPS system adopts a single battery pack architecture, with a total of 30 to 50 blocks in series. The optimal range is 40 to 50 blocks, in that range there is no derating.

Connect the battery positive and the battery negative to the UPS system. Users can select the capacity and quantity of batteries according to their own needs.

⚠ **The BAT+ of the UPS connecting pole is connected to the anode of battery 30 (31/32/33/34/35/36/37/38/39/40/41/42/43/44/45/46/47/48/49/50), and BAT- is connected to the cathode of battery 1.**

⚠ **For some lithium battery brands, an additional power supply is required, which DELPHYS XM does not provide.**

Factory setting of the long-run unit is:

- battery quantity---30 pcs,
- battery capacity---12 V 100 AH.

When connecting 31/32/33/34/35/36/37/38/39/40/41/42/43/44/45/46/47/48/49/50 batteries, please re-set the desired battery quantity and its capacity after the UPS system starts up in AC mode. Charger current may be adjusted automatically according to the battery capacity selected. All related settings can be done via the HMI panel.

9.11.2. Lithium Ion battery connection

UPS adopts single battery pack architecture, the voltage of battery voltage is 512 Vdc. Then connect the positive battery pole and the negative battery pole to the UPS system.

BAT+ of the UPS connecting pole is connected to P+ of the Lithium Ion battery, and the BAT- is connected to P- of the Lithium Ion battery.

The battery capacity is defined by the Lithium Ion battery.

With a Lithium Ion battery, the UPS can communicate with the battery in 2 different ways, dry contacts or direct BMS communication.

DRY CONTACT

A Lithium Ion battery can be connected to 4 dry contacts. For wiring each Dry Contact, the installer should use 2x1 mm^2 cables (not provided).

For some battery cabinets, the BMS must be supplied by the mains and the earth connection.

Please refer to the manual of the battery cabinet supplier for further details about cable sizing and protection devices (cables & protection devices not provided)

WARNING: the cables used for the "BMS" power supply must be protected against short circuit.

In the case of DRY contact communication, the SoC (State of Charge) data is not accurate, please refer to the SoC data available via the Battery Display or the Battery Communication Bus.

DIRECT BMS COMMUNICATION

The UPS has to be connected to the battery by an ethernet cable with RJ45 plug (not included).

For some battery cabinets, the BMS must be supplied by the mains and the earth connection.

Please refer to the manual of the battery cabinet supplier for further details about cable sizing and protection devices (cables & protection devices not provided).

WARNING: the cables used for the "BMS" power supply must be protected against short circuit.

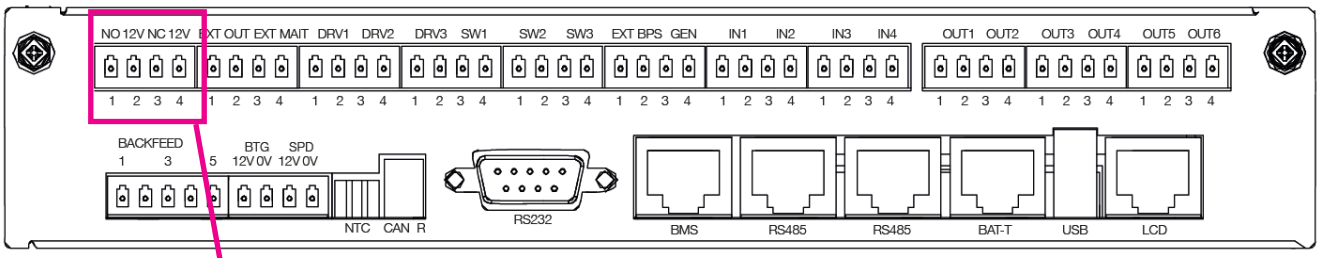
9.12. Completing the installation

Remember to put the protective screens back on.

9.13. External "UPS general power off" connection

the EPO offers the features described below but doesn't mean "emergency stop".

A remote Emergency Power Off (EPO) switch can be installed in a remote location and connected using simple wires to the EPO port as shown below:



Definition of pins:

Pin	Definition
Pin 1	NO
Pin 2	12V
Pin 3	NC
Pin 4	12V

The EPO can be connected using either a NO switch or a NC switch.

- If a NO switch is used, connect the switch on Pins 1 & 2, keep the jumper on Pins 3 & 4.
- If a NC switch is used, remove the jumper from Pins 3 & 4 and connect the switch on them, keep Pins 1 & 2 unconnected.

When the EPO switch is continuously pressed more than 5s,

- the inverter and rectifier are shut down
- there may or may not be transfer to bypass depending on the "EPO transfers to bypass" setting. This setting on the HMI specifies whether to start bypass mode when EPO occurs. The default value is Disable, "Disable" leads to the load being off.

9.14. Genset contact connection

GENERATOR SET information enables the DELPHYS XM to modify its behaviour when the generator set is supplying power to the UPS Unit. The corresponding input is located on the GEN terminals on the control unit (see Section 2.7), when used, this feature allows battery charging to be disabled if the function is enabled. This feature gives priority to the load over battery charging, limiting the power provided by the generator.

9.15. Galvanic isolation transformer

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

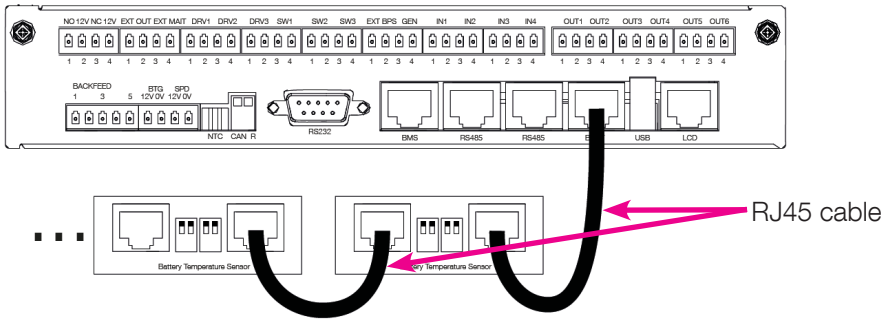
- The protection cable marked with the earth symbol should be connected directly to the distribution panel.
- The transformer can be connected either to the DELPHYS XM input or its output.

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

9.16. Connecting the battery cabinet temperature sensor

As standard, DELPHYS XM provides two inputs to connect a battery temperature sensor:

1. NTC battery temperature sensor 30 kOhm (max distance 20 m)
2. Alternative BOX via an additional port (max distance 100 m):



Instructions:

- Use and connect the temperature sensor to the proper port in the UPS with regard to the distance between the UPS and the battery cabinet;
- Fit the sensor in the battery compartment or inside the battery cabinet;
- Connect the NTC temperature sensor to port BAT-T (ref 4) or the battery temperature box to the port BAT-T (ref 10) on the control unit.

The NTC battery sensor can be connected without considering polarity and using a 2 x 1 mm² cable to extend the sensor cable up to max 20 m.

9.17. Automatic tripping of battery protection

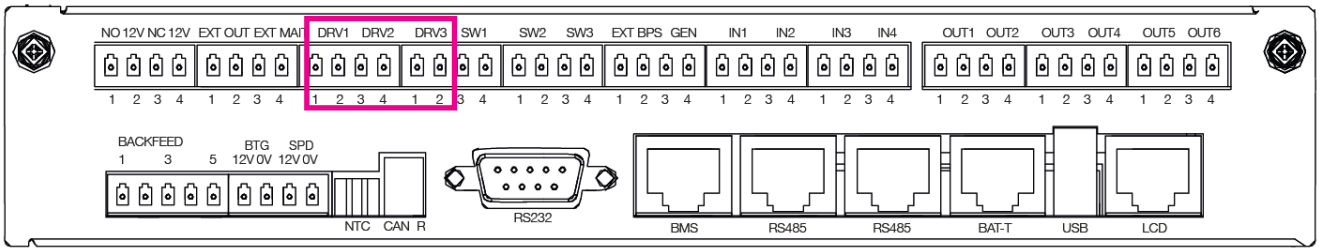
The UPS has 2 types of port that can be configured for disconnecting the battery from the UPS following a trip signal from the UPS.

- Driver ports (DRV1/2/3)
- Output ports (OUT1/2/3/4/5/6)

1. Driver ports (DRV1/2/3)

The 3 battery breaker driver ports can be configured for disconnecting the battery from the UPS following a trip signal from the UPS.

The ports' position is shown in the following figure.



If the function is enabled on the HMI, the driver port can be activated by

-Emergency Power OFF (EPO) or End of Discharge (EOD)

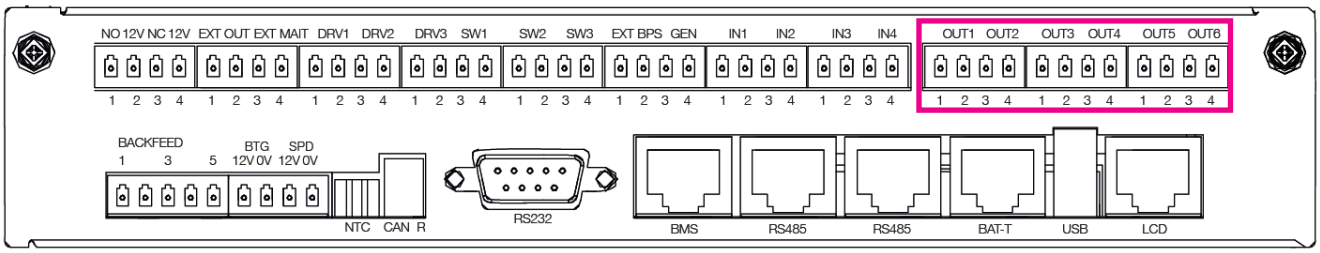
When the port is activated, the voltage on the driver port will drop from 24 V to 0 V, the battery breaker coil loses power and trips the breaker.

The ports can be set to from 0 V to 24 V using jumpers (contact us).

2. Output ports (OUT1/2/3/4/5/6)

The dry contact outputs 01-06 of the UPS can be configured for disconnecting the battery from the UPS following a trip signal from the UPS.

The ports' position is shown in the following figure.



The trip signal can be set on the HMI with the possibilities below:

-EPO alone

or

-EOD alone

or

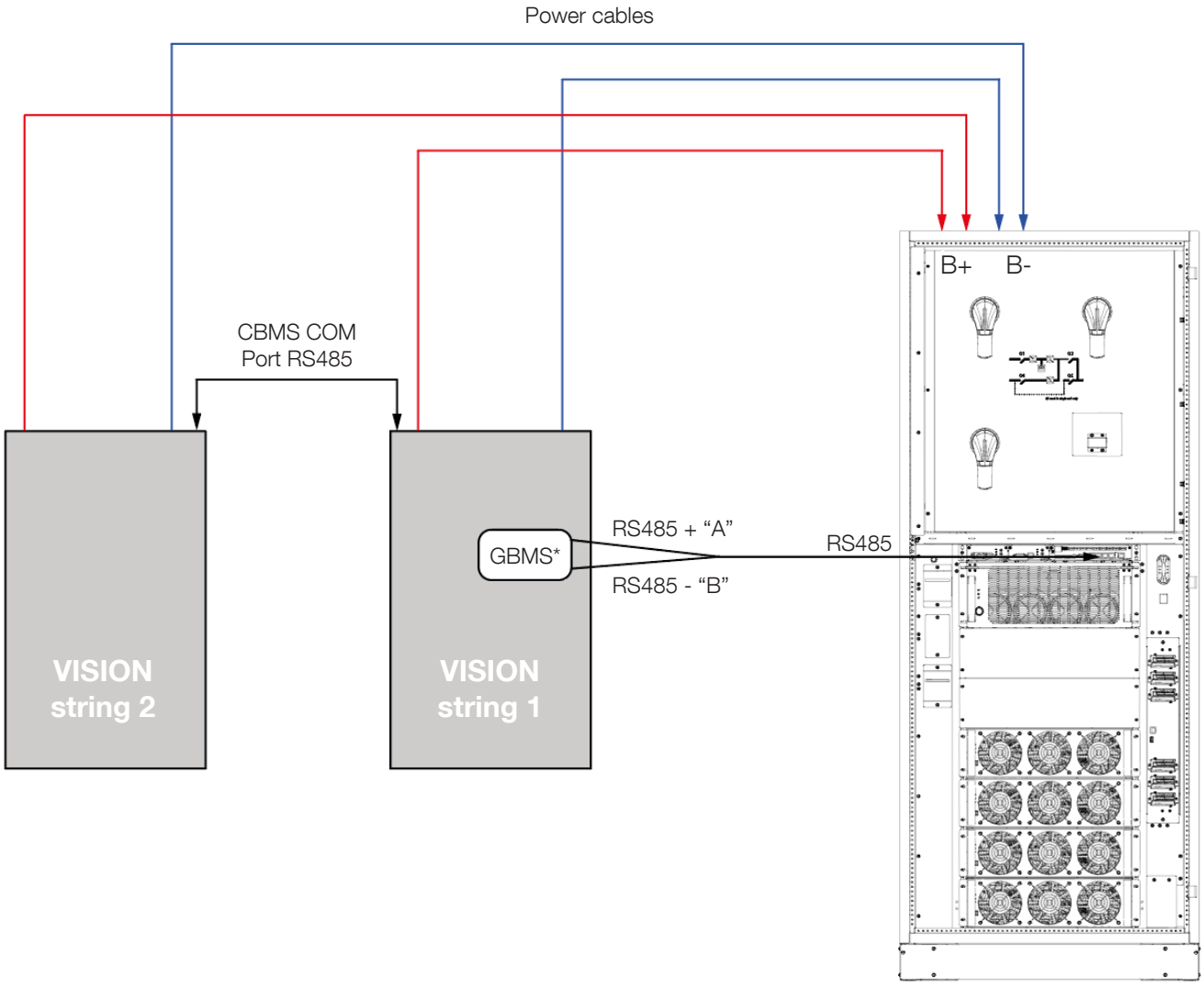
-EPO or EOD

The ports are normally open (NO). Relay rating: 125Vac/0.5A, 30Vdc/2A. When the port is activated, the port will turn from open to closed, the battery breaker coil gains power to trip the breaker.

The ports can be set to NC using jumpers (contact us).

9.18. Battery connection for Direct BMS communication

9.18.1. Separated battery



*The GBMS can communicate with the UPS system via a RS485 cable. The RS485 is plugged into the BMS port (number 7 on image 1) of the UPS and the wires corresponding to RS485 + and RS485 – (numbers 2 & 3 on image 3) are plugged into the GBMS of the VISION battery.

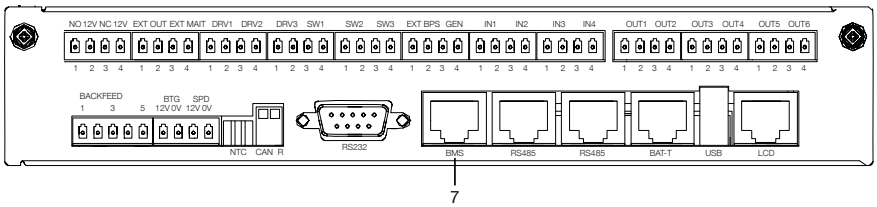
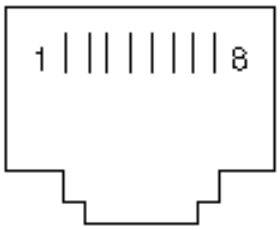


Image 1: BMS port (7)

Definition of port:



Connection between the BMS CAN or RS485 port and the UPS BMS CAN or RS485 port:

BMS	UPS (RJ45)	Description
PIN 1	PIN 1	CAN H
PIN 2	PIN 2	CAN L
PIN 4	PIN 4	485 - “B”
PIN 5	PIN 5	485 + “A”
PIN 7/8	PIN 7/8	GND

Image 2: RS485 pin for BMS

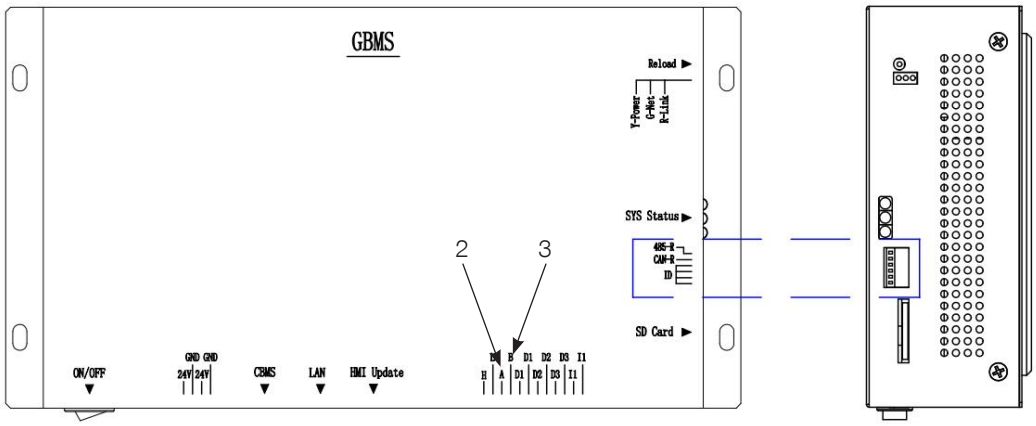


Image 3: GBMS RS485 ports

Image 4: Example of connector for Vision battery GBMS

Once the setup is done, you can configure the battery on the UPS HMI using the following menu:

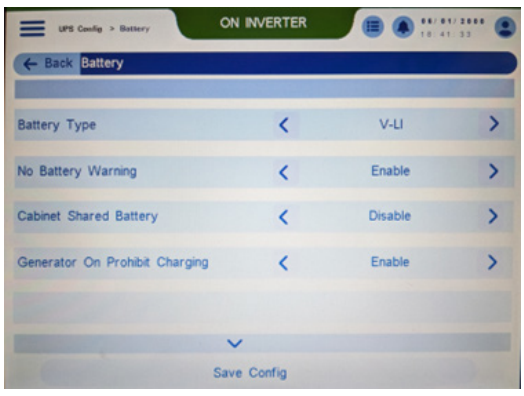
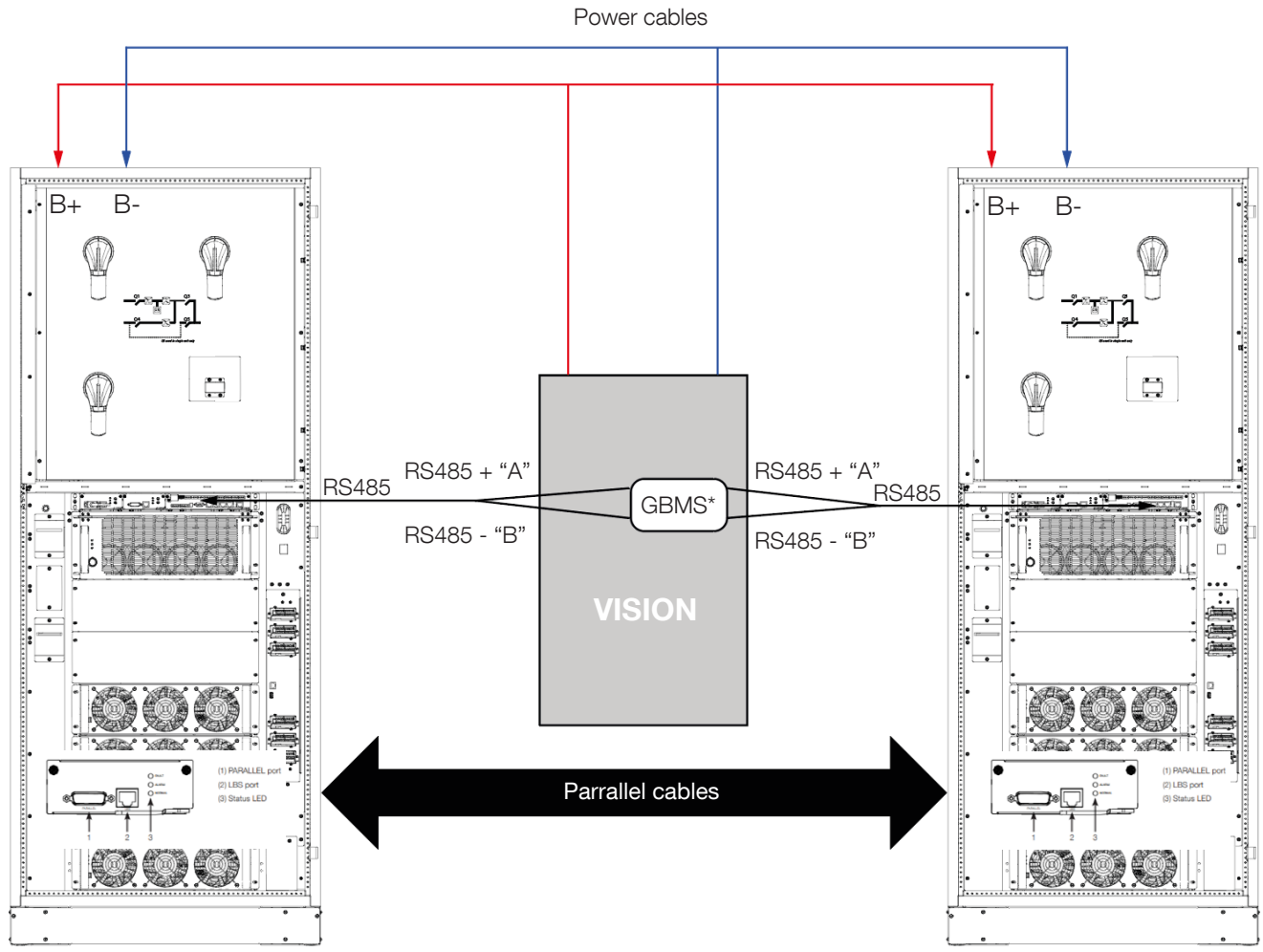


Figure 5: Vision battery configuration on the UPS

9.18.2. Common battery



*For a common battery, each UPS unit should communicate with the battery. RS485 BMS port for all UPS units (number 7 on image 1) should be plugged into the same GBMS RS485 port (image 3).

Once the setup is done, you can configure the battery on the UPS HMI using the following menu; take care that the “Cabinet shared battery” option is enabled.

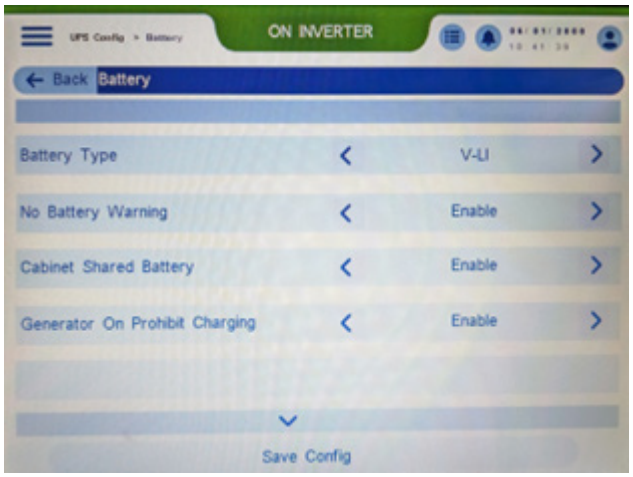


Figure 6: Vision battery configuration on the UPS

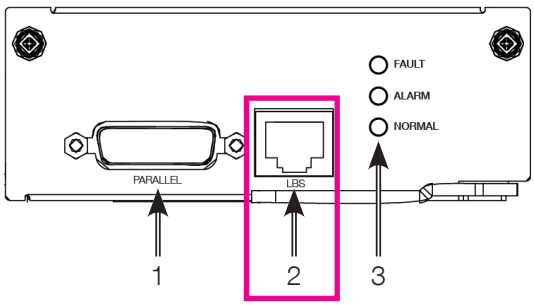
9.19. ACS (automatic cross synchronisation)

The Automatic Cross Synchronisation (ACS), also referred as Load Bus Synchronization (LBS) for DELPHYS XM, is primarily used to synchronize two UPS systems(single unit or multiple unit) that supply a Static Transfer Switch (STS) or an equivalent product. This function is designed to work exclusively within DELPHYS XM and is not compatible with other competitor UPS systems or other Socomec UPS systems. Under LBS mode, the overall performance is enhanced due to the communication between the UPS units, which increases redundancy in the event of a failure of one UPS unit or the input mains of the UPS.

Each standard UPS includes 2 types of 5 meters length cables for parallel communications:

- A black shielded and double insulated control cable with 2 female DB15 connectors. This cable should be connected to the parallel port on the ECU unit.
- A gray RS485 cable with 2 shielded RJ45 connectors. This cable should be connected to the RS485 port No.8 or No.9 on the monitor unit.

The gray cable is used for LBS connection. In parallel system, the black cable is also used. The optional 15 meters kit allow to extend the length of LBS configuration.

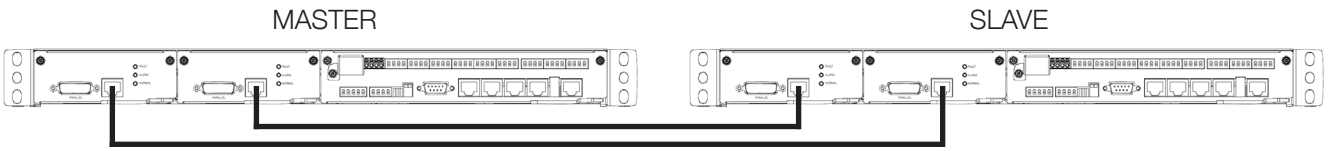


(1) PARALLEL port

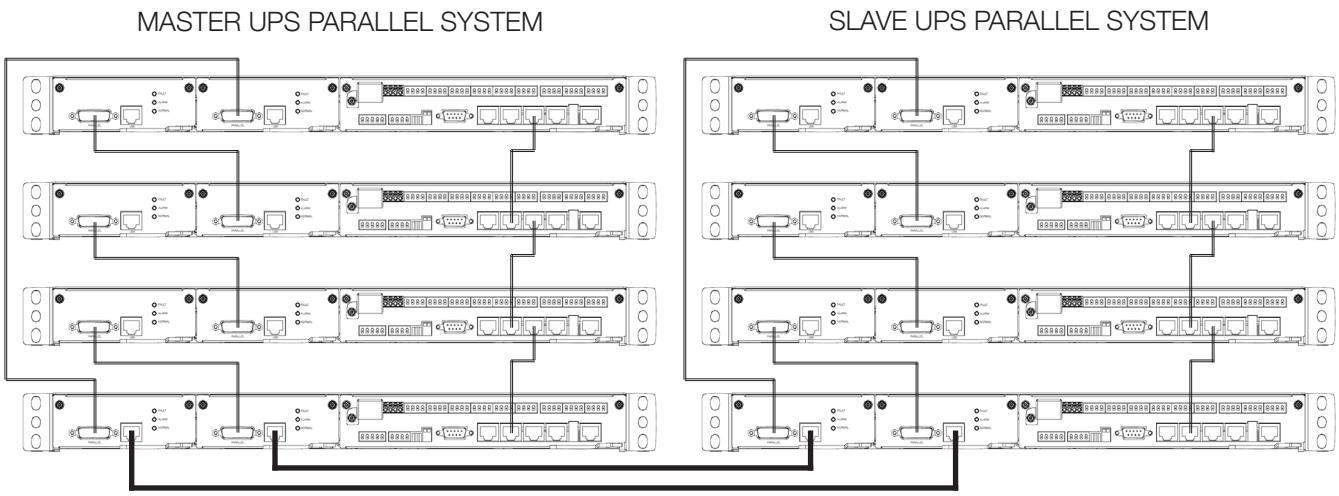
(2) LBS port

(3) Status LED

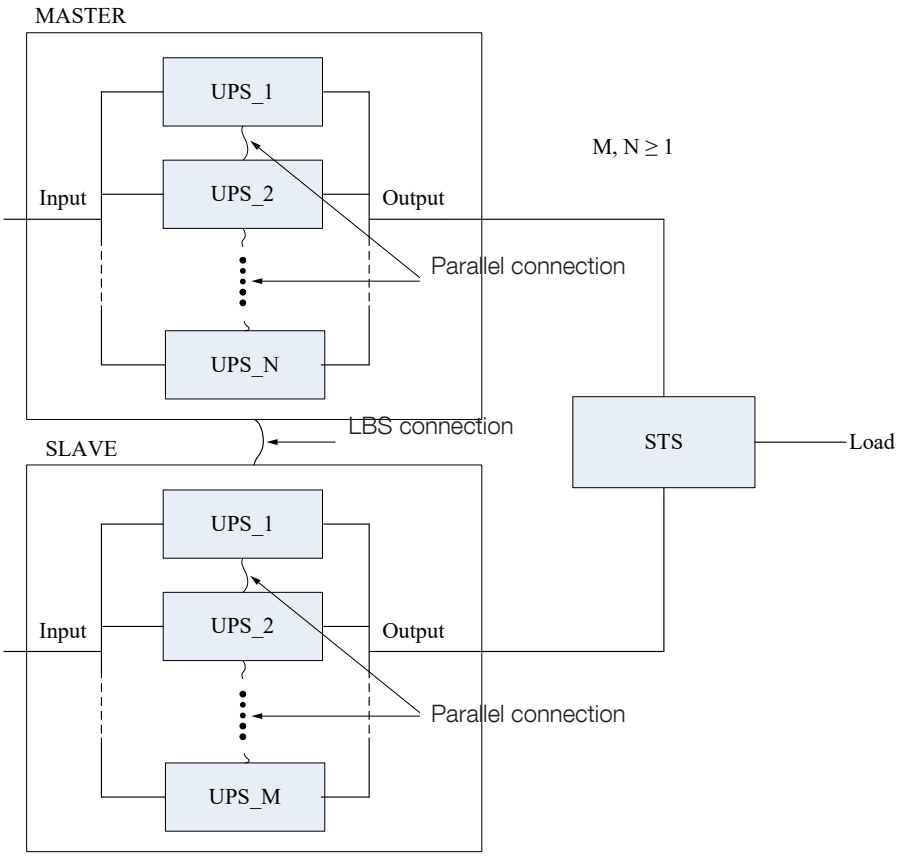
Two Single UPS LBS



Two Parallel UPS system LBS



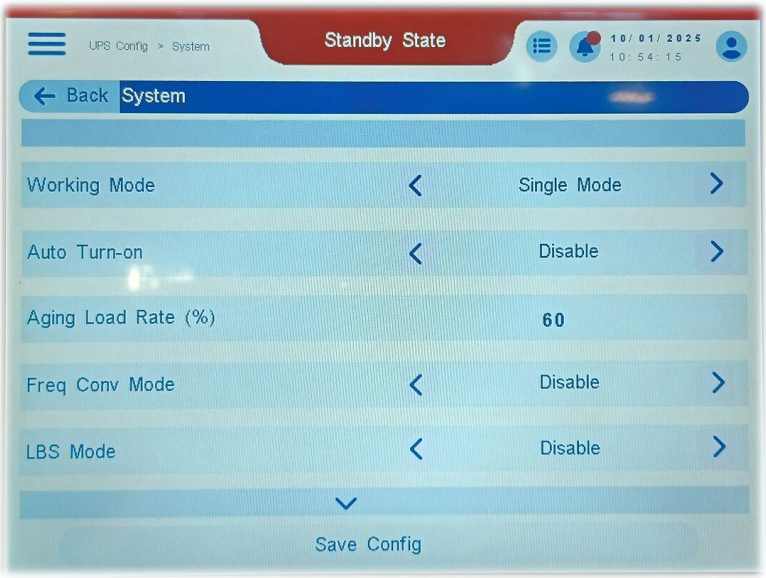
PARALLEL UPS SYSTEM LBS CONNECTED TO STS



Machine software settings

Set every UPS of the systems to be LBS Master or LBS Slave. For example, if the UPS is part of the LBS master system, its LBS setting should be configured as Master.

Setting value: Disable, LBS master, LBS slave. Default is Disable.



10. COMMUNICATION

The DELPHYS XM UPS Unit can manage various serial, contact and Ethernet communication channels at the same time. The 3 communication slots (+3 optional extension slots) available enable use of signalling accessories and cards.

Each communication channel is independent; you can set up simultaneous connections for various levels of remote signalling and monitoring (see below in this section details on 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 external devices.

	slot 1	slot 2	slot 3	slot 1 - EXT	slot 2 - EXT	slot 3 - EXT
ADC + Serial Link interface	•	•	•	a(*)	b(*)	c(*)
NetVision	•	•	•	a	b	c
Modbus TCP	•	•	•	a	b	c
IoT Gateway	•	•	•	a	b	c

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.

c: possible only if slot 3 is equipped with an ADC + Serial Link interface.

(*) a “bootloader” type ADC + Serial Link interface is required in slot 1, 2 or 3 depending on the x - EXT slot chosen.

(*) the “bootloader” type ADC + Serial Link interface is not compatible with slots 1-Ext. or 2-Ext. or 3-Ext.

For details, please see Section “2.3 The system”.

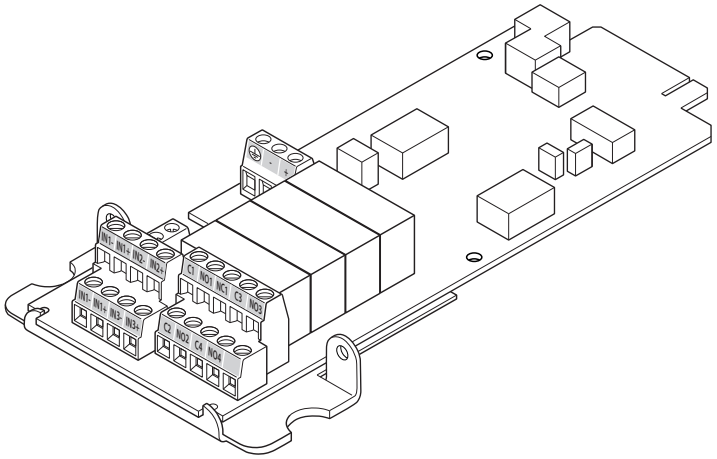
For parallel units, only master UPS has the active COM board, which can only manage maximum 3 communication slots (+3 optional extension slots) for the whole system.

Adding units in the parallel system won’t extend the communication slots number.

10.1. ADC + Serial Link interface

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

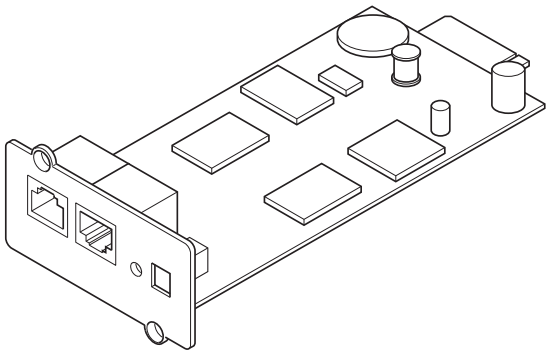
- 4 relays for external device activation (can be set as normally closed or normally open)
- 3 free inputs to feed external contacts to the MODBUS protocol



10.2. Net Vision card

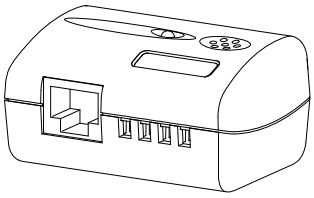
NET VISION is a communication and management interface designed for business networks. The UPS Unit behaves exactly like a networked peripheral. It can be managed remotely, and enables the shutdown of network workstations.

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.



10.2.1. 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 a web browser
- Notification of environmental alarms via email and SNMP traps

10.3. 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. 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. It is recommended that periodic specialised maintenance is carried out (annually), 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 messages.

11.1. Batteries

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

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

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

When replacing the batteries, use the same type and configuration and install them in appropriate containers 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.

11.2. Fans

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

Preventive replacement by an authorised technician is recommended within 5 years (under normal operating conditions).

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

11.3. Capacitors

In the Power Brick, the lifespan of the AC and DC capacitors depends on usage (percent load, power quality) and environmental conditions (temperature, humidity).

In some cases, these components may need to be replaced during the lifetime of the UPS.

During the preventive maintenance visit, our expert technicians will inform the end user if replacement is recommended.

In all cases, regular preventive maintenance is essential to prolong component efficiency and ensure system performance.

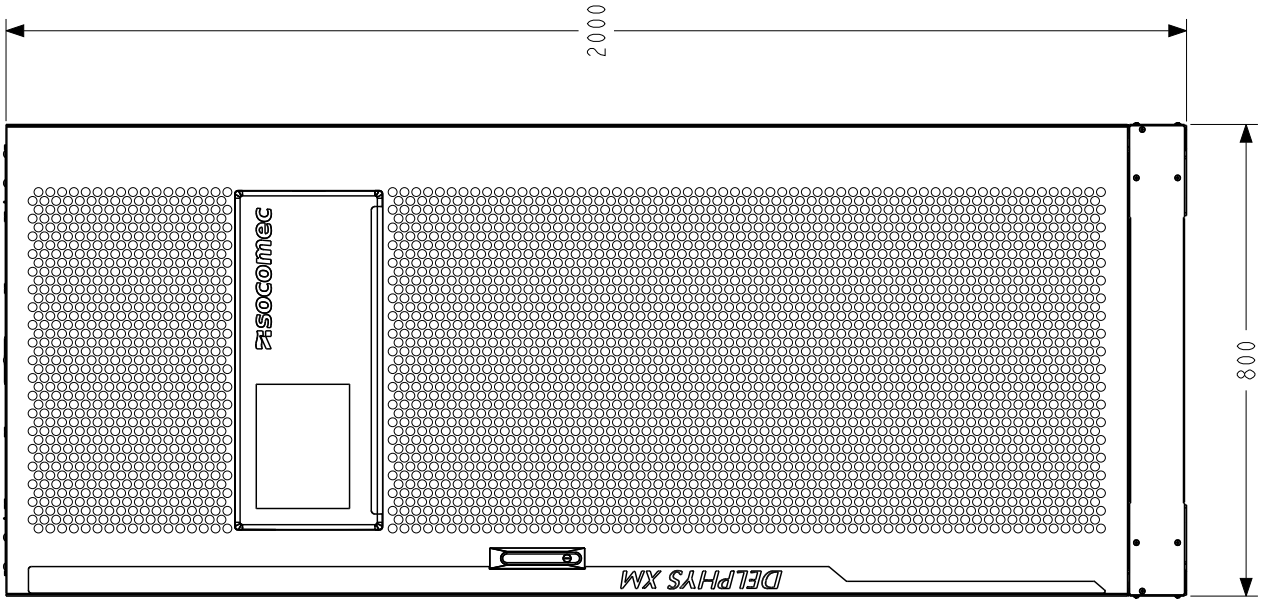
12. TECHNICAL SPECIFICATIONS

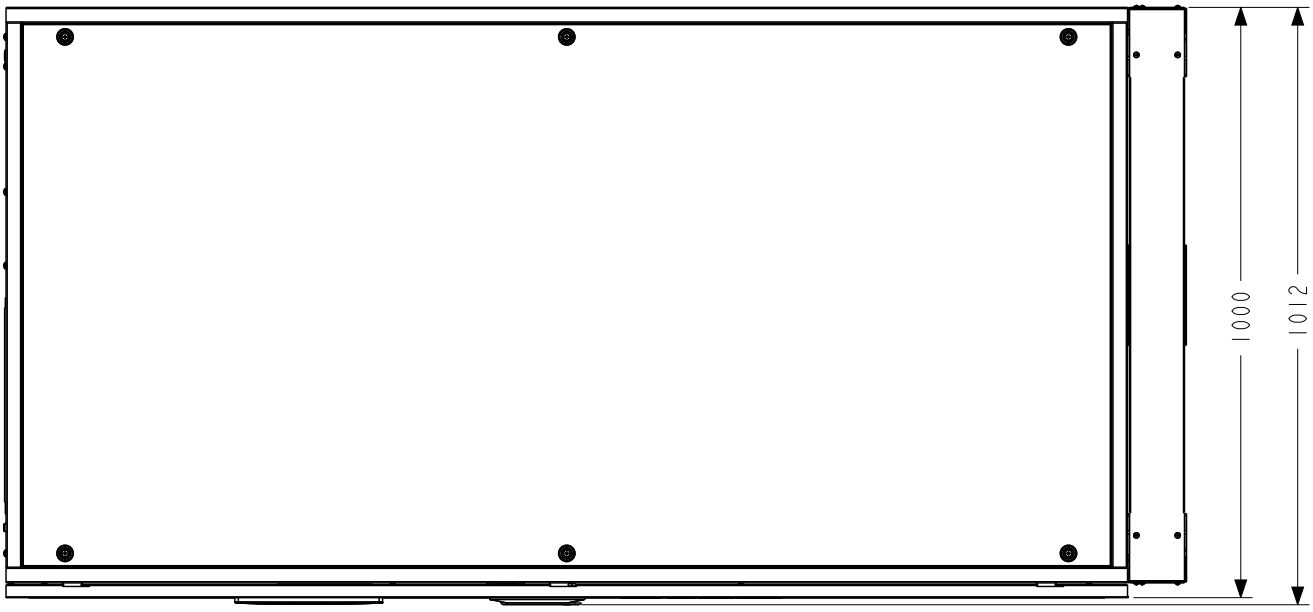
DELPHYS XM	300 kVA	400 kVA	500 kVA	600 kVA	800 kVA
Electrical specifications – rectifier input					
Mains voltage (power rating, power factor ø = 1)	380/400/415 V (3ph + N)				
Voltage tolerance [1]	240 - 485 V				
Input frequency	40 - 70 Hz				
Input power factor	> 0.99				
THDI (at full load and rated voltage)	< 3% (with THDV input < 1%)				
Electrical specifications – output					
Output voltage on inverter	380/400/415 V configurable / (3ph + N)				
Frequency	50/60 Hz (selectable)				
Overload[1]:					
• 10 minutes	375 kW	500 kW	625 kW	750 kW	1000 kW
• 1 minute	450 kW	600 kW	750 kW	900 kW	1200 kW
Total voltage distortion	ThdU < 1% with linear load				
Electrical specifications – bypass input					
Bypass rated voltage	Output rated voltage				
Bypass voltage tolerance	Nominal output voltage ±10% (configurable to ±20% for 400 Vac)				
Input frequency	50 / 60 Hz				
Maximum overload capacity admitted	110% continuous, 125% 10 min				
Rated short-time withstand current Icw	35 kA				
Environment					
UPS storage conditions	-25 to 55 °C				
UPS start-up and working conditions	0 to 40 °C under ≤ 95% condensation free RH				
Acoustic	< 75 dBA				
Standards					
Appliance classes	Protective Class I (IEC 62477-1)				
Safety	IEC 62040-1				
EMC	IEC 62040-2				
Product certification	CE				
Protection degree	IP20 (others on request)				

[1] Conditions apply – contact us

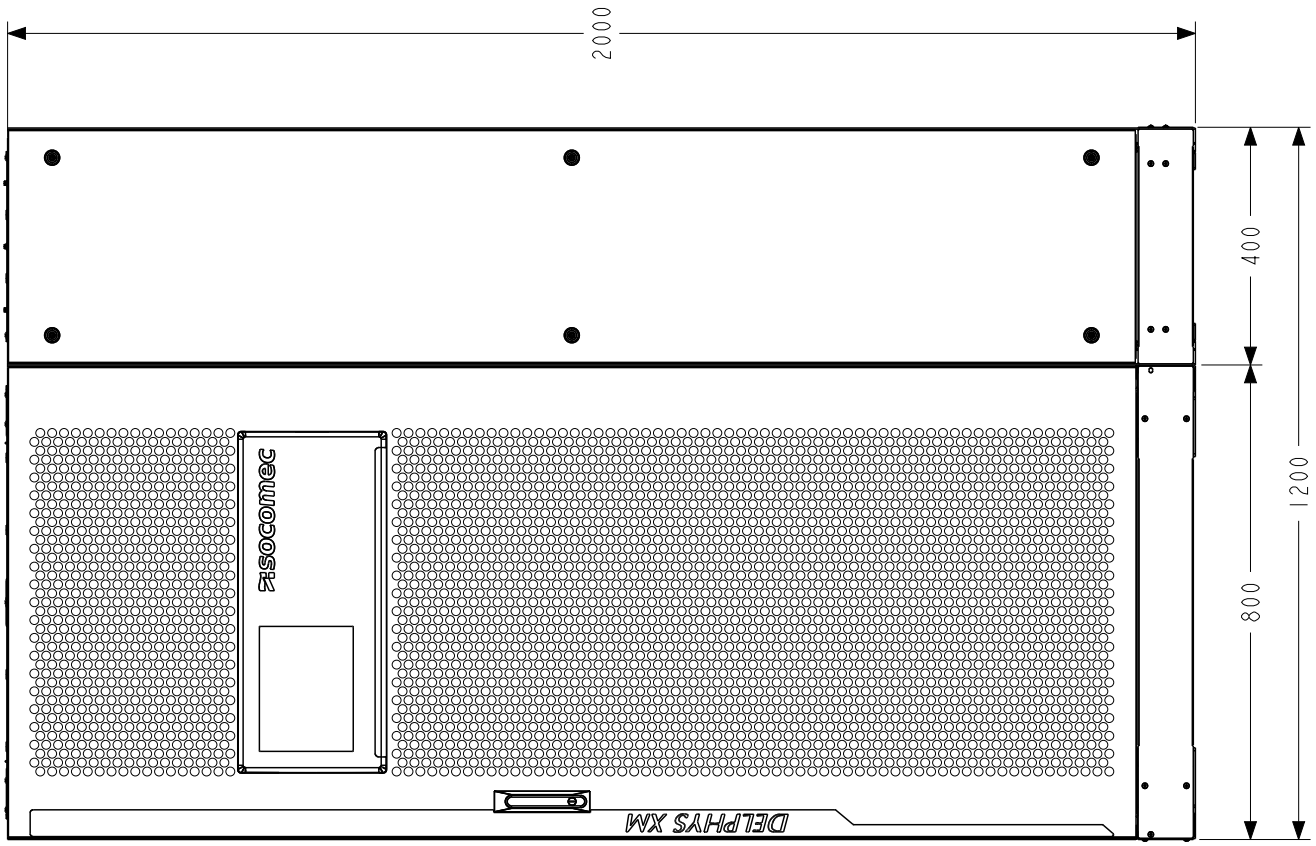
13. APPENDIX

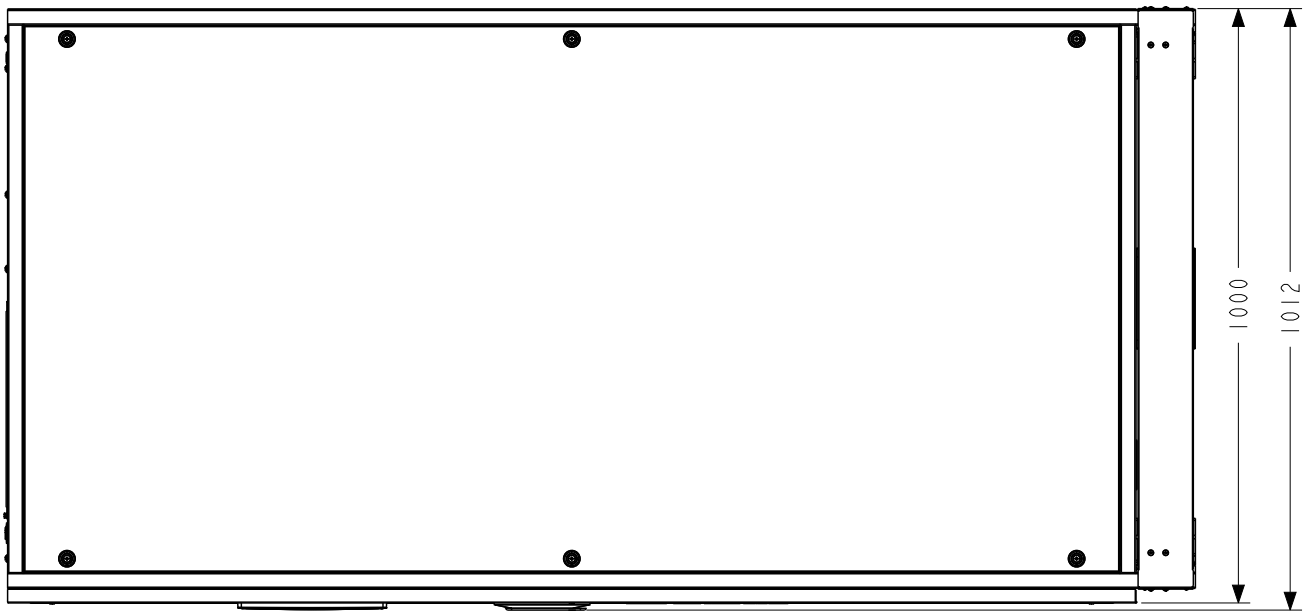
13.1. Drawing 1: DELPHYS XM 300 to 800 kVA top connection dimensions



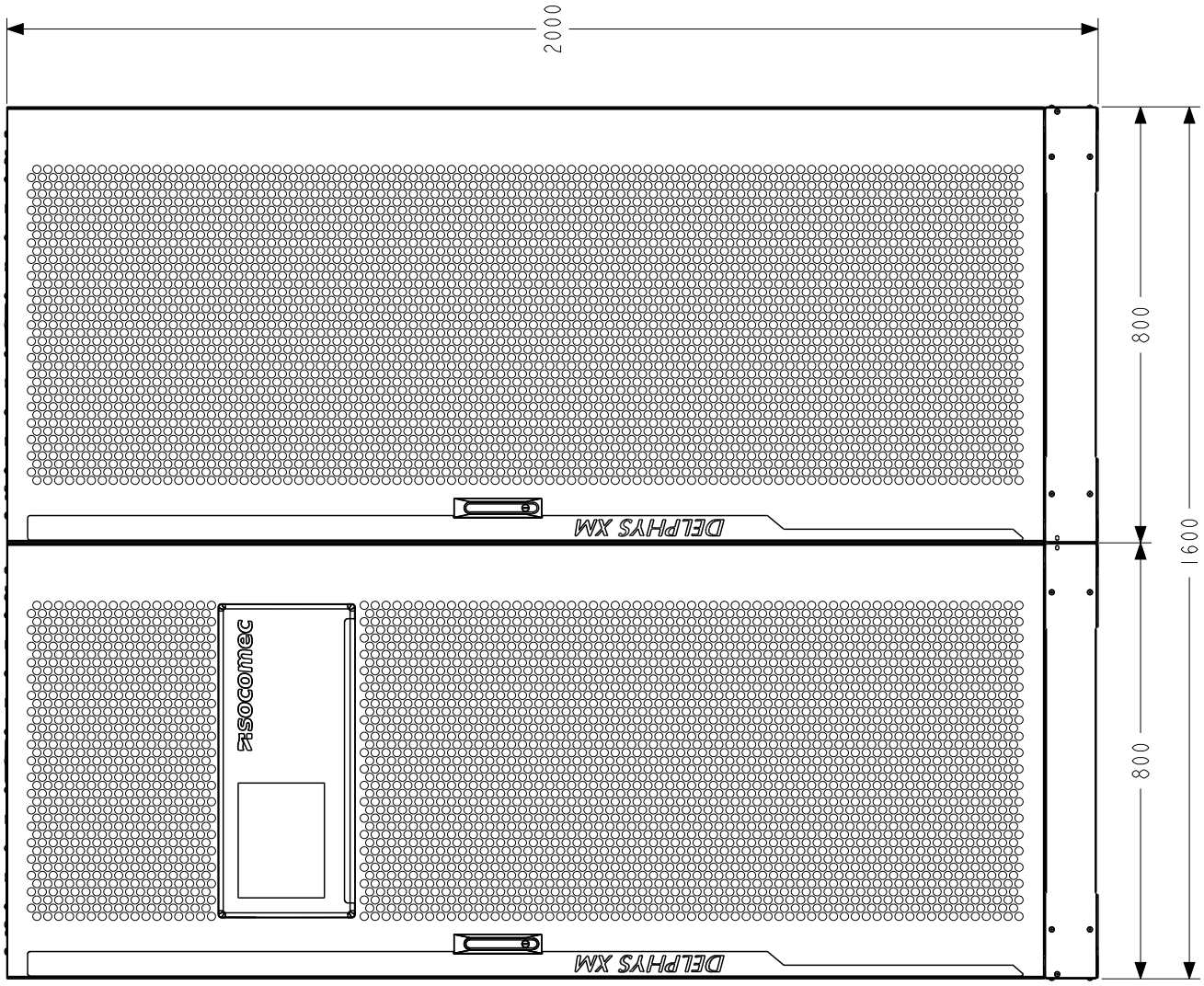


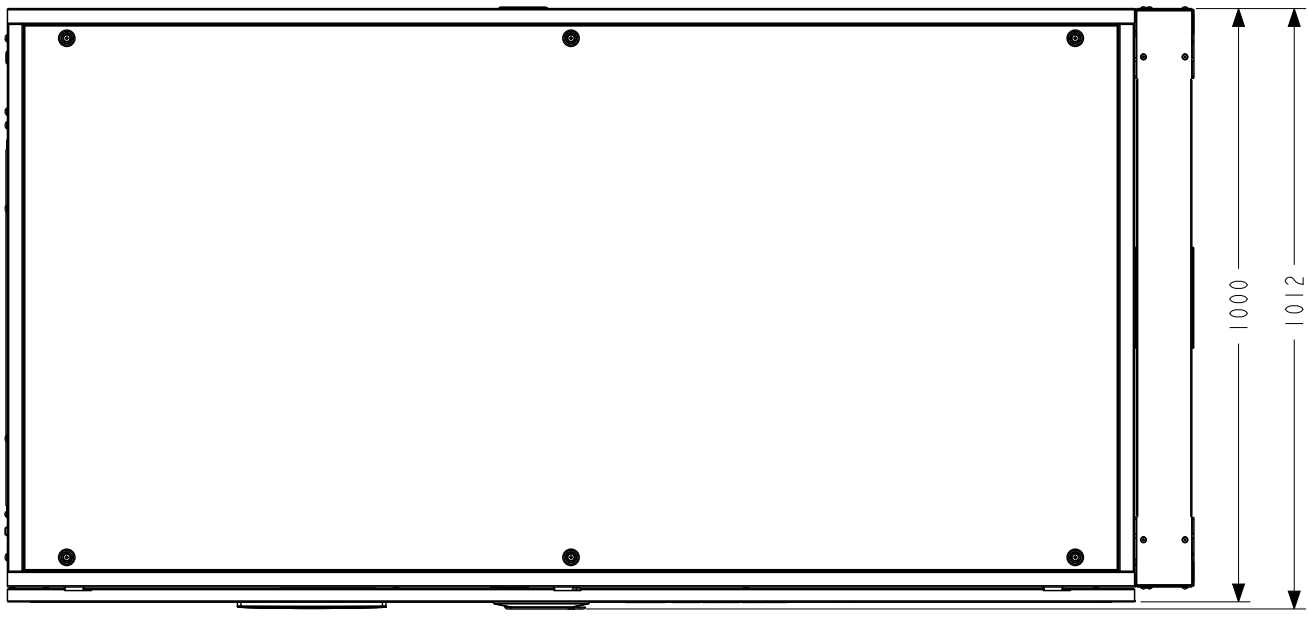
13.2. Drawing 2: DELPHYS XM 300 to 600 kVA bottom connection dimensions



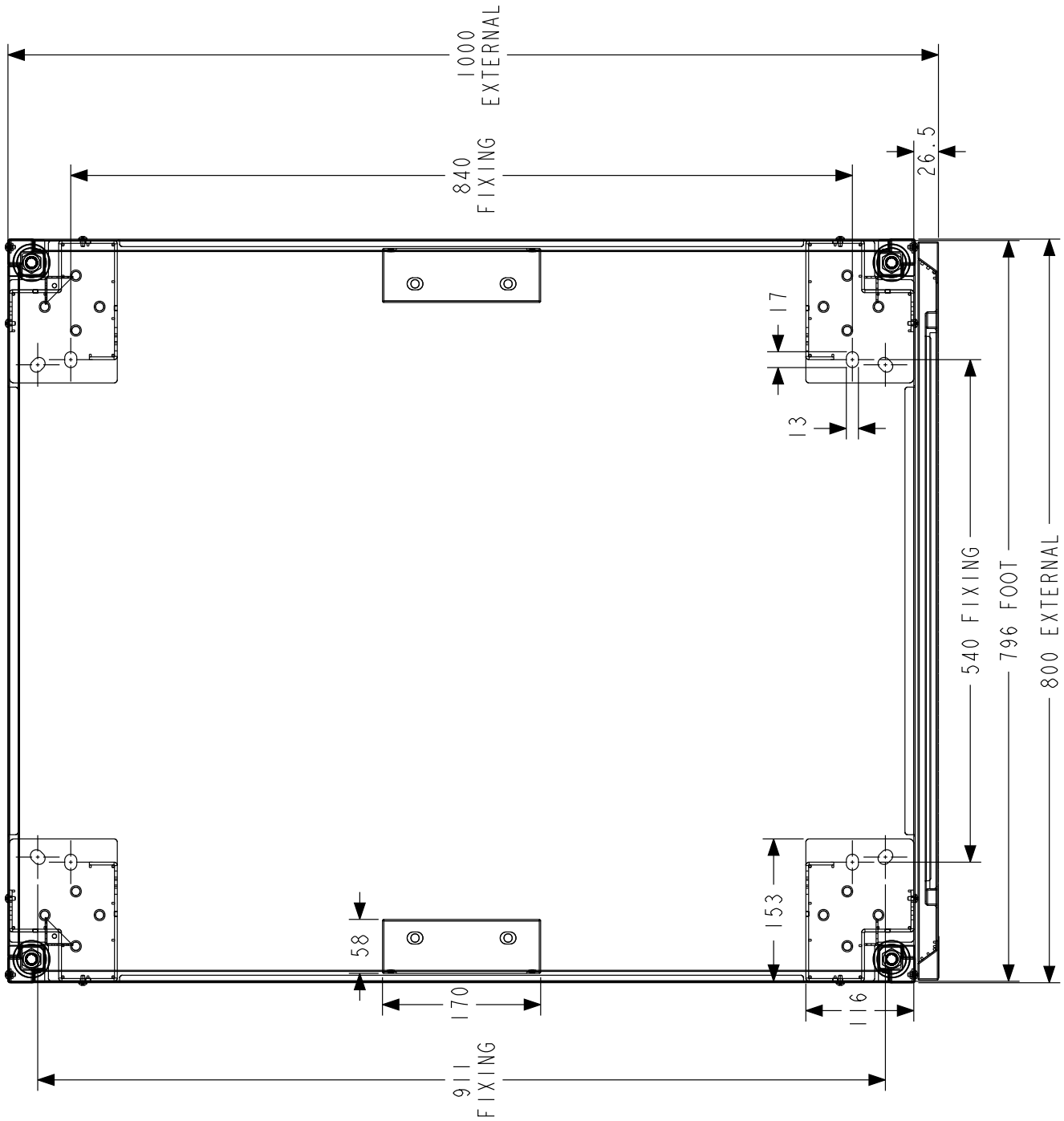


13.3. Drawing 3: DELPHYS XM 800 kVA switches version dimensions

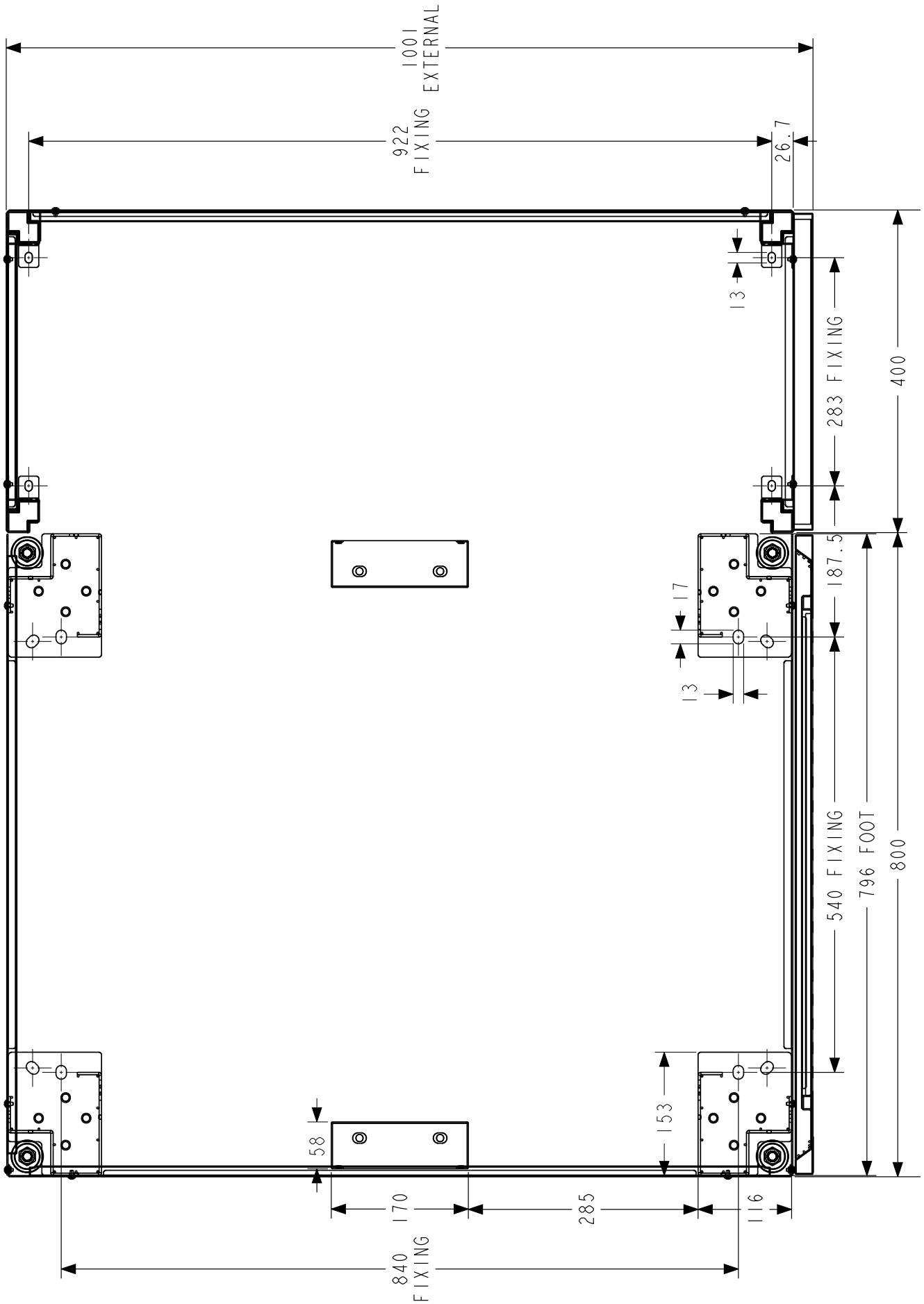




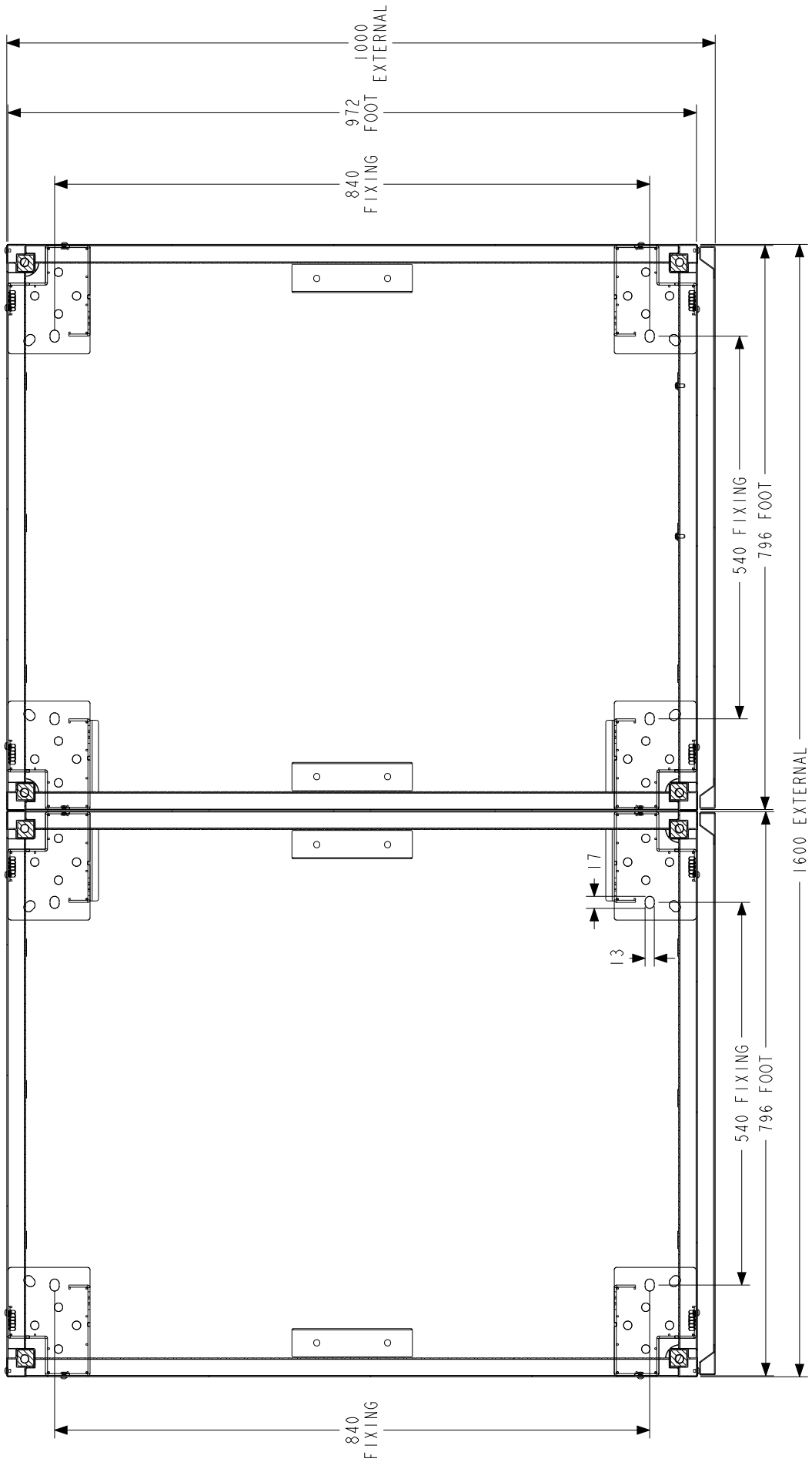
13.4. Drawing 4: DELPHYS XM 300 to 800 kVA top connection floor-mounted



13.5. Drawing 5: DELPHYS XM 300 to 600 kVA bottom connection floor-mounted



13.6. Drawing 6: DELPHYS XM 800 kVA switches version floor-mounted



Socomec: our innovations supporting your energy performance

1 independent manufacturer

4,400 employees worldwide

8 % of sales revenue dedicated to R&D

400 experts dedicated to service provision

Your power management expert

POWER SWITCHING

POWER MONITORING

POWER CONVERSION

ENERGY STORAGE

EXPERT SERVICES

The specialist for critical applications

- Control, command of LV facilities
- Safety of persons and assets
- Measurement of electrical parameters
- Energy management
- Energy quality
- Energy availability
- Energy storage
- Prevention and repairs
- Measurement and analysis
- Optimisation
- Consultancy, commissioning and training

A worldwide presence

12 production sites
- France (x3)
- Italy (x2)
- Tunisia
- India
- China (x2)
- USA (x2)
- Canada

30 subsidiaries and commercial locations
- Algeria • Australia • Austria • Belgium • China • Canada
- Dubai (United Arab Emirates) • France • Germany
- India • Indonesia • Italy • Ivory Coast • Malaysia
- Netherlands • Poland • Portugal • Romania • Serbia
- Singapore • Slovenia • South Africa • Spain • Sweden
- Switzerland • Thailand • Tunisia • Turkey • UK • USA

80 countries where our brand is distributed

4257-1745 Rev: G

553121G

HEAD OFFICE

SOCOMEC GROUP
SAS SOCOMEC capital 10 568 020 €
R.C.S. Strasbourg B 548 500 149
B.P. 60010 - 1, rue de Westhouse
F-67235 Benfeld Cedex
Tel. +33 3 88 57 41 41 - Fax +33 3 88 57 78 78
info.scp.isd@socomec.com

www.socomec.com

UK OFFICE

SOCOMEC U.K. Limited
Power Conversion (UPS)
7-9 Lakeside Business Park,
Broadway Lane, South Cerney,
Gloucestershire, GL7 5XL.
Tel. +44 (0) 333 015 3002
info.uk@socomec.com

UKCA

YOUR DISTRIBUTOR / PARTNER

100 years OF SHARED ENERGY

socomec Innovative Power Solutions