

# Galaxy 5500 / Galaxy 5500 Marine

20 - 120 kVA 400 V

## Installation

06/2018



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As standards, specifications, and designs change from time to time, please ask for confirmation of the information given in this publication.

# Table of Contents

Important Safety Instructions — SAVE THESE	
<b>INSTRUCTIONS</b> .....	5
Safety Precautions .....	6
Electrical Safety .....	8
Periodical Check .....	9
Battery Safety .....	9
Electromagnetic Compatibility .....	10
<b>Specifications</b> .....	11
Input .....	11
Output .....	11
Bypass .....	12
Environment .....	13
Batteries .....	14
Recommended Circuit Breakers and Cable Sizes .....	15
Transformers .....	19
Battery Circuit Breaker Enclosure .....	21
<b>Mechanical Assembly</b> .....	23
Clearance Dimensions .....	23
Remove Battery Protection .....	25
Remove Battery Protection from the UPS .....	25
Remove Battery Protection from the External Battery Cabinet .....	25
Install the Top Entry Option .....	26
Install the IP32 Option .....	28
<b>Floor Mounting</b> .....	29
<b>Connect Input and PE Cables in Single Systems</b> .....	30
Single Utility/Mains Systems .....	30
Dual Utility/Mains Systems .....	30
Frequency Converter .....	31
<b>Connect Input and PE Cables in Parallel Systems</b> .....	33
Overview .....	33
Single Utility/Mains Systems .....	33
Dual Utility/Mains Systems .....	34
Redundant Parallel System .....	34
Parallel System with External Bypass .....	34
Frequency Converter .....	36
<b>Connect PE Cable in TNC System</b> .....	37
<b>Connect the Communication Cables</b> .....	38
Overview of the Communication Cables .....	38
Connect Dry Contact Communication Card .....	40
Connect Network Management Card .....	42
Example of Communication Card Connection .....	42
Add or Change Communication Cards .....	42
Connect General Shutdown or Remote Emergency Power Off .....	44
Connect Parallel Communication Cables .....	44
Redundant Parallel System .....	44
Parallel System with External Bypass .....	45

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Install an External Battery .....	47
Lock Battery Cells on Shelves for Marine UPS .....	47
Connect the Battery Cables .....	47
Install An Empty Battery Cabinet .....	49
Install Battery Circuit Breaker Kit .....	49
Install Shelves and Battery Cells .....	50
Connect the Battery Remote Control .....	51
Install a Battery Circuit Breaker Kit for Third Party Battery Cabinets (Option) .....	53
Battery Circuit Breaker Enclosure (Option) .....	56
Install Battery Circuit Breaker Enclosure .....	58
Install the Battery Temperature Monitor (Option) .....	60
Install the Synchronization Module (Option) .....	61
Overview of the Synchronization Module .....	61
Mount the Synchronization Module to the Wall .....	61
Recommended Cable Sizes .....	62
Connect Cables to the Synchronization Module for Single UPS .....	62
Connect Cables to the Synchronization Module in a Parallel System .....	63
Input and Output Contacts .....	65
Install an External Bypass .....	66
Install 150 kVA External Bypass Cabinet .....	66
TNS .....	66
TNC .....	67
Install 400 kVA External Bypass Cabinet .....	68
TNS .....	68
TNC .....	69
Install Marine UPS Adaptation Voltage Transformer .....	70
Install Isolation Transformer (Option) .....	71
Transformer Configuration Options in Single Systems .....	72
Transformer Configuration Options in Parallel UPS System .....	74
Install Input Isolation Transformer .....	75
Install Output Isolation Transformer .....	79

# Important Safety Instructions — SAVE THESE INSTRUCTIONS

Read these instructions carefully and look at the equipment to become familiar with it before trying to install, operate, service or maintain it. The following safety messages may appear throughout this manual or on the equipment to warn of potential hazards or to call attention to information that clarifies or simplifies a procedure.



The addition of this symbol to a “Danger” or “Warning” safety message indicates that an electrical hazard exists which will result in personal injury if the instructions are not followed.



This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages with this symbol to avoid possible injury or death.

## **DANGER**

**DANGER** indicates a hazardous situation which, if not avoided, **will result in death or serious injury**.

**Failure to follow these instructions will result in death or serious injury.**

## **WARNING**

**WARNING** indicates a hazardous situation which, if not avoided, **could result in death or serious injury**.

**Failure to follow these instructions can result in death, serious injury, or equipment damage.**

## **CAUTION**

**CAUTION** indicates a hazardous situation which, if not avoided, **could result in minor or moderate injury**.

**Failure to follow these instructions can result in injury or equipment damage.**

## **NOTICE**

**NOTICE** is used to address practices not related to physical injury. The safety alert symbol shall not be used with this type of safety message.

**Failure to follow these instructions can result in equipment damage.**

## Please Note

Electrical equipment should only be installed, operated, serviced, and maintained by qualified personnel. No responsibility is assumed by Schneider Electric for any consequences arising out of the use of this material.

A qualified person is one who has skills and knowledge related to the construction, installation, and operation of electrical equipment and has received safety training to recognize and avoid the hazards involved.

## Safety Precautions

### **⚠ DANGER**

#### **HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH**

All safety instructions in this document must be read, understood and followed.

**Failure to follow these instructions will result in death or serious injury.**

### **⚠ DANGER**

#### **HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH**

Read all instructions in the Installation Manual before installing or working on this UPS system.

**Failure to follow these instructions will result in death or serious injury.**

### **⚠ DANGER**

#### **HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH**

Do not install the UPS system until all construction work has been completed and the installation room has been cleaned.

**Failure to follow these instructions will result in death or serious injury.**

### **⚠ DANGER**

#### **HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH**

- The product must be installed according to the specifications and requirements as defined by Schneider Electric. It concerns in particular the external and internal protections (upstream breakers, battery breakers, cabling, etc.) and environmental requirements. No responsibility is assumed by Schneider Electric if these requirements are not respected.
- After the UPS system has been electrically wired, do not start up the system. Start-up must only be performed by Schneider Electric.

**Failure to follow these instructions will result in death or serious injury.**

### **⚠ DANGER**

#### **HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH**

The UPS system must be installed according to local and national regulations. Install the UPS according to:

- IEC 60364 (including 60364-4-41 - protection against electric shock, 60364-4-42 - protection against thermal effect, and 60364-4-43 - protection against overcurrent), **or**
- NEC NFPA 70, **or**
- Canadian Electrical Code (C22.1, Part 1)

depending on which one of the standards apply in your local area.

**Failure to follow these instructions will result in death or serious injury.**

**⚠ DANGER**

**HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH**

- Install the UPS system in a temperature controlled indoor environment free of conductive contaminants and humidity.
- Install the UPS system on a non-flammable, level and solid surface (e.g. concrete) that can support the weight of the system.

**Failure to follow these instructions will result in death or serious injury.**

**⚠ DANGER**

**HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH**

The UPS is not designed for and must therefore not be installed in the following unusual operating environments:

- Damaging fumes
- Explosive mixtures of dust or gases, corrosive gases, or conductive or radiant heat from other sources
- Moisture, abrasive dust, steam or in an excessively damp environment
- Fungus, insects, vermin
- Salt-laden air or contaminated cooling refrigerant
- Pollution degree higher than 2 according to IEC 60664-1
- Exposure to abnormal vibrations, shocks, and tilting
- Exposure to direct sunlight, heat sources, or strong electromagnetic fields

**Failure to follow these instructions will result in death or serious injury.**

**⚠ DANGER**

**HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH**

Do not drill or cut holes for cables or conduits with the gland plates installed and do not drill or cut holes in close proximity to the UPS.

**Failure to follow these instructions will result in death or serious injury.**

**⚠ WARNING**

**HAZARD OF ARC FLASH**

Do not make mechanical changes to the product (including removal of cabinet parts or drilling/cutting of holes) that are not described in the Installation Manual.

**Failure to follow these instructions can result in death, serious injury, or equipment damage.**

**NOTICE**

**RISK OF OVERHEATING**

Respect the space requirements around the UPS system and do not cover the product's ventilation openings when the UPS system is in operation.

**Failure to follow these instructions can result in equipment damage.**

**NOTICE**

**RISK OF EQUIPMENT DAMAGE**

Do not connect the UPS output to regenerative load systems including photovoltaic systems and speed drives.

**Failure to follow these instructions can result in equipment damage.**

## Electrical Safety

### **⚠ DANGER**

#### **HAZARD OF ELECTRIC SHOCK, EXPLOSION OR ARC FLASH**

- Electrical equipment must be installed, operated, serviced, and maintained only by qualified personnel.
- The UPS system must be installed in a room with restricted access (qualified personnel only).
- Apply appropriate personal protective equipment (PPE) and follow safe electrical work practices.
- Turn off all power supplying the UPS system before working on or inside the equipment.
- Before working on the UPS system, check for hazardous voltage between all terminals including the protective earth.
- The UPS contains an internal energy source. Hazardous voltage can be present even when disconnected from the utility/mains supply. Before installing or servicing the UPS system, ensure that the units are OFF and that utility/mains and batteries are disconnected. Wait five minutes before opening the UPS to allow the capacitors to discharge.
- A disconnection device (e.g. disconnection circuit breaker or switch) must be installed to enable isolation of the system from upstream power sources in accordance with local regulations. This disconnection device must be easily accessible and visible.
- The UPS must be properly earthed/grounded and due to a high leakage current, the earthing/grounding conductor must be connected first.

**Failure to follow these instructions will result in death or serious injury.**

### **⚠ DANGER**

#### **HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH**

In systems where backfeed protection is not part of the standard design, an automatic isolation device (backfeed protection option or other device meeting the requirements of IEC/EN 62040–1 or UL1778 5th Edition – depending on which of the two standards apply to your local area) must be installed to prevent hazardous voltage or energy at the input terminals of the isolation device. The device must open within 15 seconds after the upstream power supply fails and must be rated according to the specifications.

**Failure to follow these instructions will result in death or serious injury.**

When the UPS input is connected through external isolators that, when opened, isolate the neutral or when the automatic backfeed isolation is provided external to the equipment or is connected to an IT power distribution system, a label must be fitted at the UPS input terminals, and on all primary power isolators installed remote from the UPS area and on external access points between such isolators and the UPS, by the user, displaying the following text (or equivalent in a language which is acceptable in the country in which the UPS system is installed):

### **⚠ DANGER**

#### **HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH**

Risk of Voltage Backfeed. Before working on this circuit: Isolate the UPS and check for hazardous voltage between all terminals including the protective earth.

**Failure to follow these instructions will result in death or serious injury.**

## Periodical Check

### **⚠ WARNING**

#### **HAZARD OF ELECTRIC SHOCK, EXPLOSION OR ARC FLASH**

- Limited lifetime components, such as capacitors, fans, electronic boards, batteries, etc., must be checked periodically by qualified personnel.
- Battery trip control must be done periodically by qualified personnel.

**This periodical check is recommended every 6 months and required every 12 months.**

**Failure to follow these instructions can result in death, serious injury, or equipment damage.**

## Battery Safety

### **⚠ DANGER**

#### **HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH**

- Battery circuit breakers must be installed according to the specifications and requirements as defined by Schneider Electric.
- Servicing of batteries must only be performed or supervised by qualified personnel knowledgeable of batteries and the required precautions. Keep unqualified personnel away from batteries.
- Disconnect charging source prior to connecting or disconnecting battery terminals.
- Do not dispose of batteries in a fire as they can explode.
- Do not open, alter, or mutilate batteries. Released electrolyte is harmful to the skin and eyes. It may be toxic.

**Failure to follow these instructions will result in death or serious injury.**

### **⚠ DANGER**

#### **HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH**

Batteries can present a risk of electric shock and high short-circuit current. The following precautions must be observed when working on batteries

- Remove watches, rings, or other metal objects.
- Use tools with insulated handles.
- Wear protective glasses, gloves and boots.
- Do not lay tools or metal parts on top of batteries.
- Disconnect the charging source prior to connecting or disconnecting battery terminals.
- Determine if the battery is inadvertently grounded. If inadvertently grounded, remove source from ground. Contact with any part of a grounded battery can result in electric shock. The likelihood of such shock can be reduced if such grounds are removed during installation and maintenance (applicable to equipment and remote battery supplies not having a grounded supply circuit).

**Failure to follow these instructions will result in death or serious injury.**

### **⚠ DANGER**

#### **HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH**

When replacing batteries, always replace with the same type and number of batteries or battery packs.

**Failure to follow these instructions will result in death or serious injury.**

**⚠ CAUTION****RISK OF EQUIPMENT DAMAGE**

Batteries must not be stored more than six months due to the requirement of recharging. If the UPS system remains de-energized for a long period, we recommend that you energize the UPS system for a period of 24 hours at least once every month. This charges the batteries, thus avoiding irreversible damage.

**Failure to follow these instructions can result in injury or equipment damage.**

**Electromagnetic Compatibility****NOTICE****RISK OF ELECTROMAGNETIC DISTURBANCE**

This is a product Category C3 according to IEC 62040-2. This is a product for commercial and industrial applications in the second environment - installation restrictions or additional measures may be needed to prevent disturbances. The second environment includes all commercial, light industry, and industrial locations other than residential, commercial, and light industrial premises directly connected without intermediate transformer to a public low-voltage mains supply. The installation and cabling must follow the electromagnetic compatibility rules, e.g.:

- the segregation of cables,
- the use of shielded or special cables when relevant,
- the use of grounded metallic cable tray and supports.

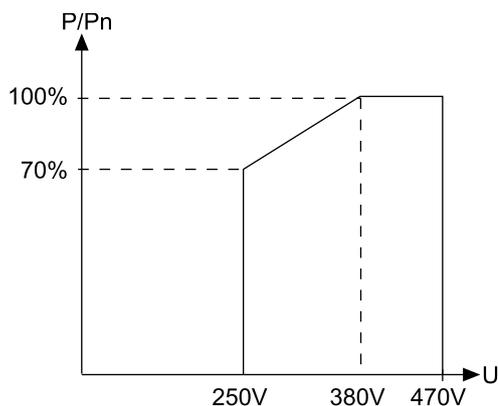
**Failure to follow these instructions can result in equipment damage.**

# Specifications

## Input

UPS rating	20 kVA	30 kVA	40 kVA	60 kVA	80 kVA	100 kVA	120 kVA
Input voltage (V)	380 - 400 - 415						
Input voltage range permitted by the standard according to the curve below (V)	250 to 470 for a standard UPS 342 to 470 for a UPS with backfeed protection						
Input frequency (Hz)	45 to 65						
Rated current <sup>1</sup> Normal AC input (A)	32	45	57	87	115	143	171
Maximum input current (A) for 400 V	33	46	58	88	116	145	173
Input current (A) for 400V, overload=1.25 In limited to 10 min.	39	56	72	108	145	181	217
Input current (A) for 400V, overload=1.5 In limited to 1 min.	47	68	87	130	174	217	260
THDI	< 6% at full load < 8% at 25–75% load						
Maximum short circuit withstand (kA)	20				30		
Input fuse ratings (A)	80	80	80	125	160	315	315

## Power Supplied as a Function of Input Voltage



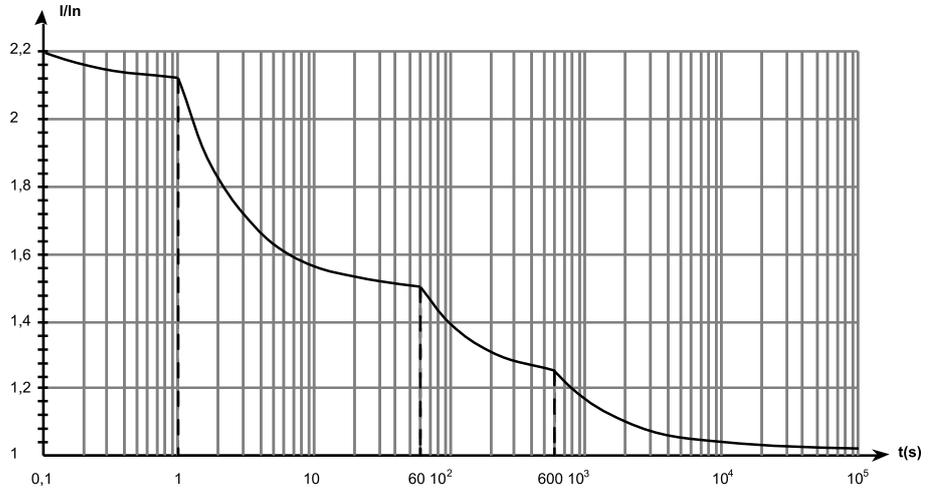
## Output

UPS rating	20 kVA	30 kVA	40 kVA	60 kVA	80 kVA	100 kVA	120 kVA
Overload capacity	125% for 10 minutes 150% for 1 minute 220% for 0.1 second						
Voltage tolerance (V)	380, 400, 415 ± 3%						
Rated output current	29	44	58	87	116	145	174
Output current limitation (A)	190			240	360	480	
Output frequency	50 Hz or 60 Hz						
THDU	≤ 1% phase to phase, ≤ 1.5% phase to neutral for linear loads ≤ 2.5% phase to phase, ≤ 3.5% phase to neutral for non-linear loads						

1. Rated currents with battery float charging. normal AC input voltage = U, AC bypass input = U, load = 400 V / P load = PN / load cos phi = 0.9

UPS rating	20 kVA	30 kVA	40 kVA	60 kVA	80 kVA	100 kVA	120 kVA
Output fuse rating	80	80	80	125	160	315	315
Crest factor	6.55	4.41	3.27	2.75	3.12	3.33	2.77

### Permissible UPS Overloads as a Function of Time



### Bypass

UPS rating	20 kVA	30 kVA	40 kVA	60 kVA	80 kVA	100 kVA	120 kVA
Connection type	3PH+N						
Input voltage (V)	380 to 443						
Input frequency (Hz)	46 to 54						

## Environment

### Operating Temperatures

The operating temperature range is 0 to 40 °C, however optimal operation is 20 to 25 °C.

Battery backup time is adversely affected by high and low temperatures. It is significantly reduced at temperatures under 10 °C.

Above 25 °C, battery service life is reduced by 50% for every 10 °C temperature increase. Above 40 °C, battery manufacturers no longer guarantee operation due to the risk of thermal runaway.

Losses calculated with maximum current → V=380 and RL load; cosφ: 0.9 @ 100% load

### Heat Dissipation

UPS rating	20 kVA	30 kVA	40 kVA	60 kVA	80 kVA	100 kVA	120 kVA
Losses (kW)	1.61	2.03	2.68	4.26	4.86	6.90	8.41
Heat dissipation (BTU/hr)	5493	6928	9146	14539	16587	23549	28362
Recommended air throughput (m <sup>3</sup> /h)	1332				2556		

## Batteries

Battery type: Sealed lead-acid or vented lead acid.

### DC Power Levels for Battery Sizing with Output Power Factor = 0.9

UPS rating		20 kVA	30 kVA	40 kVA	60 kVA	80 kVA	100 kVA	120 kVA
DC power in KW	Load 25 %	6.3	8.6	10.9	15.6	20.6	25.2	29.8
	Load 50 %	10.9	15.6	20.3	29.7	34.9	48.5	58.1
	Load 75 %	15.6	22.6	29.7	44.2	58.9	72.5	87.1
	Load 100 %	20.3	29.7	39.4	58.6	78.4	97	116.8

### DC Power Levels for Battery Sizing with Output Power Factor = 0.8

UPS rating		20 kVA	30 kVA	40 kVA	60 kVA	80 kVA	100 kVA	120 kVA
DC power in KW	Load 25 %	5.8	7.8	9.9	14.1	18.5	22.6	26.8
	Load 50 %	9.9	14.1	18.2	26.6	33.1	43.4	51.7
	Load 75 %	14.1	20.3	26.6	39.4	52.4	64.5	77.3
	Load 100 %	18.2	26.6	35.0	52.2	69.6	86.0	103.5

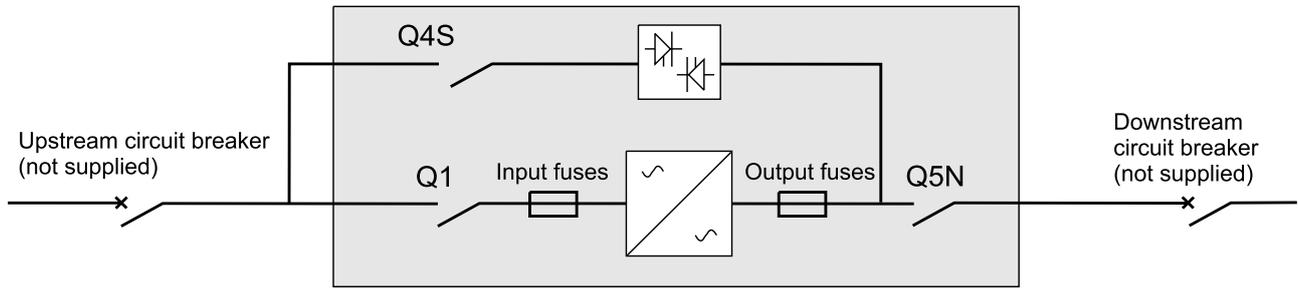
### Maximum Current at End of Discharge

UPS rating	20 kVA	30 kVA	40 kVA	60 kVA	80 kVA	100 kVA	120 kVA
Battery (A)	68	101	134	201	268	338	402
Load (A)	29	44	58	87	116	145	174

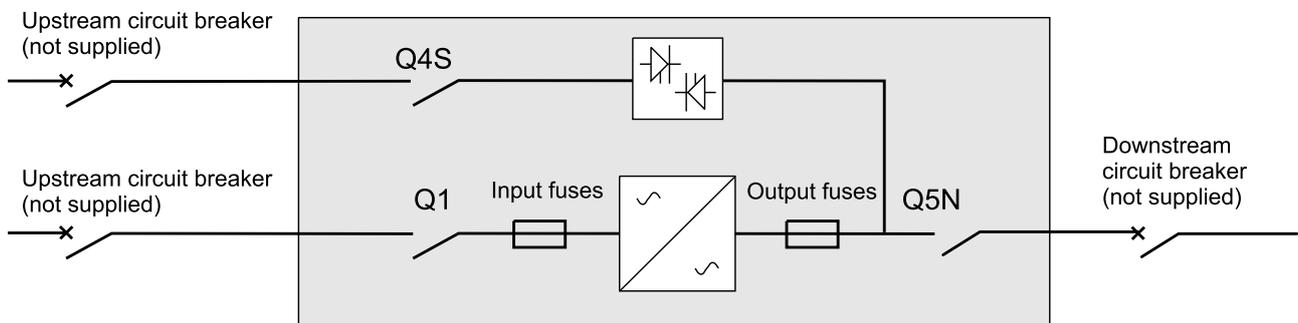
# Recommended Circuit Breakers and Cable Sizes

## Selection of Circuit Breakers

### UPS in Single Utility/Mains System



### UPS in Dual Utility/Mains System



## Recommended Upstream Circuit Breaker

UPS Rating	20 kVA	30 kVA	40 kVA	60 kVA	80 kVA	100 kVA	120 kVA
Dual utility/ mains system – Input	C60L - 50A	C60L - 63A	NSX 100F 3P- TM80D	NSX 160F 3P- TM125D	NSX 160F 3P- TM160D	NSX 250F 3P- TM200D	NSX 250F 3P- TM250D
Dual utility/ mains system – Bypass	NSX 100F 4P- TM100D	NSX 100F 4P- TM100D	NSX 100F 4P- TM100D	NSX 160F 4P- TM125D	NSX 160F 4P- TM160D	NSX 250F 4P- TM250D	NSX 250F 4P- TM250D
Single utility/ mains system	NSX 100F 4P- TM100D	NSX 100F 4P- TM100D	NSX 100F 4P- TM100D	NSX 160F 4P- TM125D	NSX 160F 4P- TM160D	NSX 250F 4P- TM250D	NSX 250F 4P- TM250D

### ⚠ WARNING

#### HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

Place a label with the following text on each upstream circuit breaker: **“Isolate the Uninterruptible Power Supply (UPS) before working on this circuit”**.

**Failure to follow these instructions can result in death, serious injury, or equipment damage.**

### NOTICE

#### RISK OF EXPLOSION, ARC FLASH OR VOLTAGE OUTAGE

For Installation design, consider:

- the above recommended upstream circuit breaker for discrimination with the UPS internal fuses.
- I<sub>cw</sub> = 20 kA for 20 to 60 kVA UPS when using the recommended upstream circuit breaker.
- I<sub>cw</sub> = 30 kA for 80 to 120 kVA UPS when using the recommended upstream circuit breaker.

**Failure to follow these instructions can result in equipment damage.**

## Recommended Downstream Circuit Breaker

UPS rating	20-30-40 kVA		60 kVA		80 kVA		100-120 kVA	
Downstream circuit breaker	C60N						C120N	NSX100
Trip unit	C 16A	B 25A	C 20A	B 32A	C 25A	B 50A	C 32A	B 63A TMG 63A

N type curve for the downstream circuit breaker can be replaced by H or L type curve, depending on the installation. The indicated protection ensures discrimination for each output circuit downstream of the UPS, whether supplied via the input or the bypass source.

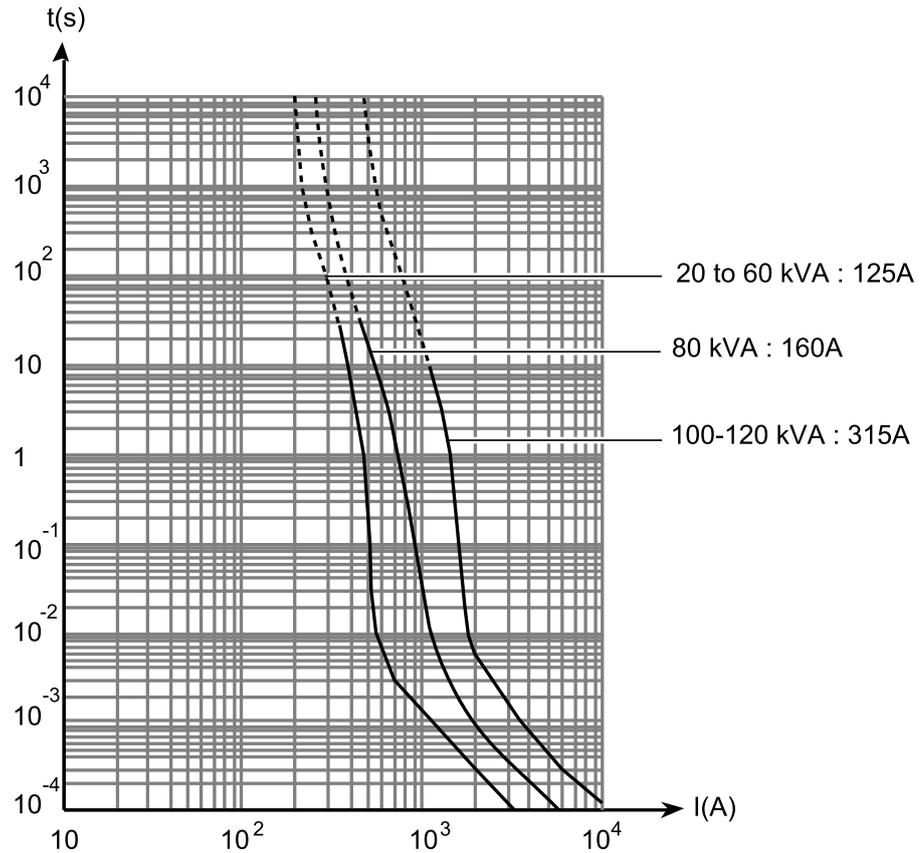
**NOTE:** If these downstream protection recommendations are not followed, it can result in a break in power longer than 20 ms in all the output circuits if a short circuit occurs on an output circuit.

## Earth-Leakage Current

UPS earth-leakage current is 1A.

**Fuses**

**Time/Current Curves for UPS Input and Output Fuses**



**Recommended Cable Sizes**

**NOTE:** Cables length must be less than 100 meters.

UPS rating	20 kVA	30 kVA	40 kVA	60 kVA	80 kVA	100 kVA	120 kVA
Dual utility/ mains system – Input (mm <sup>2</sup> )	10	16	16	25	50	50	70
Dual utility/ mains system – Bypass (mm <sup>2</sup> )	16	16	16	25	50	70	70
Single utility/ mains system – Input & bypass (mm <sup>2</sup> )	16	16	16	25	50	70	70
Output (mm <sup>2</sup> )	16	16	16	25	50	70	70
Battery (<15 m) (mm <sup>2</sup> )	16	25	35	70	95	2 x 50	2 x 70

**⚠ DANGER**

**HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH**

Use power cables of equal resistance, equal length, and equal size for the same function.

**Failure to follow these instructions will result in death or serious injury.**

**NOTE:** Cable sizes are determined for copper conductors (for aluminium conductors, increase the size by 30%). Size calculations also take into account a voltage of 400 V and grouping of four cables.

Terminal hole diameter: 6.5 mm (8.5 mm for 120 kVA).

PE cables (Protective Earth) cables connect to the earthing terminal. Hole diameter: 6.5 mm (8.5 mm for 120 kVA).

## Transformers

### Marine UPS Adaptation Voltage Transformer Specifications

UPS Rating		60 kVA		80 kVA		120 kVA	
Transformation		440V to 400V	690V to 400V	440V to 400V	690V to 400V	440V to 400V	690V to 400V
Topology		Dyn11		Dyn11		Dyn11	
Primary	Voltage (V)	440 +/- 5%	690 +/- 5%	440 +/- 5%	690 +/- 5%	440 +/- 5%	690 +/- 5%
	Current (A)	81	52	108	69	162	103
	Cable sizes (mm <sup>2</sup> ) <sup>2</sup>	35	35	95	35	95	95
Secondary	Voltage (V)	400					
	Current (A) <sup>3</sup>	87		116		174	
	Cable sizes (mm <sup>2</sup> ) <sup>2</sup>	35		35		95	
Frequency (Hz)		50/60					
Efficiency		> 97.3% at 40 °C		> 97.7% at 40 °C		> 98.5% at 40 °C	
Overload		110% for 2 hours					
Inrush current		< 5 x I <sub>n</sub>					

### Isolation Transformer Specifications

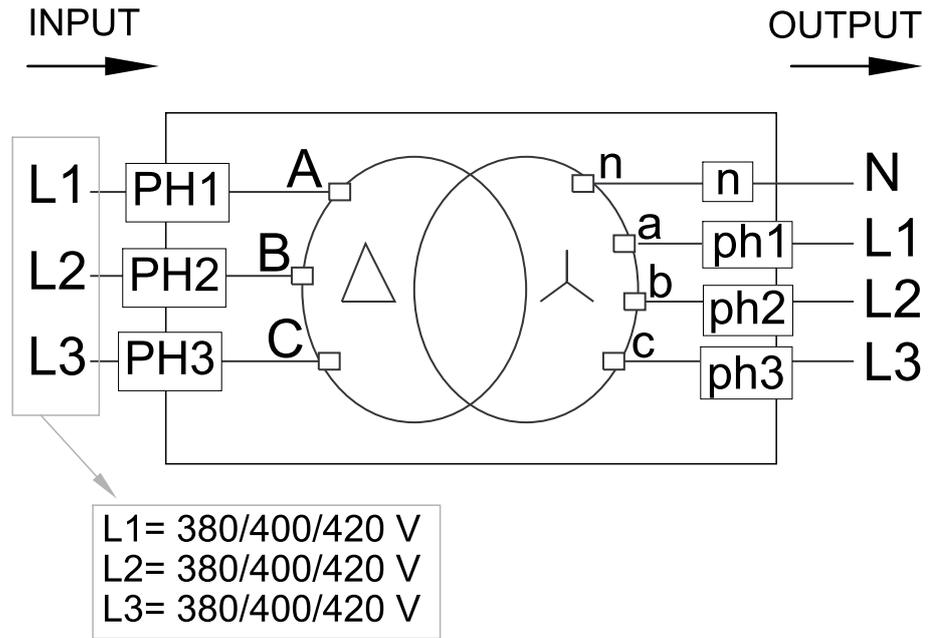
UPS Rating	40 kVA	60 kVA	120 kVA
Voltage (V)	380–400–415 +/- 5%		
Frequency (Hz)	50		
Efficiency	> 97% at 75 °C	> 96% at 75 °C	> 97% at 75 °C
Overload	110% for 1 hour		
Inrush current	< 12 I <sub>nom</sub> 915 A at 380 V	< 12 I <sub>nom</sub> 1095 A at 380 V	< 12 I <sub>nom</sub> 2005 A at 380 V
Power dissipation	1.88 KW / 450 cal/.s	2.61 KW / 624 cal/.s	4.38 KW / 1047 cal/.s

The isolation transformer is DYN05 type. It can be connected to AC input and AC bypass sources (upstream) and load output (downstream) of a Galaxy 5500 UPS. The isolation transformer can setup galvanic isolation from upstream power, network power supply to downstream power absorber. A 3 meter cable is provided with the transformer to connect it to the UPS, limiting the installation distance between the UPS and the transformer to under 3 meters.

2. The suggested cable sizes are for 1000R02V type copper cables less than 100 meters long and for a voltage drop of less than 3%.  
3. Full load

**NOTE:** The current values given in the table below are for nominal utility/mains voltages and rated load.  
The transforming ratio is equal to 1.

UPS Rating		40 kVA	60 kVA	120 kVA
Line current for various utility/mains voltages (A)	380 V	61	91	182
	400 V	58	87	173
	415 V	56	84	166
Transformer inrush current (max)		12 x Inom	12 x Inom	11 x Inom
Vector group		DYN11	DYN5	DYN5
Cable sizes <sup>4</sup> (mm <sup>2</sup> )	Power cables	35	35	70
	PE cables	16	16	35



4. The suggested cable sizes are for 1000R02V type copper cables less than 100 meters long and for a voltage drop of less than 3%.

## Battery Circuit Breaker Enclosure

The recommended cable sizes are applicable to U1000R02V type copper cables. They are calculated in relation to permissible temperature rises and take into account a maximum line voltage drop of 1 % for a maximum cable length of 25 m. For greater cable lengths, sizes will be chosen to keep the voltage drop within 1%.

<b>UPS Rating</b>		<b>20 – 120 kVA</b>	<b>100-120 kVA</b>
<b>Runtime</b>		<b>≤ 10 mn</b>	<b>&gt; 10 mn</b>
Weight (kg)	Enclosure without insulation monitor	15	35
	Enclosure with insulation monitor	17	37

### **WARNING**

#### HAZARD OF FIRE

- Protect the battery circuit with a DC circuit breaker equipped with an undervoltage coil (MN 24 VDC).
- The DC breaker must be rated. The undervoltage coil must be wired to the UPS as shown in the connection diagrams below.

**Failure to follow these instructions can result in death, serious injury, or equipment damage.**

#### Standard Battery Circuit Breaker Offer

UPS rating		20 kVA		30 kVA		40 kVA		60 kVA		80 – 120 kVA
Maximum battery backup time at full load <sup>5</sup>		≤ 30 mn	≤ 15 mn	> 15 mn to ≤ 30 mn	≤ 15 mn	> 15 mn to ≤ 30 mn	≤ 5 mn	> 5 mn to ≤ 30 mn	≤ 30 mn	
Configuration		Internal batteries	Internal batteries	External batteries	Internal batteries	External batteries	Internal batteries	External batteries	External batteries	
QF1 circuit breaker	Type	NSX160S DC 3P	NSX160S DC 3P	NSX400S DC 3P	NSX160S DC 3P	NSX400S DC 3P	NSX160S DC 3P	NSX400S DC 3P	NSX400S DC 3P	
	Trip unit	TM100D	TM100D	MP1	TM250D	MP1	TM250D	MP1	MP1	
	Magnetic setting (A)	800	800	800	1250	800	1250	800	800	
	Thermal setting	1	1	-	1	-	1	-	-	

5. For other values, consult the after sales department at Schneider Electric or your local agency.

### Circuit Breaker Specifications

UPS rating		20 kVA	30 kVA	40 kVA	60 kVA	80 kVA	100 kVA	120 kVA
Requirements		<ul style="list-style-type: none"> <li>It must be a DC current circuit breaker (Power pole and tripping).</li> <li>DC rating must be higher than 500 VDC.</li> <li>Breaking capacity must be higher than maximum battery short circuit current.</li> </ul>						
Mandatory fitted equipment		<ul style="list-style-type: none"> <li>24 VDC Undervoltage coil tripping</li> <li>Auxiliary dry contact</li> </ul>						
Current setting <sup>6</sup>	Rated discharge battery current (A)	68	101	134	201	268	338	402
	Maximum magnetic current	Magnetic current setting (Isd) must be less than 50% of maximum battery short circuit current <sup>7</sup>						
	Minimum magnetic setting (A) <sup>8</sup>	95.2	141.1	187.6	281.4	375.2	473.2	562.8

**NOTE:** Due to discharge time limited to battery backup time, circuit breaker can be overloaded according to battery supplier specifications.

6. Rated discharge battery current based on nominal load with a power factor of 0.9

7. According to circuit breaker supplier specifications.

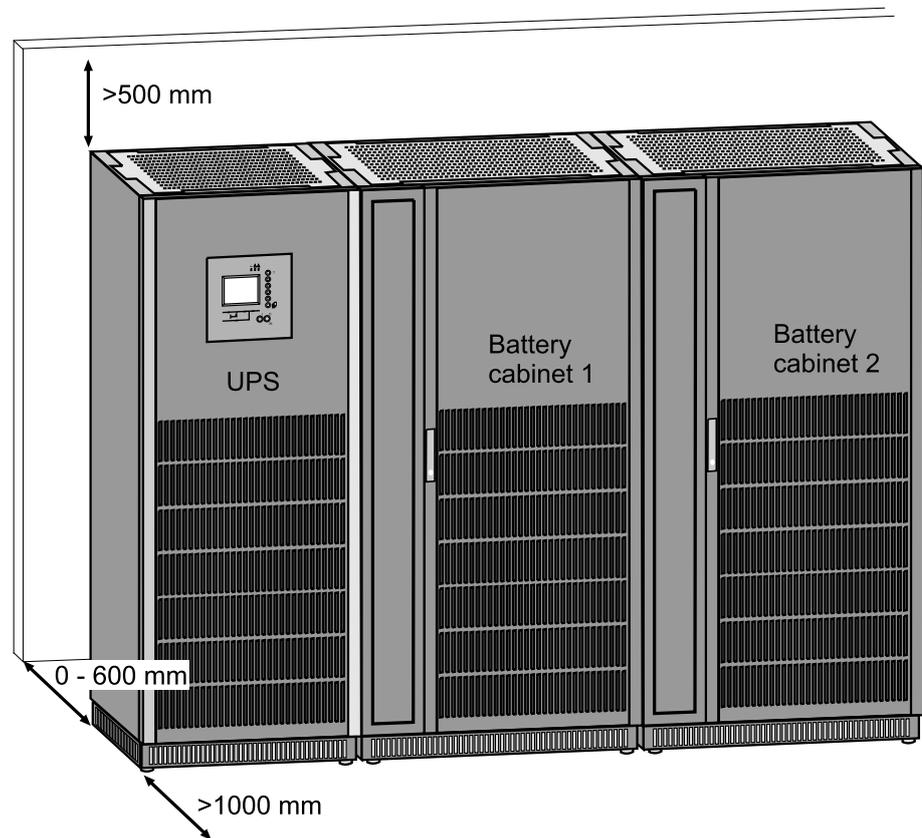
8. Including 20% of circuit breaker trip uncertainty. Magnetic must trip below 40 ms for 50% of maximum battery short circuit current.

# Mechanical Assembly

**NOTE:** Not applicable for Galaxy 5500 Marine, see Galaxy 5500 Marine receiving and unpacking manual.

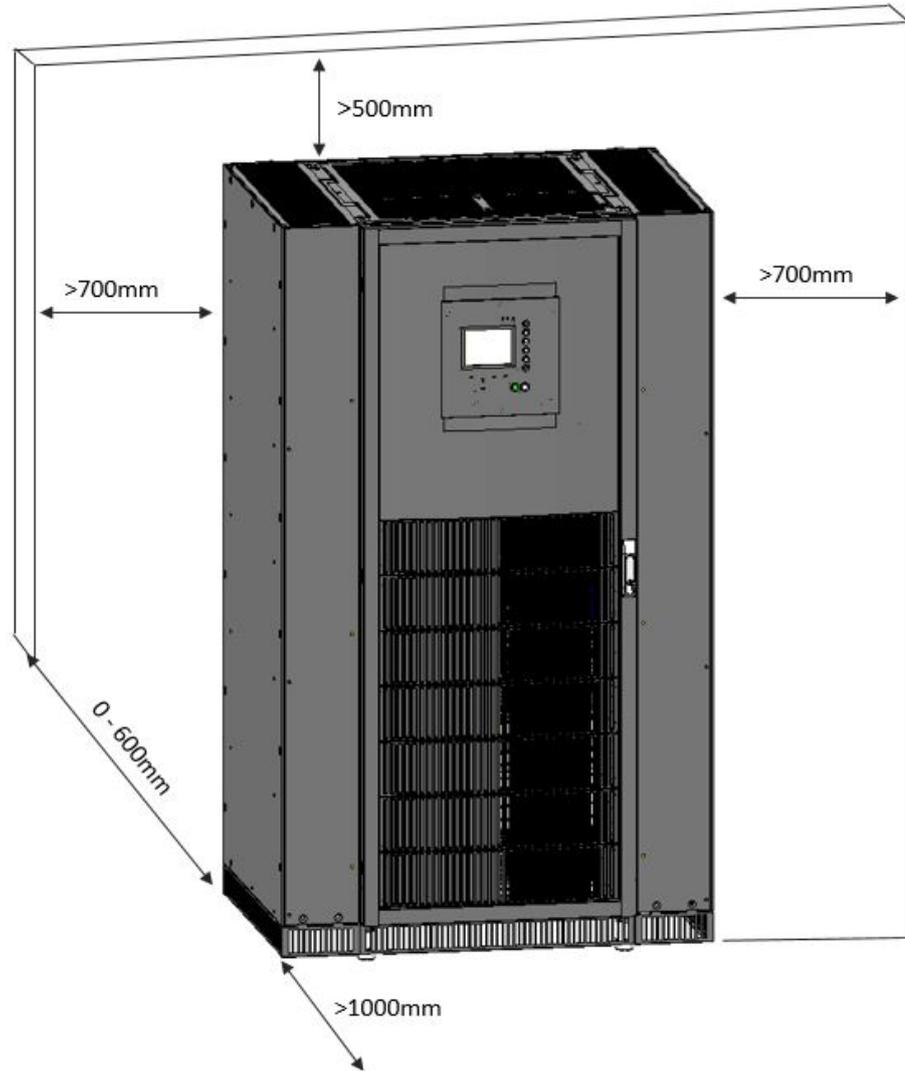
## Clearance Dimensions

### UPS with external batteries



**NOTE:** The clearance dimensions given above are published for airflow and service access only. Consult with the local safety codes and standards for additional requirements in your local area.

**UPS with internal batteries (AIOB — All In One Box)**



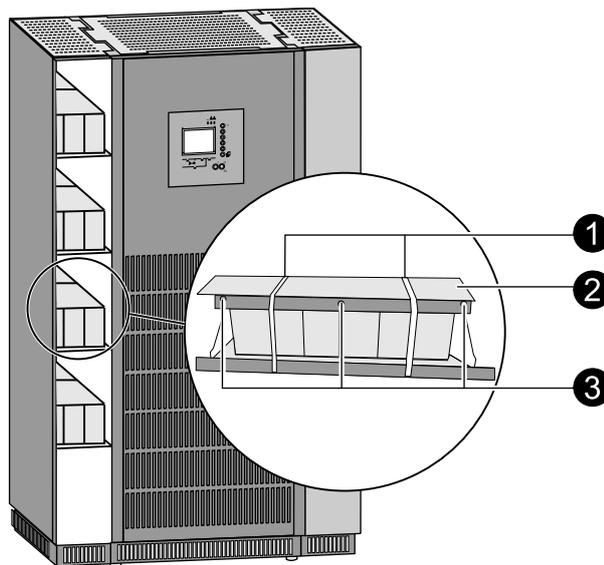
**NOTE:** The clearance dimensions given above are published for airflow and service access only. Consult with the local safety codes and standards for additional requirements in your local area.

## Remove Battery Protection

### Remove Battery Protection from the UPS

The cardboard protecting the batteries must always be removed once the cabinet is installed in its final location.

1. Remove the ties holding the cardboard.
2. Remove the cardboard.
3. Remove the struts.

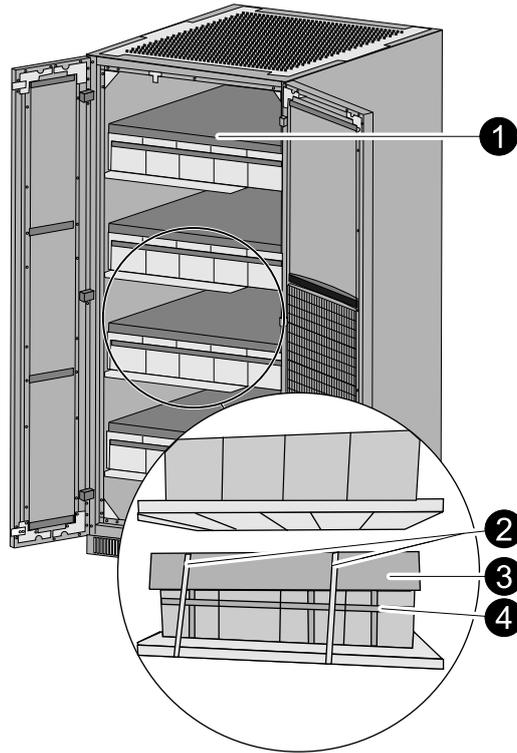


### Remove Battery Protection from the External Battery Cabinet

The cardboard protecting the batteries must always be removed once the cabinet is installed in its final location.

1. Remove the battery support upright.
2. Remove the ties holding the cardboard (1000 mm external battery cabinet).
3. Remove the cardboard protecting the batteries.

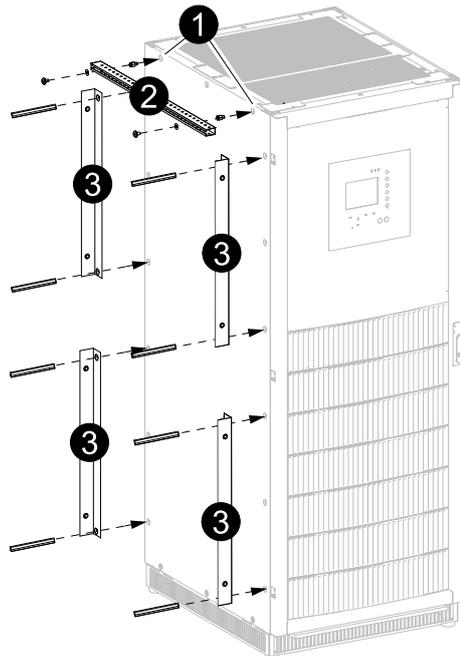
4. Remove the ties holding the batteries.



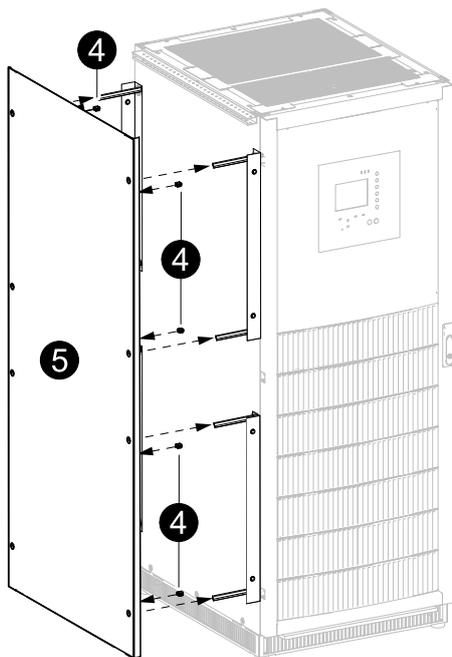
## Install the Top Entry Option

**NOTE:** Tightening torque for all operations is 6.5 Nm.

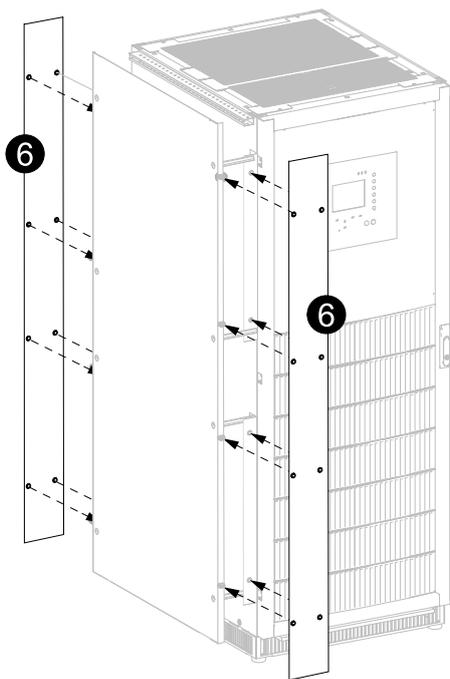
1. Remove the two screws on the top edges of the UPS left side panel.
2. Install the cable fastening bar using the M5 spacers, the washers, and the M5 screws.
3. Install the panel brackets and spacers.



4. Install four clip nuts on each sides of the left side panel.
5. Install the left side panel using M6 screws.



6. Install the front and back panels using the remaining M6 screws.

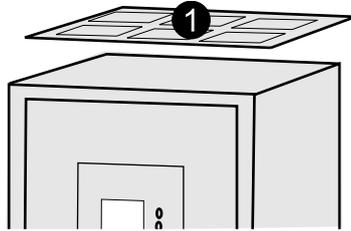


## Install the IP32 Option

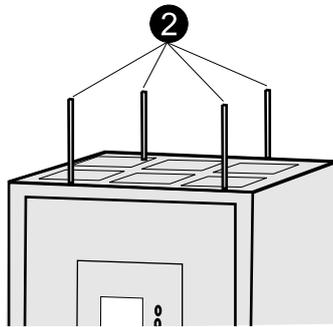
**NOTE:** Not applicable for Galaxy 5500 Marine, see Galaxy 5500 Marine receiving and unpacking manual.

**NOTE:** The IP32 option will add 200 mm to the height of the cabinet.

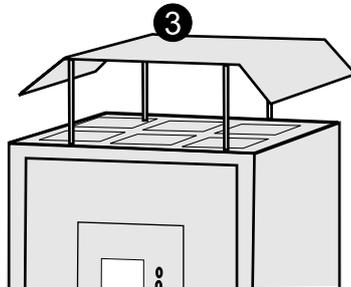
1. Install the protection cover on top of the UPS.



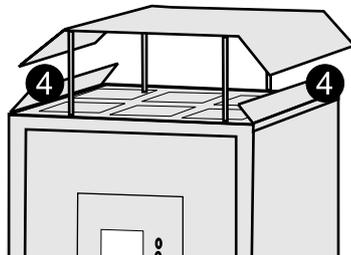
2. Install the posts. The longer posts must be positioned in the front.



3. Install the roof.



4. Install the side deflectors.



# Floor Mounting

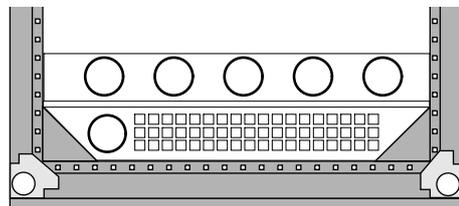
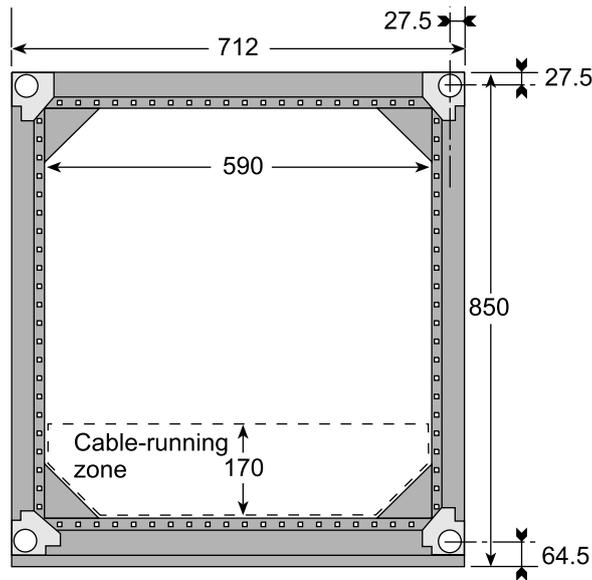
## ⚠ WARNING

### HAZARD OF OVERHEATING

Do not remove the cabinet feet as they are required to ensure sufficient ventilation.

**Failure to follow these instructions can result in death, serious injury, or equipment damage.**

The measurements include the cabinet side (panels and door).



Rodent Mesh (installed in some products)

# Connect Input and PE Cables in Single Systems

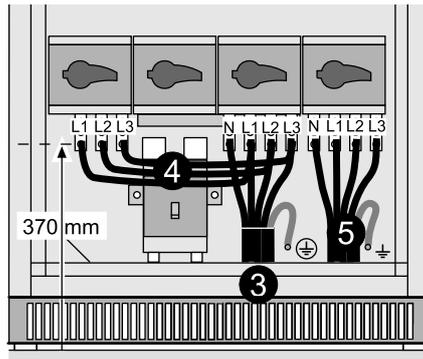
## Single Utility/Mains Systems

### ⚠ DANGER

**HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH**

PE cables must be connected first.

**Failure to follow these instructions will result in death or serious injury.**



1. Fold the dust protection cover as shown on the cover.
2. Remove the protection cover in the bottom of the cabinet.
3. Connect the AC input cables to the bypass terminals and to the UPS earthing terminal.
4. Connect cables from the input terminals to the bypass terminals.
5. Connect the AC output cables to the output terminals and to the UPS earthing terminal.
6. Fasten the cables to the cabinet.
7. Reinstall the protection cover for power terminals. Tightening torque is 2 Nm.
8. Unfold the dust protection cover.

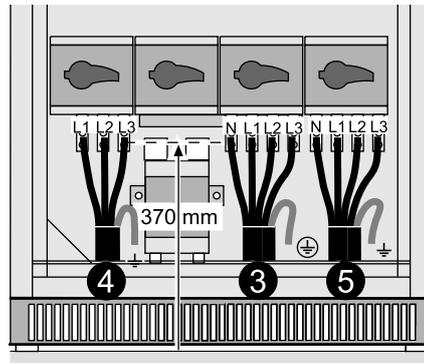
## Dual Utility/Mains Systems

### ⚠ DANGER

**HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH**

PE cables must be connected first.

**Failure to follow these instructions will result in death or serious injury.**



1. Fold the dust protection cover as shown on the cover.
2. Remove the protection cover in the bottom of the cabinet.
3. Connect the AC bypass cables to the bypass terminals and to the UPS earthing terminal.
4. Connect the AC input cables to the input terminals.
5. Connect the AC output cables to the output terminals and to the UPS earthing terminal.
6. Fasten the cables to the cabinet.
7. Reinstall the protection cover for power terminals. Tightening torque is 2 Nm.
8. Unfold the dust protection cover.

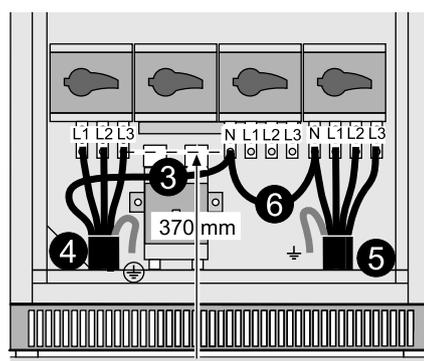
## Frequency Converter

### ⚠ DANGER

**HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH**

PE cables must be connected first.

**Failure to follow these instructions will result in death or serious injury.**

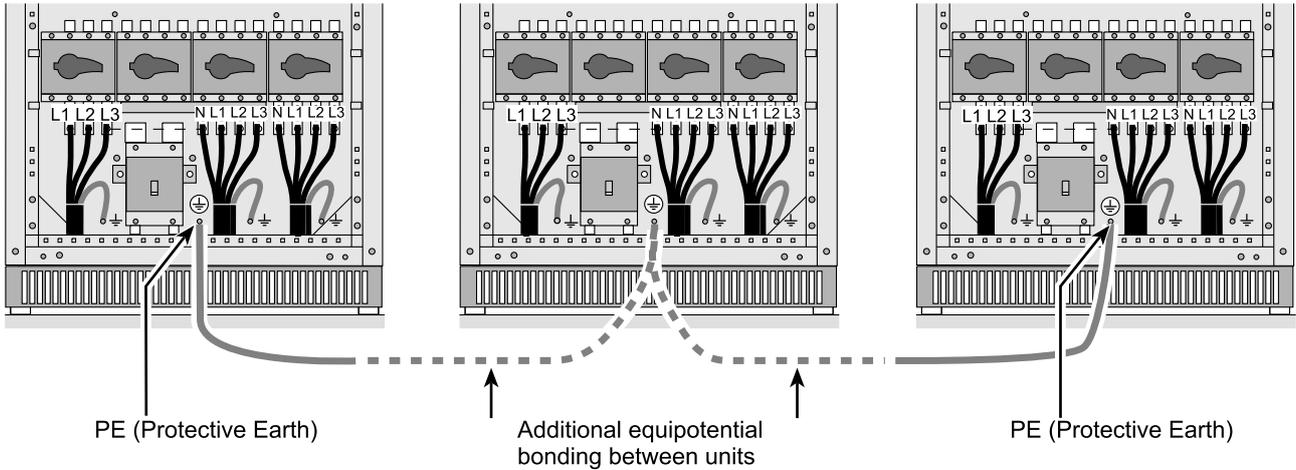


1. Fold the dust protection cover as shown on the cover.
2. Remove the protection cover in the bottom of the cabinet.
3. Connect the AC input neutral cable to the AC bypass neutral terminal.
4. Connect the AC input cables to the input terminals and to the UPS earthing terminal.
5. Connect the AC output cables to the output terminals and to the UPS earthing terminal.

6. Connect the bypass neutral terminal to the output neutral terminal.
7. Fasten the cables to the cabinet.
8. Reinstall the protection cover for power terminals. Tightening torque is 2 Nm.
9. Unfold the dust protection cover.

# Connect Input and PE Cables in Parallel Systems

## Overview



## Single Utility/Mains Systems

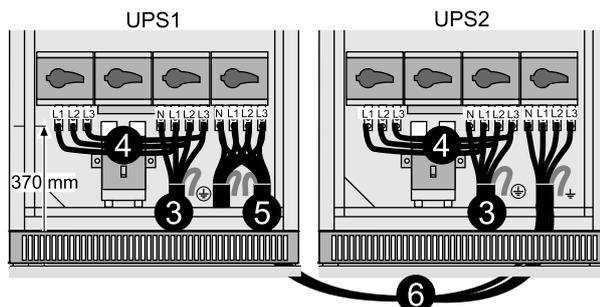
**⚠ DANGER**

**HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH**

PE cables must be connected first.

**Failure to follow these instructions will result in death or serious injury.**

1. Fold the dust protection cover as shown on the cover.
2. Remove the protection cover in the bottom of the cabinet.
3. Connect the AC input cables to the bypass terminals and to the UPS earthing terminal for each UPS.
4. Connect cables from the input terminals to the bypass terminals for each UPS.
5. Connect the AC output cables to the output terminals and to the UPS earthing terminal of UPS1.
6. Connect cables from the output terminals of UPS1 to the output terminals of UPS2.
7. Fasten the cables to the cabinet.
8. Reinstall the protection cover for power terminals. Tightening torque is 2 Nm.
9. Unfold the dust protection cover.



## Dual Utility/Mains Systems

### Redundant Parallel System

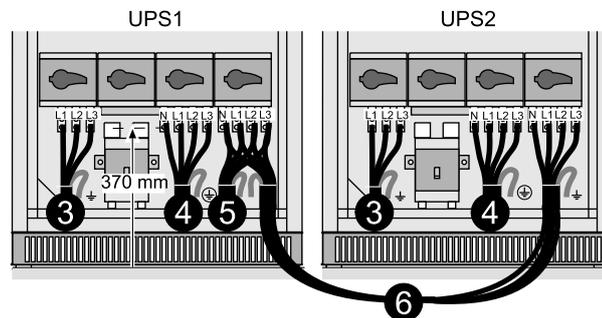
#### **⚠ DANGER**

**HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH**

PE cables must be connected first.

**Failure to follow these instructions will result in death or serious injury.**

1. Fold the dust protection cover as shown on the cover.
2. Remove the terminal protection cover in the bottom of the cabinet.
3. Connect the AC input cables to the input terminals and to the UPS earthing terminal for each UPS.
4. Connect the AC bypass cables to the bypass terminals and to the UPS earthing terminal for each UPS.
5. Connect the AC output cables to the output terminals and to the UPS earthing terminal for UPS1.
6. Connect cables from output terminals of UPS1 to output terminals of UPS2.
7. Fasten the cables to the cabinet.
8. Reinstall the protection cover for power terminals. Tightening torque is 2 Nm.
9. Unfold the dust protection cover.



### Parallel System with External Bypass

#### **⚠ DANGER**

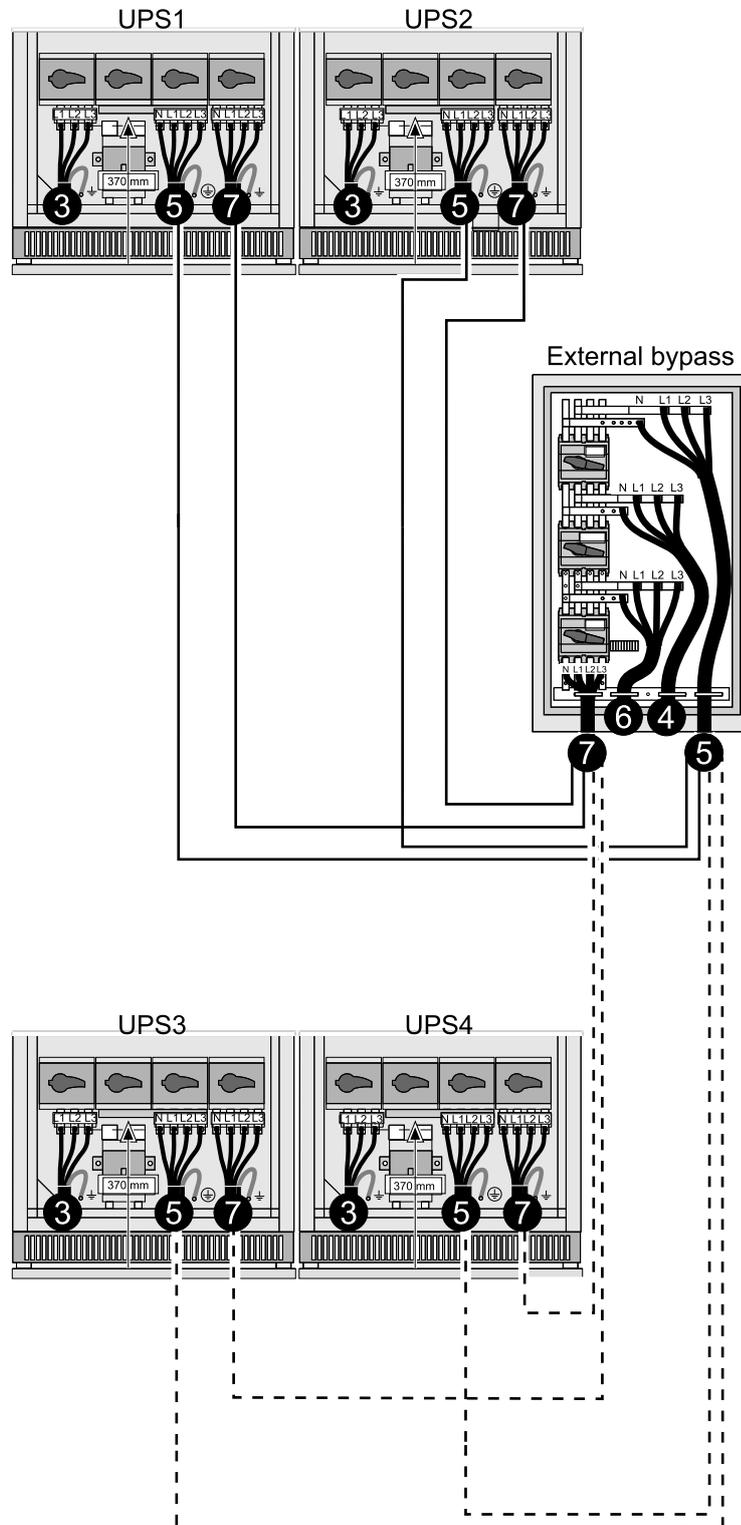
**HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH**

PE cables must be connected first.

**Failure to follow these instructions will result in death or serious injury.**

1. Fold the dust protection cover as shown on the cover.
2. Remove the protection covers in the bottom of the cabinets.
3. Connect the AC input cables to the input terminals and to the UPS earthing terminal of each UPS.
4. Connect the AC bypass input cables to the bypass terminals and to the UPS earthing terminal of the external bypass.
5. Connect the bypass terminals of the UPSs to the bypass terminals of the external bypass using cables with equal lengths and sizes.

6. Connect the AC output cables to the output terminals and to the earthing terminal of the external bypass.
7. Connect the output terminals of the UPSs to the output terminals of the external bypass using cables with equal lengths and sizes.
8. Fasten the cables to the cabinet.
9. Reinstall the protection covers for power terminals. Tightening torque is 2 Nm.
10. Unfold the dust protection cover.



## Frequency Converter

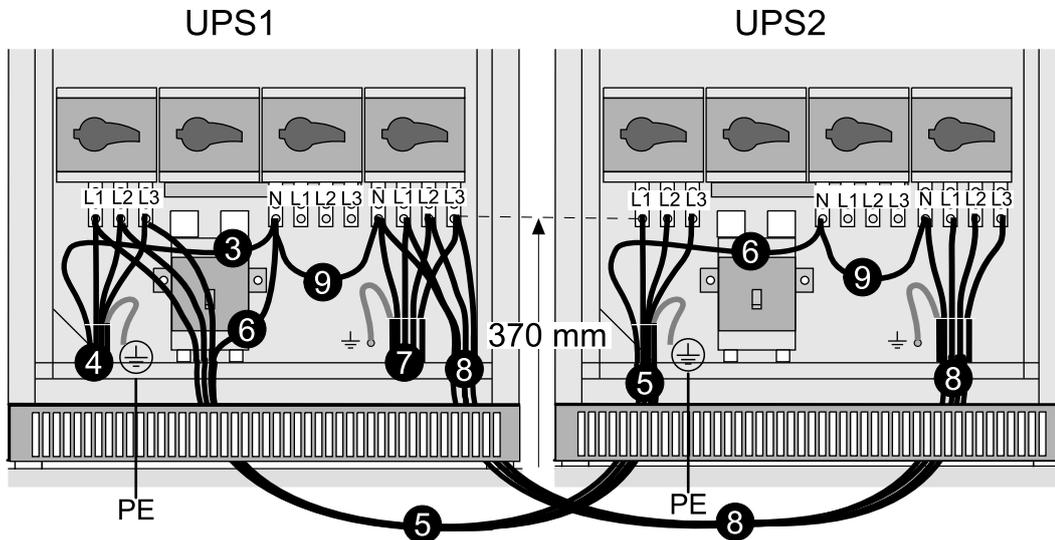
### ⚠ DANGER

#### HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

PE cables must be connected first.

**Failure to follow these instructions will result in death or serious injury.**

1. Fold the dust protection cover as shown on the cover.
2. Remove the protection cover in the bottom of the cabinet.
3. Connect the neutral cable of AC input to the neutral terminal on the bypass terminals.
4. Connect the AC input cables to the input terminals and to the UPS earthing terminal.
5. Connect the input terminal of UPS1 to the input terminal of UPS2.
6. Connect the bypass neutral terminal of UPS1 to the bypass neutral terminal of UPS2.
7. Connect the AC output cables to the output terminals of UPS1.
8. Connect the output terminals of UPS1 to the output terminals of UPS2.
9. Connect bypass neutral terminal to output neutral terminal on both UPSs.
10. Fasten the cables to the cabinet.
11. Reinstall the protection cover for power terminals. Tightening torque is 2 Nm.
12. Unfold the dust protection cover.



# Connect PE Cable in TNC System

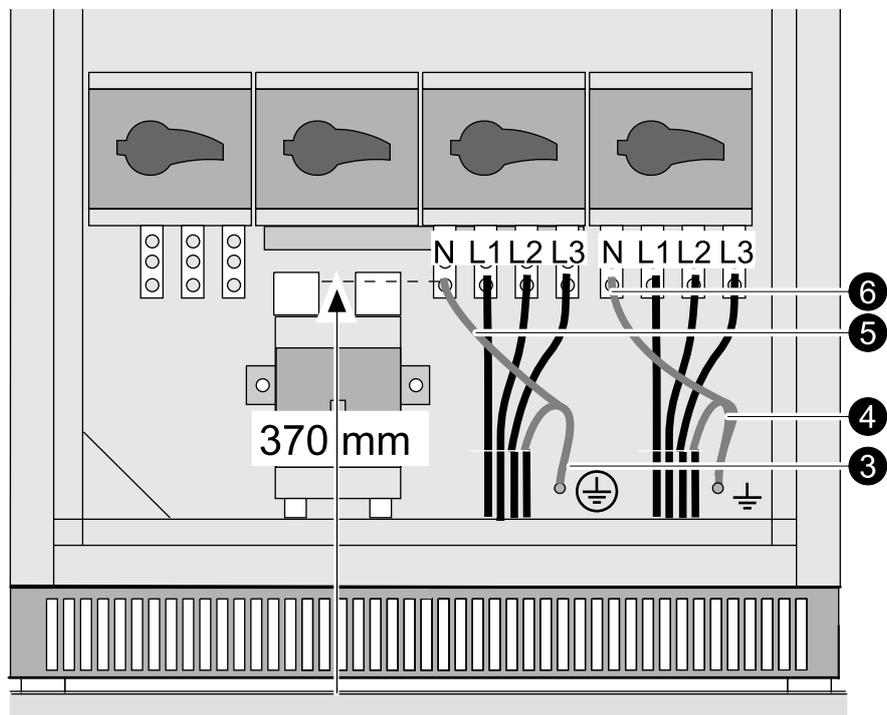
## ⚠ DANGER

### HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

PE cables must be connected for single UPSs, parallel UPSs and external bypasses.

**Failure to follow these instructions will result in death or serious injury.**

1. Fold the dust protection cover as shown on the cover.
2. Remove the protection cover in the bottom of the cabinet.
3. Connect the AC input PEN cable to the UPS bypass earthing terminal.
4. Connect the AC output PEN cable to the UPS output earthing terminal.
5. Connect the UPS bypass earthing terminal to the bypass neutral terminal with the supplied cable.
6. Connect the UPS output earthing terminal to the output neutral terminal with the supplied cable.
7. Fasten the cables to the cabinet.
8. Reinstall the protection cover for power terminals. Tightening torque is 2 Nm.
9. Unfold the dust protection cover.



# Connect the Communication Cables

## Overview of the Communication Cables

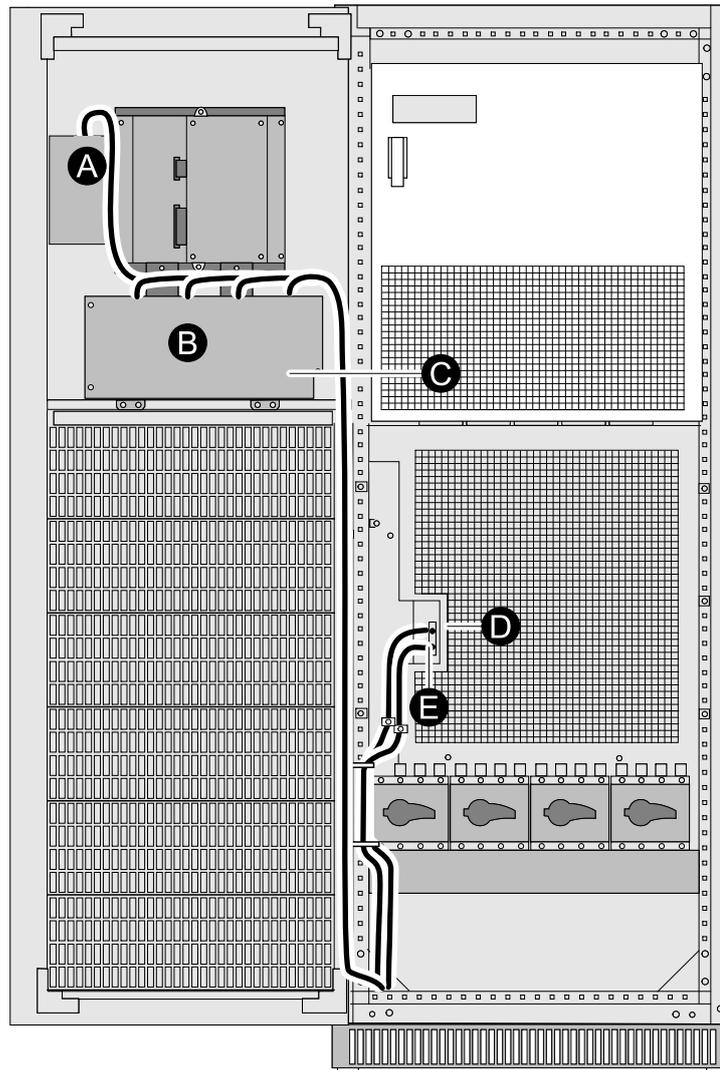
### Overview of Communication Cables in Single Systems

#### **⚠ DANGER**

#### **HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH**

Run the communication cables separately from the power cables to ensure sufficient isolation. If any risk of contact with the power cables exists, reinforce the insulation of the communication cables.

**Failure to follow these instructions will result in death or serious injury.**



- A. Network management card (SELV)
- B. Optional communication cards (SELV or LV)
- C. Dry contact communication card (SELV)
- D. External battery circuit breaker cables (SELV)
- E. General shutdown cable (SELV)

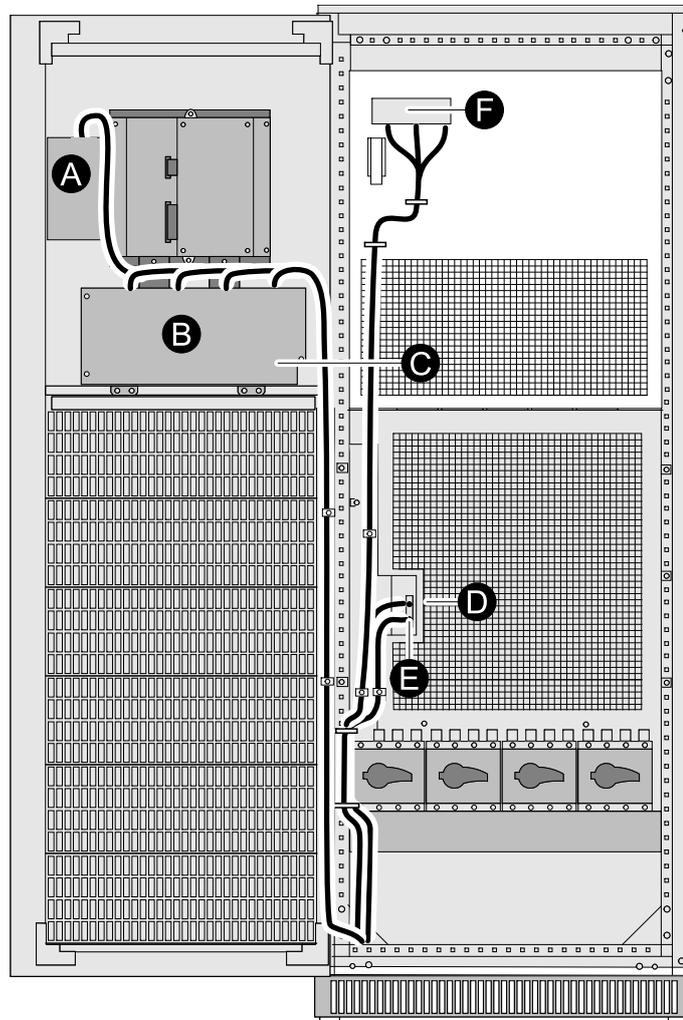
## Overview of Communication Cables in Parallel Systems

### ⚠ DANGER

#### HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

Run the communication cables separately from the power cables to ensure sufficient isolation. If any risk of contact with the power cables exists, reinforce the insulation of the communication cables.

**Failure to follow these instructions will result in death or serious injury.**



- A. Network management card (SELV)
- B. Optional communication cards (SELV or LV)
- C. Dry contact communication card (SELV)
- D. External battery circuit breaker cables (SELV)
- E. General shutdown cable (SELV)
- F. External bypass cable (ELV), CAN cables (SELV) and exchange-current cables (SELV)

## Connect Dry Contact Communication Card

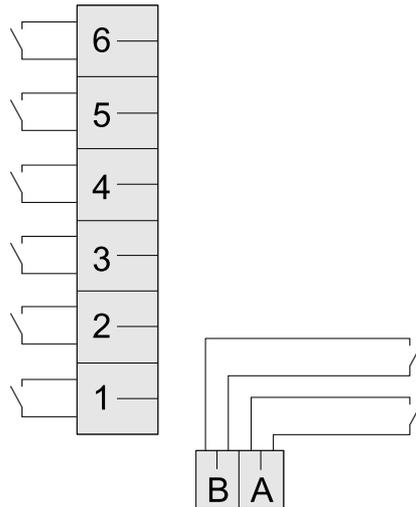
### **⚠ DANGER**

#### **HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH**

Isolate and tagout/lockout all power sources for the dry contact communication card (also known as SECI) before making connections. Never connect SELV (safety extra low voltage) and non-SELV circuits to the different outputs of the same card.

**Failure to follow these instructions will result in death or serious injury.**

**NOTE:** Only one dry contact communication card can be installed in a UPS.



#### **Characteristics of output contacts:**

- Permissible voltage: 250 V AC, 30 V DC
- Permissible current: 2 A
- Cable: 4 x 0.93 mm<sup>2</sup>, Ø 6.6 mm +/- 0.3 mm

Pin	Description
6	Low battery warning
5	Load on battery power
4	Load on automatic bypass
3	Load on UPS
2	Battery inoperable
1	General alarm

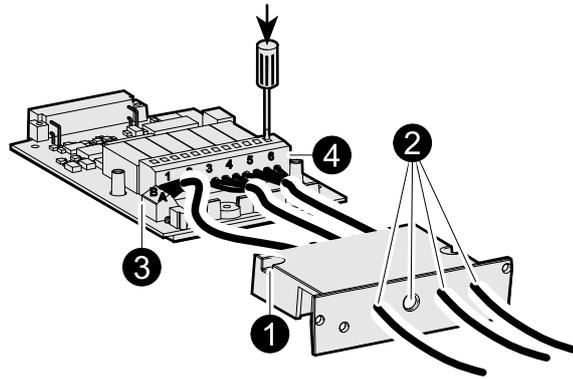
#### **Characteristics of input contacts:**

- Switched voltage: 5 V DC
- Consumption: 10 mA
- Cable: 4 x 0.34 mm<sup>2</sup>, Ø 5 mm +/- 0.5 mm

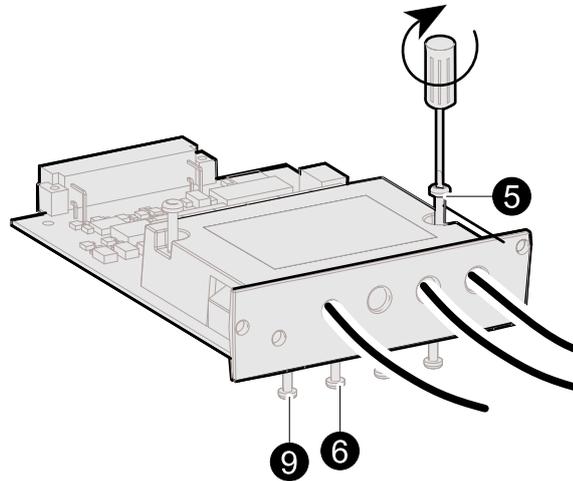
Pin	Description
A	UPS OFF
B	UPS ON

1. Remove the cover fastened by the screws.
2. Run the communication cables through the cable entry holes.
3. Connect the communication cables to the input contacts.

4. Connect the communication cables to the output contacts.



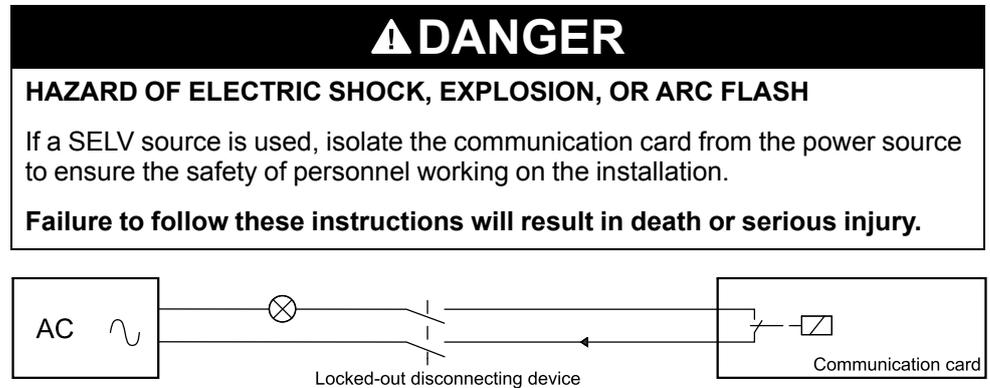
5. Reinstall the cover and fasten it with the screws.
6. Tighten the screws to lock the cables.
7. Indicate the location of the power sources on the labels.
8. Install the card in its slot.
9. Fasten the card with two screws.



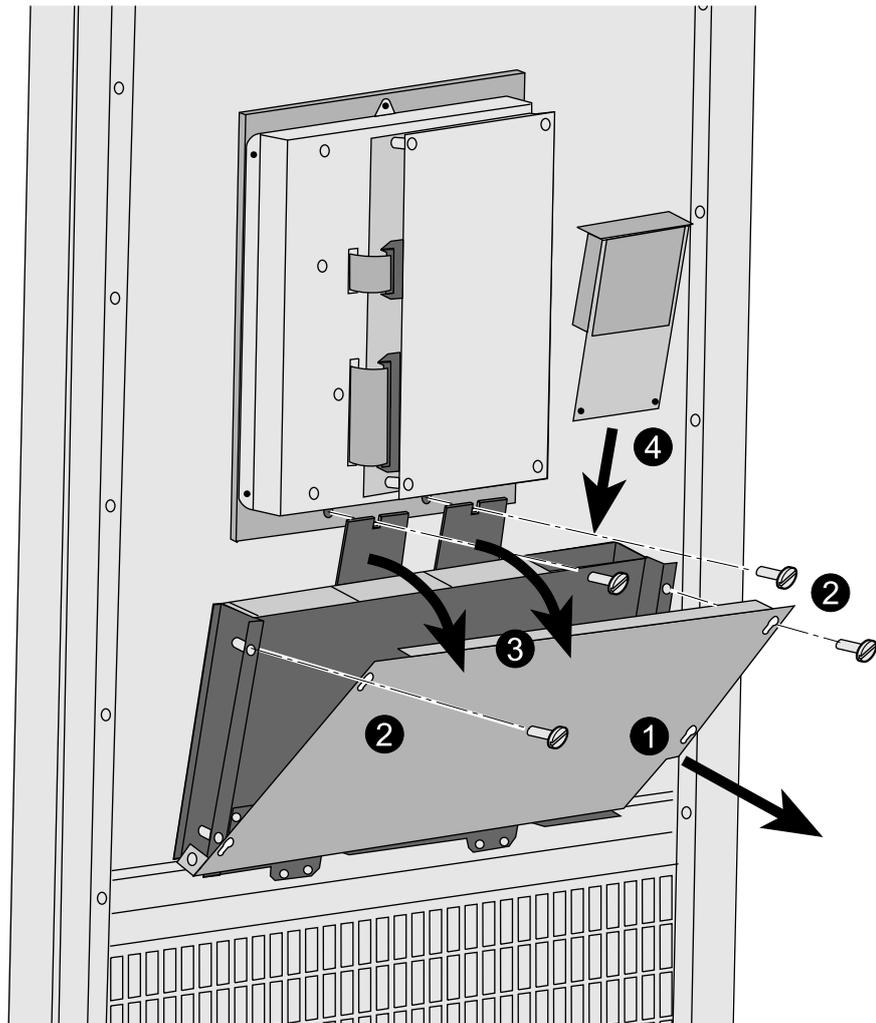
## Connect Network Management Card

Follow the instructions in the network management card installation manual 990-3194.

## Example of Communication Card Connection



## Add or Change Communication Cards



1. Open the UPS door. The cardholder for optional communication cards is placed on the inside of the door.

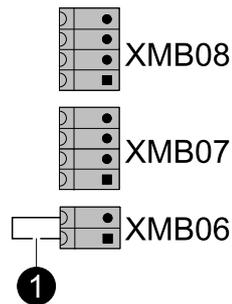
2. Remove the four screws from the cardholder.
3. Open the cardholder.
4. Insert new communication card or replace existing card(s).
5. Close cardholder, tilt back into original position, and reinstall the four screws.

## Connect General Shutdown or Remote Emergency Power Off

Pressing the general shutdown button causes UPS shutdown and opening of the battery circuit breaker (When the opening of the bypass static switch is disabled through customization settings, then the installer must make sure that the source disconnection will be managed at upstream level). A Remote Emergency Power Off (REPO) is applicable to installations where pressing the button also causes the AC input source and AC bypass source circuit breakers to open. In parallel systems, there must be a single general shutdown button with a separate contact for each UPS unit.

To locate the terminals in the cabinet, see *Overview of the Communication Cables, page 38*

1. Remove the wire jumper from the terminal block.



2. Connect the general shutdown (Normally Closed) contact to XMB06 terminals 1 and 2 (SELV).
3. Fasten the cable.

## Connect Parallel Communication Cables

### Redundant Parallel System

#### ⚠ DANGER

##### HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

De-energize the UPSs before connecting the cables.

**Failure to follow these instructions will result in death or serious injury.**

#### ⚠ DANGER

##### HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

A maximum of two UPSs can be installed in parallel.

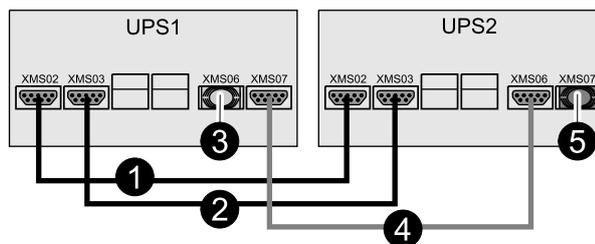
**Failure to follow these instructions will result in death or serious injury.**

**NOTE:** The supplied cables (10 m) limit the distance between the two UPSs to approximately six meters.

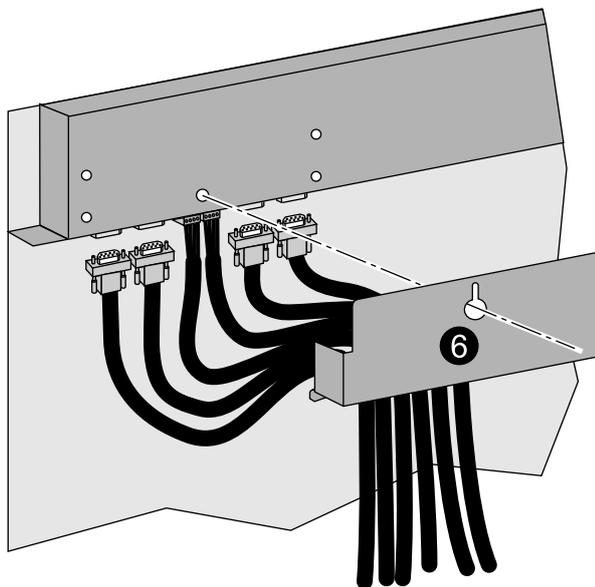
To locate the terminals in the cabinet, see *Overview of the Communication Cables, page 38*

1. Connect a communication cable from XMS02 of UPS1 to XMS02 of UPS2.
2. Connect a communication cable from XMS03 of UPS1 to XMS03 of UPS2.
3. Install a blue terminator in connector XMS06 of UPS1.
4. Connect a communication cable from XMS07 of UPS1 to XMS06 of UPS2.

- Install a red terminator in connector XMS07 of UPS2.



- Install the supplied protection cover over the communication cables.



## Parallel System with External Bypass

### ⚠ DANGER

#### HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

De-energize the UPSs before connecting the cables.

**Failure to follow these instructions will result in death or serious injury.**

### ⚠ DANGER

#### HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

A maximum of two UPSs can be installed in parallel. (Four UPSs can be present in redundancy parallel system).

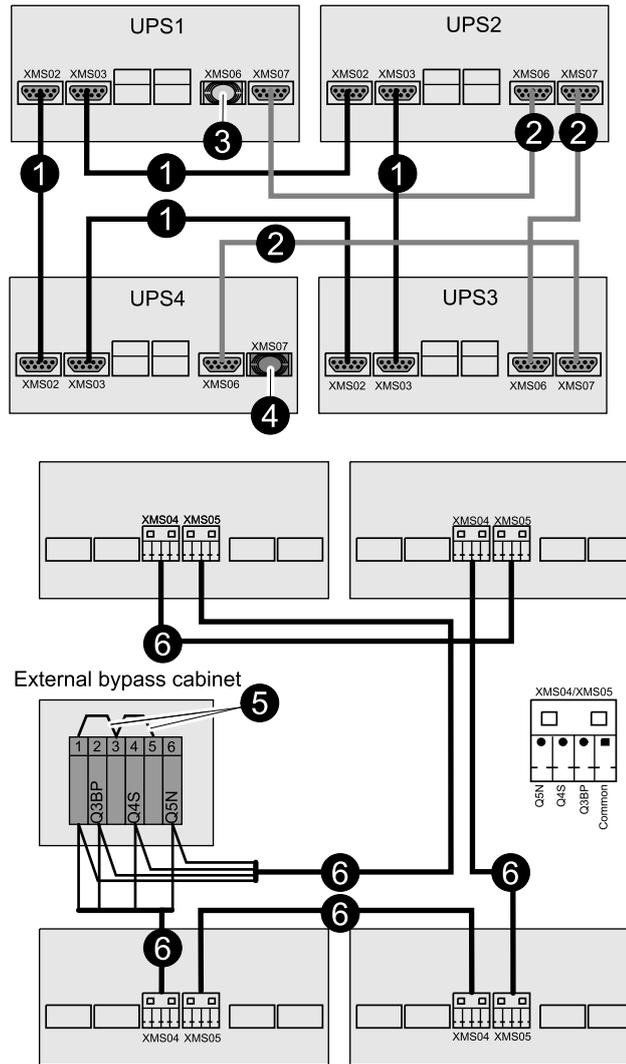
**Failure to follow these instructions will result in death or serious injury.**

**NOTE:** The supplied cables (10 m) limit the distance between the two UPSs to approximately six meters.

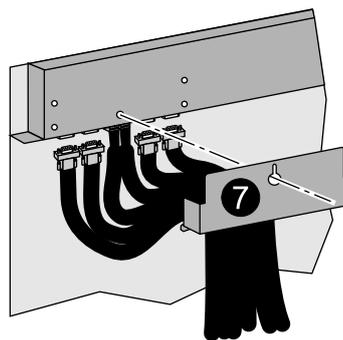
To locate the terminals in the cabinet, see *Overview of the Communication Cables, page 38*

- Connect the communication cables to XMS02 and XMS03 terminals as shown, creating a loop between all the UPSs.
- Connect the communication cables to XMS06 and XMS07 terminals as shown, creating a loop between all the UPSs.
- Install a blue terminator in connector XMS06 of UPS1.
- Install a red terminator in connector XMS07 of UPS4.

5. Connect the external bypass terminals 1,3,5 as shown.
6. Connect the external bypass terminals 1,2,4,6 to XMS04 and XMS05 terminals of the UPSs as shown, using maximum size 2.5 mm<sup>2</sup> cables.



7. Install the supplied protection cover over the communication cables.



# Install an External Battery

## Lock Battery Cells on Shelves for Marine UPS

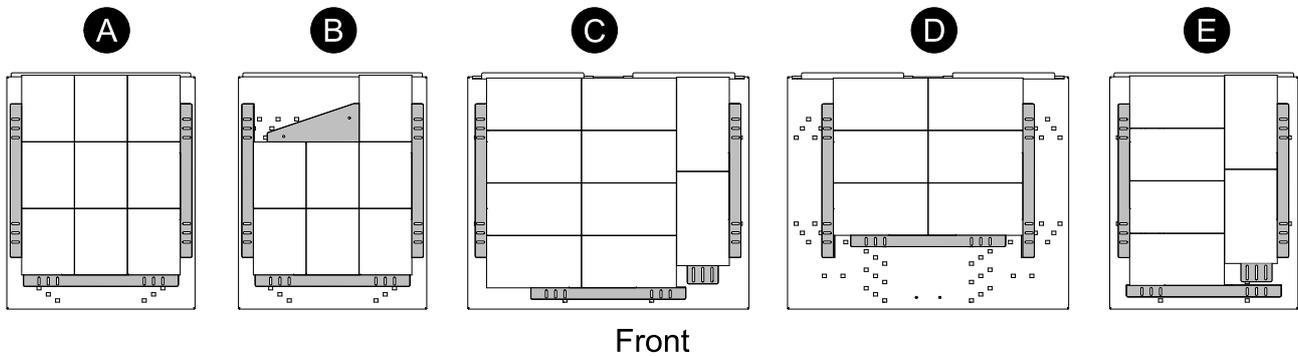
<b>⚠ CAUTION</b>
<b>FOR INSTALLATION ON SHIP – RISK OF ELECTRICAL DISCONNECTION</b>
Install wedges as shown below.
<b>Failure to follow these instructions can result in injury or equipment damage.</b>

Rear wedges are already mounted on the shelves.

Depending on battery cells configuration, some provided wedges remain unused.

### Shelf types

Top View, Wedges Filled in Grey Color



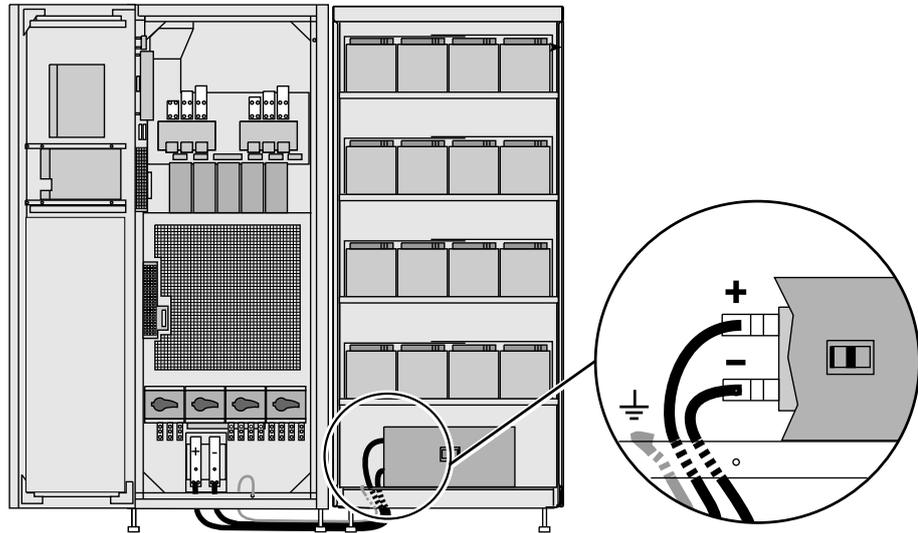
UPS power rating	Number of shelves to mount by shelf type				
	A	B	C	D	E
20 - 30 kVA	3	1	0	0	0
40 – 60 kVA	0	0	3	1	0
80 – 100 kVA <sup>9</sup>	0	0	3	1	4
120 kVA <sup>9</sup>	0	0	6	2	0

1. Install the battery cells on the shelves according to the documentation supplied by the battery vendor.
2. Mount the back wedge (20 - 30 kVA only).
3. Mount the sides wedges.
4. Mount the front wedges.

## Connect the Battery Cables

<b>⚠ DANGER</b>
<b>HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH</b>
Connect PE cables to the battery cabinet and the UPS first.
<b>Failure to follow these instructions will result in death or serious injury.</b>

9. Two battery cabinets.



1. Connect a PE cable from the battery cabinet to earth.
2. Connect the battery cables from the BAT- and BAT+ terminals of the battery breaker in the UPS to the BAT- and BAT+ terminals of the battery breaker in the battery cabinet.

## Install An Empty Battery Cabinet

### Install Battery Circuit Breaker Kit

#### ⚠ DANGER

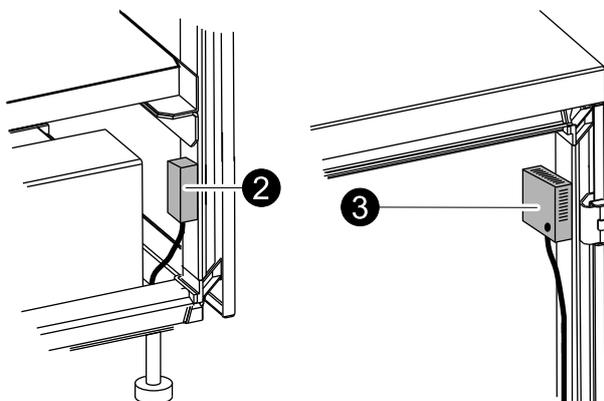
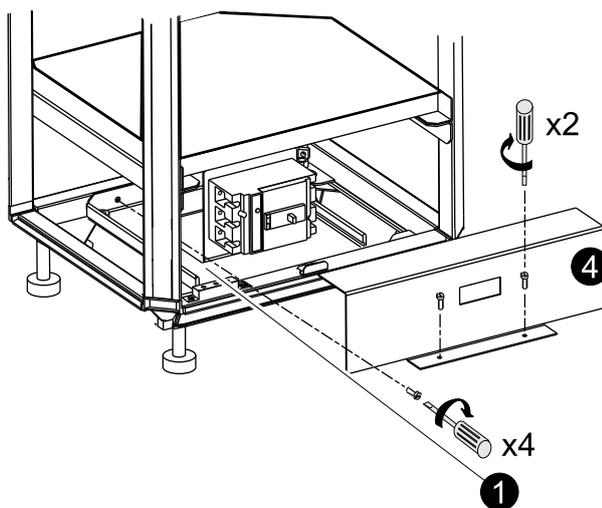
##### HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- It is mandatory to protect the battery circuit with a circuit breaker equipped with an undervoltage coil (MN 24V DC).
- Circuit breaker type and rated must be compliant with specifications given. See *Battery Circuit Breaker Enclosure*, page 21

**Failure to follow these instructions will result in death or serious injury.**

**NOTE:** Please contact Schneider Electric when selecting the battery circuit breaker. In systems with several battery cabinets, only one circuit breaker is necessary. Temperature sensors must be installed to obtain the battery warranty and to optimize battery lifetime.

1. Fasten the circuit breaker plate (four screws).
2. Fasten the XR1 terminals.
3. Fasten the temperature sensor.
4. Fasten the protection cover after connecting the batteries to the battery circuit breaker. Tightening torque is 6.5 Nm.

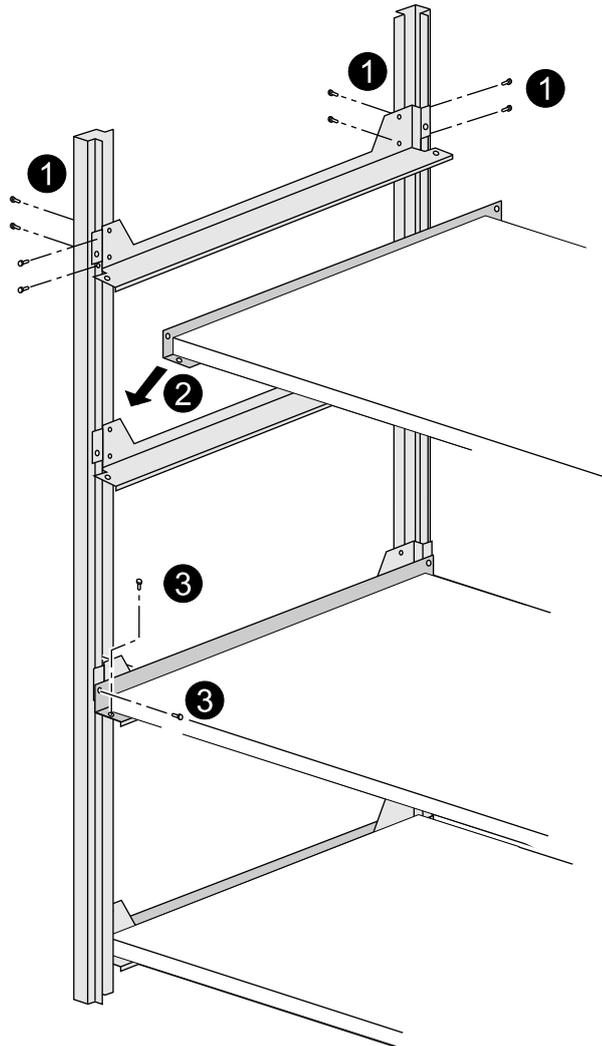


## Install Shelves and Battery Cells

**NOTE:** Assembly of the battery cabinet must be carried out by certified personnel (standard EN 62040-1).

**NOTE:** The minimum clearance between the top of the battery cells and the next shelf above them is 150 mm.

1. Fasten the angle supports (six screws per support).
2. Position the shelves individually.
3. Fasten the shelves individually with two screws in each angle.
4. Install the battery cells on each shelf, fasten and interconnect them per shelf.
5. Interconnect all the battery assemblies from the different shelves and then connect the overall battery assembly to the battery circuit breaker.



## Connect the Battery Remote Control

### **⚠ WARNING**

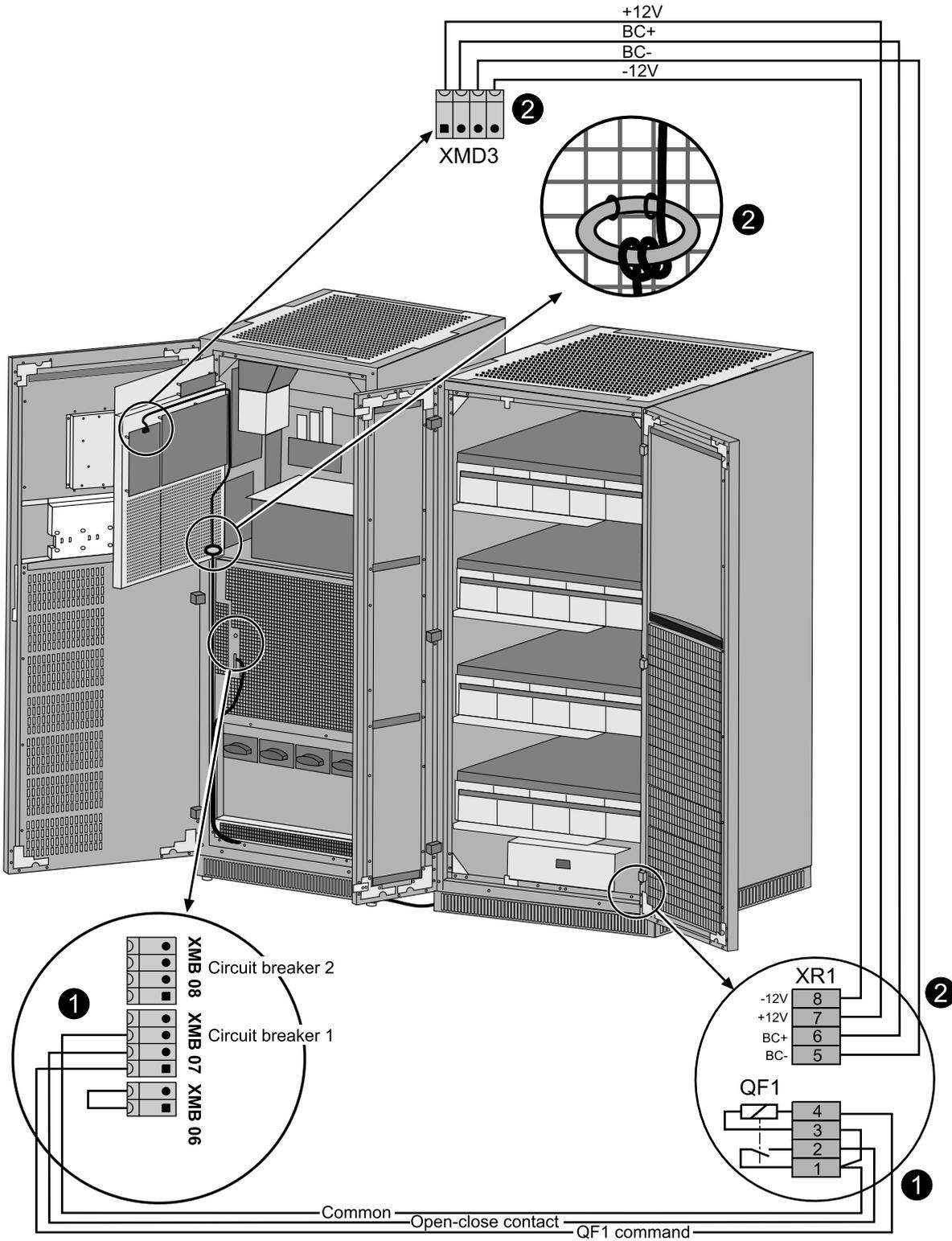
#### **RISK OF EQUIPMENT DAMAGE**

The maximum size for the communication cables (SELV) is 2.5 mm<sup>2</sup> and the total length must be less than 100 meters.

**Failure to follow these instructions can result in death, serious injury, or equipment damage.**

1. Connect the external battery cabinet connector XR1 to UPS connector XMB07, as shown.

2. Connect the external battery cabinet connector XR1 to UPS connector XMD3, and pass the cable through the ferrite three times.



# Install a Battery Circuit Breaker Kit for Third Party Battery Cabinets (Option)

## **⚠ DANGER**

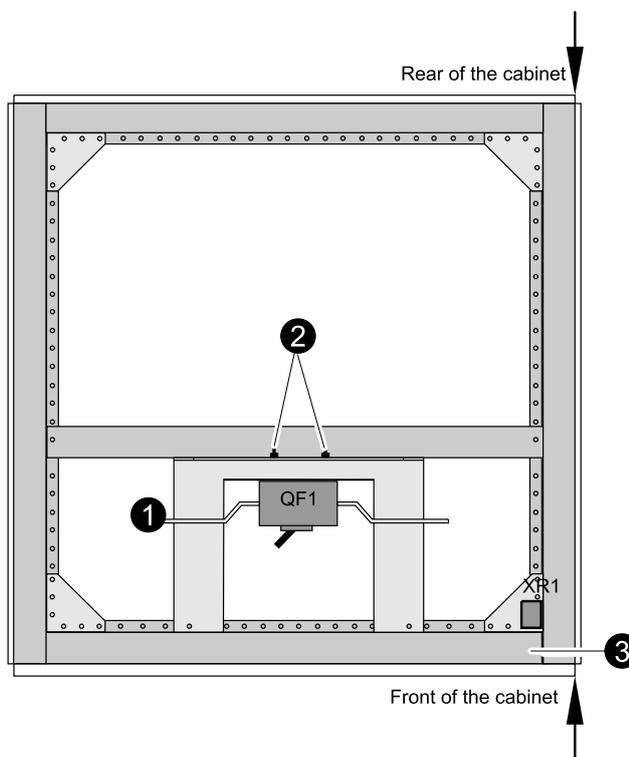
### **HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH**

This battery circuit breaker kit contains an undervoltage coil (MN 24 VDC) which is mandatory for all external battery cabinets. This battery circuit breaker is for installations with third party batteries.

**Failure to follow these instructions will result in death or serious injury.**

1. Mount the fixing bar onto the battery cabinet.
2. Position the battery circuit breaker on the fixing bar and fasten with 2 screws.
3. Bolt the support plate for the connector XR1 to the front upright of the cabinet.

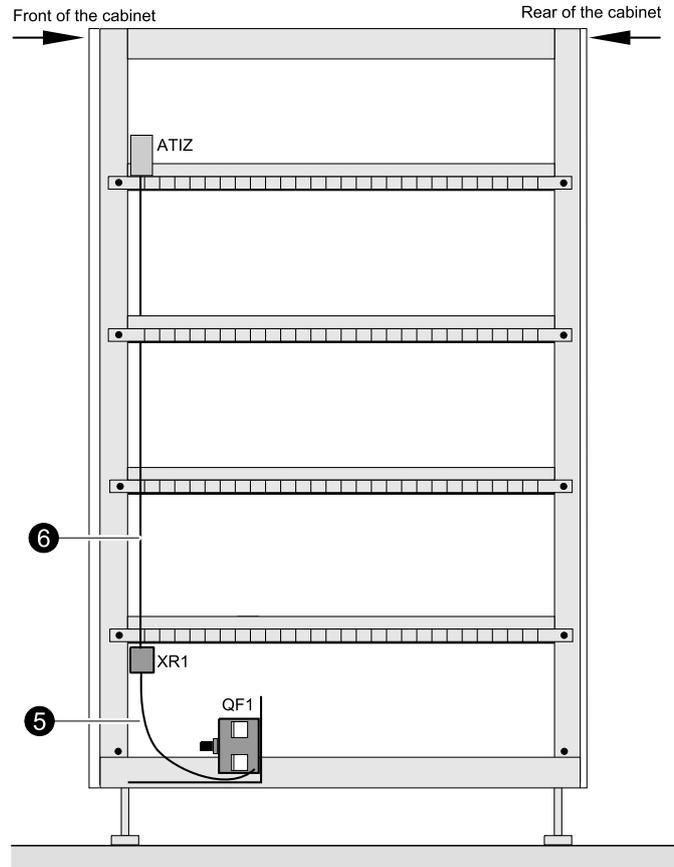
### **Bottom View of the Battery Cabinet**



4. Attach XR1 to the support plate.

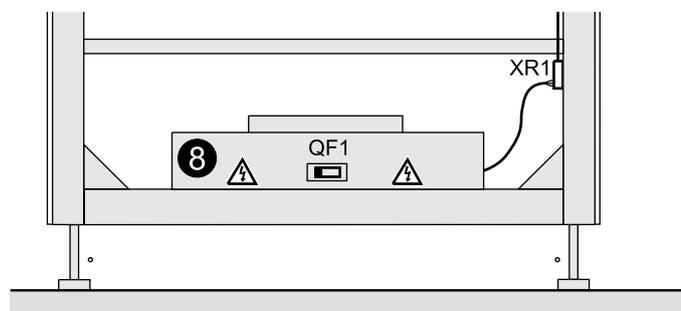
5. Connect the battery circuit breaker to XR1. The connecting cables (2.5 m) are supplied (N° 51031630).
6. Connect XR1 to the ATIZ board.

### Side View of the Battery Cabinet



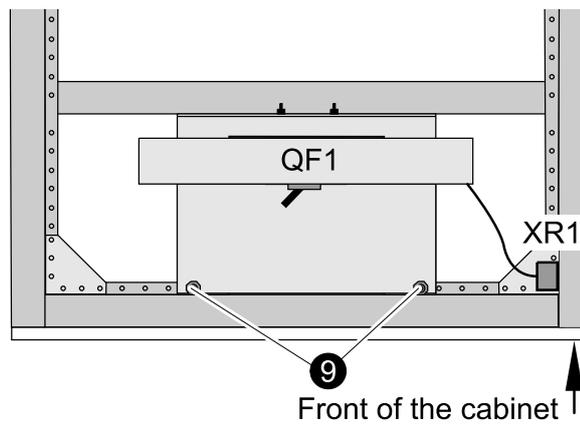
7. The terminals 1 to 4 of the XR1 terminal block must be connected to the UPS to provide the functions for automatic opening of battery circuit breaker **QF1** (in case of emergency shutdown) and detection of the battery circuit breaker position for the UPS. Details of these connections are given in the installation manuals of these units.
8. Place the QF1 protection cover over the circuit breaker and its connections.

### Side View of the Battery Cabinet



9. Fasten the protection cover to the frame with the two screws. Tightening torque is 6.5 Nm.

### Top View of the Battery Cabinet



# Battery Circuit Breaker Enclosure (Option)

## Overview

The circuit breaker enclosure must be located as close to the batteries as possible.

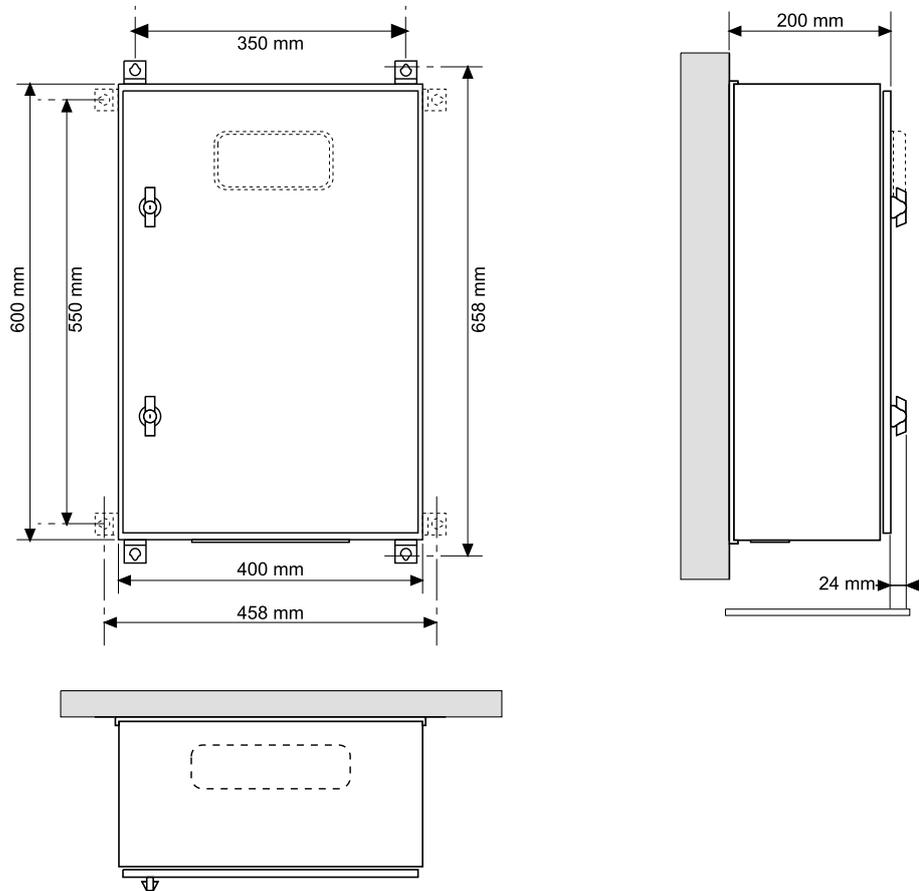
The enclosure is mounted to a vertical wall by means of four M8 screws using the fastening lugs placed in the vertical or horizontal position.

The enclosure door is closed by two lock knobs with a key (405 type) on one of the knobs.

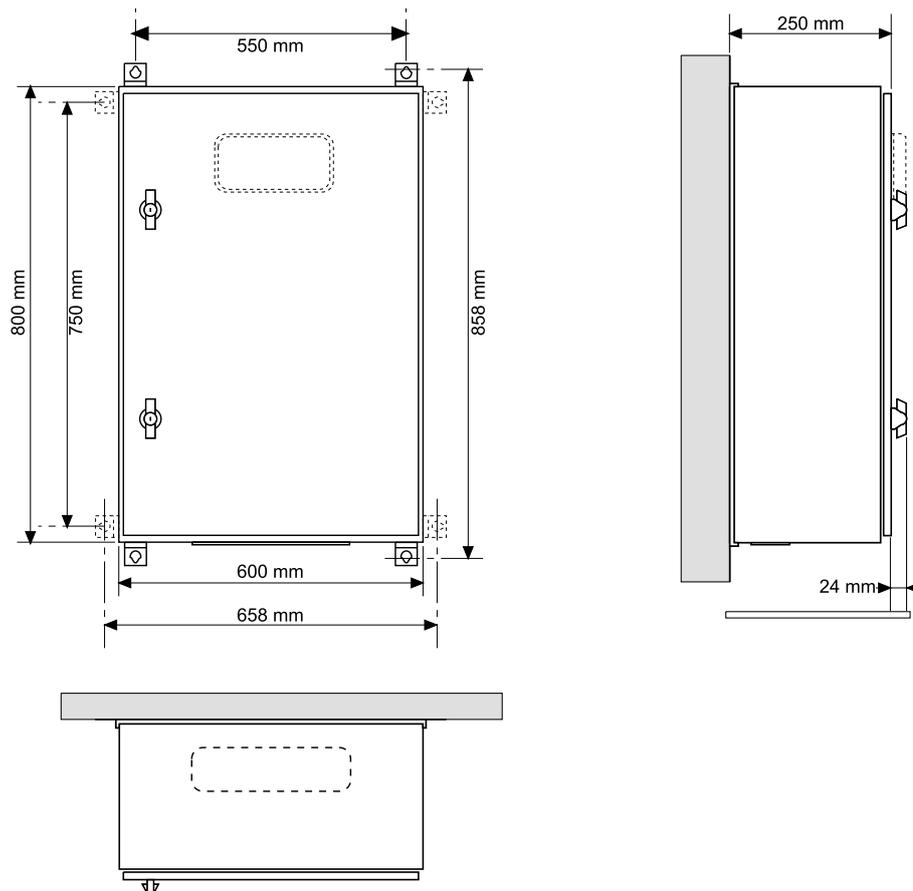
The enclosure with insulation controller has the same characteristics as the standard version (except for dimensions), with the insulation controller being located in the upper part of the enclosure door.

Cables are fed through the bottom of the enclosure via a 315 x 90 mm opening.

### 20–120 kVA Battery Circuit Breaker Enclosure with up to 10 Minutes Runtime

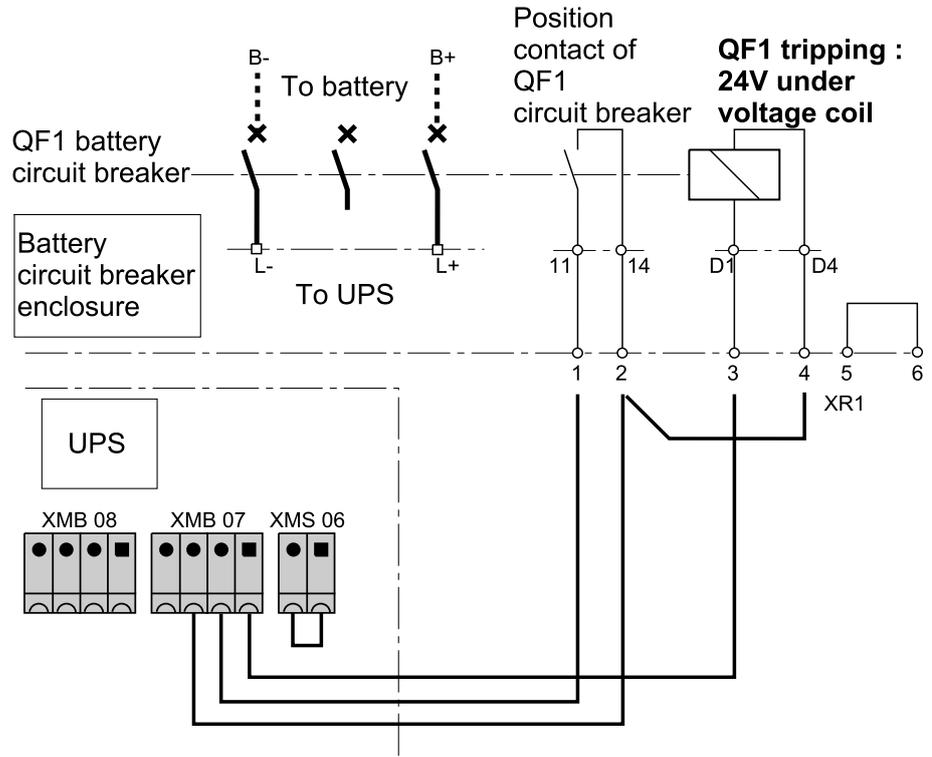


**100–120 kVA Battery Circuit Breaker Enclosure with More Than 10 Minutes Runtime**



**Connection Diagrams**

- The size of the power cables is given in the tables above.
- The recommended size of auxiliary cables is 1 mm<sup>2</sup> (terminal acceptance capacity: 2.5 mm<sup>2</sup>).
- Make sure that the auxiliary cables and power cables do not follow the same path.
- Power cables and auxiliary cables are not supplied.



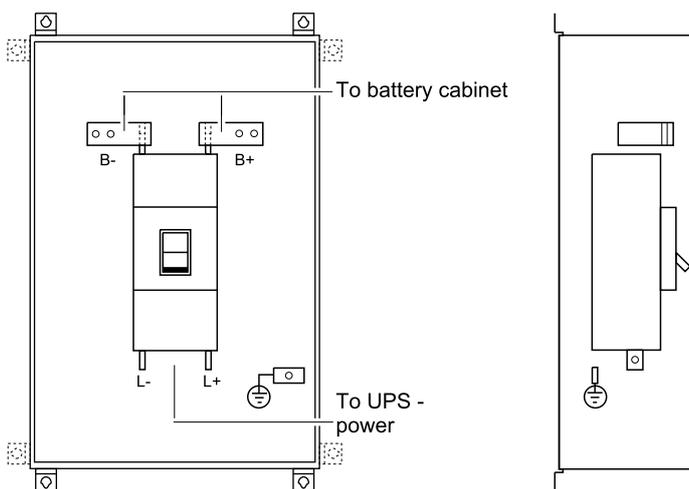
## Connection Points

UPS rating		20 – 120 kVA	100 – 120 kVA
Battery backup time		≤ 10 min	> 10 min
connection to	UPS	25 x 5 mm copper terminal 8.2 mm diameter holes	32 x 8 mm copper terminal 12.2 mm diameter holes
	battery		32 x 10 mm copper terminal 12.2 mm diameter holes
	earth	50 x 5 mm copper terminal, or 8 mm threaded rod	

## Install Battery Circuit Breaker Enclosure

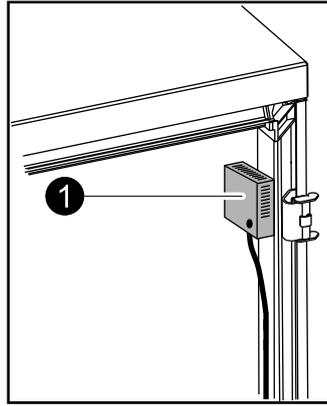
1. Drill appropriate holes in a wall and mount the battery circuit breaker enclosure to the wall as close to the batteries/battery cabinet(s) as possible.
2. Open the door of the battery circuit breaker enclosure.
3. Connect the PE terminal to PE.
4. Connect B- and B+ terminals to the battery B- and B+ terminals.

5. Connect L- and L+ terminals to the UPS power L- and L+ terminals.

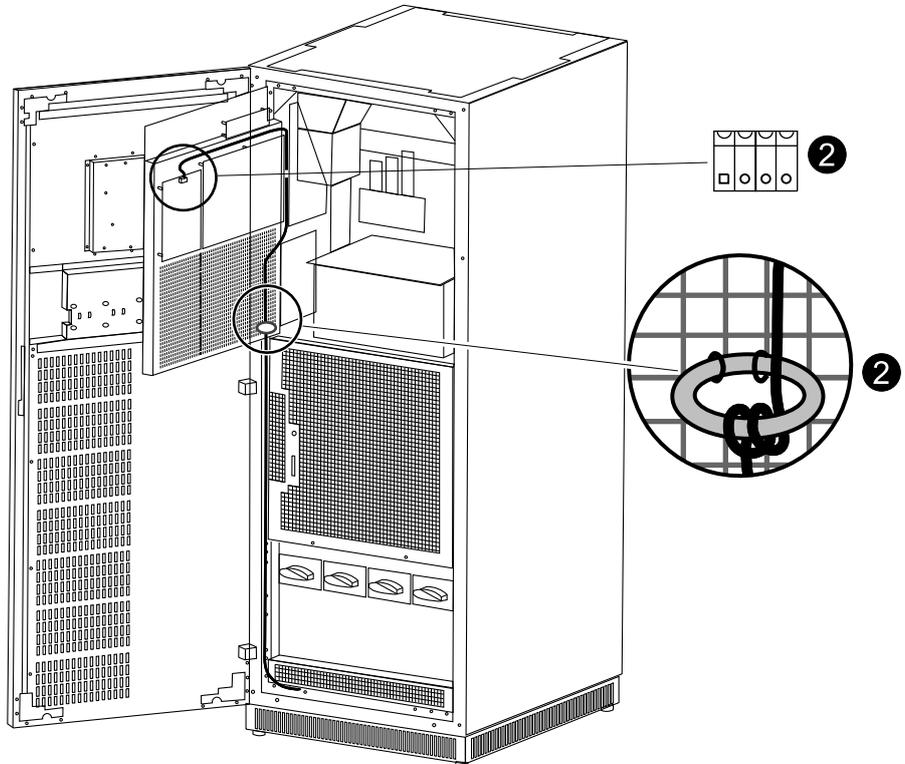


# Install the Battery Temperature Monitor (Option)

1. Install the temperature monitor in the battery cabinet.



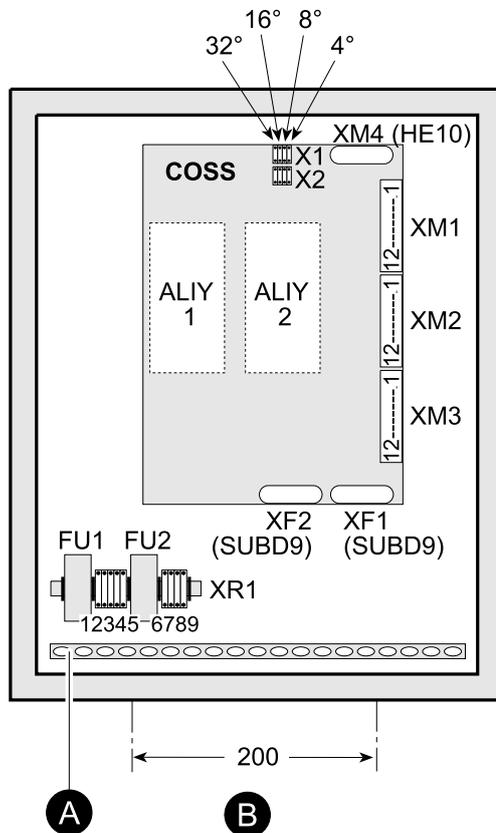
2. Connect the temperature monitor to the XMD3 connector in the UPS, and pass the cable through the ferrite three times.



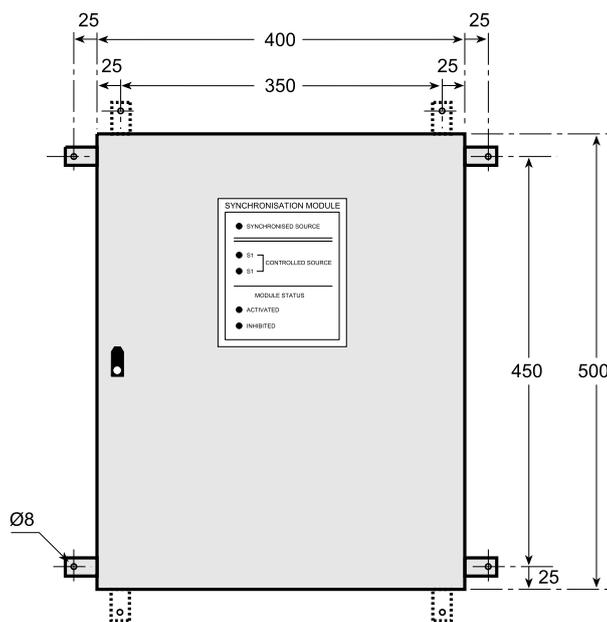
# Install the Synchronization Module (Option)

## Overview of the Synchronization Module

- A. Cable tie bar
- B. Cable entry



## Mount the Synchronization Module to the Wall

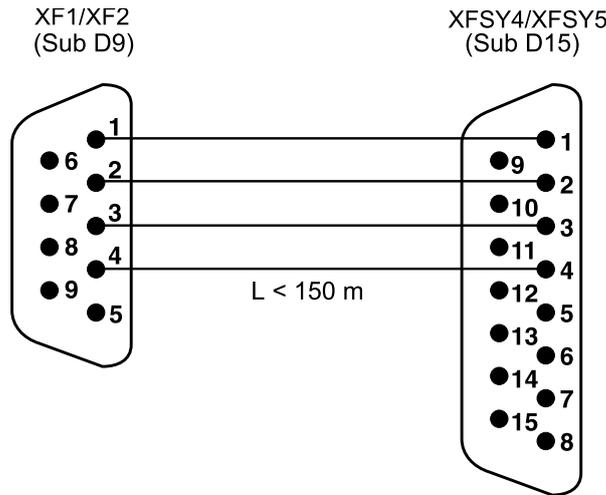


1. Mark the four mounting hole locations on the wall. You can either use the horizontal or the vertical mounting brackets. Drill holes in each of the four marked locations and install plugs.
2. Place the synchronization module enclosure against the wall lining up with the holes and fasten the synchronization module enclosure to the wall with four screws.

## Recommended Cable Sizes

A 12m long Sub D9/Sub D15 (XF1/XF2 to XFSY4/XFSY5) cable is supplied for each UPS.

You can make a longer cable (maximum length is 150 m) using the pinout diagram below **connecting only the 4 twisted wires shown**.



Connection	Cable length	Recommended cable
XF1/XF2 to XFSY4/XFSY5	< 20 m	Unshielded twisted pair cable AWG24
XF1/XF2 to XFSY4/XFSY5	> 20 m	Unshielded twisted pair cable AWG18
XR1 – XR3	All	Unshielded cable 1.5 mm <sup>2</sup>

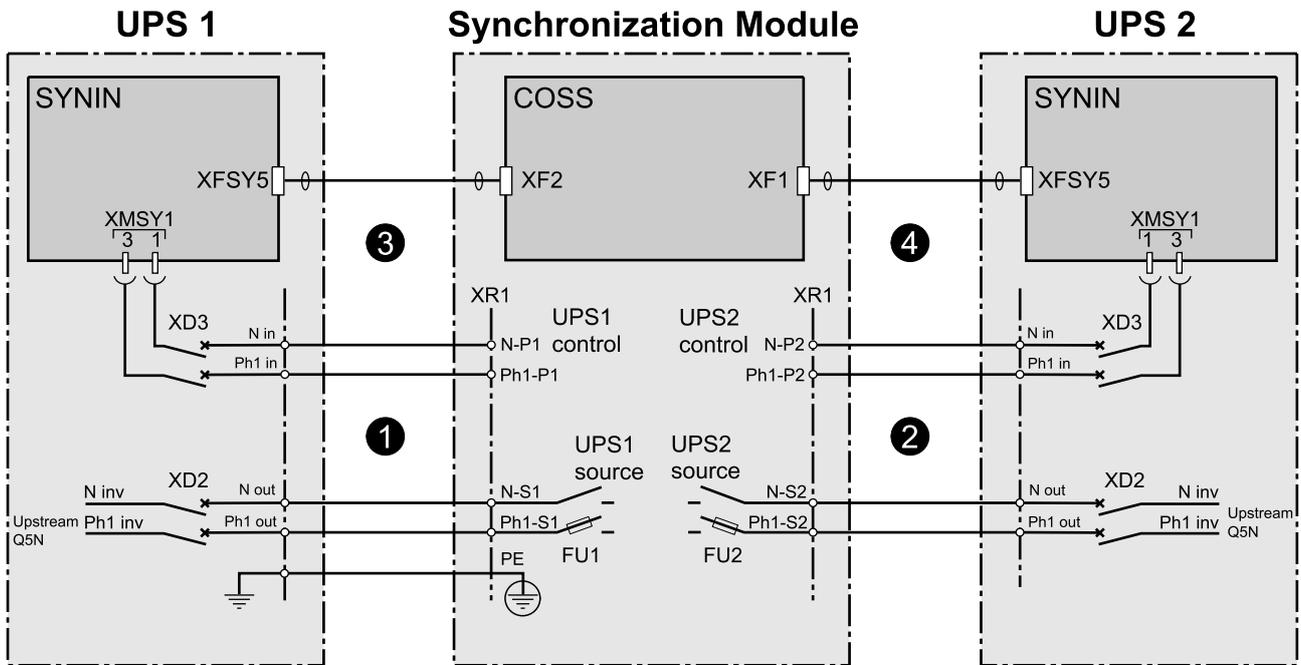
## Connect Cables to the Synchronization Module for Single UPS

**⚠ DANGER**

**HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH**

The synchronization module must be earthed at one point only.

**Failure to follow these instructions will result in death or serious injury.**



1. Connect power cables from UPS 1 to the synchronization module according to the illustration above.
2. Connect power cables from UPS 2 to the synchronization module according to the illustration above.
3. Connect the supplied 12 m Sub D9/Sub D15 cable from terminal XFSY5 on the SYNIN board in UPS 1 to XF2 on the COSS board in the synchronization module.
4. Connect the supplied 12 m Sub D9/Sub D15 cable from terminal XFSY5 on the SYNIN board in UPS 2 to XF1 on the COSS board in the synchronization module.

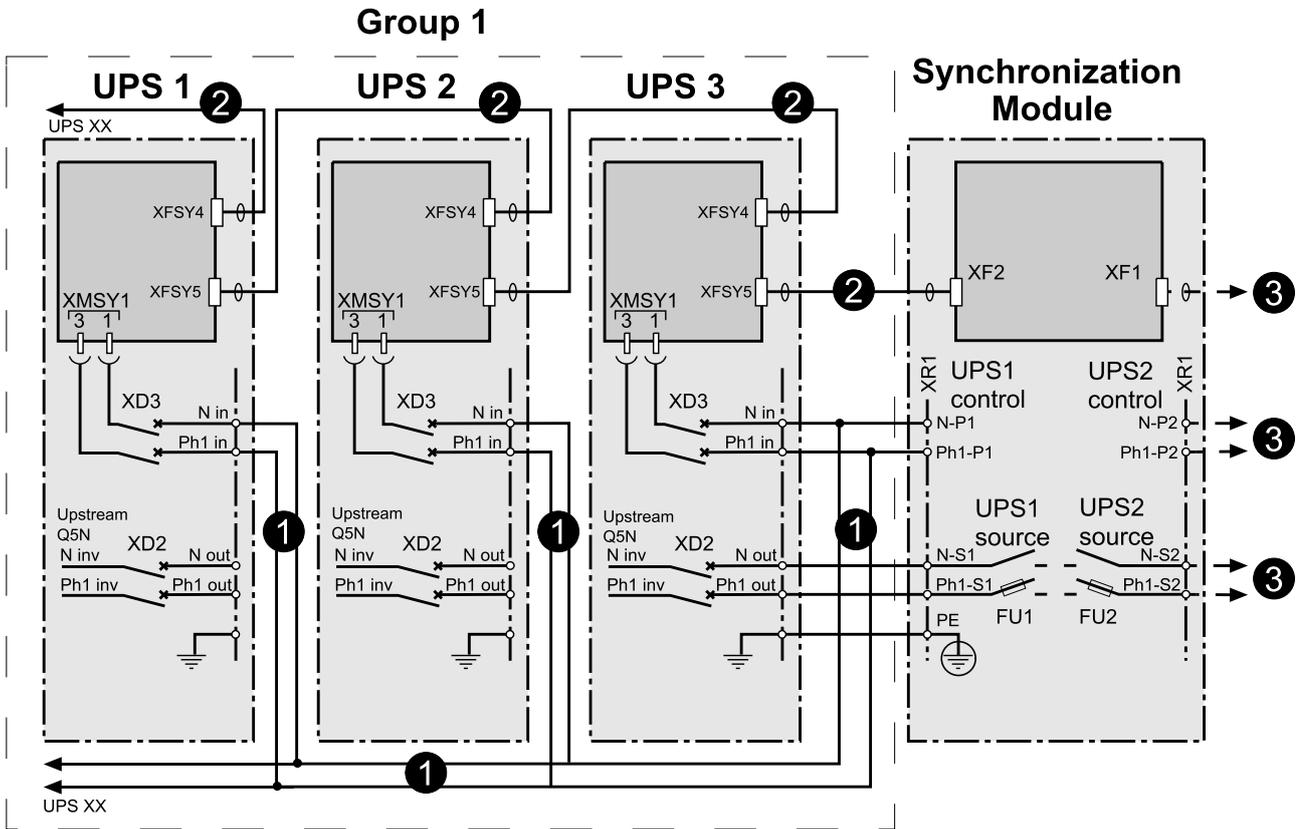
## Connect Cables to the Synchronization Module in a Parallel System

### **⚠ DANGER**

**HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH**

The synchronization module must be earthed at one point only.

**Failure to follow these instructions will result in death or serious injury.**



1. Connect power cables between all UPS units in Group 1 and connect them to the synchronization module.
2. Connect the supplied 12 m Sub D9/Sub D15 cables between the SYNIN boards in the UPS units, and connect Sub D9/Sub D15 cable from the last UPS in the row to the COSS board in the synchronization module.
3. Connect Group 2 to the synchronization module according to the procedures in step 1 and 2 above.

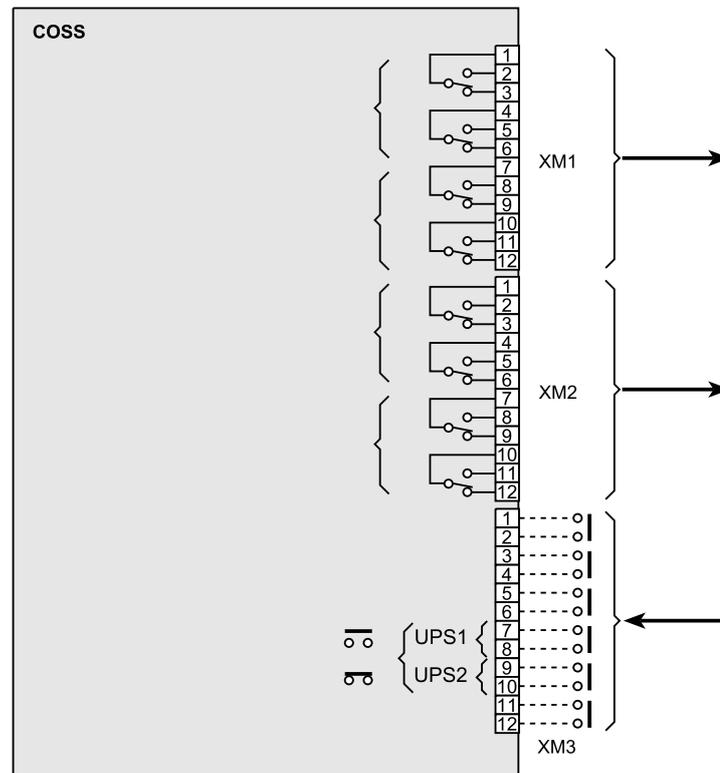
# Input and Output Contacts

## Characteristics

The **Phase in tolerance**, **Major malfunction**, **UPS 1 controlled**, and **UPS 2 controlled** relay contacts have a breaking capacity of 30 W maximum (on resistive load) for 2 A maximum current.

Permissible voltage: SELV only.

The contacts are represented in unactuated state.



## Outputs

XM1 terminals 1–6	UPS 1 controlled
XM1 terminals 7–12	UPS 2 controlled
XM2 terminals 1–6	Phase within tolerance
XM2 terminals 7–12	Major alarm

## Inputs

XM3 terminals 7–8	UPS supplied by utility/mains
XM3 terminals 9–10	UPS supplied by generator set

# Install an External Bypass

## ⚠ DANGER

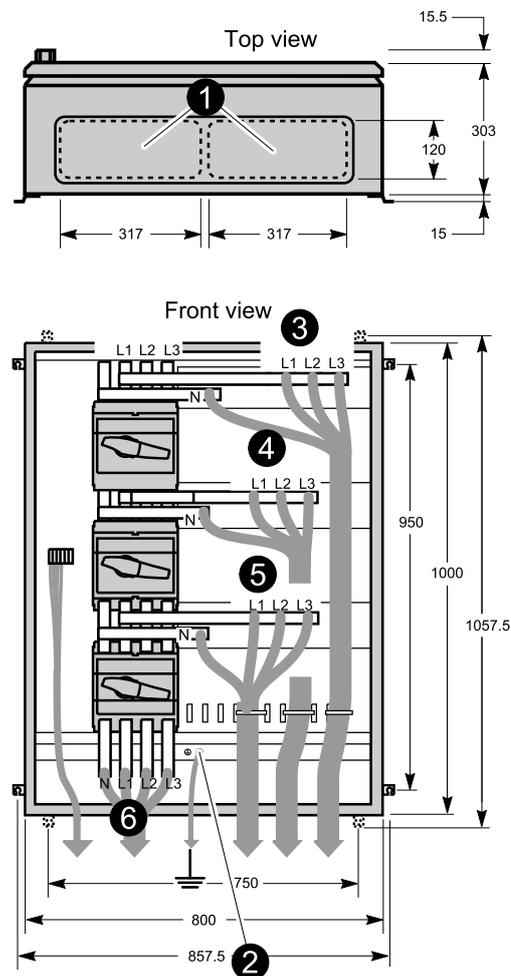
### HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

The combined UPS power of all the installed UPS cabinets must not exceed the available bypass power.

**Failure to follow these instructions will result in death or serious injury.**

## Install 150 kVA External Bypass Cabinet

### TNS

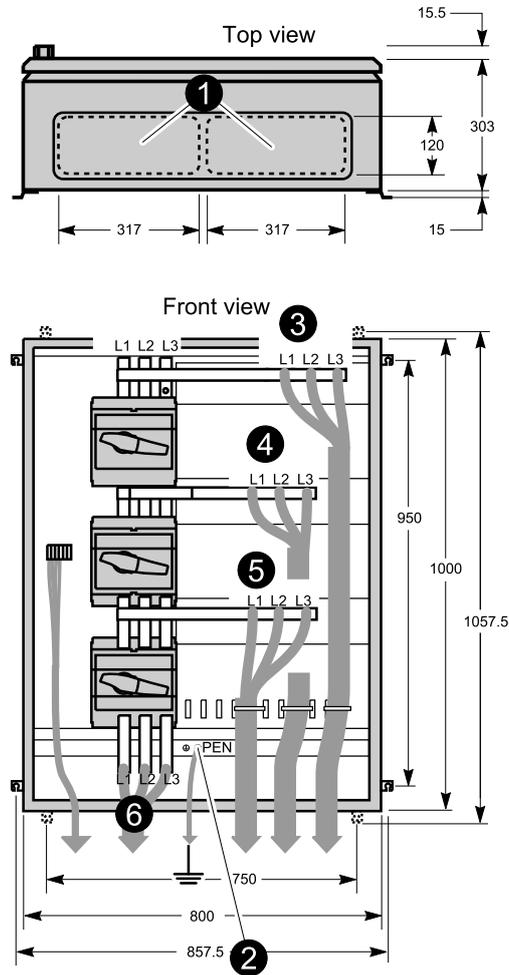


1. Prepare the external bypass cabinet for cables by clearing the cable running entries.
2. Connect the external bypass cabinet to earth.
3. Connect the bypass cables from the terminals (N, L1, L2, L3) in the external bypass cabinet to the bypass terminals (N, L1, L2, L3) on the UPSs.
4. Connect the bypass cables from the AC bypass source to the terminals (N, L1, L2, L3) in the external bypass cabinet.
5. Connect the load cables from the load to the terminals (N, L1, L2, L3) in the external bypass cabinet.

- Connect the AC output cables from output terminals (N, L1, L2, L3) in the UPSs to the terminals (N, L1, L2, L3) in the external bypass cabinet.

**NOTE:** Connection of the communication cables is shown in *Parallel System with External Bypass, page 34*.

## TNC

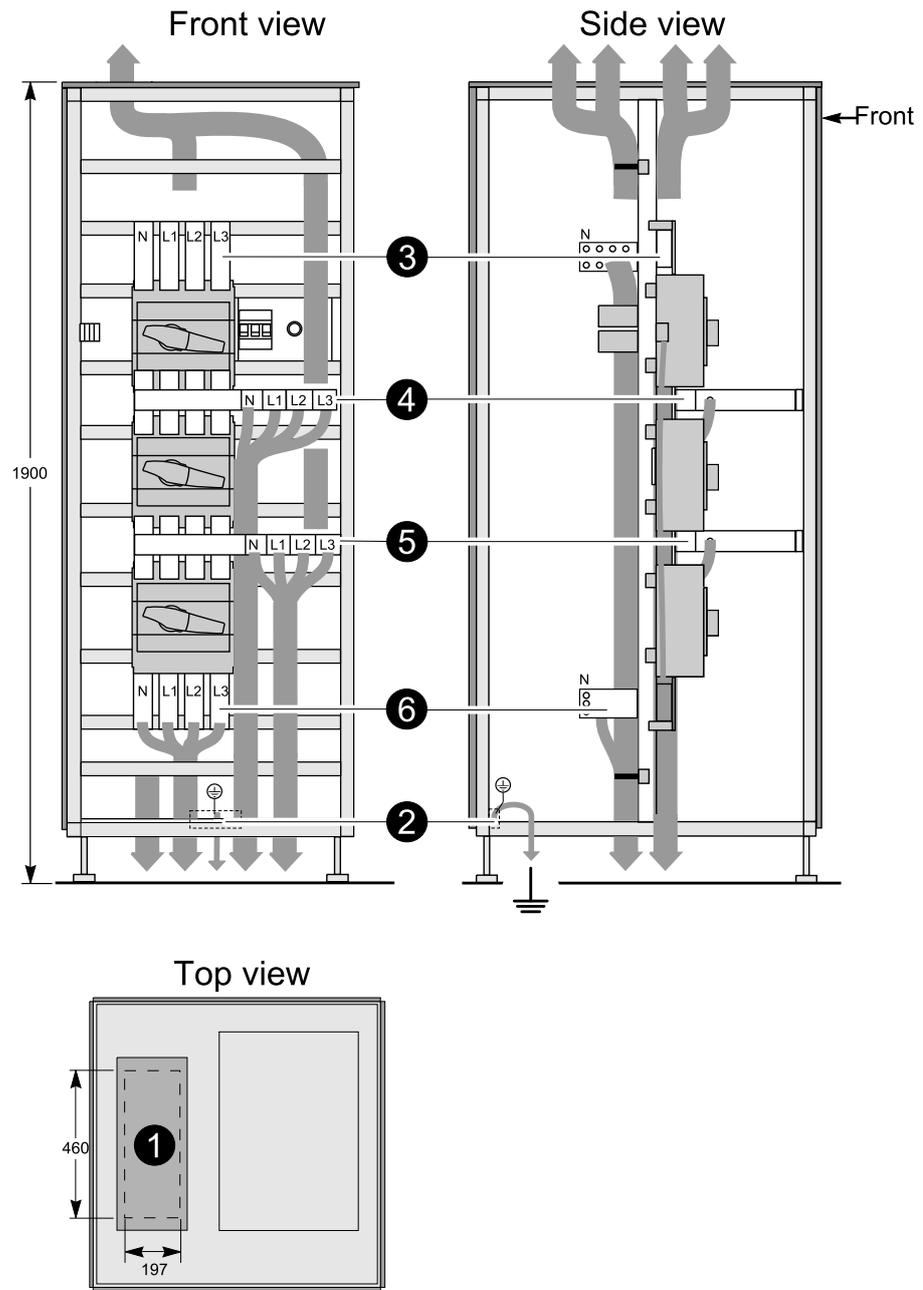


- Prepare the external bypass cabinet for cables by clearing the cable running entries.
- Connect the external bypass cabinet to earth and neutral (PEN).
- Connect the bypass cables from the terminals (L1, L2, L3) in the external bypass cabinet to the bypass terminals (L1, L2, L3) on the UPSs.
- Connect the bypass cables from the AC bypass source to the terminals (L1, L2, L3) in the external bypass cabinet.
- Connect the load cables from the load to the terminals (L1, L2, L3) in the external bypass cabinet.
- Connect the AC output cables from the output terminals (L1, L2, L3) in the UPSs to the terminals (L1, L2, L3) in the external bypass cabinet.

**NOTE:** Connection of the communication cables is shown in *Parallel System with External Bypass, page 34*.

# Install 400 kVA External Bypass Cabinet

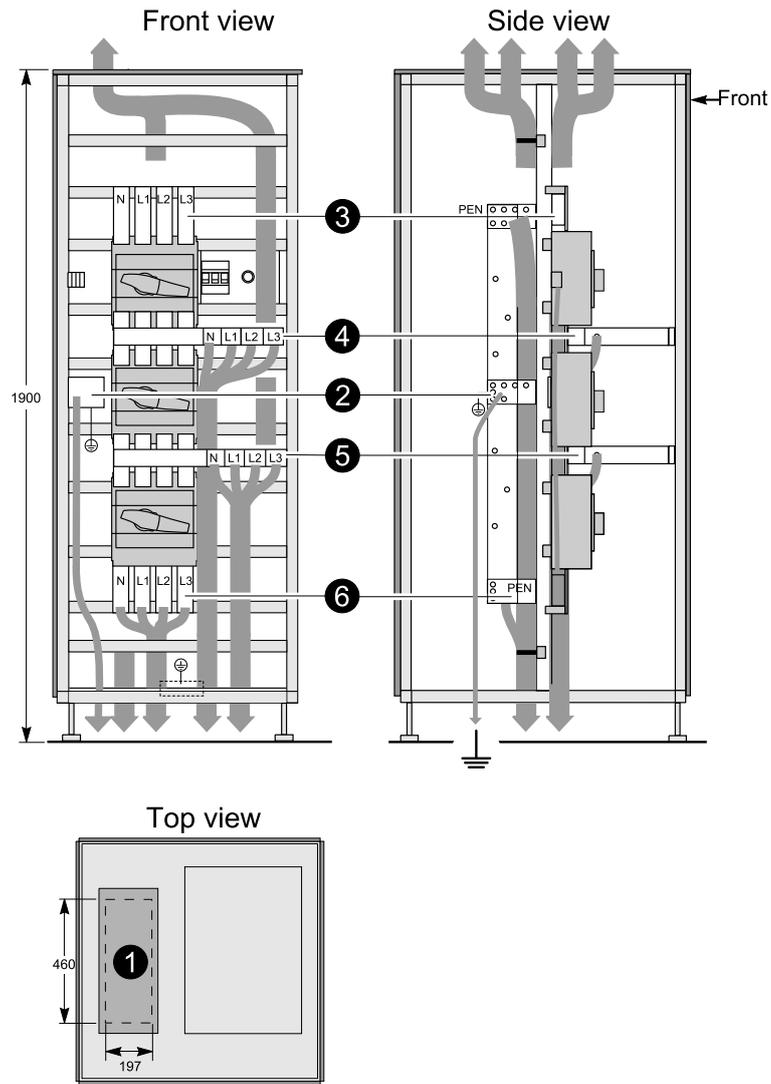
## TNS



1. Prepare the external bypass cabinet for cables by clearing the cable running entries.
2. Connect the external bypass to earth.
3. Connect the bypass cables from the terminals (N, L1, L2, L3) in the external bypass cabinet to the bypass terminals (N, L1, L2, L3) on the UPSs through the top cable entry.
4. Connect the bypass cables from the AC bypass source to the terminals (N, L1, L2, L3) in the external bypass cabinet.
5. Connect the load cables from the load to the terminals (N, L1, L2, L3) in the external bypass cabinet.
6. Connect the AC output cable from output terminals (N, L1, L2, L3) in the UPSs to the terminals (N, L1, L2, L3) in the external bypass cabinet.

**NOTE:** Connection of the communication cables is shown in *Parallel System with External Bypass*, page 34.

## TNC



1. Prepare the external bypass cabinet for cables by clearing the cable running entries.
2. Connect the external bypass cabinet to earth.
3. Connect the bypass cables from the terminals (PEN, L1, L2, L3) in the external bypass cabinet to the bypass terminals (PEN, L1, L2, L3) on the UPSs through the top cable entry.
4. Connect the bypass cables from the AC bypass source to the terminals (PEN, L1, L2, L3) in the external bypass cabinet.
5. Connect the load cables from the load to the terminals (PEN, L1, L2, L3) in the external bypass cabinet.
6. Connect the AC output cables from output terminals (PEN, L1, L2, L3) in the UPSs to the terminals (N, L1, L2, L3) in the external bypass cabinet.

**NOTE:** Connection of the communication cables is shown in *Parallel System with External Bypass*, page 34.

# Install Marine UPS Adaptation Voltage Transformer

For transformer specifications, see *Transformers*, page 19.

## **⚠ WARNING**

### **HAZARD OF OVERHEATING**

- Do not cover the transformer ventilation openings when the transformer is in operation.
- Do not remove the transformer feet.

**Failure to follow these instructions can result in death, serious injury, or equipment damage.**

Install the transformer according to the documentation supplied by the transformer vendor.

## Install Isolation Transformer (Option)

For transformer specifications, see *Transformers*, page 19.

**NOTE:** A transformer cabinet can only be placed to the right of the UPS cabinet.

### **DANGER**

#### **HAZARD OF ELECTRIC SHOCK, EXPLOSION OR ARC FLASH**

Do not install different transformer sizes that belong to different vector groups in the same UPS installation.

**Failure to follow these instructions will result in death or serious injury.**

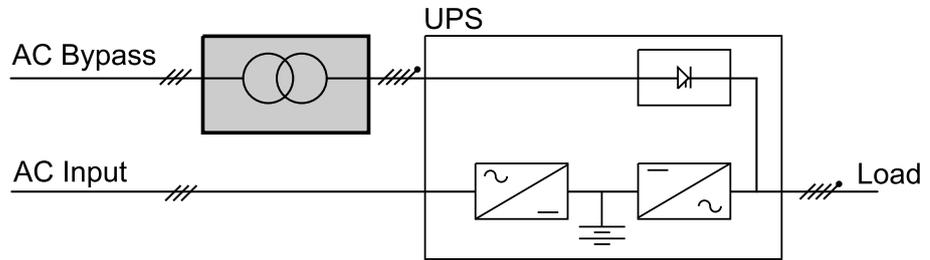
# Transformer Configuration Options in Single Systems

## For Single Transformer Connected to Input

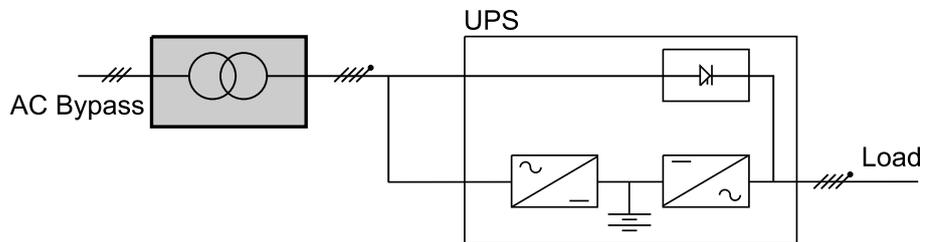
Upstream: TT, TN or IT system

Downstream: with neutral distributed

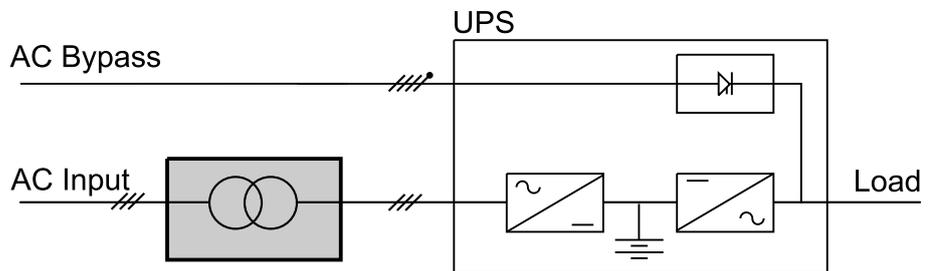
### Dual Utility/Mains System



### Single Utility/Mains System



### Dual Utility/Mains System

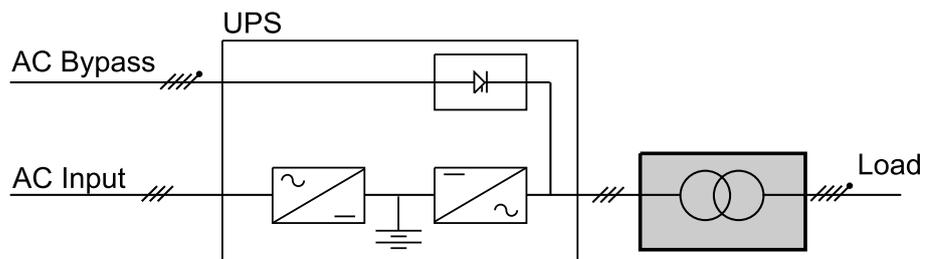


## For Single Transformer Connected to Output

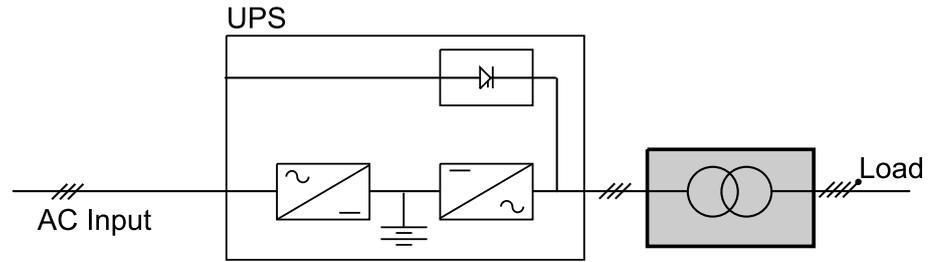
Upstream: TT, TN system

Downstream: with neutral distributed

### Dual Utility/Mains System



**Single Utility/Mains System**

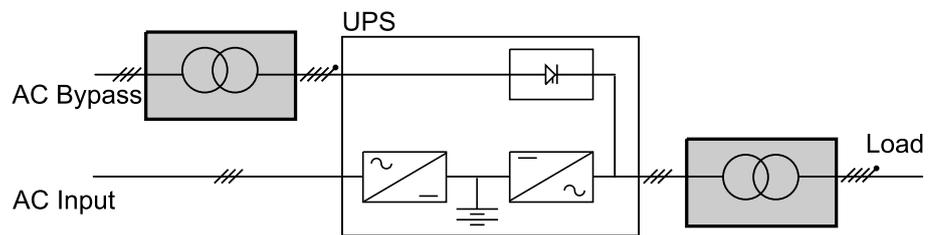


**For Transformers Connected to Output and/or One or Two Sources**

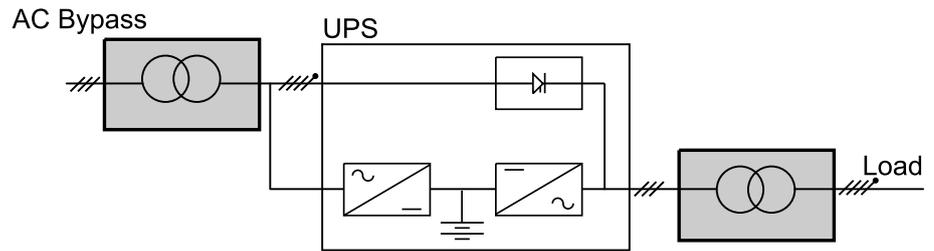
Upstream: TT, TN or IT system

Downstream: with neutral distributed

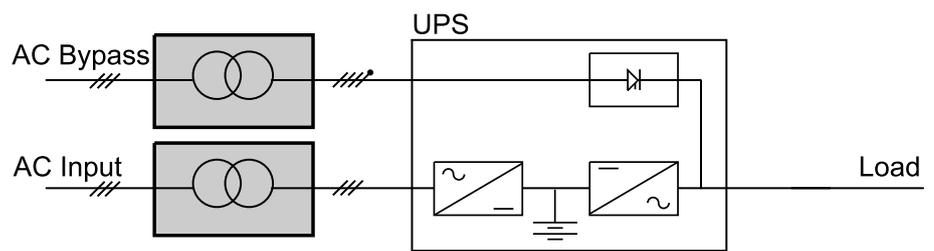
**Dual Utility/Mains System**



**Single Utility/Mains System**



**Dual Utility/Mains System**



## Transformer Configuration Options in Parallel UPS System

### ⚠ WARNING

#### RISK OF EQUIPMENT DAMAGE

Before turning on the UPS system, make sure that N on the UPSs are parallel connected and that the output of the UPSs are parallel connected as shown in the diagram below. This requires extra cables which are not provided by Schneider Electric.

**Failure to follow these instructions can result in death, serious injury, or equipment damage.**

### ⚠ DANGER

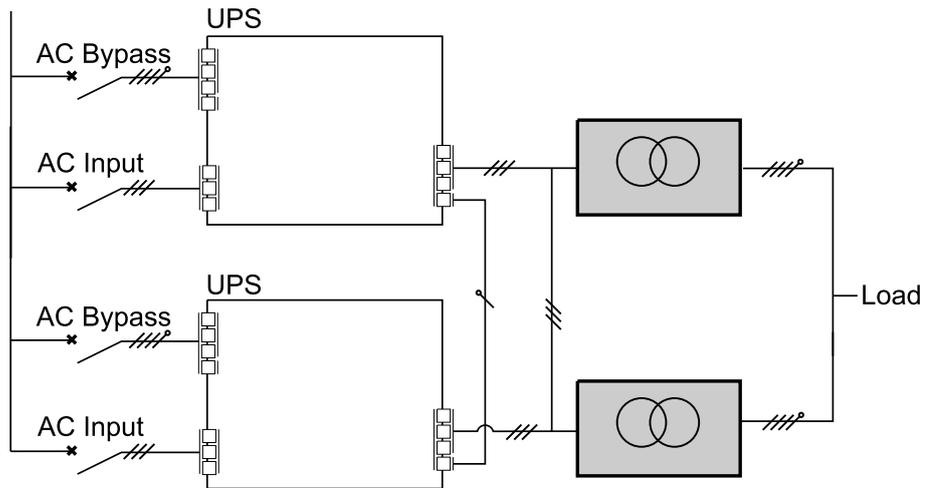
#### HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

A maximum of four UPSs plus transformers can be connected in parallel. Transformers must be earthed correctly.

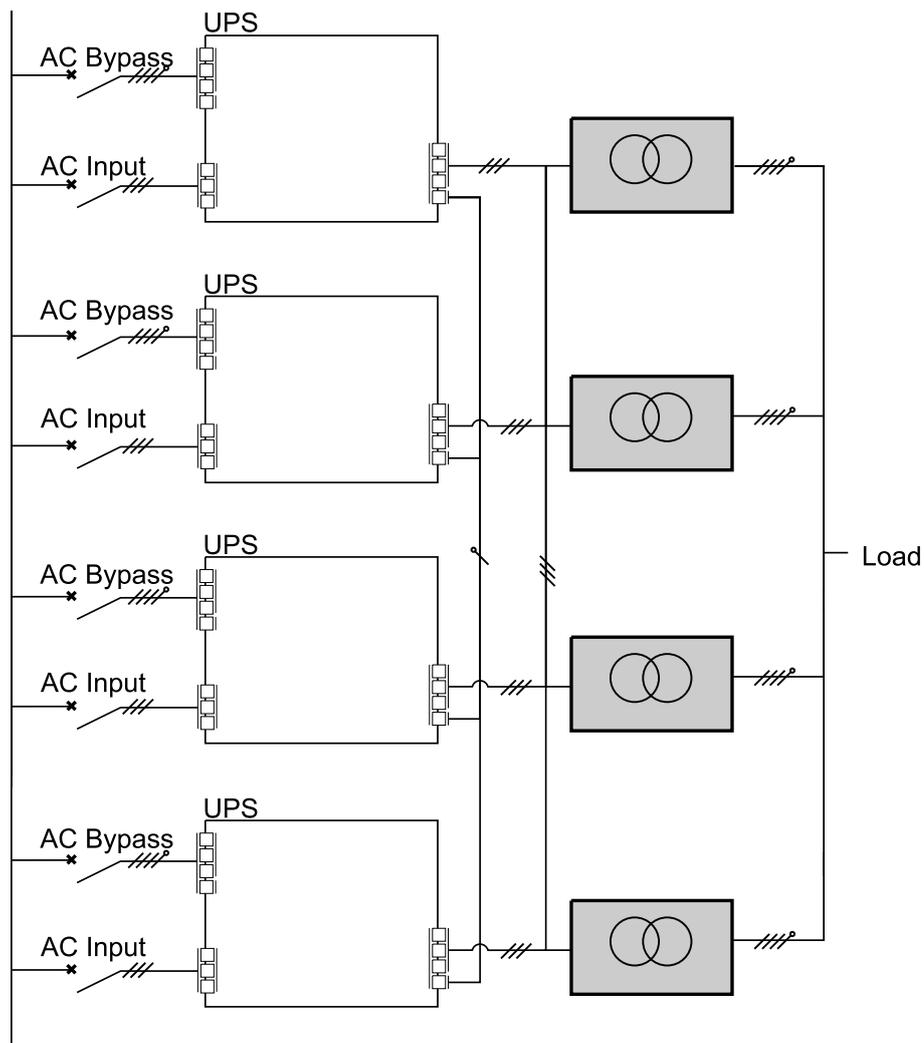
- Use power cables of equal resistance, equal length and equal size for the same function.
- To choose the correct upstream circuit breaker, see the table in *Install Isolation Transformer (Option)*, page 71.

**Failure to follow these instructions will result in death or serious injury.**

#### Two UPSs in Parallel



**Four UPSs in Parallel**

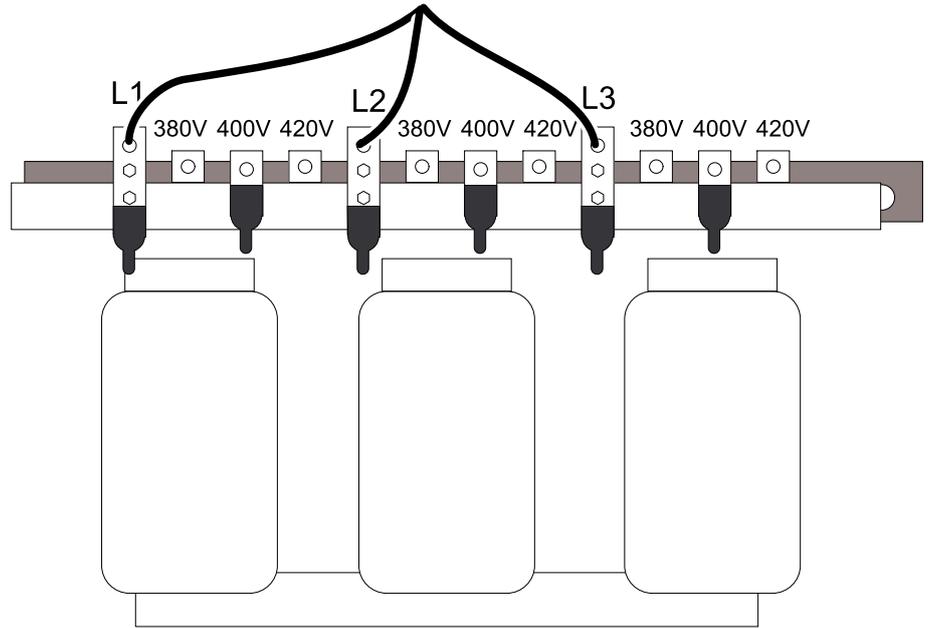


**Install Input Isolation Transformer**

<b>⚠ DANGER</b>
<b>HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH</b>
Connect PE cables to the transformer first.
<b>Failure to follow these instructions will result in death or serious injury.</b>

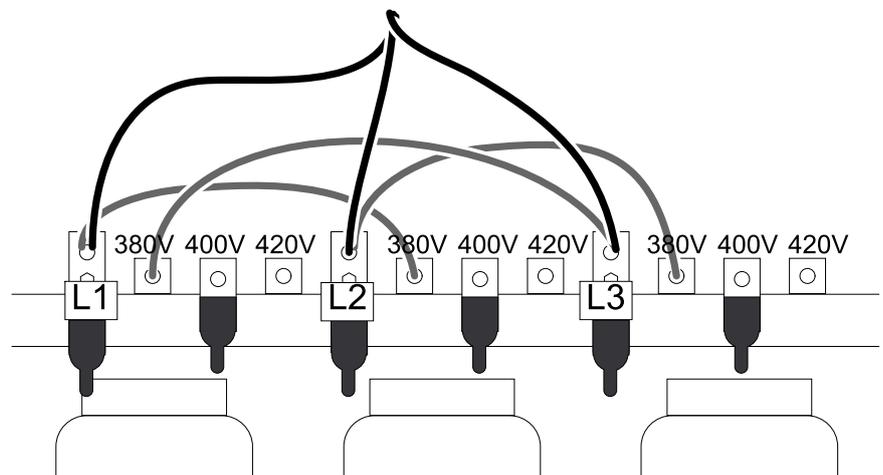
1. Connect a cable from the transformer input terminals (L1, L2, L3) to the utility/ mains supply.

**Input Terminals on the Transformer**



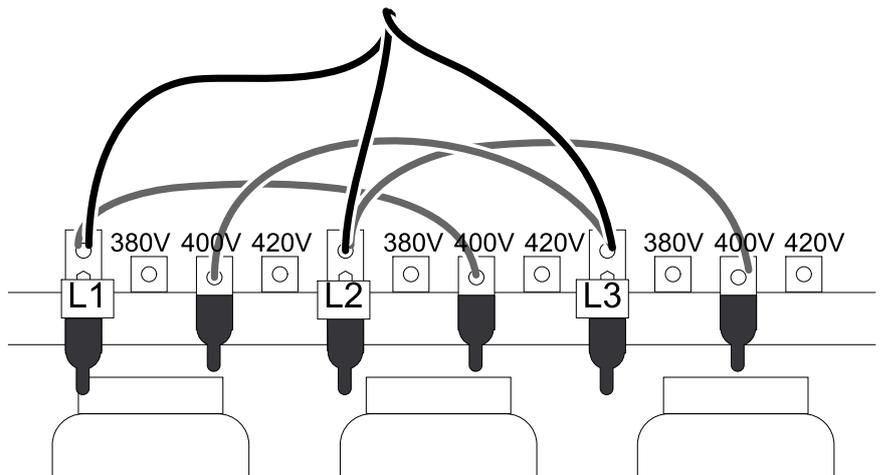
2. On the input transformer terminals, do the following interconnections depending on your available voltage from the utility/mains supply at input side to transformer:
  - a. Utility/mains supply 380 V: Interconnect the terminals as shown.

**Transformer Input Cable Interconnection— Utility/Mains Supply 380 V**



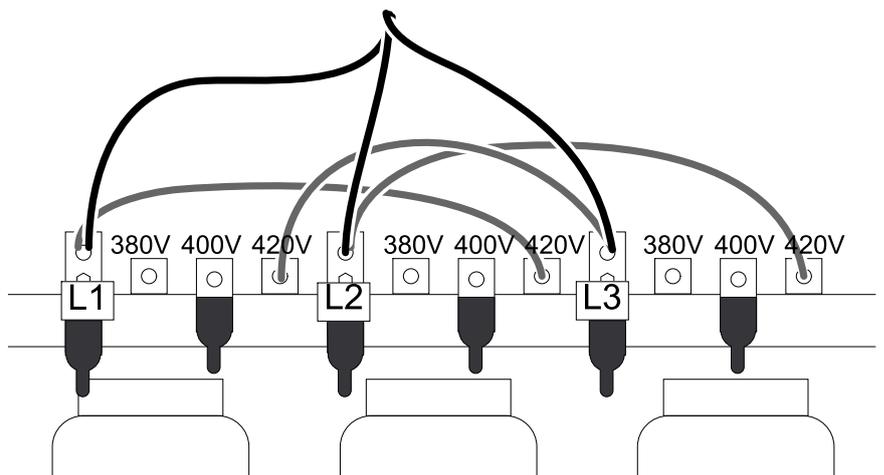
- b. Utility/mains supply 400 V: Interconnect the terminals as shown.

**Transformer Input Cable Interconnection— Utility/Mains Supply 400 V**

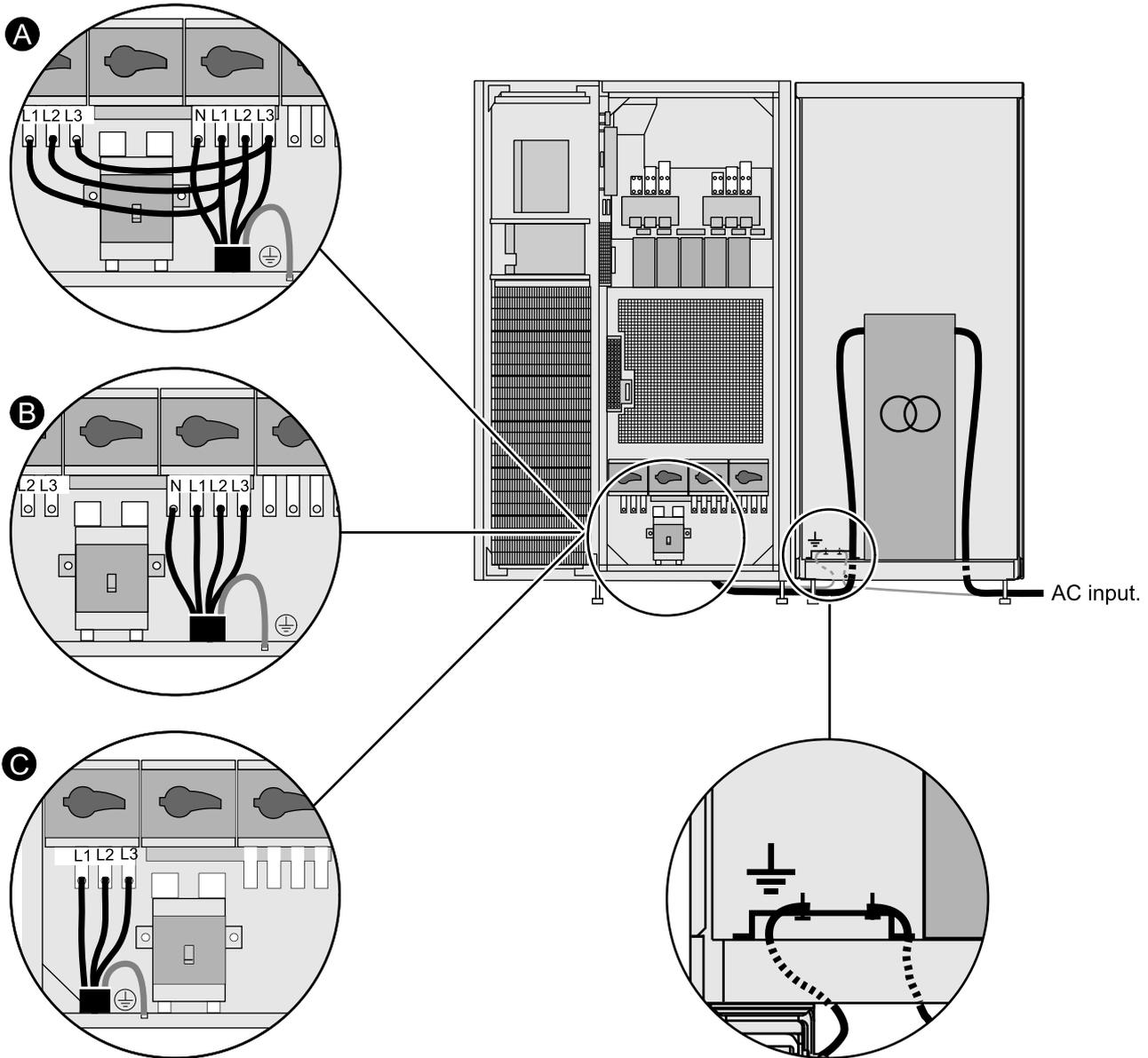


- c. Utility/mains supply 420 V: Interconnect the terminals as shown.

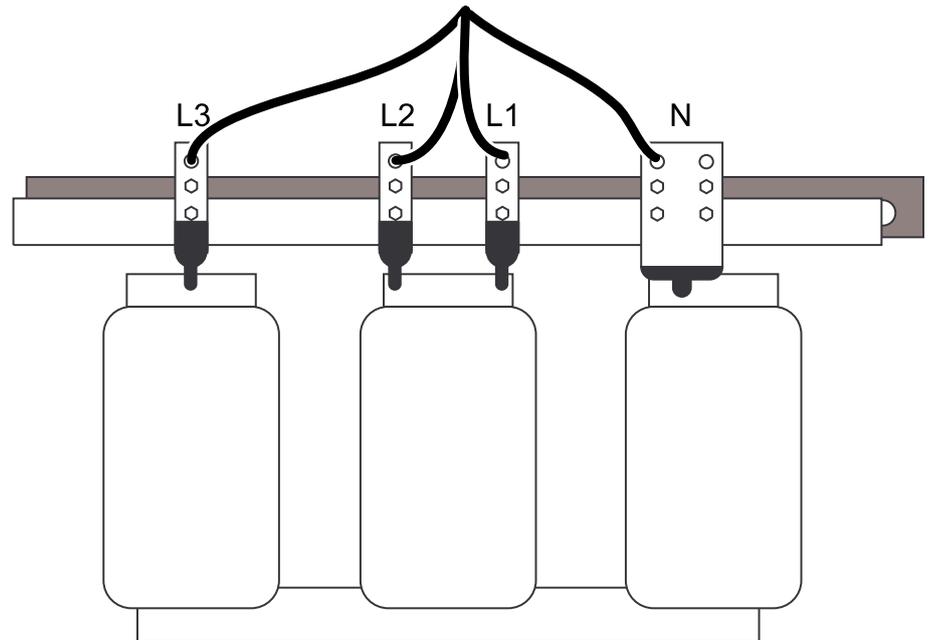
**Transformer Input Cable Interconnection— Utility/Mains Supply 420 V**



## 3. Connect the following cables as per your system:



- a. **An AC Input transformer for single utility/mains systems:** Connect L1, L2, L3 from the input terminals to the bypass terminals on the UPS. Connect a cable from the transformer output terminals (L1, L2, L3) to the UPS bypass terminals (L1, L2, L3) and to PE.
- b. **An AC Bypass transformer for dual utility/mains systems:** Connect a cable from the transformer output terminals (L1, L2, L3, N) to the UPS bypass terminals (L1, L2, L3, N) and to PE.
- c. **An AC Input transformer for dual utility/mains systems:** Connect a cable from the transformer output terminals (L1, L2, L3) to the UPS input terminals (L1, L2, L3) and to PE.

**Output Terminals on the Transformer**

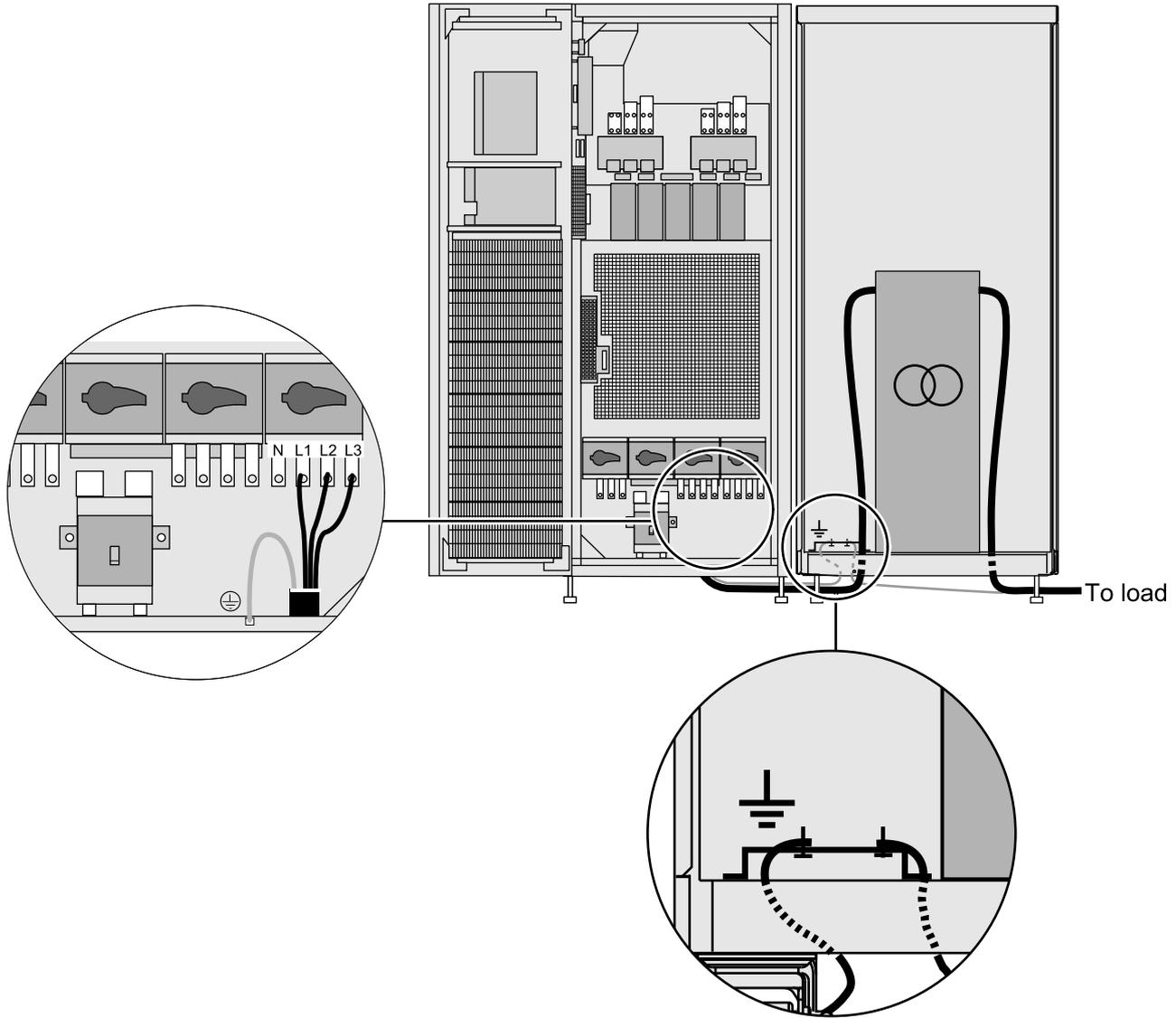
**NOTE:** The neutral cable is not supplied.

**Install Output Isolation Transformer****⚠ DANGER**

**HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH**

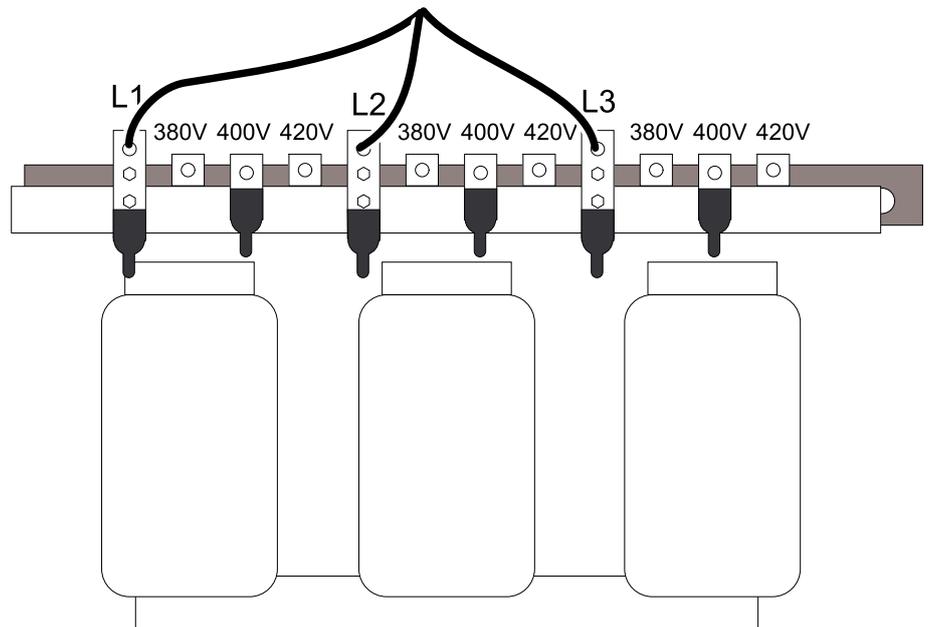
Connect PE cables to the transformer first.

**Failure to follow these instructions will result in death or serious injury.**



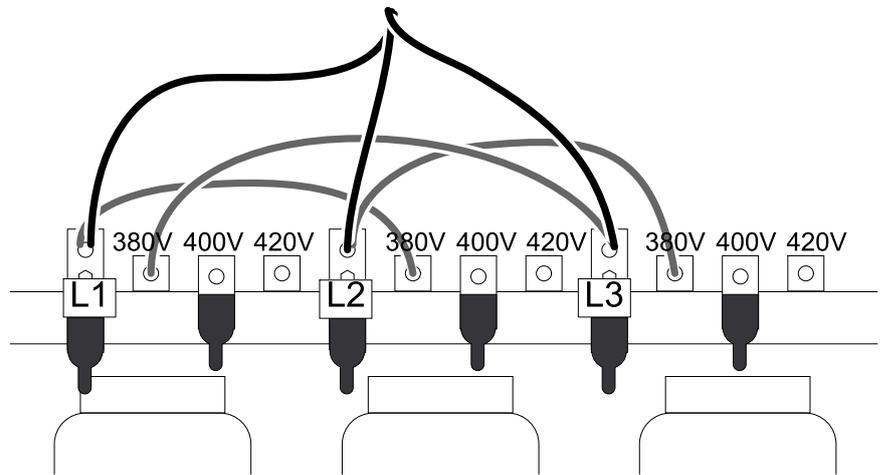
1. Connect a cable from the transformer input terminals (L1, L2, L3) to the UPS output terminals (L1, L2, L3) and to PE. Remove N if connected.

**Input Terminals on the Transformer**



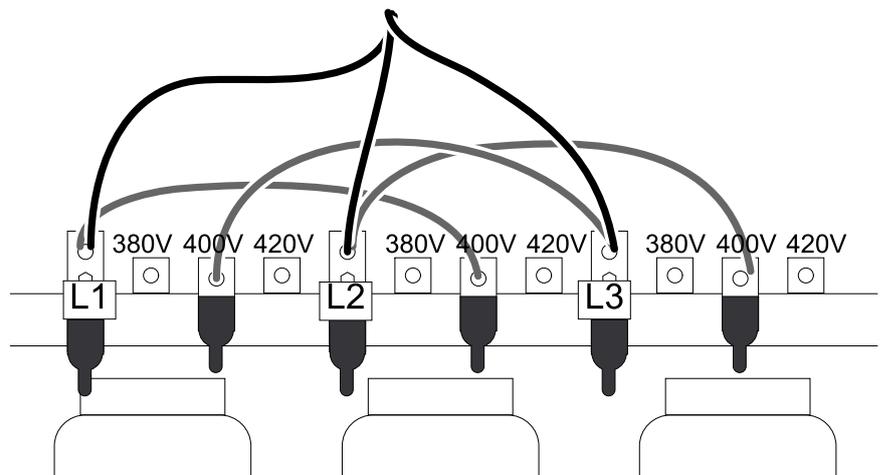
2. On the input transformer terminals, do the following interconnections depending on your available voltage from the utility/mains supply at input side to transformer:
  - a. Utility/mains supply 380 V: Interconnect the terminals as shown.

**Transformer Input Cable Interconnection— Utility/Mains Supply 380 V**



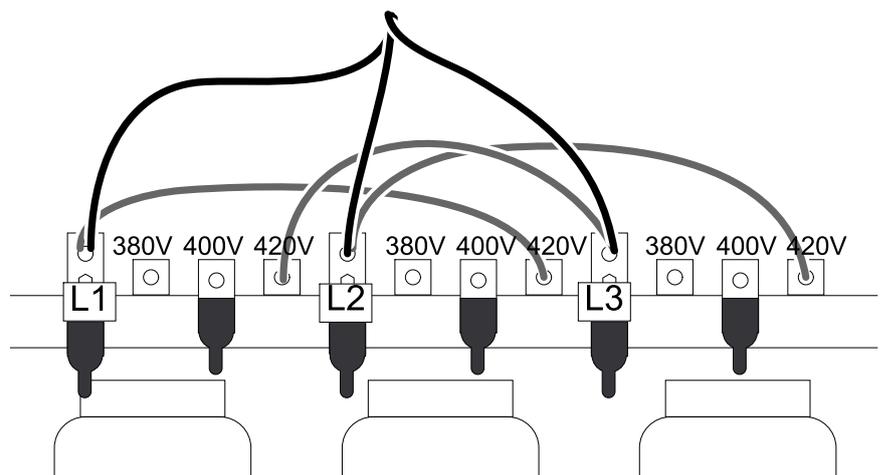
- b. Utility/mains supply 400 V: Interconnect the terminals as shown.

**Transformer Input Cable Interconnection— Utility/Mains Supply 400 V**



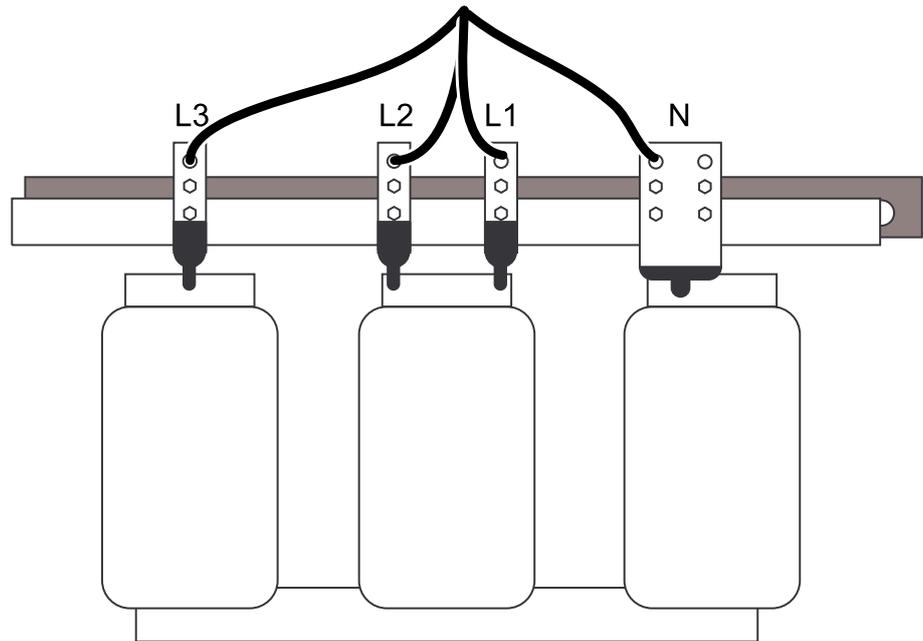
- c. Utility/mains supply 420 V: Interconnect the terminals as shown.

**Transformer Input Cable Interconnection— Utility/Mains Supply 420 V**



3. Connect a cable from the transformer output terminals (L1, L2, L3, N) to the load.

#### Output Terminals on the Transformer



4. For output transformers in parallel systems: parallel connect N between the output terminals on the UPSs and parallel connect the output of the UPSs. See *Transformer Configuration Options in Parallel UPS System, page 74* for details. This requires extra cables which are not provided by Schneider Electric.



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As standards, specifications, and design change from time to time,  
please ask for confirmation of the information given in this publication.

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